SOLID CARBIDE & MULTI-MASTER ENDMILLS

Metric Version Catalog 2012

Member IMC Group

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SOLID CARBIDE & MULTI-MASTER Metric Version Catalog 2012

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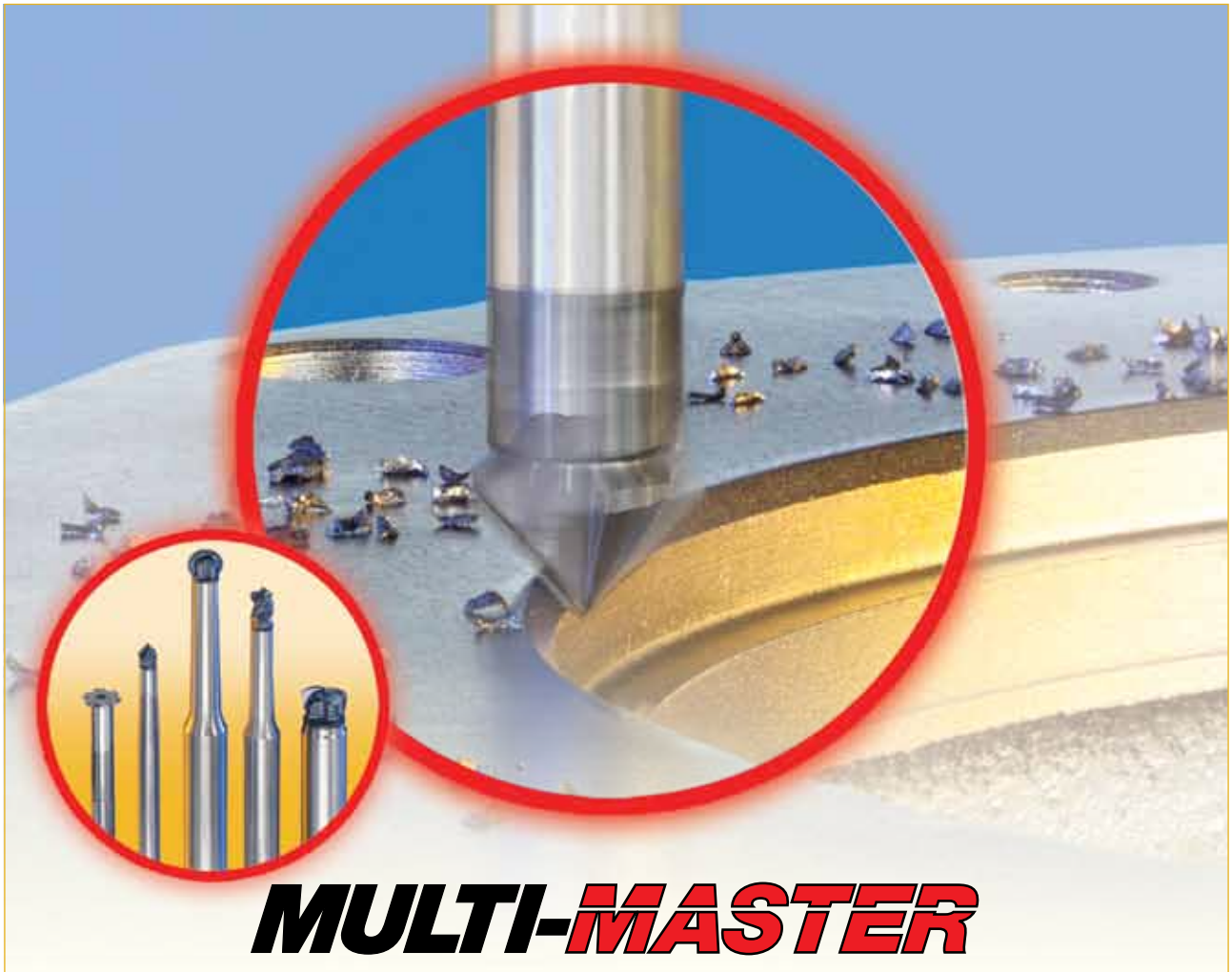


MULTI-MASTER

Interchangeable Heads for a Variety of Milling Applications

MULTI-MASTER is a family of tools with shanks and unique interchangeable heads for a variety of milling applications, including ball nose, straight shoulder, and slitting applications. Indexing is fast and convenient due to the threaded connection. Since the tool is not removed from the machine, there is no setup time for head replacement.

