HOLE MAKING TOOLS

Metric Version Catalog 2012

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HOLE MAKING TOOLS Metric Version Catalog 2012

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The Ultimate Expert in Selecting the Best Tool

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SUMOCHAM Drills for Hole Making

ISCAR's **SUMOCHAM** drill family is the next evolution of the very successful **CHAMDRILL** and **CHAMDRILLJET** families.
The **SUMOCHAM** family has similar features, with improved head and pocket design, no setup time, Fast Metal Removal and economical indexing.
The **SUMOCHAM** comprises a revolutionary clamping that enables improved productivity output rates, while enabling more insert indexes.

The drill body features twisted coolant holes and exhibits a durable and stably constructed body.
The indexable heads are available in four different standard geometries, designed for drilling steel, stainless steel and exotic materials, cast iron or aluminum.
SUMOCHAM is the most productive and most profitable solution for the hole making industry.

P
Steel

M
Stainless Steel

K
Cast Iron

N
Aluminum

DR-TWIST Drills with Twisted Coolant Holes

The **DR-TWIST** drills use 6 sizes of square inserts with 4 cutting edges. They feature twisted coolant holes. The coolant holes do not pass through the center core of the drill and therefore the drill is strong and highly resistant to torsion. The flute design leaves much room for the chips to flow out of the hole uninterrupted.

For general applications and a wide range of materials, the **SUMO TEC** grade **IC808** should be used. **IC8080** is recommended to be used on external inserts for high speed machining of cast iron and alloy steel.

The **DR-TWIST** drills are available in a drilling depth to diameter ratio of 2xD, 3xD, 4xD and 5xD and in a diameter range of 12 to 60 mm. They are available in whole metric sizes as well as half sizes in the above-mentioned range.

DR-TWIST
INDEXABLE DRILL LINE

Large Diameter DR-TWIST Drills

ISCAR's family of 61 to 80 mm large diameter range is an extension of the 12 to 60 mm range. This family features a drill body that carries cartridges with square inserts. The inserts are available with two chipformer types and in the following grades: **IC808/908** for low alloy steel, stainless steel and high temperature alloys. **IC8080**, which is recommended for high speed drilling of cast iron and steel, should be used for the peripheral insert.

- Each drill is supplied with a set of shim plates used to change the drill's diameter.
- The **PVD IC808** and **CVD IC8080** carbide grades which are used on external inserts, provide a smooth cut and a very competitive prolonged edge life when compared with any throwaway drilling insert.
- The **DR-TWIST** large diameter drills are available in whole metric sizes.
- Can be used for intermediate hole sizes on lathes by offsetting the machine's X-axis to obtain the desired hole diameter.
- Can be used as boring tools to enlarge existing holes.
- Central insert should always be **IC808/908**. External insert can be **IC8080/9080**.

BAYO T-REAM

An Interchangeable Reaming Head System

ISCAR's **BAYO T-REAM** is a high speed reaming system. In comparison to the conventional method, this advanced solution allows for increasing the feeds dramatically. This feature is most advantageous in mass production industries.
When large quantities of workpieces are involved, the savings in machining time, labor cost and productivity are multiplied greatly.

The **BAYO T-REAM** consists of an interchangeable carbide reaming head with a unique quick-change bayonet mechanism, suitable for reaming applications of **H7** hole tolerance range.
The reaming head is mounted on a **HARD TOUCH** steel shank (solid carbide or heavy metal shanks are available on request). The reaming head is attached to the shank by a bayonet screw and a special key is used to clamp and release it.
The reamer has been designed with internal coolant holes for the most efficient direct cutting edges lubrication and extremely long tool life.

ISCARDR-DH

DR-DH Deep Drills for Milling Centers and Lathe Machines

These long drills for a drilling depth-to-diameter ratio of 7XD and up, may be used on standard horizontal milling centers, turning, and multi-task machines. Use of supplementary machine and setup can be avoided. The new drills can be used with the existing adaptations, not requiring any special coolant pressure or extra pump capacity.

DR-**DH** drills are available as semi-standard items upon requsest in the diameter range of 25.4 to 69.5 mm.

Features

- High feed drilling: up to 0.35 mm/rev for high productivity
- Excellent surface quality
- Good hole cylindricity and hole tolerance
- Large drilling depth: L=7xD and higher – up to 800 mm
- Carries standard **SOMX**/**SOMT** indexable inserts with 4 cutting edges
- No dedicated machine or extra setup needed
- Standard coolant pressure is used in general drilling
- Standard indexable, double ended guide pads
- Used for steel (ISO P) and cast iron (ISO K) materials

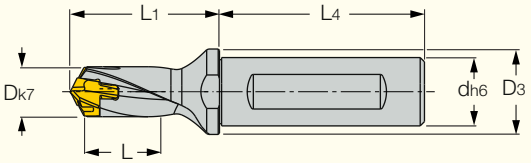
INDEXABLE DRILLS

Member IMC Group


SUMOCHAM
CHAMDRILL LINE
P
M
K
N

DCN A-1.5D

Indexable Head Drills with Coolant Holes and One Flat Shanks, Drilling Depth 1.5xD



Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCN 060-009-12A-1.5D	6.00	6.40	9.0	12.00	16.00	23.0	45.0	6.0	K DCN 6-9.99
DCN 065-010-12A-1.5D	6.50	6.90	10.0	12.00	16.00	24.1	45.0	6.0	K DCN 6-9.99
DCN 070-011-12A-1.5D	7.00	7.40	11.0	12.00	16.00	25.1	45.0	7.0	K DCN 6-9.99
DCN 075-011-12A-1.5D	7.50	7.90	11.0	12.00	16.00	25.9	45.0	7.0	K DCN 6-9.99
DCN 080-012-12A-1.5D	8.00	8.40	12.0	12.00	16.00	27.9	45.0	8.0	K DCN 6-9.99
DCN 085-013-12A-1.5D	8.50	8.90	13.0	12.00	16.00	40.9	45.0	8.0	K DCN 6-9.99
DCN 090-014-12A-1.5D	9.00	9.40	14.0	12.00	16.00	29.3	45.0	9.0	K DCN 6-9.99
DCN 095-014-12A-1.5D	9.50	9.90	14.0	12.00	16.00	43.9	45.0	9.0	K DCN 6-9.99
DCN 100-015-16A-1.5D	10.00	10.40	15.0	16.00	20.00	31.2	48.0	10.0	K DCN 10-13.99
DCN 105-016-16A-1.5D	10.50	10.90	16.0	16.00	16.00	32.0	48.0	10.0	K DCN 10-13.99
DCN 110-017-16A-1.5D	11.00	11.40	17.0	16.00	20.00	33.1	48.0	11.0	K DCN 10-13.99
DCN 115-017-16A-1.5D	11.50	11.90	17.0	16.00	20.00	33.9	48.0	11.0	K DCN 10-13.99
DCN 120-018-16A-1.5D	12.00	12.40	18.0	16.00	20.00	35.0	48.0	12.0	K DCN 10-13.99
DCN 125-019-16A-1.5D	12.50	12.90	19.0	16.00	20.00	35.8	48.0	12.0	K DCN 10-13.99
DCN 130-020-16A-1.5D	13.00	13.40	20.0	16.00	20.00	37.1	48.0	13.0	K DCN 10-13.99
DCN 135-020-16A-1.5D	13.50	13.90	20.0	16.00	20.00	37.9	48.0	13.0	K DCN 10-13.99
DCN 140-021-16A-1.5D	14.00	14.40	21.0	16.00	20.00	41.1	48.0	14.0	K DCN 14-17.99
DCN 145-022-16A-1.5D	14.50	14.90	22.0	16.00	20.00	41.9	48.0	14.0	K DCN 14-17.99
DCN 150-023-20A-1.5D	15.00	15.90	23.0	20.00	25.00	46.2	50.0	15.0	K DCN 14-17.99
DCN 160-024-20A-1.5D	16.00	16.90	24.0	20.00	25.00	49.3	50.0	16.0	K DCN 14-17.99
DCN 170-026-20A-1.5D	17.00	17.90	26.0	20.00	25.00	52.4	50.0	17.0	K DCN 14-17.99
DCN 180-027-25A-1.5D	18.00	18.90	27.0	25.00	32.00	55.5	56.0	18.0	K DCN 18-21.99
DCN 190-029-25A-1.5D	19.00	19.90	29.0	25.00	32.00	58.5	56.0	19.0	K DCN 18-21.99
DCN 200-030-25A-1.5D	20.00	20.90	30.0	25.00	32.00	61.6	56.0	20.0	K DCN 18-21.99
DCN 210-032-25A-1.5D	21.00	21.90	32.0	25.00	32.00	64.7	56.0	21.0	K DCN 18-21.99
DCN 220-033-25A-1.5D	22.00	22.90	33.0	25.00	32.00	67.8	56.0	22.0	K DCN 22-26.99
DCN 230-035-32A-1.5D	23.00	23.90	35.0	32.00	42.00	70.9	60.0	23.0	K DCN 22-26.99
DCN 240-036-32A-1.5D	24.00	24.90	36.0	32.00	42.00	74.0	60.0	24.0	K DCN 22-26.99
DCN 250-038-32A-1.5D	25.00	25.90	38.0	32.00	42.00	77.0	60.0	25.0	K DCN 22-26.99

• For user guide and cutting conditions, see pages B22-38.

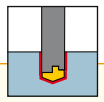
(1) Do not mount smaller drilling heads than specified range for drill body.

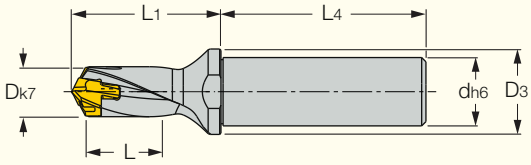
For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

Standard Tools

DCN R-1.5D

Indexable Head Drills with Coolant Holes and Cylindrical Shanks, Drilling Depth 1.5xD





Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCN 060-009-12R-1.5D	6.00	6.40	9.0	12.00	16.00	23.0	45.0	6.0	K DCN 6-9.99
DCN 065-010-12R-1.5D	6.50	6.90	10.0	12.00	16.00	24.1	45.0	6.0	K DCN 6-9.99
DCN 070-011-12R-1.5D	7.00	7.40	11.0	12.00	16.00	25.1	45.0	7.0	K DCN 6-9.99
DCN 075-011-12R-1.5D	7.50	7.90	11.0	12.00	16.00	25.9	45.0	7.0	K DCN 6-9.99
DCN 080-012-12R-1.5D	8.00	8.40	12.0	12.00	16.00	27.9	45.0	8.0	K DCN 6-9.99
DCN 085-013-12R-1.5D	8.50	8.90	13.0	12.00	16.00	40.9	45.0	8.0	K DCN 6-9.99
DCN 090-014-12R-1.5D	9.00	9.40	14.0	12.00	16.00	29.3	45.0	9.0	K DCN 6-9.99
DCN 095-014-12R-1.5D	9.50	9.90	14.0	12.00	16.00	43.9	45.0	9.0	K DCN 6-9.99
DCN 100-015-16R-1.5D	10.00	10.40	15.0	16.00	20.00	31.2	48.0	10.0	K DCN 10-13.99
DCN 105-016-16R-1.5D	10.50	10.90	16.0	16.00	20.00	32.0	48.0	10.0	K DCN 10-13.99
DCN 110-017-16R-1.5D	11.00	11.40	17.0	16.00	20.00	33.1	48.0	11.0	K DCN 10-13.99
DCN 115-017-16R-1.5D	11.50	11.90	17.0	16.00	20.00	33.9	48.0	11.0	K DCN 10-13.99
DCN 120-018-16R-1.5D	12.00	12.40	18.0	16.00	20.00	35.0	48.0	12.0	K DCN 10-13.99
DCN 125-019-16R-1.5D	12.50	12.90	19.0	16.00	20.00	35.8	48.0	12.0	K DCN 10-13.99
DCN 130-020-16R-1.5D	13.00	13.40	20.0	16.00	20.00	37.1	48.0	13.0	K DCN 10-13.99
DCN 135-020-16R-1.5D	13.50	13.90	20.0	16.00	20.00	37.9	48.0	13.0	K DCN 10-13.99
DCN 140-021-16R-1.5D	14.00	14.40	21.0	16.00	20.00	41.1	48.0	14.0	K DCN 14-17.99
DCN 145-022-16R-1.5D	14.50	14.90	22.0	16.00	20.00	41.9	48.0	14.0	K DCN 14-17.99
DCN 150-023-20R-1.5D	15.00	15.90	23.0	20.00	25.00	46.2	50.0	15.0	K DCN 14-17.99
DCN 160-024-20R-1.5D	16.00	16.90	24.0	20.00	25.00	49.3	50.0	16.0	K DCN 14-17.99
DCN 170-026-20R-1.5D	17.00	17.90	26.0	20.00	25.00	52.4	50.0	17.0	K DCN 14-17.99
DCN 180-027-25R-1.5D	18.00	18.90	27.0	25.00	32.00	55.5	56.0	18.0	K DCN 18-21.99
DCN 190-029-25R-1.5D	19.00	19.90	29.0	25.00	32.00	58.5	56.0	19.0	K DCN 18-21.99
DCN 200-030-25R-1.5D	20.00	20.90	30.0	25.00	32.00	61.6	56.0	20.0	K DCN 18-21.99
DCN 210-032-25R-1.5D	21.00	21.90	32.0	25.00	32.00	64.7	56.0	21.0	K DCN 18-21.99
DCN 220-033-25R-1.5D	22.00	22.90	33.0	25.00	32.00	67.8	56.0	22.0	K DCN 22-26.99
DCN 230-035-32R-1.5D	23.00	23.90	35.0	32.00	42.00	70.9	60.0	23.0	K DCN 22-26.99
DCN 240-036-32R-1.5D	24.00	24.90	36.0	32.00	42.00	74.0	60.0	24.0	K DCN 22-26.99
DCN 250-038-32R-1.5D	25.00	25.90	38.0	32.00	42.00	77.0	60.0	25.0	K DCN 22-26.99

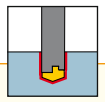
• For user guide and cutting conditions, see pages B22-38.

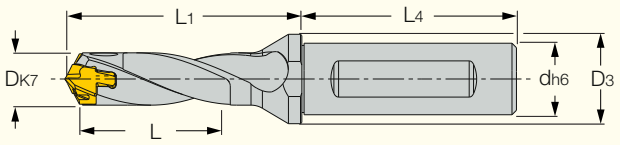
(1) Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

DCN A-3D

Indexable Head Drills with Coolant Holes and One Flat Shanks, Drilling Depth 3xD





	Dimensions								
Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCN 060-018-12A-3D	6.00	6.40	18.0	12.00	16.00	32.0	45.0	6.0	K DCN 6-9.99
DCN 065-020-12A-3D	6.50	6.90	20.0	12.00	16.00	33.8	45.0	6.0	K DCN 6-9.99
DCN 070-021-12A-3D	7.00	7.40	21.0	12.00	16.00	35.6	45.0	7.0	K DCN 6-9.99
DCN 075-023-12A-3D	7.50	7.90	23.0	12.00	16.00	35.6	45.0	7.0	K DCN 6-9.99
DCN 080-024-12A-3D	8.00	8.40	24.0	12.00	16.00	39.4	45.0	8.0	K DCN 6-9.99
DCN 085-025-12A-3D	8.50	8.90	25.0	12.00	16.00	40.9	45.0	8.0	K DCN 6-9.99
DCN 090-027-12A-3D	9.00	9.40	27.0	12.00	16.00	42.8	45.0	9.0	K DCN 6-9.99
DCN 095-029-12A-3D	9.50	9.90	29.0	12.00	16.00	44.3	45.0	9.0	K DCN 6-9.99
DCN 100-030-16A-3D	10.00	10.40	30.0	16.00	20.00	46.2	48.0	10.0	K DCN 10-13.99
DCN 105-032-16A-3D	10.50	10.90	32.0	16.00	20.00	47.7	48.0	10.0	K DCN 10-13.99
DCN 110-033-16A-3D	11.00	11.40	33.0	16.00	20.00	49.6	48.0	11.0	K DCN 10-13.99
DCN 115-035-16A-3D	11.50	11.90	35.0	16.00	20.00	51.1	48.0	11.0	K DCN 10-13.99
DCN 120-036-16A-3D	12.00	12.40	36.0	16.00	20.00	53.0	48.0	12.0	K DCN 10-13.99
DCN 125-037-16A-3D	12.50	12.90	37.0	16.00	20.00	54.5	48.0	12.0	K DCN 10-13.99
DCN 130-039-16A-3D	13.00	13.40	39.0	16.00	20.00	56.6	48.0	13.0	K DCN 10-13.99
DCN 135-041-16A-3D	13.50	13.90	41.0	16.00	20.00	58.1	48.0	13.0	K DCN 10-13.99
DCN 140-042-16A-3D	14.00	14.40	42.0	16.00	20.00	62.1	48.0	14.0	K DCN 14-17.99
DCN 145-044-16A-3D	14.50	14.90	44.0	16.00	20.00	63.6	48.0	14.0	K DCN 14-17.99
DCN 150-045-20A-3D	15.00	15.90	45.0	20.00	25.00	68.7	50.0	15.0	K DCN 14-17.99
DCN 160-048-20A-3D	16.00	16.90	48.0	20.00	25.00	73.3	50.0	16.0	K DCN 14-17.99
DCN 170-051-20A-3D	17.00	17.90	51.0	20.00	25.00	77.9	50.0	17.0	K DCN 14-17.99
DCN 180-054-25A-3D	18.00	18.90	54.0	25.00	32.00	82.5	56.0	18.0	K DCN 18-21.99
DCN 190-057-25A-3D	19.00	19.90	57.0	25.00	32.00	87.0	56.0	19.0	K DCN 18-21.99
DCN 200-060-25A-3D	20.00	20.90	60.0	25.00	32.00	91.6	56.0	20.0	K DCN 18-21.99
DCN 210-063-25A-3D	21.00	21.90	63.0	25.00	32.00	96.2	56.0	21.0	K DCN 18-21.99
DCN 220-066-25A-3D	22.00	22.90	66.0	25.00	32.00	100.8	56.0	22.0	K DCN 22-26.99
DCN 230-069-32A-3D	23.00	23.90	69.0	32.00	42.00	105.4	60.0	23.0	K DCN 22-26.99
DCN 240-072-32A-3D	24.00	24.90	72.0	32.00	42.00	110.0	60.0	24.0	K DCN 22-26.99
DCN 250-075-32A-3D	25.00	25.90	75.0	32.00	42.00	114.5	60.0	25.0	K DCN 22-26.99
DCN 260-078-32A-3D	26.00	26.90	78.0	32.00	42.00	119.3	60.0	26.0	K DCN 22-26.99
DCN 270-081-40A-3D	27.00	27.90	81.0	40.00	50.00	124.2	68.0	27.0	KDCN 27-32.99
DCN 280-084-40A-3D	28.00	28.90	84.0	40.00	50.00	129.0	68.0	28.0	KDCN 27-32.99
DCN 290-087-40A-3D	29.00	29.90	87.0	40.00	50.00	133.9	68.0	29.0	KDCN 27-32.99
DCN 300-090-40A-3D	30.00	30.90	90.0	40.00	50.00	138.7	68.0	30.0	KDCN 27-32.99
DCN 310-093-40A-3D	31.00	31.90	93.0	40.00	50.00	143.6	68.0	31.0	KDCN 27-32.99
DCN 320-096-40A-3D	32.00	32.90	96.0	40.00	50.00	148.4	68.0	32.0	KDCN 27-32.99

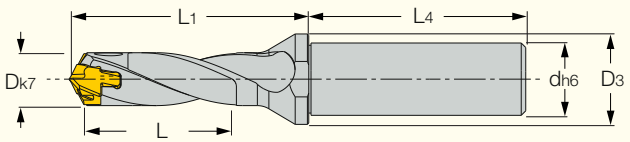
• For user guide and cutting conditions, see pages B22-38.

(1) Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

DCN R-3D

Indexable Head Drills with Coolant Holes and Cylindrical Shanks, Drilling Depth 3xD



Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCN 060-018-12R-3D	6.00	6.40	18.0	12.00	16.00	32.0	45.0	6.0	K DCN 6-9.99
DCN 065-020-12R-3D	6.50	6.90	20.0	12.00	16.00	33.8	45.0	6.0	K DCN 6-9.99
DCN 070-021-12R-3D	7.00	7.40	21.0	12.00	16.00	35.6	45.0	7.0	K DCN 6-9.99
DCN 075-023-12R-3D	7.50	7.90	23.0	12.00	16.00	35.6	45.0	7.0	K DCN 6-9.99
DCN 080-024-12R-3D	8.00	8.40	24.0	12.00	16.00	39.4	45.0	8.0	K DCN 6-9.99
DCN 085-025-12R-3D	8.50	8.90	25.0	12.00	16.00	40.9	45.0	8.0	K DCN 6-9.99
DCN 090-027-12R-3D	9.00	9.40	27.0	12.00	16.00	42.8	45.0	9.0	K DCN 6-9.99
DCN 095-029-12R-3D	9.50	9.90	29.0	12.00	16.00	44.3	45.0	9.0	K DCN 6-9.99
DCN 100-030-16R-3D	10.00	10.40	30.0	16.00	20.00	46.2	48.0	10.0	K DCN 10-13.99
DCN 105-032-16R-3D	10.50	10.90	32.0	16.00	20.00	47.7	48.0	10.0	K DCN 10-13.99
DCN 110-033-16R-3D	11.00	11.40	33.0	16.00	20.00	49.6	48.0	11.0	K DCN 10-13.99
DCN 115-035-16R-3D	11.50	11.90	35.0	16.00	20.00	51.1	48.0	11.0	K DCN 10-13.99
DCN 120-036-16R-3D	12.00	12.40	36.0	16.00	20.00	53.0	48.0	12.0	K DCN 10-13.99
DCN 125-037-16R-3D	12.50	12.90	37.0	16.00	20.00	54.5	48.0	12.0	K DCN 10-13.99
DCN 130-039-16R-3D	13.00	13.40	39.0	16.00	20.00	56.6	48.0	13.0	K DCN 10-13.99
DCN 135-041-16R-3D	13.50	13.90	41.0	16.00	20.00	58.1	48.0	13.0	K DCN 10-13.99
DCN 140-042-16R-3D	14.00	14.40	42.0	16.00	20.00	62.1	48.0	14.0	K DCN 14-17.99
DCN 145-044-16R-3D	14.50	14.90	44.0	16.00	20.00	63.6	48.0	14.0	K DCN 14-17.99
DCN 150-045-20R-3D	15.00	15.90	45.0	20.00	25.00	68.7	50.0	15.0	K DCN 14-17.99
DCN 160-048-20R-3D	16.00	16.90	48.0	20.00	25.00	73.3	50.0	16.0	K DCN 14-17.99
DCN 170-051-20R-3D	17.00	17.90	51.0	20.00	25.00	77.9	50.0	17.0	K DCN 14-17.99
DCN 180-054-25R-3D	18.00	18.90	54.0	25.00	32.00	82.5	56.0	18.0	K DCN 18-21.99
DCN 190-057-25R-3D	19.00	19.90	57.0	25.00	32.00	87.0	56.0	19.0	K DCN 18-21.99
DCN 200-060-25R-3D	20.00	20.90	60.0	25.00	32.00	91.6	56.0	20.0	K DCN 18-21.99
DCN 210-063-25R-3D	21.00	21.90	63.0	25.00	32.00	96.2	56.0	21.0	K DCN 18-21.99
DCN 220-066-25R-3D	22.00	22.90	66.0	25.00	32.00	100.8	56.0	22.0	K DCN 22-26.99
DCN 230-069-32R-3D	23.00	23.90	69.0	32.00	42.00	105.4	60.0	23.0	K DCN 22-26.99
DCN 240-072-32R-3D	24.00	24.90	72.0	32.00	42.00	110.0	60.0	24.0	K DCN 22-26.99
DCN 250-075-32R-3D	25.00	25.90	75.0	32.00	42.00	114.5	60.0	25.0	K DCN 22-26.99

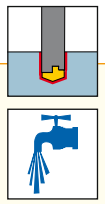
- For user guide and cutting conditions, see pages B22-38.

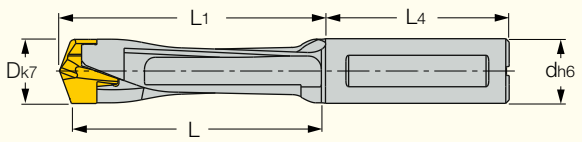
(1) Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

DCNS-3D

Indexable Head Drills without a Flange, Drilling Depth 3xD. Suitable for Chamfering Holders.





Designation	D min(1)	D max	L	d(2)	L1	L4	Po. Size	Clamping Key
DCNS 075-022-080B-3D	7.50	7.90	22.5	8.00	31.5	43.0	8.0	K DCN 6-9.99
DCNS 080-024-080B-3D	8.00	8.40	24.0	8.00	33.4	43.0	8.0	K DCN 6-9.99
DCNS 085-025-090B-3D	8.50	8.90	25.5	9.00	35.7	43.0	8.0	K DCN 6-9.99
DCNS 090-027-090B-3D	9.00	9.40	27.0	9.00	37.8	43.0	9.0	K DCN 6-9.99
DCNS 095-029-100B-3D	9.50	9.90	28.5	10.00	39.9	43.0	9.0	K DCN 6-9.99
DCNS 100-030-100B-3D	10.00	10.40	30.0	10.00	42.0	43.0	10.0	K DCN 10-13.99
DCNS 105-032-110B-3D	10.50	10.90	31.5	11.00	44.1	43.0	10.0	K DCN 10-13.99
DCNS 110-033-110B-3D	11.00	11.40	33.0	11.00	46.2	43.0	11.0	K DCN 10-13.99
DCNS 115-035-120B-3D	11.50	11.90	34.5	12.00	48.3	43.0	11.0	K DCN 10-13.99
DCNS 120-036-120B-3D	12.00	12.40	36.0	12.00	52.0	43.0	12.0	K DCN 10-13.99
DCNS 125-037-130B-3D	12.50	12.90	37.5	13.00	52.5	43.0	12.0	K DCN 10-13.99
DCNS 130-039-130B-3D	13.00	13.40	39.0	13.00	54.6	45.0	13.0	K DCN 10-13.99
DCNS 135-041-140B-3D	13.50	13.90	40.5	14.00	56.7	45.0	13.0	K DCN 10-13.99
DCNS 140-042-140B-3D	14.00	14.40	42.0	14.00	58.8	45.0	14.0	K DCN 14-17.99
DCNS 145-044-150B-3D	14.50	14.90	43.5	15.00	60.9	45.0	14.0	K DCN 14-17.99
DCNS 150-045-150B-3D	15.00	15.90	45.0	15.00	63.0	45.0	15.0	K DCN 14-17.99
DCNS 160-048-160B-3D	16.00	16.90	48.0	16.00	69.7	48.0	16.0	K DCN 14-17.99
DCNS 170-051-170B-3D	17.00	17.90	51.0	17.00	71.4	48.0	17.0	K DCN 14-17.99
DCNS 180-054-180B-3D	18.00	18.90	54.0	18.00	75.6	48.0	18.0	K DCN 18-21.99
DCNS 190-057-190B-3D	19.00	19.90	57.0	19.00	78.2	54.0	19.0	K DCN 18-21.99
DCNS 200-060-200B-3D	20.00	20.90	60.0	20.00	84.0	54.0	20.0	K DCN 18-21.99
DCNS 210-063-210B-3D	21.00	21.90	63.0	21.00	88.2	54.0	21.0	K DCN 18-21.99
DCNS 220-066-220B-3D	22.00	22.90	66.0	22.00	92.4	60.0	22.0	K DCN 22-26.99
DCNS 230-069-230B-3D	23.00	23.90	69.0	23.00	96.6	60.0	23.0	K DCN 22-26.99
DCNS 240-072-240B-3D	24.00	24.90	72.0	24.00	100.8	60.0	24.0	K DCN 22-26.99
DCNS 250-075-250B-3D	25.00	25.90	75.0	25.00	105.0	60.0	25.0	K DCN 22-26.99

• For user guide and cutting conditions, see pages B22-38.

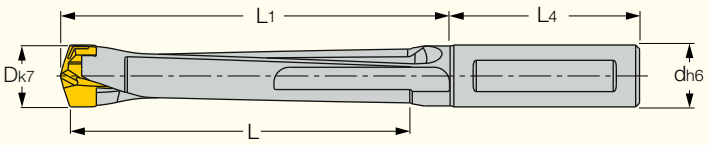
(1) Do not mount smaller drilling heads than specified range for drill body. (2) One flat shank type.

For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

For CHAMRING chamfering holders, see page B96

DCNS-5D

Indexable Head Drills without a Flange, Drilling Depth 5xD. Suitable for Chamfering Holders.



Designation	D min(1)	D max	L	d(2)	L1	L4	Po. Size	Clamping Key
DCNS 075-037-080B-5D	7.50	7.90	37.5	8.00	46.5	43.0	8.0	K DCN 6-9.99
DCNS 080-040-080B-5D	8.00	8.40	40.0	8.00	49.4	43.0	8.0	K DCN 6-9.99
DCNS 085-042-090B-5D	8.50	8.90	42.5	9.00	52.7	43.0	8.0	K DCN 6-9.99
DCNS 090-045-090B-5D	9.00	9.40	45.0	9.00	55.8	43.0	9.0	K DCN 6-9.99
DCNS 095-048-100B-5D	9.50	9.90	47.5	10.00	58.9	43.0	9.0	K DCN 6-9.99
DCNS 100-050-100B-5D	10.00	10.40	50.0	10.00	62.0	43.0	10.0	K DCN 10-13.99
DCNS 105-053-110B-5D	10.50	10.90	52.5	11.00	65.1	43.0	10.0	K DCN 10-13.99
DCNS 110-055-110B-5D	11.00	11.40	55.0	11.00	68.2	43.0	11.0	K DCN 10-13.99
DCNS 115-058-120B-5D	11.50	11.90	57.5	12.00	71.3	43.0	11.0	K DCN 10-13.99
DCNS 120-060-120B-5D	12.00	12.40	60.0	12.00	76.0	43.0	12.0	K DCN 10-13.99
DCNS 125-062-130B-5D	12.50	12.90	62.5	13.00	77.5	43.0	12.0	K DCN 10-13.99
DCNS 130-065-130B-5D	13.00	13.40	65.0	13.00	80.6	45.0	13.0	K DCN 10-13.99
DCNS 135-068-140B-5D	13.50	13.90	67.5	14.00	83.7	45.0	13.0	K DCN 10-13.99
DCNS 140-070-140B-5D	14.00	14.40	70.0	14.00	86.8	45.0	14.0	K DCN 14-17.99
DCNS 145-073-150B-5D	14.50	14.90	72.5	15.00	89.9	45.0	14.0	K DCN 14-17.99
DCNS 150-075-150B-5D	15.00	15.90	75.0	15.00	93.0	45.0	15.0	K DCN 14-17.99
DCNS 160-080-160B-5D	16.00	16.90	80.0	16.00	101.7	48.0	16.0	K DCN 14-17.99
DCNS 170-085-170B-5D	17.00	17.90	85.0	17.00	105.4	48.0	17.0	K DCN 14-17.99
DCNS 180-090-180B-5D	18.00	18.90	90.0	18.00	111.6	48.0	18.0	K DCN 18-21.99
DCNS 190-095-190B-5D	19.00	19.90	95.0	19.00	116.2	54.0	19.0	K DCN 18-21.99
DCNS 200-100-200B-5D	20.00	20.90	100.0	20.00	124.0	54.0	20.0	K DCN 18-21.99
DCNS 210-105-210B-5D	21.00	21.90	105.0	21.00	130.2	54.0	21.0	K DCN 18-21.99
DCNS 220-110-220B-5D	22.00	22.90	110.0	22.00	136.4	60.0	22.0	K DCN 22-26.99
DCNS 230-115-230B-5D	23.00	23.90	115.0	23.00	142.6	60.0	23.0	K DCN 22-26.99
DCNS 240-120-240B-5D	24.00	24.90	120.0	24.00	148.8	60.0	24.0	K DCN 22-26.99
DCNS 250-125-250B-5D	25.00	25.90	125.0	25.00	155.0	60.0	25.0	K DCN 22-26.99

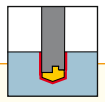
• For user guide and cutting conditions, see pages B22-38.

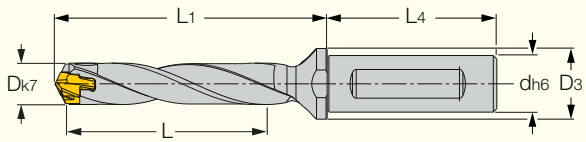
(1) Do not mount smaller drilling heads than specified range for drill body. (2) One flat shank type.

For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

DCN A-5D

Indexable Head Drills with Coolant Holes and One Flat Shanks, Drilling Depth 5xD





	Dimensions								
Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCN 060-030-12A-5D	6.00	6.40	30.0	12.00	16.00	44.0	45.0	6.0	K DCN 6-9.99
DCN 065-033-12A-5D	6.50	6.90	33.0	12.00	16.00	46.8	45.0	6.0	K DCN 6-9.99
DCN 070-035-12A-5D	7.00	7.40	35.0	12.00	16.00	49.6	45.0	7.0	K DCN 6-9.99
DCN 075-038-12A-5D	7.50	7.90	38.0	12.00	16.00	49.6	45.0	7.0	K DCN 6-9.99
DCN 080-040-12A-5D	8.00	8.40	40.0	12.00	16.00	55.4	45.0	8.0	K DCN 6-9.99
DCN 085-042-12A-5D	8.50	8.90	42.0	12.00	16.00	57.7	45.0	8.0	K DCN 6-9.99
DCN 090-045-12A-5D	9.00	9.40	45.0	12.00	16.00	60.8	45.0	9.0	K DCN 6-9.99
DCN 095-048-12A-5D	9.50	9.90	48.0	12.00	16.00	63.3	45.0	9.0	K DCN 6-9.99
DCN 100-050-16A-5D	10.00	10.40	50.0	16.00	20.00	66.2	48.0	10.0	K DCN 10-13.99
DCN 105-053-16A-5D	10.50	10.90	53.0	16.00	20.00	68.7	48.0	10.0	K DCN 10-13.99
DCN 110-055-16A-5D	11.00	11.40	55.0	16.00	20.00	71.6	48.0	11.0	K DCN 10-13.99
DCN 115-058-16A-5D	11.50	11.90	58.0	16.00	20.00	74.1	48.0	11.0	K DCN 10-13.99
DCN 120-060-16A-5D	12.00	12.40	60.0	16.00	20.00	77.0	48.0	12.0	K DCN 10-13.99
DCN 125-062-16A-5D	12.50	12.90	62.0	16.00	20.00	79.5	48.0	12.0	K DCN 10-13.99
DCN 130-065-16A-5D	13.00	13.40	65.0	16.00	20.00	82.6	48.0	13.0	K DCN 10-13.99
DCN 135-068-16A-5D	13.50	13.90	68.0	16.00	20.00	85.1	48.0	13.0	K DCN 10-13.99
DCN 140-070-16A-5D	14.00	14.40	70.0	16.00	20.00	90.2	48.0	14.0	K DCN 14-17.99
DCN 145-073-16A-5D	14.50	14.90	73.0	16.00	20.00	92.7	48.0	14.0	K DCN 14-17.99
DCN 150-075-20A-5D	15.00	15.90	75.0	20.00	25.00	98.7	50.0	15.0	K DCN 14-17.99
DCN 160-080-20A-5D	16.00	16.90	80.0	20.00	25.00	105.3	50.0	16.0	K DCN 14-17.99
DCN 170-085-20A-5D	17.00	17.90	85.0	20.00	25.00	111.9	50.0	17.0	K DCN 14-17.99
DCN 180-090-25A-5D	18.00	18.90	90.0	25.00	32.00	118.5	56.0	18.0	K DCN 18-21.99
DCN 190-095-25A-5D	19.00	19.90	95.0	25.00	32.00	125.0	56.0	19.0	K DCN 18-21.99
DCN 200-100-25A-5D	20.00	20.90	100.0	25.00	32.00	131.6	56.0	20.0	K DCN 18-21.99
DCN 210-105-25A-5D	21.00	21.90	105.0	25.00	32.00	138.2	56.0	21.0	K DCN 18-21.99
DCN 220-110-25A-5D	22.00	22.90	110.0	25.00	32.00	144.8	56.0	22.0	K DCN 22-26.99
DCN 230-115-32A-5D	23.00	23.90	115.0	32.00	42.00	151.4	60.0	23.0	K DCN 22-26.99
DCN 240-120-32A-5D	24.00	24.90	120.0	32.00	42.00	158.0	60.0	24.0	K DCN 22-26.99
DCN 250-125-32A-5D	25.00	25.90	125.0	32.00	42.00	164.5	60.0	25.0	K DCN 22-26.99
DCN 260-130-32A-5D	26.00	26.90	130.0	32.00	42.00	171.3	60.0	26.0	K DCN 22-26.99
DCN 270-135-40A-5D	27.00	27.90	135.0	40.00	50.00	178.2	68.0	27.0	K DCN 27-32.99
DCN 280-140-40A-5D	28.00	28.90	140.0	40.00	50.00	185.0	68.0	28.0	K DCN 27-32.99
DCN 290-145-40A-5D	29.00	29.90	145.0	40.00	50.00	191.9	68.0	29.0	K DCN 27-32.99
DCN 300-150-40A-5D	30.00	30.90	150.0	40.00	50.00	198.7	68.0	30.0	K DCN 27-32.99
DCN 310-155-40A-5D	31.00	31.90	155.0	40.00	50.00	205.6	68.0	31.0	K DCN 27-32.99
DCN 320-160-40A-5D	32.00	32.90	160.0	40.00	50.00	212.4	68.0	32.0	K DCN 27-32.99

• For user guide and cutting conditions, see pages B22-38.

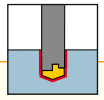
(1) Do not mount smaller drilling heads than specified range for drill body.

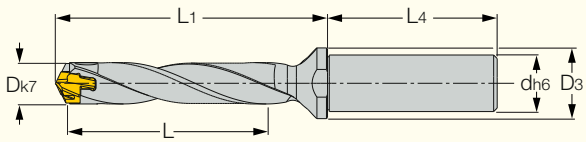
For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

SUMOCHAM
CHAMDRILL LINE

DCN R-5D

Indexable Head Drills with Coolant Holes and Cylindrical Shanks, Drilling Depth 5xD





Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCN 060-030-12R-5D	6.00	6.40	30.0	12.00	16.00	44.0	45.0	6.0	K DCN 6-9.99
DCN 065-033-12R-5D	6.50	6.90	33.0	12.00	16.00	46.8	45.0	6.0	K DCN 6-9.99
DCN 070-035-12R-5D	7.00	7.40	35.0	12.00	16.00	49.6	45.0	7.0	K DCN 6-9.99
DCN 075-038-12R-5D	7.50	7.90	38.0	12.00	16.00	49.6	45.0	7.0	K DCN 6-9.99
DCN 080-040-12R-5D	8.00	8.40	40.0	12.00	16.00	55.4	45.0	8.0	K DCN 6-9.99
DCN 085-042-12R-5D	8.50	8.90	42.0	12.00	16.00	57.7	45.0	8.0	K DCN 6-9.99
DCN 090-045-12R-5D	9.00	9.40	45.0	12.00	16.00	60.8	45.0	9.0	K DCN 6-9.99
DCN 095-048-12R-5D	9.50	9.90	48.0	12.00	16.00	63.3	45.0	9.0	K DCN 6-9.99
DCN 100-050-16R-5D	10.00	10.40	50.0	16.00	20.00	66.2	48.0	10.0	K DCN 10-13.99
DCN 105-053-16R-5D	10.50	10.90	53.0	16.00	20.00	68.7	48.0	10.0	K DCN 10-13.99
DCN 110-055-16R-5D	11.00	11.40	55.0	16.00	20.00	71.6	48.0	11.0	K DCN 10-13.99
DCN 115-058-16R-5D	11.50	11.90	58.0	16.00	20.00	74.1	48.0	11.0	K DCN 10-13.99
DCN 120-060-16R-5D	12.00	12.40	60.0	16.00	20.00	77.0	48.0	12.0	K DCN 10-13.99
DCN 125-062-16R-5D	12.50	12.90	62.0	16.00	20.00	79.5	48.0	12.0	K DCN 10-13.99
DCN 130-065-16R-5D	13.00	13.40	65.0	16.00	20.00	82.6	48.0	13.0	K DCN 10-13.99
DCN 135-068-16R-5D	13.50	13.90	68.0	16.00	20.00	85.1	48.0	13.0	K DCN 10-13.99
DCN 140-070-16R-5D	14.00	14.40	70.0	16.00	20.00	90.2	48.0	14.0	K DCN 14-17.99
DCN 145-073-16R-5D	14.50	14.90	73.0	16.00	20.00	92.7	48.0	14.0	K DCN 14-17.99
DCN 150-075-20R-5D	15.00	15.90	75.0	20.00	25.00	98.7	50.0	15.0	K DCN 14-17.99
DCN 160-080-20R-5D	16.00	16.90	80.0	20.00	25.00	105.3	50.0	16.0	K DCN 14-17.99
DCN 170-085-20R-5D	17.00	17.90	85.0	20.00	25.00	111.9	50.0	17.0	K DCN 14-17.99
DCN 180-090-25R-5D	18.00	18.90	90.0	25.00	32.00	118.5	56.0	18.0	K DCN 18-21.99
DCN 190-095-25R-5D	19.00	19.90	95.0	25.00	32.00	125.0	56.0	19.0	K DCN 18-21.99
DCN 200-100-25R-5D	20.00	20.90	100.0	25.00	32.00	131.6	56.0	20.0	K DCN 18-21.99
DCN 210-105-25R-5D	21.00	21.90	105.0	25.00	32.00	138.2	56.0	21.0	K DCN 18-21.99
DCN 220-110-25R-5D	22.00	22.90	110.0	25.00	32.00	144.8	56.0	22.0	K DCN 22-26.99
DCN 230-115-32R-5D	23.00	23.90	115.0	32.00	42.00	151.4	60.0	23.0	K DCN 22-26.99
DCN 240-120-32R-5D	24.00	24.90	120.0	32.00	42.00	158.0	60.0	24.0	K DCN 22-26.99
DCN 250-125-32R-5D	25.00	25.90	125.0	32.00	42.00	164.5	60.0	25.0	K DCN 22-26.99

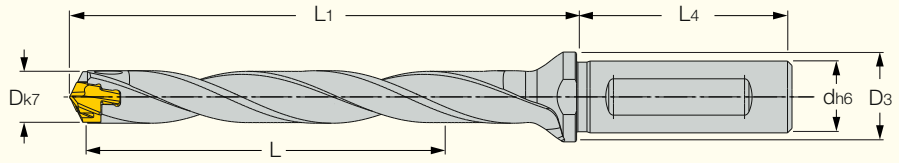
- For user guide and cutting conditions, see pages B22-38.

(1) Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

DCN A-8D

Indexable Head Drills with Coolant Holes and One Flat Shanks, Drilling Depth 8xD



	Dimensions								
Designation	D min[1]	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCN 080-064-12A-8D	8.00	8.40	64.0	12.00	16.00	79.4	45.0	8.0	K DCN 6-9.99
DCN 085-068-12A-8D	8.50	8.90	68.0	12.00	16.00	83.4	45.0	8.0	K DCN 6-9.99
DCN 090-072-12A-8D	9.00	9.40	72.0	12.00	16.00	87.8	45.0	9.0	K DCN 6-9.99
DCN 095-076-12A-8D	9.50	9.90	76.0	12.00	16.00	91.8	45.0	9.0	K DCN 6-9.99
DCN 100-080-16A-8D	10.00	10.40	80.0	16.00	20.00	96.2	48.0	10.0	K DCN 10-13.99
DCN 105-084-16A-8D	10.50	10.90	84.0	16.00	20.00	100.2	48.0	10.0	K DCN 10-13.99
DCN 110-088-16A-8D	11.00	11.40	88.0	16.00	20.00	104.6	48.0	11.0	K DCN 10-13.99
DCN 115-092-16A-8D	11.50	11.90	92.0	16.00	20.00	108.6	48.0	11.0	K DCN 10-13.99
DCN 120-096-16A-8D	12.00	12.40	96.0	16.00	20.00	113.0	48.0	12.0	K DCN 10-13.99
DCN 125-100-16A-8D	12.50	12.90	100.0	16.00	20.00	117.0	48.0	12.0	K DCN 10-13.99
DCN 130-104-16A-8D	13.00	13.40	104.0	16.00	20.00	121.6	48.0	13.0	K DCN 10-13.99
DCN 135-108-16A-8D	13.50	13.90	108.0	16.00	20.00	125.6	48.0	13.0	K DCN 10-13.99
DCN 140-112-16A-8D	14.00	14.40	112.0	16.00	20.00	132.1	48.0	14.0	K DCN 14-17.99
DCN 145-116-16A-8D	14.50	14.90	116.0	16.00	20.00	136.2	48.0	14.0	K DCN 14-17.99
DCN 150-120-20A-8D	15.00	15.90	120.0	20.00	25.00	143.7	50.0	15.0	K DCN 14-17.99
DCN 160-128-20A-8D	16.00	16.90	128.0	20.00	25.00	153.3	50.0	16.0	K DCN 14-17.99
DCN 170-136-20A-8D	17.00	17.90	136.0	20.00	25.00	162.9	50.0	17.0	K DCN 14-17.99
DCN 180-144-25A-8D	18.00	18.90	144.0	25.00	32.00	172.5	56.0	18.0	K DCN 18-21.99
DCN 190-152-25A-8D	19.00	19.90	152.0	25.00	32.00	182.0	56.0	19.0	K DCN 18-21.99
DCN 200-160-25A-8D	20.00	20.90	160.0	25.00	32.00	191.6	56.0	20.0	K DCN 18-21.99
DCN 210-168-25A-8D	21.00	21.90	168.0	25.00	32.00	201.2	56.0	21.0	K DCN 18-21.99
DCN 220-176-25A-8D	22.00	22.90	176.0	25.00	32.00	210.8	56.0	22.0	K DCN 22-26.99
DCN 230-184-32A-8D	23.00	23.90	184.0	32.00	42.00	220.4	60.0	23.0	K DCN 22-26.99
DCN 240-192-32A-8D	24.00	24.90	192.0	32.00	42.00	230.0	60.0	24.0	K DCN 22-26.99
DCN 250-200-32A-8D	25.00	25.90	200.0	32.00	42.00	239.5	60.0	25.0	K DCN 22-26.99

• For user guide and cutting conditions, see pages B22-38.

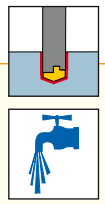
[1] Do not mount smaller drilling heads than specified range for drill body.

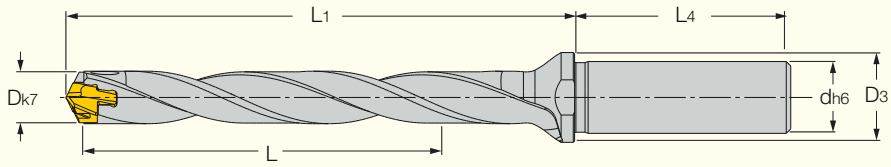
For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

SUMOCHAM
CHAMDRILL LINE

DCN R-8D

Indexable Head Drills with Coolant Holes and Cylindrical Shanks, Drilling Depth 8xD





Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCN 080-064-12R-8D	8.00	8.40	64.0	12.00	16.00	79.4	45.0	8.0	K DCN 6-9.99
DCN 085-068-12R-8D	8.50	8.90	68.0	12.00	16.00	83.4	45.0	8.0	K DCN 6-9.99
DCN 090-072-12R-8D	9.00	9.40	72.0	12.00	16.00	87.8	45.0	9.0	K DCN 6-9.99
DCN 095-076-12R-8D	9.50	9.90	76.0	12.00	16.00	91.8	45.0	9.0	K DCN 6-9.99
DCN 100-080-16R-8D	10.00	10.40	80.0	16.00	20.00	96.2	48.0	10.0	K DCN 10-13.99
DCN 105-084-16R-8D	10.50	10.90	84.0	16.00	20.00	100.2	48.0	10.0	K DCN 10-13.99
DCN 110-088-16R-8D	11.00	11.40	88.0	16.00	20.00	104.6	48.0	11.0	K DCN 10-13.99
DCN 115-092-16R-8D	11.50	11.90	92.0	16.00	20.00	108.6	48.0	11.0	K DCN 10-13.99
DCN 120-096-16R-8D	12.00	12.40	96.0	16.00	20.00	113.0	48.0	12.0	K DCN 10-13.99
DCN 125-100-16R-8D	12.50	12.90	100.0	16.00	20.00	117.0	48.0	12.0	K DCN 10-13.99
DCN 130-104-16R-8D	13.00	13.40	104.0	16.00	20.00	121.6	48.0	13.0	K DCN 10-13.99
DCN 135-108-16R-8D	13.50	13.90	108.0	16.00	20.00	125.6	48.0	13.0	K DCN 10-13.99
DCN 140-112-16R-8D	14.00	14.40	112.0	16.00	20.00	132.1	48.0	14.0	K DCN 14-17.99
DCN 145-116-16R-8D	14.50	14.90	116.0	16.00	20.00	136.2	48.0	14.0	K DCN 14-17.99
DCN 150-120-20R-8D	15.00	15.90	120.0	20.00	25.00	143.7	50.0	15.0	K DCN 14-17.99
DCN 160-128-20R-8D	16.00	16.90	128.0	20.00	25.00	153.3	50.0	16.0	K DCN 14-17.99
DCN 170-136-20R-8D	17.00	17.90	136.0	20.00	25.00	162.9	50.0	17.0	K DCN 14-17.99
DCN 180-144-25R-8D	18.00	18.90	144.0	25.00	32.00	172.5	56.0	18.0	K DCN 18-21.99
DCN 190-152-25R-8D	19.00	19.90	152.0	25.00	32.00	182.0	56.0	19.0	K DCN 18-21.99
DCN 200-160-25R-8D	20.00	20.90	160.0	25.00	32.00	191.6	56.0	20.0	K DCN 18-21.99
DCN 210-168-25R-8D	21.00	21.90	168.0	25.00	32.00	201.2	56.0	21.0	K DCN 18-21.99
DCN 220-176-25R-8D	22.00	22.90	176.0	25.00	32.00	210.8	56.0	22.0	K DCN 22-26.99
DCN 230-184-32R-8D	23.00	23.90	184.0	32.00	42.00	220.4	60.0	23.0	K DCN 22-26.99
DCN 240-192-32R-8D	24.00	24.90	192.0	32.00	42.00	230.0	60.0	24.0	K DCN 22-26.99
DCN 250-200-32R-8D	25.00	25.90	200.0	32.00	42.00	239.5	60.0	25.0	K DCN 22-26.99
DCN 260-208-32R-8D	26.00	26.90	208.0	32.00	42.00	249.3	60.0	26.0	K DCN 27-32.99
DCN 270-216-40R-8D	27.00	27.90	216.0	40.00	50.00	259.2	68.0	27.0	K DCN 27-32.99
DCN 280-224-40R-8D	28.00	28.90	224.0	40.00	50.00	269.0	68.0	28.0	K DCN 27-32.99
DCN 290-232-40R-8D	29.00	29.90	232.0	40.00	50.00	278.9	68.0	29.0	K DCN 27-32.99
DCN 300-240-40R-8D	30.00	30.90	240.0	40.00	50.00	288.7	68.0	30.0	K DCN 27-32.99
DCN 310-248-40R-8D	31.00	31.90	248.0	40.00	50.00	298.6	68.0	31.0	K DCN 27-32.99
DCN 320-256-40R-8D	32.00	32.90	256.0	40.00	50.00	308.4	68.0	32.0	K DCN 27-32.99

- For user guide and cutting conditions, see pages B22-38.

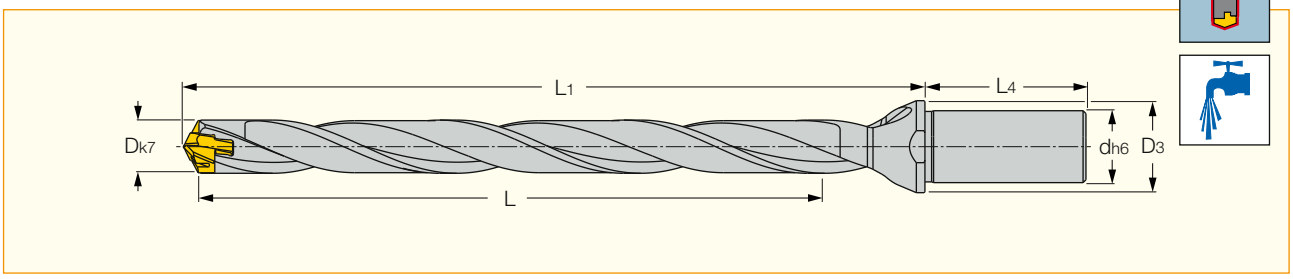
(1) Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

SUMOCHAM
CHAMDRILL LINE

DCN R-12D

Indexable Head Drills with Coolant Holes and Cylindrical Shanks, Drilling Depth 12xD



	Dimensions								
Designation	D min[1]	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCN 120-144-16R-12D	12.00	12.40	144.0	16.00	20.00	161.0	48.0	12.0	K DCN 10-13.99
DCN 125-150-16R-12D	12.50	12.90	150.0	16.00	20.00	167.0	48.0	12.0	K DCN 10-13.99
DCN 130-156-16R-12D	13.00	13.40	156.0	16.00	20.00	173.0	48.0	13.0	K DCN 10-13.99
DCN 135-162-16R-12D	13.50	13.90	162.0	16.00	20.00	179.0	48.0	13.0	K DCN 10-13.99
DCN 140-168-16R-12D	14.00	14.40	168.0	16.00	20.00	188.0	48.0	14.0	K DCN 14-17.99
DCN 145-174-16R-12D	14.50	14.90	174.0	16.00	20.00	194.0	48.0	14.0	K DCN 14-17.99
DCN 150-180-20R-12D	15.00	15.90	180.0	20.00	25.00	210.0	50.0	15.0	K DCN 14-17.99
DCN 160-192-20R-12D	16.00	16.90	192.0	20.00	25.00	224.0	50.0	16.0	K DCN 14-17.99
DCN 170-204-20R-12D	17.00	17.90	204.0	20.00	25.00	238.0	50.0	17.0	K DCN 14-17.99
DCN 180-216-25R-12D	18.00	18.90	216.0	25.00	32.00	252.0	56.0	18.0	K DCN 18-21.99
DCN 190-228-25R-12D	19.00	19.90	228.0	25.00	32.00	266.0	56.0	19.0	K DCN 18-21.99
DCN 200-240-25R-12D	20.00	20.90	240.0	25.00	32.00	280.0	56.0	20.0	K DCN 18-21.99
DCN 210-252-25R-12D	21.00	21.90	252.0	25.00	32.00	294.0	56.0	21.0	K DCN 18-21.99
DCN 220-264-25R-12D	22.00	22.90	264.0	25.00	32.00	308.0	56.0	22.0	K DCN 22-26.99
DCN 230-276-32R-12D	23.00	23.90	276.0	32.00	42.00	322.0	60.0	23.0	K DCN 22-26.99
DCN 240-288-32R-12D	24.00	24.90	288.0	32.00	42.00	336.0	60.0	24.0	K DCN 22-26.99
DCN 250-300-32R-12D	25.00	25.90	300.0	32.00	42.00	350.0	60.0	25.0	K DCN 22-26.99

• For user guide and cutting conditions, see pages B22-38.

[1] Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: FCP (B17) • ICK (B15) • ICK-2M (B16) • ICM (B15) • ICN (B15) • ICP (B15) • ICP-2M (B16).

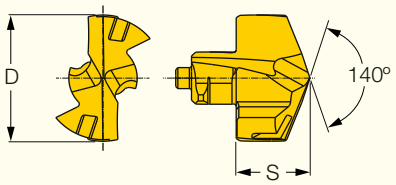
1.5xD 3xD 5xD 8xD 12xD

Standard Tools

SUMOCHAM
CHAMDRILL LINE

ICP \ICM\ICK\ICN

Exchangeable DCN Drill Heads

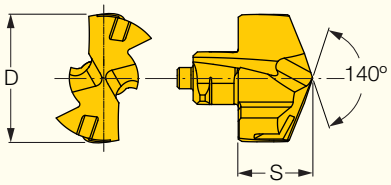


Designation	D(1)	S	Pocket Size	IC908
ICP ...	6.0-6.4	4.00	6.0	●
ICM ...	6.5-6.9	4.30	6.0	●
ICK ...	7.0-7.9	4.60	7.0	●
ICN ... IC08	8.0-8.9	5.40	8.0	●
	9.0-9.9	5.80	9.0	●
	10.0-10.9	6.20	10.0	●
	11.0-11.9	6.60	11.0	●
	12.0-12.9	7.00	12.0	●
	13.0-13.9	7.60	13.0	●
	14.0-14.9	8.15	14.0	●
	15.0-15.9	8.73	15.0	●
	16.0-16.9	9.30	16.0	●
	17.0-17.9	9.90	17.0	●
	18.0-18.9	10.50	18.0	●
	19.0-19.9	11.00	19.0	●
	20.0-20.9	11.60	20.0	●
	21.0-21.9	12.20	21.0	●
	22.0-22.9	12.80	22.0	●
	23.0-23.9	13.40	23.0	●
	24.0-24.9	14.00	24.0	●
	25.0-25.9	14.50	25.0	●
	26.00-26.9	15.30	26.0	●
	27.00-27.9	16.20	27.0	●
	28.00-28.9	17.00	28.0	●
	29.00-29.9	17.90	29.0	●
	30.00-30.9	18.70	30.0	●
	31.00-31.9	19.60	31.0	●
	32.00-32.9	20.40	32.0	●

- **ICP** for use on carbon and alloy steel (ISO P).
  The drill head has a honed cutting edge.
- **ICM** for use on stainless and high temperature alloys (ISO M).
  The drill head features a T-land on the cutting edge.
- **ICK** for use on cast iron (ISO K).
  The drill head is produced with a ground chamfer and a honed cutting edge.
- **ICN** for use on aluminum (ISO N).
  The drill head is manufactured with a sharp cutting edge and polished flutes.
  Ordering example for ICP 13.3 mm drilling head: ICP 133 IC908

ICP-2M \ICK-2M

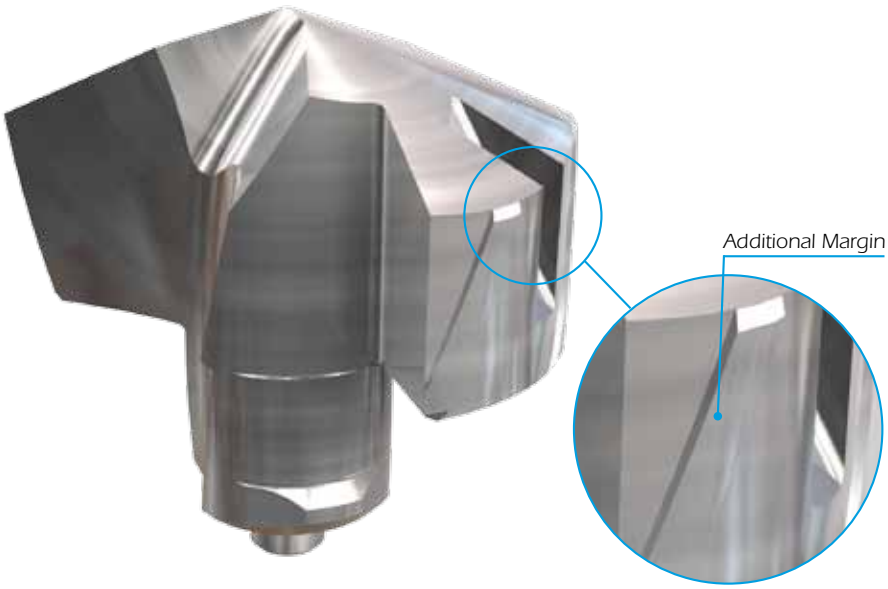
Double Margin Drilling Heads for DCN Drills for High Surface Finish



Designation	Dimensions D	S	Pocket Size	IC908
ICP-2M... ICK-2M...	7.00-7.90	4.60	7.0	●
	8.00-8.90	5.40	8.0	●
	9.00-9.90	5.80	9.0	●
	10.00-10.90	6.20	10.0	●
	11.00-11.90	6.60	11.0	●
	12.00-12.90	7.00	12.0	●
	13.00-13.90	7.60	13.0	●
	14.00-14.90	8.15	14.0	●
	15.00-15.90	8.73	15.0	●
	16.00-16.90	9.30	16.0	●
	17.00-17.90	9.90	17.0	●
	18.00-18.90	10.50	18.0	●
	19.00-19.90	11.00	19.0	●
	20.00-20.90	11.60	20.0	●
	21.00-21.90	12.20	21.0	●
	22.00-22.90	12.80	22.0	●
	23.00-23.90	13.40	23.0	●
	24.00-24.90	14.00	24.0	●
	25.00-25.90	14.50	25.0	●

- **ICP** for use on carbon and alloy steel (ISO P).
  The drill head has a honed cutting edge.
- **ICK** for use on cast iron (ISO K).
  The drill head is produced with a ground chamfer and a honed cutting edge.
- Can provide high surface finish of up to 1.6 Ra, hole cylindricity and straightness, of up to 0.05 mm.
- Ordering example for ICP 13.3 mm drilling head: ICP 133-2M IC908

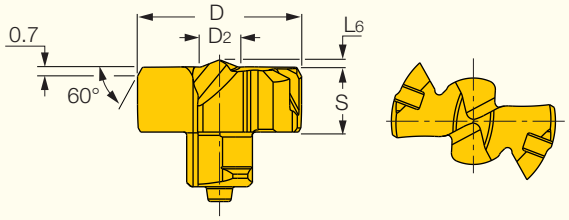
For tools, see: DCN A-1.5D (B4) • DCN A-3D (B6) • DCN A-5D (B10) • DCN A-8D (B12) • DCN R-1.5D (B5) • DCN R-12D (B14) • DCN R-3D (B7) • DCN R-5D (B11) • DCN R-8D (B13) • DCNS-3D (B8) • DCNS-5D (B9).



SUMOCHAM
CHAMDRILL LINE

FCP

Exchangeable Flat Bottom DCN Drill Heads, for Carbon and Alloy Steel
(ISO P Materials)



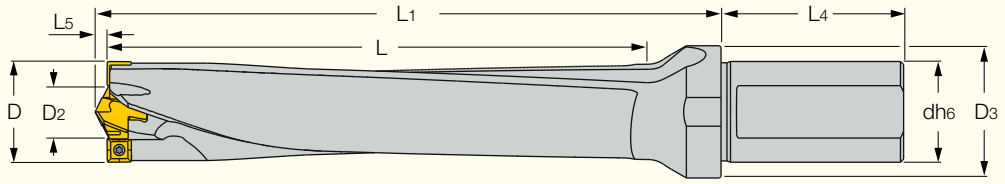
Designation	Dimensions					IC908
	D	D_2	S	L_6	Po. Size	
FCP 080	8.00	1.80	3.40	0.39	8.0	●
FCP 085	8.50	1.80	3.40	0.39	8.0	●
FCP 090	9.00	2.00	3.60	0.41	9.0	●
FCP 095	9.50	2.00	3.60	0.41	9.0	●
FCP 100	10.00	2.20	3.80	0.47	10.0	●
FCP 105	10.50	2.20	3.80	0.47	10.0	●
FCP 110	11.00	2.42	3.90	0.54	11.0	●
FCP 115	11.50	2.42	3.90	0.54	11.0	●
FCP 120	12.00	2.34	4.10	0.56	12.0	●
FCP 125	12.50	2.34	4.10	0.56	12.0	●
FCP 130	13.00	2.90	4.50	0.58	13.0	●
FCP 135	13.50	2.90	4.50	0.58	13.0	●
FCP 140	14.00	3.10	4.80	0.61	14.0	●
FCP 145	14.50	3.10	4.80	0.61	14.0	●
FCP 150	15.00	3.30	5.10	0.65	15.0	●
FCP 155	15.50	3.30	5.10	0.65	15.0	●
FCP 160	16.00	3.40	5.60	0.69	16.0	●
FCP 165	16.50	3.40	5.60	0.69	16.0	●
FCP 170	17.00	3.50	5.80	0.70	17.0	●
FCP 175	17.50	3.50	5.80	0.70	17.0	●
FCP 180	18.00	3.55	6.20	0.72	18.0	●
FCP 185	18.50	3.55	6.20	0.72	18.0	●
FCP 190	19.00	3.61	6.50	0.74	19.0	●
FCP 195	19.50	3.61	6.50	0.74	19.0	●
FCP 200	20.00	4.80	6.80	0.94	20.0	●
FCP 205	20.50	4.80	6.80	0.94	20.0	●
FCP 210	21.00	5.00	7.20	0.99	21.0	●
FCP 215	21.50	5.00	7.20	0.99	21.0	●
FCP 220	22.00	5.30	7.50	1.03	22.0	●
FCP 225	22.50	5.30	7.50	1.03	22.0	●
FCP 230	23.00	5.50	7.90	1.08	23.0	●
FCP 235	23.50	5.50	7.90	1.08	23.0	●
FCP 240	24.00	5.80	8.20	1.14	24.0	●
FCP 245	24.50	5.80	8.20	1.14	24.0	●
FCP 250	25.00	6.00	8.60	1.20	25.0	●
FCP 255	25.50	6.00	8.60	1.20	25.0	●

• The drill heads have honed cutting edges.

For tools, see: DCN A-1.5D (B4) • DCN A-3D (B6) • DCN A-5D (B10) • DCN A-8D (B12) • DCN R-1.5D (B5) • DCN R-12D (B14) • DCN R-3D (B7) • DCN R-5D (B11) • DCN R-8D (B13) • DCNS-3D (B8) • DCNS-5D (B9).

MNC

Large Diameter Indexable Drills with Integral Pilot Drills and One Flat Shanks, Drilling Depth 5xD



Designation	D	D_2	L	L_1	L_4	L_5	d	D_3	Insert(1)	Insert 1(2)
MNC 260-130 A32-150-06-5D	26.00	15.00	130.0	167.3	60.0	3.30	32.00	42.00	SOGX 060304-W	ICP 150
MNC 265-132 A32-155-06-5D	26.50	15.50	132.0	167.3	60.0	3.30	32.00	42.00	SOGX 060304-W	ICP 155
MNC 270-135 A32-160-06-5D	27.00	16.00	135.0	170.4	60.0	3.40	32.00	42.00	SOGX 060304-W	ICP 160
MNC 280-140 A32-170-06-5D	28.00	17.00	140.0	174.5	60.0	3.50	32.00	42.00	SOGX 060304-W	ICP 170
MNC 290-145 A32-160-07-5D	29.00	16.00	145.0	180.4	60.0	3.40	32.00	42.00	SOGX 070305-W	ICP 160
MNC 295-148 A32-165-07-5D	29.50	16.50	148.0	183.5	60.0	3.50	32.00	42.00	SOGX 070305-W	ICP 165
MNC 300-150 A32-165-07-5D	30.00	16.50	150.0	186.5	60.0	3.50	32.00	42.00	SOGX 070305-W	ICP 165
MNC 310-155 A32-175-07-5D	31.00	17.50	155.0	193.6	60.0	3.60	32.00	42.00	SOGX 070305-W	ICP 175
MNC 320-160 A32-185-07-5D	32.00	18.50	160.0	198.8	60.0	3.80	32.00	42.00	SOGX 070305-W	ICP 185
MNC 330-165 A32-175-09-5D	33.00	17.50	165.0	203.6	60.0	3.60	32.00	42.00	SOGT 09T306-W	ICP 175
MNC 340-170 A32-180-09-5D	34.00	18.00	170.0	208.7	60.0	3.70	32.00	42.00	SOGT 09T306-W	ICP 180
MNC 350-175 A32-189-09-5D	35.00	18.90	175.0	213.8	60.0	3.80	32.00	42.00	SOGT 09T306-W	ICP 189
MNC 360-180 A32-190-10-5D	36.00	19.00	180.0	219.3	60.0	4.30	32.00	42.00	SOGT 100408-W	ICP 190
MNC 370-185 A32-200-10-5D	37.00	20.00	185.0	224.5	60.0	4.50	32.00	42.00	SOGT 100408-W	ICP 200
MNC 375-188 A32-205-10-5D	37.50	20.50	188.0	227.6	60.0	4.60	32.00	42.00	SOGT 100408-W	ICP 205
MNC 380-190 A40-209-10-5D	38.00	20.90	190.0	231.7	68.0	4.70	40.00	50.00	SOGT 100408-W	ICP 209
MNC 390-195 A40-215-10-5D	39.00	21.50	195.0	237.8	68.0	4.80	40.00	50.00	SOGT 100408-W	ICP 215
MNC 400-200 A40-225-10-5D	40.00	22.50	200.0	244.9	68.0	4.90	40.00	50.00	SOGT 100408-W	ICP 225
MNC 405-203 A40-235-10-5D	40.50	23.50	203.0	248.1	68.0	5.10	40.00	50.00	SOGT 100408-W	ICP 235
MNC 410-205 A40-239-10-5D	41.00	23.90	205.0	250.1	68.0	5.10	40.00	50.00	SOGT 100408-W	ICP 239
MNC 420-210 A40-249-10-5D	42.00	24.90	210.0	255.3	68.0	5.30	40.00	50.00	SOGT 100408-W	ICP 249
MNC 430-215 A40-259-10-5D	43.00	25.90	215.0	263.5	68.0	5.50	40.00	50.00	SOGT 100408-W	ICP 259
MNC 440-220 A40-210-12-5D	44.00	21.00	220.0	265.2	68.0	5.20	40.00	50.00	SOGT 120408-W	ICP 210
MNC 450-225 A40-219-12-5D	45.00	21.90	225.0	270.3	68.0	5.30	40.00	50.00	SOGT 120408-W	ICP 219
MNC 460-230 A40-229-12-5D	46.00	22.90	230.0	275.5	68.0	5.50	40.00	50.00	SOGT 120408-W	ICP 229
MNC 470-235 A40-239-12-5D	47.00	23.90	235.0	281.6	68.0	5.60	40.00	50.00	SOGT 120408-W	ICP 239
MNC 480-240 A40-249-12-5D	48.00	24.90	240.0	285.8	68.0	5.80	40.00	50.00	SOGT 120408-W	ICP 249
MNC 490-245 A40-259-12-5D	49.00	25.90	245.0	293.0	68.0	6.00	40.00	50.00	SOGT 120408-W	ICP 259
MNC 500-250 A40-269-12-5D	50.00	26.90	250.0	292.0	68.0	6.10	40.00	50.00	SOGT 120408-W	ICP 269

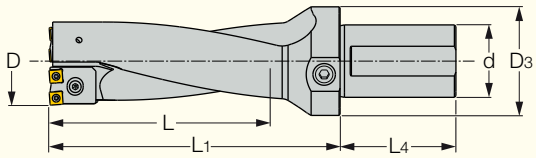
• Hole tolerance: D+0.10/-0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B30-31.

(1) Outer insert (2) Central insert

For inserts, see: ICP (B15) • SOGT-W (B20) • SOGX-W (B20).

DR-CA-N

DR Large Diameter Drills (61-80 mm) with Cartridges and One Flat Shanks



Designation	D	D max	L	d	D3	L1	L4	D5(1)	Inserts	Insert Screw	Shim	Shim Screw
DR061>062-155-50-10CA-N	61.00	62.00	155.0	50.00	75.00	201.0	80.0	62.80	SOMT 100408	SR 14-571	ISP-10-D061	SR M3X5.5
	62.00										ISP-10-D062	
DR063>066-165-50-10CA-N	63.00	66.00	165.0	50.00	75.00	215.0	80.0	67.00	SOMT 100408	SR 14-571		
	64.00										ISP-10-D064	
	65.00										ISP-10-D065	
	66.00										ISP-10-D066	
DR067>073-183-50-11CA-N	67.00	73.00	183.0	50.00	75.00	240.0	80.0	74.60	SOMT 110408	SR 14-544/S		
	68.00										ISP-11-D068	
	69.00										ISP-11-D069	
	70.00										ISP-11-D070	
	71.00										ISP-11-D071	
	72.00										ISP-11-D072	
	73.00										ISP-11-D073	
DR074>080-200-50-12CA-N	74.00	80.00	200.0	50.00	75.00	250.0	80.0	81.60	SOMT 120408	SR 14-544/S		
	75.00										ISP-12-D075	
	76.00										ISP-12-D076	
	77.00										ISP-12-D077	
	78.00										ISP-12-D078	
	79.00										ISP-12-D079	
	80.00										ISP-12-D080	

• Hole tolerance: D±0.5 in average conditions. However, it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

(1) Max. dia. on lathe, with the thickest shim plate.

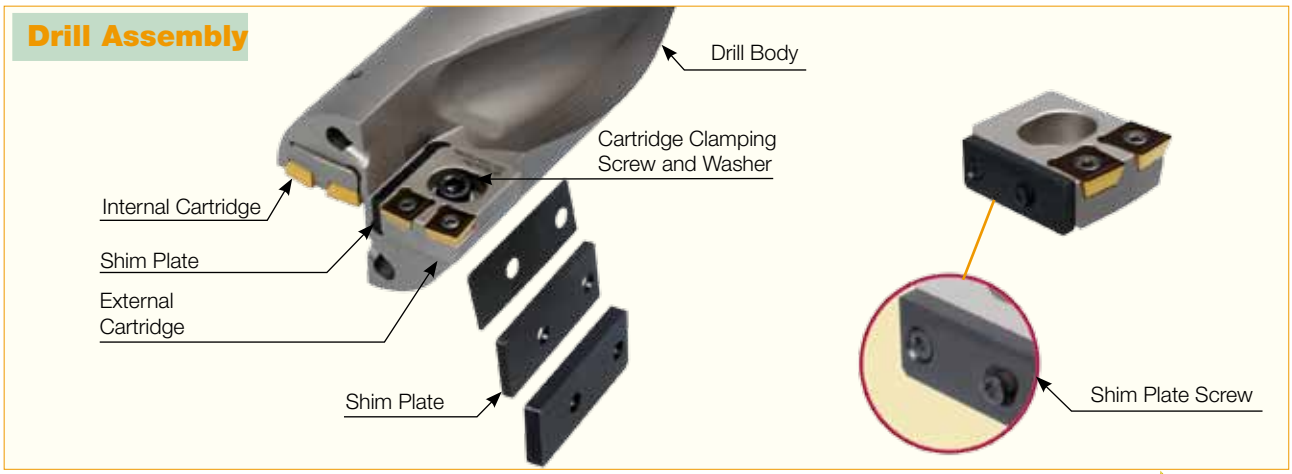
For inserts, see: SOMT-DT (B64) • SOMT-GF (B64).

Spare Parts

Designation	Int. Cartridge	Ext. Cartridge	Cartridge Screw	Cartridge Key
DR061>062-155-50-10CA-N	CA-SOMT10-IN-N-61>62	CA-SOMT10-EX-N-61>62	SR M5X16 DIN 912	HW 4.0
DR063>066-165-50-10CA-N	CA-SOMT10-IN-N-63>66	CA-SOMT10-EX-N-63>66	SR M5X16 DIN 912	HW 4.0
DR067>073-183-50-11CA-N	CA-SOMT11-IN-N-67>73	CA-SOMT11-EX-N-67>73		HW 5.0
DR074>080-200-50-12CA-N	CA-SOMT12-IN-N-74>80	CA-SOMT12-EX-N-74>80		HW 5.0

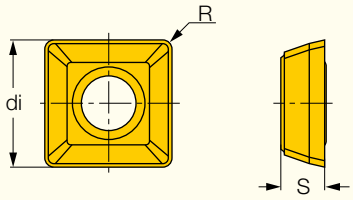
Designation	Washers	Shim Plate Key Blade	Shim Plate Key Handle	Side Coolant Hole Plug	Key	Insert Key
DR061>062-155-50-10CA-N	WASHER FLAT M5 DIN 125A	BLD T09/M7	SW6-T	PLUG R1/4 SPC	HW 6.0	BLD T10/S7
DR063>066-165-50-10CA-N	WASHER FLAT M5 DIN 125A	BLD T09/M7	SW6-T	PLUG R1/4 SPC	HW 6.0	BLD T10/S7
DR067>073-183-50-11CA-N	WASHER FLAT M6 DIN 125B	BLD T09/M7	SW6-T	PLUG R1/4 SPC	HW 6.0	BLD T15/S7
DR074>080-200-50-12CA-N	WASHER FLAT M6 DIN 125B	BLD T09/M7	SW6-T	PLUG R1/4 SPC	HW 6.0	BLD T15/S7

Drill Assembly



SOGX-W

Inserts for MNC Drills with DT General Use Chipformer and a Wiper

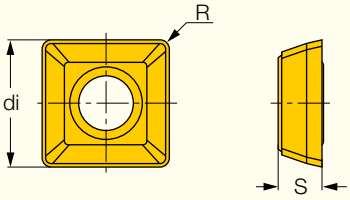


Designation	Dimensions di	S	R	IC808
SOGX 060304-W	6.20	3.20	0.40	●
SOGX 070305-W	7.70	3.60	0.50	●

For tools, see: MNC (B18).

SOGT-W

Inserts for MNC Drills with DT General Use Chipformer and a Wiper



Designation	Dimensions di	S	R	IC808
SOGT 09T306-W	9.00	3.81	0.60	●
SOGT 100408-W	9.80	4.30	0.80	●
SOGT 120408-W	12.70	4.76	0.80	●

For tools, see: MNC (B18).

COMBICHAM

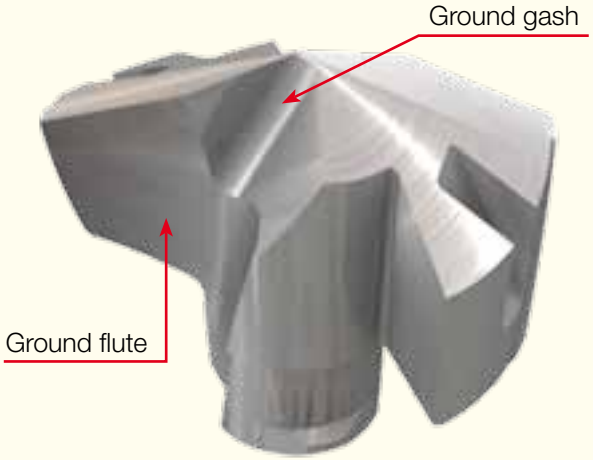
Drilling Heads

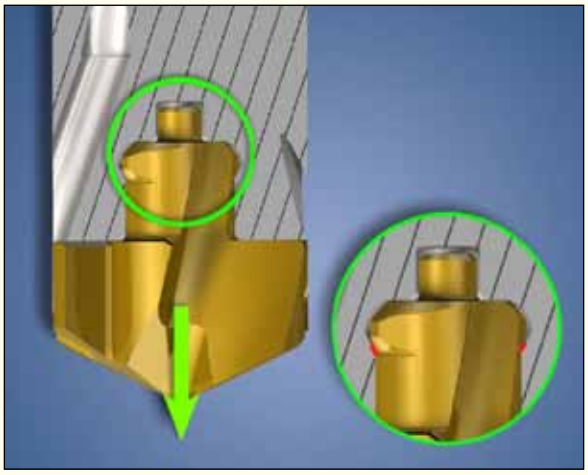
SUMOCHAM features four different standard drill head geometries, designed for optimal performance and high reliability when used on various materials.

- **ICP** for use on carbon and alloy steel (ISO P). The drill head has a honed cutting edge.
- **ICK** for use on cast iron (ISO K). The drill head is produced with a ground chamfer and a honed cutting edge.
- **ICM** for use on stainless and high temperature alloys (ISO M). The drill head features a T-land on the cutting edge.
- **ICN** for use on aluminum (ISO N). The drill head is manufactured with a sharp cutting edge and polished flutes.

ICN drill head is made from ISCAR's uncoated submicron grade IC08.
All other geometries are made from grade IC908 with a TiAlN PVD coating. IC908 features excellent performance on a large variety of drilling applications.

The ICP, ICK, ICM, ICN drilling heads are available in 0.1 mm drilling diameter increments.





The drill head has ground flutes for smooth, uninterrupted chip flow and a ground gash for improved penetration.

To prevent the insert from being pulled out during drilling, there is an axial stopper in the pocket. It is effective even after the clamping force has been lost (may happen when the drill's pocket wears out).

General Recommendations

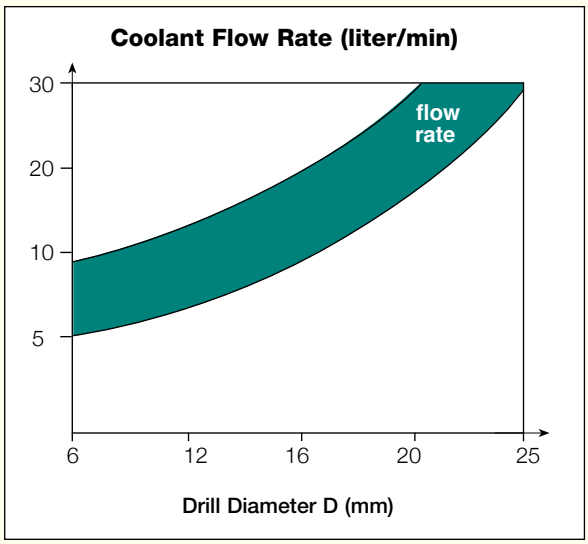
- **SUMOCHAM** drills can be used in any type of adaptation. However, concentric adaptation such as spring collets and hydraulic chucks are advantageous for better runout. When machining high temperature alloys or applying very high machining loads, it is advisable to use strong gripping adapters such as endmill holders, power or hydraulic chucks.
- Dry drilling should not be performed under any circumstances.
- Semi-synthetic or emulsion lubricants are recommended in order to extend tool life.
- It is essential to use internal coolant in all **SUMOCHAM** applications. In the event of low coolant pressure or when used in a stationary application, adding an external coolant can improve tool life.
- When only external coolant can be applied, it is recommended to drill into maximum depth of 2xD hole depth to diameter ratio.
- When using M.Q.L. coolant, there is no need for special accessories. For smooth M.Q.L. coolant flow there is a spherical cavity on the rear side of the drill shank.

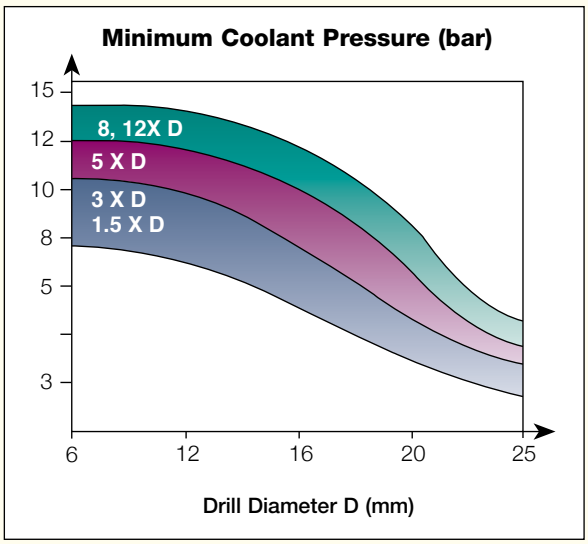
- There is a special plug with an internal thread for a coolant connection used on stationary machines that can be pressed into the cavity on the back end of the drill.

Shank Diameter	Plug	Internal Thread
12	DL-12	G 1/16
16	DL-16	G 1/16
20	DL-20	G 1/8
25	DL-25	G 1/8
32	DL-32	G 1/8

- When drilling stainless steel or high temperature alloys using the ICM drilling head, it is highly recommended to apply high pressure oil or 7-10% mineral or vegetable based oil emulsion.

- Following is recommended coolant flow rate and pressure.





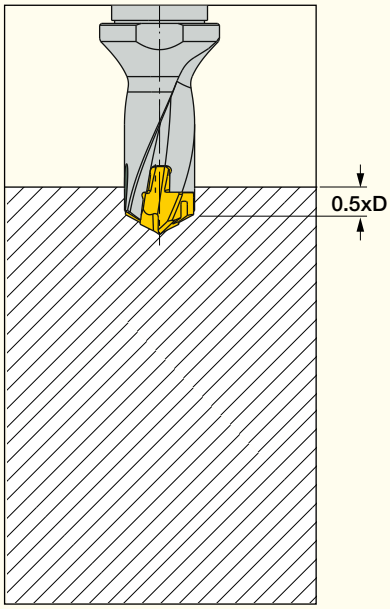
- For optimal performance, it is recommended to adjust runout of outer points or chisel with a maximum of 0.02 mm. Large runout will influence drill performance tool life and hole quality.

- No setup time is needed after indexing the SUMOCHAM drill head.

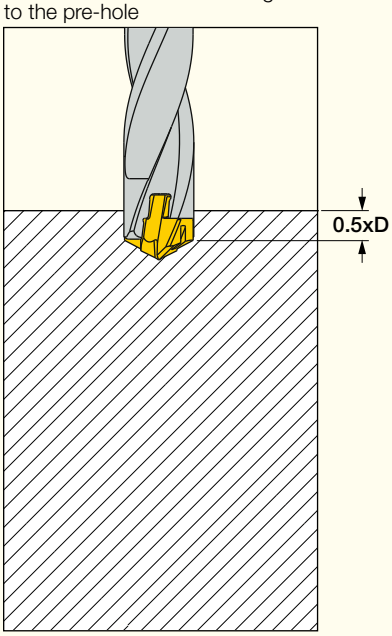
- SUMOCHAM drills can be used either on milling centers or lathe machines.

- When using SUMOCHAM drill in stationary (lathe) applications, we recommend using ISCAR GYRO device or eccenter sleeve to reduce misalignment. Misalignment will cause poor performance of the SUMOCHAM drill or even tool breakage.

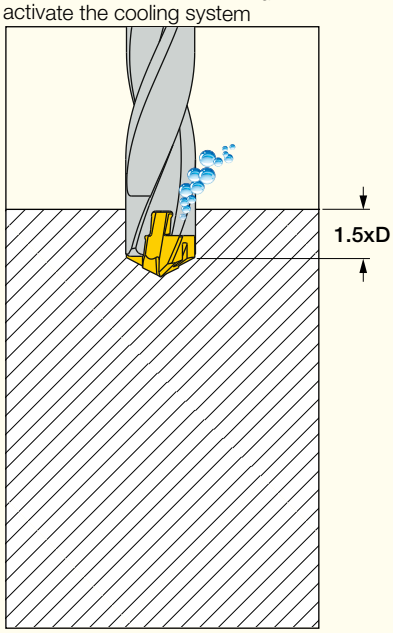
1 Pre-hole 0.5xD deep for centering



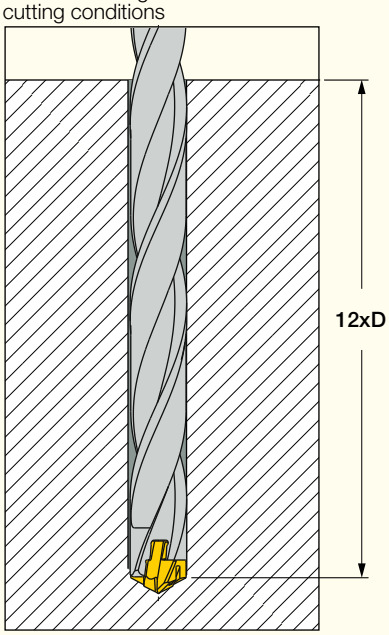
2 Slow rotation and feed during entrance to the pre-hole



3 Maintain for 2-3 seconds and activate the cooling system

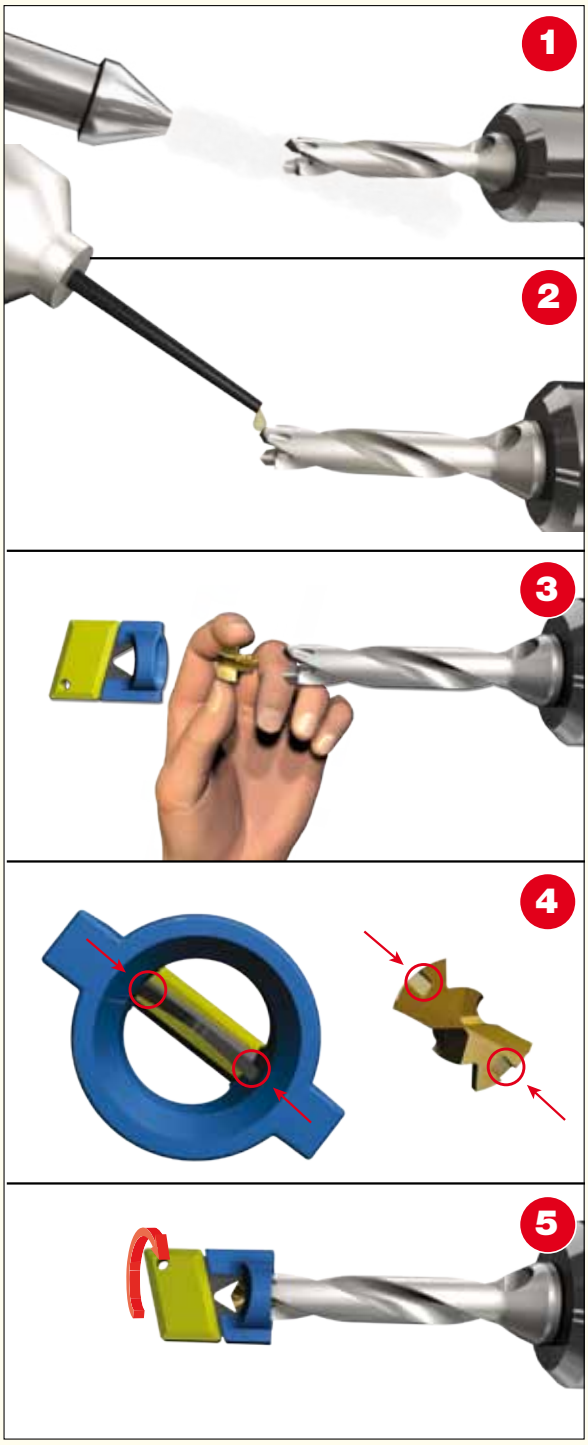


4 Continue drilling at recommended cutting conditions

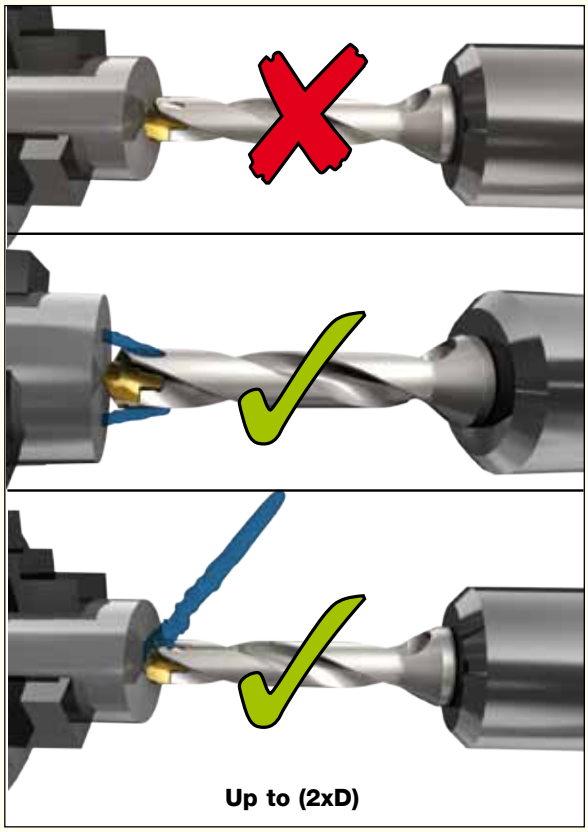


- Prior to using 8xD or 12xD drills, it is recommended to drill a 1.5xD pre-hole using a short or centering drill. Enter the pre-hole at slow speed and feed until 2-5 mm from its bottom. Start the cooling system and increase rotation to recommended drilling speed. Hold for 2-3 seconds, then, continue at the recommended drilling feed.

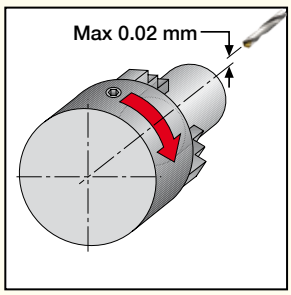
Drilling Head Mounting Procedure



Coolant Recommendations



Maximum Runout, Misalignment

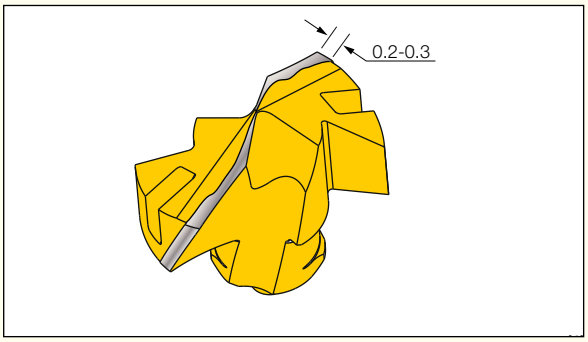


K DCN MULTI

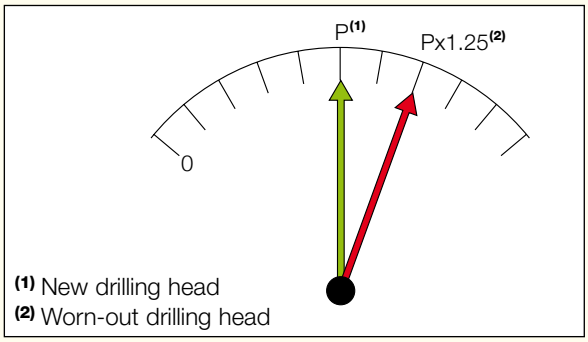
The optional K DCN MULTI key enables clamping all currently available SUMOCHAM drilling heads, in a 6-26.9 mm diameter range.

Indication of Drill Head Wear

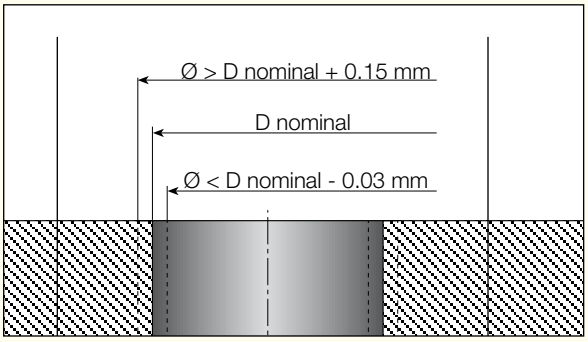
Wear Limit



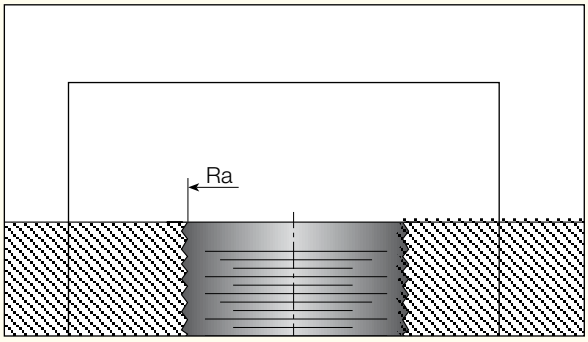
Power Restriction



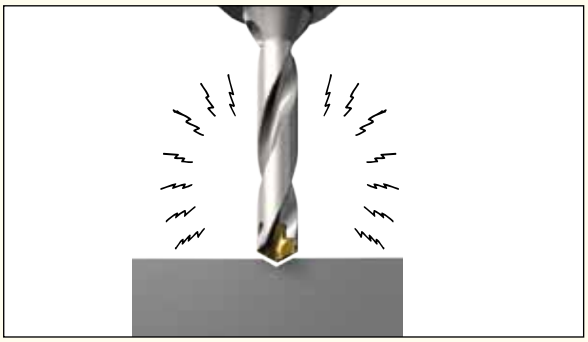
Diameter Change



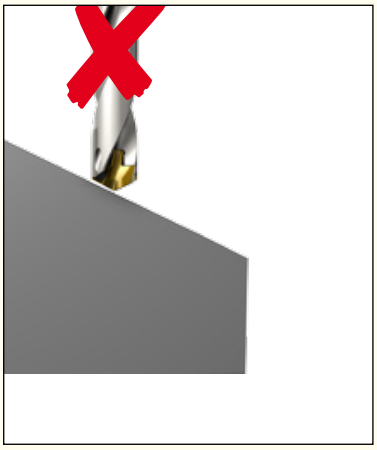
Surface Finish Declines

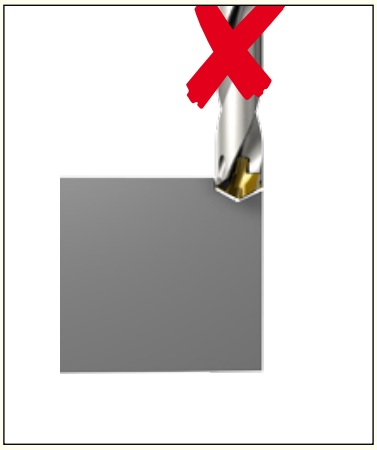


Vibration Noise Drastically Increases



Drilling Limitations





Material Groups

ISO	Material		Condition	Tensile Strength Rm [N/mm2]	Hardness HB
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125
		> = 0.25 %C	Annealed	650	190
		< 0.55 %C	Quenched and tempered	850	250
		> = 0.55 %C	Annealed	750	220
			Quenched and tempered	1000	300
	Low alloy steel and cast steel (less than 5% alloying elements)		Annealed	600	200
			Quenched and tempered	930	275
				1000	300
				1200	350
	High alloy steel, cast steel and tool steel		Annealed	680	200
			Quenched and tempered	1100	325
M	Stainless steel and cast steel		Ferritic/martensitic	680	200
			Martensitic	820	240
			Austenitic	600	180
K	Grey cast iron (GG)		Ferritic/pearlitic		180
			Pearlitic		260
	Ductile cast iron (nodular) (GGG)		Ferritic		160
			Pearlitic		250
	Malleable cast iron		Ferritic		130
			Pearlitic		230
N	Aluminum-wrought alloy		Not cureable		60
			Cured		100
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75
			Cured		90
		>12% Si	High temperature		130
	Copper alloys	>1% Pb	Free cutting		110
			Brass		90
			Electrolitic copper		100
	Non-metallic		Duroplastics, fiber plastics		
			Hard rubber		
S	High temp. alloys	Fe based	Annealed		200
			Cured		280
	Super alloys	Ni or Co based	Annealed		250
			Cured		350
			Cast		320
	Titanium, Ti alloys			Rm 400	
			Alpha+beta alloys cured	Rm 1050	
H	Hardened steel		Hardened		55 HRc
			Hardened		60 HRc
	Chilled cast iron		Cast		400
	Cast iron		Hardened		55 HRc

- When using external coolant supply only, reduce cutting speed by 10%.
- Use internal coolant supply when machining austenitic stainless steel.
- When using more than 5XD drill ratio, reduce cutting parameters by 10%.

Recommended Machining Conditions

Mtl. No.(1)	V m/min	SUMOCHAM Feed vs. Drill Diameter m/rev D=6-7.9	D=8-9.9	D=10-11.9	D=12-13.9	D=14-15.9	D=16-19.9	D=20-25.9	D=26-32.9
1	80-**110**-140	0.09 **0.11** 0.13	0.12 **0.17** 0.22	0.15 **0.21** 0.28	0.18 **0.24** 0.30	0.20 **0.27** 0.35	0.25 **0.35** 0.45	0.25 **0.35** 0.45	0.30 **0.40** 0.50
2	80-**105**-130								
3	80-**100**-120								
4	70-**90**-110								
5	50-**70**-90								
6	80-**100**-120	0.09 **0.12** 0.15	0.12 **0.18** 0.25	0.14 **0.21** 0.28	0.16 **0.24** 0.32	0.18 **0.26** 0.35	0.23 **0.31** 0.40	0.25 **0.35** 0.45	0.30 **0.40** 0.50
7	70-**90**-110								
8	50-**70**-90								
9	40-**55**-70								
10	50-**70**-90	0.09 **0.11** 0.12	0.12 **0.16** 0.20	0.12 **0.17** 0.22	0.15 **0.20** 0.25	0.18 **0.23** 0.28	0.20 **0.25** 0.30	0.22 **0.27** 0.33	0.25 **0.30** 0.35
11	40-**60**-80								
12	40-**55**-70	0.08 **0.09** 0.10	0.10 **0.12** 0.15	0.12 **0.15** 0.18	0.14 **0.17** 0.20	0.16 **0.20** 0.24	0.16 **0.21** 0.26	0.18 **0.24** 0.30	0.20 **0.27** 0.35
13	40-**55**-70								
14	30-**50**-70								
15	90-**125**-160	0.12 **0.15** 0.18	0.15 **0.22** 0.30	0.20 **0.27** 0.35	0.25 **0.32** 0.40	0.30 **0.37** 0.45	0.35 **0.45** 0.55	0.35 **0.47** 0.60	0.40 **0.50** 0.60
16	80-**110**-140								
17	90-**135**-180								
18	80-**110**-140								
19	90-**125**-160								
20	80-**110**-140								
21	90-**155**-220		0.20 **0.27** 0.35	0.25 **0.32** 0.40	0.30 **0.37** 0.45	0.35 **0.42** 0.50	0.40 **0.50** 0.60	0.45 **0.57** 0.70	0.50 **0.67** 0.75
22									
23									
24									
25	80-**120**-160								
26	90-**155**-220								
27									
28									
29									
30									
31	30-**45**-60	0.05 **0.06** 0.07	0.06 **0.08** 0.11	0.08 **0.10** 0.13	0.10 **0.12** 0.15	0.12 **0.15** 0.18	0.12 **0.16** 0.20	0.14 **0.18** 0.22	0.16 **0.20** 0.25
32	20-**35**-50								
33									
34									
35									
36	20-**35**-50	0.05 **0.06** 0.07	0.06 **0.09** 0.12	0.08 **0.11** 0.15	0.10 **0.14** 0.18	0.12 **0.16** 0.20	0.14 **0.18** 0.22	0.16 **0.20** 0.25	0.18 **0.22** 0.27
37									
38	20-**35**-50	0.05 **0.06** 0.07	0.06 **0.09** 0.12	0.08 **0.11** 0.15	0.10 **0.14** 0.18	0.12 **0.16** 0.20	0.14 **0.18** 0.22	0.16 **0.20** 0.25	0.18 **0.22** 0.27
39									
40									
41									

■ Recommended cutting data

(1) For workpiece materials list, see pages G6-41. As a starting value, the middle of the recommended machining range should be used.
Then, (according to wear results), conditions can be changed in order to optimize performance.
The data referse to IC908.

Machining Data for MNC drills

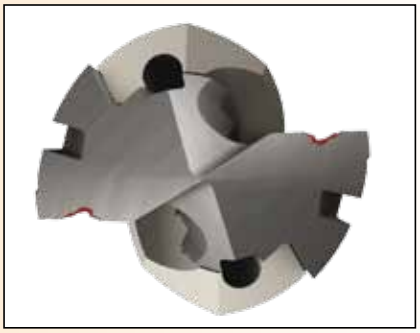
ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material No.[1]
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
			Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% of alloying elements)		Annealed	600	200	6
			Quenched and tempered	930	275	7
				1000	300	8
				1200	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	200	10
			Quenched and tempered	1100	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	12
			Martensitic	820	240	13
			Austenitic	600	180	14
K	Grey cast iron (GG)		Ferritic/pearlitic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable cast iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum-wrought alloy		Not cureable		60	21
			Cured		100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolitic copper		100	28
	Non-metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
		Ni or Co based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti alloys			RM 400		36
			Alpha+beta alloys cured	RM 1050		37
H	Hardened steel		Hardened		55 HRc	38
			Hardened		60 HRc	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRc	41

- Grades: first choice IC808.

[1]For workpiece materials list, see pages G6-41.

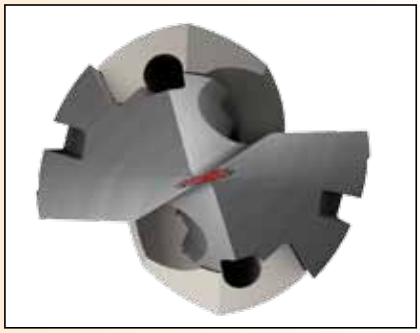
Mat. No.	Cutting Speed Vc [m/min]		Feed vs. Drill Diameter F [mm/rev]									
			26< ØD <28		29< ØD <32		33< ØD <35		36< ØD <43		44< ØD <50	
	Vc min	Vc max	f min	f max	f min	f max	f min	f max	f min	f max	f min	f max
1	120	200	0.25	0.35	0.25	0.35	0.25	0.40	0.25	0.40	0.28	0.45
2												
3	130	190										
4												
5												
6	120	180	0.25	0.33	0.25	0.33	0.25	0.38	0.25	0.38	0.26	0.43
7												
8												
9												
10	100	160	0.25	0.33	0.25	0.33	0.25	0.36	0.25	0.36	0.26	0.41
11												
12	90	140	0.12	0.24	0.12	0.24	0.16	0.25	0.18	0.25	0.18	0.30
13												
14												
15	150	250	0.25	0.40	0.25	0.45	0.3	0.50	0.3	0.50	0.35	0.55
16												
17												
18												
19												
20												
21	160	260	0.3	0.50	0.3	0.50	0.35	0.55	0.35	0.55	0.4	0.60
22												
23												
24												
25												
26												
27												
28												
29												
30												
31	30	60	0.1	0.16	0.1	0.18	0.15	0.20	0.15	0.22	0.16	0.24
32	20	50										
33												
34												
35												
36												
37												
38	20	50	0.1	0.16	0.12	0.18	0.14	0.2	0.14	0.2	0.16	0.22
39												
40												
41												

Troubleshooting



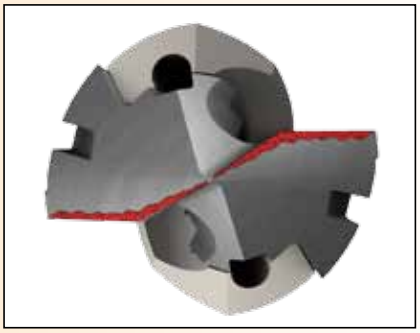
Cutting Edge Chipping

1. Check the stability of the machine spindle, tool and workpiece clamping rigidity.
2. Reduce feed rate, increase speed.
3. If the drill vibrates, reduce cutting speed and increase feed rate.
4. When drilling rough, hard or sloped surface (up to 7°), reduce the feed rate by 30%-50% during entrance and exit.
5. Check cooling lubricant. Increase coolant pressure. In case of external coolant supply, improve jet direction and add cooling jets.



Chisel Area Chipping

1. Reduce feed rate.
2. Increase coolant pressure.
3. Check the adaptation. Use hydraulic clamping chuck, MAXIN power chuck or side lock systems.
4. Increase workpiece chucking force.



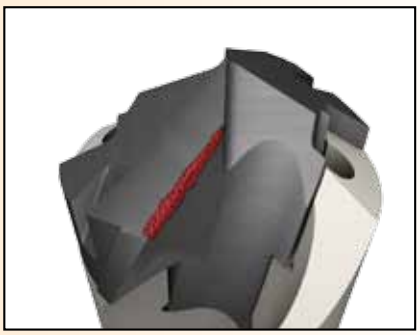
Excessive Flank Wear

1. Check that the correct geometry is used.
2. Reduce cutting speed.
3. Increase internal coolant pressure.

Excessive Flute Land Wear

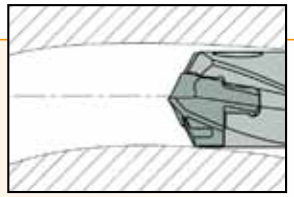
1. Check that the correct geometry is used.
2. Check the runout and make sure it is within 0.02 mm T.I.R. (radial and axial).
3. Reduce cutting speed.
4. When drilling rough, hard or sloped surface (up to 7°), reduce the feed rate by 30%-50% during entrance and exit.
5. Increase coolant pressure.
6. Check the chisel point runout and make sure it is within 0.02 mm T.I.R.
7. Increase workpiece chucking force stability and rigidity.
8. If there is low pocket gripping force - replace drill body.

Troubleshooting



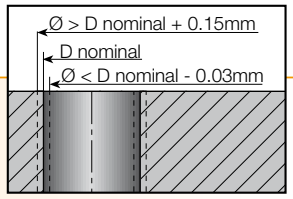
Built-Up Edge

1. Increase cutting speed/feed.
2. Increase coolant pressure.



Hole Not Straight:

- Use 2M geometry.
- Drill a pre-hole for centering (check recommendations for pre-hole operation).
- Increase coolant pressure; improve jet direction in case of external coolant supply.
- Increase the feed.

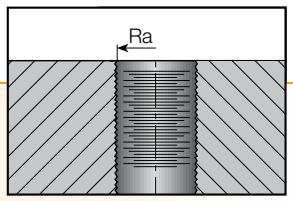


Deviation of Hole Tolerance

1. Check the runout and make sure it is within 0.02 mm T.I.R. (radial and axial cutting points).
2. Reduce feed rate.
3. Check the chisel point runout and make sure that it is within 0.02 mm T.I.R.
4. Wrong cutting edge. Replace head.
5. Increase workpiece chucking force.
6. Check the adaptation. Use hydraulic clamping chuck, MAXIN power chuck or side clamping systems.
7. Increase internal coolant pressure.

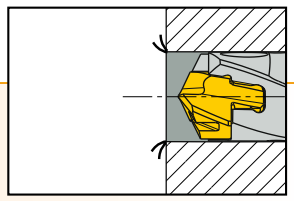
Inaccurate Hole Position

1. Check the runout and make sure it is within 0.02 mm T.I.R. (radial and axial).
2. Check the stability of the machine spindle, tool and workpiece clamping rigidity.
3. When drilling rough, hard or sloped surface (up to 7°), reduce the feed rate by 30%-50% during entrance.
4. Drill a pre-hole with a 140° point angle for centering.
5. Check the chisel point runout and make sure it is within 0.02 mm T.I.R.



Surface Finish Too Rough

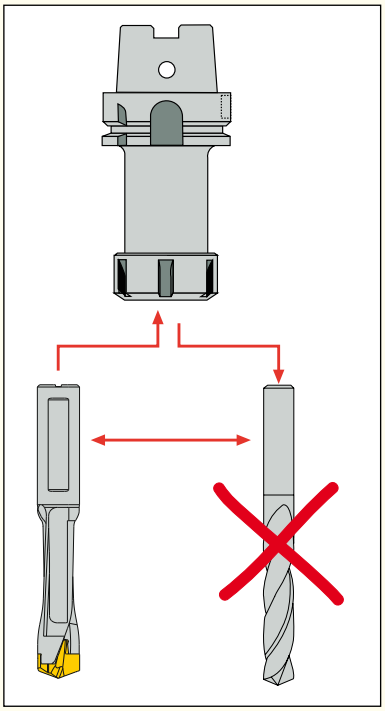
1. Check the runout and make sure it is within 0.02 mm T.I.R. (radial and axial).
2. Adjust the feed for improved chip formation.
3. In case of chip jamming - increase the coolant flow and/or reduce the cutting speed.
4. Increase the coolant pressure.
5. Check the chisel point runout and make sure it is within 0.02 mm T.I.R.
6. Use pecking cycle.
7. Use double margin geometry.



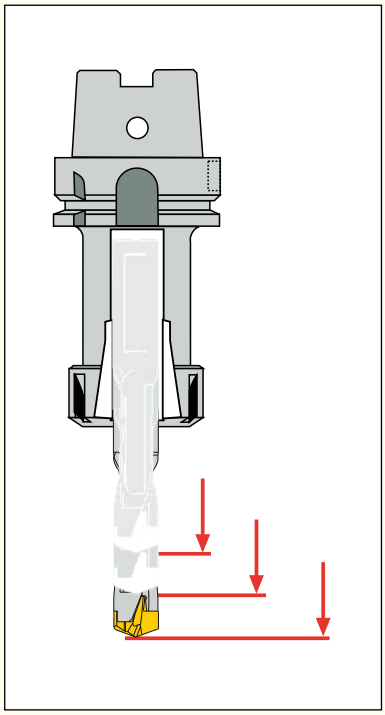
Burrs on Exit

1. Reduce the feed rate by 30%-50% during exit.
2. Replace the worn head.
3. Check the adaptation. Use hydraulic clamping chuck, MAXIN power chuck or side clamping systems.

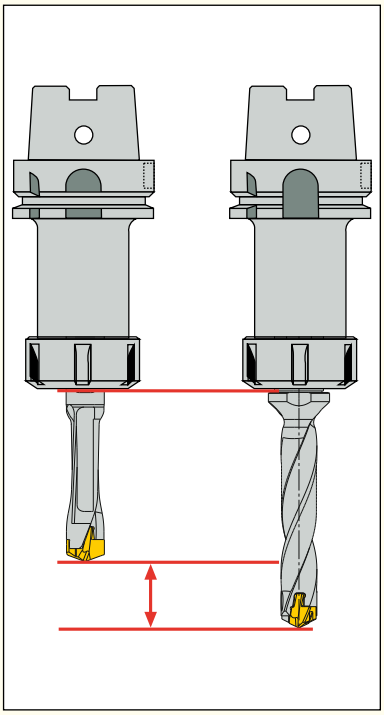
Applications for DCNS Drills



Replaces solid carbide drils without changing any holding components



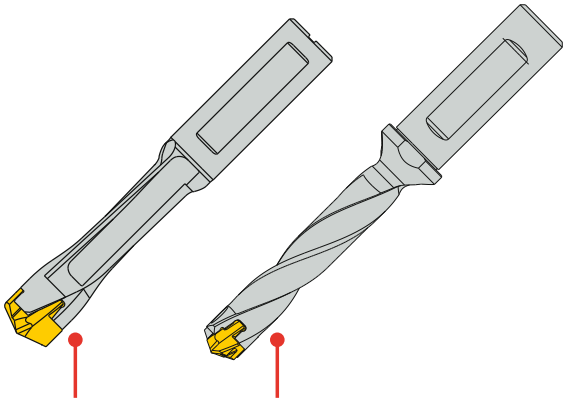
When using UNISUMOCHAM, drill's projection can be adjusted



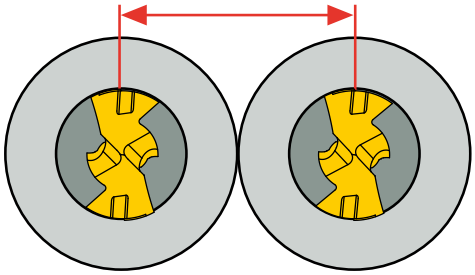
Shorter projection compared to SUMOCHAM when required

UNISUMOCHAM SUMOCHAM CHAMDRILL LINE

For better stability in rough applications and interrupted cuts

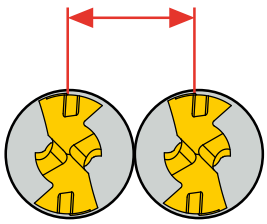


SUMOCHAM CHAMDRILL LINE



UNISUMOCHAM

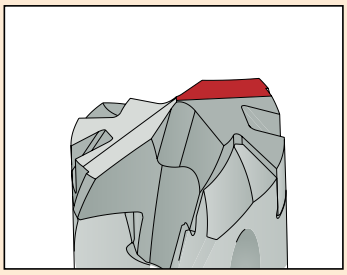
Can be used on multi-spindle applications for close spacing between adjacent drills

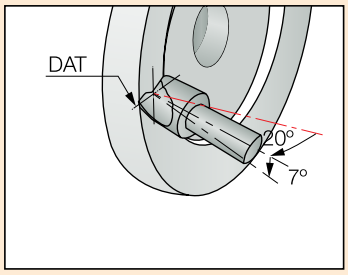


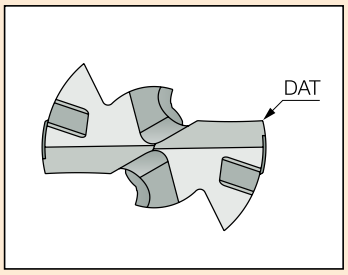
Regrinding Instructions for ICP Geometry

After Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure

1

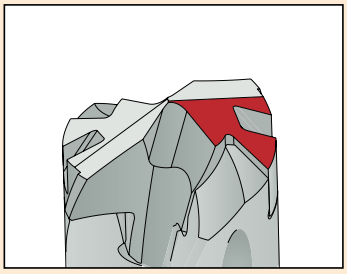


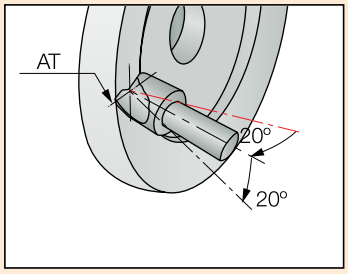


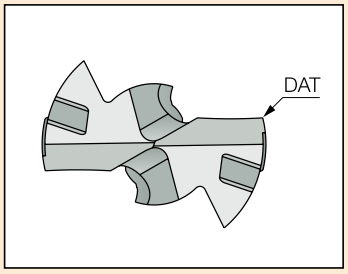


Primary Clearance

2

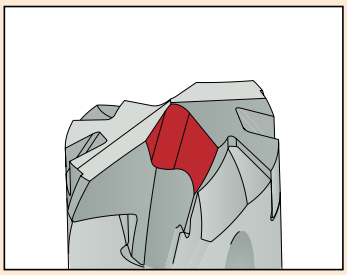


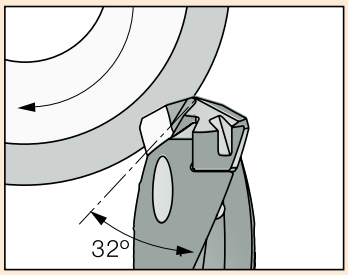


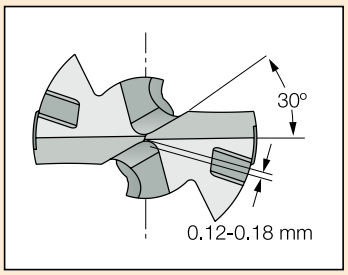


Secondary Clearance

3

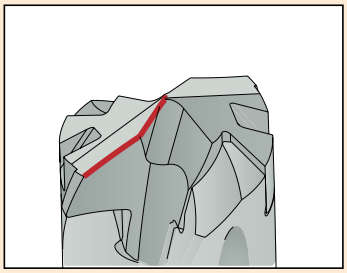


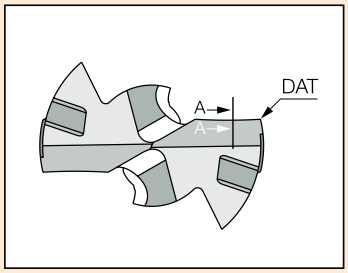


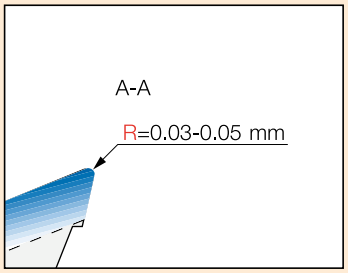


Chisel

4





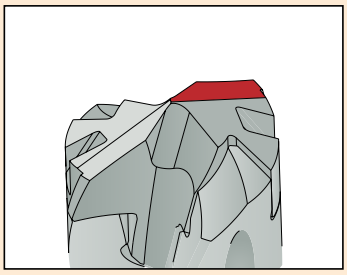


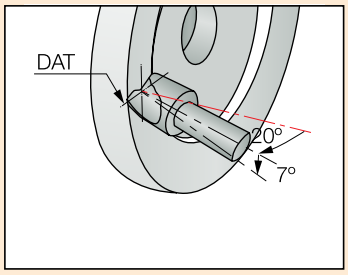
Edge Preparation

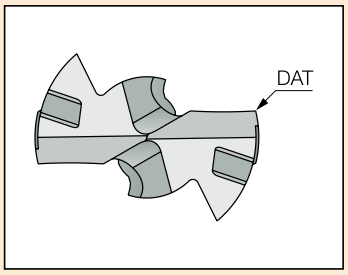
Regrinding Instructions for ICM Geometry

After Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure

1

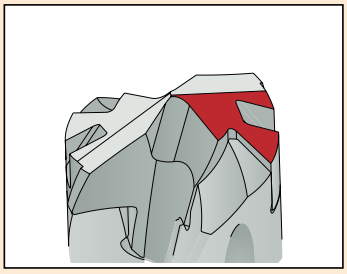


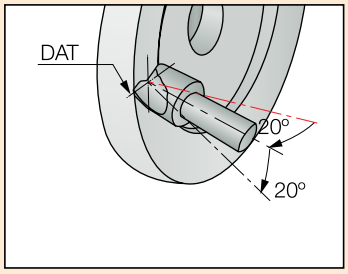


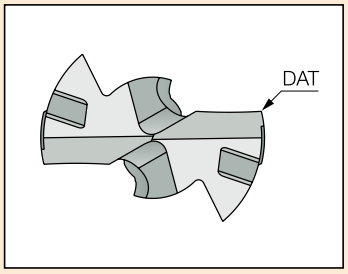


Primary Clearance

2

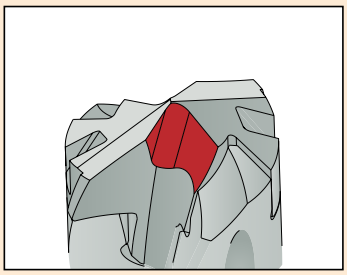


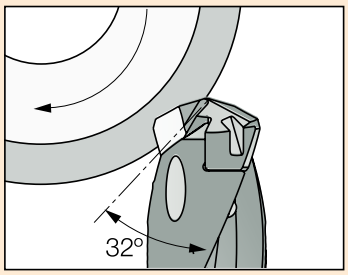


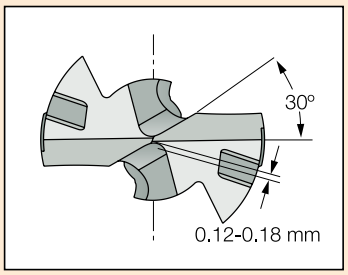


Secondary Clearance

3

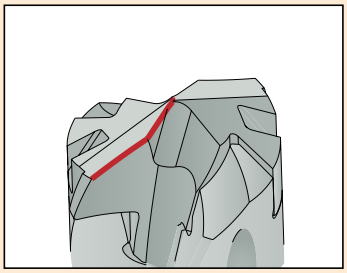


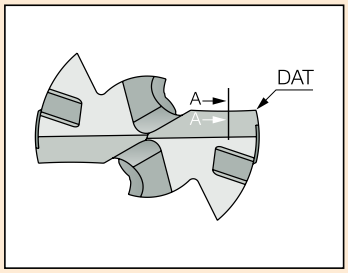


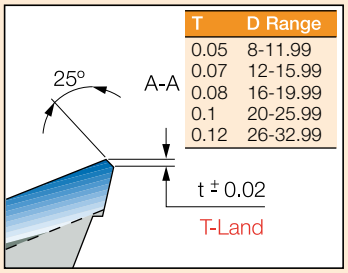


Chisel

4







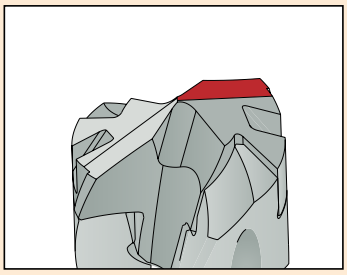
T	D Range
0.05	8-11.99
0.07	12-15.99
0.08	16-19.99
0.1	20-25.99
0.12	26-32.99

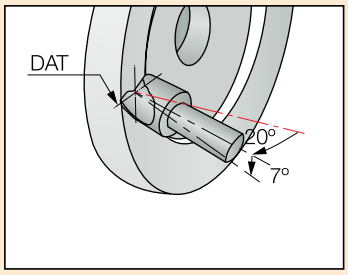
Edge Preparation

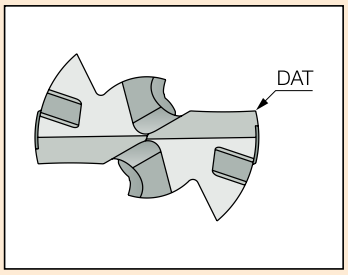
Regrinding Instructions for ICK Geometry

After Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure

1

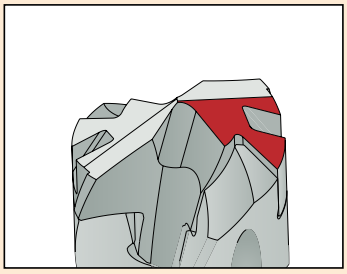


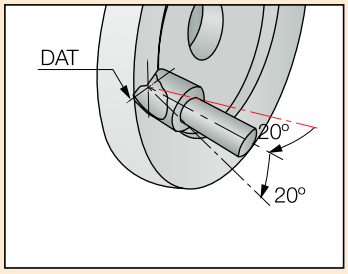


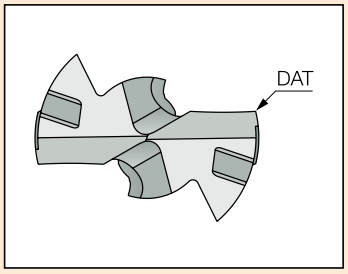


Primary Clearance

2

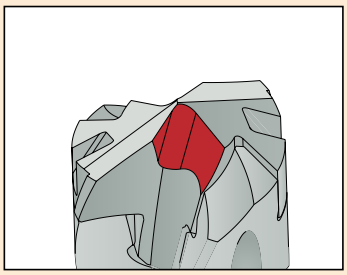


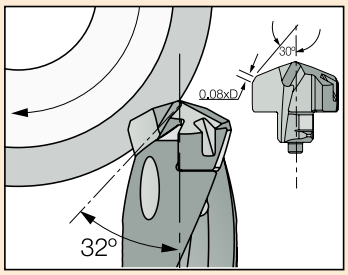


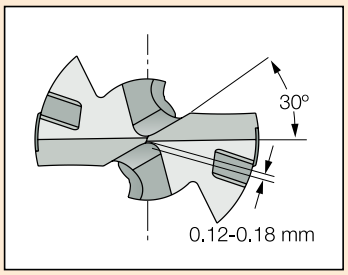


Secondary Clearance

3

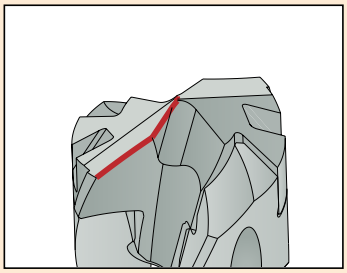


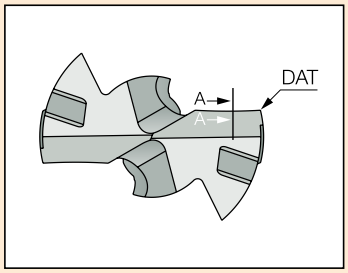


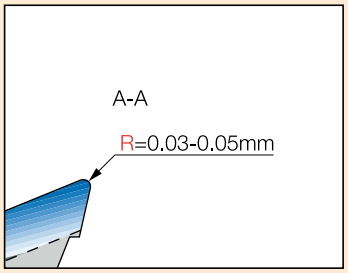


Chisel

4





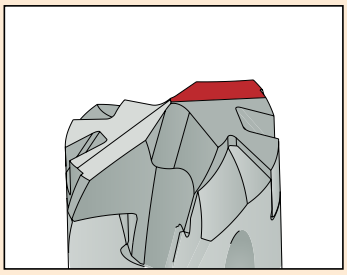


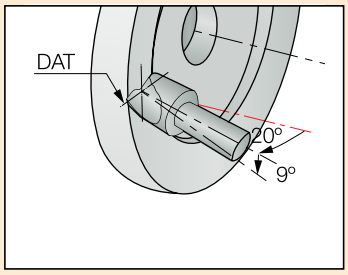
Edge Preparation

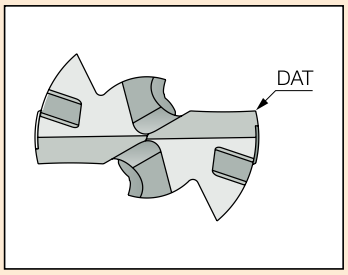
Regrinding Instructions for ICN Geometry

After Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure

1

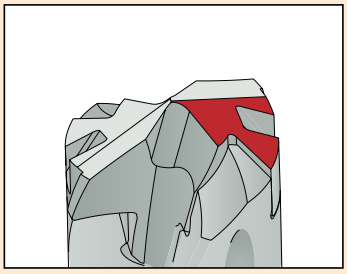


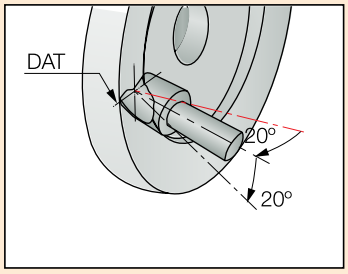


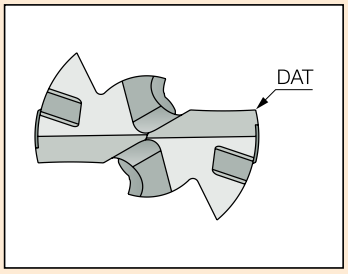


Primary Clearance

2

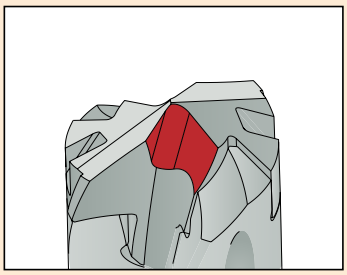


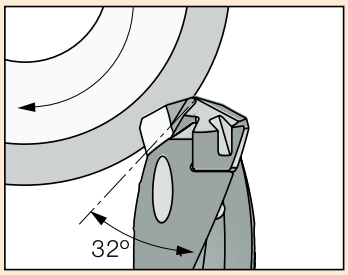


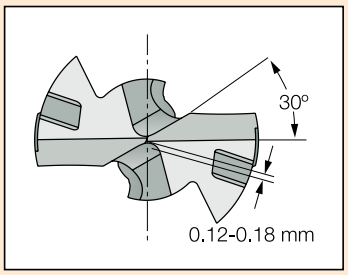


Secondary Clearance

3

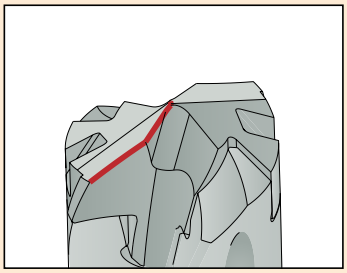


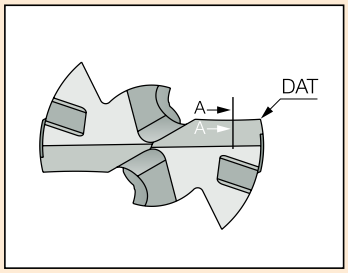


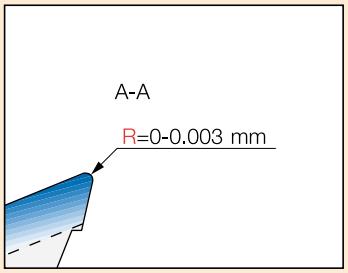


Chisel

4



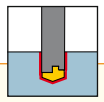




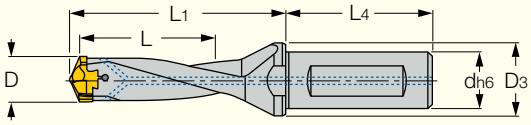
Edge Preparation

DCM-3D (7.5-25.9 mm)

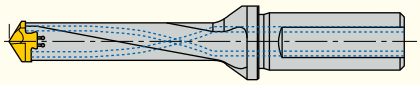
Indexable Head Drills with One Flat Shanks, Drilling Depth 3xD



D = 7.5 - 21.9



D = 22 - 25.9



Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCM 075-022-12A-3D	7.50	7.90	22.0	12.00	16.00	33.1	45.0	8.0	K DCM- 8
DCM 080-024-12A-3D	8.00	8.40	24.0	12.00	16.00	35.0	45.0	8.0	K DCM- 8
DCM 085-025-12A-3D	8.50	8.90	25.0	12.00	16.00	37.0	45.0	8.0	K DCM- 8
DCM 090-027-12A-3D	9.00	9.40	27.0	12.00	16.00	39.1	45.0	9.0	K DCM- 9
DCM 095-028-12A-3D	9.50	9.90	28.0	12.00	16.00	41.1	45.0	9.0	K DCM- 9
DCM 100-030-16A-3D	10.00	10.40	30.0	16.00	20.00	44.0	48.0	10.0	K DCM-10
DCM 105-031-16A-3D	10.50	10.90	31.0	16.00	20.00	46.0	48.0	10.0	K DCM-10
DCM 110-033-16A-3D	11.00	11.40	33.0	16.00	20.00	48.1	48.0	11.0	K DCM-11
DCM 115-034-16A-3D	11.50	11.90	34.0	16.00	20.00	50.0	48.0	11.0	K DCM-11
DCM 120-036-16A-3D	12.00	12.40	36.0	16.00	20.00	52.2	48.0	12.0	K DCM-12
DCM 125-037-16A-3D	12.50	12.90	37.0	16.00	20.00	53.8	48.0	12.0	K DCM-12
DCM 130-039-16A-3D	13.00	13.40	39.0	16.00	20.00	56.5	48.0	13.0	K DCM-13
DCM 135-040-16A-3D	13.50	13.90	40.0	16.00	20.00	58.5	48.0	13.0	K DCM-13
DCM 140-042-16A-3D	14.00	14.40	42.0	16.00	20.00	61.2	48.0	14.0	K DCM-14
DCM 145-043-16A-3D	14.50	14.90	43.0	16.00	20.00	63.2	48.0	14.0	K DCM-14
DCM 150-045-20A-3D	15.00	15.90	45.0	20.00	25.00	65.7	50.0	15.0	K DCM-15
DCM 160-048-20A-3D	16.00	16.90	48.0	20.00	25.00	70.0	50.0	16.0	K DCM-16
DCM 170-051-20A-3D	17.00	17.90	51.0	20.00	25.00	73.5	50.0	17.0	K DCM-17
DCM 180-054-25A-3D	18.00	18.90	54.0	25.00	32.00	78.3	56.0	18.0	K DCM-18
DCM 190-057-25A-3D	19.00	19.90	57.0	25.00	32.00	82.3	56.0	19.0	K DCM-19
DCM 200-060-25A-3D	20.00	20.90	60.0	25.00	32.00	87.0	56.0	20.0	K DCM-20
DCM 210-063-25A-3D	21.00	21.90	63.0	25.00	32.00	90.8	56.0	21.0	K DCM-21
DCM 220-066-25A-3D	22.00	22.90	66.0	25.00	32.00	95.1	56.0	22.0	K DCM-22
DCM 230-069-25A-3D	23.00	23.90	69.0	25.00	32.00	99.5	56.0	23.0	K DCM-23
DCM 240-072-25A-3D	24.00	24.90	72.0	25.00	32.00	103.6	56.0	24.0	K DCM-24
DCM 250-075-25A-3D	25.00	25.90	75.0	25.00	32.00	109.0	56.0	25.0	K DCM-25

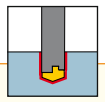
• Drill tolerance: k7 • For user guide and cutting conditions, see pages B44-52.

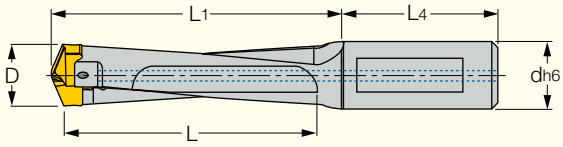
(1) Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: IDI-SG (B43) • IDI-SK (B43).

DCM-3.5D (7.5-20.9 mm)

Indexable Head Drills without a Flange and One Flat Shanks, Drilling Depth 3.5xD.
Suitable for Chamfering Holders.





Designation	D min(1)	D max	L	d	L1	L4	Po. Size	Clamping Key
DCM 075-026-8B-3.5D	7.50	7.90	26.0	8.00	33.7	43.0	8.0	K DCM- 8
DCM 080-028-8B-3.5D	8.00	8.40	28.0	8.00	35.9	43.0	8.0	K DCM- 8
DCM 085-029-9B-3.5D	8.50	8.90	29.0	9.00	36.9	43.0	8.0	K DCM- 8
DCM 090-031-9B-3.5D	9.00	9.40	31.0	9.00	39.1	43.0	9.0	K DCM- 9
DCM 095-033-10B-3.5D	9.50	9.90	33.0	10.00	40.3	43.0	9.0	K DCM- 9
DCM 100-033-10B-3.5D	10.00	10.40	33.0	10.00	43.0	43.0	10.0	K DCM-10
DCM 105-034-11B-3.5D	10.50	10.90	34.0	11.00	44.8	43.0	10.0	K DCM-10
DCM 110-036-11B-3.5D	11.00	11.40	36.0	11.00	46.9	43.0	11.0	K DCM-11
DCM 115-038-12B-3.5D	11.50	11.90	38.0	12.00	48.6	43.0	11.0	K DCM-11
DCM 120-042-12B-3.5D	12.00	12.40	42.0	12.00	50.8	43.0	12.0	K DCM-12
DCM 125-042-13B-3.5D	12.50	12.90	42.0	13.00	52.6	43.0	12.0	K DCM-12
DCM 130-042-13B-3.5D	13.00	13.40	42.0	13.00	54.5	45.0	13.0	K DCM-13
DCM 135-044-14B-3.5D	13.50	13.90	44.0	14.00	56.2	45.0	13.0	K DCM-13
DCM 140-048-14B-3.5D	14.00	14.40	48.0	14.00	59.2	45.0	14.0	K DCM-14
DCM 145-050-15B-3.5D	14.50	14.90	50.0	15.00	60.9	45.0	14.0	K DCM-14
DCM 150-052-15B-3.5D	15.00	15.90	52.0	15.00	63.1	45.0	15.0	K DCM-15
DCM 160-052-16B-3.5D	16.00	16.90	52.0	16.00	67.0	48.0	16.0	K DCM-16
DCM 170-055-17B-3.5D	17.00	17.90	55.0	17.00	73.6	48.0	17.0	K DCM-17
DCM 180-060-18B-3.5D	18.00	18.90	60.0	18.00	78.3	48.0	18.0	K DCM-18
DCM 190-062-19B-3.5D	19.00	19.90	62.5	19.00	81.8	54.0	19.0	K DCM-19
DCM 200-066-20B-3.5D	20.00	20.90	66.0	20.00	84.6	54.0	20.0	K DCM-20

• Drill tolerance: k7

• Can be used for CHAMRING chamfering rings (see page B96) • For user guide and cutting conditions, see pages B44-52.

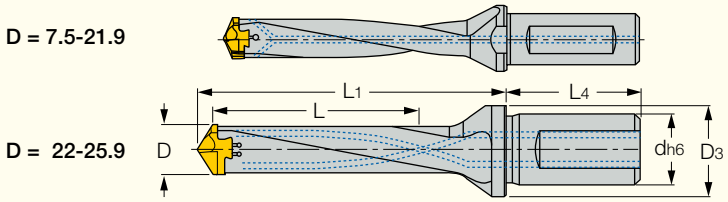
(1) Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: IDI-SG (B43) • IDI-SK (B43).

CHAMDRILL

DCM-5D (7.5-25.9 mm)

Indexable Head Drills with One Flat Shanks, Drilling Depth 5xD



Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCM 075-037-12A-5D	7.50	7.90	37.0	12.00	16.00	48.1	45.0	8.0	K DCM- 8
DCM 080-040-12A-5D	8.00	8.40	40.0	12.00	16.00	51.0	45.0	8.0	K DCM- 8
DCM 085-042-12A-5D	8.50	8.90	42.0	12.00	16.00	54.0	45.0	8.0	K DCM- 8
DCM 090-045-12A-5D	9.00	9.40	45.0	12.00	16.00	57.1	45.0	9.0	K DCM- 9
DCM 095-047-12A-5D	9.50	9.90	47.0	12.00	16.00	60.1	45.0	9.0	K DCM- 9
DCM 100-050-16A-5D	10.00	10.40	50.0	16.00	20.00	64.0	48.0	10.0	K DCM-10
DCM 105-052-16A-5D	10.50	10.90	52.0	16.00	20.00	67.0	48.0	10.0	K DCM-10
DCM 110-055-16A-5D	11.00	11.40	55.0	16.00	20.00	70.1	48.0	11.0	K DCM-11
DCM 115-057-16A-5D	11.50	11.90	57.0	16.00	20.00	73.0	48.0	11.0	K DCM-11
DCM 120-060-16A-5D	12.00	12.40	60.0	16.00	20.00	76.2	48.0	12.0	K DCM-12
DCM 125-062-16A-5D	12.50	12.90	62.0	16.00	20.00	79.2	48.0	12.0	K DCM-12
DCM 130-065-16A-5D	13.00	13.40	65.0	16.00	20.00	82.5	48.0	13.0	K DCM-13
DCM 135-067-16A-5D	13.50	13.90	67.0	16.00	20.00	85.5	48.0	13.0	K DCM-13
DCM 140-070-16A-5D	14.00	14.40	70.0	16.00	20.00	89.2	48.0	14.0	K DCM-14
DCM 145-072-16A-5D	14.50	14.90	72.0	16.00	20.00	92.2	48.0	14.0	K DCM-14
DCM 150-075-20A-5D	15.00	15.90	75.0	20.00	25.00	95.7	50.0	15.0	K DCM-15
DCM 160-080-20A-5D	16.00	16.90	80.0	20.00	25.00	102.0	50.0	16.0	K DCM-16
DCM 170-085-20A-5D	17.00	17.90	85.0	20.00	25.00	107.5	50.0	17.0	K DCM-17
DCM 180-090-25A-5D	18.00	18.90	90.0	25.00	32.00	114.3	56.0	18.0	K DCM-18
DCM 190-095-25A-5D	19.00	19.90	95.0	25.00	32.00	120.3	56.0	19.0	K DCM-19
DCM 200-100-25A-5D	20.00	20.90	100.0	25.00	32.00	127.0	56.0	20.0	K DCM-20
DCM 210-105-25A-5D	21.00	21.90	105.0	25.00	32.00	132.8	56.0	21.0	K DCM-21
DCM 220-110-25A-5D	22.00	22.90	110.0	25.00	32.00	139.1	56.0	22.0	K DCM-22
DCM 230-115-25A-5D	23.00	23.90	115.0	25.00	32.00	145.5	56.0	23.0	K DCM-23
DCM 240-120-25A-5D	24.00	24.90	120.0	25.00	32.00	151.6	56.0	24.0	K DCM-24
DCM 250-125-25A-5D	25.00	25.90	125.0	25.00	32.00	159.0	56.0	25.0	K DCM-25

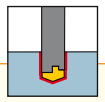
- Drill tolerance: k7
- For user guide and cutting conditions, see pages B44-52.

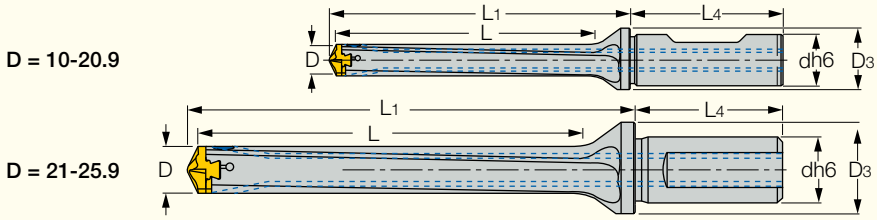
(1) Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: IDI-SG (B43) • IDI-SK (B43).

DCM-8D (10-25.9 mm)

Indexable Head Drills with One Flat Shanks, Drilling Depth 8xD





Designation	D min(1)	D max	L	d	D3	L1	L4	Po. Size	Clamping Key
DCM 100-080-16A-8D	10.00	10.90	80.0	16.00	20.00	94.0	48.0	10.0	K DCM-10
DCM 110-088-16A-8D	11.00	11.90	88.0	16.00	20.00	103.2	48.0	11.0	K DCM-11
DCM 120-096-16A-8D	12.00	12.90	96.0	16.00	20.00	112.3	48.0	12.0	K DCM-12
DCM 130-104-16A-8D	13.00	13.90	104.0	16.00	20.00	121.5	48.0	13.0	K DCM-13
DCM 140-112-16A-8D	14.00	14.90	112.0	16.00	20.00	131.2	48.0	14.0	K DCM-14
DCM 150-120-20A-8D	15.00	15.90	120.0	20.00	25.00	140.7	50.0	15.0	K DCM-15
DCM 160-128-20A-8D	16.00	16.90	128.0	20.00	25.00	150.0	50.0	16.0	K DCM-16
DCM 170-136-20A-8D	17.00	17.90	136.0	20.00	25.00	158.5	50.0	17.0	K DCM-17
DCM 180-144-25A-8D	18.00	18.90	144.0	25.00	32.00	168.3	56.0	18.0	K DCM-18
DCM 190-152-25A-8D	19.00	19.90	152.0	25.00	32.00	177.3	56.0	19.0	K DCM-19
DCM 200-160-25A-8D	20.00	20.90	160.0	25.00	32.00	187.2	56.0	20.0	K DCM-20
DCM 210-168-25A-8D	21.00	21.90	168.0	25.00	32.00	196.2	56.0	21.0	K DCM-21
DCM 220-176-25A-8D	22.00	22.90	176.0	25.00	32.00	205.2	56.0	22.0	K DCM-22
DCM 230-184-25A-8D	23.00	23.90	184.0	25.00	32.00	215.1	56.0	23.0	K DCM-23
DCM 240-192-25A-8D	24.00	24.90	192.0	25.00	32.00	224.5	56.0	24.0	K DCM-24
DCM 250-200-25A-8D	25.00	25.90	200.0	25.00	32.00	233.7	56.0	25.0	K DCM-25

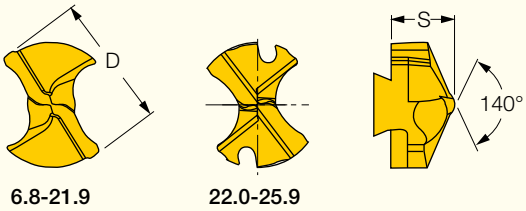
• Drill tolerance: k7 • For user guide and cutting conditions, see pages B44-52.

(1) Do not mount smaller drilling heads than specified range for drill body.

For inserts, see: IDI-SG (B43) • IDI-SK (B43).

IDI-SG /IDI-SK

SG-for General Use SK- for Cast Iron



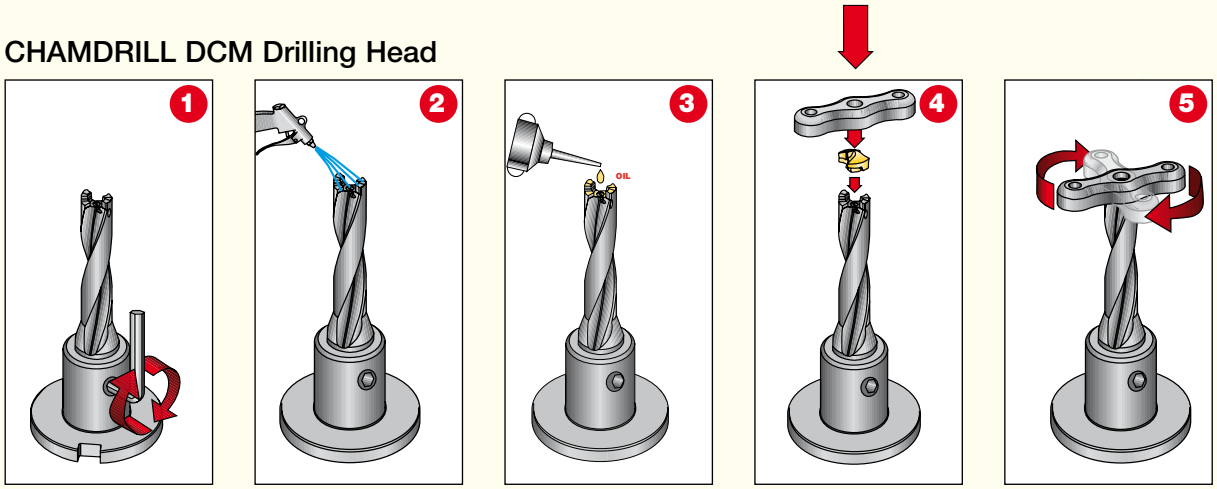
Designation	Dimensions			IC908
	D Range [1]	S	Pocket Size	
IDI-SG... IDI-SK...	6.8	4.1	6.8	●
	7.5-7.9	4.1	8.0	●
	8.0-8.9	4.1	8.0	●
	9.0-9.9	4.3	9.0	●
	10-10.9	5.3	10.0	●
	11-11.9	5.5	11.0	●
	12-12.9	5.8	12.0	●
	13-13.9	6.0	13.0	●
	14-14.9	6.8	14.0	●
	15-15.9	7.4	15.0	●
	16-16.9	7.4	16.0	●
	17-17.9	7.9	17.0	●
	18-18.9	8.3	18.0	●
	19-19.9	8.5	19.0	●
	20-20.9	9.1	20.0	●
	21-21.9	9.3	21.0	●
	22-22.9	9.3	22.0	●
	23-23.9	9.8	23.0	●
	24-24.9	10.0	24.0	●
	25-25.9	10.6	25.0	●

[1] The drilling bits are available in increments of 0.1 mm

Ordering example for IDI 10.0 mm drilling head: IDI 100-SG IC908

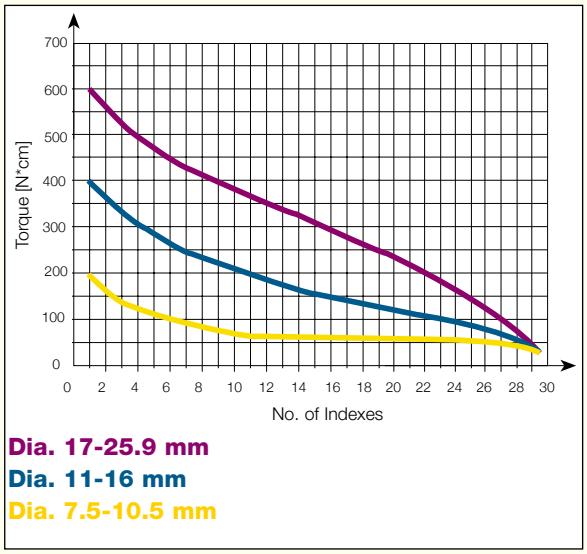
Drilling Head Mounting Procedure

CHAMDRILL DCM Drilling Head



CHAMDRILL Unlocking Change in Torque

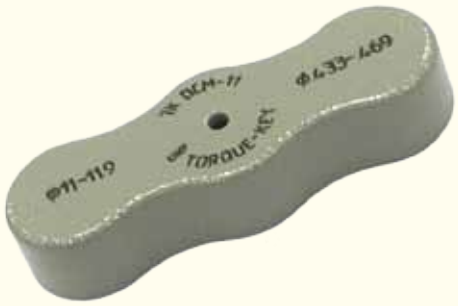
Typical Unlocking Torque Range



The number of indexing changes according to machine/clamping rigidity, machining conditions, workpiece material, coolant, cooling pressure and correct usage.

Torque Inspection Key

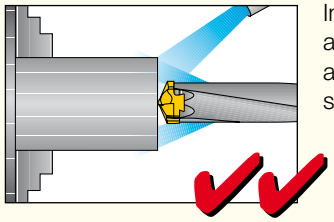
Torque keys are available for checking minimal clamping torque. If a “click” is not heard or felt while slowly unclamping with the torque key, the drill must be replaced.



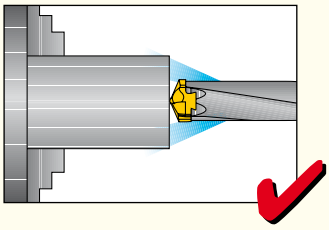
Key Designation	Minimal Clamping Torque N.cm
TK DCM-8	15-20
TK DCM-9	
TK DCM-10	
TK DCM-11	
TK DCM-12	
TK DCM-13	
TK DCM-14	
TK DCM-15	
TK DCM-16	
TK DCM-17	21-25
TK DCM-18	
TK DCM-19	
TK DCM-20	
TK DCM-21	31-35
TK DCM-22	
TK DCM-23	
TK DCM-24	
TK DCM-25	

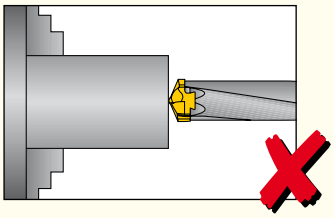
ISCAR recommends to use the torque key only for torque inspection.

Coolant

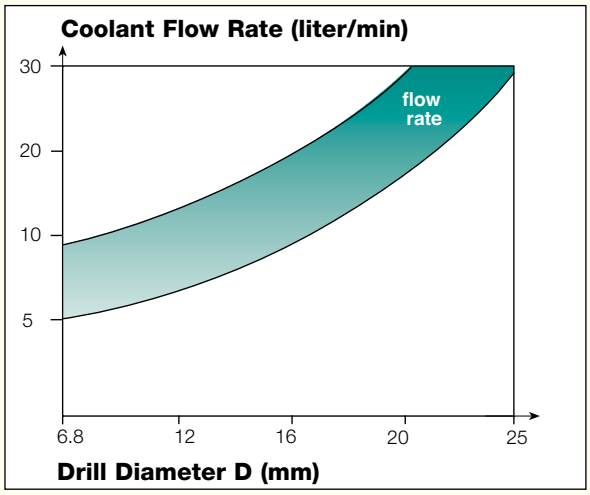


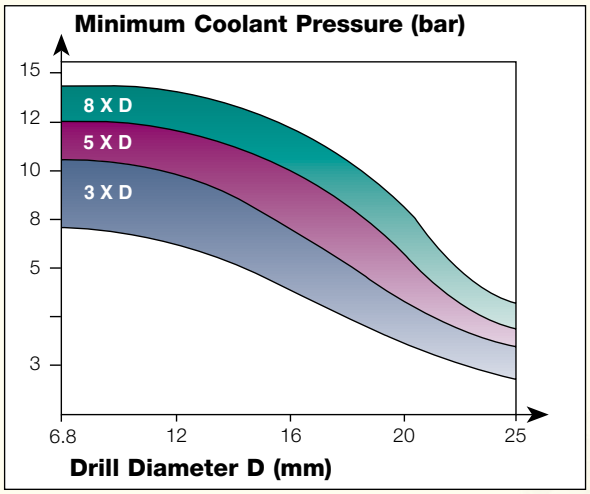
In stationary drill applications both internal and external coolant supply is recommended.





Recommended Coolant Pressure and Flow Rate





* For special drills more than 8xD, it is recommended to use higher coolant pressure: 15–70 bar.

To guarantee chip evacuation, the coolant must always flow through the tool. If the machine is not equipped with coolant through the spindle, we recommend using a coolant inducer. External coolant supply can be used if hole depth is less than 1xD and reduced cutting data is applied. The diagram shows the coolant flow rates for different drills and pressures.

Coolant Mix

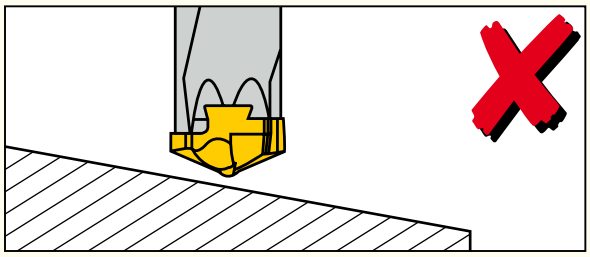
Recommended emulsion mix is 6-8%. When drilling in stainless and high strength steels, a mix of 10% is recommended.

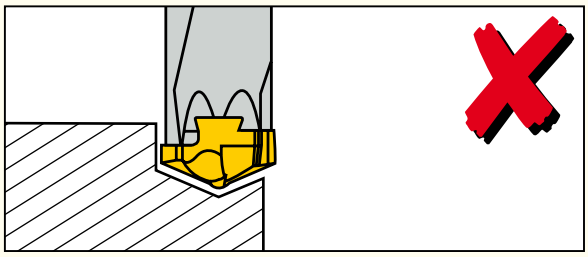
When using the IDI drilling head, high pressure oil or 7-15% mineral or vegetable based oil emulsion is highly recommended for drilling stainless steel and high temperature alloys.

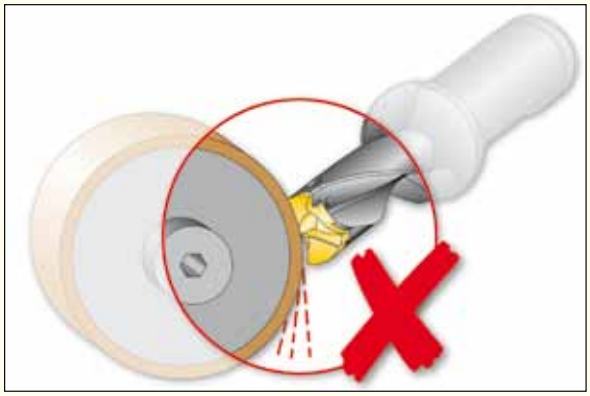
Dry Drilling

It is possible to drill without coolant in cast iron.
Oil mist through the drill is then required (for 2xD max).

Drilling Limitations





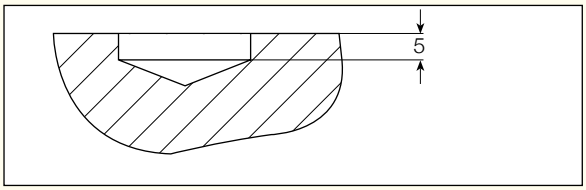


Regrinding of drill head is not recommended;
it may cause drill malfunction.

Centering Hole Data for DCM 8xD

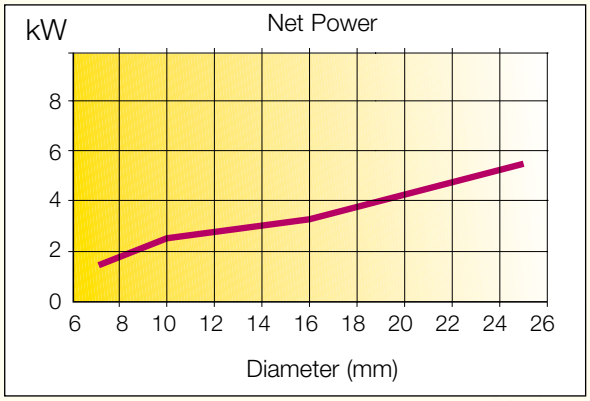
We strongly recommend the use of DCN 1.5D drill of the same diameter to drill a centering pre-hole. The use of the centering pre-hole improves hole location, accuracy, roundness, straightness and surface finish and reliability.

Use internal coolant with
at least 15 bar pressure.



Power/Force Requirements

Power/Force Requirements



Material: SAE 4340
Speed: 100 m/min
Feed: 0.2 mm/rev
Values change for different materials
and drilling conditions.


CHAMDRILL

Material Groups

ISO	Material		Condition	Tensile Strength Rm [N/mm2]	Hardness HB
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125
		> = 0.25 %C	Annealed	650	190
		< 0.55 %C	Quenched and tempered	850	250
		> = 0.55 %C	Annealed	750	220
			Quenched and tempered	1000	300
	Low alloy steel and cast steel (less than 5% alloying elements)		Annealed	600	200
			Quenched and tempered	930	275
				1000	300
				1200	350
	High alloy steel, cast steel and tool steel		Annealed	680	200
			Quenched and tempered	1100	325
M	Stainless steel and cast steel		Ferritic/martensitic	680	200
			Martensitic	820	240
			Austenitic	600	180
K	Grey cast iron (GG)		Ferritic/pearlitic		180
			Pearlitic		260
	Ductile cast iron (nodular) (GGG)		Ferritic		160
			Pearlitic		250
	Malleable cast iron		Ferritic		130
			Pearlitic		230
N	Aluminum-wrought alloy		Not cureable		60
			Cured		100
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75
			Cured		90
		>12% Si	High temperature		130
	Copper alloys	>1% Pb	Free cutting		110
			Brass		90
			Electrolitic copper		100
	Non-metallic		Duroplastics, fiber plastics		
			Hard rubber		
S	High temp. alloys	Fe based	Annealed		200
			Cured		280
	Super alloys	Ni or Co based	Annealed		250
			Cured		350
			Cast		320
	Titanium, Ti alloys			Rm 400	
			Alpha+beta alloys cured	Rm 1050	
H	Hardened steel		Hardened		55 HRc
			Hardened		60 HRc
	Chilled cast iron		Cast		400
	Cast iron		Hardened		55 HRc

- When using external coolant supply only, reduce cutting speed by 10%.
- When using more than 5XD drill ratio, reduce cutting parameters by 10%.

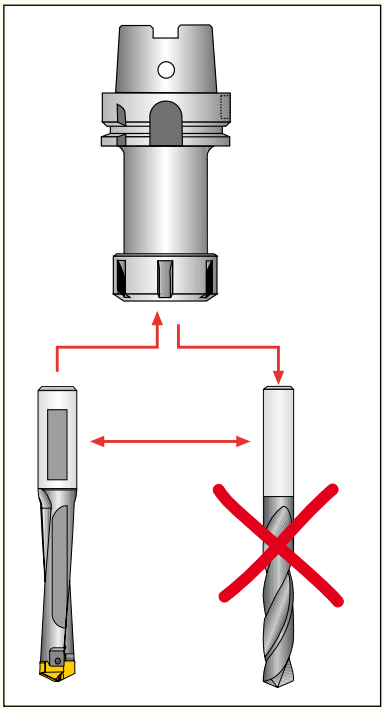
Recommended Machining Conditions

Cutting Speed Vc m/min	Feed vs. Drill Diameter mm/rev					
	D=6.8-10.9	D=11-12.9	D=13-14.9	D=15-16.9	D=17-20.9	D=21-25.9
50-130 100-120 90-110 90-120 70-90	0.12-0.2	0.15-0.25	0.2-0.3	0.25-0.35	0.25-0.45	0.25-0.45
80-130 70-110 60-90 40-70	0.12-0.2	0.15-0.25	0.2-0.3	0.25-0.35	0.3-0.4	0.3-0.45
50-80 40-70	0.12-0.2	0.12-0.22	0.15-0.25	0.2-0.28	0.25-0.33	0.25-0.35
20-50	0.08-0.14	0.12-0.22	0.12-0.15	0.14-0.20	0.16-0.24	0.15-0.28
90-140 80-130 100-180 90-160	0.2-0.3	0.25-0.35	0.3-0.4	0.35-0.45	0.4-0.5	0.4-0.6
90-160 80-120 90-160	0.2-0.35	0.25-0.4	0.3-0.45	0.35-0.5	0.4-0.6	0.4-0.65
30-50 20-40	0.05-0.1	0.08-0.13	0.1-0.15	0.12-0.18	0.12-0.2	0.12-0.22
20-50	0.06-0.12	0.09-0.15	0.12-0.18	0.15-0.2	0.15-0.23	0.15-0.25
20-50	0.06-0.12	0.09-0.15	0.12-0.18	0.15-0.2	0.15-0.23	0.15-0.25

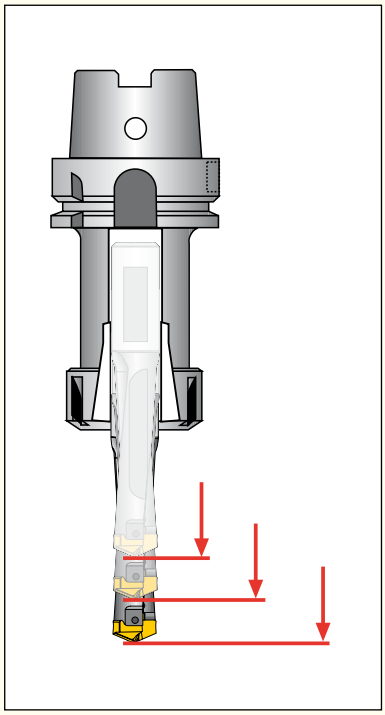
■ Recommended cutting data

As a starting value, the middle of the recommended machining range should be used.
Then, (according to wear results), conditions can be changed in order to optimize performance.
The data referse to IC908. For IC1008, cutting speed should be increased by 15%.