MULTI-MASTER is a high-tech substitute for HSS and solid carbide milling cutters. Excellent repeatability is now possible and resharpening of tools is no longer needed. **MULTI-MASTER** milling heads feature advanced pressed geometries with sharp ground cutting edges.

End milling heads are available in **ISCAR** grades **IC908** and **IC903** (submicron substrates with PVD TiAlN coating) enabling high speed machining with excellent toughness and wear resistance.
Slitting heads are available in very tough grades designated **IC328** and **IC528**. They are designed for precision circular grooves for O-rings and retaining clips, as well as thread milling applications.
The **MULTI-MASTER** system is essential for die and mold production with its long shank options and a high degree of machining efficiency.
ISCAR's **MULTI-MASTER** can reduce your production costs through increased production efficiency.

FEEDMILL

Variable Pitch Endmills with 4 Helical Flutes

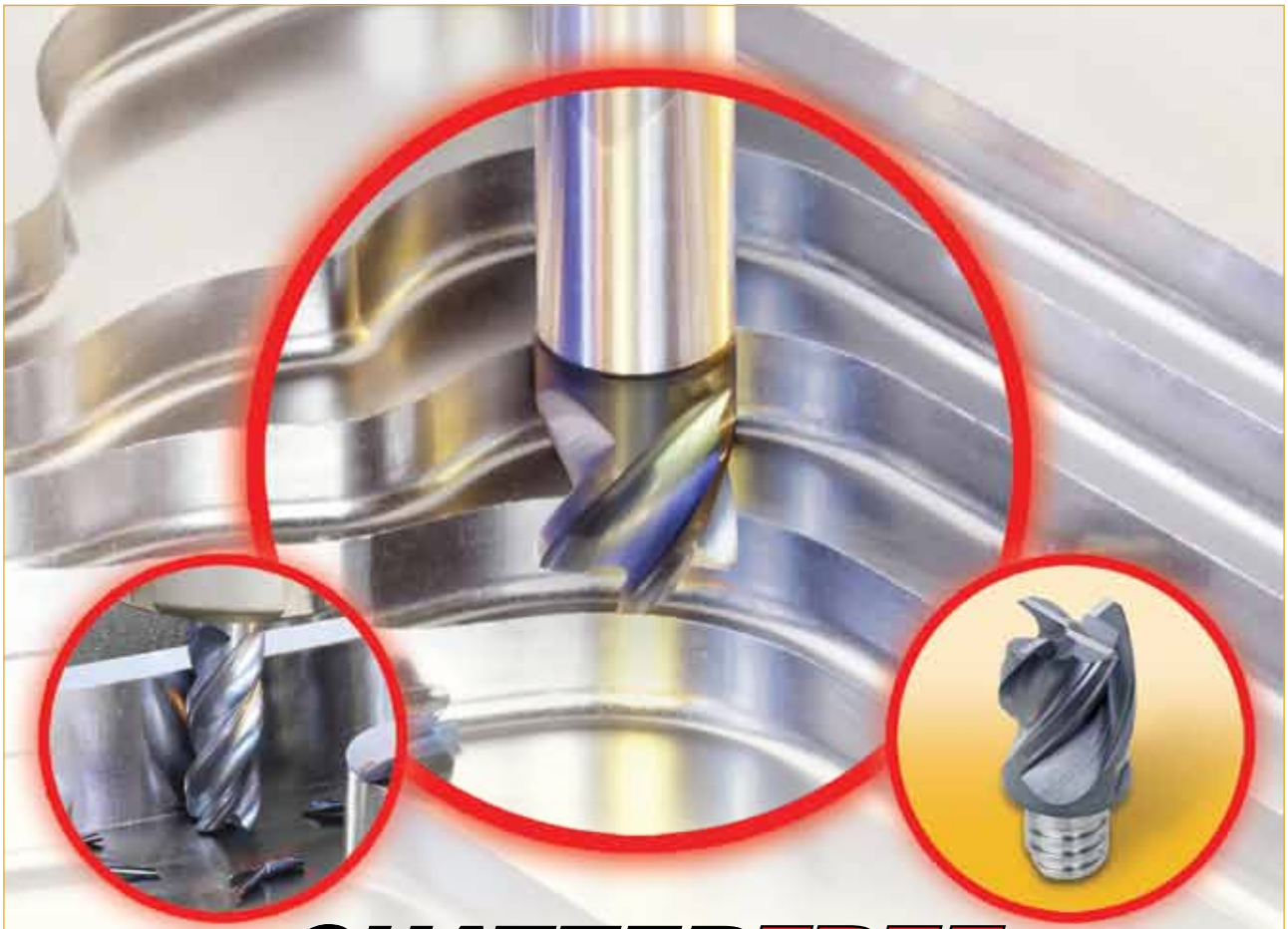
ISCAR's **FEEDMILL** solid endmills **EFF**.. and **MM EFF**... heads utilize a large radius cutting edge configuration that allows for greatly increased feeds. The unique cutting edge geometry axially directs the resultant cutting forces towards the spindle. This results in high stability and enables machining at high feeds, even with long overhang.

In addition, the tool features 4 flutes comprised of an ultra fine grain substrate and is protected by the advanced **AL**-**TEC** coating technology. The combination of these parameters offers outstanding wear resistance and toughness.
Due to the above, the solid **FEEDMILL** can operate at feeds of up to 0.5 mm/tooth, at 0.3 to 0.7 mm depth of cut, providing a significant reduction in cycle time, which thus increases productivity. These features are particularly attractive for the die & mold industry, when rough machining is required on materials such as hardened steel up to 65 HRc. Similarly, the solid **FEEDMILL** exhibits excellent performance on cast iron, stainless steel, titanium and nickel based alloys.

The unique radius geometry of the solid **FEEDMILL** enables high productivity when milling slots, pockets, helical interpolation or contouring up to 3XD deep. In fact, the feed rate obtained by the solid **FEEDMILL** is 5 to 10 times higher, when compared to conventional ball nose endmills.
The solid **FEEDMILL** is a complementary extension to the **FEEDMILL** line, offering the ultimate solution for fast feed milling using small diameter tools.

Features

- The **MM EFF**... head features 4 flutes and a durable bottom radius geometry
- Optimal solution for roughing operations, which is highly useful for the die & mold industry
- Covers a wide range of applications, including slotting, pocketing, helical interpolation and 3XD contouring
- 5 to 10 times higher feeds, when compared to conventional ball nose endmills
- Reduces cycle time and increases productivity



CHATTERFREE

Solid Carbide and MULTI-MASTER Endmills

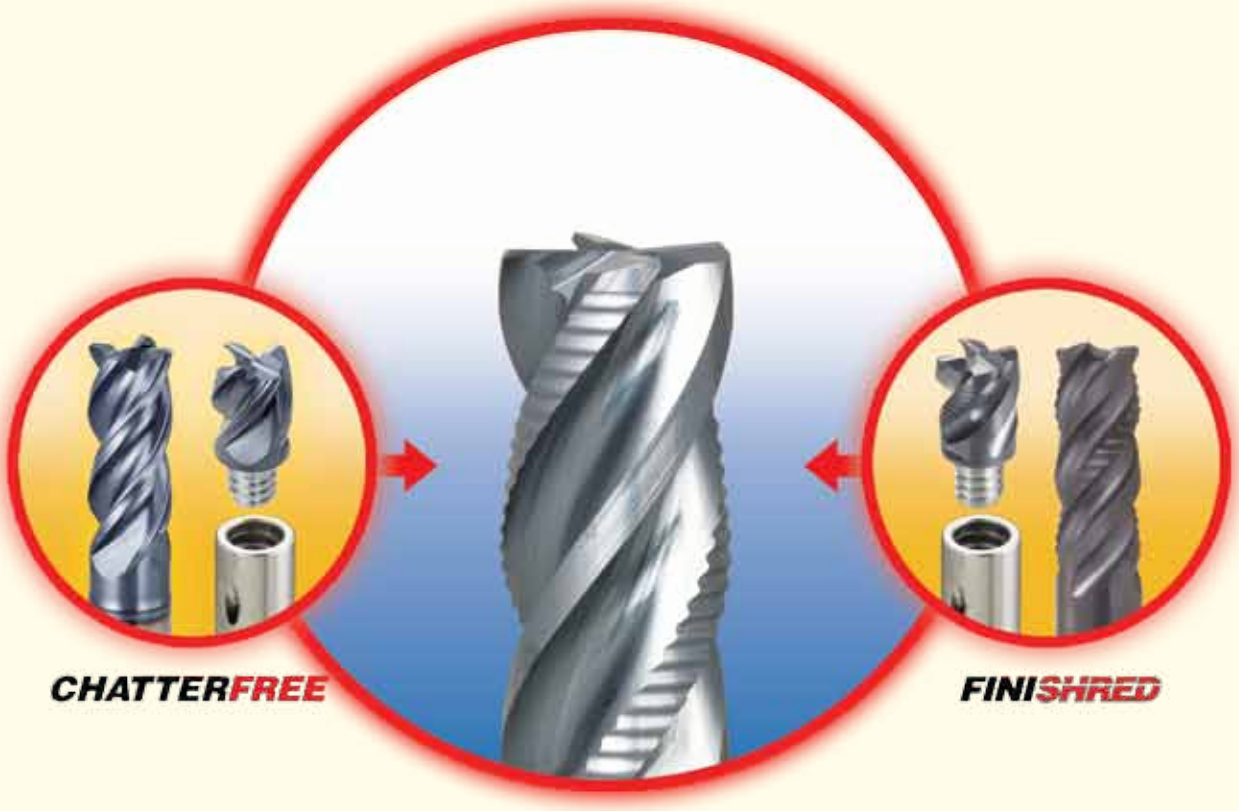
An evolution of the **CHATTERFREE** solid carbide endmills provides improved dampening performance, resulting in 20 to 25% prolonged tool life. They are capable of increased metal removal rate, when compared with the standard **CHATTERFREE** solid carbide endmills.