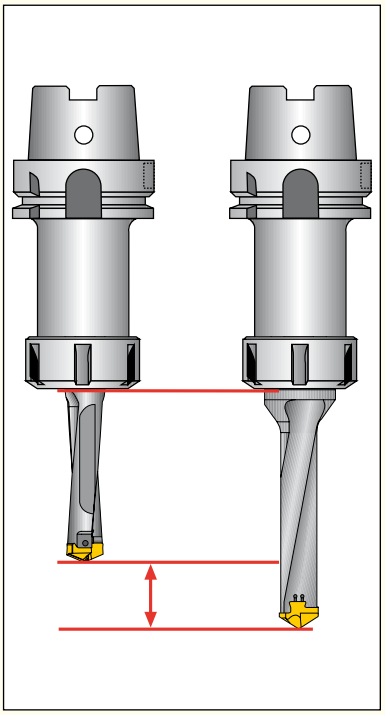
Applications for DCM 3.5D



Replaces solid carbide drils without changing any holding components



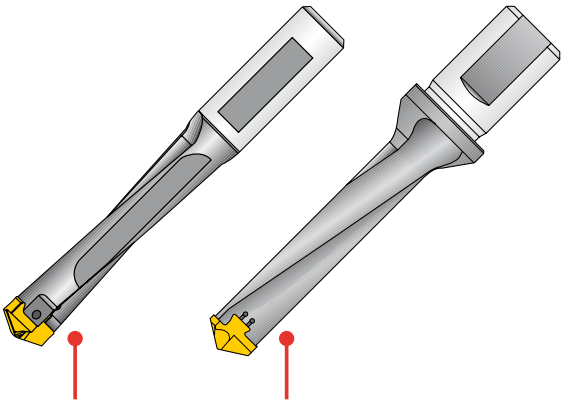
When using UNICHAMDRILL, drill's projection can be adjusted



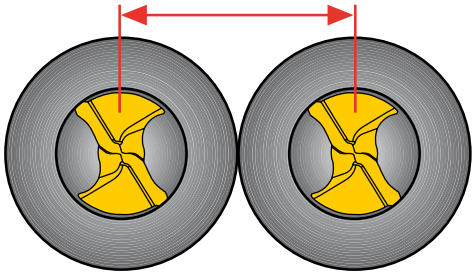
Shorter projection compared to CHAMDRILL when required

UNICHAMDRILL CHAMDRILL

For better stability in rough applications and interrupted cuts

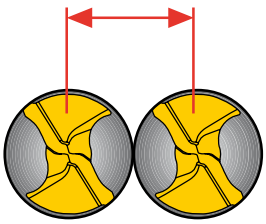


CHAMDRILL

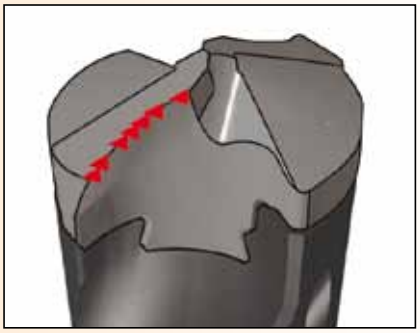


UNICHAMDRILL

Can be used on multi-spindle applications for close spacing between adjacent drills

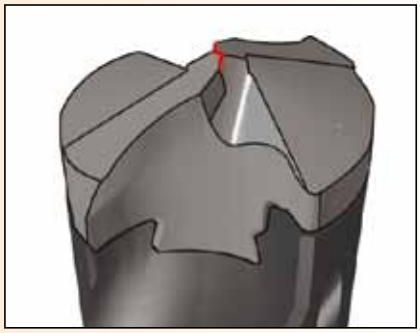


Troubleshooting



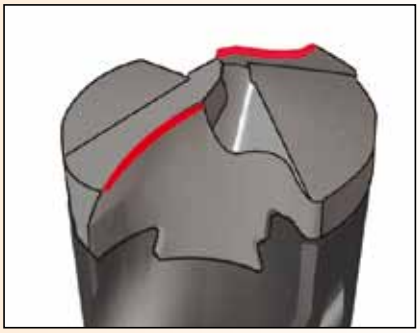
Cutting Edge Chipping

1. Check the stability of the machine spindle, tool and workpiece clamping rigidity.
2. Reduce feed rate, increase speed.
3. If the drill vibrates, reduce cutting speed and increase feed rate.
4. When drilling rough, hard or sloped surface (up to 6°), reduce the feed rate by 30%-50% during entrance and exit.
5. Check cooling lubricant. Increase coolant pressure. In case of external coolant supply, improve jet direction and add cooling jets.



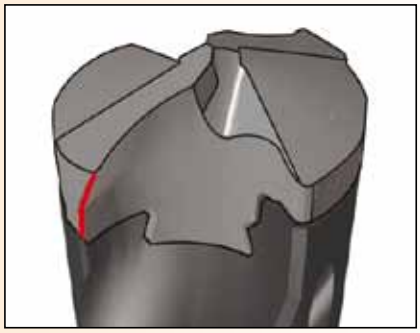
Chisel Area Chipping

1. Reduce feed rate.
2. Increase coolant pressure.
3. Check the adaptation. Use hydraulic clamping chuck, MAXIN power chuck or side lock systems.
4. Increase workpiece chucking force.



Excessive Flank Wear

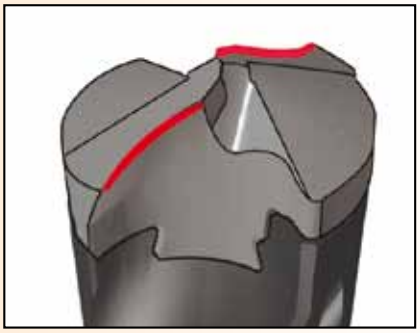
1. Check that the correct geometry is used.
2. Reduce cutting speed.
3. Increase internal coolant pressure.



Excessive Flute Land Wear

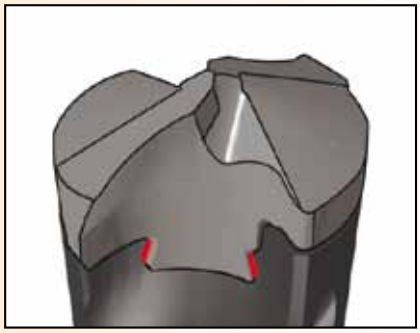
1. Check that the correct geometry is used.
2. Check the runout and make sure it is within 0.02 mm T.I.R. (radial and axial).
3. Reduce cutting speed.
4. When drilling rough, hard or sloped surface (up to 6°), reduce the feed rate by 30%-50% during entrance and exit.
5. Increase coolant pressure.
6. Check the chisel point runout and make sure it is within 0.02 mm T.I.R.
7. Increase workpiece chucking force stability and rigidity.
8. If there is low pocket gripping force - replace drill body.

Troubleshooting



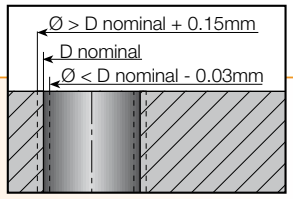
Built-Up Edge

1. Increase cutting speed.
2. Increase coolant pressure.



Insufficient Pocket Gripping Torque

1. Check unlocking gripping torque with TK DCM torque key. If there is no click indication - replace drill head.
2. Increase coolant pressure.

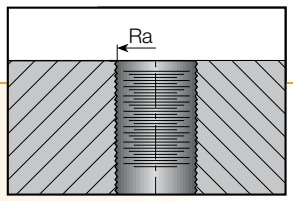


Deviation of Hole Tolerance

1. Check the runout and make sure it is within 0.02 mm T.I.R. (radial and axial cutting points).
2. Reduce feed rate.
3. Check the chisel point runout and make sure that it is within 0.02 mm T.I.R.
4. Wrong cutting edge. Replace head.
5. Increase workpiece chucking force.
6. Check the adaptation. Use hydraulic clamping chuck, MAXIN power chuck or side clamping systems.
7. Increase internal coolant pressure.

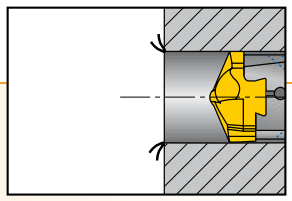
Inaccurate Hole Position

1. Check the runout and make sure it is within 0.02 mm T.I.R. (radial and axial).
2. Check the stability of the machine spindle, tool and workpiece clamping rigidity.
3. When drilling rough, hard or sloped surface (up to 6°), reduce the feed rate by 30%-50% during entrance.
4. Drill a pre-hole with a 140° point angle for centering.
5. Check the chisel point runout and make sure it is within 0.02 mm T.I.R.



Surface Finish Too Rough

1. Check the runout and make sure it is within 0.02 mm T.I.R. (radial and axial).
2. Adjust the feed for improved chip formation.
3. In case of chip jamming - increase the coolant flow and/or reduce the cutting speed.
4. Increase the coolant pressure.
5. Check the chisel point runout and make sure it is within 0.02 mm T.I.R.
6. Use pecking cycle.



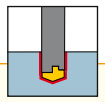
Burrs on Exit

1. Reduce the feed rate by 30%-50% during exit.
2. Replace the worn head.
3. Check the adaptation. Use hydraulic clamping chuck, MAXIN power chuck or side clamping systems.

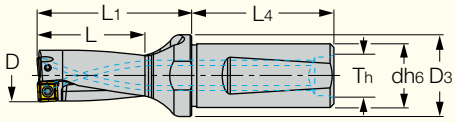

DR-TWIST
INDEXABLE DRILL LINE

DR-2D-N

Indexable Square Insert Drills with Coolant Holes, Drilling Depth 2xD



D= 14-60 mm



Designation	D	D max(1)	L	L1	L4	d	D3	Th	Insert
DR120-024-16-04-2D-N (1)	12.00	12.40	24.0	42.0	48.0	16.00	20.00	-	AOMT 04
DR125-025-16-04-2D-N (1)	12.50	12.90	25.0	43.0	48.0	16.00	20.00	-	AOMT 04
DR130-026-16-04-2D-N (1)	13.00	13.40	26.0	44.0	48.0	16.00	20.00	-	AOMT 04
DR135-027-16-04-2D-N (1)	13.50	13.90	27.0	45.0	48.0	16.00	20.00	-	AOMT 04
DR140-028-20-05-2D-N (1)	14.00	16.80	28.0	46.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR145-029-20-05-2D-N (1)	14.50	17.10	29.0	47.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR150-030-20-05-2D-N (1)	15.00	17.40	30.0	48.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR155-031-20-05-2D-N (1)	15.50	17.60	31.0	49.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR160-032-20-05-2D-N (1)	16.00	17.80	32.0	50.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR165-033-20-05-2D-N (1)	16.50	18.10	33.0	51.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR170-034-20-05-2D-N (1)	17.00	18.30	34.0	52.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR175-035-20-05-2D-N (1)	17.50	18.50	35.0	53.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR180-036-25-06-2D-N (1)	18.00	20.30	36.0	56.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR185-037-25-06-2D-N (1)	18.50	20.50	37.0	57.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR190-038-25-06-2D-N (1)	19.00	20.80	38.0	58.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR195-039-25-06-2D-N (1)	19.50	21.00	39.0	59.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR200-040-25-06-2D-N (1)	20.00	21.30	40.0	60.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR205-041-25-06-2D-N (1)	20.50	21.60	41.0	61.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR210-042-25-07-2D-N (1)	21.00	24.50	42.0	62.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR215-043-25-07-2D-N (1)	21.50	24.70	43.0	63.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR220-044-25-07-2D-N (1)	22.00	25.00	44.0	64.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR225-045-25-07-2D-N (1)	22.50	25.20	45.0	65.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR230-046-25-07-2D-N (1)	23.00	25.50	46.0	66.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR235-047-25-07-2D-N (1)	23.50	25.70	47.0	67.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR240-048-25-07-2D-N (1)	24.00	26.00	48.0	68.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR025-050-32-09-2D-N (1)	25.00	29.50	50.0	82.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR026-052-32-09-2D-N (1)	26.00	30.00	52.0	84.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR027-054-32-09-2D-N (1)	27.00	30.50	54.0	86.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR028-056-32-09-2D-N (1)	28.00	31.00	56.0	88.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR029-058-32-09-2D-N (1)	29.00	31.50	58.0	90.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR030-060-32-09-2D-N (1)	30.00	32.00	60.0	92.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR031-062-32-09-2D-N (1)	31.00	32.50	62.0	94.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR032-064-32-09-2D-N (1)	32.00	33.00	64.0	96.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR033-066-32-09-2D-N (1)	33.00	34.00	66.0	98.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR034-068-32-09-2D-N (1)	34.00	34.50	68.0	100.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR035-070-32-12-2D-N (1)	35.00	40.50	70.0	106.0	58.0	32.00	50.00	G1/2-1	SOMT 12
DR036-072-32-12-2D-N (1)	36.00	41.00	72.0	108.0	58.0	32.00	50.00	G1/2-1	SOMT 12
DR037-074-32-12-2D-N (1)	37.00	41.50	74.0	110.0	58.0	32.00	50.00	G1/2-1	SOMT 12
DR038-076-32-12-2D-N (1)	38.00	42.00	76.0	112.0	58.0	32.00	50.00	G1/2-1	SOMT 12
DR039-078-32-12-2D-N (1)	39.00	42.50	78.0	114.0	58.0	32.00	50.00	G1/2-1	SOMT 12
DR040-080-40-12-2D-N (1)	40.00	43.00	80.0	116.0	68.0	40.00	50.00	G3/4-14	SOMT 12
DR041-082-40-12-2D-N (1)	41.00	43.50	82.0	118.0	68.0	40.00	50.00	G3/4-14	SOMT 12
DR042-084-40-12-2D-N (1)	42.00	44.00	84.0	120.0	68.0	40.00	50.00	G3/4-14	SOMT 12
DR043-086-40-12-2D-N (1)	43.00	44.50	86.0	122.0	68.0	40.00	50.00	G3/4-14	SOMT 12
DR044-088-40-12-2D-N (1)	44.00	45.00	88.0	124.0	68.0	40.00	50.00	G3/4-14	SOMT 12
DR045-090-40-16-2D-N (2)	45.00	51.00	90.0	126.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR046-092-40-16-2D-N (2)	46.00	51.50	92.0	128.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR047-094-40-16-2D-N (2)	47.00	52.00	94.0	130.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR048-096-40-16-2D-N (2)	48.00	52.50	96.0	132.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR049-098-40-16-2D-N (2)	49.00	53.00	98.0	134.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR050-100-40-16-2D-N (2)	50.00	54.00	100.0	136.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR051-102-40-16-2D-N (2)	51.00	54.50	102.0	138.0	68.0	40.00	60.00	G3/4-14	SOMT 16

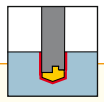
• Hole tolerance D+0.15/-0.05 in average conditions. However it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

(1) By shifting drill center along lathe X-axis.

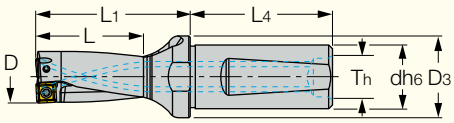
For inserts, see: AOMT-DT (B62) • SOGX-AL (B63) • SOMT-DT (B64) • SOMT-GF (B64) • SOMX-DT (B62) • SOMX-GF (B63).

DR-2D-N (continued)

Indexable Square Insert Drills with Coolant Holes, Drilling Depth 2xD



D= 14-60 mm



Designation	D	D max(1)	L	L1	L4	d	D3	Th	Insert
DR052-104-40-16-2D-N (2)	52.00	55.00	104.0	140.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR053-106-40-16-2D-N (2)	53.00	55.50	106.0	142.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR054-108-40-16-2D-N (2)	54.00	56.00	108.0	144.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR055-110-40-16-2D-N (2)	55.00	56.50	110.0	146.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR056-112-40-16-2D-N (2)	56.00	57.00	112.0	148.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR057-114-40-16-2D-N (2)	57.00	57.50	114.0	150.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR058-116-40-16-2D-N (2)	58.00	58.00	116.0	152.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR059-118-40-16-2D-N (2)	59.00	59.00	118.0	154.0	68.0	40.00	60.00	G3/4-14	SOMT 16
DR060-120-40-16-2D-N (2)	60.00	60.00	120.0	156.0	68.0	40.00	60.00	G3/4-14	SOMT 16

• Hole tolerance D+0.15/-0.05 in average conditions. However it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

(1) By shifting drill center along lathe X-axis.

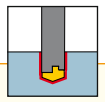
For inserts, see: AOMT-DT (B62) • SOGX-AL (B63) • SOMT-DT (B64) • SOMT-GF (B64) • SOMX-DT (B62) • SOMX-GF (B63).

Spare Parts

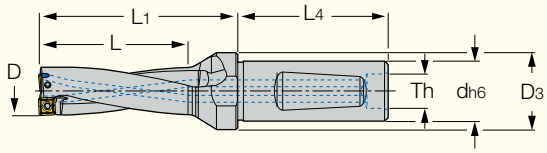
Designation	Screw	Torx Key Flag	Key	Torx Blade	Handle	T-Handle
DR(120-135)....-04-2D-N	SR 34-533	T-6/5				
DR(140-175)....-05-2D-N	SR 34-533/L	T-6/5				
DR(180-205)....-06-2D-N	SR 34-508/L		T-7/51			
DR(210-240)....-07-2D-N	SR 14-560		T-8/51			
DR(025-034)....-09-2D-N	SR 34-506			BLD T09/M7-SW4	SW4-SD	
DR(035-044)....-12-2D-N	SR 14-544/S			BLD T15/S7	SW6-SD	
DR(044-060)....-16-2D-N	SR 76-961			BLD T15/M7		SW6-T

DR-3D-N

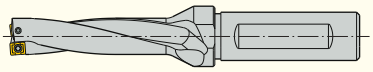
Indexable Square Insert Drills with Coolant Holes, Drilling Depth 3xD



D = 14-38 mm



D = 12-13.5 mm



Designation	D	D max(1)	L	L1	L4	d	D3	Th	Insert
DR120-036-16-04-3D-N	12.00	12.40	36.0	54.0	48.0	16.00	20.00	-	AOMT 04
DR125-038-16-04-3D-N	12.50	12.90	38.0	55.5	48.0	16.00	20.00	-	AOMT 04
DR130-039-16-04-3D-N	13.00	13.40	39.0	57.0	48.0	16.00	20.00	-	AOMT 04
DR135-041-16-04-3D-N	13.50	13.90	41.0	58.5	48.0	16.00	20.00	-	AOMT 04
DR140-042-20-05-3D-N	14.00	16.80	42.0	60.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR145-044-20-05-3D-N	14.50	17.10	43.5	61.5	50.0	20.00	25.00	G1/4"	SOMX 05
DR150-045-20-05-3D-N	15.00	17.40	45.0	63.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR155-047-20-05-3D-N	15.50	17.60	46.5	64.5	50.0	20.00	25.00	G1/4"	SOMX 05
DR160-048-20-05-3D-N	16.00	17.80	48.0	66.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR165-050-20-05-3D-N	16.50	18.10	49.5	67.5	50.0	20.00	25.00	G1/4"	SOMX 05
DR170-051-20-05-3D-N	17.00	18.30	51.0	69.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR175-053-20-05-3D-N	17.50	18.50	52.5	70.5	50.0	20.00	25.00	G1/4"	SOMX 05
DR180-054-25-06-3D-N	18.00	20.30	54.0	74.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR185-056-25-06-3D-N	18.50	20.50	55.5	75.5	56.0	25.00	32.00	G3/8"	SOMX 06
DR190-057-25-06-3D-N	19.00	20.80	57.0	77.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR195-059-25-06-3D-N	19.50	21.00	58.5	78.5	56.0	25.00	32.00	G3/8"	SOMX 06
DR200-060-25-06-3D-N	20.00	21.30	60.0	80.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR205-062-25-06-3D-N	20.50	21.60	61.5	81.5	56.0	25.00	32.00	G3/8"	SOMX 06
DR210-063-25-07-3D-N	21.00	24.50	63.0	83.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR215-065-25-07-3D-N	21.50	24.70	64.5	84.5	56.0	25.00	32.00	G3/8"	SOMX 07
DR220-066-25-07-3D-N	22.00	25.00	66.0	86.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR225-068-25-07-3D-N	22.50	25.20	67.5	87.5	56.0	25.00	32.00	G3/8"	SOMX 07
DR230-069-25-07-3D-N	23.00	25.50	69.0	89.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR235-071-25-07-3D-N	23.50	25.70	70.5	90.5	56.0	25.00	32.00	G3/8"	SOMX 07
DR240-072-25-07-3D-N	24.00	26.00	72.0	92.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR025-075-32-09-3D-N	25.00	29.50	75.0	107.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR026-078-32-09-3D-N	26.00	30.00	78.0	110.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR027-081-32-09-3D-N	27.00	30.50	81.0	113.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR028-084-32-09-3D-N	28.00	31.00	84.0	116.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR029-087-32-09-3D-N	29.00	31.50	87.0	119.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR030-090-32-09-3D-N	30.00	32.00	90.0	122.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR031-093-32-09-3D-N	31.00	32.50	93.0	125.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR032-096-32-09-3D-N	32.00	33.00	96.0	128.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR033-099-32-09-3D-N	33.00	34.00	99.0	131.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR034-102-32-09-3D-N	34.00	34.50	102.0	134.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR035-105-32-12-3D-N	35.00	40.50	105.0	141.0	58.0	32.00	50.00	G1/2-14	SOMT 12
DR036-108-32-12-3D-N	36.00	41.00	108.0	144.0	58.0	32.00	50.00	G1/2-14	SOMT 12
DR037-111-32-12-3D-N	37.00	41.50	111.0	147.0	58.0	32.00	50.00	G1/2-14	SOMT 12
DR038-114-32-12-3D-N	38.00	42.00	114.0	150.0	58.0	32.00	50.00	G1/2-14	SOMT 12

• Hole tolerance: D+0.15/-0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

(1) By shifting drill center along lathe X-axis.

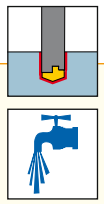
For inserts, see: AOMT-DT (B62) • SOGX-AL (B63) • SOMT-DT (B64) • SOMT-GF (B64) • SOMX-DT (B62) • SOMX-GF (B63).

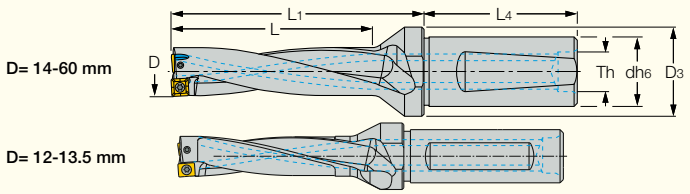
Spare Parts

Designation	Screw	Torx Key Flag	Key	Torx Blade	Handle
DR(120-135)....-04-3D-N	SR 34-533	T-6/5			
DR(140-175)....-05-3D-N	SR 34-533/L	T-6/5			
DR(180-205)....-06-3D-N	SR 34-508/L		T-7/51		
DR(210-240)....-07-3D-N	SR 14-560		T-8/51		
DR(025-034)....-09-3D-N	SR 34-506			BLD T09/M7-SW4	SW4-SD
DR(035-038)....-12-3D-N	SR 14-544/S			BLD T15/S7	SW6-SD

DR-4D-N

Indexable Square Insert Drills with Coolant Holes, Drilling Depth 4xD





Designation	D	D max(1)	L	L1	L4	d	D3	Th	Insert
DR120-048-16-04-4D-N	12.00	12.40	48.0	66.0	48.0	16.00	20.00	-	AOMT 04
DR125-050-16-04-4D-N	12.50	12.90	50.0	68.0	48.0	16.00	20.00	-	AOMT 04
DR130-052-16-04-4D-N	13.00	13.40	52.0	70.0	48.0	16.00	20.00	-	AOMT 04
DR135-054-16-04-4D-N	13.50	13.90	54.0	72.0	48.0	16.00	20.00	-	AOMT 04
DR140-056-20-05-4D-N	14.00	16.80	56.0	74.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR145-058-20-05-4D-N	14.50	17.10	58.0	76.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR150-060-20-05-4D-N	15.00	17.40	60.0	78.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR155-062-20-05-4D-N	15.50	17.60	62.0	80.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR160-064-20-05-4D-N	16.00	17.80	64.0	82.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR165-066-20-05-4D-N	16.50	18.10	66.0	84.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR170-068-20-05-4D-N	17.00	18.30	68.0	86.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR175-070-20-05-4D-N	17.50	18.50	70.0	88.0	50.0	20.00	25.00	G1/4"	SOMX 05
DR180-072-25-06-4D-N	18.00	20.30	72.0	92.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR185-074-25-06-4D-N	18.50	20.50	74.0	94.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR190-076-25-06-4D-N	19.00	20.80	76.0	96.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR195-078-25-06-4D-N	19.50	21.00	78.0	98.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR200-080-25-06-4D-N	20.00	21.30	80.0	100.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR205-082-25-06-4D-N	20.50	21.60	82.0	102.0	56.0	25.00	32.00	G3/8"	SOMX 06
DR210-084-25-07-4D-N	21.00	24.50	84.0	104.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR215-086-25-07-4D-N	21.50	24.70	86.0	106.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR220-088-25-07-4D-N	22.00	25.00	88.0	108.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR225-090-25-07-4D-N	22.50	25.20	90.0	110.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR230-092-25-07-4D-N	23.00	25.50	92.0	112.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR235-094-25-07-4D-N	23.50	25.70	94.0	114.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR240-096-25-07-4D-N	24.00	26.00	96.0	116.0	56.0	25.00	32.00	G3/8"	SOMX 07
DR025-100-32-09-4D-N	25.00	29.50	100.0	132.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR026-104-32-09-4D-N	26.00	30.00	104.0	136.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR027-108-32-09-4D-N	27.00	30.50	108.0	140.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR028-112-32-09-4D-N	28.00	31.00	112.0	144.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR029-116-32-09-4D-N	29.00	31.50	116.0	148.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR030-120-32-09-4D-N	30.00	32.00	120.0	152.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR031-124-32-09-4D-N	31.00	32.50	124.0	156.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR032-128-32-09-4D-N	32.00	33.00	128.0	160.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR033-132-32-09-4D-N	33.00	34.00	132.0	164.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR034-136-32-09-4D-N	34.00	34.50	136.0	168.0	58.0	32.00	42.00	G1/2"	SOMT 09
DR035-140-32-12-4D-N	35.00	40.50	140.0	176.0	58.0	32.00	50.00	G 1/2"-14	SOMT 12
DR036-144-32-12-4D-N	36.00	41.00	144.0	180.0	58.0	32.00	50.00	G 1/2"-14	SOMT 12
DR037-148-32-12-4D-N	37.00	41.50	148.0	184.0	58.0	32.00	50.00	G 1/2"-14	SOMT 12
DR038-152-32-12-4D-N	38.00	42.00	152.0	188.0	58.0	32.00	50.00	G 1/2"-14	SOMT 12
DR039-156-32-12-4D-N	39.00	42.50	156.0	192.0	58.0	32.00	50.00	G 1/2"-14	SOMT 12
DR040-160-40-12-4D-N	40.00	43.00	160.0	196.0	68.0	40.00	50.00	G 3/4"-14	SOMT 12
DR041-164-40-12-4D-N	41.00	43.50	164.0	200.0	68.0	40.00	50.00	G 3/4"-14	SOMT 12
DR042-168-40-12-4D-N	42.00	44.00	168.0	204.0	68.0	40.00	50.00	G 3/4"-14	SOMT 12
DR043-172-40-12-4D-N	43.00	44.50	172.0	208.0	68.0	40.00	50.00	G 3/4"-14	SOMT 12
DR044-176-40-12-4D-N	44.00	45.00	176.0	212.0	68.0	40.00	50.00	G 3/4"-14	SOMT 12
DR045-180-40-16-4D-N	45.00	51.00	180.0	215.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR046-184-40-16-4D-N	46.00	51.50	184.0	219.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR047-188-40-16-4D-N	47.00	52.00	188.0	223.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR048-192-40-16-4D-N	48.00	52.50	192.0	227.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR049-196-40-16-4D-N	49.00	53.00	196.0	231.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR050-200-40-16-4D-N	50.00	51.00	200.0	235.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR051-204-40-16-4D-N	51.00	54.50	204.0	239.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR052-208-40-16-4D-N	52.00	55.00	208.0	243.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR053-212-40-16-4D-N	53.00	55.50	212.0	247.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16

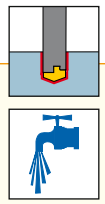
• Hole tolerance: D+0.20/-0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

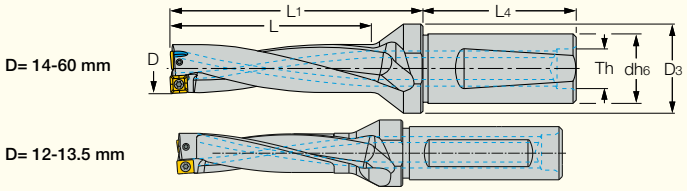
(1) By shifting drill center along lathe X-axis.

For inserts, see: AOMT-DT (B62) • SOGX-AL (B63) • SOMT-DT (B64) • SOMT-GF (B64) • SOMX-DT (B62) • SOMX-GF (B63).

DR-4D-N (continued)

Indexable Square Insert Drills with Coolant Holes, Drilling Depth 4xD





Designation	D	D max(1)	L	L1	L4	d	D3	Th	Insert
DR054-216-40-16-4D-N	54.00	56.00	216.0	251.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR055-220-40-16-4D-N	55.00	56.50	220.0	255.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR056-224-40-16-4D-N	56.00	57.00	224.0	259.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR057-228-40-16-4D-N	57.00	57.50	228.0	263.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR058-232-40-16-4D-N	58.00	58.00	232.0	267.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR059-236-40-16-4D-N	59.00	59.00	236.0	271.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16
DR060-240-40-16-4D-N	60.00	60.00	240.0	275.0	68.0	40.00	60.00	G 3/4"-14	SOMT 16

• Hole tolerance: D+0.20/-0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

(1) By shifting drill center along lathe X-axis.

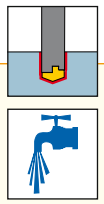
For inserts, see: AOMT-DT (B62) • SOGX-AL (B63) • SOMT-DT (B64) • SOMT-GF (B64) • SOMX-DT (B62) • SOMX-GF (B63).

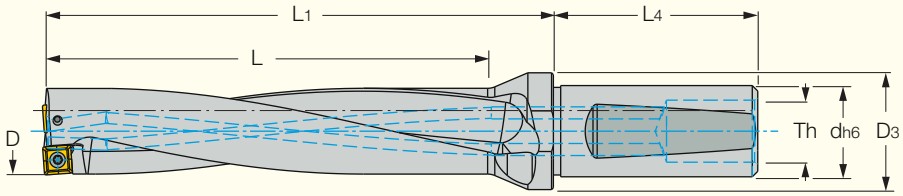
Spare Parts

Designation	Screw	Torx Key Flag	Torx Blade	Handle
DR(120-135)....-04-4D-N	SR 34-533	T-6/5		
DR(140-175)....-05-4D-N	SR 34-533/L	T-6/5		
DR(180-205)....-06-4D-N	SR 34-508/L	T-7/51		
DR(210-240)....-07-4D-N	SR 14-560	T-8/51		
DR(025-034)....-09-4D-N	SR 34-506		BLD T09/M7-SW4	SW4-SD
DR(035-044)....-12-4D-N	SR 14-544/S		BLD T15/S7	SW6-SD
DR(045-060)....-16-4D-N	SR 76-961		BLD T15/M7	SW6-T

DR-5D-N

Indexable Square Insert Drills with Coolant Holes, Drilling Depth 5xD





Designation	D	D max(1)	L	L1	L4	d	D3	Th	Insert
DR140-070-20-05-5D-N	14.00	16.10	70.0	88.0	50.0	20.00	25.00	G1/4"	SOMX 050204-DT
DR150-075-20-05-5D-N	15.00	16.80	75.0	93.0	50.0	20.00	25.00	G1/4"	SOMX 050204-DT
DR160-080-20-05-5D-N	16.00	17.35	80.0	98.0	50.0	20.00	25.00	G1/4"	SOMX 050204-DT
DR170-085-20-05-5D-N	17.00	17.98	85.0	103.0	50.0	20.00	25.00	G1/4"	SOMX 050204-DT
DR180-090-25-06-5D-N	18.00	19.73	90.0	110.0	56.0	25.00	32.00	G3/8"	SOMX 060304-DT
DR190-095-25-06-5D-N	19.00	20.35	95.0	115.0	56.0	25.00	32.00	G3/8"	SOMX 060304-DT
DR200-100-25-06-5D-N	20.00	20.98	100.0	120.0	56.0	25.00	32.00	G3/8"	SOMX 060304-DT
DR210-105-25-07-5D-N	21.00	23.63	105.0	125.0	56.0	25.00	32.00	G3/8"	SOMX 070305-DT
DR220-110-25-07-5D-N	22.00	24.25	110.0	130.0	56.0	25.00	32.00	G3/8"	SOMX 070305-DT
DR230-115-25-07-5D-N	23.00	24.88	115.0	135.0	56.0	25.00	32.00	G3/8"	SOMX 070305-DT
DR240-120-25-07-5D-N	24.00	25.50	120.0	140.0	56.0	25.00	32.00	G3/8"	SOMX 070305-DT

• Hole tolerance: in average conditions. However, it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

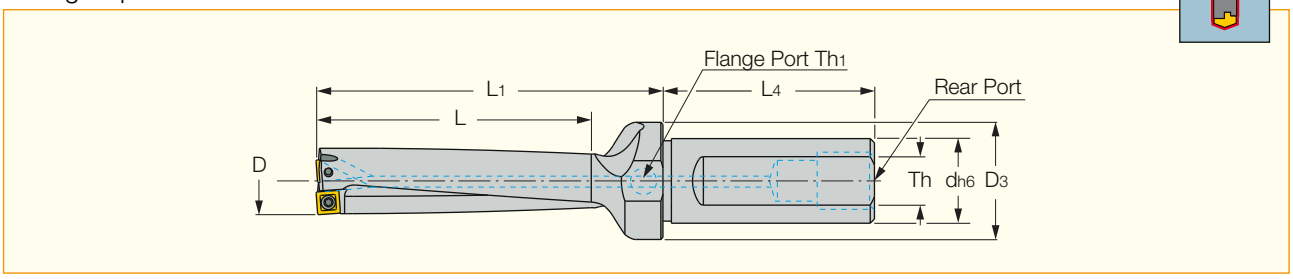
(1) By shifting drill center along lathe X-axis

Spare Parts

Designation	Key	Key 1	Screw
DR140-070-20-05-5D-N		T-6/5	SR 34-533/L
DR150-075-20-05-5D-N		T-6/5	SR 34-533/L
DR160-080-20-05-5D-N		T-6/5	SR 34-533/L
DR170-085-20-05-5D-N		T-6/5	SR 34-533/L
DR180-090-25-06-5D-N			SR 34-508/L
DR190-095-25-06-5D-N			SR 34-508/L
DR200-100-25-06-5D-N			SR 34-508/L
DR210-105-25-07-5D-N			SR 14-560
DR220-110-25-07-5D-N	T-8/53		SR 14-560
DR230-115-25-07-5D-N			SR 14-560
DR240-120-25-07-5D-N			SR 14-560

DR-4D-T

Indexable Insert Drills for Non-Rotating Applications with Coolant Holes and One Flat Shanks, Drilling Depth 4xD



Designation	D	L	L_1	L_4	D_{max}(1)	d	D_3	T_h	T_{h1}
DR140-056-20-05-4D-T	14.00	56.0	77.0	50.0	15.90	20.00	27.70	NPT 1/4-18	NPT 1/16-27
DR160-064-20-05-4D-T	16.00	64.0	82.0	50.0	17.90	20.00	27.70	NPT 1/4-18	NPT 1/16-27
DR180-072-25-06-4D-T	18.00	72.0	94.0	56.0	20.90	25.00	32.00	NPT 3/8-18	NPT 1/16-27
DR210-084-25-07-4D-T	21.00	84.0	109.0	56.0	24.90	25.00	32.00	NPT 3/8-18	NPT 1/16-27
DR250-100-32-09-4D-T	25.00	100.0	133.0	58.0	27.90	32.00	42.00	NPT 1/2-14	NPT 1/16-27
DR280-112-32-09-4D-T	28.00	112.0	144.0	58.0	30.90	32.00	42.00	NPT 1/2-14	NPT 1/16-27
DR310-124-32-09-4D-T	31.00	124.0	157.0	58.0	31.90	32.00	42.00	NPT 1/2-14	NPT 1/16-27
DR320-128-32-09-4D-T	32.00	128.0	161.0	58.0	32.90	32.00	42.00	NPT 1/2-14	NPT 1/16-27
DR330-132-32-12-4D-T	33.00	132.0	169.0	58.0	34.90	32.00	50.00	NPT 1/2-14	NPT 1/16-27
DR350-140-32-12-4D-T	35.00	140.0	177.0	58.0	39.90	32.00	50.00	NPT 1/2-14	NPT 1/16-27
DR400-160-40-12-4D-T	40.00	160.0	197.0	68.0	44.90	40.00	50.00	NPT 3/4-14	NPT 1/4-18
DR450-180-40-16-4D-T	45.00	180.0	215.0	68.0	51.90	40.00	60.00	NPT 3/4-14	NPT 1/4-18
DR520-208-40-16-4D-T	52.00	208.0	243.0	68.0	55.90	40.00	60.00	NPT 3/4-14	NPT 1/4-18
DR560-224-40-16-4D-T	56.00	224.0	259.0	68.0	57.90	40.00	60.00	NPT 3/4-14	NPT 1/4-18
DR580-232-40-16-4D-T	58.00	232.0	267.0	68.0	58.90	40.00	60.00	NPT 3/4-14	NPT 1/4-18
DR590-236-40-16-4D-T	59.00	236.0	271.0	68.0	60.00	40.00	60.00	NPT 3/4-14	NPT 1/4-18

• Hole tolerance: D+0.35/-0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions.

(1) By shifting drill center along lathe X-axis.

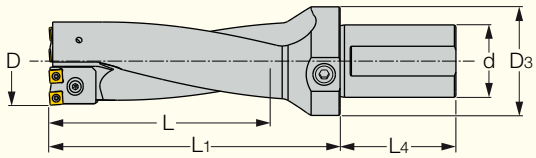
For inserts, see: SOGX-AL (B63) • SOMT-DT (B64) • SOMT-GF (B64) • SOMX-DT (B62) • SOMX-GF (B63).

Spare Parts

Designation	Screw	Key	Torx Blade	Handle	Plug	Plug 1
DR140-056-20-05-4D-T	SR 34-533/L	T-6/5			PLUG 1/16-27 PTF3/4 TAPER	PLUG 1/4"18 PTF7/8"ZINK C
DR160-064-20-05-4D-T	SR 34-533/L	T-6/5			PLUG 1/16-27 PTF3/4 TAPER	PLUG 1/4"18 PTF7/8"ZINK C
DR180-072-25-06-4D-T	SR 34-508/L	T-7/51			PLUG 1/16-27 PTF3/4 TAPER	PLUG 3/8-18 PTF 3/4 TAPER
DR210-084-25-07-4D-T	SR 14-560	T-8/51			PLUG 1/16-27 PTF3/4 TAPER	PLUG 3/8-18 PTF 3/4 TAPER
DR250-100-32-09-4D-T	SR 34-506		BLD T09/M7-SW4	SW4-SD	PLUG 1/16-27 PTF3/4 TAPER	PLUG 1/2-14 PTF 3/4 TAPER
DR280-112-32-09-4D-T	SR 34-506		BLD T09/M7-SW4	SW4-SD	PLUG 1/16-27 PTF3/4 TAPER	PLUG 1/2-14 PTF 3/4 TAPER
DR310-124-32-09-4D-T	SR 34-506		BLD T09/M7-SW4	SW4-SD	PLUG 1/16-27 PTF3/4 TAPER	PLUG 1/2-14 PTF 3/4 TAPER
DR320-128-32-09-4D-T	SR 34-506		BLD T09/M7-SW4	SW4-SD	PLUG 1/16-27 PTF3/4 TAPER	PLUG 1/2-14 PTF 3/4 TAPER
DR330-132-32-12-4D-T	SR 14-544/S		BLD T15/S7	SW6-SD	PLUG 1/16-27 PTF3/4 TAPER	PLUG 1/2-14 PTF 3/4 TAPER
DR350-140-32-12-4D-T	SR 14-544/S		BLD T15/S7	SW6-SD	PLUG 1/16-27 PTF3/4 TAPER	PLUG 1/2-14 PTF 3/4 TAPER
DR400-160-40-12-4D-T	SR 14-544/S		BLD T15/S7	SW6-SD	PLUG 1/4"18 PTF7/8"ZINK C	
DR450-180-40-16-4D-T	SR 76-961		BLD T15/M7	SW6-T	PLUG 1/4"18 PTF7/8"ZINK C	
DR520-208-40-16-4D-T	SR 76-961		BLD T15/M7	SW6-T	PLUG 1/4"18 PTF7/8"ZINK C	
DR560-224-40-16-4D-T	SR 76-961		BLD T15/M7	SW6-T	PLUG 1/4"18 PTF7/8"ZINK C	
DR580-232-40-16-4D-T	SR 76-961		BLD T15/M7	SW6-T	PLUG 1/4"18 PTF7/8"ZINK C	
DR590-236-40-16-4D-T	SR 76-961		BLD T15/M7	SW6-T	PLUG 1/4"18 PTF7/8"ZINK C	

DR-CA-N

DR Large Diameter Drills (61-80 mm) with Cartridges and One Flat Shanks



Designation	D	D max	L	d	D3	L1	L4	D5(1)	Inserts	Insert Screw	Shim	Shim Screw
DR061>062-155-50-10CA-N	61.00	62.00	155.0	50.00	75.00	201.0	80.0	62.80	SOMT 100408	SR 14-571	ISP-10-D061	SR M3X5.5
	62.00										ISP-10-D062	
DR063>066-165-50-10CA-N	63.00	66.00	165.0	50.00	75.00	215.0	80.0	67.00	SOMT 100408	SR 14-571		
	64.00										ISP-10-D064	
	65.00										ISP-10-D065	
	66.00										ISP-10-D066	
DR067>073-183-50-11CA-N	67.00	73.00	183.0	50.00	75.00	240.0	80.0	74.60	SOMT 110408	SR 14-544/S		
	68.00										ISP-11-D068	
	69.00										ISP-11-D069	
	70.00										ISP-11-D070	
	71.00										ISP-11-D071	
	72.00										ISP-11-D072	
	73.00										ISP-11-D073	
DR074>080-200-50-12CA-N	74.00	80.00	200.0	50.00	75.00	250.0	80.0	81.60	SOMT 120408	SR 14-544/S		
	75.00										ISP-12-D075	
	76.00										ISP-12-D076	
	77.00										ISP-12-D077	
	78.00										ISP-12-D078	
	79.00										ISP-12-D079	
	80.00										ISP-12-D080	

• Hole tolerance: D±0.5 in average conditions. However, it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

(1) Max. dia. on lathe, with the thickest shim plate.

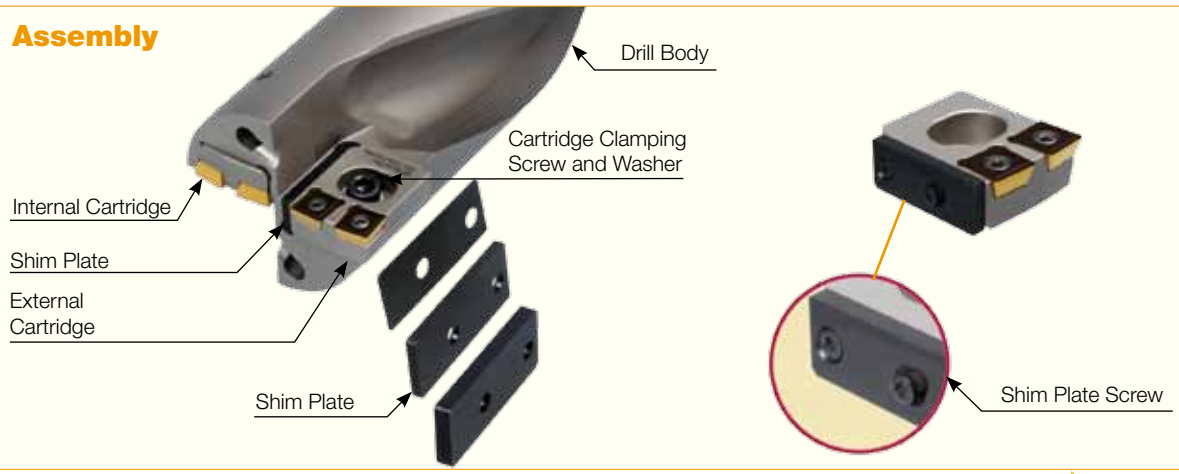
For inserts, see: SOMT-DT (B64) • SOMT-GF (B64).

Spare Parts

Designation	Int. Cartridge	Ext. Cartridge	Cartridge Screw	Cartridge Key
DR061>062-155-50-10CA-N	CA-SOMT10-IN-N-61>62	CA-SOMT10-EX-N-61>62	SR M5X16 DIN 912	HW 4.0
DR063>066-165-50-10CA-N	CA-SOMT10-IN-N-63>66	CA-SOMT10-EX-N-63>66	SR M5X16 DIN 912	HW 4.0
DR067>073-183-50-11CA-N	CA-SOMT11-IN-N-67>73	CA-SOMT11-EX-N-67>73		HW 5.0
DR074>080-200-50-12CA-N	CA-SOMT12-IN-N-74>80	CA-SOMT12-EX-N-74>80		HW 5.0

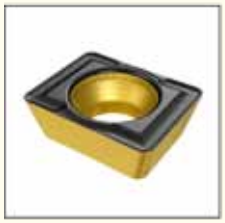
Designation	Washers	Shim Plate Key Blade	Shim Plate Key Handle	Side Coolant Hole Plug	Key	Insert Key
DR061>062-155-50-10CA-N	WASHER FLAT M5 DIN 125A	BLD T09/M7	SW6-T	PLUG R1/4 SPC	HW 6.0	BLD T10/S7
DR063>066-165-50-10CA-N	WASHER FLAT M5 DIN 125A	BLD T09/M7	SW6-T	PLUG R1/4 SPC	HW 6.0	BLD T10/S7
DR067>073-183-50-11CA-N	WASHER FLAT M6 DIN 125B	BLD T09/M7	SW6-T	PLUG R1/4 SPC	HW 6.0	BLD T15/S7
DR074>080-200-50-12CA-N	WASHER FLAT M6 DIN 125B	BLD T09/M7	SW6-T	PLUG R1/4 SPC	HW 6.0	BLD T15/S7

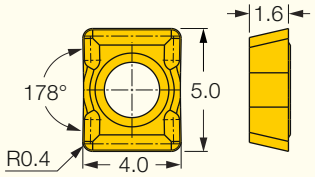
Drill Assembly



AOMT-DT

Inserts for DR Drills with DT Chipformer, for General Applications at Medium-to-High Feeds



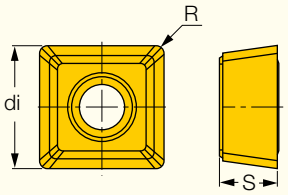


Designation	Dimensions di	S	R	Tough ↔ Hard IC808	IC908	IC1008
AOMT 040204-90DT	4.00	1.60	0.40	●	●	●

For tools, see: DR-2D-N (B54) • DR-3D-N (B56) • DR-4D-N (B57).

SOMX-DT

Inserts for DR Drills with DT General Use Chipformer



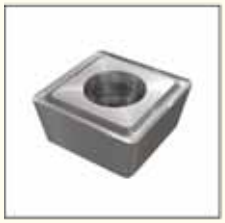
Designation	Dimensions di	S	R	Tough ↔ Hard IC808	IC908	IC8080	IC9080
SOMX 050204-DT	5.40	2.40	0.40	●	●	●	●
SOMX 060304-DT	6.20	3.20	0.40	●	●	●	●
SOMX 070305-DT	7.70	3.60	0.50	●	●	●	●
SOMX 160512-DT	16.00	5.56	1.20		●		

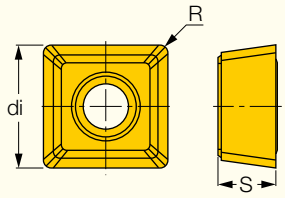
• DT - A general use chipformer for medium to high feed rates.

For tools, see: DR-2D-N (B54) • DR-3D-N (B56) • DR-4D-N (B57) • DR-4D-T (B60) • DR-5D-N (B59).

SOMX-GF

Inserts with GF Chipformer for Soft Materials, Used on DR Drills





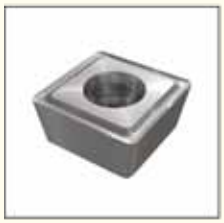
Designation	Dimensions di	S	R	IC908
SOMX 050204-GF	5.40	2.40	0.40	●
SOMX 060304-GF	6.20	3.20	0.40	●
SOMX 070305-GF	7.70	3.60	0.50	●

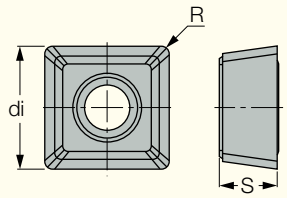
• GF - A narrow chipformer, for use on soft materials, at low to medium feed rates.

For tools, see: DR-2D-N (B54) • DR-3D-N (B56) • DR-4D-N (B57) • DR-4D-T (B60) • DR-5D-N (B59).

SOGX-AL

Inserts for Aluminum, Used on DR Drills





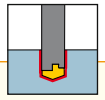
Designation	Dimensions di	S	R	IC08
SOGX 050204-AL	5.40	2.40	0.40	●
SOGX 060304-AL	6.20	3.20	0.40	●
SOGX 070305-AL	7.70	3.60	0.50	●

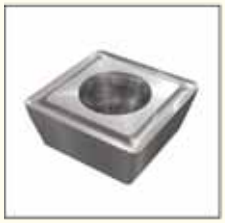
• Sharp cutting edge with polished rake for aluminum.

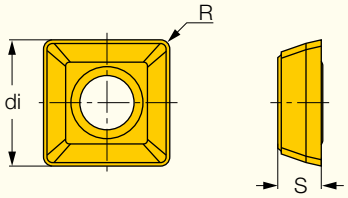
For tools, see: DR-2D-N (B54) • DR-3D-N (B56) • DR-4D-N (B57) • DR-4D-T (B60) • DR-5D-N (B59).

SOMT-GF

Inserts for DR Drills, for Soft Materials at Low-to-Medium Feeds





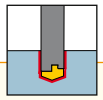


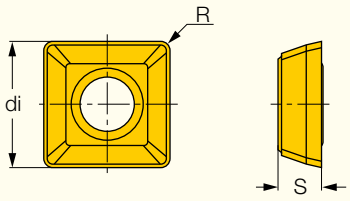
Designation	Dimensions di	S	R	Tough ↔ Hard IC328	IC908
SOMT 09T306-GF	9.00	3.81	0.60	●	●
SOMT 120408-GF	12.70	4.76	0.80		●
SOMT 160512-GF	16.00	5.56	1.20		●

For tools, see: DR-2D-N (B54) • DR-3D-N (B56) • DR-4D-N (B57) • DR-4D-T (B60) • DR-CA-N (B61).

SOMT-DT

Inserts for DR Drills, for General Applications at Medium-to-High Feeds





Designation	Dimensions di	S	R	Tough ↔ Hard IC328	IC808	IC908	IC8080	IC9080
SOMT 09T306-DT	9.00	3.81	0.60		●	●		●
SOMT 100408-DT	9.80	4.30	0.80		●	●	●	
SOMT 110408-DT	11.50	4.80	0.80		●	●		
SOMT 120408-DT	12.70	4.76	0.80		●	●		●
SOMT 160512-DT	16.00	5.56	1.20		●	●		●

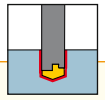
• Four cutting edges

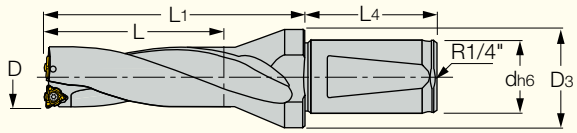
For tools, see: DR-2D-N (B54) • DR-3D-N (B56) • DR-4D-N (B57) • DR-4D-T (B60) • DR-CA-N (B61).

DZDRILLS

DZ-2.25XD

Indexable Serrated Insert Drills, Drilling Depth 2.25xD





Designation	D	L	L_1	d	D_3	L_4	Insert
DZ023-052-32-05	23.00	52.0	85.0	32.00	50.00	58.0	WOLH 05
DZ024-054-32-05	24.00	54.0	88.0	32.00	50.00	58.0	WOLH 05
DZ025-056-32-05	25.00	56.0	92.0	32.00	50.00	58.0	WOLH 05
DZ026-059-32-05	26.00	59.0	94.0	32.00	50.00	58.0	WOLH 05
DZ027-061-32-05	27.00	61.0	97.0	32.00	50.00	58.0	WOLH 05
DZ028-063-32-05	28.00	63.0	100.0	32.00	50.00	58.0	WOLH 05
DZ029-065-32-05	29.00	65.0	104.0	32.00	50.00	58.0	WOLH 05
DZ030-068-32-05	30.00	68.0	107.0	32.00	50.00	58.0	WOLH 05
DZ031-070-32-05	31.00	70.0	110.0	32.00	50.00	58.0	WOLH 05
DZ032-072-32-05	32.00	72.0	113.0	32.00	50.00	58.0	WOLH 05
DZ033-074-32-05	33.00	74.0	116.0	32.00	50.00	58.0	WOLH 05
DZ034-077-32-06	34.00	77.0	118.0	32.00	50.00	58.0	WOLH 06
DZ035-079-32-06	35.00	79.0	121.0	32.00	50.00	58.0	WOLH 06
DZ036-081-32-06	36.00	81.0	124.0	32.00	50.00	58.0	WOLH 06
DZ037-083-32-06	37.00	83.0	127.0	32.00	50.00	58.0	WOLH 06
DZ038-086-32-06	38.00	86.0	129.0	32.00	50.00	58.0	WOLH 06
DZ039-088-32-06	39.00	88.0	132.0	32.00	50.00	58.0	WOLH 06
DZ040-090-40-06	40.00	90.0	135.0	40.00	60.00	68.0	WOLH 06
DZ041-092-40-06	41.00	92.0	138.0	40.00	60.00	68.0	WOLH 06
DZ042-094-40-06	42.00	94.0	141.0	40.00	60.00	68.0	WOLH 06
DZ043-097-40-06	43.00	97.0	144.0	40.00	60.00	68.0	WOLH 06
DZ044-099-40-06	44.00	99.0	147.0	40.00	60.00	68.0	WOLH 06
DZ045-101-40-08	45.00	101.0	149.0	40.00	60.00	68.0	WOLH 08
DZ046-103-40-08	46.00	103.0	154.0	40.00	60.00	68.0	WOLH 08
DZ047-106-40-08	47.00	106.0	158.0	40.00	60.00	68.0	WOLH 08
DZ048-108-40-08	48.00	108.0	161.0	40.00	60.00	68.0	WOLH 08
DZ049-110-40-08	49.00	110.0	164.0	40.00	60.00	68.0	WOLH 08
DZ050-113-40-08	50.00	113.0	166.0	40.00	60.00	68.0	WOLH 08
DZ051-115-40-08	51.00	115.0	169.0	40.00	60.00	68.0	WOLH 08
DZ052-117-40-08	52.00	117.0	173.0	40.00	60.00	68.0	WOLH 08
DZ053-119-40-08	53.00	119.0	176.0	40.00	60.00	68.0	WOLH 08
DZ054-122-40-08	54.00	122.0	179.0	40.00	60.00	68.0	WOLH 08
DZ055-124-40-08	55.00	124.0	181.0	40.00	60.00	68.0	WOLH 08

• Hole tolerance for D=23-44 mm ±0.10, for D=45-55 mm ±0.15 in average conditions • Hole tolerance can be higher or lower according to machine and tooling conditions • For user guide and cutting conditions, see pages B70-83.

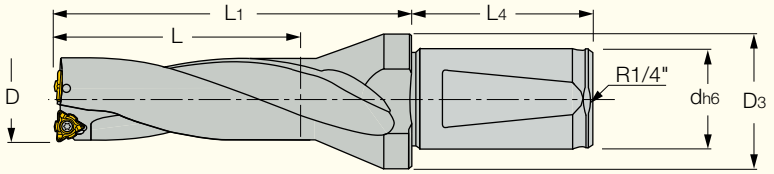
For inserts, see: WOLH-GF (B69) • WOLH-SW (B69).

Spare Parts

Designation	Screw	Key
DZ-2.25XD(023-033)....-32-05	SR 14-560	T-8/51
DZ-2.25XD(034-039)....-32-06	SR 14-562	T-10/51
DZ-2.25XD(040-044)....-40-06	SR 14-562	T-10/51
DZ-2.25XD(045-055)....-40-08	SR 14-544/S	T-15/51

DZ-3XD

Indexable Serrated Insert Drills, Drilling Depth 3xD



Designation	D	L	L_1	d	D_3	L_4	Insert
DZ023-069-32-05	23.00	69.0	102.0	32.00	50.00	58.0	WOLH 05
DZ024-072-32-05	24.00	72.0	106.0	32.00	50.00	58.0	WOLH 05
DZ025-075-32-05	25.00	75.0	110.0	32.00	50.00	58.0	WOLH 05
DZ026-078-32-05	26.00	78.0	114.0	32.00	50.00	58.0	WOLH 05
DZ027-081-32-05	27.00	81.0	117.0	32.00	50.00	58.0	WOLH 05
DZ028-084-32-05	28.00	84.0	120.0	32.00	50.00	58.0	WOLH 05
DZ029-087-32-05	29.00	87.0	125.0	32.00	50.00	58.0	WOLH 05
DZ030-090-32-05	30.00	90.0	129.0	32.00	50.00	58.0	WOLH 05
DZ031-093-32-05	31.00	93.0	133.0	32.00	50.00	58.0	WOLH 05
DZ032-096-32-05	32.00	96.0	137.0	32.00	50.00	58.0	WOLH 05
DZ033-099-32-05	33.00	99.0	140.0	32.00	50.00	58.0	WOLH 05
DZ034-102-32-06	34.00	102.0	143.0	32.00	50.00	58.0	WOLH 06
DZ035-105-32-06	35.00	105.0	147.0	32.00	50.00	58.0	WOLH 06
DZ036-108-32-06	36.00	108.0	151.0	32.00	50.00	58.0	WOLH 06
DZ037-111-32-06	37.00	111.0	155.0	32.00	50.00	58.0	WOLH 06
DZ038-114-32-06	38.00	114.0	159.0	32.00	50.00	58.0	WOLH 06

• Hole tolerance: D+0.15 in average conditions. However, it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

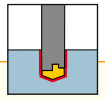
For inserts, see: WOLH-GF (B69) • WOLH-SW (B69).

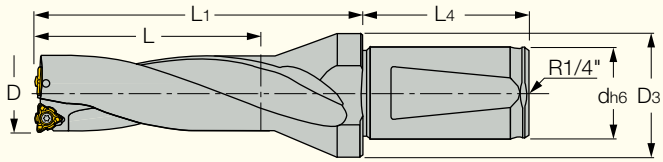
Spare Parts

Designation	Screw	Key
DZ023-069-32-05	SR 14-560	T-8/51
DZ024-072-32-05	SR 14-560	T-8/51
DZ025-075-32-05	SR 14-560	T-8/51
DZ026-078-32-05	SR 14-560	T-8/51
DZ027-081-32-05	SR 14-560	T-8/51
DZ028-084-32-05	SR 14-560	T-8/51
DZ029-087-32-05	SR 14-560	T-8/51
DZ030-090-32-05	SR 14-560	T-8/51
DZ031-093-32-05	SR 14-560	T-8/51
DZ032-096-32-05	SR 14-560	T-8/51
DZ033-099-32-05	SR 14-560	T-8/51
DZ034-102-32-06	SR 14-562	T-10/51
DZ035-105-32-06	SR 14-562	T-10/51
DZ036-108-32-06	SR 14-562	T-10/51
DZ037-111-32-06	SR 14-562	T-10/51
DZ038-114-32-06	SR 14-562	T-10/51

DZ-4XD

Indexable Serrated Insert Drills, Drilling Depth 4xD





Designation	D	L	L_1	L_4	d	D_3	Insert
DZ023-092-32-05	23.00	92.0	135.0	58.0	32.00	50.00	WOLH 05
DZ024-096-32-05	24.00	96.0	140.0	58.0	32.00	50.00	WOLH 05
DZ025-100-32-05	25.00	100.0	146.0	58.0	32.00	50.00	WOLH 05
DZ026-104-32-05	26.00	104.0	151.0	58.0	32.00	50.00	WOLH 05
DZ027-108-32-05	27.00	108.0	155.0	58.0	32.00	50.00	WOLH 05
DZ028-112-32-05	28.00	112.0	160.0	58.0	32.00	50.00	WOLH 05
DZ029-116-32-05	29.00	116.0	165.0	58.0	32.00	50.00	WOLH 05
DZ030-120-32-05	30.00	120.0	171.0	58.0	32.00	50.00	WOLH 05
DZ031-124-32-05	31.00	124.0	176.0	58.0	32.00	50.00	WOLH 05
DZ032-128-32-05	32.00	128.0	181.0	58.0	32.00	50.00	WOLH 05
DZ033-132-32-05	33.00	132.0	187.0	58.0	32.00	50.00	WOLH 05

- Hole tolerance: D±0.15/ in average conditions. However, it can be higher or lower according to machine and tooling conditions.
- For user guide and cutting conditions, see pages B70-83.

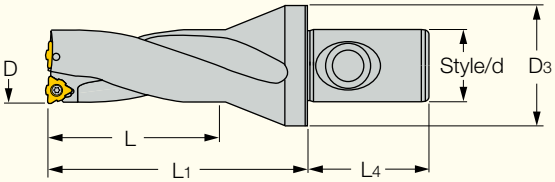
For inserts, see: WOLH-GF (B69) • WOLH-SW (B69).

Spare Parts

Designation	Screw	Key
DZ-4XD (23-33 mm 4xD)	SR 14-560	T-8/51

DZ-3XD-CF

Drills with CLICKFIT Adaptation, Using Triangular Inserts with a Serrated Cutting Edge, Drilling Depth 3xD



Designation	D	L	L_1	L_4	D_3	Style/d	Kg	Insert
DZ025-075-CF4-05	25.00	75.0	110.0	42.0	44.00	CF4	0.51	WOLH 05
DZ032-096-CF4-05	32.00	96.0	136.6	42.0	44.00	CF4	0.76	WOLH 05

• Hole tolerance: D+0.10/-0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions. • For user guide and cutting conditions, see pages B70-83.

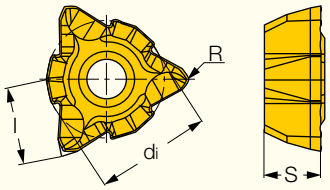
For inserts, see: WOLH-GF (B69) • WOLH-SW (B69).

Spare Parts

Designation	Screw	Key
DZ-3XD-CF (25 & 32 mm 3xD)	SR 14-560	T-8/51

WOLH-GF

Inserts for DZ Drills with Serrated Cutting Edges, for Chip Splitting at Low-to-Medium Feeds

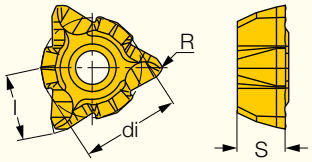


Designation	Dimensions				Tough ↔ Hard				
	di	l	S	R	IC28	IC328	IC350	IC520M	IC908
WOLH 05T304-GF	8.00	5.00	3.81	0.40	●	●	●	●	●
WOLH 06T304-GF	10.00	6.00	3.81	0.40	●	●	●		●
WOLH 080404-GF	12.00	8.00	4.76	0.40		●	●		●

For tools, see: DZ-2.25XD (B65) • DZ-3XD (B66) • DZ-3XD-CF (B68) • DZ-4XD (B67).

WOLH-SW

Inserts for DZ Drills with Serrated Cutting Edges, for Chip Splitting at Medium-to-High Feeds



Designation	Dimensions				Tough ↔ Hard			
	di	l	S	R	IC28	IC328	IC350	IC908
WOLH 05T304-SW	8.00	5.00	3.81	0.40	●	●	●	●
WOLH 06T304-SW	10.00	6.00	3.81	0.40	●	●	●	●
WOLH 080404-SW	12.00	8.00	4.76	0.40		●	●	●

For tools, see: DZ-2.25XD (B65) • DZ-3XD (B66) • DZ-3XD-CF (B68) • DZ-4XD (B67).

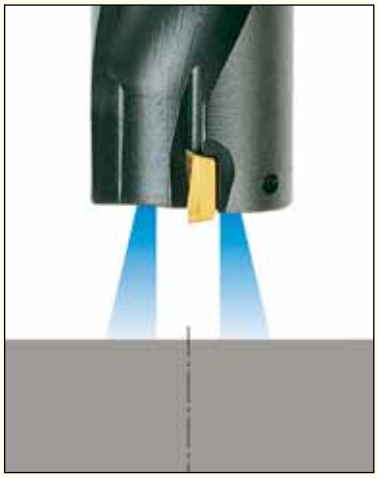
Insert Positioning

DZDRILLS • DR-TWIST INDEXABLE DRILL LINE

Machining Conditions

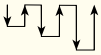
Cooling Methods

Directing the coolant through the tool is essential for reliable machining. This method prevents chip pile-up, insert damage or breakage, and damage to the workpiece surface.



Internal Coolant
Apply standard cutting data.

External Coolant
Drilling depth is limited to 1.5xD. For larger depths, a pecking cycle is recommended.



Rotating Drills

For best results:
1. Check adapter rigidity.
2. Minimize drill runout in relation to spindle center line.
3. Use recommended cutting conditions.

How to Select Cutting Parameters

Step 1 - Prior to Drilling

- Use charts on pages C140-141 to select feed and speed according to workpiece material.
- For the first grade choice. In general we recommend selecting IC808.

Step 2 - Initial Test Hole Drilling

- Evaluate chip evacuation. If not satisfactory, adjust feed and speed, using example photos below.
- If chip evacuation is still a problem, i.e. chips are too long, change the chipbreaker to GF as shown below.

Optimizing Chip Shape

Chip control is one of the most important factors for tool performance in order to facilitate chip evacuation and avoid tool damage.
Cutting conditions must be adjusted to achieve optimal chip shape.

	Too Tight May cause insert damage	**Optimal Shape**	**Too Long** May cause tool damage
 **SOMT/SOMX**			
 **WOLH**			

How To Achieve Optimal Chip Shape

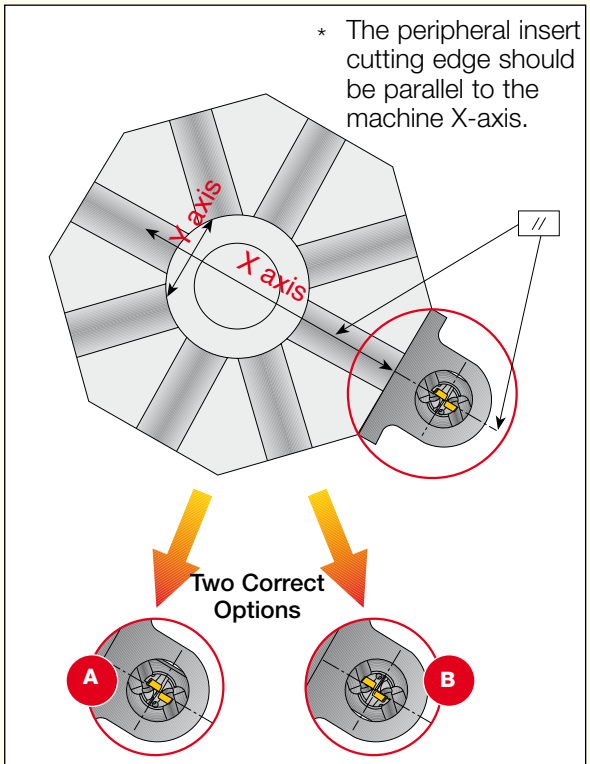
Too Tight
Increase speed within recommended limits.
If not satisfactory, decrease feed.

→ **Optimal Shape** ←

Too Long
If machining at high speed, first reduce speed.
If unsatisfactory, increase feed, but do not exceed upper limit.

Setup of Non-Rotating Drills

Drill Positioning on Turret Lathe



The drill can be mounted on the X axis or on a 180º rotation

For better chip evacuation it is recommended to apply option **A** peripheral insert position.

Diameter Change By Center Shift

DR-06

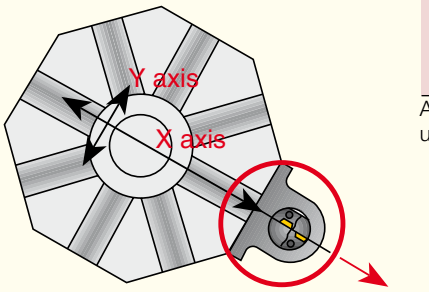
D Nominal	D Max. on Lathe
16	19.5
17	20.0
18	20.5
19	21.0
20	21.5
21	22.0
22	23.0

DR-09

D Nominal	D Max. on Lathe
23	28.5
24	29.0
25	29.5
26	30.0
27	30.5
28	31.0
29	31.5
30	32.0
31	32.5
32	33.3
33	34.0
34	34.5
35	35.0

DR-12

D Nominal	D Max. on Lathe
34	39.5
35	40.0
36	40.5
37	41.0
38	41.5
39	42.0
40	42.5
41	43.0
42	43.5
43	44.0
44	44.5



Change hole diameter by shifting drill's center along lathe x-axis

DR-16

D Nominal	D Max. on Lathe
45	51.0
46	51.5
47	52.0
48	52.5
49	53.0
50	54.0
51	54.5
52	55.0
53	55.5
54	56.0
55	56.5
56	57.0
57	57.5
58	58.0
59	59.0
60	60.0

Applicable only when using SOMT inserts.

Machining Conditions

Optimizing Chip Shape for DR Drills

SOMT...DT

A general-use chipformer, for medium to high feed rates.

SOMT...GF

A narrow chipformer, for use on soft materials, at low to medium feed rates.

Chip Formation Examples

SOMT...DT

Cutting Conditions:
Material: SAE 1060
V=120 m/min
f=0.14 mm/rev

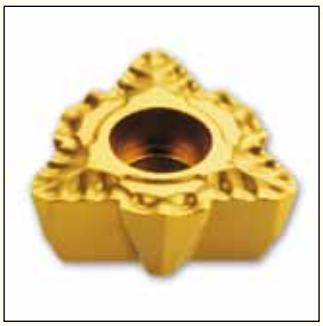
SOMT...GF

Optimizing Chip Shape for DZ Drills

WOLH...-SW

Open shape for medium-to-high feed

WOLH...-GF



Tight shape for low-to-medium feed

Chip Formation Examples

WOLH...-SW

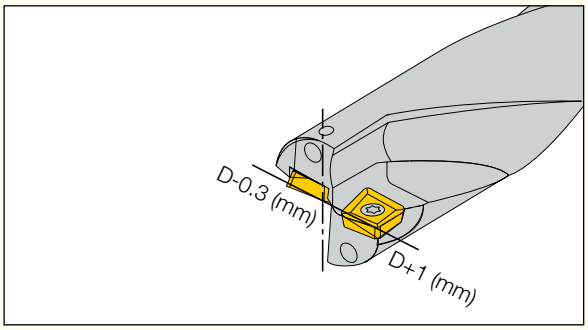
Cutting conditions:
Material: SAE 4140
V=160m/min
f=0.12mm/rev

WOLH...-GF

Setup of Non-Rotating Drills

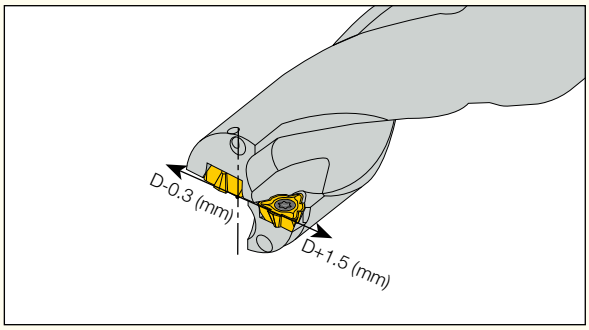
Make sure that the center line of the drill is aligned with the spindle center line.
It is recommended to verify setup according to the instructions shown below.

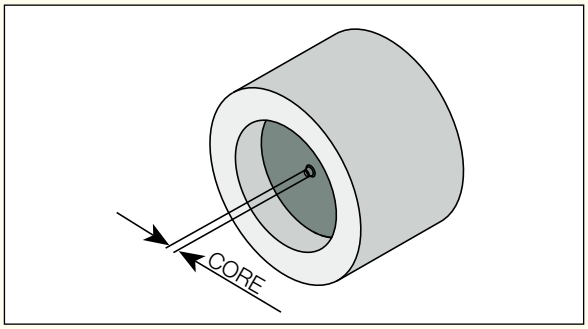
DR-06

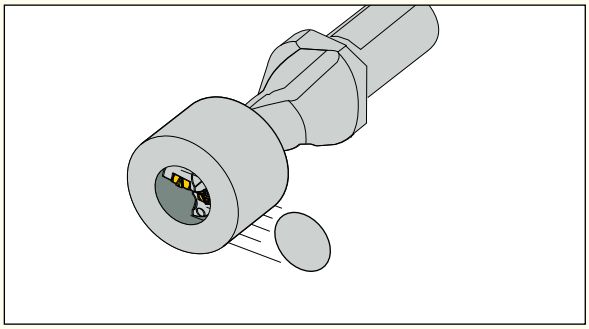


Under regular conditions it is possible to adjust the center line of the drill (X axis of the machine), in order to change hole diameter size.

DZ







How to Verify Setup

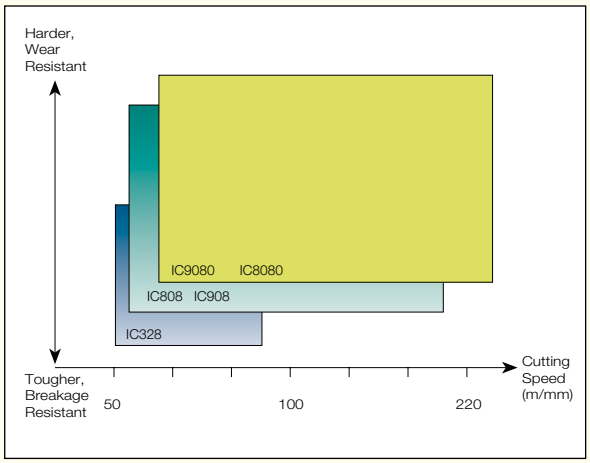
1. Drill a hole 6 mm deep, with the drill center line aligned with the spindle center line.
2. Check the existing core. If there is not a core, check alignment of the Y-axis of drill and spindle and correct by checking the adapter, or adjusting the Y-axis.
3. Check that the hole diameter equals drill diameter +0.0 - +0.2 mm.
   If not, adjust the X-axis.
   Note: In some operations, part of the core may break. If this occurs, use finger contact to verify if any core remains.

Warning: As the drill goes all the way through a workpiece, it ejects a disc. For worker safety, guards should be used.

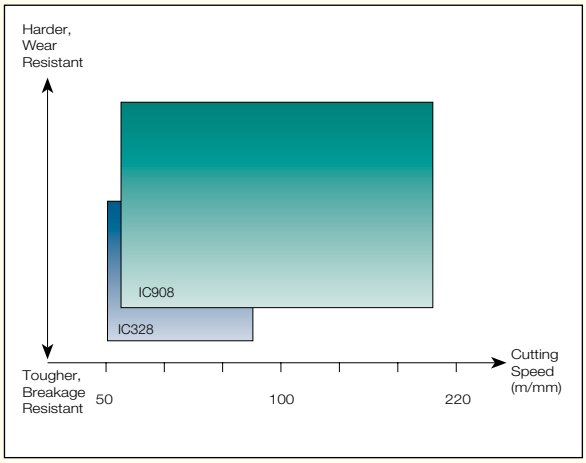
Machining Conditions

Drilling Insert Grades: Application Ranges

DR



DZ



Grades for Applications and Materials

Material Groups / Main Applications	ISO P	ISO H	ISO M	ISO S	ISO K	ISO N
	1-11 Steel	38-41 Hard Steel	12-14 Stainless Steel	31-37 High Temp.	15-20 Cast Iron	21-28 Nonferrous
DRILLING	IC808 (908)	IC808 (908)	IC808 (908)	IC808 (908)	Harder IC8080 (9080) IC808 (908) Tougher	Harder IC808 (908) IC08 Tougher

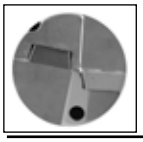
Machining Data for DR Drills

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material No.[1]
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
			Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% of alloying elements)		Annealed	600	200	6
			Quenched and tempered	930	275	7
				1000	300	8
				1200	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	200	10
			Quenched and tempered	1100	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	12
			Martensitic	820	240	13
			Austenitic	600	180	14
K	Grey cast iron (GG)		Ferritic/pearlitic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable cast iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum-wrought alloy		Not cureable		60	21
			Cured		100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolitic copper		100	28
	Non-metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
		Ni or Co based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti alloys			RM 400		36
			Alpha+beta alloys cured	RM 1050		37
H	Hardened steel		Hardened		55 HRc	38
			Hardened		60 HRc	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRc	41

- Grades: first choice IC808, IC8080.
- This table refers to 2/3xD drill ratio usage. For 4xD ratio decrease cutting data by 15%.
- Chipformer should be selected based on our geometry range recommendations.
- When using external coolant supply only, reduce cutting speed by 10%.
- Use internal coolant supply when machining austenitic stainless steel.

[1]For workpiece materials list, see pages G6-41.

USER GUIDE



Cutting Speed [1]			Feed vs. Drill Diameter mm/rev					
Vc m/min IC808/908 external	Vc m/min IC8080/9080 external	DR-04 DT	DR-05 GF/DT/AL	DR-06 GF/DT/AL	DR-07 GF/DT/AL	DR-09 GF/DT	DR-12 GF/DT	DR-16 GF/DT
200-300	260-390	0.04-0.08	0.06-0.10 0.10-0.15	0.07-0.12 0.10-0.16	0.08-0.12 0.12-0.18	0.10-0.15 0.14-0.22	0.12-0.16 0.15-0.25	0.14-0.17 0.16-0.26
150-200	190-260							
150-220	190-290		0.06-0.10 0.10-0.14	0.07-0.12 0.10-0.15	0.08-0.12 0.10-0.16	0.10-0.14 0.14-0.20	0.12-0.15 0.14-0.22	0.14-0.16 0.15-0.24
120-180	160-230							
120-190	160-250		0.06-0.10 0.10-0.14	0.06-0.10 0.10-0.14	0.06-0.10 0.10-0.14	0.08-0.12 0.12-0.18	0.10-0.15 0.14-0.20	0.14-0.17 0.16-0.24
100-160	210-310							
160-240	210-310	0.04-0.08	0.06-0.10	0.06-0.10	0.06-0.12	0.08-0.12	0.10-0.14	0.12-0.20
150-250	190-320	0.08-0.16	0.10-0.22	0.10-0.22	0.10-0.22	0.15-0.25	0.18-0.30	0.20-0.34
120-180	160-230							
150-300	190-390	0.08-0.24	0.12-0.25	0.12-0.25	0.12-0.25	0.20-0.30	0.2-0.35	0.28-0.45
20-50	30-60	0.03-0.07	0.04-0.08	0.04-0.08	0.05-0.09	0.07-0.10	0.08-0.12	0.10-0.14
50-60	60-80							
20-50	30-60	0.04-0.08	0.05-0.08	0.05-0.08	0.06-0.09	0.07-0.10	0.08-0.12	0.10-0.14

[1] Central insert should always be IC808/IC908.

- This table refers to 2/3xD drill lengths. For 4xD and 5XD drills, decrease cutting data by 15%.
- When using only external coolant supply, reduce cutting speed by 10%.
- Use internal coolant supply when machining austenitic stainless steel.

Machining Data for DZ Drills

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material No.[1]
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
			Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% of alloying elements)		Annealed	600	200	6
			Quenched and tempered	930	275	7
				1000	300	8
				1200	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	200	10
			Quenched and tempered	1100	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	12
			Martensitic	820	240	13
			Austenitic	600	180	14
K	Grey cast iron (GG)		Ferritic/pearlitic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable cast iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum-wrought alloy		Not cureable		60	21
			Cured		100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolitic copper		100	28
	Non-metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
		Ni or Co based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti alloys			RM 400		36
			Alpha+beta alloys cured	RM 1050		37
H	Hardened steel		Hardened		55 HRc	38
			Hardened		60 HRc	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRc	41

- Grades: first choice IC908.
- Chipformer should be selected based on our geometry range recommendations.
- When using external coolant supply only, reduce cutting speed by 10%.

[1]For workpiece materials list, see pages G6-41.

Cutting Speed Vc m/min	Feed vs. Drill Diameter mm/rev		
	DZ-05 Ø23-33	DZ-06 Ø34-44	DZ-08 Ø45-55
180-260	0.06-0.16	0.08-0.19	0.10-0.21
130-210			
130-190	0.06-0.14	0.08-0.16	0.12-0.18
100-150			
100-160	0.05-0.12	0.06-0.15	0.08-0.16
80-140			
120-200	0.05-0.08	0.06-0.10	0.07-0.12
150-200	0.10-0.20	0.15-0.22	0.18-0.25
120-180			
120-250	0.10-0.20	0.16-0.26	0.20-0.30
20-50	0.04-0.07	0.05-0.08	0.06-0.09
50-60			
20-50	0.05-0.08	0.06-0.09	0.07-0.11

As a starting value, the middle of the recommended machining range should be used.
Then, (according to wear results), conditions can be changed in order to optimize performance.

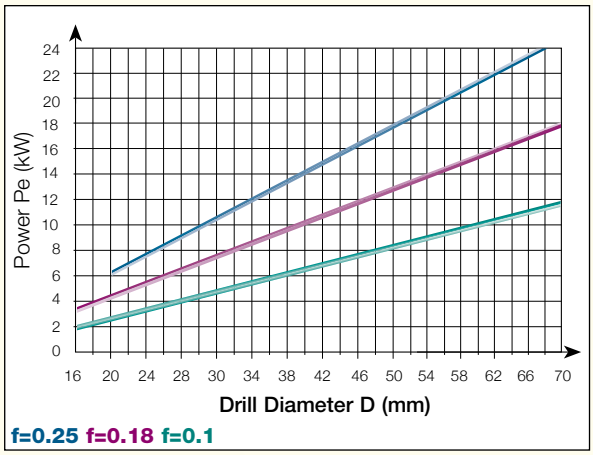
Machining Conditions for Large Diameter DR-TWIST Drills

Material	Vc (m/min)	Feed (mm/rev)		
		60-66 dia.	67-73 dia.	74-80 dia.
Low Carbon Steel (<0.3% C)	180-250	0.08-0.12	0.08-0.12	0.09-0.14
Carbon Steel (>0.3% C)	160-220	0.12-0.18	0.12-0.18	0.14-0.21
Low Alloy Steel (<HB300)	150-220	0.10-0.18	0.10-0.18	0.12-0.21
High Alloy Steel (>HB300)	130-180	0.10-0.15	0.10-0.15	0.12-0.17
Stainless Steel	170-240	0.08-0.15	0.08-0.15	0.09-0.17
Cast Iron	180-250	0.15-0.22	0.15-0.22	0.17-0.25
Ductile Cast Iron	130-200	0.10-0.20	0.10-0.20	0.12-0.23
Aluminum	330-380	0.15-0.25	0.15-0.25	0.17-0.29
Ti Alloy (Ti 6Al)	30-60	0.12-0.16	0.12-0.16	0.14-0.18

Machining Conditions

Machine Power and Feed Force Requirements

Power required, in relation to drill diameter



Required Machine Power
Material: SAE 4140
Cutting speed: 100 m/min

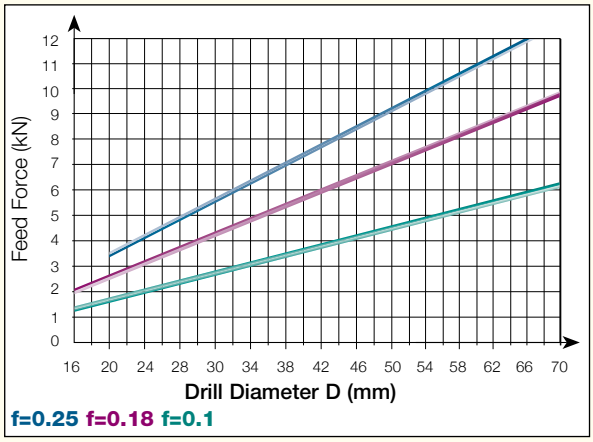
For different cutting speeds, use factor as follows:

Vc [m/min]	100	150	200
C	1.0	1.5	2.0

$$\text{Machine Power } P = \frac{Pe \cdot C}{\eta}$$

η=Machine efficiency

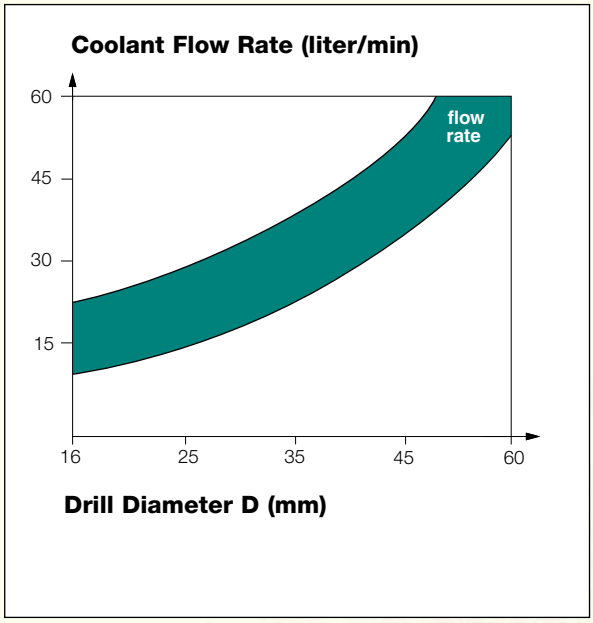
Feed force (thrust force) required, in relation to drill diameter

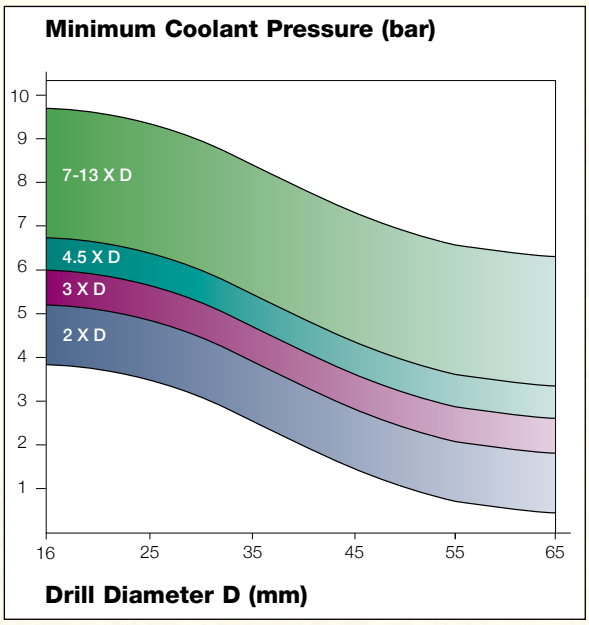


Required Feed Force
Material: SAE 4140

Internal Coolant Pressure

Selecting Cooling Pressure and Flow Rate

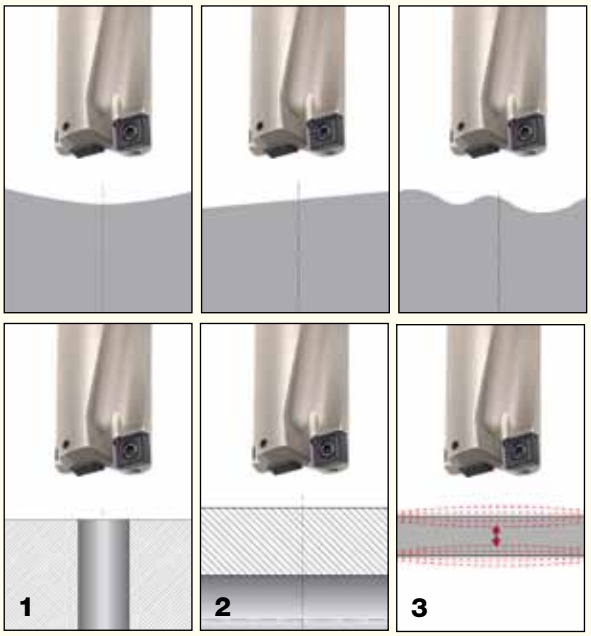




* For special drills more than 4xD, it is recommended to use high coolant pressure 15–70 bar.

Troubleshooting

Irregular Conditions for DR Drills



If surface slope exceeds 5º, reduce feed by 50% during penetration or exit.
It is preferred to pre-face the surface to eliminate slope.

1 Drilling into a Pre-Hole
Reduce feed to eliminate deflection[1] of the drill body.

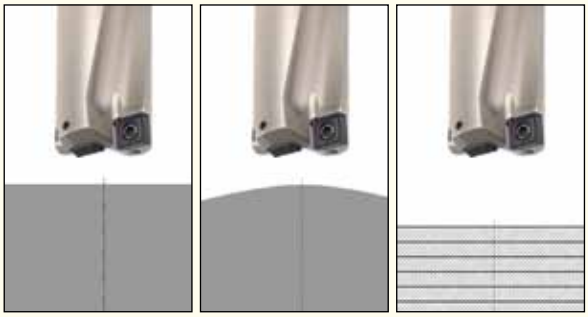
2 Drilling an Interrupted Cut
Reduce feed during crossing to eliminate deflection[1] of the drill body.

3 Insufficient Stability of Workpiece
Provide additional support. Reduce feed.

[1] Deflection may be observed by a mark on the drill body.

Note: For irregular applications use as a first priority DR drills with XOMT inserts.

Regular Conditions for DR Drills



Apply standard cutting data.

Note: For irregular applications use as a first priority DR drills with XOMT inserts.

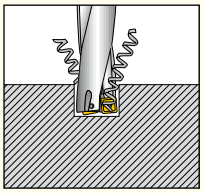
Stacked Plates
Drilling operation is not recommended, but may be done by specially designed drills in 16-60 mm range.

Indexable Insert Drills - Troubleshooting DR and DZ Chips

Chip Jamming due to Long Chips

Solutions

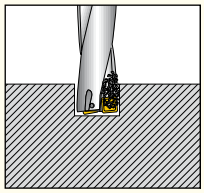
1. Increase feed. If drilling a very soft material, reduce feed and increase speed.
2. Choose a geometry with tighter chip breaking for lower feeds (GF).
3. Long chips that rotate around the drill are problematic. If chip formation can not be improved by changing machining conditions, use a pecking cycle.



Chip Jamming Despite Short Chips

Solutions

1. Increase coolant pressure/volume.
2. Reduce cutting speed.



Troubleshooting

Chipping Along Cutting Edge

Solutions

1. Reduce entrance feed.
2. Choose a tougher grade.
3. Choose a geometry with open chip breaking for higher feeds. (SOMT, WOLH)
4. Reduce feed.*
5. Reduce cutting speed.
6. Increase coolant pressure.

Chipping of Center Insert

Solutions

1. Check mounting of drill.
2. Check mounting of workpiece.
3. Reduce entrance feed.
4. Reduce cutting speed.
5. Check drill runout (should be 0.05 mm maximum).

Excessive Flank Wear

Solutions

1. Reduce cutting speed.
2. Increase coolant pressure/volume.
3. Choose a better wear resistant grade.

Machine Troubleshooting

Vibrations

Solutions

1. Check mounting of drill.
2. Check mounting of workpiece.
3. Increase feed. If drilling a very soft material, reduce feed and increase speed.*
4. Reduce cutting speed.

Insufficient Torque

Solutions

1. Reduce feed.*
2. Choose a geometry with a less tight chipformer.

Insufficient Power

Solutions

1. Reduce cutting speed.
2. Reduce feed.*
3. Choose a geometry with a less tight chipformer.

* Use GF chipformer

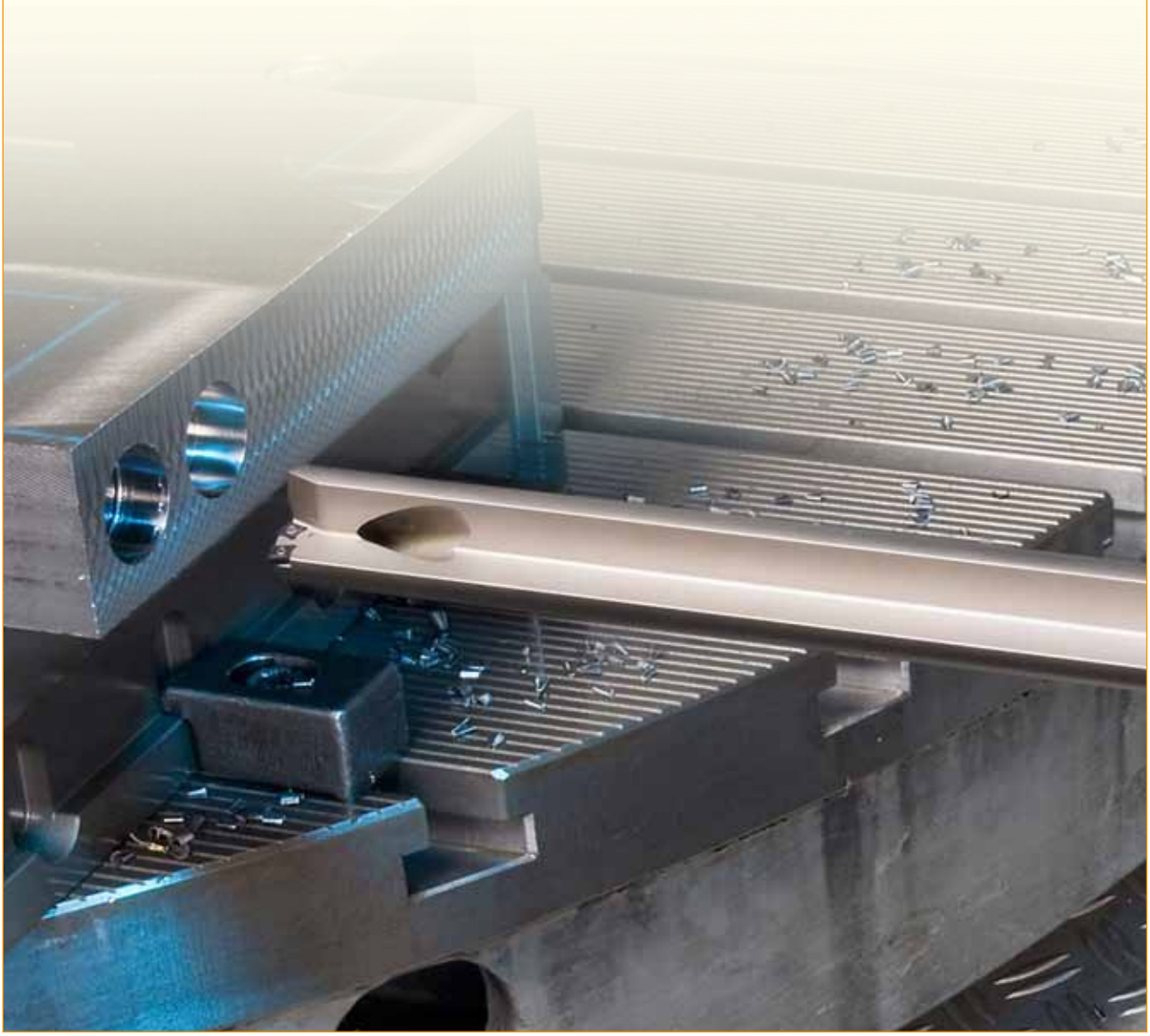
DR-DH Deep Drills for Milling Centers and Lathe Machines

DR-DH are drills for a drilling depth-to-diameter ratio of 7XD and up, to be used on standard horizontal milling centers, turning, and multi-task machines.
Use of supplementary machine and setup can be avoided. These drills can be used with the existing adaptations, not requiring any special coolant pressure or extra pump capacity.

DR-DH drills are available as semi-standard items in the diameter range of 25.4 to 69.5 mm.

Features

- High feed drilling: up to 0.35 mm/rev for high productivity
- Excellent surface quality: Ra = 0.6 – 2.0 [µm]
- Good hole cylindricity: 50-80 [µm]
- Hole tolerance: IT10
- Large drilling depth: L=7xD and higher – up to 800 mm
- Carries standard SOMX/SOMT indexable inserts with 4 cutting edges
- No dedicated machine or extra setup needed
- Standard coolant pressure as used in general drilling
- Standard indexable, double-ended guide pads
- Used for steel (ISO P) and cast iron (ISO K) materials



ISCAR offers two drill versions:

Single Flute
DR-DH-31.65-0350NC-2FS

- Very rigid tool
- Designed for easily cut materials such as cast iron and low alloyed steel
- Patented chip gullet design

Double Flute
DR-DH-31.65-0350NC-2FD

- Double chip gullet for improved chip flow
- Designed for drilling gummy materials such as non-alloyed steel and high temperature alloys

Designation

Metric

DR-DH-31.65-0350NC-2 F D

- DR-DH: Family
- 31.65: Dia. (mm)
- 0350: Drilling depth (mm)
- N: Shank Type[1]
- C: Shank dia.[1]
- 2: No. of Pads
- F: F=Cartridge, R= No cartridge
- D: D=Double flute, S=Single flute

Inch

DR-DH-1.500-12.00NC-2 F D

[1] See Specially Tailored Drills designation code page C51

The DR-DH drills will be supplied upon request.
For a quotation, please contact ISCAR headquarters, providing all necessary hole and drill details (See following requested information form).

Requested Information Form for Deep Hole Drill Design

Company name _____ **Telephone no.** _____

Address _____ **Date** _____

Contact person _____ **Customer no.** _____

WORKPIECE

Product name _____ Hole diameter _____

Hole depth _____ No. of holes _____ Tolerance (of hole) _____

Surface finish (Rz, Ra...) _____ Straightness (mm/100) _____

Material

Material (DIN, AISI, JIS...) _____

Hardness (HB, HS, HRC...) _____

Condition ☐ Annealed ☐ Quenched ☐ Tempered ☐ Cast

☐ Other _____

MACHINE

Machine supplier name _____

Machine type/model ☐ NC lathe Machining center ☐ Horizontal ☐ Vertical

Rigidity ☐ Good ☐ Normal ☐ Poor

Spindle power (kW) _____

Tool and/or workpiece rotation (TR/WR)

☐ Tool and workpiece ☐ Rotating workpiece (WR) ☐ Rotating tool (TR)

TYPE OF COOLANT

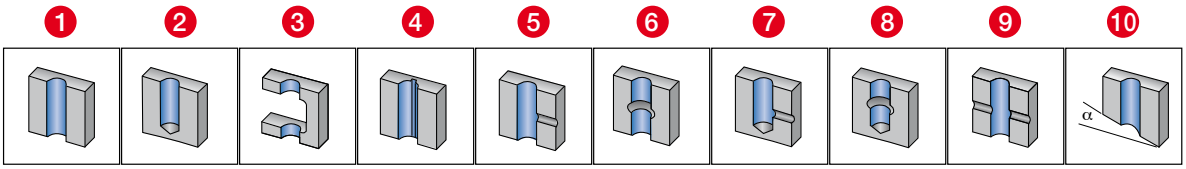
Water based ☐ Soluble ☐ Emulsion _____ %

Oil based ☐ Coolant Pressure (bar) _____ Coolant Volume (L/min) _____

Hole Data

Need a pre-hole drill quotation ☐ Pre-drilled hole size _____ (mm/inch)

Bore Type



Please sketch your drilling application

GENERAL PRODUCTION INFORMATION

Quantity of parts per year _____

Grade, tool life, etc. _____

Cutting data

Perfomance expectation Vc= ____ mm/min N= ____ RPM F= _____ mm/min f=____ mm/rev

Description of present system in use _____

_____

_____

_____

_____

Please fill in and return to your ISCAR representative.

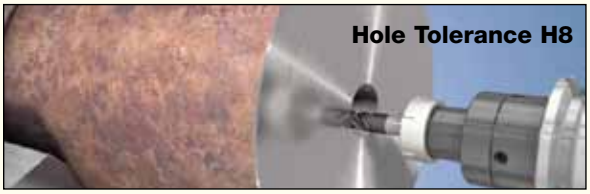
User Guide

[1] A short pre-hole 20 mm long (minimum) with H8 hole tolerance should be prepared to guide the long drill (a standard DR drill or an endmill can be used).

Option No.1

1.1- Penetration with an endmill

2.1- Enlargement with the endmill



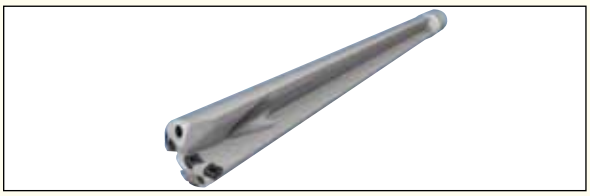
Option No.2

1.2- Penetration by drilling

2.2- DR-MF boring

3- Deep hole drilling with DR-DH

DR-DH



[2] The DR-DH drill should enter into the pre-hole at slow rotation speed and with coolant supply.

DR-DH Insert Mounting Configuration vs. Drill Diameter

DR-DH Ø##.# [mm]	Central Insert	Intermediate Insert	Peripheral Insert	Guide Pad
25.4 - 28.5	SOMX 050204...	SOMX 050204...	SOMX 050204...	GP-01CD… GP-03CD
28.6 - 30.0	SOMX 050204...	SOMX 060304...	SOMX 050204...	GP-10CD
30.1 - 33.0	SOMX 060304...	SOMX 060304...	SOMX 060304...	GP-10CD
33.1 - 37.5	SOMX 060304...	SOMX 070305...	SOMX 060304...	GP-04CD
37.6 - 40.5	SOMX 070305...	SOMX 070305...	SOMX 070305...	GP-11CD
40.6 -42.9	SOMX 070305...	SOMT 09T306...	SOMX 070305...	GP-06CD
43.0 - 47.5	SOMT 09T306...	SOMT 09T306...	SOMT 09T306...	GP-06CD
47.6 - 51.0	SOMT 100408...	SOMT 100408...	SOMT 100408...	GP-12CD
51.1 - 54	SOMT 100408...	SOMT 110408...	SOMT 100408...	GP-12CD
54.1 - 57.4	SOMT 100408...	SOMT 110408...	SOMT 110408...	GP-12CD
57.5 - 61.0	SOMT 110408...	SOMT 110408...	SOMT 110408...	GP-08CD
61.1 - 63.0	SOMT 110408...	SOMT 120408...	SOMT 110408...	GP-08CD
63.1 - 69.5	SOMT 120408...	SOMT 120408...	SOMT 120408...	GP-08CD

Spare Parts

Insert	Screw	Key
SOMX 050204...	SR 34-533/L	T-6/51
SOMX 060304...	SR 34-508/L	T-7/51
SOMX 070305...	SR 14-560	T-8/51
SOMT 09T306...	SR 34-506	T-9/51
SOMT 100408...	SR 14-571	T-10/51
SOMT 110408...	SR 14-544/S	T-15/51
SOMT 120408...	SR 14-544/S	T-15/51

Guide Pad	Clamping Screw	Key
GP-01CD	SR 11201753-1	T-7/51
GP-02CD	SR 11201753-1	T-7/51
GP-03CD	SR 11201753-1	T-7/51
GP-04CD	SR 11201753-4	T-9/51
GP-06CD	SR 11201753-4	T-9/51
GP-08CD	SR 11201752-2	T-15/51
GP-10CD	SR 11201753-4	T-9/51
GP-11CD	SR 11201753-6	T-15/51
GP-12CD	SR 11201753-6	T-15/51

- DR-DH drills can be used with any type of adaptation. However, concentric adapters such as hydraulic chucks are advantageous for better runout. When machining high temperature alloys or applying very high machining loads, it is advisable to use strong gripping adapters such as: Side lock adapters, power / hydraulic chucks
- In case of chip formation or chip evacuation problems, the following sequence is recommended:

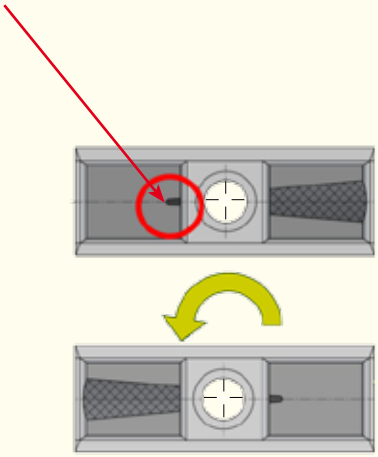
1. Reduce cutting speed by 10%
2. Increase internal coolant pressure
3. Apply a pecking cycle

- Interrupted cut will have a direct influence on hole accuracy, quality and drill life. (Sometimes even tool breakage can occur).

Double-ended Pad

Worn support pads provide poor surface finish in a drilled hole. In this case, pads should be rotated or replaced.

Rotate when wear shows on the back side of the pad



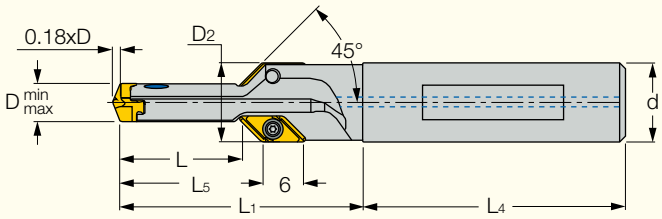
DR-DH Machining Recommendations

ISO	Material		Condition	Tensile Strength Rm [N/mm2]	Hardness HB	Mtl. No.	Cutting speed vc m/min	Feed mm/rev
P	Non-alloy steel, cast steel, free cutting steel	0.1 - 0.25 %C	Annealed	420	125	1	100-150	0.10-0.25
		0.25 - 0.25 %C	Annealed	650	190	2		0.10-0.25
		0.25 - 0.25 %C	Quenched and tempered	850	250	3	80-150	0.15-0.30
		0.55 - 0.80 %C	Annealed	750	220	4		0.15-0.30
		0.55 - 0.80 %C	Quenched and tempered	1000	300	5		0.15-0.30
	Low alloy steel and cast steel (less than 5% alloying elements)		Annealed	600	200	6		0.15-0.30
			Quenched and tempered	930	275	7	70-120	0.15-0.30
				1000	300	8		0.15-0.30
				1200	350	9		0.15-0.30
	High alloy steel, cast steel and tool steel		Annealed	680	200	10	80-150	0.10-0.25
			Quenched and tempered	1100	325	11	70-120	0.10-0.25
K	Cast iron nodular (GGG)		Ferritic/pearlitic		180	15	180-300	0.18-0.35
			Pearlitic		260	16		0.18-0.35
	Grey cast iron (GG)		Ferritic		160	17	150-250	0.15-0.30
			Pearlitic		250	18		0.15-0.30
	Malleable cast iron		Ferritic		130	19		0.15-0.35
			Pearlitic		230	20		0.15-0.35

CHAMFERING DRILLS

DCT (M8-M24)

Indexable Head Drills with Chamfering Insert, Mainly for Pre-Thread Holes



Designation	D min(2)	D max	Dnominal(3)	D2	d	L	L1	L4	L5	Po. Size	Th(4)
DCT 068-021-14B-M8 (1)	6.80	7.49	6.80	13.90	14.00	21.0	41.9	45.0	24.70	6.8	M8
DCT 085-026-14B-M10	8.30	8.99	8.50	14.00	14.00	26.0	46.5	45.0	28.90	8.0	M10
DCT 102-030-14B-M12	10.00	10.99	10.20	14.00	14.00	30.0	52.0	45.0	32.10	10.0	M12
DCT 120-035-16B-M14	12.00	12.99	12.00	16.00	16.00	35.0	58.0	48.0	37.20	12.0	M14
DCT 140-039-18B-M16	14.00	14.99	14.00	18.00	18.00	39.0	60.0	48.0	41.50	14.0	M16
DCT 175-042-20B-M20	17.30	17.99	17.50	21.00	20.00	42.0	63.0	50.0	43.40	17.0	M20
DCT 210-048-25B-M24	21.00	21.99	21.00	25.50	25.00	48.0	69.0	56.0	50.20	21.0	M24

• Hole tolerance: D+0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions. • Dnominal is the pre-thread hole dia. • For user guide and cutting conditions, see page B92.

(1) Reduce recommended feed for DCM 6.8 mm drills by 10%. (2) Do not mount smaller drilling heads than specified range for drill body. (3) Pre-thread hole diameter. (4) Used for standard thread size.

For inserts, see: AOMT-Chamfering (B91) • IDI-SG (B43) • IDI-SK (B43).

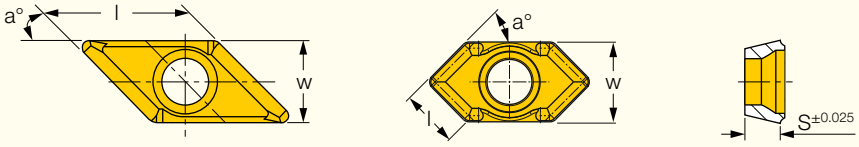
Spare Parts

Designation	Screw	Key	Clamping Key
DCT 068-021-14B-M8	SR 34-508	T-7/51	K DCM- 8
DCT 085-026-14B-M10	SR 34-508	T-7/51	K DCM- 8
DCT 102-030-14B-M12	SR 34-508	T-7/51	K DCM-10
DCT 120-035-16B-M14	SR 34-508	T-7/51	K DCM-12
DCT 140-039-18B-M16	SR 34-508	T-7/51	K DCM-14
DCT 175-042-20B-M20	SR 34-508	T-7/51	K DCM-17
DCT 210-048-25B-M24	SR 34-508	T-7/51	K DCM-21

AOMT-Chamfering

Chamfering Inserts

AOMT 060204-45DT



Designation	Dimensions l	W	S	a°	Tough ← → Hard IC508	IC908	IC1008
AOMT 060204-45DT	5.66	4.50	1.96	45.5	●	●	
AOMT 030204-N-45DT (1)	2.80	4.00	1.59	45.5			●
AOMT 030204-N-30DT (1)	4.00	4.00	1.59	30.5			●

(1) Used for specially tailored tools

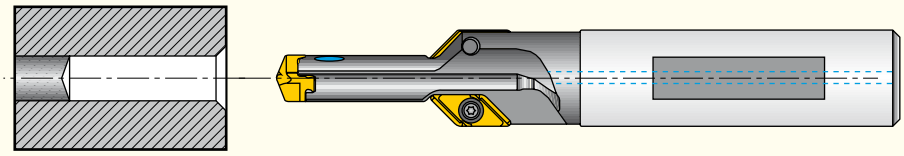
For tools, see: DCT (M8-M24) (B91).

Pre-Thread DCT Drills

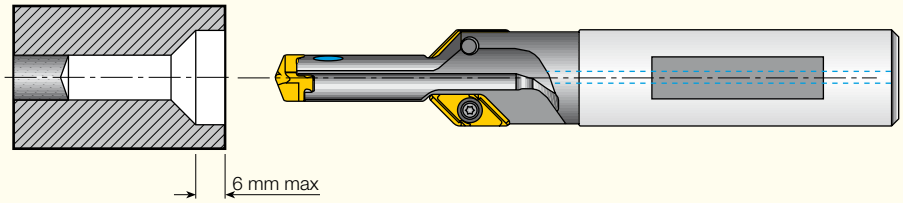
There are two main applications for pre-thread hole drilling:

Drilling pre-thread **blind** and **through holes**:

Drilling with a 45° chamfer



Drilling and counter boring



Pre-Thread DCT Metric Threads Recommended Diameters

Drill Designation	Dia. Range	M Thread	Head Dia.	MF Head	Head Dia.	TR Thread	Head Dia.	M Helicoil Thread	Head Dia.
DCT 068-021-14B-M8	6.80-7.49	M8	6.8	MF8X0.75	7.20	TR10X3	7.49		
				MF8X1	7.00				
DCT 085-026-14B-M10	8.30-8.99	M10	8.5	MF10X1	8.99	TR10X1.5	8.60	M8	8.40
				MF10X1.25	8.80				
DCT 102-030-14B-M12	10.0-10.99	M12	10.2	MF11X1	10.00	TR12X2	10.20	M10	10.50
				MF12X1	10.99	TR14X4	10.50		
				MF12X1.25	10.80				
				MF12X1.5	10.50				
DCT 120-035-16B-M14	12.0-12.99	M14	12.0	MF13X1	12.00	TR14X2	12.20	M12	12.50
				MF14X1	12.99	TR16X4	12.30		
				MF14X1.25	12.80				
				MF14X1.5	12.50				
DCT 140-039-18B-M16	14.0-14.99	M16	14.0	MF14X1	14.00	TR18X4	14.30	M14	14.99
				MF16X1	14.99				
				MF16X1.5	14.50				
DCT 175-042-20B-M20	17.3-17.99	M20	17.5			TR22X5	17.30		
				MF20X2	17.99				
DCT 210-048-25B-M24	21.0-21.99	M24	21.0	MF22X1	21.00				

Inch Threads

Drill Designation	Dia. Range	UNF Thread	Head Dia.	UNC Thread	Head Dia.	UNC Helicoil Thread	Head Dia.	BSW Thread	Head Dia.	BSF Thread	Head Dia.
DCT 085-026-14B-M10	8.30-8.99	UNF3/8-24	8.5			UNC5/16-18	8.4				
DCT 102-030-14B-M12	10.0-10.99			UNC1/2-13	10.8			BSW1/2-12	10.5	BSF1/2-16	10.99
DCT 120-035-16B-M14	12.0-12.99			UNC9/16-12	12.3					BSF9/16-16	12.50
DCT 140-039-18B-M16	14.0-14.99	UNF5/8-18	14.5								
DCT 175-042-20B-M20	17.3-17.99	UNF3/4-16	17.5								

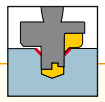
Inch Threads

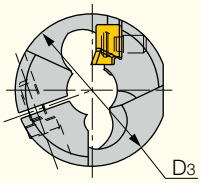
Drill Designation	Dia. Range	NPT Thread	Head Dia.	BSF Thread	Head Dia.	BSP Thread	Head Dia.	UNEF Thread	Head Dia.	UNJF Helicoil Thread	Head Dia.
DCT 085-026-14B-M10	8.30-8.99	NPT1/8-27	8.5			G1/8-28	8.8	UNEF3/8-32	8.7	UNJF3/8-24	8.6
DCT 102-030-14B-M12	10.0-10.99			BSF1/2-16	10.99						
DCT 120-035-16B-M14	12.0-12.99			BSF9/16-16	12.50						
DCT 140-039-18B-M16	14.0-14.99	NPT3/8-18	14.5					UNEF5/8-24	14.8	UNJF5/8-18	14.5
DCT 175-042-20B-M20	17.3-17.99	NPT1/2-14	17.5					UNEF3/4-20	17.8		

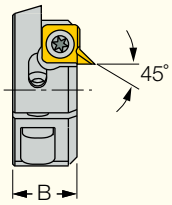
CHAMDRILL

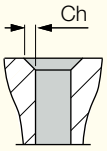
RING DCM

Chamfering Ring Mounted on the CHAMDRILL Drills for Drilling and Chamfering in One Operation









Designation	SS(1)	D min	D max	D3(2)	B	Ch
RING DCM 100	DCM 100	10.00	10.40	32.00	14.5	1.5
RING DCM 105	DCM 105	10.50	10.90	32.00	14.5	1.5
RING DCM 110	DCM 110	11.00	11.40	35.00	14.5	1.5
RING DCM 115	DCM 115	11.50	11.90	35.00	14.5	1.5
RING DCM 120	DCM 120	12.00	12.40	37.50	14.5	1.5
RING DCM 125	DCM 125	12.50	12.90	37.50	14.5	1.5
RING DCM 130	DCM 130	13.00	13.40	39.00	14.5	1.5
RING DCM 135	DCM 135	13.50	13.90	39.00	14.5	1.5
RING DCM 140	DCM 140	14.00	14.40	41.00	15.5	1.5
RING DCM 145	DCM 145	14.50	14.90	41.00	15.5	1.5
RING DCM 150	DCM 150	15.00	15.90	43.00	16.5	1.5
RING DCM 160	DCM 160	16.00	16.90	45.00	17.0	2.0
RING DCM 170	DCM 170	17.00	17.90	47.00	17.5	2.0
RING DCM 180	DCM 180	18.00	18.90	48.00	18.0	2.0
RING DCM 190	DCM 190	19.00	19.90	50.00	18.0	2.0
RING DCM 200	DCM 200	20.00	20.90	52.00	18.5	2.0

• RING DCM can be mounted only on DCM 3XD and DCM 5XD drills. • For mounting instructions, see page B95.

(1) Drill size (2) D3=D ring

For inserts, see: XOGX-DT (B94).

Spare Parts

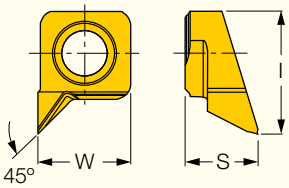
Designation	Insert Screw	Torx Blade	Side Locking Screw	Torx Blade 1	T-Handle	Hex Blade
RING DCM 100	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 105	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 110	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 115	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 120	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 125	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 130	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 135	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 140	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 145	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 150	SR 14-544/S	BLD T15/S7	SR M5X15 TORX 25(2)	BLD T25/S7	SW6-T	
RING DCM 160	SR 14-544/S	BLD T15/S7	SR M6X20DIN912(1)		SW6-T	HEX BIT HW5
RING DCM 170	SR 14-544/S	BLD T15/S7	SR M6X20DIN912(1)		SW6-T	HEX BIT HW5
RING DCM 180	SR 14-544/S	BLD T15/S7	SR M6X20DIN912(1)		SW6-T	HEX BIT HW5
RING DCM 190	SR 14-544/S	BLD T15/S7	SR M6X20DIN912(1)		SW6-T	HEX BIT HW5
RING DCM 200	SR 14-544/S	BLD T15/S7	SR M6X20DIN912(1)		SW6-T	HEX BIT HW5

(1) Maximum tightening torque 10(Nm)

(2) Maximum tightening torque 7(Nm)

XOGX-DT

Inserts Used on Chamfering Rings

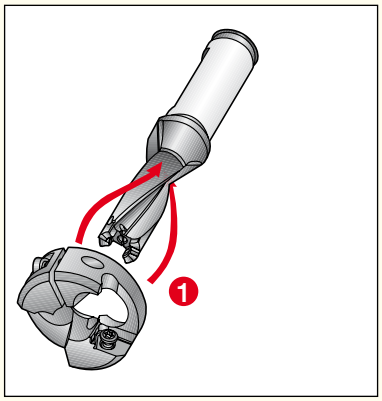


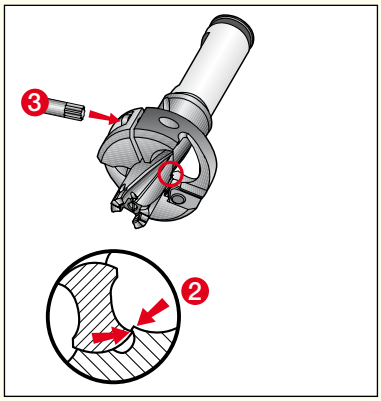
Designation	Dimensions			IC528
	W	S	l	
XOGX 090700-45DT	9.00	7.00	12.00	●

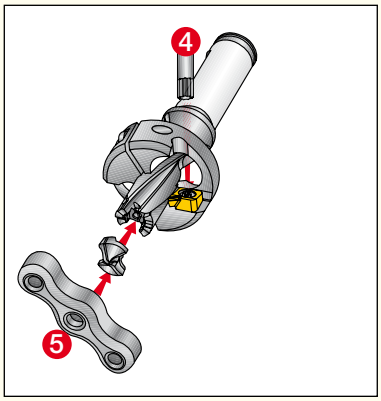
For tools, see: RING DCM (B93).

Chamfer Ring

Drilling and Chamfering in One Operation for DCM 3xD and 5xD Drills



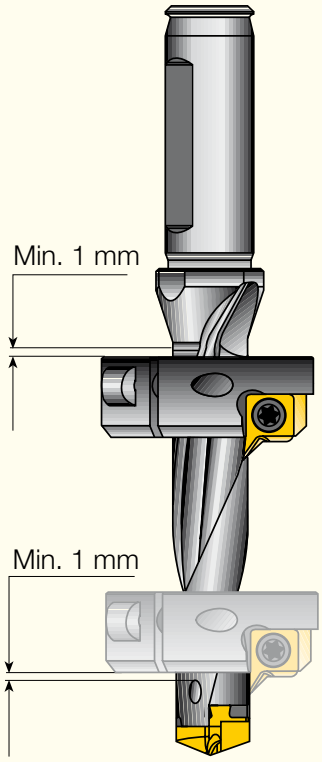




Mounting Instructions

1. Insert the chamfer ring on the drill body, and slide to the desired position[1].
2. Rotate the ring clockwise until stopper engages the flute edge.
3. Tighten the ring screw according to the maximum tightening torque indicated on page B93.
4. Mount the chamfer insert.
5. Mount the CHAMDRILL head.

NO SETUP TIME!



Chamfer Ring Position Range

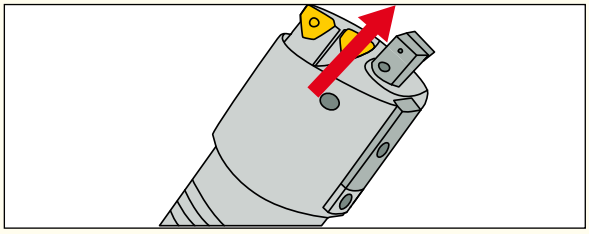
Drill Diameter	Drill Body 3xD L (min-max)	Drill Body 5xD L (min-max)	Maximum Chamfer Size
10	8-16	15-36	1.5
10.5	8-18	17-39	
11	8-19	18-41	
11.5	8-21	20-44	
12	8-22	21-46	
12.5	8-24	23-49	
13	8-25	24-51	
13.5	8-27	26-54	
14	9-29	28-57	
14.5	9-30	29-60	
15	9-31	30-60	
16	9-33	32-65	2.0
17	11-35	34-69	
18	11-38	34-74	
19	11-42	41-80	
20	11-45	44-85	

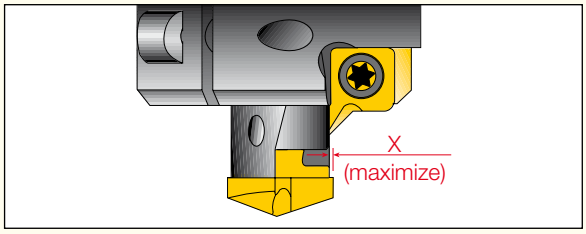
User Guide

Recommendations for better stability:

1. Use 3xD drill instead of 5xD, if possible.
2. Mount the chamfer ring as close as possible to the drill shank.
3. For better chamfering insert life, apply a coolant to the chamfering insert, in addition to the internal and/or external coolant.
4. A wider gap "X" between the drill and the head size is preferred (i.e. for head 14.6 mm, use body of 14 mm rather than of 14.5 mm). A slightly larger "X" dimension can dramatically increase the chamfering insert life.

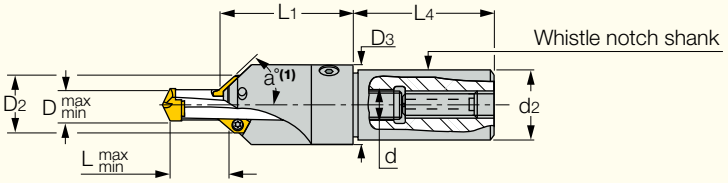
[1] The "L" dimension shown is relative to the common 1 mm chamfer.
For other sizes, adjust "L" accordingly.





CHAMRING

Drill Holders used for Drilling and Chamfering in One Operation



(1) Chamfering angle (a°) is dependent on the chamfering insert being used.

Designation		D min	D max	DCNS 3D(1) L min	DCNS 3D(1) L max	DCM 3.5D(2) L min	DCM 3.5D(2) L max	DCNS 5D(3) L min	DCNS 5D(3) L max	d	D3	D2	L1	L4	d2	Inserts
CHAMRING 080-WN20-06	DC... 075	7.5	7.9	12.6	24	12.4	21.9	17.3	38	8	25	18.8	47.4	50	20	XCGT 06...
	DC... 080	8	8.4	13.5	24.6	14	23	24.7	45							
CHAMRING 090-WN20-06	DC... 085	8.5	8.9	12.6	26.2	15.1	26.6	18.5	43	9	25	19.8	47.4	50	20	XCGT 06...
	DC... 090	9	9.4	13	29.2	15.6	27.1	22.9	46.8							
CHAMRING 100-WN32-09	DC... 095	9.5	9.9	12.9	27.8	17.2	29.2	26	47	10	38	24.9	67.3	60	32	XCGT 09...
	DC... 100	10	10.4	14.5	31.8	14.3	28.3	31.7	51.8							
CHAMRING 110-WN32-09	DC... 105	10.5	10.9	15.7	33.3	14.4	29.4	31.2	54.2	11	38	25.9	67.3	60	32	XCGT 09...
	DC... 110	11	11.4	16.2	35.3	18	31	34.1	57.3							
CHAMRING 120-WN32-09	DC... 115	11.5	11.9	15.1	36.7	15.6	33.1	33.8	59.4	12	38	26.9	67.3	60	32	XCGT 09...
	DC... 120	12	12.4	16.5	37.7	19.2	35.2	36.6	61.6							
CHAMRING 130-WN32-09	DC... 125	12.5	12.9	16.1	39.6	19.3	37.3	39.7	64.8	13	38	27.9	67.3	60	32	XCGT 09...
	DC... 130	13	13.4	17.5	41.5	21.4	38.4	42.7	68							
CHAMRING 140-WN32-09	DC... 135	13.5	13.9	17.7	42.9	19.5	39.5	41.4	70.3	14	38	28.4	67.3	60	32	XCGT 09...
	DC... 140	14	14.4	18.1	45	21.5	41.5	44.8	73.1							
CHAMRING 150-WN32-09	DC... 145	14.5	14.9	19.2	44.6	20.1	42.1	44	73.9	15	38	29.4	67.3	60	32	XCGT 09...
	DC... 150	15	15.9	19.7	47.4	25.2	43.7	47.6	80.7							
CHAMRING 160-WN32-09	DC... 160	16	16.9	19.5	55.36	26.3	49.3	57	87.5	16	38	30.4	67.3	60	32	XCGT 09...
CHAMRING 170-WN32-09	DC... 170	17	17.9	21.4	54.9	28.4	52.4	55.9	88.5	17	38	31.4	67.3	60	32	XCGT 09...
CHAMRING 180-WN32-09	DC... 180	18	18.9	24.2	65.2	31	57	60	93	18	38	32.4	67.3	60	32	XCGT 09...
CHAMRING 190-WN32-09	DC... 190	19	19.9	28.5	62.3	32.3	63.3	67	100	19	38	33.4	75	60	32	XCGT 09...
CHAMRING 200-WN32-09	DC... 200	20	20.9	38.9	73.5	36.6	67.1	79	113	20	38	34.4	75	60	32	XCGT 09...
CHAMRING 210-WN40-09	DC... 210	21	21.9	33.2	69.1			76	110	21	50	35.4	84.4	68	40	XCGT 09...
CHAMRING 220-WN40-09	DC... 220	22	22.9	36.5	71.3			81	114.5	22	50	36.4	84.4	68	40	XCGT 09...
CHAMRING 230-WN40-09	DC... 230	23	23.9	39.9	75.6			83	121.5	23	50	37.4	84.4	68	40	XCGT 09...
CHAMRING 240-WN40-09	DC... 240	24	24.9	43.4	79			91	127	24	50	38.4	84.4	68	40	XCGT 09...
CHAMRING 250-WN40-09	DC... 250	25	25.9	46.9	82.6			97	133	25	50	39.4	84.4	68	40	XCGT 09...

• It is recommended to apply external coolant on the chamfering inserts • Reduce the recommended feed and speed by 50% when machining maximum chamfer size • Lmin & Lmax dimensions are based on the 45° chamfering insert.

(1) When DCNS-3D is used. (2) When DCM-3.5D is used. (3) When DCNS-5D is used.

For inserts, see: XCGT-DT (B97).

For suitable drills, see pages: DCM-3.5D (7.5-20.9 mm 3.5xD) (B40) , DCNS-3D (B8), DCNS-5D (B9)

Assembly Instructions

- Insert the UNICHAMDRILL into the CHAMRING prior to clamping the chamfering inserts.
- Adjust the UNICHAMDRILL protrusion by using the rear screw, then correct adjustment using the side clamping screw.
- Attach the chamfering inserts.

Adjustment of UNICHAMDRILL Protrusion

- Loosen the chamfering inserts clamping screws.
- Loosen the side clamping screw.
- Adjust the UNICHAMDRILL protrusion by using the rear screw, then correct adjustment using the side clamping screw.
- Re-tighten the chamfering inserts.

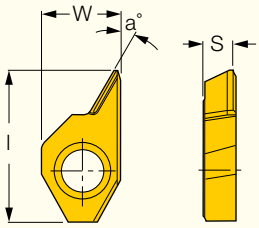
Spare Parts

Designation	Side Locking Screw	Side Locking Screw Key	BACK Screw	Back Screw Key	Insert Screw	Torx Key	Torex Blade	Handle
CHAMRING 8-9	SR M6X6DIN916	HW 3.0	SR M6X1S	HW 3.0	SR 14-560	T-8/53		
CHAMRING 10-20	SR M10X10DIN916	HW 5.0	SR M10X1.5S	HW 5.0	SR 14-544/S		BLD T15/S7	SW6-SD
CHAMRING 21-25	SR M16X16 DIN1835-B	HW 8.0	SR M12X1.75S	HW 6.0	SR 14-544/S		BLD T15/S7	SW6-SD

CHAMRING

XCGT-DT

Inserts used on Chamfering Drill Holders for Chamfering and Drilling in One Operation



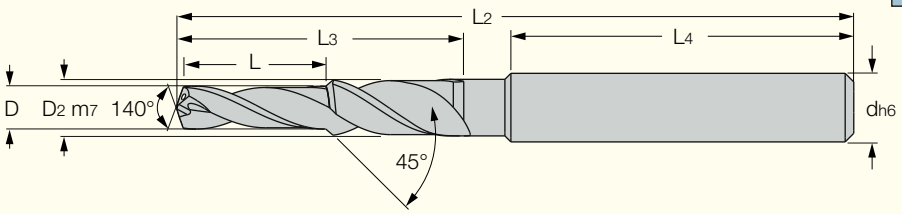
Designation	Dimensions W	l	S	a°	IC508
XCGT 060300-30DT	6.40	12.30	2.80	30	●
XCGT 060300-45DT	6.40	12.30	2.80	45	●
XCGT 060300-60DT	6.40	12.30	2.80	60	●
XCGT 090300-30DT	8.80	16.00	3.30	30	●
XCGT 090300-45DT	8.80	16.00	3.30	45	●
XCGT 090300-60DT	8.80	16.00	3.30	60	●

For tools, see: CHAMRING (B96).

SOLIDDRILL • PRE-THREAD

SCDT

Pre-Thread Solid Carbide Drills with Coolant Holes



Designation	Dimensions T_h[1]	D	D_2	L_2	L	L_3	d	L_4	IC908
SCDT 025-009-060-M3	M3	2.50	4.00	62.0	8.8	20.0	6.00	36.0	●
SCDT 033-011-060-M4	M4	3.30	4.50	62.0	11.4	24.0	6.00	36.0	●
SCDT 042-014-060-M5	M5	4.20	5.50	66.0	13.6	28.0	6.00	36.0	●
SCDT 050-017-080-M6	M6	5.00	6.60	79.0	16.5	34.0	8.00	40.0	●
SCDT 068-021-100-M8	M8	6.80	9.00	89.0	21.0	47.0	10.00	40.0	●
SCDT 085-026-120-M10	M10	8.50	11.00	102.0	25.5	55.0	12.00	40.0	●

• For user guide and cutting conditions, see pages C31-39,C42-44,C50

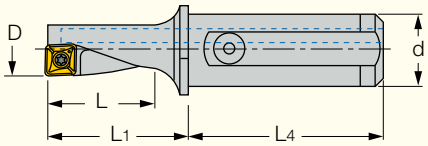
[1] Used for standard thread size.

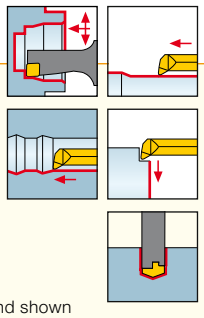
MULTIFUNCTION TOOLS

MULTIFUNCTION TOOLS

DR-MF-2.25D

Multifunction Drilling, Boring, Facing and External Turning Tool





Right-hand shown

Designation	D	d	L	L_1	L_4
DR-MF-08R-2.25D-12A-04	8.00	12.00	18.0	22.0	38.0
DR-MF-10R/L-2.25D-12A-05	10.00	12.00	22.5	27.5	42.0
DR-MF-12R/L-2.25D-16A-06	12.00	16.00	27.0	33.0	45.0
DR-MF-14R/L-2.25D-16A-07	14.00	16.00	31.5	38.5	45.0
DR-MF-16R/L-2.25D-20A-08	16.00	20.00	36.0	44.0	50.0
DR-MF-20R/L-2.25D-25A-10	20.00	25.00	45.0	55.0	56.0
DR-MF-25R/L-2.25D-32A-13	25.00	32.00	56.5	69.0	61.0
DR-MF-32R/L-2.25D-40A-17	32.00	40.00	72.0	86.0	74.0

• In non-rotating applications hole diameter can be adjusted within the specified range by shifting drill's center line along machine's X-axis. • The tools have an internal coolant hole.

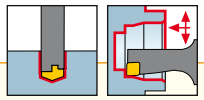
For TGHR holders, see next page.

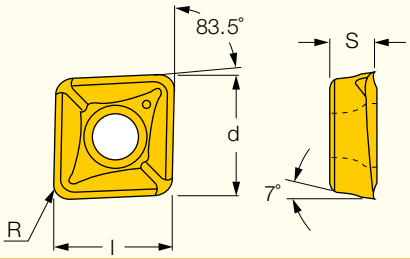
Spare Parts

Designation	Key	Key 1	Screw
DR-MF-08R-2.25D-12A-04		IP-6/5	SR 18034/HG-P
DR-MF-10R/L-2.25D-12A-05		IP-6/5	SR 20038/HG-P
DR-MF-12R/L-2.25D-16A-06		IP-7/5	SR 22052/HG-P
DR-MF-14R/L-2.25D-16A-07		IP-8/5	SR 25064/HG-P
DR-MF-16R/L-2.25D-20A-08		IP-9/151	SR 30070/HG-P
DR-MF-20R/L-2.25D-25A-10		IP-10/151	SR 35088/HG-P
DR-MF-25R/L-2.25D-32A-13	IP-20/51		SR 45A100I/HG
DR-MF-32R/L-2.25D-40A-17	IP-20/51		SR 45A100I/HG

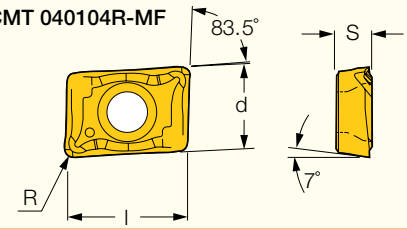
XCMT-MF

Inserts for DR-MF Multifunction Tools, Two Cutting Edges, for Hard Materials and Interrupted Cut





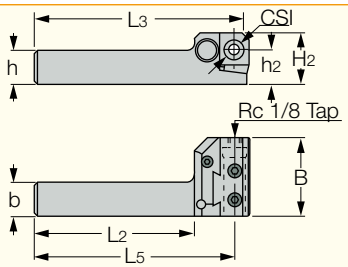
XCMT 040104R-MF



Designation	Dimensions di	l	S	R	IC908
XCMT 040104L-MF	4.40	6.40	1.70	0.40	●
XCMT 040104R-MF	4.40	6.40	1.70	0.40	●
XCMT 050204-MF	5.60	5.60	2.10	0.40	●
XCMT 060204-MF	6.38	6.38	2.38	0.40	●
XCMT 070304-MF	7.48	7.48	3.18	0.40	●
XCMT 080304-MF	8.44	8.44	3.18	0.40	●
XCMT 10T308-MF	10.50	10.50	3.97	0.80	●
XCMT 130404-MF	13.40	13.40	4.76	0.40	●
XCMT 130408-MF	13.40	13.40	4.76	0.80	●
XCMT 170508-MF	17.40	17.40	5.56	0.80	●

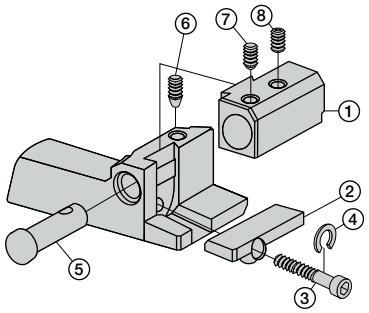
TGHR

Center Alignment Clamping Units for Lathe Machines



Designation	h	h_2	b	CSI	H_2	B	L_2	L_5	L_3
TGHR 2020-D16	20.0	20.0	20.0	16	38.0	58.0	120.00	150.00	161.00
TGHR 2525-D16	25.0	25.0	25.0	16	38.0	58.0	120.00	150.00	161.00

For tools, see: DR-MF-2.25D (B99).



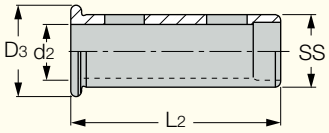
Spare Parts

Designation	Block	Wedge	Wedge Screw	Snap Ring	Mounting Pin	Mounting Pin Screw	Clamping	Screws	Wrench
TGHR 2020-D16	TGHR-D16 -BL	TGHR-WD	TGH-WS	WSR 4	TGH-MPI	TGH-MPS	SS M6x1x277-C	SS M6x1x275	L-W3
TGHR 2525-D16									

DR-MF tools with 16 mm shanks can be clamped directly into the TGHR clamping units.
Also available is a reduction sleeve for 12 mm shanks.

TSL

Reduction Sleeves for Center Alignment Clamping Units for Lathe Machines



Designation	SS	d_2	D_3	L_2
TSL 16-12	16	12.00	20.00	47.00

Coolant Pressure

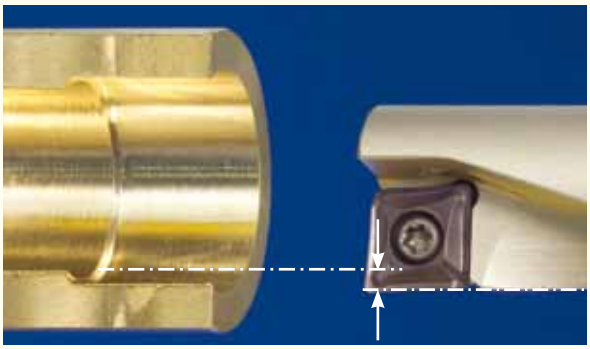
- Apply above 6 bar in 2.25xD tools (optimal pressure is above 10 bar).

Optimization of Chip Shape

- Apply high speed machining on low carbon steel.
- Produce thin chips, as most problems are caused by thick chips.
- Regulate chips produced by machining medium to high carbon steel:
- If too tight, either increase speed and reduce feed; or reduce speed and increase feed.
- If too long, reduce speed and increase feed.

Radial Adjustment (off-center drilling)

- Radial adjustment is depending on drill diameter



Tool	Drill Dia.	D_{min}	D_{max}
DR-MF-10	10	9.82	11.60
DR-MF-12	12	11.82	12.60
DR-MF-14	14	13.80	14.60
DR-MF-16	16	15.76	16.50

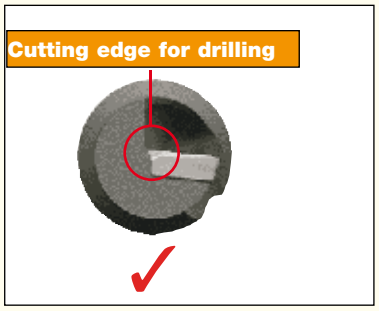
Troubleshooting

Problem	Solution
Chipping caused by built-up edge	Increase cutting speed. Reduce feed. Check tool and workpiece rigidity. Reduce tool and workpiece overhang.
Excessive flank wear	Reduce cutting speed. Use a harder grade (special). Increase coolant flow. Check cutting edge height.
Edge deformation	Reduce cutting speed. Use a harder grade (special). Increase coolant flow. Reduce feed.
Poor surface quality	Reduce feed. Increase coolant flow. Check tool and workpiece rigidity. Increase cutting speed.
Long chips	Increase feed. Reduce cutting speed. Increase coolant flow.
Tight chips	Reduce feed.
Vibrations	Check tool and workpiece rigidity. Reduce tool and workpiece overhang. Reduce cutting speed. Increase feed. Check cutting edge height. Reduce feed and increase cutting speed on very soft materials.

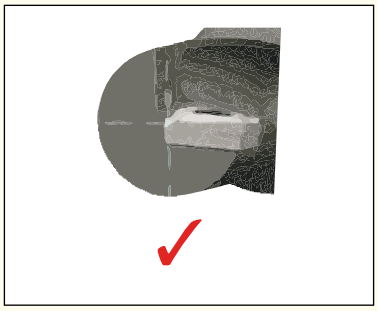
User Guide for Turn-Mill Machines

Insert Positioning

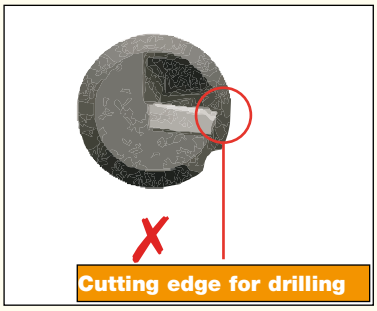
For drilling, cutting edge should be positioned in the center of tool body.



Correct

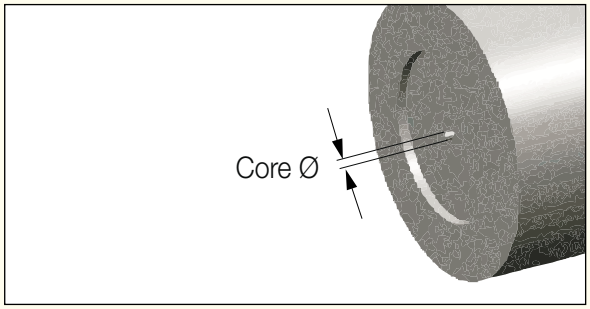


Correct

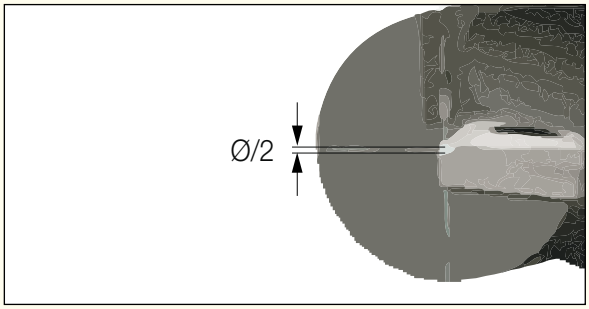


Wrong

Setup

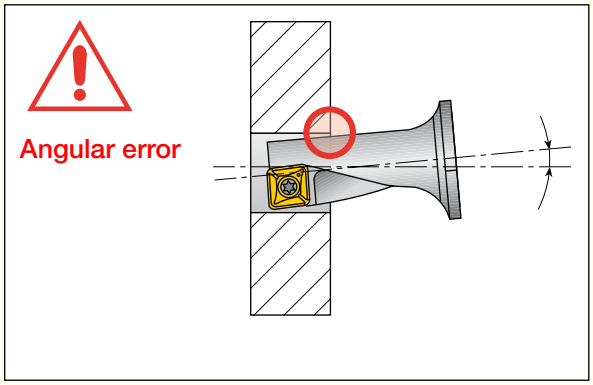


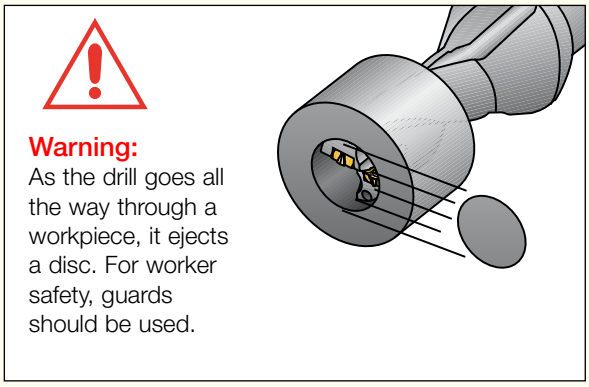
Check formation of core and its size after drilling 3 mm to 6 mm depth.
The diameter of core should be within 0.15-0.45 mm.
Adjust Y-axis of the tool body by using the new adjustable clamping unit (if it is available) or rotate the tool body 180° and secure it into a turret. Check the core again.



Important: If a core does not appear, this can cause breakage of insert and vibration when drilling or turning.

If the size of the core is over the recommended size, it will cause overload and vibration.





Recommended Cutting Conditions

Cutting speed (Vc)

Workpiece Materials	Material No. VDI 3323	Hardness (BHN)	Cutting speed: Vc (m/min) for IC908	
			Drilling	Turning & Boring
Low carbon steel (≤0.25% C)	1	~150	130-240	150-270
Carbon steel (≥0.25% C)	2	150-250	90-160	100-180
Low alloy steel	6	~180	120-210	140-230
Medium alloy steel	7	200-250	70-140	80-160
High alloy steel	8, 9	250-350	50-100	60-120
Martensitic stainless steel	12	200	110-180	130-200
Austenitic stainless steel	14	200	90-160	100-180
Grey cast iron	17, 18	180-220	110-180	1200-200
Ductile cast iron	15, 16	200-240	90-160	100-180
Aluminum alloy	21-24	60-130	100-500	150-600
Copper alloy	26-28	90-100	100-400	100-500

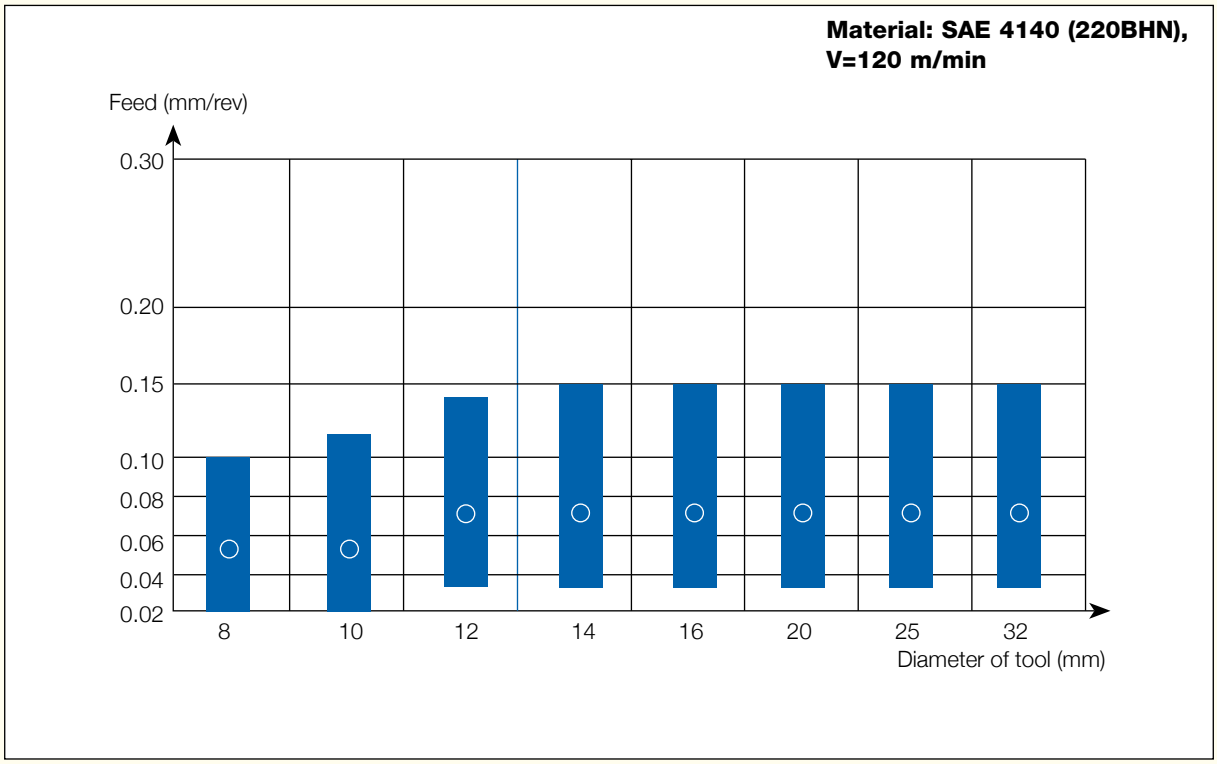
Recommended Cutting Conditions

Insert	Machining Type	Cutting Conditions	
		ap (mm)	f (mm/rev)
XCMT 040104	External Turning	0.6 (0.2-1.8)	0.05 (0.02-0.15)
	Drilling	-	0.06 (0.02-0.10)
XCMT 050204	External Turning	0.8 (0.2-2.5)	0.08 (0.02-0.15)
	Face Turning	0.6 (0.2-1.7)	0.06 (0.02-0.13)
	Drilling	-	0.05 (0.02-0.10)
XCMT 060204	External Turning	1.0 (0.2-3.0)	0.10 (0.03-0.20)
	Face Turning	0.8 (0.2-2.5)	0.07 (0.03-0.15)
	Drilling	-	0.05 (0.02-0.10)
XCMT 070304	External Turning	1.3 (0.3-3.5)	0.12 (0.03-0.20)
	Face Turning	1.0 (0.25-3.0)	0.10 (0.03-0.18)
	Drilling	-	0.06 (0.03-0.12)
XCMT 0803..	Face Turning	1.5 (0.35-4.0)	0.14 (0.06-0.25)
	External Turning	1.2 (0.3-3.5)	0.12 (0.06-0.24)
	Drilling	-	0.08 (0.05-0.16)
XCMT 10T304	External Turning	1.8 (0.5-3.5)	0.12 (0.06-0.30)
	Drilling	-	0.08 (0.03-0.15)
XCMT 10T308	External Turning	1.8 (0.5-3.5)	0.20 (0.10-0.40)
	Drilling	-	0.08 (0.03-0.15)
XCMT 130404	External Turning	2.0 (0.6-4.3)	0.15 (0.07-0.32)
	Drilling	-	0.08 (0.03-0.15)
XCMT 130408	External Turning	2.0 (0.6-4.3)	0.20 (0.10-0.40)
	Drilling	-	0.08 (0.03-0.15)
XCMT 170508	External Turning	3.0 (0.7-5.3)	0.22 (0.10-0.40)
	Drilling	-	0.08 (0.03-0.15)

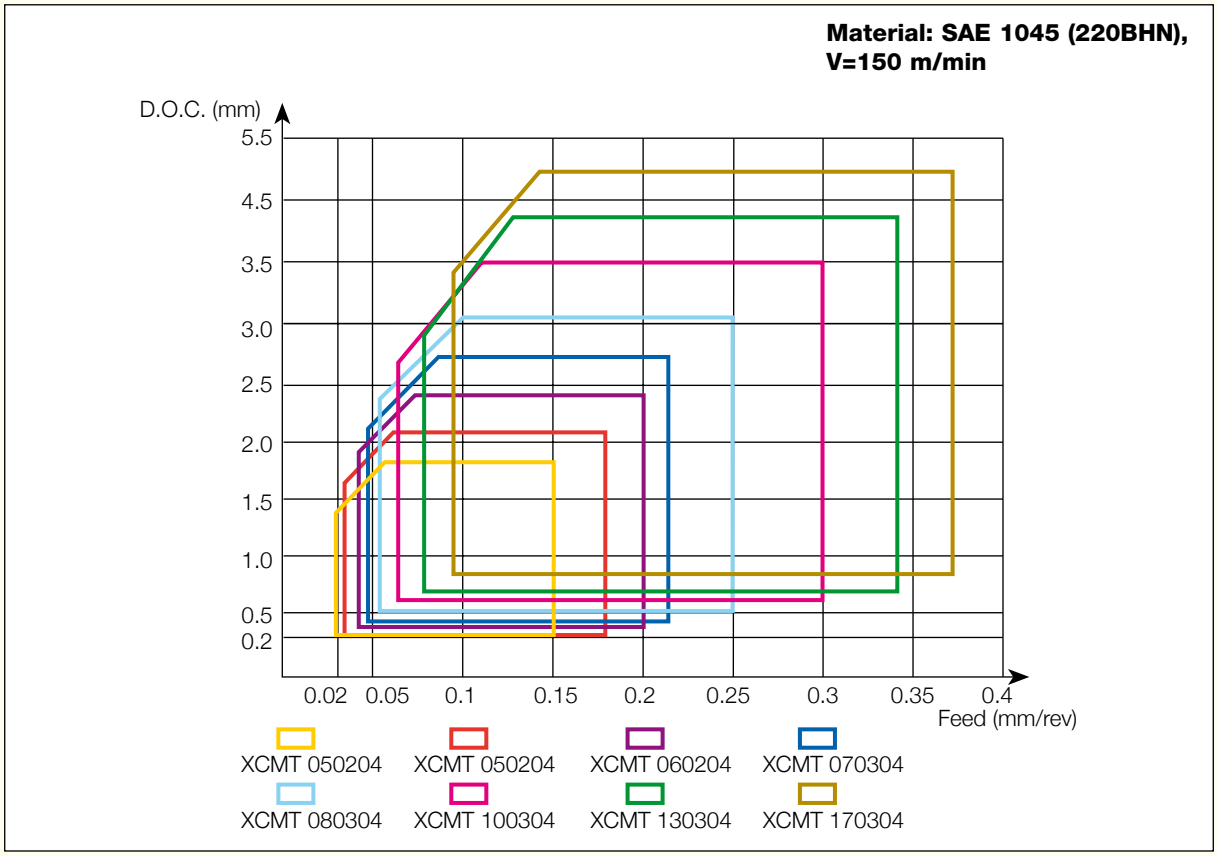
Cutting parameters are for 2.25xD steel shank.
Internal coolant supply is recommended.

Chip Control Range

Drilling



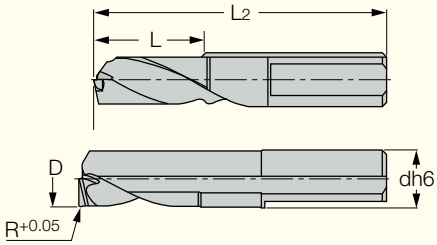
Turning



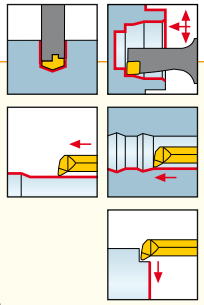
MULTIFUNCTION TOOLS

PICCO-MF

Multifunction, Solid Carbide Tools for Drilling, Facing, Int. and Ext. Turning on Swiss and Small CNC Machines



Right-hand shown

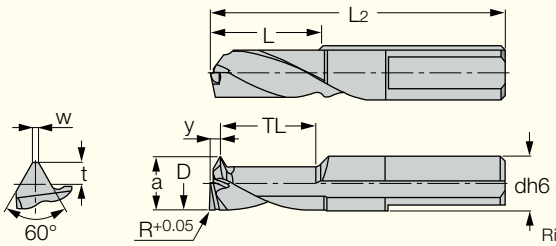


Designation	Dimensions D	L	L2	d	R	IC908
PICCO R-MF 6-3 L06	3.00	6.0	28.0	6.00	0.10	●
PICCO R/L-MF 6-4 L08	4.00	8.0	30.0	6.00	0.10	●
PICCO R/L-MF 6-4 L12	4.00	12.0	34.0	6.00	0.20	●
PICCO R/L-MF 6-5 L10	5.00	10.0	32.0	6.00	0.10	●
PICCO R/L-MF 6-5 L15	5.00	15.0	41.0	6.00	0.30	●
PICCO R/L-MF 6-6 L12	6.00	12.0	34.0	6.00	0.10	●
PICCO R/L-MF 6-6 L18	6.00	18.0	43.0	6.00	0.30	●
PICCO R/L-MF 8-7 L14	7.00	14.0	41.0	8.00	0.10	●
PICCO R/L-MF 8-7 L21	7.00	21.0	55.0	8.00	0.30	●
PICCO R/L-MF 8-8 L16	8.00	16.0	43.0	8.00	0.10	●
PICCO R/L-MF 8-8 L24	8.00	24.0	58.5	8.00	0.30	●

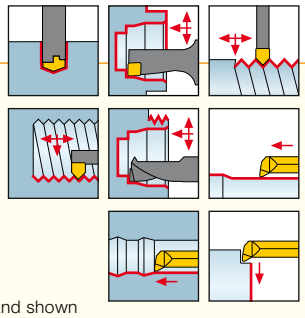
• Dmin can be 0.1 mm smaller by shifting tool center • Applications: Drilling, face turning, internal chamfering, internal turning\ boring, internal profiling, external chamfering, external turning.

PICCO-MFT

Solid Carbide Tools for Drilling, Facing, Int. and Ext. Turning and Threading on Swiss and Small CNC Machines



Right-hand shown

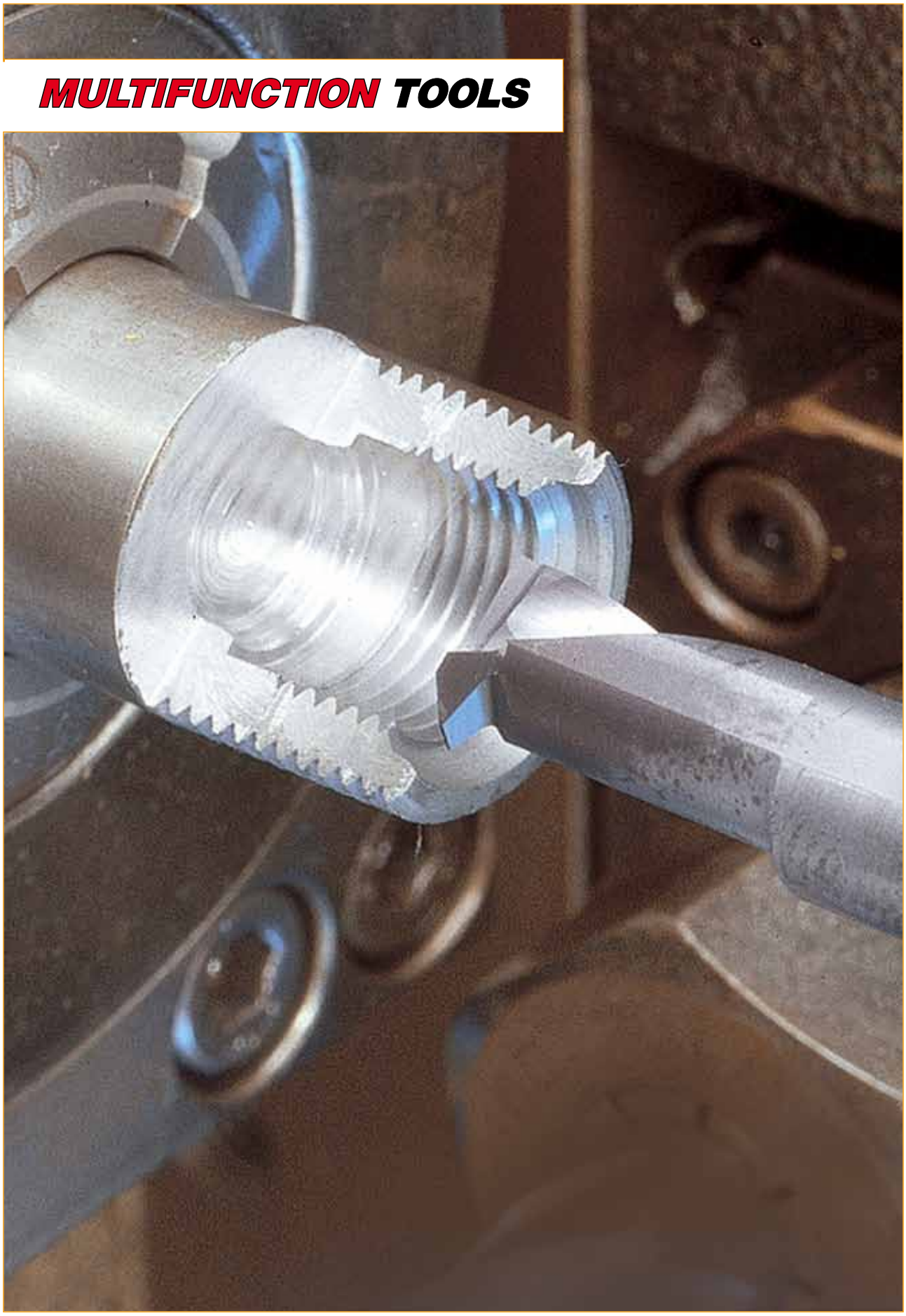


Designation	Dimensions D min	Pmin	Pmax	t	a	w	L	TL	L2	Y	d	R	IC908
PICCO R/L-MFT60 6-4 L08	4.00	0.50	0.75	0.46	3.90	0.06	8.0	7.3	30.0	1.30	6.00	0.10	●
PICCO R/L-MFT60 6-4 L12 (1)	4.00	0.50	0.75	0.46	3.90	0.06	12.0	11.6	34.0	1.15	6.00	0.20	●
PICCO R/L-MFT60 6-5 L10	5.00	0.50	1.00	0.61	4.90	0.06	10.0	9.0	32.0	1.35	6.00	0.10	●
PICCO R/L-MFT60 6-5 L15 (1)	5.00	0.50	1.00	0.61	4.90	0.06	15.0	14.4	37.0	1.35	6.00	0.30	●
PICCO R/L-MFT60 6-6 L12	6.00	0.50	1.00	0.61	5.90	0.06	12.0	11.0	34.0	1.40	6.00	0.10	●
PICCO R/L-MFT60 6-6 L18 (1)	6.00	0.50	1.00	0.61	5.90	0.06	18.0	17.3	40.0	1.40	6.00	0.30	●
PICCO R/L-MFT60 8-7 L14	7.00	0.75	1.25	0.76	6.90	0.09	14.0	13.0	41.0	1.50	8.00	0.10	●
PICCO R/L-MFT60 8-7 L21 (1)	7.00	0.75	1.25	0.76	6.90	0.09	21.0	20.0	55.0	1.50	8.00	0.30	●
PICCO R/L-MFT60 8-8 L16	8.00	0.90	1.50	0.92	7.90	0.11	16.0	15.0	43.0	1.50	8.00	0.10	●
PICCO R/L-MFT60 8-8 L24 (1)	8.00	0.90	1.50	0.92	7.90	0.11	24.0	23.0	57.0	1.50	8.00	0.30	●

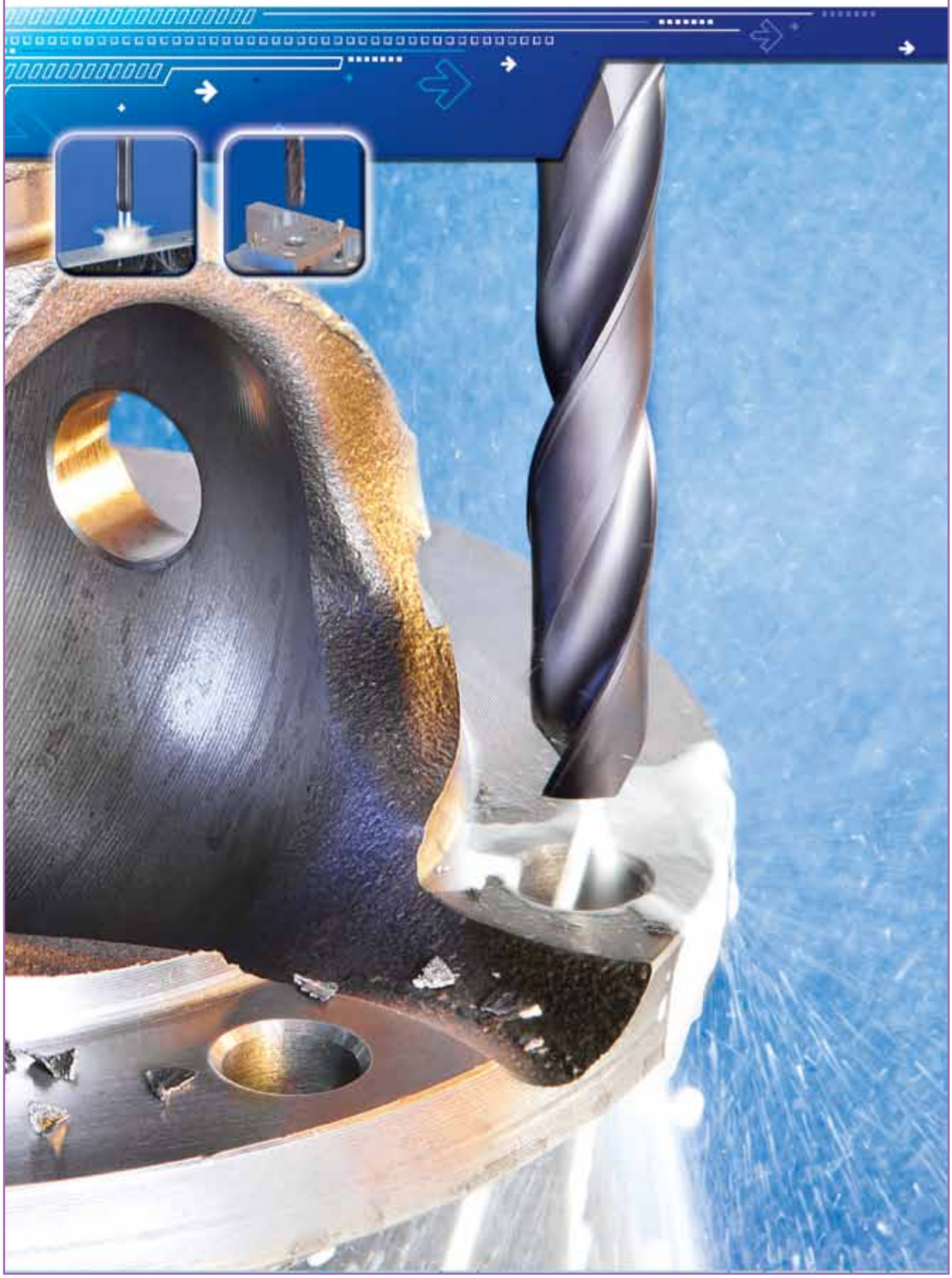
• Applications: Drilling; face turning; internal chamfering; internal turning\boring; internal profiling; external chamfering; external turning; internal and external 60° threading (right- and left-hand).

(1) Available on request.