ISCAR's EC-H endmills feature 4 and 5 flutes, variable pitch (similar to the standard **CHATTERFREE** endmills) and in addition, different flute helix angles: two 35° helix flutes and two 37° helix flutes. These endmills are an excellent solution for low power machines, improving material removal rate and eliminating vibration.

They can be used for up to 2XD full slot machining of alloy and stainless steel, titanium and exotic materials.

Two families are available: cylindrical and relieved shank endmills. All of the endmills are made from IC900, which is a versatile PVD coated grade.
Each family includes endmills in a diameter range of 6 to 25 mm. All have corner radii and each diameter is available in both Weldon and cylindrical shank options.

The new tools reduce cutting forces and power consumption of the machine and improve tool life, providing better chip evacuation and good surface quality on stainless and alloyed steel.



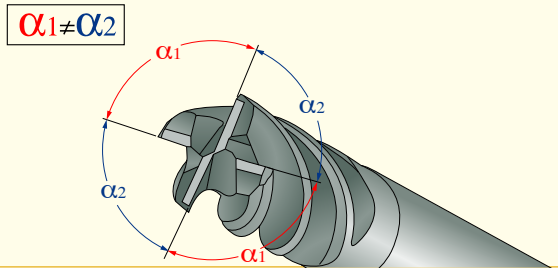
ALL IN ONE

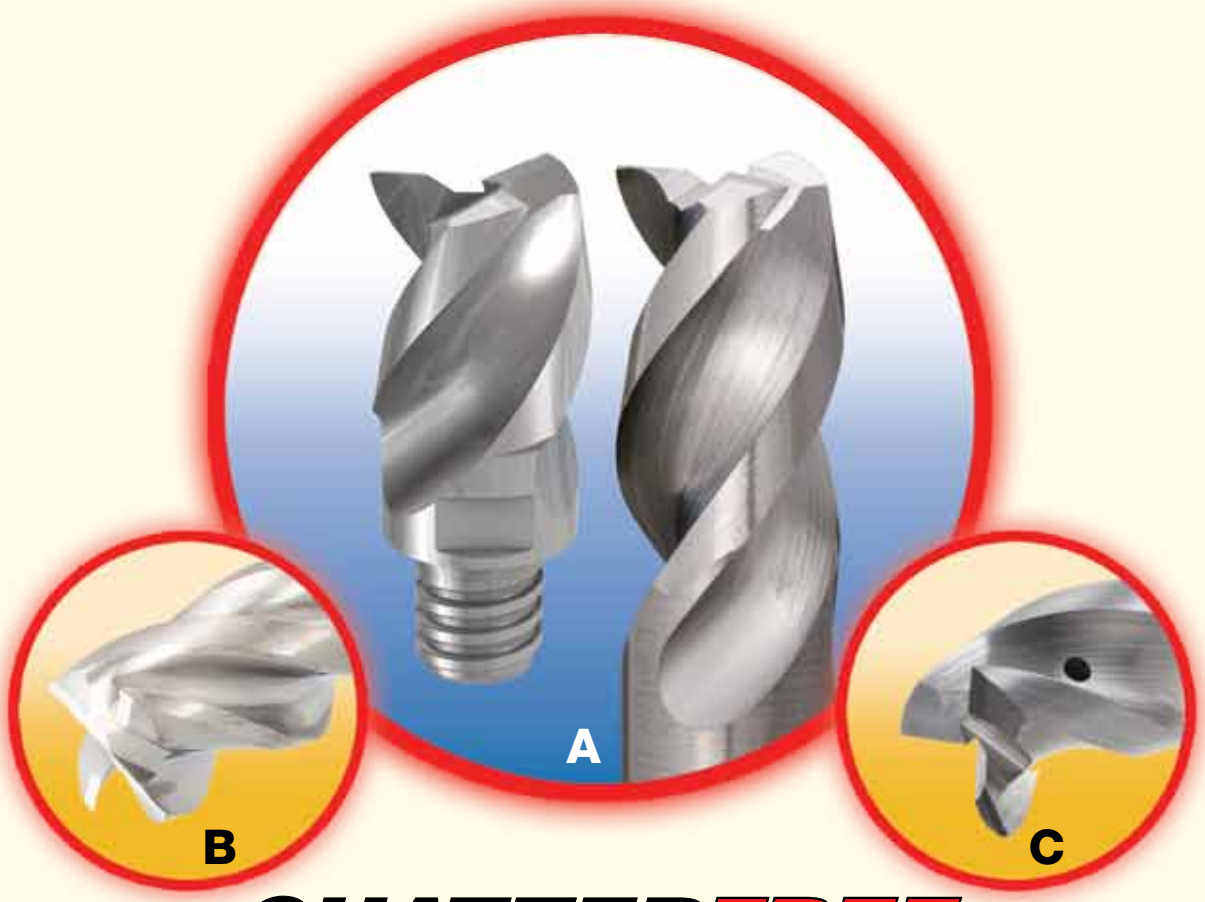
2 Applications in 1 Solid Carbide Endmill