MULTIFUNCTION TOOLS



PREMIUM SOLID CARBIDE DRILLS



Member IMC Group

Identification System

SCD / SCCD [1]

Solid Carbide Drill

[1] 3 Flute

126 – **060** – **140** **A** **C** **G** **5**

- 126: Cutting Diameter
- 060: Effective Drilling Depth
- 140: Shank Diameter

Shank Type

A	Cylindrical

Coolant

	If not specified - external coolant
C	Internal coolant

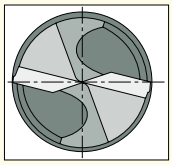
Cutting Geometry

P	Cutting geometry for steel
N	Cutting geometry for aluminum
G	Cutting geometry for general use

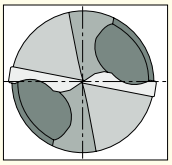
L/D

Cutting Edge Configurations

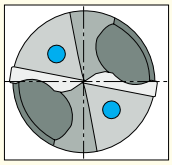
AP



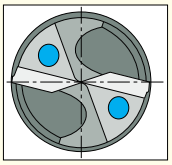
AG



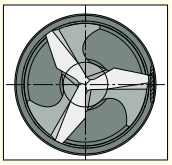
ACG



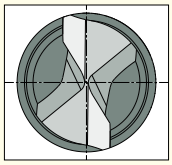
ACP



SCCD

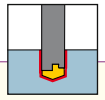


SCD... AH

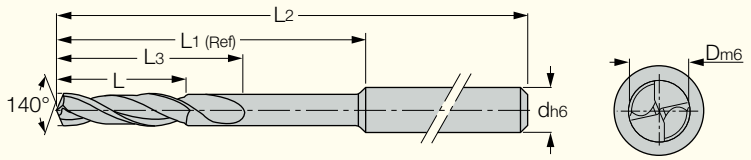


SCD-AP4 (4xD)

Solid Carbide Drills without Coolant Holes, Drilling Depth 4xD, DIN 6537



D	Tolerance m6
0.8-2.9	0.002-0.008



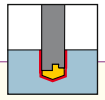
Designation	Dimensions							IC908
	D	d	L	L_3	L_1	L_2	T_h[1]	
SCD 008-003-030 AP4	0.80	3.00	3.2	4.8	8.8	46.0	-	●
SCD 009-003-030 AP4	0.90	3.00	3.6	5.4	9.4	46.0	-	●
SCD 010-004-030 AP4	1.00	3.00	4.0	6.0	10.0	46.0	-	●
SCD 011-004-030 AP4	1.10	3.00	4.4	6.6	10.6	46.0	M1.4	●
SCD 012-004-030 AP4	1.20	3.00	4.8	7.2	11.2	46.0	-	●
SCD 013-005-030 AP4	1.30	3.00	5.2	7.8	11.8	46.0	-	●
SCD 014-005-030 AP4	1.40	3.00	5.6	8.4	12.4	46.0	-	●
SCD 015-006-030 AP4	1.50	3.00	6.0	9.0	13.0	46.0	-	●
SCD 016-006-030 AP4	1.60	3.00	6.4	9.6	13.6	46.0	M2	●
SCD 017-006-030 AP4	1.70	3.00	6.8	10.2	14.2	46.0	-	●
SCD 018-007-030 AP4	1.80	3.00	7.2	10.8	14.8	46.0	-	●
SCD 019-007-030 AP4	1.90	3.00	7.6	11.4	15.4	46.0	-	●
SCD 020-008-030 AP4	2.00	3.00	8.0	12.0	16.0	60.0	-	●
SCD 021-008-030 AP4	2.10	3.00	8.4	12.6	16.6	60.0	-	●
SCD 022-008-030 AP4	2.20	3.00	8.8	13.2	17.2	60.0	-	●
SCD 023-009-030 AP4	2.30	3.00	9.2	13.8	17.8	60.0	-	●
SCD 024-009-030 AP4	2.40	3.00	9.6	14.4	18.4	60.0	-	●
SCD 025-010-030 AP4	2.50	3.00	10.0	15.0	19.0	60.0	M3	●
SCD 026-010-030 AP4	2.60	3.00	10.4	15.6	19.6	60.0	-	●
SCD 027-010-030 AP4	2.70	3.00	10.8	16.2	20.2	60.0	-	●
SCD 028-011-030 AP4	2.80	3.00	11.2	16.8	20.8	60.0	-	●
SCD 029-011-030 AP4	2.90	3.00	11.6	17.4	21.4	60.0	M3.5	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

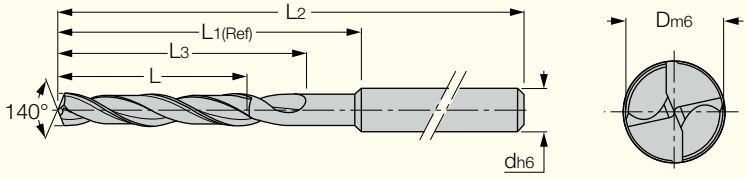
[1] Used for standard thread size.

SCD-AP6 (6xD)

Solid Carbide Drills without Coolant Holes, Drilling Depth 6xD, DIN 6537



D	Tolerance m6
0.8-2.9	0.002-0.008



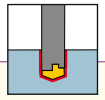
Designation	Dimensions							IC908
	D	d	L	L_3	L_1	L_2	T_h[1]	
SCD 008-004-030 AP6	0.80	3.00	4.8	6.4	10.7	46.0	-	●
SCD 009-005-030 AP6	0.90	3.00	5.4	7.2	11.5	46.0	-	●
SCD 010-006-030 AP6	1.00	3.00	6.0	8.0	12.2	46.0	-	●
SCD 011-006-030 AP6	1.10	3.00	6.6	8.8	13.0	46.0	M1.4	●
SCD 012-007-030 AP6	1.20	3.00	7.2	9.6	13.7	46.0	-	●
SCD 013-007-030 AP6	1.30	3.00	7.8	10.4	14.5	46.0	-	●
SCD 014-008-030 AP6	1.40	3.00	8.4	11.2	15.2	46.0	-	●
SCD 015-009-030 AP6	1.50	3.00	9.0	12.0	16.0	46.0	-	●
SCD 016-009-030 AP6	1.60	3.00	9.6	12.8	16.7	46.0	M2	●
SCD 017-010-030 AP6	1.70	3.00	10.2	13.6	17.5	60.0	-	●
SCD 018-010-030 AP6	1.80	3.00	10.8	14.4	18.2	60.0	-	●
SCD 019-011-030 AP6	1.90	3.00	11.4	15.2	18.9	60.0	-	●
SCD 020-012-030 AP6	2.00	3.00	12.0	16.0	19.7	60.0	-	●
SCD 021-012-030 AP6	2.10	3.00	12.6	16.8	20.4	60.0	-	●
SCD 022-013-030 AP6	2.20	3.00	13.2	17.6	21.1	60.0	-	●
SCD 023-013-030 AP6	2.30	3.00	13.8	18.4	21.8	60.0	-	●
SCD 024-014-030 AP6	2.40	3.00	14.4	19.2	22.5	60.0	-	●
SCD 025-015-030 AP6	2.50	3.00	15.0	20.0	23.2	60.0	M3	●
SCD 026-015-030 AP6	2.60	3.00	15.6	20.8	23.9	60.0	-	●
SCD 027-016-030 AP6	2.70	3.00	16.2	21.6	24.5	60.0	-	●
SCD 028-016-030 AP6	2.80	3.00	16.8	22.4	25.2	60.0	-	●
SCD 029-017-030 AP6	2.90	3.00	17.4	23.2	25.7	60.0	M3.5	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

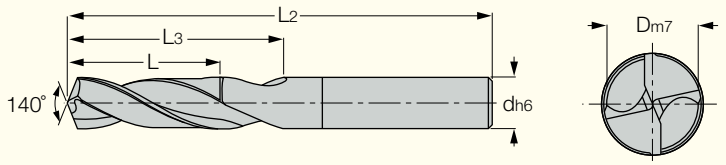
[1] Used for standard thread size.

SCD-AP3 (3xD)

Solid Carbide Drills without Coolant Holes, Drilling Depth 3xD, DIN 6537



D	Tolerance m7
3.00- 6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



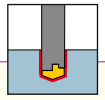
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 030-014-060 AP3	3.00	6.00	14.0	20.0	62.0	-	●
SCD 031-014-060 AP3	3.10	6.00	14.0	20.0	62.0	-	●
SCD 032-014-060 AP3	3.20	6.00	14.0	20.0	62.0	-	●
SCD 033-014-060 AP3	3.30	6.00	14.0	20.0	62.0	M4	●
SCD 034-014-060 AP3	3.40	6.00	14.0	20.0	62.0	-	●
SCD 035-014-060 AP3	3.50	6.00	14.0	20.0	62.0	-	●
SCD 036-014-060 AP3	3.60	6.00	14.0	20.0	62.0	-	●
SCD 037-014-060 AP3	3.70	6.00	14.0	20.0	62.0	-	●
SCD 038-017-060 AP3	3.80	6.00	17.0	24.0	66.0	-	●
SCD 039-017-060 AP3	3.90	6.00	17.0	24.0	66.0	-	●
SCD 040-017-060 AP3	4.00	6.00	17.0	24.0	66.0	-	●
SCD 041-017-060 AP3	4.10	6.00	17.0	24.0	66.0	-	●
SCD 042-017-060 AP3	4.20	6.00	17.0	24.0	66.0	M5	●
SCD 043-017-060 AP3	4.30	6.00	17.0	24.0	66.0	-	●
SCD 044-017-060 AP3	4.40	6.00	17.0	24.0	66.0	-	●
SCD 045-017-060 AP3	4.50	6.00	17.0	24.0	66.0	-	●
SCD 046-017-060 AP3	4.60	6.00	17.0	24.0	66.0	-	●
SCD 047-017-060 AP3	4.70	6.00	17.0	24.0	66.0	-	●
SCD 048-020-060 AP3	4.80	6.00	20.0	28.0	66.0	-	●
SCD 049-020-060 AP3	4.90	6.00	20.0	28.0	66.0	-	●
SCD 050-020-060 AP3	5.00	6.00	20.0	28.0	66.0	M6	●
SCD 051-020-060 AP3	5.10	6.00	20.0	28.0	66.0	-	●
SCD 052-020-060 AP3	5.20	6.00	20.0	28.0	66.0	-	●
SCD 053-020-060 AP3	5.30	6.00	20.0	28.0	66.0	-	●
SCD 054-020-060 AP3	5.40	6.00	20.0	28.0	66.0	-	●
SCD 055-020-060 AP3	5.50	6.00	20.0	28.0	66.0	-	●
SCD 056-020-060 AP3	5.60	6.00	20.0	28.0	66.0	-	●
SCD 057-020-060 AP3	5.70	6.00	20.0	28.0	66.0	-	●
SCD 058-020-060 AP3	5.80	6.00	20.0	28.0	66.0	-	●
SCD 059-020-060 AP3	5.90	6.00	20.0	28.0	66.0	-	●
SCD 060-020-060 AP3	6.00	6.00	20.0	28.0	66.0	M7	●
SCD 061-024-080 AP3	6.10	8.00	24.0	34.0	79.0	-	●
SCD 062-024-080 AP3	6.20	8.00	24.0	34.0	79.0	-	●
SCD 063-024-080 AP3	6.30	8.00	24.0	34.0	79.0	-	●
SCD 064-024-080 AP3	6.40	8.00	24.0	34.0	79.0	-	●
SCD 065-024-080 AP3	6.50	8.00	24.0	34.0	79.0	-	●
SCD 066-024-080 AP3	6.60	8.00	24.0	34.0	79.0	-	●
SCD 067-024-080 AP3	6.70	8.00	24.0	34.0	79.0	-	●
SCD 068-024-080 AP3	6.80	8.00	24.0	34.0	79.0	M8	●
SCD 069-024-080 AP3	6.90	8.00	24.0	34.0	79.0	-	●
SCD 070-024-080 AP3	7.00	8.00	24.0	34.0	79.0	-	●
SCD 071-029-080 AP3	7.10	8.00	29.0	41.0	79.0	-	●
SCD 072-029-080 AP3	7.20	8.00	29.0	41.0	79.0	-	●
SCD 073-029-080 AP3	7.30	8.00	29.0	41.0	79.0	-	●
SCD 074-029-080 AP3	7.40	8.00	29.0	41.0	79.0	-	●
SCD 075-029-080 AP3	7.50	8.00	29.0	41.0	79.0	-	●
SCD 076-029-080 AP3	7.60	8.00	29.0	41.0	79.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions,see pages C45.

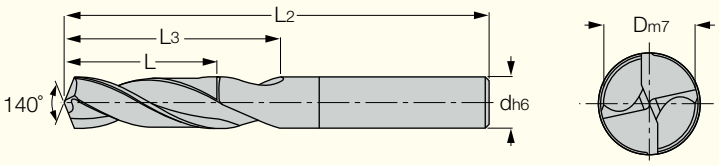
(1) Used for standard thread size.

SCD-AP3 (3xD) (continued)

Solid Carbide Drills without Coolant Holes, Drilling Depth 3xD, DIN 6537



D	Tolerance m7
3.00- 6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



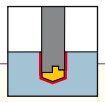
Designation	Dimensions D	d	L	L_3	L_2	T_h[1]	IC908
SCD 077-029-080 AP3	7.70	8.00	29.0	41.0	79.0	-	●
SCD 078-029-080 AP3	7.80	8.00	29.0	41.0	79.0	M9	●
SCD 079-029-080 AP3	7.90	8.00	29.0	41.0	79.0	-	●
SCD 080-029-080 AP3	8.00	8.00	29.0	41.0	79.0	-	●
SCD 081-035-100 AP3	8.10	10.00	35.0	47.0	89.0	-	●
SCD 082-035-100 AP3	8.20	10.00	35.0	47.0	89.0	-	●
SCD 083-035-100 AP3	8.30	10.00	35.0	47.0	89.0	-	●
SCD 084-035-100 AP3	8.40	10.00	35.0	47.0	89.0	-	●
SCD 085-035-100 AP3	8.50	10.00	35.0	47.0	89.0	M10	●
SCD 086-035-100 AP3	8.60	10.00	35.0	47.0	89.0	-	●
SCD 087-035-100 AP3	8.70	10.00	35.0	47.0	89.0	-	●
SCD 088-035-100 AP3	8.80	10.00	35.0	47.0	89.0	-	●
SCD 089-035-100 AP3	8.90	10.00	35.0	47.0	89.0	-	●
SCD 090-035-100 AP3	9.00	10.00	35.0	47.0	89.0	-	●
SCD 091-035-100 AP3	9.10	10.00	35.0	47.0	89.0	-	●
SCD 092-035-100 AP3	9.20	10.00	35.0	47.0	89.0	-	●
SCD 093-035-100 AP3	9.30	10.00	35.0	47.0	89.0	-	●
SCD 094-035-100 AP3	9.40	10.00	35.0	47.0	89.0	-	●
SCD 095-035-100 AP3	9.50	10.00	35.0	47.0	89.0	M11	●
SCD 096-035-100 AP3	9.60	10.00	35.0	47.0	89.0	-	●
SCD 097-035-100 AP3	9.70	10.00	35.0	47.0	89.0	-	●
SCD 098-035-100 AP3	9.80	10.00	35.0	47.0	89.0	-	●
SCD 099-035-100 AP3	9.90	10.00	35.0	47.0	89.0	-	●
SCD 100-035-100 AP3	10.00	10.00	35.0	47.0	89.0	-	●
SCD 101-040-120 AP3	10.10	12.00	40.0	55.0	102.0	-	●
SCD 102-040-120 AP3	10.20	12.00	40.0	55.0	102.0	M12	●
SCD 103-040-120 AP3	10.30	12.00	40.0	55.0	102.0	-	●
SCD 104-040-120 AP3	10.40	12.00	40.0	55.0	102.0	-	●
SCD 105-040-120 AP3	10.50	12.00	40.0	55.0	102.0	-	●
SCD 106-040-120 AP3	10.60	12.00	40.0	55.0	102.0	-	●
SCD 107-040-120 AP3	10.70	12.00	40.0	55.0	102.0	-	●
SCD 108-040-120 AP3	10.80	12.00	40.0	55.0	102.0	-	●
SCD 109-040-120 AP3	10.90	12.00	40.0	55.0	102.0	-	●
SCD 110-040-120 AP3	11.00	12.00	40.0	55.0	102.0	-	●
SCD 111-040-120 AP3	11.10	12.00	40.0	55.0	102.0	-	●
SCD 112-040-120 AP3	11.20	12.00	40.0	55.0	102.0	-	●
SCD 113-040-120 AP3	11.30	12.00	40.0	55.0	102.0	-	●
SCD 114-040-120 AP3	11.40	12.00	40.0	55.0	102.0	-	●
SCD 115-040-120 AP3	11.50	12.00	40.0	55.0	102.0	-	●
SCD 116-040-120 AP3	11.60	12.00	40.0	55.0	102.0	-	●
SCD 117-040-120 AP3	11.70	12.00	40.0	55.0	102.0	-	●
SCD 118-040-120 AP3	11.80	12.00	40.0	55.0	102.0	-	●
SCD 119-040-120 AP3	11.90	12.00	40.0	55.0	102.0	-	●
SCD 120-040-120 AP3	12.00	12.00	40.0	55.0	102.0	M14	●
SCD 121-043-140 AP3	12.10	14.00	43.0	60.0	107.0	-	●
SCD 122-043-140 AP3	12.20	14.00	43.0	60.0	107.0	-	●
SCD 123-043-140 AP3	12.30	14.00	43.0	60.0	107.0	-	●
SCD 124-043-140 AP3	12.40	14.00	43.0	60.0	107.0	-	●
SCD 125-043-140 AP3	12.50	14.00	43.0	60.0	107.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions,see pages C45.

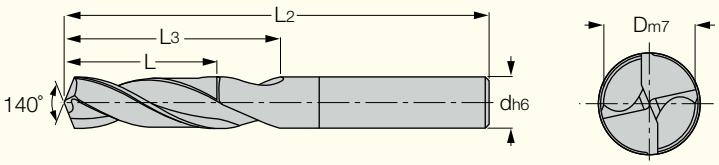
[1] Used for standard thread size.

SCD-AP3 (3xD) (continued)

Solid Carbide Drills without Coolant Holes, Drilling Depth 3xD, DIN 6537



D	Tolerance m7
3.00- 6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



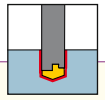
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 126-043-140 AP3	12.60	14.00	43.0	60.0	107.0	-	●
SCD 127-043-140 AP3	12.70	14.00	43.0	60.0	107.0	-	●
SCD 128-043-140 AP3	12.80	14.00	43.0	60.0	107.0	-	●
SCD 129-043-140 AP3	12.90	14.00	43.0	60.0	107.0	-	●
SCD 130-043-140 AP3	13.00	14.00	43.0	60.0	107.0	-	●
SCD 131-043-140 AP3	13.10	14.00	43.0	60.0	107.0	-	●
SCD 132-043-140 AP3	13.20	14.00	43.0	60.0	107.0	-	●
SCD 133-043-140 AP3	13.30	14.00	43.0	60.0	107.0	-	●
SCD 134-043-140 AP3	13.40	14.00	43.0	60.0	107.0	-	●
SCD 135-043-140 AP3	13.50	14.00	43.0	60.0	107.0	-	●
SCD 136-043-140 AP3	13.60	14.00	43.0	60.0	107.0	-	●
SCD 137-043-140 AP3	13.70	14.00	43.0	60.0	107.0	-	●
SCD 138-043-140 AP3	13.80	14.00	43.0	60.0	107.0	-	●
SCD 139-043-140 AP3	13.90	14.00	43.0	60.0	107.0	-	●
SCD 140-043-140 AP3	14.00	14.00	43.0	60.0	107.0	M16	●
SCD 141-045-160 AP3	14.10	16.00	45.0	65.0	115.0	-	●
SCD 142-045-160 AP3	14.20	16.00	45.0	65.0	115.0	-	●
SCD 143-045-160 AP3	14.30	16.00	45.0	65.0	115.0	-	●
SCD 144-045-160 AP3	14.40	16.00	45.0	65.0	115.0	-	●
SCD 145-045-160 AP3	14.50	16.00	45.0	65.0	115.0	-	●
SCD 146-045-160 AP3	14.60	16.00	45.0	65.0	115.0	-	●
SCD 147-045-160 AP3	14.70	16.00	45.0	65.0	115.0	-	●
SCD 148-045-160 AP3	14.80	16.00	45.0	65.0	115.0	-	●
SCD 149-045-160 AP3	14.90	16.00	45.0	65.0	115.0	-	●
SCD 150-045-160 AP3	15.00	16.00	45.0	65.0	115.0	-	●
SCD 151-045-160 AP3	15.10	16.00	45.0	65.0	115.0	-	●
SCD 152-045-160 AP3	15.20	16.00	45.0	65.0	115.0	-	●
SCD 153-045-160 AP3	15.30	16.00	45.0	65.0	115.0	-	●
SCD 154-045-160 AP3	15.40	16.00	45.0	65.0	115.0	-	●
SCD 155-045-160 AP3	15.50	16.00	45.0	65.0	115.0	M18	●
SCD 156-045-160 AP3	15.60	16.00	45.0	65.0	115.0	-	●
SCD 157-045-160 AP3	15.70	16.00	45.0	65.0	115.0	-	●
SCD 158-045-160 AP3	15.80	16.00	45.0	65.0	115.0	-	●
SCD 159-045-160 AP3	15.90	16.00	45.0	65.0	115.0	-	●
SCD 160-045-160 AP3	16.00	16.00	45.0	65.0	115.0	-	●
SCD 161-051-180 AP3	16.10	18.00	51.0	73.0	123.0	-	●
SCD 162-051-180 AP3	16.20	18.00	51.0	73.0	123.0	-	●
SCD 163-051-180 AP3	16.30	18.00	51.0	73.0	123.0	-	●
SCD 164-051-180 AP3	16.40	18.00	51.0	73.0	123.0	-	●
SCD 165-051-180 AP3	16.50	18.00	51.0	73.0	123.0	-	●
SCD 166-051-180 AP3	16.60	18.00	51.0	73.0	123.0	-	●
SCD 167-051-180 AP3	16.70	18.00	51.0	73.0	123.0	-	●
SCD 168-051-180 AP3	16.80	18.00	51.0	73.0	123.0	-	●
SCD 169-051-180 AP3	16.90	18.00	51.0	73.0	123.0	-	●
SCD 170-051-180 AP3	17.00	18.00	51.0	73.0	123.0	-	●
SCD 171-051-180 AP3	17.10	18.00	51.0	73.0	123.0	-	●
SCD 172-051-180 AP3	17.20	18.00	51.0	73.0	123.0	-	●
SCD 173-051-180 AP3	17.30	18.00	51.0	73.0	123.0	-	●
SCD 174-051-180 AP3	17.40	18.00	51.0	73.0	123.0	-	●
SCD 175-051-180 AP3	17.50	18.00	51.0	73.0	123.0	M20	●
SCD 176-051-180 AP3	17.60	18.00	51.0	73.0	123.0	-	●
SCD 177-051-180 AP3	17.70	18.00	51.0	73.0	123.0	-	●
SCD 178-051-180 AP3	17.80	18.00	51.0	73.0	123.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions,see pages C45.

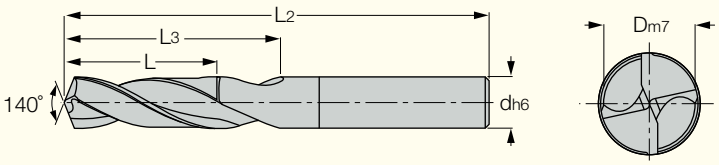
(1) Used for standard thread size.

SCD-AP3 (3xD) (continued)

Solid Carbide Drills without Coolant Holes, Drilling Depth 3xD, DIN 6537



D	Tolerance m7
3.00- 6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



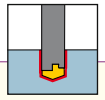
Designation	Dimensions D	d	L	L_3	L_2	T_h[1]	IC908
SCD 179-051-180 AP3	17.90	18.00	51.0	73.0	123.0	-	●
SCD 180-051-180 AP3	18.00	18.00	51.0	73.0	123.0	-	●
SCD 181-055-200 AP3	18.10	20.00	55.0	79.0	131.0	-	●
SCD 182-055-200 AP3	18.20	20.00	55.0	79.0	131.0	-	●
SCD 183-055-200 AP3	18.30	20.00	55.0	79.0	131.0	-	●
SCD 184-055-200 AP3	18.40	20.00	55.0	79.0	131.0	-	●
SCD 185-055-200 AP3	18.50	20.00	55.0	79.0	131.0	-	●
SCD 186-055-200 AP3	18.60	20.00	55.0	79.0	131.0	-	●
SCD 187-055-200 AP3	18.70	20.00	55.0	79.0	131.0	-	●
SCD 188-055-200 AP3	18.80	20.00	55.0	79.0	131.0	-	●
SCD 189-055-200 AP3	18.90	20.00	55.0	79.0	131.0	-	●
SCD 190-055-200 AP3	19.00	20.00	55.0	79.0	131.0	-	●
SCD 191-055-200 AP3	19.10	20.00	55.0	79.0	131.0	-	●
SCD 192-055-200 AP3	19.20	20.00	55.0	79.0	131.0	-	●
SCD 193-055-200 AP3	19.30	20.00	55.0	79.0	131.0	-	●
SCD 194-055-200 AP3	19.40	20.00	55.0	79.0	131.0	-	●
SCD 195-055-200 AP3	19.50	20.00	55.0	79.0	131.0	M22	●
SCD 196-055-200 AP3	19.60	20.00	55.0	79.0	131.0	-	●
SCD 197-055-200 AP3	19.70	20.00	55.0	79.0	131.0	-	●
SCD 198-055-200 AP3	19.80	20.00	55.0	79.0	131.0	-	●
SCD 199-055-200 AP3	19.90	20.00	55.0	79.0	131.0	-	●
SCD 200-055-200 AP3	20.00	20.00	55.0	79.0	131.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

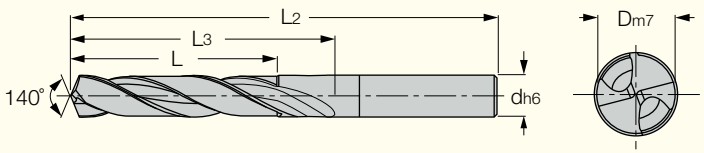
[1] Used for standard thread size.

SCD-AG5 (5xD)

Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD, DIN 6537



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



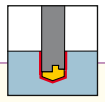
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 030-023-060 AG5	3.00	6.00	23.0	28.0	66.0	M3	●
SCD 031-023-060 AG5	3.10	6.00	23.0	28.0	66.0	-	●
SCD 032-023-060 AG5	3.20	6.00	23.0	28.0	66.0	-	●
SCD 033-023-060 AG5	3.30	6.00	23.0	28.0	66.0	-	●
SCD 034-023-060 AG5	3.40	6.00	23.0	28.0	66.0	M4	●
SCD 035-023-060 AG5	3.50	6.00	23.0	28.0	66.0	-	●
SCD 036-023-060 AG5	3.60	6.00	23.0	28.0	66.0	-	●
SCD 037-023-060 AG5	3.70	6.00	23.0	28.0	66.0	-	●
SCD 038-029-060 AG5	3.80	6.00	29.0	36.0	74.0	-	●
SCD 039-029-060 AG5	3.90	6.00	29.0	36.0	74.0	-	●
SCD 040-029-060 AG5	4.00	6.00	29.0	36.0	74.0	-	●
SCD 041-029-060 AG5	4.10	6.00	29.0	36.0	74.0	-	●
SCD 042-029-060 AG5	4.20	6.00	29.0	36.0	74.0	-	●
SCD 043-029-060 AG5	4.30	6.00	29.0	36.0	74.0	M5	●
SCD 044-029-060 AG5	4.40	6.00	29.0	36.0	74.0	-	●
SCD 045-029-060 AG5	4.50	6.00	29.0	36.0	74.0	-	●
SCD 046-029-060 AG5	4.60	6.00	29.0	36.0	74.0	-	●
SCD 047-029-060 AG5	4.70	6.00	29.0	36.0	74.0	-	●
SCD 048-035-060 AG5	4.80	6.00	35.0	44.0	74.0	-	●
SCD 049-035-060 AG5	4.90	6.00	35.0	44.0	82.0	-	●
SCD 050-035-060 AG5	5.00	6.00	35.0	44.0	82.0	-	●
SCD 051-035-060 AG5	5.10	6.00	35.0	44.0	82.0	M6	●
SCD 052-035-060 AG5	5.20	6.00	35.0	44.0	82.0	-	●
SCD 053-035-060 AG5	5.30	6.00	35.0	44.0	82.0	-	●
SCD 054-035-060 AG5	5.40	6.00	35.0	44.0	82.0	-	●
SCD 055-035-060 AG5	5.50	6.00	35.0	44.0	82.0	-	●
SCD 056-035-060 AG5	5.60	6.00	35.0	44.0	82.0	-	●
SCD 057-035-060 AG5	5.70	6.00	35.0	44.0	82.0	-	●
SCD 058-035-060 AG5	5.80	6.00	35.0	44.0	82.0	-	●
SCD 059-035-060 AG5	5.90	6.00	35.0	44.0	82.0	-	●
SCD 060-035-060 AG5	6.00	6.00	35.0	44.0	82.0	M7	●
SCD 061-043-080 AG5	6.10	8.00	43.0	53.0	91.0	-	●
SCD 062-043-080 AG5	6.20	8.00	43.0	53.0	91.0	-	●
SCD 063-043-080 AG5	6.30	8.00	43.0	53.0	91.0	-	●
SCD 064-043-080 AG5	6.40	8.00	43.0	53.0	91.0	-	●
SCD 065-043-080 AG5	6.50	8.00	43.0	53.0	91.0	-	●
SCD 066-043-080 AG5	6.60	8.00	43.0	53.0	91.0	-	●
SCD 067-043-080 AG5	6.70	8.00	43.0	53.0	91.0	-	●
SCD 068-043-080 AG5	6.80	8.00	43.0	53.0	91.0	-	●
SCD 069-043-080 AG5	6.90	8.00	43.0	53.0	91.0	-	●
SCD 070-043-080 AG5	7.00	8.00	43.0	53.0	91.0	-	●
SCD 071-043-080 AG5	7.10	8.00	43.0	53.0	91.0	-	●
SCD 072-043-080 AG5	7.20	8.00	43.0	53.0	91.0	-	●
SCD 073-043-080 AG5	7.30	8.00	43.0	53.0	91.0	-	●
SCD 074-043-080 AG5	7.40	8.00	43.0	53.0	91.0	-	●
SCD 075-043-080 AG5	7.50	8.00	43.0	53.0	91.0	-	●
SCD 076-043-080 AG5	7.60	8.00	43.0	53.0	91.0	-	●
SCD 077-043-080 AG5	7.70	8.00	43.0	53.0	91.0	-	●
SCD 078-043-080 AG5	7.80	8.00	43.0	53.0	91.0	M9	●
SCD 079-043-080 AG5	7.90	8.00	43.0	53.0	91.0	-	●
SCD 080-043-080 AG5	8.00	8.00	43.0	53.0	91.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see pages C46.

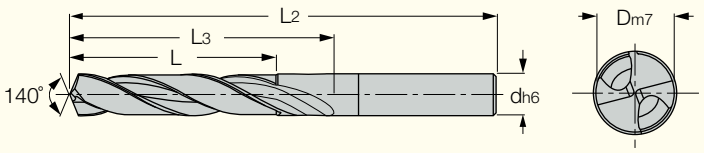
(1) Used for standard thread size.

SCD-AG5 (5xD) (continued)

Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD, DIN 6537



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



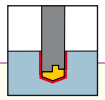
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 081-049-100 AG5	8.10	10.00	49.0	61.0	103.0	-	●
SCD 082-049-100 AG5	8.20	10.00	49.0	61.0	103.0	-	●
SCD 083-049-100 AG5	8.30	10.00	49.0	61.0	103.0	-	●
SCD 084-049-100 AG5	8.40	10.00	49.0	61.0	103.0	-	●
SCD 085-049-100 AG5	8.50	10.00	49.0	61.0	103.0	M10	●
SCD 086-049-100 AG5	8.60	10.00	49.0	61.0	103.0	-	●
SCD 087-049-100 AG5	8.70	10.00	49.0	61.0	103.0	-	●
SCD 088-049-100 AG5	8.80	10.00	49.0	61.0	103.0	-	●
SCD 089-049-100 AG5	8.90	10.00	49.0	61.0	103.0	-	●
SCD 090-049-100 AG5	9.00	10.00	49.0	61.0	103.0	-	●
SCD 091-049-100 AG5	9.10	10.00	49.0	61.0	103.0	-	●
SCD 092-049-100 AG5	9.20	10.00	49.0	61.0	103.0	-	●
SCD 093-049-100 AG5	9.30	10.00	49.0	61.0	103.0	-	●
SCD 094-049-100 AG5	9.40	10.00	49.0	61.0	103.0	-	●
SCD 095-049-100 AG5	9.50	10.00	49.0	61.0	103.0	M11	●
SCD 096-049-100 AG5	9.60	10.00	49.0	61.0	103.0	-	●
SCD 097-049-100 AG5	9.70	10.00	49.0	61.0	103.0	-	●
SCD 098-049-100 AG5	9.80	10.00	49.0	61.0	103.0	-	●
SCD 099-049-100 AG5	9.90	10.00	49.0	61.0	103.0	-	●
SCD 100-049-100 AG5	10.00	10.00	49.0	61.0	103.0	-	●
SCD 101-056-120 AG5	10.10	12.00	56.0	71.0	118.0	-	●
SCD 103-056-120 AG5	10.30	12.00	56.0	71.0	118.0	-	●
SCD 104-056-120 AG5	10.40	12.00	56.0	71.0	118.0	-	●
SCD 105-056-120 AG5	10.50	12.00	56.0	71.0	118.0	-	●
SCD 106-056-120 AG5	10.60	12.00	56.0	71.0	118.0	-	●
SCD 107-056-120 AG5	10.70	12.00	56.0	71.0	118.0	-	●
SCD 108-056-120 AG5	10.80	12.00	56.0	71.0	118.0	-	●
SCD 109-056-120 AG5	10.90	12.00	56.0	71.0	118.0	-	●
SCD 110-056-120 AG5	11.00	12.00	56.0	71.0	118.0	-	●
SCD 111-056-120 AG5	11.10	12.00	56.0	71.0	118.0	-	●
SCD 112-056-120 AG5	11.20	12.00	56.0	71.0	118.0	-	●
SCD 113-056-120 AG5	11.30	12.00	56.0	71.0	118.0	-	●
SCD 114-056-120 AG5	11.40	12.00	56.0	71.0	118.0	-	●
SCD 115-056-120 AG5	11.50	12.00	56.0	71.0	118.0	-	●
SCD 116-056-120 AG5	11.60	12.00	56.0	71.0	118.0	-	●
SCD 117-056-120 AG5	11.70	12.00	56.0	71.0	118.0	-	●
SCD 118-056-120 AG5	11.80	12.00	56.0	71.0	118.0	-	●
SCD 119-056-120 AG5	11.90	12.00	56.0	71.0	118.0	-	●
SCD 120-056-120 AG5	12.00	12.00	56.0	71.0	118.0	M14	●
SCD 121-060-140 AG5	12.10	14.00	60.0	77.0	124.0	-	●
SCD 122-060-140 AG5	12.20	14.00	60.0	77.0	124.0	-	●
SCD 123-060-140 AG5	12.30	14.00	60.0	77.0	124.0	-	●
SCD 124-060-140 AG5	12.40	14.00	60.0	77.0	124.0	-	●
SCD 125-060-140 AG5	12.50	14.00	60.0	77.0	124.0	-	●
SCD 126-060-140 AG5	12.60	14.00	60.0	77.0	124.0	-	●
SCD 127-060-140 AG5	12.70	14.00	60.0	77.0	124.0	-	●
SCD 128-060-140 AG5	12.80	14.00	60.0	77.0	124.0	-	●
SCD 129-060-140 AG5	12.90	14.00	60.0	77.0	124.0	-	●
SCD 130-060-140 AG5	13.00	14.00	60.0	77.0	124.0	-	●
SCD 131-060-140 AG5	13.10	14.00	60.0	77.0	124.0	-	●
SCD 132-060-140 AG5	13.20	14.00	60.0	77.0	124.0	-	●
SCD 133-060-140 AG5	13.30	14.00	60.0	77.0	124.0	-	●
SCD 134-060-140 AG5	13.40	14.00	60.0	77.0	124.0	-	●
SCD 135-060-140 AG5	13.50	14.00	60.0	77.0	124.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C46

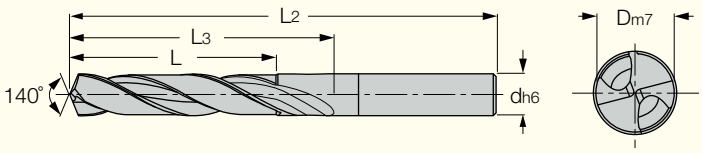
(1) Used for standard thread size.

SCD-AG5 (5xD) (continued)

Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD, DIN 6537



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



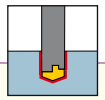
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 136-060-140 AG5	13.60	14.00	60.0	77.0	124.0	-	●
SCD 137-060-140 AG5	13.70	14.00	60.0	77.0	124.0	-	●
SCD 138-060-140 AG5	13.80	14.00	60.0	77.0	124.0	-	●
SCD 139-060-140 AG5	13.90	14.00	60.0	77.0	124.0	-	●
SCD 140-060-140 AG5	14.00	14.00	60.0	77.0	124.0	M16	●
SCD 141-063-160 AG5	14.10	16.00	63.0	83.0	133.0	-	●
SCD 142-063-160 AG5	14.20	16.00	63.0	83.0	133.0	-	●
SCD 143-063-160 AG5	14.30	16.00	63.0	83.0	133.0	-	●
SCD 144-063-160 AG5	14.40	16.00	63.0	83.0	133.0	-	●
SCD 145-063-160 AG5	14.50	16.00	63.0	83.0	133.0	-	●
SCD 146-063-160 AG5	14.60	16.00	63.0	83.0	133.0	-	●
SCD 147-063-160 AG5	14.70	16.00	63.0	83.0	133.0	-	●
SCD 148-063-160 AG5	14.80	16.00	63.0	83.0	133.0	-	●
SCD 149-063-160 AG5	14.90	16.00	63.0	83.0	133.0	-	●
SCD 150-063-160 AG5	15.00	16.00	63.0	83.0	133.0	-	●
SCD 151-063-160 AG5	15.10	16.00	63.0	83.0	133.0	-	●
SCD 152-063-160 AG5	15.20	16.00	63.0	83.0	133.0	-	●
SCD 153-063-160 AG5	15.30	16.00	63.0	83.0	133.0	-	●
SCD 154-063-160 AG5	15.40	16.00	63.0	83.0	133.0	-	●
SCD 155-063-160 AG5	15.50	16.00	63.0	83.0	133.0	M18	●
SCD 156-063-160 AG5	15.60	16.00	63.0	83.0	133.0	-	●
SCD 157-063-160 AG5	15.70	16.00	63.0	83.0	133.0	-	●
SCD 158-063-160 AG5	15.80	16.00	63.0	83.0	133.0	-	●
SCD 159-063-160 AG5	15.90	16.00	63.0	83.0	133.0	-	●
SCD 160-063-160 AG5	16.00	16.00	63.0	83.0	133.0	-	●
SCD 161-071-180 AG5	16.10	18.00	71.0	93.0	143.0	-	●
SCD 162-071-180 AG5	16.20	18.00	71.0	93.0	143.0	-	●
SCD 163-071-180 AG5	16.30	18.00	71.0	93.0	143.0	-	●
SCD 164-071-180 AG5	16.40	18.00	71.0	93.0	143.0	-	●
SCD 165-071-180 AG5	16.50	18.00	71.0	93.0	143.0	-	●
SCD 166-071-180 AG5	16.60	18.00	71.0	93.0	143.0	-	●
SCD 167-071-180 AG5	16.70	18.00	71.0	93.0	143.0	-	●
SCD 168-071-180 AG5	16.80	18.00	71.0	93.0	143.0	-	●
SCD 169-071-180 AG5	16.90	18.00	71.0	93.0	143.0	-	●
SCD 170-071-180 AG5	17.00	18.00	71.0	93.0	143.0	-	●
SCD 171-071-180 AG5	17.10	18.00	71.0	93.0	143.0	-	●
SCD 172-071-180 AG5	17.20	18.00	71.0	93.0	143.0	-	●
SCD 173-071-180 AG5	17.30	18.00	71.0	93.0	143.0	-	●
SCD 174-071-180 AG5	17.40	18.00	71.0	93.0	143.0	-	●
SCD 175-071-180 AG5	17.50	18.00	71.0	93.0	143.0	M20	●
SCD 176-071-180 AG5	17.60	18.00	71.0	93.0	143.0	-	●
SCD 177-071-180 AG5	17.70	18.00	71.0	93.0	143.0	-	●
SCD 178-071-180 AG5	17.80	18.00	71.0	93.0	143.0	-	●
SCD 179-071-180 AG5	17.90	18.00	71.0	93.0	143.0	-	●
SCD 180-071-180 AG5	18.00	18.00	71.0	93.0	143.0	-	●
SCD 181-077-200 AG5	18.10	20.00	77.0	101.0	153.0	-	●
SCD 182-077-200 AG5	18.20	20.00	77.0	101.0	153.0	-	●
SCD 183-077-200 AG5	18.30	20.00	77.0	101.0	153.0	-	●
SCD 184-077-200 AG5	18.40	20.00	77.0	101.0	153.0	-	●
SCD 185-077-200 AG5	18.50	20.00	77.0	101.0	153.0	-	●
SCD 186-077-200 AG5	18.60	20.00	77.0	101.0	153.0	-	●
SCD 187-077-200 AG5	18.70	20.00	77.0	101.0	153.0	-	●
SCD 188-077-200 AG5	18.80	20.00	77.0	101.0	153.0	-	●
SCD 189-077-200 AG5	18.90	20.00	77.0	101.0	153.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see pages C46.

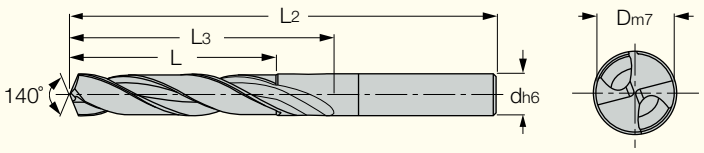
(1) Used for standard thread size.

SCD-AG5 (5xD) (continued)

Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD, DIN 6537



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



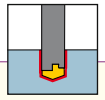
Designation	Dimensions D	d	L	L_3	L_2	T_h[1]	IC908
SCD 190-077-200 AG5	19.00	20.00	77.0	101.0	153.0	-	●
SCD 191-077-200 AG5	19.10	20.00	77.0	101.0	153.0	-	●
SCD 192-077-200 AG5	19.20	20.00	77.0	101.0	153.0	-	●
SCD 193-077-200 AG5	19.30	20.00	77.0	101.0	153.0	-	●
SCD 194-077-200 AG5	19.40	20.00	77.0	101.0	153.0	-	●
SCD 195-077-200 AG5	19.50	20.00	77.0	101.0	153.0	M22	●
SCD 196-077-200 AG5	19.60	20.00	77.0	101.0	153.0	-	●
SCD 197-077-200 AG5	19.70	20.00	77.0	101.0	153.0	-	●
SCD 198-077-200 AG5	19.80	20.00	77.0	101.0	153.0	-	●
SCD 199-077-200 AG5	19.90	20.00	77.0	101.0	153.0	-	●
SCD 200-077-200 AG5	20.00	20.00	77.0	101.0	153.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C46

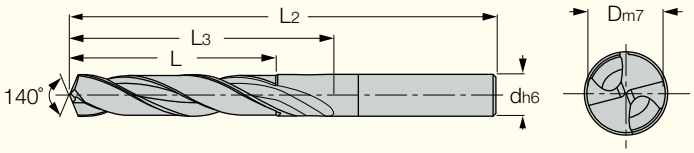
[1] Used for standard thread size.

SCD-AP5 (5xD)

Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



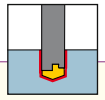
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 030-023-060 AP5	3.00	6.00	23.0	28.0	66.0	-	●
SCD 031-023-060 AP5	3.10	6.00	23.0	28.0	66.0	-	●
SCD 032-023-060 AP5	3.20	6.00	23.0	28.0	66.0	-	●
SCD 033-023-060 AP5	3.30	6.00	23.0	28.0	66.0	M4	●
SCD 034-023-060 AP5	3.40	6.00	23.0	28.0	66.0	-	●
SCD 035-023-060 AP5	3.50	6.00	23.0	28.0	66.0	-	●
SCD 036-023-060 AP5	3.60	6.00	23.0	28.0	66.0	-	●
SCD 037-023-060 AP5	3.70	6.00	23.0	28.0	66.0	-	●
SCD 038-029-060 AP5	3.80	6.00	29.0	36.0	74.0	-	●
SCD 039-029-060 AP5	3.90	6.00	29.0	36.0	74.0	-	●
SCD 040-029-060 AP5	4.00	6.00	29.0	36.0	74.0	-	●
SCD 041-029-060 AP5	4.10	6.00	29.0	36.0	74.0	-	●
SCD 042-029-060 AP5	4.20	6.00	29.0	36.0	74.0	M4	●
SCD 043-029-060 AP5	4.30	6.00	29.0	36.0	74.0	-	●
SCD 044-029-060 AP5	4.40	6.00	29.0	36.0	74.0	-	●
SCD 045-029-060 AP5	4.50	6.00	29.0	36.0	74.0	-	●
SCD 046-029-060 AP5	4.60	6.00	29.0	36.0	74.0	-	●
SCD 047-029-060 AP5	4.70	6.00	29.0	36.0	74.0	-	●
SCD 048-035-060 AP5	4.80	6.00	35.0	44.0	74.0	-	●
SCD 049-035-060 AP5	4.90	6.00	35.0	44.0	82.0	-	●
SCD 050-035-060 AP5	5.00	6.00	35.0	44.0	82.0	M6	●
SCD 051-035-060 AP5	5.10	6.00	35.0	44.0	82.0	-	●
SCD 052-035-060 AP5	5.20	6.00	35.0	44.0	82.0	-	●
SCD 053-035-060 AP5	5.30	6.00	35.0	44.0	82.0	-	●
SCD 054-035-060 AP5	5.40	6.00	35.0	44.0	82.0	-	●
SCD 055-035-060 AP5	5.50	6.00	35.0	44.0	82.0	-	●
SCD 056-035-060 AP5	5.60	6.00	35.0	44.0	82.0	-	●
SCD 057-035-060 AP5	5.70	6.00	35.0	44.0	82.0	-	●
SCD 058-035-060 AP5	5.80	6.00	35.0	44.0	82.0	-	●
SCD 059-035-060 AP5	5.90	6.00	35.0	44.0	82.0	-	●
SCD 060-035-060 AP5	6.00	6.00	35.0	44.0	82.0	M7	●
SCD 061-043-080 AP5	6.10	8.00	43.0	53.0	91.0	-	●
SCD 062-043-080 AP5	6.20	8.00	43.0	53.0	91.0	-	●
SCD 063-043-080 AP5	6.30	8.00	43.0	53.0	91.0	-	●
SCD 064-043-080 AP5	6.40	8.00	43.0	53.0	91.0	-	●
SCD 065-043-080 AP5	6.50	8.00	43.0	53.0	91.0	-	●
SCD 066-043-080 AP5	6.60	8.00	43.0	53.0	91.0	-	●
SCD 067-043-080 AP5	6.70	8.00	43.0	53.0	91.0	-	●
SCD 068-043-080 AP5	6.80	8.00	43.0	53.0	91.0	-	●
SCD 069-043-080 AP5	6.90	8.00	43.0	53.0	91.0	-	●
SCD 070-043-080 AP5	7.00	8.00	43.0	53.0	91.0	-	●
SCD 071-043-080 AP5	7.10	8.00	43.0	53.0	91.0	-	●
SCD 072-043-080 AP5	7.20	8.00	43.0	53.0	91.0	-	●
SCD 073-043-080 AP5	7.30	8.00	43.0	53.0	91.0	-	●
SCD 074-043-080 AP5	7.40	8.00	43.0	53.0	91.0	-	●
SCD 075-043-080 AP5	7.50	8.00	43.0	53.0	91.0	-	●
SCD 076-043-080 AP5	7.60	8.00	43.0	53.0	91.0	-	●
SCD 077-043-080 AP5	7.70	8.00	43.0	53.0	91.0	-	●
SCD 078-043-080 AP5	7.80	8.00	43.0	53.0	91.0	M9	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

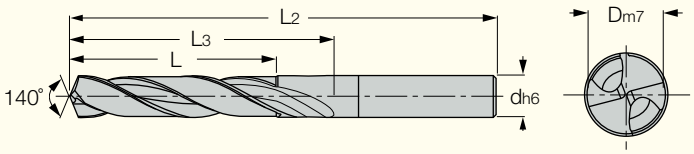
(1) Used for standard thread size

SCD-AP5 (5xD) (continued)

Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



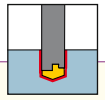
Designation	Dimensions D	d	L	L_3	L_2	T_h[1]	IC908
SCD 079-043-080 AP5	7.90	8.00	43.0	53.0	91.0	-	●
SCD 080-043-080 AP5	8.00	8.00	43.0	53.0	91.0	-	●
SCD 081-049-100 AP5	8.10	10.00	49.0	61.0	103.0	-	●
SCD 082-049-100 AP5	8.20	10.00	49.0	61.0	103.0	-	●
SCD 083-049-100 AP5	8.30	10.00	49.0	61.0	103.0	-	●
SCD 084-049-100 AP5	8.40	10.00	49.0	61.0	103.0	-	●
SCD 085-049-100 AP5	8.50	10.00	49.0	61.0	103.0	M10	●
SCD 086-049-100 AP5	8.60	10.00	49.0	61.0	103.0	-	●
SCD 087-049-100 AP5	8.70	10.00	49.0	61.0	103.0	-	●
SCD 088-049-100 AP5	8.80	10.00	49.0	61.0	103.0	-	●
SCD 089-049-100 AP5	8.90	10.00	49.0	61.0	103.0	-	●
SCD 090-049-100 AP5	9.00	10.00	49.0	61.0	103.0	-	●
SCD 091-049-100 AP5	9.10	10.00	49.0	61.0	103.0	-	●
SCD 092-049-100 AP5	9.20	10.00	49.0	61.0	103.0	-	●
SCD 093-049-100 AP5	9.30	10.00	49.0	61.0	103.0	-	●
SCD 094-049-100 AP5	9.40	10.00	49.0	61.0	103.0	-	●
SCD 095-049-100 AP5	9.50	10.00	49.0	61.0	103.0	M11	●
SCD 096-049-100 AP5	9.60	10.00	49.0	61.0	103.0	-	●
SCD 097-049-100 AP5	9.70	10.00	49.0	61.0	103.0	-	●
SCD 098-049-100 AP5	9.80	10.00	49.0	61.0	103.0	-	●
SCD 099-049-100 AP5	9.90	10.00	49.0	61.0	103.0	-	●
SCD 100-049-100 AP5	10.00	10.00	49.0	61.0	103.0	-	●
SCD 101-056-120 AP5	10.10	12.00	56.0	71.0	118.0	-	●
SCD 102-056-120 AP5	10.20	12.00	56.0	71.0	118.0	M12	●
SCD 103-056-120 AP5	10.30	12.00	56.0	71.0	118.0	-	●
SCD 104-056-120 AP5	10.40	12.00	56.0	71.0	118.0	-	●
SCD 105-056-120 AP5	10.50	12.00	56.0	71.0	118.0	-	●
SCD 106-056-120 AP5	10.60	12.00	56.0	71.0	118.0	-	●
SCD 107-056-120 AP5	10.70	12.00	56.0	71.0	118.0	-	●
SCD 108-056-120 AP5	10.80	12.00	56.0	71.0	118.0	-	●
SCD 109-056-120 AP5	10.90	12.00	56.0	71.0	118.0	-	●
SCD 110-056-120 AP5	11.00	12.00	56.0	71.0	118.0	-	●
SCD 111-056-120 AP5	11.10	12.00	56.0	71.0	118.0	-	●
SCD 112-056-120 AP5	11.20	12.00	56.0	71.0	118.0	-	●
SCD 113-056-120 AP5	11.30	12.00	56.0	71.0	118.0	-	●
SCD 114-056-120 AP5	11.40	12.00	56.0	71.0	118.0	-	●
SCD 115-056-120 AP5	11.50	12.00	56.0	71.0	118.0	-	●
SCD 116-056-120 AP5	11.60	12.00	56.0	71.0	118.0	-	●
SCD 117-056-120 AP5	11.70	12.00	56.0	71.0	118.0	-	●
SCD 118-056-120 AP5	11.80	12.00	56.0	71.0	118.0	-	●
SCD 119-056-120 AP5	11.90	12.00	56.0	71.0	118.0	-	●
SCD 120-056-120 AP5	12.00	12.00	56.0	71.0	118.0	M14	●
SCD 121-060-140 AP5	12.10	14.00	60.0	77.0	124.0	-	●
SCD 122-060-140 AP5	12.20	14.00	60.0	77.0	124.0	-	●
SCD 123-060-140 AP5	12.30	14.00	60.0	77.0	124.0	-	●
SCD 124-060-140 AP5	12.40	14.00	60.0	77.0	124.0	-	●
SCD 125-060-140 AP5	12.50	14.00	60.0	77.0	124.0	-	●
SCD 126-060-140 AP5	12.60	14.00	60.0	77.0	124.0	-	●
SCD 127-060-140 AP5	12.70	14.00	60.0	77.0	124.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

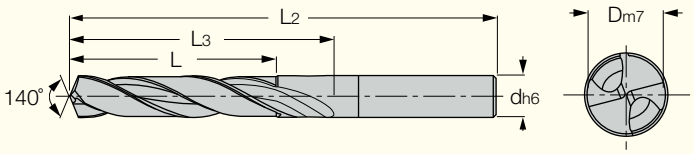
[1] Used for standard thread size

SCD-AP5 (5xD) (continued)

Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



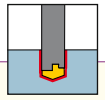
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 128-060-140 AP5	12.80	14.00	60.0	77.0	124.0	-	●
SCD 129-060-140 AP5	12.90	14.00	60.0	77.0	124.0	-	●
SCD 130-060-140 AP5	13.00	14.00	60.0	77.0	124.0	-	●
SCD 131-060-140 AP5	13.10	14.00	60.0	77.0	124.0	-	●
SCD 132-060-140 AP5	13.20	14.00	60.0	77.0	124.0	-	●
SCD 133-060-140 AP5	13.30	14.00	60.0	77.0	124.0	-	●
SCD 134-060-140 AP5	13.40	14.00	60.0	77.0	124.0	-	●
SCD 135-060-140 AP5	13.50	14.00	60.0	77.0	124.0	-	●
SCD 136-060-140 AP5	13.60	14.00	60.0	77.0	124.0	-	●
SCD 137-060-140 AP5	13.70	14.00	60.0	77.0	124.0	-	●
SCD 138-060-140 AP5	13.80	14.00	60.0	77.0	124.0	-	●
SCD 139-060-140 AP5	13.90	14.00	60.0	77.0	124.0	-	●
SCD 140-060-140 AP5	14.00	14.00	60.0	77.0	124.0	M16	●
SCD 141-063-160 AP5	14.10	16.00	63.0	83.0	133.0	-	●
SCD 142-063-160 AP5	14.20	16.00	63.0	83.0	133.0	-	●
SCD 143-063-160 AP5	14.30	16.00	63.0	83.0	133.0	-	●
SCD 144-063-160 AP5	14.40	16.00	63.0	83.0	133.0	-	●
SCD 145-063-160 AP5	14.50	16.00	63.0	83.0	133.0	-	●
SCD 146-063-160 AP5	14.60	16.00	63.0	83.0	133.0	-	●
SCD 147-063-160 AP5	14.70	16.00	63.0	83.0	133.0	-	●
SCD 148-063-160 AP5	14.80	16.00	63.0	83.0	133.0	-	●
SCD 149-063-160 AP5	14.90	16.00	63.0	83.0	133.0	-	●
SCD 150-063-160 AP5	15.00	16.00	63.0	83.0	133.0	-	●
SCD 151-063-160 AP5	15.10	16.00	63.0	83.0	133.0	-	●
SCD 152-063-160 AP5	15.20	16.00	63.0	83.0	133.0	-	●
SCD 153-063-160 AP5	15.30	16.00	63.0	83.0	133.0	-	●
SCD 154-063-160 AP5	15.40	16.00	63.0	83.0	133.0	-	●
SCD 155-063-160 AP5	15.50	16.00	63.0	83.0	133.0	M18	●
SCD 156-063-160 AP5	15.60	16.00	63.0	83.0	133.0	-	●
SCD 157-063-160 AP5	15.70	16.00	63.0	83.0	133.0	-	●
SCD 158-063-160 AP5	15.80	16.00	63.0	83.0	133.0	-	●
SCD 159-063-160 AP5	15.90	16.00	63.0	83.0	133.0	-	●
SCD 160-063-160 AP5	16.00	16.00	63.0	83.0	133.0	-	●
SCD 161-071-180 AP5	16.10	18.00	71.0	93.0	143.0	-	●
SCD 162-071-180 AP5	16.20	18.00	71.0	93.0	143.0	-	●
SCD 163-071-180 AP5	16.30	18.00	71.0	93.0	143.0	-	●
SCD 164-071-180 AP5	16.40	18.00	71.0	93.0	143.0	-	●
SCD 165-071-180 AP5	16.50	18.00	71.0	93.0	143.0	-	●
SCD 166-071-180 AP5	16.60	18.00	71.0	93.0	143.0	-	●
SCD 167-071-180 AP5	16.70	18.00	71.0	93.0	143.0	-	●
SCD 168-071-180 AP5	16.80	18.00	71.0	93.0	143.0	-	●
SCD 169-071-180 AP5	16.90	18.00	71.0	93.0	143.0	-	●
SCD 170-071-180 AP5	17.00	18.00	71.0	93.0	143.0	-	●
SCD 171-071-180 AP5	17.10	18.00	71.0	93.0	143.0	-	●
SCD 172-071-180 AP5	17.20	18.00	71.0	93.0	143.0	-	●
SCD 173-071-180 AP5	17.30	18.00	71.0	93.0	143.0	-	●
SCD 174-071-180 AP5	17.40	18.00	71.0	93.0	143.0	-	●
SCD 175-071-180 AP5	17.50	18.00	71.0	93.0	143.0	M20	●
SCD 176-071-180 AP5	17.60	18.00	71.0	93.0	143.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

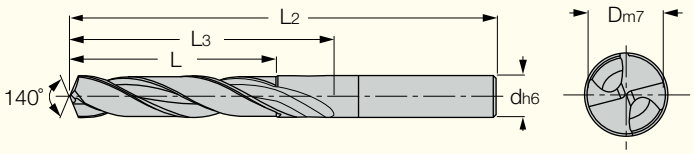
(1) Used for standard thread size

SCD-AP5 (5xD) (continued)

Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



Designation	Dimensions D	d	L	L_3	L_2	T_h[1]	IC908
SCD 177-071-180 AP5	17.70	18.00	71.0	93.0	143.0	-	●
SCD 178-071-180 AP5	17.80	18.00	71.0	93.0	143.0	-	●
SCD 179-071-180 AP5	17.90	18.00	71.0	93.0	143.0	-	●
SCD 180-071-180 AP5	18.00	18.00	71.0	93.0	143.0	-	●
SCD 181-077-200 AP5	18.10	20.00	77.0	101.0	153.0	-	●
SCD 182-077-200 AP5	18.20	20.00	77.0	101.0	153.0	-	●
SCD 183-077-200 AP5	18.30	20.00	77.0	101.0	153.0	-	●
SCD 184-077-200 AP5	18.40	20.00	77.0	101.0	153.0	-	●
SCD 185-077-200 AP5	18.50	20.00	77.0	101.0	153.0	-	●
SCD 186-077-200 AP5	18.60	20.00	77.0	101.0	153.0	-	●
SCD 187-077-200 AP5	18.70	20.00	77.0	101.0	153.0	-	●
SCD 188-077-200 AP5	18.80	20.00	77.0	101.0	153.0	-	●
SCD 189-077-200 AP5	18.90	20.00	77.0	101.0	153.0	-	●
SCD 190-077-200 AP5	19.00	20.00	77.0	101.0	153.0	-	●
SCD 191-077-200 AP5	19.10	20.00	77.0	101.0	153.0	-	●
SCD 192-077-200 AP5	19.20	20.00	77.0	101.0	153.0	-	●
SCD 193-077-200 AP5	19.30	20.00	77.0	101.0	153.0	-	●
SCD 194-077-200 AP5	19.40	20.00	77.0	101.0	153.0	-	●
SCD 195-077-200 AP5	19.50	20.00	77.0	101.0	153.0	M22	●
SCD 196-077-200 AP5	19.60	20.00	77.0	101.0	153.0	-	●
SCD 197-077-200 AP5	19.70	20.00	77.0	101.0	153.0	-	●
SCD 198-077-200 AP5	19.80	20.00	77.0	101.0	153.0	-	●
SCD 199-077-200 AP5	19.90	20.00	77.0	101.0	153.0	-	●
SCD 200-077-200 AP5	20.00	20.00	77.0	101.0	153.0	-	●

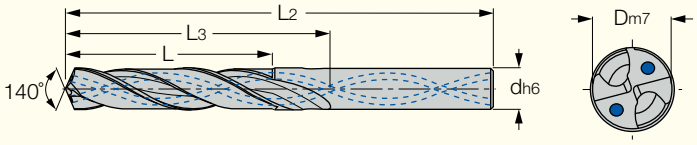
• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

[1] Used for standard thread size

SCD-ACG5 (5xD)

Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD, DIN 6537

D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01- 21	0.008-0.029



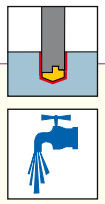
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 030-023-060 ACG5	3.00	6.00	23.0	28.0	66.0	-	●
SCD 031-023-060 ACG5	3.10	6.00	23.0	28.0	66.0	-	●
SCD 032-023-060 ACG5	3.20	6.00	23.0	28.0	66.0	-	●
SCD 033-023-060 ACG5	3.30	6.00	23.0	28.0	66.0	M4	●
SCD 034-023-060 ACG5	3.40	6.00	23.0	28.0	66.0	-	●
SCD 035-023-060 ACG5	3.50	6.00	23.0	28.0	66.0	-	●
SCD 036-023-060 ACG5	3.60	6.00	23.0	28.0	66.0	-	●
SCD 037-023-060 ACG5	3.70	6.00	23.0	28.0	66.0	-	●
SCD 038-029-060 ACG5	3.80	6.00	29.0	36.0	74.0	-	●
SCD 039-029-060 ACG5	3.90	6.00	29.0	36.0	74.0	-	●
SCD 040-029-060 ACG5	4.00	6.00	29.0	36.0	74.0	-	●
SCD 041-029-060 ACG5	4.10	6.00	29.0	36.0	74.0	-	●
SCD 042-029-060 ACG5	4.20	6.00	29.0	36.0	74.0	M5	●
SCD 043-029-060 ACG5	4.30	6.00	29.0	36.0	74.0	-	●
SCD 044-029-060 ACG5	4.40	6.00	29.0	36.0	74.0	-	●
SCD 045-029-060 ACG5	4.50	6.00	29.0	36.0	74.0	-	●
SCD 046-029-060 ACG5	4.60	6.00	29.0	36.0	74.0	-	●
SCD 047-029-060 ACG5	4.70	6.00	29.0	36.0	74.0	-	●
SCD 053-035-060 ACG5	5.30	6.00	35.0	44.0	82.0	-	●
SCD 054-035-060 ACG5	5.40	6.00	35.0	44.0	82.0	-	●
SCD 059-035-060 ACG5	5.90	6.00	35.0	44.0	82.0	-	●
SCD 069-043-080 ACG5	6.90	8.00	43.0	53.0	91.0	-	●
SCD 073-043-080 ACG5	7.30	8.00	43.0	53.0	91.0	-	●
SCD 076-043-080 ACG5	7.60	8.00	43.0	53.0	91.0	-	●
SCD 081-049-100 ACG5	8.10	10.00	49.0	61.0	103.0	-	●
SCD 083-049-100 ACG5	8.30	10.00	49.0	61.0	103.0	-	●
SCD 089-049-100 ACG5	8.90	10.00	49.0	61.0	103.0	-	●
SCD 091-049-100 ACG5	9.10	10.00	49.0	61.0	103.0	-	●
SCD 092-049-100 ACG5	9.20	10.00	49.0	61.0	103.0	-	●
SCD 094-049-100 ACG5	9.40	10.00	49.0	61.0	103.0	-	●
SCD 097-049-100 ACG5	9.70	10.00	49.0	61.0	103.0	-	●
SCD 103-056-120 ACG5	10.30	12.00	56.0	71.0	118.0	-	●
SCD 107-056-120 ACG5	10.70	12.00	56.0	71.0	118.0	-	●
SCD 109-056-120 ACG5	10.90	12.00	56.0	71.0	118.0	-	●
SCD 112-056-120 ACG5	11.20	12.00	56.0	71.0	118.0	-	●
SCD 117-056-120 ACG5	11.70	12.00	56.0	71.0	118.0	-	●
SCD 118-056-120 ACG5	11.80	12.00	56.0	71.0	118.0	-	●
SCD 119-056-120 ACG5	11.90	12.00	56.0	71.0	118.0	-	●
SCD 121-060-140 ACG5	12.10	14.00	60.0	77.0	124.0	-	●
SCD 122-060-140 ACG5	12.20	14.00	60.0	77.0	124.0	-	●
SCD 123-060-140 ACG5	12.30	14.00	60.0	77.0	124.0	-	●
SCD 124-060-140 ACG5	12.40	14.00	60.0	77.0	124.0	-	●
SCD 126-060-140 ACG5	12.60	14.00	60.0	77.0	124.0	-	●
SCD 130-060-140 ACG5	13.00	14.00	60.0	77.0	124.0	-	●
SCD 131-060-140 ACG5	13.10	14.00	60.0	77.0	124.0	-	●
SCD 132-060-140 ACG5	13.20	14.00	60.0	77.0	124.0	-	●
SCD 133-060-140 ACG5	13.30	14.00	60.0	77.0	124.0	-	●
SCD 134-060-140 ACG5	13.40	14.00	60.0	77.0	124.0	-	●
SCD 135-060-140 ACG5	13.50	14.00	60.0	77.0	124.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C46.

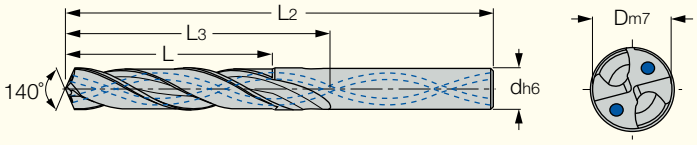
(1) Used for standard thread size.

SCD-ACG5 (5xD) (continued)

Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD, DIN 6537



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01- 21	0.008-0.029



Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 136-060-140 ACG5	13.60	14.00	60.0	77.0	124.0	-	●
SCD 137-060-140 ACG5	13.70	14.00	60.0	77.0	124.0	-	●
SCD 138-060-140 ACG5	13.80	14.00	60.0	77.0	124.0	-	●
SCD 140-060-140 ACG5	14.00	14.00	60.0	77.0	124.0	M16	●
SCD 142-063-160 ACG5	14.20	16.00	63.0	83.0	133.0	-	●
SCD 144-063-160 ACG5	14.40	16.00	63.0	83.0	133.0	-	●
SCD 146-063-160 ACG5	14.60	16.00	63.0	83.0	133.0	-	●
SCD 147-063-160 ACG5	14.70	16.00	63.0	83.0	133.0	-	●
SCD 148-063-160 ACG5	14.80	16.00	63.0	83.0	133.0	-	●
SCD 149-063-160 ACG5	14.90	16.00	63.0	83.0	133.0	-	●
SCD 151-063-160 ACG5	15.10	16.00	63.0	83.0	133.0	-	●
SCD 152-063-160 ACG5	15.20	16.00	63.0	83.0	133.0	-	●
SCD 153-063-160 ACG5	15.30	16.00	63.0	83.0	133.0	-	●
SCD 154-063-160 ACG5	15.40	16.00	63.0	83.0	133.0	-	●
SCD 155-063-160 ACG5	15.50	16.00	63.0	83.0	133.0	M18	●
SCD 156-063-160 ACG5	15.60	16.00	63.0	83.0	133.0	-	●
SCD 157-063-160 ACG5	15.70	16.00	63.0	83.0	133.0	-	●
SCD 158-063-160 ACG5	15.80	16.00	63.0	83.0	133.0	-	●
SCD 161-071-180 ACG5	16.10	18.00	71.0	93.0	143.0	-	●
SCD 162-071-180 ACG5	16.20	18.00	71.0	93.0	143.0	-	●
SCD 163-071-180 ACG5	16.30	18.00	71.0	93.0	143.0	-	●
SCD 164-071-180 ACG5	16.40	18.00	71.0	93.0	143.0	-	●
SCD 165-071-180 ACG5	16.50	18.00	71.0	93.0	143.0	-	●
SCD 167-071-180 ACG5	16.70	18.00	71.0	93.0	143.0	-	●
SCD 168-071-180 ACG5	16.80	18.00	71.0	93.0	143.0	-	●
SCD 169-071-180 ACG5	16.90	18.00	71.0	93.0	143.0	-	●
SCD 170-071-180 ACG5	17.00	18.00	71.0	93.0	143.0	-	●
SCD 171-071-180 ACG5	17.10	18.00	71.0	93.0	143.0	-	●
SCD 172-071-180 ACG5	17.20	18.00	71.0	93.0	143.0	-	●
SCD 173-071-180 ACG5	17.30	18.00	71.0	93.0	143.0	-	●
SCD 174-071-180 ACG5	17.40	18.00	71.0	93.0	143.0	-	●
SCD 176-071-180 ACG5	17.60	18.00	71.0	93.0	143.0	-	●
SCD 177-071-180 ACG5	17.70	18.00	71.0	93.0	143.0	-	●
SCD 178-071-180 ACG5	17.80	18.00	71.0	93.0	143.0	-	●
SCD 179-071-180 ACG5	17.90	18.00	71.0	93.0	143.0	-	●
SCD 180-071-180 ACG5	18.00	18.00	71.0	93.0	143.0	-	●
SCD 181-077-200 ACG5	18.10	20.00	77.0	101.0	153.0	-	●
SCD 182-077-200 ACG5	18.20	20.00	77.0	101.0	153.0	-	●
SCD 183-077-200 ACG5	18.30	20.00	77.0	101.0	153.0	-	●
SCD 184-077-200 ACG5	18.40	20.00	77.0	101.0	153.0	-	●
SCD 185-077-200 ACG5	18.50	20.00	77.0	101.0	153.0	-	●
SCD 186-077-200 ACG5	18.60	20.00	77.0	101.0	153.0	-	●
SCD 187-077-200 ACG5	18.70	20.00	77.0	101.0	153.0	-	●
SCD 188-077-200 ACG5	18.80	20.00	77.0	101.0	153.0	-	●
SCD 189-077-200 ACG5	18.90	20.00	77.0	101.0	153.0	-	●
SCD 190-077-200 ACG5	19.00	20.00	77.0	101.0	153.0	-	●
SCD 191-077-200 ACG5	19.10	20.00	77.0	101.0	153.0	-	●
SCD 192-077-200 ACG5	19.20	20.00	77.0	101.0	153.0	-	●
SCD 193-077-200 ACG5	19.30	20.00	77.0	101.0	153.0	-	●

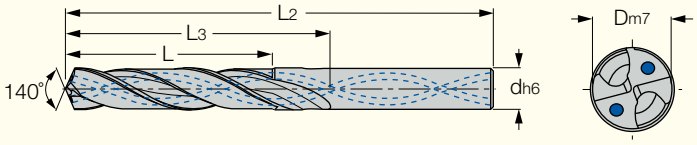
• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C46.

(1) Used for standard thread size.

SCD-ACG5 (5xD) (continued)

Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD, DIN 6537

D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01- 21	0.008-0.029



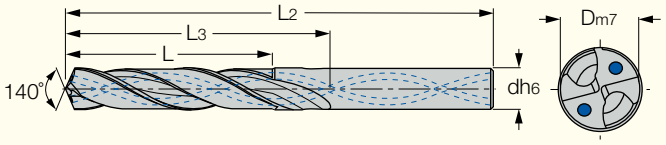
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 194-077-200 ACG5	19.40	20.00	77.0	101.0	153.0	-	●
SCD 195-077-200 ACG5	19.50	20.00	77.0	101.0	153.0	M22	●
SCD 196-077-200 ACG5	19.60	20.00	77.0	101.0	153.0	-	●
SCD 197-077-200 ACG5	19.70	20.00	77.0	101.0	153.0	-	●
SCD 198-077-200 ACG5	19.80	20.00	77.0	101.0	153.0	-	●
SCD 200-077-200 ACG5	20.00	20.00	77.0	101.0	153.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C46.

(1) Used for standard thread size.

SCD-ACP5 (5xD)

Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD



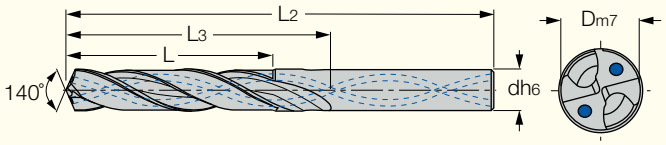
Designation	Dimensions						IC908
	D	d	L	L3	L2	Th(1)	
SCD 030-023-060 ACP5	3.00	6.00	23.0	28.0	66.0	-	●
SCD 031-023-060 ACP5	3.10	6.00	23.0	28.0	66.0	-	●
SCD 032-023-060 ACP5	3.20	6.00	23.0	28.0	66.0	-	●
SCD 033-023-060 ACP5	3.30	6.00	23.0	28.0	66.0	M4	●
SCD 034-023-060 ACP5	3.40	6.00	23.0	28.0	66.0	-	●
SCD 035-023-060 ACP5	3.50	6.00	23.0	28.0	66.0	-	●
SCD 036-023-060 ACP5	3.60	6.00	23.0	28.0	66.0	-	●
SCD 037-023-060 ACP5	3.70	6.00	23.0	28.0	66.0	-	●
SCD 038-029-060 ACP5	3.80	6.00	29.0	36.0	74.0	-	●
SCD 039-029-060 ACP5	3.90	6.00	29.0	36.0	74.0	-	●
SCD 040-029-060 ACP5	4.00	6.00	29.0	36.0	74.0	-	●
SCD 041-029-060 ACP5	4.10	6.00	29.0	36.0	74.0	-	●
SCD 042-029-060 ACP5	4.20	6.00	29.0	36.0	74.0	M5	●
SCD 043-029-060 ACP5	4.30	6.00	29.0	36.0	74.0	-	●
SCD 044-029-060 ACP5	4.40	6.00	29.0	36.0	74.0	-	●
SCD 045-029-060 ACP5	4.50	6.00	29.0	36.0	74.0	-	●
SCD 046-029-060 ACP5	4.60	6.00	29.0	36.0	74.0	-	●
SCD 047-029-060 ACP5	4.70	6.00	29.0	36.0	74.0	-	●
SCD 048-035-060 ACP5	4.80	6.00	35.0	44.0	82.0	-	●
SCD 049-035-060 ACP5	4.90	6.00	35.0	44.0	82.0	-	●
SCD 050-035-060 ACP5	5.00	6.00	35.0	44.0	82.0	M6	●
SCD 051-035-060 ACP5	5.10	6.00	35.0	44.0	82.0	-	●
SCD 052-035-060 ACP5	5.20	6.00	35.0	44.0	82.0	-	●
SCD 053-035-060 ACP5	5.30	6.00	35.0	44.0	82.0	-	●
SCD 054-035-060 ACP5	5.40	6.00	35.0	44.0	82.0	-	●
SCD 055-035-060 ACP5	5.50	6.00	35.0	44.0	82.0	-	●
SCD 056-035-060 ACP5	5.60	6.00	35.0	44.0	82.0	-	●
SCD 057-035-060 ACP5	5.70	6.00	35.0	44.0	82.0	-	●
SCD 058-035-060 ACP5	5.80	6.00	35.0	44.0	82.0	-	●
SCD 059-035-060 ACP5	5.90	6.00	35.0	44.0	82.0	-	●
SCD 060-035-060 ACP5	6.00	6.00	35.0	44.0	82.0	-	●
SCD 061-043-080 ACP5	6.10	8.00	35.0	44.0	91.0	M7	●
SCD 062-043-080 ACP5	6.20	8.00	43.0	53.0	91.0	-	●
SCD 063-043-080 ACP5	6.30	8.00	43.0	53.0	91.0	-	●
SCD 064-043-080 ACP5	6.40	8.00	43.0	53.0	91.0	-	●
SCD 065-043-080 ACP5	6.50	8.00	43.0	53.0	91.0	-	●
SCD 066-043-080 ACP5	6.60	8.00	43.0	53.0	91.0	-	●
SCD 067-043-080 ACP5	6.70	8.00	43.0	53.0	91.0	-	●
SCD 068-043-080 ACP5	6.80	8.00	43.0	53.0	91.0	M8	●
SCD 069-043-080 ACP5	6.90	8.00	43.0	53.0	91.0	-	●
SCD 070-043-080 ACP5	7.00	8.00	43.0	53.0	91.0	-	●
SCD 071-043-080 ACP5	7.10	8.00	43.0	53.0	91.0	-	●
SCD 072-043-080 ACP5	7.20	8.00	43.0	53.0	91.0	-	●
SCD 073-043-080 ACP5	7.30	8.00	43.0	53.0	91.0	-	●
SCD 074-043-080 ACP5	7.40	8.00	43.0	53.0	91.0	-	●
SCD 075-043-080 ACP5	7.50	8.00	43.0	53.0	91.0	-	●
SCD 076-043-080 ACP5	7.60	8.00	43.0	53.0	91.0	-	●
SCD 077-043-080 ACP5	7.70	8.00	43.0	53.0	91.0	-	●
SCD 078-043-080 ACP5	7.80	8.00	43.0	53.0	91.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

(1) Used for standard thread size.

SCD-ACP5 (5xD) (continued)

Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD



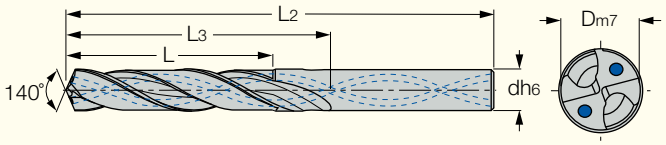
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 079-043-080 ACP5	7.90	8.00	43.0	53.0	91.0	-	●
SCD 080-043-080 ACP5	8.00	8.00	43.0	53.0	91.0	-	●
SCD 081-049-100 ACP5	8.10	10.00	49.0	61.0	103.0	-	●
SCD 082-049-100 ACP5	8.20	10.00	49.0	61.0	103.0	-	●
SCD 083-049-100 ACP5	8.30	10.00	49.0	61.0	103.0	-	●
SCD 084-049-100 ACP5	8.40	10.00	49.0	61.0	103.0	-	●
SCD 085-049-100 ACP5	8.50	10.00	49.0	61.0	103.0	M10	●
SCD 086-049-100 ACP5	8.60	10.00	49.0	61.0	103.0	-	●
SCD 087-049-100 ACP5	8.70	10.00	49.0	61.0	103.0	-	●
SCD 088-049-100 ACP5	8.80	10.00	49.0	61.0	103.0	-	●
SCD 089-049-100 ACP5	8.90	10.00	49.0	61.0	103.0	-	●
SCD 090-049-100 ACP5	9.00	10.00	49.0	61.0	103.0	-	●
SCD 091-049-100 ACP5	9.10	10.00	49.0	61.0	103.0	-	●
SCD 092-049-100 ACP5	9.20	10.00	49.0	61.0	103.0	-	●
SCD 093-049-100 ACP5	9.30	10.00	49.0	61.0	103.0	-	●
SCD 094-049-100 ACP5	9.40	10.00	49.0	61.0	103.0	-	●
SCD 095-049-100 ACP5	9.50	10.00	49.0	61.0	103.0	M11	●
SCD 096-049-100 ACP5	9.60	10.00	49.0	61.0	103.0	-	●
SCD 097-049-100 ACP5	9.70	10.00	49.0	61.0	103.0	-	●
SCD 098-049-100 ACP5	9.80	10.00	49.0	61.0	103.0	-	●
SCD 099-049-100 ACP5	9.90	10.00	49.0	61.0	103.0	-	●
SCD 100-049-100 ACP5	10.00	10.00	49.0	61.0	103.0	-	●
SCD 101-056-120 ACP5	10.10	12.00	56.0	71.0	118.0	-	●
SCD 102-056-120 ACP5	10.20	12.00	56.0	71.0	118.0	M12	●
SCD 103-056-120 ACP5	10.30	12.00	56.0	71.0	118.0	-	●
SCD 104-056-120 ACP5	10.40	12.00	56.0	71.0	118.0	-	●
SCD 105-056-120 ACP5	10.50	12.00	56.0	71.0	118.0	-	●
SCD 106-056-120 ACP5	10.60	12.00	56.0	71.0	118.0	-	●
SCD 107-056-120 ACP5	10.70	12.00	56.0	71.0	118.0	-	●
SCD 108-056-120 ACP5	10.80	12.00	56.0	71.0	118.0	-	●
SCD 109-056-120 ACP5	10.90	12.00	56.0	71.0	118.0	-	●
SCD 110-056-120 ACP5	11.00	12.00	56.0	71.0	118.0	-	●
SCD 111-056-120 ACP5	11.10	12.00	56.0	71.0	118.0	-	●
SCD 112-056-120 ACP5	11.20	12.00	56.0	71.0	118.0	-	●
SCD 113-056-120 ACP5	11.30	12.00	56.0	71.0	118.0	-	●
SCD 114-056-120 ACP5	11.40	12.00	56.0	71.0	118.0	-	●
SCD 115-056-120 ACP5	11.50	12.00	56.0	71.0	118.0	-	●
SCD 116-056-120 ACP5	11.60	12.00	56.0	71.0	118.0	-	●
SCD 117-056-120 ACP5	11.70	12.00	56.0	71.0	118.0	-	●
SCD 118-056-120 ACP5	11.80	12.00	56.0	71.0	118.0	-	●
SCD 119-056-120 ACP5	11.90	12.00	56.0	71.0	118.0	-	●
SCD 120-056-120 ACP5	12.00	12.00	56.0	71.0	118.0	M14	●
SCD 121-060-140 ACP5	12.10	14.00	60.0	77.0	124.0	-	●
SCD 122-060-140 ACP5	12.20	14.00	60.0	77.0	124.0	M14	●
SCD 123-060-140 ACP5	12.30	14.00	60.0	77.0	124.0	-	●
SCD 124-060-140 ACP5	12.40	14.00	60.0	77.0	124.0	-	●
SCD 125-060-140 ACP5	12.50	14.00	60.0	77.0	124.0	-	●
SCD 126-060-140 ACP5	12.60	14.00	60.0	77.0	124.0	-	●
SCD 127-060-140 ACP5	12.70	14.00	60.0	77.0	124.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

(1) Used for standard thread size.

SCD-ACP5 (5xD) (continued)

Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD



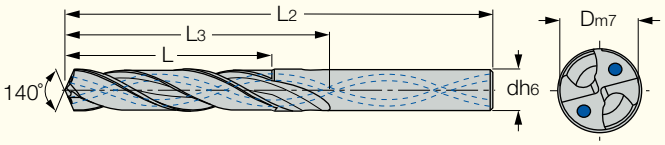
Designation	Dimensions						IC908
	D	d	L	L3	L2	Th(1)	
SCD 128-060-140 ACP5	12.80	14.00	60.0	77.0	124.0	-	●
SCD 129-060-140 ACP5	12.90	14.00	60.0	77.0	124.0	-	●
SCD 130-060-140 ACP5	13.00	14.00	60.0	77.0	124.0	-	●
SCD 131-060-140 ACP5	13.10	14.00	60.0	77.0	124.0	-	●
SCD 132-060-140 ACP5	13.20	14.00	60.0	77.0	124.0	-	●
SCD 133-060-140 ACP5	13.30	14.00	60.0	77.0	124.0	-	●
SCD 134-060-140 ACP5	13.40	14.00	60.0	77.0	124.0	-	●
SCD 135-060-140 ACP5	13.50	14.00	60.0	77.0	124.0	-	●
SCD 136-060-140 ACP5	13.60	14.00	60.0	77.0	124.0	-	●
SCD 137-060-140 ACP5	13.70	14.00	60.0	77.0	124.0	-	●
SCD 138-060-140 ACP5	13.80	14.00	60.0	77.0	124.0	-	●
SCD 139-060-140 ACP5	13.90	14.00	60.0	77.0	124.0	-	●
SCD 140-060-140 ACP5	14.00	14.00	60.0	77.0	124.0	M16	●
SCD 141-063-160 ACP5	14.10	16.00	63.0	83.0	133.0	-	●
SCD 142-063-160 ACP5	14.20	16.00	63.0	83.0	133.0	-	●
SCD 143-063-160 ACP5	14.30	16.00	63.0	83.0	133.0	-	●
SCD 144-063-160 ACP5	14.40	16.00	63.0	83.0	133.0	-	●
SCD 145-063-160 ACP5	14.50	16.00	63.0	83.0	133.0	-	●
SCD 146-063-160 ACP5	14.60	16.00	63.0	83.0	133.0	-	●
SCD 147-063-160 ACP5	14.70	16.00	63.0	83.0	133.0	-	●
SCD 148-063-160 ACP5	14.80	16.00	63.0	83.0	133.0	-	●
SCD 149-063-160 ACP5	14.90	16.00	63.0	83.0	133.0	-	●
SCD 150-063-160 ACP5	15.00	16.00	63.0	83.0	133.0	-	●
SCD 151-063-160 ACP5	15.10	16.00	63.0	83.0	133.0	-	●
SCD 152-063-160 ACP5	15.20	16.00	63.0	83.0	133.0	-	●
SCD 153-063-160 ACP5	15.30	16.00	63.0	83.0	133.0	-	●
SCD 154-063-160 ACP5	15.40	16.00	63.0	83.0	133.0	-	●
SCD 155-063-160 ACP5	15.50	16.00	63.0	83.0	133.0	M18	●
SCD 156-063-160 ACP5	15.60	16.00	63.0	83.0	133.0	-	●
SCD 157-063-160 ACP5	15.70	16.00	63.0	83.0	133.0	-	●
SCD 158-063-160 ACP5	15.80	16.00	63.0	83.0	133.0	-	●
SCD 159-063-160 ACP5	15.90	16.00	63.0	83.0	133.0	-	●
SCD 160-063-160 ACP5	16.00	16.00	63.0	83.0	133.0	-	●
SCD 161-071-180 ACP5	16.10	18.00	71.0	93.0	143.0	-	●
SCD 162-071-180 ACP5	16.20	18.00	71.0	93.0	143.0	-	●
SCD 163-071-180 ACP5	16.30	18.00	71.0	93.0	143.0	-	●
SCD 164-071-180 ACP5	16.40	18.00	71.0	93.0	143.0	-	●
SCD 165-071-180 ACP5	16.50	18.00	71.0	93.0	143.0	-	●
SCD 166-071-180 ACP5	16.60	18.00	71.0	93.0	143.0	-	●
SCD 167-071-180 ACP5	16.70	18.00	71.0	93.0	143.0	-	●
SCD 168-071-180 ACP5	16.80	18.00	71.0	93.0	143.0	-	●
SCD 169-071-180 ACP5	16.90	18.00	71.0	93.0	143.0	-	●
SCD 170-071-180 ACP5	17.00	18.00	71.0	93.0	143.0	-	●
SCD 171-071-180 ACP5	17.10	18.00	71.0	93.0	143.0	-	●
SCD 172-071-180 ACP5	17.20	18.00	71.0	93.0	143.0	-	●
SCD 173-071-180 ACP5	17.30	18.00	71.0	93.0	143.0	-	●
SCD 174-071-180 ACP5	17.40	18.00	71.0	93.0	143.0	-	●
SCD 175-071-180 ACP5	17.50	18.00	71.0	93.0	143.0	-	●
SCD 176-071-180 ACP5	17.60	18.00	71.0	93.0	143.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

(1) Used for standard thread size.

SCD-ACP5 (5xD) (continued)

Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD



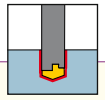
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 177-071-180 ACP5	17.70	18.00	71.0	93.0	143.0	-	●
SCD 178-071-180 ACP5	17.80	18.00	71.0	93.0	143.0	-	●
SCD 179-071-180 ACP5	17.90	18.00	71.0	93.0	143.0	-	●
SCD 180-071-180 ACP5	18.00	18.00	71.0	93.0	143.0	-	●
SCD 181-077-200 ACP5	18.10	20.00	77.0	101.0	153.0	-	●
SCD 182-077-200 ACP5	18.20	20.00	77.0	101.0	153.0	-	●
SCD 183-077-200 ACP5	18.30	20.00	77.0	101.0	153.0	-	●
SCD 184-077-200 ACP5	18.40	20.00	77.0	101.0	153.0	-	●
SCD 185-077-200 ACP5	18.50	20.00	77.0	101.0	153.0	-	●
SCD 186-077-200 ACP5	18.60	20.00	77.0	101.0	153.0	-	●
SCD 187-077-200 ACP5	18.70	20.00	77.0	101.0	153.0	-	●
SCD 188-077-200 ACP5	18.80	20.00	77.0	101.0	153.0	-	●
SCD 189-077-200 ACP5	18.90	20.00	77.0	101.0	153.0	-	●
SCD 190-077-200 ACP5	19.00	20.00	77.0	101.0	153.0	-	●
SCD 191-077-200 ACP5	19.10	20.00	77.0	101.0	153.0	-	●
SCD 192-077-200 ACP5	19.20	20.00	77.0	101.0	153.0	-	●
SCD 193-077-200 ACP5	19.30	20.00	77.0	101.0	153.0	-	●
SCD 194-077-200 ACP5	19.40	20.00	77.0	101.0	153.0	-	●
SCD 195-077-200 ACP5	19.50	20.00	77.0	101.0	153.0	M22	●
SCD 196-077-200 ACP5	19.60	20.00	77.0	101.0	153.0	-	●
SCD 197-077-200 ACP5	19.70	20.00	77.0	101.0	153.0	-	●
SCD 198-077-200 ACP5	19.80	20.00	77.0	101.0	153.0	-	●
SCD 199-077-200 ACP5	19.90	20.00	77.0	101.0	153.0	-	●
SCD 200-077-200 ACP5	20.00	20.00	77.0	101.0	153.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

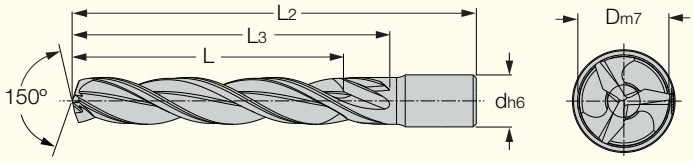
(1) Used for standard thread size.

SCCD-AP5

3 Flute Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD, DIN 6537



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



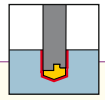
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCCD 030-023-060 AP5	3.00	6.00	23.0	28.0	66.0	-	●
SCCD 031-023-060 AP5	3.10	6.00	23.0	28.0	66.0	-	●
SCCD 032-023-060 AP5	3.20	6.00	23.0	28.0	66.0	-	●
SCCD 033-023-060 AP5	3.30	6.00	23.0	28.0	66.0	M4	●
SCCD 035-023-060 AP5	3.50	6.00	23.0	28.0	66.0	-	●
SCCD 037-023-060 AP5	3.70	6.00	23.0	28.0	66.0	-	●
SCCD 038-029-060 AP5	3.80	6.00	29.0	36.0	74.0	-	●
SCCD 040-029-060 AP5	4.00	6.00	29.0	36.0	74.0	-	●
SCCD 041-029-060 AP5	4.10	6.00	29.0	36.0	74.0	-	●
SCCD 042-029-060 AP5	4.20	6.00	29.0	36.0	74.0	M5	●
SCCD 043-029-060 AP5	4.30	6.00	29.0	36.0	74.0	-	●
SCCD 045-029-060 AP5	4.50	6.00	29.0	36.0	74.0	-	●
SCCD 046-029-060 AP5	4.60	6.00	29.0	36.0	74.0	-	●
SCCD 047-029-060 AP5	4.70	6.00	29.0	47.0	74.0	-	●
SCCD 048-035-060 AP5	4.80	6.00	35.0	44.0	82.0	-	●
SCCD 050-035-060 AP5	5.00	6.00	35.0	44.0	82.0	M6	●
SCCD 051-035-060 AP5	5.10	6.00	35.0	44.0	82.0	-	●
SCCD 052-035-060 AP5	5.20	6.00	35.0	44.0	82.0	-	●
SCCD 055-035-060 AP5	5.50	6.00	35.0	44.0	82.0	-	●
SCCD 056-035-060 AP5	5.60	6.00	35.0	44.0	82.0	-	●
SCCD 057-035-060 AP5	5.70	6.00	35.0	44.0	82.0	-	●
SCCD 058-035-060 AP5	5.80	6.00	35.0	44.0	82.0	-	●
SCCD 059-035-060 AP5	5.90	6.00	35.0	44.0	82.0	-	●
SCCD 060-035-060 AP5	6.00	6.00	35.0	44.0	82.0	M7	●
SCCD 061-043-080 AP5	6.10	8.00	43.0	53.0	91.0	-	●
SCCD 063-043-080 AP5	6.30	8.00	43.0	53.0	91.0	-	●
SCCD 064-043-080 AP5	6.40	8.00	43.0	53.0	91.0	-	●
SCCD 065-043-080 AP5	6.50	8.00	43.0	53.0	91.0	-	●
SCCD 066-043-080 AP5	6.60	8.00	43.0	53.0	91.0	-	●
SCCD 067-043-080 AP5	6.70	8.00	43.0	53.0	91.0	-	●
SCCD 068-043-080 AP5	6.80	8.00	43.0	53.0	91.0	M8	●
SCCD 069-043-080 AP5	6.90	8.00	43.0	53.0	91.0	-	●
SCCD 070-043-080 AP5	7.00	8.00	43.0	53.0	91.0	-	●
SCCD 071-043-080 AP5	7.10	8.00	43.0	53.0	91.0	-	●
SCCD 074-043-080 AP5	7.40	8.00	43.0	53.0	91.0	-	●
SCCD 075-043-080 AP5	7.50	8.00	43.0	53.0	91.0	-	●
SCCD 076-043-080 AP5	7.60	8.00	43.0	53.0	91.0	-	●
SCCD 078-043-080 AP5	7.80	8.00	43.0	53.0	91.0	M9	●
SCCD 080-043-080 AP5	8.00	8.00	43.0	43.0	91.0	-	●
SCCD 081-049-100 AP5	8.10	10.00	49.0	61.0	103.0	-	●
SCCD 082-049-100 AP5	8.20	10.00	49.0	61.0	103.0	-	●
SCCD 083-049-100 AP5	8.30	10.00	49.0	61.0	103.0	-	●
SCCD 084-049-100 AP5	8.40	10.00	49.0	61.0	103.0	-	●
SCCD 085-049-100 AP5	8.50	10.00	49.0	61.0	103.0	M10	●
SCCD 086-049-100 AP5	8.60	10.00	49.0	61.0	103.0	-	●
SCCD 087-049-100 AP5	8.70	10.00	49.0	61.0	103.0	-	●
SCCD 088-049-100 AP5	8.80	10.00	49.0	61.0	103.0	-	●
SCCD 090-049-100 AP5	9.00	10.00	49.0	61.0	103.0	-	●
SCCD 091-049-100 AP5	9.10	10.00	49.0	61.0	103.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

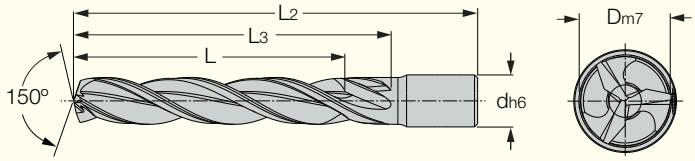
(1) Used for standard thread size.

SCCD-AP5 (continued)

3 Flute Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD, DIN 6537



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



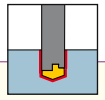
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCCD 093-049-100 AP5	9.30	10.00	49.0	61.0	103.0	-	●
SCCD 095-049-100 AP5	9.50	10.00	49.0	61.0	103.0	M11	●
SCCD 096-049-100 AP5	9.60	10.00	49.0	61.0	103.0	-	●
SCCD 097-049-100 AP5	9.70	10.00	49.0	61.0	103.0	-	●
SCCD 098-049-100 AP5	9.80	10.00	49.0	61.0	103.0	-	●
SCCD 100-049-100 AP5	10.00	10.00	49.0	61.0	103.0	-	●
SCCD 101-056-120 AP5	10.10	12.00	56.0	71.0	118.0	-	●
SCCD 102-056-120 AP5	10.20	12.00	56.0	71.0	118.0	M12	●
SCCD 103-056-120 AP5	10.30	12.00	56.0	71.0	118.0	-	●
SCCD 105-056-120 AP5	10.50	12.00	56.0	71.0	118.0	-	●
SCCD 107-056-120 AP5	10.70	12.00	56.0	71.0	118.0	-	●
SCCD 108-056-120 AP5	10.80	12.00	56.0	71.0	118.0	-	●
SCCD 110-056-120 AP5	11.00	12.00	56.0	71.0	118.0	-	●
SCCD 111-056-120 AP5	11.10	12.00	56.0	71.0	118.0	-	●
SCCD 112-056-120 AP5	11.20	12.00	56.0	71.0	118.0	-	●
SCCD 115-056-120 AP5	11.50	12.00	56.0	71.0	118.0	-	●
SCCD 117-056-120 AP5	11.70	12.00	56.0	71.0	118.0	-	●
SCCD 118-056-120 AP5	11.80	12.00	56.0	71.0	118.0	-	●
SCCD 120-056-120 AP5	12.00	12.00	56.0	71.0	118.0	M14	●
SCCD 121-060-140 AP5	12.10	14.00	60.0	77.0	124.0	-	●
SCCD 125-060-140 AP5	12.50	14.00	60.0	77.0	124.0	-	●
SCCD 127-060-140 AP5	12.70	14.00	60.0	77.0	124.0	-	●
SCCD 128-060-140 AP5	12.80	14.00	60.0	77.0	124.0	-	●
SCCD 130-060-140 AP5	13.00	14.00	60.0	77.0	124.0	-	●
SCCD 131-060-140 AP5	13.10	14.00	60.0	77.0	124.0	-	●
SCCD 135-060-140 AP5	13.50	14.00	60.0	77.0	124.0	-	●
SCCD 138-060-140 AP5	13.80	14.00	60.0	77.0	124.0	-	●
SCCD 140-060-140 AP5	14.00	14.00	60.0	77.0	124.0	M16	●
SCCD 142-063-160 AP5	14.20	16.00	63.0	83.0	133.0	-	●
SCCD 145-063-160 AP5	14.50	16.00	63.0	83.0	133.0	-	●
SCCD 150-063-160 AP5	15.00	16.00	63.0	83.0	133.0	-	●
SCCD 151-063-160 AP5	15.10	16.00	63.0	83.0	133.0	-	●
SCCD 155-063-160 AP5	15.50	16.00	63.0	83.0	133.0	M18	●
SCCD 158-063-160 AP5	15.80	16.00	63.0	83.0	133.0	-	●
SCCD 160-063-160 AP5	16.00	16.00	63.0	83.0	133.0	-	●
SCCD 165-071-180 AP5	16.50	18.00	71.0	93.0	143.0	-	●
SCCD 169-071-180 AP5	16.90	18.00	71.0	93.0	143.0	-	●
SCCD 170-071-180 AP5	17.00	18.00	71.0	93.0	143.0	-	●
SCCD 175-071-180 AP5	17.50	18.00	71.0	93.0	143.0	M20	●
SCCD 177-071-180 AP5	17.70	18.00	71.0	93.0	143.0	-	●
SCCD 180-071-180 AP5	18.00	18.00	71.0	93.0	143.0	-	●
SCCD 185-077-200 AP5	18.50	20.00	77.0	101.0	153.0	-	●
SCCD 190-077-200 AP5	19.00	20.00	77.0	101.0	153.0	-	●
SCCD 195-077-200 AP5	19.50	20.00	77.0	101.0	153.0	M22	●
SCCD 200-077-200 AP5	20.00	20.00	77.0	101.0	153.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

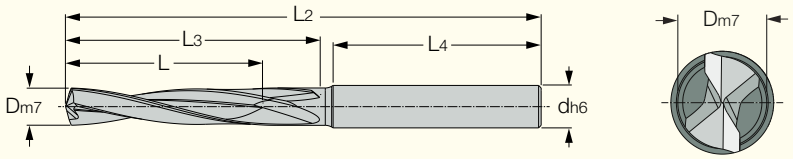
(1) Used for standard thread size.

SCD-AH5 (5xD)

Solid Carbide Drills for Hard Materials, Drilling Depth 5xD



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



Designation	Dimensions D	L	L3	d	L4	L2	Th(1)	IC903
SCD 030-015-060 AH5	3.00	15.0	26.0	6.00	35.0	66.0	M4	●
SCD 033-017-060 AH5	3.30	16.5	26.0	6.00	35.0	66.0	-	●
SCD 035-018-060 AH5	3.50	17.5	26.0	6.00	35.0	66.0	-	●
SCD 040-020-060 AH5	4.00	20.0	29.0	6.00	32.0	66.0	-	●
SCD 042-021-060 AH5	4.20	21.0	32.0	6.00	46.0	82.0	M5	●
SCD 044-022-060 AH5	4.40	22.0	32.0	6.00	46.0	82.0	-	●
SCD 045-023-060 AH5	4.50	22.5	32.0	6.00	46.0	82.0	-	●
SCD 050-025-060 AH5	5.00	25.0	37.0	6.00	41.0	82.0	M6	●
SCD 053-027-060 AH5	5.30	26.5	39.0	6.00	37.0	82.0	-	●
SCD 055-028-060 AH5	5.50	27.5	39.0	6.00	37.0	82.0	-	●
SCD 060-030-060 AH5	6.00	30.0	43.0	6.00	37.0	82.0	M7	●
SCD 065-033-080 AH5	6.50	32.5	46.0	8.00	39.0	91.0	-	●
SCD 068-034-080 AH5	6.80	34.0	49.0	8.00	39.0	91.0	M8	●
SCD 070-035-080 AH5	7.00	35.0	49.0	8.00	39.0	91.0	-	●
SCD 075-038-080 AH5	7.50	37.5	52.0	8.00	34.0	91.0	-	●
SCD 078-039-080 AH5	7.80	42.0	55.0	8.00	34.0	91.0	M9	●
SCD 080-040-080 AH5	8.00	40.0	55.0	8.00	34.0	91.0	-	●
SCD 085-043-100 AH5	8.50	42.5	59.0	10.00	46.0	112.0	-	●
SCD 088-044-100 AH5	8.80	44.0	63.0	10.00	46.0	112.0	M10	●
SCD 090-045-100 AH5	9.00	45.0	63.0	10.00	46.0	112.0	-	●
SCD 095-048-100 AH5	9.50	47.5	66.0	10.00	39.0	112.0	M11	●
SCD 100-050-100 AH5	10.00	50.0	70.0	10.00	39.0	112.0	-	●
SCD 105-053-120 AH5	10.50	52.5	71.0	12.00	45.0	122.0	-	●
SCD 110-055-120 AH5	11.00	55.0	74.0	12.00	45.0	122.0	-	●
SCD 115-058-120 AH5	11.50	57.5	77.0	12.00	40.0	122.0	-	●
SCD 120-060-120 AH5	12.00	60.0	81.0	12.00	40.0	122.0	M14	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C49.

(1) Used for standard thread size

Recommended Machining Conditions for SCD...AH5 Solid Drills

ISO	Material	Hardness	Material No.	Cutting Speed Vc (m/min)	Feed vs. Drill Diameter (mm/rev) Ø3-5	Ø5.1-8	Ø8.1-12
H	Hardened steel	50-55 HRc	38	25-40	0.04-0.07	0.05-0.08	0.06-0.10
	Hardened steel	56-60 HRc	39	15-25	0.03-0.06	0.04-0.07	0.05-0.08
	Hardened steel	61-70 HRc	39	10-15	0.02-0.04	0.03-0.05	0.03-0.05

Materials over 50 HRc must be used with external cooling while machining.

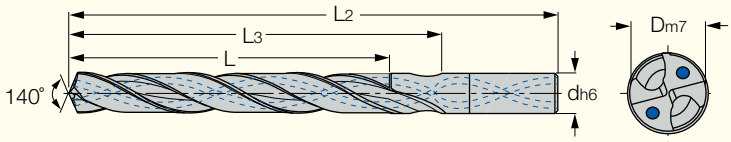
Use of semi-synthetic or emulsion with more than 6% oil concentration is highly recommended to extend tool life and hole quality.

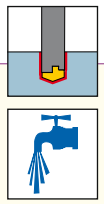
SOLIDDRILL

SCD-ACG8 (8xD)

Solid Carbide Drills with Coolant Holes, Drilling Depth 8xD, DIN 6537

D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029





Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 030-029-060 ACG8	3.00	6.00	29.0	34.0	72.0	-	●
SCD 031-029-060 ACG8	3.10	6.00	29.0	34.0	72.0	-	●
SCD 032-029-060 ACG8	3.20	6.00	29.0	34.0	72.0	-	●
SCD 033-029-060 ACG8	3.30	6.00	29.0	34.0	72.0	M4	●
SCD 034-029-060 ACG8	3.40	6.00	29.0	34.0	72.0	-	●
SCD 035-029-060 ACG8	3.50	6.00	29.0	34.0	72.0	-	●
SCD 036-029-060 ACG8	3.60	6.00	29.0	34.0	72.0	-	●
SCD 037-029-060 ACG8	3.70	6.00	29.0	34.0	72.0	-	●
SCD 038-036-060 ACG8	3.80	6.00	36.0	43.0	81.0	-	●
SCD 039-036-060 ACG8	3.90	6.00	36.0	43.0	81.0	-	●
SCD 040-036-060 ACG8	4.00	6.00	36.0	43.0	81.0	-	●
SCD 041-036-060 ACG8	4.10	6.00	36.0	43.0	81.0	-	●
SCD 042-036-060 ACG8	4.20	6.00	36.0	43.0	81.0	M5	●
SCD 043-036-060 ACG8	4.30	6.00	36.0	43.0	81.0	-	●
SCD 044-036-060 ACG8	4.40	6.00	36.0	43.0	81.0	-	●
SCD 045-036-060 ACG8	4.50	6.00	36.0	43.0	81.0	-	●
SCD 046-036-060 ACG8	4.60	6.00	36.0	43.0	81.0	-	●
SCD 047-036-060 ACG8	4.70	6.00	36.0	43.0	81.0	-	●
SCD 053-048-060 ACG8	5.30	6.00	48.0	57.0	95.0	-	●
SCD 054-048-060 ACG8	5.40	6.00	48.0	57.0	95.0	-	●
SCD 056-048-060 ACG8	5.60	6.00	48.0	57.0	95.0	-	●
SCD 057-048-060 ACG8	5.70	6.00	48.0	57.0	95.0	-	●
SCD 058-048-060 ACG8	5.80	6.00	48.0	57.0	95.0	-	●
SCD 059-048-060 ACG8	5.90	6.00	48.0	57.0	95.0	-	●
SCD 060-048-060 ACG8	6.00	6.00	48.0	57.0	95.0	M7	●
SCD 062-064-080 ACG8	6.20	8.00	64.0	76.0	114.0	-	●
SCD 063-064-080 ACG8	6.30	8.00	64.0	76.0	114.0	-	●
SCD 068-064-080 ACG8	6.80	8.00	64.0	76.0	114.0	M8	●
SCD 073-064-080 ACG8	7.30	8.00	64.0	76.0	114.0	-	●
SCD 074-064-080 ACG8	7.40	8.00	64.0	76.0	114.0	-	●
SCD 075-064-080 ACG8	7.50	8.00	64.0	76.0	114.0	-	●
SCD 077-064-080 ACG8	7.70	8.00	64.0	76.0	114.0	-	●
SCD 078-064-080 ACG8	7.80	8.00	64.0	76.0	114.0	M9	●
SCD 079-064-080 ACG8	7.90	8.00	64.0	76.0	114.0	-	●
SCD 081-080-100 ACG8	8.10	10.00	80.0	95.0	142.0	-	●
SCD 082-080-100 ACG8	8.20	10.00	80.0	95.0	142.0	-	●
SCD 083-080-100 ACG8	8.30	10.00	80.0	95.0	142.0	-	●
SCD 084-080-100 ACG8	8.40	10.00	80.0	95.0	142.0	-	●
SCD 085-080-100 ACG8	8.50	10.00	80.0	95.0	142.0	M10	●
SCD 086-080-100 ACG8	8.60	10.00	80.0	95.0	142.0	-	●
SCD 087-080-100 ACG8	8.70	10.00	80.0	95.0	142.0	-	●
SCD 088-080-100 ACG8	8.80	10.00	80.0	95.0	142.0	-	●
SCD 089-080-100 ACG8	8.90	10.00	80.0	95.0	142.0	-	●
SCD 091-080-100 ACG8	9.10	10.00	80.0	95.0	142.0	-	●
SCD 092-080-100 ACG8	9.20	10.00	80.0	95.0	142.0	-	●
SCD 093-080-100 ACG8	9.30	10.00	80.0	95.0	142.0	-	●
SCD 094-080-100 ACG8	9.40	10.00	80.0	95.0	142.0	-	●
SCD 095-080-100 ACG8	9.50	10.00	80.0	95.0	142.0	M11	●
SCD 096-080-100 ACG8	9.60	10.00	80.0	95.0	142.0	-	●
SCD 097-080-100 ACG8	9.70	10.00	80.0	95.0	142.0	-	●
SCD 099-080-100 ACG8	9.90	10.00	80.0	95.0	142.0	-	●
SCD 100-080-100 ACG8	10.00	10.00	80.0	95.0	142.0	-	●

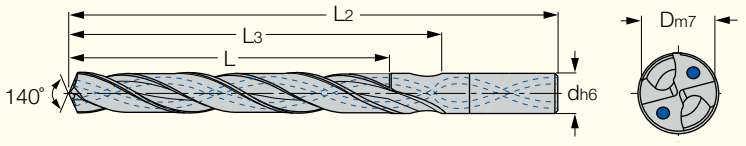
• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C46.

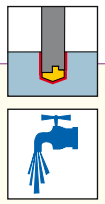
(1) Used for standard thread size.

SCD-ACP8 (8xD)

Solid Carbide Drills with Coolant Holes, Drilling Depth 8xD

D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029





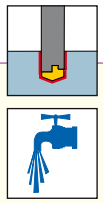
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 030-029-060 ACP8	3.00	6.00	29.0	34.0	72.0	-	●
SCD 031-029-060 ACP8	3.10	6.00	29.0	34.0	72.0	-	●
SCD 032-029-060 ACP8	3.20	6.00	29.0	34.0	72.0	-	●
SCD 033-029-060 ACP8	3.30	6.00	29.0	34.0	72.0	M4	●
SCD 034-029-060 ACP8	3.40	6.00	29.0	34.0	72.0	-	●
SCD 035-029-060 ACP8	3.50	6.00	29.0	34.0	72.0	-	●
SCD 036-029-060 ACP8	3.60	6.00	29.0	34.0	72.0	-	●
SCD 037-029-060 ACP8	3.70	6.00	29.0	34.0	72.0	-	●
SCD 038-036-060 ACP8	3.80	6.00	36.0	43.0	81.0	-	●
SCD 039-036-060 ACP8	3.90	6.00	36.0	43.0	81.0	-	●
SCD 040-036-060 ACP8	4.00	6.00	36.0	43.0	81.0	-	●
SCD 041-036-060 ACP8	4.10	6.00	36.0	43.0	81.0	-	●
SCD 042-036-060 ACP8	4.20	6.00	36.0	43.0	81.0	M5	●
SCD 043-036-060 ACP8	4.30	6.00	36.0	43.0	81.0	-	●
SCD 044-036-060 ACP8	4.40	6.00	36.0	43.0	81.0	-	●
SCD 045-036-060 ACP8	4.50	6.00	36.0	43.0	81.0	-	●
SCD 046-036-060 ACP8	4.60	6.00	36.0	43.0	81.0	-	●
SCD 047-036-060 ACP8	4.70	6.00	36.0	43.0	81.0	-	●
SCD 048-048-060 ACP8	4.80	6.00	48.0	57.0	95.0	-	●
SCD 049-048-060 ACP8	4.90	6.00	48.0	57.0	95.0	-	●
SCD 050-048-060 ACP8	5.00	6.00	48.0	57.0	95.0	M6	●
SCD 051-048-060 ACP8	5.10	6.00	48.0	57.0	95.0	-	●
SCD 052-048-060 ACP8	5.20	6.00	48.0	57.0	95.0	-	●
SCD 053-048-060 ACP8	5.30	6.00	48.0	57.0	95.0	-	●
SCD 054-048-060 ACP8	5.40	6.00	48.0	57.0	95.0	-	●
SCD 055-048-060 ACP8	5.50	6.00	48.0	57.0	95.0	-	●
SCD 056-048-060 ACP8	5.60	6.00	48.0	57.0	95.0	-	●
SCD 057-048-060 ACP8	5.70	6.00	48.0	57.0	95.0	-	●
SCD 058-048-060 ACP8	5.80	6.00	48.0	57.0	95.0	-	●
SCD 059-048-060 ACP8	5.90	6.00	48.0	57.0	95.0	-	●
SCD 060-048-060 ACP8	6.00	6.00	48.0	57.0	95.0	M7	●
SCD 061-064-080 ACP8	6.10	8.00	64.0	76.0	114.0	-	●
SCD 062-064-080 ACP8	6.20	8.00	64.0	76.0	114.0	-	●
SCD 063-064-080 ACP8	6.30	8.00	64.0	76.0	114.0	-	●
SCD 064-064-080 ACP8	6.40	8.00	64.0	76.0	114.0	-	●
SCD 065-064-080 ACP8	6.50	8.00	64.0	76.0	114.0	-	●
SCD 066-064-080 ACP8	6.60	8.00	64.0	76.0	114.0	-	●
SCD 067-064-080 ACP8	6.70	8.00	64.0	76.0	114.0	-	●
SCD 068-064-080 ACP8	6.80	8.00	64.0	76.0	114.0	M8	●
SCD 069-064-080 ACP8	6.90	8.00	64.0	76.0	114.0	-	●
SCD 070-064-080 ACP8	7.00	8.00	64.0	76.0	114.0	-	●
SCD 071-064-080 ACP8	7.10	8.00	64.0	76.0	114.0	-	●
SCD 072-064-080 ACP8	7.20	8.00	64.0	76.0	114.0	-	●
SCD 073-064-080 ACP8	7.30	8.00	64.0	76.0	114.0	-	●
SCD 074-064-080 ACP8	7.40	8.00	64.0	76.0	114.0	-	●
SCD 075-064-080 ACP8	7.50	8.00	64.0	76.0	114.0	-	●
SCD 076-064-080 ACP8	7.60	8.00	64.0	76.0	114.0	-	●
SCD 077-064-080 ACP8	7.70	8.00	64.0	76.0	114.0	-	●
SCD 078-064-080 ACP8	7.80	8.00	64.0	76.0	114.0	M9	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

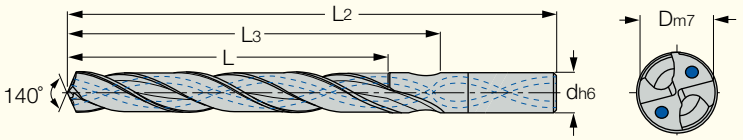
(1) Used for standard thread size.

SCD-ACP8 (8xD) (continued)

Solid Carbide Drills with Coolant Holes, Drilling Depth 8xD



D	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



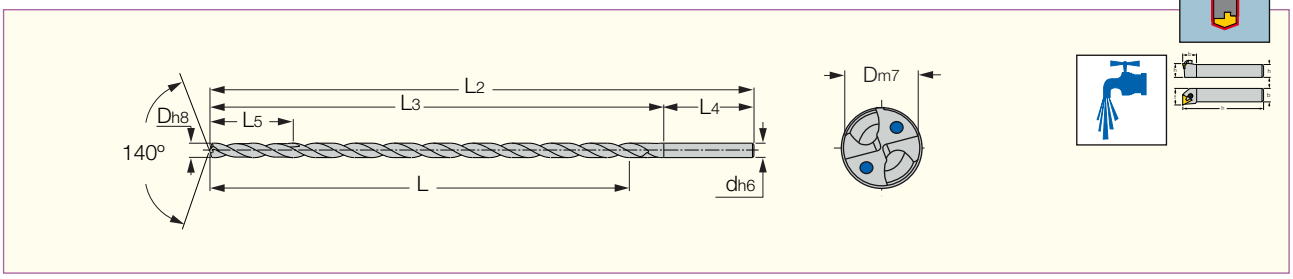
Designation	Dimensions D	d	L	L3	L2	Th(1)	IC908
SCD 079-064-080 ACP8	7.90	8.00	64.0	76.0	114.0	-	●
SCD 080-064-080 ACP8	8.00	8.00	64.0	76.0	114.0	-	●
SCD 081-080-100 ACP8	8.10	10.00	80.0	95.0	142.0	-	●
SCD 082-080-100 ACP8	8.20	10.00	80.0	95.0	142.0	-	●
SCD 083-080-100 ACP8	8.30	10.00	80.0	95.0	142.0	-	●
SCD 084-080-100 ACP8	8.40	10.00	80.0	95.0	142.0	-	●
SCD 085-080-100 ACP8	8.50	10.00	80.0	95.0	142.0	M10	●
SCD 086-080-100 ACP8	8.60	10.00	80.0	95.0	142.0	-	●
SCD 087-080-100 ACP8	8.70	10.00	80.0	95.0	142.0	-	●
SCD 088-080-100 ACP8	8.80	10.00	80.0	95.0	142.0	-	●
SCD 089-080-100 ACP8	8.90	10.00	80.0	95.0	142.0	-	●
SCD 090-080-100 ACP8	9.00	10.00	80.0	95.0	142.0	-	●
SCD 091-080-100 ACP8	9.10	10.00	80.0	95.0	142.0	-	●
SCD 092-080-100 ACP8	9.20	10.00	80.0	95.0	142.0	-	●
SCD 093-080-100 ACP8	9.30	10.00	80.0	95.0	142.0	-	●
SCD 094-080-100 ACP8	9.40	10.00	80.0	95.0	142.0	-	●
SCD 095-080-100 ACP8	9.50	10.00	80.0	95.0	142.0	M11	●
SCD 096-080-100 ACP8	9.60	10.00	80.0	95.0	142.0	-	●
SCD 097-080-100 ACP8	9.70	10.00	80.0	95.0	142.0	-	●
SCD 098-080-100 ACP8	9.80	10.00	80.0	95.0	142.0	-	●
SCD 099-080-100 ACP8	9.90	10.00	80.0	95.0	142.0	-	●
SCD 100-080-100 ACP8	10.00	10.00	80.0	95.0	142.0	-	●

• For user guide and cutting conditions, see pages C31-44 • For regrinding instructions, see page C45.

(1) Used for standard thread size.

SCD-ACP20 (20xD)

Solid Carbide Drills with Coolant Holes, Drilling Depth 20xD



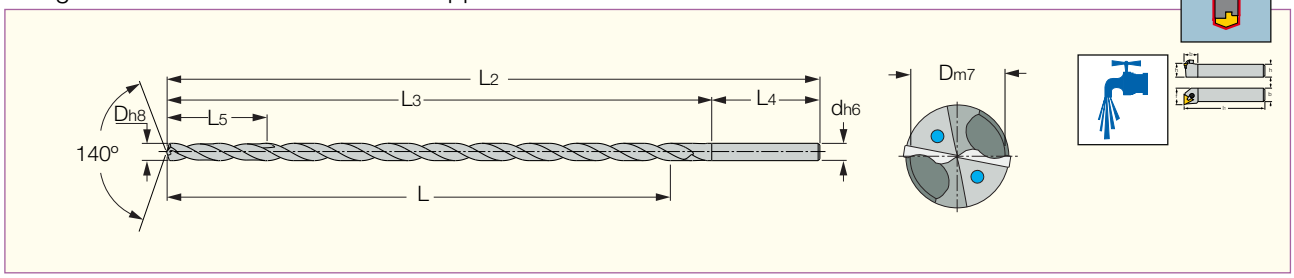
Designation	Dimensions D	L	L3	L2	L4	L5(1)	d	IC908
SCD 050-100-050ACP20	5.00	100.0	115.0	165.0	50.0	40.00	5.00	●
SCD 060-120-060ACP20	6.00	120.0	140.0	190.0	50.0	40.00	6.00	●
SCD 070-140-070ACP20	7.00	140.0	160.0	210.0	50.0	55.00	7.00	●
SCD 080-160-080ACP20	8.00	160.0	180.0	230.0	50.0	55.00	8.00	●
SCD 090-180-090ACP20	9.00	180.0	205.0	265.0	60.0	55.00	9.00	●
SCD 100-200-100ACP20	10.00	200.0	225.0	285.0	60.0	55.00	10.00	●

• For user guide and cutting conditions, see pages C31-44.

(1) Four margin leading portion, up to 50% of this length may be used for regrinding.

SCD-ACP-CS (20xD)

Solid Carbide Drills with Coolant Holes, Drilling Depth 20-22xD,
Designed for Automotive Crankshaft Applications



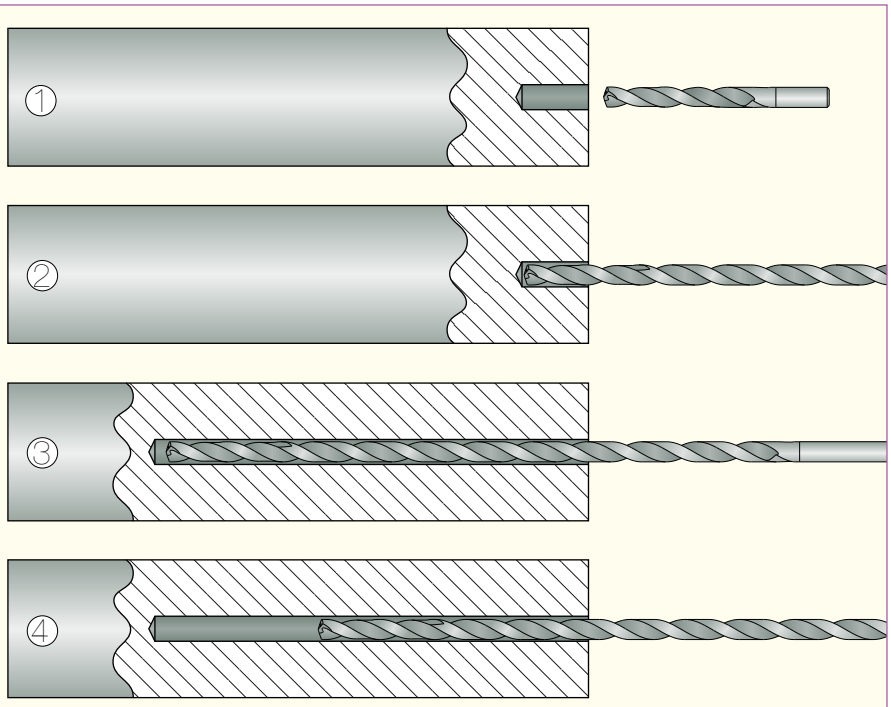
Designation	Dimensions D	L	L3	L2	d	Coolant	L4	L5(1)	IC908
SCD 050-103-060ACP-CS	5.00	103.0	118.0	156.0	6.00	Y	38.0	40.00	●
SCD 054-107-060ACP-CS	5.40	107.0	127.0	165.0	6.00	Y	38.0	40.00	●
SCD 060-120-060ACP-CS	6.00	120.0	140.0	178.0	6.00	Y	38.0	40.00	●
SCD 070-160-070ACP-CS	7.00	160.0	180.0	235.0	7.00	Y	55.0	55.00	●

• For user guide and cutting conditions, see pages C31-44.

(1) Up to 50% of this length may be used to regrind

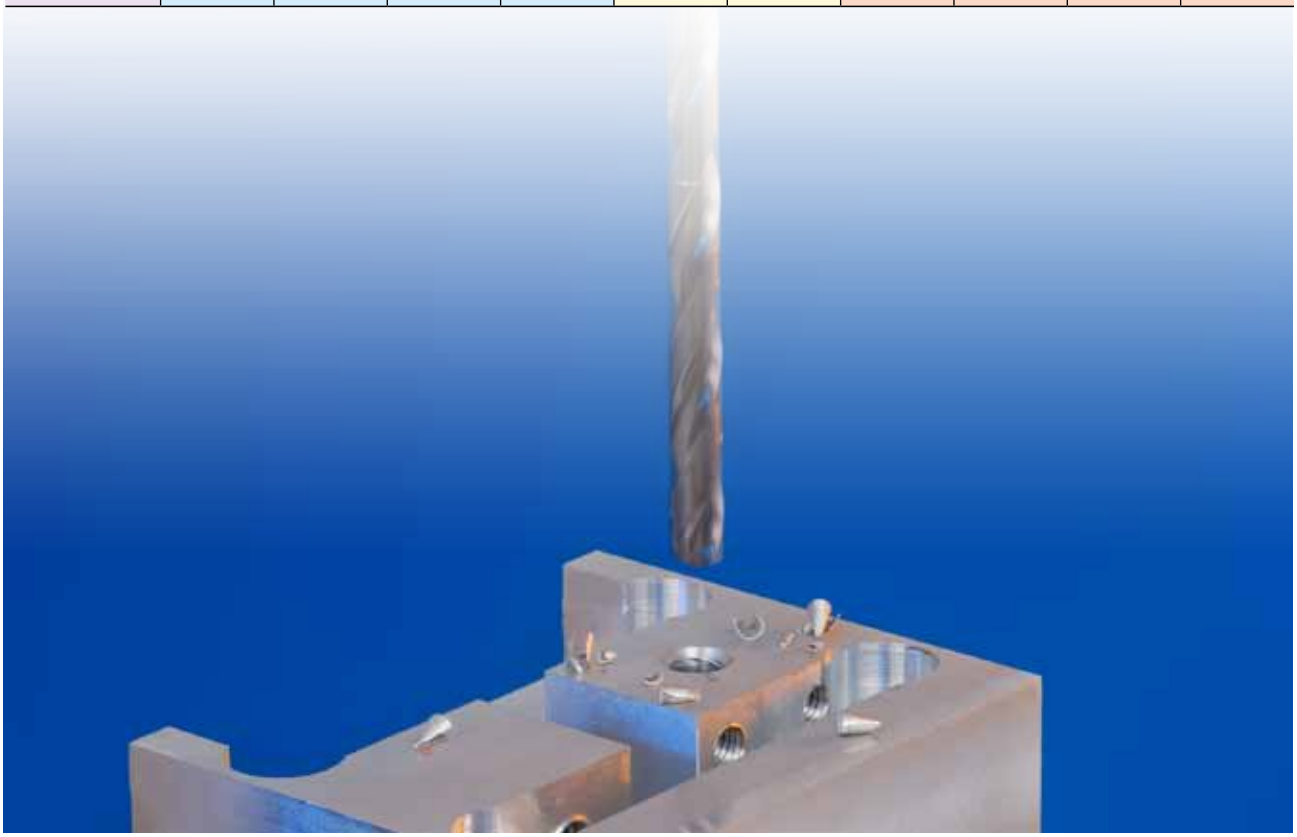
Recommended Drilling Procedure for Deep Hole Drilling (20XD)

- Drill a pilot hole 1-2*D deep with a short drill. The pilot drill should be 0.03-0.05 mm larger than the long drill and its point angle should also be larger (over 140°).
- Enter the pre-hole using low speed and feed, until it engages the material.
- Increase cutting speed and feed to recommended conditions – **no pecking is required!**
- After having reached the required depth, reduce speed by more than 50% while retracting from the hole.



Recommended Drilling Conditions for Solid Carbide 20xD Drills

	Carbon Steel (30 HRc)		Alloy Steel (45 HRc)		Stainless Steel		Cast Iron (GG25)		Ductile Cast Iron (GG45)	
Drill Dia. (mm)	V(m/min)	f(mm/rev)	V(m/min)	f(mm/rev)	V(m/min)	f(mm/rev)	V(m/min)	f(mm/rev)	V(m/min)	f(mm/rev)
5	60-120	0.12-0.25	50-100	0.1-0.20	30-60	0.08-0.15	60-120	0.15-0.30	40-80	0.15-0.25
6	60-120	0.14-0.25	50-100	0.14-0.25	30-60	0.10-0.18	60-120	0.14-0.25	40-80	0.14-0.25
7-8	60-120	0.16-0.30	50-100	0.16-0.30	30-60	0.10-0.20	60-120	0.16-0.30	40-80	0.16-0.30
9-10	60-120	0.16-0.30	50-100	0.10-0.20	30-60	0.08-0.115	60-120	0.20-0.35	40-80	0.20-0.35



General Recommendations

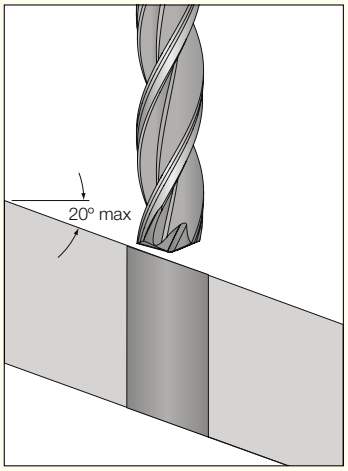
- It is most recommended to use an external coolant jet at a minimum pressure of 10 to15 bar during drilling, for prolonged tool life and to facilitate chip evacuation.
- When machining alloy and stainless steel, it is most recommended to use ER JET 2 collet in order to prolong tool life and prevent built-up edge.
- Semi-synthetic or emulsion lubricants should be used to extend tool life.
- Drilling stainless steel or high temperature alloys requires high oil pressure and 7-15% mineral or vegetable based oil emulsion for prolonged tool life. Dry machining may badly affect hole quality and drill tool life.
- In case of chip evacuation problems or when poor surface finish is obtained, it is most recommended to use pecking cycle.
- For optimal performance, it is recommended to use the three-flute, 5xD solid carbide drills in rotating or stationary applications with a maximum of 0.02 mm drill's runout. Larger runout will reduce drill performance and badly affect hole quality.
- The solid drills can be clamped into any of ISCAR's tooling systems such as:

1. Collet chucks
2. Thermal shrink chucks
3. ISCAR MAXIN power chucks

- It is recommended to use the solid drills in SHORTIN adapters with AA super precision collets, in order to obtain a high level of hole quality and prolonged drill tool life. Balanceable adapters should be used for applications above 10,000 RPM in order to minimize vibrations and gain a reliable and prolonged cutting edge life.
- Interrupted cut applications reduce hole accuracy, quality and drill life.
- See pages C42-44 for troubleshooting guide for common problems.
- Solid carbide drills can be used on a wide range of materials and different cutting conditions with high reliability and performance repeatability. This can reduce tool inventory and logistic costs.

3 Flute Solid Carbide Drills

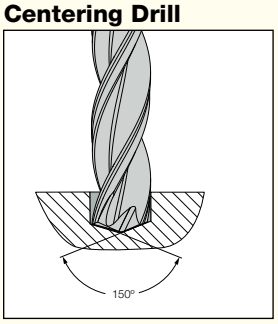
Three-flute drills are used extensively on nonferrous metals because of their excellent performance on these materials. These solid carbide drills were designed with a special cutting edge geometry which can be used on a broad spectrum of materials including steel, stainless steel, high temperature alloys, cast iron and nonferrous materials.
Their dimensions are according to DIN 6537 standard. The SCCD drills are manufactured in m7 diameter tolerance, with cylindrical shanks according to DIN 6535 HA standard, 30° spiral flute helix, 150° head point angle and a reinforced web taper.
The drills can be used on surface applications of up to 20° sloped entry/exit. (In this case, the drill should be held in a thermal shrink collet or a MAXIN power chuck). The three-flute solid carbide drills cannot be used on radial drill adjustment diameter devices such as our FITBORE adapter.



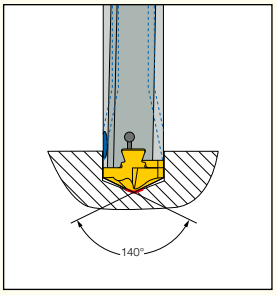
Advantages

The drills provide higher hole cylindricity, roundness, straightness, concentricity and surface finish when compared to two-flute solid carbide drills.
The three-flute solid carbide drills with a 150° point head can serve as centering drills for **CHAMDRIL**L/ **SUMOCHAM** or **CHAMGUN** if necessary.

3-Flute Centering Drill

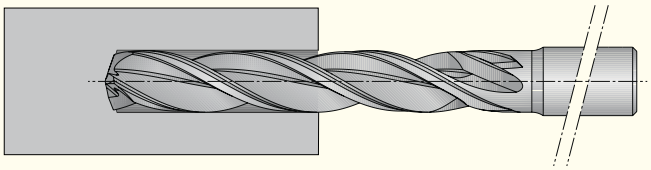


Followed by a CHAMDRILL SUMOCHAM/ CHAMGUN

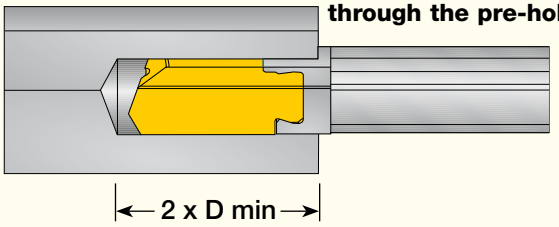


3 Flute Solid Carbide Drills

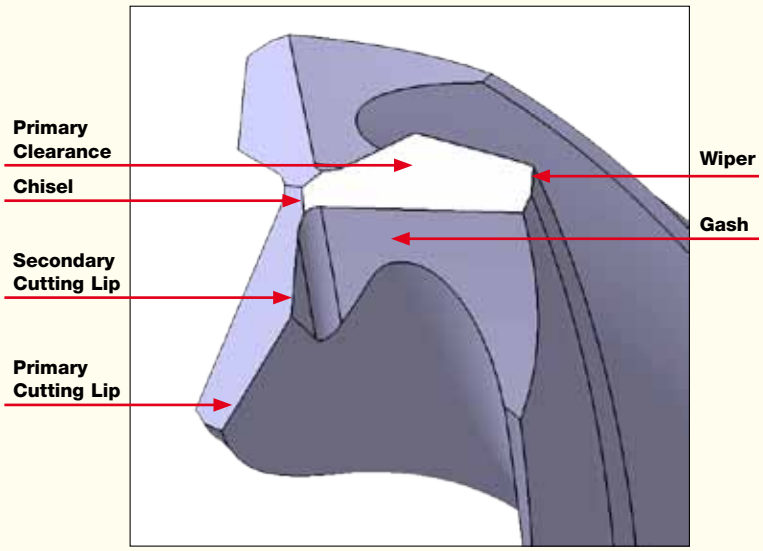
1 **3 flute drill, drilling a pre-hole (drill diameter +0.02 mm)**



2 **Gundrill penetration through the pre-hole**

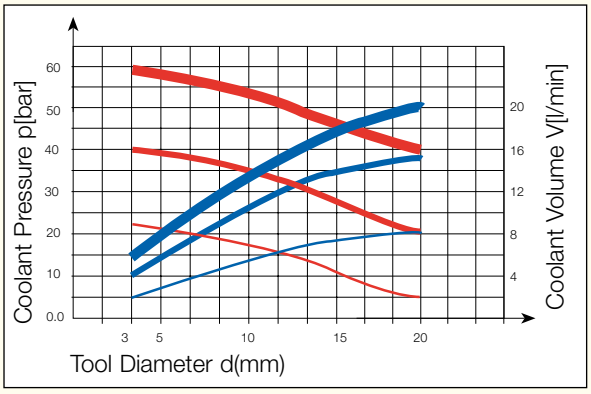


- The solid carbide drills can be re-sharpened and re-coated at least 10 times (see re-grinding instructions on page C48).
- The three-flute drills feature high dynamic stability and reduced vibrations, which enable high speed drilling on nonferrous materials. (It is recommended to use balanceable adapters when exceeding 10,000 RPM).
- Three-flute, solid carbide drills can be used with Minimal Quantity Lubrication or emulsion spray (MMS or MQL systems) or even dry machining for nonferrous materials.
- The three-flute solid carbide drill has a unique cutting edge and gash geometry, producing an optimal chip on all kinds of materials, providing excellent chip evacuation.



- Excellent performance on low carbon steel or other gummy materials, when compared to any other three-flute solid carbide drills which are usually not recommended to be used on such materials.
- Higher cutting edge life, when compared to two-flute solid carbide drills without internal coolant holes. (The load is divided among three cutting edges, versus two).
- When compared to two-flute solid carbide drills:
- Prolonged cutting edge life increases productivity, due to decrease in drill change and setup time.
- Less torque per cutting edge. Therefore they can be used at higher feed rates, or used to reduce torque on machines with limited torque.
- The three-flute solid carbide drills can be used on any CNC machining center, lathe machine, or drilling machine (which usually provides better and more stable conditions).

Coolant Pressure and Volume Recommendations



Required coolant pressure and volume for SCD drills with internal coolant spiral nozzles.

Required Coolant Pressure

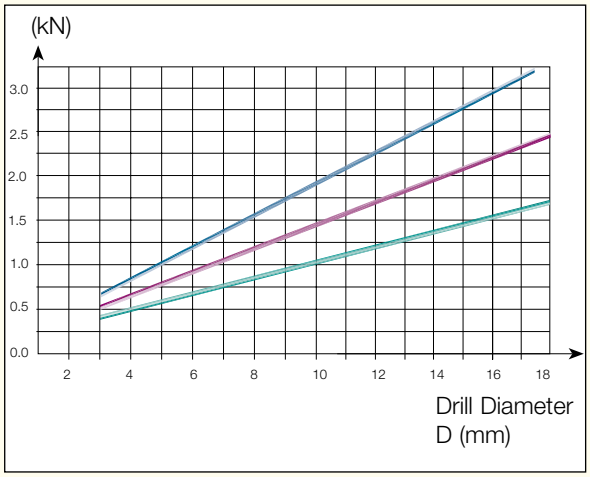
- Optimum pressure
- Good pressure
- Minimum pressure

Required Coolant Volume

- Optimum volume
- Good volume
- Minimum volume

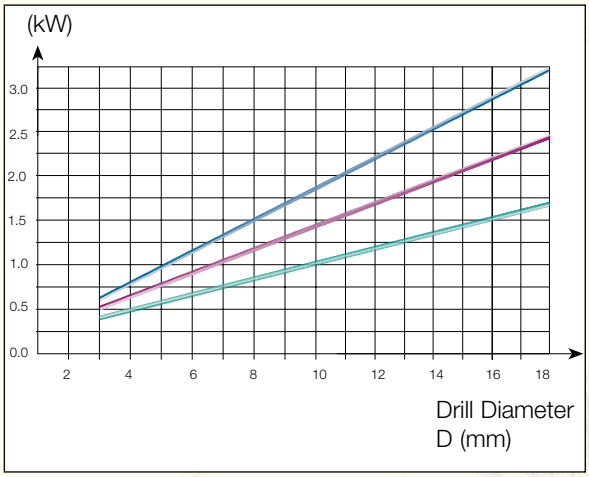
Force and Power Characteristics

Feed Force



- **f=0.30 mm/rev**
- **f=0.25 mm/rev**
- **f=0.20 mm/rev**

Net Power Consumption



- **f=0.30 mm/rev**
- **f=0.25 mm/rev**
- **f=0.20 mm/rev**

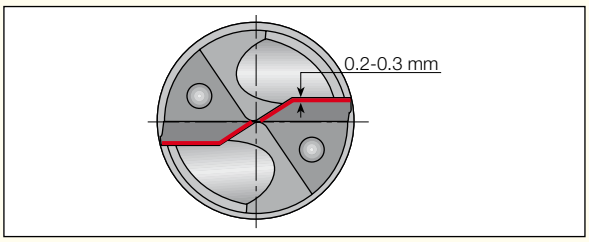
Material: SAE 4340
Speed: 100 m/min
Values may change for different materials and drilling conditions.

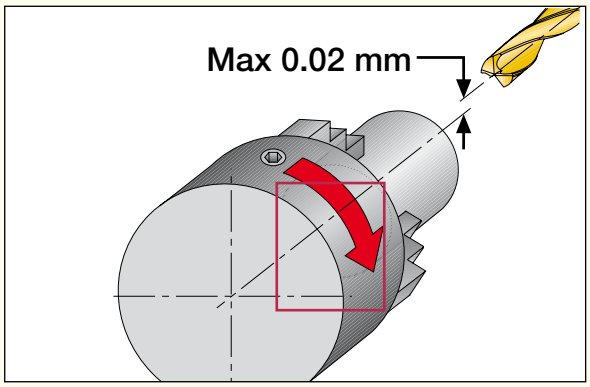
Stability

The stability of the volume of the application is important in order to obtain the best tool life and hole accuracy. Check the condition of the machine spindle, fixture and fixturing of the component to secure maximum stability and rigidity.
Unstable conditions can cause tool breakage.

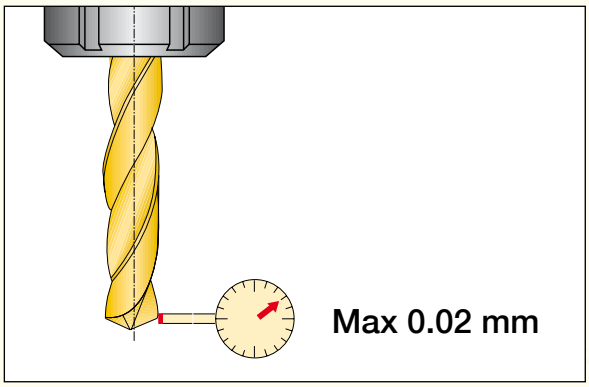
Tool Life

Drills should not be used with flank wear exceeding 0.2-0.3 mm.

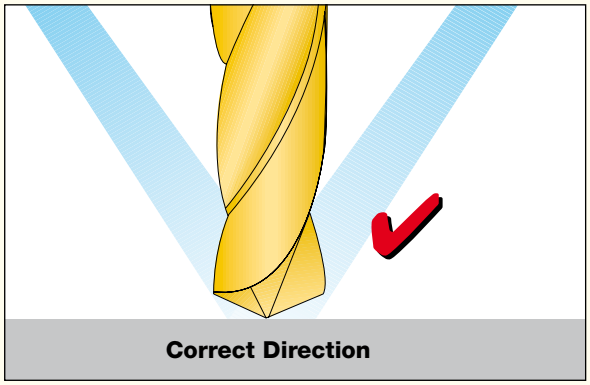




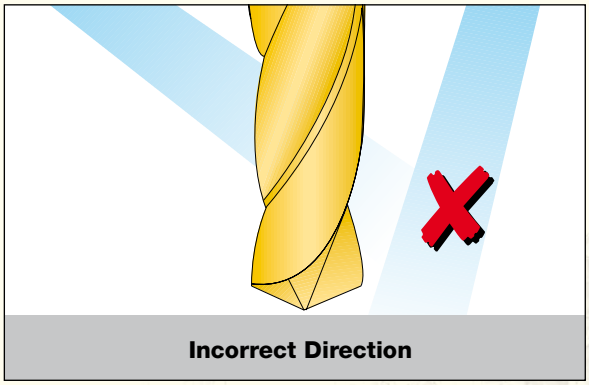
Stationary Drill



Rotating Drill



External Coolant



External Coolant

Machining Data for Solid Carbide Drills D=Ø0.8-2.9 mm

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material No.(1)
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
			Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% of alloying elements)		Annealed	600	200	6
			Quenched and tempered	930	275	7
				1000	300	8
				1200	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	200	10
			Quenched and tempered	1100	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	12
			Martensitic	820	240	13
			Austenitic	600	180	14
K	Grey cast iron (GG)		Ferritic/pearlitic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable cast iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum-wrought alloy		Not cureable		60	21
			Cured		100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolitic copper		100	28
	Non-metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
		Ni or Co based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti alloys			RM 400		36
			Alpha+beta alloys cured	RM 1050		37
H	Hardened steel		Hardened		55 HRc	38
			Hardened		60 HRc	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRc	41

- For drill with lengh to diameter ratio larger than 6xD, reduce feed by 20%.
- If the RPM exceeds 10,000 a dynamic balance should be done to the system.
- Maximal radial and axial runout should not exceed 0.01 mm.

(1)For workpiece materials list, see pages G6-41.

Cutting Speed Vc m/min	Feed (mm/rev) vs. Drill Diameter			
	Ø0.8-1.4	Ø1.5-1.9	Ø2-2.4	Ø2.5-2.9
50-100	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-100	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-85	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-85	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-85	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-75	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-60	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-60	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-60	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
30-50	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
30-50	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
20-35	0.03-0.06	0.04-0.08	0.05-0.1	0.06-0.1
20-35	0.03-0.06	0.04-0.08	0.05-0.1	0.06-0.1
20-35	0.03-0.06	0.04-0.08	0.05-0.1	0.06-0.1
40-80	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-70	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-95	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
50-95	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
40-80	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
80-150	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
80-150	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
80-150	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
80-150	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
80-150	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
80-150	0.03-0.1	0.05-0.15	0.07-0.17	0.08-0.2
50-150	0.05-0.12	0.07-0.15	0.08-0.18	0.09-0.18
60-160	0.05-0.15	0.07-0.18	0.08-0.2	0.09-0.22
10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
10-20	0.02-0.03	0.02-0.03	0.03-0.04	0.03-0.04
10-20	0.02-0.03	0.02-0.03	0.03-0.04	0.03-0.04
10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03

As a starting value, the middle of the recommended machining range should be used.
Then, (according to wear results), conditions can be changed in order to optimize performance.

Machining Data for Solid Carbide Drills - IC908 D=3.0-20.0 mm

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material No.(1)
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
			Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% of alloying elements)		Annealed	600	200	6
			Quenched and tempered	930	275	7
				1000	300	8
				1200	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	200	10
			Quenched and tempered	1100	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	12
			Martensitic	820	240	13
			Austenitic	600	180	14
K	Grey cast iron (GG)		Ferritic/pearlitic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable cast iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum-wrought alloy		Not cureable		60	21
			Cured		100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolitic copper		100	28
	Non-metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
		Ni or Co based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti alloys			RM 400		36
			Alpha+beta alloys cured	RM 1050		37
H	Hardened steel		Hardened		55 HRc	38
			Hardened		60 HRc	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRc	41

- When using external coolant supply only, reduce cutting speed by 10%.
- Use internal coolant supply when machining austenitic stainless steel.

(1)For workpiece materials list, see pages G6-41.

Cutting Speed Vc m/min	Feed (mm/rev) vs. Drill Diameter				
	Ø3-5	Ø5.1-8	Ø8.1-12	Ø12.1-16	Ø16.1-20
80-120	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
80-110	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
70-100	0.10-0.20	0.15-0.28	0.2-0.35	0.20-0.38	0.25-0.42
70-90	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
60-80	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
50-70	0.10-0.20	0.15-0.28	0.2-0.35	0.20-0.38	0.25-0.42
60-80	0.10-0.20	0.15-0.28	0.18-0.35	0.20-0.38	0.25-0.42
50-70	0.10-0.15	0.12-0.20	0.14-0.25	0.16-0.30	0.18-0.32
25-75	0.04-0.10	0.05-0.15	0.05-0.18	0.08-0.20	0.10-0.20
85-105	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.50	0.35-0.55
75-90	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.50	0.35-0.55
65-80	0.12-0.20	0.15-0.25	0.20-0.35	0.25-0.40	0.30-0.45
70-300	0.10-0.25	0.15-0.35	0.25-0.45	0.30-0.50	0.35-0.55
70-200					
70-300	0.07-0.18	0.12-0.25	0.20-0.35	0.25-0.45	0.30-0.50
15-35	0.02-0.07	0.04-0.10	0.06-0.12	0.08-0.15	0.08-0.18
40-70	0.06-0.10	0.08-0.12	0.10-0.14	0.12-0.16	0.14-0.18

As a starting value, the middle of the recommended machining range should be used.
Then, (according to wear results), conditions can be changed in order to optimize performance.

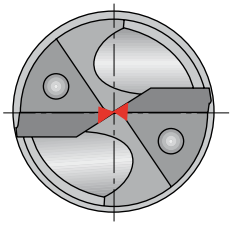
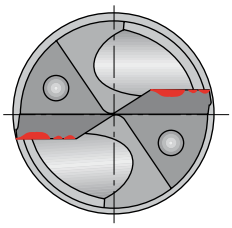
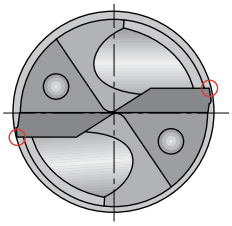
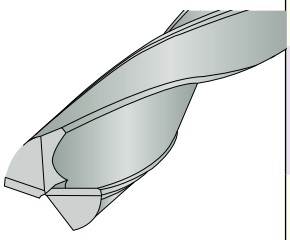
Cutting Recommendations for 3-Flute Solid Carbide Drills

ISO	Material		Condition	Tensile Strength Rm [N/mm2]	Hardness HB
P	Non-alloy steel, cast steel, free cutting steel	0.1 - 0.25 %C	Annealed	420	125
		0.25 - 0.25 %C	Annealed	650	190
		0.25 - 0.25 %C	Quenched and tempered	850	250
		0.55 - 0.80 %C	Annealed	750	220
		0.55 - 0.80 %C	Quenched and tempered	1000	300
	Low alloy steel and cast steel (less than 5% alloying elements)		Annealed	600	200
			Quenched and tempered	930	275
				1000	300
				1200	350
	High alloy steel, cast steel and tool steel		Annealed	680	200
			Quenched and tempered	1100	325
M	Stainless steel and cast steel		Ferritic/martensitic	680	200
			Martensitic	820	240
			Austenitic	600	180
K	Grey cast iron (GG)		Ferritic/pearlitic		180
			Pearlitic		260
	Ductile cast iron (nodular) (GGG)		Ferritic		160
			Pearlitic		250
	Malleable cast iron		Ferritic		130
			Pearlitic		230
N	Aluminum-wrought alloy		Not cureable		60
			Cured		100
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75
			Cured		90
		>12% Si	High temp.		130
	Copper alloys	>1% Pb	Free cutting		110
			Brass		90
			Electrolitic copper		100
	Non-metallic		Duroplastics, fiber plastics		
			Hard rubber		
S	High temp. alloys	Fe based	Annealed		200
			Cured		280
	Super alloys	Ni or Co based	Annealed		250
			Cured		350
			Cast		320
	Titanium, Ti alloys			Rm 400	
		Alpha+beta alloys cured		Rm 1050	
H	Hardened steel		Hardened		55 HRc
			Hardened		60 HRc
	Chilled cast iron		Cast		400
	Cast iron		Hardened		55 HRc

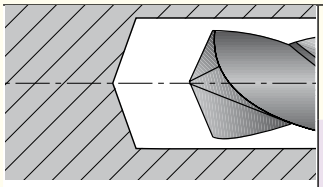
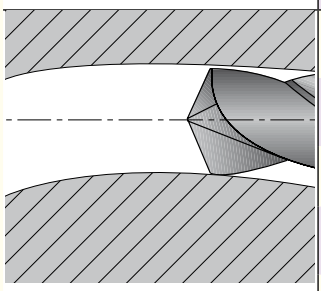
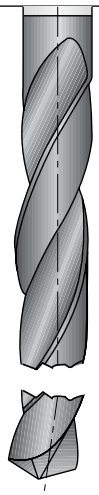
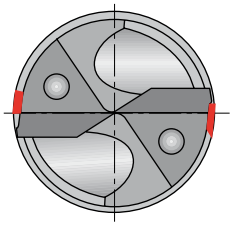
Mtl. No.[1]	Cutting speed vc m/min	Feed (mm/rev) vs. Drill Diameter				
		3-5	5.1-8	8.1-12	12.1-16	16.1-20
1	60-120	0.08-0.15	0.12-0.2	0.15-0.22	0.18-0.3	0.24-0.38
2	60-120					
3	70-100	0.08-0.16	0.12-0.23	0.15-0.28	0.2-0.34	0.25-0.40
4	70-110					
5	70-90					
6	60-120	0.08-0.15	0.12-0.2	0.15-0.22	0.16-0.28	0.2-0.32
7	70-110					
8	60-90					
9	50-80	0.08-0.16	0.12-0.23	0.15-0.28	0.15-0.31	0.2-0.34
10	60-120	0.08-0.16	0.12-0.23	0.15-0.28	0.15-0.31	0.2-0.34
11	40-70	0.08-0.12	0.1-0.16	0.11-0.2	0.13-0.24	0.15-0.26
12	25-80	0.03-0.08	0.04-0.12	0.04-0.15	0.065-0.16	0.08-0.18
13						
14						
15	60-110	0.1-0.2	0.14-0.24	0.18-0.32	0.22-0.38	0.26-0.4
16	60-110					
17	80-150	0.12-0.24	0.16-0.28	0.2-0.36	0.24-0.45	0.28-0.48
18	80-150					
19	90-115					
20	90-115					
21	100-300	0.14-0.25	0.18-0.35	0.25-0.45	0.3-0.5	0.35-0.55
22						
23						
24						
25	100-200					
26	80-180	0.1-0.18	0.12-0.25	0.2-0.34	0.24-0.42	0.26-0.5
27						
28						
29						
30						
31	15-40	0.03-0.06	0.04-0.08	0.05-0.1	0.06-0.12	0.08-0.15
32						
33	15-25[1]					
34						
35						
36	15-40					
37						
38	20-50	0.03-0.06	0.04-0.08	0.05-0.1	0.06-0.12	0.08-0.15
39						
40						
41						

[1]For workpiece materials list, see pages G6-41.

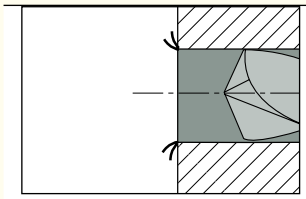
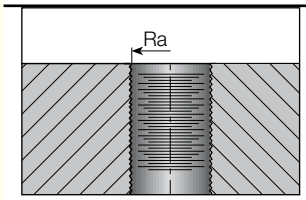
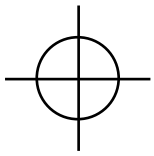
Troubleshooting

Problem	Cause	Solution
 Chipping on the chisel edge	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.
	• Unsuitable cutting conditions	• Decrease feed, increase coolant pressure.
	• Chisel runout	• Check or replace the clamping adaptation.
	• Workpiece movement	• Increase workpiece chucking force.
 Chipping on the cutting edges / built-up edge	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.
	• Unsuitable cutting conditions	• Increase cutting speed, reduce feed rate.
	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.
	• Rough application	• Reduce feed rate by 30-50% during entry and exit.
 Excessive wear on the cutting corners	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add coolant jets.
	• Large runout	• Check if the runout is within 0.02 mm T.I.R. (radial & axial)
	• Unsuitable cutting conditions	• Reduce cutting speed, increase feed.
	• Rough application	• Reduce feed rate by 30-50% during entry and exit.
	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.
 Chipping on the lands	• Workpiece movement	• Increase workpiece chucking force.
	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add coolant jets.
	• Wrong drill	• Check drill type, drilling depth, cooling system and workpiece material.
	• Unsuitable cutting conditions	• Increase feed. When spot drilling, reduce feed.

Troubleshooting

Problem	Cause	Solution
 Hole diameter out of tolerance	• Unsuitable cutting conditions	• If hole size is too large, INCREASE CUTTING SPEED OR REDUCE FEED. If hole size is too small, reduce cutting speed or increase feed.
	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• Large runout	• Make sure that the drill's runout is within 0.02 mm (radial & axial).
	• Worn out center point (chisel)	• Regrind cutting edge or replace the drill .
 Hole not straight	• Insufficient chip evacuation	• Use pecking cycle.
	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.
	• Workpiece rigidity	• Increase workpiece chucking force.
	• Worn out drill center point (chisel)	• Regrind cutting edge.
	• Unsuitable cutting conditions	• Increase feed. When spot drilling, reduce feed.
 Drill breakage	• Poor clamping of the chuck	• Check the clamping. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.
	• Workpiece movement	• Increase workpiece chucking force.
	• Wrong drill	• Check drill type and drilling depth, cooling system and workpiece material.
	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.
	• Unsuitable cutting conditions	• Reduce feed.
	• Worn out drill center point (chisel)	• Regrind cutting edge.
	• Insufficient chip evacuation	• Use pecking cycle.
 Chipping on the cutting corners	• Poor clamping of the chuck	• Check the clamping and adaptation. Use hydraulic clamping chuck, MAXIN power chuck or a shrink system.
	• Workpiece movement	• Increase workpiece chucking force.
	• Wrong drill	• Check drill type and drilling depth, cooling system and workpiece material. Possibly use longer drill.
	• Insufficient coolant	• Check cooling lubricant. Increase coolant pressure. In the case of external coolant supply, improve jet direction and add cooling jets.
	• Unsuitable cutting conditions	• Check cutting parameters, and possibly reduce feed.
	• Worn out or broken cutting corner	• Replace drill or regrind cutting edge.

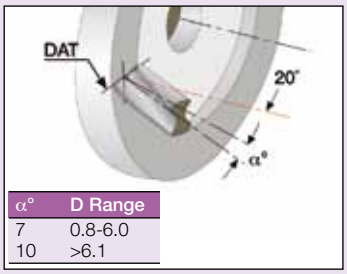
Troubleshooting

Problem	Cause	Solution
 Burrs on exit	• Unsuitable cutting conditions	• Reduce feed by 30-50% during exit.
	• Worn out drill	• Replace drill.
 Rough surface finish	• Unsuitable cutting conditions	• Adjust feed to improve chip flow.
	• Large runout	• Make sure that the drill's runout is within 0.02 mm (radial & axial).
	• Chip jamming	• Reduce cutting speed.
		• Increase coolant pressure.
		• Apply pecking procedure.
 Deviation of hole position	• Large runout	• Make sure that the drill runout is within 0.02 mm (radial & axial).
	• Poor stability	• Check and improve drill and workpiece clamping rigidity.
	• Rough application	• When drilling hard materials or sloped surfaces, reduce feed by 30-50% during entrance.
		• Use a short pilot drill with 140° point angle.

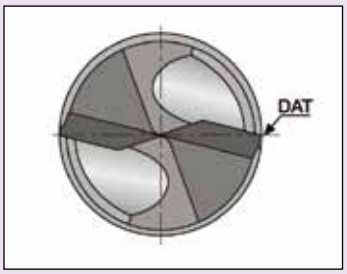
Regrinding Instructions for AP3, AP4, AP5, AP6, ACP5 and ACP8 Geometries

For Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure

1

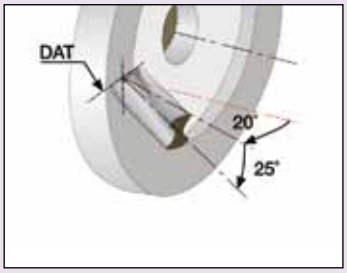


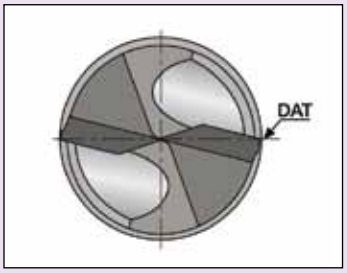
α°	D Range
7	0.8-6.0
10	>6.1



Primary Clearance

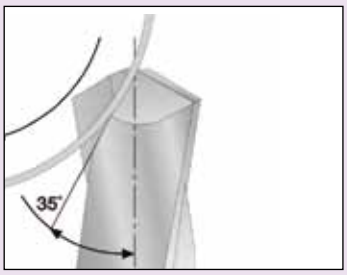
2

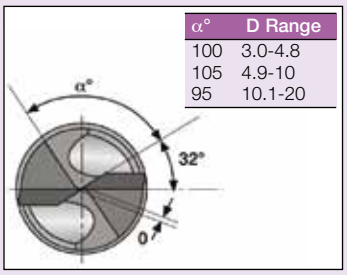




Secondary Clearance

3

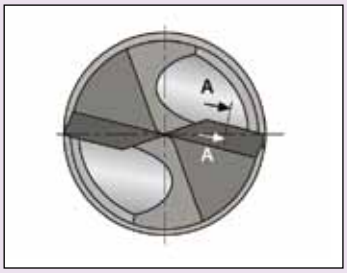


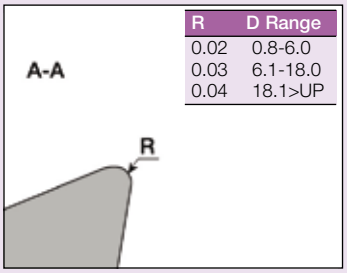


α°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

Chisel

4





R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

Edge Preparation

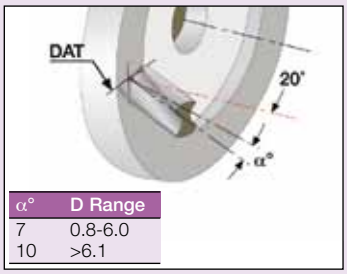
Grinding Wheel Recommended Specifications:

1. Diameter grinding wheel: GA2
2. Grinding wheel bond: synthetic resin
3. Grit size: 325/400 mesh (45/38μ).
4. Diamond concentration: C-75 (3.3 carat/cm3).
5. Cutting fluid emulsion 3%

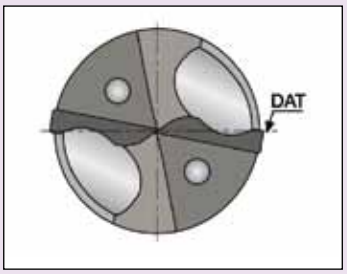
Regrinding Instructions for ACG5, AG5 and ACG8 Geometry

For Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure

1

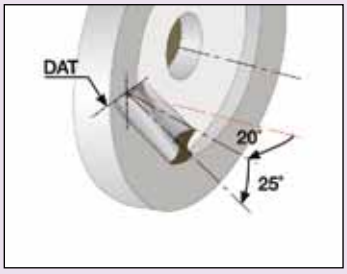


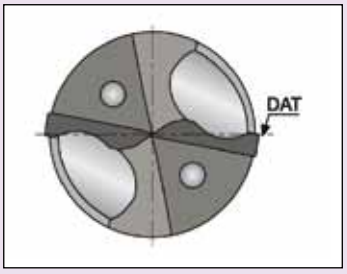
α°	D Range
7	0.8-6.0
10	>6.1



Primary Clearance

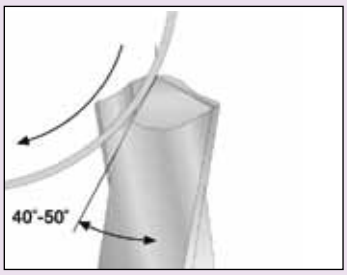
2

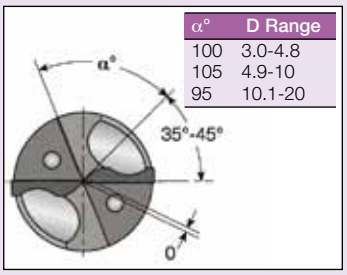




Secondary Clearance

3

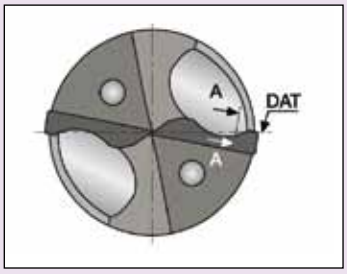


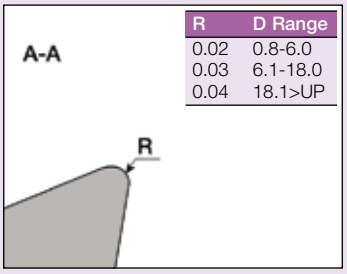


α°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

Chisel

4





R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

Edge Preparation

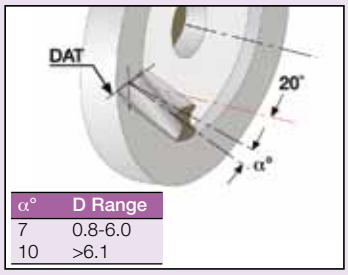
Grinding Wheel Recommended Specifications:

1. Diameter grinding wheel: GA2
2. Grinding wheel bond: synthetic resin
3. Grit size: 325/400 mesh (45/38μ).
4. Diamond concentration: C-75 (3.3 carat/cm3).
5. Cutting fluid emulsion 3%

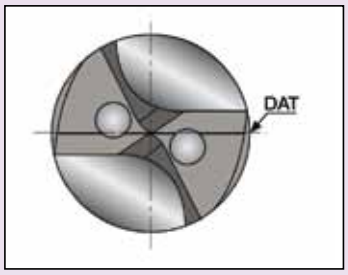
Regrinding Instructions for ACK3, ACK5 Geometries

For Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure

1

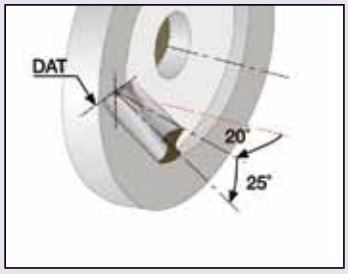


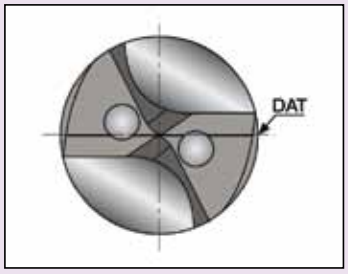
α°	D Range
7	0.8-6.0
10	>6.1



Primary Clearance

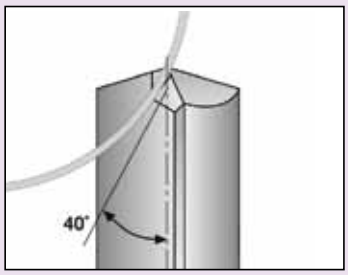
2

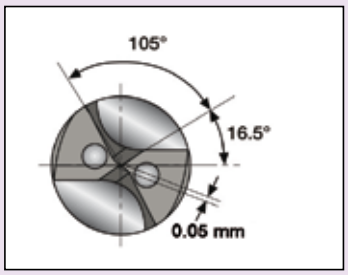




Secondary Clearance

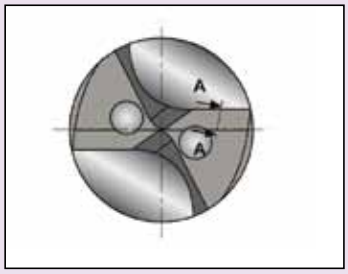
3

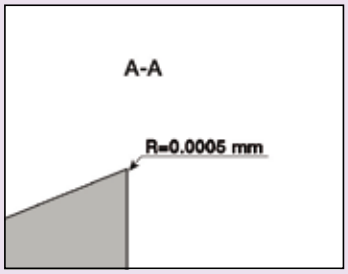




Chisel

4





Edge Preparation

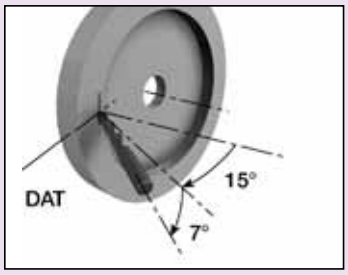
Grinding Wheel Recommended Specifications:

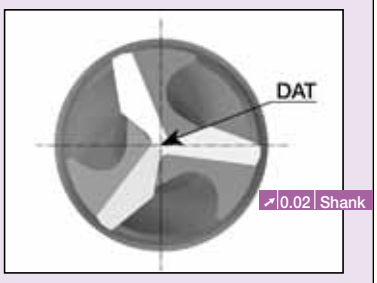
1. Diameter grinding wheel: GA2
2. Grinding wheel bond: synthetic resin
3. Grit size: 325/400 mesh (45/38μ).
4. Diamond concentration: C-75 (3.3 carat/cm3).
5. Cutting fluid emulsion 3%

Regrinding Instructions for 3 Flute SCCD Drills

For Each Grinding Operation,
Rotate the Drill 120° and Repeat the
Grinding Procedure

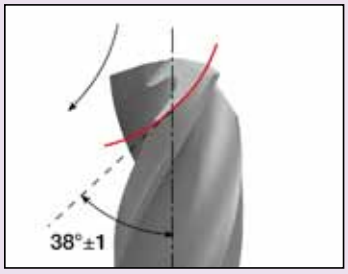
1

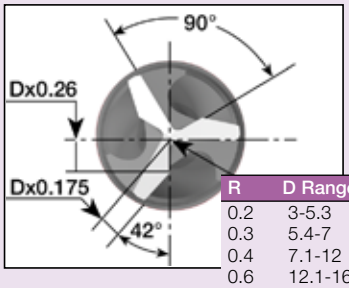




Primary Clearance

2

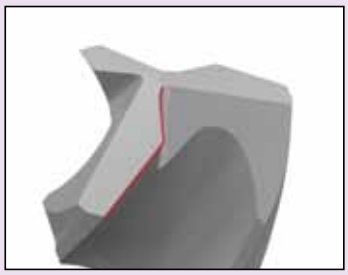


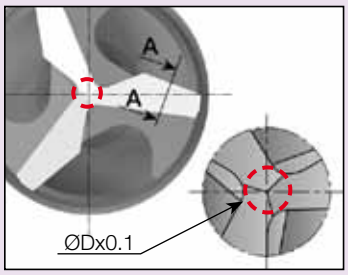


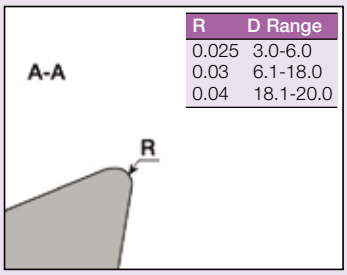
R	D Range
0.2	3-5.3
0.3	5.4-7
0.4	7.1-12
0.6	12.1-16
0.8	16.1-20

Chisel

3







R	D Range
0.025	3.0-6.0
0.03	6.1-18.0
0.04	18.1-20.0

Edge Preparation

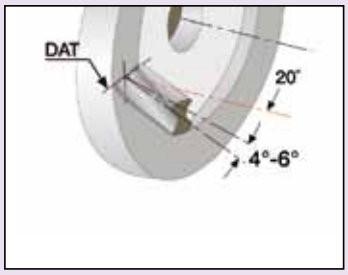
Grinding Wheel Recommended Specifications:

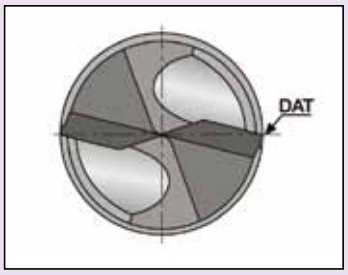
1. Diameter grinding wheel: GA2
2. Grinding wheel bond: synthetic resin
3. Grit size: 325/400 mesh (45/38μ).
4. Diamond concentration: C-75 (3.3 carat/cm3).
5. Cutting fluid emulsion 3%

Regrinding Instructions for AH5 Geometry

For Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure

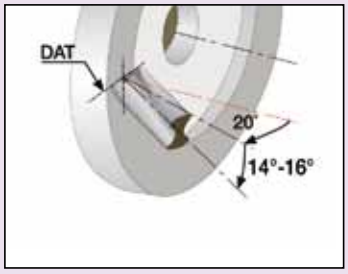
1

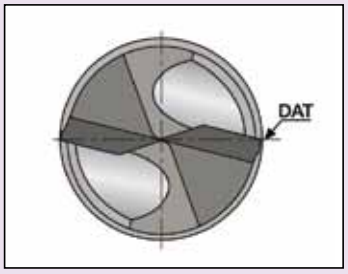




Primary Clearance

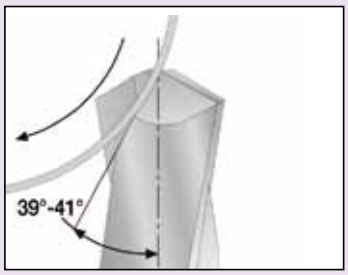
2

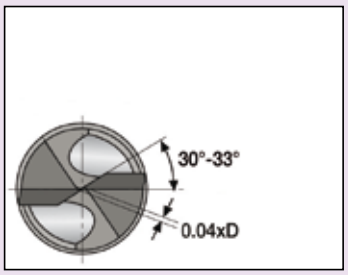




Secondary Clearance

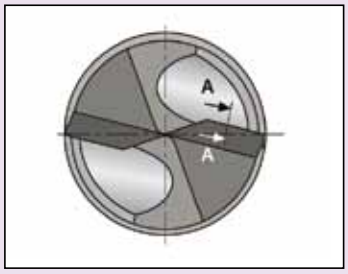
3

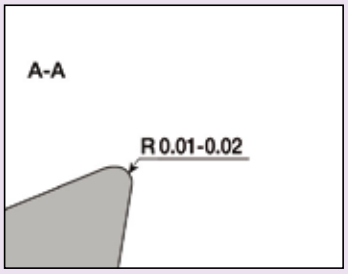




Chisel

4





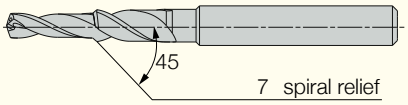
Edge Preparation

Grinding Wheel Recommended Specifications:

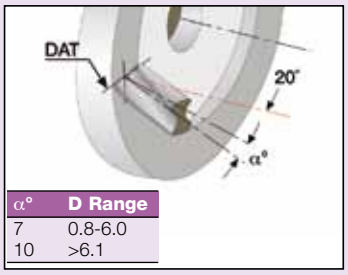
1. Diameter grinding wheel: GA2
2. Grinding wheel bond: synthetic resin
3. Grit size: 325/400 mesh (45/38μ).
4. Diamond concentration: C-75 (3.3 carat/cm3).
5. Cutting fluid emulsion 3%

Regrinding Instructions for SCDT Pre-Thread Solid Drills

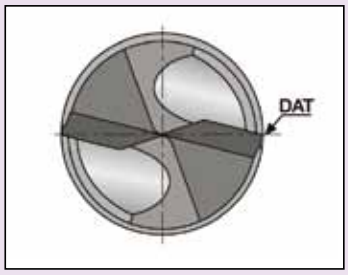
For Each Grinding Operation Rotate the Drill 180° and Repeat the Grinding Procedure



1

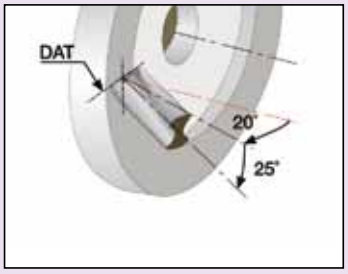


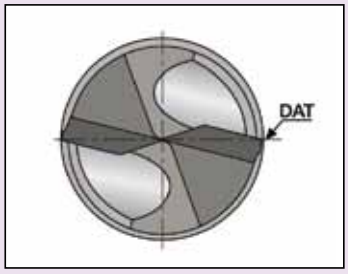
α°	D Range
7	0.8-6.0
10	>6.1



Primary Clearance

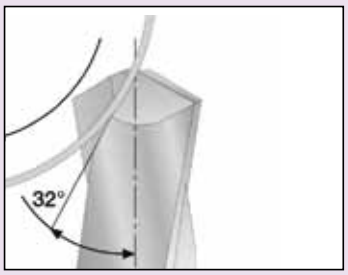
2

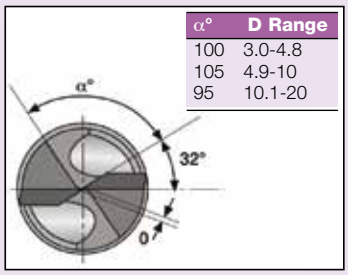




Secondary Clearance

3

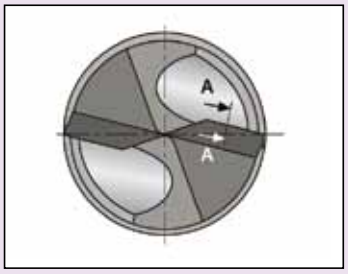


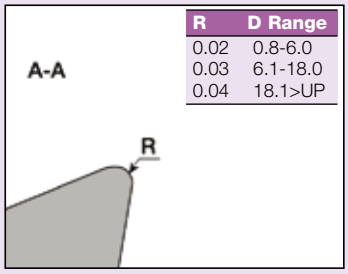


α°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

Chisel

4





R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

Edge Preparation

Grinding Wheel Recommended Specifications:

1. Diameter grinding wheel: GA2
2. Grinding wheel bond: synthetic resin
3. Grit size: 325/400 mesh (45/38μ).
4. Diamond concentration: C-75 (3.3 carat/cm3).
5. Cutting fluid emulsion 3%

Specially Tailored Designation Code Key

Metric

MN	—	SUMOCHAM heads
MD	—	IDI Heads
MJ	—	JET Heads
MR	—	XOMT/SOMT/SOMX Inserts
MZ	—	WOLH Inserts
MC	—	Assembly
MH	—	Combi Holder

Metric ##.#

Metric ##.#

Other Characteristics

F	—	Cartridge
A	—	Adjustable Cartridge
R	—	No Cartridge
L	—	Left-Hand Drill
B	—	Boring Tool
S	—	Stacked Plates
T	—	Flat Bottom
C	—	Frontal Coolant
H	—	Heavy Metal
P	—	Combi Head
Y	—	Combi Assembly
M	—	Twisted

Inch

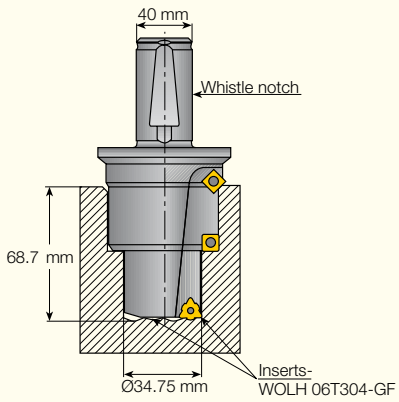
IN	—	SUMOCHAM heads
ID	—	IDI Heads
IJ	—	JET Heads
IR	—	XOMT/SOMT/SOMX Inserts
IZ	—	WOLH Inserts
IC	—	Assembly
IH	—	Combi Holder

Inch #.##

Inch ##.#

		ANSI	ISO
A	—	2	
B	—	2.5	05
C	—	3	
D	—	4	
F	—	3	09
H	—	4	12
K	—	5	16
E	—	DCM Pocket	
S	—	JET Pocket	
G	—	ISO	
P	—	SOMX 05	
Q	—	SOMX 06	
R	—	SOMX 07	
N	—	DCN Pocket	

Line	Drill Diameter				Drilling Depth				Shank/Flange Code		Insert Size	Insert Qty	Other
M	Z	3	4	8	–	0	6	9	N	D	–	C	4	R



Shank Type Code

F	—	One Parallel Flat
D	—	Two Parallel Flats (DZ Metric Type)
E	—	Extended Length (For Coolant Ring)
N	—	Whistle Notch (DR Metric Type)
L	—	One Flat (ISO 9266 Cham Shank)
R	—	Round (Fully Rounded)
W	—	Weldon
M	—	Morse
H	—	HSK
X	—	Special
P	—	CLICKFIT
B	—	BBS (ABS Compatible)
K	—	IM (ISO 26622-1 standard)
C	—	CAMFIX
V	—	VDI (ISO 26623-1 standard)
J	—	COMBICHAM Connection
(1)		

(1) Other types on request.

Shank/Diameter Type Code

P	—	10 mm	**Z**	—	.375”
S	—	12 mm	**T**	—	.437”
Q	—	14 mm	**V**	—	.500”
R	—	16 mm	**W**	—	.562”
H	—	18 mm	**U**	—	.625”
A	—	20 mm	**J**	—	.750”
B	—	25 mm	**K**	—	1.000”
C	—	32 mm	**L**	—	1.250”
D	—	40 mm	**M**	—	1.500”
E	—	50 mm	**N**	—	2.000”
F	—	63 mm	**2**	—	MT2
G	—	80 mm	**3**	—	MT3
X	—	Special	**4**	—	MT4
			5	—	MT5

General - Calculations

Spindle Speed (min^{-1})

$$n = \frac{v_c \cdot 1000}{\pi \cdot D}$$

Cutting Speed (m/min)

$$v_c = \frac{\pi \cdot D \cdot n}{1000}$$

Table Feed (mm/min)

$$v_f = f \cdot n$$

Material Removal Rate (cm³/min)

$$Q = \frac{v_f \cdot \pi \cdot D^2}{4000}$$

Power Requirement (kW)

$$P_c = \frac{Q}{60.000 \cdot \eta} \cdot k_c \cdot \sin k$$

Torque (Nm)

$$M_c = \frac{f \cdot k_c}{1000} \cdot \frac{D^2}{8} \cdot \sin k \cdot k_m$$

Feed Force (approx.) **(N)**

$$F_f = 0.63 \cdot \frac{D}{2} \cdot f \cdot k_c \cdot \sin k \cdot k_f$$

Machining Time (min/piece)

$$T_c = \frac{L+h}{v_f}$$

Machining Cost ($/piece)

$$C_c = \frac{C_{Mh}}{60} \cdot T_c$$

f	= Feed/rev	mm/rev
k_c	= Material specific cutting force	N/mm²
h	= Distance from drill point to workpiece before feeding	mm
L	= Depth of hole	mm
C_{Mh}	= Cost/machine hour	$/h
η	= Machine efficiency	%
k	= 90° } 180° bottom drills DR...	
$\sin k$	= 1	
k	= 70° } 140° point angle drills SCD.., DCM.., DCN..	
$\sin k$	= 0.94	

Drill Geometry Coeficient

	DCM	DCN	SCD
k_m	1	0.85	0.85
k_f	1	0.85	0.85

Example

Drill DR 220-044-25-07-2D-N (Ø22 mm) k=90°; sin k=1

Material No. 4 k_c=2200 N/mm² C_{Mh}=50 $/h η=0.75
v_c=200 m/min f=0.15 mm/rev L=25 mm h=10 mm
k_m=1 k_f=1

$$n = \frac{v_c \cdot 1000}{\pi \cdot D} = \frac{200 \cdot 1000}{\pi \cdot 22} = 2894 \text{ min}^{-1}$$

$$v_f = f \cdot n = 0.15 \cdot 2894 = 434 \text{ mm/min}$$

$$Q = \frac{v_f \cdot \pi \cdot D^2}{4000} = \frac{434 \cdot 3.14 \cdot (22)^2}{4000} = 165 \text{ cm}^3/\text{min}$$

$$P_c = \frac{Q}{60.000 \cdot \eta} \cdot k_c \cdot \sin k = \frac{165}{60.000 \cdot 0.75} \cdot 2200 \cdot 1 = 8.06 \text{ kW}$$

$$M_c = \frac{f \cdot k_c}{1000} \cdot \frac{D^2}{8} \cdot \sin k = \frac{0.15 \cdot 2200}{1000} \cdot \frac{22^2}{8} \cdot 1 \cdot 1 = 20 \text{ Nm}$$

$$F_f = 0.63 \cdot \frac{D}{2} \cdot f \cdot k_c \cdot \sin k = 0.63 \cdot \frac{22}{2} \cdot 0.15 \cdot 2200 \cdot 1 \cdot 1 = 2286 \text{ N}$$

$$T_c = \frac{L+h}{v_f} = \frac{25+10}{434} = 0.08 \text{ min/piece}$$

$$C_c = \frac{C_{Mh}}{60} \cdot T_c = \frac{50 \cdot 0.08}{60} = 0.067 \text{ \$/piece}$$

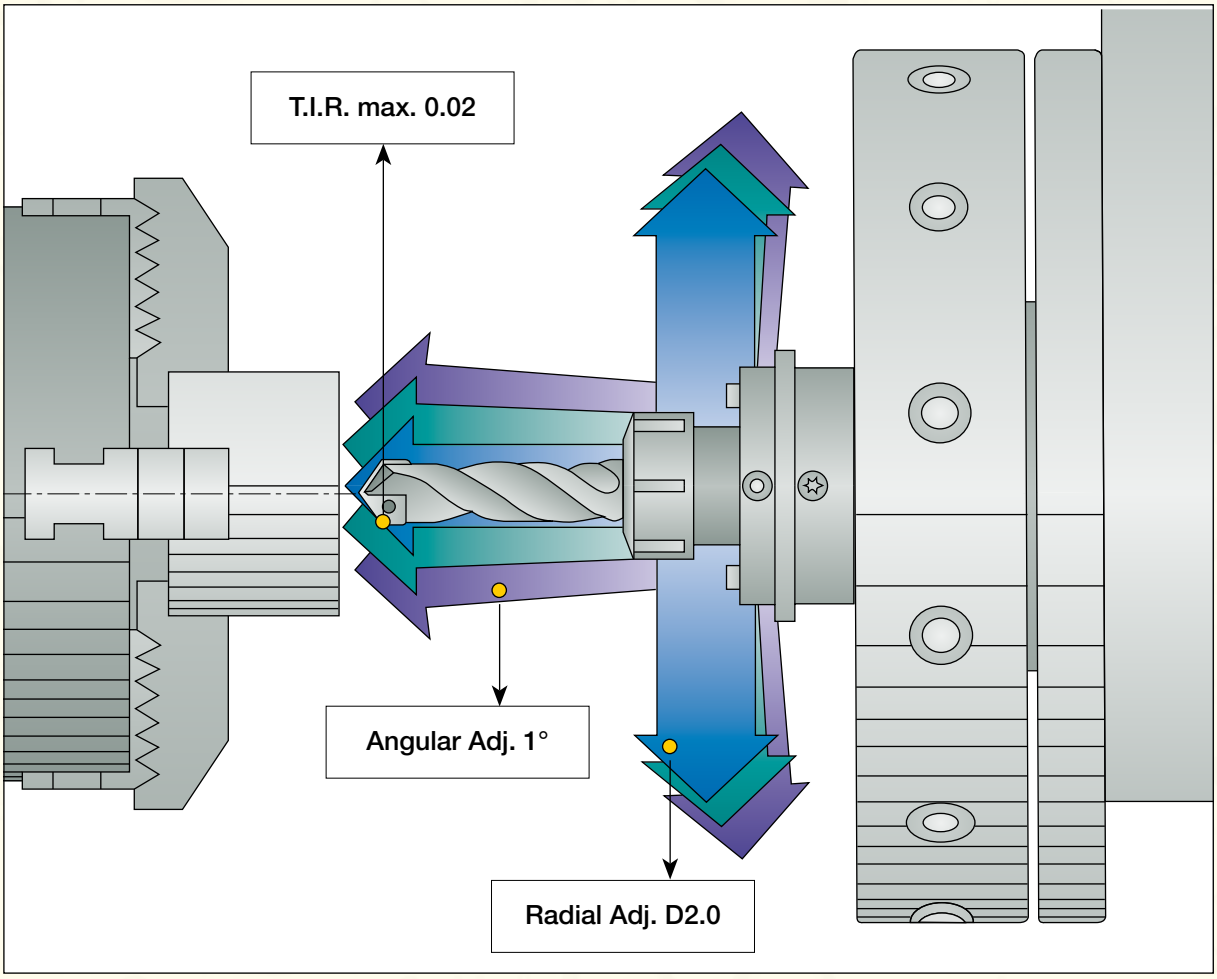
k_c Values

Material Group	kc Value
1	2000
2	2100
3	2150
4	2200
5	2200
6	2100
7	2100
8	2100
9	2100
10	2500
11	3250
12	2300
13	2800
14	2600
15	1100
16	1300
17	1100
18	1800
19	900
20	1000
21	500
22	800
23	800
26	700
27	700
28	1700
31	3000
32	3100
33	3300
34	3300
35	3200
36	1700
37	1700
38	4600
39	4700
40	4600
41	4500

For material groups, see page see pages G6-41.

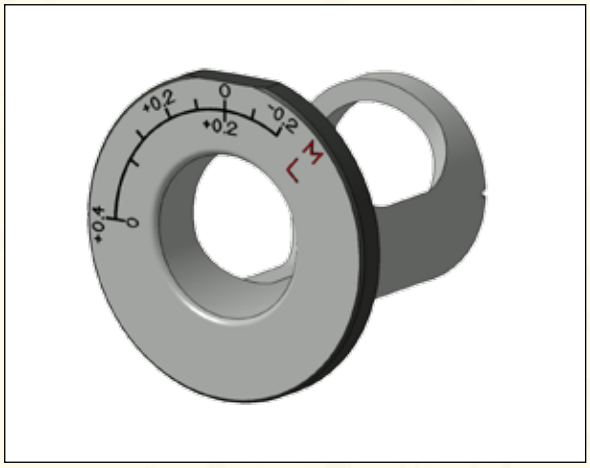
GYRO

Designed to Correct Misalignment on Stationary Operation



- Drills can be used on sloped surfaces up to 6°. When drilling sloped surfaces of more than 6°, reduce feed by 30-50% during penetration of up to 5 mm depth; or use a spot or pre-hole drill to avoid drill deviation or poor drill performance.

Drill Center Adjustment Sleeves



For detailed information on center alignment devices and drill holders, refer to **ISCAR** TO**OL HOLDING SYSTEMS c**atalog.


SOLIDDRILL

DEEP HOLE DRILLING SOLUTIONS

Member IMC Group

SINGLE TUBE SYSTEM - EXTERNAL THREAD

Drilling Head		Diameter Range	Hole Tolerance	Surface Finish	Fixture	Page
DSD-E0		8.00-14.79	IT9	2µm	Brazed Tips	**D6**
DSD-E1		12.60-20.00				**D6**
DSD-E3		12.60-65.00				**D7**
DSD-EA		16.01-28.50		3µm	Indexable Inserts	**D8**
DSD-EC		29.00-232.99				**D9**
DSD-EI		25.00-53.20				**D10**
DSD-EF		30.00-65.00	IT10			**D10**

Counterbore Head		Diameter Range	Hole Tolerance	Surface Finish	Fixture	Page
DSC-E1		18.91-65.00	IT7	1µm	Brazed Tips	**D11**
DST-E1		18.91-65.00				**D12**
DSC-EA		25.00-39.99	IT8	2µm	Indexable Inserts	**D13**
DSC-EC		40.00-99.99				**D13**

SINGLE TUBE SYSTEM - INTERNAL THREAD

Drilling Head		Diameter Range	Hole Tolerance	Surface Finish	Fixture	Page
DSD-I1		14.51-65.00	IT9	3µm	Brazed Tips	**D14**
DSD-IA		16.01-28.5			Indexable Inserts	**D15**
DSD-IC		29.00-245.99				**D16**

Counterbore Head		Diameter Range	Hole Tolerance	Surface Finish	Fixture	Page
DSC-I1		14.51-65.00	IT7	1µm	Brazed Tips	**D17**
DST-I1		14.51-65.00				**D18**
DSC-IA		25.00-39.99	IT8	2µm	Indexable Inserts	**D19**
DSC-IC		40.00-110.99				**D19**

DOUBLE TUBE SYSTEM

Drilling Head		Diameter Range	Hole Tolerance	Surface Finish	Fixture	Page
DDD-E3		18.41-65.00	IT9	2µm	Brazed Tips	**D20**
DDD-EI		25.00-53.20		3µm	Indexable Inserts	**D21**
DDD-EF		30.00-65.00	IT10			**D21**
DDD-EC		38.00-168.99	IT9			**D22**

Counterbore Head		Diameter Range	Hole Tolerance	Surface Finish	Fixture	Page
DDC-E1		18.41-65.00	IT7	1µm	Brazed Tips	**D23**
DDT-E1		18.41-65.00				**D24**

DEEP HOLE DRILLING Index

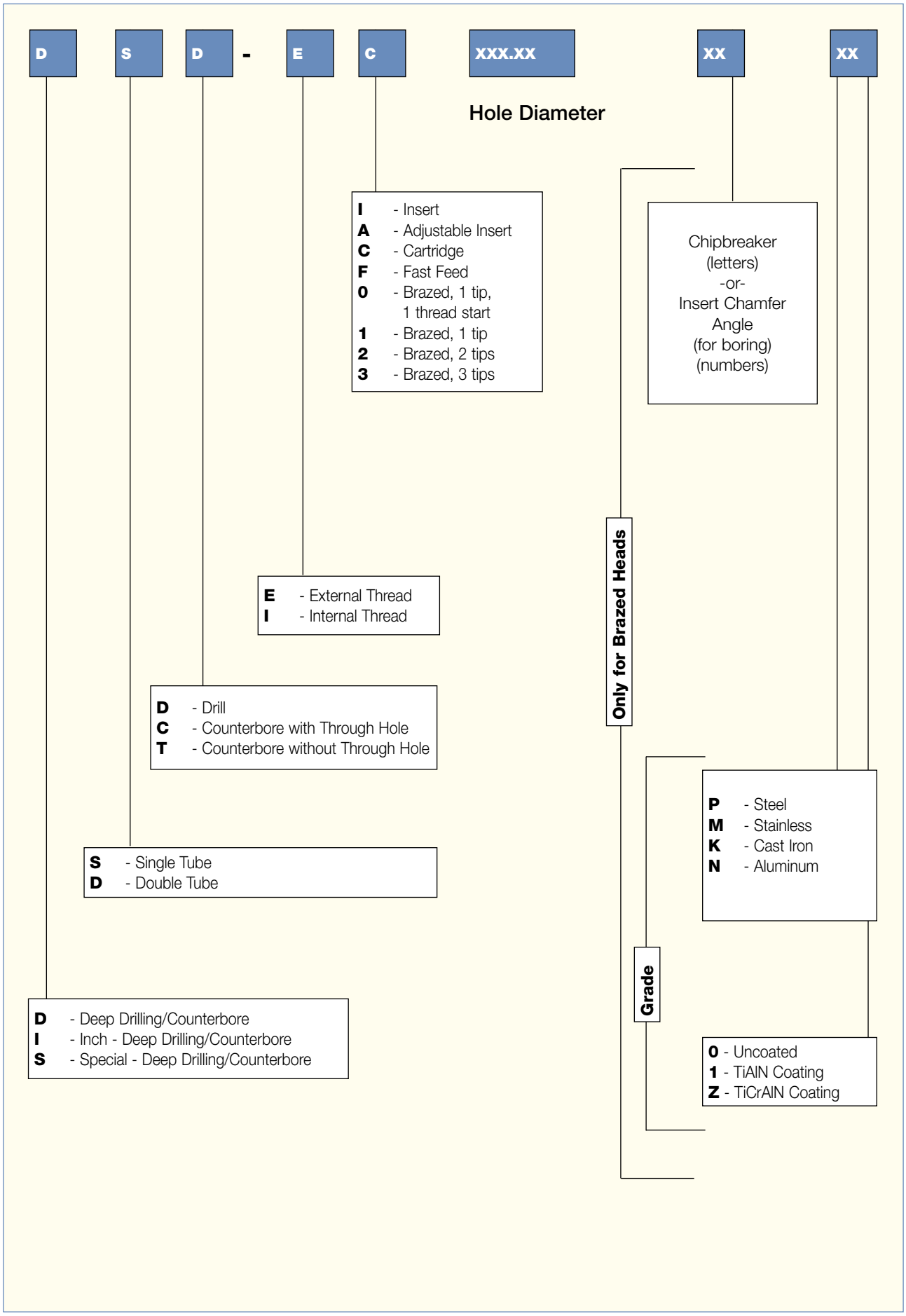
SINGLE TUBE SYSTEM

Single Tube System (STS) –
Cooling fluid is induced through the gap between the drill and the hole, conveying the chips through the tube. Requires the usage of dedicated machines.

DOUBLE TUBE SYSTEM

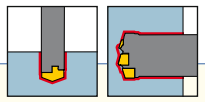
Double Tube System (DTS) -
Cooling fluid is induced between the coaxial tubes, conveying the chips through the inner tube
Can be applied for standard machines.

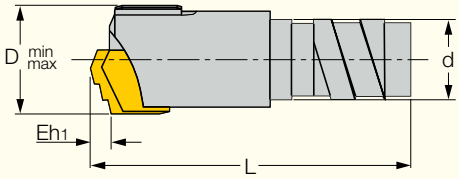
Deep Drilling Heads Identification System

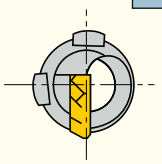


DSD-E0

Deep Single Tube Drills with External Single Thread Connection and a Brazed Single Tip







NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head

Designation	D min	D max	L	d	Eh1	Ts(1)
DSD-E0 8.00-8.99 NOM 0	8.00	8.99	35.00	6.00	2.0	TS001
DSD-E0 8.00-8.99 NOM 2	8.00	8.99	35.00	6.00	2.0	TS001
DSD-E0 9.00-9.99 NOM 0	9.00	9.99	35.00	7.20	2.0	TS002
DSD-E0 9.00-9.99 NOM 2	9.00	9.99	35.00	7.20	2.0	TS002
DSD-E0 10.00-10.99 NOM 0	10.00	10.99	35.20	7.60	2.2	TS003
DSD-E0 10.00-10.99 NOM 2	10.00	10.99	35.20	7.60	2.2	TS003
DSD-E0 11.00-11.99 NOM 0	11.00	11.99	35.20	8.60	2.2	TS004
DSD-E0 11.00-11.99 NOM 2	11.00	11.99	35.20	8.60	2.2	TS004
DSD-E0 12.00-13.49 NOM 0	12.00	13.49	35.30	9.10	2.3	TS005
DSD-E0 12.00-13.49 NOM 2	12.00	13.49	35.30	9.10	2.3	TS005
DSD-E0 13.50-14.79 NOM 0	13.50	14.79	35.40	10.80	2.4	TS006
DSD-E0 13.50-14.79 NOM 2	13.50	14.79	35.40	10.80	2.4	TS006

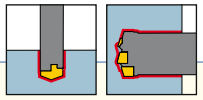
• The drill tip is supplied in a grade that is suitable to machine the material group indicated in the drill head designation: P-Steel M-Stainless Steel K-Cast Iron. • For user guide and quotation form see pages D43-59 • Ordering example: DSD-E0 11.30 DT-PO

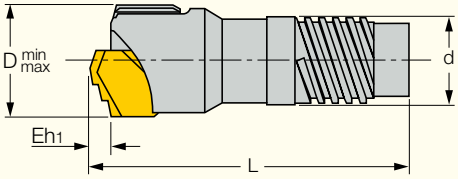
(1) Tube designation

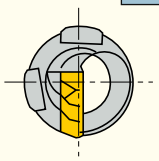
For holders, see: TS*** (D35).

DSD-E1

Deep Single Tube Drills with External 2 and 4 Start Thread and a Single Brazed Tip







NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	L	d	Eh1	Threads(1)	Ts(2)
DSD-E1 12.60-13.60 NOM 0	12.60	13.60	42.50	9.60	2.3	2	TS-I01
DSD-E1 12.60-13.60 NOM 2	12.60	13.60	42.50	9.60	2.3	2	TS-I01
DSD-E1 13.61-14.60 NOM 0	13.61	14.60	42.70	10.60	2.4	2	TS-I02
DSD-E1 13.61-14.60 NOM 2	13.61	14.60	42.70	10.60	2.4	2	TS-I02
DSD-E1 14.61-15.59 NOM 0	14.61	15.59	43.20	12.60	3.0	4	TS-I0
DSD-E1 14.61-15.59 NOM 2	14.61	15.59	43.20	12.60	3.0	4	TS-I0
DSD-E1 15.60-16.70 NOM 0	15.60	16.70	42.70	11.60	2.4	2	TS-I03
DSD-E1 15.60-16.70 NOM 2	15.60	16.70	42.70	11.60	2.4	2	TS-I03
DSD-E1 16.71-17.70 NOM 0	16.71	17.70	43.20	13.60	3.0	4	TS-I1
DSD-E1 16.71-17.70 NOM 2	16.71	17.70	43.20	13.60	3.0	4	TS-I1
DSD-E1 17.71-18.90 NOM 0	17.71	18.90	43.60	14.50	3.3	4	TS-I2
DSD-E1 17.71-18.90 NOM 2	17.71	18.90	43.60	14.50	3.3	4	TS-I2
DSD-E1 18.91-20.00 NOM 0	18.91	20.00	43.60	15.50	3.3	4	TS-I3
DSD-E1 18.91-20.00 NOM 2	18.91	20.00	43.60	15.50	3.3	4	TS-I3

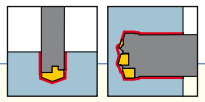
• The drill tip is supplied in a grade that is suitable to machine the material group indicated in the drill head designation: P-Steel M-Stainless Steel K-Cast Iron. • For user guide and quotation form see pages D43-59 • Ordering example: DSD-E1 14.50 DT-PO

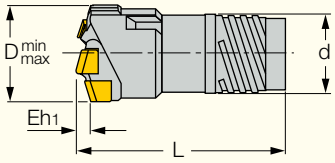
(1) No. of thread starts (2) Tube designation

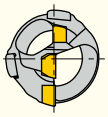
For holders, see: TS-I** (D36).

DSD-E3

Deep Single Tube Drills with External 2 and 4 Start Thread and 3 Brazed Tips







NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	L	d	Eh1	Eh1max	Threads(1)	Ts(2)
DSD-E3 12.60-13.10 NOM 0	12.60	13.10	43.00	9.60	1.1	-	2	TS-I01
DSD-E3 12.60-13.10 NOM 2	12.60	13.10	43.00	9.60	1.1	-	2	TS-I01
DSD-E3 13.11-13.60 NOM 0	13.11	13.60	43.00	9.60	1.1	-	2	TS-I01
DSD-E3 13.11-13.60 NOM 2	13.11	13.60	43.00	9.60	1.1	-	2	TS-I01
DSD-E3 13.61-14.10 NOM 0	13.61	14.10	43.00	10.60	1.2	-	2	TS-I02
DSD-E3 13.61-14.10 NOM 2	13.61	14.10	43.00	10.60	1.2	-	2	TS-I02
DSD-E3 14.11-14.60 NOM 0	14.11	14.60	43.00	10.60	1.2	-	2	TS-I02
DSD-E3 14.11-14.60 NOM 2	14.11	14.60	43.00	10.60	1.2	-	2	TS-I02
DSD-E3 14.61-15.10 NOM 0	14.61	15.10	43.00	11.60	1.3	-	2	TS-I03
DSD-E3 14.61-15.10 NOM 2	14.61	15.10	43.00	11.60	1.3	-	2	TS-I03
DSD-E3 15.11-15.59 NOM 0	15.11	15.59	43.00	11.60	1.3	-	2	TS-I03
DSD-E3 15.11-15.59 NOM 2	15.11	15.59	43.00	11.60	1.3	-	2	TS-I03
DSD-E3 15.60-16.20 NOM 0	15.60	16.20	43.00	12.60	2.7	-	4	TS-I0
DSD-E3 15.60-16.20 NOM 2	15.60	16.20	43.00	12.60	2.7	-	4	TS-I0
DSD-E3 16.21-16.70 NOM 0	16.21	16.70	43.00	12.60	2.7	-	4	TS-I0
DSD-E3 16.21-16.70 NOM 2	16.21	16.70	43.00	12.60	2.7	-	4	TS-I0
DSD-E3 16.71-17.20 NOM 0	16.71	17.20	43.00	13.60	2.7	-	4	TS-I1
DSD-E3 16.71-17.20 NOM 2	16.71	17.20	43.00	13.60	2.7	-	4	TS-I1
DSD-E3 17.21-17.70 NOM 0	17.21	17.70	43.00	13.60	2.7	-	4	TS-I1
DSD-E3 17.21-17.70 NOM 2	17.21	17.70	43.00	13.60	2.7	-	4	TS-I1
DSD-E3 17.71-18.40 NOM 0	17.71	18.40	47.00	14.50	2.8	-	4	TS-I2
DSD-E3 17.71-18.40 NOM 2	17.71	18.40	47.00	14.50	2.8	-	4	TS-I2
DSD-E3 18.41-18.90 NOM 0	18.41	18.90	47.00	14.50	2.9	-	4	TS-I2
DSD-E3 18.41-18.90 NOM 2	18.41	18.90	47.00	14.50	2.9	-	4	TS-I2
DSD-E3 18.91-20.00 NOM 0	18.91	20.00	47.00	15.50	2.9	3.0	4	TS-I3
DSD-E3 18.91-20.00 NOM 2	18.91	20.00	47.00	15.50	2.9	3.0	4	TS-I3
DSD-E3 20.01-21.80 NOM 0	20.01	21.80	52.50	16.00	3.2	3.3	4	TS-I4
DSD-E3 20.01-21.80 NOM 2	20.01	21.80	52.50	16.00	3.2	3.3	4	TS-I4
DSD-E3 21.81-24.10 NOM 0	21.81	24.10	56.00	18.00	3.2	3.4	4	TS-I5
DSD-E3 21.81-24.10 NOM 2	21.81	24.10	56.00	18.00	3.2	3.4	4	TS-I5
DSD-E3 24.11-26.40 NOM 0	24.11	26.40	57.50	19.50	3.5	-	4	TS-I6
DSD-E3 24.11-26.40 NOM 2	24.11	26.40	57.50	19.50	3.5	-	4	TS-I6
DSD-E3 26.41-28.70 NOM 0	26.41	28.70	57.50	21.00	3.7	-	4	TS-I7
DSD-E3 26.41-28.70 NOM 2	26.41	28.70	57.50	21.00	3.7	-	4	TS-I7
DSD-E3 28.71-31.00 NOM 0	28.71	31.00	63.50	23.50	4.0	4.2	4	TS-I8
DSD-E3 28.71-31.00 NOM 2	28.71	31.00	63.50	23.50	4.0	4.2	4	TS-I8
DSD-E3 31.01-33.30 NOM 0	31.01	33.30	63.50	25.50	4.3	4.4	4	TS-I9
DSD-E3 31.01-33.30 NOM 2	31.01	33.30	63.50	25.50	4.3	4.4	4	TS-I9
DSD-E3 33.31-36.20 NOM 0	33.31	36.20	63.50	28.00	4.5	4.7	4	TS-I10
DSD-E3 33.31-36.20 NOM 2	33.31	36.20	63.50	28.00	4.5	4.7	4	TS-I10
DSD-E3 36.21-39.60 NOM 0	36.21	39.60	73.50	30.00	4.8	5.2	4	TS-I11
DSD-E3 36.21-39.60 NOM 2	36.21	39.60	73.50	30.00	4.8	5.2	4	TS-I11
DSD-E3 39.61-43.00 NOM 0	39.61	43.00	73.50	33.00	5.6	5.7	4	TS-I12
DSD-E3 39.61-43.00 NOM 2	39.61	43.00	73.50	33.00	5.6	5.7	4	TS-I12
DSD-E3 43.01-47.00 NOM 0	43.01	47.00	75.00	36.00	5.4	5.9	4	TS-I13
DSD-E3 43.01-47.00 NOM 2	43.01	47.00	75.00	36.00	5.4	5.9	4	TS-I13
DSD-E3 47.01-51.70 NOM 0	47.01	51.70	75.00	39.00	6.1	6.4	4	TS-I14
DSD-E3 47.01-51.70 NOM 2	47.01	51.70	75.00	39.00	6.1	6.4	4	TS-I14
DSD-E3 51.71-56.20 NOM 0	51.71	56.20	82.00	43.00	6.5	6.7	4	TS-I15
DSD-E3 51.71-56.20 NOM 2	51.71	56.20	82.00	43.00	6.5	6.7	4	TS-I15
DSD-E3 56.21-60.60 NOM 0	56.21	60.60	84.00	47.00	6.6	7.1	4	TS-I16
DSD-E3 56.21-60.60 NOM 2	56.21	60.60	84.00	47.00	6.6	7.1	4	TS-I16
DSD-E3 60.61-65.00 NOM 0	60.61	65.00	84.00	47.00	7.0	7.4	4	TS-I16
DSD-E3 60.61-65.00 NOM 2	60.61	65.00	84.00	47.00	7.0	7.4	4	TS-I16

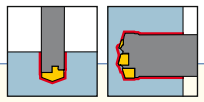
• The drill tip is supplied in a grade that is suitable to machine the material group indicated in the drill head designation: ISO P, K, M, N materials • For user guide and quotation form see pages D43-59 • Ordering example: DSD-E3 43.30 DT-PO

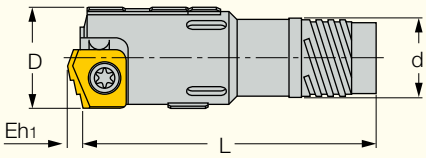
(1) No. of thread starts (2) Tube designation

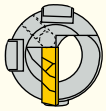
For holders, see: TS-I** (D36).

DSD-EA

Deep Single Tube Drills with External 4 Start Thread, Adjustable Diameter







Designation	D min	D max	L	d	Eh1	Eh1max	Ts(1)
DSD-EA 16.01-16.70	16.01	16.70	62.00	12.60	3.1	-	TS-I0
DSD-EA 16.71-17.70	16.71	17.70	62.00	13.60	3.1	-	TS-I1
DSD-EA 17.71-18.90	17.71	18.90	62.00	14.50	3.1	3.3	TS-I2
DSD-EA 18.91-20.00	18.91	20.00	62.00	15.50	3.3	-	TS-I3
DSD-EA 20.01-21.80	20.01	21.80	69.00	16.00	3.3	3.6	TS-I4
DSD-EA 21.81-24.10	21.81	24.10	69.00	18.00	3.6	-	TS-5
DSD-EA 24.11-26.40	24.11	26.40	72.50	19.50	3.6	3.8	TS-I6
DSD-EA 26.41-28.50	26.41	28.50	72.50	21.00	3.8	-	TS-I7

• For spare parts and insert information, see pages D26 • For user guide and quotation form, see pages D43-59 • Ordering example: DSD-EA 022.10

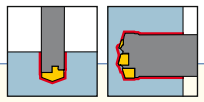
(1) Tube designation

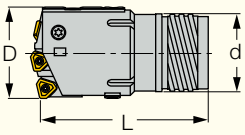
For inserts, see: XPMT-UB (D30).

For holders, see: TS-I** (D36).

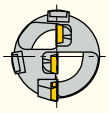
DSD-EC

Deep Single Tube Drills with External 4 Start Thread and Cartridges



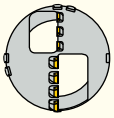


29.00 - 106.99



107 -168.99

169 - 232.99



Designation	D min	D max	L	d	Ts(1)
DSD-EC 29.00-31.00	29.00	31.00	69.00	23.50	TS-I8
DSD-EC 31.01-33.30	30.01	33.30	69.00	25.50	TS-I9
DSD-EC 33.31-36.20	33.31	36.20	69.00	28.00	TS-I10
DSD-EC 36.21-37.99	36.21	37.99	75.00	30.00	TS-I11
DSD-EC 38.00-39.60	38.00	36.90	85.00	30.00	TS-I11
DSD-EC 39.61-43.00	39.61	43.00	85.00	33.00	TS-I12
DSD-EC 43.01-47.00	43.01	47.00	95.00	36.00	TS-I13
DSD-EC 47.01-51.70	47.01	51.70	95.00	39.00	TS-I14
DSD-EC 51.71-56.20	51.71	56.20	100.00	43.00	TS-I15
DSD-EC 56.21-60.60	56.21	60.60	110.00	47.00	TS-I16
DSD-EC 60.61-65.00	60.61	65.00	110.00	51.00	TS-I17
DSD-EC 65.00-66.99	65.00	66.99	150.00	52.00	TS-I18
DSD-EC 67.00-72.99	67.00	72.99	150.00	58.00	TS-I19
DSD-EC 73.00-79.99	73.00	79.99	150.00	63.00	TS-I20
DSD-EC 80.00-86.99	80.00	86.99	180.00	70.00	TS-I21
DSD-EC 87.00-99.99	87.00	99.99	180.00	77.00	TS-I22
DSD-EC 100.00-106.99	100.00	106.99	180.00	89.00	TS-I23
DSD-EC 107.00-111.99	107.00	111.99	180.00	89.00	TS-I23
DSD-EC 112.00-123.99	112.00	123.99	205.00	101.00	TS-I24
DSD-EC 124.00-135.99	124.00	135.99	205.00	113.00	TS-I25
DSD-EC 136.00-147.99	136.00	147.99	205.00	125.00	TS-I26
DSD-EC 148.00-159.99	148.00	159.99	225.00	137.00	TS-I27
DSD-EC 160.00-168.99	160.00	168.99	225.00	149.00	TS-I28
DSD-EC 169.00-171.99	169.00	171.99	230.00	149.00	TS-I28
DSD-EC 172.00-183.99	172.00	183.99	230.00	161.00	TS-I29
DSD-EC 184.00-195.99	184.00	195.99	250.00	173.00	TS-I30
DSD-EC 196.00-207.99	196.00	207.99	250.00	185.00	TS-I31
DSD-EC 208.00-219.99	208.00	219.99	250.00	197.00	TS-I32
DSD-EC 220.00-231.99	220.00	231.99	270.00	208.00	TS-I33
DSD-EC 232.00-232.99	232.00	232.99	270.00	220.00	TS-I34

• Important: The specified drilling range using the original outer cartridge and pad may be enlarged by using optional outer cartridges and pads as specified on page D28 • For quotation form and user guide see pages D43-59 • For spare parts and insert information, see page D28
• Ordering example: DSD-EC 067.30

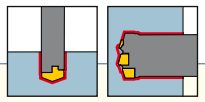
(1) Tube designation

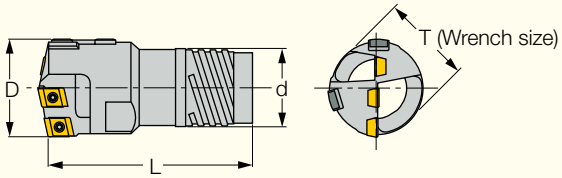
For inserts, see: NPMX 0802 RG (D29) • NPMX 0803 RB/RG (D29) • TPMX-LG/RG/RB/DT (D29).

For holders, see: TS-I** (D36).

DSD-EI

Deep Single Tube Drills with External 4 Start Thread and Indexable Inserts





Designation	D min	D max	L	d	T	Ts(1)
DSD-EI 25.00-26.40	25.00	26.40	65.00	19.50	19.0	TS-I6
DSD-EI 26.41-28.70	26.41	28.70	65.00	21.00	21.0	TS-I7
DSD-EI 28.71-31.00	28.71	31.00	70.00	23.50	24.0	TS-I8
DSD-EI 31.01-33.30	31.01	33.30	70.00	25.50	26.0	TS-I9
DSD-EI 33.31-36.20	33.31	36.20	70.00	28.00	28.0	TS-I10
DSD-EI 36.21-39.60	36.21	39.60	80.00	30.00	30.0	TS-I11
DSD-EI 39.61-43.00	39.61	43.00	80.00	33.00	32.0	TS-I12
DSD-EI 43.01-47.00	43.01	47.00	90.00	36.00	36.0	TS-I13
DSD-EI 47.01-51.70	47.01	51.70	90.00	39.00	41.0	TS-I14
DSD-EI 51.71-53.20	51.71	53.20	100.00	43.00	46.0	TS-I15

• For spare parts and insert information, see page D26 • For user guide and quotation form see pages D43-59 • Ordering example: DSD-EI 036.60

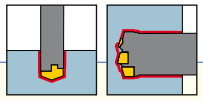
(1) Tube designation

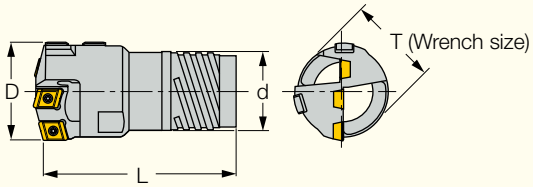
For inserts, see: NPMT-R1 (D30) • NPMT-R1/2-DT (D31).

For holders, see: TS-I** (D36).

DSD-EF

Deep Single Tube Drills with External 4 Start Thread for Fast Feed





Designation	D min	D max	L	d	T	Ts(1)
DSD-EF 30.00-31.00	30.00	31.00	70.00	23.50	24.0	TS-I8
DSD-EF 31.00-33.30	31.00	33.30	70.00	25.50	26.0	TS-I9
DSD-EF 33.31-36.20	33.31	36.20	70.00	28.00	28.0	TS-I10
DSD-EF 36.21-39.60	36.21	39.60	80.00	30.00	30.0	TS-I11
DSD-EF 39.61-43.00	39.61	43.00	80.00	33.00	32.0	TS-I12
DSD-EF 43.01-47.00	43.01	47.00	90.00	36.00	36.0	TS-I13
DSD-EF 47.01-51.70	47.01	51.70	90.00	39.00	38.0	TS-I14
DSD-EF 51.71-56.20	51.71	56.20	100.00	43.00	46.0	TS-I15
DSD-EF 56.21-60.60	56.21	60.60	100.00	47.00	50.0	TS-I16
DSD-EF 60.61-65.00	60.61	65.00	100.00	51.00	54.0	TS-I17

• For spare parts and insert information, see page D26 • For user guide and quotation form see pages D43-59 • Ordering example: DSD-EF 043.10

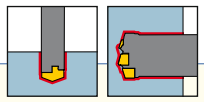
(1) Tube designation

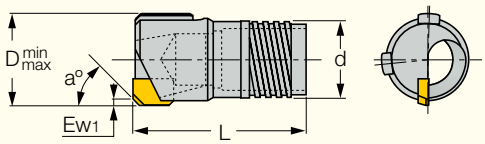
For inserts, see: NPMT-L/R-DT (D31) • NPMT-L2/R2 (D31).

For holders, see: TS-I** (D36).

DSC-E1

Deep Single Tube Counterborer with Through Hole,
External 4 Start Thread and a Brazed Tip





NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	a°	Ew1	L	d	Ts(1)
DSC-E1 18.91-20.00 NOM 0	18.91	20.00	20/45	1.0	57.00	15.50	TS-I3
DSC-E1 18.91-20.00 NOM 2	18.91	20.00	20/45	1.0	57.00	15.50	TS-I3
DSC-E1 20.01-21.80 NOM 0	20.01	21.80	20/45	2.0	65.00	16.00	TS-I4
DSC-E1 20.01-21.80 NOM 2	20.01	21.80	20/45	2.0	65.00	16.00	TS-I4
DSC-E1 21.81-24.10 NOM 0	21.81	24.10	20/45	2.0	65.00	18.00	TS-I5
DSC-E1 21.81-24.10 NOM 2	21.81	24.10	20/45	2.0	65.00	18.00	TS-I5
DSC-E1 24.11-26.40 NOM 0	24.11	26.40	20/45	2.0	65.00	19.50	TS-I6
DSC-E1 24.11-26.40 NOM 2	24.11	26.40	20/45	2.0	65.00	19.50	TS-I6
DSC-E1 26.41-28.70 NOM 0	26.41	28.70	20/45	2.0	65.00	21.00	TS-I7
DSC-E1 26.41-28.70 NOM 2	26.41	28.70	20/45	2.0	65.00	21.00	TS-I7
DSC-E1 28.71-31.00 NOM 0	28.71	31.00	20/45	2.0	70.00	23.50	TS-I8
DSC-E1 28.71-31.00 NOM 2	28.71	31.00	20/45	2.0	70.00	23.50	TS-I8
DSC-E1 31.01-33.30 NOM 0	31.01	33.30	20/45	3.0	70.00	25.50	TS-I9
DSC-E1 31.01-33.30 NOM 2	31.01	33.30	20/45	3.0	70.00	25.50	TS-I9
DSC-E1 33.31-36.20 NOM 0	33.31	36.20	20/45	3.0	70.00	28.00	TS-I10
DSC-E1 33.31-36.20 NOM 2	33.31	36.20	20/45	3.0	70.00	28.00	TS-I10
DSC-E1 36.21-39.60 NOM 0	36.21	39.60	20/45	3.0	82.00	30.00	TS-I11
DSC-E1 36.21-39.60 NOM 2	36.21	39.60	20/45	3.0	82.00	30.00	TS-I11
DSC-E1 39.61-43.00 NOM 0	39.61	43.00	20/45	3.0	82.00	33.00	TS-I12
DSC-E1 39.61-43.00 NOM 2	39.61	43.00	20/45	3.0	82.00	33.00	TS-I12
DSC-E1 43.01-47.00 NOM 0	43.01	47.00	20/45	3.0	82.00	36.00	TS-I13
DSC-E1 43.01-47.00 NOM 2	43.01	47.00	20/45	3.0	82.00	36.00	TS-I13
DSC-E1 47.01-51.70 NOM 0	47.01	51.70	20/45	3.0	82.00	39.00	TS-I14
DSC-E1 47.01-51.70 NOM 2	47.01	51.70	20/45	3.0	82.00	39.00	TS-I14
DSC-E1 51.71-56.20 NOM 0	51.71	56.20	20/45	3.0	93.00	43.00	TS-I15
DSC-E1 51.71-56.20 NOM 2	51.71	56.20	20/45	3.0	93.00	43.00	TS-I15
DSC-E1 56.21-60.60 NOM 0	56.21	60.60	20/45	3.0	93.00	47.00	TS-I16
DSC-E1 56.21-60.60 NOM 2	56.21	60.60	20/45	3.0	93.00	47.00	TS-I16
DSC-E1 60.61-65.00 NOM 0	60.61	65.00	20/45	3.0	93.00	51.00	TS-I17
DSC-E1 60.61-65.00 NOM 2	60.61	65.00	20/45	3.0	93.00	51.00	TS-I17

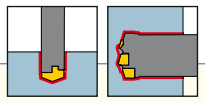
• The drill tip is supplied in a grade that is suitable to machine the material group which is indicated in the drill head designation: P-Steel, M-Stainless Steel, K-Cast Iron • For quotation form and user guide see page D43-59 • Ordering example: DSC-E1 42.20 45-P0

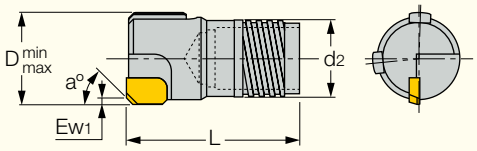
(1) Tube designation

For holders, see: TS-I** (D36).

DST-E1

Deep Single Tube Counterborer with Through Hole,
External 4 Start Thread and a Brazed Tip





NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	a°	Ew1	L	d2	Ts(1)
DST-E1 18.91-20.00 NOM 0	18.91	20.00	20/45	1.0	57.00	15.50	TS-I3
DST-E1 18.91-20.00 NOM 2	18.91	20.00	20/45	1.0	57.00	15.50	TS-I3
DST-E1 20.01-21.80 NOM 0	20.01	21.80	20/45	2.0	65.00	16.00	TS-I4
DST-E1 20.01-21.80 NOM 2	20.01	21.80	20/45	2.0	65.00	16.00	TS-I4
DST-E1 21.81-24.10 NOM 0	21.81	24.10	20/45	2.0	65.00	18.00	TS-I5
DST-E1 21.81-24.10 NOM 2	21.81	24.10	20/45	2.0	65.00	18.00	TS-I5
DST-E1 24.11-26.40 NOM 0	24.11	26.40	20/45	2.0	65.00	19.50	TS-I6
DST-E1 24.11-26.40 NOM 2	24.11	26.40	20/45	2.0	65.00	19.50	TS-I6
DST-E1 26.41-28.70 NOM 0	26.41	28.70	20/45	2.0	65.00	21.00	TS-I7
DST-E1 26.41-28.70 NOM 2	26.41	28.70	20/45	2.0	65.00	21.00	TS-I7
DST-E1 28.71-31.00 NOM 0	28.71	31.00	20/45	2.0	70.00	23.50	TS-I8
DST-E1 28.71-31.00 NOM 2	28.71	31.00	20/45	2.0	70.00	23.50	TS-I8
DST-E1 31.01-33.30 NOM 0	31.01	33.30	20/45	3.0	70.00	25.50	TS-I9
DST-E1 31.01-33.30 NOM 2	31.01	33.30	20/45	3.0	70.00	25.50	TS-I9
DST-E1 33.31-36.20 NOM 0	33.31	36.20	20/45	3.0	70.00	28.00	TS-I10
DST-E1 33.31-36.20 NOM 2	33.31	36.20	20/45	3.0	70.00	28.00	TS-I10
DST-E1 36.21-39.60 NOM 0	36.21	39.60	20/45	3.0	82.00	30.00	TS-I11
DST-E1 36.21-39.60 NOM 2	36.21	39.60	20/45	3.0	82.00	30.00	TS-I11
DST-E1 39.61-43.00 NOM 0	39.61	43.00	20/45	3.0	82.00	33.00	TS-I12
DST-E1 39.61-43.00 NOM 2	39.61	43.00	20/45	3.0	82.00	33.00	TS-I12
DST-E1 43.01-47.00 NOM 0	43.01	47.00	20/45	3.0	82.00	36.00	TS-I13
DST-E1 43.01-47.00 NOM 2	43.01	47.00	20/45	3.0	82.00	36.00	TS-I13
DST-E1 47.01-51.70 NOM 0	47.01	51.70	20/45	3.0	82.00	39.00	TS-I14
DST-E1 47.01-51.70 NOM 2	47.01	51.70	20/45	3.0	82.00	39.00	TS-I14
DST-E1 51.71-56.20 NOM 0	51.71	56.20	20/45	3.0	93.00	43.00	TS-I15
DST-E1 51.71-56.20 NOM 2	51.71	56.20	20/45	3.0	93.00	43.00	TS-I15
DST-E1 56.21-60.60 NOM 0	56.21	60.60	20/45	3.0	93.00	47.00	TS-I16
DST-E1 56.21-60.60 NOM 2	56.21	60.60	20/45	3.0	93.00	47.00	TS-I16
DST-E1 60.61-65.00 NOM 0	60.61	65.00	20/45	3.0	93.00	51.00	TS-I17
DST-E1 60.61-65.00 NOM 2	60.61	65.00	20/45	3.0	93.00	51.00	TS-I17

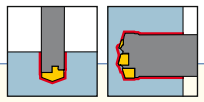
• The drill tip is supplied in a grade that is suitable to machine the material group which is indicated in the drill head designation: P-Steel, M-Stainless Steel, K-Cast Iron • For quotation form and user guide see pages D43-59 • Ordering example: DST-E1 42.20 45-P0

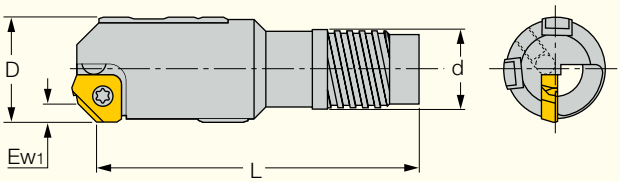
(1) Tube designation

For holders, see: TS-I** (D36).

DSC-EA

Deep Single Tube Counterborer with Through Hole, External 4 Start Thread, Adjustable Diameter





Designation	D min	D max	Ew1	L	d	Ts(1)
DSC-EA 25.00-26.40	25.00	26.40	3.5	70.00	19.50	TS-I6
DSC-EA 26.41-28.70	26.41	28.70	3.5	70.00	21.00	TS-I7
DSC-EA 28.71-31.00	28.71	31.00	3.5	75.00	23.50	TS-I8
DSC-EA 31.01-33.30	31.01	33.30	3.5	75.00	25.50	TS-I9
DSC-EA 33.31-36.20	33.31	36.20	3.5	75.00	28.00	TS-I10
DSC-EA 36.21-39.60	36.21	39.60	3.5	90.00	30.00	TS-I11
DSC-EA 39.61-39.99	39.61	39.99	3.5	90.00	33.00	TS-I12

• For spare parts and insert information, see page D27 • For user guide and quotation form see pages D43-59 • Ordering example: DSC-EA 033.20

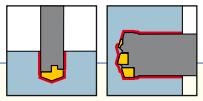
(1) Tube designation

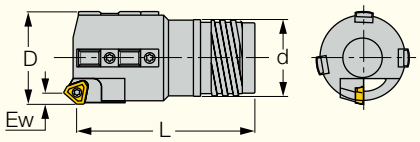
For inserts, see: XPMT-45 (D30).

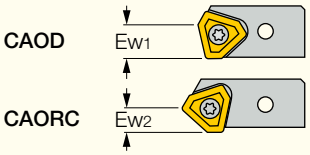
For holders, see: TS-I** (D36).

DSC-EC

Deep Single Tube Counterborer with Through Hole External 4 Start Thread and a Cartridge







Designation	D min	D max	Ew1	Ew2	L	d	Ts(1)
DSC-EC 40.00-43.00	40.00	43.00	8.0	5.5	90.00	33.00	TS-I12
DSC-EC 43.01-47.00	43.01	47.00	8.0	5.5	95.00	36.00	TS-I13
DSC-EC 47.01-51.70	47.01	51.70	8.0	5.5	100.00	39.00	TS-I14
DSC-EC 51.71-56.20	51.71	56.20	8.0	5.5	100.00	43.00	TS-I15
DSC-EC 56.21-60.60	56.21	60.60	9.0	6.0	105.00	47.00	TS-I16
DSC-EC 60.61-65.00	60.61	65.00	9.0	6.0	110.00	51.00	TS-I17
DSC-EC 65.00-66.99	65.00	66.99	9.0	6.0	150.00	52.00	TS-I18
DSC-EC 67.00-72.99	67.00	72.99	13.5	9.0	150.00	58.00	TS-I19
DSC-EC 73.00-79.99	73.00	79.99	13.5	9.0	150.00	63.00	TS-I20
DSC-EC 80.00-86.99	80.00	86.99	13.5	9.0	180.00	70.00	TS-I21
DSC-EC 87.00-99.99	87.00	99.99	13.5	9.0	180.00	77.00	TS-I22

• CAOD - Rough boring cartridge (for large D.O.C.), supplied with the cartridge, unless ordered differently • CAORC - Precision boring cartridge • For spare parts and insert information, see page D27 • For quotation form and user guide see pages D43-59.

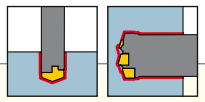
(1) Tube designation

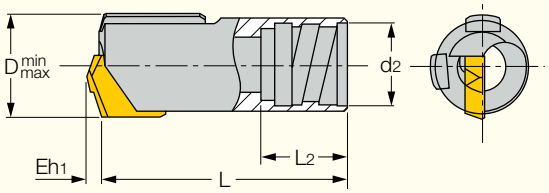
For inserts, see: TPMX-LG/RG/RB/DT (D29) • XPMT-45 (D30).

For holders, see: TS-I** (D36).

DSD-I1

Deep Single Tube Drills with Internal Single Start Thread and a Brazed Tip





NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	L	L2	d2	Eh1	Ts(1)
DSD-I1 14.51-15.00 NOM 0	14.51	15.00	52.00	22.00	11.50	2.2	TS-00
DSD-I1 14.51-15.00 NOM 2	14.51	15.00	52.00	22.00	11.50	2.2	TS-00
DSD-I1 15.01-15.50 NOM 0	15.01	15.50	52.30	22.80	11.80	2.3	TS-01
DSD-I1 15.01-15.50 NOM 2	15.01	15.50	52.30	22.80	11.80	2.3	TS-01
DSD-I1 15.51-16.00 NOM 0	15.51	16.00	52.30	22.80	12.40	2.3	TS-02
DSD-I1 15.51-16.00 NOM 2	15.51	16.00	52.30	22.80	12.40	2.3	TS-02
DSD-I1 16.01-16.50 NOM 0	16.01	16.50	52.40	22.80	12.70	2.4	TS-03
DSD-I1 16.01-16.50 NOM 2	16.01	16.50	52.40	22.80	12.70	2.4	TS-03
DSD-I1 16.51-17.25 NOM 0	16.51	17.25	52.70	22.80	13.40	2.7	TS-04
DSD-I1 16.51-17.25 NOM 2	16.51	17.25	52.70	22.80	13.40	2.7	TS-04
DSD-I1 17.26-18.00 NOM 0	17.26	18.00	52.70	22.80	13.70	2.7	TS-05
DSD-I1 17.26-18.00 NOM 2	17.26	18.00	52.70	22.80	13.70	2.7	TS-05
DSD-I1 18.01-19.00 NOM 0	18.01	19.00	52.80	22.80	14.40	2.8	TS-06
DSD-I1 18.01-19.00 NOM 2	18.01	19.00	52.80	22.80	14.40	2.8	TS-06
DSD-I1 19.01-19.99 NOM 0	19.01	19.99	52.90	22.80	15.40	2.9	TS-07
DSD-I1 19.01-19.99 NOM 2	19.01	19.99	52.90	22.80	15.40	2.9	TS-07
DSD-I1 20.00-21.99 NOM 0	20.00	21.99	62.10	25.00	16.50	3.1	TS-08
DSD-I1 20.00-21.99 NOM 2	20.00	21.99	62.10	25.00	16.50	3.1	TS-08
DSD-I1 22.00-24.99 NOM 0	22.00	24.99	62.40	25.00	19.00	3.4	TS-09
DSD-I1 22.00-24.99 NOM 2	22.00	24.99	62.40	25.00	19.00	3.4	TS-09
DSD-I1 25.00-26.99 NOM 0	25.00	26.99	69.70	25.00	20.00	3.7	TS-010
DSD-I1 25.00-26.99 NOM 2	25.00	26.99	69.70	25.00	20.00	3.7	TS-010
DSD-I1 27.00-29.99 NOM 0	27.00	29.99	70.00	25.00	22.00	4.0	TS-011
DSD-I1 27.00-29.99 NOM 2	27.00	29.99	70.00	25.00	22.00	4.0	TS-011
DSD-I1 30.00-31.99 NOM 0	30.00	31.99	75.40	25.00	24.00	4.4	TS-012
DSD-I1 30.00-31.99 NOM 2	30.00	31.99	75.40	25.00	24.00	4.4	TS-012
DSD-I1 32.00-33.99 NOM 0	32.00	33.99	85.60	25.00	26.00	4.6	TS-013
DSD-I1 32.00-33.99 NOM 2	32.00	33.99	85.60	25.00	26.00	4.6	TS-013
DSD-I1 34.00-36.99 NOM 0	34.00	36.99	86.00	40.00	27.00	5.0	TS-014
DSD-I1 34.00-36.99 NOM 2	34.00	36.99	86.00	40.00	27.00	5.0	TS-014
DSD-I1 37.00-39.99 NOM 0	37.00	39.99	86.20	40.00	30.00	5.2	TS-015
DSD-I1 37.00-39.99 NOM 2	37.00	39.99	86.20	40.00	30.00	5.2	TS-015
DSD-I1 40.00-43.99 NOM 0	40.00	43.99	86.60	40.00	33.00	5.1	TS-016
DSD-I1 40.00-43.99 NOM 2	40.00	43.99	86.60	40.00	33.00	5.1	TS-016
DSD-I1 44.00-46.99 NOM 0	44.00	46.99	97.00	40.00	37.00	5.5	TS-017
DSD-I1 44.00-46.99 NOM 2	44.00	46.99	97.00	40.00	37.00	5.5	TS-017
DSD-I1 47.00-51.99 NOM 0	47.00	51.99	97.40	40.00	41.00	5.9	TS-018
DSD-I1 47.00-51.99 NOM 2	47.00	51.99	97.40	40.00	41.00	5.9	TS-018
DSD-I1 52.00-56.99 NOM 0	52.00	56.99	97.70	40.00	44.00	6.2	TS-019
DSD-I1 52.00-56.99 NOM 2	52.00	56.99	97.70	40.00	44.00	6.2	TS-019
DSD-I1 57.00-60.99 NOM 0	57.00	60.99	98.20	40.00	49.00	6.7	TS-020
DSD-I1 57.00-60.99 NOM 2	57.00	60.99	98.20	40.00	49.00	6.7	TS-020
DSD-I1 61.00-65.00 NOM 0	61.00	65.00	98.70	40.00	53.00	7.2	TS-021
DSD-I1 61.00-65.00 NOM 2	61.00	65.00	98.70	40.00	53.00	7.2	TS-021

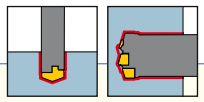
• The drill tip is supplied in a grade that is suitable to machine the material group which is indicated in the drill head designation: P-Steel, M-Stainless Steel, K-Cast Iron • For quotation form and user guide see pages D43-59 • Ordering example: DSD-I1 38.20 DT-P0

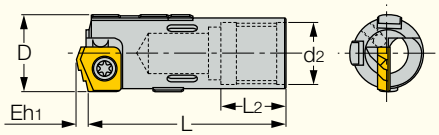
(1) Tube designation

For holders, see: TS-O** (D38).

DSD-IA

Deep Single Tube Drills with Internal Single Start Thread, Adjustable Diameter





Designation	D min	D max	L	L2	d2	Eh1	Ts(1)
DSD-IA 16.01-16.50	16.01	16.50	52.00	22.80	12.70	3.1	TS-O3
DSD-IA 16.51-17.25	16.51	17.25	52.00	22.80	13.40	3.1	TS-O4
DSD-IA 17.26-18.00	17.26	18.00	52.00	22.80	13.70	3.1	TS-O5
DSD-IA 18.01-19.00	18.01	19.00	52.00	22.80	14.40	3.3	TS-O6
DSD-IA 19.01-19.99	19.01	19.99	52.00	22.80	15.40	3.3	TS-O7
DSD-IA 20.00-21.99	20.00	21.99	55.00	25.00	16.50	3.3	TS-O8
DSD-IA 22.00-24.99	22.00	24.99	55.00	25.00	19.00	3.6	TS-O9
DSD-IA 25.00-26.99	25.00	26.99	60.00	25.00	20.00	3.8	TS-O10
DSD-IA 27.00-28.50	27.00	28.50	60.00	25.00	22.00	3.8	TS-O11

• For spare parts and insert information, see page D26 • For user guide and quotation form see pages D43-59 • Ordering example: DSD-IA 025.10

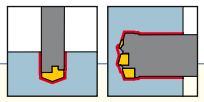
(1) Tube designation

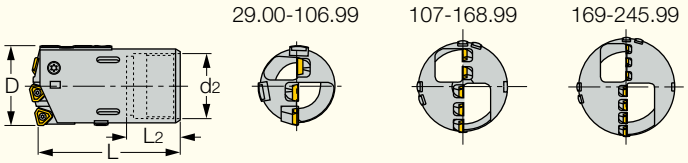
For inserts, see: XPMT-UB (D30).

For holders, see: TS-O** (D38).

DSD-IC

Deep Single Tube Drills with Internal Single Start Thread and Cartridges





Designation	D min	D max	L	L2	d2	Ts(1)
DSD-IC 29.00-29.99	29.00	29.99	75.00	25.00	22.00	TS-O11
DSD-IC 30.00-31.99	30.00	31.99	75.00	25.00	24.00	TS-O12
DSD-IC 32.00-33.99	32.00	33.99	75.00	25.00	26.00	TS-O13
DSD-IC 34.00-36.99	34.00	36.99	90.00	40.00	27.00	TS-O14
DSD-IC 37.00-37.99	37.00	37.99	90.00	40.00	30.00	TS-O15
DSD-IC 38.00-39.99	38.00	39.99	80.00	40.00	30.00	TS-O15
DSD-IC 40.00-43.99	40.00	43.99	80.00	40.00	33.00	TS-O16
DSD-IC 44.00-46.99	44.00	46.99	90.00	40.00	37.00	TS-O17
DSD-IC 47.00-51.99	47.00	51.99	90.00	40.00	41.00	TS-O18
DSD-IC 52.00-56.99	52.00	56.99	100.00	40.00	44.00	TS-O19
DSD-IC 57.00-60.99	57.00	60.99	110.00	40.00	49.00	TS-O20
DSD-IC 61.00-67.99	61.00	67.99	110.00	40.00	53.00	TS-O21
DSD-IC 68.00-74.99	68.00	74.99	120.00	40.00	59.00	TS-O22
DSD-IC 75.00-80.99	75.00	80.99	150.00	70.00	65.00	TS-O23
DSD-IC 81.00-90.99	81.00	90.99	150.00	70.00	71.00	TS-O24
DSD-IC 91.00-98.99	91.00	98.99	150.00	70.00	79.00	TS-O25
DSD-IC 99.00-106.99	99.00	106.99	150.00	70.00	90.00	TS-O26
DSD-IC 107.00-110.99	107.00	110.99	150.00	70.00	90.00	TS-O26
DSD-IC 111.00-122.99	111.00	122.99	150.00	70.00	102.00	TS-O27
DSD-IC 123.00-134.99	123.00	134.99	150.00	70.00	114.00	TS-O28
DSD-IC 135.00-148.99	135.00	148.99	150.00	70.00	126.00	TS-O29
DSD-IC 149.00-161.99	149.00	161.99	150.00	70.00	139.00	TS-O30
DSD-IC 162.00-168.99	162.00	168.99	190.00	85.00	151.00	TS-O31
DSD-IC 169.00-173.99	169.00	173.99	190.00	85.00	151.00	TS-O31
DSD-IC 174.00-185.99	174.00	185.99	190.00	85.00	163.00	TS-O32
DSD-IC 186.00-197.99	186.00	197.99	190.00	85.00	175.00	TS-O33
DSD-IC 198.00-209.99	198.00	209.99	190.00	85.00	187.00	TS-O34
DSD-IC 210.00-221.99	210.00	221.99	190.00	85.00	199.00	TS-O35
DSD-IC 222.00-233.99	222.00	233.99	190.00	85.00	211.00	TS-O36
DSD-IC 234.00-245.99	234.00	245.99	190.00	85.00	223.00	TS-O37

• Important: The specified drilling range using the original outer cartridge and pad may be enlarged by using optional outer cartridges and pads as specified on page D28 • For spare parts and insert information, see page D28 • For user guide and quotation form, see pages D43-59.

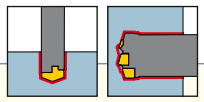
(1) Tube designation

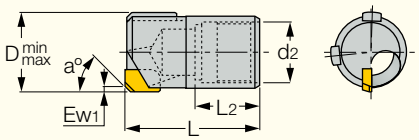
For inserts, see: NPMX 0802 RG (D29) • NPMX 0803 RB/RG (D29) • TPMX-LG/RG/RB/DT (D29).

For holders, see: TS-O** (D38).

DSC-I1

Deep Single Tube Counterborer with Through Hole,
Internal Single Start Thread and a Brazed Tip





NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	a°	Ew1	L	L2	d2	Ts(1)
DSC-I1 14.51-15.00 NOM 0	14.51	15.00	20/45	3.0	52.00	23.00	11.50	TS-00
DSC-I1 14.51-15.00 NOM 2	14.51	15.00	20/45	3.0	52.00	23.00	11.50	TS-00
DSC-I1 15.01-15.50 NOM 0	15.01	15.50	20/45	3.0	52.00	23.00	11.80	TS-01
DSC-I1 15.01-15.50 NOM 2	15.01	15.50	20/45	3.0	52.00	23.00	11.80	TS-01
DSC-I1 15.51-16.00 NOM 0	15.51	16.00	20/45	3.0	52.00	23.00	12.40	TS-02
DSC-I1 15.51-16.00 NOM 2	15.51	16.00	20/45	3.0	52.00	23.00	12.40	TS-02
DSC-I1 16.01-16.50 NOM 0	16.01	16.50	20/45	3.0	52.00	23.00	12.70	TS-03
DSC-I1 16.01-16.50 NOM 2	16.01	16.50	20/45	3.0	52.00	23.00	12.70	TS-03
DSC-I1 16.51-17.25 NOM 0	16.51	17.25	20/45	3.0	52.00	23.00	13.40	TS-04
DSC-I1 16.51-17.25 NOM 2	16.51	17.25	20/45	3.0	52.00	23.00	13.40	TS-04
DSC-I1 17.26-18.00 NOM 0	17.26	18.00	20/45	3.0	52.00	23.00	13.70	TS-05
DSC-I1 17.26-18.00 NOM 2	17.26	18.00	20/45	3.0	52.00	23.00	13.70	TS-05
DSC-I1 18.01-19.00 NOM 0	18.01	19.00	20/45	3.0	52.00	23.00	14.40	TS-06
DSC-I1 18.01-19.00 NOM 2	18.01	19.00	20/45	3.0	52.00	23.00	14.40	TS-06
DSC-I1 19.01-19.99 NOM 0	19.01	19.99	20/45	3.0	52.00	23.00	15.40	TS-07
DSC-I1 19.01-19.99 NOM 2	19.01	19.99	20/45	3.0	52.00	23.00	15.40	TS-07
DSC-I1 20.00-21.99 NOM 0	20.00	21.99	20/45	3.0	57.00	25.00	16.50	TS-08
DSC-I1 20.00-21.99 NOM 2	20.00	21.99	20/45	3.0	57.00	25.00	16.50	TS-08
DSC-I1 22.00-24.99 NOM 0	22.00	24.99	20/45	3.0	57.00	25.00	19.00	TS-09
DSC-I1 22.00-24.99 NOM 2	22.00	24.99	20/45	3.0	57.00	25.00	19.00	TS-09
DSC-I1 25.00-26.99 NOM 0	25.00	26.99	20/45	3.0	67.00	25.00	20.00	TS-010
DSC-I1 25.00-26.99 NOM 2	25.00	26.99	20/45	3.0	67.00	25.00	20.00	TS-010
DSC-I1 27.00-29.99 NOM 0	27.00	29.99	20/45	3.0	67.00	25.00	22.00	TS-011
DSC-I1 27.00-29.99 NOM 2	27.00	29.99	20/45	3.0	67.00	25.00	22.00	TS-011
DSC-I1 30.00-31.99 NOM 0	30.00	31.99	20/45	3.0	67.00	25.00	24.00	TS-012
DSC-I1 30.00-31.99 NOM 2	30.00	31.99	20/45	3.0	67.00	25.00	24.00	TS-012
DSC-I1 32.00-33.99 NOM 0	32.00	33.99	20/45	3.0	67.00	25.00	26.00	TS-013
DSC-I1 32.00-33.99 NOM 2	32.00	33.99	20/45	3.0	67.00	25.00	26.00	TS-013
DSC-I1 34.00-36.99 NOM 0	34.00	36.99	20/45	3.0	80.00	40.00	27.00	TS-014
DSC-I1 34.00-36.99 NOM 2	34.00	36.99	20/45	3.0	80.00	40.00	27.00	TS-014
DSC-I1 37.00-39.99 NOM 0	37.00	39.99	20/45	3.0	80.00	40.00	30.00	TS-015
DSC-I1 37.00-39.99 NOM 2	37.00	39.99	20/45	3.0	80.00	40.00	30.00	TS-015
DSC-I1 40.00-43.99 NOM 0	40.00	43.99	20/45	3.0	80.00	40.00	33.00	TS-016
DSC-I1 40.00-43.99 NOM 2	40.00	43.99	20/45	3.0	80.00	40.00	33.00	TS-016
DSC-I1 44.00-46.99 NOM 0	44.00	46.99	20/45	3.0	90.00	40.00	37.00	TS-017
DSC-I1 44.00-46.99 NOM 2	44.00	46.99	20/45	3.0	90.00	40.00	37.00	TS-017
DSC-I1 47.00-51.99 NOM 0	47.00	51.99	20/45	5.0	90.00	40.00	41.00	TS-018
DSC-I1 47.00-51.99 NOM 2	47.00	51.99	20/45	5.0	90.00	40.00	41.00	TS-018
DSC-I1 52.00-56.99 NOM 0	52.00	56.99	20/45	5.0	90.00	40.00	44.00	TS-019
DSC-I1 52.00-56.99 NOM 2	52.00	56.99	20/45	5.0	90.00	40.00	44.00	TS-019
DSC-I1 57.00-60.99 NOM 0	57.00	60.99	20/45	5.0	90.00	40.00	49.00	TS-020
DSC-I1 57.00-60.99 NOM 2	57.00	60.99	20/45	5.0	90.00	40.00	49.00	TS-020
DSC-I1 61.00-65.00 NOM 0	61.00	65.00	20/45	5.0	90.00	40.00	53.00	TS-021
DSC-I1 61.00-65.00 NOM 2	61.00	65.00	20/45	5.0	90.00	40.00	53.00	TS-021

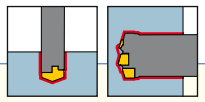
• The drill tip is supplied in a grade that is suitable to machine the material group which is indicated in the drill head designation: P-Steel, M-Stainless Steel, K-Cast Iron • For quotation form and user guide see pages D43-59 • Ordering example: DSC-I1 25.10 45-P0

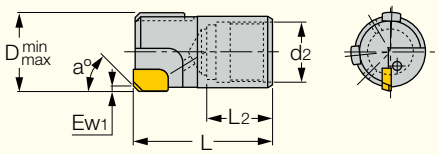
(1) Tube designation

For holders, see: TS-O** (D38).

DST-I1

Deep Single Tube Counterborer without a Through Hole, Internal Single Start Thread and a Brazed Tip





NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	a°	Ew1	L	L2	d2	Ts(1)
DST-I1 14.51-15.00 NOM 0	14.51	15.00	20/45	3.0	52.00	23.00	11.50	TS-00
DST-I1 14.51-15.00 NOM 2	14.51	15.00	20/45	3.0	52.00	23.00	11.50	TS-00
DST-I1 15.01-15.50 NOM 0	15.01	15.50	20/45	3.0	52.00	23.00	11.80	TS-01
DST-I1 15.01-15.50 NOM 2	15.01	15.50	20/45	3.0	52.00	23.00	11.80	TS-01
DST-I1 15.51-16.00 NOM 0	15.51	16.00	20/45	3.0	52.00	23.00	12.40	TS-02
DST-I1 15.51-16.00 NOM 2	15.51	16.00	20/45	3.0	52.00	23.00	12.40	TS-02
DST-I1 16.01-16.50 NOM 0	16.01	16.50	20/45	3.0	52.00	23.00	12.70	TS-03
DST-I1 16.01-16.50 NOM 2	16.01	16.50	20/45	3.0	52.00	23.00	12.70	TS-03
DST-I1 16.51-17.25 NOM 0	16.51	17.25	20/45	3.0	52.00	23.00	13.40	TS-04
DST-I1 16.51-17.25 NOM 2	16.51	17.25	20/45	3.0	52.00	23.00	13.40	TS-04
DST-I1 17.26-18.00 NOM 0	17.26	18.00	20/45	3.0	52.00	23.00	13.70	TS-05
DST-I1 17.26-18.00 NOM 2	17.26	18.00	20/45	3.0	52.00	23.00	13.70	TS-05
DST-I1 18.01-19.00 NOM 0	18.01	19.00	20/45	3.0	52.00	23.00	14.40	TS-06
DST-I1 18.01-19.00 NOM 2	18.01	19.00	20/45	3.0	52.00	23.00	14.40	TS-06
DST-I1 19.01-19.99 NOM 0	19.01	19.99	20/45	3.0	52.00	23.00	15.40	TS-07
DST-I1 19.01-19.99 NOM 2	19.01	19.99	20/45	3.0	52.00	23.00	15.40	TS-07
DST-I1 20.00-21.99 NOM 0	20.00	21.99	20/45	3.0	57.00	25.00	16.50	TS-08
DST-I1 20.00-21.99 NOM 2	20.00	21.99	20/45	3.0	57.00	25.00	16.50	TS-08
DST-I1 22.00-24.99 NOM 0	22.00	24.99	20/45	3.0	57.00	25.00	19.00	TS-09
DST-I1 22.00-24.99 NOM 2	22.00	24.99	20/45	3.0	57.00	25.00	19.00	TS-09
DST-I1 25.00-26.99 NOM 0	25.00	26.99	20/45	3.0	67.00	25.00	20.00	TS-010
DST-I1 25.00-26.99 NOM 2	25.00	26.99	20/45	3.0	67.00	25.00	20.00	TS-010
DST-I1 27.00-29.99 NOM 0	27.00	29.99	20/45	3.0	67.00	25.00	22.00	TS-011
DST-I1 27.00-29.99 NOM 2	27.00	29.99	20/45	3.0	67.00	25.00	22.00	TS-011
DST-I1 30.00-31.99 NOM 0	30.00	31.99	20/45	3.0	67.00	25.00	24.00	TS-012
DST-I1 30.00-31.99 NOM 2	30.00	31.99	20/45	3.0	67.00	25.00	24.00	TS-012
DST-I1 32.00-33.99 NOM 0	32.00	33.99	20/45	3.0	67.00	25.00	26.00	TS-013
DST-I1 32.00-33.99 NOM 2	32.00	33.99	20/45	3.0	67.00	25.00	26.00	TS-013
DST-I1 34.00-36.99 NOM 0	34.00	36.99	20/45	3.0	80.00	40.00	27.00	TS-014
DST-I1 34.00-36.99 NOM 2	34.00	36.99	20/45	3.0	80.00	40.00	27.00	TS-014
DST-I1 37.00-39.99 NOM 0	37.00	39.99	20/45	3.0	80.00	40.00	30.00	TS-015
DST-I1 37.00-39.99 NOM 2	37.00	39.99	20/45	3.0	80.00	40.00	30.00	TS-015
DST-I1 40.00-43.99 NOM 0	40.00	43.99	20/45	3.0	80.00	40.00	33.00	TS-016
DST-I1 40.00-43.99 NOM 2	40.00	43.99	20/45	3.0	80.00	40.00	33.00	TS-016
DST-I1 44.00-46.99 NOM 0	44.00	46.99	20/45	3.0	90.00	40.00	37.00	TS-017
DST-I1 44.00-46.99 NOM 2	44.00	46.99	20/45	3.0	90.00	40.00	37.00	TS-017
DST-I1 47.00-51.99 NOM 0	47.00	51.99	20/45	5.0	90.00	40.00	41.00	TS-018
DST-I1 47.00-51.99 NOM 2	47.00	51.99	20/45	5.0	90.00	40.00	41.00	TS-018
DST-I1 52.00-56.99 NOM 0	52.00	56.99	20/45	5.0	90.00	40.00	44.00	TS-019
DST-I1 52.00-56.99 NOM 2	52.00	56.99	20/45	5.0	90.00	40.00	44.00	TS-019
DST-I1 57.00-60.99 NOM 0	57.00	60.99	20/45	5.0	90.00	40.00	49.00	TS-020
DST-I1 57.00-60.99 NOM 2	57.00	60.99	20/45	5.0	90.00	40.00	49.00	TS-020
DST-I1 61.00-65.00 NOM 0	61.00	65.00	20/45	5.0	90.00	40.00	53.00	TS-021
DST-I1 61.00-65.00 NOM 2	61.00	65.00	20/45	5.0	90.00	40.00	53.00	TS-021

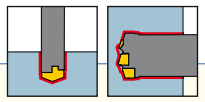
• The drill tip is supplied in a grade that is suitable to machine the material group which is indicated in the drill head designation: P-Steel, M-Stainless Steel, K-Cast Iron • For quotation form and user guide see pages D43-59 • Ordering example: DST-I1 25.10 20-P0

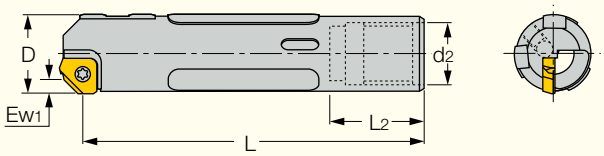
(1) Tube designation

For holders, see: TS-O** (D38).

DSC-IA

Deep Single Tube Counterbore with a Through Hole,
Internal Single Start Thread, Adjustable Diameter





Designation	D min	D max	Ew1	L	L2	d2	Ts(1)
DSC-IA 25.00-26.99	25.00	26.99	3.5	110.00	25.00	20.00	TS-O10
DSC-IA 27.00-29.99	27.00	29.99	3.5	110.00	25.00	22.00	TS-O11
DSC-IA 30.00-31.99	30.00	31.99	3.5	110.00	25.00	24.00	TS-O12
DSC-IA 32.00-33.99	32.00	33.99	3.5	110.00	25.00	26.00	TS-O13
DSC-IA 34.00-36.99	34.00	36.99	3.5	135.00	40.00	27.00	TS-O14
DSC-IA 37.00-39.99	37.00	39.99	3.5	135.00	40.00	30.00	TS-O15

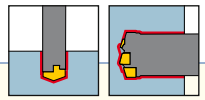
• For spare parts and insert information, see pages D27 • For user guide and quotation form see pages D43-59 • Ordering example: DSC-IA 30.35

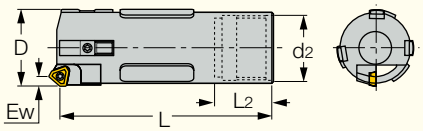
(1) Tube designation

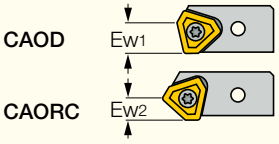
For holders, see: TS-O** (D38).

DSC-IC

Deep Single Tube Counterborer with a Through Hole,
Internal Single Start Thread and a Cartridge







Designation	D min	D max	Ew1	Ew2	L	L2	d	Ts(1)
DSC-IC 40.00-43.99	40.00	43.99	8.0	2.5	135.00	40.00	33.00	TS-O16
DSC-IC 44.00-46.99	44.00	46.99	8.0	2.5	135.00	40.00	37.00	TS-O17
DSC-IC 47.00-51.99	47.00	51.99	8.0	2.5	145.00	40.00	41.00	TS-O18
DSC-IC 52.00-56.99	52.00	56.99	9.0	4.0	145.00	40.00	44.00	TS-O19
DSC-IC 57.00-60.99	57.00	60.99	9.0	4.0	170.00	40.00	49.00	TS-O20
DSC-IC 61.00-67.99	61.00	67.99	9.0	4.0	170.00	40.00	53.00	TS-O21
DSC-IC 68.00-74.99	68.00	74.99	13.0	5.0	170.00	40.00	59.00	TS-O22
DSC-IC 75.00-80.99	75.00	80.99	13.0	5.0	205.00	70.00	65.00	TS-O23
DSC-IC 81.00-90.99	81.00	90.99	13.0	5.0	205.00	70.00	71.00	TS-024
DSC-IC 91.00-98.99	91.00	98.99	13.0	5.0	215.00	70.00	79.00	TS-O25
DSC-IC 99.00-110.99	99.00	110.99	13.0	5.0	225.00	70.00	90.00	TS-O26

• CAOD - Rough boring cartridge (for large D.O.C.) supplied with the cartridge, unless ordered differently • CAORC - Precision boring cartridge • For spare parts and insert information, see page D27 • For user guide and quotation form see pages D43-59 • Ordering example: DSC-IC 091.10

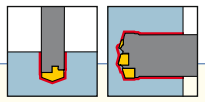
(1) Tube designation

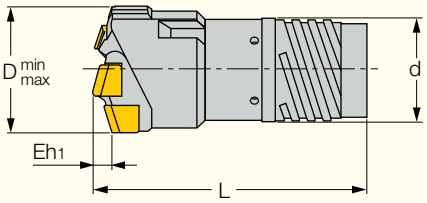
For inserts, see: TPMX-LG/RG/RB/DT (D29) • XPMT-45 (D30).

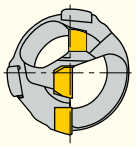
For holders, see: TS-O** (D38).

DDD-E3

Deep Double Tube Drills with External 4 Start Thread and Brazed Tips







Ordering example:DDD-E3 47.10 OT-P0

NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	L	d	Eh1	Ts(1)	Tsi(2)
DDD-E3 18.41-20.00 NOM 0	18.41	20.00	50.00	16.00	2.9	TDO-I0	TDI-N0
DDD-E3 18.41-20.00 NOM 2	18.41	20.00	50.00	16.00	2.9	TDO-I0	TDI-N0
DDD-E3 20.01-21.80 NOM 0	20.01	21.80	56.00	18.00	3.2	TDO-I1	TDI-N1
DDD-E3 20.01-21.80 NOM 2	20.01	21.80	56.00	18.00	3.2	TDO-I1	TDI-N1
DDD-E3 21.81-24.10 NOM 0	21.81	24.10	56.00	19.50	3.2	TDO-I2	TDI-N2
DDD-E3 21.81-24.10 NOM 2	21.81	24.10	56.00	19.50	3.2	TDO-I2	TDI-N2
DDD-E3 24.11-26.40 NOM 0	24.11	26.40	57.50	21.00	3.5	TDO-I3	TDI-N3
DDD-E3 24.11-26.40 NOM 2	24.11	26.40	57.50	21.00	3.5	TDO-I3	TDI-N3
DDD-E3 26.41-28.70 NOM 0	26.41	28.70	60.50	23.50	3.7	TDO-I4	TDI-N4
DDD-E3 26.41-28.70 NOM 2	26.41	28.70	60.50	23.50	3.7	TDO-I4	TDI-N4
DDD-E3 28.71-31.00 NOM 0	28.71	31.00	63.50	25.50	4.0	TDO-I5	TDI-N5
DDD-E3 28.71-31.00 NOM 2	28.71	31.00	63.50	25.50	4.0	TDO-I5	TDI-N5
DDD-E3 31.01-33.30 NOM 0	31.01	33.30	63.50	28.00	4.1	TDO-I6	TDI-N6
DDD-E3 31.01-33.30 NOM 2	31.01	33.30	63.50	28.00	4.1	TDO-I6	TDI-N6
DDD-E3 33.31-36.20 NOM 0	33.31	36.20	70.50	30.00	4.5	TDO-I7	TDI-N7
DDD-E3 33.31-36.20 NOM 2	33.31	36.20	70.50	30.00	4.5	TDO-I7	TDI-N7
DDD-E3 36.21-39.60 NOM 0	36.21	39.60	73.50	33.00	4.8	TDO-I8	TDI-N8
DDD-E3 36.21-39.60 NOM 2	36.21	39.60	73.50	33.00	4.8	TDO-I8	TDI-N8
DDD-E3 39.61-43.00 NOM 0	39.61	43.00	73.50	36.00	5.3	TDO-I9	TDI-N9
DDD-E3 39.61-43.00 NOM 2	39.61	43.00	73.50	36.00	5.3	TDO-I9	TDI-N9
DDD-E3 43.01-47.00 NOM 0	43.01	47.00	75.00	39.00	5.5	TDO-I10	TDI-N10
DDD-E3 43.01-47.00 NOM 2	43.01	47.00	75.00	39.00	5.5	TDO-I10	TDI-N10
DDD-E3 47.01-51.70 NOM 0	47.01	51.70	79.00	43.00	6.1	TDO-I11	TDI-N11
DDD-E3 47.01-51.70 NOM 2	47.01	51.70	79.00	43.00	6.1	TDO-I11	TDI-N11
DDD-E3 51.71-56.20 NOM 0	51.71	56.20	82.00	47.00	6.5	TDO-I12	TDI-N12
DDD-E3 51.71-56.20 NOM 2	51.71	56.20	82.00	47.00	6.5	TDO-I12	TDI-N12
DDD-E3 56.21-65.00 NOM 0	56.21	65.00	84.00	51.00	6.6	TDO-I13	TDI-N13
DDD-E3 56.21-65.00 NOM 2	56.21	65.00	84.00	51.00	6.6	TDO-I13	TDI-N13

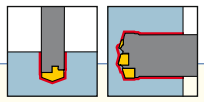
- The drill tip is supplied in a grade that is suitable to machine the material group which is indicated in the drill head designation: ISO P, K, M, N materials
- For quotation form and user guide see pages D43-59.

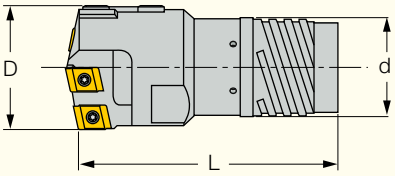
(1) Outer tube designation (2) Inner tube designation

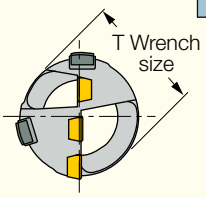
For holders, see: TDI-N (D18.41-65.00) (D40) • TDO-I (D18.41-65.00) (D40).

DDD-EI

Deep Double Tube Drills with External 4 Start Thread and Indexable Inserts







Designation	D min	D max	L	d	T	Ts(1)	Tsi(2)
DDD-EI 25.00-26.40	25.00	26.40	65.00	21.00	19.0	TDO-I3	TDI-N3
DDD-EI 26.41-28.70	26.41	28.70	70.00	23.50	21.0	TDO-I4	TDI-N4
DDD-EI 28.71-31.00	28.71	31.00	70.00	25.50	24.0	TDO-I5	TDI-N5
DDD-EI 31.01-33.30	31.01	33.30	70.00	28.00	26.0	TDO-I6	TDI-N6
DDD-EI 33.31-36.20	33.31	36.20	80.00	30.00	28.0	TDO-I7	TDI-N7
DDD-EI 36.21-38.40	36.21	38.40	80.00	33.00	30.0	TDO-I8	TDI-N8
DDD-EI 38.41-39.60	38.41	39.60	80.00	33.00	30.0	TDO-I8	TDI-N8
DDD-EI 39.61-41.80	39.61	41.80	80.00	36.00	32.0	TDO-I9	TDI-N9
DDD-EI 41.81-43.00	41.81	43.00	80.00	36.00	32.0	TDO-I9	TDI-N9
DDD-EI 43.01-45.60	43.01	45.60	90.00	39.00	36.0	TDO-I10	TDI-N10
DDD-EI 45.61-47.00	45.61	47.00	90.00	39.00	36.0	TDO-I10	TDI-N10
DDD-EI 47.01-51.70	47.01	51.70	100.00	43.00	41.0	TDO-I11	TDI-N11
DDD-EI 51.71-53.20	51.71	53.20	100.00	47.00	46.0	TDO-I12	TDI-N12

• For spare parts and insert information, see page D26 • For user guide and quotation form see pages D43-59 • Ordering example: DDD-EI 041.20

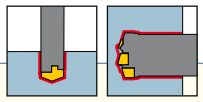
(1) Outer tube designation (2) Inner tube designation

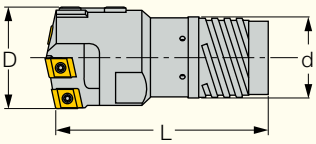
For inserts, see: NPMT-R1 (D30) • NPMT-R1/2-DT (D31).

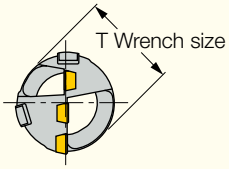
For holders, see: TDI-N (D18.41-65.00) (D40). • TDO-I (D18.41-65.00) (D40).

DDD-EF

Deep Double Tube Drills with External 4 Start Thread for Fast Feed







Designation	D min	D max	L	d	T	Ts(1)	Tsi(2)
DDD-EF 30.00-31.00	30.00	31.00	70.00	25.50	24.0	TDO-I5	TDI-N5
DDD-EF 31.01-33.30	31.01	33.30	70.00	28.00	26.0	TDO-I6	TDI-N6
DDD-EF 33.31-36.20	33.31	36.20	80.00	30.00	28.0	TDO-I7	TDI-N7
DDD-EF 36.21-39.60	36.21	39.60	80.00	33.00	30.0	TDO-I8	TDI-N8
DDD-EF 39.61-43.00	39.61	43.00	95.00	36.00	32.0	TDO-I9	TDI-N9
DDD-EF 43.01-47.00	43.01	47.00	90.00	39.00	36.0	TDO-I10	TDI-N10
DDD-EF 47.01-51.70	47.01	51.70	100.00	43.00	38.0	TDO-I11	TDI-N11
DDD-EF 51.71-56.20	51.71	56.20	100.00	47.00	46.0	TDO-I12	TDI-N12
DDD-EF 56.21-60.60	56.21	60.60	100.00	51.00	50.0	TDO-I13	TDI-N13
DDD-EF 60.60-65.00	60.60	65.00	100.00	51.00	54.0	TDO-I13	TDI-N13

• For spare parts and insert information, see page D26 • For user guide and quotation form see pages D43-59 • Ordering example: DDD-EF 043.00

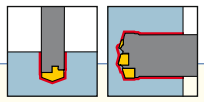
(1) Outer tube designation (2) Inner tube designation

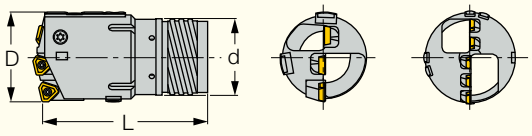
For inserts, see: NPMT-L/R-DT (D31) • NPMT-L2/R2 (D31).

For holders, see: TDI-N (D18.41-65.00) (D40) • TDO-I (D18.41-65.00) (D40).

DDD-EC

Deep Double Tube Drills with External 4 Start Thread and Cartridges





Designation	D min	D max	L	d	Ts(1)	Tsi(2)
DDD-EC 38.00-39.60	38.00	39.60	85.00	33.00	TDO-I8	TDI-N8
DDD-EC 39.61-43.00	39.61	43.00	85.00	36.00	TDO-I9	TDI-N9
DDD-EC 43.01-47.00	43.01	47.00	95.00	39.00	TDO-I10	TDI-N10
DDD-EC 47.01-51.70	47.01	51.70	100.00	43.00	TDO-I11	TDI-N11
DDD-EC 51.71-56.20	51.71	56.20	100.00	47.00	TDO-I12	TDI-N12
DDD-EC 56.21-65.00	56.21	65.00	110.00	51.00	TDO-I13	TDI-N13
DDD-EC 65.00-66.99	65.00	66.99	150.00	52.00	TDO-I14	TDI-N14
DDD-EC 67.00-72.99	67.00	72.99	150.00	58.00	TDO-I15	TDI-N15
DDD-EC 73.00-79.99	73.00	79.99	150.00	63.00	TDO-I16	TDI-N16
DDD-EC 80.00-86.99	80.00	86.99	180.00	70.00	TDO-I17	TDI-N17
DDD-EC 87.00-99.99	87.00	99.99	180.00	77.00	TDO-I18	TDI-N18
DDD-EC 100.00-106.99	100.00	106.99	180.00	89.00	TDO-I19	TDI-N19
DDD-EC 107.00-111.99	107.00	111.99	180.00	89.00	TDO-I20	TDI-N20
DDD-EC 112.00-123.99	112.00	123.99	205.00	101.00	TDO-I21	TDI-N21
DDD-EC 124.00-135.99	124.00	135.99	205.00	113.00	TDO-I22	TDI-N22
DDD-EC 136.00-147.99	136.00	147.99	205.00	125.00	TDO-I23	TDI-N23
DDD-EC 148.00-159.99	148.00	159.99	225.00	137.00	TDO-I24	TDI-N24
DDD-EC 160.00-168.99	160.00	168.99	225.00	149.00	TDO-I25	TDI-N25

• Important: The specified drilling range using the original outer cartridge and pad may be enlarged by using optional outer cartridges and pads as specified on page D28 • For spare parts and insert information, see page D28 • For user guide and quotation form see pages D43-59
• Ordering example: DDD-EC 148.00

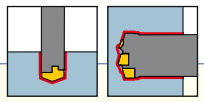
(1) Outer tube designation (2) Inner tube designation

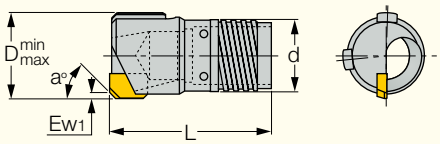
For inserts, see: NPMX 0803 RB/RG (D29) • TPMX-LG/RG/RB/DT (D29).

For holders, see: TDI-N (D18.41-65.00) (D40) • TDI-N (D65.00-171.99) (D41) • TDO-I (D18.41-65.00) (D40) • TDO-I (D65.00-171.99) (D41).

DDC-E1

Deep Double Tube Counterborer with a Through Hole, External 4 Start Thread and a Brazed Tip





NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	a°	Ew1	L	d	Ts(1)	Tsi(2)
DDC-E1 18.41-20.00 NOM 0	18.41	20.00	20/45	1.0	57.00	16.00	TDO-I0	TDI-N0
DDC-E1 18.41-20.00 NOM 2	18.41	20.00	20/45	1.0	57.00	16.00	TDO-I0	TDI-N0
DDC-E1 20.01-21.80 NOM 0	20.01	21.80	20/45	2.0	65.00	18.00	TDO-I1	TDI-N1
DDC-E1 20.01-21.80 NOM 2	20.01	21.80	20/45	2.0	65.00	18.00	TDO-I1	TDI-N1
DDC-E1 21.81-24.10 NOM 0	21.81	24.10	20/45	2.0	65.00	19.50	TDO-I2	TDI-N2
DDC-E1 21.81-24.10 NOM 2	21.81	24.10	20/45	2.0	65.00	19.50	TDO-I2	TDI-N2
DDC-E1 24.11-26.40 NOM 0	24.11	26.40	20/45	2.0	65.00	21.00	TDO-I3	TDI-N3
DDC-E1 24.11-26.40 NOM 2	24.11	26.40	20/45	2.0	65.00	21.00	TDO-I3	TDI-N3
DDC-E1 26.41-28.70 NOM 0	26.41	28.70	20/45	2.0	65.00	23.50	TDO-I4	TDI-N4
DDC-E1 26.41-28.70 NOM 2	26.41	28.70	20/45	2.0	65.00	23.50	TDO-I4	TDI-N4
DDC-E1 28.71-31.00 NOM 0	28.71	31.00	20/45	2.0	70.00	25.50	TDO-I5	TDI-N5
DDC-E1 28.71-31.00 NOM 2	28.71	31.00	20/45	2.0	70.00	25.50	TDO-I5	TDI-N5
DDC-E1 31.01-33.30 NOM 0	31.01	33.30	20/45	3.0	70.00	28.00	TDO-I6	TDI-N6
DDC-E1 31.01-33.30 NOM 2	31.01	33.30	20/45	3.0	70.00	28.00	TDO-I6	TDI-N6
DDC-E1 33.31-36.20 NOM 0	33.31	36.20	20/45	3.0	70.00	30.00	TDO-I7	TDI-N7
DDC-E1 33.31-36.20 NOM 2	33.31	36.20	20/45	3.0	70.00	30.00	TDO-I7	TDI-N7
DDC-E1 36.21-39.60 NOM 0	36.21	39.60	20/45	3.0	82.00	33.00	TDO-I8	TDI-N8
DDC-E1 36.21-39.60 NOM 2	36.21	39.60	20/45	3.0	82.00	33.00	TDO-I8	TDI-N8
DDC-E1 39.61-43.00 NOM 0	39.61	43.00	20/45	3.0	82.00	36.00	TDO-I9	TDI-N9
DDC-E1 39.61-43.00 NOM 2	39.61	43.00	20/45	3.0	82.00	36.00	TDO-I9	TDI-N9
DDC-E1 43.01-47.00 NOM 0	43.01	47.00	20/45	3.0	82.00	39.00	TDO-I10	TDI-N10
DDC-E1 43.01-47.00 NOM 2	43.01	47.00	20/45	3.0	82.00	39.00	TDO-I10	TDI-N10
DDC-E1 47.01-51.70 NOM 0	47.01	51.70	20/45	3.0	82.00	43.00	TDO-I11	TDI-N11
DDC-E1 47.01-51.70 NOM 2	47.01	51.70	20/45	3.0	82.00	43.00	TDO-I11	TDI-N11
DDC-E1 51.71-56.20 NOM 0	51.71	56.20	20/45	3.0	93.00	47.00	TDO-I12	TDI-N12
DDC-E1 51.71-56.20 NOM 2	51.71	56.20	20/45	3.0	93.00	47.00	TDO-I12	TDI-N12
DDC-E1 56.21-65.00 NOM 0	56.21	65.00	20/45	3.0	93.00	51.00	TDO-I13	TDI-N13
DDC-E1 56.21-65.00 NOM 2	56.21	65.00	20/45	3.0	93.00	51.00	TDO-I13	TDI-N13

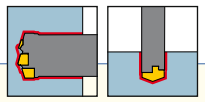
• The drill tip is supplied in a grade that is suitable to machine the material group which is indicated in the drill head designation: P-Steel, M-Stainless Steel, K-Cast Iron • For quotation form and user guide see pages D43-59 • Ordering example: DDC-E1 36.00 20-P0

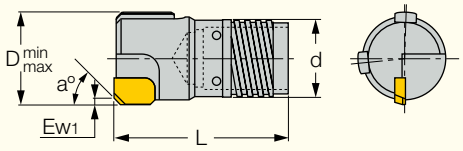
(1) Outer tube designation (2) Inner tube designation

For holders, see: TDI-N (D18.41-65.00) (D40) • TDO-I (D18.41-65.00) (D40).

DDT-E1

Deep Double Tube Counterborer without a Through Hole, External 4 Start Thread and a Brazed Tip





NOM 0 refers to non-coated drill head, NOM 2 refers to coated drill head.

Designation	D min	D max	a°	Ew1	L	d	Ts(1)	Tsi(2)
DDT-E1 18.41-20.00 NOM 0	18.41	20.00	20/45	1.0	57.00	16.00	TDO-I0	TDI-N0
DDT-E1 18.41-20.00 NOM 2	18.41	20.00	20/45	1.0	57.00	16.00	TDO-I0	TDI-N0
DDT-E1 20.01-21.80 NOM 0	20.01	21.80	20/45	2.0	65.00	18.00	TDO-I1	TDI-N1
DDT-E1 20.01-21.80 NOM 2	20.01	21.80	20/45	2.0	65.00	18.00	TDO-I1	TDI-N1
DDT-E1 21.81-24.10 NOM 0	21.81	24.10	20/45	2.0	65.00	19.50	TDO-I2	TDI-N2
DDT-E1 21.81-24.10 NOM 2	21.81	24.10	20/45	2.0	65.00	19.50	TDO-I2	TDI-N2
DDT-E1 24.11-26.40 NOM 0	24.11	26.40	20/45	2.0	65.00	21.00	TDO-I3	TDI-N3
DDT-E1 24.11-26.40 NOM 2	24.11	26.40	20/45	2.0	65.00	21.00	TDO-I3	TDI-N3
DDT-E1 26.41-28.70 NOM 0	26.41	28.70	20/45	2.0	65.00	23.50	TDO-I4	TDI-N4
DDT-E1 26.41-28.70 NOM 2	26.41	28.70	20/45	2.0	65.00	23.50	TDO-I4	TDI-N4
DDT-E1 28.71-31.00 NOM 0	28.71	31.00	20/45	2.0	70.00	25.50	TDO-I5	TDI-N5
DDT-E1 28.71-31.00 NOM 2	28.71	31.00	20/45	2.0	70.00	25.50	TDO-I5	TDI-N5
DDT-E1 31.01-33.30 NOM 0	31.01	33.30	20/45	3.0	70.00	28.00	TDO-I6	TDI-N6
DDT-E1 31.01-33.30 NOM 2	31.01	33.30	20/45	3.0	70.00	28.00	TDO-I6	TDI-N6
DDT-E1 33.31-36.20 NOM 0	33.31	36.20	20/45	3.0	70.00	30.00	TDO-I7	TDI-N7
DDT-E1 33.31-36.20 NOM 2	33.31	36.20	20/45	3.0	70.00	30.00	TDO-I7	TDI-N7
DDT-E1 36.21-39.60 NOM 0	36.21	39.60	20/45	3.0	82.00	33.00	TDO-I8	TDI-N8
DDT-E1 36.21-39.60 NOM 2	36.21	39.60	20/45	3.0	82.00	33.00	TDO-I8	TDI-N8
DDT-E1 39.61-43.00 NOM 0	39.61	43.00	20/45	3.0	82.00	36.00	TDO-I9	TDI-N9
DDT-E1 39.61-43.00 NOM 2	39.61	43.00	20/45	3.0	82.00	36.00	TDO-I9	TDI-N9
DDT-E1 43.01-47.00 NOM 0	43.01	47.00	20/45	3.0	82.00	39.00	TDO-I10	TDI-N10
DDT-E1 43.01-47.00 NOM 2	43.01	47.00	20/45	3.0	82.00	39.00	TDO-I10	TDI-N10
DDT-E1 47.01-51.70 NOM 0	47.01	51.70	20/45	3.0	82.00	43.00	TDO-I11	TDI-N11
DDT-E1 47.01-51.70 NOM 2	47.01	51.70	20/45	3.0	82.00	43.00	TDO-I11	TDI-N11
DDT-E1 51.71-56.20 NOM 0	51.71	56.20	20/45	3.0	93.00	47.00	TDO-I12	TDI-N12
DDT-E1 51.71-56.20 NOM 2	51.71	56.20	20/45	3.0	93.00	47.00	TDO-I12	TDI-N12
DDT-E1 56.21-65.00 NOM 0	56.21	65.00	20/45	3.0	93.00	51.00	TDO-I13	TDI-N13
DDT-E1 56.21-65.00 NOM 2	56.21	65.00	20/45	3.0	93.00	51.00	TDO-I13	TDI-N13

• The drill tip is supplied in a grade that is suitable to machine the material group which is indicated in the drill head designation: P-Steel, M-Stainless Steel, K-Cast Iron • For quotation form and user guide see pages D43-59 • Order example: DDT-E1 036.00 20-PO

(1) Outer tube designation (2) Inner tube designation

For holders, see: TDI-N (D18.41-65.00) (D40) • TDO-I (D18.41-65.00) (D40).

TUBES AND SPARE PARTS

DSD-EA / DSD-IA

Diameter	Guide Pads (2 pcs) Pg. D34	Guide Pad Protectors Pg. D34	Sub Guide Pads Pg. D34	Inserts Pg. D30	Adjustment Ball	Insert Clamping Screw	Adjustment Screw
16.01-18.00	GP-01	GPP-01	SGP-01	XPMT 16002UB	B2.5	SR11201754-4-4.5	SR 11201755-1
18.01-21.00	GP-02	GPP-02	SGP-01	XPMT 18003UB	B3	SR11201754-4-5.5	SR 11201755-3
21.01-24.99	GP-03	GPP-03	SGP-01	XPMT 21003UB	B4	SR11201754-4-6.5	SR 11201755-5
25.00-28.50	GP-04	GPP-04	SGP-01	XPMT 25003UB	B5	SR11201754-4-7.5	SR 11201755-7

DSD-EI / DDD-EI

Diameter	Guide Pads (2 pcs) Pg. D34	Peripheral Insert Pg. D30	Inner Insert Pg. D30	Central Insert Pg. D30	Insert Clamping Screw
25.00-26.40	GP-10	NPMT 05504R1	NPMT 05504R1	NPMT 05504R1	SR 11201753-3
26.41-28.70	GP-10	NPMT 05504R1	NPMT 05504R1	NPMT 05504R1	SR 11201753-3
28.71-31.00	GP-10	NPMT 06504R1	NPMT 05504R1	NPMT 05504R1	SR 11201753-3
31.01-33.30	GP-10	NPMT 06504R1	NPMT 05504R1	NPMT 06504R1	SR 11201753-3
33.31-36.20	GP-10	NPMT 06504R1	NPMT 06504R1	NPMT 06504R1	SR 11201753-3
36.21-38.40	GP-10	NPMT 07504R1	NPMT 06504R1	NPMT 06504R1	SR 11201753-3
38.41-39.60	GP-11	NPMT 07504R1	NPMT 06504R1	NPMT 07504R1	SR 11201753-3
39.61-41.80	GP-11	NPMT 07504R1	NPMT 07504R1	NPMT 07504R1	SR 11201753-3
41.81-43.00	GP-11	NPMT 09504R1	NPMT 07504R1	NPMT 07504R1	SR 11201753-3
43.01-45.60	GP-11	NPMT 09504R1	NPMT 07504R1	NPMT 09504R1	SR 11201753-3
45.61-47.00	GP-12	NPMT 09504R1	NPMT 07504R1	NPMT 09504R1	SR 11201753-3
47.01-51.70	GP-12	NPMT 09504R1	NPMT 09504R1	NPMT 09504R1	SR 11201753-3
51.71-53.20	GP-12	NPMT 09504R1	NPMT 09504R1	NPMT 09504R1	SR 11201753-3

DSD-EF / DDD-EF

Diameter	Guide Pads (2 pcs) Pg. D34	Peripheral Insert Pg. D31	Inner Insert Pg. D31	Center Insert Pg. D31	Insert Clamping Screw
30.00-33.00	GP-10	NPMT 06504R2	NPMT 06504R2	NPMT 06504L2	SR 11201753-3
33.01-36.00	GP-10	NPMT 06504R2	NPMT 06504R2	NPMT 0804L2	SR 11201753-3
36.01-39.00	GP-10	NPMT 0804R2	NPMT 06504R2	NPMT 0804L2	SR 11201753-3
39.01-42.00	GP-11	NPMT 0804R2	NPMT 0804R2	NPMT 0804L2	SR 11201753-3
42.01-45.00	GP-11	NPMT 0804R2	NPMT 0804R2	NPMT 09504L2	SR 11201753-3
45.01-48.00	GP-12	NPMT 09504R2	NPMT 0804R2	NPMT 09504L2	SR 11201753-3
48.01-51.00	GP-12	NPMT 09504R2	NPMT 09504R2	NPMT 09504L2	SR 11201753-3
51.01-57.00	GP-12	NPMT 09504R2	NPMT 09504R2	NPMT 12504L2	SR 11201753-3
57.01-63.00	GP-13	NPMT 12504R2	NPMT 09504R2	NPMT 12504L2	SR 11201753-3
63.01-65.00	GP-13	NPMT 12504R2	NPMT 12504R2	NPMT 12504L2	SR 11201753-3

DSD-IC/ DSD-EC

Diameter	Peripheral Pg. D32	Inner Central Pg. D32	Guide Pads (2 pcs) Pg. D34	Guide Pad Protectors (2 pcs) Pg. D34	Sub Guide Pads Pg. D34	Peripheral Insert Pg. D29	Inner Central Insert Pg. D29	Insert Clamping Screw
29.00-33.99	CAOD-085	CAID-085 (2 pcs)	GP-05	GPP-05	SGP-01	NPMX 0802RG	NPMX 0802RG	SR 11201753-2
34.00-34.99	CAOD-085	CAID-080 CAID-085	GP-05	GPP-05	SGP-01	NPMX 0802RG	NPMX 0803RG NPMX 0802RG	SR 11201753-2
35.00-37.99	CAOD-080	CAID-080 CAID-085	GP-05	GPP-05	SGP-01	NPMX 0803RG	NPMX 0803RG NPMX 0802RG	SR 11201753-2

DSC-EA

Diameter	Guide Pads (3 pcs)	Guide Pad Protectors (3 pcs)	Close Tolerance Insert	Insert Clamping Screw
	Pg. D34	Pg. D34	Pg. D30	
25.00-27.99	GP-04	GPP-04	XPMT16002-45	SR 11201754-4
28.00-29.99	GP-04	GPP-04	XPMT16002-45	SR 11201754-4
30.00-37.99	GP-05	GPP-05	XPMT16002-45	SR 11201754-4
38.00-39.99	GP-06	GPP-06	XPMT16002-45	SR 11201754-4

DSC-EC

Diameter	Close Tolerance Cartridge	Normal Tolerance Cartridge	Guide Pads (3 pcs)	Sub Guide Pad (1 pc)	Guide Pad Protectors (3 pcs)	Close Tolerance Insert	Normal Tolerance Insert
	Pg. D34	Pg. D33	Pg. D34	Pg. D34	Pg. D34	Pg. D29	Pg. D29
40.00-45.99	CAORC-0845	CAOD-0845	GP-06	SGP-02	GPP-06	TPMX 1403LG	TPMX 1403RG
46.00-51.99	CAORC-0845	CAOD-0845	GP-07	SGP-02	GPP-07	TPMX 1403LG	TPMX 1403RG
52.00-56.99	CAORC-103	CAOD-103	GP-07	SGP-02	GPP-07	TPMX 1704LG	TPMX 1704RG
57.00-59.99	CAORC-103	CAOD-103	GP-07	SGP-02	GPP-07	TPMX 1704LG	TPMX 1704RG
60.00-66.99	CAORC-103	CAOD-103	GP-08	SGP-03	GPP-08	TPMX 1704LG	TPMX 1704RG
67.00-80.99	CAORC-142	CAOD-142	GP-08	SGP-03	GPP-08	TPMX 2405LG	TPMX 2405RG
81.00-90.99	CAORC-142	CAOD-142	GP-08	SGP-03	GPP-08	TPMX 2405LG	TPMX 2405RG
91.00-99.99	CAORC-142	CAOD-142	GP-08	SGP-03	GPP-08	TPMX 2405LG	TPMX 2405RG
100.00-122.99	CAORC-142	CAOD-142	GP-09	SGP-04	GPP-09	TPMX 2405LG	TPMX 2405RG

DSC-IA

Diameter	Guide Pads (3 pcs)	Resin Guide Pads (3 pcs)	Close Tolerance Insert	Insert Clamping Screw
	Pg. D34	Pg. D33	Pg. D30	
25.00-27.99	GP-04	RGP01	XPMT 16002-45	SR 11201754-4
28.00-29.99	GP-04	RGP02	XPMT 16002-45	SR 11201754-4
30.00-37.99	GP-05	RGP02	XPMT 16002-45	SR 11201754-4
38.00-39.99	GP-06	RGP03	XPMT 16002-45	SR 11201754-4

DSC-IC

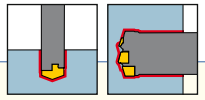
Diameter	Close Tolerance Cartridge	Normal Tolerance Cartridge	Guide Pads (3 pcs)	Resin Guide Pads (3 pcs)	Close Tolerance Insert	Normal Tolerance Insert
	Pg. D32	Pg. D32	Pg. D34	Pg. D33	Pg. D29	Pg. D29
40.00-45.99	CAORC-0845	CAOD-0845	GP-06	RGP03	TPMX 1403LG	TPMX 1403RG
46.00-51.99	CAORC-0845	CAOD-0845	GP-07	RGP03	TPMX 1403LG	TPMX 1403RG
52.00-56.99	CAORC-103	CAOD-103	GP-07	RGP03	TPMX 1704LG	TPMX 1704RG
57.00-59.99	CAORC-103	CAOD-103	GP-07	RGP03	TPMX 1704LG	TPMX 1704RG
60.00-66.99	CAORC-103	CAOD-103	GP-08	RGP04	TPMX 1704LG	TPMX 1704RG
67.00-80.99	CAORC-142	CAOD-142	GP-08	RGP04	TPMX 2405LG	TPMX 2405RG
81.00-90.99	CAORC-142	CAOD-142	GP-08	RGP05	TPMX 2405LG	TPMX 2405RG
91.00-99.99	CAORC-142	CAOD-142	GP-08	RGP06	TPMX 2405LG	TPMX 2405RG
100.00-122.99	CAORC-142	CAOD-142	GP-09	RGP06	TPMX 2405LG	TPMX 2405RG

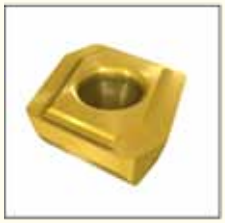
DSD-EC / DDD-EC / DSD-IC

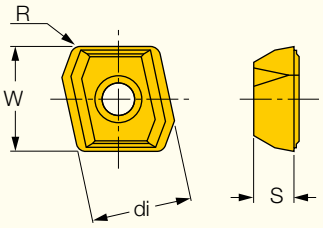
Diameter	Peripheral	Qty.	Inner/ Central	Qty.	Guide Pad	Qty.	Guide Pad Protectors	Qty.	Sub Guide Pad	Qty.	Peripheral Insert	Qty.	Inner/ Central Insert	Qty.
	Pgs. D32		Pg. D32		Pg. D34		Pg. D34		Pg. D34		Pg. D29		Pg. D29	
38.00 - 39.99	CAOD-080	1	CAID-080	2	GP-06	2	GPP-06	2	SGP-02	1	NPMX 0803RG	1	NPMX 0803RG	2
40.00-44.99	CAOD-0845	1	CAID-080	2	GP-06	2	GPP-06	2	SGP-02	1	TPMX 1403RG	1	NPMX 0803RG	2
45.00-47.99	CAOD-0845	1	CAID-080 CAID-0845	1 1	GP-07	2	GPP-07	2	SGP-02	1	TPMX 1403RG	1	NPMX 0803RG TPMX 1403RG	1 1
48.00-51.99	CAOD-0845	1	CAID-0845	2	GP-07	2	GPP-07	2	SGP-02	1	TPMX 1403RG	1	TPMX 1403RG	2
52.00-54.99	CAOD-103	1	CAID-0845	2	GP-07	2	GPP-07	2	SGP-02	1	TPMX 1704RG	1	TPMX 1403RG	2
55.00-57.99	CAOD-103	1	CAID-0845 CAID-103	1 1	GP-07	2	GPP-07	2	SGP-02	1	TPMX 1704RG	1	TPMX 1403RG TPMX 1704RG	1 1
58.00-59.99	CAOD-103	1	CAID-103	2	GP-07	2	GPP-07	2	SGP-02	1	TPMX 1704RG	1	TPMX 1704RG	2
60.00-63.99	CAOD-103	1	CAID-103	2	GP-08	2	GPP-08	2	SGP-02	1	TPMX 1704RG	1	TPMX 1704RG	2
64.00-67.99	CAOD-142	1	CAID-103	2	GP-08	2	GPP-08	2	SGP-03	1	TPMX 2405RG	1	TPMX 1704RG	2
68.00-77.99	CAOD-103	1	CAID-142	2	GP-08	2	GPP-08	2	SGP-03	1	TPMX 1704RG	1	TPMX 2405RG	2
78.00-84.99	CAOD-142	1	CAID-142	2	GP-08	2	GPP-08	2	SGP-03	1	TPMX 2405RG	1	TPMX 2405RG	2
85.00-91.99	CAOD-170	1	CAID-142	2	GP-08	2	GPP-08	2	SGP-03	1	TPMX 2807RG	1	TPMX 2405RG	2
92.00-98.99	CAOD-142	1	CAID-170	2	GP-08	2	GPP-08	2	SGP-03	1	TPMX 2405RG	1	TPMX 2807RG	2
99.00-106.99	CAOD-170	1	CAID-170	2	GP-09	2	GPP-09	2	SGP-04	1	TPMX 2807RG	1	TPMX 2807RG	2
107.00-117.99	CAOD-142	1	CAID-103 CAID-142	3 1	GP-09	2	GPP-09	2	SGP-04	1	TPMX 2405RG	1	TPMX 1704RG TPMX 2405RG	3 1
118.00-135.99	CAOD-142	1	CAID-142	4	GP-09	2	GPP-09	2	SGP-04	1	TPMX 2405RG	1	TPMX 2405RG	4
136.00-144.99	CAOD-142	1	CAID-142 CAID-170	3 1	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2405RG	1	TPMX 2405RG TPMX 2807RG	3 1
145.00-150.99	CAOD-142	1	CAID-142 CAID-170	2 2	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2405RG	1	TPMX 2405RG TPMX 2807RG	2 2
151.00-156.99	CAOD-170	1	CAID-142 CAID-170	2 2	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2807RG	1	TPMX 2405RG TPMX 2807RG	2 2
157.00-162.99	CAOD-170	1	CAID-142 CAID-170	1 3	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2807RG	1	TPMX 2405RG TPMX 2807RG	1 3
163.00-168.99	CAOD-170	1	CAID-170	4	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2807RG	1	TPMX 2807RG	4
169.00-188.99	CAOD-142	1	CAID-142	6	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2405RG	1	TPMX 2405RG	6
189.00-196.99	CAOD-142	1	CAID-142 CAID-170	5 1	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2405RG	1	TPMX 2405RG TPMX 2807RG	5 1
197.00-202.99	CAOD-142	1	CAID-142 CAID-170	4 2	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2405RG	1	TPMX 2405RG TPMX 2807RG	4 2
203.00-208.99	CAOD-142	1	CAID-142 CAID-170	3 3	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2405RG	1	TPMX 2405RG TPMX 2807RG	3 3
209.00-214.99	CAOD-170	1	CAID-142 CAID-170	3 3	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2807RG	1	TPMX 2405RG TPMX 2807RG	3 3
215.00-220.99	CAOD-170	1	CAID-142 CAID-170	2 4	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2807RG	1	TPMX 2405RG TPMX 2807RG	2 4
221.00-226.99	CAOD-170	1	CAID-142 CAID-170	1 5	GP-09	4	GPP-09	4	SGP-04	1	TPMX 2807RG	1	TPMX 2405RG TPMX 2807RG	1 5

NPMX 0803 RB/RG

Inserts for Drilling Heads DSD-EC / DDD-EC / DSD-IC



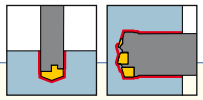




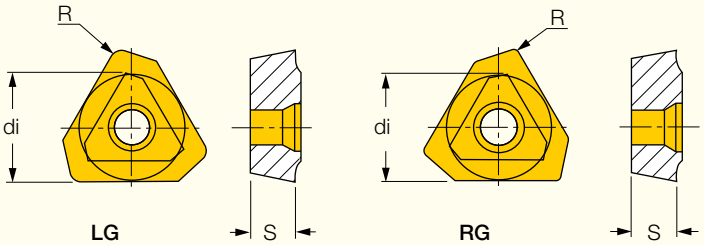
Designation	di	S	R	W
NPMX 0803RB	8.00	3.18	0.40	8.36
NPMX 0803RG	8.00	3.18	0.80	8.36

TPMX-LG/RG/RB/DT

Inserts for Drilling Heads DSD-EC / DDD-EC / DSD-IC / DSC-EC / DSC-IC



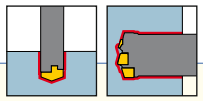
Left-hand shown

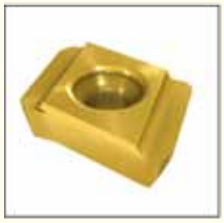


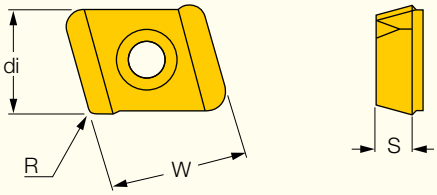
Designation	di	S	R
TPMX 1403R/LG	8.45	3.50	0.80
TPMX 1403R-DT	8.45	3.50	0.80
TPMX 1403RB	8.45	3.50	0.40
TPMX 1704R/LG	10.30	4.00	0.80
TPMX 1704R-DT	10.30	4.00	0.80
TPMX 1704RB	10.30	4.00	0.40
TPMX 2405R/LG	14.20	5.50	1.20
TPMX 2405R-DT	14.20	5.50	1.20
TPMX 2405RB	14.20	5.50	0.40
TPMX 2807R-DT	17.00	7.50	1.60
TPMX 2807RB	17.00	7.50	0.80
TPMX 2807RG	17.00	7.50	1.60

NPMX 0802 RG

Inserts for Drilling Heads DSD-EC / DDD-EC / DSD-IC



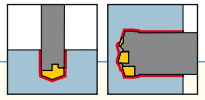


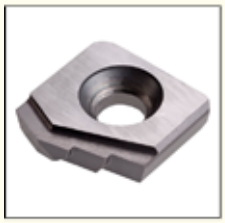


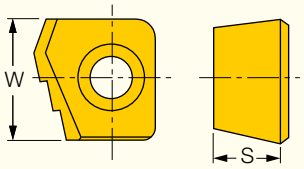
Designation	di	S	R	W
NPMX 0802RG	6.50	2.38	0.80	8.50

XPMT-UB

Inserts for Drilling Heads DSD-EA / DSD-IA



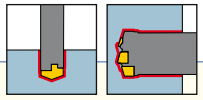


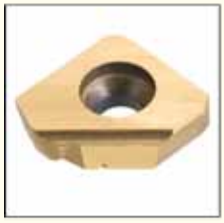


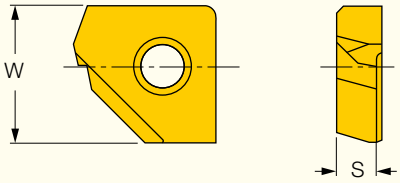
Designation	W	S
XPMT 16002UB	9.50	2.80
XPMT 18003UB	11.00	3.05
XPMT 21003UB	13.00	3.55
XPMT 25003UB	14.00	3.40

XPMT-45

Insert for Drilling Heads DSC-EC / DSC-IC / DSC-EA



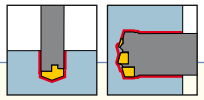


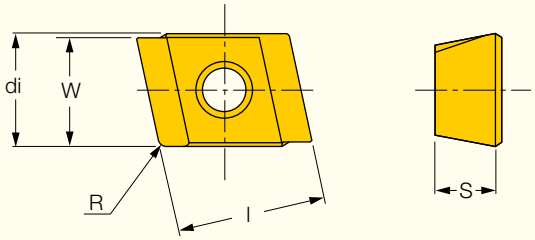


Designation	W	S
XPMT 16002-45	9.50	2.80

NPMT-R1

Inserts for Drilling Heads DSD-EI / DDD-EA

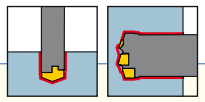


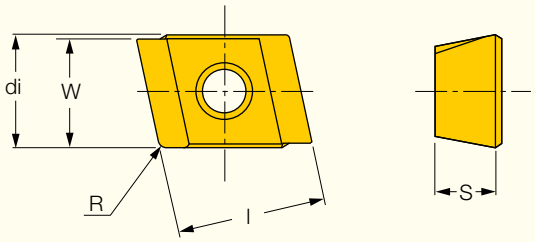


Designation	di	S	l	W	R
NPMT 05504R1	5.50	4.00	10.00	5.20	0.60
NPMT 07504R1	7.50	4.00	10.00	7.20	0.60
NPMT 09504R1	9.50	4.00	10.00	9.20	0.80

NPMT-R1/2-DT

Inserts for Drilling Heads DSD-EI / DDD-EI

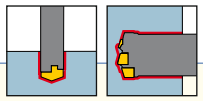


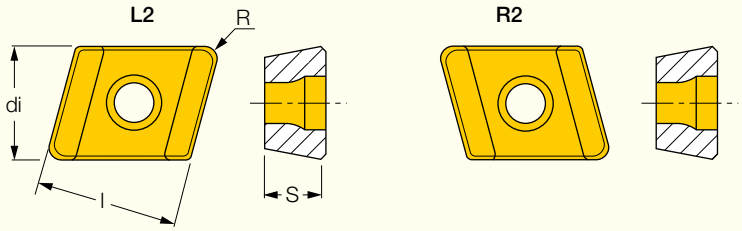


Designation	di	S	l	W	R
NPGT 05504R1-DT	5.50	4.00	10.00	5.20	0.40
NPMT 05504R1-DT	5.50	4.00	10.00	5.20	0.40
NPMT 06504R2-DT	6.50	4.00	10.00	6.20	0.40
NPMT 07504R2-DT	7.50	4.00	10.00	7.20	0.40
NPMT 09504R2-DT	9.50	4.00	10.00	9.20	0.40

NPMT-L2/R2

Inserts for Drilling Heads DSD-EF / DDD-EF

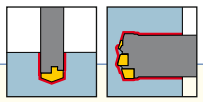


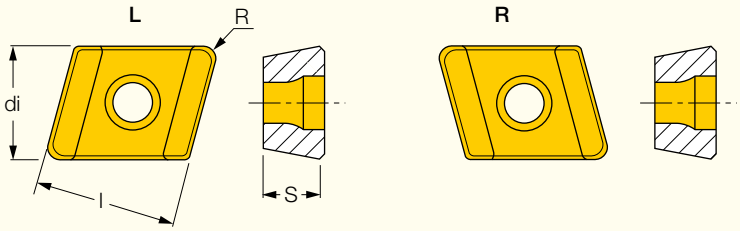


Designation	di	R	S	l
NPMT 06504R/L2	6.50	0.80	4.00	10.00
NPMT 0804R/L2	8.00	0.80	4.00	10.00
NPMT 09504R/L2	9.50	0.80	4.00	10.00
NPMT 12504R/L2	12.50	0.80	4.00	10.00

NPMT-L/R-DT

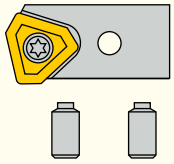
Inserts for Drilling Heads DSD-EF / DDD-EF





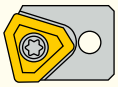
Designation	di	R	S	l
NPMT 06504LS-DT	6.50	0.40	4.00	10.00
NPMT 06504R-DT	6.50	0.40	4.00	10.00
NPMT 0804LS-DT	8.00	0.40	4.00	10.00
NPMT 0804R-DT	8.00	0.40	4.00	10.00
NPMT 09504L2-DT	9.50	0.40	4.00	10.00
NPMT 09504R-DT	9.50	0.40	4.00	10.00
NPMT 12504LS-DT	12.50	0.40	4.00	10.00
NPMT 12504R-DT	12.50	0.40	4.00	10.00

CAOD
Peripheral Cartridge



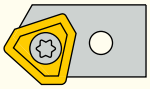
Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAOD-080	SR 11201755-7	H1.5	SR 11201756-11	HW 2.0	NPMX 0803RG	SR 11201753-2
CAOD-0845	SR 11201755-6	H2.0	SR 11201756-10	HW 2.5	TPMX 1403RG	SR 11201753-3
CAOD-103	SR 11201755-8	H2.5	SR 11201756-12	HW 3.0	TPMX 1704RG	SR 11201753-7
CAOD-142	SR 11201755-9	H2.5	SR 11201756-15	HW 4.0	TPMX 2405RG	SR 11201753-9
CAOD-170	SR 11201755-11	H3.0	SR 11201756-15	HW 4.0	TPMX 2807RG	SR 11201753-10

CAID
Inner Cartridge



Designation	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAID-080	HW 1.5	SR 11201753-5	T-9/51	NPMX 0803RG	SR 11201753-2
CAID-0845	HW 2.0	SR 11201753-5	T-15/51	TPMX 1403RG	SR 11201753-3
CAID-103	HW 2.5	SR 11201752-1	T-15/51	TPMX 1704RG	SR 11201753-7
CAID-142	HW 2.5	SR 11201756-7	HW 3.0	TPMX 2405RG	SR 11201753-9
CAID-170	HW 2.5	SR 11201756-7	HW 3.0	TPMX 2807RG	SR 11201753-10

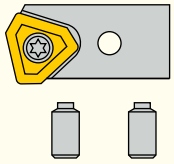
CAORC
Central Cartridge



Designation	Adjustment Screw	Key	Locking Screw	Key	Insert	Insert Clamping Screw
CAORC-0845	SR 11201755-6	HW 2.0	SR 11201756-10	HW 2.5	TPMX 1403LG	SR 11201753-3
CAORC-103	SR 11201755-10	HW 2.5	SR 11201756-12	HW 3.0	TPMX 1704LG	SR 11201753-7
CAORC-142	SR 11201755-11	HW 2.5	SR 11201756-15	HW 4.0	TPMX 2405LG	SR 11201753-9

CAOD Cartridges and Pads for Diameter Enlargement

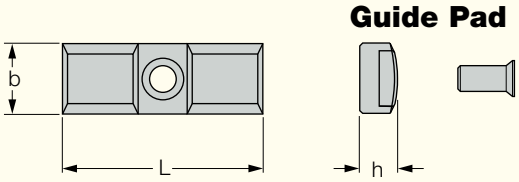
Outer Cartridge Enlargement



Original Outer Cartridge	Cartridges for the Specified Enlargement Increments				
	+1 mm	+2 mm	+3 mm	+4 mm	+5 mm
CAOD-080	CAOD-080+1	CAOD-080+2			
CAOD-0845	CAOD-0845+1	CAOD-0845+2	CAOD-0845+3		
CAOD-103	CAOD-103+1	CAOD-103+2	CAOD-103+3	CAOD-103+4	
CAOD-142	CAOD-142+1	CAOD-142+2	CAOD-142+3	CAOD-142+4	CAOD-142+5
CAOD-170	CAOD-170+1	CAOD-170+2	CAOD-170+3	CAOD-170+4	CAOD-170+5

GP Cartridges and Pads for Diameter Enlargement

Enlargement Guide Pad

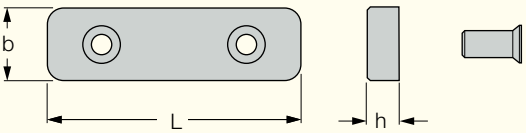


Original Guide Pad	Guide Pads for the Specified Enlargement Increments				
	+1 mm	+2 mm	+3 mm	+4 mm	+5 mm
GP-06	GP-06+1	GP-06+2	GP-06+3		
GP-07	GP-07+1	GP-07+2	GP-07+3	GP-07+4	
GP-08	GP-08+1	GP-08+2	GP-08+3	GP-08+4	GP-08+5
GP-09	GP-09+1	GP-09+2	GP-09+3	GP-09+4	GP-09+5

Select an outer cartridge and pad for the required enlarged diameter.

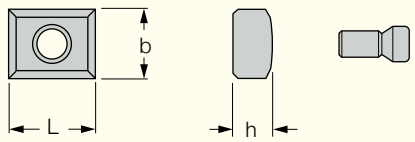
RGP

Resin Guide Pad



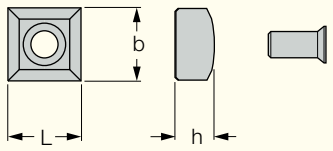
Designation	L	b	h	Lock Screw	Wrench
RGP01	40	10	4	SR 11201756-2	HW 2.0
RGP02	45	12	5	SR 11201756-3	HW 2.0
RGP03	50	15	5.8	SR 11201756-4	HW 2.5
RGP04	70	20	7.5	SR 11201756-5	HW 3.0
RGP05	80	30	12.5	SR 11201756-6	HW 4.0
RGP06	100	35	15.5	SR 11201756-6	HW 4.0

SGP
Sub Guide Pad



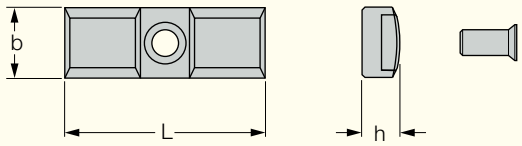
Designation	L	b	h	Clamping Screw	Key
SGP-01	10	6	3	SR 11201753-1	T-7/51
SGP-02	10	8	4.5	SR 11201753-4	T-9/51
SGP-03	10	10	5	SR 11201753-4	T-9/51
SGP-04	20	14	7	SR 11201752-2	T-15/51

GPP
Guide Pad Protector



Designation	L	b	h	Clamping Screw	Key
GPP-01	6	6	3.25	SR 11201753-1	T-7/51
GPP-02	6	6	3.8	SR 11201753-1	T-7/51
GPP-03	6	6	3.9	SR 11201753-1	T-7/51
GPP-04	8	8	4.4	SR 11201753-4	T-9/51
GPP-05	8	8	3.5	SR 11201753-4	T-9/51
GPP-06	8	8	4.5	SR 11201753-4	T-9/51
GPP-07	10	10	6	SR 11201753-8	T-15/51
GPP-08	14	14	7.5	SR 11201752-2	T-15/51
GPP-09	18	18	9	SR 11201756-15	HW 3.0

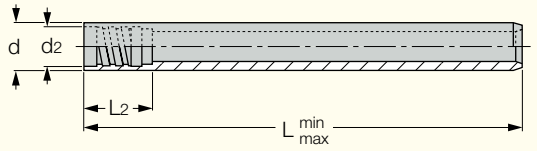
GP
Guide Pad



Designation	L	b	h	Clamping Screw	Key
GP-01	20	6	3.25	SR 11201753-1	T-7/51
GP-02	20	6	3.8	SR 11201753-1	T-7/51
GP-03	20	6	3.9	SR 11201753-1	T-7/51
GP-04	25	8	4.4	SR 11201753-4	T-9/51
GP-05	25	8	3.5	SR 11201753-4	T-9/51
GP-06	25	8	4.5	SR 11201753-4	T-9/51
GP-07	35	10	6	SR 11201753-8	T-15/51
GP-08	40	14	7.5	SR 11201752-2	T-15/51
GP-09	40	18	9	SR 11201756-7S	HW 3.0
GP-10	20	7	3.5	SR 11201753-4	T-9/51
GP-11	25	8	4.5	SR 11201753-6	T-15/51
GP-12	10	30	4.5	SR 11201753-6	T-15/51
GP-13	12	35	5.5	SR 11201753-6	T-15/51

TS***

Drill Tubes - STS System - Inner Single Start Thread Connection

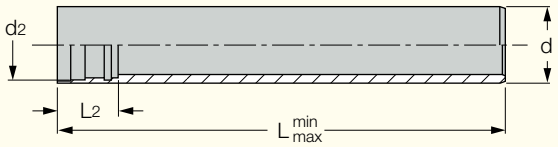


Designation	d Range	d	d_2	L_2	L_{min}	L_{max}
TS001 L=(0-1749)MM	8.00-8.99	7.10	6.00	16.00	0.0	660.0
TS001 L=(1750-2600)MM	8.00-8.99	7.10	6.00	16.00	661.0	1100.0
TS002 L=(0-1749)MM	9.00-9.99	8.30	7.20	16.00	0.0	660.0
TS002 L=(1750-2600)MM	9.00-9.99	8.30	7.20	16.00	661.0	1100.0
TS003 L=(0-1749)MM	10.00-10.99	9.00	7.60	16.00	0.0	660.0
TS003 L=(1750-2600)MM	10.00-10.99	9.00	7.60	16.00	661.0	1100.0
TS004 L=(0-1749)MM	11.00-11.99	10.00	8.60	16.00	0.0	660.0
TS004 L=(1750-2600)MM	11.00-11.99	10.00	8.60	16.00	661.0	1100.0
TS005 L=(0-1749)MM	12.00-13.49	11.00	9.10	16.00	0.0	660.0
TS005 L=(1750-2600)MM	12.00-13.49	11.00	9.10	16.00	661.0	1100.0
TS006 L=(0-1749)MM	13.50-14.79	12.00	10.80	16.00	0.0	660.0
TS006 L=(1750-2600)MM	13.50-14.79	12.00	10.80	16.00	661.0	1100.0

• Indicate overall length (L) when ordering. • Ordering example: TS004-L1500

TS-I**

Drill Tubes - STS System - Inner 4 Start Thread Connection

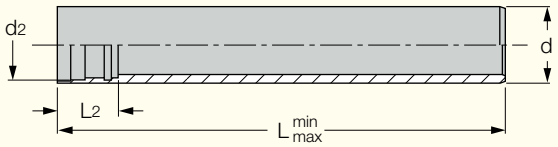


Designation	d Range	d	d_2	L_2	L_{min}	L_{max}
TS-I01 L=(0-1749)MM	12.60-13.60	11.00	9.60	22.00	0.0	660.0
TS-I01 L=(1750-2600)MM	12.60-13.60	11.00	9.60	22.00	661.0	1100.0
TS-I02 L=(0-1749)MM	13.61-14.60	12.00	10.60	22.00	0.0	660.0
TS-I02 L=(1750-2600)MM	13.61-14.60	12.00	10.60	22.00	661.0	1100.0
TS-I03 L=(0-1749)MM	14.61-15.99	13.00	11.60	22.00	0.0	660.0
TS-I03 L=(1750-2600)MM	14.61-15.99	13.00	11.60	22.00	661.0	1100.0
TS-I0 L=(0-1749)MM	15.60-16.70	14.00	12.60	21.00	0.0	660.0
TS-I0 L=(1750-2600)MM	15.60-16.70	14.00	12.60	21.00	661.0	1100.0
TS-I1 L=(0-1749)MM	16.71-17.70	15.00	13.60	21.00	0.0	660.0
TS-I1 L=(1750-2600)MM	16.71-17.70	15.00	13.60	21.00	661.0	1100.0
TS-I2 L=(0-1749)MM	17.71-18.90	16.00	14.50	22.00	0.0	660.0
TS-I2 L=(1750-2600)MM	17.71-18.90	16.00	14.50	22.00	661.0	1100.0
TS-I3 L=(0-1749)MM	18.91-20.00	17.00	15.50	22.00	0.0	660.0
TS-I3 L=(1750-2600)MM	18.91-20.00	17.00	15.50	22.00	661.0	1100.0
TS-I4 L=(0-1749)MM	20.01-21.80	18.00	16.00	27.50	0.0	660.0
TS-I4 L=(1750-2600)MM	20.01-21.80	18.00	16.00	27.50	661.0	1100.0
TS-I5 L=(0-1749)MM	21.81-24.10	20.00	18.00	30.00	0.0	660.0
TS-I5 L=(1750-2600)MM	21.81-24.10	20.00	18.00	30.00	661.0	1100.0
TS-I6 L=(0-1749)MM	24.11-26.40	22.00	19.50	30.00	0.0	660.0
TS-I6 L=(1750-2600)MM	24.11-26.40	22.00	19.50	30.00	661.0	1100.0
TS-I7 L=(0-1749)MM	26.41-28.70	24.00	21.00	30.00	0.0	660.0
TS-I7 L=(1750-2600)MM	26.41-28.70	24.00	21.00	30.00	661.0	1100.0
TS-I8 L=(0-1749)MM	28.71-31.00	26.00	23.50	33.00	0.0	660.0
TS-I8 L=(1750-2600)MM	28.71-31.00	26.00	23.50	33.00	661.0	1100.0
TS-I9 L=(0-1749)MM	31.01-33.30	28.00	25.50	33.00	0.0	660.0
TS-I9 L=(1750-2600)MM	31.01-33.30	28.00	25.50	33.00	661.0	1100.0
TS-I10 L=(0-1749)MM	33.31-36.20	30.00	28.00	33.00	0.0	660.0
TS-I10 L=(1750-2600)MM	33.31-36.20	30.00	28.00	33.00	661.0	1100.0
TS-I11 L=(0-1749)MM	36.21-39.60	33.00	30.00	40.00	0.0	660.0
TS-I11 L=(1750-2600)MM	36.21-39.60	33.00	30.00	40.00	661.0	1100.0
TS-I12 L=(1750-2600)MM	39.41-43.00	36.00	33.00	40.00	661.0	1100.0
TS-I12 L=(0-1749)MM	39.61-43.00	36.00	33.00	40.00	0.0	660.0
TS-I13 L=(0-1749)MM	43.01-47.00	39.00	36.00	40.00	0.0	660.0
TS-I13 L=(1750-2600)MM	43.01-47.00	39.00	36.00	40.00	661.0	1100.0
TS-I14 L=(0-1749)MM	47.01-51.70	43.00	39.00	40.00	0.0	660.0
TS-I14 L=(1750-2600)MM	47.01-51.70	43.00	39.00	40.00	661.0	1100.0
TS-I15 L=(0-1749)MM	51.71-56.20	47.00	43.00	44.00	0.0	660.0
TS-I15 L=(1750-2600)MM	51.71-56.20	47.00	43.00	44.00	661.0	1100.0
TS-I16 L=(1750-2600)MM	56.21-60.06	51.00	47.00	44.00	661.0	1100.0
TS-I16 L=(0-1749)MM	56.21-60.60	51.00	47.00	44.00	0.0	600.0
TS-I17 L=(0-1749)MM	60.61-65.00	56.00	51.00	44.00	0.0	660.0
TS-I17 L=(1750-2600)MM	60.61-65.00	56.00	51.00	44.00	661.0	1100.0
TS-I18 L=(0-1749)MM	65.00-66.99	56.00	52.00	75.00	0.0	660.0
TS-I18 L=(1750-2600)MM	65.00-66.99	56.00	52.00	75.00	661.0	1100.0
TS-I19 L=(0-1749)MM	67.00-72.99	62.00	58.00	75.00	0.0	660.0
TS-I19 L=(1750-2600)MM	67.00-72.99	62.00	58.00	75.00	661.0	1100.0
TS-I20 L=(0-1749)MM	73.00-79.99	68.00	63.00	75.00	0.0	660.0
TS-I20 L=(1750-2600)MM	73.00-79.99	68.00	63.00	75.00	661.0	1100.0
TS-I21 L=(0-1749)MM	80.00-86.99	75.00	70.00	97.00	0.0	660.0
TS-I21 L=(1750-2600)MM	80.00-86.99	75.00	70.00	97.00	661.0	1100.0
TS-I22 L=(0-1749)MM	87.00-99.99	82.00	77.00	97.00	0.0	660.0
TS-I22 L=(1750-2600)MM	87.00-99.99	82.00	77.00	97.00	661.0	1100.0
TS-I23 L=(0-1749)MM	100.00-111.99	94.00	89.00	97.00	0.0	660.0

• Indicate overall length (L) when ordering. • Ordering example: TS-I12-L2000

TS-I** (continued)

Drill Tubes - STS System - Inner 4 Start Thread Connection

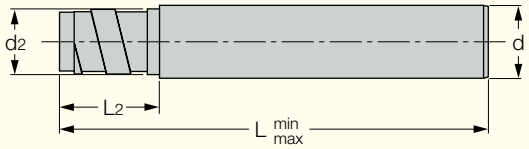


Designation	d Range	d	d_2	L_2	L_{min}	L_{max}
TS-I23 L=(1750-2600)MM	100.00-111.99	94.00	89.00	97.00	661.0	1100.0
TS-I24 L=(0-1749)MM	112.00-123.99	106.00	101.00	118.00	0.0	660.0
TS-I24 L=(1750-2600)MM	112.00-123.99	106.00	101.00	118.00	661.0	1100.0
TS-I25 L=(0-1749)MM	124.00-135.99	118.00	113.00	118.00	0.0	660.0
TS-I25 L=(1750-2600)MM	124.00-135.99	118.00	113.00	118.00	661.0	1100.0
TS-I26 L=(0-1749)MM	136.00-147.99	130.00	125.00	118.00	0.0	660.0
TS-I26 L=(1750-2600)MM	136.00-147.99	130.00	125.00	118.00	661.0	1100.0
TS-I27 L=(0-1749)MM	148.00-159.99	142.00	137.00	139.00	0.0	660.0
TS-I27 L=(1750-2600)MM	148.00-159.99	142.00	137.00	139.00	661.0	1100.0
TS-I28 L=(0-1749)MM	160.00-171.99	154.00	149.00	139.00	0.0	660.0
TS-I28 L=(1750-2600)MM	160.00-171.99	154.00	149.00	139.00	661.0	1100.0
TS-I29 L=(0-1749)MM	172.00-183.99	166.00	161.00	139.00	0.0	660.0
TS-I29 L=(1750-2600)MM	172.00-183.99	166.00	161.00	139.00	661.0	1100.0
TS-I30 L=(0-1749)MM	184.00-195.99	178.00	173.00	144.00	0.0	660.0
TS-I30 L=(1750-2600)MM	184.00-195.99	178.00	173.00	144.00	661.0	1100.0
TS-I31 L=(0-1749)MM	196.00-207.99	190.00	185.00	144.00	0.0	660.0
TS-I31 L=(1750-2600)MM	196.00-207.99	190.00	185.00	144.00	661.0	1100.0
TS-I32 L=(0-1749)MM	208.00-219.99	202.00	197.00	144.00	0.0	660.0
TS-I32 L=(1750-2600)MM	208.00-219.99	202.00	197.00	144.00	661.0	1100.0
TS-I33 L=(0-1749)MM	220.00-231.99	214.00	208.00	164.00	0.0	660.0
TS-I33 L=(1750-2600)MM	220.00-231.99	214.00	208.00	164.00	661.0	1100.0
TS-I34 L=(0-1749)MM	232.00-243.99	226.00	220.00	164.00	0.0	660.0
TS-I34 L=(1750-2600)MM	232.00-243.99	226.00	220.00	164.00	661.0	1100.0

• Indicate overall length (L) when ordering. • Ordering example: TS-I12-L2000

TS-O**

Drill Tubes - STS System - Outer Single Start Thread Connection

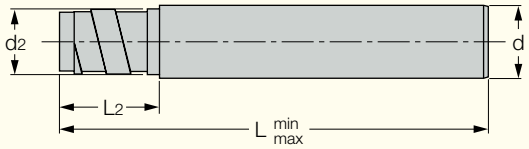


Designation	d Range	d	d_2	L_2	L_{min}	L_{max}
TS-O0 L=(0-660)MM	14.50-15.00	12.00	11.50	23.00	0.0	660.0
TS-O0 L=(661-1100)MM	14.50-15.00	12.00	11.50	23.00	661.0	1100.0
TS-O1 L=(0-660)MM	15.01-15.50	12.00	11.80	23.00	0.0	660.0
TS-O1 L=(0661-1100)MM	15.01-15.50	12.00	11.80	23.00	661.0	1100.0
TS-O2 L=(0-660)MM	15.51-16.00	13.00	12.40	23.00	0.0	660.0
TS-O2 L=(661-1100)MM	15.51-16.00	13.00	12.40	23.00	661.0	1100.0
TS-O3 L=(0-660)MM	16.01-16.50	13.00	12.70	23.00	0.0	660.0
TS-O3 L=(661-1100)MM	16.01-16.50	13.00	12.70	23.00	661.0	1100.0
TS-O4 L=(0-660)MM	16.51-17.25	14.00	13.40	23.00	0.0	660.0
TS-O4 L=(661-1100)MM	16.51-17.25	14.00	13.40	23.00	661.0	1100.0
TS-O5 L=(0-1749)MM	17.26-18.00	14.00	13.70	23.00	0.0	1300.0
TS-O5 L=(1750-2600)MM	17.26-18.00	14.00	13.70	23.00	1301.0	2600.0
TS-O6 L=(0-1749)MM	18.01-19.00	15.00	14.40	23.00	0.0	1300.0
TS-O6 L=(1750-2600)MM	18.01-19.00	15.00	14.40	23.00	1301.0	2600.0
TS-O7 L=(0-1749)MM	19.01-19.99	16.50	15.40	23.00	0.0	1300.0
TS-O7 L=(1750-2600)MM	19.01-19.99	16.50	15.40	23.00	1301.0	2600.0
TS-O8 L=(0-1749)MM	20.00-21.99	18.00	16.50	26.00	0.0	1300.0
TS-O8 L=(1750-2600)MM	20.00-21.99	18.00	16.50	26.00	1301.0	2600.0
TS-O9 L=(0-1749)MM	22.00-24.99	20.00	19.00	26.00	0.0	1300.0
TS-O9 L=(1750-2600)MM	22.00-24.99	20.00	19.00	26.00	1301.0	2600.0
TS-O10 L=(0-1749)MM	25.00-26.99	22.00	20.00	26.00	0.0	1300.0
TS-O10 L=(1750-2600)MM	25.00-26.99	22.00	20.00	26.00	1301.0	2600.0
TS-O11 L=(0-1749)MM	27.00-29.99	24.00	22.00	26.00	0.0	1300.0
TS-O11 L=(1750-2600)MM	27.00-29.99	24.00	22.00	26.00	1301.0	2600.0
TS-O12 L=(0-1749)MM	30.00-31.99	26.00	24.00	26.00	0.0	1300.0
TS-O12 L=(1750-2600)MM	30.00-31.99	26.00	24.00	26.00	1301.0	2600.0
TS-O13 L=(0-1749)MM	32.00-33.99	30.00	27.00	26.00	0.0	1300.0
TS-O13 L=(1750-2600)MM	32.00-33.99	30.00	27.00	26.00	1301.0	2600.0
TS-O14 L=(0-1749)MM	34.00-36.99	30.00	27.00	41.00	0.0	1300.0
TS-O14 L=(1750-2600)MM	34.00-36.99	30.00	27.00	41.00	1301.0	2600.0
TS-O15 L=(0-1749)MM	37.00-39.99	33.00	30.00	41.00	0.0	1300.0
TS-O15 L=(1750-2600)MM	37.00-39.99	33.00	30.00	41.00	1301.0	2600.0
TS-O16 L=(0-1749)MM	40.00-43.99	36.00	33.00	41.00	0.0	1300.0
TS-O16 L=(1750-2600)MM	40.00-43.99	36.00	33.00	41.00	1301.0	2600.0
TS-O17 L=(0-1749)MM	44.00-46.99	39.00	37.00	41.00	0.0	1300.0
TS-O17 L=(1750-2600)MM	44.00-46.99	39.00	37.00	41.00	1301.0	2600.0
TS-O18 L=(0-1749)MM	47.00-51.99	43.00	41.00	41.00	0.0	1300.0
TS-O18 L=(1750-2600)MM	47.00-51.99	43.00	41.00	41.00	1301.0	2600.0
TS-O19 L=(0-1749)MM	52.00-56.99	47.00	44.00	41.00	0.0	1300.0
TS-O19 L=(1750-2600)MM	52.00-56.99	47.00	44.00	41.00	1301.0	2600.0
TS-O20 L=(0-1749)MM	57.00-60.99	51.00	49.00	41.00	0.0	1300.0
TS-O20 L=(1750-2600)MM	57.00-60.99	51.00	49.00	41.00	1301.0	2600.0
TS-O21 L=(0-1749)MM	61.00-67.99	56.00	53.00	41.00	0.0	1300.0
TS-O21 L=(1750-2600)MM	61.00-67.99	56.00	53.00	41.00	1301.0	2600.0
TS-O22 L=(0-1749)MM	68.00-74.99	62.00	59.00	41.00	0.0	1300.0
TS-O22 L=(1750-2600)MM	68.00-74.99	62.00	59.00	41.00	1301.0	2600.0
TS-O23 L=(0-1749)MM	75.00-80.99	68.00	65.00	71.00	0.0	1300.0
TS-O23 L=(1750-2600)MM	75.00-80.99	68.00	65.00	71.00	1301.0	2600.0
TS-O24 L=(0-1749)MM	81.00-90.99	75.00	71.00	71.00	0.0	1300.0
TS-O24 L=(1750-2600)MM	81.00-90.99	75.00	71.00	71.00	1301.0	2600.0
TS-O25 L=(0-1749)MM	91.00-98.99	82.00	79.00	71.00	0.0	1300.0
TS-O25 L=(1750-2600)MM	91.00-98.99	82.00	79.00	71.00	1301.0	2600.0
TS-O26 L=(0-1749)MM	99.00-110.99	94.00	90.00	71.00	0.0	1300.0

• Indicate overall length (L) when ordering. • Ordering example: TS-036-L1100

TS-O** (continued)

Drill Tubes - STS System - Outer Single Start Thread Connection

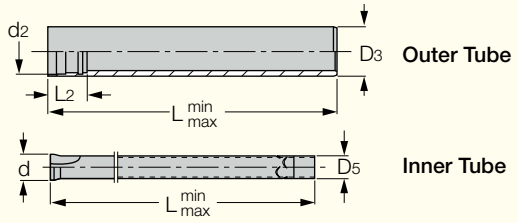


Designation	d Range	d	d_2	L_2	L_{min}	L_{max}
TS-O26 L=(1750-2600)MM	99.00-110.99	94.00	90.00	71.00	1301.0	2600.0
TS-O27 L=(0-1749)MM	111.00-122.99	106.00	102.00	71.00	0.0	1300.0
TS-O27 L=(1750-2600)MM	111.00-122.99	106.00	102.00	71.00	1301.0	2600.0
TS-O28 L=(0-1749)MM	123.00-134.99	118.00	114.00	71.00	0.0	1300.0
TS-O28 L=(1750-2600)MM	123.00-134.99	118.00	114.00	71.00	1301.0	2600.0
TS-O29 L=(0-1749)MM	135.00-148.99	130.00	126.00	71.00	0.0	1300.0
TS-O29 L=(1750-2600)MM	135.00-148.99	130.00	126.00	71.00	1301.0	2600.0
TS-O30 L=(0-1749)MM	149.00-161.99	142.00	139.00	71.00	0.0	1300.0
TS-O30 L=(1750-2600)MM	149.00-161.99	142.00	139.00	71.00	1301.0	2600.0
TS-O31 L=(0-1749)MM	162.00-173.99	154.00	151.00	86.00	0.0	1300.0
TS-O31 L=(1750-2600)MM	162.00-173.99	154.00	151.00	86.00	1301.0	2600.0
TS-O32 L=(0-1749)MM	174.00-185.99	166.00	163.00	86.00	0.0	1300.0
TS-O32 L=(1750-2600)MM	174.00-185.99	166.00	163.00	86.00	1301.0	2600.0
TS-O33 L=(0-1749)MM	186.00-197.99	178.00	175.00	86.00	0.0	1300.0
TS-O33 L=(1750-2600)MM	186.00-197.99	178.00	175.00	86.00	1301.0	2600.0
TS-O34 L=(0-1749)MM	198.00-209.99	190.00	187.00	86.00	0.0	1300.0
TS-O34 L=(1750-2600)MM	198.00-209.99	190.00	187.00	86.00	1301.0	2600.0
TS-O35 L=(0-1749)MM	210.00-221.99	202.00	199.00	86.00	0.0	1300.0
TS-O35 L=(1750-2600)MM	210.00-221.99	202.00	199.00	86.00	1301.0	2600.0
TS-O36 L=(0-1749)MM	222.00-233.99	214.00	211.00	86.00	0.0	1300.0
TS-O36 L=(1750-2600)MM	222.00-233.99	214.00	211.00	86.00	1301.0	2600.0
TS-O37 L=(0-1749)MM	234.00-245.99	226.00	223.00	86.00	0.0	1300.0
TS-O37 L=(1750-2600)MM	234.00-245.99	226.00	223.00	86.00	1301.0	2600.0

• Indicate overall length (L) when ordering. • Ordering example: TS-036-L1100

TDO-I (D18.41-65.00)

Double-Tube Drill System, 4 Start Thread Connection Outer Tubes

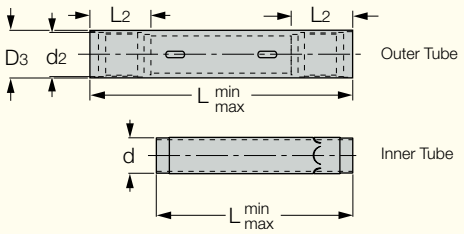


Designation	d Range	D_3	d_2	L_2	In. Tube	d	D_5	L min	L max
TDO-I0 L=(0-630)MM	18.41-20.00	18.00	16.00	27.50	TDI-N0	12.00	10.00	0.0	660.0
TDO-I0 L=(631-1070)MM	18.41-20.00	18.00	16.00	27.50	TDI-N0	12.00	10.00	661.0	1100.0
TDO-I1 L=(0-630)MM	20.01-21.80	19.50	18.00	30.00	TDI-N1	14.00	12.00	0.0	660.0
TDO-I1 L=(631-1070)MM	20.01-21.80	19.50	18.00	30.00	TDI-N1	14.00	12.00	661.0	1100.0
TDO-I2 L=(0-630)MM	21.81-24.10	21.50	19.50	30.00	TDI-N2	15.00	13.00	0.0	660.0
TDO-I2 L=(631-1070)MM	21.81-24.10	21.50	19.50	30.00	TDI-N2	15.00	13.00	661.0	1100.0
TDO-I3 L=(0-630)MM	24.11-26.40	23.50	21.00	30.00	TDI-N3	16.00	14.00	0.0	660.0
TDO-I3 L=(631-1070)MM	24.11-26.40	23.50	21.00	30.00	TDI-N3	16.00	14.00	661.0	1100.0
TDO-I4 L=(0-630)MM	26.41-28.70	26.00	23.50	33.00	TDI-N4	18.00	16.00	0.0	660.0
TDO-I4 L=(631-1070)MM	26.41-28.70	26.00	23.50	33.00	TDI-N4	18.00	16.00	661.0	1100.0
TDO-I5 L=(0-630)MM	28.71-31.00	28.00	25.50	33.00	TDI-N5	20.00	18.00	0.0	600.0
TDO-I5 L=(631-1070)MM	28.71-31.00	28.00	25.50	33.00	TDI-N5	20.00	18.00	661.0	1100.0
TDO-I6 L=(0-630)MM	31.01-33.30	30.50	28.00	33.00	TDI-N6	22.00	20.00	0.0	660.0
TDO-I6 L=(631-1070)MM	31.01-33.30	30.50	28.00	33.00	TDI-N6	22.00	20.00	661.0	1100.0
TDO-I7 L=(0-630)MM	33.31-36.20	33.00	30.00	40.00	TDI-N7	24.00	22.00	0.0	660.0
TDO-I7 L=(631-1070)MM	33.31-36.20	33.00	30.00	40.00	TDI-N7	24.00	22.00	661.0	1100.0
TDO-I8 L=(0-630)MM	36.21-39.60	35.50	33.00	40.00	TDI-N8	26.00	24.00	0.0	660.0
TDO-I8 L=(631-1070)MM	36.21-39.60	35.50	33.00	40.00	TDI-N8	26.00	24.00	661.0	1100.0
TDO-I9 L=(0-630)MM	39.61-43.00	39.00	36.00	40.00	TDI-N9	29.00	27.00	0.0	660.0
TDO-I9 L=(631-1070)MM	39.61-43.00	39.00	36.00	40.00	TDI-N9	29.00	27.00	661.0	1100.0
TDO-I10 L=(0-630)MM	43.01-47.00	42.50	39.00	40.00	TDI-N10	32.00	30.00	0.0	660.0
TDO-I10 L=(631-1070)MM	43.01-47.00	42.50	39.00	40.00	TDI-N10	32.00	30.00	661.0	1100.0
TDO-I11 L=(0-630)MM	47.01-51.70	46.50	43.00	44.00	TDI-N11	35.00	32.00	0.0	660.0
TDO-I11 L=(631-1070)MM	47.01-51.70	46.50	43.00	44.00	TDI-N11	35.00	32.00	661.0	1100.0
TDO-I12 L=(0-630)MM	51.71-56.20	51.00	47.00	44.00	TDI-N12	39.00	36.00	0.0	660.0
TDO-I12 L=(631-1070)MM	51.71-56.20	51.00	47.00	44.00	TDI-N12	39.00	36.00	661.0	1100.0
TDO-I13 L=(0-630)MM	56.21-65.00	55.50	51.00	44.00	TDI-N13	43.00	40.00	0.0	660.0
TDO-I13 L=(631-1070)MM	56.21-65.00	55.50	51.00	44.00	TDI-N13	43.00	40.00	661.0	1100.0

• Please indicate overall length (L) when ordering • Ordering example: TDO-I13-L1100 • For 18.41-65.00 diameter range, the inner tube should be 30 mm longer than the outer tube

TDO-I (D65.00-171.99)

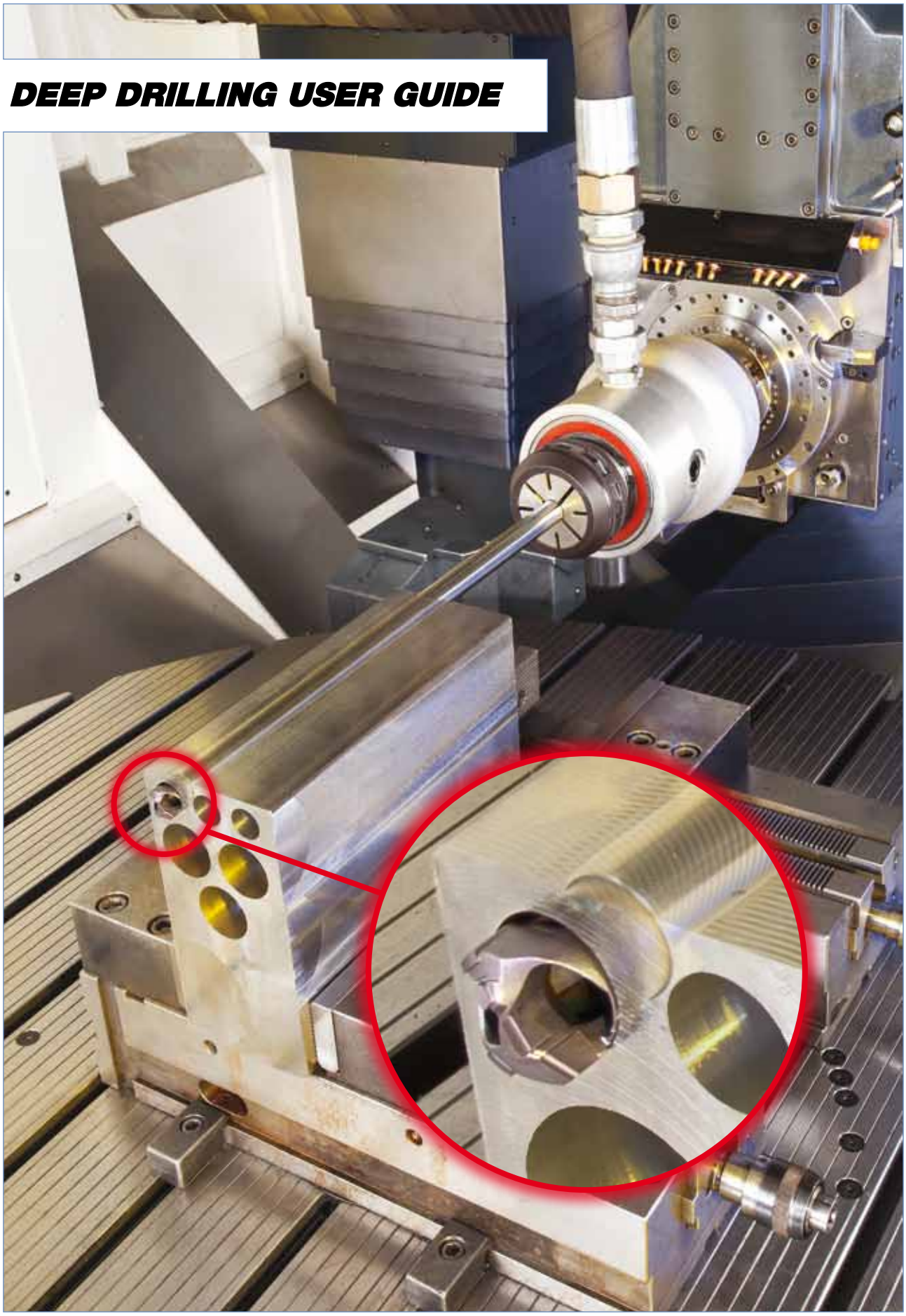
Double-Tube Drill System, 4 Start Thread Connection Outer Tubes



Designation	d Range	D3	d2	L2	Int Tube	d	L min	L max
TDO-I14 L=(0-660)MM	65.00-66.99	56.00	52.00	75.00	TDI-N14	40.00	0.0	660.0
TDO-I14 L=(661-1100)MM	65.00-66.99	56.00	52.00	75.00	TDI-N14	40.00	661.0	1100.0
TDO-I15 L=(0-660)MM	67.00-72.99	62.00	58.00	75.00	TDI-N15	44.00	0.0	660.0
TDO-I15 L=(661-1100)MM	67.00-72.99	62.00	58.00	75.00	TDI-N15	44.00	661.0	1100.0
TDO-I16 L=(0-630)MM	73.00-79.99	68.00	63.00	75.00	TDI-N16	48.00	0.0	660.0
TDO-I16 L=(631-1070)MM	73.00-79.99	68.00	63.00	75.00	TDI-N16	48.00	661.0	1100.0
TDO-I17 L=(0-630)MM	80.00-86.99	75.00	70.00	97.00	TDI-N17	54.00	0.0	660.0
TDO-I17 L=(631-1070)MM	80.00-86.99	75.00	70.00	97.00	TDI-N17	54.00	661.0	1100.0
TDO-I18 L=(0-630)MM	87.00-99.99	82.00	77.00	97.00	TDI-N18	60.00	0.0	660.0
TDO-I18 L=(631-1070)MM	87.00-99.99	82.00	77.00	97.00	TDI-N18	60.00	661.0	1100.0
TDO-I19 L=(0-630)MM	100.00-111.99	94.00	89.00	97.00	TDI-N19	70.00	0.0	660.0
TDO-I19 L=(631-1070)MM	100.00-111.99	94.00	89.00	97.00	TDI-N19	70.00	661.0	1100.0
TDO-I20 L=(0-630)MM	112.00-123.99	106.00	101.00	118.00	TDI-N20	80.00	0.0	660.0
TDO-I20 L=(631-1070)MM	112.00-123.99	106.00	101.00	118.00	TDI-N20	80.00	661.0	1100.0
TDO-I21 L=(0-630)MM	124.00-135.99	118.00	113.00	118.00	TDI-N21	80.00	0.0	660.0
TDO-I21 L=(631-1070)MM	124.00-135.99	118.00	113.00	118.00	TDI-N21	80.00	661.0	1100.0
TDO-I22 L=(0-630)MM	136.00-147.99	130.00	125.00	118.00	TDI-N22	90.00	0.0	660.0
TDO-I22 L=(631-1070)MM	136.00-147.99	130.00	125.00	118.00	TDI-N22	90.00	661.0	1100.0
TDO-I23 L=(0-630)MM	148.00-159.99	142.00	137.00	139.00	TDI-N23	100.00	0.0	660.0
TDO-I23 L=(631-1070)MM	148.00-159.99	142.00	137.00	139.00	TDI-N23	100.00	661.0	1100.0
TDO-I24 L=(0-630)MM	160.00-171.99	154.00	149.00	139.00	TDI-N24	120.00	0.0	660.0
TDO-I24 L=(631-1070)MM	160.00-171.99	154.00	149.00	139.00	TDI-N24	120.00	661.0	1100.0

• Indicate overall length (L) when ordering • Ordering example: TDO-I18-L1150 • For 65.00-123.99 diameter range, the inner tube should be 190 mm longer than the outer tube. • For 124.00-183.99 diameter range, the inner tube should be 220 mm longer than the outer tube.