EFS-E44
A combination of **ISCAR**'s two families, **CHATTERFREE** and **FINISHRED**, deliver a powerful hybrid tool with extraordinary performance never seen before. The user gets a 'Three in One' rather than just a 'Two in One' version of the **FINISHRED**.
ISCAR's new solid carbide endmills feature 4 flutes with a 38° helix - two serrated flutes and two continuous flutes. These high productivity, fully effective endmills enable running at rough machining parameters, resulting in finish surface quality.
In addition to eliminating the need to maintain a large amount of stock; one tool change and setup time can be eliminated.

EFS-B44
ISCAR's **FINISHRED** is a solid carbide tool which replaces the roughing and finishing endmills, dramatically reducing cycle time and increasing productivity, while providing excellent performance and tool life. The **EFS**.. **B44** endmill features 4 flutes with a 45° helix, two serrated flutes and two continuous flutes. The tool is fully effective and enables running at rough machining parameters, resulting in finish surface quality. Its unique tool design reduces vibration at high load applications. The **FINISHRED** tool produces short and long chips simultaneously. This chip mixture is evacuated more easily than each individual chip type, which is an excellent solution for slotting and cavity milling applications.

Features
ISCAR' new **FINISHRED** solid carbide endmills, made from IC300, provides an even higher performance advantage on titanium or other high temperature materials, as well as on stainless steel. IC300 features excellent thermal shock resistance. It should be used with emulsion cooling directed to the cutting zone.





CHATTERFREE

Solid Carbide and MULTI-MASTER Endmills for Machining Aluminum

A **ISCAR's CHATTERFREE** endmills for machining aluminum are an excellent solution for the aerospace industry. They improve material removal rate, eliminate vibration, maximize stock removal rate and reduce cycle time in most milling operations.

The variable helix endmills are available with 3, 4, 5xD neck relief in a variety of corner radii. They have a unique ground and polished geometry that provides excellent bottom and side surface finish with no mismatch.

B **ECA-H4...CF** endmills, designed for both roughing and finishing operations, feature excellent chatter dampening ability. They can be used with external cooling at very high cutting speeds, for full slot machining of aluminum up to 1XD.

C **ECA-H3...CF** 3 flute, solid carbide endmills for machining aluminum with variable helix and coolant holes directed to each individual cutting edge. These endmills can be used for both roughing and finishing operations and they feature excellent chatter dampening ability. The coolant holes improve chip evacuation, and eliminate chip re-cutting - thus enabling machining full slots at very high cutting speeds and high material removal rates, providing extended tool life.