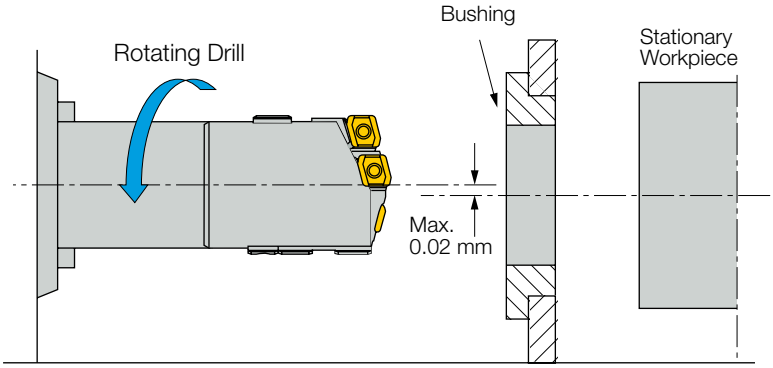
DEEP DRILLING USER GUIDE



Drill Setup

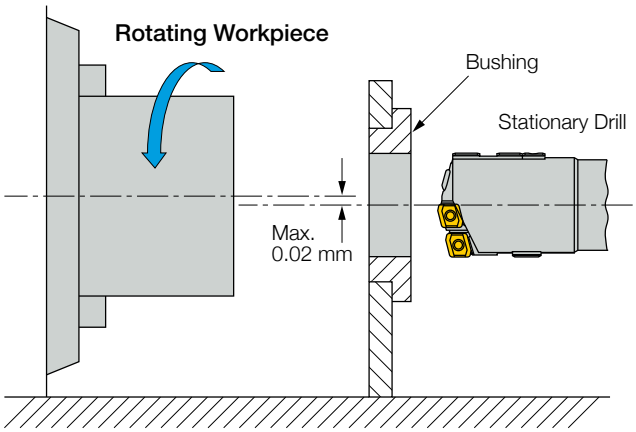
Rotating Drill

- Can be applied on symmetrical and non-symmetrical workpieces.
- Drill to bushing center misalignment should not exceed 0.02 mm.



Stationary Drill

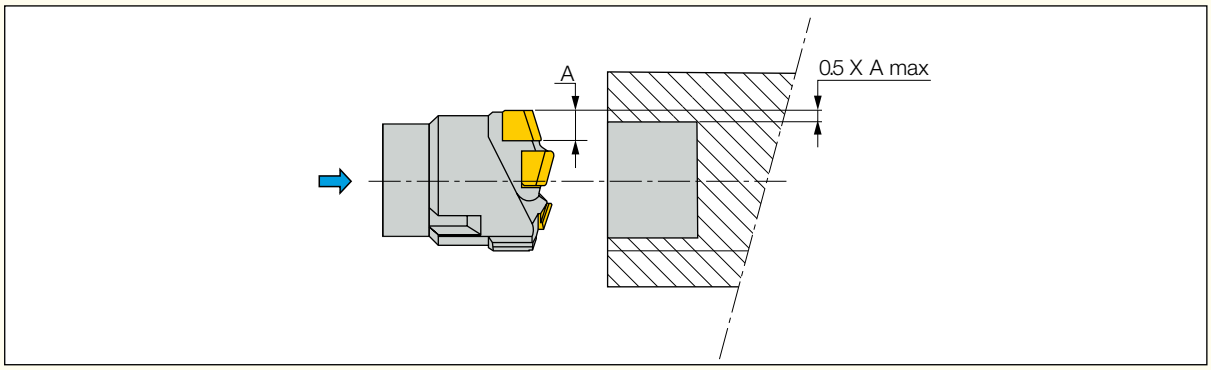
- Applied on symmetrical workpieces.
- Improved hole straightness and bushing wear.
- Drill to bushing center misalignment should not exceed 0.02 mm.

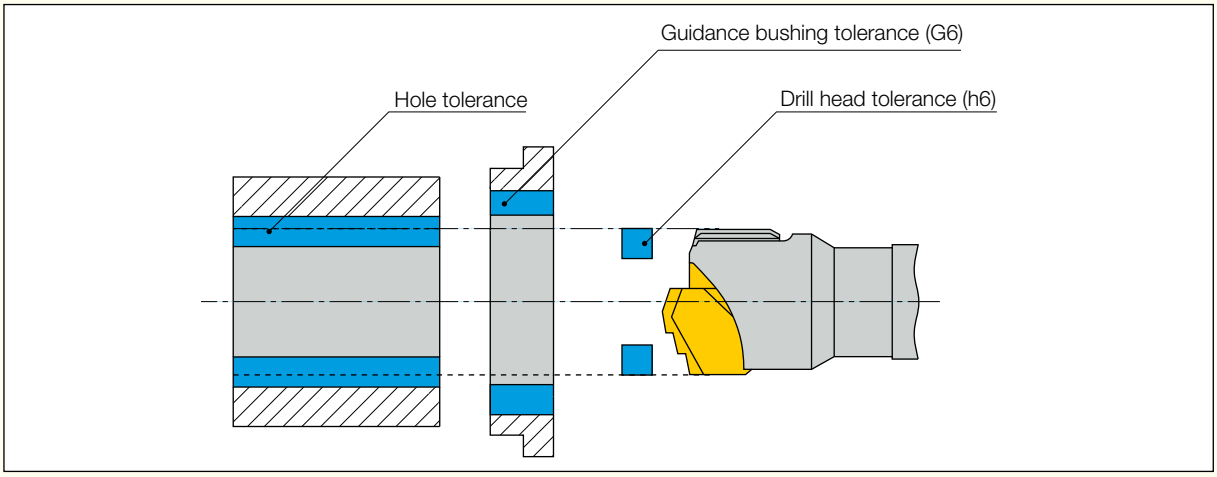


Drill Bushing and Workpiece Tolerance Relative Positioning

Pre-drilled Hole

- A large pre-drilled hole (larger than D-a) ensures precise hole size and center location.



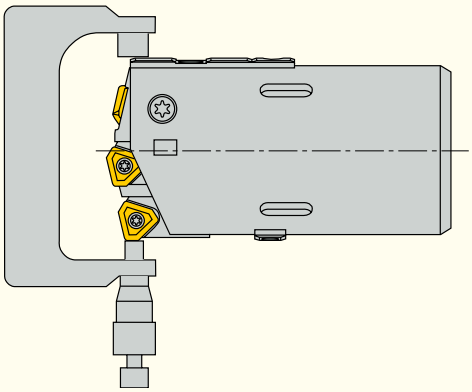


Measurement and Adjustment of the Drilling Head

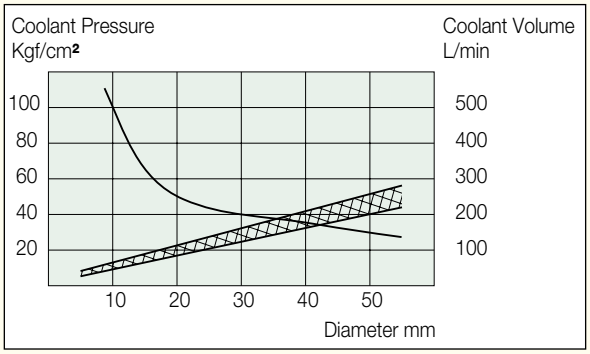
- The drill diameter can be measured by attaching the micrometer to the outer insert edge on one side of the head and the guidance pad on the other side. If necessary, the guidance pad can be moved forward to enable measuring the diameter accurately.

- The drilling diameter can be adjusted by moving the outer cartridge radially:
  Loosen the rear clamping screws and clamp the cartridge while holding it against the adjustment screws.
  Re-measure the diameter.

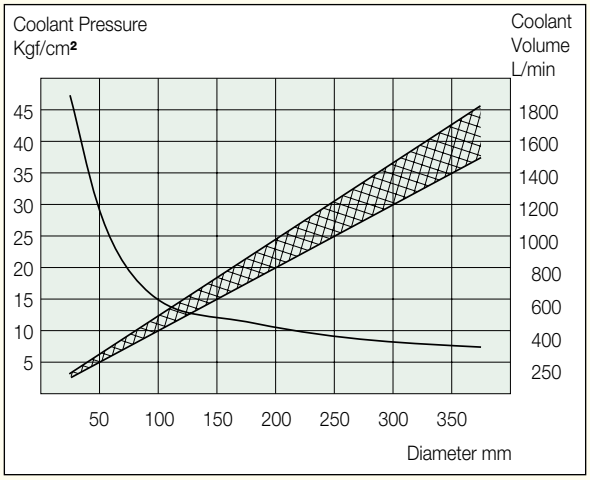
  If necessary it can be corrected according to the procedure described above.



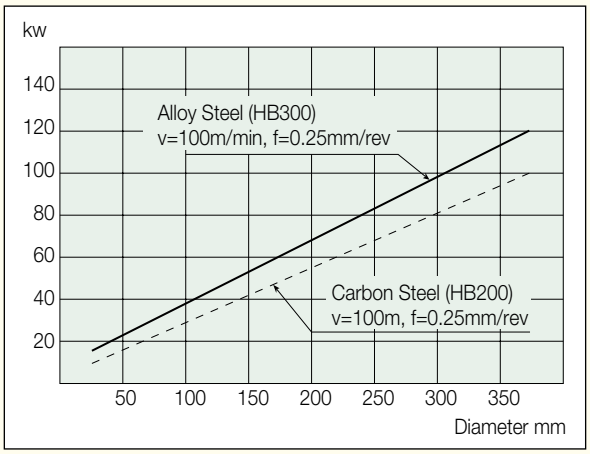
Recommended Coolant Pressure and Volume ≤ 50 mm



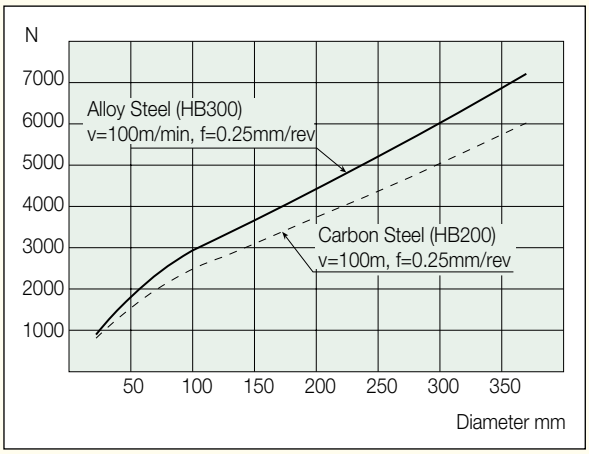
Recommended Coolant Pressure and Volume > 50 mm



Machine Power



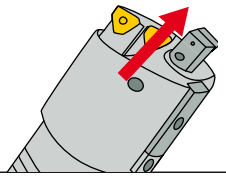
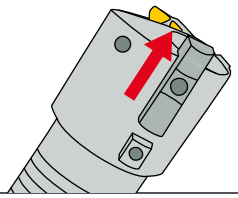
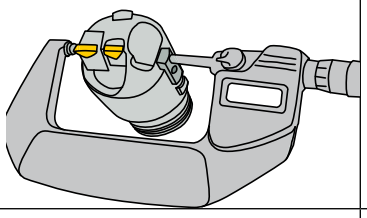
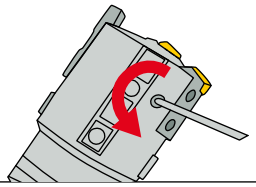
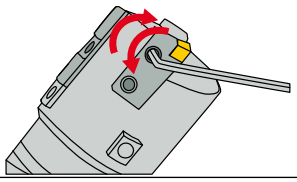
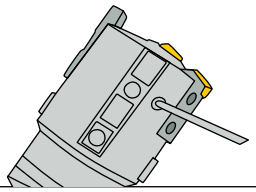
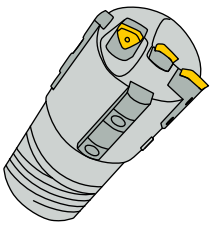
Machine Thrust Force



Technical Information - Cartridge Style Drill Head Diameter Setting

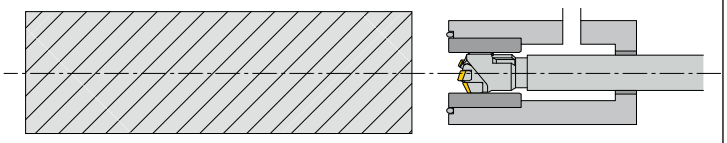
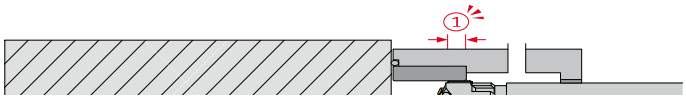
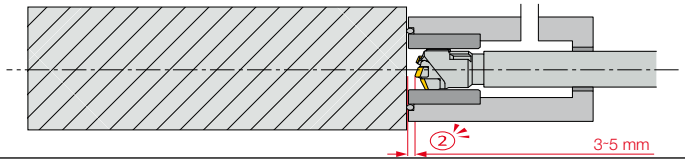
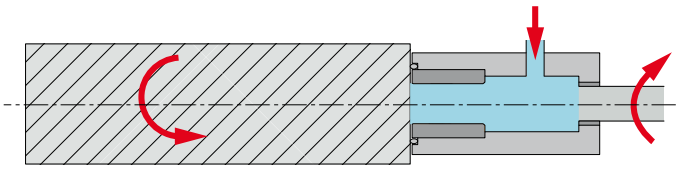
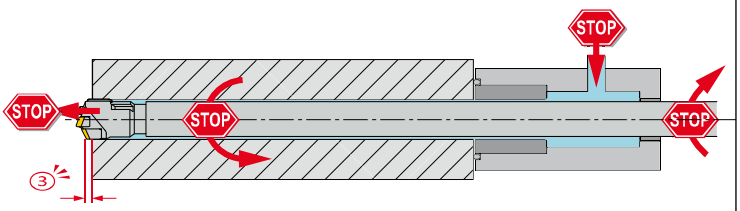
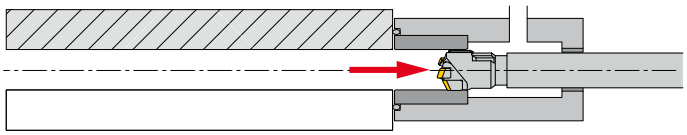
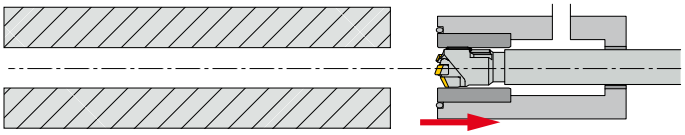
The drill head diameter is set and inspected with a master insert in our final inspection. However, the inserts in the market have a tolerance fluctuation so each time you index the insert, the diameter must be adjusted as per the following method.

Note: When a corner change is made on the insert, it must be adjusted to correct size or damage can be caused to the head body or workpiece material.

	1. Remove the inner cartridge to avoid interference with the guide screw.
	2. The dimensional guide pad must be slid forward to measure the diameter. 2.1 Loosen the lock screw and slide the guide pad forward. 2.2 Re-tighten the lock screw at the measuring position.
	3. Measure the diameter with a micrometer. We recommend setting the tool diameter at h8 tolerance to the cutting diameter. If the diameter is incorrect, go to step 4 below. If it's correct, go to step 5 below.
	4. Adjust the outer cartridge 4.1 First loosen the lock screw of the outer cartridge and then tighten it slightly.
	4.2 Proceed to adjust the diameter, using the 2 adjustment screws and measure with a micrometer.
	4.3 When set to the size, re-tighten the lock screw. 4.4 Recheck the diameter with a micrometer. If it is still out of tolerance, repeat the procedure from steps 1-4. **Note: Please make sure to tighten the lock screw firmly before use. If loose, the cartridge may move and cause serious problems during machining.**
	5. Slide the dimensional guide pad back to the original position and tighten the lock screw. 6. Replace the inner cartridge and tighten the lock screw. **Note: Please check that all lock screws are firmly tightened, as they may come loose if vibration occurs during drilling.**

Technical Information - NC Cycle

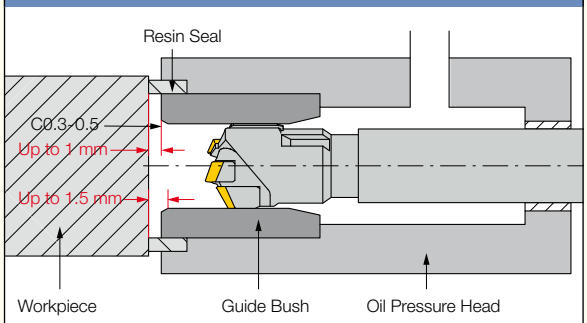
Use the NC cycle as instructed below in order to optimize tool performance more safely.

	**1. Start NC operation cycle.**
	**2. Oil pressure head moves until it touches the workpiece** ① **Set the starting point of main axis of the tool, so the guide pad remains inside the guide bush when the oil pressure head moves forward.**
	**3. Move tool until workpiece** ② **Move tool until tool to a position of 3 to 5 mm from the edge of the workpiece.** • If the available NC machine can support this approach, the operation process may start from this point
	**4. Start cutting** • Start coolant supply • Start rotating (tool / workpiece / tool & workpiece) • Start feeding
	**5. Stop cutting** • Stop feeding • Stop rotating (tool / workpiece / tool & workpiece) • Stop coolant supply ③ **Stop rotation when the outer tip is at the edge of the workpiece.**
	**6. Tool main axis back to starting point**
	**7. Oil pressure head back to starting point**

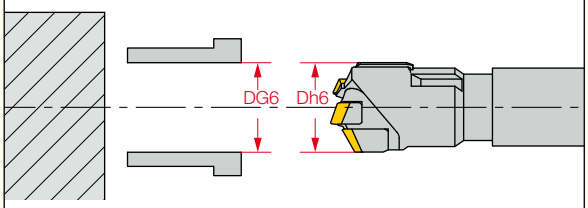
Technical Information - Notes for Guide Bush Installation

Many of the problems in BTA drilling are caused by incorrect use of the guide bush. The shape, type and tolerance greatly affect cutting accuracy and tool life. Please note the following when using one in your application.

Resin Seal Type

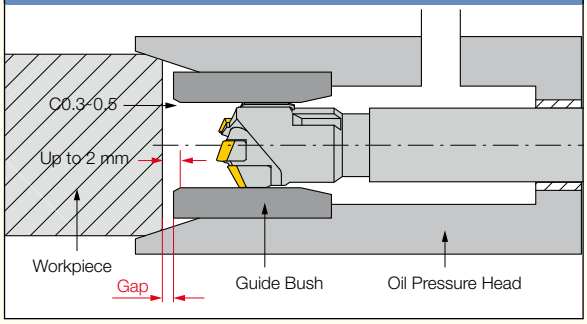


Guide Bush Tolerance

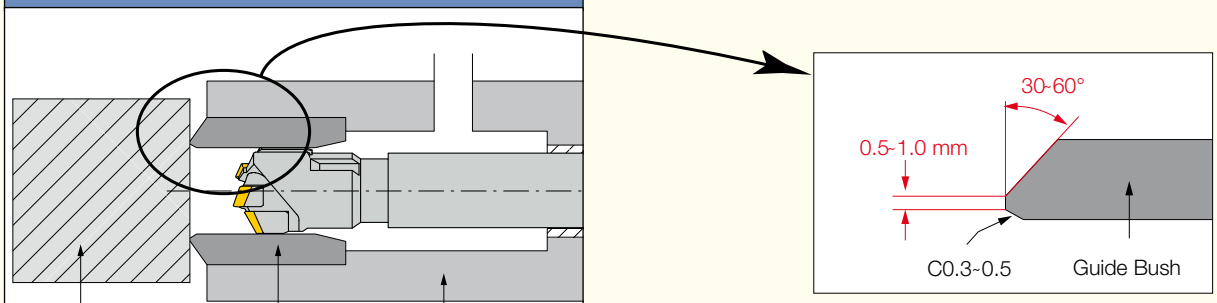


Tool Diameter D (mm)	G6 Tolerance (mm)
8.00 - 10.00	+0.005 ~ +0.014
10.01 - 18.00	+0.006 ~ +0.017
18.01 - 30.00	+0.007 ~ +0.020
30.01 - 50.00	+0.009 ~ +0.025
50.01 - 80.00	+0.010~ +0.029
80.01 - 120.00	+0.012 ~ +0.034
120.01 - 180.00	+0.014 ~ +0.039
180.01 - 245.99	+0.015 ~ +0.044

Taper Cone Type



Flat-edge Type



Recommended for Ø65 mm and less

Technical Information - Cutting Fluid Management

Successful deep hole drilling can be achieved not only by tooling but also by an optimized combination of the tool, the machine and the cutting fluid. The cutting fluid is one of the essential components to obtain safe, stable and cost efficient deep hole drilling. Therefore it is very important to choose and use the cutting fluid correctly.

Cutting Fluid

The cutting fluid plays a large role in lubrication of tool, cooling of cutting edges and chips and evacuation of chips in deep hole drilling. It also contributes to improved tool life, surface finish and cutting accuracy when being fed continuously during cutting.

Lubrication

Lubrication of cutting edges and guide pads is necessary in deep hole drilling. To get efficient lubrication, it is recommended to use EP (Extreme Pressure) additives which contain sulfur or chlorine.

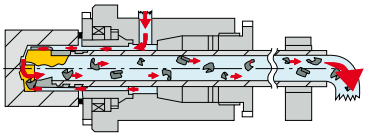
Heat dissipation

The coolability of cutting fluid depends on thermal characteristics such as thermal conductivity and specific heat. The cutting fluid of good coolability increases tool life, but a water-soluble type is not preferred in deep hole drilling because of a lesser lubrication effect. If water-soluble fluid is used, the concentration is recommended to be 10% (dilution rate 1/10) or more.
Cooling of chips is important as well as cooling of cutting edges and guide pads in deep hole drilling. Temperature control is also important to maintain long tool life, stable cutting conditions and cutting accuracy.

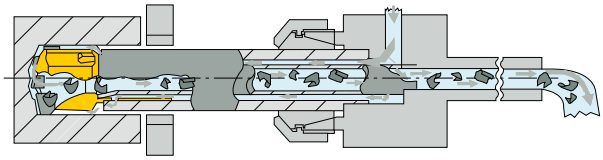
Chip evacuation

Cutting fluid has an important role in deep hole drilling as it evacuates chips through to the back end of boring bar (for STS) or inner tube (for DTS), whereas it finishes its role as soon as the chips are separated from the workpiece in general cutting. It is also important to control the flow and the pressure of cutting fluid.

STS (Single Tube System)



DTS (Double Tube System)



Coolant Unit

The coolant unit is also important to obtain the optimal effect of the cutting fluid, which has an important role in deep hole drilling.

Supply cutting fluid continuously at constant pressure and flow

Fluid pressure and flow are recommended to be continuously variable and monitored with a pressure gauge and a flow gauge. Recently, screw pumps with an inverter are suitable.

Maintain constant temperature

The cutting fluid is heated by factors such as:

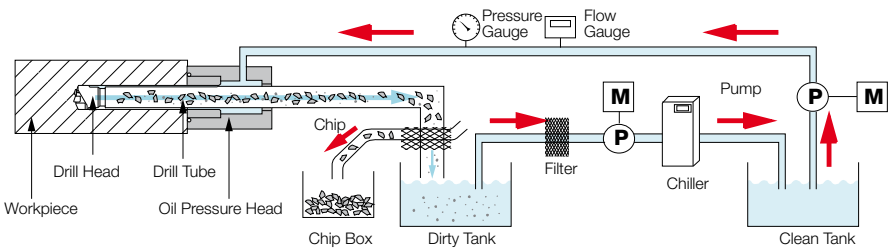
- Cutting edge
- Friction of guide pad
- Contact duration of heated chips and cutting fluid
- Pump

Maintenance of the constant cutting fluid temperature is important for stable cutting conditions, chip formation and cutting accuracy.
The temperature should be lower than 40°C (100°F) for EP additives to provide sufficient lubrication.
Therefore the cutting fluid temperature should be kept at 30-40°C (90-100°F) throughout the cutting operation.

Filtration

A lot of particles are contained in cutting fluid after finishing cutting and chip evacuation; thus filtration is necessary to remove them. The filter size should be selected to catch particles but not EP additives. The size depends on the cutting fluid, but generally it is suggested to be around 10-20 µm. For iron-based workpieces, a magnetic separator will be helpful, which decreases filter maintenance frequency.

Flow chart of cutting fluid in deep hole drilling



Deep Hole Drilling Systems

Problem	Possible Cause	Solution
The drill breaks or insert chips	Chip evacuation problems.	Check that the coolant passages are clear and that the Venturi slots are not damaged.
	Center misalignment of drill to workpiece.	Check center alignment of drill to workpiece. Check workpiece and drill clamping rigidity.
Poor surface finish	Workpiece or drill clamping rigidity problem.	Improve workpiece or drill clamping.
	Inadequate coolant oil.	Check the coolant oil and replace if necessary.
	Cutting speed too low.	Increase the cutting speed.
Excessive leakage of the coolant	Chips block the fluid passages.	Clear the chips.
	The drill was incorrectly assembled, or the Venturi slots of the internal tube are located in the wrong direction.	Check all connections and the direction of the internal tube.
Insufficient coolant flow at the cutting zone, despite correct fluid supply	Chips block the fluid passages.	Clear the chips.
	Worn bushing or sealing device.	Check the bushing and seal and replace if necessary.
	Venturi slots are too wide (worn)	Replace the internal tube.
	Internal tube shorter than the external tube.	Replace the internal tube to one with a correct length.
Chips jam in the front end of the drill	Insufficient coolant flow.	Adjust the fluid flow by raising the pressure; check the filter and fluid quality.

Connection Adapters

Various kinds of rotating and non-rotating drill connectors are available upon request.

Oil Pressure Heads

Oil pressure heads are available on request.

Special Heads

Special form heads for trepanning or any other special contours can be produced on request.

Recommended Machining Conditions

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material No.[1]
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
		>= 0.55 %C	Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% all elements)		Annealed	600	200	6
			Quenched and tempered	930	275	7
				1000	300	8
				1200	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	200	10
			Quenched and tempered	1100	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	12
			Martensitic	820	240	13
			Austenitic	600	180	14
K	Grey cast iron (GG)		Pearlitic/ferritic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable cast iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum-wrought alloy		Not cureable		60	21
			Cured		100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolitic copper		100	28
	Non-metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
		Ni or Co based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti alloys			RM 400		36
			Alpha+beta alloys cured	RM 1050		37
H	Hardened steel		Hardened		55 HRc	38
			Hardened		60 HRc	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRc	41

[1] For material groups see G6-41

Ground Brazed Solid Drill Heads DSD-E0, DSD-E1, DSD-E3, DDD-E3, DSD-I1						Adjustable Solid Drill Heads DSD-IA, DSD-EA		
Dia. Range	8.00-20.00 *1	15.60-20.00	20.01-31.00	31.01-43.00	43.01-65.00	Dia. Range	16.01-21.99	22.00-28.50
Vc (m/min)	Feed Rate f (mm/rev)					Vc (m/min)	Feed Rate f (mm/rev)	
70-120	0.05-0.13	0.08-0.15	0.1-0.17	0.13-0.2	0.16-0.3	60-120	0.08-0.13	0.1-0.15
70-120	0.05-0.13	0.08-0.15	0.1-0.17	0.13-0.2	0.16-0.3	60-120	0.08-0.13	0.1-0.15
40-70	0.05-0.13	0.08-0.15	0.1-0.17	0.13-0.2	0.16-0.3	60-120	0.08-0.13	0.1-0.15
70-120	0.05-0.13	0.08-0.15	0.1-0.17	0.13-0.2	0.16-0.3	60-120	0.08-0.13	0.1-0.15
55-100	0.05-0.1	0.08-0.12	0.1-0.15	0.13-0.17	0.15-0.28	50-100	0.08-0.11	0.1-0.13
70-100	0.05-0.13	0.08-0.15	0.1-0.17	0.13-0.2	0.16-0.3	50-100	0.08-0.11	0.1-0.15
55-100	0.05-0.1	0.08-0.12	0.1-0.15	0.13-0.17	0.15-0.28	50-100	0.08-0.11	0.1-0.13
55-100	0.05-0.1	0.08-0.12	0.1-0.15	0.13-0.17	0.15-0.28	50-100	0.08-0.11	0.1-0.13
55-100	0.05-0.1	0.08-0.12	0.1-0.15	0.13-0.17	0.15-0.28	50-100	0.08-0.11	0.1-0.13
50-85	0.05-0.13	0.08-0.15	0.1-0.17	0.13-0.2	0.16-0.3	60-120	0.08-0.13	0.1-0.15
55-100	0.05-0.1	0.08-0.12	0.1-0.15	0.13-0.17	0.15-0.28	50-100	0.08-0.11	0.1-0.13
60-100	0.05-0.13	0.08-0.15	0.1-0.28	0.13-0.3	0.16-0.35	40-80	0.08-0.13	0.1-0.15
60-100	0.05-0.13	0.08-0.15	0.1-0.28	0.13-0.3	0.16-0.35	40-80	0.08-0.13	0.1-0.15
60-100	0.05-0.12	0.05-0.12	0.08-0.25	0.1-0.28	0.15-0.33	30-60	0.05-0.11	0.08-0.14
80-100	0.05-0.13	0.08-0.15	0.1-0.17	0.13-0.2	0.16-0.3	70-100	0.08-0.13	0.1-0.15
80-100	0.05-0.13	0.08-0.15	0.1-0.17	0.13-0.2	0.16-0.3	70-100	0.08-0.13	0.1-0.15
60-100	0.05-0.13	0.06-0.13	0.08-0.18	0.1-0.2	0.15-0.25	50-90	0.06-0.12	0.08-0.16
60-100	0.05-0.13	0.06-0.13	0.08-0.18	0.1-0.2	0.15-0.25	50-80	0.06-0.12	0.08-0.16
50-100	0.05-0.13	0.06-0.13	0.08-0.18	0.1-0.2	0.15-0.25	50-90	0.06-0.12	0.08-0.16
50-100	0.05-0.13	0.06-0.13	0.08-0.18	0.1-0.2	0.15-0.25	50-90	0.06-0.12	0.08-0.16
65-130	0.05-0.13	0.08-0.15	0.1-0.2	0.15-0.25	0.16-0.3	60-120	0.08-0.13	0.1-0.18
65-100	0.05-0.13	0.08-0.15	0.1-0.2	0.15-0.25	0.16-0.3	60-90	0.08-0.13	0.1-0.18
65-130	0.05-0.13	0.08-0.15	0.1-0.2	0.15-0.25	0.16-0.3	60-120	0.08-0.13	0.1-0.18
65-130	0.05-0.13	0.08-0.15	0.1-0.2	0.15-0.25	0.16-0.3	60-120	0.08-0.13	0.1-0.18
65-130	0.05-0.13	0.08-0.15	0.1-0.2	0.15-0.25	0.16-0.3	60-120	0.08-0.13	0.1-0.18
65-130	0.05-0.13	0.08-0.15	0.1-0.2	0.15-0.25	0.16-0.3	60-120	0.08-0.13	0.1-0.18
65-130	0.05-0.13	0.08-0.15	0.1-0.2	0.15-0.25	0.16-0.3	60-120	0.08-0.13	0.1-0.18
65-130	0.05-0.13	0.08-0.15	0.1-0.2	0.15-0.25	0.16-0.3	60-120	0.08-0.13	0.1-0.18
10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25	20-50	0.06-0.11	0.08-0.14
10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25	20-50	0.06-0.11	0.08-0.14
10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25	20-50	0.06-0.11	0.08-0.14
10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25	20-50	0.06-0.11	0.08-0.14
10-50	0.05-0.12	0.06-0.12	0.08-0.15	0.12-0.18	0.15-0.25	20-50	0.06-0.11	0.08-0.14
30-50	0.05-0.1	0.05-0.1	0.08-0.12	0.1-0.15	0.12-02	20-50	0.05-0.09	0.08-0.11
30-50	0.05-0.1	0.05-0.1	0.08-0.12	0.1-0.15	0.12-0.2	20-50	0.05-0.09	0.08-0.11

Recommended Machining Conditions

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material No.[1]
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
		>= 0.55 %C	Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% all elements)		Annealed	600	200	6
			Quenched and tempered	930	275	7
				1000	300	8
				1200	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	200	10
			Quenched and tempered	1100	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	12
			Martensitic	820	240	13
			Austenitic	600	180	14
K	Grey cast iron (GG)		Pearlitic/ferritic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable cast iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum-wrought alloy		Not cureable		60	21
			Cured		100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolitic copper		100	28
	Non-metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
		Ni or Co based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti alloys			RM 400		36
			Alpha+beta alloys cured	RM 1050		37
H	Hardened steel		Hardened		55 HRc	38
			Hardened		60 HRc	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRc	41

[1] For material groups see G6-41

Solid Drill Heads DSD-EI, DDD-EI, DSD-EF, DDD-EF					Adjustable Solid Drill Heads DSD-EC, DDD-EC, DSD-IC					
Dia. Range	25.00-39.60	39.61-53.20	30.00-43.00	43.01-65.00	Dia. Range	38.00-39.99	40.00-51.99	52.00-63.99	64.00-84.99	85.00-
Vc (m/min)	Feed Rate f (mm/rev)		Heavy Feed Rate f (mm/rev)		Vc (m/min)	Feed Rate f (mm/rev)				
70-130	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
70-130	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
70-130	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
70-130	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
70-130	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
70-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
60-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
60-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	50-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
60-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	50-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
70-130	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
70-130	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-120	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
40-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-110	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
40-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-110	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
40-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-110	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
50-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-100	0.08-0.13	0.1-0.15	0.13-0.18	0.15-0.2	0.18-0.23
50-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-100	0.08-0.13	0.1-0.15	0.13-0.18	0.15-0.2	0.18-0.23
60-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-100	0.08-0.13	0.1-0.15	0.13-0.18	0.15-0.2	0.18-0.23
60-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-100	0.08-0.13	0.1-0.15	0.13-0.18	0.15-0.2	0.18-0.23
70-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-100	0.08-0.13	0.1-0.15	0.13-0.18	0.15-0.2	0.18-0.23
70-110	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-100	0.08-0.13	0.1-0.15	0.13-0.18	0.15-0.2	0.18-0.23
65-130	0.1-0.20	0.12-0.30	0.1-0.25	0.12-0.35	60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33
65-130	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33
65-130	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33
65-130	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33
65-130	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33
65-130	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33
65-130	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33
65-130	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	60-130	0.08-0.2	0.1-0.25	0.13-0.28	0.15-0.3	0.18-0.33
20-50	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	20-65	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
20-50	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	20-65	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
20-50	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	20-65	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
20-50	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	20-65	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
20-50	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	20-65	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
30-60	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	30-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3
30-60	0.08-0.18	0.12-0.22	0.08-0.22	0.12-0.28	30-100	0.08-0.15	0.1-0.2	0.13-0.23	0.15-0.25	0.18-0.3

Recommended Machining Conditions

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material No.[1]
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
		>= 0.55 %C	Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% all elements)		Annealed	600	200	6
			Quenched and tempered	930	275	7
				1000	300	8
				1200	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	200	10
			Quenched and tempered	1100	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	12
			Martensitic	820	240	13
			Austenitic	600	180	14
K	Grey cast iron (GG)		Pearlitic/ferritic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable cast iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum-wrought alloy		Not cureable		60	21
			Cured		100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolitic copper		100	28
	Non-metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
		Ni or Co based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti alloys			RM 400		36
			Alpha+beta alloys cured	RM 1050		37
H	Hardened steel		Hardened		55 HRc	38
			Hardened		60 HRc	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRc	41

[1] For material groups see G6-41

Adjustable Counterboring Heads DSC-EA, DSC-EC, DSC-I1, DST-I1, DSC-IA, DSC-IC, DDC-E1, DDT-E1 (Width of Cut, mm)				Trepanning Heads		Ground Brazed Counterboring Heads DSC-E1, DST-E1, DSC-I1, DST-I1, DDC-E1 (Width of Cut, mm)		
Dia. Range	1-3	3-8	8-23	Dia. Range	120-400	Dia. Range	1-3	3-5
Vc (m/min)	Feed Rate f (mm/rev)			Vc (m/min)	Feed Rate f (mm/rev)	Vc (m/min)	Feed Rate f (mm/rev)	
60-140	0.1-0.3	0.15-0.3	0.1-0.3	80-100	0.12-0.3	60-140	0.1-0.3	0.15-0.3
60-120	0.1-0.3	0.15-0.3	0.1-0.3	80-100	0.12-0.3	60-120	0.1-0.3	0.15-0.3
60-120	0.1-0.3	0.15-0.3	0.1-0.3	80-100	0.12-0.3	60-120	0.1-0.3	0.15-0.3
50-100	0.1-0.3	0.15-0.3	0.1-0.3	80-100	0.12-0.3	50-100	0.1-0.3	0.15-0.3
50-100	0.1-0.3	0.15-0.3	0.1-0.3	80-100	0.12-0.3	50-100	0.1-0.3	0.15-0.3
60-130	0.1-0.3	0.15-0.3	0.1-0.3	70-100	0.12-0.3	60-130	0.1-0.3	0.15-0.3
60-120	0.1-0.3	0.15-0.3	0.1-0.3	70-100	0.12-0.3	60-120	0.1-0.3	0.15-0.3
60-100	0.1-0.3	0.15-0.3	0.1-0.3	60-100	0.12-0.3	60-100	0.1-0.3	0.15-0.3
60-100	0.1-0.3	0.15-0.3	0.1-0.3	60-100	0.12-0.3	60-100	0.1-0.3	0.15-0.3
50-100	0.1-0.3	0.15-0.3	0.1-0.3	70-100	0.12-0.3	50-100	0.1-0.3	0.15-0.3
60-100	0.1-0.3	0.15-0.3	0.1-0.3	60-100	0.12-0.3	60-100	0.1-0.3	0.15-0.3
60-100	0.1-0.3	0.15-0.3	0.1-0.3	50-90	0.12-0.3	60-100	0.1-0.3	0.15-0.3
60-100	0.1-0.3	0.15-0.3	0.1-0.3	50-90	0.12-0.3	60-100	0.1-0.3	0.15-0.3
60-100	0.1-0.3	0.15-0.3	0.1-0.3	50-90	0.12-0.3	60-100	0.1-0.3	0.15-0.3
60-120	0.1-0.3	0.15-0.3	0.1-0.3	80-100	0.12-0.3	60-120	0.1-0.3	0.15-0.3
50-120	0.1-0.3	0.15-0.3	0.1-0.3	60-100	0.12-0.3	50-120	0.1-0.3	0.15-0.3
60-120	0.1-0.3	0.15-0.3	0.1-0.3	50-100	0.12-0.3	60-120	0.1-0.3	0.15-0.3
60-120	0.1-0.3	0.15-0.3	0.1-0.3	50-100	0.12-0.3	60-120	0.1-0.3	0.15-0.3
60-120	0.1-0.3	0.15-0.3	0.1-0.3	80-100	0.12-0.3	60-120	0.1-0.3	0.15-0.3
60-120	0.1-0.3	0.15-0.3	0.1-0.3	80-100	0.12-0.3	60-120	0.1-0.3	0.15-0.3
70-200	0.1-0.4	0.15-0.3	0.1-0.3	65-130	0.1-0.3	70-200	0.1-0.4	0.15-0.3
60-200	0.1-0.4	0.1-0.4	0.1-0.4	65-130	0.1-0.3	60-200	0.1-0.4	0.1-0.4
60-200	0.1-0.4	0.1-0.4	0.1-0.4	65-130	0.1-0.3	60-200	0.1-0.4	0.1-0.4
60-200	0.1-0.4	0.1-0.4	0.1-0.4	65-130	0.1-0.3	60-200	0.1-0.4	0.1-0.4
60-200	0.1-0.4	0.1-0.4	0.1-0.4	65-130	0.1-0.3	60-200	0.1-0.4	0.1-0.4
60-200	0.1-0.4	0.1-0.4	0.1-0.4	65-130	0.1-0.3	60-200	0.1-0.4	0.1-0.4
60-200	0.1-0.4	0.1-0.4	0.1-0.4	65-130	0.1-0.3	60-200	0.1-0.4	0.1-0.4
60-200	0.1-0.4	0.1-0.4	0.1-0.4	65-130	0.1-0.3	60-200	0.1-0.4	0.1-0.4
40-80	0.1-0.3	0.15-0.3	0.1-0.3	20-65	0.1-0.2	40-80	0.1-0.3	0.15-0.3
40-80	0.1-0.3	0.15-0.3	0.1-0.3	20-65	0.1-0.2	40-80	0.1-0.3	0.15-0.3
40-80	0.1-0.3	0.15-0.3	0.1-0.3	20-65	0.1-0.2	40-80	0.1-0.3	0.15-0.3
40-80	0.1-0.3	0.15-0.3	0.1-0.3	20-65	0.1-0.2	40-80	0.1-0.3	0.15-0.3
40-80	0.1-0.3	0.15-0.3	0.1-0.3	20-65	0.1-0.2	40-80	0.1-0.3	0.15-0.3
60-100	0.1-0.3	0.15-0.3	0.1-0.3	30-100	0.1-0.2	60-100	0.1-0.3	0.15-0.3
60-100	0.1-0.3	0.15-0.3	0.1-0.3	30-100	0.1-0.2	60-100	0.1-0.3	0.15-0.3

Requested Information Form for Deep Hole Drill Design

Company name _____ **Telephone no.** _____

Address _____ **Date** _____

Contact person _____ **Customer no.** _____

WORKPIECE

Product name: _____ Hole diameter: _____

Hole depth: _____ No. of holes: _____ Tolerance (of hole): _____

Surface finish (Rz, Ra...): _____ Deviation (mm/100): _____ Straightness (mm/100): _____

Material

Material (DIN, AISI, JIS...): _____

Hardness (HB, HS, HRC...): _____

Condition: ☐ Annealed ☐ Quenched ☐ Tempered ☐ Cast

☐ Other _____

MACHINE

Machine supplier name: _____

Machine type/model: ☐ NC lathe ☐ Machining center ☐ Other _____

Rigidity: ☐ Good ☐ Normal ☐ Poor

Spindle power (kW): _____

Tool and/or workpiece rotation (TR/WR):

☐ Tool and workpiece ☐ Rotating workpiece (WR) ☐ Rotating tool (TR)

TYPE OF COOLANT

Water based: ☐ Soluble ☐ Emulsion _____ %

Oil based: ☐ Coolant Pressure (bar): _____ Coolant Volume (L/min): _____

TOOL

Drill Head

Drill diameter: _____ (mm/inch)

Thread: ☐ Inner ☐ Outer Brazed: ☐

Indexable: ☐ Adjustable ☐ Direct mount Coating: ☐ Coated ☐ Uncoated

Solid drilling: ☐ Counterboring: ☐

Pre-drilled hole size: _____ (mm/inch)

Bottom finishing: ☐ Full ball R ☐ Flat bottom R ☐ Corner R ☐ Other _____

Trepanning: ☐ Y ☐ N

Tube outer diameter: _____ (mm/inch) Core size diameter: _____ (mm/inch)

Please fill in and return to your ISCAR representative.

Requested Information Form for Deep Hole Drill Design (continued)

TUBE

Outside diameter: _____ (mm/inch) Total Length: _____ (mm/inch)

Internal Thread: _____

External Thread: ☐ 4 Starts ☐ 2 Starts ☐ 1 Start

Tube Thread: ☐ 1 End ☐ Both ends

Inner Tube Length: _____ (mm/inch)

Inner Tube Slit: ☐ 1 End ☐ Both ends

Drilling System & Boring Conditions

Single Tube System: ☐ Blind Hole Drilling: ☐ Double Tube System: ☐

Cross Hole Drilling: ☐ Through Hole Drilling: ☐

Please sketch your drilling application

GENERAL PRODUCTION INFORMATION

Quantity of parts per year: _____

Grade, tool life, etc.: _____

Perfomance expectation: Vc= ___ mm/min N= ____ RPM F= _____ mm/min f= ___ mm/rev

Cutting data: _____

Description of present system in use: _____

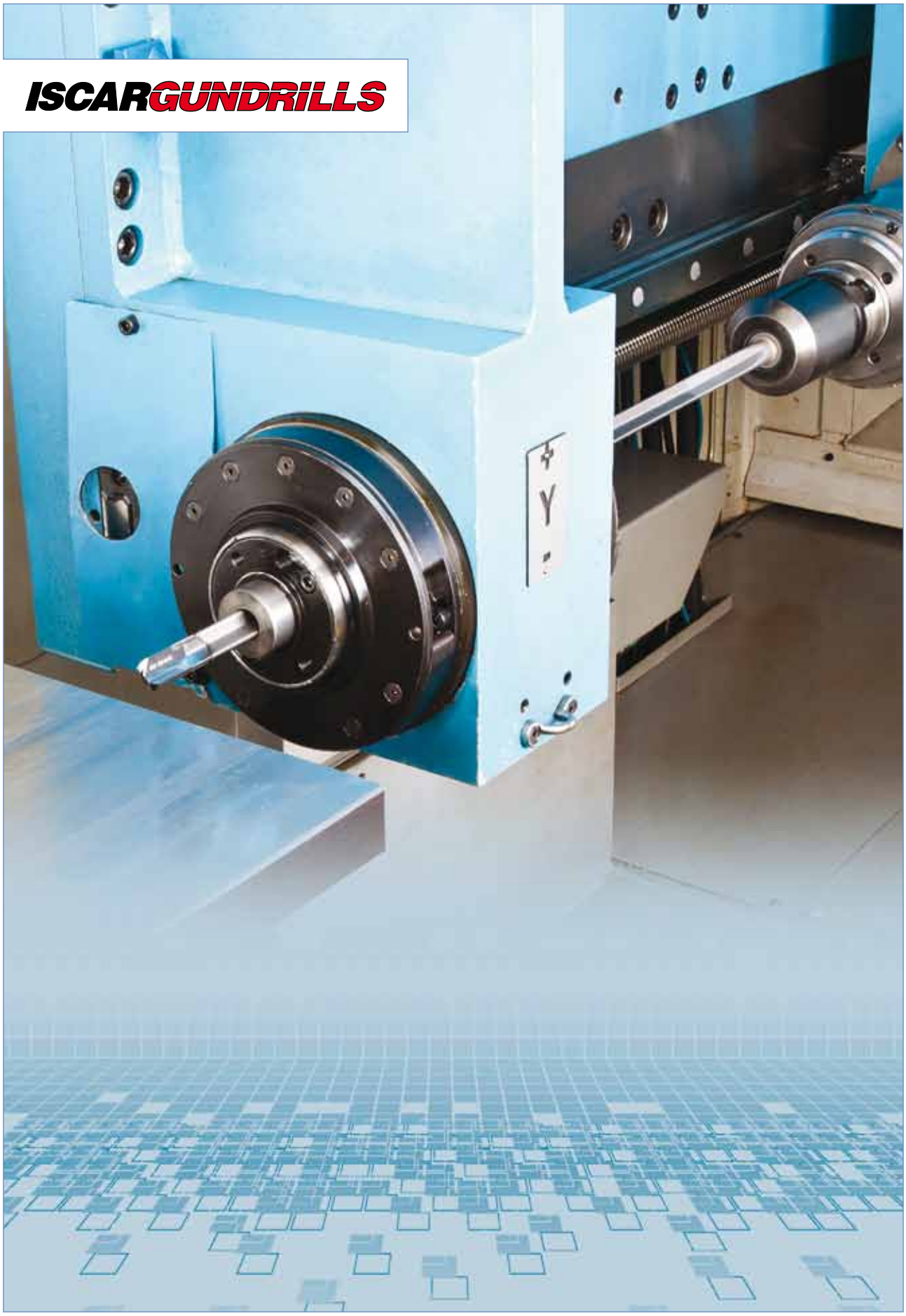
_____

_____

_____

_____

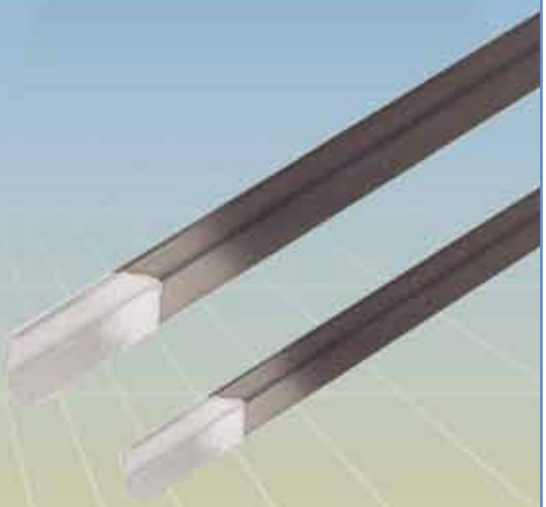
Please fill in and return to your ISCAR representative.


ISCARGUNDRILLS

GUNDRILLS

Brazed Heads

ISCAR's gundrill consists of a single piece carbide head, a streamlined shank and a driver through which coolant flows to the working end where it is most needed. Chips are evacuated along the V-shaped external flute.

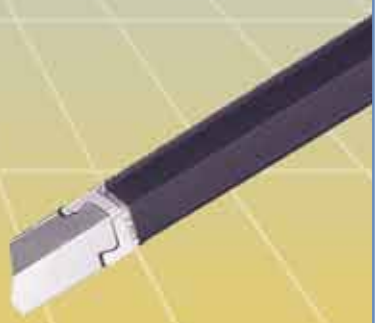


CHAMGUN

Indexable Heads

CHAMGUN enables replacement of the drilling head inside the machine – there is no need to remove the drill for head indexing.

- No setup time.



CHAMGUN

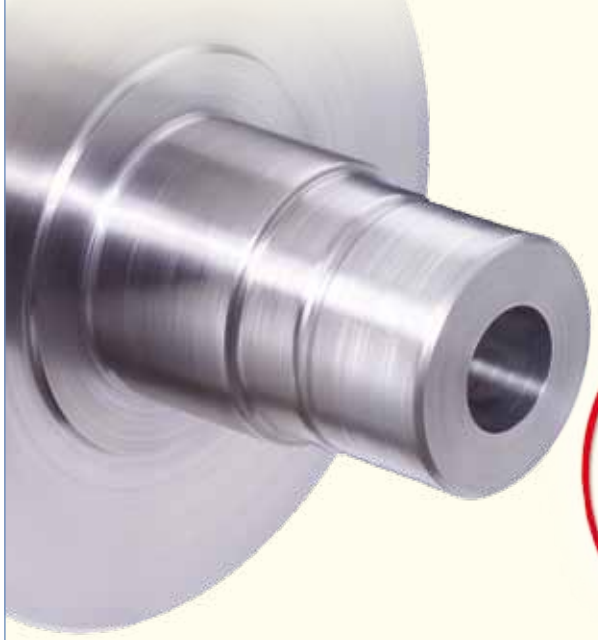
A New Revolution of Deep Hole Drilling

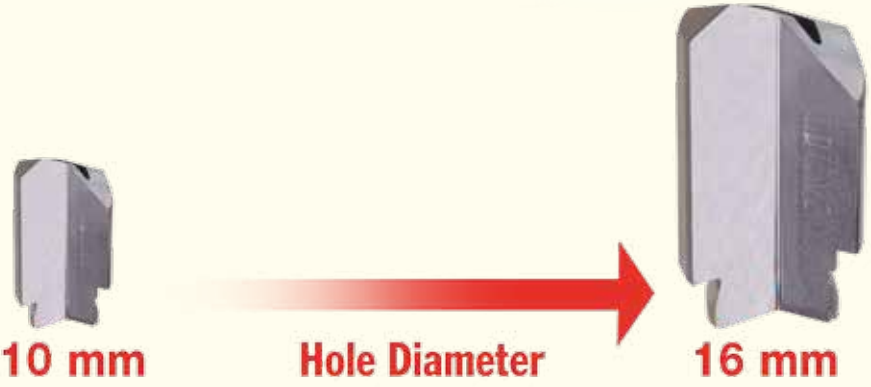
The **CHAMGUN** is the ultimate economical solution for deep drilling.

Features

- No setup time
- Various chipformers available
- Carbide grades – coated and uncoated
- Profiles – standard pad profiles
- Drilling precision of IT7 to IT9 tolerance can be achieved
- Excellent straightness and concentricity – comparable to using brazed drills
- Maintains high hole precision center alignment
- Surface roughness of 0.4-1.6 Ra is easily obtained
- Re-boring operation is often unnecessary
- The insert can be replaced at least 25 times
- It is possible to regrind and recoat the drilling head up to 10 times, still obtaining good repeatability.

NO SETUP TIME!





Revolutionary New Gundrills with Indexable Re-Grindable Heads

Drill range: 9.8-16.19 mm
Each drill pocket can carry a variety of:

- Drilling head diameters
- Head geometries
- Profiles
- Chipformers
- Carbide grades – coated and uncoated

Ordering Example:

Standard Drill Designation Code

STGDT □□□□□ - □□□□ - :□
Drill dia. / Overall length / (1)Driver code

Standard Insert Designation Code

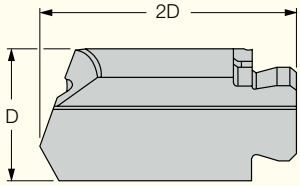
GDI □□□ - : - : - IC□□
Drill dia. / (2) Head geometry / (3) Head profile / Carbide grade

(1) See pages D72-73
(2) P-for steel M-for stainless steel
(3) See page D71

CHAMGUN

The Ultimate Economical Solution for Deep Drilling!

GDI Standard Inserts



Description	Diameter
GDI 100-M/P-G	10.0
GDI 105-M/P-G	10.5
GDI 110-M/P-G	11.0
GDI 115-M/P-G	11.5
GDI 120-M/P-G	12.0
GDI 125-M/P-G	12.5
GDI 130-M/P-G	13.0
GDI 135-M/P-G	13.5
GDI 140-M/P-G	14.0
GDI 145-M/P-G	14.5
GDI 150-M/P-G	15.0
GDI 155-M/P-G	15.5
GDI 160-M/P-G	16.0

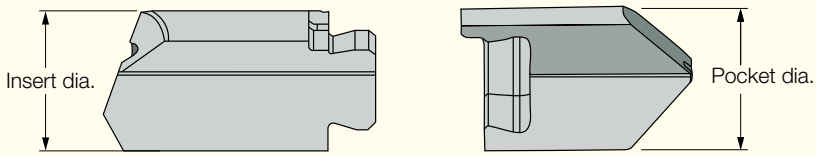
The standard grade is IC08 (an uncoated submicron grade).
IC908 grade is optional on the P geometry only.
Ordering example: GDI 140-M-G IC08

Two standard drill head geometries are available, designed for optimal performance and maximum reliability when used on two different material groups:

- GDI ###-**P**-#-IC## - for use on carbon and alloy steel, cast iron and aluminum (ISO P,K,N) Uncoated insert (optional IC908 TiAlN coating)

- GDI ###-**M**-#-IC## - for use on stainless steel and high temperature alloys (ISO M, S). Uncoated insert

Pocket Size vs. Insert Diameter Range



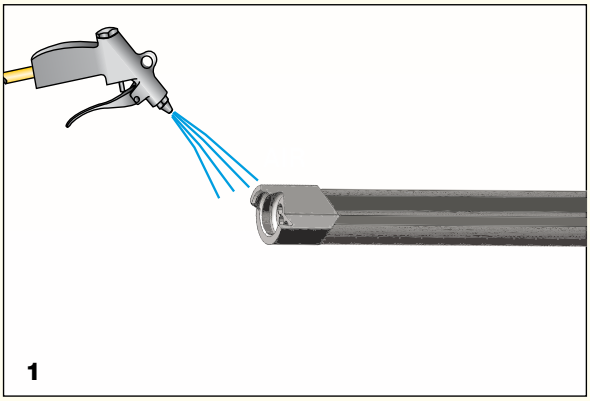
Pocket Diameter	Insert Diameter Range
9.6	9.80-9.99
9.8	10.0-10.19
10.0	10.2-10.39
10.2	10.4-10.69
10.5	10.7-10.89
10.7	10.9-11.19
11.0	11.2-11.39
11.2	11.4-11.69
11.5	11.7-11.89
11.7	11.9-12.19
12.0	12.2-12.39
12.2	12.4-12.69

Pocket Diameter	Insert Diameter Range
12.5	12.7-12.89
12.7	12.9-13.19
13.0	13.2-13.39
13.2	13.4-13.69
13.5	13.7-13.89
13.7	13.9-14.19
14.0	14.2-14.49
14.3	14.5-14.79
14.6	14.8-15.19
15.0	15.2-15.49
15.3	15.5-15.79
15.6	15.8-16.19

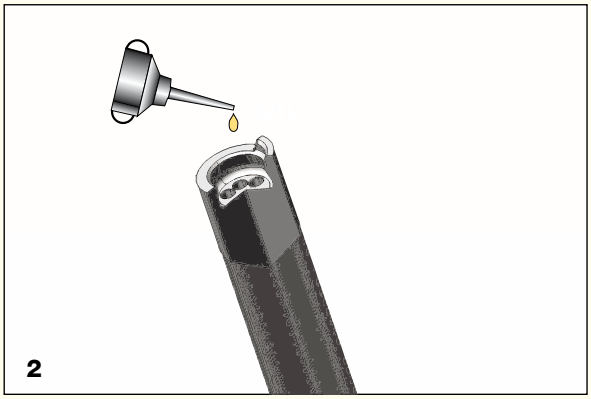
Clamping Key vs. Drilling Head Diameter

Clamping Key	Drillng Head Diameter Range
K GDT-100	9.80-10.99
K GDT-110	11.00-11.99
K GDT-120	12.00-12.99
K GDT-130	13.00-13.99
K GDT-140	14.00-14.99
K GDT-150	15.00-16.99

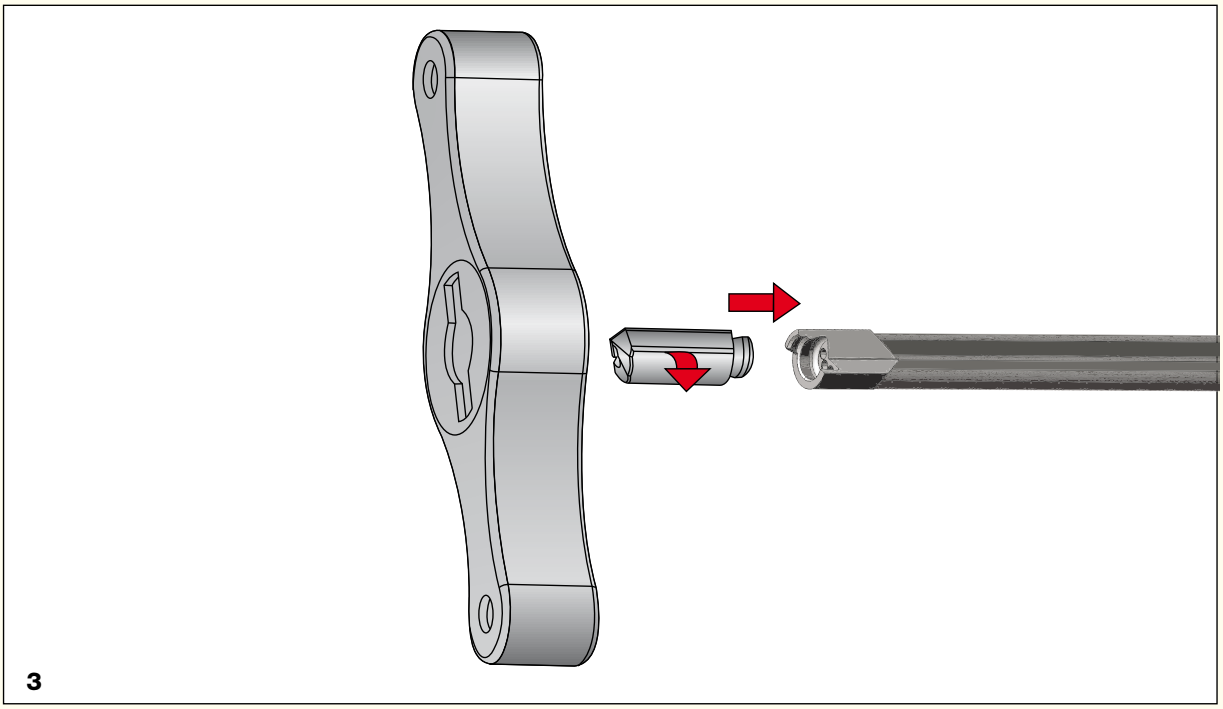
Drilling Head Mounting Procedure



1



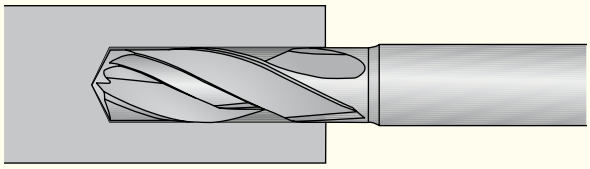
2



3

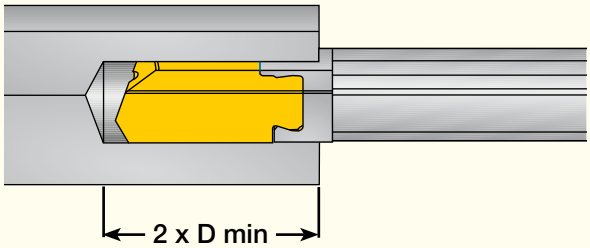
When using a gundrill on a lathe machine, a short solid carbide centering drill should be used prior to the gundrill. Once the gundrill enters the pre-drilled hole, it is self-guided.

1

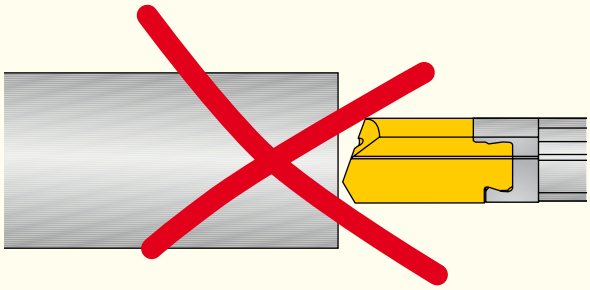


Drilling a pre-hole (drill diameter +0.02 mm)

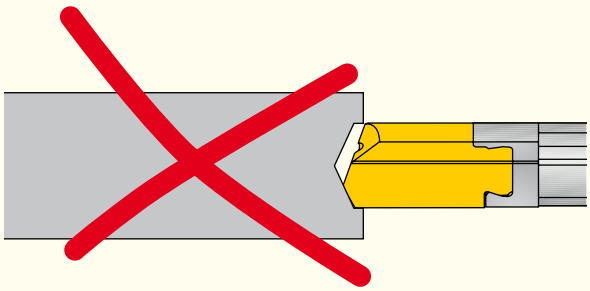
2



Gundrill penetration through the pre-hole



Never try to penetrate the workpiece by using a gundrill

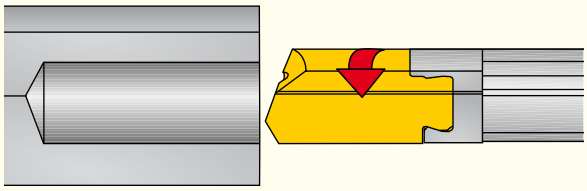


A shallow pre-hole can't lead the unbalanced gundrill

Drill Penetration Instructions

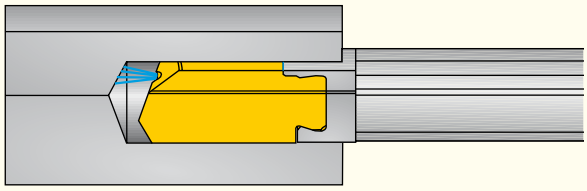
1

Rotate the drill counterclockwise prior and during hole penetration



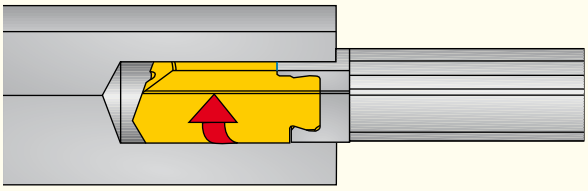
2

Stop the drill rotation and start the coolant

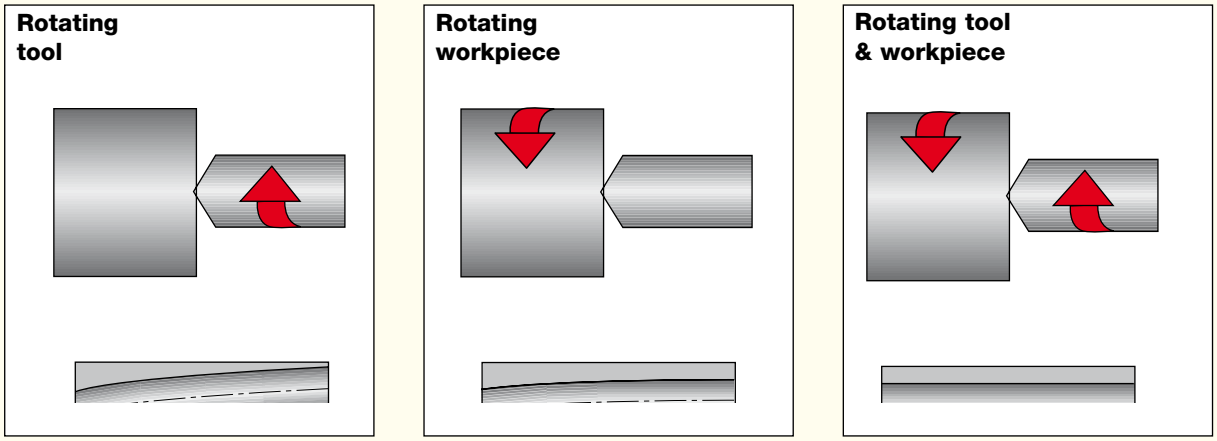


3

Rotate the drill clockwise prior to drilling operation

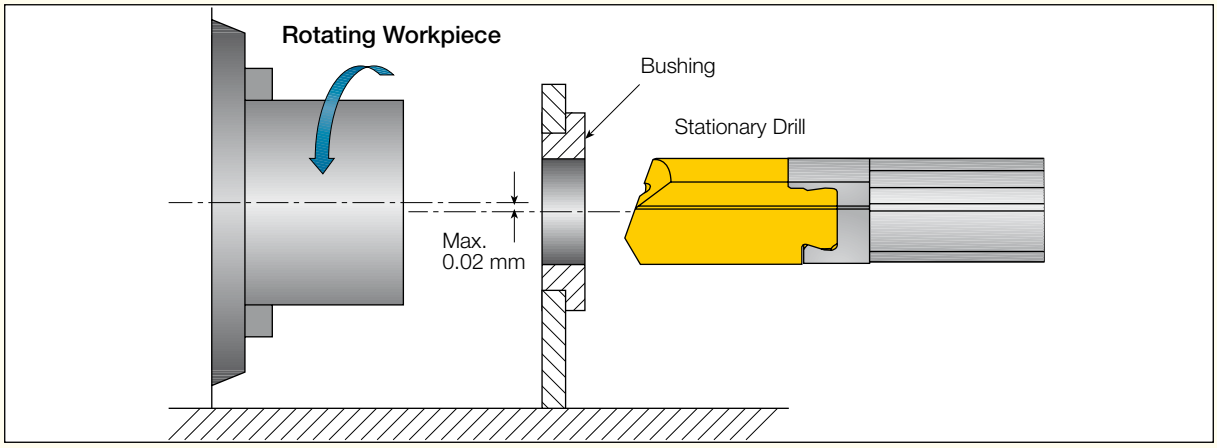


The Influence of Tool vs. Workpiece Rotation



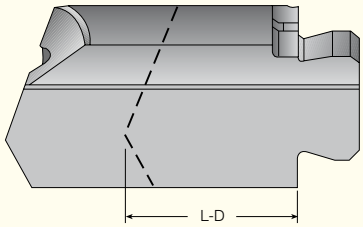
Worst **Medium** **Best**

The maximum misalignment between the drill bushing and the workpiece center line should not exceed 0.02 mm.



Regrinding

The GDI inserts can be reground minimum 10 times. However, head length should not be shortened to less than L-D.
The M-type chipformer is still effective even after 10 regrinding operations.



The insert is clamped on the regrinding machine by a clamping screw. This clamping method ensures high rigidity and accuracy.

Single Flute Gundrill

ISCAR's gundrill consists of a single piece carbide head, a streamlined shank and a driver through which coolant flows to the working end where it is most needed.
Chips are evacuated along the V-shaped external flute.

Drilling Head

The carbide head is tapered on its length to reduce friction. The taper angle depends on the type of material to be drilled. For high precision drilling, the taper should be reduced to a minimum (see page D70).
Note that when the head is resharpened, the diameter of the drill changes, affecting the hole tolerance.

Shank

The cross-section of the shank is V-shaped with coolant holes. It is made of hardened steel that is highly resistant to twisting (for information on carbide shanks, see next page). This cross-section provides the optimal conditions for twist resistance, coolant flow and chip evacuation.

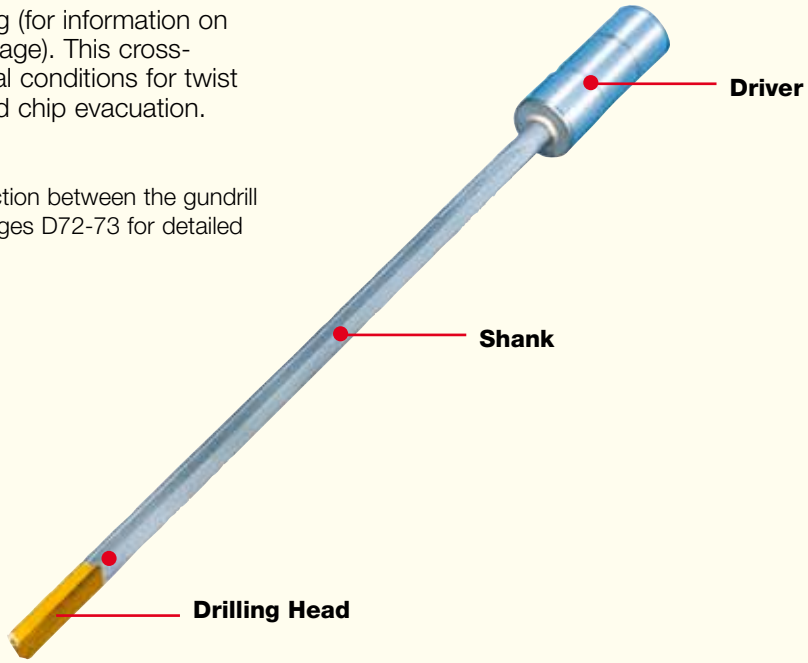
Driver

The driver ensures the connection between the gundrill and the machine tool, (see pages D72-73 for detailed driver information).

Carbide Tipped Gundrill Range

Drill Diameter	Max. Flute Length
2.50 to 3.09	1100
3.10 to 5.99	2500
6.00 to 11.39	3000
11.40 to 40.00	3500

Overall length=flute length+driver length
(see page D74)



Advantages

- Drilling precision of IT7 to IT9 tolerances can be reached.
- Excellent straightness and concentricity.
- Maintains high precision hole center alignment.
- Surface roughness of R0.4 - R1.6 is easily obtained.
- Reboring operations are often unnecessary.

ISCAR's advanced gundrill technology provides superior geometric and dimensional quality for both deep and shallow drilling.
The drills are available in the range of 2.5 to 40 mm.

ISCAR Single Flute Solid Carbide Gundrills

Another type of gundrill is made with integral tip and shank, made of solid carbide with either a steel or a carbide driver.
These drills are designed for conventional machines, machining centers and lathes. This style of gundrill is available from 0.9-16 mm and can be used on various types of materials. It provides superior rigidity and optimal coolant flow rates. As a result of its rigidity, up to 100% higher feed rate can be reached.
When using the small diameter drills, it is crucial to adhere closely to recommended drilling parameters.

Solid Carbide Gundrill Range

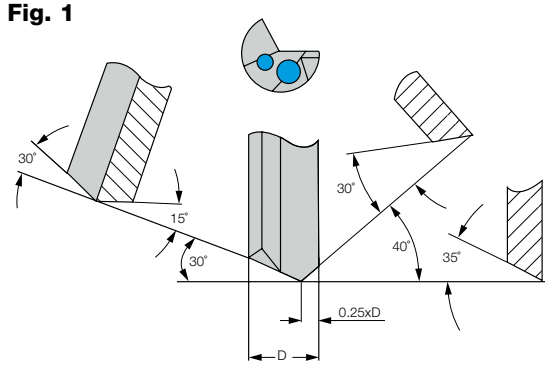
(with or without brazed steel driver)

Drill Diameter	Max. Flute Length
0.9 to 16.00	300 mm

Standard Gundrill Head Sharpening Angles

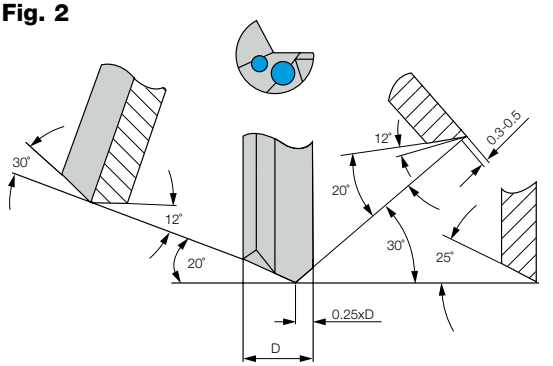
Subject to the required tolerance, cutting performance and desired chip shape,
the following standard sharpening angles are recommended (shown in figures 1 and 2).

Fig. 1



Standard sharpening for 0.9 to 4 mm drill diameters

Fig. 2



Standard sharpening for 4 to 32 mm drill diameters

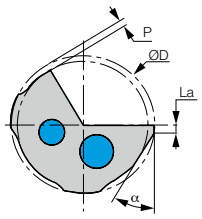
Note: For special or semi-standard gundrills, special geometries will be offered to match the application.

ISCAR Standard Gundrill Head Profiles

Drilling capacity and finish of the drilled hole are dependent on the geometrical shape of the drill head. Both the profile and the sharpening must be matched to the workpiece material. The profile is defined when the tool is manufactured. Although regrinding may change the cutting geometry, the profile should remain the same.

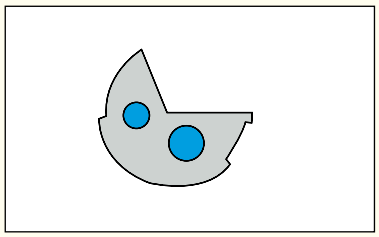
General Sketch

All cross section profile parameters such as: P, La and a must be precisely matched to the workpiece material properties.



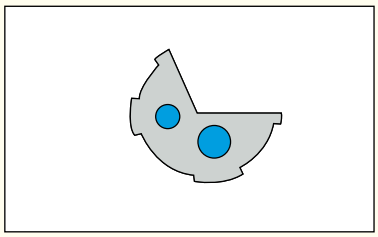
Profile G (Universal)

Standard form for most material types, particularly for materials with a tendency to shrink. Recommended for high precision bore tolerance and straightness. Maintains precise exit hole size. Recommended when extra burnishing is required.



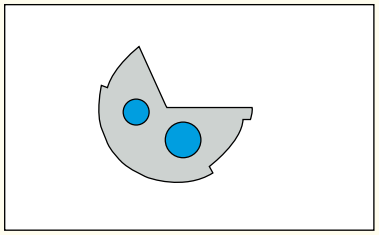
Profile A

Suitable for cast iron (usually coated) and aluminum alloys. Can be used for cross drilling, angular entry or exit and for interrupted cut. Large coolant gaps between pads.



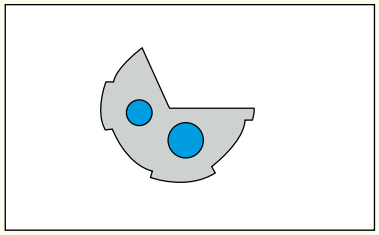
Profile B

Excellent size control, for high precision hole tolerance. Used for cast iron and aluminum alloys.



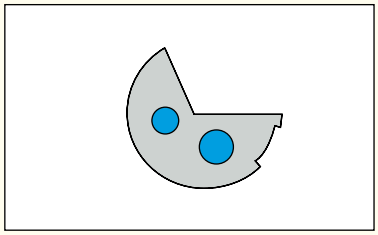
Profile C

Used for angled entry or exit. Large back taper, for shrinking materials such as some kinds of alloys and stainless steel. Large coolant gaps between pads.



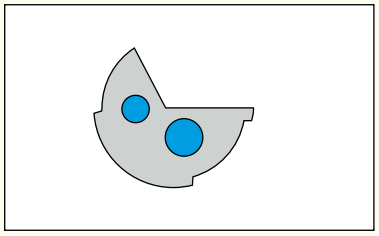
Profile D

Suitable for cast iron only. Very effective in grey cast iron (usually coated).



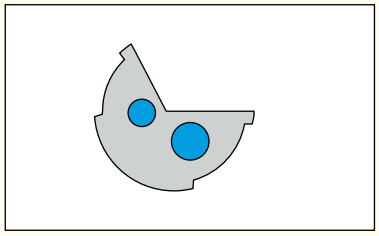
Profile E

General use, for alloys and stainless steel. This profile eliminates the problem of the tool sticking in the hole after the outer corner dulls. Especially suitable for crankshaft and other forged materials. Recommended for accurate hole straightness.



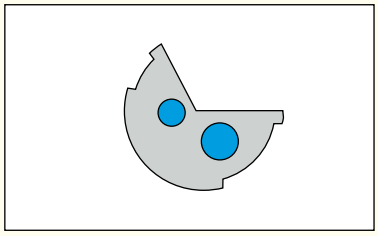
Profile H

Recommended for all nonferrous and cast iron materials up 5 mm diameter. Sometimes used for wood and plastic with larger back taper.

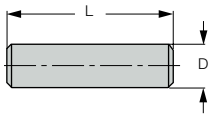
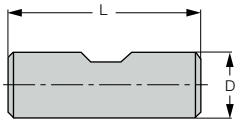
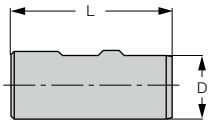
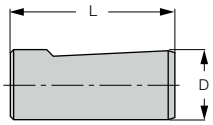
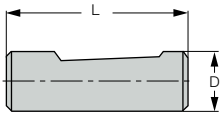
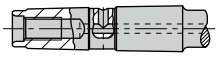
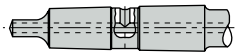


Profile I

Used for aluminum and brass for best hole finish. For intersecting holes and interrupted cut or when extra outer diameter support and burnishing is required.

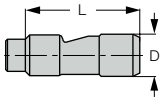
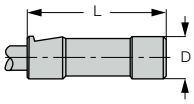
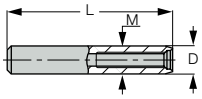
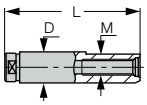
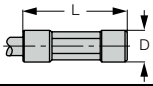
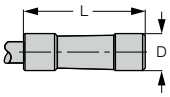
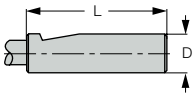
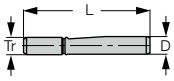
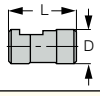


Standard Gundrill Drivers for Machining Centers, Lathes, etc.

Driver Type	Drawing	øD x L	Driver Code	Carbide Tipped Gundrills	Solid Carbide Gundrills
Cylindrical DIN1835A DIN6535HA		4x28	01	●	●
		5x28	02		●
		6x36	03	●	●
		8x36	04	●	●
		10x40	05	●	●
		12x45	06	●	●
		.50x1.78”	94	●	●
		14x45	07		●
		16x48	08	●	●
		18x48	09	●	●
		.75x2.03”	95	●	●
		20x50	10	●	
		25x56	11	●	
		1.00x2.28”	96	●	●
		1.25x2.28”	97	●	●
		32x60	12	●	
		40x70	13	●	
		50x80	14	●	
		63x90	15	●	
Weldon DIN1835B DIN6535HB	 	6x36	16	●	
		8x36	17	●	
		10x40	18	●	●
		12x45	19	●	●
		.50x1.78”	98		
		16x48	20	●	●
		18x48	21	●	●
		.75x2.03”	99	●	●
		20x50	22	●	●
		25x56	23	●	
		1.00x2.28”	100	●	●
		1.25x2.28”	101	●	●
		32x60	24	●	
		40x70	25	●	
		50x80	26	●	
		63x90	27	●	
Whistle Notch DIN1835E		6x36	28	●	
		8x36	29	●	
		10x40	30	●	●
		12x45	31	●	●
		16x48	32	●	●
		18x48	33	●	●
		20x50	34	●	●
		25x56	35	●	
		32x60	36	●	
		40x70	37	●	
Whistle Notch DIN6535HE		6x36	38	●	
		8x36	39	●	
		10x40	40	●	●
		12x45	41	●	●
		16x48	42	●	●
		18x48	43	●	●
		20x50	44	●	●
DIN228AK		CM1	45		
		CM2	46		
		CM3	47		
		CM4	48		
DIN228BK		CM1	49		
		CM2	50		
		CM3	51		
		CM4	52		

● Recommended style

Standard Drivers for Gundrill Machines

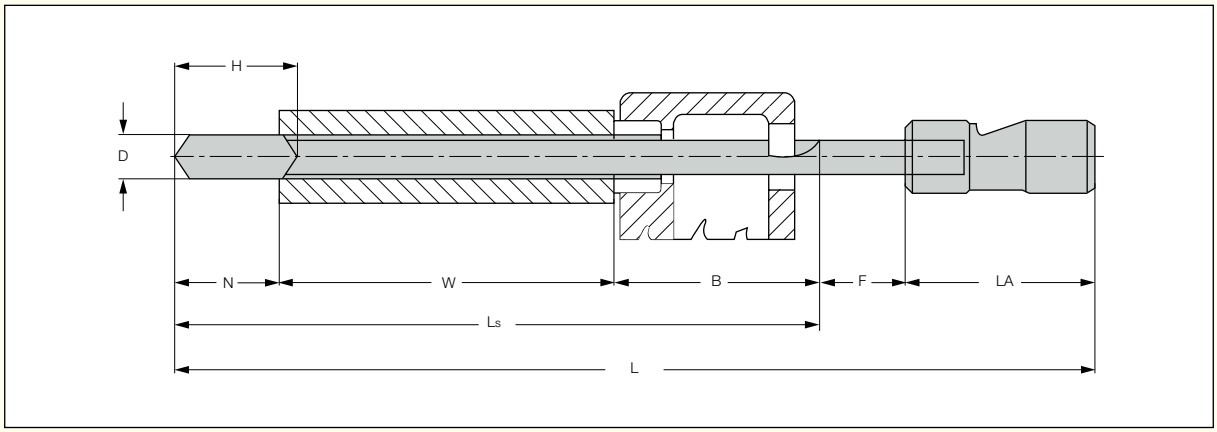
Driver Type	Drawing	øD x L	Driver Code	Carbide Tipped Gundrills	Solid Carbide Gundrills
Central Clamping Surface 15°		6x30	53		●
		10x40	54	●	●
		16x45	55	●	
		.750x2.75”	56	●	
		25x70	57	●	
		1.00x2.75”	58	●	
		1.25x2.75”	59	●	
		1.50x2.75”	60	●	
Frontal Clamping Surface 15°		16x50	61	●	
Cylindrical with Thread		10x50 M6X0.5	62		●
		10x60 M6X0.5	63	●	
		.50x1.97” M6x0.5	64		●
		16x80 M10X1	65	●	●
		25x100 M16x1.5	66	●	
		36x120 M24x1.5	67	●	
VDI Design		10x68 M6x0.5	68	●	
		16x90 M10x1	69	●	●
		25x112 M16x1.5	70	●	
		36x135 M24x1.5	71		
Central Clamping Hexagonal		25x70	72	●	
		32x70	73	●	
Central Clamping Tapered		.50x1.50”	74	●	●
		16x70	75	●	●
		.75x2.75”	76	●	
		20x70	77	●	●
Frontal Clamping Surface 2°		.50x1.50”	78	●	
		.75x2.75”	79	●	
		1.00x2.75”	80	●	
		1.00x3.94”	81	●	
		1.25x2.75”	82	●	
		1.25x3.94”	83	●	
		1.50x2.75”	84	●	
		1.50x3.94”	85	●	
Trapezoidal Thread		16x112 Tr 16x1.5	86	●	
		20x126 Tr 20x2	87	●	
		28x126 Tr 28x2	88	●	
		36x162 Tr 36x2	89	●	
Spraymist Driver		16x40	90	●	
		25x50	91	●	
		35x60	92	●	

● Recommended style

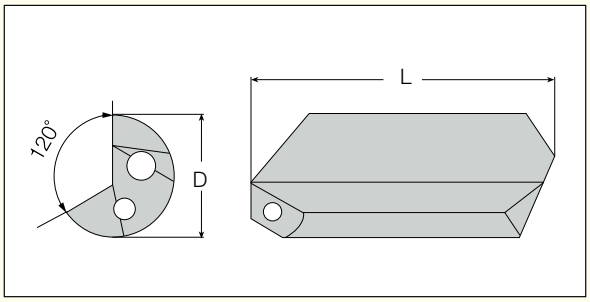
Drivers

Drivers are available for dedicated and CNC machines, for any specified diameter and length. Below are the driver codes and technical data.

Standard Gundrill Length Calculation



Standard Gundrill Carbide Head Length



Diameter Range	Head Length
2.50-3.80	20
3.80-4.05	23
4.05-5.05	25
5.05-6.55	30
6.55-11.05	35
11.05-18.35	40
18.35-21.35	45
21.35-23.35	50
23.35-26.35	55
26.35-32.00	65

Note: regrindable length=L-D

D = Cutting diameter
H = Carbide length (page D70)
N = Regrinding area = H-D
W = Hole depth
B = Chip evacuation area
= For typical gundrill machines, 250 mm
= For machining centers, 2xD (minimum 15 mm)
F = 10 mm.
LA = Driver length
LS = Flute length
L = Overall length

Example 1:

Drilling of a ø10x500 depth hole on a gundrill machine with ø25x70 mm driver code No. 57 (See page D73)
D=10 W=500 LA=70 B=250 (or per experience)
L=N+W+B+F+LA
L=(35-10)+500+250+13+70=858 (OAL)
Ls=N+W+B=770 (flute length)

Ordering Code

For example 1:
D and Ls are available as standard
STGD-10000-0858-57-IC08

Example 2:

8 mm diameter gundrill 1550 mm overall length with a ø25x70 mm driver on a gundrill machine
D=8 L=1550 LA=70 B=250 (or as per experience)
Ls = L-LA-F
= 1550-70-13=1467

Ordering Code

For example 2:
Ls is not available in standard. For an 8 mm diameter, the maximum length of a standard tool is 1455 mm.
This is a semi-standard tool.

Note for Example 2:
The same tool diameter, but 15 mm shorter, is available in the standard range with a shorter delivery time.

Delivery Schedule Based on Drill Dimension for Carbide Tipped Gundrills

Single Flute Carbide Tipped Gundrill Designations

New Tools

Standard[1] Brazed Drill (Carbide Tipped):

Ordering Example:

STGD	**– 05500**	**–**	**0500**	**-**	**57**	**-**	**IC08** (The only available carbide grade)
	Drill Diameter		Overall Length		Driver Type		

Ø2.5 to Ø20 each 0.1 mm and Ø20 to Ø32 each 1 mm
Standard geometry suitable in any material
Standard driver from the table (pages D72-73)
1-2 weeks delivery”

Semi-Standard[1] Brazed Drill (Carbide Tipped):

Ordering Example:

GD	**– 05520**	**–**	**0500**	**–**	**57**	**–**	**ER**	**– IC908** (carbide grade)[2]
	Drill Diameter		Overall Length		Driver Type		E=Head Profile R=Rough (P-Polished)	

Diameter out of standard range

Standard geometry AND/OR head profile from page 71 AND/OR coating

Standard driver from the table (pages D72-73)

3-4 weeks delivery

Special[1] Gundrill Carbide Tipped:

Ordering Example:

SPGD	**– 05520**	**–**	**0500**	**–**	**02051**	**–**	**01**
	Drill Diameter		Overall Length		Offer No. or Drawing No.		Version No.

Any special specification (special geometry, special driver, etc.)

3-4 weeks delivery

Repair (Replacement of the Carbide Tip)

Repair of Standard[1] Drills

Ordering Example:

RSTGD	**– 05520**	**–**	**0500**	**–**	**IC08** (The only available carbide grade)
	Drill Diameter		Overall Length		

Repair of Semi-Standard[1]

Ordering Example:

RGD	**- 05520**	**-**	**0500**	**-**	**GR**	**-**	**IC508** (carbide grade)[2]
	Drill Diameter		Overall Length		G=Drill Profile R=Rough (P=Polished)		

Repair of Special[1] Drills

Ordering Example:

RSPGD	**- 05520**	**-**	**0500**	**-**	**02051**	**-**	**01**
	Drill Diameter		Overall Length		Offer No. or Drawing No.		Version No.

Single Flute Solid Carbide Gundrill Designation

New Tools

4-6 weeks delivery for any kind of solid cabide GUNDRILL

Standard[1] Solid Carbide Drills

Ordering Example:

STCGD	–	**05500**	–	**0200**	–	**05**
		Drill Diameter		Overall Length		Driver Type

Semi-Standard[1] Solid Carbide Drills

Ordering Example:

CGD	–	**05520**	–	**0200**	–	**05**	**CPIC08**
		Drill Diameter		Overall Length		Driver Type	C=Drill Profile P=Polished (R=Rough) IC08=Carbide Grade[2]

Special[1] Solid Carbide Gundrills

Ordering Example:

SPCGD	-	**05520**	-	**0500**	-	**02051**	-	**01**
		Dril Diameter		Overall Length		Offer No. or Drawing No.		Version No.

Repair of a solid carbide drill is not possible

Special[1] Two Flute Carbide Tipped Gundrill Designations

Ordering Example:

GD2L	-	**05520**	-	**0500**	-	**02051**	-	**01**
		Drill Diameter		Overall Length		Offer No. or Drawing No.		Version No.

(1) Standard gundrills: Delivery within 1-2 weeks from order (shipment time not included).
Semi-standard gundrills: Delivery within 2-4 weeks from order (shipment time not included).
Special gundrills: Delivery within 8-10 weeks from order (shipment time not included).

(2) Available carbide grades:
IC08 – uncoated grade used as a substrate for the following coated grades:
IC908 (TIAlN); IC508 (TiCN+TiN); IC308 (TiCN); IC208 (TiN).

Standard Geometry Resharpening of Carbide Tipped or Solid Gundrills

(See page D70)

Ordering Example:

STGRIND	-	**05520**
		Drill Diameter

Special Geometry Resharpening

Ordering Example:

SPGRIND	-	**05520**	-	**02051**	- **01**
		Drill Diameter		Offer No.	Version No.

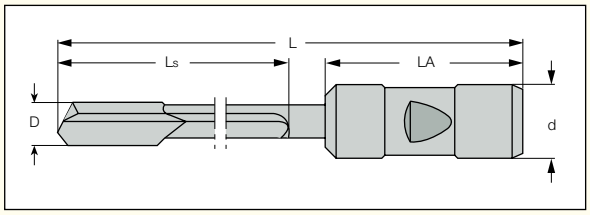
Gundrill Inquiry Form

1. Tool

Quantity.....

Nominal diameter and tolerance .....

Please fill in dimensions on the sketch below.



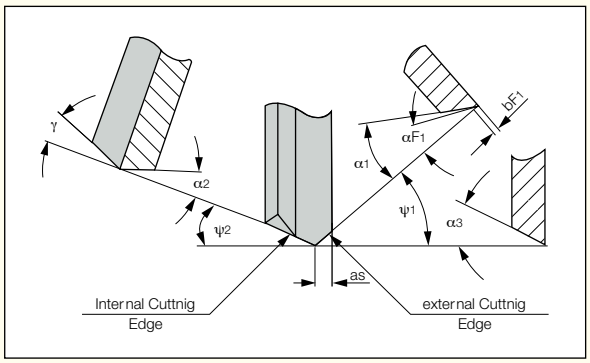
Driver

Driver: for standard drivers please use codes from pages D72-70.....

☐ Code No.

☐ Special, please attach sketch and specifications.

Grind:: Special (fill in the dimensions and angles below).



α_1= ..... αF_1= ..... ψ_1= .....

α_2= ..... bF_1= ..... ψ_2= .....

α_3= ..... as= ..... γ= .....

☐ Standard (see page C231)

Coating:

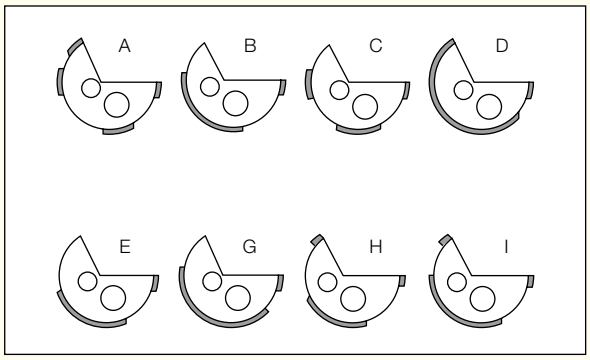
☐ TiN : TiCN : TiN+TiCN : TiAlN : Other

☐ IC208 (TiN) : IC308 (TiCN) : IC508 (TiCN+TiN)

☐ IC908 (TiAlN)

Type:

Please circle the required type. See page D71.



2. Workpiece

(If possible, please attach a drawing)

2.1 Material

Material description (DIN material number or any other standard):

.....

Hardness and Properties:

.....

☐ Short Chips ☐ Long Chips

2.2 Hole Type

☐ Blind Hole ☐ Drilling into Pre-hole ☐ Angled Entry

☐ Drilling into Solid ☐ Boring ☐ Angled Exit

Drilling Depth mm Hole Tolerance

2.3 Application:

Workpiece:: Stationary : Rotating

Tool : Stationary : Rotating

3. Machine

3.1 Technical Data

Machine Type.....

Power: ..... kW .....

3.2 Cutting Data:

Cutting Speed V_c ..... m/min .....

Revolutions **N**min ..... RPM, **N**max ..... RPM

Feed **F**min..... mm/rev,

Fmax..... mm/rev.....

Feed Rate **VF** ..... mm/min .....

Coolant:

☐ Oil ☐ Soluble Oil : Other

Coolant Pressure: ..... Bar .....

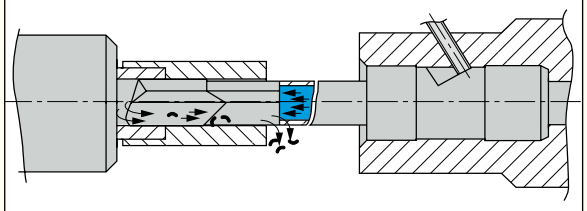
Sketch of drilling application

Note: It may be necessary to change several of the parameters that you indicated, based on our experience with your application.

Typical Gundrill Applications

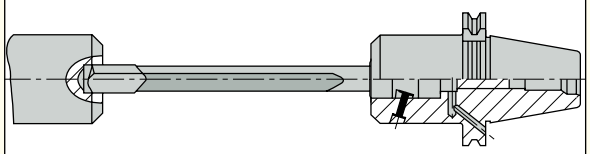
Main Drilling Methods

Figure 1



Guide Barrel

Figure 2



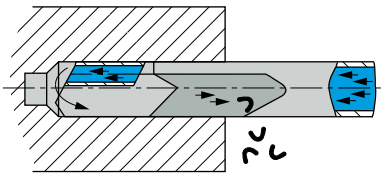
Pre-Drilled Guide Hole

User Guide

The gundrill is not a self-centering tool. Therefore an external means must be used to guide it to the point of entry into the workpiece.
It is recommended that the machine tool be equipped with a means for guiding the gundrill, preferably during the entire drilling process.
An alternative method is a pre-drilled guide hole (figure 2), which is common for machining centers. Once the drill has been fully engaged into this hole, it continues to be self-guided.
The guide pads contribute to the high degree of calibration and provide burnishing of the drilled hole.

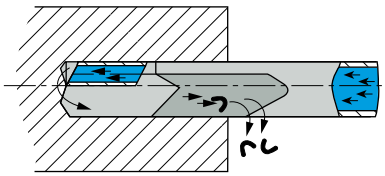
Typical Gundrill Applications - Chip Evacuation and Coolant Flow

Figure 3



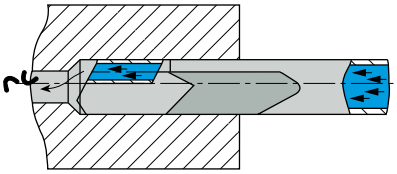
Boring with chip evacuation and coolant flowing opposite the boring direction

Figure 4



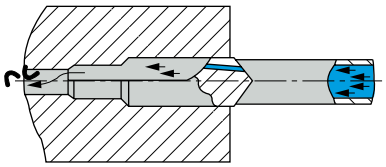
Drilling of solid material with chip evacuation and coolant flow opposite the drilling direction.

Figure 5



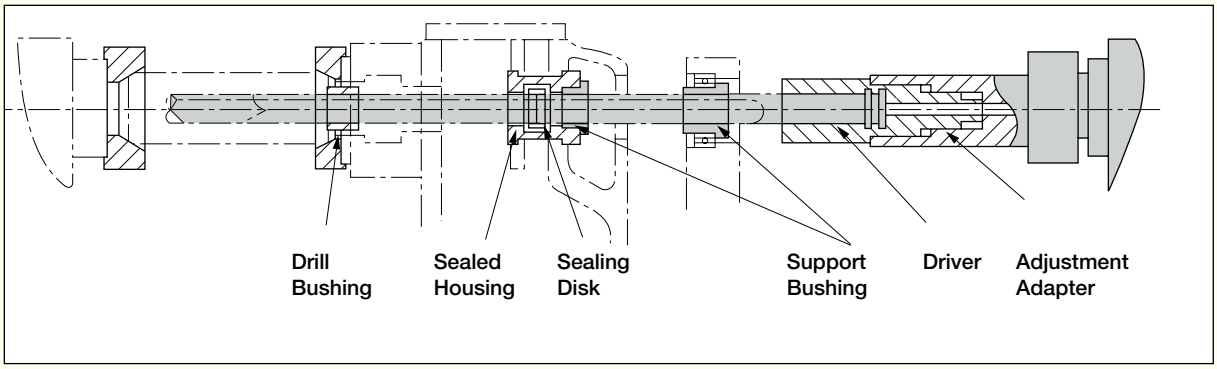
Boring with chip evacuation in the boring direction.

Figure 6



Boring with a staged tool. Chip evacuation and coolant flow in the boring direction.

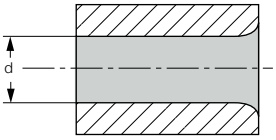
Deep Hole Machine Accessories



Bushing

Based on modified DIN 179 specify the "d" diameter of the drill. Carbide bushing is delivered only on request.

d = Drill diameter +0.02

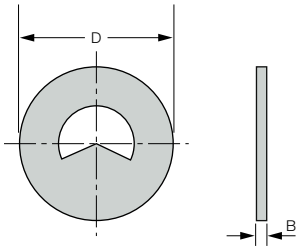


Guide Bushings

As the gundrill is not a self-centering tool and its radial rigidity is low (due to diameter to length ratio), a guide bushing is an essential component for a proper gundrill operation. The function of the guide bushing is to direct the gundrill into the material during penetration. The guide bushing's diameter should be within 20 microns larger than the diameter of the drill. Dedicated gundrill machines are equipped with a guide bushing system.

Sealing Disk

Supplied with a single sealing disk or a protection sheet. Indicate the dimensions needed for your requirements.

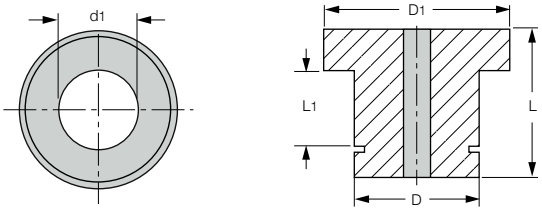


Sealing Disk		
Tool Ø "d"	Ext. Ø "D"	Thick. " B"
2 to 6	20	3
3,1 to 15,559	32	4
15,6 to 25,999	40	4
26 to 40	90	4

Sealing Disk with Protection		
Tool Ø "d1"	Ext. Ø "D"	Thick. " B"
2,9 - 5,249	20	7
5,25 - 14,449	32	11
14,45 - 25,999	40	12
26 - 41	90	12

Support Bushing

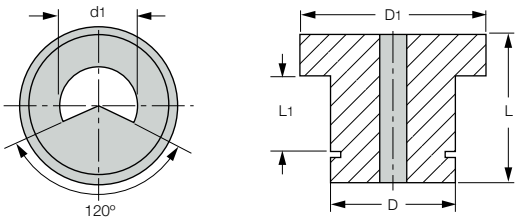
Indicate the "d" diameter of the drill.



Support Bushing				
Tool Ø "d1"	Ext. Ø "D"	Ext. Ø "D1"	Length "L"	Length "L1"
1,9 - 16,399	20	26	20	12
1,9 - 25,999	30	38	26	16
1,9 - 34	45	50	26	16

Support Bushing with "V" Form

Indicate the "d" diameter of the drill.



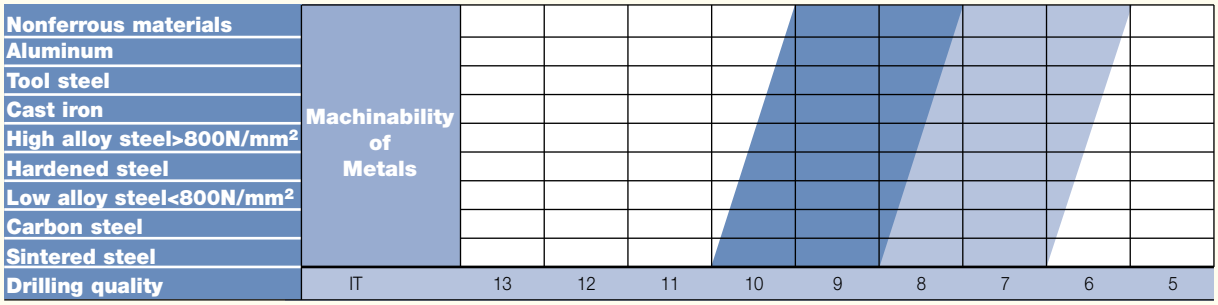
Support Bushing with "V" Form				
Tool Ø "d1"	Ext. Ø "D"	Ext. Ø "D1"	Length " L"	Length " L1"
1,9 - 16,399	20	26	20	12
1,9 - 23,799	30	38	26	16

Drilling Tolerances Obtainable In Deep Hole Drilling

Deep Drilling Tolerances

ISCAR gundrill configurations when used under recommended conditions, can produce holes with tolerances of IT8-IT9.

When operating under optimal conditions, even better tolerances can be achieved.

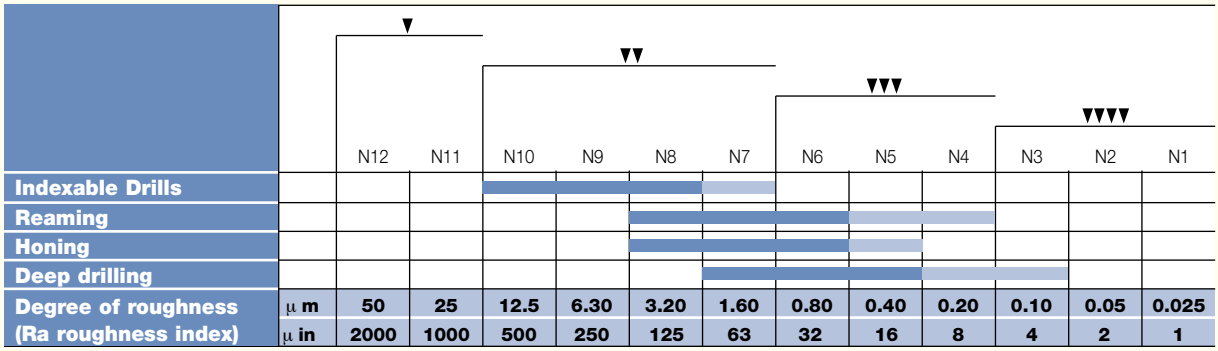


Tolerance range under normal conditions.

Tolerance range under optimal conditions.

Surface Quality

Surface quality of 0.2 Ra can be achieved when using gundrills under recommended conditions.



Tolerance range under normal conditions.

Tolerance range under optimal conditions.

Concentricity and Straightness

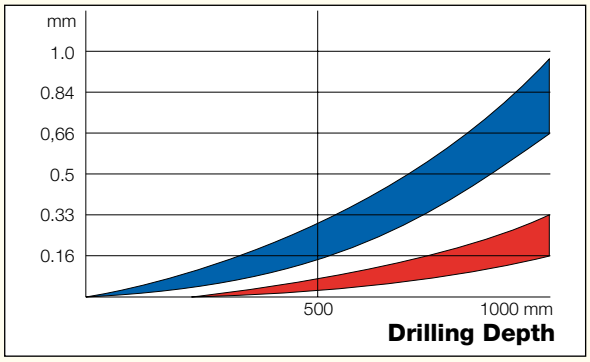
The resulting quality depends on different factors such as:

- Drilling depth and diameter
- Type of machining and cutting parameters
- Quality and uniformity of the workpiece material
- Machine tool conditions
- Gundrill support

Circularity

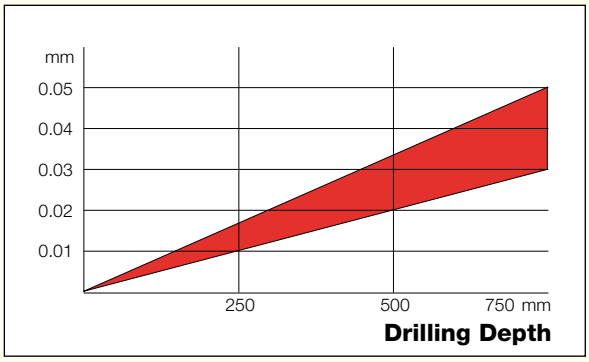
The geometric quality of bores obtained from deep hole drill bits is clearly higher than that obtained with the use of twist drills. It is possible to obtain precision with deviations of less than 4µm.

Concentricity

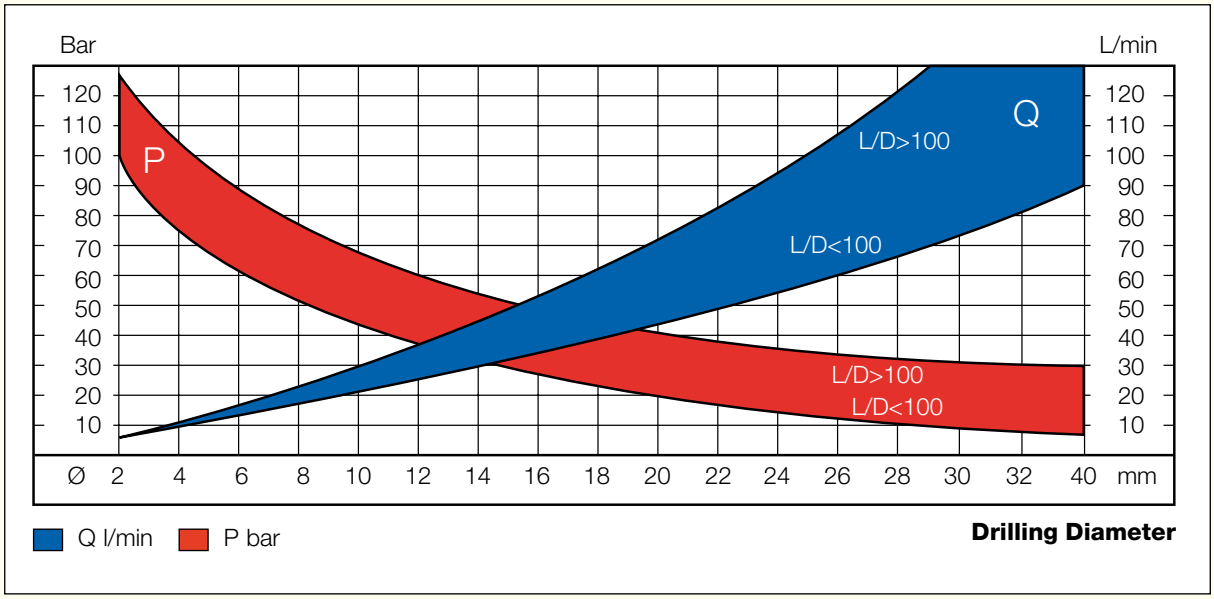


Stationary workpiece – rotating tool
Rotating workpiece – stationary tool

Straightness



Pressure and Coolant Flow Rate for Gundrills



Gundrill Lubrication and Cooling

The best performance is obtained by using oil. On equipment that uses water-soluble fluids (i.e. machining centers and CNC machines) a concentration between 10% and 15% is recommended.

Guidelines for Optimal Gundrill Performance

- **Coolant pressure and flow**
  It is recommended to use a strong coolant flow for efficient chip flushing and cooling of the cutting edge.
- **Filtration**
  It is recommended to use a filter under 20 µm be used.
  Note: Improper filtration may result in interrupted flow of the lubricating oil. This creates a sticky surface on the bearing pads and leads to premature wear of the tool and overloading the coolant pump and spindle seals.
- **Temperature of the coolant**
  The coolant temperature should be between 20 and 22° C.
  Note: Above 50ºC the viscosity of the coolant is reduced by 50% and becomes ineffective.

Choice of coolant

ISCAR, in cooperation with JP INDUSTRIE, recommends the following oils and water-soluble fluids in order to obtain the finest performance from your gundrills.

	Copper and Copper Alloys	Aluminum and Alloys	Cast Iron and Steel	High-Speed Steel Titanium and Inconel
Top Performance				SITALA D601
High Performance		SITALA A401	SITALA A401	
Good Performance	SITALA B1230			

Soluble Cutting Oil	Soft metal, and/or aluminum, copper alloys	Hard metal (steel, stainless steel, tempered steel, high-speed, titanium)
	SOFT-DUCTILE ←	**METAL** →
Top Performance		GARIA 604S15-GARIA 1660S15/22
High Performance	MACRON 402M5	GARIA 604M8/15-GARIA 602.01M15
Good Performance		GARIA 402F15

Material Groups

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material No.[1]
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	125	1
		>= 0.25 %C	Annealed	650	190	2
		< 0.55 %C	Quenched and tempered	850	250	3
		>= 0.55 %C	Annealed	750	220	4
		>= 0.55 %C	Quenched and tempered	1000	300	5
	Low alloy steel and cast steel (less than 5% all elements)		Annealed	600	200	6
			Quenched and tempered	930	275	7
				1000	300	8
				1200	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	200	10
			Quenched and tempered	1100	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	200	12
			Martensitic	820	240	13
			Austenitic	600	180	14
K	Grey cast iron (GG)		Pearlitic/ferritic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		160	17
			Pearlitic		250	18
	Malleable cast iron		Ferritic		130	19
			Pearlitic		230	20
N	Aluminum-wrought alloy		Not cureable		60	21
			Cured		100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		75	23
			Cured		90	24
		>12% Si	High temperature		130	25
	Copper alloys	>1% Pb	Free cutting		110	26
			Brass		90	27
			Electrolitic copper		100	28
	Non-metallic		Duroplastics, fiber plastics			29
			Hard rubber			30
S	High temp. alloys	Fe based	Annealed		200	31
			Cured		280	32
		Ni or Co based	Annealed		250	33
			Cured		350	34
			Cast		320	35
	Titanium and Ti alloys			RM 400		36
			Alpha+beta alloys cured	RM 1050		37
H	Hardened steel		Hardened		55 HRc	38
			Hardened		60 HRc	39
	Chilled cast iron		Cast		400	40
	Cast iron		Hardened		55 HRc	41

[1]For workpiece materials list, see pages G6-41.

Gundrill Recommended Machining Conditions

Mtl. No.	Cutting speed vc m/min	Feed vs. mm/rev Drill Diameter mm				
		2.0-9.79	9.8-11.69	11.7-13.19	13.2-16.19	16.2-40
1	70-110	0.01-0.03	0.03-0.05	0.035-0.06	0.04-0.07	0.02-0.10
2	80-110					
3	70-100					
4	70-110					
5	70-90					
6	80-110	0.01-0.03	0.03-0.05	0.035-0.06	0.04-0.07	0.02-0.10
7	70-110					
8	60-90					
9	50-80					
10	50-70	0.01-0.03	0.025-0.04	0.03-0.045	0.035-0.05	0.12-0.10
11	40-70					
12	40-80	0.01-0.03	0.025-0.04	0.03-0.045	0.035-0.05	0.02-0.10
13						
14						
15	70-100	0.01-0.40	0.04-0.1	0.05-0.12	0.06-0.14	0.05-0.20
16	70-100					
17	80-110					
18	80-110					
19	90-115					
20	90-115					
21	80-160	0.02-0.04	0.03-0.17	0.03-0.18	0.035-0.19	0.03-0.15
22						
23						
24						
25	80-120					
26	80-180	0.02-0.04	0.02-0.13	0.03-0.16	0.04-0.18	0.03-0.15
27						
28						
29						
30						
31	25-60	0.01-0.03	0.025-0.03	0.03-0.035	0.03-0.04	0.02-0.10
32						
33						
34						
35						
36						
37						
38	20-50	0.01-0.03	0.025-0.03	0.03-0.035	0.03-0.04	0.02-0.10
39						
40						
41						

Gundrill Troubleshooting Guide

	Drill Problems												Hole Problems					
Possible Cause	Cratering	Built-up edge	Damaged wear pad	Bent flute	Drill heat	Excessive flank wear	Excessive corner wear	Excessive margin wear	Poor drill life	Chipping	Breakage		Curved hole axis	Conical entry	Runout	Rough surface finish	Undersized	Oversized
Poor clamping								+			+		+		+			+
Insufficient coolant flow					+	+			+		+					+		+
Low coolant pressure									+		+					+	+	
Incorrect coolant type	+	+	+			+	+	+	+							+		
Feed fluctuations		+		+					+	+	+		+		+	+		
Too high feed	+	+		+	+	+			+		+		+	+	+	+		+
Too low feed		+							+	+			+					
Spindle speed too high			+	+	+	+	+	+	+		+							
Spindle speed too low	+	+														+		
Material structure	+	+	+				+		+	+	+		+		+			
Material shrinking due to heat			+		+		+		+		+				+	+	+	
Workpiece thin wall section									+		+		+		+			
Misalignment			+	+		+		+	+		+		+		+			+
Undersized hole			+		+	+		+	+		+					+		
Rough cutting edge finish	+	+					+		+	+	+		+		+			
Built up edge							+		+		+					+		+
Worn out edge	+	+					+	+	+	+	+		+		+	+		
Interrupted chip flow			+	+		+		+	+		+		+		+	+		+
Too small flute clearance			+		+	+		+	+	+			+		+			
Incorrect drill profile	+	+	+	+			+	+	+		+		+		+	+	+	+
Incorrect head angles	+	+		+		+	+		+	+	+		+	+		+	+	+
Vibrations	+	+	+	+			+		+	+	+		+	+	+	+		+
Oversized bushing									+		+		+	+	+			+
Gap between bushing and workpiece						+			+		+		+	+	+	+	+	+
Undersized bushing			+	+		+		+	+		+				+		+	
Loss of coolant pressure		+	+	+	+				+		+			+		+	+	
High coolant pressure													+					+
Coolant overheating	+		+		+	+	+	+	+							+		
Insufficent coolant	+	+	+	+	+				+		+		+		+	+		+
Excessive wear of head inside angle			+	+					+						+	+		+
Excessive wear of head outside angle		+		+			+		+						+	+	+	
Too short carbide head	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+
Tool heel drag			+	+	+	+		+	+		+		+		+	+		+
Worn supporting pads	+		+	+	+		+		+		+				+			+
Tool whip - Reverse tool rotation	+	+	+	+			+		+	+	+				+	+		+

HIGH PRECISION REAMING SOLUTIONS

Member IMC Group

BAYO T-REAM

Holder Designation Code Key

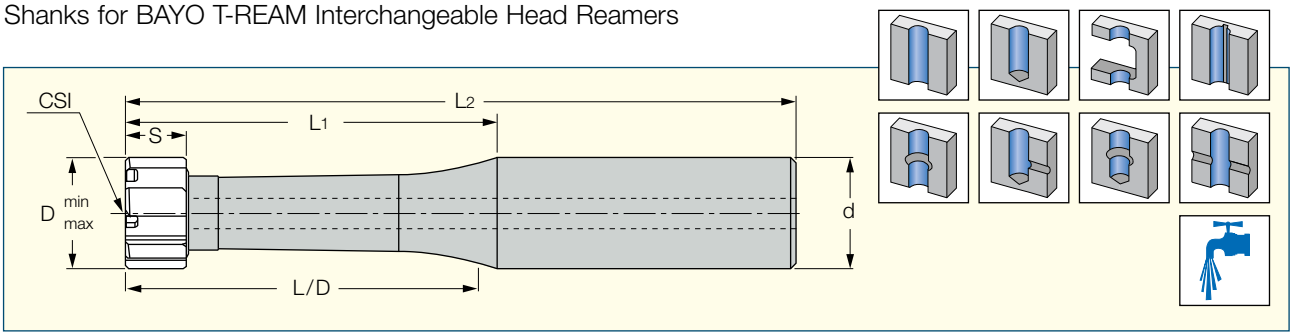
RM	-	BNT7	-	3D	-	20	-	C [1]	-	□ [2]
Reamer		Bayonet tool size		Functional length		Shank diameter in mm		Shank type		Shank material

[1] C- cylindrical, W-Weldon, M-Morse

[2] No letter - Steel (default), C-Carbide, W- Heavy metal

RM-BNT-3D/5D/8D (Shanks)

Shanks for BAYO T-REAM Interchangeable Head Reamers



Designation	L/D	D_r(min)	D_r(max)	S	L_2	L_1	d	CSI[1]
RM-BNT5-3D-16C	3.00	11.501	13.500	9.20	97.8	49.8	16.00	BN5
RM-BNT6-3D-16C	3.00	13.501	16.000	9.20	105.4	57.4	16.00	BN6
RM-BNT7-3D-20C	3.00	16.001	20.000	10.40	120.6	70.6	20.00	BN7
RM-BNT8-3D-20C	3.00	20.001	25.400	12.60	137.8	87.8	20.00	BN8
RM-BNT9-3D-25C	3.00	25.401	32.000	12.60	150.2	94.2	25.00	BN9
RM-BNT9-3D-32C	3.00	26.001	32.000	12.60	167.1	107.1	32.00	BN9
RM-BNT5-5D-16C	5.00	11.501	13.500	9.20	125.0	77.0	16.00	BN5
RM-BNT6-5D-16C	5.00	13.501	16.000	9.20	137.4	89.4	16.00	BN6
RM-BNT7-5D-20C	5.00	16.001	20.000	10.40	160.8	110.6	20.00	BN7
RM-BNT8-5D-20C	5.00	20.001	25.400	12.60	187.8	137.8	20.00	BN8
RM-BNT9-5D-32C	5.00	25.401	32.000	12.60	231.1	171.1	32.00	BN9
RM-BNT5-8D-16C	8.00	11.501	13.500	9.20	165.5	117.5	16.00	BN5
RM-BNT6-8D-16C	8.00	13.501	16.000	9.20	185.4	137.4	16.00	BN6
RM-BNT7-8D-20C	8.00	16.001	20.000	10.40	220.6	170.6	20.00	BN7
RM-BNT8-8D-20C	8.00	20.001	25.400	12.60	262.8	212.8	20.00	BN8
RM-BNT9-8D-32C	8.00	25.401	32.000	12.60	327.1	267.1	32.00	BN9

[1] Connection size

For inserts, see: RM-BN-H7LB (E3) • RM-BN-H7SA (E4).

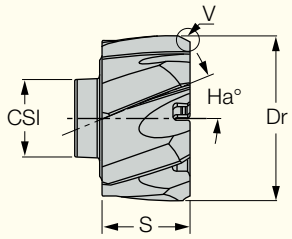
Spare Parts

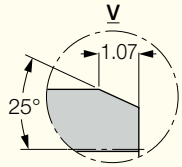
Designation	Bayonet Screw	Clamping Key
RM-BNT5-3D-16C	RM-BN5-SR	RM-BN5-K
RM-BNT6-3D-16C	RM-BN6-SR	RM-BN6-K
RM-BNT7-3D-20C	RM-BN7-SR	RM-BN7-K
RM-BNT8-3D-20C	RM-BN8-SR	RM-BN8-K
RM-BNT9-3D-25C	RM-BN9-SR	RM-BN9-K
RM-BNT9-3D-32C	RM-BN9-SR	RM-BN9-K
RM-BNT5-5D-16C	RM-BN5-SR	RM-BN5-K
RM-BNT6-5D-16C	RM-BN6-SR	RM-BN6-K
RM-BNT7-5D-20C	RM-BN7-SR	RM-BN7-K
RM-BNT8-5D-20C	RM-BN8-SR	RM-BN8-K
RM-BNT9-5D-32C	RM-BN9-SR	RM-BN9-K
RM-BNT5-8D-16C	RM-BN5-SR	RM-BN5-K
RM-BNT6-8D-16C	RM-BN6-SR	RM-BN6-K
RM-BNT7-8D-20C	RM-BN7-SR	RM-BN7-K
RM-BNT8-8D-20C	RM-BN8-SR	RM-BN8-K
RM-BNT9-8D-32C	RM-BN9-SR	RM-BN9-K

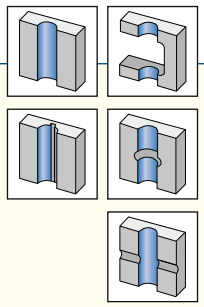
BAYO T-REAM

RM-BN-H7LB

Interchangeable Left-Hand Flute Solid Carbide Reaming Heads with a Quick Change for High Speed Reaming of Through Holes







Designation	Dimensions					Tough ↔ Hard	
	CSI	D_r	S	Flute	H_a°	IC08	IC908
RM-BN5-11.501-H7LB	BN5	11.501	9.20	6	20.0	●	●
RM-BN5-12.000-H7LB	BN5	12.000	9.20	6	20.0	●	●
RM-BN5-13.000-H7LB	BN5	13.000	9.20	6	20.0	●	●
RM-BN5-13.500-H7LB	BN5	13.500	9.20	6	20.0	●	●
RM-BN6-13.501-H7LB	BN6	13.501	9.20	6	20.0	●	●
RM-BN6-14.000-H7LB	BN6	14.000	9.20	6	20.0	●	●
RM-BN6-15.000-H7LB	BN6	15.000	9.20	6	20.0	●	●
RM-BN6-16.000-H7LB	BN6	16.000	9.20	6	20.0	●	●
RM-BN7-16.001-H7LB	BN7	16.001	10.40	6	20.0	●	●
RM-BN7-17.000-H7LB	BN7	17.000	10.40	6	20.0	●	●
RM-BN7-18.000-H7LB	BN7	18.000	10.40	6	20.0	●	●
RM-BN7-19.000-H7LB	BN7	19.000	10.40	6	20.0	●	●
RM-BN7-20.000-H7LB	BN7	20.000	10.40	6	20.0	●	●
RM-BN8-20.001-H7LB	BN8	20.001	12.60	8	20.0	●	●
RM-BN8-21.000-H7LB	BN8	21.000	12.60	8	20.0	●	●
RM-BN8-22.000-H7LB	BN8	22.000	12.60	8	20.0	●	●
RM-BN8-23.000-H7LB	BN8	23.000	12.60	8	20.0	●	●
RM-BN8-24.000-H7LB	BN8	24.000	12.60	8	20.0	●	●
RM-BN8-25.000-H7LB	BN8	25.000	12.60	8	20.0	●	●
RM-BN9-26.000-H7LB	BN9	26.000	12.60	8	20.0		●
RM-BN9-27.000-H7LB	BN9	27.000	12.60	8	20.0		●
RM-BN9-28.000-H7LB	BN9	28.000	12.60	8	20.0		●
RM-BN9-29.000-H7LB	BN9	29.000	12.60	8	20.0		●
RM-BN9-30.000-H7LB	BN9	30.000	12.60	8	20.0		●
RM-BN9-31.000-H7LB	BN9	31.000	12.60	8	20.0		●
RM-BN9-32.000-H7LB	BN9	32.000	12.60	8	20.0		●

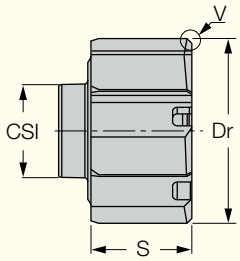
• For user guide see pages E5-11.

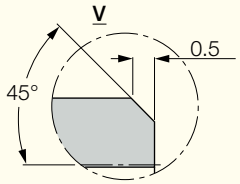
For tools, see: RM-BNT-3D/5D/8D (Shanks) (E2).

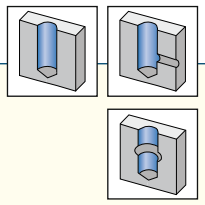
BAYO T-REAM

RM-BN-H7SA

Interchangeable Straight Flute Solid Carbide Reaming Heads with Quick Change Bayonet Mechanism for High Speed Reaming





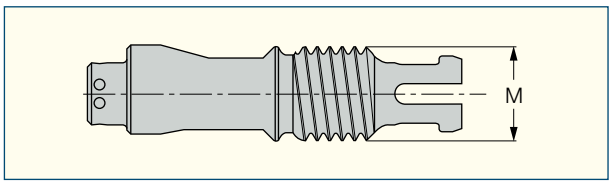


Designation	Dimensions				Tough ↔ Hard	
	CSI	D_r	S	Flute	IC08	IC908
RM-BN5-11.501-H7SA	BN5	11.501	9.20	6	●	●
RM-BN5-12.000-H7SA	BN5	12.000	9.20	6	●	●
RM-BN5-13.000-H7SA	BN5	13.000	9.20	6	●	●
RM-BN5-13.500-H7SA	BN5	13.500	9.20	6	●	●
RM-BN6-13.501-H7SA	BN6	13.501	9.20	6	●	●
RM-BN6-14.000-H7SA	BN6	14.000	9.20	6	●	●
RM-BN6-15.000-H7SA	BN6	15.000	9.20	6	●	●
RM-BN6-16.000-H7SA	BN6	16.000	9.20	6	●	●
RM-BN7-16.001-H7SA	BN7	16.001	10.40	6	●	●
RM-BN7-17.000-H7SA	BN7	17.000	10.40	6	●	●
RM-BN7-18.000-H7SA	BN7	18.000	10.40	6	●	●
RM-BN7-19.000-H7SA	BN7	19.000	10.40	6	●	●
RM-BN7-20.000-H7SA	BN7	20.000	10.40	6	●	●
RM-BN8-20.001-H7SA	BN8	20.001	12.60	8	●	●
RM-BN8-21.000-H7SA	BN8	21.000	12.60	8	●	●
RM-BN8-22.000-H7SA	BN8	22.000	12.60	8	●	●
RM-BN8-23.000-H7SA	BN8	23.000	12.60	8	●	●
RM-BN8-24.000-H7SA	BN8	24.000	12.60	8	●	●
RM-BN8-25.000-H7SA	BN8	25.000	12.60	8	●	●
RM-BN9-26.000-H7SA	BN9	26.000	12.60	8		●
RM-BN9-27.000-H7SA	BN9	27.000	12.60	8		●
RM-BN9-28.000-H7SA	BN9	28.000	12.60	8		●
RM-BN9-29.000-H7SA	BN9	29.000	12.60	8		●
RM-BN9-30.000-H7SA	BN9	30.000	12.60	8		●
RM-BN9-31.000-H7SA	BN9	31.000	12.60	8	●	●
RM-BN9-32.000-H7SA	BN9	32.000	12.60	8	●	●

• For user guide see pages E5-11.

For tools, see: RM-BNT-3D/5D/8D (Shanks) (E2).

Bayonet Screw



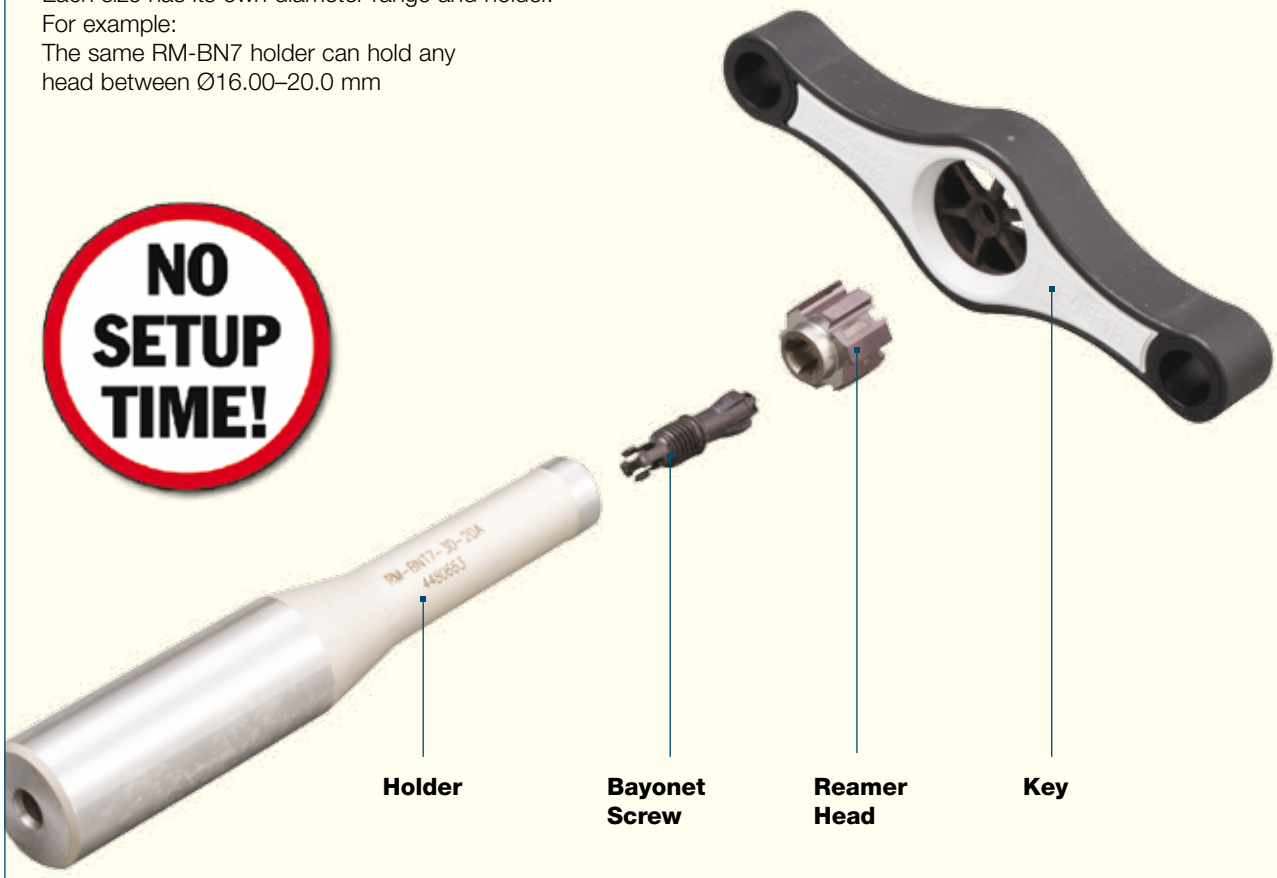
Designation	Head Diameter	Bayonet Size	M
RM-BN5-SR	11.501-13.500	BN5	M5
RM-BN6-SR	13.501-16.000	BN6	M6
RM-BN7-SR	16.001-20.000	BN7	M7
RM-BN8-SR	20.001-25.400	BN8	M8
RM-BN9-SR	25.401-32.000	BN9	M9

Clamping Key

Designation	Head Diameter	Bayonet Size
RM-BN5-K	11.501-13.500	BN5
RM-BN6-K	13.501-16.000	BN6
RM-BN7-K	16.001-20.000	BN7
RM-BN8-K	20.001-25.400	BN8
RM-BN9-K	25.401-32.000	BN9

The BAYO T-REAM Line is Available in 5 Sizes

Each size has its own diameter range and holder.
For example:
The same RM-BN7 holder can hold any head between Ø16.00–20.0 mm



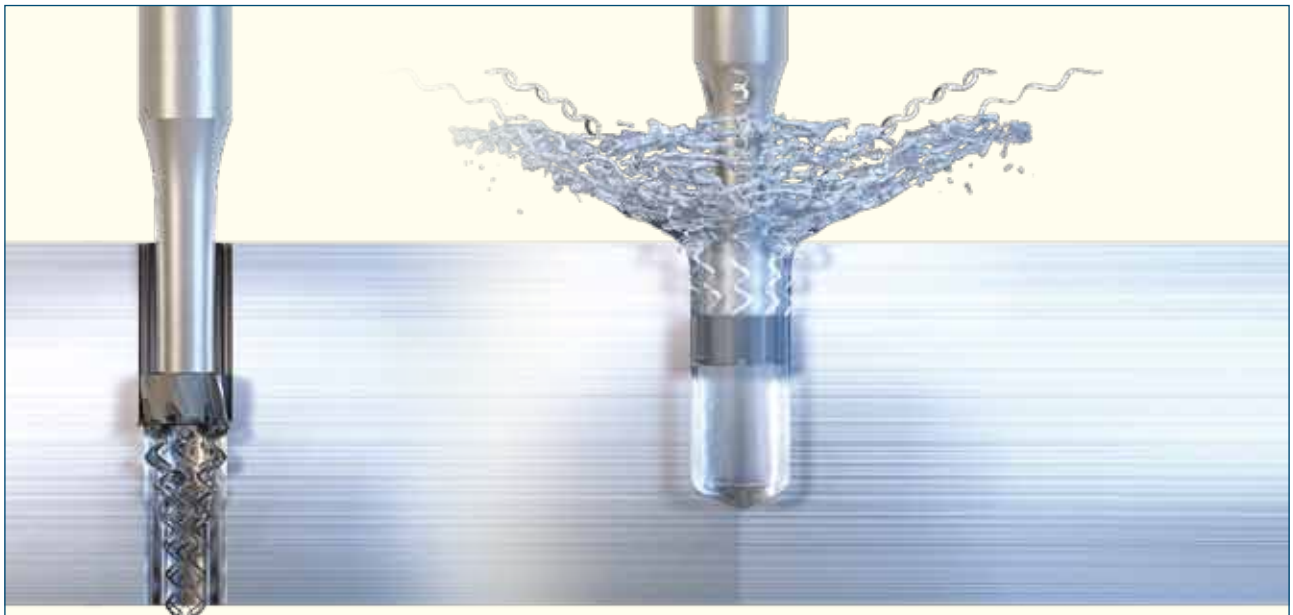
RM-BN8
Ø20.0-25.4 mm

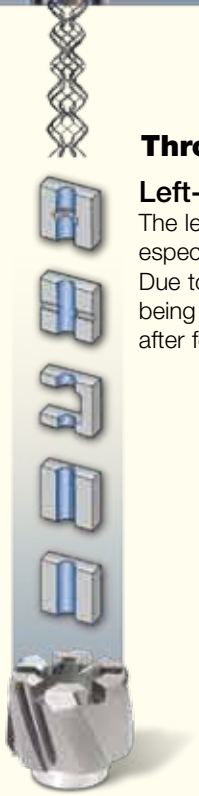
RM-BN9
Ø25.4-32.0 mm

RM-BN5
Ø11.5-13.5 mm

RM-BN6
Ø13.5-16 mm

RM-BN7
Ø16.0-20.0 mm





Through Hole

Left-hand Flute

The left-hand spiral is designed especially for through hole reaming. Due to this design, the chips are being pushed forward immediately after formation.

Blind Hole

Straight Flute

The coolant flow assists the chip evacuation process. It directs the just-formed chips backwards. The chips pass through the straight flutes and are thrown out of the hole, without causing any damage to the reamer or hole surface.

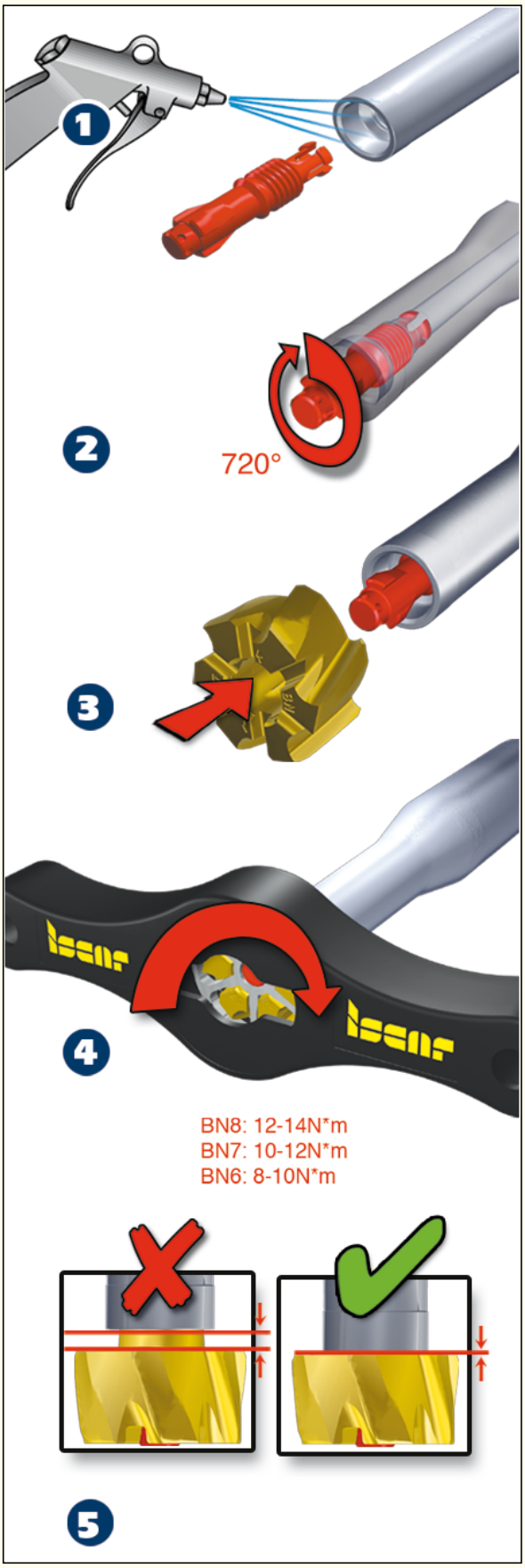
ATTENTION: Cutting tools can break during use.
To avoid injury always use safety precautions such as gloves, shields and eye protection.

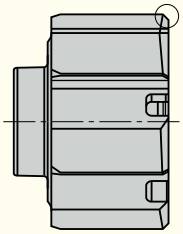
First Assembly

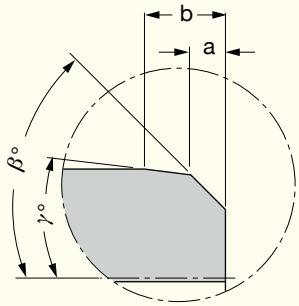
- Clean the toolholder pocket. (Fig. 1)
- Clean the reamer head clamping cone.
- Insert the clamping screw into the holder and rotate it 2-3 turns in a clockwise direction. (Fig. 2)
- Clamp the reaming head on the screw.
  Please note that BN8 can be assembled only in a specific position relative to the screw (rotate the head until locating the correct position). (Fig. 3)
- Manually rotate the reaming head until it sits firmly in the pocket.
- Tighten with the special key: 12-14 N x m (the toolholder should be clamped into an adapter). (Fig. 4)
- Make sure there is no face gap between the toolholder and the reaming head. (Fig. 5)

Indexing

- Release the reaming head with the key, turning in a counterclockwise direction until it rotates freely.
- Rotate by hand another one turn.
- Remove the reamer head from the tool.
  The clamping screw should remain inside!!!
- Clean the pocket of the toolholder. (Fig. 1)
- Clean the cone on the new reamer head.
- Clamp the reaming head on the screw.
  Pay attention that BN8 can be assembled only in one position relative to the screw (rotate the head until locating the correct position). (Fig. 3)
- Manually rotate the reaming head.
  In the beginning it should rotate without the screw and then (after 1/6 of a turn) it should engage with the screw. Rotate until it sits firmly in the pocket. If the screw is rotating together with the reaming head from the beginning, remove the reaming head and open the screw another one turn.
- Tighten with the special key: 12-14 N/m (the toolholder should be clamped into an adapter). (Fig. 4)
- Make sure that there is no face gap between the toolholder and the reaming head. (Fig. 5)







Lead Code / Parameter	β°	a [mm]	γ°	b [mm]
A	45°	0.5	–	–
B	25°	1.07	–	–
C	45°	0.5	8°	0.75
D	30°	0.5	4°	1.85
E	45°	0.2	–	–
F	90°	–	–	–
G	75°	0.15	–	–
X	Specially Tailored **(undesignated)**			

When choosing a reamer, it is important to select a lead geometry which covers the reaming allowance.

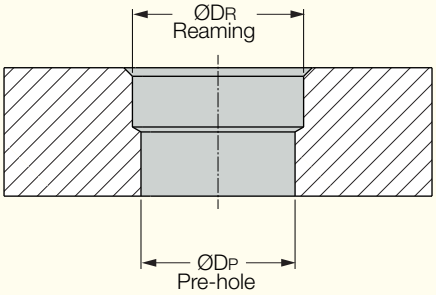
Reaming Allowance

Reaming allowance is the stock material which should be removed by reaming.
It is recommended to leave different reaming allowances depending on the workpiece material and the pre-hole quality.

Pre-hole should be smooth and straight, without deep scratches on it.

Δ – Reaming allowance

$\Delta = \varnothing D_R - \varnothing D_P$



Material \ Hole Ø mm	< 9.5	9.5 - 11.5	11.5 - 13.5	13.5 - 16	16 - 32	>32	
Steel and Cast Iron	0.07-0.10	0.07-0.15	0.10-0.20	0.10-0.30	0.10-0.30	0.20-0.40	mm/Ø
Aluminum and Brass	0.07-0.10	0.10-0.15	0.15-0.25	0.20-0.30	0.20-0.40	0.20-0.50	mm/Ø

Complementary Grades (on request):

IC30N cermet tipped, recommended for reaming the following materials: non-alloyed (mild) steel, low alloyed steel (<5% of alloying elements), free cutting steel, tempered steel (tensile strength <1100 N/mm2) and nodular iron (GGG40, GGG60, etc.)

ID5 (PCD) recommended for high speed reaming of aluminum (special cases).
RN01 (DLC coating) recommended for reaming the following materials: aluminum alloys (cast, wrought, etc.), brass, bronze and other nonferrous materials.

BAYO T-REAM

Recommeded Cutting Conditions for BAYO T-REAM High Speed Reaming Heads

ISO	Material	Condition	Material No.[1]	Through Hole				Interrupted Through Hole			
				FIRST Choice		Second Choice		FIRST Choice		Second Choice	
P	Non-alloyed steel, cast steel, free cutting steel	Annealed	1	IC908	LB	IC30N	LA	IC908	LB	IC908	SA
		Annealed	2	Vc = 80 - 200		Vc = 90 - 240		Vc = 60 - 120		Vc = 60 - 120	
		Quenched & tempered	3	BN4 - BN6	fz = 0.08 - 0.21	BN4 - BN6	fz = 0.08 - 0.21	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.05 - 0.15
		Annealed	4								
		Quenched & tempered	5	BN7 - BN9	fz = 0.12 - 0.27	BN7 - BN9	fz = 0.12 - 0.27	BN7 - BN9	fz = 0.09 - 0.21	BN7 - BN9	fz = 0.07 - 0.16
	Low alloyed steel, cast steel (less than 5% alloying elements)	Annealed	6	IC908	LB	IC30N	LA	IC908	LB	IC908	SA
			7	Vc = 80 - 200		Vc = 90 - 240		Vc = 60 - 120		Vc = 60 - 120	
		Quenched & tempered	8	BN4 - BN6	fz = 0.08 - 0.21	BN4 - BN6	fz = 0.08 - 0.21	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.05 - 0.15
			9	BN7 - BN9	fz = 0.12 - 0.27	BN7 - BN9	fz = 0.12 - 0.27	BN7 - BN9	fz = 0.09 - 0.21	BN7 - BN9	fz = 0.07 - 0.16
	High alloyed steel, cast steel, and tool steel	Annealed	10	IC908	LB	IC908	SA	IC908	LB	IC908	SA
				Vc = 20 - 60		Vc = 20 - 60		Vc = 20 - 60		Vc = 20 - 60	
		Quenched & tempered	11	BN4 - BN6	fz = 0.05 - 0.13	BN4 - BN6	fz = 0.04 - 0.11	BN4 - BN6	fz = 0.04 - 0.11	BN4 - BN6	fz = 0.03 - 0.09
				BN7 - BN9	fz = 0.07 - 0.17	BN7 - BN9	fz = 0.06 - 0.14	BN7 - BN9	fz = 0.05 - 0.14	BN7 - BN9	fz = 0.04 - 0.11
M	Stainless steel, cast steel	Ferritic / martensitic	12	IC908	LB	IC908	SA	IC908	LB	IC908	SA
				Vc = 20 - 40		Vc = 20 - 40		Vc = 20 - 40		Vc = 20 - 40	
		Martensitic	13	BN4 - BN6	fz = 0.05 - 0.13	BN4 - BN6	fz = 0.04 - 0.11	BN4 - BN6	fz = 0.04 - 0.11	BN4 - BN6	fz = 0.03 - 0.09
		Austentic	14	BN7 - BN9	fz = 0.07 - 0.17	BN7 - BN9	fz = 0.06 - 0.14	BN7 - BN9	fz = 0.05 - 0.14	BN7 - BN9	fz = 0.04 - 0.11
K	Grey iron (GG)	Ferritic	15	IC908	LB	IC908	SA	IC908	LB	IC908	SA
				Vc = 120 - 220		Vc = 120 - 220		Vc = 80 - 200		Vc = 80 - 200	
		Pearlitic	16	BN4 - BN6	fz = 0.08 - 0.18	BN4 - BN6	fz = 0.08 - 0.16	BN4 - BN6	fz = 0.05 - 0.13	BN4 - BN6	fz = 0.05 - 0.13
				BN7 - BN9	fz = 0.10 - 0.24	BN7 - BN9	fz = 0.10 - 0.22	BN7 - BN9	fz = 0.07 - 0.17	BN7 - BN9	fz = 0.07 - 0.17
	Nodular iron (GGG)	Pearlitic / ferritic	17	IC908	SA or LB	IC30N	LA	IC908	LB	IC908	SA
				Vc = 160 - 280		Vc = 160 - 300		Vc = 150 - 250		Vc = 150 - 250	
		Pearlitic / martensitic	18	BN4 - BN6	fz = 0.11 - 0.20	BN4 - BN6	fz = 0.11 - 0.20	BN4 - BN6	fz = 0.06 - 0.15	BN4 - BN6	fz = 0.06 - 0.15
				BN7 - BN9	fz = 0.11 - 0.24	BN7 - BN9	fz = 0.11 - 0.24	BN7 - BN9	fz = 0.08 - 0.19	BN7 - BN9	fz = 0.08 - 0.19
	Malleable iron, Nodular iron ferritic / pearlitic	Ferritic	19	IC908	SA or LB	IC30N	LA or SA	IC908	LB	IC908	SA
				Vc = 100 - 220		Vc = 100 - 240		Vc = 100 - 220		Vc = 100 - 220	
		Pearlitic	20	BN4 - BN6	fz = 0.11 - 0.20	BN4 - BN6	fz = 0.11 - 0.20	BN4 - BN6	fz = 0.06 - 0.15	BN4 - BN6	fz = 0.06 - 0.15
				BN7 - BN9	fz = 0.11 - 0.24	BN7 - BN9	fz = 0.11 - 0.24	BN7 - BN9	fz = 0.08 - 0.20	BN7 - BN9	fz = 0.08 - 0.19
N	Aluminum wrought alloy	Not cureable	21	RN01	LB or SG	ID5	SG	RN01	LB	ID5	SG
		Cured	22	Vc = 150 - 400		Vc = 200 - 500		Vc = 150 - 350		Vc = 200 - 500	
	Aluminum - cast, alloyed	Not cureable	23								
		Cured	24	BN4 - BN6	fz = 0.08 - 0.16	BN4 - BN6	fz = 0.08 - 0.2	BN4 - BN6	fz = 0.08 - 0.16	BN4 - BN6	fz = 0.08 - 0.2
		High temperature	25	BN7 - BN9	fz = 0.10 - 0.20	BN7 - BN9	fz = 0.11 - 0.24	BN7 - BN9	fz = 0.10 - 0.20	BN7 - BN9	fz = 0.11 - 0.24
	Copper alloys Brass, bronze	Free cutting	26	IC30N	SA or SG	IC08	SG or SA	IC08	SG or SA		
				Vc = 180 - 240		Vc = 30 - 100		Vc = 30 - 100			
		Brass	27	BN4 - BN6	fz = 0.05 - 0.16	BN4 - BN6	fz = 0.04 - 0.13	BN4 - BN6	fz = 0.04 - 0.13		
		Electrolitic copper	28	BN7 - BN9	fz = 0.04 - 0.20	BN7 - BN9	fz = 0.05 - 0.16	BN7 - BN9	fz = 0.05 - 0.16		
	Non-metallic	Duroplastics, fiber plastics	29	IC908	SA	IC908	LB	IC908	SA	IC908	LB
				Vc = 25 - 80		Vc = 25 - 80		Vc = 25 - 80		Vc = 25 - 80	
		Hard rubber	30	BN4 - BN6	fz = 0.05 - 0.10	BN4 - BN6	fz = 0.05 - 0.12	BN4 - BN6	fz = 0.05 - 0.10	BN4 - BN6	fz = 0.05 - 0.12
				BN7 - BN9	fz = 0.10 - 0.20	BN7 - BN9	fz = 0.10 - 0.23	BN7 - BN9	fz = 0.10 - 0.20	BN7 - BN9	fz = 0.10 - 0.23
S	* High temp. alloys	Annealed	31	IC908	L *	IC908	S*	IC908	L*	IC908	S*
		Cured	32	Vc = 15 - 50		Vc = 15 - 50		Vc = 15 - 50		Vc = 15 - 50	
		Annealed	33								
		Cured	34	BN4 - BN6	fz = 0.04 - 0.10	BN4 - BN6	fz = 0.04 - 0.10	BN4 - BN6	fz = 0.03 - 0.08	BN4 - BN6	fz = 0.03 - 0.08
		Cast	35								
				BN7 - BN9	fz = 0.05 - 0.13	BN7 - BN9	fz = 0.05 - 0.13	BN7 - BN9	fz = 0.04 - 0.11	BN7 - BN9	fz = 0.04 - 0.11
H	Hardened steel	Hardened	38	IC908	LB	IC908	SA	IC908	LB	IC908	SA
		Hardened	39	Vc = 25 - 50		Vc = 25 - 50		Vc = 25 - 50		Vc = 25 - 50	
		Cast	40	BN4 - BN6	fz = 0.06 - 0.15	BN4 - BN6	fz = 0.05 - 0.13	BN4 - BN6	fz = 0.06 - 0.15	BN4 - BN6	fz = 0.05 - 0.13
		Hardened	41	BN7 - BN9	fz = 0.10 - 0.20	BN7 - BN9	fz = 0.10 - 0.20	BN7 - BN9	fz = 0.10 - 0.20	BN7 - BN9	fz = 0.10 - 0.20

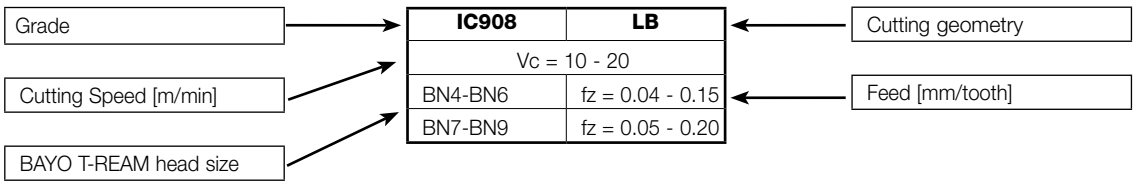
* Standard edge geometries are not suitable for reaming titanium and high temperature alloys.
In order to choose a proper geometry, please ask for our recommendations.

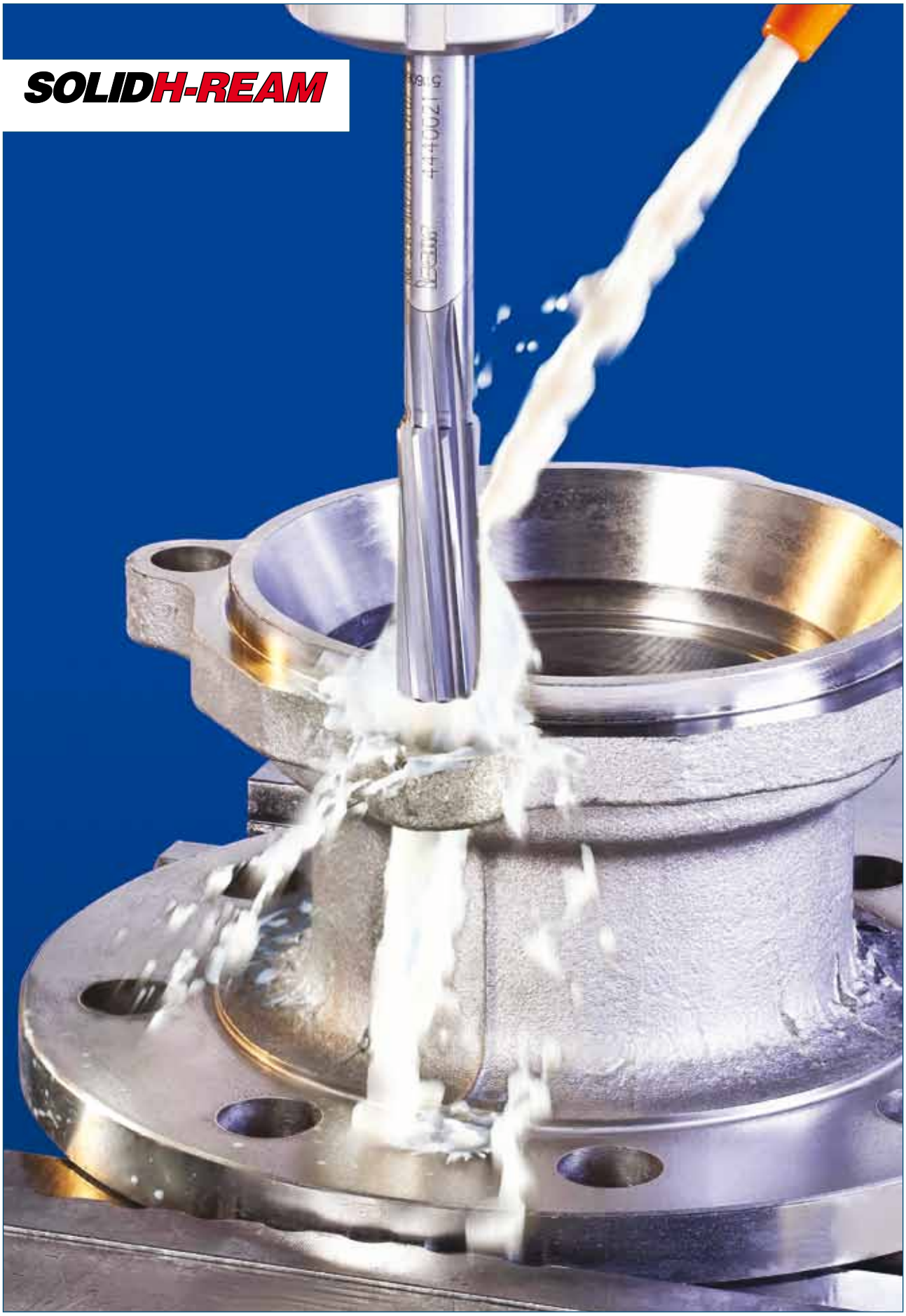
- The given cutting data recommendations refer to the short holders (3xD effective reaming overhang). For longer holders, the cutting speed should be reduced proportionally.
- For relatively large leading angles (spot-facing geometries), the feed should be reduced up to 30%.
- All the given cutting data recommendations refer to the machines with spindle through coolant supply.

[1] For workpiece materials list, see pages G6-41.

	Blind Hole				Interrupted Blind Hole				IC08	
Material No.	FIRST choice		Second choice		FIRST choice		Second choice		Through Hole - LB Blind Hole - SA	
1	IC908	SA	IC30N	SA	IC908	SA			Vc = 6 - 10	
2	Vc = 60-160		Vc = 90 - 200		Vc = 60 - 120					
3 4	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.05 - 0.15			BN4 - BN6	fz = 0.05 - 0.17
5	BN7 - BN9	fz = 0.08 - 0.20	BN7 - BN9	fz = 0.08 - 0.21	BN7 - BN9	fz = 0.07 - 0.16			BN7 - BN9	fz = 0.07 - 0.20
6	IC908	SA	IC30N	SA	IC908	SA			Vc = 6 - 10	
7	Vc = 60-160		Vc = 90 - 200		Vc = 60 - 120					
8	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.05 - 0.15			BN4 - BN6	fz = 0.05 - 0.17
9	BN7 - BN9	fz = 0.08 - 0.20	BN7 - BN9	fz = 0.08 - 0.21	BN7 - BN9	fz = 0.07 - 0.16			BN7 - BN9	fz = 0.07 - 0.20
10	IC908	SA			IC908	SA			Vc = 6 - 10	
	Vc = 20 - 60				Vc = 20 - 60					
11	BN4 - BN6	fz = 0.04 - 0.10			BN4 - BN6	fz = 0.03 - 0.08			BN4 - BN6	fz = 0.03 - 0.08
	BN7 - BN9	fz = 0.05 - 0.13			BN7 - BN9	fz = 0.04 - 0.10			BN7 - BN9	fz = 0.05 - 0.10
12	IC908	SA			IC908	SA			Vc = 4 - 8	
	Vc = 20 - 40				Vc = 20 - 40					
13	BN4 - BN6	fz = 0.04 - 0.10			BN4 - BN6	fz = 0.03 - 0.08			BN4 - BN6	fz = 0.03 - 0.08
14	BN7 - BN9	fz = 0.05 - 0.13			BN7 - BN9	fz = 0.05 - 0.10			BN7 - BN9	fz = 0.05 - 0.10
15	IC908	SA			IC908	SA			Vc = 8 - 20	
	Vc = 80 - 200				Vc = 60 - 120					
16	BN4 - BN6	fz = 0.06 - 0.18			BN4 - BN6	fz = 0.05 - 0.13			BN4 - BN6	fz = 0.08 - 0.16
	BN7 - BN9	fz = 0.08 - 0.23			BN7 - BN9	fz = 0.08 - 0.18			BN7 - BN9	fz = 0.10 - 0.20
17	IC908	SA	IC30N	SA	IC908	SA			Vc = 9 - 20	
	Vc = 160 - 280		Vc = 160 - 280		Vc = 160 - 240					
18	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.06 - 0.16			BN4 - BN6	fz = 0.06 - 0.16
	BN7 - BN9	fz = 0.08 - 0.23	BN7 - BN9	fz = 0.08 - 0.24	BN7 - BN9	fz = 0.08 - 0.18			BN7 - BN9	fz = 0.08 - 0.20
19	IC908	SA	IC30N	SA	IC908	SA			Vc = 10 - 20	
	Vc = 100 - 220		Vc = 100 - 240		Vc = 100 - 220					
20	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.06 - 0.18	BN4 - BN6	fz = 0.05 - 0.15			BN4 - BN6	fz = 0.05 - 0.15
	BN7 - BN9	fz = 0.08 - 0.23	BN7 - BN9	fz = 0.08 - 0.23	BN7 - BN9	fz = 0.08 - 0.20			BN7 - BN9	fz = 0.08 - 0.15
21	RN01	SG or SA	ID5	SG or SA	RN01	SG or SA	ID5	SG or SA	Vc = 10 - 30	
22 23	Vc = 150 - 400		Vc = 200 - 400		Vc = 150 - 300		Vc = 200 - 400			
24	BN4 - BN6	fz = 0.08 - 0.16	BN4 - BN6	fz = 0.08 - 0.16	BN4 - BN6	fz = 0.07 - 0.15	BN4 - BN6	fz = 0.08 - 0.16	BN4 - BN6	fz = 0.05 - 0.12
25	BN7 - BN9	fz = 0.11 - 0.20	BN7 - BN9	fz = 0.11 - 0.24	BN7 - BN9	fz = 0.11 - 0.20	BN7 - BN9	fz = 0.11- 0.24	BN7 - BN9	fz = 0.08 - 0.15
26	IC30N	SG or SA	IC08	SG or SA	IC08	SG or SA			Vc = 30 - 100	
	Vc = 180 - 240		Vc = 30 - 100		Vc = 30 - 100					
27	BN4 - BN6	fz = 0.05 - 0.16	BN4 - BN6	fz = 0.04 - 0.13	BN4 - BN6	fz = 0.04 - 0.13			BN4 - BN6	fz = 0.04 - 0.13
28	BN7 - BN9	fz = 0.05 - 0.21	BN7 - BN9	fz = 0.05 - 0.16	BN7 - BN9	fz = 0.05 - 0.16			BN7 - BN9	fz = 0.05 - 0.16
29	IC908	SA			IC908	SA			Vc = 10 - 20	
	Vc = 25 - 80				Vc = 25 - 80					
30	BN4 - BN6	fz = 0.05 - 0.10			BN4 - BN6	fz = 0.05 - 0.10			BN4 - BN6	fz = 0.05 - 0.12
	BN7 - BN9	fz = 0.10 - 0.20			BN7 - BN9	fz = 0.10 - 0.20			BN7 - BN9	fz = 0.08 - 0.16
31	IC908	S*			IC908	S*				
32 33	Vc = 15 - 50				Vc = 15 - 50					
34 35	BN4 - BN6	fz = 0.03 - 0.08			BN4 - BN6	fz = 0.03 - 0.08				
	BN7 - BN9	fz = 0.04 - 0.11			BN7 - BN9	fz = 0.04 - 0.11				
38	IC908	SA			IC908	SA				
39	Vc = 25 - 50				Vc = 25 - 50					
40	BN4 - BN6	fz = 0.05 - 0.13			BN4 - BN6	fz = 0.05 - 0.13				
41	BN7 - BN9	fz = 0.10 - 0.20			BN7 - BN9	fz = 0.10 - 0.20				

Legend:

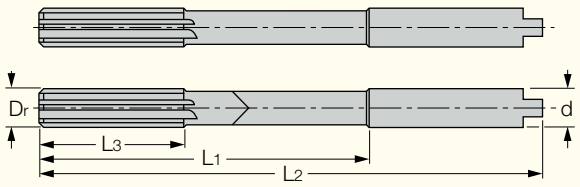



SOLIDH-REAM

SOLIDH-REAM

RM-SHR-H7S-CS

Solid Carbide Reamers, Cylindrical Shank, Straight Flute DIN 8093



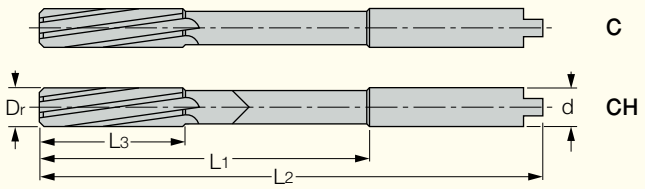
Designation	Dimensions						IC07
	D_r	L_2	L_1	L_3	Flute	d	
RM-SHR-0300-H7S-CS-C	3.000	61.0	30.0	15.0	6	3.00	●
RM-SHR-0320-H7S-CS-C	3.200	70.0	33.0	18.0	6	3.20	●
RM-SHR-0350-H7S-CS-C	3.500	70.0	33.0	18.0	6	3.50	●
RM-SHR-0400-H7S-CS-C	4.000	75.0	44.0	19.0	6	4.00	●
RM-SHR-0450-H7S-CS-C	4.500	80.0	46.0	21.0	6	4.50	●
RM-SHR-0500-H7S-CS-C	5.000	86.0	53.0	23.0	6	5.00	●
RM-SHR-0550-H7S-CS-C	5.500	93.0	56.0	26.0	6	5.60	●
RM-SHR-0600-H7S-CS-C	6.000	93.0	56.0	26.0	6	5.60	●
RM-SHR-0650-H7S-CS-C	6.500	101.0	63.0	28.0	6	6.30	●
RM-SHR-0700-H7S-CS-C	7.000	109.0	69.0	31.0	6	7.10	●
RM-SHR-0750-H7S-CS-C	7.500	109.0	69.0	31.0	6	7.10	●
RM-SHR-0800-H7S-CS-C	8.000	117.0	75.0	33.0	6	8.00	●
RM-SHR-0850-H7S-CS-CH	8.500	117.0	75.0	33.0	6	8.00	●
RM-SHR-0900-H7S-CS-CH	9.000	125.0	81.0	36.0	6	9.00	●
RM-SHR-0950-H7S-CS-CH	9.500	125.0	81.0	36.0	6	9.00	●
RM-SHR-1000-H7S-CS-CH	10.000	133.0	87.0	38.0	6	10.00	●
RM-SHR-1050-H7S-CS-CH	10.500	133.0	87.0	38.0	6	10.00	●
RM-SHR-1100-H7S-CS-CH	11.000	142.0	96.0	41.0	6	10.00	●
RM-SHR-1200-H7S-CS-CH	12.000	151.0	105.0	44.0	6	10.00	●
RM-SHR-1300-H7S-CS-CH	13.000	151.0	105.0	44.0	6	10.00	●
RM-SHR-1400-H7S-CS-CH	14.000	160.0	110.0	47.0	8	12.50	●
RM-SHR-1500-H7S-CS-CH	15.000	162.0	112.0	50.0	8	12.50	●
RM-SHR-1600-H7S-CS-CH	16.000	170.0	120.0	52.0	8	12.50	●

• -C: Solid carbide • -CH: Brazed solid carbide head with DIN 1809 tang • Hole tolerance: H7 manufacturing tolerance according to DIN 1420 • Reamers above 5 mm diameter have the tang back-end design • Available grades: IC07 (uncoated), optional: IC907 (TiAlN PVD coated) • Special diameters are available on request • For user guide and cutting conditions, see pages E19-23.

SOLIDH-REAM

RM-SHR-H7N-CS

Solid Carbide Reamers, Cylindrical Shank Spiral Flute DIN 8093



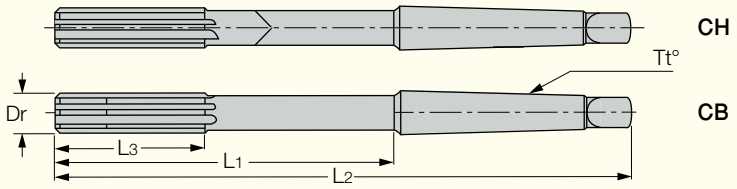
Designation	Dimensions						IC07
	D_r	L_3	L_1	L_2	Flute	d	
RM-SHR-0300-H7N-CS-C	3.000	15.0	30.0	61.0	6	3.00	●
RM-SHR-0320-H7N-CS-C	3.200	18.0	33.0	70.0	6	3.20	●
RM-SHR-0350-H7N-CS-C	3.500	18.0	33.0	70.0	6	3.50	●
RM-SHR-0400-H7N-CS-C	4.000	19.0	44.0	75.0	6	4.00	●
RM-SHR-0450-H7N-CS-C	4.500	21.0	46.0	80.0	6	4.50	●
RM-SHR-0500-H7N-CS-C	5.000	23.0	53.0	86.0	6	5.00	●
RM-SHR-0550-H7N-CS-C	5.500	26.0	56.0	93.0	6	5.60	●
RM-SHR-0600-H7N-CS-C	6.000	26.0	56.0	93.0	6	5.60	●
RM-SHR-0650-H7N-CS-C	6.500	28.0	63.0	101.0	6	6.30	●
RM-SHR-0700-H7N-CS-C	7.000	31.0	69.0	109.0	6	7.10	●
RM-SHR-0750-H7N-CS-C	7.500	31.0	69.0	109.0	6	7.10	●
RM-SHR-0800-H7N-CS-C	8.000	33.0	75.0	117.0	6	8.00	●
RM-SHR-0850-H7N-CS-CH	8.500	33.0	75.0	117.0	6	8.00	●
RM-SHR-0900-H7N-CS-CH	9.000	36.0	81.0	125.0	6	9.00	●
RM-SHR-0950-H7N-CS-CH	9.500	36.0	81.0	125.0	6	9.00	●
RM-SHR-1000-H7N-CS-CH	10.000	38.0	87.0	133.0	6	10.00	●
RM-SHR-1050-H7N-CS-CH	10.500	38.0	87.0	133.0	6	10.00	●
RM-SHR-1100-H7N-CS-CH	11.000	41.0	96.0	142.0	6	10.00	●
RM-SHR-1200-H7N-CS-CH	12.000	44.0	105.0	151.0	6	10.00	●
RM-SHR-1300-H7N-CS-CH	13.000	44.0	105.0	151.0	6	10.00	●
RM-SHR-1400-H7N-CS-CH	14.000	47.0	110.0	160.0	8	12.50	●
RM-SHR-1500-H7N-CS-CH	15.000	50.0	112.0	162.0	8	12.50	●
RM-SHR-1600-H7N-CS-CH	16.000	52.0	120.0	170.0	8	12.50	●

• -C: Solid carbide • -CH: Brazed solid carbide head with DIN 1809 tang • Hole tolerance: H7 manufacturing tolerance according to DIN 1420 • Reamers above 5 mm diameter have the tang back-end design • Available grades: IC07 (uncoated), optional: IC907 (TiAlN PVD coated) • Special diameters are available on request • For user guide and cutting conditions, see pages E19-23.

SOLIDH-REAM

RM-SHR-H7S-MT

Solid Carbide Reamers with Morse Taper Shanks, Straight Flute,
According to DIN 8094



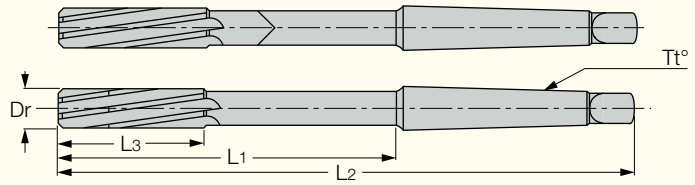
Designation	Dimensions						IC07
	D_r	L_2	L_1	L_3	Flute	T_t°	
RM-SHR-0500-H7S-MT1-CH	5.000	133.0	67.5	23.0	4	MT1	●
RM-SHR-0600-H7S-MT1-CH	6.000	138.0	72.5	26.0	4	MT1	●
RM-SHR-0700-H7S-MT1-CH	7.000	150.0	84.5	31.0	4	MT1	●
RM-SHR-0800-H7S-MT1-CH	8.000	156.0	90.5	33.0	4	MT1	●
RM-SHR-0900-H7S-MT1-CH	9.000	162.0	96.5	36.0	4	MT1	●
RM-SHR-1000-H7S-MT1-CH	10.000	168.0	102.5	38.0	6	MT1	●
RM-SHR-1100-H7S-MT1-CH	11.000	175.0	109.5	41.0	6	MT1	●
RM-SHR-1200-H7S-MT1-CH	12.000	182.0	116.5	44.0	6	MT1	●
RM-SHR-1300-H7S-MT1-CH	13.000	182.0	116.5	44.0	6	MT1	●
RM-SHR-1400-H7S-MT1-CH	14.000	189.0	123.5	47.0	6	MT1	●
RM-SHR-1500-H7S-MT2-CH	15.000	204.0	124.0	50.0	6	MT2	●
RM-SHR-1600-H7S-MT2-CH	16.000	210.0	130.0	52.0	6	MT2	●
RM-SHR-1700-H7S-MT2-CB	17.000	214.0	134.0	54.0	6	MT2	●
RM-SHR-1800-H7S-MT2-CB	18.000	219.0	139.0	56.0	6	MT2	●
RM-SHR-1900-H7S-MT2-CB	19.000	223.0	143.0	58.0	6	MT2	●
RM-SHR-2000-H7S-MT2-CB	20.000	228.0	148.0	60.0	6	MT2	●
RM-SHR-2200-H7S-MT2-CB	22.000	237.0	157.0	64.0	8	MT2	●
RM-SHR-2400-H7S-MT3-CB	24.000	268.0	169.0	68.0	8	MT3	●
RM-SHR-2500-H7S-MT3-CB	25.000	268.0	169.0	68.0	8	MT3	●
RM-SHR-2600-H7S-MT3-CB	26.000	273.0	174.0	70.0	8	MT3	●
RM-SHR-2800-H7S-MT3-CB	28.000	277.0	178.0	71.0	8	MT3	●
RM-SHR-3000-H7S-MT3-CB	30.000	281.0	182.0	73.0	8	MT3	●
RM-SHR-3200-H7S-MT4-CB	32.000	317.0	193.0	77.0	8	MT4	●
RM-SHR-3400-H7S-MT4-CB	34.000	321.0	197.0	78.0	8	MT4	●
RM-SHR-3600-H7S-MT4-CB	36.000	325.0	201.0	79.0	8	MT4	●
RM-SHR-3800-H7S-MT4-CB	38.000	329.0	205.0	81.0	8	MT4	●
RM-SHR-4000-H7S-MT4-CB	40.000	329.0	205.0	81.0	8	MT4	●

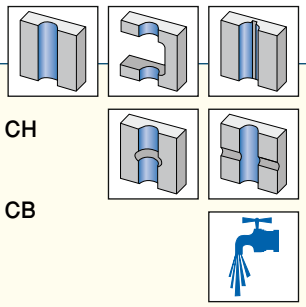
• Available only upon request • -CH: Brazed solid carbide head • -CB: Brazed solid carbide tips • Hole tolerance: H7 manufacturing tolerance according to DIN 1420 • Available grades: IC07 (uncoated), optional: IC907 (TiAlN PVD coated) • For user guide and cutting conditions, see pages E19-23.

SOLIDH-REAM

RM-SHR-H7N-MT

Solid Carbide Reamers with Morse Taper Shank, Spiral Flute DIN 8093





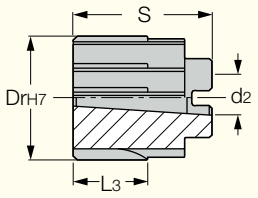
Designation	Dimensions						IC07
	D_r	L_2	L_1	L_3	Flute	T_t°	
RM-SHR-0500-H7N-MT1-CH	5.000	133.0	67.5	23.0	4	MT1	●
RM-SHR-0600-H7N-MT1-CH	6.000	138.0	72.5	26.0	4	TM1	●
RM-SHR-0700-H7N-MT1-CH	7.000	150.0	84.5	31.0	4	MT1	●
RM-SHR-0800-H7N-MT1-CH	8.000	156.0	90.5	33.0	4	MT1	●
RM-SHR-0900-H7N-MT1-CH	9.000	162.0	96.5	36.0	4	MT1	●
RM-SHR-1000-H7N-MT1-CH	10.000	168.0	102.5	38.0	6	MT1	●
RM-SHR-1100-H7N-MT1-CH	11.000	175.0	109.5	41.0	6	MT1	●
RM-SHR-1200-H7N-MT1-CH	12.000	182.0	116.5	44.0	6	MT1	●
RM-SHR-1300-H7N-MT1-CH	13.000	182.0	116.5	44.0	6	MT1	●
RM-SHR-1400-H7N-MT1-CH	14.000	189.0	123.5	47.0	6	MT1	●
RM-SHR-1500-H7N-MT2-CH	15.000	204.0	124.0	50.0	6	MT2	●
RM-SHR-1600-H7N-MT2-CH	16.000	210.0	130.0	52.0	6	MT2	●
RM-SHR-1700-H7N-MT2-CB	17.000	214.0	134.0	54.0	6	MT2	●
RM-SHR-1800-H7N-MT2-CB	18.000	219.0	139.0	56.0	6	MT2	●
RM-SHR-1900-H7N-MT2-CB	19.000	223.0	143.0	58.0	6	MT2	●
RM-SHR-2000-H7N-MT2-CB	20.000	228.0	148.0	60.0	6	MT2	●
RM-SHR-2200-H7N-MT2-CB	22.000	237.0	157.0	64.0	8	MT2	●
RM-SHR-2400-H7N-MT3-CB	24.000	268.0	169.0	68.0	8	MT3	●
RM-SHR-2500-H7N-MT3-CB	25.000	268.0	169.0	68.0	8	MT3	●
RM-SHR-2600-H7N-MT3-CB	26.000	273.0	174.0	70.0	8	MT3	●
RM-SHR-2800-H7N-MT3-CB	28.000	277.0	178.0	71.0	8	MT3	●
RM-SHR-3000-H7N-MT3-CB	30.000	281.0	182.0	73.0	8	MT3	●
RM-SHR-3200-H7N-MT4-CB	32.000	317.0	193.0	77.0	8	MT4	●
RM-SHR-3400-H7N-MT4-CB	34.000	321.0	197.0	78.0	8	MT4	●
RM-SHR-3500-H7N-MT4-CB	35.000	321.0	197.0	78.0	8	MT4	●
RM-SHR-3600-H7N-MT4-CB	36.000	325.0	201.0	79.0	8	MT4	●
RM-SHR-3800-H7N-MT4-CB	38.000	329.0	205.0	81.0	8	MT4	●
RM-SHR-4000-H7N-MT4-CB	40.000	329.0	205.0	81.0	8	MT4	●

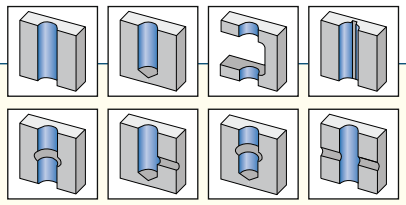
• Available only upon request • -CH: Brazed solid carbide head • -CB: Brazed solid carbide tips • Hole tolerance: H7 manufacturing tolerance according to DIN 1420 • Available grades: IC07 (uncoated), optional: IC907 (TiAlN PVD coated) • For user guide and cutting conditions, see pages E19-23.

SOLIDH-REAM

RM-SR-H7S

Straight Flute Shell Reamers with Brazed Carbide Tips DIN 8054





1:30 conical connection with brazed tips

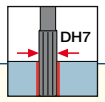
Designation	Dimensions					IC07
	D_r	S	L_3	d_2	Flute	
RM-SR25.000H7S-13	25.000	45.00	30.0	13.00	6	●
RM-SR30.000H7S-13	30.000	45.00	30.0	13.00	6	●
RM-SR32.000H7S-13	32.000	45.00	30.0	13.00	8	●
RM-SR34.000H7S-13	34.000	45.00	30.0	13.00	8	●
RM-SR35.000H7S-13	35.000	45.00	30.0	13.00	8	●
RM-SR36.000H7S-16	36.000	50.00	30.0	16.00	8	●
RM-SR37.000H7S-16	37.000	50.00	30.0	16.00	8	●
RM-SR38.000H7S-16	38.000	50.00	30.0	16.00	8	●
RM-SR40.000H7S-16	40.000	50.00	30.0	16.00	8	●
RM-SR42.000H7S-16	42.000	50.00	30.0	16.00	8	●
RM-SR44.000H7S-16	44.000	50.00	30.0	16.00	8	●
RM-SR45.000H7S-16	45.000	50.00	30.0	16.00	8	●
RM-SR48.000H7S-19	48.000	56.00	30.0	19.00	10	●
RM-SR50.000H7S-19	50.000	56.00	30.0	19.00	10	●
RM-SR55.000H7S-22	55.000	63.00	30.0	22.00	10	●
RM-SR58.000H7S-22	58.000	63.00	30.0	22.00	10	●
RM-SR60.000H7S-22	60.000	63.00	30.0	22.00	10	●
RM-SR70.000H7S-27	70.000	71.00	30.0	27.00	12	●
RM-SR75.000H7S-27	75.000	71.00	30.0	27.00	12	●

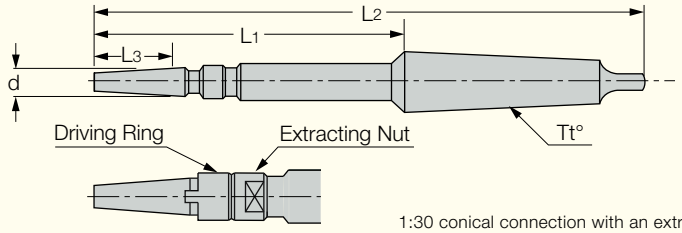
• Available upon request only • Right-hand, H7 manufacturing tolerance according to DIN 1420 • For user guide and cutting conditions, see pages E19-23.

For tools, see: RM-SRH-Q-MT (E18).

RM-SRH-Q-MT

Shell Reamer Shanks, Morse Taper Connection DIN 217





1:30 conical connection with an extraction nut, driving ring and a key.

Designation	d	D min	D max	L2	L1	L3	Tt°
RM-SRH Q13-MT3	13.00	25.00	35.00	250.0	151.0	45.00	MT3
RM-SRH Q16-MT3	16.00	36.00	45.00	261.0	162.0	50.00	MT3
RM-SRH Q19-MT3	19.00	48.00	52.00	298.0	174.0	56.00	MT3
RM-SRH Q19-MT4	19.00	48.00	52.00	273.0	174.0	56.00	MT4
RM-SRH Q22-MT3	22.00	55.00	62.00	312.0	188.0	63.00	MT3
RM-SRH Q22-MT4	22.00	55.00	62.00	287.0	188.0	63.00	MT4
RM-SRH Q27-MT4	27.00	65.00	75.00	359.0	203.0	71.00	MT4
RM-SRH Q27-MT5	27.00	65.00	75.00	327.0	203.0	71.00	MT5

• Available only upon request

For inserts, see: RM-SR-H7S (E17).

Machining Conditions for Solid Carbide Reamers

Material	Tensile strength or Brinell hardness N/mm2 bzw. HB	Reamer diameter mm	Reaming allowance relative to diameter mm	Feed mm/rev	Cutting speed m/min
Steel	up to 1000	up to 10 10-25 25-40	0.04-0.10 0.10-0.25 0.25-0.40	0.15-0.25 0.20-0.35 0.30-0.50	6-20
	1000-1400	up to 10 10-25 25-40	0.04-0.10 0.10-0.25 0.25-0.40	0.12-0.20 0.15-0.30 0.20-0.40	6-15
Cast steel	400-500	up to 10 10-25 25-40	0.05-0.10 0.10-0.25 0.25-0.40	0.15-0.25 0.20-0.40 0.30-0.50	10-20
	500-700	up to 10 10-25 25-40	0.04-0.10 0.10-0.25 0.25-0.40	0.12-0.20 0.15-0.30 0.20-0.40	6-15
Titanium Titanium alloy	500-1300	up to 10 10-25 25-40	0.06-0.12 0.10-0.25 0.25-0.40	0.12-0.20 0.15-0.30 0.20-0.40	6-15
Grey cast iron	up to 220 HB	up to 10 10-25 25-40	0.06-0.12 0.10-0.30 0.30-0.50	0.20-0.30 0.30-0.45 0.40-0.70	10-25
	over 220 HB	up to 10 10-25 25-40	0.06-0.12 0.10-0.30 0.30-0.50	0.15-0.25 0.20-0.35 0.30-0.50	10-20
Spheroidal graphite Cast iron Malleable cast iron		up to 10 10-25 25-40	0.06-0.12 0.10-0.25 0.25-0.40	0.15-0.25 0.20-0.40 0.30-0.60	8-15
Aluminum alloy	over 80 HB	up to 10 10-25 25-40	0.06-0.12 0.10-0.30 0.30-0.50	0.20-0.30 0.30-0.50 0.40-0.70	Si<7% 10-30 Si<7% 30-60
Copper		up to 10 10-25 25-40	0.10-0.20 0.20-0.40 0.40-0.60	0.30-0.60 0.40-0.80 0.50-1.00	20-60
Brass Red bronze Cast bronze		up to 10 10-25 25-40	0.06-0.12 0.10-0.30 0.30-0.50	0.20-0.30 0.30-0.50 0.40-0.70	15-50
Thermoset polymers		up to 10 10-25 25-40	0.10-0.25 0.20-0.40 0.40-0.60	0.30-0.60 0.40-0.80 0.50-1.00	15-30

Reamer Manufacturing Tolerances

Nominal diameter of reamer D_1 in mm		Reamer Manufacturing Tolerances DIN 1420 — Admissible maximum and minimum reamer dimensions of nominal diameter d_1 in µm for drilling tolerance range									
Over	**Up to**	**A9**	**A11**	**B8**	**B9**	**B10**	**B11**	**C8**	**C9**	**C10**	**C11**
1	**3**	+291 +282	+321 +300	+151 +146	+161 +152	+174 +160	+191 +170	+ 71 + 66	+ 81 + 72	+ 94 + 80	+111 + 90
3	**6**	+295 +284	+333 +306	+155 +148	+165 +154	+180 +163	+203 +176	+ 85 + 78	+ 95 + 84	+110 + 93	+133 +106
6	**10**	+310 +297	+356 +324	+168 +160	+180 +167	+199 +178	+226 +194	+ 98 + 90	+110 + 97	+129 +108	+156 +124
10	**18**	+326 +310	+383 +344	+172 +162	+186 +170	+209 +184	+243 +204	+117 +107	+131 +115	+154 +129	+188 +149
18	**30**	+344 +325	+410 +364	+188 +176	+204 +185	+231 +201	+270 +224	+138 +126	+154 +135	+181 +151	+220 +174
30	**40**	+362 +340	+446 +390	+203 +189	+222 +200	+255 +220	+206 +250	+153 +139	+172 +150	+205 +170	+256 +200
40	**50**	+372 +350	+456 +400	+213 +199	+232 +210	+265 +230	+316 +260	+163 +149	+182 +160	+215 +180	+266 +210
50	**65**	+402 +376	+501 +434	+229 +212	+252 +226	+292 +250	+351 +284	+179 +162	+202 +176	+242 +200	+301 +234
65	**80**	+422 +396	+521 +454	+239 +222	+262 +236	+302 +260	+361 +294	+189 +172	+212 +186	+252 +210	+311 +244
80	**100**	+453 +422	+567 +490	+265 +246	+293 +262	+339 +290	+407 +330	+215 +196	+243 +212	+289 +240	+357 +280
100	**120**	+483 +452	+597 +520	+285 +266	+313 +282	+359 +310	+427 +350	+225 +206	+253 +222	+299 +250	+367 +290
120	**140**	+545 +510	+672 +584	+313 +290	+345 +310	+396 +340	+472 +384	+253 +230	+285 +250	+336 +280	+412 +324
140	**160**	+605 +570	+732 +644	+333 +310	+365 +330	+416 +360	+492 +404	+263 +240	+295 +260	+346 +290	+422 +334
160	**180**	+665 +630	+792 +704	+363 +340	+395 +360	+446 +390	+522 +434	+283 +260	+315 +280	+366 +310	+442 +354

Reamer Manufacturing Tolerances

Nominal diameter of reamer D_1 in mm		Reamer Manufacturing Tolerances DIN 1420 — Admissible maximum and minimum reamer dimensions of nominal diameter d_1 in µm for drilling tolerance range												
Over	**Up to**	**D8**	**D9**	**D10**	**D11**	**E7**	**E8**	**E9**	**F6**	**F7**	**F8**	**F9**	**G6**	**G7**
1	**3**	+ 31 + 26	+ 41 + 32	+ 54 + 40	+ 71 + 50	+ 22 + 18	+ 25 + 20	+ 35 + 26	+ 11 + 8	+ 14 + 10	+ 17 + 12	+ 27 + 18	+ 7 + 4	+ 10 + 6
3	**6**	+ 45 + 38	+ 55 + 44	+ 70 + 53	+ 93 + 66	+ 30 + 25	+ 35 + 28	+ 45 + 34	+ 16 + 13	+ 20 + 15	+ 25 + 18	+ 35 + 24	+ 10 + 7	+ 14 + 9
6	**10**	+ 58 + 50	+ 70 + 57	+ 89 + 68	+116 + 84	+ 37 + 31	+ 43 + 35	+ 55 + 42	+ 20 + 16	+ 25 + 19	+ 31 + 23	+ 43 + 30	+ 12 + 8	+ 17 + 11
10	**18**	+ 72 + 62	+ 86 + 70	+109 + 84	+143 +104	+ 47 + 40	+ 54 + 44	+ 68 + 52	+ 25 + 21	+ 31 + 24	+ 38 + 28	+ 52 + 36	+ 15 + 11	+ 21 + 14
18	**30**	+ 93 + 81	+109 + 90	+136 +106	+175 +129	+ 57 + 49	+ 68 + 56	+ 84 + 65	+ 31 + 26	+ 37 + 29	+ 48 + 36	+ 64 + 45	+ 18 + 13	+ 24 + 16
30	**50**	+113 + 99	+132 +110	+165 +130	+216 +160	+ 71 + 62	+ 83 + 69	+ 102 + 80	+ 38 + 32	+ 46 + 37	+ 58 + 44	+ 77 + 55	+ 22 + 16	+ 30 + 21
50	**80**	+139 +122	+162 +136	+202 +160	+261 +194	+ 5 + 74	+ 99 + 82	+122 + 96	+ 46 + 39	+ 55 + 44	+ 69 + 52	+ 92 + 66	+ 26 + 19	+ 35 + 24
80	**120**	+165 +146	+193 +162	+239 +190	+307 +230	+101 + 88	+117 + 98	+145 +114	+ 54 + 46	+ 65 + 52	+ 81 + 62	+109 + 78	+ 30 + 22	+ 41 + 28
120	**180**	+198 +175	+230 +195	+281 +225	+357 +269	+119 +105	+138 +115	+170 +135	+ 64 + 55	+ 77 + 63	+ 96 + 73	+ 128 + 93	+ 35 + 26	+ 48 + 34

Reamer Manufacturing Tolerances (continued)

Nominal diameter of reamer D_1 in mm		Reamer Manufacturing Tolerances DIN 1420											
		Admissible maximum and minimum reamer dimensions of nominal diameter d_1 in µm for drilling tolerance range											
Over	**Up to**	**R6**	**R7**	**S6**	**S7**	**T6**	**U6**	**U7**	**U10**	**X10**	**X11**	**Z10**	**Z11**
1	**3**	-11 -14	-12 -16	-15 -18	-16 -20	-19 -22	-19 -22	-20 -24	-24 -38	-26 -40	-29 -50	-32 -46	-35 -56
3	**6**	-14 -17	-13 -18	-18 -21	-17 -22	-22 -25	-22 -25	-21 -26	-31 -48	-36 -53	-40 -67	-43 -60	-47 -56
6	**10**	-18 -22	-16 -22	-22 -26	-20 -26	-27 -31	-27 -31	-25 -31	-37 -58	-43 -64	-48 -80	-51 -72	-47 -74
10	**14**	-22 -26	-19 -26	-27 -31	-24 -31	-32 -36	-32 -36	-29 -36	-44 -69	-51 -76	-57 -96	-61 -86	-56 -88
14	**18**	-22 -26	-19 -26	-27 -31	-24 -31	-32 -36	-32 -36	-29 -36	-44 -69	- 56 - 81	-62 -101	-71 -96	-67 -106
18	**24**	-26 -31	-24 -32	-33 -38	-31 -39	-39 -44	-39 -44	-37 -45	-54 -84	- 67 - 97	-74 -120	-86 -116	-77 -116
24	**30**	-26 -31	-24 -32	-33 -38	-31 -39	-39 -44	-46 -51	-44 -52	-61 -69	- 77 -107	-84 -130	-101 -131	-108 -154
30	**40**	-32 -38	-29 -38	-41 -47	-38 -47	-46 -52	-58 -64	-55 -64	-75 -110	- 95 -130	-104 -160	-127 -162	-136 -192
40	**50**	-32 -38	-29 -38	-41 -47	-38 -47	-52 -58	-68 -74	-65 -74	-85 -120	-112 -147	-121 -177	-151 -186	-160 -216
50	**65**	-38 -45	-35 -46	-50 -57	-47 -58	-63 -70	-84 -91	-81 -92	-105 -147	-140 -182	-151 -218	-190 -232	-201 -268
65	**80**	-40 -47	-37 -48	-56 -63	-53 -64	-72 -79	-99 -106	-96 -107	-120 -162	-164 -206	-175 -242	-228 -170	-239 -306
80	**100**	-48 -56	-44 -57	-68 -76	-64 -77	-88 -96	-121 -129	-117 -130	-145 -194	-199 -248	-211 -288	-179 -328	-291 -368
100	**120**	-51 -59	-47 -60	-76 -84	-72 -85	-101 -109	-141 -149	-139 -150	-165 -214	-231 -280	-243 -320	-331 -380	-343 -420
120	**140**	-60 -69	-54 -68	-89 -98	-83 -97	-119 -128	-167 -176	-161 -175	-194 -250	-272 -328	-286 -374	-389 -445	-403 -491
140	**160**	-62 -71	-56 -70	-97 -106	-91 -105	-131 -140	-187 -196	-181 -195	-214 -270	-304 -360	-318 -406	-439 -495	-453 -541

Reamer Manufacturing Tolerances (continued)

Nominal diameter of reamer D_1 in mm		Reamer Manufacturing Tolerances DIN 1420													
		Admissible maximum and minimum reamer dimensions of nominal diameter d_1 in µm for drilling tolerance range													
Over	Up to	H6	H7	H8	H9	H10	H11	H12	J6	J7	J8	JS6	JS7	JS8	JS9
1	3	+5 +2	+8 +4	+11 +6	+21 +12	+34 +20	+51 +30	+85 +50	+1 -2	+2 -2	+3 -2	+2 -1	+3 -1	+4 -1	+8 -1
3	6	+6 +3	+10 +5	+15 +8	+25 +14	+40 +23	+63 +30	+102 +60	+3 0	+4 -1	+7 0	+2 -1	+4 -1	+6 -1	+10 -1
6	10	+7 +3	+12 +6	+18 +10	+30 +17	+49 +28	+76 +44	+127 +74	+3 -1	+5 -1	+8 0	+3 -1	+5 -1	+7 -1	+12 -1
10	16	+9 +5	+15 +8	+22 +12	+36 +20	+59 +34	+93 +54	+153 +90	+4 0	+7 0	+10 0	+3 -1	+6 -1	+9 -1	+15 -1
18	30	+11 +6	+17 +9	+28 +16	+44 +25	+71 +41	+110 +64	+178 +104	+6 +1	+8 0	+15 +3	+4 -1	+7 -1	+11 -1	+18 -1
30	50	+13 +7	+21 +12	+33 +19	+52 +30	+85 +50	+136 +80	+212 +124	+7 +1	+10 +1	+18 +4	+5 -1	+8 -1	+13 -1	+21 -1
50	80	+16 +9	+25 +14	+39 +22	+62 +36	+102 +60	+161 +94	+255 +150	+10 +3	+13 +2	+21 +4	+6 -1	+10 -1	+16 -1	+25 -1
90	120	+18 +10	+29 +16	+45 +26	+73 +42	+119 +70	+187 +110	+297 +174	+12 +4	+16 +3	+25 +6	+7 -1	+12 -1	+18 -1	+30 -1
120	180	+21 +12	+34 +20	+53 +30	+85 +50	+136 +80	+212 +124	+360 +200	+14 +5	+20 +6	+31 +8	+8 -1	+16 0	+72 -1	+35 0

Nominal diameter of reamer D_1 in mm		Reamer Manufacturing Tolerances DIN 1420													
		Admissible maximum and minimum reamer dimensions of nominal diameter d_1 in µm for drilling tolerance range													
Over	Up to	K6	K7	K8	M6	M7	M8	N6	N7	N8	N9	N10	N11	P6	P7
1	3	-1 -4	-2 -6	-3 -8	-3 -6	-4 -8	-5 -10	-5 -8	-6 -10	-7 -12	-8 -17	-10 -24	-13 -34	-7 -10	-8 -12
3	6	0 -3	+1 -4	+2 -5	-3 -6	-2 -7	-1 -8	-7 -10	-6 -11	-5 -12	-5 -16	-8 -25	-12 -39	-11 -14	-10 -15
6	10	0 -4	+2 -4	+2 -6	-5 -9	-3 -9	-3 -11	-9 -13	-7 -13	-7 -15	-6 -19	-9 -30	-14 -46	-14 -18	-12 -18
10	18	0 -4	+3 -4	+3 -7	-6 -10	-3 -10	-3 -13	-11 -15	-8 -15	-8 -18	-7 -23	-11 -36	-17 -56	-17 -21	-14 -21
18	30	0 -5	+2 -6	+5 -7	-6 -11	-4 -12	-1 -13	-13 -18	-11 -19	-8 -20	-8 -27	-13 -43	-20 -66	-20 -25	-18 -26
30	50	0 -6	+3 -6	+6 -8	-7 -13	-4 -13	-1 -15	-15 -21	-12 -21	-9 -23	-10 -32	-15 -50	-24 -80	-24 -30	-21 -30
50	80	+1 -6	+4 -7	+7 -10	-8 -15	-5 -16	-2 -19	-17 -24	-14 -25	-11 -28	-12 -38	-18 -60	-29 -96	-29 -36	-26 -37
80	120	0 -8	+4 -9	+7 -12	-10 -18	-6 -19	-3 -22	-20 -28	-16 -29	-13 -32	-14 -45	-21 -70	-33 -110	-34 -42	-30 -43
120	180	0 -9	+6 -8	+10 -13	-12 -21	-6 -20	-2 -25	-24 -33	-18 -32	-14 -37	-15 -50	-24 -80	-38 -126	-40 -49	-34 +48

Cutting Speed

The cutting speed has the highest influence on the surface quality of the reamed hole and on the life of the tool. Increasing the cutting speed beyond the optimum will cause increased tool wear due to the increased cutting temperature.
The increased speed also causes an increase in the built-up edge (material that is welded to the cutting edge). The built-up edge damages the surface finish and shortens the life of the tool. In order to achieve high surface quality and longer tool life, the cutting speed for reaming should be kept relatively low.

Feed Rate

The feed rate directly influences the wear on the cutting edge. As the feed rate is increased, the cutting forces increase almost proportionally. The feed, however, has less influence on the machined surface quality and tool wear than the cutting speed (i.e. the feed can be varied in a relatively wide range without having a material influence on the quality of the machined hole and the respective tool life). It is therefore recommended to select the highest possible feed in order to shorten reaming times without significantly reducing the tool life.

Reaming Allowance

The reaming allowance (the amount of material to be reamed) also influences the tool life. In order to achieve high tool life, the reaming allowance should be kept to a reasonable minimum considering the process to be performed. If the reaming allowance is too small, it may result in a high dimensional variation (inability to maintain the required tolerances) and a decrease in the machined surface quality.
When reaming materials that have surface defects or have been welded or flame cut, the reaming allowance should be increased so these factors do not appear in the reamed surface.

Coolant/Lubrication

The high degree of friction between the tool and the wall being reamed demands the use of a fluid for lubrication and cooling. Using lubrication is more critical for maintaining tolerances than using a coolant. General cutting oils and emulsions may be used. It should be noted that in some cases emulsions will yield a better surface finish than cutting oils. Emulsions are thinner fluids that are able to reach and more uniformly lubricate the cutting edges better than viscous cutting oils (especially when performing deep applications).
In order to determine the most suitable lubricant for a particular application, tests should be run on the material to be cut, on a case-to-case basis.

Reaming Prerequisites

In order to achieve high tolerances for reaming applications, there are certain requirements that must be considered.

a) Condition of the tool
If the tool is reground, both an exact concentricity and high quality grinding are indispensable.

b) Workpiece material
Axis shifting and warping
(i.e. incorrect hole positioning) can only be corrected to a certain degree with reaming. A critical factor is the initial opening in the workpiece.
This opening must be even, or if the prepared hole is countersunk, a cone countersink must be used.
Failure to properly prepare the initial opening can result in irregular countersinking that leads to the reamer being pushed out of its proper alignment. Ideally, pre-machining should be performed in a chuck to avoid alignment defects.

c) Through holes
For the best results from reaming applications, the holes to be reamed should extend completely through the workpiece material. This allows for easy exit of both the cutting fluid and the reamed material.
Negative flute reamers are advantageous in through hole reaming.

d) Blind holes
Use straight flute reamers for blind holes.

INDEX H-REAM Single Edged Reamers

A high speed reaming system with internal coolant holes. The **INDEXH-REAM** standard line covers reaming applications of 8-32 mm hole diameters.
The indexable cutting insert has two cutting corners with 4 lead angle options and 3 rake angle variations, covering most workpiece material types.
The **INDEXH-REAM** single indexable insert with carbide pads provides a combination of economical and highest precision results on a very wide range of materials.

Tool Designation Code Key

RM	SET	12.000[1]	H6	T	B	C16	S
Reamer	Single Edge Tool	Hole Diameter	Hole Tolerance				

Hole Type

B	Blind
T	Through

Lead Type [2]

A, B, C, D
(see page E29)

Shank Type

C	Cylindrical
W	Weldon
F	Flat

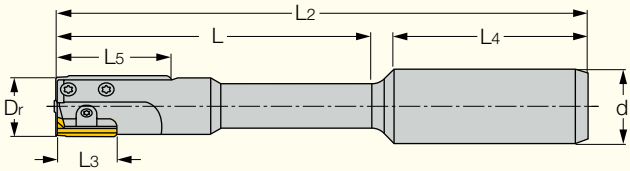
Reamer Length S-Short

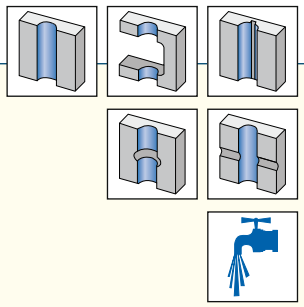
[1] To be ordered for each specific diameter and tolerance.
[2] Tool lead type - according to insert's lead type

INDEXH-REAM

RM-SET-T-B

Single-Edged Indexable Reamers for Through Holes



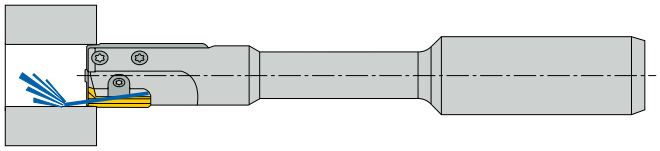


Designation	D_r	L_3	L_5(1)	L	L_4	L_2	d	Po. Size(2)
RM-SET8.000H6T-B-C16S	8.000	15.5	30.00	78.5	45.0	123.50	16.00	1.0
RM-SET9.000H6T-B-C16S	9.000	15.5	30.00	78.5	45.0	123.50	16.00	1.0
RM-SET10.000H6T-B-C16S	10.000	15.5	30.00	78.5	45.0	123.50	16.00	2.0
RM-SET11.000H6T-B-C16S	11.000	15.5	30.00	78.5	45.0	123.50	16.00	2.0
RM-SET12.000H6T-B-C16S	12.000	17.0	30.00	85.0	45.0	135.00	16.00	3.0
RM-SET13.000H6T-B-C16S	13.000	17.0	30.00	85.0	45.0	135.00	16.00	3.0
RM-SET14.000H6T-B-C16S	14.000	17.0	30.00	85.0	45.0	135.00	16.00	3.0
RM-SET15.000H6T-B-C16S	15.000	17.0	30.00	85.0	45.0	135.00	16.00	3.0
RM-SET16.000H6T-B-C20S	16.000	17.0	30.00	110.0	50.0	165.00	20.00	3.0
RM-SET17.000H6T-B-C20S	17.000	17.0	30.00	110.0	50.0	165.00	20.00	3.0
RM-SET18.000H6T-B-C20S	18.000	17.0	30.00	110.0	50.0	165.00	20.00	3.0
RM-SET19.000H6T-B-C20S	19.000	17.0	30.00	110.0	50.0	165.00	20.00	3.0
RM-SET20.000H6T-B-C25S	20.000	17.0	30.00	110.0	56.0	171.00	25.00	3.0
RM-SET21.000H6T-B-C25S	21.000	17.0	30.00	110.0	56.0	171.00	25.00	3.0
RM-SET22.000H6T-B-C25S	22.000	17.0	30.00	130.0	56.0	191.00	25.00	3.0
RM-SET23.000H6T-B-C25S	23.000	17.0	30.00	130.0	56.0	191.00	25.00	3.0
RM-SET24.000H6T-B-C25S	24.000	17.0	30.00	130.0	56.0	191.00	25.00	3.0
RM-SET25.000H6T-B-C25S	25.000	17.0	30.00	130.0	56.0	191.00	25.00	3.0
RM-SET26.000H6T-B-C25S	26.000	22.5	30.00	160.0	56.0	221.00	25.00	4.0
RM-SET27.000H6T-B-C25S	27.000	22.5	30.00	160.0	56.0	221.00	25.00	4.0
RM-SET28.000H6T-B-C25S	28.000	22.5	30.00	160.0	56.0	221.00	25.00	4.0
RM-SET29.000H6T-B-C25S	29.000	22.5	30.00	160.0	56.0	221.00	25.00	4.0
RM-SET30.000H6T-B-C25S	30.000	22.5	30.00	160.0	56.0	221.00	25.00	4.0
RM-SET31.000H6T-B-C25S	31.000	22.5	30.00	160.0	56.0	221.00	25.00	4.0
RM-SET32.000H6T-B-C25S	32.000	22.5	30.00	160.0	56.0	221.00	25.00	4.0

• For spare parts, see page E26 • For user guide and cutting conditions, see pages E29-40.

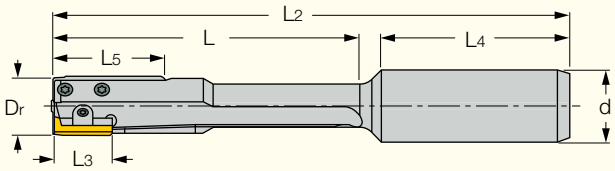
(1) Pad length (2) Insert size

For inserts, see: RM-SEI-A (E27) • RM-SEI-B (E28) • RM-SEI-C (E28).



RM-SET-B-B

Single-Edged Indexable Reamers for Blind Holes

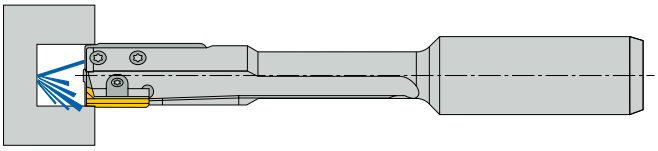


Designation	D_r	L_3	L_2	L_4	L	L_5(1)	d	Po. Size(2)
RM-SET8.000H6B-B-C16S	8.000	15.5	123.5	45.0	78.5	30.00	16.00	1.0
RM-SET9.000H6B-B-C16S	9.000	15.5	123.5	45.0	78.5	30.00	16.00	1.0
RM-SET10.000H6B-B-C16S	10.000	15.5	123.5	45.0	78.5	30.00	16.00	2.0
RM-SET11.000H6B-B-C16S	11.000	15.5	123.5	45.0	78.5	30.00	16.00	2.0
RM-SET12.000H6B-B-C16S	12.000	17.0	135.0	45.0	90.0	30.00	16.00	3.0
RM-SET13.000H6B-B-C16S	13.000	17.0	135.0	45.0	90.0	30.00	16.00	3.0
RM-SET14.000H6B-B-C16S	14.000	17.0	135.0	45.0	90.0	30.00	16.00	3.0
RM-SET15.000H6B-B-C16S	15.000	17.0	135.0	45.0	90.0	30.00	16.00	3.0
RM-SET16.000H6B-B-C20S	16.000	17.0	165.0	50.0	115.0	30.00	20.00	3.0
RM-SET17.000H6B-B-C20S	17.000	17.0	165.0	50.0	115.0	30.00	20.00	3.0
RM-SET18.000H6B-B-C20S	18.000	17.0	165.0	50.0	115.0	30.00	20.00	3.0
RM-SET19.000H6B-B-C20S	19.000	17.0	165.0	50.0	115.0	30.00	20.00	3.0
RM-SET20.000H6B-B-C25S	20.000	17.0	171.0	56.0	115.0	30.00	25.00	3.0
RM-SET21.000H6B-B-C25S	21.000	17.0	171.0	56.0	115.0	30.00	25.00	3.0
RM-SET22.000H6B-B-C25S	22.000	17.0	191.0	56.0	135.0	30.00	25.00	3.0
RM-SET23.000H6B-B-C25S	23.000	17.0	191.0	56.0	135.0	30.00	25.00	3.0
RM-SET24.000H6B-B-C25S	24.000	17.0	191.0	56.0	135.0	30.00	25.00	3.0
RM-SET25.000H6B-B-C25S	25.000	17.0	191.0	56.0	135.0	30.00	25.00	3.0
RM-SET26.000H6B-B-C25S	26.000	22.5	221.0	56.0	165.0	30.00	25.00	4.0
RM-SET27.000H6B-B-C25S	27.000	22.5	221.0	56.0	165.0	30.00	25.00	4.0
RM-SET28.000H6B-B-C25S	28.000	22.5	221.0	56.0	165.0	30.00	25.00	4.0
RM-SET29.000H6B-B-C25S	29.000	22.5	221.0	56.0	165.0	30.00	25.00	4.0
RM-SET30.000H6B-B-C25S	30.000	22.5	221.0	56.0	165.0	30.00	25.00	4.0
RM-SET31.000H6B-B-C25S	31.000	22.5	221.0	56.0	165.0	30.00	25.00	4.0
RM-SET32.000H6B-B-C25S	32.000	22.5	221.0	56.0	165.0	30.00	25.00	4.0

• For user guide and cutting conditions, see pages E29-40.

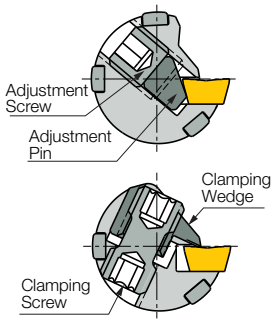
(1) Pad length (2) Insert size

For inserts, see: RM-SEI-A (E27) • RM-SEI-B (E28) • RM-SEI-C (E28).



Spare Parts

D [mm]	Clamping Wedge	Clamping Screw	Adjustment Screw	Adjustment Pin	Insert Size
8	WDG-RM-SE-1	SR-CL-RM-SE-1	SR-ADJ-M3x2.5	PIN-ADJ-RM-SE-1	1
9	WDG-RM-SE-1	SR-CL-RM-SE-1	SR-ADJ-M3x3	PIN-ADJ-RM-SE-1	1
10	WDG-RM-SE-2	SR-CL-RM-SE-1	SR-ADJ-M3x3	PIN-ADJ-RM-SE-2	2
11	WDG-RM-SE-2	SR-CL-RM-SE-1	SR-ADJ-M3x4	PIN-ADJ-RM-SE-2	2
12	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x4	PIN-ADJ-RM-SE-3	3
13	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x4	PIN-ADJ-RM-SE-3	3
14	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x4	PIN-ADJ-RM-SE-3	3
15	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x6	PIN-ADJ-RM-SE-3	3
16	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x6	PIN-ADJ-RM-SE-3	3
17	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x8	PIN-ADJ-RM-SE-3	3
18	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x8	PIN-ADJ-RM-SE-3	3
19	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x8	PIN-ADJ-RM-SE-3	3
20	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x10	PIN-ADJ-RM-SE-3	3
21	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x10	PIN-ADJ-RM-SE-3	3
22	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x10	PIN-ADJ-RM-SE-3	3
23	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x10	PIN-ADJ-RM-SE-3	3
24	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x10	PIN-ADJ-RM-SE-3	3
25	WDG-RM-SE-3	SR-CL-RM-SE-3	SR-ADJ-M4x10	PIN-ADJ-RM-SE-3	3
26	WDG-RM-SE-4	SR-CL-RM-SE-4	SR-ADJ-M4x10	PIN-ADJ-RM-SE-4	4
27	WDG-RM-SE-4	SR-CL-RM-SE-4	SR-ADJ-M4x10	PIN-ADJ-RM-SE-4	4
28	WDG-RM-SE-4	SR-CL-RM-SE-4	SR-ADJ-M4x10	PIN-ADJ-RM-SE-4	4
29	WDG-RM-SE-4	SR-CL-RM-SE-4	SR-ADJ-M4x10	PIN-ADJ-RM-SE-4	4
30	WDG-RM-SE-4	SR-CL-RM-SE-4	SR-ADJ-M4x10	PIN-ADJ-RM-SE-4	4
31	WDG-RM-SE-4	SR-CL-RM-SE-4	SR-ADJ-M4x10	PIN-ADJ-RM-SE-4	4
32	WDG-RM-SE-4	SR-CL-RM-SE-4	SR-ADJ-M4x10	PIN-ADJ-RM-SE-4	4



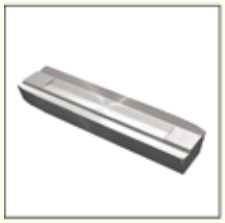
INDEXH-REAM

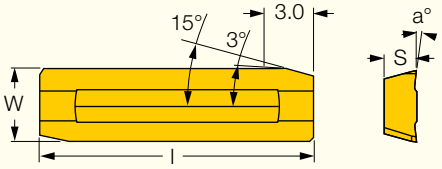
Insert Designation Code Key

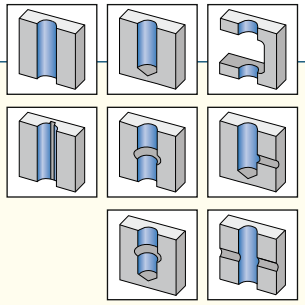
RM	SEI	4	B	12	IC907
Reamer	Single Edge Insert	Insert Size	Lead Type A, B, C, D (see next page)	Rake Angle	Carbide Grade

RM-SEI-A

Single-Edged Reaming Inserts for High Surface Quality at Low Cutting Conditions







Designation	Dimensions					Tough ↔ Hard	
	Po. Size[1]	a°	l	W	S	IC507	IC907
RM-SEI-1A-06	1.0	6	15.50	2.80	1.50	●	
RM-SEI-2A-06	2.0	6	15.50	3.60	1.50	●	
RM-SEI-3A-06	3.0	6	15.50	4.40	2.00	●	
RM-SEI-3A-12	3.0	12	17.00	4.40	2.00		●
RM-SEI-4A-06	4.0	6	22.50	6.60	3.00	●	

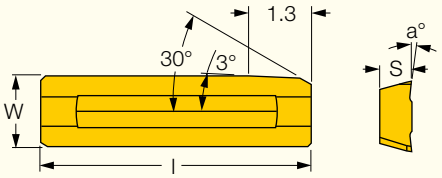
• Lead type of insert should be compatible with lead type of the tool

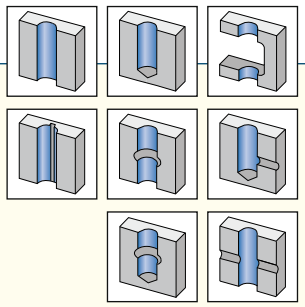
[1] Insert size

For tools, see: RM-SET-B-B (E26) • RM-SET-T-B (E25).

RM-SEI-B

Single-Edged Reaming Inserts for General Applications at High Cutting Speeds





Designation	Dimensions					Tough ↔ Hard			
	Po. Size(1)	a°	l	W	S	IC07	IC507	IC907	IC20N
RM-SEI-1B-00	1.0	0	15.50	2.80	1.50			●	
RM-SEI-1B-06	1.0	6	15.50	2.80	1.50		●	●	●
RM-SEI-1B-12	1.0	12	15.50	2.80	1.50	●		●	
RM-SEI-2B-00	2.0	0	15.50	3.60	1.50			●	
RM-SEI-2B-06	2.0	0	15.50	3.60	1.50		●	●	●
RM-SEI-2B-12	2.0	12	15.50	3.60	1.50	●		●	
RM-SEI-3B-00	3.0	0	17.00	4.40	2.00			●	
RM-SEI-3B-06	3.0	6	17.00	4.40	2.00		●	●	●
RM-SEI-3B-12	3.0	12	17.00	4.40	2.00	●		●	
RM-SEI-4B-00	4.0	0	22.50	6.60	3.00			●	
RM-SEI-4B-06	4.0	6	22.50	6.60	3.00		●	●	●
RM-SEI-4B-12	4.0	12	22.50	6.60	3.00	●		●	

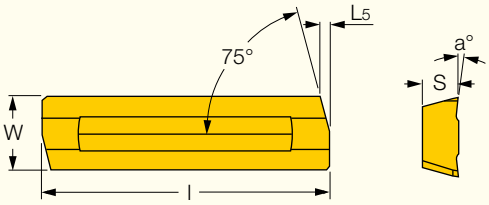
• Lead type of insert should be compatible with lead type of the tool

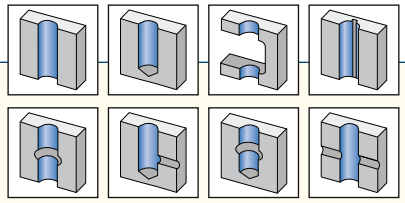
(1) Insert size

For tools, see: RM-SET-B-B (E26) • RM-SET-T-B (E25).

RM-SEI-C

Single-Edged Reaming Inserts, for Aluminum and Brass





Designation	Dimensions						
	Po. Size(1)	a°	l	W	S	L_5	IC07
RM-SEI-1C-12	1.0	12	15.50	2.80	1.50	0.55	●
RM-SEI-2C-12	2.0	12	15.50	3.60	1.50	0.55	●
RM-SEI-3C-12	3.0	12	17.00	4.40	2.00	0.55	●
RM-SEI-4C-12	4.0	12	22.50	6.60	3.00	0.55	●

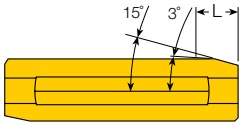
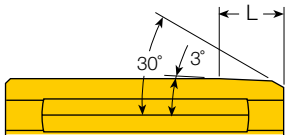
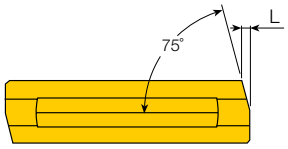
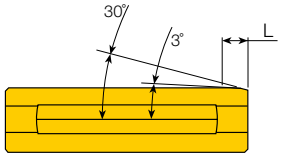
• Lead type of insert should be compatible with lead type of the tool

(1) Insert size

For tools, see: RM-SET-B-B (E26) • RM-SET-T-B (E25).

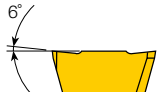
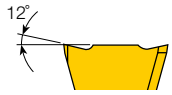
Front Angles and Cutting Geometries

4 standard lead angles are available:

Lead	L [mm]		Use
A	3		Higher surface quality, lower cutting conditions (Not recommended for nonferrous materials)
B	1.3		Universal use, high speed cutting conditions Can be used on wide range of materials
C	0.55		Suitable for aluminum and brass, high cutting speed
D(1)	0.6		When needed for blind hole - lower feed

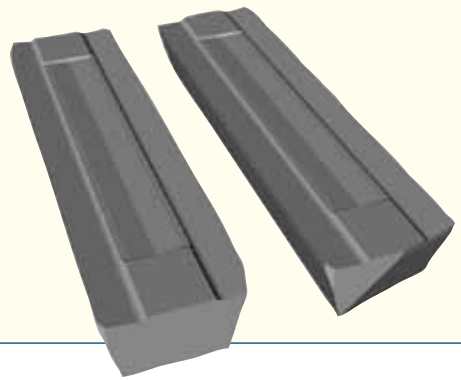
(1) On request

3 standard cutting angles are available:

	Angle [deg.]	Use
00		For cast iron applications
06		General use
12		For stainless steel and aluminum

Carbide Grades

IC07 grade is the basic substrate for the reaming inserts. It is a very versatile submicron grade.
IC07 features very high fracture toughness and wear resistance, which are required for efficient high speed reaming.
An uncoated IC07 can be used for machining nonferrous (N type material group) applications.



In the first stage, two types of standard coatings will be available:

- IC907 – a TiAlN PVD coating for steel (P) and stainless steel (M) workpiece material groups
- IC507 - a TiCN+TiN PVD coating for cast iron (K) workpiece material group
- We will consider more grade options according to market feedback and specific requests

The following grades can be provided on request:

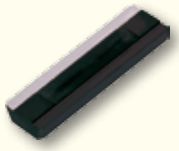
- PCD grade for machining aluminum
- PCBN grade for machining cast iron
- IC30N (cermet) for machining steel

Concept

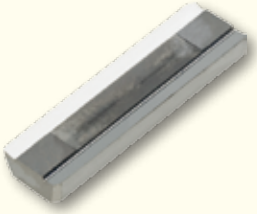
The Index H-Ream Line is Available in 4 Sizes

There are two different holder geometries (short flute and long flute).
Holder selection depends on the hole type (through or blind).

Insert **Holder**



RM-SEI-1
Ø8.00-9.99 mm
(Ø.315-.393")

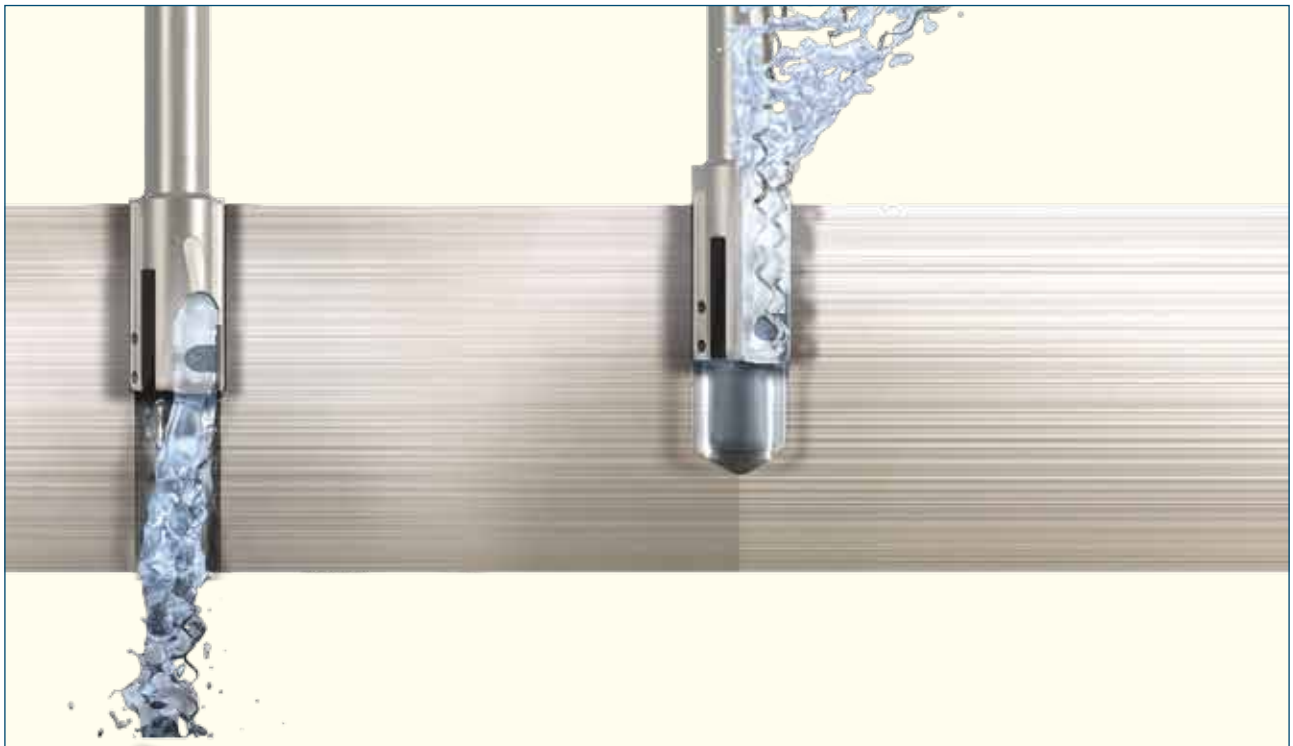


RM-SEI-2
Ø10.00-11.99 mm
(Ø.393-.472")

RM-SEI-3
Ø12.00-25.99 mm
(Ø.472-1.024")

RM-SEI-4
Ø26.00-32.00 mm
(Ø1.024-1.260")

Applications

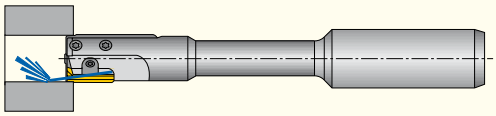


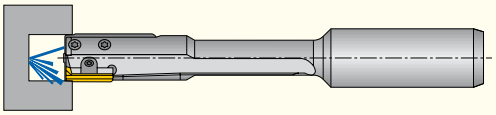
Through Hole

Short Flute Holder
This holder has a lateral coolant outlet located right above the insert. The coolant is pointed directly to the cutting edge in order to lubricate it and divert the chips forward.
Additional coolant outlets are located behind the guiding pads. Their purpose is to reduce the high friction which is created between the pads and the reamed surface during machining.

Blind Hole

Long Flute Holder
This holder has a frontal coolant outlet. The liquid reaches the bottom of the blind hole and evacuates the formed chips. These chips are conveyed backwards through the long chip gullet (flute) of the holder.





Setting Procedure

1

Place the reamer between the centering pins of the device.

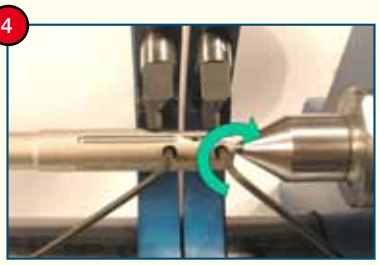
2

Use the pad as a reference for setting the indicator to zero.

3

Rotate and place the inserts against indicators.

4



Tighten the adjustment screws in a clockwise direction.

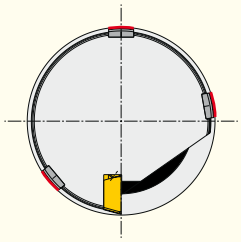
4

5 Adjust the frontal side of the insert to +15/20 µm. (+0.6/+0.75 µin)

6 Adjust the rear side of insert to +5/+10 µm (+0.2/+0.4 µin).

Back Taper
The back taper prevents the reamer from jamming, as well as lowering reaming forces and improving surface quality. Incorrect back taper may cause instable reaming, accelerated wear and rough surface finish.

High Friction Lubricated Zones

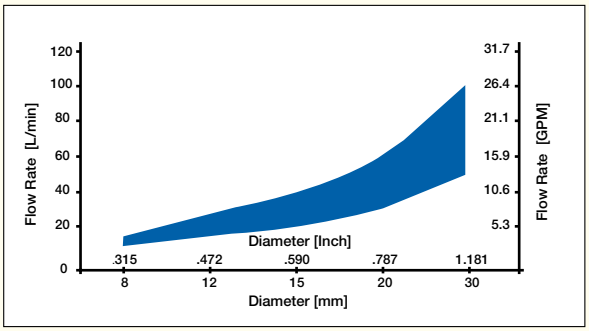


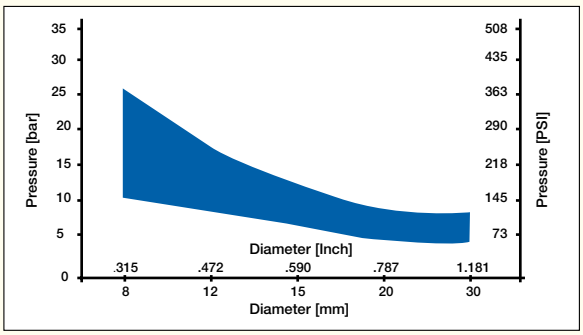
Coolant

In order to gain maximum tool life and hole quality, high capacity and pressure of internal coolant is required.
The coolant has three main functions during the machining process:
To reduce wear of the cutting edge, in order to achieve longer tool life.

To maintain good chip evacuation, in order to prevent damage to the surface quality.
Good lubrication, to maintain size and surface quality of the finished hole.

The high friction between the guide pads and the hole surface requires an adequate coolant film to lubricate the pads.
It is recommended to increase the coolant concentration to a 10-12% mixture.
Recommended pressure and lubricant capacity can be seen in the charts below.





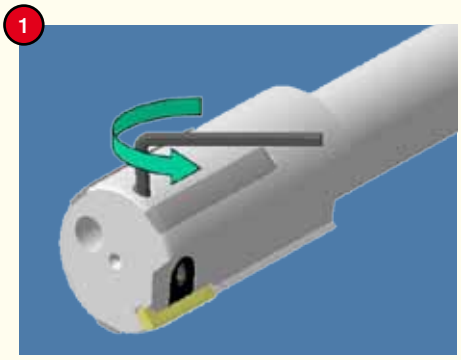
Hole Preparation

The recommended pre-hole diameter depends on several parameters such as workpiece material, coolant, application, required surface quality, etc. Our recommended starting guideline is specified in the cutting data table.
The pre-reaming hole diameter may change according to the specific machining results.
Prior to the reaming operation, it is recommended to produce a chamfer around the hole in order to help the reamer maintain an accurate central position, obtain better surface finish during penetration and improve tool life. In addition, it is recommended to perform the drilling and the reaming operation while the workpiece is clamped in the same position.

If the workpiece has been removed after drilling and then clamped again for reaming, misalignment between the reamer and the hole center lines may occur. Therefore, it is recommended to leave a larger allowance for reaming.
In cases when an extremely precise and high surface hole quality is required, a semi-finish operation such as core drill is used prior to the reaming operation.

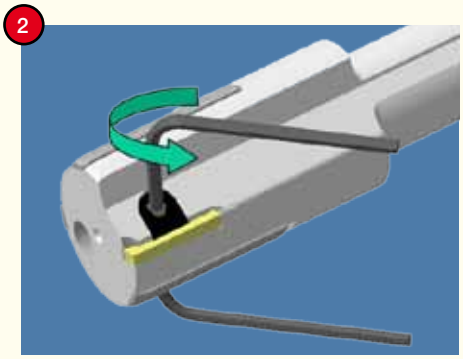
Insert Indexing

1



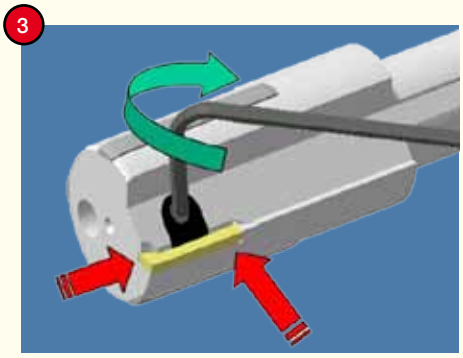
Rotate the adjustment screws one turn counterclockwise (CCW).

2



Rotate the clamping screw CCW from the top and/ or clockwise (CW) from the bottom, turning both sides simultaneously.

3



Remove the insert. Clean the insert and the pocket.
Place the sharp edge on the outer position.
Press the insert against the back stopper and the two adjustment pins.
Tighten the clamping wedge by rotating the clamping screw CW from the top or CCW from the bottom.

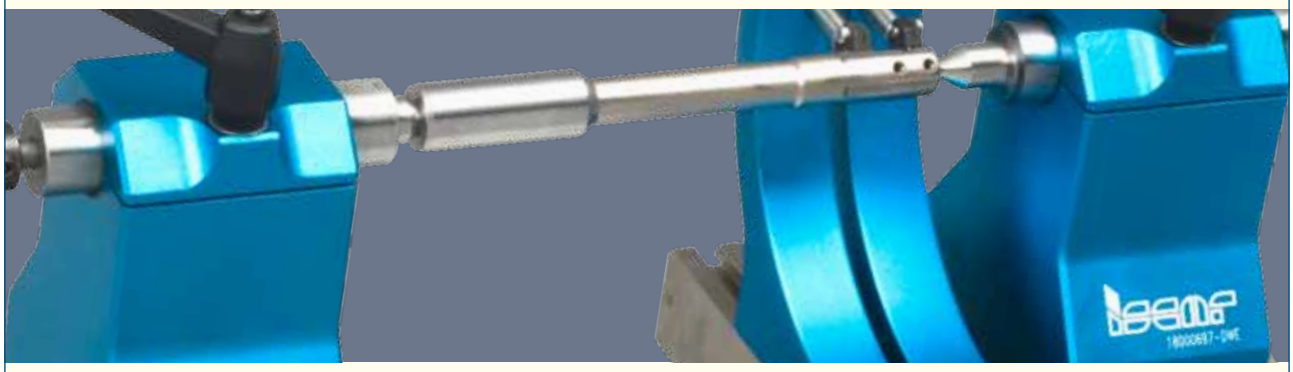
Setting Methods

There are two optional setting methods - comparison micrometer and setting device.

Comparison micrometer with dial gauge, although a low cost solution and readily available for small workshops, is prone to damage the cutting edge and therefore not recommended.

Using a Comparison Micrometer

Set the micrometer to the correct diameter using the precision blocks.
Adjust the frontal diameter and back taper by turning the adjustment screw clockwise.
The frontal diameter should be larger than the rear diameter by approximately 0.015 mm.
(0.6 µin)



Using a Setting Device

ISCAR is offering a mechanical setting device, which enables easy, quick and accurate adjustment.
Due to its modular construction, it can be used for standard as well as for special and more complicated reamer adjustments.

Setting Device, Located Between Centers

- Shorter setting time
- Modular system
- Higher accuracy
- No risk of damaging the cutting edge

H-REAM Cutting Conditions

The cutting conditions in the table below should be used to start a new application. Optimal conditions for a specific application should be evaluated by examining the results and changing the machining conditions accordingly.

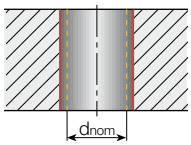
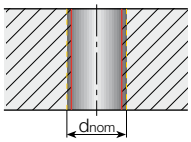
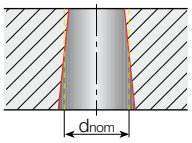
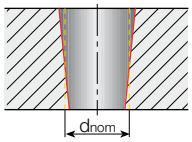
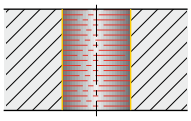
		Lead A=15°/3° L3 (reaming allowance = 0.1-0.3)						
		Feed [mm/rev]	Rake [°]	Cutting Speed Vc[m/min]				
Material No.	Material			Carbide	Coated Carbide	Cermet	PCD	CBN
1	Non-alloy steel, cast steel and free cutting steel	0.1-0.4	6	40-60	60-80	110-160		
2	Low alloy steel and cast steel (less than 5% of alloying elements)	0.1-0.4	6	20-40	40-60	110-160		
3	High alloyed steel, cast steel and tool steel	0.1-0.4	6	20-40	20-60	20-60		
4	Stainless steel and cast steel	0.1-0.3	12	20-40	40-60	40-60		
5	Cast iron nodular (GGG)	0.1-0.3	0 / 6	40-60	60-100			Please ask
6	Grey cast iron (GG)	0.1-0.3	0 / 6	40-60	60-100			
7	Malleable cast iron	0.1-0.3	0 / 6	40-60	60-100			
8	Aluminum wrought alloy						Please ask	
9	Aluminum -cast, alloyed							
10	Copper alloys							
11	Non-metallic							

		Lead B=30°/3° L1.3 (reaming allowance = 0.1-0.3)						
		Feed [mm/rev]	Rake [°]	Cutting Speed Vc[m/min]				
Material No.	Material			Carbide	Coated Carbide	Cermet	PCD	CBN
1	Non-alloy steel, cast steel and free cutting steel	0.1-0.3	6	60-80	80-120	110-160		
2	Low alloy steel and cast steel (less than 5% of alloying elements)	0.1-0.3	6	60-80	80-120	110-160		
3	High alloyed steel, cast steel and tool steel	0.1-0.3	6	40-60	40-80	40-80		
4	Stainless steel and cast steel	0.1-0.2	12	40-60	60-80	60-80		
5	Cast iron nodular (GGG)	0.1-0.3	0 / 6	60-80	80-120			Please ask
6	Grey cast iron (GG)	0.1-0.3	0 / 6	60-80	80-120			
7	Malleable cast iron	0.1-0.3	0 / 6	60-80	80-120			
8	Aluminum wrought alloy	0.1-0.3	12	160-200			Please ask	
9	Aluminum -cast, alloyed	0.1-0.3	12	160-200				
10	Copper alloys	0.1-0.2	0	80-100				
11	Non-metallic	0.1-0.3	0	10-70				

		Lead D=30°/3° L0.6 (reaming allowance = 0.1-0.2)						
		Feed [mm/rev]	Rake [°]	Cutting Speed Vc[m/min]				
Material No.	Material			Carbide	Coated Carbide	Cermet	PCD	CBN
1	Non-alloy steel, cast steel and free cutting steel	0.05-0.2	6	60-80	80-120	110-160		
2	Low alloy steel and cast steel (less than 5% of alloying elements)	0.05-0.2	6	60-80	80-120	110-160		
3	High alloyed steel, cast steel and tool steel	0.05-0.2	6	40-60	40-80	40-80		
4	Stainless steel and cast steel	0.05-0.2	12	40-60	60-80	60-80		
5	Cast iron nodular (GGG)	0.05-0.2	0 / 6	60-80	80-120			Please ask
6	Grey cast iron (GG)	0.05-0.2	0 / 6	60-80	80-120			
7	Malleable cast iron	0.05-0.2	0 / 6	60-80	80-120			
8	Aluminum wrought alloy	0.05-0.2	12	110-200			Please ask	
9	Aluminum -cast, alloyed	0.05-0.2	12	180-200				
10	Copper alloys	0.05-0.2	0	80-100				
11	Non-metallic							

		Lead C=75°/3° L0.55 (reaming allowance = 0.2-0.4)						
		Feed [mm/rev]	Rake [°]	Cutting Speed Vc[m/min]				
Material No.	Material			Carbide	Coated Carbide	Cermet	PCD	CBN
1	Non-alloy steel, cast steel and free cutting steel							
2	Low alloy steel and cast steel (less than 5% of alloying elements)							
3	High alloyed steel, cast steel and tool steel							
4	Stainless steel and cast steel							
5	Cast iron nodular (GGG)							Please ask
6	Grey cast iron (GG)							
7	Malleable cast iron							
8	Aluminum wrought alloy	0.15-0.3	12	150-250			Please ask	
9	Aluminum -cast, alloyed	0.15-0.3	12	150-250				
10	Copper alloys							
11	Non-metallic							

Troubleshooting

Problem	Cause	Solution
Hole too large 	• Reamer or pilot hole not centered • Reamer too large • Cooling / lubrication problems	• Use a floating reamer chuck or correct pilot hole • Check reamer's size and correct if necessary • Change lubricant and increase coolant pressure
Hole too small 	• Worn reamer • Reaming allowance too small • Cooling / lubrication problems	• Replace the reamer • Increase reaming allowance • Change lubricant and increase coolant pressure
Conical hole (larger bottom) 	• Misalignment between pre-hole and reamer centers	• Re-align or use a floating reamer chuck
Conical hole (larger entrance) 	• Misalignment between pre-hole and reamer centers • Material jammed between reamer and hole in the upper hole section	• Re-align or use a floating reamer chuck • Secure the tool axially
Poor surface finish 	• Worn reamer • Misalignment between pre-hole and reamer centers • Problems with chip evacuation • Incorrect cutting parameters • Built-up edge	• Replace the tool • Re-align or use a floating reamer chuck • Increase coolant pressure • Change cutting parameters • Change cutting parameters or coolant conditions

Application Form

Information Needed for the Preparation of ISCAR Reamers

Date: ____ / ____ / ____

Customer:

	Company		Contact Person	
Distributor	Company Name		Name	
	Company Address		Title	
	Telephone		Telephone	
	Fax		Fax	
	Email		Email	

Component:

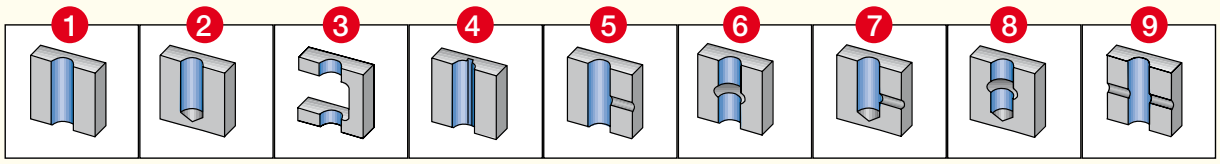
Workpiece Description: _____

Drawing Number: _____

Please add drawings of the workpiece, final product and tool layout.

	Material			
Workpiece	Specification		Hardness	[HRc]
	Heat Treatment		Tensile Strength	[Mpa]
	Bore			
	Diameter	[mm]	Tolerance	[mm]
	Diameter of Pre-reamed Hole	[mm]	Tolerance	[mm]
	Method of Pre-reaming Hole		Depth of Bore	[mm]
	Bore Type	Number (See table below)	Interruption Size/Length	[mm]
	Surface Finish	[Ra]/[Rz]	Circularity	[µm/µinch]

Bore Type



Application Form

Machining Details				
	Machine			
	Manufacturer/ Brand		Type	
	Tool	Rotating/Stationary	Component	Rotating/Stationary
	Machine Condition		Attachment to Spindle (BT, HSK...)	
	Fix Feed	Yes/No [mm/min]	Min-Max Feed	[mm/min]
	Fix Rotation Speed	Yes/No [RPM]	Min-Max RPM	[RPM]
	Circular Runout of Spindle	[µm]	Spindle Position	Vertical/Horizontal
	Adapter			
	Morse Taper	Yes/No	Morse Size	
	Cylindrical Shank	Yes/No	Diameter	Ø [mm]
	Whistle Notch	Yes/No	Weldon	Yes/No
	Type of Adapter (Floating, Adjustable)		Internal Coolant Supply	Yes/No
	Coolant	Yes/No		
	Coolant			
	Brand		Type	
	Mixture Ratio	[%]	Coolant Pressure	[Bar]
	Coolant Capacity	[Liter/min]		

Application Form

Additional Information	Existing Tool (for Running Application)			
	Brand		Type	
	Tool Life	[Holes]	Coolant Pressure	[bar]
	No. of Teeth		Carbide Grade	
	Coating		Holder Type (Shank)	
	Cutting Speed	[m/min]	Feed	[mm/rev]

Notes:

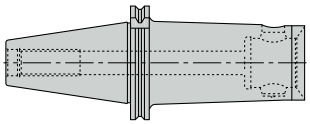
ITSBORE MODULAR BORING SYSTEM

Member IMC Group

The ITSBORE System

Shanks

SKA/SKB **Pages F9-10**



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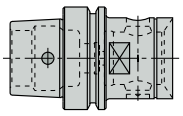
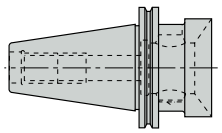
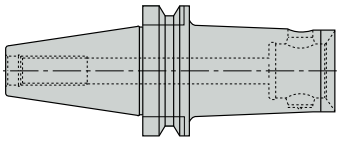


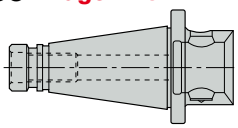
CATM **Page F10**



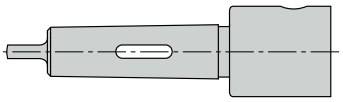
BT/BTB **Page F14-15**



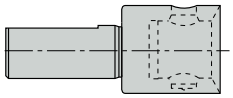
IS0M/ISO **Page F15**



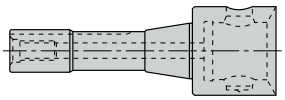
MTT/MTD **Page F17-18**



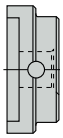
ST **Page F16-17**



R-8 **Page F17**

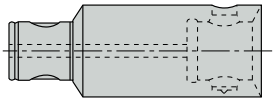


DIN2079 **Page F18**

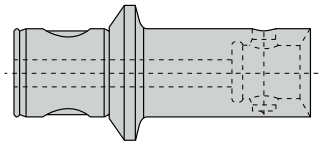


Extensions and Reducers

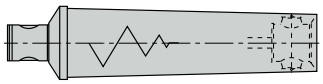
EX **Page F19**



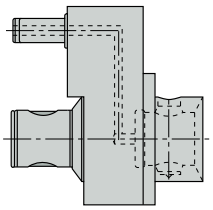
RE **Page F20**



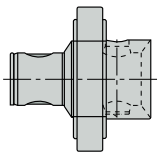
RE AVI **Page F21**



CHS **Page F21**

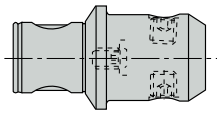


CHR **Page F21**

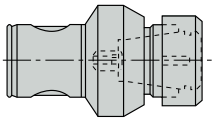


Toolholders

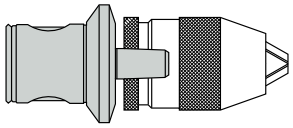
EMH **Page F22**



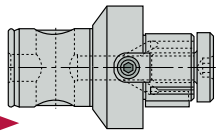
CC **Page F23**



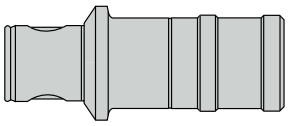
DC **Page F23**



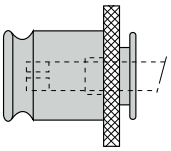
SMH /STUB **Pages F24-25**



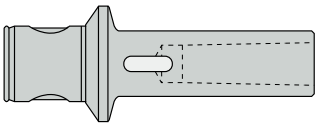
TP **Page F25**



TCS/TCC **Page F26**



AMT **Page F27**



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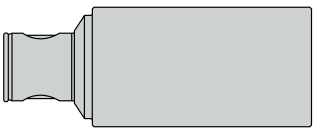
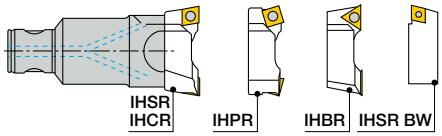


The ITSBORE System

Rough Boring Heads

BHR MB 16, 20, 25, 32, 40, 50, 63, 80

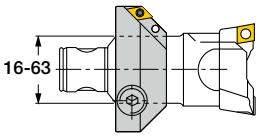
(ø18-200)



Page F29

CHA 16,20,25,32,40,50,63

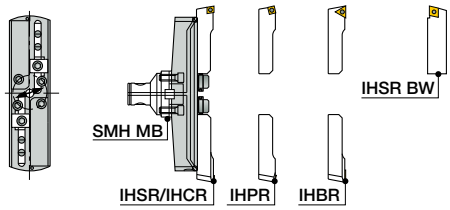
(ø18-125)
45° Chamfering



Page F29

TCH 200, 300, 400

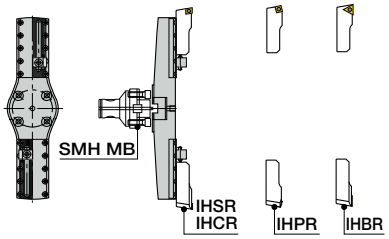
(ø200-500)



Page F30

TCH A.L 500, 600, 700

(ø500-800)

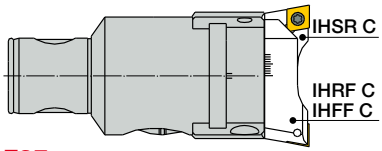


Page F31

Rough & Fine Boring Heads

BHC MB 25, 32, 40, 50, 63, 80

(ø28-125)

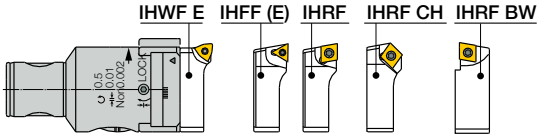


Page F37

Fine Boring Heads (10 µm)

BHE MB 14, 16, 20, 25, 32, 40

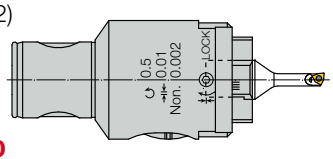
(Ø14.5-66)



Page F40

BHE MB-H 32, 50

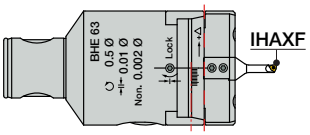
(Ø2.5-22)



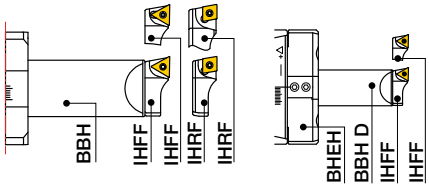
Page F40

BHE MB 50, 63, 80

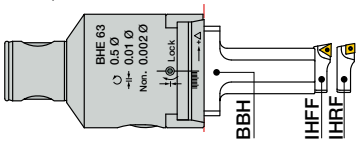
(Ø6-30)



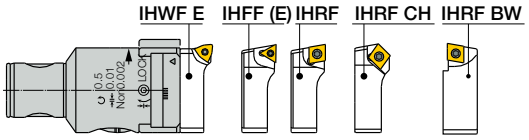
(Ø28-56)



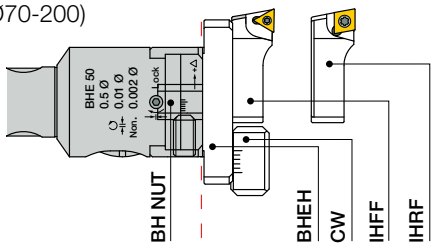
(Ø40-90)



(Ø50-80)



(Ø70-200)



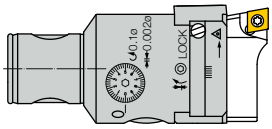
Pages F39, F41-43

The ITSBORE System

Fine Boring Heads (2 µm)

BHF MB 16, 20, 25, 32, 40

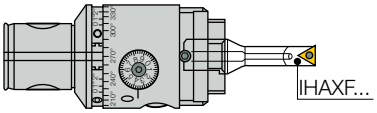
(Ø18-63)



Page F52

BHF MB 50-BL

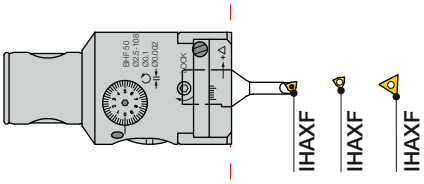
(Ø2.5-20)



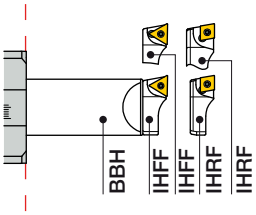
Pages F45, 50

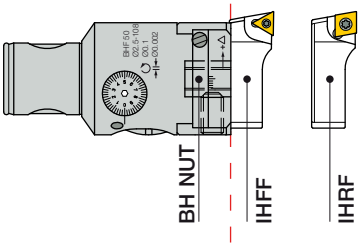
BHF MB 50-50X60

(Ø6-108)
(Ø6-30)

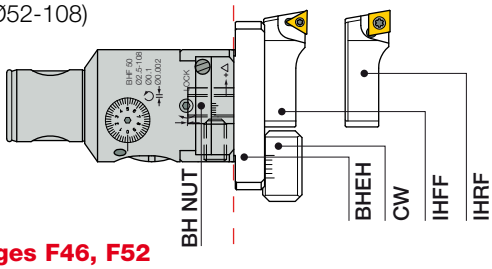


(Ø28-54)





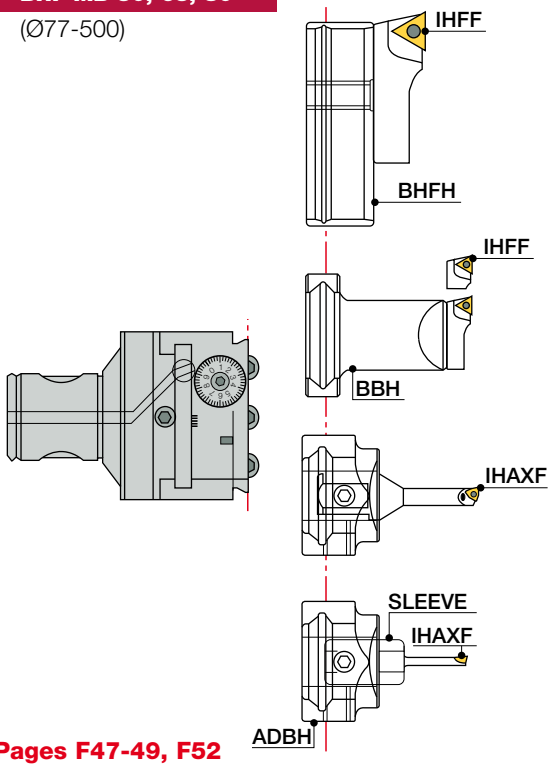
(Ø52-108)



Pages F46, F52

BHF MB 50, 63, 80

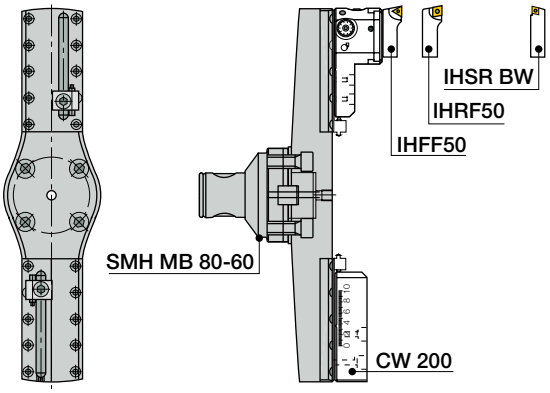
(Ø77-500)



Pages F47-49, F52

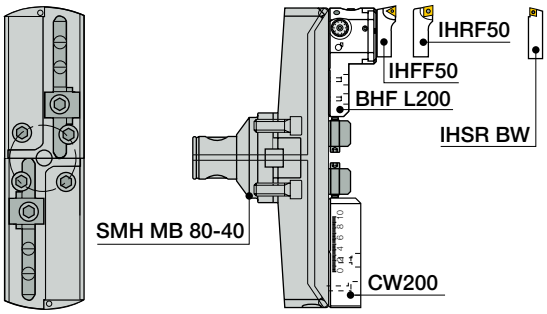
TCH 200, 300, 400

(Ø200-500)



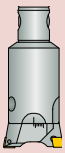
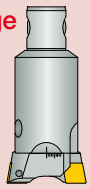
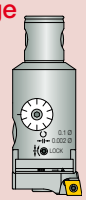
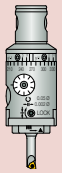
TCH A.L 500, 600, 700

(Ø500-800)



Pages F60-61

ITSBORE Boring Heads Selection Guide

MB Size	14	16	20	25	32	40
BHR-TCH Ø18-800		BHR MB16-16 Ø18-22 Page F29 	BHR MB20-20 Ø22-28 Page F29 	BHR MB25-25 Ø28-38 Page F29 	BHR MB32-32 Ø36-50 Page F29 	BHR MB40-40 Ø50-68 Page F29 
BHC Ø28-120 10 µm				BHC MB25-25 Ø28-36 Page F37 	BHC MB32-32 Ø36-46 Page F37 	BHC MB40-40 Ø46-60 Page F37 
BHE Ø2.5-200 10 µm	BHE MB14-14 Ø14.5-18 Page F40 	BHE MB16-16 Ø18-24 Page F40 	BHE MB20-20 Ø22-30 Page F40 	BHE MB25-25 Ø28-40 Page F40 	BHE MB32-32 Ø35-53 Page F40 	BHE MB40-40 Ø48-66 Page F40 
BHE H Ø2.5-22 10 µm					BHE MB32-32...H Ø2.5-18 Page F40 	
BHF Ø2.5-800 2 µm		BHF MB16-16 Ø18-23 Page F52 	BHF MB20-20 Ø22-29 Page F52 	BHF MB25-25 Ø28-38 Page F52 	BHF MB32-32 Ø36-50 Page F52 	BHF MB40-40 Ø48-63 Page F52 
BHF BL Ø2.5-22 2 µm					BHF MB50-32...BL Ø2.5-12 Page F50 	

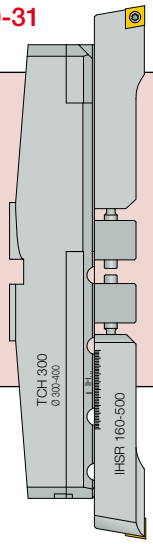
ITSBORE Boring Heads Selection Guide

50	63	80	125
BHR MB50-50 Ø68-90 Page F29	BHR MB50-63 Ø90-120 Page F29	BHR MB80-80 Ø120-200 Page F29	
BHC MB50-50 Ø60-75 Page F37	BHC MB63-63 Ø78-100 Page F37	BHC MB80-80 Ø100-125 Page F37	
BHE MB50-50 Ø6-110 Page F40	BHE MB63-63 Ø6-125 Page F40	BHE MB80-80 Ø6-200 Page F40	
BHE MB50-50...H Ø2.5-22 Page F40			
BHF MB50-50 Ø6-108 Page F52	BHF MB50-63 Ø6-125 Page F52	BHF MB50-80 Ø6-160 Page F52	BHF MB80-125 Ø36-500 Page F52
BHF MB50-50...BL Ø2.5-20 Page F50			

BHR MB63-63

Pages F30-31

Roughing



TCH 200 Ø200-300

TCH 300 Ø300-400

TCH 400 Ø400-500

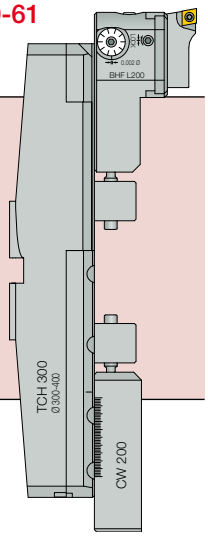
TCH 500 Ø500-600

TCH 600 Ø600-700

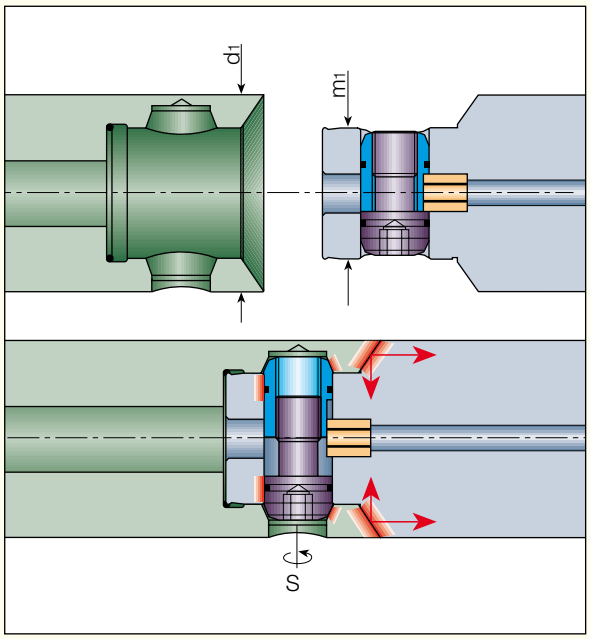
TCH 700 Ø700-800

Pages F60-61

Finishing



MB Connection

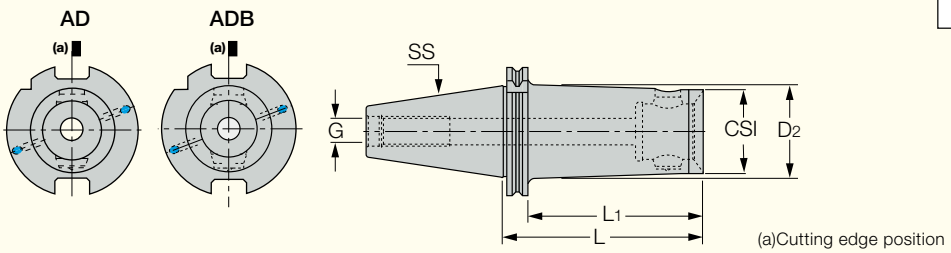


ITSBORE is a modular toolholder system for boring, milling, drilling and tapping.
This rigid, high-precision system is manufactured in one of the world's most advanced design and production facilities. The system is designed with extreme flexibility and simplicity making it suitable for machine tools, machining centers and flexible manufacturing systems.
It is recommended for machining to strict tolerances with a high degree of surface finish.
Its cylindrical-conical coupling and radial-expanding pin ensure maximum rigidity and concentricity in boring and milling.
The system has internal coolant supply in all components.

Designation	d_1	øm_1	Size Allen Key (mm)	⚠ Tightening Torque (Nm)
MB 14	14	10	2.5	2-2.5
MB 16	16	10	2.5	2-2.5
MB 20	20	13	3	4-4.5
MB 25	25	16	3	6.5-7.5
MB 32	32	20	4	7-8
MB 40	40	25	5	16-18
MB 50	50	32	6	30-35
MB 63	63	42	8	80-90
MB 80	80	42	8	80-90
MB 110	110	76	14	250-270

SKA-MB

MB Modular Connection System with DIN69871 Form AD/ADB / ISO 7388/1 Taper Shank

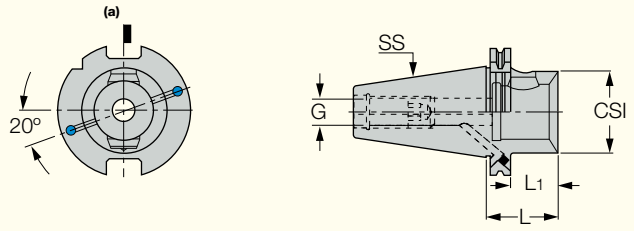


Designation	SS	CSI	L	L_1	D_2	G	Kg
SKA 30-MB32	30	MB32	30.00	10.5	-	M12	0.05
SKA 30-MB50	30	MB50	60.00	41.0	-	M12	0.45
SKA 40-MB40	40	MB40	45.00	26.0	-	M16	0.94
SKA 40-MB40X120 A/B	40	MB40	120.00	101.0	44.50	M16	1.20
SKA 40-MB50	40	MB50	48.00	29.0	-	M16	1.00
SKA 40-MB50X120 A/B	40	MB50	120.00	101.0	-	M16	2.82
SKA 40-MB63	40	MB63	80.00	61.0	-	M16	1.56
SKA 45-MB50	45	MB50	48.00	29.0	-	M20	1.75
SKA 45-MB63	45	MB63	60.00	41.0	-	M20	1.99
SKA 45-MB80	45	MB80	66.00	47.0	-	M20	2.31
SKA 50-MB50	50	MB50	48.00	29.0	-	M24	2.82
SKA 50-MB50X120 A/B	50	MB50	120.00	101.0	60.00	M24	4.03
SKA 50-MB63	50	MB63	56.00	37.0	-	M24	2.96
SKA 50-MB63X150 A/B	50	MB63	150.00	131.0	70.00	M24	5.34
SKA 50-MB80	50	MB80	62.00	43.0	-	M24	3.52
SKA 50-MB80X180 A/B	50	MB80	180.00	161.0	-	M24	7.90
SKA 50-MB110X150	50	MB110	150.00	131.0	-	M24	8.17
SKA 60 MB50X60	60	MB50	50.00	31.0	60.00	M30	0.00
SKA 60 MB63X60	60	MB63	60.00	41.0	71.00	M30	9.79
SKA 60-MB80X65	60	MB80	65.00	46.0	-	M30	10.70
SKA 60-MB110X100	60	MB110	100.00	81.0	-	M30	0.00
SKA 60-MB110X200	60	MB110	200.00	181.0	-	M30	0.00

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability • The coolant passages of holders with A/B suffix are plugged with screws, so it can be used either as SKA or SKB (cooled through).

SKB-MB

MB Modular Connection System with DIN69871 Form B (coolant through flange)
Taper Shank



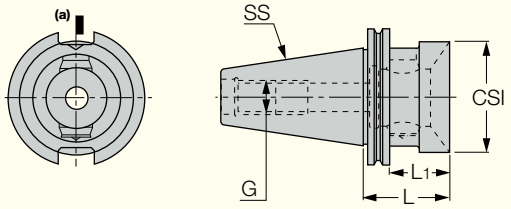
(a)Cutting edge position

Designation	SS	CSI	L_1	L	G	Kg
SKB 40-MB50	40	MB50	29.0	48.00	M16	1.01
SKB 40-MB63	40	MB63	-	80.00	M16	1.57
SKB 45-MB50	45	MB50	29.0	48.00	M20	1.77
SKB 45-MB63	45	MB63	41.0	60.00	M20	2.03
SKB 50-MB50	50	MB50	29.0	48.00	M24	2.80
SKB 50-MB63	50	MB63	37.0	56.00	M24	2.98
SKB 50-MB80	50	MB80	43.0	62.00	M24	3.55

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

CATM-MB

MB Modular Boring System Connections with CATM FORM AD ANSI B5.5 Caterpillar
Tapered Shanks and Metric Pull Stud Threads



(a)Cutting edge position

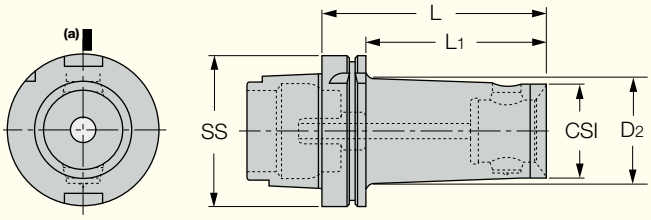
Designation	SS	CSI	L_1	L	G	Kg
CATM 40 MB50	40	MB50	47.0	66.00	M16	1.20
CATM 40 MB63	40	MB63	-	100.00	M16	1.91
CATM 45 MB50	45	MB50	29.0	48.00	M20	1.83
CATM 45 MB63	45	MB63	56.0	75.00	M20	2.30
CATM 45 MB80	45	MB80	-	80.00	M20	2.88
CATM 50 MB50	50	MB50	29.0	48.00	M24	3.06
CATM 50 MB63	50	MB63	37.0	56.00	M24	3.08
CATM 50 MB80	50	MB80	43.0	62.00	M24	3.35

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

HSK A-MB

MB Modular Connection System with DIN 69893 HSK A Taper Shanks



(a)Cutting edge position

Designation	SS	CSI	L_1	L	D_2	Kg
HSK A 40 MB32	40	MB32	28.0	48.00	-	1.05
HSK A 50 MB50	50	MB50	-	66.00	-	0.71
HSK A 63 MB40	63	MB40	34.0	60.00	-	1.00
HSK A 63 MB40X120	63	MB40	94.0	120.00	46.00	1.60
HSK A 63 MB50	63	MB50	40.0	66.00	-	1.04
HSK A 63 MB50X120	63	MB50	94.0	120.00	-	1.05
HSK A 63 MB63	63	MB63	-	75.00	-	1.20
HSK A 80 MB50	80	MB50	44.0	70.00	-	1.61
HSK A 80 MB63	80	MB63	54.0	80.00	-	0.02
HSK A 80 MB80	80	MB80	-	86.00	-	2.54
HSK A 100 MB50	100	MB50	43.0	72.00	-	2.56
HSK A 100 MB50X120	100	MB50	91.0	120.00	60.00	4.85
HSK A 100 MB63	100	MB63	53.0	82.00	-	2.86
HSK A 100 MB63X150	100	MB63	121.0	150.00	70.00	4.72
HSK A 100 MB80	100	MB80	59.0	88.00	-	3.60
HSK A 100 MB80X180	100	MB80	151.0	180.00	-	7.30

• A cooling tube must be used with all coolant through HSK spindles (should be ordered separately) • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

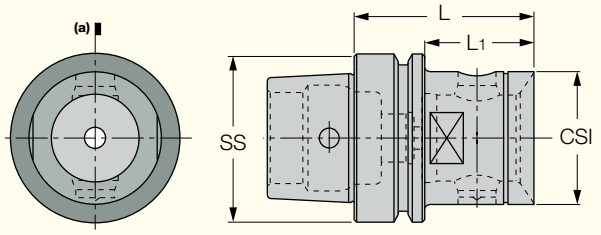
Spare Parts

Designation	Cooling Tube	Wrench
HSK A 40 MB32	COOLING TUBE HSK A 40*	WRENCH COOL TUBE HSK 40*
HSK A 50 MB50	COOLING TUBE HSK A 50*	WRENCH COOL TUBE HSK 50*
HSK A 63 MB40	COOLING TUBE HSK A 63*	WRENCH COOL TUBE HSK 63*
HSK A 63 MB40X120	COOLING TUBE HSK A 63*	WRENCH COOL TUBE HSK 63*
HSK A 63 MB50	COOLING TUBE HSK A 63*	WRENCH COOL TUBE HSK 63*
HSK A 63 MB50X120	COOLING TUBE HSK A 63*	WRENCH COOL TUBE HSK 63*
HSK A 63 MB63	COOLING TUBE HSK A 63*	WRENCH COOL TUBE HSK 63*
HSK A 80 MB50	COOLING TUBE HSK A 80*	WRENCH COOL TUBE HSK 80*
HSK A 80 MB63	COOLING TUBE HSK A 80*	WRENCH COOL TUBE HSK 80*
HSK A 80 MB80	COOLING TUBE HSK A 80*	WRENCH COOL TUBE HSK 80*
HSK A 100 MB50	COOLING TUBE HSK A100*	WRENCH COOL TUBE HSK100*
HSK A 100 MB50X120	COOLING TUBE HSK A100*	WRENCH COOL TUBE HSK100*
HSK A 100 MB63	COOLING TUBE HSK A100*	WRENCH COOL TUBE HSK100*
HSK A 100 MB63X150	COOLING TUBE HSK A100*	WRENCH COOL TUBE HSK100*
HSK A 100 MB80	COOLING TUBE HSK A100*	WRENCH COOL TUBE HSK100*
HSK A 100 MB80X180	COOLING TUBE HSK A100*	WRENCH COOL TUBE HSK100*

* Optional, should be ordered separately

HSK E-MB

MB Modular Connection System with DIN 69893 E Taper Shank



(a)Cutting edge position

Designation	SS	CSI	L_1	L	Kg
HSK E 40 MB32	40	MB32	22.0	42.00	0.30
HSK E 50 MB50	50	MB50	-	66.00	0.71
HSK E 63 MB50	63	MB50	40.0	66.00	0.40

• A cooling tube must be used with all coolant through HSK spindles (should be ordered separately) • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

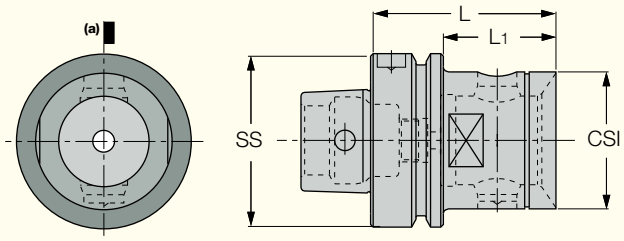
Spare Parts

Designation	Cooling Tube	Wrench
HSK E 40 MB32	COOLING TUBE HSK A 40*	WRENCH COOL TUBE HSK 40*
HSK E 50 MB50	COOLING TUBE HSK A 50*	WRENCH COOL TUBE HSK 50*
HSK E 63 MB50	COOLING TUBE HSK A 63*	WRENCH COOL TUBE HSK 63*

* Optional, should be ordered separately

HSK F-MB

MB Modular Connection System with DIN 69893 F Taper Shank



(a)Cutting edge position

Designation	SS	CSI	L_1	L	Kg
HSK F 63 MB50	63	MB50	40.0	66.00	1.15

• A cooling tube must be used with all coolant through HSK spindles (should be ordered separately) • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

Spare Parts

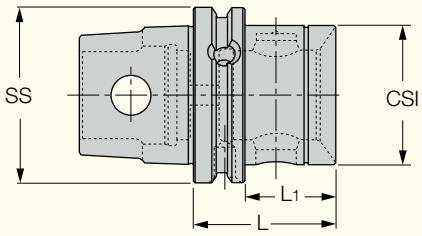
Designation	Cooling Tube	Wrench
HSK F-MB	COOLING TUBE HSK A 63*	WRENCH COOL TUBE HSK 63*

* Optional, should be ordered separately

ITSBORE

IM63 XMZ MB

MB Modular Boring System Connection with ISO 26622-1 XMZ Tapered Shanks for Mazak Integrex Machines



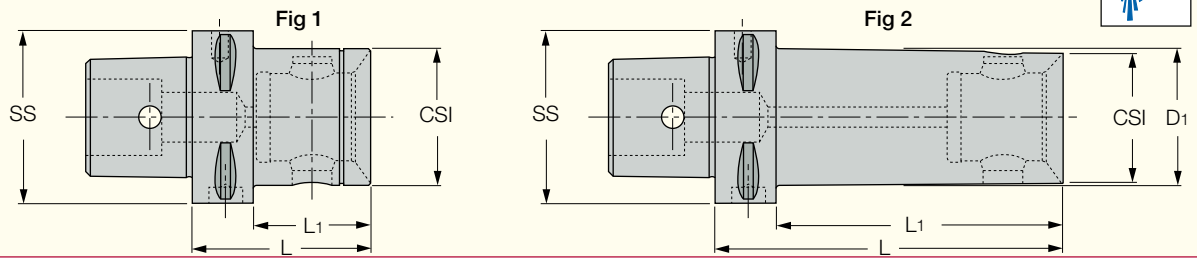
Designation	SS	CSI	L	L_1	Kg
IM63 XMZ MB50	63	MB50	50.00	32.0	1.01
IM63 XMZ MB63	63	MB63	70.00	52.0	1.29

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE • CAMFIX

C#-MB

MB Modular Boring System Connection with CAMFIX Exchangeable Shanks

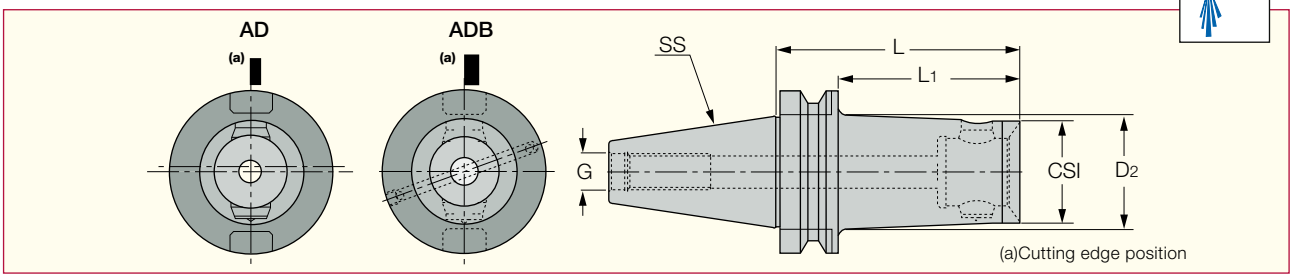


Designation	SS	CSI	L	L_1	D_1	Kg	Fig
C4 MB32X42	40	MB32	42.00	22.0	-	0.30	1
C5 MB50X55	50	MB50	55.00	-	-	0.80	1
C6 MB40X50	63	MB40	50.00	28.0	-	0.90	1
C6 MB40X120	63	MB40	120.00	98.0	44.0	1.50	2
C6 MB50X67	63	MB50	67.00	45.0	-	1.10	1
C6 MB50X120	63	MB50	120.00	98.0	54.0	1.90	2
C6 MB63X77	63	MB63	77.00	-	-	1.80	1
C8 MB50X60	80	MB50	60.00	30.0	-	2.00	1
C8 MB50X120	80	MB50	120.00	90.0	54.0	2.80	2
C8 MB63X70	80	MB63	70.00	40.0	-	2.30	1
C8 MB63X150	80	MB63	150.00	120.0	67.0	4.00	2
C8 MB80X75	80	MB80	75.00	-	-	2.60	1
C8 MB80X120	80	MB80	120.00	-	-	4.30	1
C10 MB80X80	100	MB80	80.00	48.0	-	3.50	1
C10 MB110X120	100	MB110	120.00	88.0	-	5.00	1

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

BT-MB

MB Modular Connection System with BT MAS-403 FORM AD/ADB Taper Shanks

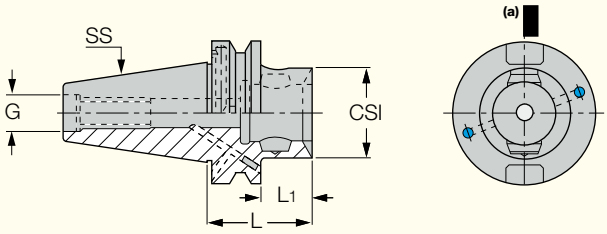


Designation	SS	CSI	L_1	L	D_2	G	Kg
BT 30 MB32	30	MB32	10.6	32.00	-	M12	0.38
BT 30 MB50	30	MB50	38.6	60.00	-	M12	0.69
BT 40 MB40	40	MB40	18.0	45.00	-	M16	1.01
BT 40 MB40X120 A/B	40	MB40	93.0	120.00	44.50	M16	1.78
BT 40 MB50	40	MB50	21.0	48.00	-	M16	1.03
BT 40 MB50X120 A/B	40	MB50	93.0	120.00	-	M16	2.08
BT 40 MB63	40	MB63	39.0	66.00	-	M16	1.35
BT 45 MB50	45	MB50	29.0	62.00	-	M20	2.32
BT 45 MB63	45	MB63	37.0	70.00	-	M20	2.48
BT 45 MB80	45	MB80	37.0	70.00	-	M20	2.63
BT 50 MB50	50	MB50	28.0	66.00	-	M24	3.73
BT 50 MB50X120 A/B	50	MB50	82.0	120.00	60.00	M24	4.64
BT 50 MB63	50	MB63	37.0	75.00	-	M24	3.92
BT 50 MB63X150 A/B	50	MB63	112.0	150.00	70.00	M24	5.85
BT 50 MB80	50	MB80	37.0	75.00	-	M24	4.25
BT 50 MB80X180 A/B	50	MB80	142.0	180.00	-	M24	8.19
BT 50 MB110X140	50	MB110	102.0	140.00	-	M24	0.00
BT 60-MB80X65	60	MB80	17.0	65.00	-	M30	0.00
BT 60-MB110X110	60	MB110	63.0	110.00	-	M30	0.00
BT 60-MB110X200	60	MB110	152.0	200.00	-	M30	0.00

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

BTB-MB

MB Modular Connection System with BT MAS-403 Type B Taper Shanks



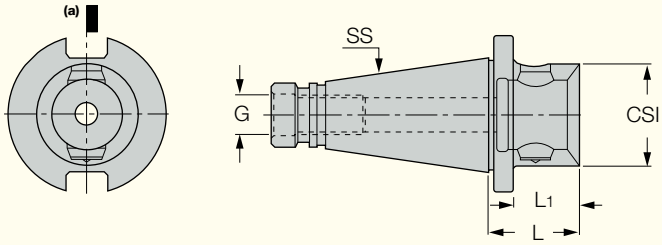
(a)Cutting edge position

Designation	SS	CSI	L_1	L	G	Kg
BTB 40 MB50	40	MB50	21.0	48.00	M16	1.05
BTB 40 MB63	40	MB63	-	66.00	M16	1.34
BTB 50 MB50X 66 A/B	50	MB50	28.0	66.00	M24	3.80
BTB 50 MB63X 75 A/B	50	MB63	37.0	75.00	M24	4.00
BTB 50 MB80 A/B	50	MB80	37.0	75.00	M24	4.30

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ISOM-MB

MB Modular Connection System with DIN 2080-A Taper Shanks



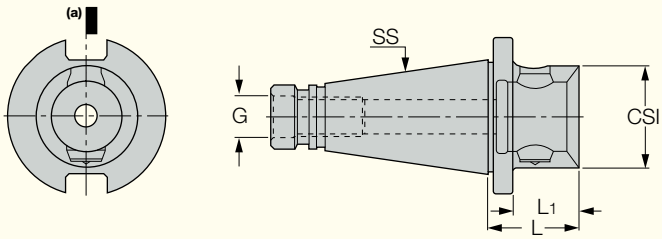
(a)Cutting edge position

Designation	SS	CSI	L_1	L	G	Kg
ISOM 30-MB50	30	MB50	-	58.00	M12	0.78
ISOM 40-MB50	40	MB50	36.0	48.00	M16	1.04
ISOM 40-MB63	40	MB63	-	60.00	M16	1.28
ISOM 45-MB50	45	MB50	33.0	48.00	M20	1.81
ISOM 45-MB63	45	MB63	45.0	60.00	M20	1.99
ISOM 45-MB80	45	MB80	-	66.00	M20	2.40
ISOM 50-MB50	50	MB50	33.0	48.00	M24	2.80
ISOM 50-MB63	50	MB63	41.0	56.00	M24	2.98
ISOM 50-MB80	50	MB80	45.0	60.00	M24	3.52

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ISO-MB

MB Modular Connection System with ISO 297 Taper Shanks



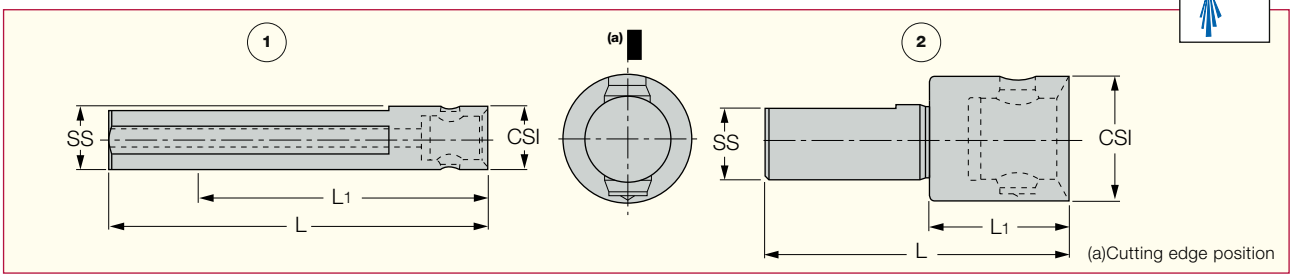
(a)Cutting edge position

Designation	SS	CSI	L_1	L	G	Kg
ISO 40-MB50	40	MB50	36.0	48.00	UNC 5/8"-11	1.05
ISO 40-MB63	40	MB63	-	60.00	UNC 5/8"-11	1.36
ISO 50-MB50	50	MB50	33.0	48.00	UNC 1.0"-8	2.81
ISO 50-MB63	50	MB63	41.0	56.00	UNC 1.0"-8	2.95
ISO 50-MB80	50	MB80	45.0	60.00	UNC 1.0"-8	3.50

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ST-MB

MB Modular Connection System with Straight Cylindrical Shanks



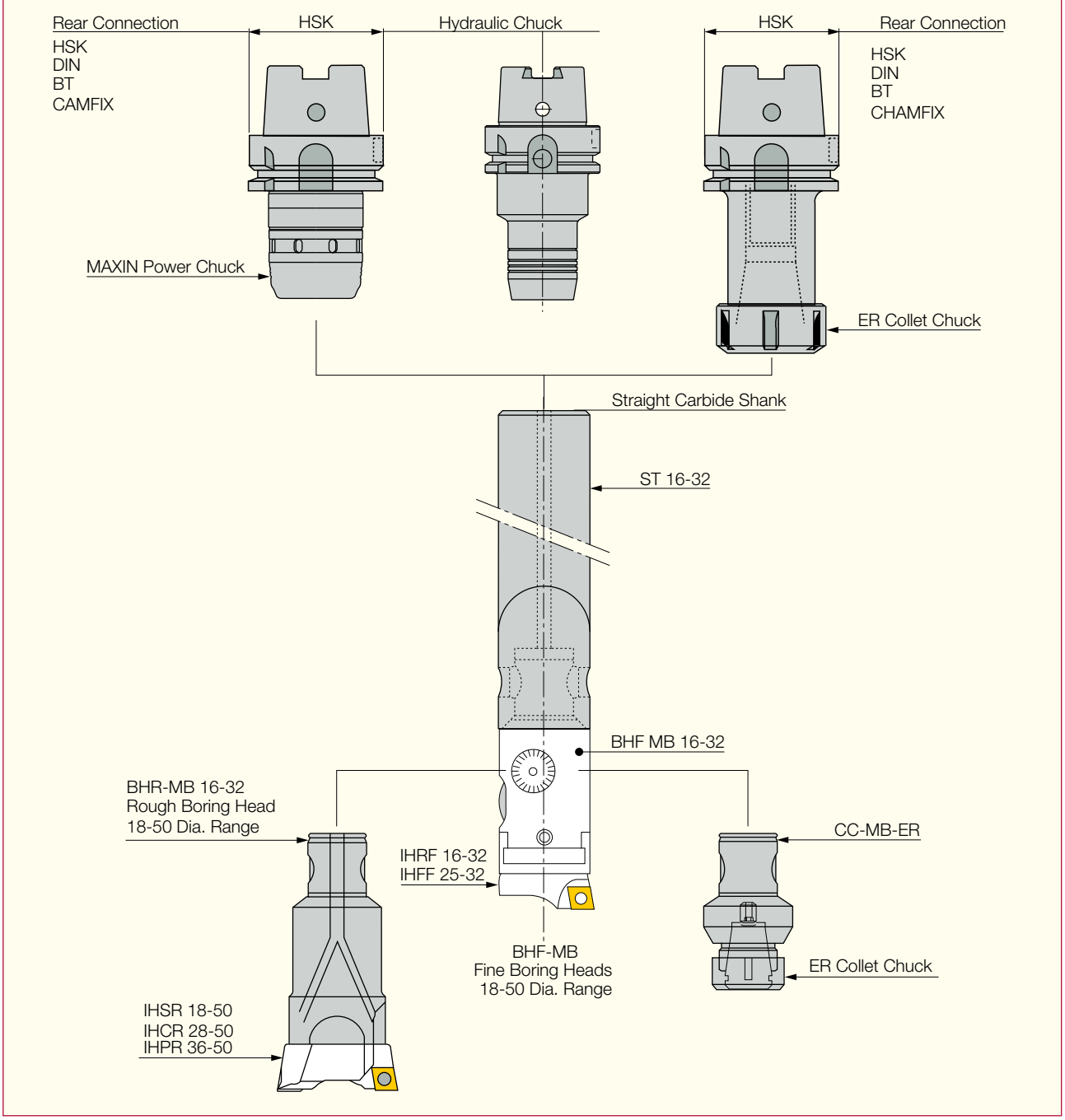
Designation	SS	CSI	L	L_1(1)	Kg	Fig
ST 16-MB16	16	MB16	100.00	66.0	0.16	1
ST 20-MB20	20	MB20	125.00	85.0	0.28	1
ST 25-MB32	25	MB32	100.00	35.0	0.41	2
ST 32-MB50	32	MB50	140.00	60.0	1.13	2

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

(1) Max overhang.

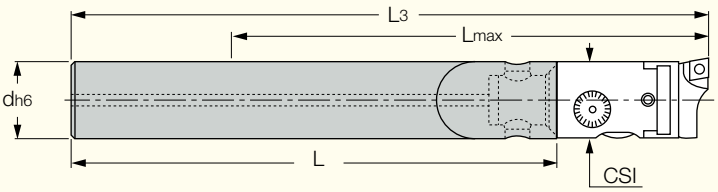
ST-MB Straight Carbide Shank with MB Connection Assembly Options

ST16-32 MB16-MB32 Diameter Range: 18-50 mm



ST-MB-E

MB Connection Modular System with Cylindrical Carbide Shanks

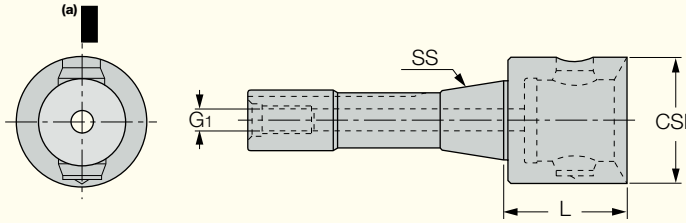


Designation	CSI	d	L_3	L_{max}	L	Kg
ST 16-MB16X110E	MB16	16.00	144.00	100.0	110.00	0.29
ST 16-MB16X140E	MB16	16.00	174.00	125.0	140.00	0.17
ST 16-MB16X170E	MB16	16.00	204.00	160.0	170.00	0.45
ST 20-MB20X135E	MB20	20.00	175.00	125.0	135.00	0.40
ST 20-MB20X170E	MB20	20.00	210.00	160.0	170.00	0.69
ST 20-MB20X210E	MB20	20.00	250.00	200.0	210.00	0.86
ST 25-MB25X160E	MB25	25.00	210.00	160.0	160.00	0.98
ST 25-MB25X205E	MB25	25.00	255.00	200.0	205.00	0.48
ST 25-MB25X255E	MB25	25.00	305.00	250.0	255.00	1.64
ST 32-MB32X195E	MB32	32.00	258.00	200.0	195.00	1.96
ST 32-MB32X250E	MB32	32.00	313.00	250.0	250.00	2.50
ST 32-MB32X315E	MB32	32.00	378.00	320.0	315.00	3.30

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

R8-MB

MB Modular Connection System with R-8 Bridgeport Shanks



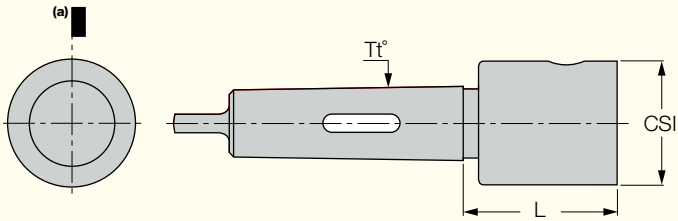
(a)Cutting edge position

Designation	SS	CSI	L	G_1	Kg
R8 MB50	R8	MB50	50.00	UNF 7/16-20	0.84

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

MTT-MB

MB Modular Connection System with DIN 228/B 1806 Morse Taper Shanks



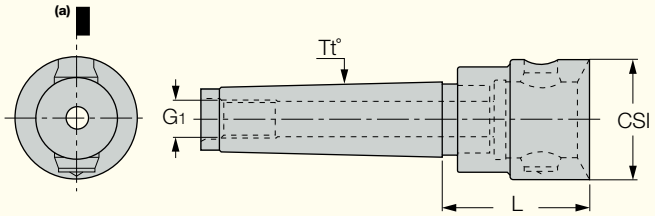
(a)Cutting edge position

Designation	T_t°	CSI	L	Kg
MTT 5-MB63	MT5	MB63	65.00	2.25

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

MTD-MB

MB Modular Connection System with DIN 228/A 220 Morse Taper Shanks



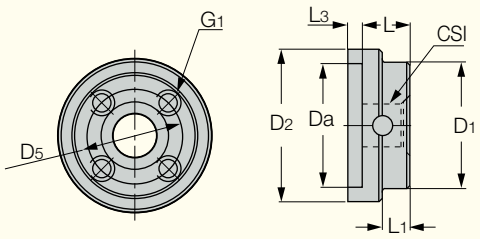
(a)Cutting edge position

Designation	T_t°	CSI	L	G_1	Kg
MTD 4-MB50	MT4	MB50	63.00	M16	0.91
MTD 4-MB50 SIP	MT4	MB50	63.00	M14	0.99

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

DIN2079-MB

MB Modular Connection with DIN 2079 Spindle Connecting Interface

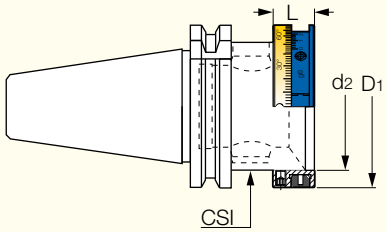


Designation	CSI	L	L_3	L_1	D_1	D_2	Da	D_5	G_1	Kg
DIN2079 MB50 40	MB50	35.00	10.00	21.0	90.0	110.00	88.89	66.70	M12	1.96
DIN2079 MB63 40	MB63	45.00	10.00	31.0	90.0	110.00	88.89	66.70	M12	2.21
DIN2079 MB63 50	MB63	45.00	12.00	31.0	135.0	150.00	128.57	101.60	M16	4.60
DIN2079 MB80 50	MB80	45.00	12.00	31.0	135.0	150.00	128.57	101.60	M16	4.50

• A standard connecting plate that can be assembled easily on most CNC spindle machines with a DIN2079 interface. This connecting plate enables the use of ITSBORE components with MB connection by using any standard adapter with four screws. It is affixed directly on the machine spindle.

MB-BL-RING

Interchangeable Balancing Rings for MB Modular Boring Heads



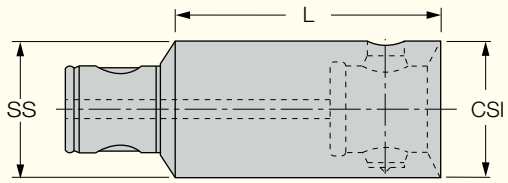
Designation	CSI	D_1	d_2	L	Kg
MB 32 BL-RING	MB32	42.0	31.00	14.00	0.07
MB 40 BL-RING	MB40	50.0	39.00	15.00	0.07
MB 50 BL-RING	MB50	63.5	49.00	16.00	0.14
MB 63 BL-RING	MB63	80.0	62.00	18.00	0.12

The balancing rings enable a high degree of balance. This is achieved by setting the two counterweights to balance the toolholder on which it is mounted. The result is a more economical and accurate mounting technique.
The use of the balancing rings provides the following advantages:
-Improved accuracy and surface finish
-Considerable extension of tool life
-Considerable extension of spindle bearing life
-Drastic reduction of vibrations and noise

The purpose of balancing a toolholder is to improve the distribution of the masses of the different elements in order to produce centrifugal forces within a prescribed limit, when spinning at a given spindle speed (RPM).
The balancing operation for a toolholder has the aim of bringing the original unbalance within the maximum admissible level “G” prescribed by the ISO 1940/1 standards.

EX-MB

Extensions for the MB Modular Connection System

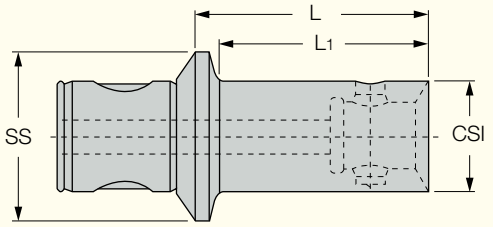


Designation	SS	CSI	L	Kg
EX 14X25-MB14	MB14	MB14	25.00	0.05
EX 16X25-MB16	MB16	MB16	25.00	0.06
EX 20X32-MB20	MB20	MB20	32.00	0.09
EX 25X25-MB25	MB25	MB25	25.00	0.11
EX 25X40-MB25	MB25	MB25	40.00	0.16
EX 32X32-MB32	MB32	MB32	32.00	0.21
EX 32X50-MB32	MB32	MB32	50.00	0.32
EX 40X40-MB40	MB40	MB40	40.00	0.39
EX 40X63-MB40	MB40	MB40	63.00	0.61
EX 50X 50-MB50	MB50	MB50	50.00	0.75
EX 50X 80-MB50	MB50	MB50	80.00	1.21
EX 50X100-MB50	MB50	MB50	100.00	1.52
EX 63X 63-MB63	MB63	MB63	63.00	1.49
EX 63X100-MB63	MB63	MB63	100.00	2.40
EX 63X125-MB63	MB63	MB63	125.00	3.00
EX 80X 80-MB80	MB80	MB80	80.00	3.10
EX 80X125-MB80	MB80	MB80	125.00	4.90
EX 80X160-MB80	MB80	MB80	160.00	6.26
EX 110X140-MB110	MB110	MB110	140.00	0.00
EX 110X200-MB110	MB110	MB110	200.00	0.00

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

RE MB-MB

Reducers for the MB Modular Connection System

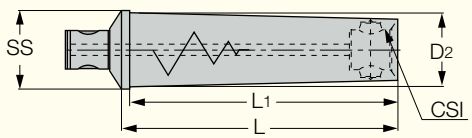


Designation	SS	CSI	L_1	L	Kg
RE MB16-MB14X24	MB16	MB14	19.5	24.00	0.22
RE MB20-MB14X19	MB20	MB14	13.5	19.00	0.00
RE MB20-MB16X20	MB20	MB16	16.0	20.00	0.05
RE MB25-MB14X19	MB25	MB14	13.5	19.00	0.00
RE MB25-MB16X20	MB25	MB16	15.0	20.00	0.08
RE MB25-MB20X25	MB25	MB20	20.0	25.00	0.10
RE MB32-MB14X25	MB32	MB14	17.0	23.00	0.00
RE MB32-MB16X24	MB32	MB16	18.0	24.00	0.13
RE MB32-MB20X25	MB32	MB20	20.0	25.00	0.14
RE MB32-MB25X28	MB32	MB25	23.0	28.00	0.16
RE MB40-MB14X23	MB40	MB14	16.0	23.00	0.24
RE MB40-MB16X24	MB40	MB16	17.0	24.00	0.23
RE MB40-MB20X26	MB40	MB20	20.0	26.00	0.24
RE MB40-MB25X28	MB40	MB25	22.0	28.00	0.26
RE MB40-MB32X32	MB40	MB32	27.0	32.00	0.30
RE MB50-MB14X23	MB50	MB14	14.5	23.00	0.39
RE MB50-MB14X39	MB50	MB14	30.5	39.00	0.40
RE MB50-MB16X24	MB50	MB16	15.0	24.00	0.39
RE MB50-MB16X40	MB50	MB16	31.0	40.00	0.41
RE MB50-MB16X74	MB50	MB16	65.0	74.00	0.48
RE MB50-MB20X26	MB50	MB20	18.0	26.00	0.40
RE MB50-MB20X70	MB50	MB20	62.0	70.00	0.28
RE MB50-MB20X93	MB50	MB20	85.0	93.00	0.56
RE MB50-MB25X117	MB50	MB25	110.0	117.00	0.76
RE MB50-MB25X28	MB50	MB25	21.0	28.00	0.43
RE MB50-MB25X87	MB50	MB25	80.0	87.00	0.64
RE MB50-MB32X144	MB50	MB32	137.0	144.00	1.16
RE MB50-MB32X32	MB50	MB32	25.0	32.00	0.45
RE MB50-MB32X87	MB50	MB32	80.0	87.00	0.77
RE MB50-MB40X176	MB50	MB40	170.0	176.00	1.90
RE MB50-MB40X36	MB50	MB40	30.0	36.00	0.52
RE MB50-MB40X87	MB50	MB40	80.0	87.00	0.98
RE MB63-MB50X40	MB63	MB50	34.0	40.00	0.98
RE MB80-MB50X45	MB80	MB50	36.0	45.00	1.35
RE MB80-MB63X60	MB80	MB63	52.0	60.00	1.77
RE MB110-MB80X70	MB110	MB80	52.0	70.00	0.00

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

RE MB-AVI

MB Modular System Vibration Damping Reducers

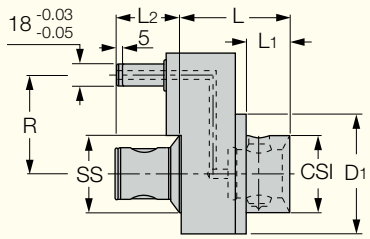


Designation	SS	CSI	D_2	L_1	L	Kg
RE MB50-MB16X74-AVI	MB50	MB16	17.50	65.0	74.00	0.52
RE MB50-MB20X93-AVI	MB50	MB20	21.50	85.0	93.00	0.65
RE MB50-MB25X117-AVI	MB50	MB25	27.00	110.0	117.00	0.94
RE MB50-MB32X144-AVI	MB50	MB32	35.00	138.0	144.00	1.47
RE MB50-MB40X176-AVI	MB50	MB40	47.00	170.0	176.00	2.73
RE MB63-MB50X220-AVI	MB63	MB50	60.00	214.0	220.00	5.20
RE MB80-MB63X280-AVI	MB80	MB63	77.00	272.0	280.00	10.40

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

CHS MB-R

Coolant Supply Collar with a Stopper for the MB Modular Boring System

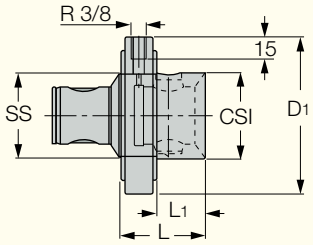


Designation	SS	CSI	R	D_1	L_1	L	L_2	RPM max	Bar	Kg
CHS MB50-R65	MB50	MB50	65	80.0	28.5	72.00	43.00	7000	10	3.06
CHS MB50-R80	MB50	MB50	80	80.0	28.5	72.00	43.00	7000	10	3.30
CHS MB63-R80	MB63	MB63	80	100.0	37.0	88.00	51.00	5600	10	5.16

• Use with stop block • Important: coolant flow must be started prior to rotating the spindle to avoid damage of the O-rings
• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

CHR MB

Coolant Supply Collar for the MB Modular Boring System

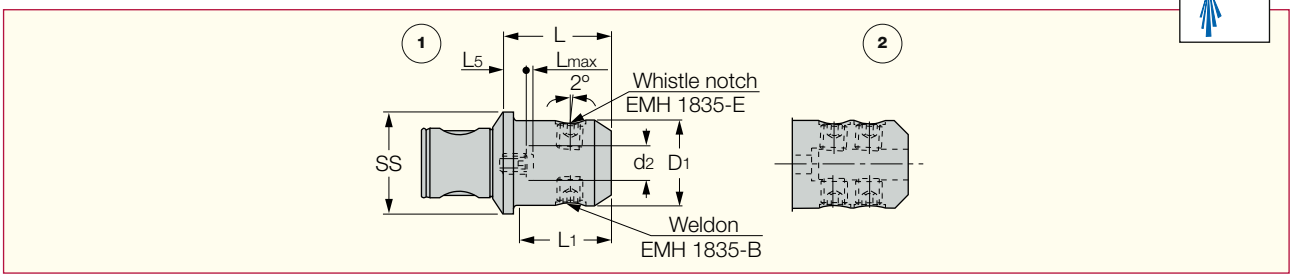


Designation	SS	CSI	D_1	L_1	L	RPM max	Bar	Kg
CHR MB63	MB63	MB63	115.0	35.0	63.00	3500	10	3.30

• Important: coolant flow must be started prior to rotating the spindle to avoid damage of the O-rings • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

EMH MB

Weldon and Whistle Notch Side-Lock Holders with MB Modular Boring System Connection



Designation	SS	d_2	D_1	L_1	L	L_5	L_{max}	Fig	Kg
EMH MB50-6	MB50	6.00	25.0	32.5	44.00	7.00	2.0	1	0.51
EMH MB50-8	MB50	8.00	28.0	33.0	44.00	7.00	2.0	1	0.54
EMH MB50-10	MB50	10.00	35.0	42.0	52.00	11.00	3.0	1	0.68
EMH MB50-12	MB50	12.00	42.0	48.0	57.00	11.00	3.0	1	0.86
EMH MB50-14	MB50	14.00	42.0	48.0	57.00	11.00	3.0	1	0.84
EMH MB50-16	MB50	16.00	48.0	61.0	67.00	17.00	4.0	1	1.12
EMH MB50-20	MB50	20.00	51.0	-	67.00	16.00	4.0	1	1.19
EMH MB50-25	MB50	25.00	63.0	-	80.00	22.00	4.0	2	1.82
EMH MB63-16	MB63	16.00	48.0	53.0	64.00	14.00	4.0	1	1.45
EMH MB63-20	MB63	20.00	52.0	56.0	66.00	14.00	4.0	1	1.56
EMH MB63-25	MB63	25.00	64.0	-	74.00	16.00	4.0	2	2.11
EMH MB63-32	MB63	32.00	72.0	-	76.00	14.00	4.0	2	2.50
EMH MB80-40	MB80	40.00	80.0	-	83.00	12.00	4.0	2	3.25

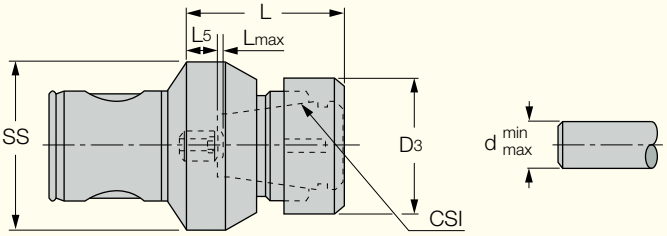
• Please verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

Spare Parts

Designation	Hex Socket Screw	Hex Socket Screw 1	Screw
EMH MB50-6		EMH 50-6/8 SCREW	SR M6x10 DIN 1835B
EMH MB50-8	BH M8X10 EM SCREW/EMH	EMH 50-6/8 SCREW	SR M8x10 DIN 1835B
EMH MB50-10	BH M10X12 EM SCREW/EMH	EMH 50-10/12/14 SCREW	SR M10x12 DIN 1835B
EMH MB50-12	BH M12X16 EM SCREW/EMH	EMH 50-10/12/14 SCREW	SR M12x16 DIN 1835B
EMH MB50-14	BH M12X16 EM SCREW/EMH	EMH 50-10/12/14 SCREW	SR M14x16 DIN 1835B
EMH MB50-16	BH M14X16 EM SCREW/EMH	EMH 50/63-16/20 SCREW	SR M14x16 DIN 1835B
EMH MB50-20	BH M16X16 EM SCREW/EMH	EMH 50/63-16/20 SCREW	SR M16x16 DIN 1835B
EMH MB63-16	BH M14X16 EM SCREW/EMH	EMH 50/63-16/20 SCREW	SR M14x16 DIN 1835B
EMH MB63-20	BH M16X16 EM SCREW/EMH	EMH 50/63-16/20 SCREW	SR M16x16 DIN 1835B
EMH MB63-25	BH M18X20 EM SCREW/EMH	EMH 63-25/32 SCREW	SR M18x20 DIN 1835B
EMH MB63-32	BH M20X20 EM SCREW/EMH	EMH 63-25/32 SCREW	SR M18x20 DIN 1835B
EMH MB80-40	BH M20X20 EM SCREW/EMH	EMH 80-40 SCREW	SR M20x20 DIN 1835B

CC MB-ER

DIN 6499 ER Collet Chuck with MB Modular Boring System Connection

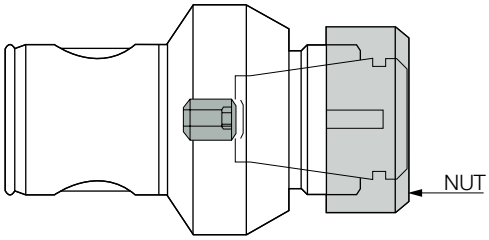


Designation	SS	CSI	d min	d max	D3	L	L5	L max	Kg
CC MB16 ER11M	MB16	ER11	0.5	7.0	16.00	25.00	2.50	2.0	0.05
CC MB20 ER16M	MB20	ER16	0.5	10.0	22.00	32.00	1.00	2.0	0.05
CC MB25 ER20M	MB25	ER20	1.0	13.0	28.00	40.00	2.50	2.0	0.15
CC MB32 ER25M	MB32	ER32	1.0	16.0	35.00	42.00	1.50	2.0	0.23
CC MB40 ER25	MB40	ER25	1.0	16.0	42.00	45.00	5.00	2.0	0.45
CC MB50 ER25	MB50	ER25	1.0	16.0	42.00	48.00	7.00	2.0	0.67
CC MB50 ER32	MB50	ER32	2.0	20.0	50.00	59.00	7.00	2.0	0.79
CC MB63 ER32	MB63	ER32	2.0	20.0	50.00	59.00	12.00	2.0	1.36
CC MB63 ER40	MB63	ER40	3.0	26.0	63.00	64.00	12.00	2.0	1.57

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.
- For ER collets, see ISCAR TOOL HOLDING SYSTEMS catalog.

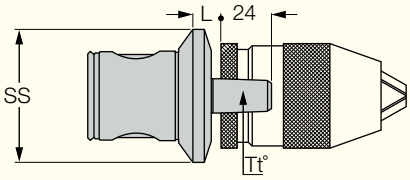
Spare Parts

Designation	ER Nut	ER Wrench
CC MB16 ER11M	NUT ER11 MINI	WRENCH ER11 MINI
CC MB20 ER16M	NUT ER16 MINI	WRENCH ER16 MINI
CC MB25 ER20M	NUT ER20 MINI	WRENCH ER20 MINI
CC MB32 ER25M	NUT ER25 MINI	WRENCH ER25 MINI
CC MB40 ER25	NUT ER25 TOP	WRENCH ER25
CC MB50 ER25	NUT ER25 TOP	WRENCH ER25
CC MB50 ER32	NUT ER32 TOP	WRENCH ER32
CC MB63 ER32	NUT ER32 TOP	WRENCH ER32
CC MB63 ER40	NUT ER40 TOP	WRENCH ER40



DC MB

DIN238 DC Drill Chuck Arbor with MB Connection Modular System

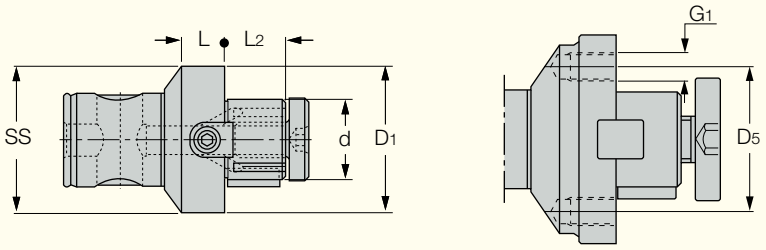


Designation	SS	L	Tt°	Kg
DC MB50 B16	MB50	10.00	B16	0.41
DC MB63 B16	MB63	13.50	B16	0.84

- Without drill chuck.

SMH MB

Shell Mill Holders with MB Modular Boring System Connection



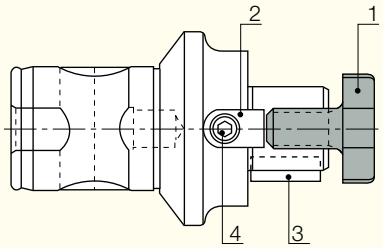
Designation	SS	d	D_1	G_1	L_2	L	Kg
SMH MB40-16	MB40	16.00	32.0	M8	17.00	15.00	0.48
SMH MB40-22	MB40	22.00	40.0	M10	19.00	13.00	0.38
SMH MB50-16	MB50	16.00	32.0	M8	17.00	15.00	0.48
SMH MB50-22	MB50	22.00	40.0	M10	19.00	15.00	0.55
SMH MB50-27	MB50	27.00	50.0	M12	21.00	15.00	0.66
SMH MB50-32	MB50	32.00	70.0	M16	24.00	15.00	0.79
SMH MB63-22	MB63	22.00	60.0	M16	19.00	15.00	1.10
SMH MB63-27	MB63	27.00	60.0	M12	21.00	15.00	1.09
SMH MB63-32	MB63	32.00	70.0	M16	24.00	15.00	1.24
SMH MB80-32	MB80	32.00	88.0	M16	24.00	24.00	2.10
SMH MB80-40	MB80	40.00	88.0	M12	27.00	24.00	2.23
SMH MB80-50	MB80	50.00	90.0	M24	30.00	24.00	2.64
SMH MB80-60	MB80	60.00	128.5	M30	40.00	31.50	4.74
SMH MB110-60	MB110	60.00	128.5	M30	40.00	36.00	7.70

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

Spare Parts

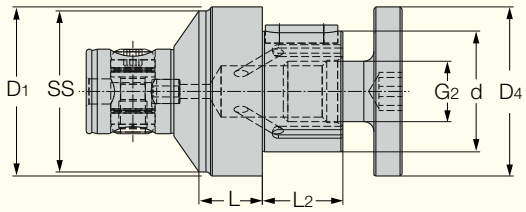
Designation	(1) Shell Lock Screw	(2) Driving Key	(3) Clamping Key	(4) Screw
SMH MB40-16	M 8 CLAMP SCREW SEM 16*	BH DOG DRIVE SMH 16*	KEY SMH 16*	M3X8 SMH KEY SCREW*
SMH MB40-22	M 10 CLAMP SCREW SEM 22	BH DOG DRIVE SMH 22	KEY SMH 22	M4X10SMH KEY SCREW
SMH MB50-16	M 8 CLAMP SCREW SEM 16	BH DOG DRIVE SMH 16	KEY SMH 16	M3X8 SMH KEY SCREW
SMH MB50-22	M 10 CLAMP SCREW SEM 22	BH DOG DRIVE SMH 22	KEY SMH 22	M4X10SMH KEY SCREW
SMH MB50-27	M 12 CLAMP SCREW SEM 27	BH DOG DRIVE SMH 27	KEY SMH 27	M5X12SMH KEY SCREW
SMH MB50-32	M 16 CLAMP SCREW SEM 32	BH DOG DRIVE SMH 32	KEY SMH 32	M6X16SMH KEY SCREW
SMH MB63-27	M 12 CLAMP SCREW SEM 27	BH DOG DRIVE SMH 27	KEY SMH 27	M5X12SMH KEY SCREW
SMH MB63-32	M 16 CLAMP SCREW SEM 32	BH DOG DRIVE SMH 32	KEY SMH 32	M6X16SMH KEY SCREW
SMH MB80-32	M 16 CLAMP SCREW SEM 32	BH DOG DRIVE SMH 32	KEY SMH 32	M6X16SMH KEY SCREW
SMH MB80-40	M 20 CLAMP SCREW SEM 40	BH DOG DRIVE SMH 40	KEY SMH 40	M6X18SMH KEY SCREW

* Optional, should be ordered separately



STUB MB

STUB 60 Holder with an MB80 Connection for Disk Type Milling Cutters

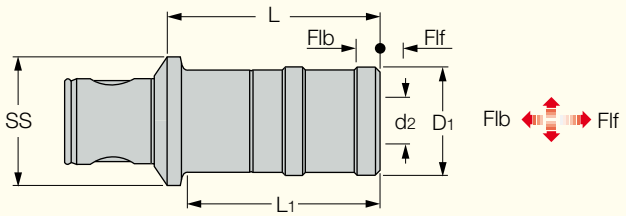


Designation	SS	D_1	d	L	L_2	G_2	D_4	Kg
STUB MB80-60	MB80	84.0	60.00	31.50	40.00	M30	84.00	0.01

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

TP MB-M

Tapping Chucks with MB Modular System Connections

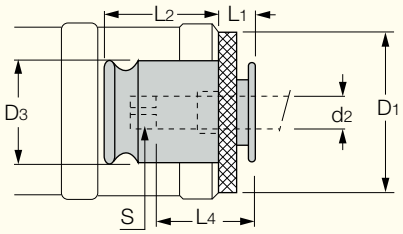


Designation	SS	Tap min	Tap max	L_1	L	D_1	d_2	Flf	Flb	Kg
TP MB50-M 3-12	MB50	M3	M12	60.0	72.00	36.0	19.00	7.5	7.5	0.79
TP MB50-M 8-20	MB50	M8	M20	-	106.00	53.0	31.00	12.5	12.5	1.64
TP MB63-M 3-12	MB63	M3	M12	58.0	70.00	36.0	19.00	7.5	7.5	1.14
TP MB63-M 8-20	MB63	M8	M20	93.0	104.00	53.0	31.00	12.5	12.5	1.88

• Please verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

TCS-DIN

Quick Change Tap Collets for Solid Taps



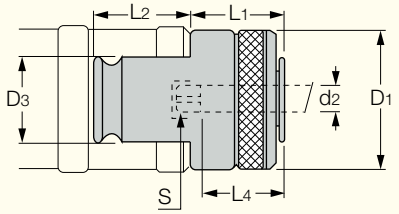
Designation	d_2(1)	S(2)	S_1(3)	S_2(4)	D_1	D_3	L_4	L_1	L_2
TCS #1 DIN 2.8-2.1	2.80	2.10	M2, M2.5	M4	30.0	19.00	17.0	7.0	21.50
TCS #1 DIN 3.5-2.7	3.50	2.70	M3	M4.5, M5	30.0	19.00	17.0	7.0	21.50
TCS #1 DIN 4.5-3.4	4.50	3.40	M3.5	M6	30.0	19.00	17.0	7.0	21.50
TCS #1 DIN 6-4.9	6.00	4.90	M4.5, M6	M8	30.0	19.00	17.0	7.0	21.50
TCS #1 DIN 7-5.5	7.00	5.50	M7	M10	30.0	19.00	17.0	7.0	21.50
TCS #1 DIN 8-6.2	8.00	6.20	M8	-	30.0	19.00	17.0	7.0	21.50
TCS #1 DIN 9-7	9.00	7.00	-	M12	30.0	19.00	17.0	7.0	21.50
TCS #1 DIN 10-8	10.00	8.00	M10	-	30.0	19.00	17.0	7.0	21.50
TCS #1 DIN 11-9	11.00	9.00	M14	M14	30.0	19.00	17.0	7.0	21.50
TCS #2 DIN 6X4.9	6.00	4.90	M4.5, M6	M8	48.0	31.00	30.0	11.0	35.00
TCS #2 DIN 7X5.5	7.00	5.50	M7	M10	48.0	31.00	30.0	11.0	35.00
TCS #2 DIN 8X6.2	8.00	6.20	M8	-	48.0	31.00	30.0	11.0	35.00
TCS #2 DIN 9X 7	9.00	7.00	-	M12	48.0	31.00	30.0	17.0	35.00
TCS #2 DIN 10X 8	10.00	8.00	M10	-	48.0	31.00	30.0	17.0	35.00
TCS #2 DIN 11X 9	11.00	9.00	-	M14	48.0	31.00	30.0	17.0	35.00
TCS #2 DIN 12X 9	12.00	9.00	-	M16	48.0	31.00	30.0	17.0	35.00
TCS #2 DIN 14X11	14.00	11.00	-	M18	48.0	31.00	30.0	17.0	35.00
TCS #2 DIN 16X12	16.00	12.00	-	M20	48.0	31.00	30.0	17.0	35.00

• Please note: Tap holders are not supplied by ISCAR

(1) According to tap shank size. (2) Square size. (3) Tap size according to DIN371 (4) Tap size according to DIN376/374

TCC-DIN

Quick Change Tap Collets with a Safety Clutch



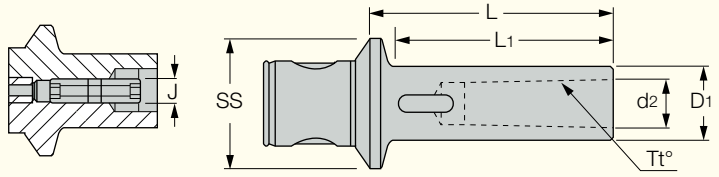
Designation	d_2(1)	S(2)	S_1(3)	S_2(4)	D_1	D_3	L_1	l_1	L_2
TCC #1 DIN 2.8-2.1	2.80	2.10	M2, M2.5	M4	32.0	19.00	17.0	25.00	21.50
TCC #1 DIN 3.5-2.7	3.50	2.70	M3	M4.5, M5	32.0	19.00	17.0	25.00	21.50
TCC #1 DIN 4-3	4.00	3.00	M3.5	-	32.0	19.00	17.0	25.00	21.50
TCC #1 DIN 4.5-3.4	4.50	3.40	M4	M6	32.0	19.00	17.0	25.00	21.50
TCC #1 DIN 6-4.9	6.00	4.90	M4.5, M6	M8	32.0	19.00	17.0	25.00	21.50
TCC #1 DIN 7-5.5	7.00	5.50	M7	M10	32.0	19.00	17.0	25.00	21.50
TCC #1 DIN 8-6.2	8.00	6.20	M8	-	32.0	19.00	17.0	25.00	21.50
TCC #1 DIN 9-7	9.00	7.00	-	M12	32.0	19.00	17.0	25.00	21.50
TCC #1 DIN 10-8	10.00	8.00	M10	-	32.0	19.00	17.0	25.00	21.50
TCC #1 DIN 11-9	11.00	9.00	M10	M14	32.0	19.00	17.0	25.00	21.50
TCC #2 DIN 6X4.9	6.00	4.90	M4.5, M6	M8	50.0	31.00	30.0	34.00	35.00
TCC #2 DIN 7X5.5	7.00	5.50	M7	M10	50.0	31.00	30.0	34.00	35.00
TCC #2 DIN 8X6.2	8.00	6.20	M8	-	50.0	31.00	30.0	34.00	35.00
TCC #2 DIN 9X7	9.00	7.00	M7	M12	50.0	31.00	30.0	34.00	35.00
TCC #2 DIN 10X8	10.00	8.00	M10	-	50.0	31.00	30.0	34.00	35.00
TCC #2 DIN 11X9	11.00	9.00	-	M14	50.0	31.00	30.0	34.00	35.00
TCC #2 DIN 12X9	12.00	9.00	-	M16	50.0	31.00	30.0	34.00	35.00
TCC #2 DIN 14X11	14.00	11.00	-	M18	50.0	31.00	30.0	34.00	35.00
TCC #2 DIN 16X12	16.00	12.00	-	M20	50.0	31.00	30.0	34.00	35.00

• Please note: Tap holders are not supplied by ISCAR

(1) According to tap shank size. (2) Square size. (3) Tap size according to DIN371 (4) Tap size according to DIN376/374

AMT MB-MT

MB Modular System Connection with Morse Taper Tang DIN 228 A/B



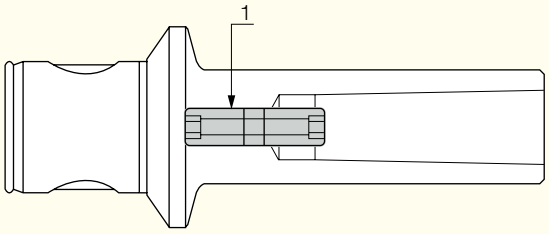
DIN 228A DIN 228B

Designation	SS	T_t°	d_2	D_1	J	L_1	L	Kg
AMT MB50-MT1	MB50	MT1	12.07	20.0	M6	68.0	80.00	0.52
AMT MB50-MT2	MB50	MT2	17.78	30.0	M10	86.0	100.00	0.78
AMT MB50-MT3	MB50	MT3	23.82	36.0	M12	110.0	120.00	1.03
AMT MB63-MT3	MB63	MT3	23.82	36.0	M12	108.0	120.00	1.40
AMT MB63-MT4	MB63	MT4	31.26	48.0	M16	133.0	150.00	2.23

• Please verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

AMT

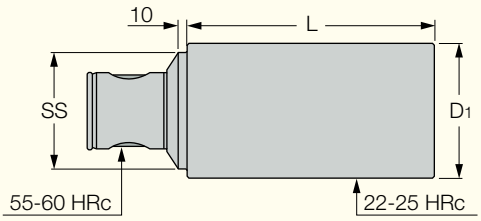
Screw for Shanks – Morse Taper Tang AMT



Designation	1
AMT MB50-MT2	AMT MT2-SCREW
AMT MB50-MT3	AMT MT3-SCREW
AMT MB63-MT3	AMT MT3-SCREW
AMT MB63-MT4	AMT MT4-SCREW

BLANK MB

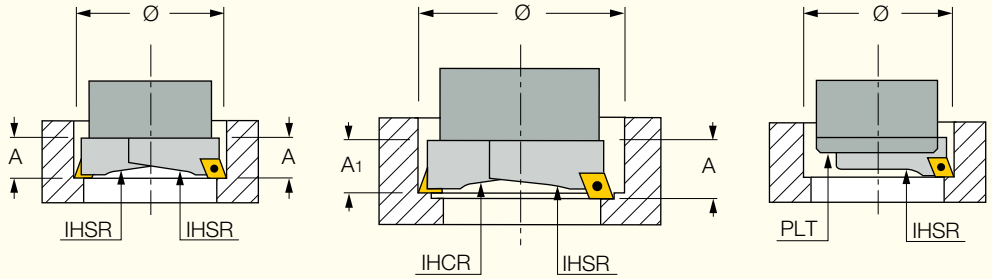
Blanks with MB Modular System Connection



Designation	SS	D_1	L	Kg
BLANK MB50-63X160	MB50	63.0	160.00	4.40
BLANK MB63-80X200	MB63	80.0	200.00	8.77
BLANK MB80-100X250	MB80	100.0	250.00	16.00
BLANK MB110-130X250	MB110	130.0	250.00	0.00

• Material: 39NiCrMo3

Rough Boring Options



Roughing with High Feed — **Fig. a**

Roughing with High Cutting Depth — **Fig. b**

Light Roughing or Semi-Finishing Applications — **Fig. c**

1. Radial setting of the cutting edges should be carried out with tool presetting equipment.
2. Boring bars fitted with two insert pockets are for roughing operations involving heavy chip removal.