MULTI-MASTER

INDEXABLE SOLID CARBIDE LINE

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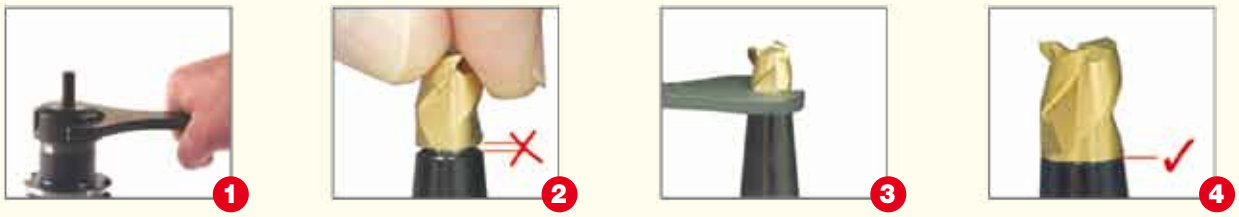
Clamping and Indexing Instructions

MM GRIT

MM TS...



Do not apply lubricant to the threaded connection.

Designation	Thread Size	Key [1]	Tightening Torque (Nxcm)
MM	T05	MM KEY 6x4	700
MM	T06	MM KEY 8x5	1000
MM	T08	MM KEY 10x7	1500
MM	T10	MM KEY 13x8	2800
MM	T12	MM KEY 16x9	2800
MM	T15	MM KEY 20	4000

[1] Order separately

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

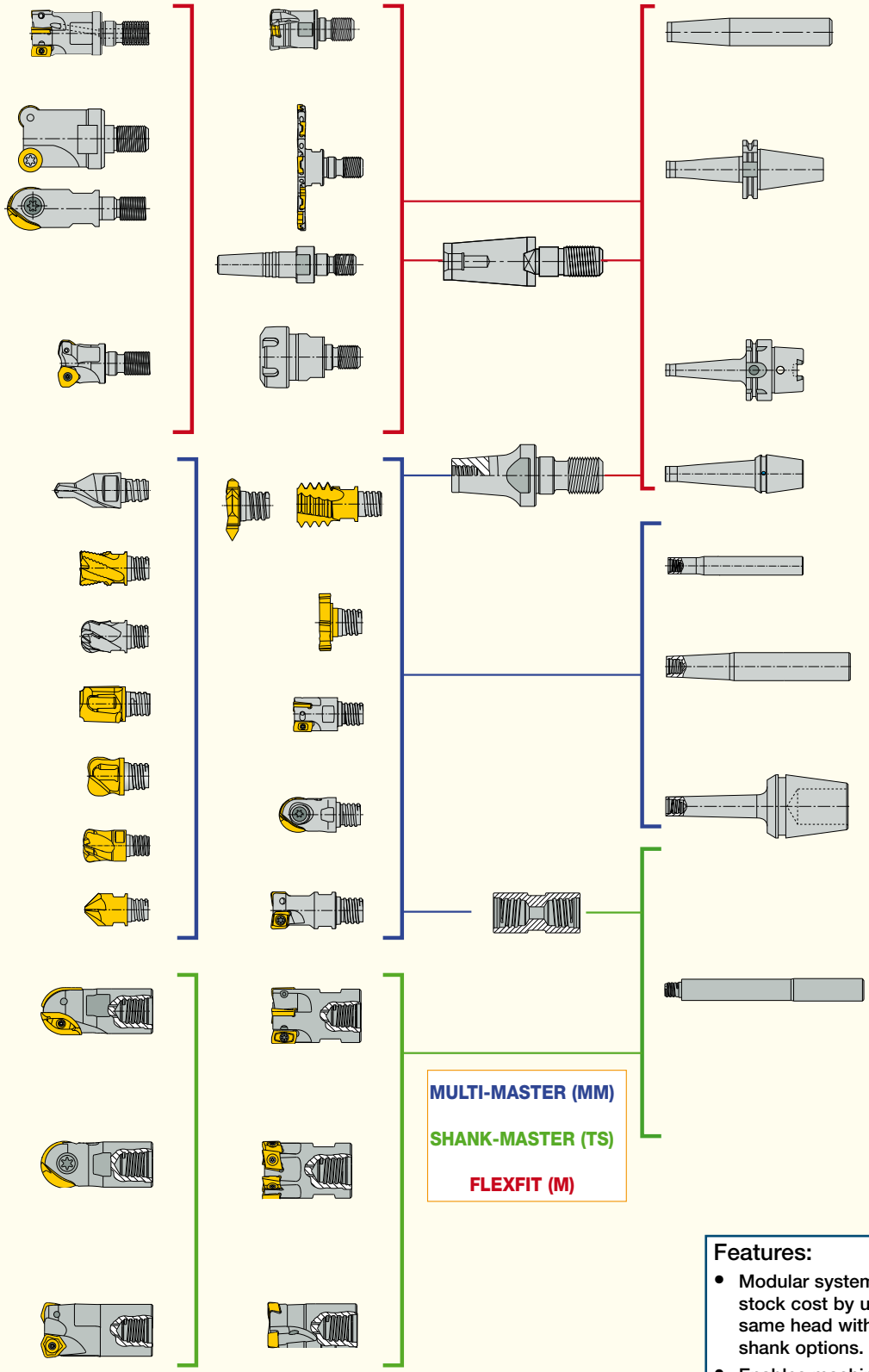
Indexable Solid Carbide Milling Heads
Table of Contents