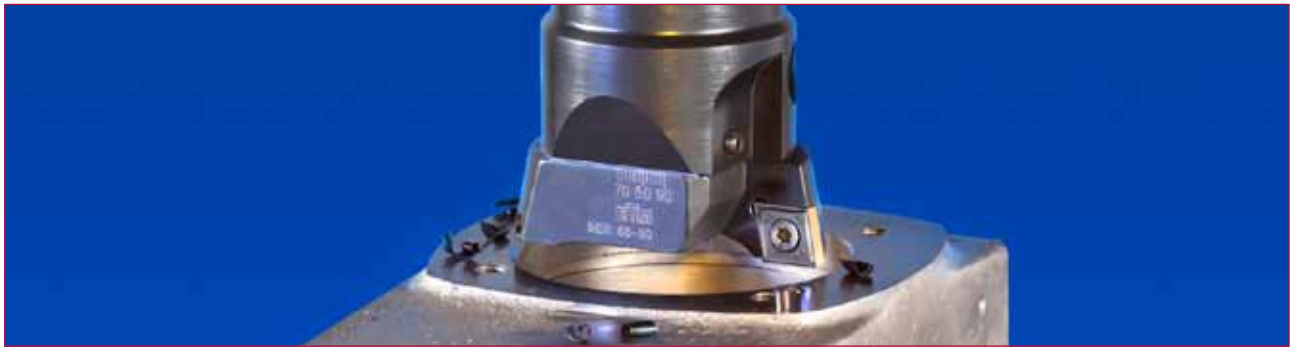
   The double-insert boring bars include:

- Two **IHSR** insert holders on the same plane with the two cutting edges set at identical radial distance for high feed rate roughing operations (Fig. a).
- An **IHCR** insert holder and an **IHSR** insert holder not on the same plane with the two cutting edges set at different radial distances for high-depth roughing operations (Fig. b).

3. Boring bars fitted with a single insert holder are for roughing and finishing operations involving normal chip removal. The serrated surface protection plate **PLT** should always be used (Fig. c).

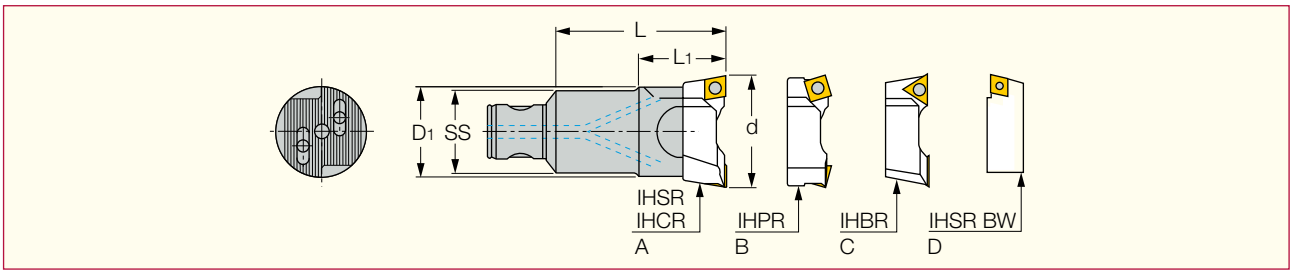
Rough Boring Head Diameter Range

Assembly Reference	10	20	30	40	50	60	70	80	90	100	110	120	130	200	300	400	500	600	700	800	900	Page
BHR MB16-16x34			18-22																			F29
BHR MB20-20x40			22-28																			
BHR MB25-25x50				28-38																		
BHR MB32-32x63					36-50																	
BHR MB40-40x80							50-68															
BHR MB50-50x100									68-90													
BHR MB63-63x125												90-120										
BHR MB80-80x140														120-200								
TCH 200															200-300							F30-31
TCH 300																300-400						
TCH 400																	400-500					
TCH A.L 500																		500-600				
TCH A.L 600																			600-700			
TCH A.L 700																				700-800		



BHR MB

Rough Boring Heads for Diameter Range 18-200 mm



Designation	SS	d min	d max	D1	L	L1	IH(1)	Kg
BHR MB16-16X34	MB16	18.0	22.0	16.0	34.00	-	IH...18-22	0.07
BHR MB20-20X40	MB20	22.0	28.0	20.0	40.00	-	IH...22-28	0.11
BHR MB25-25X50	MB25	28.0	38.0	25.0	50.00	-	IH...28-38	0.18
BHR MB32-32X63	MB32	36.0	50.0	32.0	63.00	-	IH...36-50	0.36
BHR MB40-40X80	MB40	50.0	68.0	40.0	80.00	-	IH...50-68	0.72
BHR MB50-50X100	MB50	68.0	90.0	55.0	100.00	50.0	IH...68-90	1.50
BHR MB50-63X80	MB50	90.0	120.0	72.0	80.00	60.0	IH...90-120	1.50
BHR MB63-63X125	MB63	90.0	120.0	72.0	125.00	63.0	IH...90-120	3.06
BHR MB80-80X140	MB80	120.0	200.0	95.0	140.00	75.0	IH...120-800	5.35

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

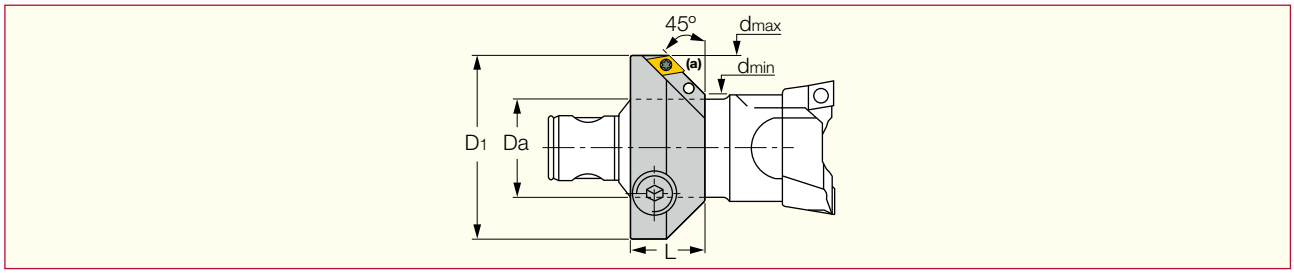
(1) Insert holders

For tools, see: CHA (F29) • IHBR (F34) • IHCR (F33) • IHPR (F33) • IHSR (F32) • IHSR-BW (F36) • IHSR-CH (F35).

• For spare parts see page F92.

CHA

45° Chamfering Holders



Designation	d min	d max	Da	D1	L	Inserts	Kg
CHA 16-45	18.0	28.0	16.00	28.0	13.00	DC.. 0702...	0.06
CHA 20-45	23.0	32.0	20.00	32.0	15.00	DC.. 0702...	0.07
CHA 25-45	28.0	43.0	25.00	43.0	18.00	DC.. 0702...	0.12
CHA 32-45	35.0	54.0	32.00	54.0	22.00	DC.. 0702...	0.22
CHA 40-45	46.0	72.0	40.00	72.0	30.00	DC.. 11T3...	0.53
CHA 50-45	56.0	95.0	50.00	95.0	38.00	DC.. 11T3...	1.15
CHA 63-45	75.0	125.0	63.00	125.0	46.00	DC.. 1504...	2.45

• To minimize mismatch use insert radius 0.2 mm • (a) Only one insert can be mounted on either one of the two pockets.

For inserts, see: DCGT-AS (F82) • DCMT-14 (F80) • DCMT-PF (F81) • DCMT/DCGT (F81) • DCMT/DCGT-SM (F80) • DCMW (F82).

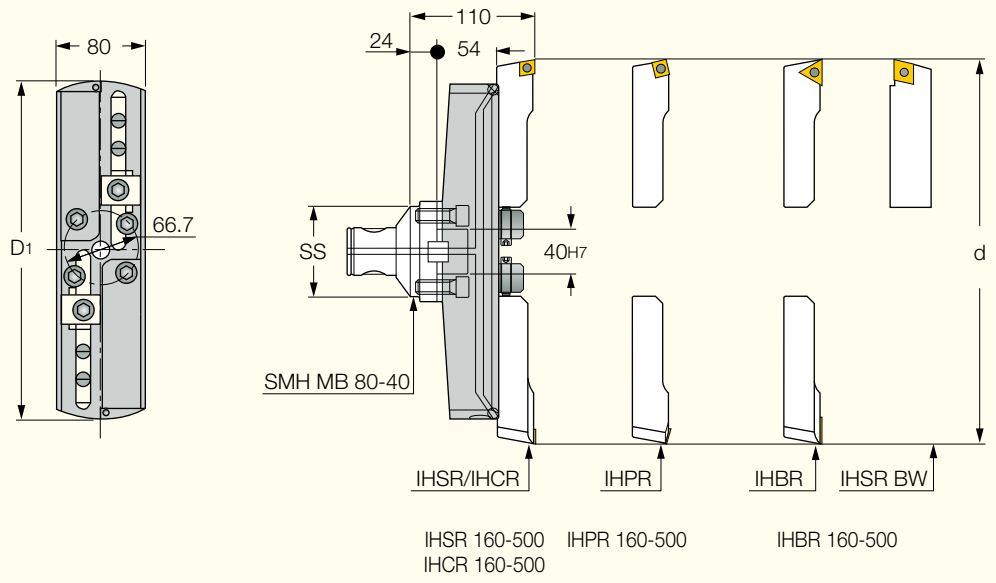
For holders, see: BHR MB (F29).

Spare Parts

Designation	Screw
CHA 16-45	SR 14-548
CHA 20-45	SR 14-548
CHA 25-45	SR 14-548
CHA 32-45	SR 14-548
CHA 40-45	SR 16-236 P
CHA 50-45	SR 16-236 P

TCH

Rough and Fine Boring Heads for Diameter Range 200-500 mm



Designation	d min	d max	D1	SS	Kg
TCH 200	200.0	300.0	194.0	80	3.40
TCH 300	300.0	400.0	298.0	80	4.30
TCH 400	400.0	500.0	398.0	80	6.70

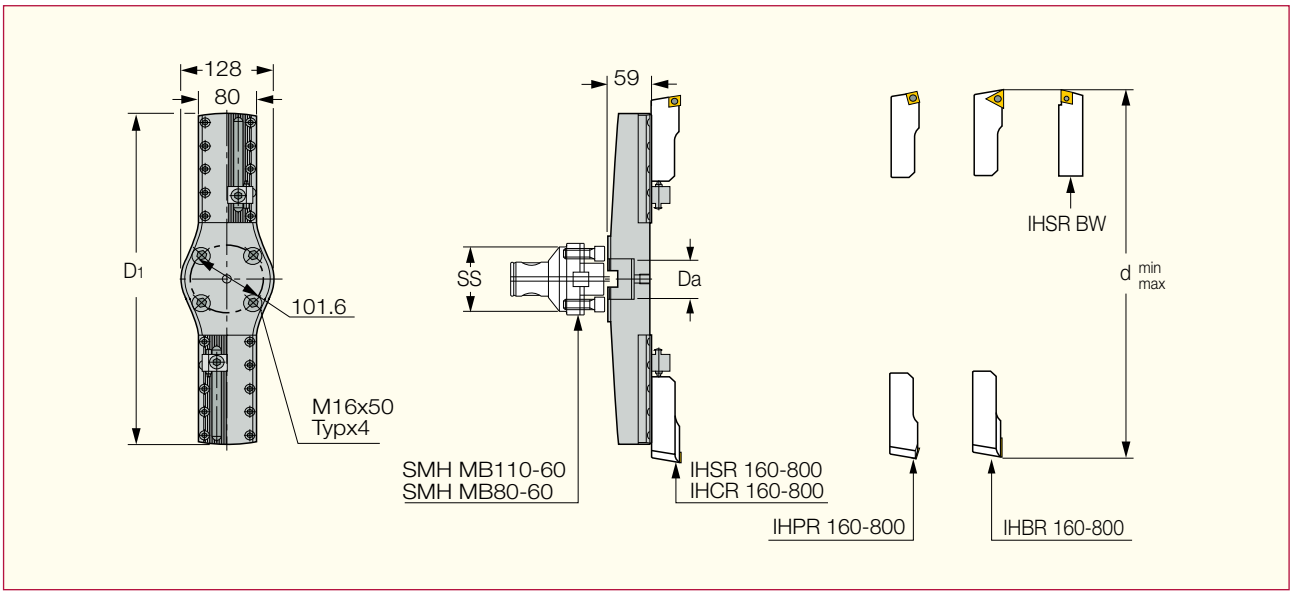
• Aluminum body, with steel serrated seats. • Please verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

For tools, see: IHBR (F34) • IHCR (F33) • IHPR (F33) • IHSR (F32) • IHSR-BW (F36).

• For spare parts see pages F59, F94.

TCH AL

Aluminum Twin Cutter Heads for Rough and Fine Boring Operations,
Diameter Range 500-800 mm



Designation	d min	d max	D1	Da	SS	Kg
TCH A.L500	500.0	600.0	494.0	60.00	80,110	8.70
TCH A.L600	600.0	700.0	594.0	60.00	80,110	8.34
TCH A.L700	700.0	800.0	694.0	60.00	80,110	8.34

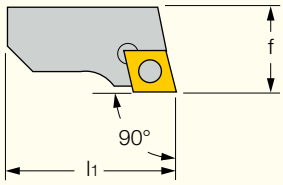
• Aluminum body, with steel serrated seats. • The "O" position on the counterweight balances the BHF boring head for D=200 mm boring diameter position. For every 10 mm change in boring diameter, move the counterweight by 1 measurement mark. • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

For tools, see: IHBR (F34) • IHCR (F33) • IHPR (F33) • IHSR (F32) • IHSR-BW (F36).

• For spare parts see pages F59, F94.

IHSR

Rough Boring Tools Used for Twin Cutters. Radial and Axial Edge Positioned Inner to the Opposite Finishing Tool



Designation	d min	d max	f	l1	Inserts
IHSR 18-22	18.0	22.0	8.0	15.00	CCMT 0602...
IHSR 22-28	22.0	28.0	9.5	19.00	CCMT 0602...
IHSR 28-38	28.0	38.0	12.5	23.00	CCMT 0602...
IHSR 36-50	35.5	50.0	15.0	32.00	CCMT 0602...
IHSR 36-50-09	36.0	50.0	15.0	32.00	CCMT 09T3...
IHSR 50-68	50.0	68.0	19.0	40.00	CCMT 09T3...
IHSR 50-68-12	50.0	68.0	19.0	40.00	CCMT 1204...
IHSR 68-90	68.0	90.0	22.0	54.00	CCMT 1204...
IHSR 90-120	90.0	120.0	27.0	70.50	CCMT 1204...
IHSR 120-160	120.0	160.0	32.0	94.50	CCMT 1204...
IHSR 160-800	160.0	800.0	32.0	130.00	CCMT 1204...

• For user guide, see pages F28, F97, F100-106.

For inserts, see pages: CCET-WF (F76) • CCGT-AF (F79) • CCGT-AS (F79) • CCMT (CBN) (F78) • CCMT (PCD) (F78) • CCMT-14 (F76) • CCMT-PF (F75) • CCMT-WG (F77) • CCMT/CCGT (F77) • CCMT/CCGT-SM (F75).

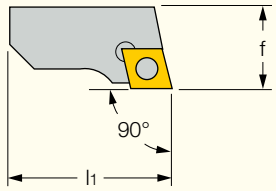
For holders, see: BHR MB (F29) • TCH (F30) • TCH AL (F31).

Spare Parts

Designation	Key	Screw
IHSR 22-28	T-7/5	SR 14-548
IHSR 28-38	T-7/5	SR 14-548
IHSR 36-50	T-7/5	SR 14-548
IHSR 36-50-09	T-15/5	SR 16-236
IHSR 50-68	T-15/5	SR 16-236
IHSR 50-68-12	T-20/5	SR 16-212
IHSR 68-90	T-20/5	SR 16-212
IHSR 90-120	T-20/5	SR 16-212
IHSR 120-160	T-20/5	SR 16-212
IHSR 160-800	T-20/5	SR 16-212

IHCR

Boring Toolholders Used on the MB Modular Boring System



Designation	d min	d max	f	l1	Inserts
IHCR 28-38	28.0	38.0	12.3	23.00	CCMT 0602...
IHCR 36-50	35.5	50.0	14.8	32.00	CCMT 0602...
IHCR 50-68	50.0	68.0	18.7	40.00	CCMT 09T3...
IHCR 50-68-12	50.0	68.0	18.7	40.00	CCMT 1204...
IHCR 68-90	68.0	90.0	21.7	54.00	CCMT 1204...
IHCR 90-120	90.0	120.0	26.7	70.50	CCMT 1204...
IHCR 120-160	120.0	160.0	31.7	94.50	CCMT 1204...
IHCR 160-800	160.0	800.0	31.7	130.00	CCMT 1204...

• For user guide, see pages F28, F97, F100-106.

For inserts, see: CCET-WF (F76) • CCGT-AF (F79) • CCGT-AS (F79) • CCMT (CBN) (F78) • CCMT (PCD) (F78) • CCMT-14 (F76) • CCMT-PF (F75) • CCMT-WG (F77) • CCMT/CCGT (F77) • CCMT/CCGT-SM (F75).

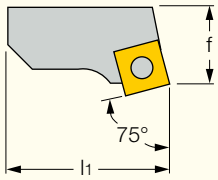
For holders, see: BHR MB (F29) • TCH (F30) • TCH AL (F31).

Spare Parts

Designation	Key	Screw
IHCR 28-38	T-7/5	SR 14-548
IHCR 36-50	T-7/5	SR 14-548
IHCR 50-68	T-15/5	SR 16-236
IHCR 68-90	T-20/5	SR 16-212
IHCR 90-120	T-20/5	SR 16-212
IHCR 120-160	T-20/5	SR 16-212
IHCR 160-800	T-20/5	SR 16-212

IHPR

75° Rough Boring Toolholders



Designation	d min	d max	f	l1	Inserts
IHPR 36-50	36.0	50.0	15.0	32.00	SCMT 09T3...
IHPR 50-68	50.0	68.0	19.0	40.00	SCMT 09T3...
IHPR 68-90	68.0	90.0	22.0	54.00	SCMT 1204...
IHPR 90-120	90.0	120.0	27.0	70.50	SCMT 1204...
IHPR 120-160	120.0	160.0	32.0	94.50	SCMT 1204...
IHPR 160-800	160.0	800.0	32.0	130.00	SCMT 1204...

• For user guide, see pages F28, F97, F100-106.

For inserts, see: SCGT-AS (F84) • SCMT-14 (F83) • SCMT-19 (F83) • SCMT-SM (F83).

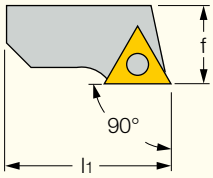
For holders, see: BHR MB (F29) • TCH (F30) • TCH AL (F31).

Spare Parts

Designation	Key	Screw
IHPR 36-50	T-15/5	SR 16-236
IHPR 50-68	T-15/5	SR 16-236
IHPR 68-90	T-20/5	SR 16-212
IHPR 90-120	T-20/5	SR 16-212
IHPR 120-160	T-20/5	SR 16-212
IHPR 160-800	T-20/5	SR 16-212

IHBR

Rough Boring Toolholders



Designation	d min	d max	f	l1	Inserts
IHBR 90-120	90.0	120.0	27.0	70.50	TCMT 2205...
IHBR 120-160	120.0	160.0	32.0	94.50	TCMT 2205...
IHBR 160-800	160.0	800.0	32.0	130.00	TCMT 2205...

• For user guide, see pages F28, F97, F100-106.

For inserts, see: TCMT-19 (F84).

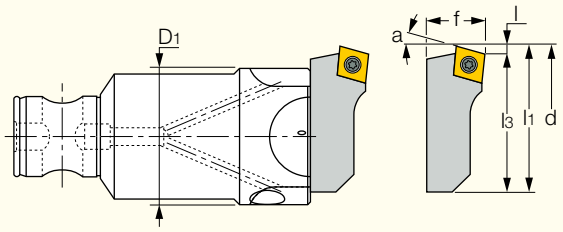
For holders, see: BHR MB (F29) • TCH (F30) • TCH AL (F31).

Spare Parts

Designation	Key	Screw
IHBR	T-20/5	SR 16-212

IHSR-CH

Chamfering Tools for BHR Boring Heads



Designation	d min	d max	a°	L3	l1	f	l	D1	Inserts
IHSR 26-38 CH15	26.0	38.0	15.0	23.00	24.70	13.5	1.70	25.0	CCMT 0602...
IHSR 26-38 CH30	26.0	38.0	30.0	23.00	26.20	13.5	3.20	25.0	CCMT 0602...
IHSR 26-38 CH45	26.0	38.0	45.0	23.00	27.50	13.5	4.50	25.0	CCMT 0602...
IHSR 34.5-49 CH15	34.5	49.0	15.0	31.00	32.70	16.0	1.70	32.0	CCMT 0602...
IHSR 34.5-49 CH30	34.5	49.0	30.0	31.00	34.20	16.0	3.20	32.0	CCMT 0602...
IHSR 34.5-49 CH45	34.5	49.0	45.0	31.00	35.50	16.0	4.50	32.0	CCMT 0602...
IHSR 46.5-66 CH15	46.5	66.0	15.0	39.00	41.50	20.0	2.50	40.0	CCMT 09T3...
IHSR 46.5-66 CH30	46.5	66.0	30.0	39.00	43.80	20.0	4.80	40.0	CCMT 09T3...
IHSR 46.5-66 CH45	46.5	66.0	45.0	39.00	45.80	20.0	6.80	40.0	CCMT 09T3...
IHSR 65-88 CH15	65.0	88.0	15.0	53.00	55.50	23.0	2.50	50.0	CCMT 1204...
IHSR 65-88 CH30	65.0	88.0	30.0	53.00	57.80	23.0	4.80	50.0	CCMT 1204...
IHSR 65-88 CH45	65.0	88.0	45.0	53.00	59.80	23.0	6.80	50.0	CCMT 1204...

• For user guide, see pages F28, F97, F100-106.

For inserts, see: CCET-WF (F76) • CCGT-AF (F79) • CCGT-AS (F79) • CCMT-14 (F76) • CCMT-PF (F75) • CCMT-WG (F77) • CCMT/CCGT (F77) • CCMT/CCGT-SM (F75).

For holders, see: BHR MB (F29).

Spare Parts

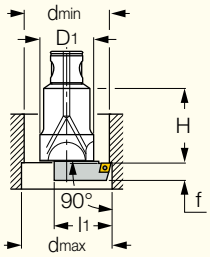
Designation	Key	Screw
IHSR 26-38 CH15	T-7/5*	SR 14-548*
IHSR 26-38 CH30	T-7/5*	SR 14-548*
IHSR 26-38 CH45	T-7/5*	SR 14-548*
IHSR 34.5-49 CH15	T-7/5*	SR 14-548*
IHSR 34.5-49 CH30	T-7/5*	SR 14-548*
IHSR 34.5-49 CH45	T-7/5*	SR 14-548*
IHSR 46.5-66 CH15	T-15/5*	SR 16-236*
IHSR 46.5-66 CH30	T-15/5*	SR 16-236*
IHSR 46.5-66 CH45	T-15/5*	SR 16-236*
IHSR 65-88 CH15	T-15/5*	SR 16-236*
IHSR 65-88 CH30	T-15/5*	SR 16-236*
IHSR 65-88 CH45	T-15/5*	SR 16-236*

* Optional, should be ordered separately

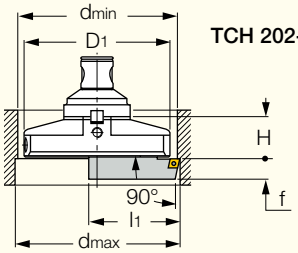
IHSR-BW

Back Face Turning Tools Used on BHR and TCH Rough Boring Heads

BHR 20-200



TCH 202-802



Designation	SS	d min	d max	D1(1)	H	f	l1	Inserts
IHSR 20-24 BW	BHR MB16-16	20.0	25.0	16.0	27.50	8.0	16.00	CCMT 0602...
IHSR 23.5-30BW	BHR MB20-20	23.5	30.0	20.0	32.50	9.5	19.50	CCMT 0602...
IHSR 29.5-40BW	BHR MB25-25	29.5	40.0	25.0	39.00	12.0	24.00	CCMT 0602...
IHSR 39-52 BW	BHR MB32-32	39.0	52.0	32.0	50.00	14.0	32.00	CCMT 09T3...
IHSR 51-70 BW	BHR MB40-40	51.0	70.0	40.0	63.50	17.5	42.00	CCMT 1204...
IHSR 69-92 BW	BHR MB50-50	69.0	92.0	55.0	80.50	21.0	57.00	CCMT 1204...
IHSR 91-122 BW	BHR MB63-63	91.0	122.0	72.0	100.50	25.0	76.00	CCMT 1204...
IHSR 121-162 BW	BHR MB80-80	121.0	162.0	95.0	110.50	28.0	101.00	CCMT 1204...
IHSR 161-802 BW	BHR MB80-80	161.0	200.0	95.0	110.50	28.0	122.00	CCMT 1204...
	TCH200	202.0	302.0	198	56.50	28.0	122.00	CCMT 1204...
	TCH300	302.0	402.0	298	56.50	28.0	122.00	CCMT 1204...
	TCH400	402.0	502.0	398	61.50	28.0	122.00	CCMT 1204...
	TCH500	502.0	602.0	494	61.50	28.0	122.00	CCMT 1204...
	TCH600	602.0	702.0	594	61.50	28.0	122.00	CCMT 1204...
	TCH700	702.0	802.0	694	61.50	28.0	122.00	CCMT 1204...

• dmin=(min bore diameter)=(dmax+D1+1)/2 • D1=Size of the boring head being used • For user guide, see pages F28, F97, FF100-106.

(1) Size of the boring head being used.

For inserts, see: CCET-WF (F76) • CCGT-AF (F79) • CCGT-AS (F79) • CCMT (CBN) (F78) • CCMT (PCD) (F78) • CCMT-14 (F76) • CCMT-PF (F75) • CCMT-WG (F77) • CCMT/CCGT (F77) • CCMT/CCGT-SM (F75).

For holders, see: BHF L200 (F59) • BHR MB (F29) • TCH (F30) • TCH AL (F31).

Spare Parts

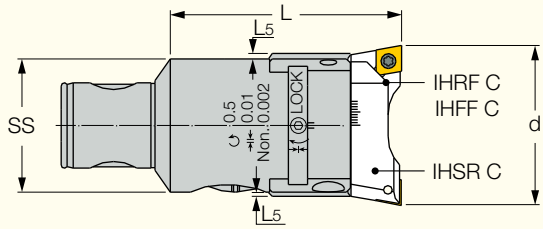
Designation	Key	Screw
IHSR 20-24 BW	T-7/5*	SR 14-548*
IHSR 23.5-30BW	T-7/5*	SR 14-548*
IHSR 29.5-40BW	T-7/5*	SR 14-548*
IHSR 39-52 BW	T-15/5*	SR 16-236*
IHSR 51-70 BW	T-20/5*	SR 16-212*
IHSR 69-92 BW	T-20/5*	SR 16-212*
IHSR 91-122 BW	T-20/5*	SR 16-212*
IHSR 121-162 BW	T-20/5*	SR 16-212*
IHSR 161-802 BW	T-20/5*	SR 16-212*

* Optional, should be ordered separately

BHC MB

Combi Rough and Fine Boring Heads with 10 µm Direct Dia. Adjustment and 2 µm by a Vernier Scale

10 µm
2 µm



Designation	SS	d min	d max	L	L5	IH
BHC MB25-25X57	MB25	28.0	36.0	56.50	0.50	IH...-C
BHC MB32-32X71	MB32	36.0	46.0	71.00	0.50	IH...-C
BHC MB40-40X90	MB40	46.0	60.0	90.00	1.00	IH...-C
BHC MB50-50X87	MB50	60.0	75.0	87.00	1.00	IH...-C
BHC MB63-63X109	MB63	78.0	100.0	109.00	2.00	IH...-C
BHC MB80-80X130	MB80	100.0	125.0	130.00	2.00	IH...-C

- The roughing head precedes the finishing head by 0.2 mm. Each head can be adjusted independently
- Important: insert radius for combi rough and fine boring must be the same size.

For tools, see: IHFF-C (F38) • IHRF-C (F38) • IHSR-C (F39).

• For spare parts see page F92.

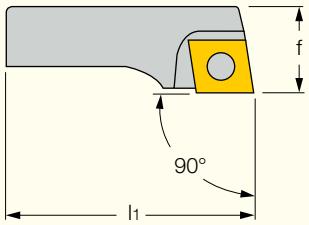
Graduated dial of 0.01 mm with circular vernier of 0.002 mm

Spare Parts

Designation	Rectangular Nut	Screw
BHC MB25-25X57	BH NUT BHC MB25	BH SR M4X11 DIN 912 PT
BHC MB32-32X71	BH NUT BHC MB32	BH SR M5X12.5 DIN 912 PT
BHC MB40-40X90	BH NUT BHC MB40	BH SR M6X16 DIN 912 PT
BHC MB50-50X87	BH NUT BHC MB50	BH SR M8X20 DIN 912 PT
BHC MB63-63X109	BH NUT BHC MB63	BH SR M10X26 DIN 912 PT
BHC MB80-80X130	BH NUT BHC MB80	BH SR M12X30 DIN 912 PT

IHRF-C

Boring Tools Used for Twin Cutters, Inner to the Opposite - Finishing Tools on MB BHC Combi Boring Heads



Designation	d Range	f	l_1	Inserts
IHRF 28-36 C	28-36	9.8	24.00	CCGT 0602...
IHRF 36-46 C	36-46	11.3	30.00	CCGT 0602...
IHRF 46-60 C	46-60	13.6	40.00	CCGT 09T3...
IHRF 60-75 C	60-78	18.8	54.00	CCGT 09T3...
IHRF 75-95 C	78-100	24.3	68.00	CCGT 09T3...
IHRF 95-120 C	100-125	29.5	87.00	CCGT 09T3...

For inserts, see: CCGT-AS (F79) • CCMT (CBN) (F78) • CCMT (PCD) (F78) • CCMT-14 (F76) • CCMT-PF (F75) • CCMT-WG (F77) • CCMT/CCGT (F77) • CCMT/CCGT-SM (F75).

For holders, see: BHC MB (F37).

• For user guide, see page F106.

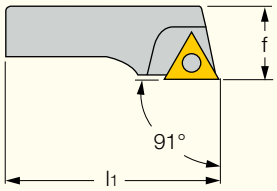
Spare Parts

Designation	Key	Screw
IHRF 28-36 C	T-7/5*	SR 14-548*
IHRF 36-46 C	T-7/5*	SR 14-548*
IHRF 46-60 C	T-15/5*	SR 16-236*
IHRF 60-75 C	T-15/5*	SR 16-236*
IHRF 75-95 C	T-15/5*	SR 16-236*
IHRF 95-120 C	T-15/5*	SR 16-236*

* Optional, should be ordered separately

IHFF-C

Triangular Finishing Insert Holders Used for BHC Combi Boring Heads



Designation	d Range	f	l_1	Inserts
IHFF 28-36 C	28-36	9.8	24.00	TPGX 0902...
IHFF 36-46 C	36-46	11.3	30.00	TPGX 0902...
IHFF 46-60 C	46-60	13.8	40.00	TPGX 1103...
IHFF 60-75 C	60-75	18.8	54.00	TPGX 1103...
IHFF 75-95 C	75-95	24.3	68.00	TPGX 1103...
IHFF 95-120 C	95-120	29.3	87.00	TPGX 1103...

For inserts, see: TPGX (F85) • TPGX (CBN) (F86).

For holders, see: BHC MB (F37).

• For user guide, see page F106.

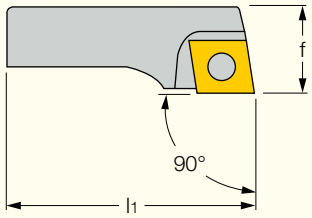
Spare Parts

Designation	Key	Screw
IHFF 28-36 C	T-8/5*	SR 14-298*
IHFF 36-46 C	T-8/5*	SR 14-298*
IHFF 46-60 C	T-8/5*	SR 14-300*
IHFF 60-75 C	T-8/5*	SR 14-300*
IHFF 75-95 C	T-8/5*	SR 14-300*
IHFF 95-120 C	T-8/5*	SR 14-300*

* Optional, should be ordered separately

IHSR-C

Rhombic Rough Insert Holders Used on the BHC Combi Boring Heads



Designation	d Range	f	l_1	Inserts
IHSR 28-36 C	28-36	10.0	24.00	CCMT 0602
IHSR 36-46 C	36-46	11.5	30.00	CCMT 0602
IHSR 46-60 C	46-60	14.0	40.00	CCMT 09T3
IHSR 60-75 C	60-78	19.0	54.00	CCMT 09T3
IHSR 75-95 C	78-100	24.5	68.00	CCMT 09T3
IHSR 95-120 C	100-125	29.5	87.00	CCMT 09T3

• For user guide, see pages F106.

For inserts, see pages: CCET-WF (F76) • CCGT-AF (F79) • CCGT-AS (F79) • CCMT (CBN) (F78) • CCMT (PCD) (F78) • CCMT-14 (F76) • CCMT-PF (F75) • CCMT-WG (F77) • CCMT/CCGT (F77) • CCMT/CCGT-SM (F75).

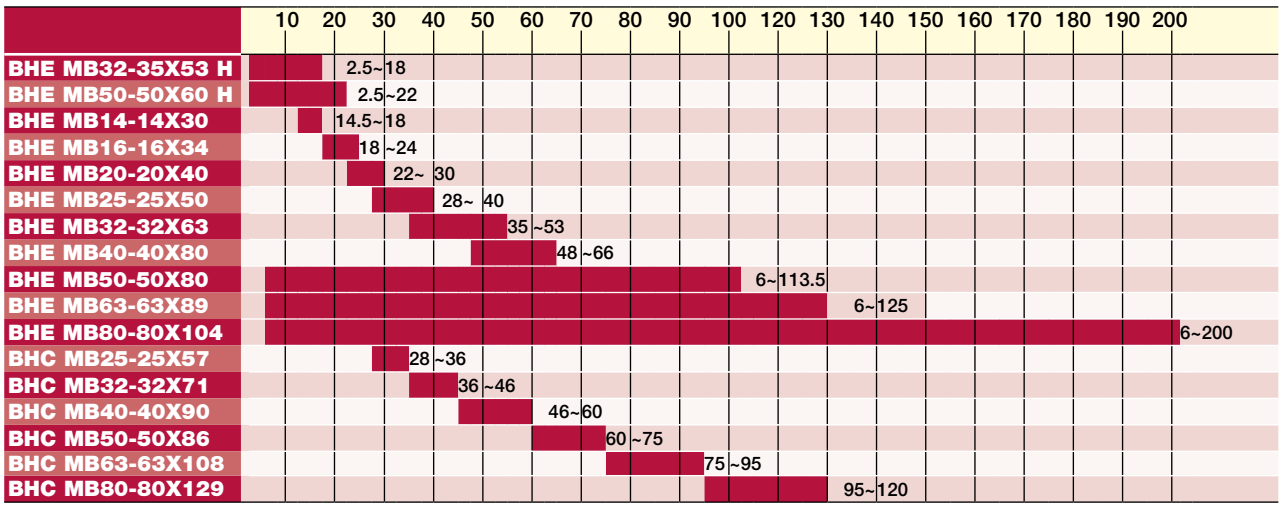
For holders, see: BHC MB (F37).

Spare Parts

Designation	Key	Screw
IHSR 28-36 C	T-7/5*	SR 14-548*
IHSR 36-46 C	T-7/5*	SR 14-548*
IHSR 46-60 C	T-15/5*	SR 16-236*
IHSR 60-75 C	T-15/5*	SR 16-236*
IHSR 75-95 C	T-15/5*	SR 16-236*
IHSR 95-120 C	T-15/5*	SR 16-236*

* Optional, should be ordered separately

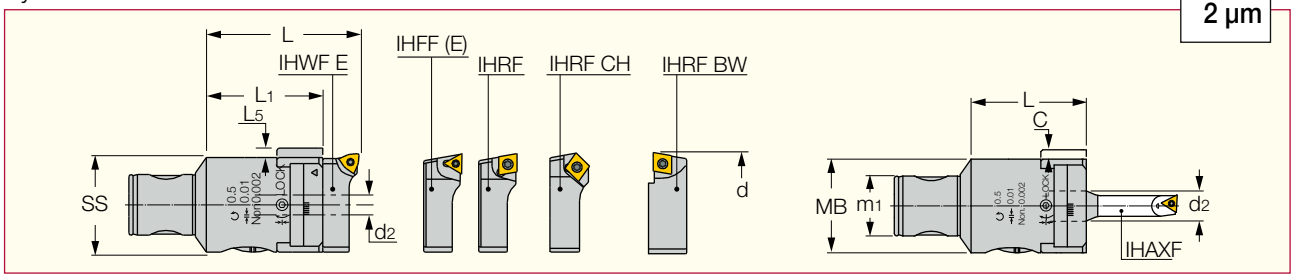
Boring Head Diameter Range



BHE MB

Fine Boring Head for the MB Boring System 10 µm Direct Dia. Adjustment and 2 µm by a Vernier Scale

10 µm
2 µm



Designation	SS	d min	d max	L	L1	L5	d2	Kg
BHE MB14-14X30	MB14	14.5	18.0	30.00	22.0	1.00	-	0.09
BHE MB16-16X34	MB16	18.0	24.0	34.00	26.0	2.00	-	0.10
BHE MB20-20X40	MB20	22.0	30.0	40.00	31.5	3.00	-	0.15
BHE MB25-25X50	MB25	28.0	40.0	50.00	40.0	3.00	-	0.23
BHE MB32-32X63	MB32	35.0	53.0	63.00	51.5	4.00	8.00	0.42
BHE MB40-40X80	MB40	48.0	66.0	80.00	66.0	5.00	-	0.83
BHE MB50-50X80	MB50	6.0	110.0	80.00	61.0	5.00	16.00	1.15
BHE MB63-63X89	MB63	6.0	125.0	89.00	69.5	10.00	-	2.13
BHE MB80-80X104	MB80	6.0	200.0	104.00	85.0	12.00	-	3.83

• For boring options, see pages F6-7, F39 ,F41-43 • For spare parts, see pages F56, F57, F90-91.

For tools, see: IHAXF (F53) • IHAXF-AVI (F54) • IHAXF-E (F55) • IHFF (F57) • IHRF (F58) • IHRF-BW (F62) • IHRF-CH (F63) • IHWF (F58).

Spare Parts

Designation	Screw
BHE MB14-14X30	BH SR M3X3.5 DIN 913
BHE MB16-16X34	BH SR M3X4.5 DIN 913
BHE MB20-20X40	BH SR M3X4.5 DIN 913

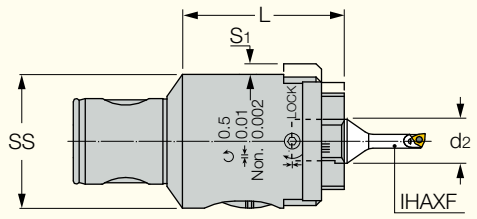
BHE MB50-50X80

Graduated dial of 0.01 mm with circular vernier of 0.002 mm

BHE MB-H

Fine Boring Heads for High Rotation Speed with 10 Micrometer Direct Dia. Adjustment and 2 Micrometer by a Vernier Scale

10 µm
2 µm



Designation	SS	d min	d max	L	d2	S1	RPM max	Kg
BHE MB32-32X53 H	MB32	2.5	18.0	53.00	8.00	3	12.000	0.42
BHE MB50-50X60 H	MB50	2.5	22.0	60.00	16.00	4	12.000	1.06

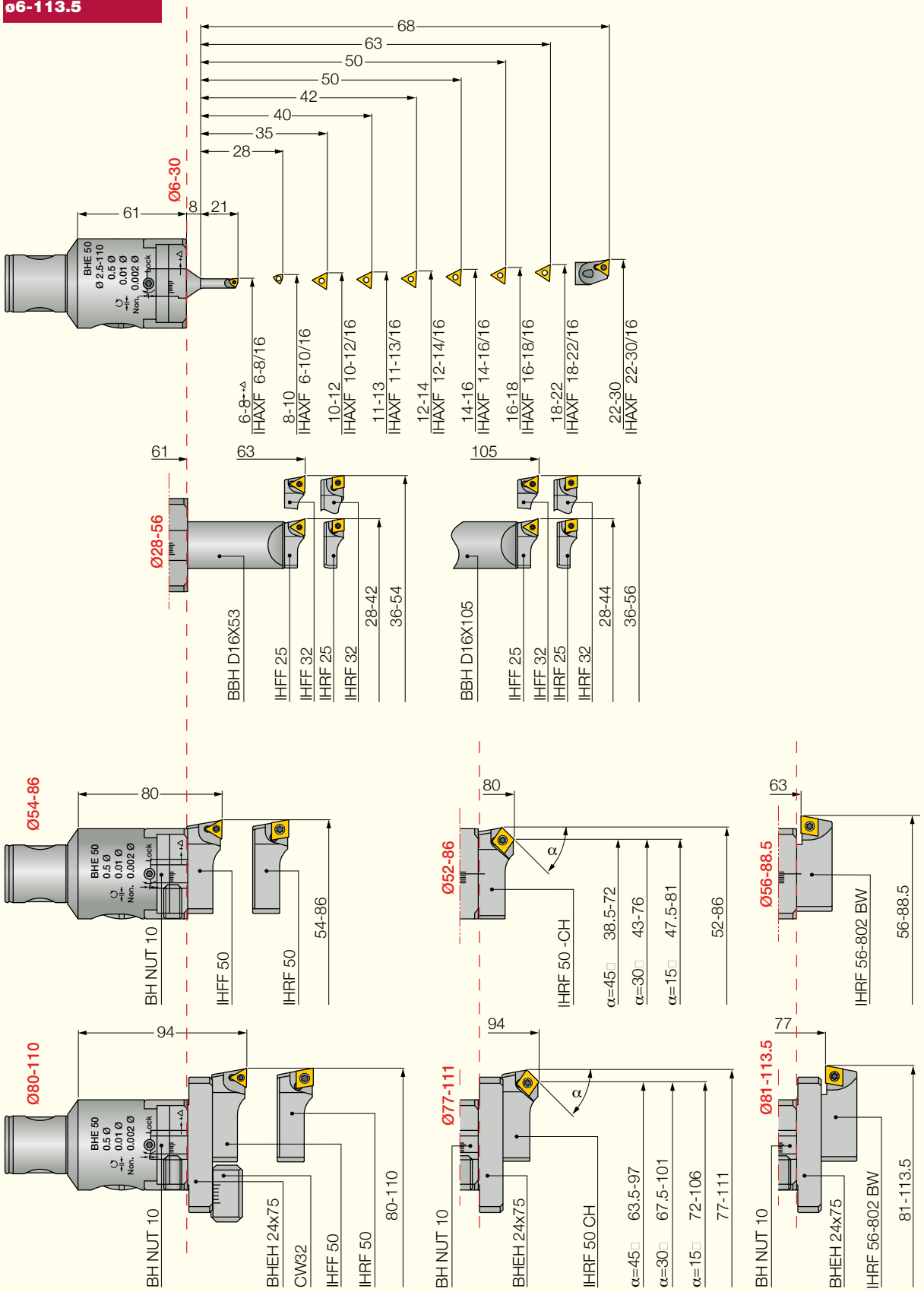
For tools, see: IHAXF (F53) • IHAXF-AVI (F54) • IHAXF-E (F55).

Fine Boring Head Range

10 µm Direct Diametric Adjustment and 2 mm by a Vernier Scale

10 µm
2 µm

BHE MB50-50x80
ø6-113.5

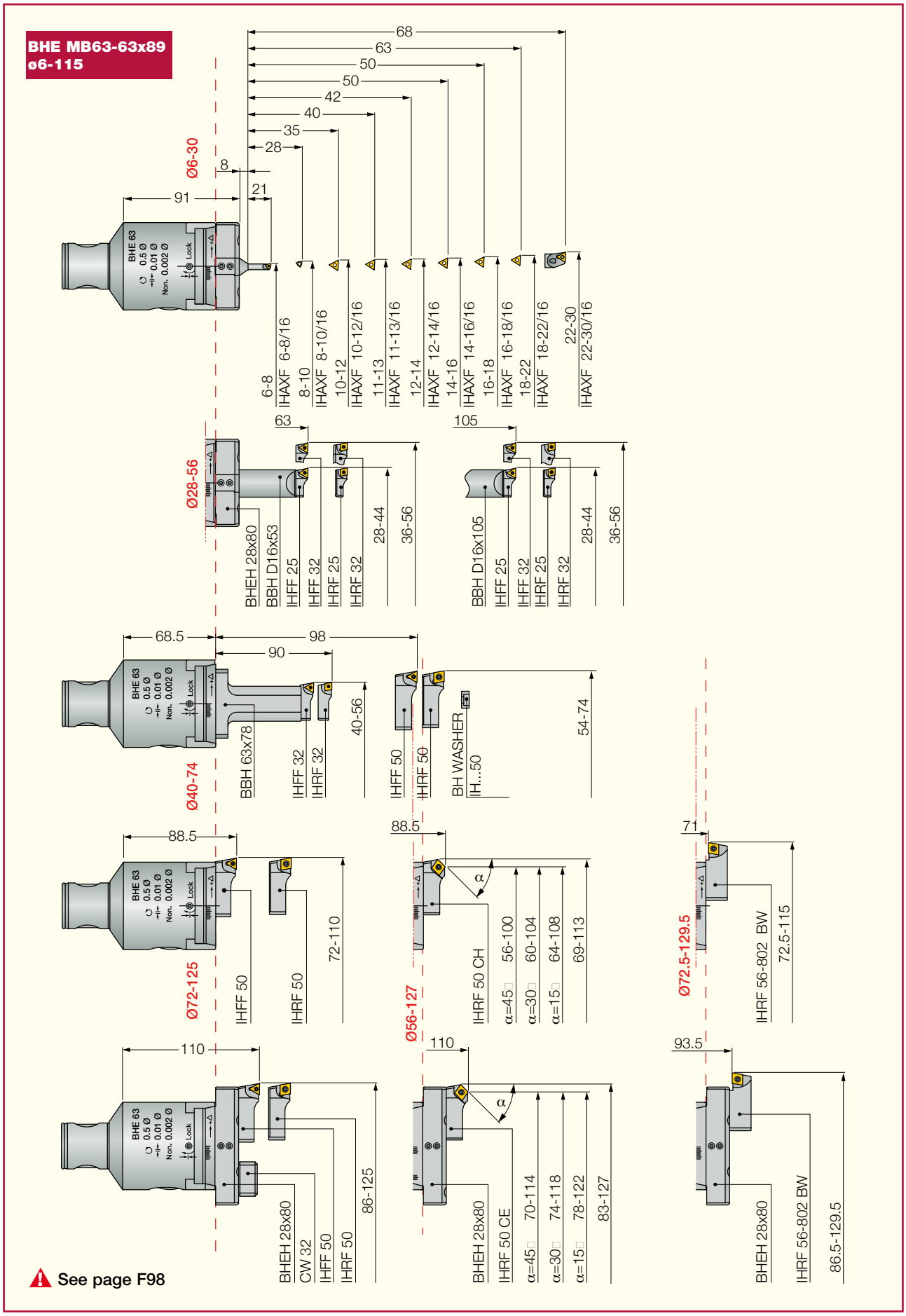


See page F98

10 µm
2 µm

Fine Boring Head Range

10 µm Direct Diametric Adjustment and 2 mm by a Vernier Scale



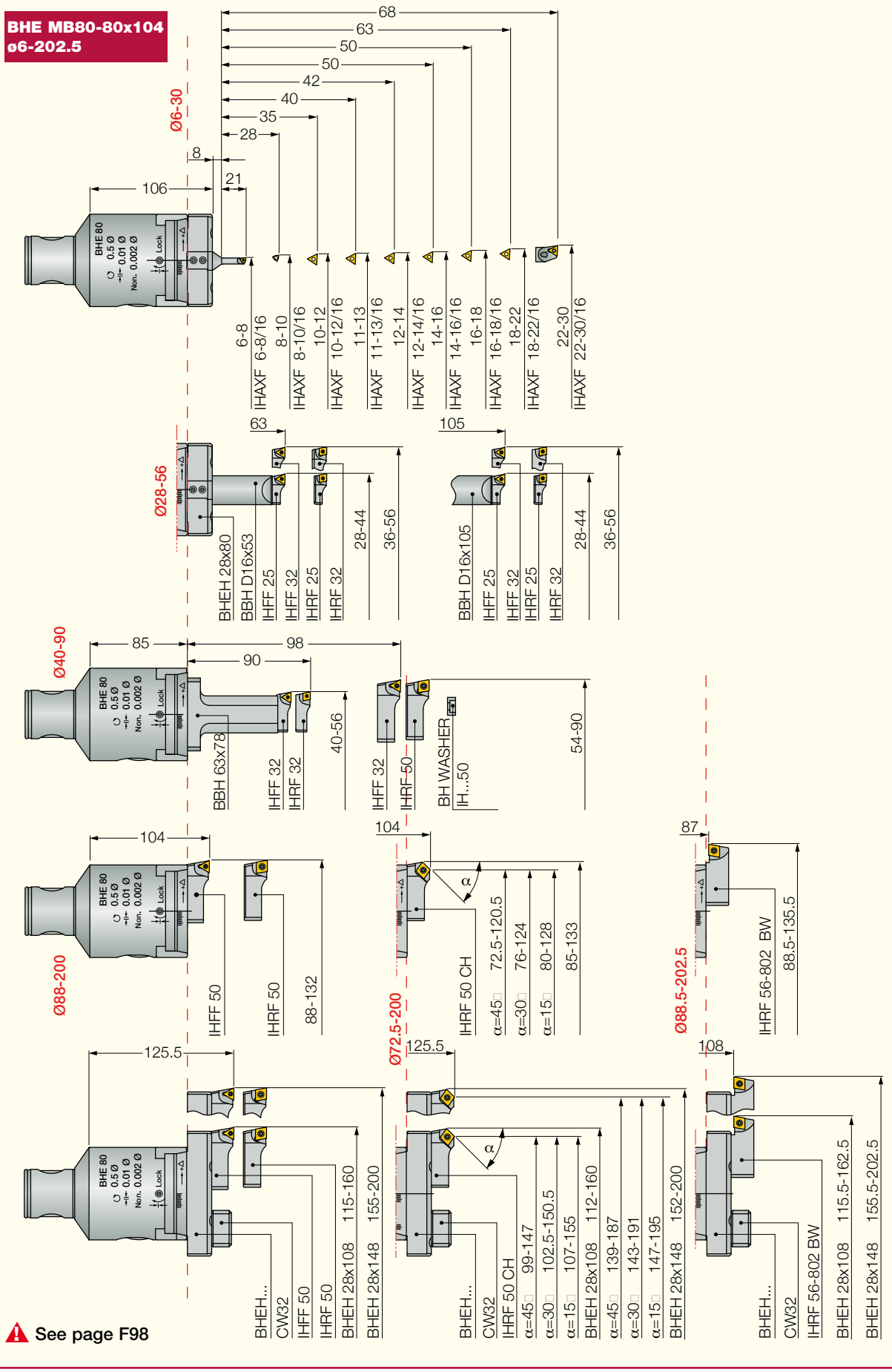
See page F98

10 µm
2 µm

Fine Boring Head Range

10 µm Direct Diametric Adjustment and 2 mm by a Vernier Scale

BHE MB80-80x104
ø6-202.5



See page F98

BHF Fine Boring Heads

2 µm Direct Diametric Adjustment

2 µm

Fine Boring Head Diameter Range

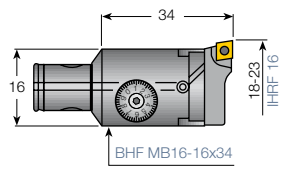
	0 10 20 30 40 50 60 70 80 90 100 110 120 130 150 180 280 400 600 700 800	Assembly Reference Page
BHF MB50-32x60 BL	2.5-12	F50
BHF MB50-50x68 BL	2.5-20	
BHF MB50-50x60	6-108	F52
BHF MB50-63x87	2.5-160	F52
BHF MB50-80x94	2.5-220	
BHF MB80-80x94	2.5-220	
BHF MB16-16x34	18-23	F52
BHF MB20-20x40	22-29	
BHF MB25-25x50	28-38	
BHF MB32-32x63	36-50	
BHF MB40-40x80	48-63	F52
BHF MB80-125x114	36-500	F52, F61
TCH A.L 500	500-600	
TCH A.L 600	600-700	
TCH A.L 700	700-800	

BHF Fine Boring Heads

High precision machining to a close tolerance with a high surface quality.
These heads enable a fine diametric adjustment as small as **2 µm** with a direct reading.

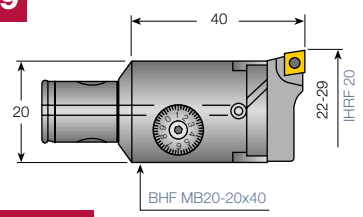
BHF MB16-MB40
Diameter Range: 18-63

ø18-23



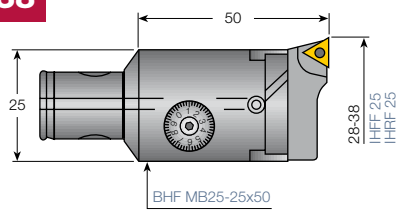
BHF MB16-16x34

ø22-29

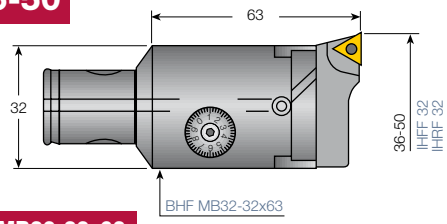


BHF MB20-20x40

ø28-38

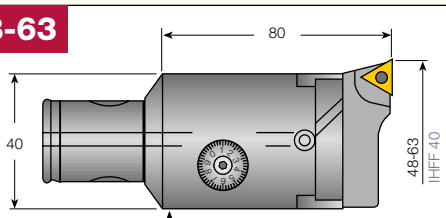


ø36-50



BHF MB32-32x63

ø48-63



BHF MB40-40x80

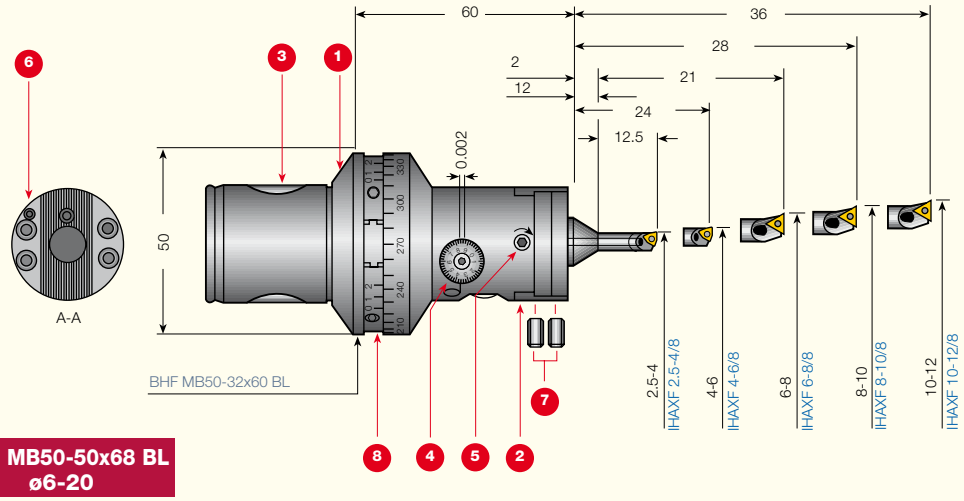
Fine Boring Heads with Balancing Rings

2 µm Direct Diametric Adjustment

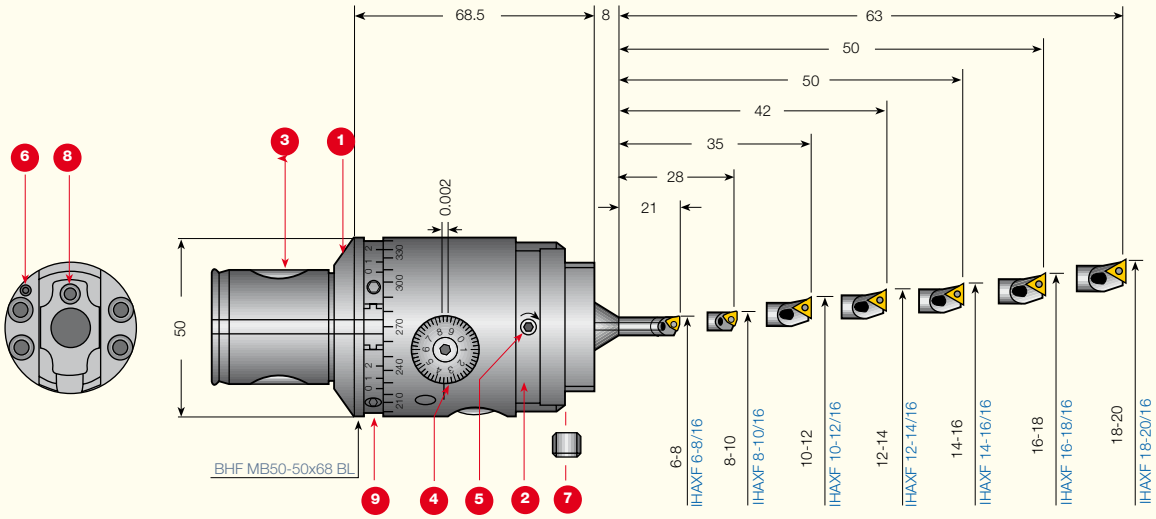
2 µm

BHF MB50-32x60 BL ø2.5-12

1. Body
2. Tool Slide
3. Expansion Pin
4. Graduated Dial
5. Slide Locking Screw
6. Coolant Nozzle
7. Boring Bar Locking Screws
8. Balancing Rings



BHF MB50-50x68 BL ø6-20



1. Body
2. Tool Slide
3. Expansion Pin
4. Graduated Dial
5. Slide Locking Screw
6. Coolant Nozzle
7. Boring Bar Locking Screws
8. Oiling Nipple
9. Balancing Rings

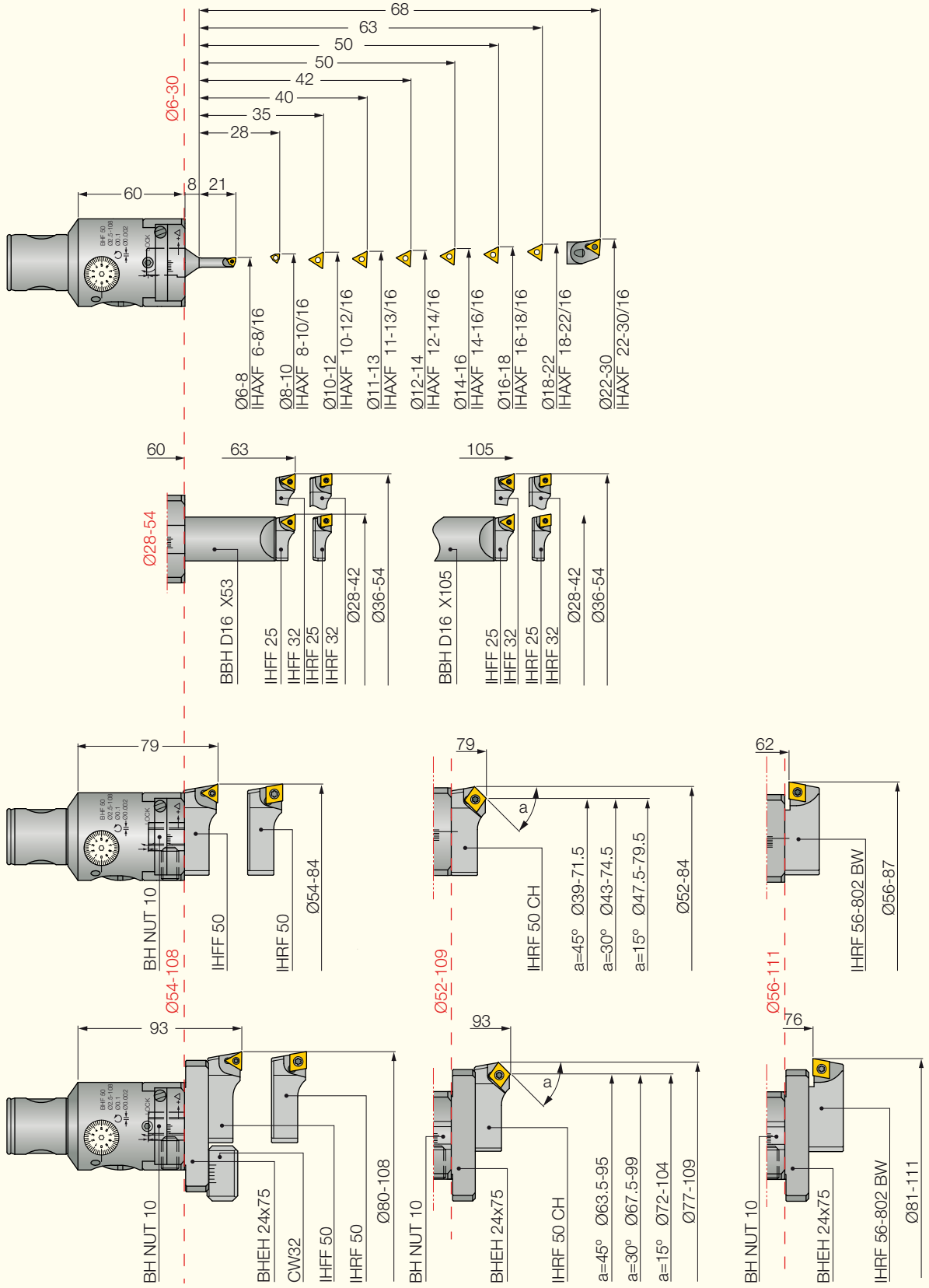
See page F98

Fine Boring Head Range

2 µm Direct Diametric Adjustment

2 µm

BHF MB50-50x60
ø6-108



See page F98

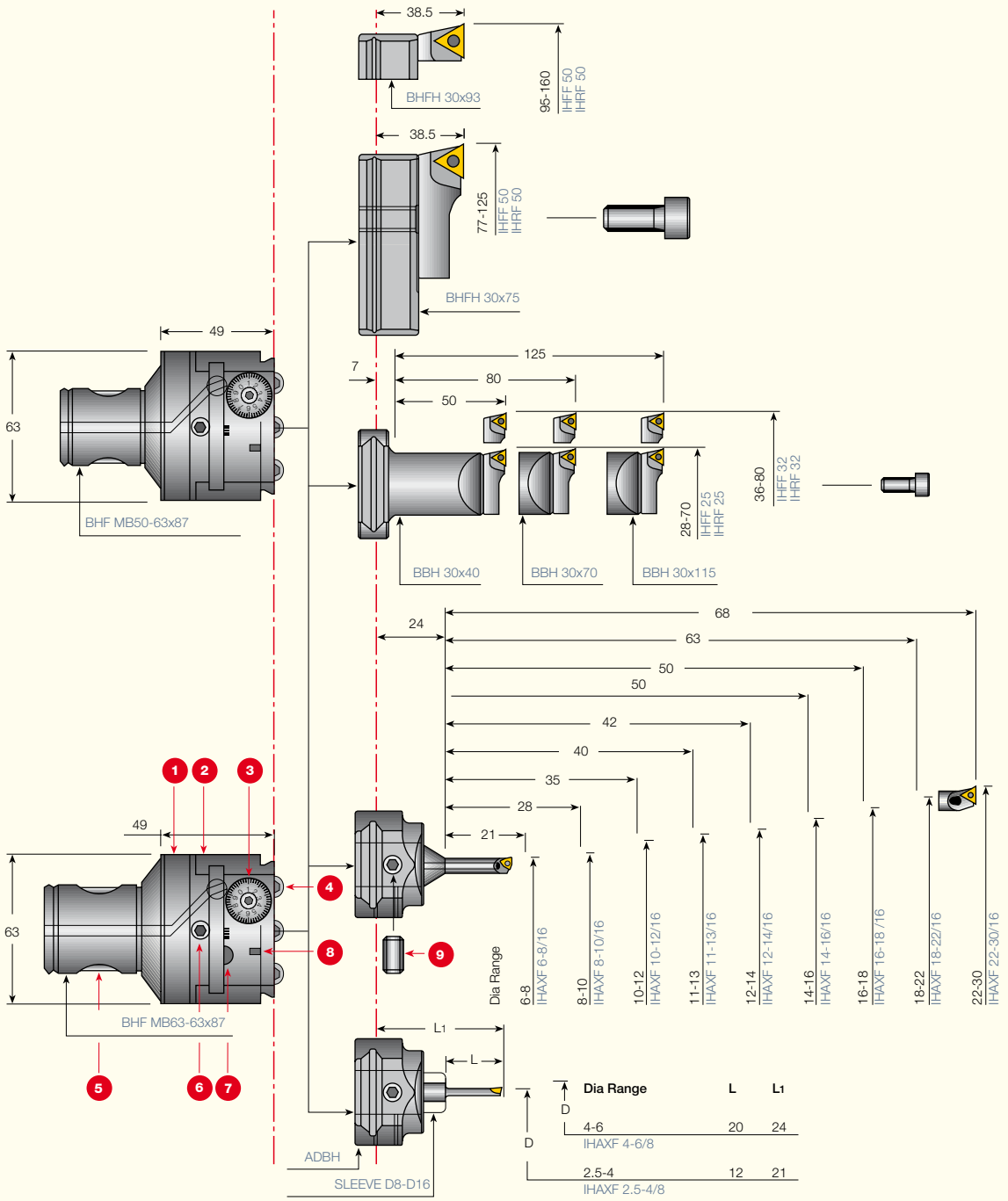
Fine Boring Head Range

2 µm Direct Diametric Adjustment

2 µm

BHF MB50-63x87
BHF MB63-63x87
ø2.5-160

1. Body
2. Tool Slide
3. ⚠ Graduated Dial
4. Toolholder Locking Screw
5. Expansion Pin
6. Slide Locking Screw
7. Coolant Nozzle
8. Oiling Nipple
9. Toolholder Locking Screw



⚠ See page F98

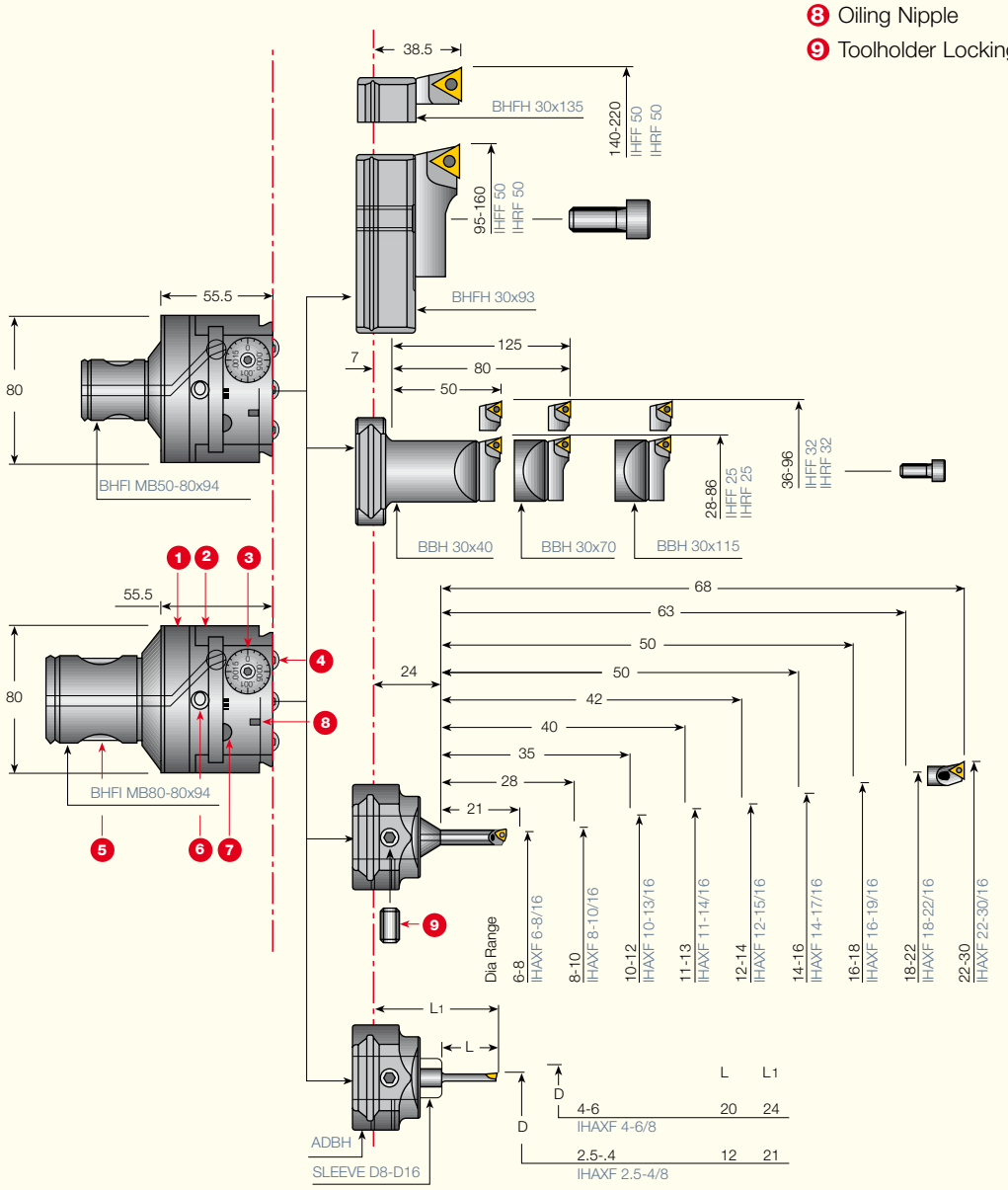
Fine Boring Head Range

2 µm Direct Diametric Adjustment

2 µm

BHF MB50-80x94
BHF MB80-80x94
ø2.5-220

1. Body
2. Tool Slide
3. ⚠ Graduated Dial
4. Toolholder Locking Screw
5. Expansion Pin
6. Slide Locking Screw
7. Coolant Nozzle
8. Oiling Nipple
9. Toolholder Locking Screw



⚠ See page F98

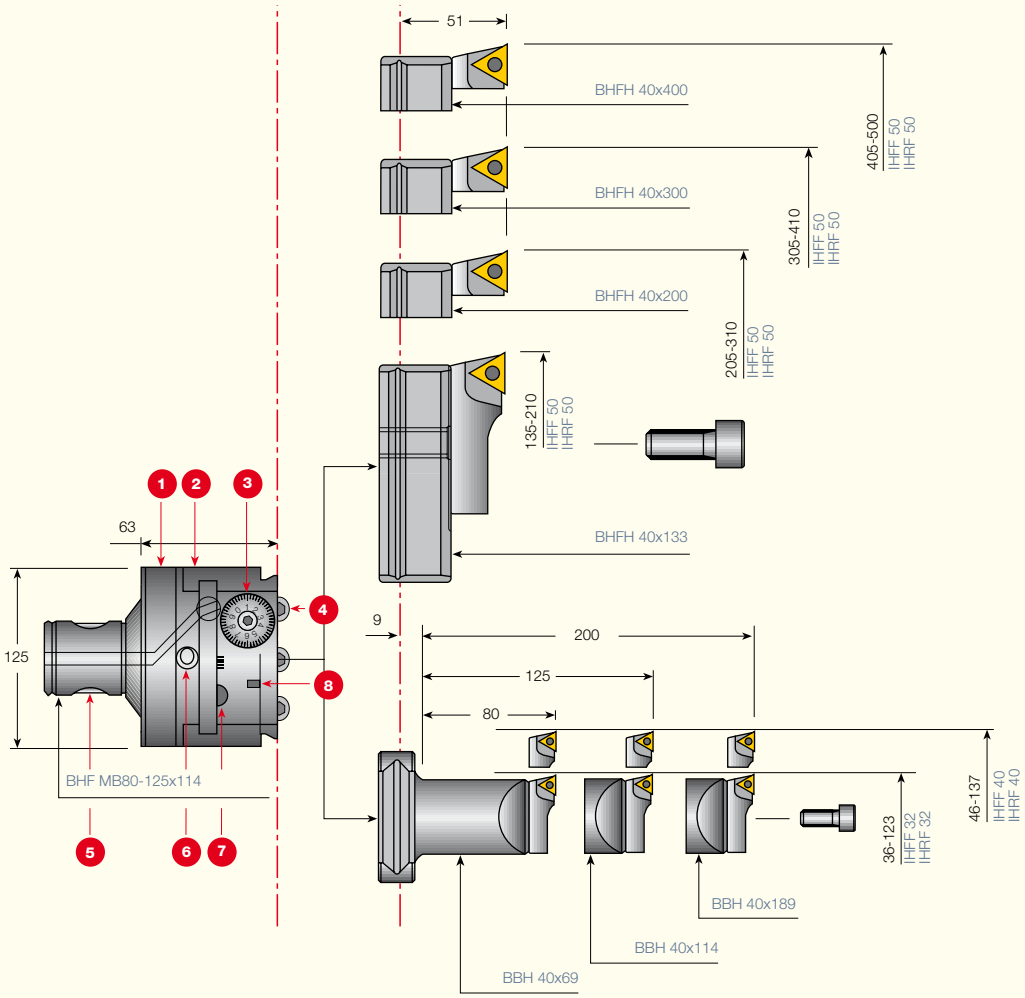
Fine Boring Head Range

2 µm Direct Diametric Adjustment

2 µm

BHF MB80-125x114
ø36-500

1. Body
2. Tool Slide
3. Graduated Dial
4. Toolholder Locking Screw
5. Expansion Pin
6. Slide Locking Screw
7. Coolant Nozzle
8. Oiling Nipple

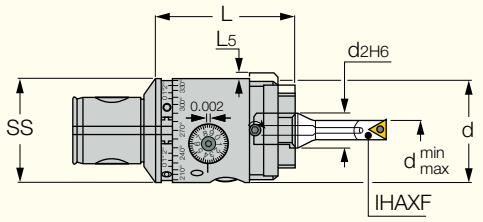


See page F98

BHF MB-BL

Fine Boring Heads with a Balancing Mechanism and 2 Micrometer Direct Diametric Adjustment

2 µm



Designation	d min	d max	d2	SS	d	L	L5	Kg
BHF MB50-32X60 BL	2.5	12.0	8.00	MB50	32.00	60.00	3.00	0.79
BHF MB50-50X68 BL	2.5	20.0	16.00	MB50	50.00	68.50	4.00	1.16

For tools, see: IHAXF (F53).

- For boring options, see page F45
- For spare parts see page F89
- For cutting conditions see page F97

Balancing Weights **W1** & **W2**

BHF MB50-32X60 BL and BHF MB50-50X68 BL, with the simple positioning of the two counterweights into the graduated groove.
The table below displays all tools available for the working range of 2.5-22 mm diameters.

Balance Correction for BHF MB50-32x60BL

TOOLS	Ø BORE	SKB 40-MB50		BTB 40 MB50		HSK 63 MB50	
		W1	W2	W1	W2	W1	W2
IHAXF 2.5-4/8	2.5	66°	283°	54°	292°	60°	257°
	3	76°	283°	56°	284°	8°	196°
	3.5	83°	360°	44°	246°	107°	261°
	4	116°	285°	30°	224°	128°	264°
IHAXF 4-6/8	4	71°	293°	50°	294°	63°	262°
	4.5	75°	287°	55°	287°	6°	194°
	5.5	4°	238°	44°	248°	129°	287°
	5.5	126°	298°	32°	229°	129°	268°
	6	123°	264°	145°	301°	136°	254°
IHAXF 6-8/8	6.6	2°	302°	45°	307°	68°	280°
	6.5	75°	288°	56°	288°	78°	274°
	7.7	5°	280°	55°	280°	179°	351°
	7.5	16°	199°	78°	295°	129°	284°
	8	121°	292°	18°	214°	128°	275°
IHAXF 8-10/8	8	70°	295°	49°	297°	88°	300°
	8.5	75°	280°	55°	281°	51°	245°
	9	67°	255°	49°	258°	160°	330°
	9.5	131°	302°	19°	216°	112°	273°
	10	119°	272°	167°	320°	129°	266°
IHAXF 10-12/8	10	65°	293°	46°	293°	56°	257°
	10.5	66°	273°	29°	262°	182°	351°
	11	44°	234°	45°	255°	163°	317°
	11.5	130°	295°	16°	214°	131°	270°
	12	127°	275°	156°	312°	138°	259°

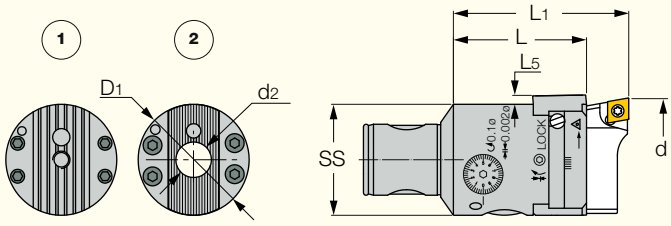
Balancing Data for Various BHF...MB...BL Boring Combinations (continued)

Balance Correction for BHF MB50-50x68 BL							
TOOLS	Ø BORE	SKB 40-MB50		BTB 40 MB50		HSK 63 MB50	
		W1	W2	W1	W2	W1	W2
IHAXF 6- 8/16	6.0	43°	315°	46°	346°	46°	346°
	6.5	63°	326°	44°	326°	59°	336°
	7	82°	305°	67°	304°	93°	323°
	7.5	30°	205°	62°	255°	5.5°	163°
	8	124°	242°	126°	258°	92°	219°
IHAXF 8-10/16	8	42°	312°	36°	336°	48°	348°
	8.5	52°	328°	39°	339°	75°	330°
	9	68°	318°	51°	317°	112°	331°
	9.5	104°	283°	73°	268°	56°	212°
	10	110°	270°	15°	200°	113°	222°
IHAXF 10-12/16	10	35°	336°	30°	330°	44°	344°
	10.5	44°	321°	32°	332°	45°	345°
	11	56°	307°	35°	312°	71°	325°
	11.5	153°	328°	21°	223°	327°	121°
	12	139°	297°	171°	333°	84°	234°
IHAXF 12-14/16	12	30°	330°	26°	326°	40°	340°
	12.5	32°	332°	28°	328°	48°	334°
	13	64°	281°	40°	280°	80°	304°
	13.5	38°	236°	42°	261°	38°	208°
	14	138°	253°	177°	300°	114°	236°
IHAXF 14-16/16	14	22°	324°	18°	318°	39°	339°
	14.5	30°	330°	16°	316°	357°	357°
	15	37°	257°	22°	266°	54°	302°
	15.5	184°	340°	35°	270°	130°	297°
	16	160°	253°	172°	277°	138°	251°
IHAXF 16-18/16	16	26°	326°	24°	324°	358°	358°
	16.5	36°	303°	14°	313°	37°	319°
	17	37°	276°	27°	292°	56°	272°
	17.5	151°	287°	187°	324°	128°	288°
	18	160°	279°	189°	304°	140°	243°
IHAXF 18-22/16	18	10°	310°	6°	305°	28°	328°
	18.5	29°	328°	0°	300°	17°	313°
	19	200°	317°	230°	332°	26°	259°
	19.5	190°	295°	208°	307°	169°	303°
	20	180°	242°	188°	249°	174°	234°
	20.5	179°	240°	186°	247°	168°	228°
	21	176°	236°	174°	236°	169°	229°
	21.5	190°	252°	141°	202°	170°	230°
	22	180°	240°	170°	230°	176°	236°

BHF MB16-MB50 Dia. 6-108

Fine Boring Heads with 2 µm Direct Diametric Adjustment for Diameter Range 6 to 108 mm

2 µm



Designation	SS	d min	d max	D1	L	L1	L5	d2	Fig	IH	Kg
BHF MB16-16X34 RV	MB16	18.0	23.0	16.0	26.00	34.0	1.00	-	1	IH.. 16..	0.11
BHF MB20-20X40 RV	MB20	22.0	29.0	20.0	31.50	40.0	2.00	-	1	IH.. 20..	0.16
BHF MB25-25X50	MB25	28.0	38.0	25.0	40.00	50.0	2.00	-	1	IH.. 25..	0.23
BHF MB32-32X63	MB32	35.5	50.0	32.0	51.50	63.0	3.00	-	1	IH.. 32..	0.43
BHF MB40-40X80	MB40	48.0	63.0	40.0	66.00	80.0	4.00	-	1	IH.. 40..	0.83
BHF MB50-50X60	MB50	6.0	108.0	50.0	60.00	79.0	4.00	16.00	2	IH.. 50..	1.15

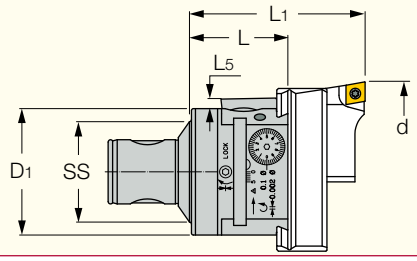
For tools, see: IHAXF (F53) • IHAXF-AVI (F54) • IHAXF-E (F55) • IHFF (F57) • IHRF (F58) • IHRF-BW (F62) • IHRF-CH (F63).

- For user guide see pages F46, F98.
- For spare parts see page F88

BHF MB50-MB80 Dia. 77-500

Fine Boring Heads with 2 µm Direct Diametric Adjustment for Diameter Range 77 to 500 mm

2 µm



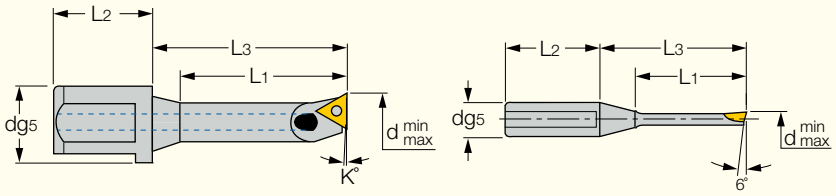
Designation	SS	d min	d max	D1	L	L1	L5	Kg
BHF MB50-63X87 (1)	MB50	77.0	125.0	63.0	49.00	87.0	5.00	1.26
BHF MB50-80X94 (2)	MB50	95.0	160.0	80.0	58.00	94.0	5.00	2.16
BHF MB63-63X87 (1)	MB63	77.0	125.0	63.0	49.00	87.0	5.00	1.57
BHF MB80-80X94 (2)	MB80	95.0	160.0	80.0	58.00	94.0	5.00	2.67
BHF MB80-125X114 (3)	MB80	135.0	500.0	125.0	63.00	114.0	5.00	5.78

(1) Use with slide BHFH 30X75 or BHFH 30X93. (2) Use with slide BHFH 30X93 or BHFH 30X135. (3) Use with slide BHFH 40X133, BHFH 40X200, BHFH 40X300 and BHFH 40X400.

- For tools, see pages: IHAXF (F53) • IHFF (F57) • IHRF (F58).
- For user guide see pages: F47-49, F99.
- For spare parts see pages F55-56, F89, F95.

IHAXF

Brazed and Indexable Boring Bars Used on the Modular MB Boring System



Designation	d min	d max	L1	L3	L2	d	Insert
IHAXF 2.5-4/8 (1)	2.5	4.0	12.5	21.00	22.00	8.00	SOLID
IHAXF 4- 6/8 (1)	4.0	6.0	20.0	24.00	24.00	8.00	SOLID
IHAXF 6- 8/16	6.0	8.0	21.0	29.00	22.00	16.00	WCGT 0201...
IHAXF 6- 8/8	6.0	8.0	21.0	21.00	16.00	8.00	WCGT 0201...
IHAXF 8-10/16	8.0	10.0	28.0	36.00	22.00	16.00	WCGT 0201...
IHAXF 8-10/8	8.0	10.0	-	21.00	16.00	8.00	WCGT 0201...
IHAXF 10-12/16	10.0	12.0	35.0	43.00	22.00	16.00	TPGX 0902...
IHAXF 10-12/8	10.0	12.0	-	36.00	16.00	8.00	TPGX 0902...
IHAXF 11-13/16	11.0	13.0	40.0	48.00	22.00	16.00	TPGX 0902...
IHAXF 12-14/16	12.0	14.0	42.0	48.00	22.00	16.00	TPGX 0902...
IHAXF 12-14/8	12.0	14.0	-	42.00	14.00	8.00	TPGX 0902...
IHAXF 14-16/16	14.0	16.0	50.0	52.00	22.00	16.00	TPGX 0902...
IHAXF 14-16/8	14.0	16.0	-	48.00	14.00	8.00	TPGX 0902...
IHAXF 16-18/16	16.0	18.0	50.0	58.00	22.00	16.00	TPGX 0902...
IHAXF 16-18/8	16.0	18.0	-	54.00	14.00	8.00	TPGX 0902...
IHAXF 18-22/16	18.0	22.0	60.0	63.00	22.00	16.00	TPGX 0902...
IHAXF 22-30/16	22.0	30.0	60.0	68.00	22.00	16.00	TPGX 0902...

(1) Brazed tool

For inserts, see: TPGX (F85) • TPGX (CBN) (F86) • TPGX (PCD) (F86) • WCGT (F85).

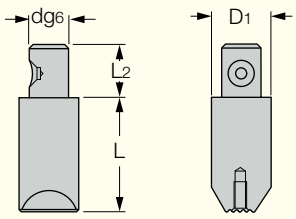
For holders, see: ADBH (F57) • BHE MB (F40) • BHE MB-H (F40) • BHF MB-BL (F50) • BHF MB16-MB50 Dia. 6-108 (F52) • SLEEVE (F54).

Spare Parts

Designation	Key	Screw
IHAXF 6- 8/16	T-6/5	SR 14-299
IHAXF 8-10/16	T-6/5	SR 14-299
IHAXF 11-13/16	T-8/5	SR 14-298
IHAXF 16-18/16	T-8/5	SR 14-298
IHAXF 22-30/16	T-8/5	SR 14-298

BBH D16

Extension Slide for Fine Boring Holders, Used on the MB Boring Modular System



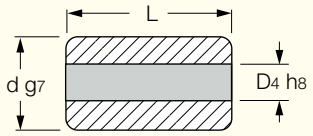
Designation	D1	L	d	L2	Kg
BBH D16X53	25.0	53.00	16.00	21.50	0.25
BBH D16X105	25.0	95.00	16.00	21.50	0.26

For tools, see: IHFF (F57) • IHRF (F58).

• For spare parts see page F94

SLEEVE

Reduction Sleeves Used for Boring Bars on the MB Boring Modular System

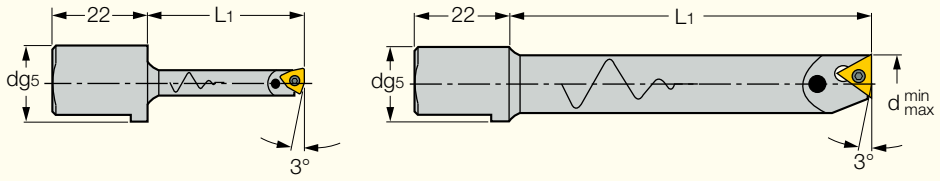


Designation	d	D_4	L
SLEEVE D 4-D16	16.00	4.00	23.00
SLEEVE D 8-D16	16.00	8.00	22.00
SLEEVE D10-D16	16.00	10.00	23.00
SLEEVE D12-D16	16.00	12.00	23.00

For tools, see: IHAXF (F53).

IHAXF-AVI

Heavy Metal, Vibration Damping Boring Bars



Designation	d min	d max	L_1	d	Inserts
IHAXF 6- 8-AVI	6.0	8.0	36.0	16.00	WCGT 0201...
IHAXF 8-10-AVI	8.0	10.0	48.0	16.00	WCGT 0201...
IHAXF 10-12-AVI	10.0	12.0	60.0	16.00	TPGX 0902...
IHAXF 12-14-AVI	12.0	14.0	72.0	16.00	TPGX 0902...
IHAXF 14-16-AVI	14.0	16.0	84.0	16.00	TPGX 0902...
IHAXF 16-18-AVI	16.0	18.0	96.0	16.00	TPGX 0902...

• Note: Not recommended for use on balanceable BHF-BL fine boring heads.

For inserts, see: TPGX (F85) • TPGX (CBN) (F86) • WCGT (F85).

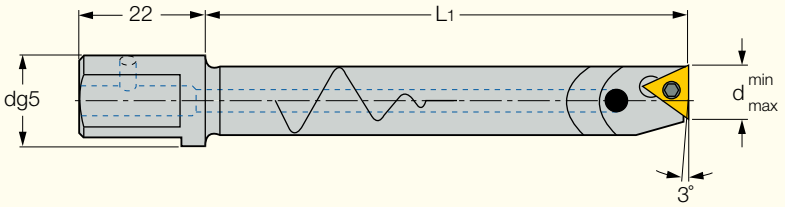
For holders, see: ADBH (F57) • BHE MB (F40) • BHE MB-H (F40) • BHF MB16-MB50 Dia. 6-108 (F52).

Spare Parts

Designation	Key	Screw
IHAXF 6- 8-AVI	T-6/5	SR 14-299
IHAXF 8-10-AVI	T-6/5	SR 14-299
IHAXF 10-12-AVI	T-8/5	SR 14-298
IHAXF 12-14-AVI	T-8/5	SR 14-298
IHAXF 14-16-AVI	T-8/5	SR 14-298
IHAXF 16-18-AVI	T-8/5	SR 14-298

IHAXF-E

Carbide Vibration Dampening Boring Bars



Designation	d min	d max	L1	d	Inserts
IHAXF 6- 8-E	6.0	8.0	45.0	16.00	WCGT 0201...
IHAXF 8-10-E	8.0	10.0	60.0	16.00	WCGT 0201...
IHAXF 10-12-E	10.0	12.0	75.0	16.00	TPGX 0902...
IHAXF 12-14-E	12.0	14.0	90.0	16.00	TPGX 0902...
IHAXF 14-16-E	14.0	16.0	105.0	16.00	TPGX 0902...
IHAXF 16-18-E	16.0	18.0	120.0	16.00	TPGX 0902...

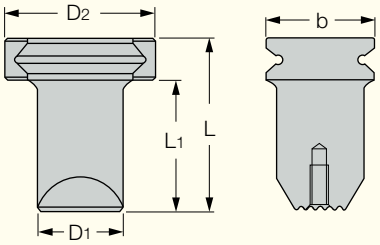
• Note: Not recommended to be used on balanceable BHF-BL fine boring heads.

For inserts, see: TPGX (F85) • TPGX (CBN) (F86) • WCGT (F85).

For holders, see: ADBH (F57) • BHE MB (F40) • BHE MB-H (F40) • BHF MB16-MB50 Dia. 6-108 (F52).

BBH 30/40

Extension Slides for the MB Modular Fine Boring Holders

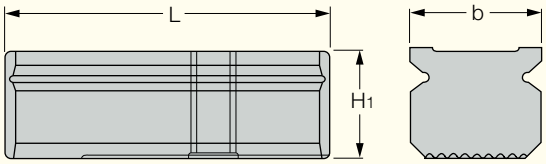


Designation	D1	L1	L	D2	b	Kg
BBH 30X40	25.0	40.0	52.50	43.00	30.5	0.26
BBH 30X70	25.0	70.0	82.50	43.00	30.5	0.37
BBH 30X115	27.0	115.0	127.50	43.00	30.5	0.63
BBH 40X69	32.0	69.0	86.00	56.00	40.0	0.69
BBH 40X114	32.0	114.0	131.00	56.00	40.0	0.99
BBH 40X189	38.0	189.0	206.00	56.00	40.0	1.94

For tools, see: IHFF (F57) • IHRF (F58).

BHFH

Slides for Fine Boring Holders, Used on the MB Boring Modular System



Designation	H_1	b	L	Kg
BHFH 30X75	25.0	30.5	75.00	0.43
BHFH 30X93	25.0	30.5	93.00	0.53
BHFH 30X135	25.0	30.5	135.00	0.77
BHFH 40X133	40.0	40.0	133.00	1.53
BHFH 40X200	40.0	40.0	200.00	2.30
BHFH 40X300	40.0	40.0	300.00	3.47
BHFH 40X400	40.0	40.0	400.00	4.64

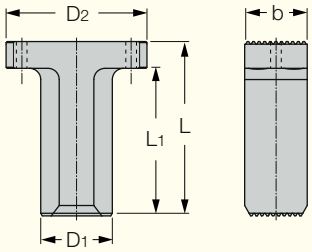
For holders, see page: BHF MB50-MB80 Dia. 77-500 (F52)

For tools, see pages: IHRF (F58) • IHFF (F57) • IHRF-BW (F62) • IHRF-CH (F63)

• For spare parts see page: F95.

BBH 63

Extension Slides for BHE Fine Boring Holders, Used on the MB Boring Modular System

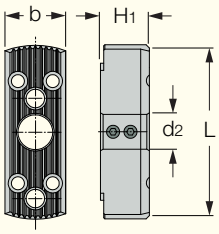


Designation	D_1	L_1	L	D_2	b	Kg
BBH 63X78	32.0	66.0	78.00	63.00	28.0	0.51

For tools, see: IHFF (F57) • IHRF (F58).

BHEH

Slides for BHE Fine Boring Holders, Used on the MB Modular Boring System



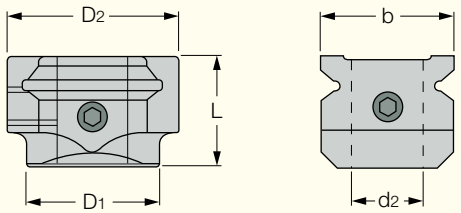
Designation	H_1	b	L	d_2	Kg
BHEH 24X75	14.5	24.0	75.00	-	0.20
BHEH 28X80	22.5	28.0	80.00	16.00	0.34
BHEH 28X108	22.5	28.0	108.00	-	0.52
BHEH 28X148	22.5	28.0	148.00	-	0.68

For tools, see: IHFF (F57) • IHRF (F58).

• For spare parts see page: F95.

ADBH

Sleeve for Fine Boring Holders, Used on the MB Boring Modular System



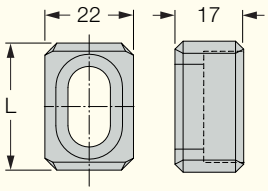
Designation	D_1	L	D_2	b	d_2	Kg
ADBH 30XD16	30.0	25.00	39.00	30.5	16.00	0.15

For tools, see: IHAXF (F53) • IHAXF-AVI (F54) • IHAXF-E (F55).

• For spare parts see page: F94.

CW32

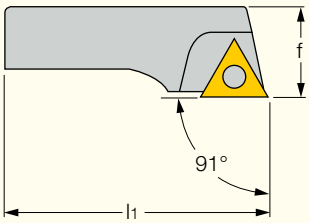
Counter Balancing Weight, Used on BHEH Slide for Fine Boring Holders



Designation	L	Kg
CW32	31.50	0.09

IHFF

Triangular Insert Holders for Mounting on the MB Fine Boring Heads



Designation	f	l_1	d Range	Inserts
IHFF 25	10.0	26.50	28-40	TPGX 0902...
IHFF 32	11.5	34.50	35-53	TPGX 0902...
IHFF 40	14.0	44.00	48-66	TPGX 1103...
IHFF 50	19.0	52.00	54-86	TPGX 1103...

For inserts, see: TPGX (F85) • TPGX (CBN) (F86).

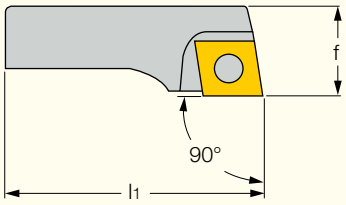
For holders, see: BBH 30/40 (F55) • BBH 63 (F56) • BBH D16 (F53) • BHE MB (F40) • BHEH (F56) • BHF L200 (F59) • BHF MB16-MB50 Dia. 6-108 (F52) • BHFH (F56).

Spare Parts

Designation	Key	Screw
IHFF 25	T-8/5	SR 14-298
IHFF 32	T-8/5	SR 14-298
IHFF 40	T-8/5	SR 14-300
IHFF 50	T-8/5	SR 14-300

IHRF

80° Rhombic Insert Holders for Mounting on the MB Fine Boring Heads



Designation	f	l_1	d Range	Inserts
IHRF 16	8.0	17.00	18-24	CCGT 0602...
IHRF 20	8.5	21.00	22-30	CCGT 0602...
IHRF 25	10.0	26.50	28-40	CCGT 0602...
IHRF 32	11.5	34.50	35-53	CCGT 0602...
IHRF 40	14.0	44.00	48-66	CCGT 09T3...
IHRF 50	19.0	52.00	54-86	CCGT 09T3...

For inserts, see: CCET-WF (F76) • CCGT-AF (F79) • CCGT-AS (F79) • CCMT (CBN) (F78) • CCMT (PCD) (F78) • CCMT-14 (F76) • CCMT-PF (F75) • CCMT-WG (F77) • CCMT/CCGT (F77) • CCMT/CCGT-SM (F75).

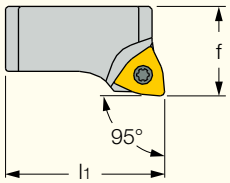
For holders, see: BBH 30/40 (F55) • BBH 63 (F56) • BBH D16 (F53) • BHE MB (F40) • BHEH (F56) • BHF MB16-MB50 Dia. 6-108 (F52) • BHFH (F56).

Spare Parts

Designation	Key	Screw
IHRF 16	T-7/5	SR 14-548
IHRF 20	T-7/5	SR 14-548
IHRF 25	T-7/5	SR 14-548
IHRF 32	T-7/5	SR 14-548
IHRF 40	T-15/5	SR 16-236
IHRF 50	T-15/5	SR 16-236

IHWF

Trigon Insert Holders for Mounting on the MB Fine Boring Heads



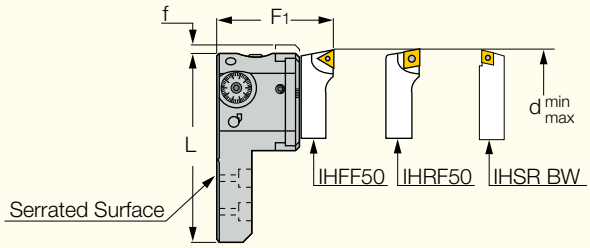
Designation	f	l_1	d Range	Inserts
IHWF 14 E	8.0	14.00	14.5-18	WCGT 0201...

For inserts, see: WCGT (F85).

For holders, see: BHE MB (F40).

BHF L200

Fine Boring Slide Head Used on TCH Large Diameter Holders

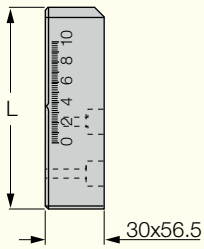


Designation	d min	d max	L	F1	f	Kg
BHF L200	200.0	800.0	110.00	67.0	5.0	1.28

For tools, see: IHFF (F57) • IHRF-BW (F62) • IHSR-BW (F36).

CW200

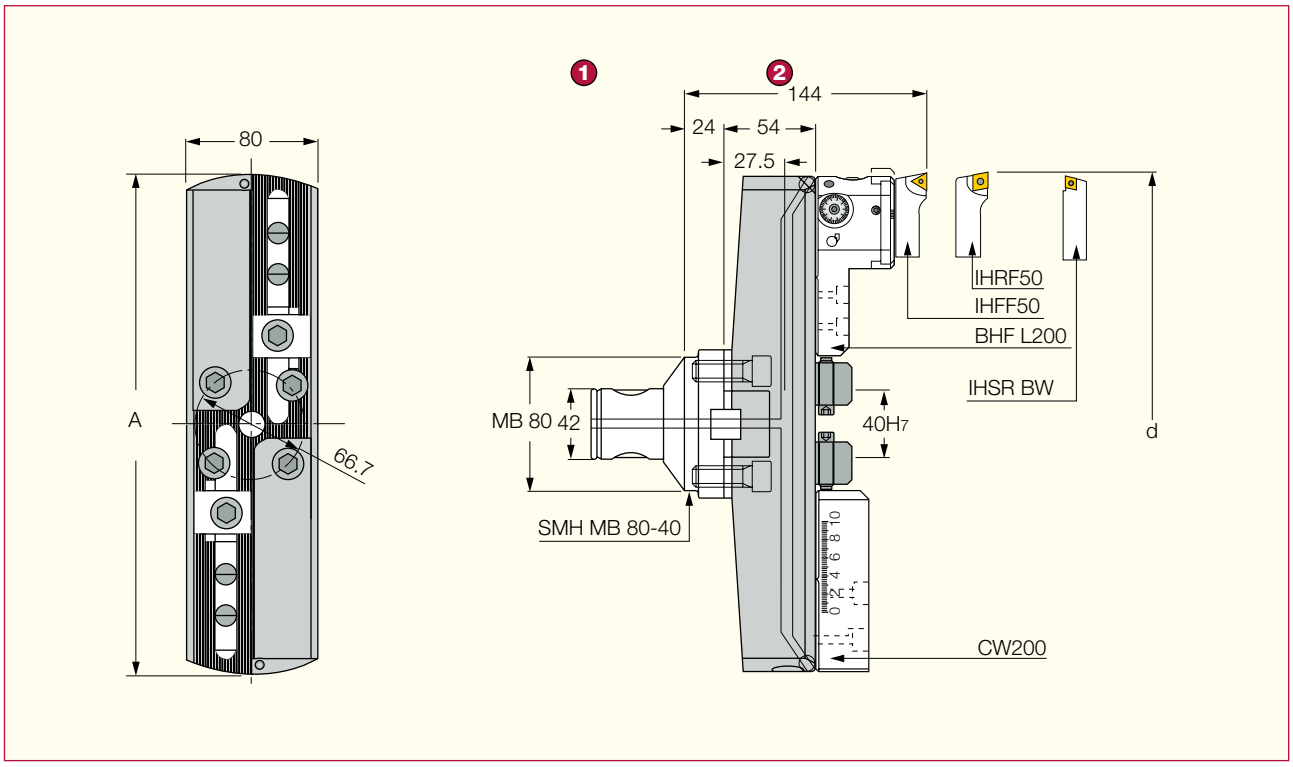
Counter Balancing Weight, for TCH Rough and Fine Boring Holders



Designation	L	Kg
CW200	105.00	1.12

TCH-MB

Fine Boring Aluminum Head Range: Ø200-500 with MB Connection



1 SMH MB 80-40

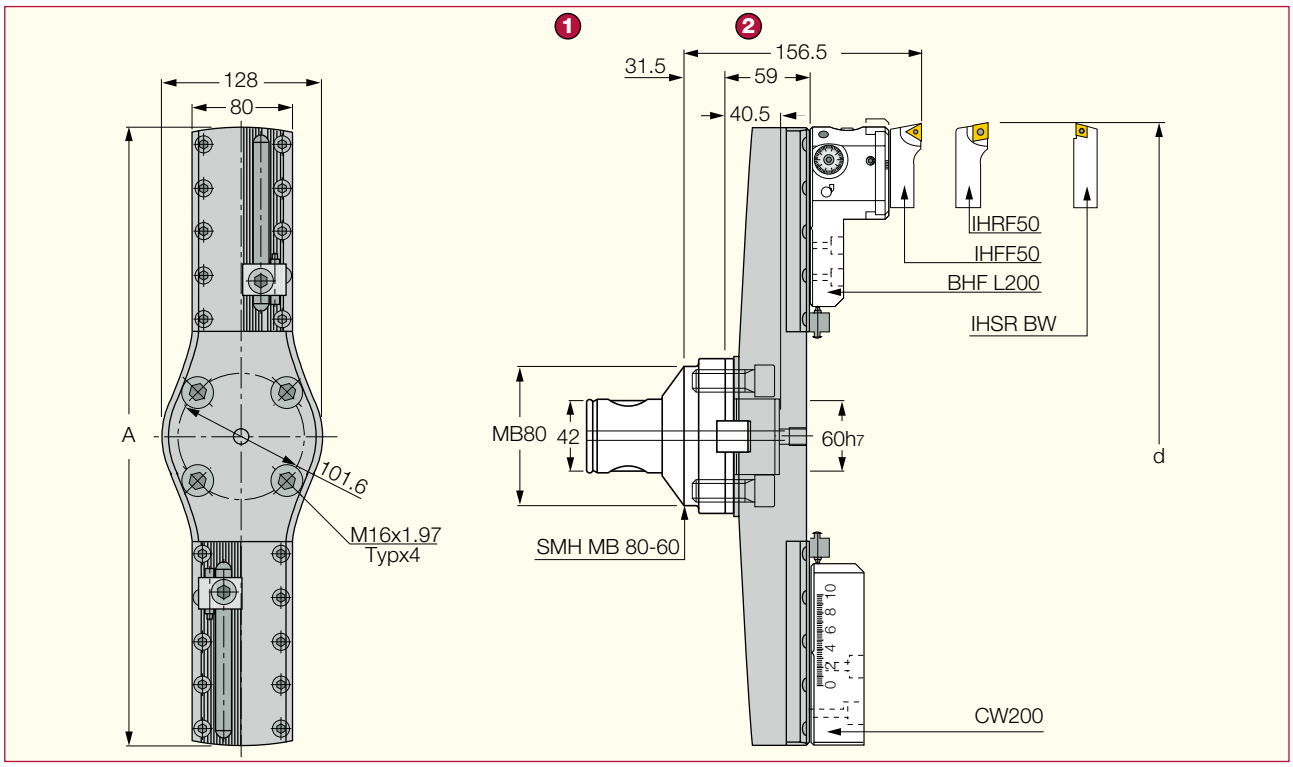
2 TCH-Fine Boring - Insert Holders

Designation	d	A	Kg
TCH 200	200-300	198	2.6
TCH 300	300-400	298	3.5
TCH 400	400-500	398	4.1

• For spare parts see pages F59, F93-94 • For tools see pages F36, F57-58, F62-63.

TCH AL

Flne Boring Head Range: Ø500-800 with MB Connection



1 SMH MB 80-60

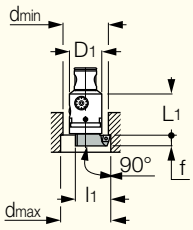
2 TCH AL - Fine Boring Holders IH...

Designation	d	A	Kg
TCH A.L 500	500-600	494	7.5
TCH A.L 600	600-700	594	9.0
TCH A.L 700	700-800	694	10.5

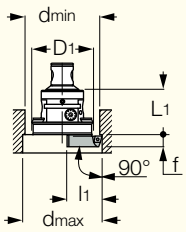
• For spare parts see pages F59, F93-94 • For tools see pages F36, F57-58, F62-63

IHRF-BW

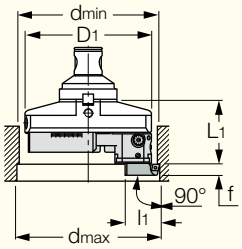
Back Face Turning Toolholders for BHF and TCH Fine Boring Heads



BHF16-50
IHRF...BW



BHF63-125
BHFH
IHRF...BW



TCH200-800
BHF L200
IHRF...BW

Designation	SS	d min	d max	D_1	L_1	f	l_1	Inserts
IHRF 20-25BW	BHF MB16-16x34	20.0	25.0	16.0	27.5	8.0	18.00	CCMT 0602...
IHRF 24.5-32BW	BHF MB20-20x40	24.5	32.0	20.0	33.5	8.5	22.50	CCMT 0602...
IHRF 31.5-41.5BW	BHF MB25-25x50	31.5	41.5	25.0	41.5	9.5	28.50	CCMT 0602...
IHRF 38.5-51.5BW	BHF MB32-32x63	38.5	51.5	32.0	53.0	11.0	35.50	CCMT 0602...
IHRF 50.5-65BW	BHF MB40-40X80	50.5	65.0	40.0	68.0	13.5	46.00	CCMT 09T3...
IHRF 56-802BW	BHF50-50	56.0	86.0	50	62.0	17.5	53.0	CCMT 09T3...
	BHF63+BHFH30X75	82.0	120.0	75	70.2			
	BHF80+BHFH30X93	100.0	142.0	93	79.5			
	BHF125+BHFH40X133	140.0	240.0	135	98.0			
	TCH200+BHF L200	202.0	302.0	198	103.0			
	TCH300+BHF L200	302.0	402.0	298	103.0			
	TCH400+BHF L200	402.0	502.0	398	103.0			
	TCH500+BHF L200	502.0	602.0	494	108.0			
	TCH600+BHF L200	602.0	702.0	594	108.0			
	TCH700+BHF L200	702.0	802.0	694	108.0			

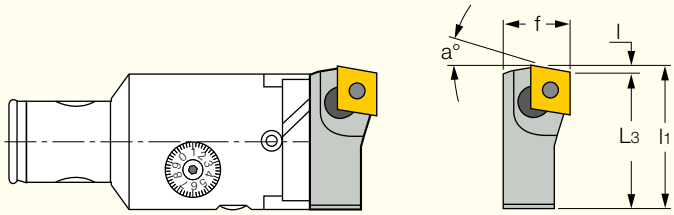
• dmin=(min bore diameter)=(dmax+D1+1)/2 • D1=Size of the boring head being used

For inserts, see: CCGT-AS (F79) • CCMT (CBN) (F78) • CCMT (PCD) (F78) • CCMT-14 (F76) • CCMT-PF (F75) • CCMT-WG (F77) • CCMT/CCGT (F77) • CCMT/CCGT-SM (F75).

For holders, see pages: BHE MB (F40) • BHF L200 (F59) • BHF MB16-MB50 Dia. 6-108 (F52) • BHFH (F56) • BHF MB50-MB80 Dia. 77-500 (F52).

IHRF-CH

Chamfering Tools for BHF Boring Heads



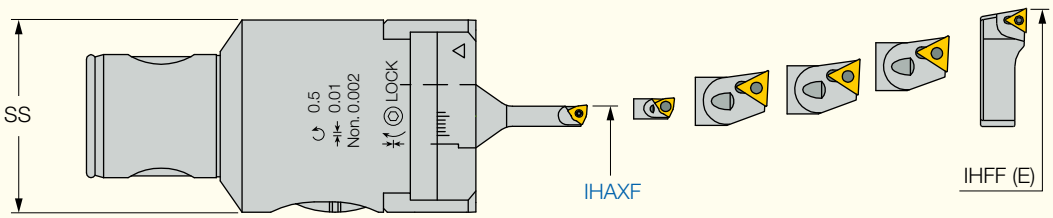
Designation	a°	d min	d max	L3	l1	f	l	Inserts
IHFR 20 CH15 22-29	15.0	22.0	29.0	22.30	24.00	11.0	1.60	CCGT 0602...
IHRF 25 CH15 28-38	15.0	28.0	38.0	28.00	29.60	13.0	1.60	CCGT 0602...
IHRF 32 CH15 35-53	15.0	36.0	50.0	33.10	34.70	13.0	1.60	CCGT 0602...
IHRF 40 CH15 48-66	15.0	48.0	63.0	44.90	47.40	17.5	2.50	CCGT 09T3...
IHRF 50 CH15 54-800	15.0	54.0	160.0	52.90	55.40	17.5	2.50	CCGT 09T3...
IHRF 20 CH20 22-29	20.0	22.0	29.0	21.70	23.90	11.0	2.20	CCGT 0602...
IHRF 25 CH20 28-38	20.0	28.0	38.0	27.40	29.60	13.0	2.20	CCGT 0602...
IHRF 32 CH20 36-50	20.0	36.0	50.0	32.50	34.70	13.0	2.20	CCGT 0602...
IHRF 40 CH20 48-63	20.0	48.0	63.0	44.10	47.40	17.5	3.30	CCGT 09T3...
IHRF 50 CH20 54-800	20.0	54.0	160.0	52.10	55.40	17.5	3.30	CCGT 09T3...
IHRF 20 CH30 22-29	30.0	22.0	29.0	20.70	23.90	9.0	3.20	CCGT 0602...
IHRF 25 CH30 28-38	30.0	28.0	38.0	25.40	29.60	11.0	3.20	CCGT 0602...
IHRF 32 CH30 35-53	30.0	36.0	50.0	31.50	34.70	11.0	3.20	CCGT 0602...
IHRF 40 CH30 48-66	30.0	48.0	63.0	42.60	47.40	15.4	4.80	CCGT 09T3...
IHRF 50 CH30 54-800	30.0	54.0	160.0	50.60	55.40	15.4	4.80	CCGT 09T3...
IHRF 16 CH45 18-23	45.0	18.0	23.0	15.50	20.00	9.5	4.50	CCGT 0602...
IHRF 20 CH45 22-29	45.0	22.0	29.0	19.40	24.00	9.5	4.50	CCGT 0602...
IHRF 25 CH45 28-38	45.0	28.0	38.0	25.10	29.60	11.5	4.50	CCGT 0602...
IHRF 32 CH45 36-50	45.0	36.0	50.0	30.20	34.70	11.5	4.50	CCGT 0602...
IHRF 40 CH45 48-66	45.0	48.0	63.0	40.60	47.40	16.0	6.80	CCGT 09T3...
IHRF 50 CH45 54-800	45.0	54.0	160.0	48.60	55.40	16.0	6.80	CCGT 09T3...
IHRF 20 CH60 22-29	60.0	22.0	29.0	18.40	23.90	9.5	5.50	CCGT 0602...
IHRF 25 CH60 28-38	60.0	28.0	38.0	24.10	29.60	11.5	5.50	CCGT 0602...
IHRF 32 CH60 36-50	60.0	36.0	50.0	29.20	34.70	11.5	5.50	CCGT 0602...
IHRF 40 CH60 48-63	60.0	48.0	63.0	39.10	47.40	16.0	8.30	CCGT 09T3...
IHRF 50 CH60 54-800	60.0	54.0	160.0	47.10	55.40	16.0	8.30	CCGT 09T3...

For inserts, see: CCGT-AS (F79) • CCMT (CBN) (F78) • CCMT (PCD) (F78) • CCMT-14 (F76) • CCMT-PF (F75) • CCMT-WG (F77) • CCMT/CCGT (F77) • CCMT/CCGT-SM (F75).

For holders, see: BHE MB (F40) • BHF MB16-MB50 Dia. 6-108 (F52) • BHFH (F56).• BHFH (F56).

KIT BHE MB

Kits Contain a Fine Boring Head and Various Boring Toolholders and Inserts



Designation	SS	d Range
KIT BHE MB32-32X53 H [1]	MB32	2.5-12
KIT BHE MB50-50X60 H [1]	MB50	6-22
KIT BHE MB50-50X80	MB50	6-110
KIT BHE MB63-63X89	MB63	6-30, 40-125
KIT BHE MB80-80X104	MB80	6-30, 40-200

• For kit contents and boring options, see following pages • 0.01 mm direct diametric adjustment and 0.002 mm by a Vernier scale.

[1] Balanced to G2.5/12,000 RPM

10 µm 2 µm	G2.5 12,000 RPM

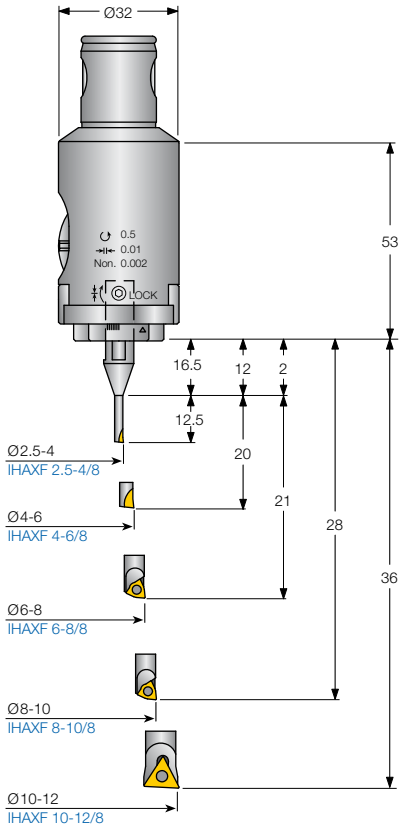
Boring Kit BHE MB32-32x53 H (ø2.5-12 mm)

with Fine Boring Head 10 mm direct diametric adjustment and 2 mm by a Vernier scale

Boring Tools:
1 BHE MB32-32X53 H
1 IHAXF 2.5-4/8
1 IHAXF 4-6/8
1 IHAXF 6-8/8
1 IHAXF 8-10/8
1 IHAXF 10-12/8

Inserts:
5 TPGX 090202L
2 WCGT 020102L

Designation	MB	Boring Range
KIT BHE MB32-32X53 H	32	2.5-12



10 µm 2 µm	G2.5 12,000 RPM

Boring Kit BHE MB50-50x60 H (ø6-22 mm)

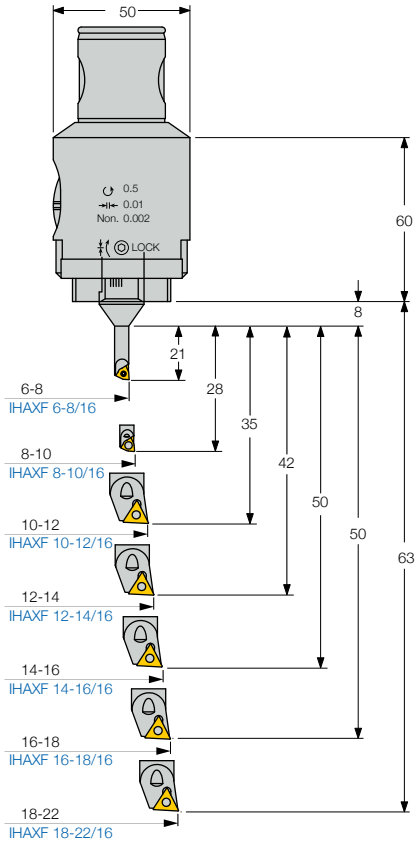
with Fine Boring Head 10 mm direct diametric adjustment and 2 µm by a Vernier scale

Boring Tools:
1 BHE MB50-50X60 H
1 IHAXF 6-8/16
1 IHAXF 8-10/16
1 IHAXF 10-12/16
1 IHAXF 12-14/16
1 IHAXF 14-16/16
1 IHAXF 16-18/16
1 IHAXF 18-22/16

Inserts:
5 TPGX 090202L
2 WCGT 020102L

Designation	MB	Boring Range
KIT BHE MB50-50X60 H	50	6-22

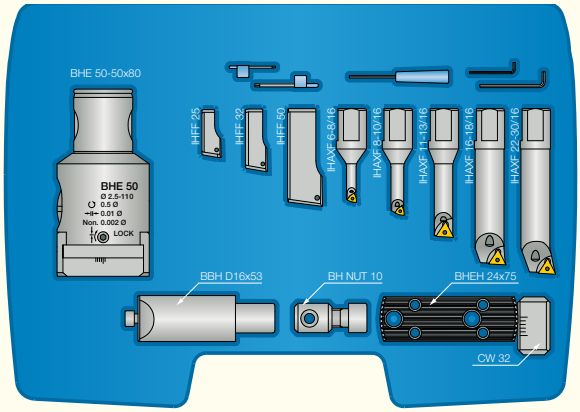
10 µm direct diametric adjustment and 2 µm by a Vernier scale



10 µm
2 µm

Boring Kit BHE MB50-50 x 80 (ø6-110 mm)

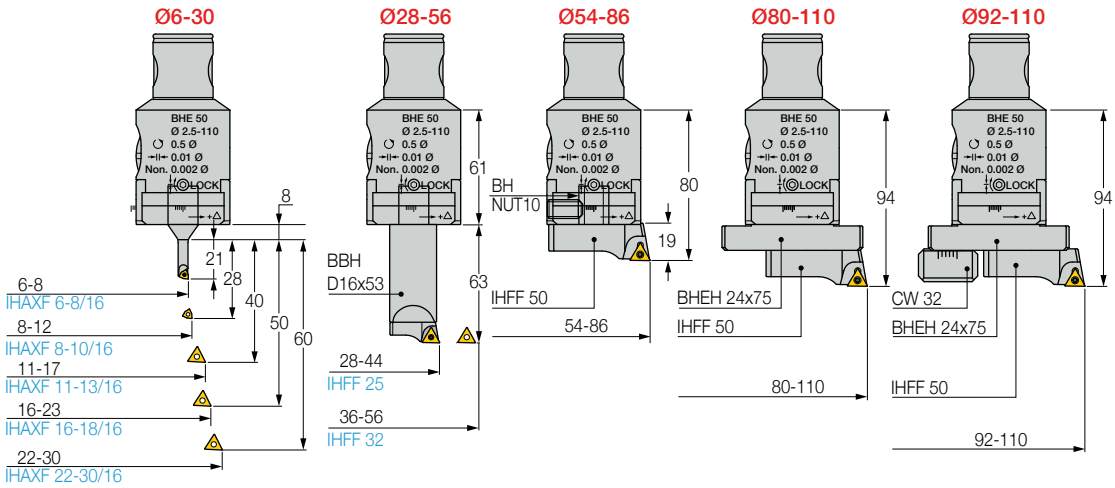
with Fine Boring Head 10 mm direct diametric adjustment and 2 µm by a Vernier scale



1 BHE MB50-50x80
1 IHFF 25
1 IHFF 32
1 IHFF 50
1 IHAXF 6-8/16
1 IHAXF 8-10/16
1 IHAXF 11-13/16
1 IHAXF 16-18/16
1 IHAXF 22-30/16
1 BBH D16x53
1 BHEH 24x75
1 BH NUT 10
1 CW 32

Designation	MB d1	Boring Range
KIT BHE MB50-50X80	50	6-110

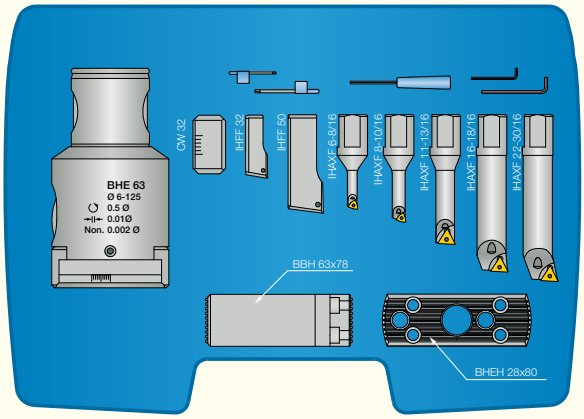
10 µm direct diametric adjustment and 2 µm by a Vernier scale



10 µm
2 µm

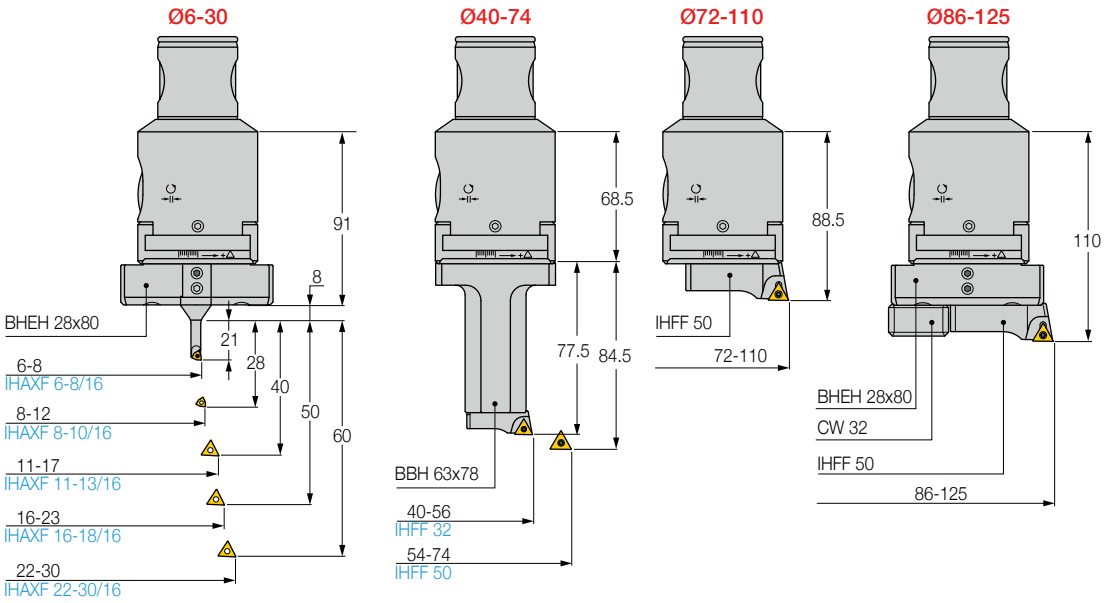
Boring Kit BHE MB63-63 x 89 (ø6-125 mm) with

Fine Boring Head 10 mm direct diametric adjustment and 2 µm by a Vernier scale



1 BHE MB63-63x89
1 IHFF 32
1 IHFF 50
1 IHFF 6-8/16
1 IHAXF 8-10/16
1 IHAXF 11-13/16
1 IHAXF 16-18/16
1 IHAXF 22-30/16
1 BBH 63x78
1 BHEH 28x80
1 BH WASHER IH..50
1 CW 32

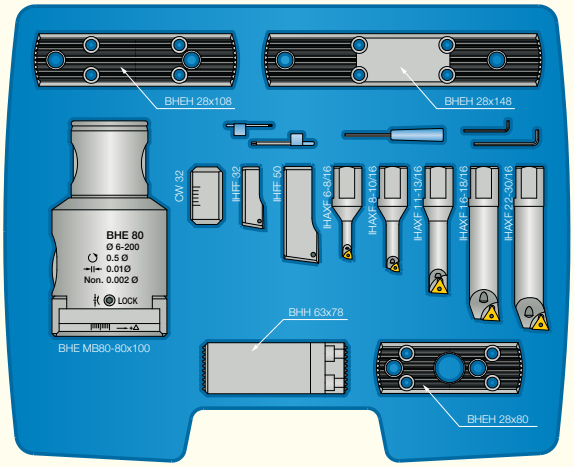
Designation	MB d1	Boring Range
KIT BHE MB63-63X89	63	6-125



10 µm
2 µm

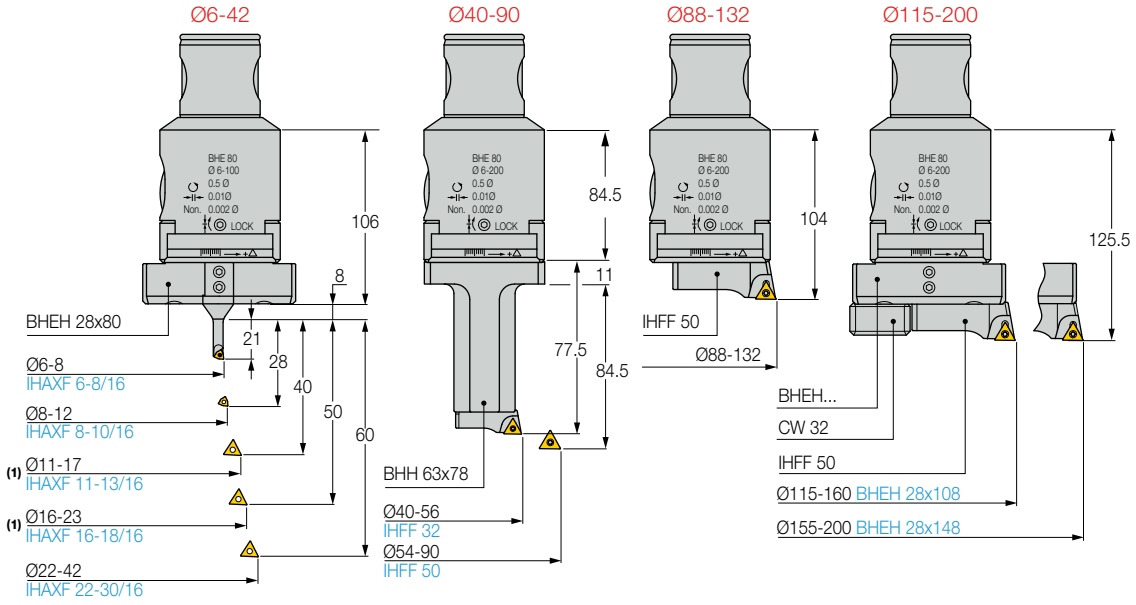
Boring Kit BHE MB80-80 x104 (ø6-200 mm) with

Fine Boring Head 10 mm direct diametric adjustment and 2 µm by a Vernier scale



1 BHE MB80-80x104
1 IHFF 32
1 IHFF 50
1 IHFF 6-8/16
1 IHAXF 8-10/16
1 IHAXF 11-13/16
1 IHAXF 16-18/16
1 IHAXF 22-30/16
1 BBH 63x78
1 BHEH 28x80
1 BHEH 28x108
1 BHEH 28x148
1 BH WASHER IH..50
1 CW 32

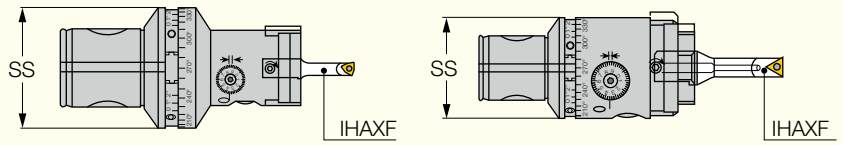
Designation	MB d1	Boring Range
KIT BHE MB80-80X104	80	6-200



(1) The specified boring range differs from the one specified for boring bar.
The extra range is not recommended for high rotational speed.

KIT BHF MB-BL

Kit Contains a Balanceable Fine Boring Head and Various Boring Toolholders and Inserts



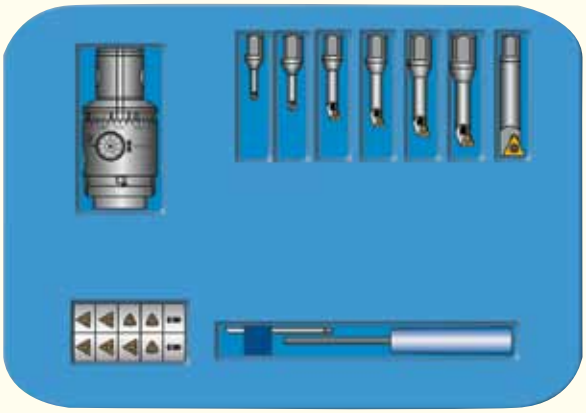
Designation	SS	d Range
KIT BHF MB50-50 BL [1]	MB50	6-20

[1] Balanced to G2.5/20,000 RPM.

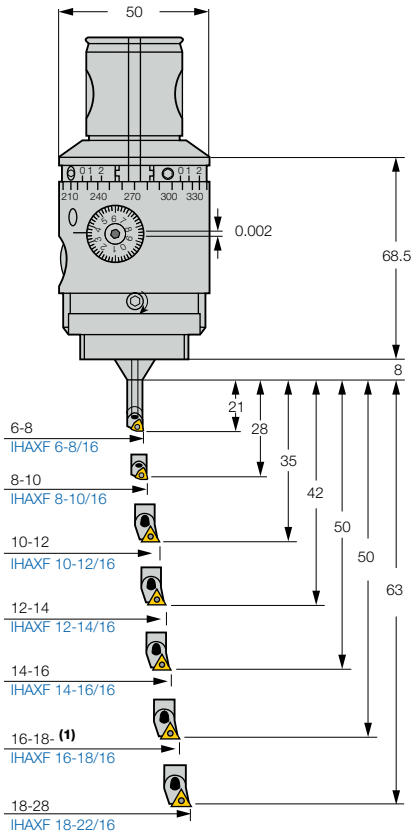
2 µm | G2.5 / 20,000 RPM

Boring Kit BL BHF MB50-50 (ø6-20 mm)

with BHF BL Fine Boring Balanceable Head



1 BHF MB50-50X68 BL
1 IHAXF 6-8/16
1 IHAXF 8-10/16
1 IHAXF 10-12/16
1 IHAXF 12-14/16
1 IHAXF 14-16/16
1 IHAXF 16-18/16
1 IHAXF 18-22/16
5 TPGX 090202L
2 WCGT 020102L

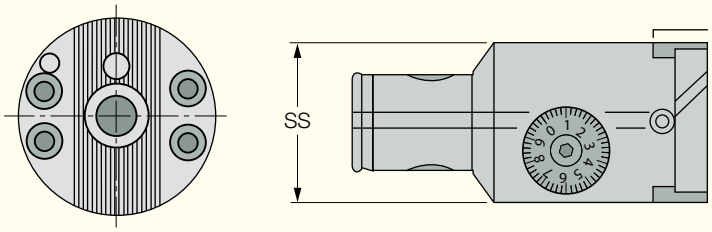


[1] On BHF BL max. balanceable dia. is 20 mm.

Designation	MB d1	Boring Range
KIT BL BHF MB50-50	50	6-20

KIT BHF-MB

Kits Contain a Fine Boring Head and Various Boring Toolholders and Inserts

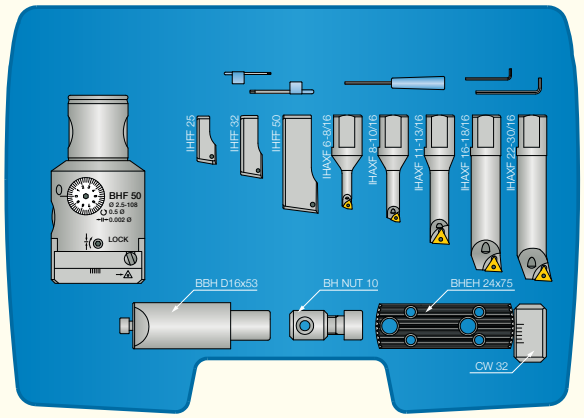


Designation	SS	d Range
KIT BHF MB50-50 6-108	MB50	6-108
KIT BHF MB50-63	MB50	6-125
KIT BHF MB50-80	MB50	6-220
KIT BHF MB63-63	MB63	6-125
KIT BHF MB80-80	MB80	6-200

2 µm

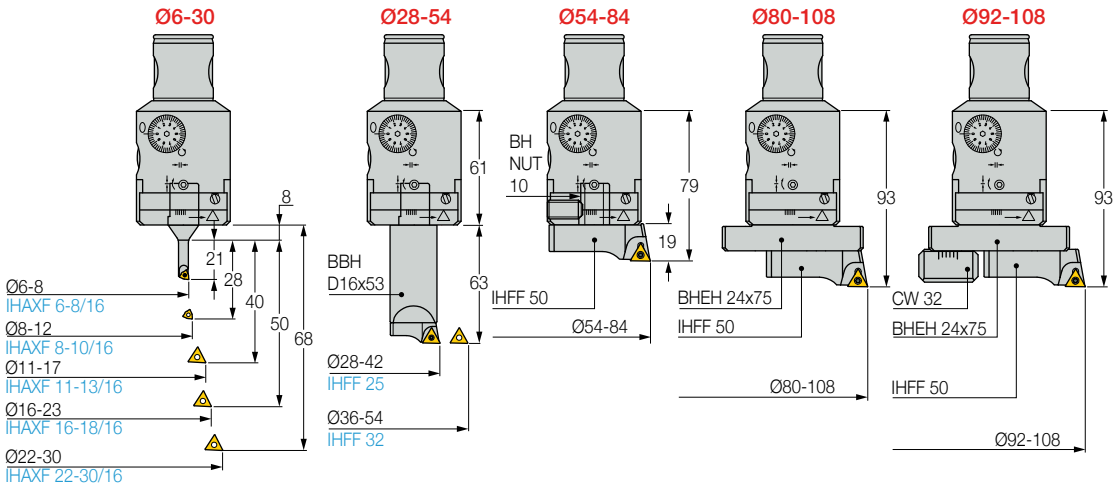
Boring Kit BHF MB50-50 (ø6-108 mm)

Fine Boring Head 10 mm direct diametric adjustment and 2 µm by a Vernier scale



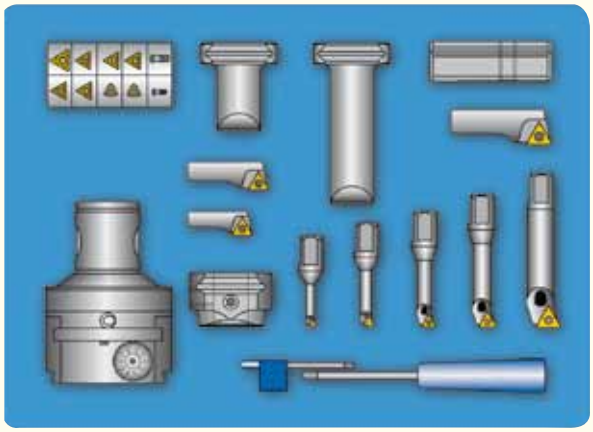
1 BHF MB50-50x60
1 IHFF 25
1 IHFF 32
1 IHFF 50
1 IHAXF 6-8/16
1 IHAXF 8-10/16
1 IHAXF 11-13/16
1 IHAXF 16-18/16
1 IHAXF 22-30/16
1 BBH D16x53
1 BHEH 24x75
1 BH NUT 10
1 CW 32

Designation	MB d1	Boring Range
KIT BHF MB50-50X60 6-108	50	6-108



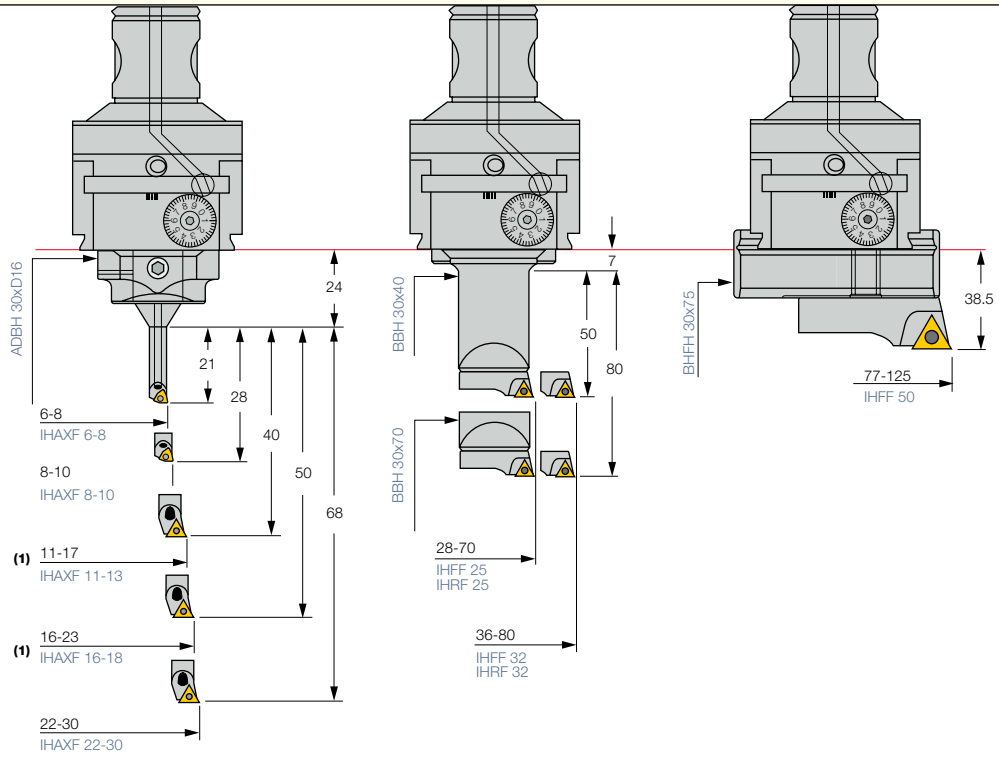
2 µm

Boring Kit BHF MB50-63 / Boring Kit BHF MB63-63 (ø6-125 mm)



1 BHF MB...-63x87
1 IHAXF 6-8/16
1 IHAXF 8-10/16
1 IHAXF 11-13/16
1 IHAXF 16-18/16
1 IHAXF 22-30/16
1 ADBH 30xD16
1 BBH 30x40
1 BBH 30x70
1 BHFH 30x75
1 IHFF 25
1 IHFF 32
1 IHFF 50
5 TPGX 090202L
1 TPGX 110302L
2 WCGT 020102L

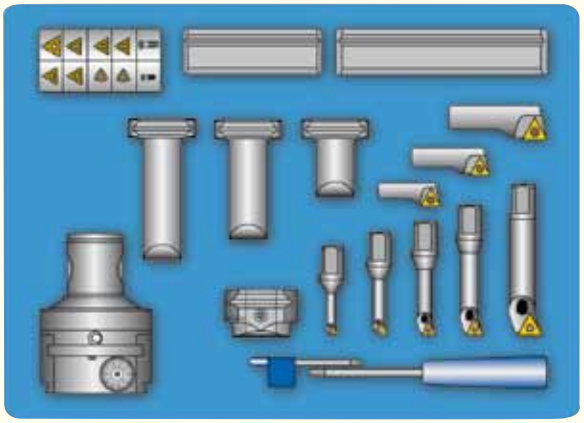
Designation	MB d1	Boring Range
KIT BHF MB50-63	50	6-125
KIT BHF MB63-63	63	6-125



(1) The specified boring range differs from the one specified for boring bar. The extra range is not recommended for high rotational speed.

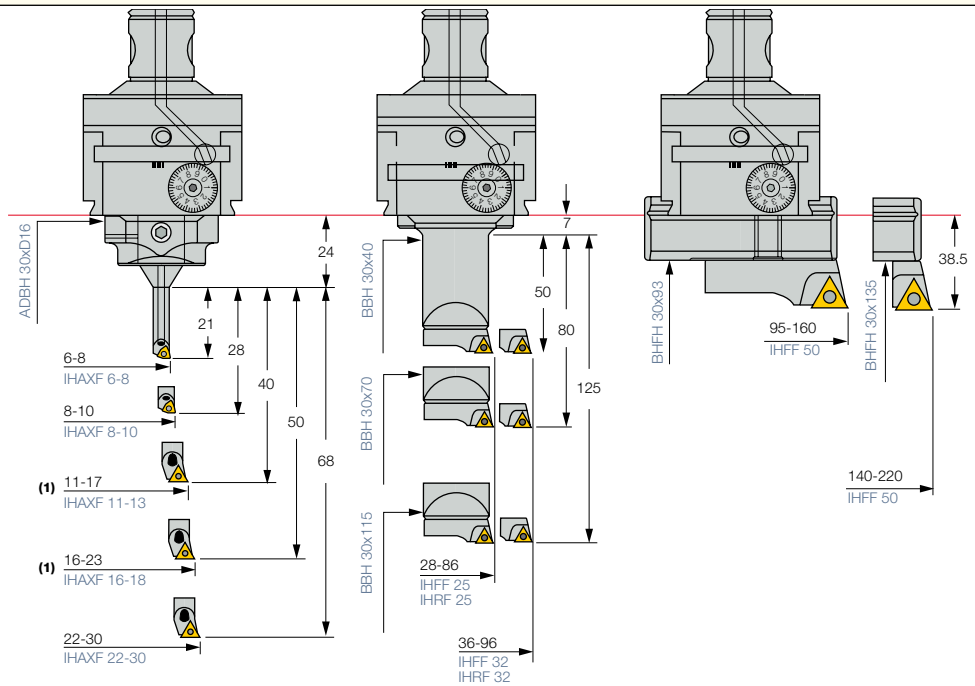
2 µm

Boring Kit BHF MB50-80 / Boring Kit BHF MB80-80 (ø6-220 mm)



1 BHF MB..-80x94
1 IHAXF 6-8/16
1 IHAXF 8-10/16
1 IHAXF 11-13/16
1 IHAXF 16-18/16
1 IHAXF 22-30/16
1 ADBH 30xD16
1 BBH 30x40
1 BBH 30x70
1 BBH 30x115
1 BHFH 30x93
1 BHFH 30x135
1 IHFF 25
1 IHFF 32
1 IHFF 50
5 TPGX 090202L
1 TPGX 110302L
2 WCGT 020102L

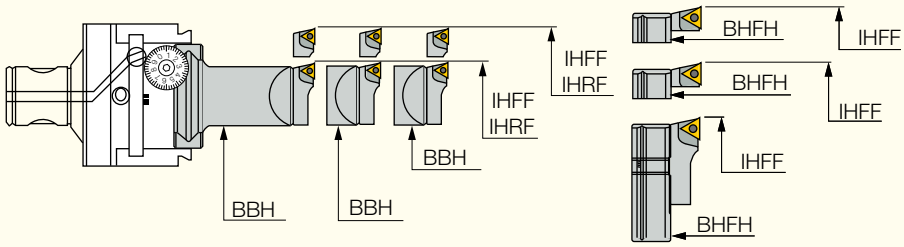
Designation	MB d1	Boring Range
KIT BHF MB50-80	50	6-220
KIT BHF MB80-80	80	6-220



(1) The specified boring range differs from the one specified for boring bar. The extra range is not recommended for high rotational speed.

KIT BHFH-MB

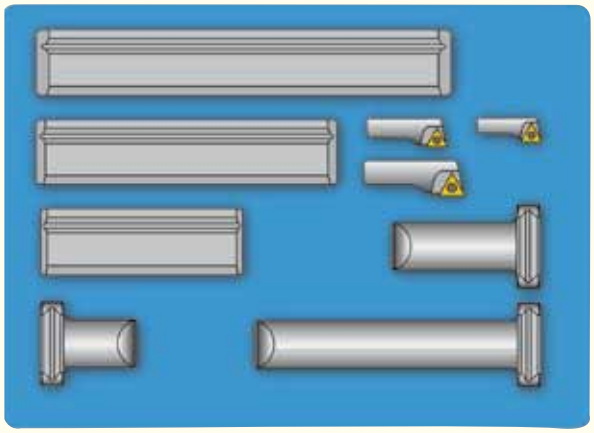
Kit Contains Adapters, Extensions and Boring Bars for 36 to 400 mm Boring Range



Designation	SS	d Range
KIT BHFH MB80-125	MB80	36-400

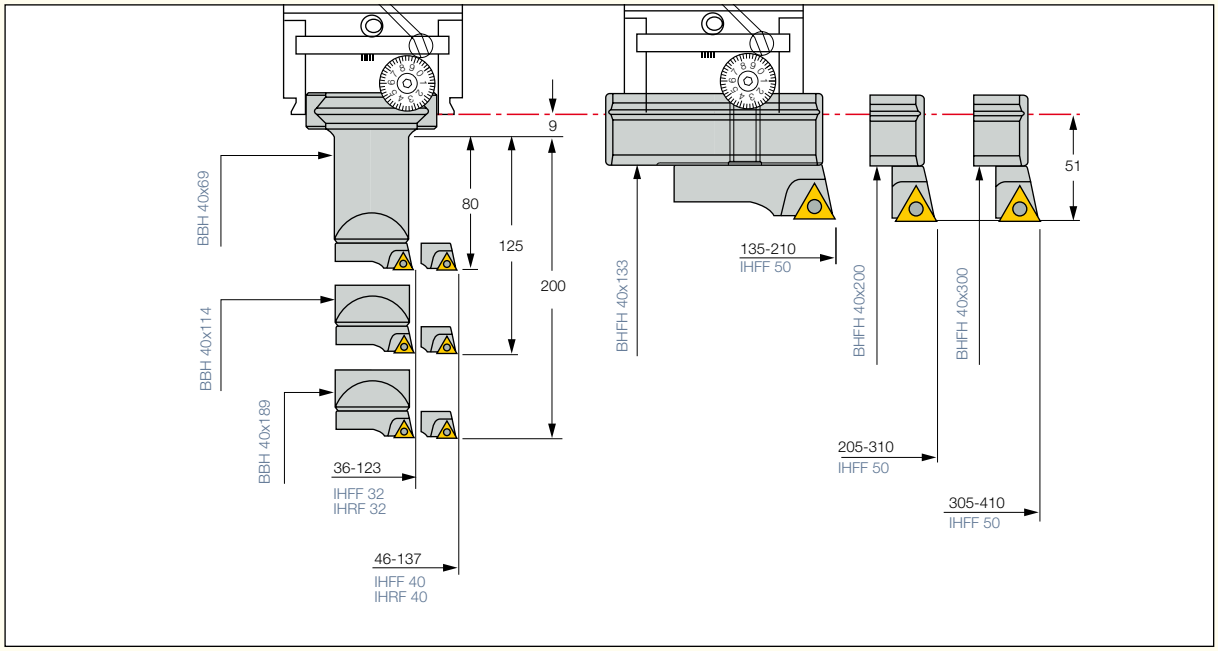
2 µm

Kit BHFH MB80-125 Holder for BHF MB80-125x114 ø36-410



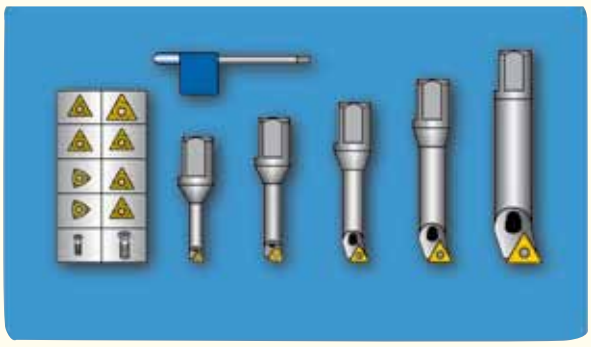
1 BBH 40x69
1 BBH 40x114
1 BBH 40x189
1 BHFH 40x133
1 BHFH 40x200
1 BHFH 40x300
1 IHFF 25
1 IHFF 40
1 IHFF 50

Designation	MB d1	Boring Range
KIT BHFH MB80-125	80	36-410



2 µm

Kit IHAXF 6-30
ø6-30



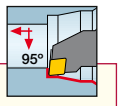
(1) 1 IHAXF 6-8/16
(1) 1 IHAXF 8-10/16
(1) 1 IHAXF 11-13/16
(1) 1 IHAXF 16-18/16
(1) 1 IHAXF 22-30/16
5 TPGX 090202L
3 WCGT 020102L

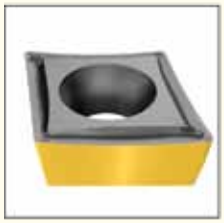
Designation	Boring Range
KIT IHAXF 6-30	6-30

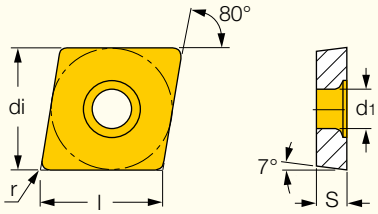
(1) Available only in kit.

CCMT/CCGT-SM

Single-Sided Turning Inserts for Semi-Finishing and Finishing on Soft Materials and Exotic Alloys



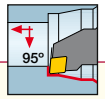


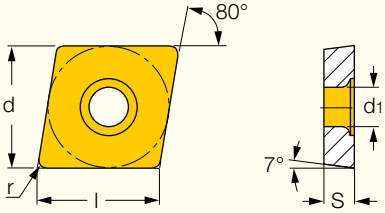


Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC 3028	IC830	IC9350	IC8250	IC9250	IC8150	IC9150	IC570	IC20	IC428	IC5010	IC5005	IC507	IC807	IC907	IC806	Recommended Machining Data ap (mm)	f (mm/rev)
CCGT 060201-SM	6.30	6.35	2.38	0.10	2.80															●		0.25-2.00	0.05-0.20
CCGT 060202-SM	6.30	6.35	2.38	0.20	2.80															●		0.25-2.00	0.05-0.25
CCMT 060202-SM	6.30	6.35	2.38	0.20	2.80				●	●	●	●										0.25-2.00	0.05-0.25
CCMT 060204-SM	6.30	6.35	2.38	0.40	2.80				●	●	●	●						●	●	●	●	0.50-2.50	0.07-0.25
CCMT 060208-SM	6.30	6.35	2.38	0.80	2.80														●	●		0.50-2.50	0.07-0.25
CCMT 09T302-SM	9.70	9.53	3.97	0.20	4.40					●									●	●		0.50-2.50	0.06-0.25
CCMT 09T304-SM	9.70	9.53	3.97	0.40	4.40	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	0.50-2.50	0.06-0.25
CCMT 09T308-SM	9.70	9.53	3.97	0.80	4.40				●	●	●	●				●	●		●	●	●	0.50-3.00	0.07-0.25
CCMT 120404-SM	12.90	12.70	4.76	0.40	5.50				●	●	●	●							●	●		0.70-3.50	0.07-0.25
CCMT 120408-SM	12.90	12.70	4.76	0.80	5.50				●	●	●	●							●	●		0.70-3.50	0.07-0.30

CCMT-PF

80° Rhombic Positive Flank Inserts for Semi-Finishing and Finishing on Soft Materials and Exotic Alloys

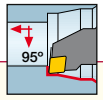




Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC3028	IC807	IC907	Recommended Machining Data ap (mm)	f (mm/rev)
CCMT 060202-PF	6.30	6.35	2.38	0.20	2.80	●	●	●	0.20-2.50	0.04-0.25
CCMT 060204-PF	6.30	6.35	2.38	0.40	2.80	●	●	●	0.40-2.50	0.04-0.30
CCMT 09T302-PF	9.70	9.53	3.97	0.20	4.40	●	●	●	0.50-3.00	0.05-0.30
CCMT 09T304-PF	9.70	9.53	3.97	0.40	4.40	●	●	●	0.50-3.50	0.05-0.35

CCMT-14

80° Rhombic 7° Positive Flank Inserts for Semi-Finish and Finish Turning

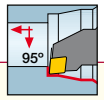


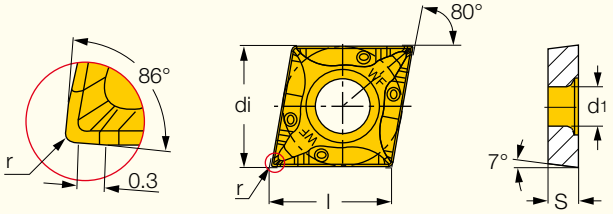
G2.5	
HSK 63=15,000 RPM HSK 100=10,000 RPM	

Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC3028	IC8250	IC9250	IC20	IC428	IC5005	IC807	IC907	Recommended Machining Data ap (mm)	f (mm/rev)
CCMT 060202-14	6.30	6.35	2.38	0.20	2.80		●							0.50-2.00	0.10-0.20
CCMT 060204-14	6.30	6.35	2.38	0.40	2.80	●			●	●	●	●	●	0.50-2.50	0.14-0.25
CCMT 09T304-14	9.70	9.53	3.97	0.40	4.40		●					●	●	0.50-3.00	0.14-0.25
CCMT 09T308-14	9.70	9.53	3.97	0.80	4.40	●	●	●	●	●	●			0.80-3.00	0.14-0.30
CCMT 120408-14	12.90	12.70	4.76	0.80	5.50	●			●					0.80-3.00	0.14-0.30

CCET-WF

80° Rhombic Insert with a 7° Positive Flank and a Wiper Near the Corner, for High-Feed Finishing

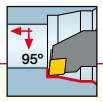


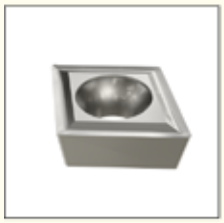


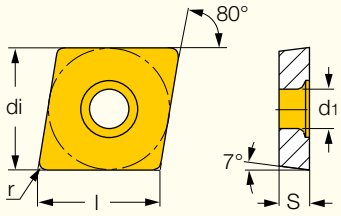
Designation	Dimensions l	di	S	r	d1	IC907	Recommended Machining Data ap (mm)	f (mm/rev)
CCET 0602005-WF	6.30	6.35	2.38	0.05	2.80	●	0.05-2.00	0.01-0.20
CCET 09T3005-WF	9.50	9.53	3.97	0.05	4.40	●	0.05-2.00	0.01-0.20

CCMT/CCGT

80° Rhombic 7° Positive Flank Inserts for Semi-Finish and Finish Turning







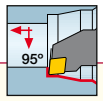
Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC30N	IC20	IC520N	IC20N	Recommended Machining Data ap (mm)	f (mm/rev)
CCGT 060202	6.30	6.35	2.38	0.20	2.80	●				0.50-2.00	0.10-0.20
CCGT 060202L (1)	6.30	6.35	2.38	0.20	2.80	●	●			0.50-2.00	0.10-0.20
CCGT 060204	6.30	6.35	2.38	0.40	2.80	●				0.50-2.00	0.10-0.20
CCGT 060204L (1)	6.30	6.35	2.38	0.40	2.80	●				0.50-2.00	0.10-0.20
CCMT 060202	6.30	6.35	2.38	0.20	2.80				●	0.50-2.00	0.10-0.20
CCMT 060204	6.30	6.35	2.38	0.40	2.80	●		●	●	0.50-2.00	0.12-0.22
CCMT 09T302	9.70	9.53	3.97	0.20	4.40			●	●	0.50-2.50	0.12-0.25
CCMT 09T304	9.70	9.53	3.97	0.40	4.40			●	●	0.50-2.50	0.12-0.25
CCMT 09T308	9.70	9.53	3.97	0.80	4.40			●	●	0.80-3.00	0.14-0.25

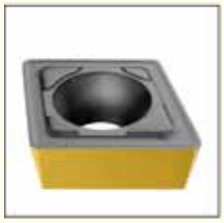
• Use left-hand inserts for left-hand external tools and for right-hand internal tools • For user guide and cutting speed recommendations, see pages ..

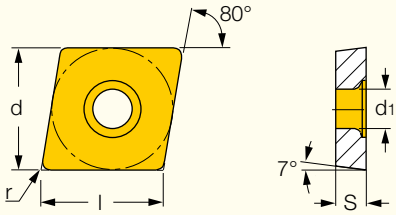
(1) Left-hand insert

CCMT-WG

80° Rhombic Insert with a 7° Positive Flank and a Wiper Near the Corner, for High Feed Finishing



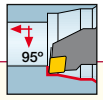




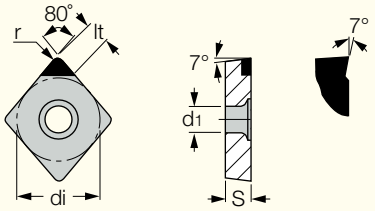
Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC8250	IC807	IC907	Recommended Machining Data ap (mm)	f (mm/rev)
CCMT 060204-WG	6.30	6.35	2.38	0.40	2.80		●	●	0.40-2.00	0.10-0.35
CCMT 09T304-WG	9.70	9.53	3.97	0.40	4.40	●			0.40-2.00	0.14-0.30
CCMT 09T308-WG	9.70	9.53	3.97	0.80	4.40	●			0.50-2.50	0.20-0.38
CCMT 120408-WG	12.90	12.70	4.76	0.80	5.50	●			0.50-3.00	0.20-0.36

CCMT (PCD)

Inserts with 7° Clearance, PCD Single Top Corner Tip and Positive Rake Angle, for Finishing Aluminum



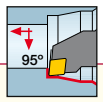
PCD-Sharp cutting edge

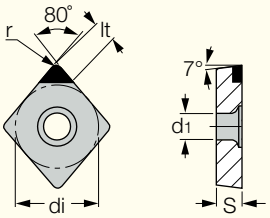


Designation	Dimensions						ID5	Recommended Machining Data	
	l	di	S	r	lt	d1		ap (mm)	f (mm/rev)
CCMT 060204D	6.30	6.35	2.38	0.40	3.0	2.80	●	0.10-3.00	0.05-0.30
CCMT 09T304D	9.70	9.53	3.97	0.40	3.9	4.40	●	0.10-3.00	0.05-0.30

CCMT (CBN)

80° Rhombic Inserts with 7° Clearance and CBN Single Top Corner Tip

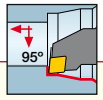


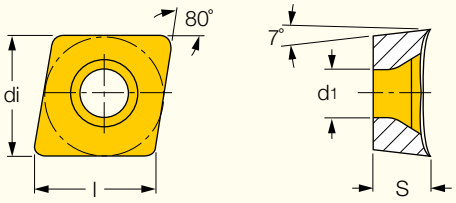


Designation	Dimensions						IB55	Recommended Machining Data	
	l	di	S	r	lt	d1		ap (mm)	f (mm/rev)
CCMT 060202T	6.30	6.35	2.38	0.20	2.6	2.80	●	0.05-0.50	0.05-0.20
CCMT 060204T	6.30	6.35	2.38	0.40	2.7	2.80	●	0.05-0.50	0.05-0.20
CCMT 09T304T	9.70	9.53	3.97	0.40	2.9	4.40	●	0.05-0.50	0.05-0.20
CCMT 09T308T	9.70	9.53	3.97	0.80	3.6	4.40	●	0.05-0.50	0.05-0.20

CCGT-AS

80° Rhombic 7° Positive Flank, Very Positive Rake Angle and Sharp Cutting Edge, for Machining Aluminum

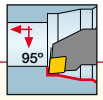


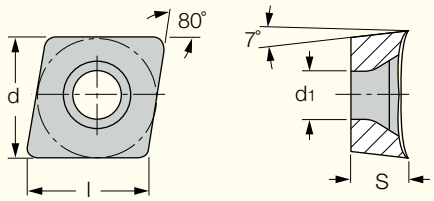


Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC20	IC520	Recommended Machining Data ap (mm)	f (mm/rev)
CCGT 060201-AS	6.40	6.35	2.38	0.10	2.80	●		0.50-2.00	0.10-0.20
CCGT 060202-AS	6.40	6.35	2.38	0.20	2.80	●	●	0.50-2.00	0.10-0.20
CCGT 060204-AS	6.40	6.35	2.38	0.40	2.80	●	●	0.50-2.00	0.10-0.25
CCGT 09T301-AS	9.70	9.53	3.97	0.10	4.40	●		0.50-2.50	0.10-0.25
CCGT 09T302-AS	9.70	9.53	3.97	0.20	4.40	●	●	0.50-2.50	0.10-0.25
CCGT 09T304-AS	9.70	9.53	3.97	0.40	4.40	●	●	0.50-2.50	0.10-0.25
CCGT 09T308-AS	9.70	9.53	3.97	0.80	4.40	●		0.80-3.00	0.10-0.30
CCGT 120402-AS	12.90	12.70	4.76	0.20	5.50	●		0.50-2.50	0.10-0.25
CCGT 120404-AS	12.90	12.70	4.76	0.40	5.50	●	●	0.50-2.50	0.10-0.25
CCGT 120408-AS	12.90	12.70	4.76	0.80	5.50	●		1.00-3.50	0.10-0.30

CCGT-AF

80° Rhombic 7° Positive Flank Inserts, Very Positive Rake and Sharp Cutting Edge for Machining Aluminum

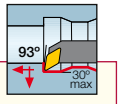


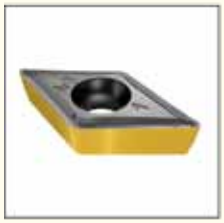


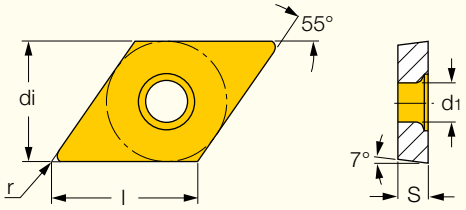
Designation	Dimensions l	di	S	r	d1	IC20	Recommended Machining Data ap (mm)	f (mm/rev)
CCGT 09T308-AF	9.70	9.53	3.97	0.80	4.40	●	0.80-3.00	0.15-0.25
CCGT 120408-AF	12.90	12.70	4.76	0.80	5.50	●	1.00-3.50	0.15-0.30

DCMT/DCGT-SM

55° Rhombic 7° Positive Flank Inserts for Semi-Finish and Finish Turning on Soft Materials and Exotic Alloys



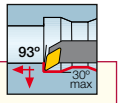


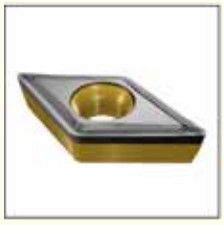


Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC8350	IC9350	IC8250	IC9250	IC8150	IC9150	IC530N	IC520N	IC507	IC807	IC907	IC806	Recommended Machining Data ap (mm)	f (mm/rev)
DCMT 070202-SM	7.70	6.35	2.38	0.20	2.80										●	●		0.50-2.00	0.04-0.20
DCMT 070204-SM	7.70	6.35	2.38	0.40	2.80			●	●	●	●				●	●	●	0.50-2.50	0.05-0.25
DCMT 070208-SM	7.70	6.35	2.38	0.80	2.80			●	●									0.50-3.00	0.07-0.25
DCGT 11T304-SM	11.60	9.52	3.97	0.40	4.40											●		0.50-2.50	0.05-0.25
DCMT 11T302-SM	11.60	9.52	3.97	0.20	4.40			●	●			●			●	●		0.50-2.50	0.05-0.25
DCMT 11T304-SM	11.60	9.52	3.97	0.40	4.40	●	●	●	●	●	●	●		●	●	●	●	0.50-2.50	0.07-0.25
DCMT 11T308-SM	11.60	9.52	3.97	0.80	4.40	●	●	●	●	●	●			●	●	●		1.00-3.00	0.07-0.25
DCMT 11T312-SM	11.60	9.52	3.97	1.20	4.40								●					1.00-3.50	0.10-0.28

DCMT-14

55° Rhombic 7° Positive Flank Inserts for Semi-Finish and Finish Turning on Soft Materials and Exotic Alloys



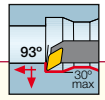


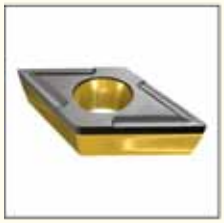
G2.5	
SK 30,000 RPM	

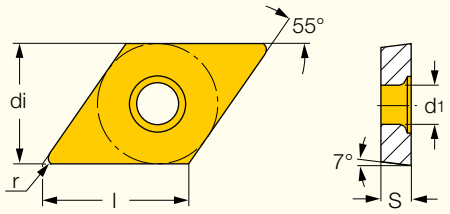
Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC3028	IC8150	IC9150	IC20	IC428	Recommended Machining Data ap (mm)	f (mm/rev)
DCMT 11T304-14	11.60	9.52	3.97	0.40	4.40	●	●	●	●		1.00-2.50	0.14-0.25
DCMT 11T308-14	11.60	9.52	3.97	0.80	4.40		●	●	●	●	1.50-3.00	0.14-0.29

DCMT/DCGT

55° Rhombic Insert with 7° Positive Clearance, for Finishing Applications



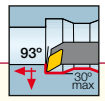


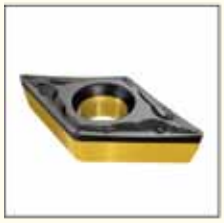


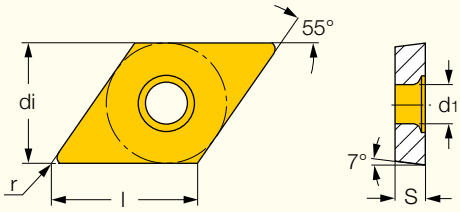
Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC3028	IC8250	IC9250	IC8150	IC9150	IC30N	IC908	IC530N	IC520N	IC20N	Recommended Machining Data ap (mm)	f (mm/rev)
DCGT 070201R	7.70	6.35	2.38	0.10	2.80							●				0.25-1.50	0.05-0.15
DCGT 070202	7.70	6.35	2.38	0.20	2.80						●					0.50-2.00	0.08-0.20
DCGT 070204	7.70	6.35	2.38	0.40	2.80						●					0.80-2.50	0.10-0.25
DCMT 070202	7.70	6.35	2.38	0.20	2.80	●	●		●					●	●	0.50-2.00	0.08-0.20
DCMT 070204	7.70	6.35	2.38	0.40	2.80	●		●	●	●	●			●	●	0.50-2.00	0.08-0.22
DCGT 11T302	11.60	9.52	3.97	0.20	4.40						●					0.50-2.00	0.08-0.20
DCGT 11T304	11.60	9.52	3.97	0.40	4.40						●				●	1.00-2.50	0.12-0.25
DCMT 11T302	11.60	9.52	3.97	0.20	4.40						●		●	●	●	0.50-2.00	0.08-0.20
DCMT 11T304	11.60	9.52	3.97	0.40	4.40						●			●	●	0.50-2.00	0.12-0.25
DCMT 11T308	11.60	9.52	3.97	0.80	4.40	●					●			●	●	1.50-3.00	0.14-0.29

DCMT-PF

55° Rhombic Positive Flank Inserts, for Semi-Finishing and Finishing on Soft Materials and Exotic Alloys



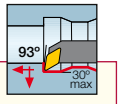


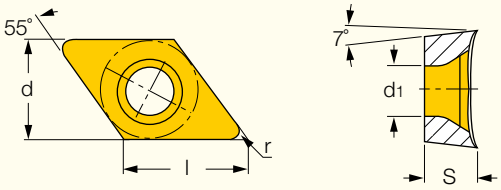


Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC3028	IC830	IC8250	IC9250	IC807	IC907	Recommended Machining Data ap (mm)	f (mm/rev)
DCMT 070201-PF	7.70	6.35	2.38	0.10	2.80					●	●	0.30-3.00	0.02-0.25
DCMT 070202-PF	7.70	6.35	2.38	0.20	2.80	●						0.40-3.00	0.03-0.25
DCMT 070204-PF	7.70	6.35	2.38	0.40	2.80	●						0.50-3.50	0.05-0.30
DCMT 070208-PF	7.70	6.35	2.38	0.80	2.80					●	●	0.70-3.00	0.08-0.30
DCMT 11T302-PF	11.60	9.52	3.97	0.20	4.40	●				●		0.30-2.50	0.04-0.25
DCMT 11T304-PF	11.60	9.52	3.97	0.40	4.40	●	●	●		●	●	0.50-3.00	0.05-0.25
DCMT 11T308-PF	11.60	9.52	3.97	0.80	4.40	●	●	●	●	●	●	0.70-3.00	0.10-0.25

DCGT-AS

55° Rhombic 7° Positive Flank, Very Positive Rake Angle and Sharp Cutting Edge for Machining Aluminum

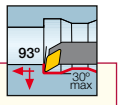


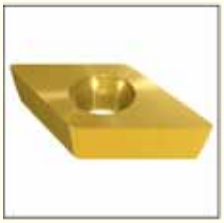


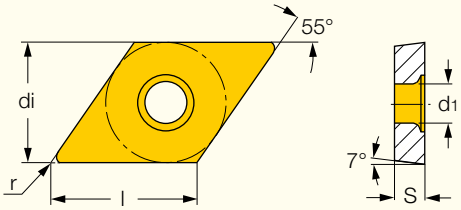
Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC20	IC520	IC907	Recommended Machining Data ap (mm)	f (mm/rev)
DCGT 070201-AS	7.75	6.35	2.38	0.10	2.80	●			0.50-2.00	0.03-0.20
DCGT 070202-AS	7.75	6.35	2.38	0.20	2.80	●	●		0.50-2.00	0.05-0.20
DCGT 070204-AS	7.75	6.35	2.38	0.40	2.80	●	●		0.50-2.50	0.05-0.25
DCGT 11T301-AS	11.60	9.52	3.97	0.10	4.40	●	●		0.50-2.50	0.05-0.25
DCGT 11T302-AS	11.60	9.52	3.97	0.20	4.40	●	●		0.50-2.50	0.05-0.26
DCGT 11T304-AS	11.60	9.52	3.97	0.40	4.40	●	●	●	0.50-2.50	0.05-0.25
DCGT 11T308-AS	11.60	9.52	3.97	0.80	4.40	●	●		0.80-3.00	0.08-0.30

DCMW

55° Rhombic 7° Positive Flank Inserts, for Short Chipping Materials



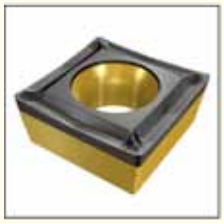


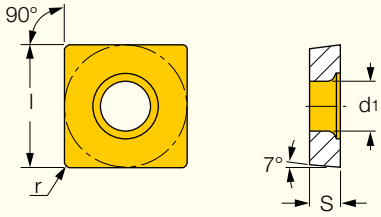


Designation	Dimensions l	di	S	r	d1	IC20	Recommended Machining Data ap (mm)	f (mm/rev)
DCMW 11T304	11.60	9.52	3.97	0.40	4.40	●	1.00-2.50	0.08-0.30

SCMT-SM

Square 7° Positive Flank Inserts, for Semi-Finish and Finish Turning on Soft Materials and Exotic Alloys

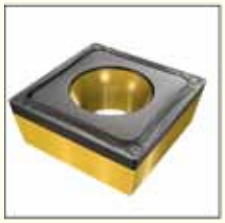


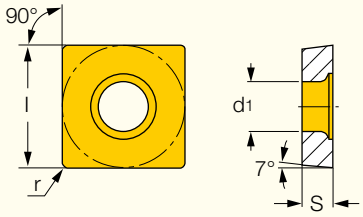


Designation	Dimensions l	S	r	d1	Tough ↔ Hard IC3028	IC9350	IC8250	IC9250	IC8150	IC9150	IC807	IC907	Recommended Machining Data ap (mm)	f (mm/rev)
SCMT 09T304-SM	9.52	3.97	0.40	4.40			●	●	●	●	●	●	0.50-3.00	0.07-0.25
SCMT 09T308-SM	9.52	3.97	0.80	4.40	●	●	●	●	●	●	●	●	0.50-3.00	0.10-0.30
SCMT 120404-SM	12.70	4.76	0.40	5.50						●			0.50-3.50	0.10-0.25
SCMT 120408-SM	12.70	4.76	0.80	5.50			●	●	●	●	●	●	1.00-4.00	0.10-0.30

SCMT-14

Square 7° Positive Flank Inserts, for Semi-Finish and Finish Turning on Soft Materials and Exotic Alloys

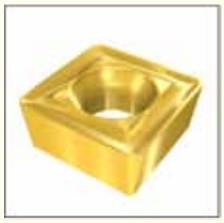


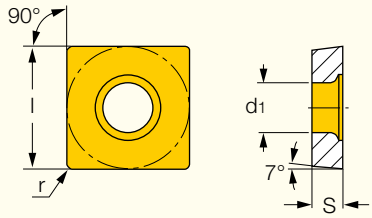


Designation	Dimensions l	S	r	d1	Tough ↔ Hard IC8250	IC9150	IC20	IC807	IC907	Recommended Machining Data ap (mm)	f (mm/rev)
SCMT 09T304-14	9.52	3.97	0.40	4.40		●	●	●	●	1.00-3.50	0.12-0.30
SCMT 120404-14	12.70	4.76	0.40	5.50	●		●			1.00-4.00	0.12-0.30

SCMT-19

Square 7° Positive Inserts, for Semi-Roughing at Medium to High Feeds

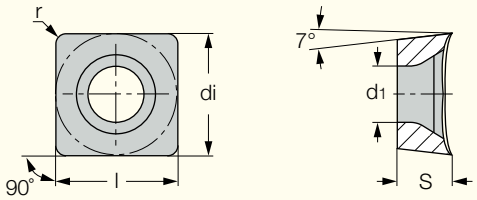




Designation	Dimensions l	S	r	d1	Tough ↔ Hard IC635	IC50M	IC520M	IC20	Recommended Machining Data ap (mm)	fz (mm/t)
SCMT 09T308-19	9.52	3.97	0.80	4.40	●	●	●	●	1.00-5.00	0.08-0.15
SCMT 120408-19	12.70	4.76	0.80	5.50	●	●	●	●	3.00-8.00	0.08-0.15

SCGT-AS

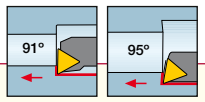
Square 7° Positive Flank Very Positive Rake Angle and Sharp Cutting Edge for Machining Aluminum

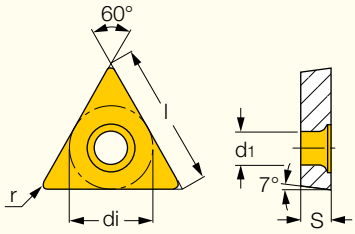


Designation	Dimensions l	di	S	r	d1	IC20	Recommended Machining Data ap (mm)	f (mm/rev)
SCGT 09T308-AS	9.52	9.52	3.97	0.40	4.40	●	0.50-3.00	0.10-0.30
SCGT 120408-AS	12.70	12.70	4.76	0.80	5.50	●	1.00-4.00	0.10-0.30

TCMT-19

Triangular 7° Positive Flat Rake Inserts, for Semi-Roughing Applications at Medium to High Feeds

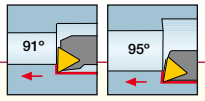


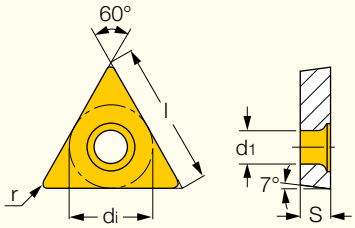


Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC50M	IC20	Recommended Machining Data ap (mm)	f (mm/t)
TCMT 110204-19	11.00	6.35	2.38	0.40	2.80	●	●	0.50-3.00	0.10-0.30
TCMT 16T308-19	16.50	9.52	3.97	0.80	4.40	●	●	1.00-4.00	0.20-0.35
TCMT 220508-19	22.00	12.70	5.00	0.80	5.50	●		1.00-4.00	0.20-0.35

TCMT-SM

Triangular 7° Positive Flank Inserts, for Semi-Finish and Finish Turning on Soft Materials and Exotic Alloys

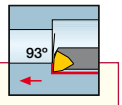


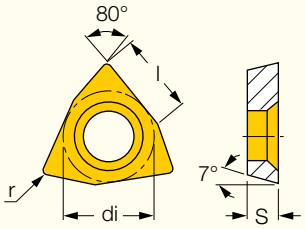


Designation	Dimensions l	di	S	r	d1	Tough ↔ Hard IC3028	IC8350	IC9350	IC8250	IC9250	IC8150	IC9150	IC570	IC908	IC428	IC5010	IC5005	IC807	IC907	Recommended Machining Data ap (mm)	f (mm/rev)
TCMT 110204-SM	11.00	6.35	2.38	0.40	2.80		●	●	●	●	●	●		●		●	●	●	●	0.20-3.00	0.05-0.25
TCMT 110208-SM	11.00	6.35	2.38	0.80	2.80					●								●	●	0.50-2.50	0.07-0.25
TCMT 16T304-SM	16.50	9.52	3.97	0.40	4.40	●			●	●	●	●	●		●		●	●	●	0.50-3.00	0.06-0.25
TCMT 16T308-SM	16.50	9.52	3.97	0.80	4.40	●		●	●	●	●	●					●	●	●	0.50-3.00	0.08-0.28
TCMT 22T308-SM	22.00	12.70	3.97	0.80	5.50							●								0.50-4.00	0.20-0.35

WCGT

Trigon 7° Positive Flank Inserts with a Ground Chipformer for Finish Turning

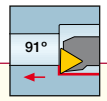


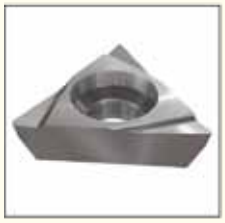


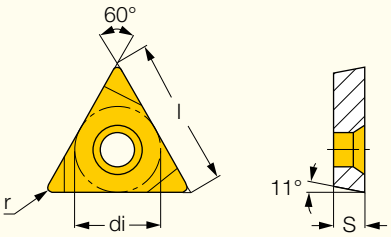
Designation	Dimensions l	di	S	r	Tough ↔ Hard IC30N	IC908	Recommended Machining Data a_p (mm)	f (mm/rev)
WCGT 020102L	2.18	3.97	1.59	0.20	●	●	0.40-2.00	0.05-0.10
WCGT 020104L	2.18	3.97	1.59	0.40	●	●	0.40-2.00	0.10-0.15

TPGX

Triangular 11° Positive Flank Inserts with a Ground Chipformer for Finish Turning



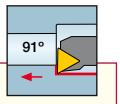


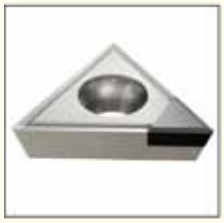


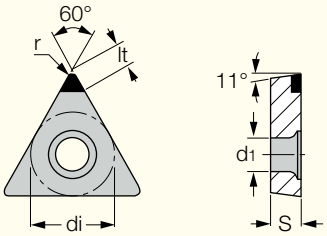
Designation	Dimensions l	di	S	r	d_1	Tough ↔ Hard IC54	IC908	IC20	IC20N	Recommended Machining Data a_p (mm)	f (mm/rev)
TPGX 090202-L	9.52	5.56	2.38	0.20	2.50		●	●	●	1.00-2.00	0.10-0.20
TPGX 090204-L	9.52	5.56	2.38	0.40	2.50	●	●	●	●	1.00-2.50	0.15-0.20
TPGX 110302-L	11.00	6.35	3.18	0.20	3.50		●	●	●	1.00-2.50	0.10-0.20
TPGX 110304-L	11.00	6.35	3.18	0.40	3.50	●	●	●	●	1.00-3.00	0.15-0.20
TPGX 110308-L	11.00	6.35	3.18	0.80	3.50			●		1.00-3.50	0.15-0.25

TPGX (CBN)

Triangular Inserts with 11° Clearance and CBN Single Top Corner Tip



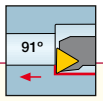




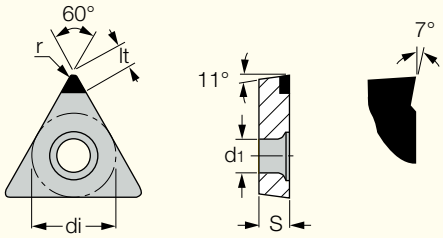
Designation	Dimensions						Tough ↔ Hard		Recommended Machining Data	
	l	di	S	r	lt	d1	IB90	IB50	ap (mm)	f (mm/rev)
TPGX 090202T	9.52	5.56	2.38	0.20	2.5	2.50	●	●	0.05-0.05	0.03-0.20
TPGX 090204T	9.52	5.56	2.38	0.40	2.6	2.50	●	●	0.05-0.05	0.03-0.20
TPGX 110302T	11.00	6.35	3.18	0.20	3.3	3.50	●	●	0.05-0.05	0.03-0.20
TPGX 110304T	11.00	6.35	3.18	0.40	3.0	3.50	●	●	0.05-0.05	0.03-0.20

TPGX (PCD)

Triangular Inserts with 11° Clearance, PCD Single Top Corner Tip and Positive Rake Angle, for Finishing Aluminum



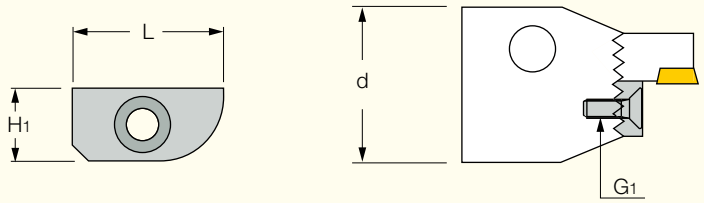
PCD-Sharp cutting edge



Designation	Dimensions							Recommended Machining Data	
	l	di	S	r	lt	d1	ID5	ap (mm)	f (mm/rev)
TPGX 090202	9.52	5.56	2.38	0.20	3.0	2.50	●	0.10-3.00	0.05-0.30
TPGX 090204	9.52	5.56	2.38	0.40	3.0	2.50	●	0.10-3.00	0.05-0.30
TPGX 110302	11.00	6.35	3.18	0.20	3.4	3.50	●	0.10-3.00	0.05-0.30
TPGX 110304	11.00	6.35	3.18	0.40	3.8	3.50	●	0.10-3.00	0.05-0.30

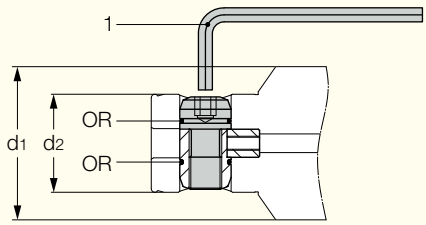
PLT

Cover Plate, Protects the Serrated Faces When a Single Toolholder is Used



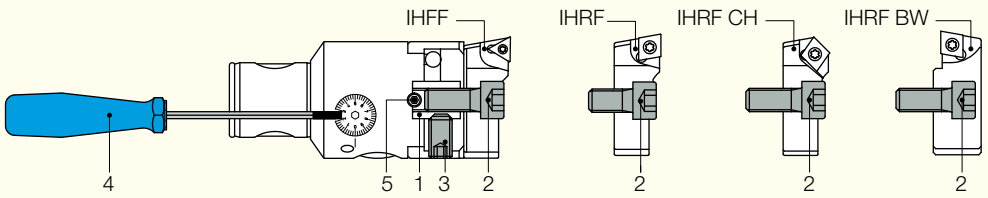
Designation	d	H_1	L	G_1
PLT 16	16.00	7.0	14.00	M3X8
PLT 20	20.00	8.5	17.00	M4X10
PLT 25	25.00	10.2	21.00	M4X16
PLT 32	32.00	13.9	28.00	M5X20
PLT 40	40.00	17.4	35.00	M6X25
PLT 50	50.00	21.4	47.50	M8X25
PLT 63	63.00	26.4	62.00	M10X30
PLT 80	80.00	33.9	82.50	M12X35

BH MB COUPLING SET



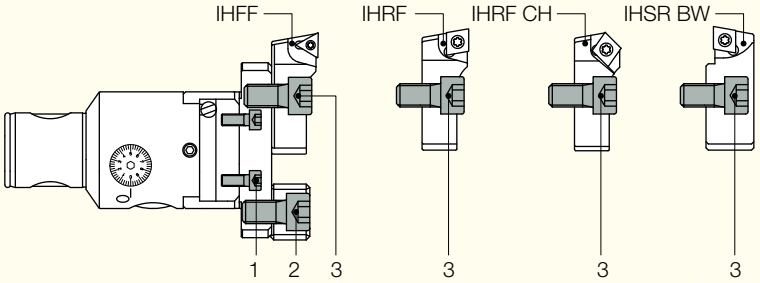
Designation	d_1	d_2	1	OR
BH MB14 COUPLING SET	14	10	2.5	-
BH MB16 COUPLING SET	16	10	2.5	-
BH MB20 COUPLING SET	20	13	3	-
BH MB25 COUPLING SET	25	16		-
BH MB32 COUPLING SET	32	20	4	ORM 0075-10
BH MB40 COUPLING SET	40	25	5	ORM 0100-10
BH MB50 COUPLING SET	50	32	6	ORM 0130-10
BH MB63-80 COUPLING SET	63 - 80	42	8	OR 2075
BH MB110 COUPLING SET	110	76	14	OR 3112

BHF - SPARE PARTS



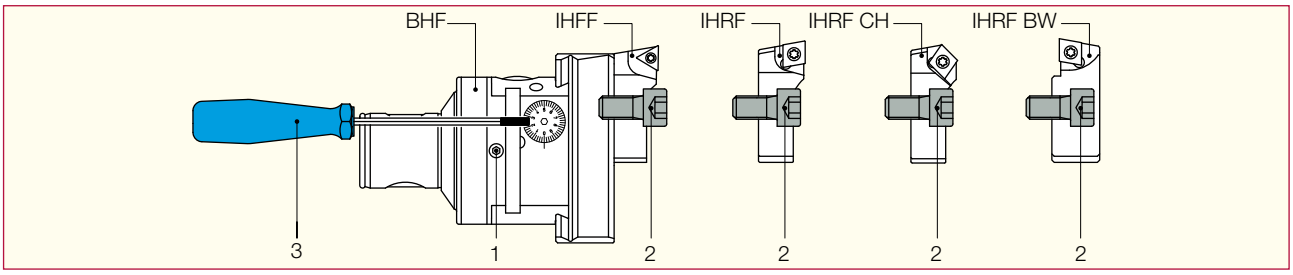
Designation	1	2	3	4	5
BHF...-16...	-	SR M3X6 DIN 912	-	BH SR 1.5 HANDLE	SR M3X4.5 DIN 913
BHF...-20...	-	SR M4X8 DIN 912	-	BH SR 1.5 HANDLE	SR M3X4.5 DIN 913
BHF...-25...	-	SR M5X1O DIN 912	-	BH SR 2.0 HANDLE	SR M4X4 DIN 913
BHF...-32...	-	SR M6X12 DIN 912	-	BH SR 2.0 HANDLE	SR M4X5 DIN 913
BHF...-40...	-	SR M8X14 DIN 912	-	BH SR 2.5 HANDLE	SR M5X6 DIN 913 SR
BHF...-50-60	BH NUT 10	SR M1OX25 DIN 912	SR M10X16 DIN 913	BH SR 2.5 HANDLE	SR M5X8 DIN 913

BHF - SPARE PARTS



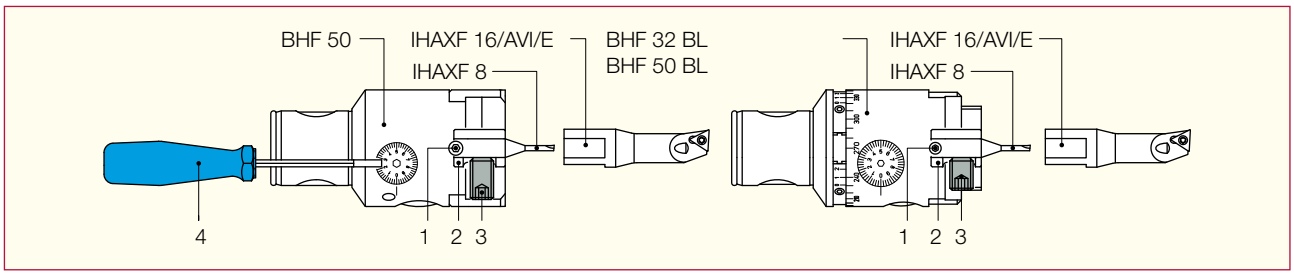
Designation	1	2	3
BHF...-50...	SR M5X12 DIN 912	SR M1OX20 DIN 912	SR M1OX25 DIN 912

BHF - SPARE PARTS



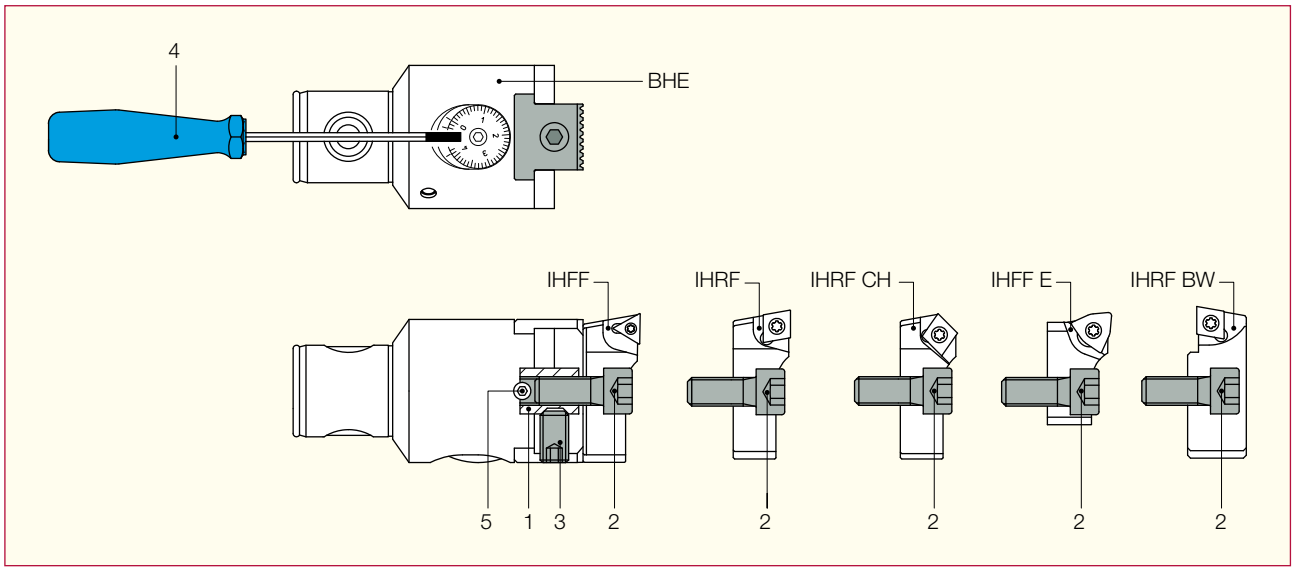
Designation	1	2	3
BHF...-63...	SR M6X10 DIN 915		
BHF...-80...	SR M6X14 DIN 915	SR M1OX25 DIN 912	BH SR 3.0 HANDLE
BHF...-125...	SR M6X22 DIN 915		

BHF - SPARE PARTS



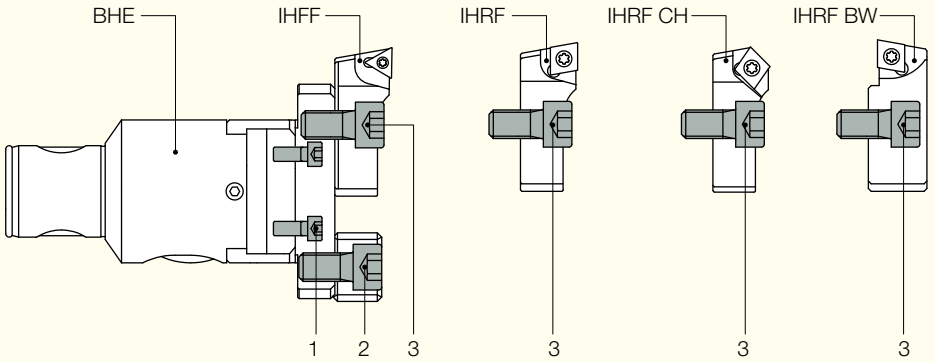
Designation	1	2	3	4
BHF...-50...	SR M5X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	BH SR 2.5 HANDLE
BHF...-32... BL	SR M4X5 DIN 913	-	SR M5X8 DIN 913 SR M5X12 DIN 913	BH SR 2.0 HANDLE
BHF...-50... BL	SR M5X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	BH SR 2.5 HANDLE

BHE MB - SPARE PARTS



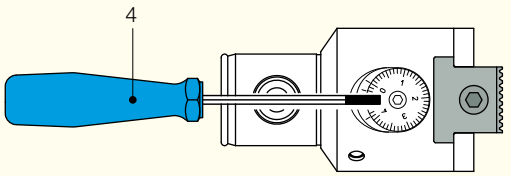
Designation	1	2	3	4	5
BHE MB14-14X30	-	SR M3X6 DIN 912	-	BH SR 1.5 HANDLE	SR M3X3.5 DIN 913
BHE MB16-16X34	-	SR M3X6 DIN 912	-		SR M3X4.5 DIN 913
BHE MB20-20X40	-	SR M4X8 DIN 912	-		SR M3X4.5 DIN 913
BHE MB25-25X50	-	SR M5X1O DIN 912	-		SR M4X4 DIN 913
BHE MB32-32X63	-	SR M6X12 DIN 912	-	BH SR 2.5 HANDLE	SR M5X5 DIN 913
BHE MB40-40X80	-	SR M8X14 DIN 912	-		SR M6X6 DIN 913
BHE MB50-50X80	BH NUT 10	SR M1OX25 DIN 912	SR M10X16 DIN 913	BH SR 3.0 HANDLE	SR M6X8 DIN 913
BHE MB63-63X89	-	SR M1OX20 DIN 912	-		SR M6X8 DIN 913
BHE MB80-80X104	-	SR M1OX25 DIN 912	-		SR M6X12 DIN 913

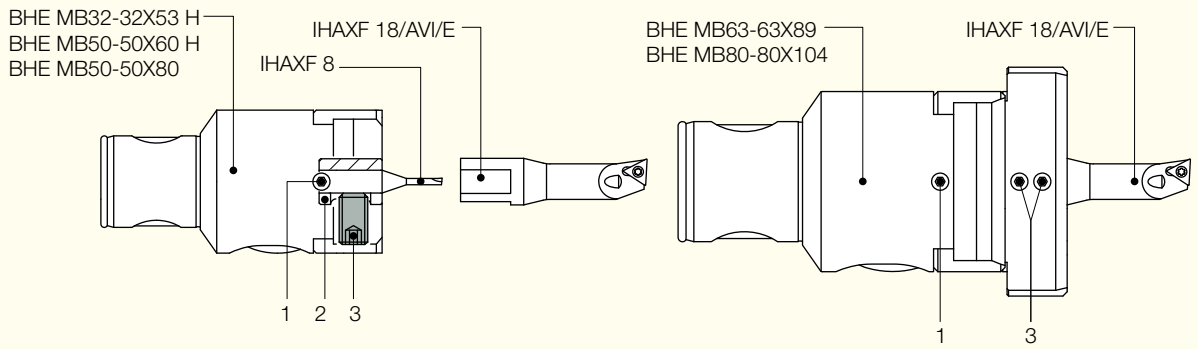
BHE - SPARE PARTS



Designation	1	2	3
BHE MB50-50X80	SR M5X12 DIN 912	SR M1OX20 DIN 912	SR M1OX25 DIN 912
BHE MB63-63X89	SR M5X25 DIN 912		
BHE MB80-80X104			

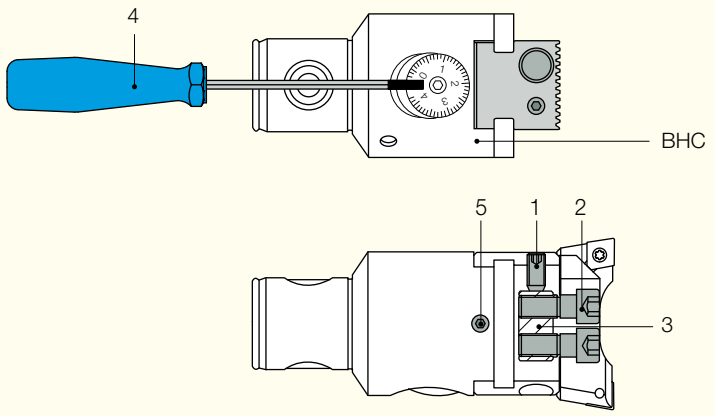
BHE - SPARE PARTS





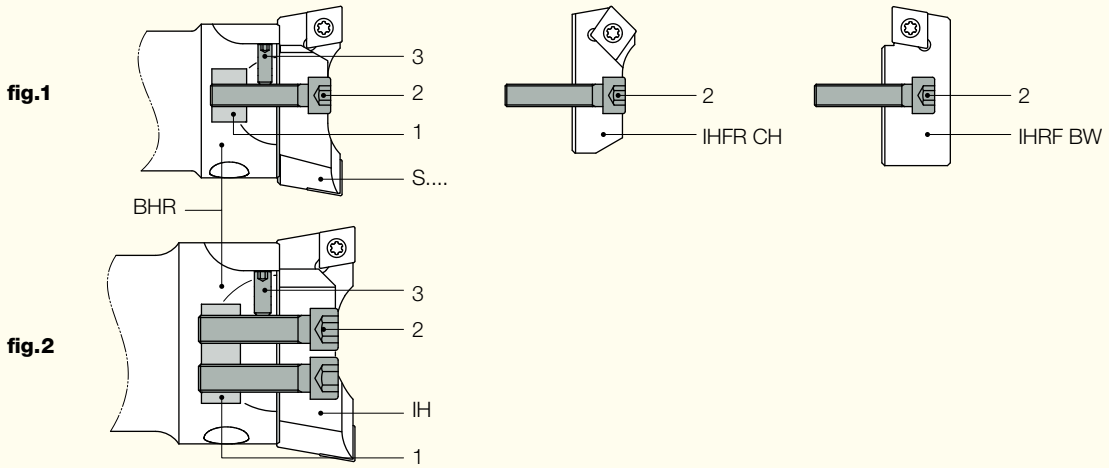
Designation	1	2	3	4
BHE MB32-32X53 H	SR M5X5 DIN 913	-	SR M5X8 DIN 913	BH SR 2.5 HANDLE
	SR M5X5 DIN 913	-	SR M5X12 DIN 913	
BHE MB50-50X60 H	SR M6X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	BH SR 3.0 HANDLE
BHE MB50-50X80	SR M6X8 DIN 913	-	SR M10X10 DIN 913	
BHE MB63-63X89	SR M6X8 DIN 913	-	SR M6X6 DIN 913	
BHE MB80-80X104	SR M6X12 DIN 913	-	SR M6X6 DIN 913	

BHC - SPARE PARTS



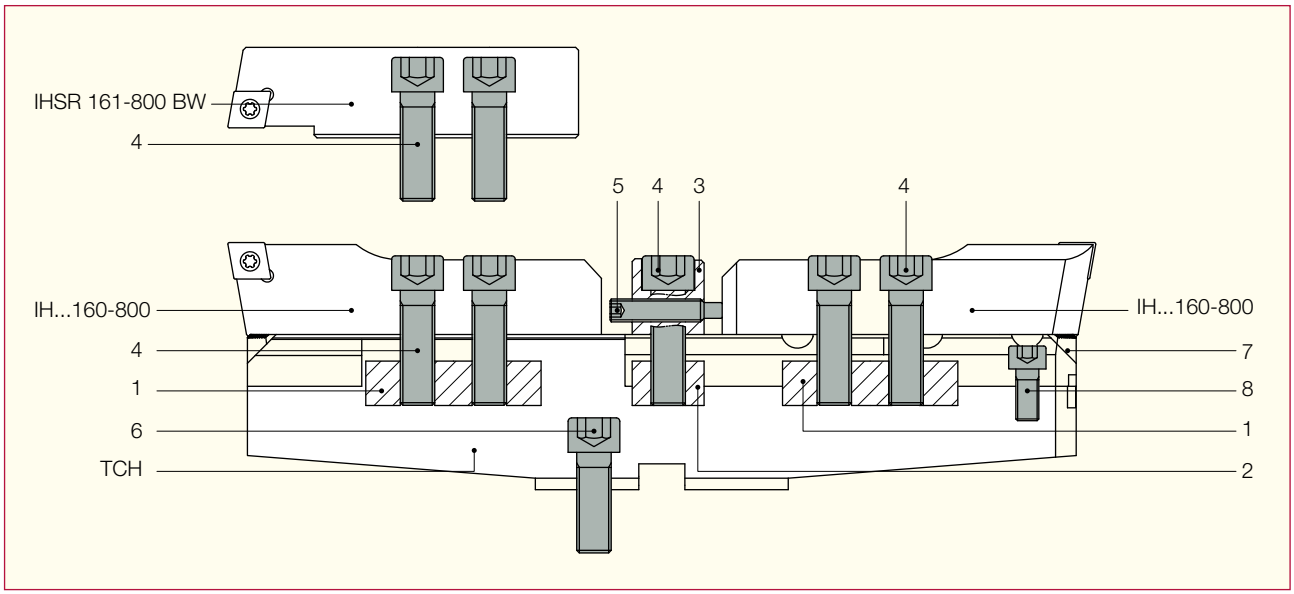
Designation	1	2	3	4	5
BHC MB25-25X57	SR M4X8 DIN 913	BH SR M4X11 DIN 912 PT	BH NUT-BHC MB25	BH SR 2.0 HANDLE	SR M4X5 DIN 913
BHC MB32-32X71	SR M5X10 DIN 913	BH SR M5X12.5 DIN 912 PT	BH NUT-BHC MB32	BH SR 2.5 HANDLE	SR M5X5 DIN 913
BHC MB40-40X90	SR M6X12 DIN 913	BH SR M6X16 DIN 912 PT	BH NUT-BHC MB40	BH SR 3.0 HANDLE	SR M6X6 DIN 913
BHC MB50-50X87	SR M6X14 DIN 913	BH SR M8X20 DIN 912 PT	BH NUT-BHC MB50	BH SR 3.0 HANDLE	SR M6X8 DIN 913
BHC MB63-63X109	SR M6X16 DIN 913	BH SR M10X26 DIN 912 PT	BH NUT-BHC MB63	BH SR 3.0 HANDLE	SR M6X8 DIN 913
BHC MB80-80X130	SR M6X20 DIN 913	BH SR M12X30 DIN 912 PT	BH NUT-BHC MB80	BH SR 3.0 HANDLE	SR M6X12 DIN 913

BHR - SPARE PARTS



Designation	1	2	3
BHR MB16...16	BH NUT BHR MB16	SR M3X14 DIN912	SR M3X4 DIN913
BHR MB20...20	BH NUT BHR MB20	SR M4X15 DIN912	SR M3X5 DIN913
BHR MB25...25	BH NUT BHR MB25	SR M4X20 DIN912	SR M3X8 DIN913
BHR MB32...32	BH NUT BHR MB32	SR M5X25 DIN912	SR M4X12 DIN913
BHR MB40...50	BH NUT BHR MB40	SR M6X30 DIN912	SR M5X14 DIN913
BHR MB50...50	BH NUT BHR MB50	SR M8X35 DIN912	SR M5X12 DIN913
BHR MB50...63	BH NUT BHR MB63	SR M10X40 DIN912	SR M6X16 DIN913
BHR MB63...63	BH NUT BHR MB63	SR M10X40 DIN912	SR M6X16 DIN913
BHR MB80...80	BH NUT BHR MB80	SR M12X45 DIN912	SR M8X25 DIN913

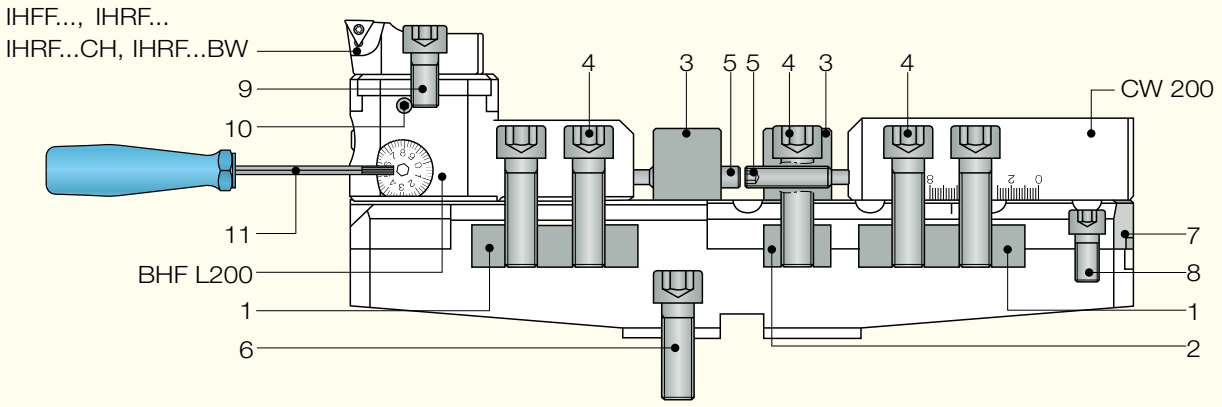
TCH - SPARE PARTS



Designation	1	2	3	4
TCH 200-300-400 TCH 500-600-700	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40 DIN 912

Designation	5	6	7	8
TCH 200-300	SR M8X40 DIN 915	SR M12X35 DIN 912	BH SERRATED PLATE 200-300	SR M8X25 DIN 912
TCH 400	SR M8X40 DIN 915	SR M12X35 DIN 912	BH SERRATED PLATE 400-700	SR M8X20 DIN 912
TCH 500-600-700	SR M8X40 DIN 915	SR M16X50 DIN 912	BH SERRATED PLATE 400-700	SR M8X25 DIN 912

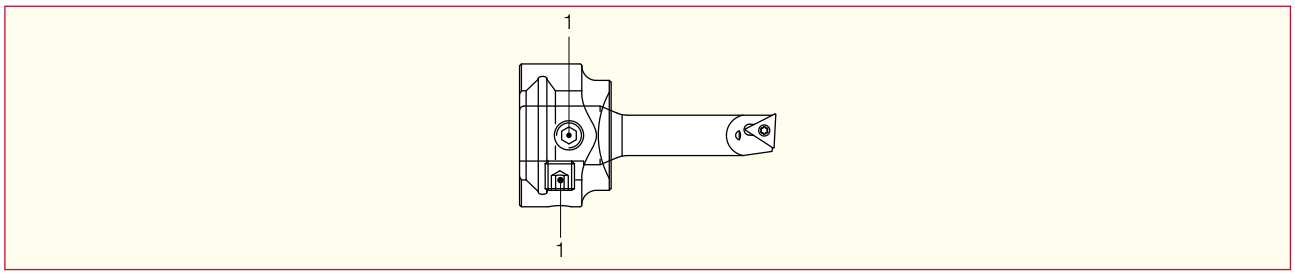
TCH - SPARE PARTS



Designation	1	2	3	4	5
TCH 200-300-400 TCH 500-600-700	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40 DIN 912	SR M8X40 DIN 915

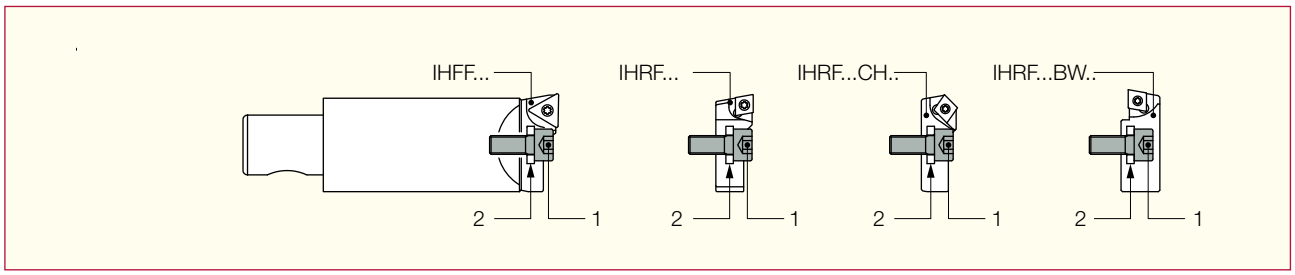
Designation	6	7	8	9	10	11
TCH 200-300	SR M12X35 DIN 912	BH SERRATED PLATE 200-300	SR M8X25 DIN 912	SR M1OX20 DIN 912	SR M6X8 DIN 915	BH SR 3.0 HANDLE
TCH 400	SR M12X35 DIN 912	BH SERRATED PLATE 400-700	SR M8X20 DIN 912	SR M1OX20 DIN 912	SR M6X8 DIN 915	BH SR 3.0 HANDLE
TCH 500-600-700	SR M16X50 DIN 912	BH SERRATED PLATE 400-700	SR M8X25 DIN 912	SR M1OX20 DIN 912	SR M6X8 DIN 915	BH SR 3.0 HANDLE

ADBH - SPARE PARTS



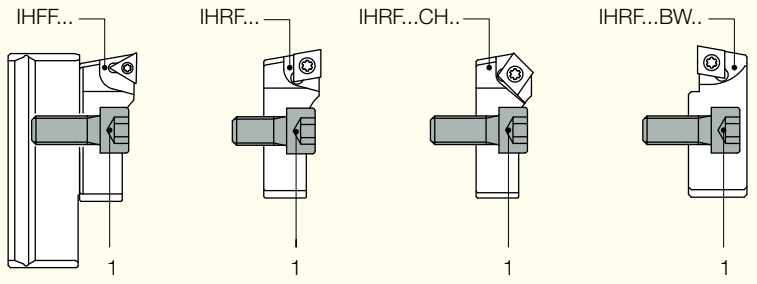
Designation	1
ADBH 30XD16	SR M5X8 DIN 913

BBH-D - SPARE PARTS



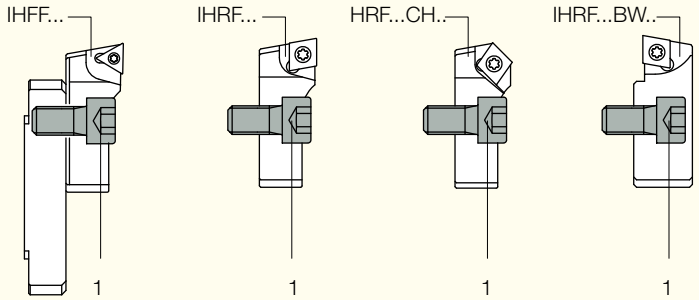
Designation	1	2
BBH D16x63 BBH D16x105	SR M5X12 DIN 912	WASHER DIN 125A M5

BHFH - SPARE PARTS



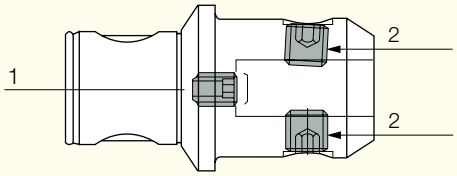
Designation	1
BHFH 30X75	SR M1OX18 DIN 912
BHFH 40X133	
BHFH 30X93	
BHFH 40X200	SR M1OX25 DIN 912
BHFH 30X135	
BHFH 40X300	
BHFH 40X400	

BHEH - SPARE PARTS



Designation	1
BHEH 24x75	SR M1OX20 DIN 912
BHEH 28x80	SR M1OX25 DIN 912
BHEH 28x108	
BHEH 28x148	

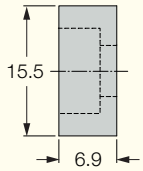
EMH - SPARE PARTS



Designation	Screw #1	Screw # 2
EMH MB 50-6	EMH 50-6 SCREW	M6x10 EM SCREW
EMH MB 50-8	EMH 50-8 SCREW	M8x10 EM SCREW
EMH MB 50-10	EMH 50-10 SCREW	M10x12 EM SCREW
EMH MB 50-12	EMH 50-12 SCREW	M12x16 EM SCREW
EMH MB 50-14	EMH 50-14 SCREW	M14x16 EM SCREW
EMH MB 50-16	EMH 50-16 SCREW	M14x16 EM SCREW
EMH MB 50-20	EMH 50-20 SCREW	M16x16 EM SCREW
EMH MB 63-16	EMH 63-16 SCREW	M14x16 EM SCREW
EMH MB 63-20	EMH 63-20 SCREW	M16x16 EM SCREW
EMH MB 63-25	EMH 63-25 SCREW	M18x20 EM SCREW
EMH MB 63-32	EME 63-32 SCREW	M18x20 EM SCREW
EMH MB 80-40	EMH 80-40 SCREW	M20x20 EM SCREW

BH WASHER - SPARE PARTS

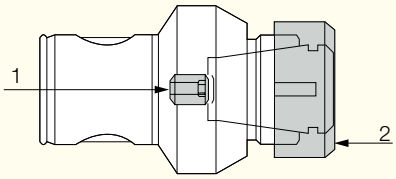
For Kit BHE



Designation	For Kit BHE
BH WASHER IH..50	KIT BHE MB50-50X80
	KIT BHE MB63-63X89
	KIT BHE MB80-80X104
	KIT BHF MB50-50X80 6-108

CCI - SPARE PARTS

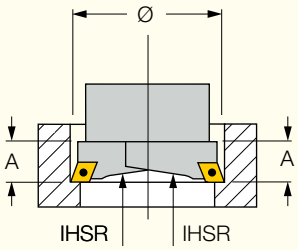
Components for CC



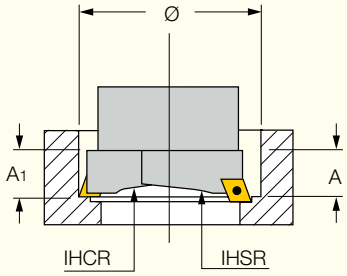
Designation	1	2	Wrench
CC MB16-ER11M	CC MB16 SCREW	NUT ER11 MINI	WRENCH ER11 MINI
CC MB20-ER16M	CC MB20 SCREW	NUT ER16 MINI	WRENCH ER16 MINI
CC MB25-ER20M	CC MB25 SCREW	NUT ER20 MINI	WRENCH ER20 MINI
CC MB32-ER25M	CC MB32 SCREW	NUT ER25 MINI	WRENCH ER25 MINI
CC MB40-ER25	CC MB40 SCREW	NUT ER25 TOP	WRENCH ER25
CC MB50-ER25	CC MB50 SCREW	NUT ER25 TOP	WRENCH ER25
CC MB50-ER32	CC MB50 SCREW	NUT ER32 TOP	WRENCH ER32
CC MB63-ER32	CC MB63 SCREW	NUT ER32 TOP	WRENCH ER32
CC MB63-ER40	CC MB63 SCREW	NUT ER40 TOP	WRENCH ER40

Cutting Depth

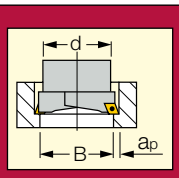
Cutting Conditions for **BHR** Rough Boring Heads



Twin boring cutters
with the same cutting diameter



Twin boring cutters
with different cutting diameters
and heights (Z=1)

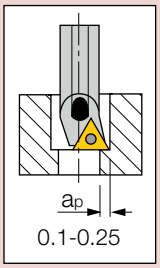


It's advisable to start with B hole ≥ boring bar diameter d

B Working Range	a_p Steel	a_p Cast Iron, Aluminum
18-28	ap - 1.5-2	ap - 2-2.5
28-50	ap - 2-3	ap - 2.5-3.5
50-68	ap - 3-4	ap - 3.5-5
68-200	ap - 4-5	ap - 5-7
200-500	ap - 5-6	ap - 6-8

Cutting Conditions for BHF Fine Boring Heads

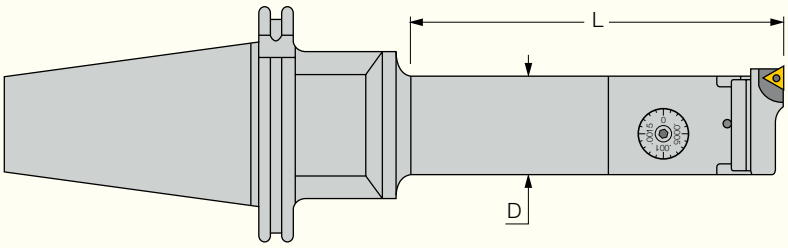
Material	L/D	Stability	Cutting Speed Vc=m/min	Feed f=mm/rev Insert Radius R=0.2	R=0.4	Insert Grade
Carbon Steel HB≤200	L/D=2.5	●●●	200-300	0.05-0.08	0.08-0.10	IC20N
	L/D=4	●●	160-250	0.05-0.08	0.08-0.10	IC30N
	L/D=6.3	●	70-100	0.05-0.08	—	IC54
Carbon Steel HB>200	L/D=2.5	●●●	160-250	0.05-0.08	0.08-0.10	IC20N
	L/D=4	●●	150-200	0.05-0.08	0.08-0.10	IC30N
	L/D=6.3	●	70-100	0.05-0.08	—	
Stainless Steel	L/D	●●●	150-200	0.05-0.08	0.08-0.10	IC20N/30N
	L/D	●●	120-160	0.05-0.08	0.08-0.10	IC54
	L/D	●	70- 80	0.05-0.08	0.08-0.10	IC908
Alloyed Steel (1) HB 480-550	L/D=2.5	●●●	120-160	0.05-0.08	0.08-0.10	IC54
	L/D=4	●●	100-140	0.05-0.08	0.08-0.10	
	L/D=6.3	●	70-100	0.05-0.08	—	
Cast Iron	L/D=2.5	●●●	120-160	0.05-0.08	0.08-0.10	IC20
	L/D=4	●●	100-140	0.05-0.08	0.08-0.10	
	L/D=6.3	●	70-100	00.05-0.08	—	
Aluminum	L/D=2.5	●●●	300-400	0.05-0.08	0.08-0.10	IC20
	L/D=4	●●	250-350	0.05-0.08	0.08-0.10	
	L/D=6.3	●	100-150	0.05-0.08	—	



Stability

●●● – Good
●● – Normal
● – Poor

(1) ap=0.1 min

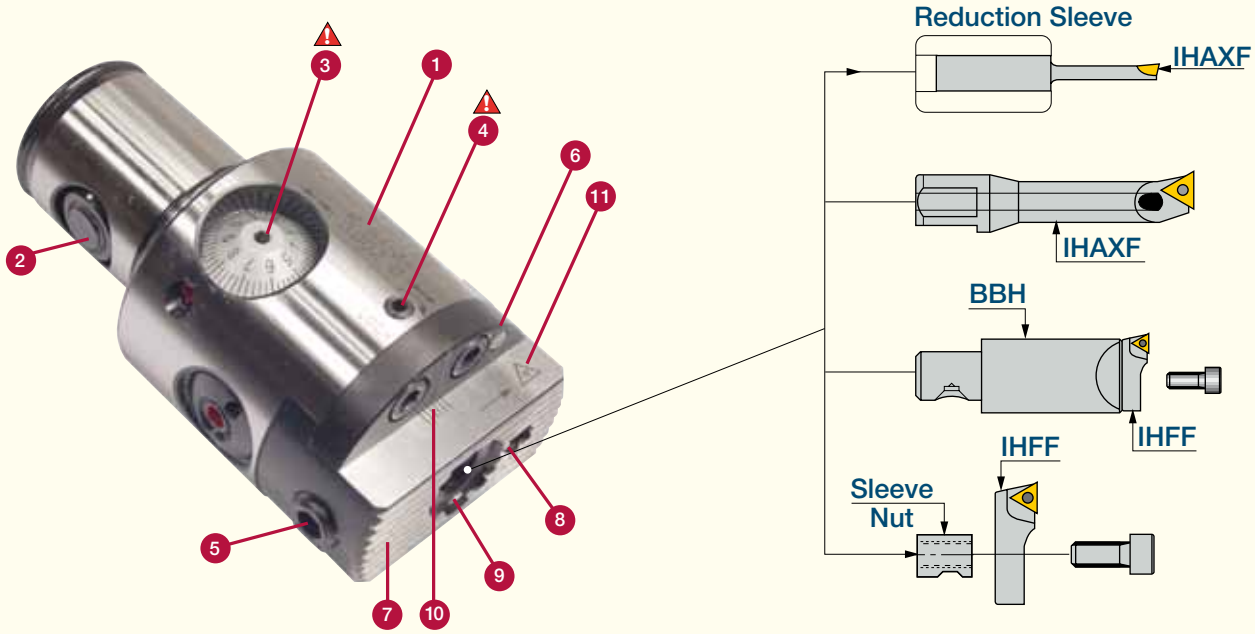


In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

Fine Boring Head BHF 16-50

Operating Instructions

BHF 50 Shown



1. Body
2. Expanding pin
3. ⚠ Graduated dial
4. ⚠ Slide locking screw
5. Toolholder locking screw
6. Coolant nozzle
7. Serrated face
8. Oiling nipple
9. Tool bore 16H7
10. Slide adjustment range Do not exceed the range marks!!
11. Cutting edge position mark

Assembly

- Before mounting the BHF boring head make sure that expanding pin (2) does not protrude from the cylindrical body part.
- Insert BHF into the shank.
- **Tighten pin (2) by turning clockwise** following the recommended tightening torque guidelines below:

Recommended torque:	(N·m)
BHF MB16-16x34	2.0 - 2.5
BHF MB20-20x40	4.0 - 4.5
BHF MB25-25x50	6.5 - 7.5
BHF MB32-32x63	7.0 - 8.0
BHF MB40-40x80	16.0 - 18.0
BHF MB50-50x60	30.0 - 35.0

- Insert the screw (5). If it protrudes, the sleeve should be rotated until the screw can enter the recess in the sleeve nut, reduction sleeve or boring bar.

Disassembly

In order to separate the BHF from the shank, loosen the expanding pin (2) by turning counterclockwise.

Positioning

The tool slide (7) allows for a 4 mm adjustment, by turning graduated dial (3) counterclockwise.

- When changing the direction of dial rotation, backlash must be compensated for.
- After positioning, lock the tool slide by means of screw (4).
- **Loosen screw (4) before making any slide adjustment**.

Maintenance

Weekly:

- Lubricate through the nipple (8) with ISO UN G220 oil.

Periodically:

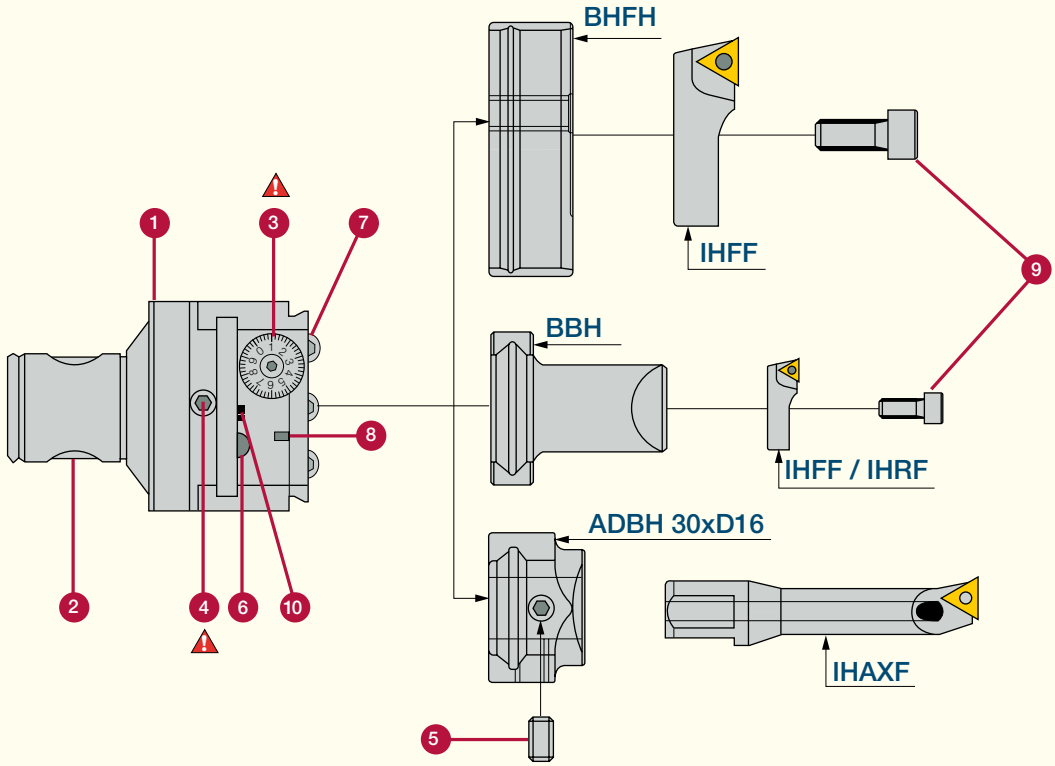
- Clean and lubricate the conical and cylindrical matching surfaces.
- Treat expanding pin (2) with an anti-friction lubricant.
- Clean and lubricate the tool slide guideway.

Important Note:

Toolholder should be firmly affixed to the slide.

Fine Boring Head BHF 63-125

Operating Instructions



1 Body
2 Expansion pin
3 Graduated dial
4 Slide locking screw
5 Toolholder locking screw
6 Coolant nozzle
7 Slide holder
8 Oiling nipple
9 Toolholder locking screws
10 Slide adjustment range
Do not exceed the range marks

Assembly

- Before mounting the BHF boring head make sure that expansion pin (2) does not protrude from the cylindrical body part.
- Insert BHF into the shank.
- **Tighten pin (2) by turning clockwise** following the recommended tightening torque guidelines below:

Recommended torque:	(N.m)
BHF MB50- 63x87	30-35
BHF MB50- 80x94	30-35
BHF MB63- 63x87	80-90
BHF MB80- 80x94	80-90
BHF MB80-125x94	80-90

- Insert the screw (5). If it protrudes, the sleeve should be rotated until the screw can enter the recess in the sleeve nut or boring bar.

Disassembly

In order to separate the BHF from the shank, loosen the expanding pin (2) by turning counterclockwise.

Positioning

The tool slide (7) allows for a 5 mm adjustment, by turning graduated dial (3) counterclockwise.

- When changing the direction of dial rotation, backlash must be compensated for.
- After positioning, lock the tool slide by means of screw (4).
- **Loosen screw (4) before making any slide adjustment.**

Maintenance

Weekly:

- Lubricate through the nipple (8) with ISO UN G220 oil.

Periodically:

- Clean and lubricate the conical and cylindrical matching surfaces.
- Treat expanding pin (2) with an anti-friction lubricant.
- Clean and lubricate the tool slide guideway.

Important Note:

Toolholder should be firmly affixed to the slide.

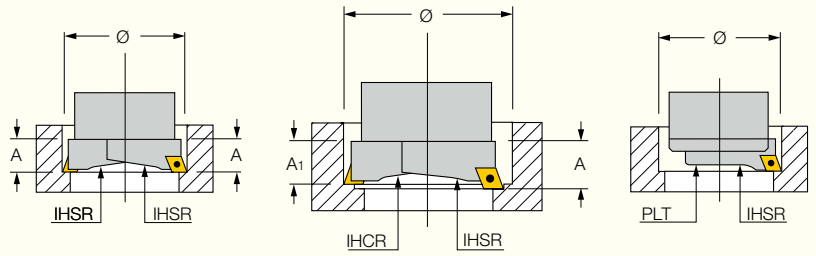
BHR Rough Boring Cutting Data

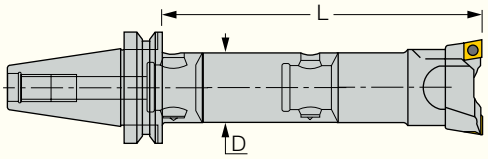
ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D18-28		Boring Range D28-50		Boring Range D50-68	
					0.5-1.2 0.2	1.2-2.5 0.4	0.8-1.5 0.2-0.4	1.5-2.5 0.4	0.8-1.5 0.2-0.4	1.5-3.0 0.4-0.8
P	Carbon Steel	HB<200	2.5 ●●●	Vc (m/min) f (mm/rev)	150-180 0.1-0.2	120-150 0.08-0.2	160-200 0.15-0.2	140-170 0.1-0.175	160-200 0.15-0.25	140-180 0.08-0.2
			4 ●●	Vc (m/min) f (mm/rev)	140-160 0.1-0.18	100-140 0.08-0.15	160-180 0.1-0.12	120-150 0.08-0.1	160-180 0.1-0.12	120-150 0.08-0.1
			6.3 ●	Vc (m/min) f (mm/rev)	60-80 0.06-0.12	40-60 0.06-0.1	60-90 0.06-0.12	50-60 0.06-0.1	70-90 0.06-0.1	50-70 0.06-0.1
	Carbon Steel	HB>200	2.5 ●●●	Vc (m/min) f (mm/rev)	130-160 0.08-0.15	100-130 0.08-0.12	140-180 0.08-0.2	120-160 0.06-0.12	140-180 0.08-0.25	120-160 0.08-0.18
			4 ●●	Vc (m/min) f (mm/rev)	110-140 0.08-0.12	80-110 0.08-0.1	100-140 0.08-0.15	80-120 0.06-0.15	100-140 0.08-0.2	80-120 0.06-0.15
			6.3 ●	Vc (m/min) f (mm/rev)	70-90 0.08-0.1	60-70 0.06-0.08	80-100 0.06-0.1	60-80 0.06-0.08	80-100 0.08-0.15	60-80 0.06-0.1

ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D68-120		Boring Range D120-200		Boring Range D200-500	
					0.8-1.5 0.2-0.4	1.5-3.5 0.4-0.8	0.8-2.0 0.2-0.4	2.0-3.5 R=0.4-0.8	0.8-2.0 R=0.2-0.4	2.0-4.0 R=0.4-0.8
P	Carbon Steel	HB<200	2.5 ●●●	Vc (m/min) f (mm/rev)	160-220 0.15-0.25	150-180 0.08-0.2	180-250 0.15-0.3	160-200 0.1-0.2	220-280 0.15-0.3	200-220 0.1-0.15
			4 ●●	Vc (m/min) f (mm/rev)	140-180 0.08-0.2	120-150 0.08-0.15	160-200 0.1-0.2	140-180 0.08-0.15	N.R.	N.R.
			6.3 ●	Vc (m/min) f (mm/rev)	70-100 0.06-0.1	50-70 0.06-0.1	N.R.	N.R.	N.R.	N.R.
	Carbon Steel	HB<200	2.5 ●●●	Vc (m/min) f (mm/rev)	140-180 0.15-0.3	120-160 0.12-0.2	150-170 0.15-0.25	100-140 0.1-0.2	100-140 0.15-0.3	80-120 0.1-0.2
			4 ●●	Vc (m/min) f (mm/rev)	120-150 0.1-0.2	100-140 0.1-0.18	100-130 0.08-0.2	80-110 0.08-0.12	N.R.	N.R.
			6.3 ●	Vc (m/min) f (mm/rev)	80-100 0.08-0.12	60-80 0.08-0.12	N.R.	N.R.	N.R.	N.R.

N.R. = Not Recommended

Stability
- ●●● – Good
- ●● – Normal
- ● – Poor





In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

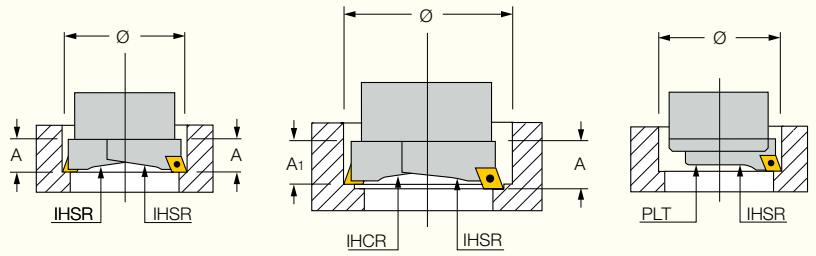
BHR Rough Boring Cutting Data

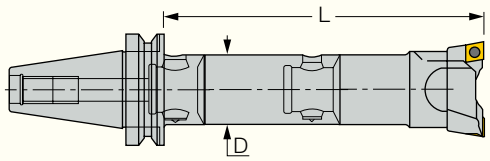
ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D18-28		Boring Range D28-50		Boring Range D50-68	
					0.5-1.0 0.2	1.0-1.8 0.4	0.5-1.0 0.2-0.4	1.0-1.8 0.4	0.5-1.2 0.2-0.4	1.2-2.0 0.4-0.8
P	Alloyed Steel	HB<200	2.5 ●●●	Vc (m/min)	140-160	90-120	150-180	100-130	160-200	140-180
				f (mm/rev)	0.08-0.18	0.08-0.15	0.08-0.2	0.08-0.18	0.1-0.25	0.1-0.15
			4 ●●	Vc (m/min)	100-130	70-100	110-150	90-120	140-180	100-130
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.08-0.15	0.8-0.18	0.08-0.12
			6.3 ●	Vc (m/min)	80-100	60-90	80-100	70-90	100-140	80-120
				f (mm/rev)	0.08-0.15	0.06-0.1	0.06-0.12	0.06-0.12	0.6-0.15	0.08-0.1
	Alloyed Steel	HB>200	2.5 ●●●	Vc (m/min)	130-150	120-140	130-150	120-140	140-170	120-150
				f (mm/rev)	0.08-0.18	0.06-0.15	0.08-0.18	0.06-0.15	0.08-0.2	0.08-0.18
			4 ●●	Vc (m/min)	100-130	100-120	100-130	100-120	120-150	100-120
				f (mm/rev)	0.08-0.15	0.06-0.13	0.08-0.15	0.06-0.13	0.08-0.18	0.08-0.15
			6.3 ●	Vc (m/min)	80-100	70-90	80-100	70-90	100-120	70-90
				f (mm/rev)	0.08-0.12	0.06-0.11	0.08-0.12	0.06-0.11	0.08-0.12	0.06-0.11

ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D68-120		Boring Range D120-200		Boring Range D200-500	
					1.8 0.2-0.4	2.5 0.4-0.8	0.8-2.0 0.2-0.4	2.0-3.5 0.4-0.8	0.8-2.0 0.2-0.4	2.0-4.0 0.4-0.8
P	Alloyed Steel	HB<200	2.5 ●●●	Vc (m/min)	160-220	140-180	160-220	140-180	160-220	140-180
				f (mm/rev)	0.1-0.3	0.1-0.25	0.1-0.3	0.1-0.25	0.1-0.35	0.1-0.3
			4 ●●	Vc (m/min)	150-200	120-160	120-160	120-160	N.R.	N.R.
				f (mm/rev)	0.1-0.2	0.08-0.18	0.1-0.2	0.08-0.18		
			6.3 ●	Vc (m/min)	100-140	100-140	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.08-0.18	0.08-0.15				
	Alloyed Steel	HB>200	2.5 ●●●	Vc (m/min)	160-200	140-180	140-200	140-180	140-200	140-180
				f (mm/rev)	0.1-0.3	0.01-0.25	0.01-0.35	0.01-0.3	0.01-0.35	0.01-0.3
			4 ●●	Vc (m/min)	140-160	120-140	150-180	120-140	N.R.	N.R.
				f (mm/rev)	0.08-0.2	0.08-0.15	0.08-0.12	0.08-0.12		
			6.3 ●	Vc (m/min)	100-120	70-90	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.08-0.16	0.08-0.12				

N.R. = Not Recommended

Stability
- ●●● – Good
- ●● – Normal
- ● – Poor



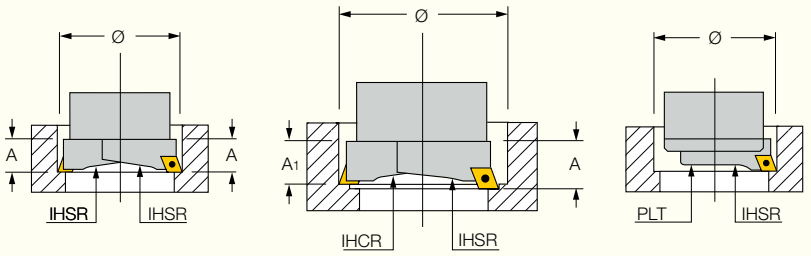


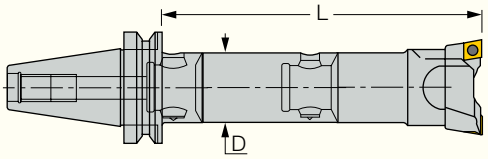
In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D18-28		Boring Range D28-50		Boring Range D50-68	
					0.5-1.0 0.2	1.0-1.8 0.4	0.5-1.0 0.2-0.4	1.0-1.8 0.4	0.5-1.2 0.2-0.4	1.2-2.0 0.4-0.8
M	Stainless Steel	Ferritic & Martensitic	2.5 ●●●	Vc (m/min)	100-150	110-130	120-160	100-150	120-160	110-160
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.06-0.12	0.08-0.25	0.08-0.18
			4 ●●	Vc (m/min)	90-130	90-120	100-140	90-140	100-150	80-120
				f (mm/rev)	0.08-0.12	0.06-0.1	0.08-0.12	0.06-0.1	0.08-0.18	0.08-0.12
			6.3 ●	Vc (m/min)	60-90	50-70	60-90	50-70	70-100	50-70
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.12	0.06-0.1	0.06-0.15	0.08-0.1
	Stainless Steel	Austenitic	2.5 ●●●	Vc (m/min)	110-130	100-130	120-150	110-140	110-160	100-150
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.06-0.12	0.08-0.25	0.06-0.12
			4 ●●	Vc (m/min)	80-110	80-110	90-130	90-120	100-150	90-130
				f (mm/rev)	0.08-0.12	0.06-0.1	0.08-0.12	0.06-0.1	0.08-0.18	0.06-0.1
			6.3 ●	Vc (m/min)	60-90	50-70	60-90	50-70	70-100	50-70
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.12	0.06-0.1	0.06-0.15	0.06-0.1
	Cast Stainless Steel	Ferritic & Martensitic	2.5 ●●●	Vc (m/min)	90-130	100-130	120-150	110-140	120-160	100-150
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.06-0.12	0.08-0.25	0.06-0.12
			4 ●●	Vc (m/min)	70-110	80-110	90-130	90-120	100-150	90-130
				f (mm/rev)	0.08-0.12	0.06-0.1	0.08-0.12	0.06-0.1	0.08-0.18	0.06-0.1
			6.3 ●	Vc (m/min)	60-90	50-70	60-90	50-70	70-100	50-70
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.12	0.06-0.1	0.06-0.15	0.06-0.1
	Cast Stainless Steel	Austenitic	2.5 ●●●	Vc (m/min)	80-120	70-110	100-150	90-140	110-150	100-150
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.06-0.12	0.08-0.25	0.06-0.12
			4 ●●	Vc (m/min)	70-100	70-100	80-130	70-120	90-140	90-130
				f (mm/rev)	0.08-0.12	0.06-0.1	0.08-0.12	0.06-0.1	0.08-0.18	0.06-0.1
			6.3 ●	Vc (m/min)	60-90	50-70	60-90	50-70	70-100	50-70
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.12	0.06-0.1	0.06-0.15	0.06-0.1

Stability
- ●●● – Good
- ●● – Normal
- ● – Poor





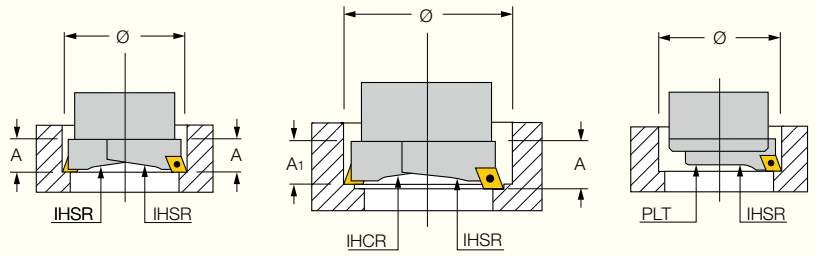
In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

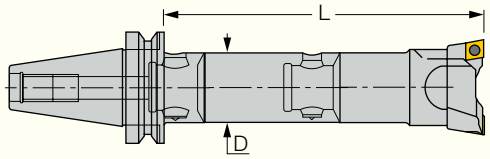
BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D68-120		Boring Range D120-200		Boring Range D200-500	
					0.8-1.8 0.2-0.4	1.8-2.5 0.4-0.8	0.8-2.0 0.2-0.4	2.0-3.0 0.4-0.8	0.8-2.0 0.2-0.4	2.0-3.5 0.4-0.8
M	Stainless Steel	Ferritic & Martensitic	2.5 ●●●	Vc (m/min) f (mm/rev)	130-220 0.08-0.3	120-200 0.08-0.25	140-220 0.08-0.3	120-180 0.08-0.25	150-220 0.08-0.3	120-200 0.08-0.25
			4 ●●	Vc (m/min) f (mm/rev)	100-160 0.08-0.25	90-140 0.08-0.18	120-180 0.08-0.25	90-140 0.08-0.18	N.R.	N.R.
			6.3 ●	Vc (m/min) f (mm/rev)	70-100 0.08-0.2	50-70 0.08-0.15	N.R.	N.R.	N.R.	N.R
	Stainless Steel	Austenitic	2.5 ●●●	Vc (m/min) f (mm/rev)	120-200 0.08-0.3	100-160 0.08-0.25	120-200 0.08-0.3	100-160 0.08-0.25	120-200 0.08-0.3	100-180 0.08-0.25
			4 ●●	Vc (m/min) f (mm/rev)	100-150 0.08-0.25	90-140 0.08-0.18	100-160 0.08-0.25	90-140 0.08-0.18	N.R.	N.R.
			6.3 ●	Vc (m/min) f (mm/rev)	70-100 0.08-0.2	50-70 0.08-0.15	N.R.	N.R.	N.R.	N.R.
	Stainless Steel Cast	Ferritic & Martensitic	2.5 ●●●	Vc (m/min) f (mm/rev)	130-200 0.08-0.3	120-180 0.08-0.25	140-200 0.08-0.3	120-160 0.08-0.25	140-200 0.08-0.3	120-180 0.08-0.25
			4 ●●	Vc (m/min) f (mm/rev)	110-150 0.08-0.25	90-150 0.08-0.18	100-160 0.08-0.25	90-140 0.08-0.18	N.R.	N.R.
			6.3 ●	Vc (m/min) f (mm/rev)	70-100 0.08-0.2	50-70 0.08-0.15	N.R.	N.R.	N.R.	N.R.
	Stainless Steel Cast	Austenitic	2.5 ●●●	Vc (m/min) f (mm/rev)	130-180 0.08-0.3	120-180 0.08-0.25	120-200 0.08-0.3	100-160 0.08-0.25	120-200 0.08-0.3	100-180 0.08-0.25
			4 ●●	Vc (m/min) f (mm/rev)	100-140 0.08-0.25	90-140 0.08-0.18	100-160 0.08-0.25	90-140 0.08-0.18	N.R.	N.R.
			6.3 ●	Vc (m/min) f (mm/rev)	70-190 0.08-0.2	50-70 0.08-0.15	N.R.	N.R.	N.R.	N.R.

N.R. = Not Recommended

Stability
- ●●● – Good
- ●● – Normal
- ● – Poor





In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

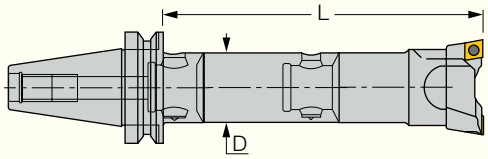
BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D18-28		Boring Range D28-50		Boring Range D50-68	
					0.5-1.0 0.2-0.4	1.0-1.8 0.4	0.5-1.0 0.2-0.4	1.0-1.8 0.4	0.5-1.2 0.2-0.4	1.2-2.0 0.4-0.8
K	Grey Cast Iron GG 10-25	HB<200	2.5 ●●●	Vc (m/min)	120-160	100-140	120-180	110-150	120-180	110-150
				f (mm/rev)	0.06-0.15	0.06-0.18	0.06-0.15	0.06-0.12	0.08-0.2	0.08-0.12
			4 ●●	Vc (m/min)	100-140	80-120	100-150	80-120	100-150	80-120
				f (mm/rev)	0.06-0.12	0.06-0.1	0.06-0.12	0.06-0.1	0.08-0.12	0.08-0.1
			6.3 ●	Vc (m/min)	70-100	60-90	70-100	60-90	70-100	60-90
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.08-0.1	0.08-0.1
	Grey Cast Iron GG 25-40		2.5 ●●●	Vc (m/min)	140-200	140-200	140-220	160-250	180-220	200-280
				f (mm/rev)	0.06-0.15	0.06-0.18	0.06-0.15	0.06-0.18	0.08-0.2	0.1-0.25
			4 ●●	Vc (m/min)	120-160	120-160	120-180	140-200	140-180	180-220
				f (mm/rev)	0.06-0.12	0.06-0.14	0.06-0.12	0.06-0.14	0.08-0.12	0.08-0.2
			6.3 ●	Vc (m/min)	70-100	60-90	70-100	60-90	60-100	60-120
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.08-0.1	0.08-0.1
	Cast Iron GGG	Spheroidal & Graphite	2.5 ●●●	Vc (m/min)	120-180	120-180	120-200	140-220	180-220	180-240
				f (mm/rev)	0.06-0.15	0.06-0.18	0.06-0.15	0.06-0.18	0.08-0.18	0.1-0.2
			4 ●●	Vc (m/min)	120-160	120-160	120-180	140-200	140-200	160-220
				f (mm/rev)	0.06-0.12	0.06-0.14	0.06-0.12	0.06-0.14	0.08-0.12	0.08-0.18
			6.3 ●	Vc (m/min)	60-100	60-90	60-100	60-90	60-90	60-100
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.08-0.1	0.08-0.1

ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D68-120		Boring Range D120-200		Boring Range D50-68	
					0.8-1.8 0.2-0.4	1.8-2.5 0.4-0.8	0.8-2.0 0.2-0.4	2.0-3.0 0.4-0.8	0.8-2.0 0.2-0.4	2.0-3.5 0.4-0.8
K	Grey Cast Iron GG 10-25	HB<200	2.5 ●●●	Vc (m/min)	120-200	110-150	150-250	180-280	150-250	180-280
				f (mm/rev)	0.08-0.25	0.08-0.3	0.08-0.25	0.08-0.35	0.08-0.25	0.08-0.35
			4 ●●	Vc (m/min)	100-150	80-120	120-170	120-170	N.R.	N.R.
				f (mm/rev)	0.08-0.18	0.08-0.2	0.08-0.18	0.08-0.25		
			6.3 ●	Vc (m/min)	70-100	60-90	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.08-0.15	0.08-0.12				
	Grey Cast Iron GG 25-40	4	2.5 ●●●	Vc (m/min)	250-300	250-350	250-350	250-350	250-350	250-350
				f (mm/rev)	0.12-0.35	0.12-0.35	0.15-0.3	0.15-0.4	0.15-0.3	0.15-0.4
			●●	Vc (m/min)	200-270	230-300	200-300	200-270	N.R.	N.R.
				f (mm/rev)	0.1-0.25	0.12-0.3	0.15-0.3	0.15-0.35		
			6.3 ●	Vc (m/min)	70-150	60-120	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.1-0.15	0.12-0.25				
	Cast Iron GGG	Spheroidal & Graphite	2.5 ●●●	Vc (m/min)	200-240	200-280	200-280	220-300	220-300	220-300
				f (mm/rev)	0.12-0.3	0.12-0.3	0.15-0.3	0.15-0.35	0.15-0.3	0.15-0.35
			4 ●●	Vc (m/min)	160-220	180-240	180-250	200-270	N.R.	N.R.
				f (mm/rev)	0.1-0.2	0.12-0.25	0.15-0.25	0.15-0.35		
			6.3 ●	Vc (m/min)	60-100	60-100	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.1-0.15	0.12-0.2				

N.R. = Not Recommended

Stability
- ●●● – Good
- ●● – Normal
- ● – Poor



In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

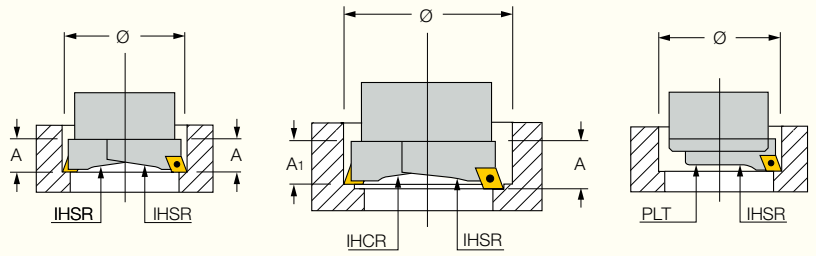
BHR Rough Boring Cutting Data

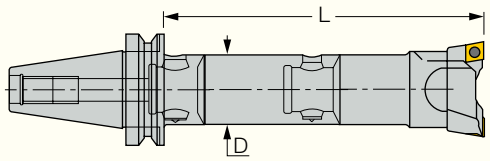
ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D18-28		Boring Range D28-50		Boring Range D50-68	
					0.5-1.5 0.2-0.4	1.5-2.5 0.4	0.5-1.5 0.2-0.4	1.5-2.5 0.4	0.5-2.0 0.2-0.4	1.2-3.0 0.4-0.8
N	Aluminum/ Cast	>12si	2.5 ●●●	Vc (m/min) f (mm/rev)	200-300 0.06-0.2	240-350 0.06-0.25	200-300 0.06-0.2	240-350 0.06-0.25	200-300 0.06-0.25	240-350 0.06-0.3
			4 ●●	Vc (m/min) f (mm/rev)	150-220 0.06-0.2	150-220 0.06-0.2	150-220 0.06-0.2	150-220 0.06-0.2	150-220 0.06-0.2	150-220 0.06-0.2
			6.3 ●	Vc (m/min) f (mm/rev)	60-100 0.06-0.1	60-100 0.06-0.1	60-100 0.06-0.1	60-100 0.06-0.1	60-100 0.06-0.1	60-100 0.06-0.1
	Aluminum/ Cast	<12si	2.5 ●●●	Vc (m/min) f (mm/rev)	180-250 0.06-0.2	220-280 0.06-0.25	180-250 0.06-0.25	220-280 0.06-0.25	180-250 0.06-0.25	220-280 0.06-0.3
			4 ●●	Vc (m/min) f (mm/rev)	120-220 0.06-0.2	120-220 0.06-0.2	120-220 0.06-0.2	120-220 0.06-0.2	120-220 0.06-0.2	120-220 0.06-0.25
			6.3 ●	Vc (m/min) f (mm/rev)	60-100 0.06-0.1	60-100 0.06-0.1	60-100 0.06-0.1	60-100 0.06-0.1	60-100 0.06-0.1	60-100 0.06-0.1

ISO	Workpiece Material	Hardness HB	Overhang L/D	ap (mm) R (Radius)	Boring Range D68-120		Boring Range D120-200		Boring Range D200-500	
					0.8-3.0 0.2-0.4	1.8-4.0 0.4-0.8	0.8-3.0 0.2-0.4	2.0-4.0 0.4-0.8	0.8-3.0 0.2-0.4	2.0-4.5 0.4-0.8
N	Aluminum/ Cast	>12si	2.5 ●●●	Vc (m/min) f (mm/rev)	200-300 0.06-0.25	240-350 0.06-0.3	200-300 0.06-0.25	240-350 0.06-0.4	200-300 0.06-0.25	240-350 0.06-0.4
			4 ●●	Vc (m/min) f (mm/rev)	150-220 0.06-0.2	150-220 0.06-0.2	150-220 0.06-0.2	150-220 0.06-0.2	N.R.	N.R.
			6.3 ●	Vc (m/min) f (mm/rev)	60-100 0.06-0.1	60-100 0.06-0.1	N.R.	N.R.	N.R.	N.R.
	Aluminum/ Cast	<12si	2.5 ●●●	Vc (m/min) f (mm/rev)	180-250 0.06-0.25	220-280 0.06-0.3	180-250 0.06-0.3	220-280 0.06-0.4	180-250 0.06-0.3	220-280 0.06-0.4
			4 ●●	Vc (m/min) f (mm/rev)	120-220 0.06-0.2	120-220 0.06-0.25	120-220 0.06-0.2	120-220 0.06-0.25	N.R.	N.R.
			6.3 ●	Vc (m/min) f (mm/rev)	60-100 0.06-0.1	60-100 0.06-0.1	N.R.	N.R.	N.R.	N.R.

N.R. = Not Recommended

Stability
- ●●● – Good
- ●● – Normal
- ● – Poor





In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

Recommended Cutting Conditions for Boring Operations with BHC Combi Rough and Fine

Material	Boring Depth to Diameter Ratio	Working Conditions	Cutting Speed Vc=m/min	Feed fn=mm/rev R=0.2	Feed fn=mm/rev R=0.4	Carbide Grade	Cutting Depth mm			
Carbon steel HB < 200	L / D = 2.5	good	160 - 250	0.1 - 0.2	0.1 - 0.2	IC807, IC908, IC520N, IC20N, IC30N, IC8150, IC8250, IC3028	0.15 - 0.3	1.5	2	2.5
	L / D = 4	normal	120 - 180	0.1 - 0.2	0.1 - 0.2					
	L / D = 6.3	difficult	70 - 100	*0.1 - 0.15	0.1 - 0.2					
Carbon steel HB > 200	L / D = 2.5	good	140 - 200	0.1 - 0.2	0.1 - 0.2		0.15 - 0.3	1.5	2	2.5
	L / D = 4	normal	100 - 160	0.1 - 0.2	0.1 - 0.2					
	L / D = 6.3	difficult	70 - 100	*0.1 - 0.15	0.1 - 0.2					
Stainless steel AISI 304 - 316	L / D = 2.5	good	100 - 140	0.1 - 0.2	0.1 -0.2	IC807, IC30N, IC3028	0.15 - 0.3	1.5	2	2.5
	L / D = 4	normal	80 - 110	0.1 - 0.2	0.1 -0.2					
	L / D = 6.3	difficult	60 - 90	*0.1 - 0.15	0.1 - 0.2					
Cast iron	L / D = 2.5	good	120 - 160	0.1 - 0.2	0.1 -0.2	IB55, IC908, IC5005, IC428	0.15 - 0.3	2	2.5	3
	L / D = 4	normal	90 - 120	0.1 - 0.2	0.1 -0.2					
	L / D = 6.3	difficult	60 - 90	*0.1 - 0.15	0.1 - 0.2					
Aluminum	L / D = 2.5	good	250 - 350	0.1 - 0.2	0.1 - 0.2	ID5, IC20	0.15 - 0.3	2	2.5	3
	L / D = 4	normal	160 - 250	0.1 - 0.2	0.1 - 0.2					
	L / D = 6.3	difficult	100 - 150	*0.1 - 0.15	0.1 - 0.2					

* Only for finishing Inserts.

**Use inserts with the same corner radii for both roughing and finishing inserts.

Vc Cutting speed (m/min)

D Diameter of workpiece (mm)

n Number of revolutions / min' (rev./min)

Vf Feed rate (mm/min.)

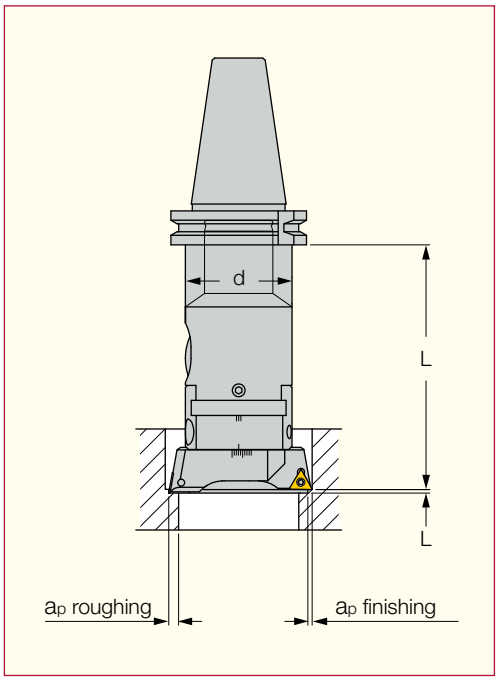
fn Feed / rev/ (mm/rev)

π 3.14

$$Vc = \frac{\pi \cdot D \cdot n}{1000}$$

$$n = \frac{VC\ 1000}{\pi \cdot D}$$

$$Vf = n \cdot fn$$



MATERIALS AND GRADES

Member IMC Group

ISCAR Hole Making Grades Chart

Grades	ISO	Coating Layers
S.T. IC808 IC908	P15-P30 M20-M30 K20-K40 S05-S20 H05-H15	TiN TIAIN
	A tough submicron substrate, TiAlN + AlTiAlN + TiN PVD coated grade. Designed for machining heat resistant alloys, austenitic stainless steel, hard alloys and carbon steel at medium to high cutting speeds, interrupted cut and unfavorable conditions. Excellent notch wear and built-up edge resistance.	
S.T. IC8080	K01-K20 P05-P20	TiN Al_2O_3 TiCN
	A hard fine grain substrate with MTCVD TiCN + Al_2O_3 + TiN coating. Features excellent chipping and wear resistance. Recommended for high speed drilling of cast iron and steel, to be used for the peripheral insert on DR drills.	
IC08	M10-M30 N10-N25 S10-S30	
	An uncoated , fine grain carbide grade. Used mainly for aluminum, can also be used on stainless steel and high temperature alloys at low to medium cutting speeds.	

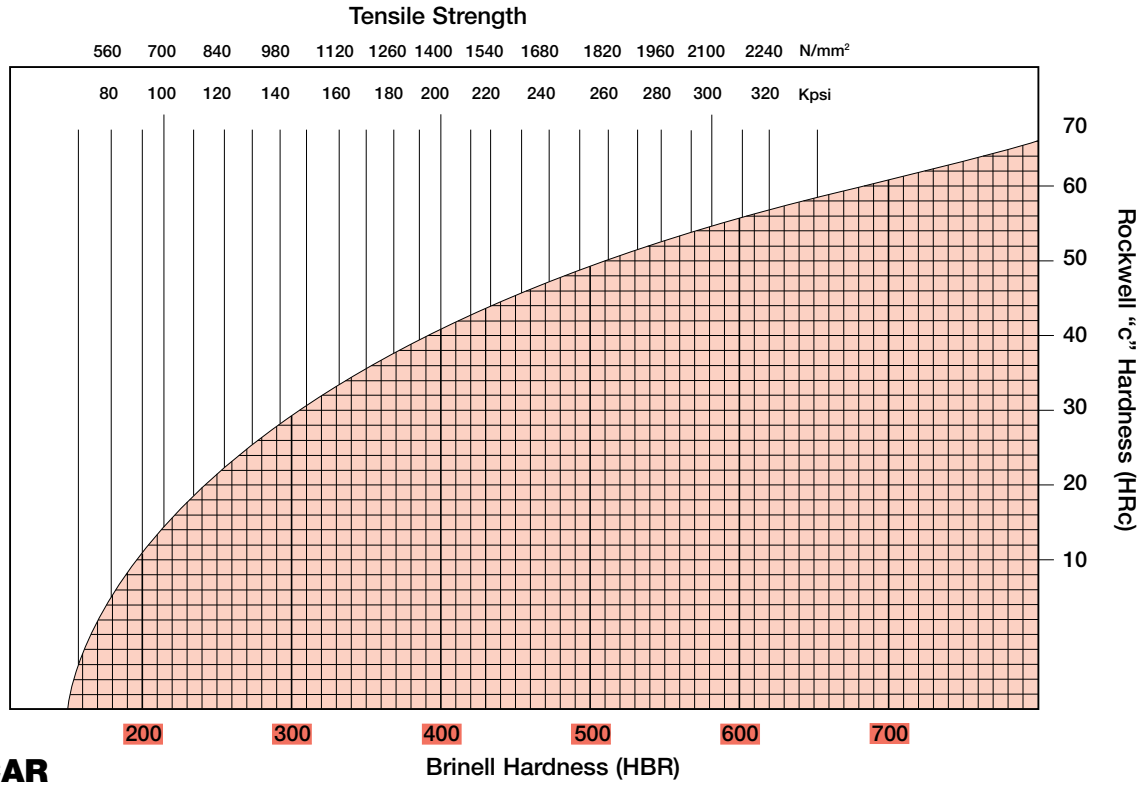
S.T. SUMO TEC ■ PVD COATED ■ CVD COATED

Grades for Applications and Materials

Material Groups / Main Applications	ISO P	ISO H	ISO M	ISO S	ISO K	ISO N
	1-11 Steel	38-41 Hard Steel	12-14 Stainless Steel	31-37 High Temp.	15-20 Cast Iron	21-28 Nonferrous
DRILLING	IC808 (908)	IC808 (908)	IC808 (908)	IC808 (908)	Harder IC8080[1] (9080) IC808 (908) Tougher	Harder IC808 (908) IC08 Tougher

[1] Use for an outer insert on DR drills.

Hardness Conversion Table



MATERIAL GROUPS

According to DIN / ISO 513 and VDI 3323

ISO	Material		Condition	Tensile Strength [N/mm²]	Kc1 (1) [N/mm²]	m_c (2)	Hardness HB	Material No.
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	1350	0.21	125	1
		>= 0.25 %C	Annealed	650	1500	0.22	190	2
		< 0.55 %C	Quenched and tempered	850	1675	0.24	250	3
		>= 0.55 %C	Annealed	750	1700	0.24	220	4
			Quenched and tempered	1000	1900	0.24	300	5
	Low alloy steel and cast steel (less than 5% of alloying elements		Annealed	600	1775	0.24	200	6
				930	1675	0.24	275	7
			Quenched and tempered	1000	1725	0.24	300	8
				1200	1800	0.24	350	9
	High alloy steel, cast steel, and tool steel		Annealed	680	2450	0.23	200	10
			Quenched and tempered	1100	2500	0.23	325	11
M	Stainless steel and cast steel		Ferritic/martensitic	680	1875	0.21	200	12
			Martensitic	820	1875	0.21	240	13
			Austenitic	600	2150	0.20	180	14
K	Grey cast iron (GG)		Pearlitic/ferritic		1150	0.20	180	15
			Pearlitic/martensitic		1350	0.28	260	16
	Ductile cast iron (nodular) (GGG)		Ferritic		1225	0.25	160	17
			Pearlitic		1350	0.28	250	18
	Malleable cast iron		Ferritic		1225	0.25	130	19
			Pearlitic		1420	0.3	230	20
N	Aluminum-wrought alloy		Not cureable		700	0.25	60	21
			Cured		800	0.25	100	22
	Aluminum-cast, alloyed	<=12% Si	Not cureable		700	0.25	75	23
			Cured		700	0.25	90	24
		>12% Si	High temperature		750	0.25	130	25
	Copper alloys	>1% Pb	Free cutting		700	0.27	110	26
			Brass		700	0.27	90	27
			Electrolitic copper		700	0.27	100	28
	Non-metallic		Duroplastics, fiber plastics					29
			Hard rubber					30
S	High temp. alloys	Fe based	Annealed		2600	0.24	200	31
			Cured		3100	0.24	280	32
		Ni or Co based	Annealed		3300	0.24	250	33
			Cured		3300	0.24	350	34
			Cast		3300	0.24	320	35
	Titanium and Ti alloys			RM 400	1700	0.23		36
			Alpha+beta alloys cured	RM 1050	2110	0.22		37
H	Hardened steel		Hardened		4600		55 HRc	38
			Hardened		4700		60 HRc	39
	Chilled cast iron		Cast		4600		400	40
	Cast iron		Hardened		4500		55 HRc	41

Steel · Stainless Steel · Cast Iron · Nonferrous · High Temp. Alloys · Hardened Steel

(1) Specific cutting force for 1 mm² chip section.
(2) Chip thickness factor.

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
1		1.0028	Ust 34-2 (S250G1T)		
1		1.0034	RSt 34-2 (S250G2T)	1449 34/20HR; 1449 34/20HS; 1449 34/20CR; 1449 34/20CS	
1		1.0035	St185 (Fe 310-0); St 33	Fe 310-0; 1449 15HR; 1449 15HS	
1	A 570 Gr. 33; A 570 Gr. 36	1.0036	S235JRG1; (Fe 360 B); Ust 37-2	Fe 360 B; 4360-40 B	
1		1.0037	S235JR (Fe 360 B); St 37-2	Fe 360 B; 4360-40 B	
1	A 570 Gr. 40	1.0044	S275JR (Fe 430 B); St44-2	Fe 430 B FN; 1449 43/25 HR; 1449 43/25HS; 4360-43 B	
1		1.0045	S355JR	4360-50 B	
1	A 570 Gr.50; A 572 Gr.50	1.0050	E295 (Fe 490-2); St 50-2	Fe 490-2 FN; 4360-50 B	
1	A 572 Gr. 65	1.0060	E335 (Fe 590-2); St 60-2	Fe 60-2; 4360-55 E; 4360-55 C	
1		1.0112	P235S	1501-164-360B LT20	
1		1.0114	S235JU; St 37-3 U	4360-40C	
1		1.0130	P265S	1501-164-400B LT 20	
1		1.0143	S275J0; St 44-3 U	4360-43C	
1	A 573 Gr. 70; A 611 Gr.D	1.0144	S275J2G3 (Fe 430 D 1); St 44-3	Fe 430 D1 FF; 4360-43 C; 4360-43 D	
1		1.0149	S275JOH; RoSt 44-2	4360-43C	
1		1.0226	DX51D; St 02 Z	Z2	
1	M 1010	1.0301	C10	040 A 10; 045 M 10; 1449 10 CS	
1	A 621 (1008)	1.0330	DC 01; St 2; St 12	1449 4 CR; 1449 3 CS	
1	A 619 (1008)	1.0333	Ust 3 (DC03G1); Ust 13	1449 2 CR;1449 3 CR	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
A 34-2		Fe 330; Fe 330 B FU		SS 330	
A 34-2 NE		Fe 330 B FN			St2sp; St2ps
A 33	1300	Fe 320	Fe 310-0		St0
	1311; 1312	FE37BFU	AE 235 B; Fe 360 B		16D; 18Kp; St3Kp
E 24-2	1311	Fe 360 B; 1449 37/23 HR	AE 235 B; Fe 360 B	STKM 12 A; STKM 12 AC	
E 28-2	1412	Fe 430 B; Fe 430 B FN	AE 275 B; Fe 430 B FN	SM 400 A; SM 400 B; SM 400 C	St4ps; St4sp
E 36-2	2172	Fe 510 B	AE 355 B		
A 50-2	1550; 2172	Fe 490	a 490-2; Fe 490-2 FN	SS 490	ST5ps; ST5sp
A 60-2	1650	Fe 60-2; Fe 590	A 590-2; Fe 590-2 FN	SM 570	St6ps; St6sp
A37AP		Fe 360 C	AE 235 C		
E 24-3		Fe 360 C	AE 235 C		
A 42 AP			SPH 265		
E 28-3	1414-01	Fe 430 D	AE 275 D		
E 28-3; E 28-4	1411; 1412; 1414	Fe 430 B; Fe 430 C (FN); Fe 430 D (FF)	AE 275 D; Fe 430 D1 FF	SM 400 A; SM 400 B; SM 400 C	St4kp; St4ps; St4sp
	1412-04	Fe 430 C	Fe 430 C		
GC	1151 10	FeP 02 G	FeP 02 G		
AF 34 C 10; XC 10		C 10; 1 C 10	F.1511; F.151.A	S 10C	10
TC	1142	FeP 00; FeP 01	AP 11	SPHD	15 kp
E		FeP 02	AP 02	SPCD	

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
1	A 621 (1008)	1.0334	UStW 23 (DD12G1)		
1	A 622 (1008)	1.0335	DD13; StW 24	1449 1 HR	
1	A 620 (1008)	1.0338	DC04; St 4; St 14	1449 1 CR; 1449 2 CR	
1	A 516 Gr. 65; 55 A 515 Gr. 65; 55 A 414 Gr. C; A 442 Gr.55	1.0345	P235GH/H I	1501 Gr. 141-360; 1501 Gr. 161-360; 151-360 1501 Gr. 161-400; 154-360 1501 Gr. 164-360; 161-360	
1	(M) 1020; M 1023	1.0402	C22	055 M 15; 070 M 20; 1499 22 HS; 1499 22 CS	2C/2D
1	1020	1.0402	C22	050A20	2C/2D
1	1020; 1023	1.0402	C22	055 M 15; 070 M 20	2C
1		1.0425	P265GH/H II	1501 Gr. 161-400; 151-400 1501 Gr. 164-360; 161-400 1501 Gr. 164-400; 154-400	
1	A27 65-35	1.0443	GS-45	A1	
1		1.0539	S355NH;StE 335		
1		1.0545	S355N; StE 355	4360-50E	
1		1.0546	S355NL;TStE 355	4360-50EE	
1		1.0547	S355JOH	4360-50C	
1		1.0549	S355 NLH;TStE 355		
1		1.0553	S355JO;St 52-3U	4360-50C	
1	A 633 Gr.C; A 588	1.0562	P355N; StE 355	1501 Gr.225-490A LT 20	
1		1.0565	P355NH; WStE 355	1501-225-490B LT 20	
1		1.0566	P355NL1; TStE 355	1501-225-490A LT 50	
1	1	1.0570	S355J2G3; St 52-3	Fe 510 D1 FF; 1449 50/35 HR›HS; 4360-50 D	
1	1213	1.0715	9 SMn 28 (1SMn30)	230 M 07	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
S C		FeP 12	AP 12	SPHE	10kp
3 C		FeP 13	AP 13	SPHE	08kp
ES	1147	FeP 04	AP 04	SPCE	08jU; JUA
A 37 CP; A 37 AP	1331; 1330	FeE235; Fe 360 1 KW; Fe 360 1KG; Fe 360 2 KW; Fe 360 2 KG	A 37 RC I; RA II	SGV 410; SGV 450; SGV 480; SPV 450; SPV 480	
AF 42 C 20; XC 25; 1 C 22	1450	C 20; C 21; C 25	1 C 22; F.112	S20C	20
CC20	1450	C20; C21	F.112	S22 C	20
AF 42 C 20; XC 25; 1 C 22	1450	C 20;C 21;C 25	1 C 22F.112	S 20 C; S 22 C	
A 42 CP; A 42 AP	1431; 1430; 1432	Fe 410 1KW; Fe 410 1KG; Fe 410 1KT; Fe 410 2KW; Fe 410 2KG	A 42 RC I; A 42 RC II	SPV 315; SPV 355; SG 295; SGV 410; SGV 450; SGV 480	16K; 20K
E 23-45 M	1305				
TSE 355-4	2134-04	Fe 510 B	Fe 355 KGN		
E 355 R	2334-01	FeE 355 KG	AE 355 KG		
E 355 FP	2135-01	FeE 355 KT	AE 355 KT		
TSE 355-3	2172-04	Fe 510 C	Fe 510 C		
	2135	Fe 510 D	FeE 355 KTM		
E 36-3		Fe 510 C			
FeE 355 KG N; E 355 R/FP; A 510 AP	2106	FeE 355 KG; FeE 355 KW	AEE 355 KG; AEE 355 DD	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490YB	15GF
A 510 AP	2106	FeE 355-2			
A 510 FP	2107-01	FeE 355-3			
E 36-3; E 36-4	2132; 2133; 2134; 2174	17GS; 17G1S	AE 355 D; Fe 510 D1 FF	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490YB	17GS; 17G1S
S 250	1912	CF SMn 28	F.2111 - 11 SMn 28	SUM 22	

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
1	1213	1.0715	9 SMn 28	230 M 07	
1	12 L 13	1.0718	9 SMnPb 28 (11SMnPb30)		
1	1108; 1109	1.0721	10 S 20	10S20	
1	11 L 08	1.0722	10 SPb 20		
1	11 L 08	1.0722	10 SPb 20		
1	1215	1.0736	9 SMn 36 11SMn37)		
1	12 L 14	1.0737	9 SMnPb 36 (11SMnPb37)		
1		1.0972	S315MC; QStE 300 TM	1501-40F30	
1		1.0976	S355MC; QStE 360 TM	1501-43F35	
1		1.0982	S460MC; QStE 460 TM	1501-50F45	
1		1.0984	S500MC; QStE 500 TM		
1		1.0986	S500MC; QStE 500 TM	1501 - 60F55	
1	1010	1.1121	CK 10; (C10E)	040 A 10	
1		1.1121	St 37-1	4360 40 A	
1	1015	1.1141	CK 15; (C15E)	040 A 15; 080 M 15	32C
1	1020; 1023	1.1151	C22E; CK 22	055 M 15; (070 M 20)	
1		1.2083			
1	A572-60	1.8900	StE 380	4360 55 E	
1	A36		St 44-2	4360 43 A	
1			StE 320-3Z	1 501 160	
2	(M) 1025	1.0406	C 25	070 M 26	
2		1.0416	GS-38		
2	A 537 Cl.1; A 414 Gr. G; A 612	1.0473	P355GH; 19 Mn 6		
2	1035	1.0501	C35	080 A 32; 080 A 35; 080 M 36; 1449 40 CS	
2	1045	1.0503	CF 45; (C45G)	060 A 47; 080 M 46	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
S 250	1912	CF 9 SMn 28	11 SMn 28	SUM 22	
S 250 Pb	1914	CF 9 SMnPb 28	F.2112-11 SMnPb 28	SUM 22 L; SUM 23 L; SUM 24 L	
10S20; 10 F 2		CF 10 S 20	F. 2121 - 10 S 20		
10PbF 2		CF 10 SPb 20	F.2122-10 SPb 20		
10 PbF 2		CF 10 SPb 20	10 SPb 20		
S 300		CF 9 Mn 36	F.2113 - 12 SMn 35	SUM 25	
S 300 Pb	1926	CF 9 SMnPb 36	F.2114- 12 SMnPb 35		
E 315 D					
E 355 D	2642	FeE 355TM			
E 490 D	2662	FeE 490 TM			
E 560 D		FeE 560 TM			
XC 10	1265	C 10; 2 C 10; 2 C 15	F-1510-C 10 K	S 9 CK; S 10 C	08;10
	1300				
XC 12; XC 15; XC 18	1370	C 15; C 16	F.1110-C 15 K; F.1511-C 16 K	S 15; S 15 CK	15
2 C 22; XC 18; XC 25	1450	C 20; C 25	F.1120-C 25 K	S 20 C; S 20 CK; S 22 C	20
	2314				
	2145	FeE390KG		S25C	
NFA 35-501 E 28	1411				
	1421				
1 C 25		C 25; 1 C 25			
20-400 M	1306				
A 52 CP	2101; 2102	Fe E 355-2	A 52 RC I, RA II	SGV 410; SGV 450; SGV 480	
1 C 35; AF 55 C 35; XC 38	1572; 1550	C 35; 1 C 35	F.113	S 35 C	35
XC 42 H 1 TS	1672	C 43; C 46		S 45 C	45

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
2	1040	1.0511	C40	080 M 40	
2		1.0540	C 50		
2	A27 70-36	1.0551	GS-52	A2	
2	A148 80-40	1.0553	GS-60	A3	
2	A738	1.0577	S355J2G4 (Fe 510 D 2)	Fe 510 D2 FF; 1501 Gr.224-460; 1501 Gr. 224-490	
2	1140	1.0726	35 S 20	212 M 36	8M
2	1146	1.0727	45 S 20 (46S20)		
2	1035; 1041	1.1157	40Mn4	150 M 36	15
2	1025	1.1158	C25E; CK 25	(070 M 25)	
2	1536	1.1166	34Mn5		
2	1330	1.1170	28Mn6	(150 M 28); (150 M 18)	14A
2		1.1178	C30E; CK 30	080M30	
2	1035	1.1180	C35R; Cm 35	080 A 35	
2	1035; 1038	1.1181	C35E; CK 35	080 A 35; (080 M 36)	
2	1035	1.1181	C35E; CK 35	080 A 35; (080 M 36)	
2	1035	1.1183	Cf 35 (C35G)	080 A 35	
2	1042	1.1191	GS- Ck 45	080 A 46	
2	1049; 1050	1.1206	C50E; CK 50	080 M 50	
2	1050; 1055	1.1213	Cf 53; (C53G)	070 M 55	
2	4520	1.5423	22Mo4	1503-245-420	
3	A 516 Gr.70; A 515 Gr. 70; A 414 Gr.F; A 414 Gr.G	1.0481	P295GH; 17 Mn 4	1501 Gr. 224	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
1 C 40; AF 60 C 40		C40; 1 C 40	F.114.A		
	1674	C 50	1 C 50		
280-480 M	1505				
320-560 M	1606				
A 52 FP	2107		A 52 RB II; AE 355 D		
35MF 6	1957		F.210.G		
45 MF 4	1973				
35 M 5; 40 M 5					40G
2 C 25; XC 25		C25	F.1120 - C 25 K	S 25 C; S 28 C	25
			TO.B	SMn 433 H	
20 M 5; 28 Mn 6		C 28 Mn	28 Mn 6	SCMn 1	30G
XC 32		C 30	2 C 30		
3 C 35; XC 32	1572		F.1135-C 35 K-1		
2 C 35; XC 32; XC 38 H 1	1550; 1572	C 35	F.1130-C 35 K	S 35 C	35
XC 38	1572	C36		S35C	
XC 38 H 1 TS	1572	C 36; C 38		S 35 C	35
XC 45	1660	C45	F-1140		
2 C 50; XC 48 H 1; XC 50 H1	1674	C 50			50
XC 48 H TS	1674	C 53		S 50 C	50
		16 Mo 5 KG; 16 Mo 5 KW	F.2602- 16 Mo 5	SB 450 M; SB 480 M	
A 48 CP; A 48 AP		Fe 510 KG; Fe 510 KT; Fe 510 KW; Fe 510-2 KG; Fe 510-2KT; Fe 510-2KW; FeE 295	A 47 RC I; RA II	SG 365; SGV 410; SGV 450; SGV 480	14G2

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
3	1043	1.0503	C35	060 A 47; 080 M 46; 1449 50 HS, 1449 50 CS	
3	1074	1.0614	C 76 D; D 75-2		
3	1086	1.0616	C 86 D; D 85-2		
3	1095	1.0618	C 92 D; D 95-2		
3	1036; 1330	1.1165	30Mn5	120 M 36; (150 M 28)	
3	1335	1.1167	36Mn5	150 M 36	
3	1040	1.1186	C40E; CK 40	060 A 40; 080 A 40; 080 M 40	
3	1045	1.1191	C45E; CK 45	080 M 46; 060 A 47	
3	1049	1.1201	C45R; Cm 45	080 M 46	
3		1.7242	18 CrMo 4		
3	A 387 Gr. 12 Cl	1.7337	16 CrMo 4 4		
3		1.7362	12 CrMo 19 5	3606-625	
3	A572-60		17 MnV 6	436055 E	
4	1055	1.0535	C55	070 M 55	
4	1060	1.0601	C60	060 A 62; 1449 HS; 1449 CS	43D
4	107	1.0603	C67	080 A 67; 1449 70 HS	
4	1074; 1075	1.0605	C75	1449 80 HS	
4	1055	1.1203	C55E; CK 55	060 A 57; 070 M 55	
4	1055	1.1209	C55R; Cm 55	070 M 55	
4	1060; 1064	1.1221	C60E; CK 60	060 A 62	43D
4	1070	1.1231	Ck 67; (C67E)	060 A 67	
4	1074; 1075; 1078	1.1248	CK 75; (C75E)	060 A 78	
4	1086	1.1269	CK 85 (C85E)		

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
1 C 45; AF 65 C 45	1672; 1650	C 45; 1 C 45	F.114	S 45 C	45
XC 75					
XC 80		C 85			
XC 90					
35 M 5			F.8211-30 Mn 5; f.8311-AM 30 Mn 5	SMn 433 H; SCMn 2	27ChGSNMDTL 30GSL
40 M 5	2120		F. 1203-36 Mn 6; F. 8212-36 Mn 5	ssmN 438 (H); SCMn 3	35G2; 35GL
2 C 40; XC 42 H 1		C 40		S 40 C	
2 C 45; XC 42 H 1; XC 45; XC 48 H 1	1672	C 45; C 46	F.1140-C 45 K; F.1142-C48 K	S 45 C; S 48 C	45
3 C 45; XC 42 H 1; XC 48 H 1	1660	C 45	F.1145-C 45K-1; F.1147C 48 K-1	S 50 C	
		A 18 CrMo 4 5 KW			15ChM
Z 10 CD 5.05		16 CrMo 20 5			
NFA 35-501 E 36	2142				
1 C 55; AF 70 C 55	1655	C 55; 1 C 55		S 55 C	55
1 C 60; AF 70 C 55		C 60; 1 C 60		S 58 C	60(G)
XC 65		C 67			
		C 75			75
2 C 55; XC 55 H 1	1655	C 55	F.1150-C 55 K	S 55 C	55
3 C 55; XC 55 H 1		C 55	F.1155-C 55K-1		
2 C 60; XC 60 H 1	1665; 1678	C 60		S 58 C	60; 60G; 60GA
XC 68	1770	C70			65GA; 68GA; 70
XC 75	1774	C 75			75(A)
XC 90		C 90			85(A)

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
4	1095	1.1274	Ck 101 (C101E)		
4	W 112	1.1663	C 125 W		
4					
5		1.0070	E360 (Fe 690-2); St 70-2	Fe 690-2 FN	
5		1.7238	49 CrMo 4		
5		1.7701	51 CrMoV 4		
6	A 284 Gr.D; A 573 Gr.58; A 570 Gr 36; A 570 Gr C; A 611 Gr. C	1.0116	S235J2G3 (Fe 360 D 1); St 37-3	Fe 360 D1 FF; 1449 37/23 CR; 4360-40 D	
6	5120	1.0841	St 52-3	150 M 19	
6	9255	1.0904	55 Si 7	250A53	45
6	9254	1.0904	55 Si 7	250 A 53	
6	9262	1.0961	60SiCr7		
6	L3	1.2067	100Cr6	BL3	
6	L1	1.2108	90 CrSi 5		
6	L2	1.2210	115CrV3		
6		1.2241	51CrV4		
6		1.2311	40 CrMnMo 7		
6	4135	1.2330	35 CrMo 4	708 A 37	
6		1.2419	105WCr6	105WC 13	
6	0 1	1.2510	100 MnCrW 4	BO1	
6	S1	1.2542	45 WCrV7	BS1	
6	S1	1.2550	60WCrV7		
6	L6	1.2713	55NiCrMoV6		
6	L 6	1.2721	50NiCr13		
6	O2	1.2842	90MnCrV8	BO2	
6	E 50100	1.3501	100 Cr 2		
6	52100	1.3505	100Cr6	2 S 135; 535 A 99	31
6		1.5024	46Si7		
6	9255	1.5025	51Si7		
6	9255	1.5026	55Si7	251 a 58	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
XC 100	1870	C 100	F-5117	SUP 4	
Y2 120					
	2223				
A 70-2	1655	Fe 70-2; Fe 690	A 690-2; Fe 690-2 FN		
		51 CrMoV 4			
E 24-3; E 24-4	1312; 1313	Fe 360 D1 FF; Fe 360 C FN; Fe 360 D FF; Fe 37-2	AE 235 D; Fe 360 D1 FF		St3kp; St3ps; St3sp; 16D
20 MC 5	2172	Fe 52	F-431		
55S7	2085	55Si8	56Si7		
55 S 7	2090				
60SC6		60SiCr8	60SiCr8		
Y100C6			100Cr6		
	2092	105WCR 5			
100C3		107CrV3KU			
		35 cRmO 8 KU			
34 CD 4	2234	35CrMo4	34CrMo4	SCM435TK	
105WC13	2140	10WCr6	105WCr5		ChWG
8 MO 8	2140	10WCr6	105WCr5	SKS31	
	2710	45 WCrV8 KU	45WCrSi8		5ChW25F
55WC20	2710	58WCr9KU			
55NCDV7			F.520.S	SKT4	5ChNM
55 NCV 6	2550		f-528		
90 MV8					
100 C 6	2258	100Cr6	F.1310 - 100 Cr 6	SUJ2	SchCh 15
45 S 7; Y 46 7; 46 SI 7			F. 1451 - 46 SI 7		
51 S 7; 51 Si 7	2090	48 Si 7; 50 Si 7	F.1450-50 Si 7		
55 S 7	2085; 2090	55 Si 7	F.1440 - 56 Si 7		55S2

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
6	9260	1.5027	60Si7	251 A 60; 251 H 60	
6	9260 H	1.5028	65Si7		
6		1.5120	38 MnSi 4		
6	A 204 Gr.A; 4017	1.5415	16Mo3; 15 Mo 3	1503-243 B	
6	4419	1.5419	20Mo4	1503-243-430	
6	A 350-LF 5	1.5622	14Ni6		
6	3415	1.5732	1 NilCr10		
6	3310; 3314	1.5752	14NilCr14	655M13	36A
6		1.6587	17CrNiMo6	820A16	
6		1.6657	14NiCrMo134		
6	5015	1.7015	15 Cr 3	523 M 15	
6	5132	1.7033	34Cr4	530A32	18B
6	5140	1.7035	41C r4	530M40	18
6	5140	1.7045	42Cr41	530 A 40	
6	5115	1.7131	16MnCr5	527 M 17	
6		1.7139	16MnCr5		
6	5155	1.7176	55Cr3	527 A 60	48
6	4135; 4137	1.7220	34CrMo4	708 Aa 37	
6	4142	1.7223	41CrMo4		
6	4140	1.7225	42CrMo4	708 M 0	
6		1.7228	55NiCrMoV6G	823M30	33
6		1.7262	15CrMo5		
6		1.7321	20 mOcR 4		
6	ASTM A182 F12	1.7335	13CrMo4 4	1501-620Gr27	
6	A 182-F11; A 182-F12	1.7335	13 CrMo 4 4	1 501 620 Gr. 27	
6	ASTM A 182 F22	1.7380	10CrMo9 10	1501-622gR31; 1501-622gR45	
6	A182 F22	1.7380	10 CrMo 9 10	1501-622	
6		1.7715	14MoV6 3	1503-660-440	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
60 S 7		60 Si 7	F. 1441 - 60 Si 7		60S2
60 S 7				50 P 7; SUP 6	
15 D 3	2912	16Mo3 KG; 16Mo3KW	F. 2601 - 16 Mo 3		
	2512	G 20 Mo 5; G 22 Mo5		SCPH 11	
16N6		14 Ni 6 KG; 14 Ni 6 KT	F.2641 - 15 Ni 6		
14 NC 11		16NiCr11	15NiCr11	SNC415(H)	
12NC15				SNC815(H)	
18NCD6			14NiCrMo13		
			14NiCrMo131		
12 C 3				SCr415(H)	15Ch
32C4		34Cr4(KB)	35Cr4	SCr430(H)	35Ch
42C4		41Cr4	42Cr4	SCr440(H)	
42 C 4 TS	2245	41Cr4	42Cr4	SCr440	
16 MC 5	2511	16MnCr5	16MnCr5		
	2127				
55 C 3	2253			SUP9(A)	50ChGA
35 CD 4	2234				35ChM
		41CrMo4	42CrMo4	SNB 22-1	40ChFA
42 CD 4	2244				
	2512	653M31			
12 CD 4	2216		12CrMo4		
	2625				
		14CrMo4 5	14CrMo45		
15 CD 4.5	2216		12CrMo4	SCM415(H)	12ChM; 15ChM
12 CD 9.10	2218	12CrMo9, 12CrMo10	TU.H		
			13MoCrV6		

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
6	A355A	1.8509	41CrAlMo 7	905 M 39	41B
7	A570.36	1.0038	S235JRG2 (Fe 360 B); RSt 37-2	Fe 360 B FU; 1449 27/23 CR; 4360-40 B	
7	3135	1.5710	36NiCr6	640A35	111A
7		1.5755	31 NiCr 14	653 M 31	
7	8620	1.6523	2 NiCrMo2	805M20	362
7	8740	1.6546	40 NiCrMo 22	311-Tyre 7	
7	4340	1.6565	40NiCrMo6	817 M 40	24
7	4130	1.7218	25CrMo4	CDS 110	
7		1.7733	24 CrMoV 5 5		
7		1.7755	GS-45 CrMOV 10 4		
7		1.8070	21 CrMoV 5 11		
8	C 45 W	1.173	C 45 W3		
8	4142	1.2332	47 CrMo 4	708 M 40	19A
8	A128 (A)	1.3401	G-X120 Mn 12		
8	3435	1.5736	36 NiCr 10		
8	9840	1.6511	36CrNiMo4	816M40	110
8		1.7361	32 CeMo12	722 M 24	40B
8	6150	1.8159	50 CrV 4	735 A 50	47
8		1.8161	58 CrV 4		
8		1.8515	32 CrMo 12	722 M 24	40B
8		1.8523	39CrMoV13 9	897M39	40C
9		1.4882	X 50 CrMnNiNbN 21 9		
9		1.5864	35 niCr 18		
9			31 NiCrMo 13 4	830 m 31	
10	A 619	1.0347	DCO3; RRSt; RRSt 13	1449 3 CR; 1449 2 CR	
10	M 1015; M 1016; M 1017	1.0401	C15	080 M 15; 080 M 15; 1449 17 CS	
10		1.0723	15 S22; 15 S 20	210 A 15; 210 M 15	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
40 CAD 6.12	2940	41CrAlMo7	41CrAlMo7		
E 24-2NE	1312	Fe 360 B FN	AE 235 B FN; AE 235 B FU; Fe 360 B FN; Fe 360 B FU		St3ps; St3sp
35NC6				SNC236	
18 NC 13					
20 NCD 2	2506	20NiCrMo2	20NiCrMo2	SNCM220(H)	20ChGNM
		40NiCrMo2(KB)	40NiCrMo2	SNCM240	38ChGNM
35 NCD 6	2541	35NiCrMo6(KB)		SNCM 447	38Ch2N2MA
25 CD 4	2225	25CrMo4(KB)	55Cr3	SCM420; SCM430	20ChM; 30ChM
20 CDV 6		21 CrMoV 5 11			
		35 NiCr 9			
XC 48					
42 CD 4	2244	42CrMo4	42CrMo4	SCM (440)	
Z 120 M 12	2183	GX120Mn12	F. 8251-AM-X120Mn12	SCMnH 1; SCMn H 11	110G13L
30 NC 11					
40NCD3		36nlcRmO4(KB)	35NiCrMo4	SUP10	40ChN2MA
30 CD 12	2240	30CrMo12	F.124.A		
50CrV4	2230	50CrV4	51CrV4		50ChGFA
30 CD 12	2240	32CrMo12	F.124.A		
		36CrMoV12			
Z 50 CMNNb 21.09					
	2534		f-1270		
E		Fep 02	AP 02		08JU
AF 37 C12; XC 18	1350	C15; C16; 1 C 15	F.111	S 15 C	
	1922		F.210.F	SUM 32	

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
10	D 3	1.2080	X 210 Cr 12	BD 3	
10	420	1.2083	X 42 Cr 13		
10		1.2085	X 33 CrS 16		
10		1.2162	21 MnCr 5		
10	L2	1.2210	115 Cr V3		
10		1.2311	40 CrMnMo7		
10	P20+S	1.2312	40CrMnMoS 8.6		
10		1.2316	X36CrMo17		X38CrMo16
10	H 11	1.2343	x 38 CrMoV 5 1	BH 11	
10		1.234	X 38 CrMoV 5 1		
10	H 13	1.2344	X 40 CrMoV 5 1	BH 13	
10	A 2	1.2363	X100 CrMoV 5 1	BA 2	
10		1.236	X 100 CrMo V5-1		
10	D 2	1.2379	X 155 CrVMo 12 1	BD2	
10		1.238	X 155 CrVMo 12 1		
10	HNV3	1.2379	X210Cr12G	BD2	
10	D 4 (D 6)	1.2436	X 210 CrW 12	BD6	
10		1.244	X 210 CrW 12		
10	O1	1.251	100 MnCrW 4	B0 1	
10	H 21	1.2581	X 30 WCrV 9 3	BH 21	
10		1.2601	X 165 CrMoV 12		
10	H 12	1.2606	X 37 CrMoW 5 1	BH 12	
10		1.277	X 45 NiCrMo 4		
10	O2	1.284	90 MnCrV 8	B0 2	
10	D3	1.3343	S 6-5-2	BM2	
10	ASTM A353	1.5662	X8Ni9	1501-509; 1501-510	
10	ASM A353	1.5662	X8Ni9	502-650	
10	2517	1.568	12Ni19	12Ni19	
10	2515	1.5680	12 Ni 19		
10		1.713	16 MnCr 5		
10		1.276	X 19 NiCrMo 4		
11		1.3202	S 12-1-4-5	BT 15	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
Z 200 C 12					
Z40 C14	2314			SUS 420 J 2	
Z35V CD 17.S					
20 MC 5					
100 C3		107 CrV3 KU	F.520 L		
40 CMD 8		35 cRmO 8 KU			
40CMD8S					
Z 38 CDV 5		X 37 CrMoV 5 1 KU			4Ch5MFS
Z 38 CDV 5		X 37 CrMoV 51 KU			
Z 40 CDV 5	2242	X40CrMoV511KU	F-5318	SKD61	4Ch5MF1S
Z 100 CDV 5	2260	X100CrMoV51KU	F-5227	SKD12	
Z 160 CDV 12	2310	X165CrMoW12KU	X160CrMoW12KU	SKD11	
Z 160 CDV 12		X 155 CrVMo 12 1 KU			
Z160CDV12	2736				
Z 200 CD 12	2312	X215CrW 12 1 KU	F-5213		
90 MnWRrV5		95MnWCr 5 KU	95 MnCrW 5		
Z 30 WCV 9		X30WCrV 9 3 KU	F-526	SKD5	3Ch2W8F
	2310				
Z 35 CWDV 5		X 35 CrMoW 05 KU	F.537		5ChNM
45 NCD 16		40 NiCrMoV 8 KU			
90 MV 8		90 MnVCr 8 KU			
Z200C12	2715	X210Cr13KU	X210Cr12	SUH3	R6M5
		14 Ni 6 KG; 14 Ni 6 KT	XBNiO9		
9 Ni		X10Ni9	F-2645	SL9N60(53)	
Z18N5					
Z 18 N 5					
16 MC 5					
		HS 12-1-5-5	12-1-5-5		

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
11		1.3207	S 10-4-3-10	BT42	
11	T 15	1.3243	S 6-5-2-5		
11		1.3246	S 7-4-2-5		
11		1.3247	S 2-10-1-8	BM 42	
11	M 42	1.3249	S 2-9-2-8	BM 34	
11	T 4	1.3255	S 18-1-2-5	BT 4	
11	M 2	1.3343	S6-5-2	BM2	
11	M 7	1.3348	S2-9-2		
11	T 1	1.3355	S 18-0-1	BT 1	
11	HNV 3	1.4718	X45CrSi 9 3	401S45	52
11	422	1.4935	x20 CrMoWV 12 1		
12	403	1.4000	X6Cr13	403 S 17	
12		1.4001	X6Cr14		
12	(410S)	1.4001	X7 Cr 13	(403 S 7)	
12	405	1.4002	X6CrA12	405S17	
12	405	1.4002	X6 CrAl 13	405 S 17	
12	416	1.4005	X12CrS 13	416 S 21	
12	410; CA-15	1.4006	(G-)X10 Cr 13	410S21	56A
12	430	1.4016	X8Cr17	Z8C17	
12	430	1.4016	X6 Cr 17	430 S 15	60
12		1.4027	G-X20Cr14	420C29	
12	420	1.4028	X30 Cr 13	420 S 45	
12		1.4086	G-X120Cr29	452C11	
12	430 F	1.4104	X12CrMoS17	420 S 37	
12	440B	1.4112	X90 CrMoV 18		
12	434	1.4113	X6CrMo 17	434 S 17	
12		1.4340	G-X40CrNi27 4		
12	S31500	1.4417	X2CrNiM0Si19 5		
12	S31500	1.4417	X2 CrNoMoSi 18 5 3		

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
Z130WKCDV					
KCV 06-05-05-04-02	2723	HS 6-5-2-5	6-5-2-5	SKH55	R6M5K5
Z110 WKCDV 07-05-04	7-4-2-5	HS 7-4-2-5	M 35		
Z110 DKCWV 09-08-04	2-10-1-8	HS 2-9-1-8	M 41		
			2-9-2-8		R6M5
Z 80 WKCV 18-05-04-0					
Z 85 WDCV	2722	HS 6 5 2	F-5604	SKH 51	
Z 100 DCWV 09-04-02-	2782	HS 2 9 2	F-5607		
Z 80 WCV 18-4-01					R18
Z45CS9		X45CrSi8	F322	SUH1	40Ch9S2
Z 6 C 13	2301	X6Cr13	F.3110	SUS403	08Ch13
			F8401		08Ch13
Z 8 C 13	2301				08Ch13
Z8CA12		X6CrAl13			
Z6CA13	2302	X6CrAl13			
Z11 CF 13	2380	X12 CrSC13	F-3411	SUS 416	
Z10 C 13	2302	X12Cr13	F.3401	SUS410	12Ch13
430S15	2320	X8Cr17	F.3113		12Ch17
Z 8 C 17	2320	X8Cr17	F3113	SUS430	12Ch17
Z20C13M					20Ch13L
Z 30 C 13	2304				20Ch13
Z 10 CF 17	2383	X10CrS17	F.3117	SUS430F	
Z 8 CD 17.01	2325	X8CrMo17		SUS434	
	2376				
	2376				

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
12		1.4418	X4 CrNiMo16 5		
12	XM 8; 430 Ti; 439	1.4510			
12	430tI	1.4510	X6 CrTi 17		
12		1.4511	X 6 CrNb 17		
12	409	1.4512	X 6 CrTi 12; (X2CrTi12)	LW 19; 409 S 19	
12		1.4720	X20CrMo13		
12	405	1.4724	X10CrA113	403S17	
12	430	1.4742	X10CrA118	439S15	60
12	HNV6	1.4747	X80CrNiSi20	443S65	59
12	446	1.4749	x18 cRn 28		
12	446	1.4762	X10CrA124		
12	EV 8	1.4871	X 53 CrMnNiN 21 9	349 S 54	
12	302		x12 CrNi 18 9	302 S 31	
12	429		X10 CrNi 15		
13	420	1.4021	X20Cr13	420S37	
13	420	1.4031	X40 Cr 13		
13		1.4034	X46Cr13	420 S 45	
13	431	1.4057	X20CrNi172	431 S 29	57
13	CA6-NM	1.4313	G-X4 CrNi 13 4	425 C 11	
13		1.4544		S. 524; S. 526	
13	348	1.4546	X5CrNiNb 18-10	347 S 31; 2 S. 130; 2 S. 143; 2 S. 144; 2 S. 145; S.525; S.527	
13		1.4922	x20cRmV12-1		
13		1.4923	X22 CrMoV12 1		
14	304	1.4301	X 5 CrNi 18 9	304 S 15	
14	303	1.4305	X10 CrNiS 18 9	303 S 21	58M
14	304L	1.4306	X2CrNi18 9	304S12	
14	304L	1.4306	X2 CrNi 18 10	304 S 11	
14	CF-8	1.4308	X6 CrNi 18 9	304 C 15	58E
14	301	1.4310	X12CrN i17 7	301 S 21	
14	304 LN	1.4311	X2 CrNiN 18 10	304 S 62	
14		1.4312	G-X10CrNi18 8	302C25	
14	305	1.4312	X8 CrNi 18 12	305 s 19	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
Z6CND16-04-01	2387				
Z 4 CT 17		X 6 CrTi 17	F.3115 -X 5 CrTi 17	SUS 430 LX	08 Ch17T
Z 4 CT 17					08Ch17T
Z 4 CNb 17		X 6 CrNb 17	F.3122-X 5 CrNb 17	SUS 430 LK	
Z 3 CT 12		X 6 CrTi 12		SUH 409	
Z10C13		X10CrA112	F.311		10Ch13SJu
Z10CAS18		X8Cr17	F.3113	SUS430	15Ch13SJu
Z80CSN20.02		X80CrSiNi20	F.320B	SUH4	
Z10CAS24	2322	X16Cr26		SUH446	
Z 52 CMN 21.09		X53CrMnNiN21 9		SUH35, SUH36	55Ch20G9AN4
Z 10 CN 18-09	2330				
Z 20 C 13	2303	14210			20Ch13
Z 40 C 14	-2304				40Ch13
Z40 C 14		X40Cr14	F.3405	SUS420J2	
Z 15 CN 16.02	2321	X16CrNi16	F.3427	SUS431	20Ch17N2
Z 4 CND 13-04 M	2385	(G)X6CrNi304		SCS5	
		X 6 CrNiTi 18 11			08Ch 18N12T
		X 6 CrNiNb 18 11			
	2317	x20cRmOnI 12 01			
Z 5 CN 18.09	2332; 2333				08Ch18N10
Z 8 CNF 18-09	2346	X10CrNiS18.09	F.3508	SUS303	30Ch18N11
Z2CrNi18 10	2352	x2cRnI18 11	F.3503	SCS19	
Z 3 CN 19-11	2352	X2CrNi18 11			
Z 6 CN 18-10 M	2333			SUS304L	
Z 12 CN 17.07	2331	X2CrNi18 07	F.3517		
Z 2 CN18.10	2371	X2CrNiN18 10		SUS304LN	
Z10CN18.9M					10Ch18N9L
					10Ch18N9L

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
14	304	1.4350	X5CrNi18 9	304S15	58E
14	S32304	1.4362	X2 CrNiN 23 4		
14	202	1.4371	X3 CrMnNiN 188 8 7	284 S 16	
14	316	1.4401	X 5 CrNiMo 17 12 2; (X4 CrNiMo 17 -12-2)	316 S 13; 316 S 17; 316 S 19; 316 S 31; 316 S 33	
14	316L	1.4404	X2 CrNiMo 17 13 2; (X2 CrNiMo 17-12-2); GX 2 CrNiMoN 18-10	316 S 11; 316 S 13; 316 S 14; 316 S 31; 316 S 42; S.537; 316 C 12; T.75; S. 161	
14	316LN	1.4406	X2 CrNiMoN 17 12 2; (X2CrNiMoN 18-10)	316 S 61; 316 S 63	
14	CF-8M	1.4408	GX 5 CrNiMoN 7 12 2; G-X 6 CrNiMo 18 10	316 C 16 (LT 196); ANC 4 B	
14		1.4410	G-X10CrNiMo18 9		
14	316 Ln	1.4429	X2 CrNiMo 17 -13-3	316 S 62	
14	316L	1.4435	X2 CrNiMo18 14 3	316 S 11; 316 S 13; 316 S 14; 316 S 31; LW 22; LWCF 22	
14	316	1.4436	X 5 CrNiMo 17 13 3; (X4CRNIMO 17-13-3	316 S 19; 316 S 31; 316 S 33; LW 23; LWCF 23	
14	317L	1.4438	X2 CrNiMo 18 16 4; (X2CrNiMo 18-15-4)	317 S 12	
14	(s31726)	1.4439	X2 CrNiMoN 17 13 5		
14		1.444	X 2 CrNiMo 18 13		
14	317	1.4449	X5 CrNiMo 17 13 3	317 S 16	
14	329	1.4460	X 4 CrNiMo 27 5 2; (X3CrNiMo27-5-2)		
14	329	1.4460	X8CrNiMo27 5		

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
Z6CN18.09	2332	X5CrNi18 10	F.3551	SUS304	
Z 2 CN 23-04 AZ	2327				
Z 8 CMN 18- 08-05					
Z 3 CND 17 -11-01; Z 6 CND 17-11; Z 6 CND 17-11-02; Z 7 CND 17-11-02; Z 7 CND 17-12-02	2347	X 5 CrNiMo 17 12	F.3534-X 5 CrNiMo 17 12 2	SUS 316	
Z 2 CND 17-12; Z 2 CND 18-13; Z 3 CND 17-11-02; Z 3 CND 17-12-02 FF; Z 3 CND 18-12-03; Z 3 CND 19.10 M	2348	X 2 CrNiMo 17 12; G-X 2 CrNiMo 19 11	F.3533 - X 2 CrNiMo 17 13 2; F.3537 - X 2 CrNiMo 17 13 3	SUS 316 L	
Z2 CND 17-12 AZ		X 2 CrNiMoN 17 12	F.3542-X 2 CrNiMoN 17 12 2	SUS316LN	07 Ch 18N
	2343		F.8414-AM-X 7 CrNiMo 20 10	SCS 14	10G2S2MSL
Z5CND20.12M	2328				
Z 2 CND 17-13 Az	2375	X 2 CrNiMoN 17 13	F.3543-X 2 CrNiMoN 17 13 3	SUS 316 LN	
Z 3 CND 17-12-03; Z 3 CND 18-14-03	2375	X2CrNiMoN 17 13	F.3533-X 2 CrNiMo 17 13 2	SUS 316 L	O3 Ch 17N14M3
Z 6 CND 18-12-03; Z 7 CND 18-12-03	2343	X 5 CrNiMo 117 13; X 8 cRnlmO 17 13	F.3543-X 5 CrNiMo 17 12 2 F.3538-X 5 CrNiMo 17 13 3	SUS 316	
Z 2 CND 19-15-04; z 3 cnd 19-15-04	2367	X2CrNiMo18 16	f.3539-x 2 cRnlmO 18 16 4	SUS317L	
Z 3 CND 18-14-06 AZ					
		X 5 CrNiMo 18 15		SUS 317	
(Z 3 CND 25-07 Az); Z 5 CND 27-05 Az	2324		F.3309-X 8 CrNiMo 17 12 2; F.3552-X 8 CrNiMo 18 16 4	SUS 329 J 1	
	2324				

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
14		1.4462	X2CrNiMoN22 5 3	318 S 13	
14		1.4500	G-X7NiCrMoCuNb25 20		
14	17-7PH	1.4504		316S111	
14	443 444	1.4521	X2CrMoTi18-2		
14	UNS N 08904	1.4539	X1NiCrMoCuN25-20-5		
14	CN-7M	1.4539	(G-)X1 NiCrMoCu 25 20 5		
14	321	1.4541	Z 6 CrNiTi 18-10	321 S 31; 321 S 51 (1010; 1105); LW 24; LWCF 24	
14	630	1.4542	X5 CrNiCuNb 17 4; (X5 CrNiChNb 16-4)		
14	15-5PH	1.4545	Z7 CNU15.05		
14	S31254	1.4547	X1 CrNiMoN 20 18 7		
14	347	1.4550	X6 CrNiNb 18 10	347 S 17	58F
14		1.4552	G-X7CrNiNb18 9		
14	17-7PH	1.4568		316S111	
14	316tTi	1.4571	X6 CrNiMoTi 17 12 2	320 S 31	
14	316 Ti	1.4571	x 6 CrNiMoTi 17 12 2	320 S 31	58J
14		1.4581	G-X 5 CrNiMoNb	318 C 17	
14	318	1.4583	X 10CrNiMoNb 18 12	303 S 21	
14		1.4585	G-X7CrNiMoCuNb18 18		
14		1.4821	X20CrNiSi25 4		
14		1.4823	G-X40CrNiSi27 4		
14	309	1.4828	X15CrNiSi20 12	309 S 24	58C
14	309S	1.4833	X6 CrNi 22 13	309 S 13	
14	310 S	1.4845	X12 CrNi 25 21	310S24	
14	321	1.4878	X6 CrNiTi 18 9	32 1 S 20	58B

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
Z 3 CND 22-05 Az; (Z 2 CND 24 -08 Az); (Z 3 CND 25-06-03 Az)	2377			SUS 329 J3L	
23NCDU25.20M					
		Z8CNA17-07	X2CrNiMo1712		
	2326		F.3123-X 2 CrMoTiNb 18 2	SUS 444	
Z 2 NCDU 25-20	2562				
Z1 NCDU 25-02 M	2564				
Z 6 CNT 18-10	2337	X 6 CrNiTi 18 11	F.3523 - X 6 CrNiTi 18 10	SUS 321	06Ch18N10T; 08Ch18N10T; 09Ch18N10T; 12Ch18N10T
Z 7 CNU 15-05; Z 7 CNU 17-04				SCS 24; SUS 630	
	2378				
Z 6 CNNb 18.10	2338	X6CrNiNb18 11	F.3552	SUS347	08Ch18N12B
Z4CNNb19.10M					
		Z8CNA17-07	X2CrNiMo1712		09Ch17NJu1
Z 6 CNDT 17-12002	2350				10Ch17N13M2T
Z 6 NDT 17.12	2350	X6CrNiMoTi17 12	F.3535		10Ch17N13M2T
Z 4 CNDNb 18.12 M					
Z15CNS20.12		x15cRnlsl2 12			
		X6CrNiMoTi17 12			
Z20CNS25.04					
Z15CNS20.12			F.8414	SCS17	20Ch20N14S2
Z 15 CN 24-13					
Z 12 CN 25-20	2361	X6CrNi25 20	F.331	SUH310	20Ch23N18
Z 6 CNT 18-12 (B)	2337	X6CrNiTi18 11	F.3553	SUS321	

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
14	Ss30415	1.4891	X5 CrNiNb 18 10		
14	S30815	1.4893	X8 CrNiNb 11		
14	304H	1.4948	X6 CrNi 18 11	304 S 51	
14	660	1.4980	X5 NiCrTi 25 15		
14			X5 NiCrN 35 25		
14	S31753		X2 CrNiMoN 18 13 4		
14			X2 CrNiMoN 25 22 7		
15	CLASS20	0.6010	GG10		
15	A48-20B	0.6010	GG-10		
15	NO 25 B	0.6015	GG 15	Grade 150	
15	CLASS25	0.6015	GG15	GRADE150	
15	A48 25 B	0.6015	GG 15	Grade 150	
15	A48-30B	0.6020	GG-20	Grade 220	
15	NO 30 B	0.6020	GG 20	Grade 220	
15	A436 Type 2	0.6660	GGL-NiCr202	L-NiCuCr202	
15	60-40-18	0.7040	GGG 40	SNG 420/12	
15	No 20 B		GG 10		
16	CLASS30	0.6020	GG20	GRADE220	
16	A48-40 B	0.6025	EN- GJL-250 (GG25)	Grade260	
16	CLASS45	0.6030	GG30	GRADE300	
16	A48-45 B	0.6030		Grade 300	
16	A48-50	0.6035	GG-35	GRADE 350	
16	A48-60 B	0.6040	GG40	GRADE400	
16		1.4829	X 12 CrNi 22 12		
16					
16					
17		0.7033	GGG-35.3	350/22 L 40	
17	60/40/18	0.7043	GGG-40.3	370/7	
17	80-55-06	0.7050	EN- GJS-800-7 (GGG50)	SNG500/7	
17	65-45-12	0.7050	GGG-50	SNG 500/7	
17		0.7652	GGG-NiMn 13 7	S-NiMn 137	
17	A43D2	0.7660	GGG-NiCr 20 2	Grade S6	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
	2372				
	2368				
Z 5 CN 18-09	2333				
Zz 8 nctv 25-15 b ff	2570				
Ft10D	110	G10			SCh10
FT 10 D	0110-00				SCh10
FT 15 D	0115-00	G 15	FG 15	FC150	SCh15
Ft15D	115	G 15	FG 15		SCh15
Ft 15 D	01 15-00	G14	FG15		SCh15
Ft 20 D	0120-00				SCh20
Ft 20 D	120	G 20		FC200	SCh20
L-NC 202	0523-00				
FCS 400-12	0717-02	GS 370-17	FGE 38-17	FCD400	VCh42-12
Ft 10 D	110			FC100	
Ft20D	120	G 20	FG 20		
Ft 25 D	125	G 25	FG 25	FC250	VCh60-2
Ft30D	130	G 30	FG 30	FC300	SCh20
Ft 30 D	01 30-00				SCh30
Ft35D	135	G 35	FG 35	FC350	SCh30
Ft 40 D	140				SCh40
					SCh25
FGS 370/17	0717-15				VCh42-12
FGS 370/17	0717-15				VCh50-2
FGS 500/7	0727-02	GGG 50		FCD500	VCh50-2
FGS 500-7	0727-02				
S-Mn 137	0772-00				
S-NC 202	0776-00				

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
17			GGG 40.3	SNG 370/17	
18		0.7060	GGG60	SNG600/3	
18	80/55/06	0.7060	GGG-60	600/3	
18	100/70/03	0.7070	GGG-70	SNG700/2	
18	A48 40 B				
19		0.8055	GTW55		
19	32510	0.8135	GTS-35-10	B 340/12	
19	A47-32510	0.8135	GTS-35-10	B 340/2	
19	A220-40010	0.8145	GTS-45-06	P 440/7	
19			GTS-35	B 340/12	
19				8 290/6	
19	32510		GTS-35	B340/12	
20		0.8035	GTM-35	W340/3	
20		0.8040	GTW-40	W410/4	
20		0.8045			
20		0.8065	GTMW-65		
20	A220-50005	0.8155	GTS-55-04	P 510/4	
20	50005	0.8155	GTS-55-04	P510/4	
20	70003	0.8165	GTS-65-02	P 570/3	
20	90001	0.8170	GTS-70-02	P 690/2	
20	A220-90001	0.8170	GTS-70-02		
20	1022; 1518	1.1133	20Mn5	120 M 19	
20	400 10		GTS-45	P440/7	
20	70003		GTS-65	P 570/3	
21	Al99	3.0205			
21	1000	3.0255	Al99.5	L31; L34; L36	
21		3.3315	AlMg1		
22		3.1325	AlCuMg 1		
22		3.1655	AlCuSiPb		
22		3.2315	AlMgSi1		
22	7050	3.4345	AlZnMgCuO,5	L 86	
22		3.437	AlZnMgCu 1,5		
23		3.2381	G-AlSi 10 Mg		
23		3.2382	GD-AlSi10Mg		

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
FGS 370-17	0717-12			FC250	
FGS600-3	07 32-03	GGG 60	GGG 60		
FGS 600/3	0727-03			FCD600	
FGS 700-2	07 37-01	GGG 70	GGG 70	FCD700	
			GTW 55		
MN35-10	810		GTS 35		KCh35-10
Mn 35-10	0815-00				KCh35-10
Mn 450-6	0852-00	GMN 45		FCMW370	
	0810-00				
MN 32-8	814			AC4A	
MN 35-10	08 15			FCMW330	
MB35-7	852		GTM 35		
MB40-10		GMB40	GTM 40		
		GMB45	GTM 45		KCh55-4
			GTW 65		KCh55-4
Mn 550-4	0854-00				KCh60-3
MP 50-5	854	GMN 55		FCMP490	KCh70-2
Mn 650-3	0856-00	GMN 65		FCMP590	KCh70-2
Mn 700-2	0862-00	GMN 70		FCMP690	KCh70-2
Mn 700-2	0864-00				20G
20 M 5	2132	G 22 Mn 3; 20 Mn 7	F.1515-20 Mn 6	SMnC 420	
	08 52				
MP 60-3	858			FCMP540	AD0
A59050C					D1
					AD35
					AK9
AZ 4 GU/9051		811-04			
					AK12

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
23	A360.2	3.2383	G-AlSi0Mg(Cu)	LM9	
23		3.2581	G-AlSi12		
23		3.3561	G-AlMg 5		
23	ZE 41	3.5101	G-MgZn4sE1Zr1	MAG 5	
23	EZ 33	3.5103	MgSE3Zn27r1	MAG 6	
23	AZ 81	3.5812	G-MgAl8Zn1	NMAG 1	
23	AZ 91	3.5912	G-MgAl9Zn1	MAG 7	
23	A356-72			2789; 1973	
23	356,1			LM25	
23	A413.2		G-AlSi12	LM 6	
23	A413.1		G-AlSi 12 (Cu)	LM 20	
23	A413.0		GD-AlSi12		
23	A380.1		GD-AlSi8Cu3	LM24	
24		2.1871	G-AlCu 4 TiMg		
24		3.1754	G-AlCu5Ni1,5		
24		3.2163	G-AlSi9Cu3		
24	4218 B	3.2371	G-AlSi 7 Mg		
24	SC64D	3.2373	G-AlSI9MGWA		
24		3.2373	G-AlSi 9 Mg		
24	QE 22	3.5106	G-MgAg3SE2Zr1	mag 12	
24	GD-AlSI12		G-ALMG5	LM5	
26	C93200	2.1090	G-CuSn 7 5 pb		
26	c 83600	2.1096	G-CuSn5ZnPb	LG 2	
26	C 83600	2.1098	G-CuSn 2 Znpb		
26	C23000	2.1182	G-CuPb15Sn	LB1	
26	C 93800	2.1182	G-CuPb15Sn		
27		2.0240	CuZn 15		
27	C27200	2.0321	CuZn 37	cz 108	
27	C27700	2.0321	CuZn 37	cz 108	
27		2.0590	G-CuZn40Fe		
27	C 86500	2.0592	G-CuZn 35 Al 1	U-Z 36 N 3	
27	C 86200	2.0596	G-CuZn 34 Al 2	HTB 1	
27	C 18200	2.1293	CuCrZr	CC 102	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
	4253				
G-TR3Z2					
NF A32-201					
	4244			A5052	AK7
	4261				
	4260			ADC12	AK12
	4247			A6061	
	4250			A7075	
					VAL 8
					AK8
A-S7G	4251			C4BS	AK9
A-SU12	4252				
U-E 7 Z 5 pb 4					
U-pb 15 E 8					
Uu-PB 15e 8					
CuZn 36, CuZn 37		C 2700			L 63
CuZn 36, CuZn 37		C2720			L 63
HTB 1					
U-Z 36 N 3					LTs23AD; ZMts
U-Cr 0.8 Zr					

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
28		2.0060	E-Cu57		
28		2.0375	CuZn36Pb3		
28	C 63000	2.0966	CuAl 10 Ni 5 Fe 4	Ca 104	
28	B-148-52	2.0975	G-CuAl 10 Ni		
28	c 90700	2.1050	G-CuSn 10	CT1	
28	C 90800	2.1052	G-CuSn 12	pb 2	
28	C 81500	2.1292	G-CuCrF 35	CC1-FF	
28		2.4764	CoCr20W15Ni		
31	N 08800	1.4558	X 2 NiCrAlTi 32 20	NA 15	
31	N 08031	1.4562	X 1 NiCrMoCu 32 28 7		
31	N 08028	1.4563	X 1 NiCrMoCuN 31 27 4		
31	N 08330	1.4864	X 12 NiCrSi 36 16	NA 17	
31	330	1.4864	X12 NiCrSi 36 16	NA 17	
31		1.4865	G-X40NiCrSi38 18	330 C 40	
31		1.4958	X 5 NiCrAlTi 31 20		
31	AMS 5544	LW2.4668	NiCr19NbMo		
32		1.4977	X 40 CoCrNi 20 20		
33	Monel 400	2.4360	NiCu30Fe	NA 13	
33	5390A	2.4603			
33	Hastelloy C-4	2.4610	NiMo16cR16Ti		
33	Nimonic 75	2.4630	NiCr20Ti	HR 5,203-4	
33		2.4630	NiCr20Ti	HR5,203-4	
33	Inconel 690	2.4642	NiC29Fe		
33	Inconel 625	2.4856	NiCr22Mo9Nb	NA 21	
33	5666	2.4856	NiCr22Mo9Nb		
33	Incoloy 825	2.4858	NiCr21Mo	NA 16	
34	Monel k-500	2.4375	NiCu30 Al	NA 18	
34	4676	2.4375	NiCu30Al	3072-76	
34		2.4631	NiCr20TiAl	Hr40; 601	
34	Inconel 718	2.4668	NiCr19FeNbMo		
34	Inconel 751	2.4694	NiCr16fE7TiAl		
34		2.4955	NiFe25Cr20NbTi		
34	5383	LM2.4668	NiCr19Fe19NbMo	HR8	
34	5391	LW2 4670	S-NiCr13A16MoNb	3146-3	

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
					LS60-2
U-A 10 N					BrAD; N10-4-4
UE 12 P					
Z1NCDU31-27-03	2584				EK 77
Z 12 NCS 35.16					
Z 12 NCS 37.18				SUH330	
		XG50NiCr39 19		SCH15	
NC20K14					
Z 42 CNKDWNb					
NU 30					
NC22FeD					
NC 20 T					
NC20T					
Nnc 30 Fe					
NC 22 FeDNb					
Inconel 625					
NC 21 Fe DU					KhN38VT
NU 30 AT					
NC20TA					KhN77TYuR
NC 19 Fe Nb					
NC19eNB					
NC12AD					

ISCAR MATERIAL GROUPS

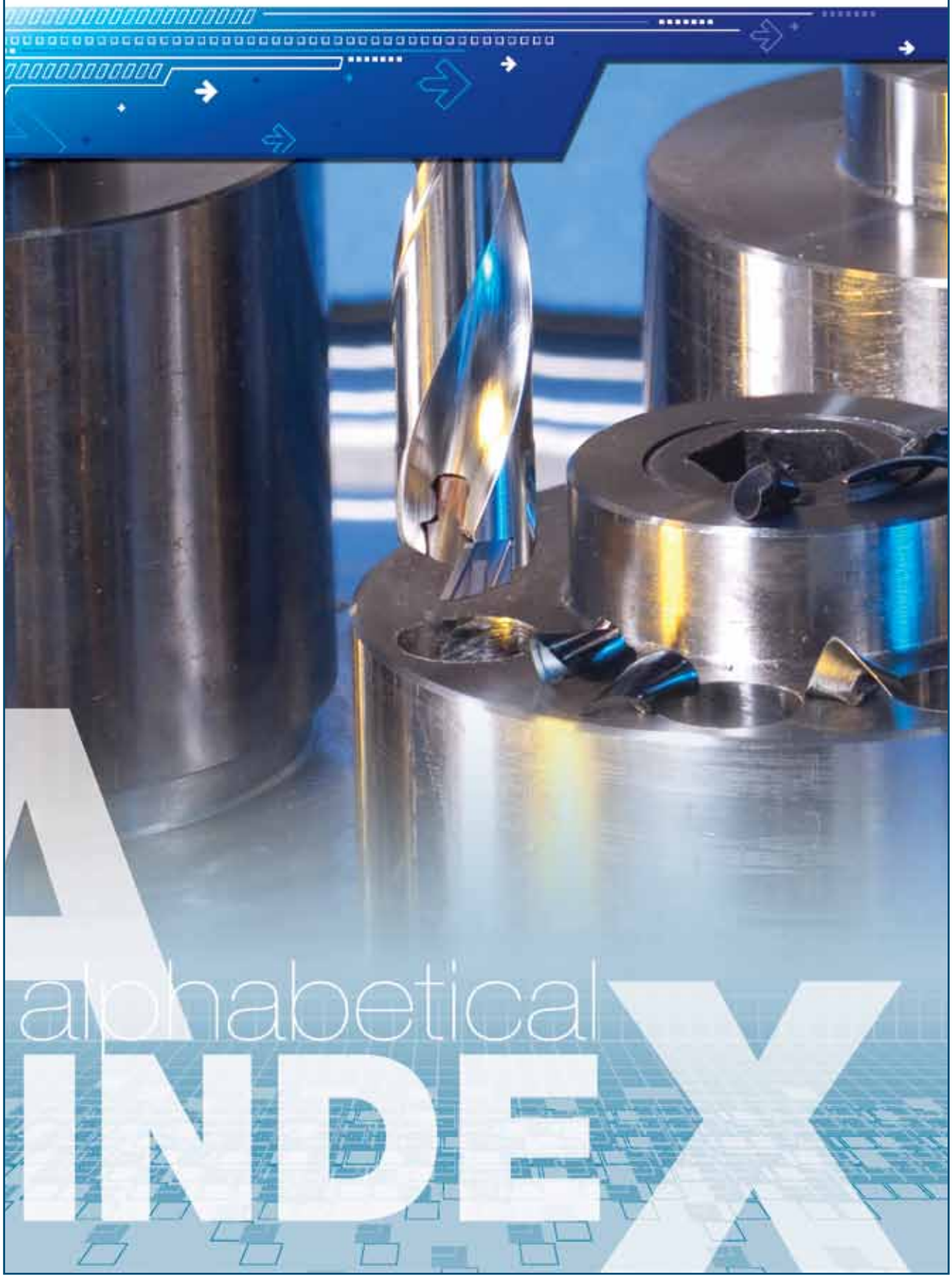
According to VDI 3323 Standard

	USA	GERMANY		Great Britain	
Mtl. No.	AISI/SAE	Werkstoff	DIN	BS	EN
34	5660	LW2.4662	NiFe35Cr14MoTi		
34	5537C	LW2.4964	CoCr20W15Ni		
34	AMS 5772		C0Cr22W14Ni		
35	Inconel X-750	2.4669	NiCr15Fe7TiAl		
35	Hastelloy B	2.4685	G-NiMo28		
35	Hastelloy C	2.4810	G-NiMo30		
35	AMS 5399	2.4973	NiCr19Co11MoTi		
35		3.7115	TiAl5Sn2		
36	R 50250	3.7025	Ti 1	2 TA 1	
36	R 52250	3.7225	Ti 1 pd	TP 1	
36	AMS 5397	LW2.4674	NiCo15Cr10MoAlTi		
37		3.7124	TiCu2	2 TA 21-24	
37	R 54620	3.7145	TiAl6Sn2Zr4Mo2Si		
37		3.7165	TiAl6V4	TA 10-13; TA 28	
37		3.7185	TiAl4Mo4Sn2	TA 45-51; TA 57	
37		3.7195	TiAl 3 V 2.5		
37			TiAl4Mo4Sn4Si0.5		
37	AMS R54520		TiAl5Sn2.5	TA14/17	
37	AMS R56400		TiAl6V4	TA10-13/TA28	
37	AMS R56401		TiAl6V4ELI	TA11	
38	W 1	1.1545	C 105 W1	BW 1A	
38	W210	1.1545	C105W1	BW2	
38		1.2762	75 CrMoNiW 6 7		
38	440C	1.4125	X105 CrMo 17		
38		1.6746	32 nlcRmO 14 5	832 M 31	
40	Ni- Hard 2	0.9620	G-X 260 NiCr 4 2	Grade 2 A	
40	Ni- Hard 1	0.9625	G-X 330 Ni Cr 4 2	Grade 2 B	
40	Ni-Hard 4	0.9630	G-X 300 CrNiSi 9 5 2		
40		0.9640	G-X 300 CrMoNi 15 2 1		
40	A 532 III A 25% Cr	0.9650	G-X 260 Cr 27	Grade 3 D	
40	A 532 III A 25% Cr	0.9655	G-X 300 CrNMo 27 1	Grade 3 E	
40	310	1.4841	X15 CrNiSi 25 20	314 S31	
41		0.9635	G-X 300 CrMo 15 3		
41		0.9645	G-X 260 CrMoNi 20 2 1		

France AFNOR	Sweden SS	Italy UNI	Spain UNE	Japan JIS	Russia GOST
ZSNCDT42					
KC20WN					
KC22WN					
NC 15 TNb A					
NC19KDT					VT5-1
					VT1-00
T-A 6 V					VT6
T-A5E					
T-A6V					
Y1 105	1880	C 100 KU	F-5118	SK 3	
Y120	2900	C120KU	CF.515	SUP4	U10A
Z 100 CD 17		X 105 CrMo 17			95Ch18
35 NCD 14					
	0512-00				
	0513-00				
	0466-00				ChWG
					20Ch25N20S2
Z 15 CNS 25-20					

ISCAR MATERIAL GROUPS

INDEX



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