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

Indexable Solid Carbide Milling Heads
Table of Contents

E = Economical

MULTI-MASTER, SHANK-MASTER and FLEXFIT
Connection Options

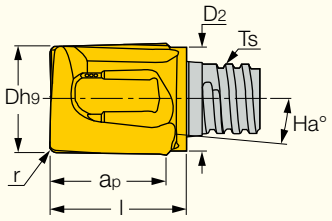


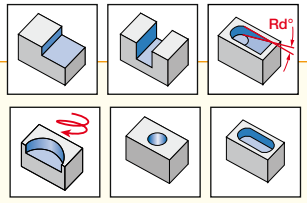
Features:

- Modular system reduces stock cost by using the same head with different shank options.
- Enables machining with larger overthang.
- Same head can be mounted on metric and inch combinations.

MM HC

Interchangeable Solid Carbide Slot Drill Milling Heads with Two 10° Helix Flutes





ECONOMICAL SOLUTION

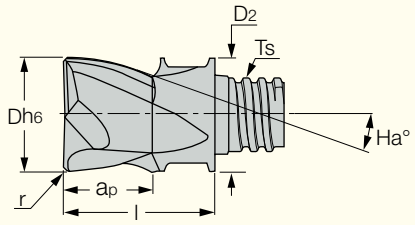
Designation	Dimensions									Tough ↔ Hard		Recommended Machining Data
	D	Flute	a_p	r	Ts	D_2	l	H_a°	T_m[1]	IC908	IC903	f_z (mm/t)
MM HC078C08R0.2-2T05	7.80	2	7.70	0.20	T05	7.60	10.00	10.0	r0-2.0	●		0.03-0.09
MM HC080C08R0.4-2T05	8.00	2	7.70	0.40	T05	7.60	10.00	10.0	r0-2.0	●	●	0.03-0.09
MM HC080C08R1.0-2T05	8.00	2	7.70	1.00	T05	7.60	10.00	10.0	r0-2.0	●	●	0.03-0.09
MM HC080C08R2.0-2T05	8.00	2	7.70	2.00	T05	7.60	10.00	10.0	r0-2.0	●	●	0.03-0.09
MM HC098C10R0.3-2T06	9.80	2	9.00	0.30	T06	9.60	12.35	10.0	r0-3.0	●		0.03-0.10
MM HC100C10R0.4-2T06	10.00	2	9.00	0.40	T06	9.60	12.35	10.0	r0-3.0	●	●	0.03-0.10
MM HC100C10R1.0-2T06	10.00	2	9.00	1.00	T06	9.60	12.35	10.0	r0-3.0	●	●	0.03-0.10
MM HC100C10R2.0-2T06	10.00	2	9.00	2.00	T06	9.60	12.35	10.0	r0-3.0	●	●	0.03-0.10
MM HC117C13R0.3-2T08	11.70	2	10.00	0.30	T08	11.50	14.20	10.0	r0-3.0	●		0.04-0.11
MM HC120C13R0.4-2T08	12.00	2	10.00	0.40	T08	11.50	14.20	10.0	r0-3.0	●	●	0.04-0.11
MM HC120C13R1.0-2T08	12.00	2	10.00	1.00	T08	11.50	14.20	10.0	r0-3.0	●	●	0.04-0.11
MM HC120C13R2.0-2T08	12.00	2	10.00	2.00	T08	11.50	14.20	10.0	r0-3.0	●	●	0.04-0.11
MM HC.500C55R016-2T08	12.70	2	11.00	0.40	T08	11.50	15.25	10.0	r0-3.2	●		0.04-0.11
MM HC140C11R0.4-2T08	14.00	2	11.60	0.40	T08	11.50	15.05	10.0	r0-4.0	●		0.04-0.12
MM HC157C16R0.3-2T10	15.70	2	15.00	0.30	T10	15.20	19.05	10.0	r0-4.0	●		0.05-0.13
MM HC160C16R0.4-2T10	16.00	2	14.90	0.40	T10	15.20	19.05	10.0	r0-4.0	●	●	0.05-0.13
MM HC160C16R0.8-2T10	16.00	2	14.90	0.80	T10	15.20	19.05	10.0	r0-4.0	●	●	0.05-0.13

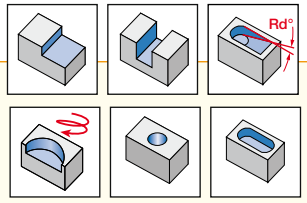
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

[1] Specially tailored radius range, available upon request.

MM EA

Interchangeable Solid Carbide Slot Drill Milling Heads for Machining Aluminum





ALUMINUM

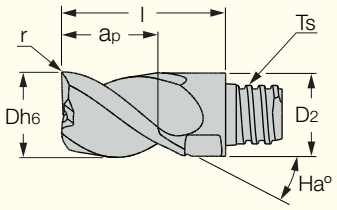
Designation	Dimensions D	Flute	a_p	r	Ts	D_2	l	H_a°	IC08	Recommended Machining Data f_z (mm/t)
MM EA080B05R0.5-2T05	8.00	2	5.00	0.50	T05	7.70	10.00	45.0	●	0.03-0.09
MM EA080B05R0.5-3T05	8.00	3	5.00	0.50	T05	7.70	10.00	45.0	●	0.03-0.09
MM EA100B07R0.5-2T06	10.00	2	7.00	0.50	T06	9.60	13.00	45.0	●	0.03-0.10
MM EA100B07R1.0-2T06	10.00	2	7.00	1.00	T06	9.60	13.00	45.0	●	0.03-0.10
MM EA100B06R0.5-3T06	10.00	3	6.00	0.50	T06	9.60	13.00	45.0	●	0.03-0.10
MM EA100B06R1.0-3T06	10.00	3	6.00	1.00	T06	9.60	13.00	45.0	●	0.03-0.10
MM EA120B09R0.5-2T08	12.00	2	9.00	0.50	T08	11.70	16.50	45.0	●	0.04-0.11
MM EA120B09R1.0-2T08	12.00	2	9.00	1.00	T08	11.70	16.50	45.0	●	0.04-0.11
MM EA120B08R0.5-3T08	12.00	3	8.00	0.50	T08	11.70	16.50	45.0	●	0.04-0.11
MM EA120B08R1.0-3T08	12.00	3	8.00	1.00	T08	11.70	16.50	45.0	●	0.04-0.11
MM EA120B08R3.0-3T08	12.00	3	8.00	3.00	T08	11.70	16.50	45.0	●	0.04-0.11
MM EA.500B37R000-2T08	12.70	2	9.50	0.00	T08	12.40	16.50	45.0	●	0.04-0.11
MM EA.500B37R020-2T08	12.70	2	9.50	0.50	T08	12.40	16.50	45.0	●	0.04-0.11
MM EA.500B31R031-3T08	12.70	3	8.00	0.80	T08	12.40	16.50	45.0	●	0.04-0.11
MM EA.500B31R062-3T08	12.70	3	8.00	1.60	T08	12.40	16.50	45.0	●	0.04-0.11
MM EA.500B31R094-3T08	12.70	3	8.00	2.40	T08	12.40	16.50	45.0	●	0.04-0.11
MM EA.500B31R125-3T08	12.70	3	8.00	3.20	T08	12.40	16.50	45.0	●	0.04-0.11
MM EA160B10R000-3T10	16.00	3	10.00	0.00	T10	15.30	20.50	45.0	●	0.05-0.13
MM EA160B10R1.0-3T10	16.00	3	10.00	1.00	T10	15.30	20.50	45.0	●	0.05-0.13
MM EA160B10R2.0-3T10	16.00	3	10.00	2.00	T10	15.30	20.50	45.0	●	0.05-0.13
MM EA160B10R3.0-3T10	16.00	3	10.00	3.00	T10	15.30	20.50	45.0	●	0.05-0.13
MM EA160B10R4.0-3T10	16.00	3	10.00	4.00	T10	15.30	20.50	45.0	●	0.05-0.13
MM EA200B12R0.5-3T12	20.00	3	12.00	0.50	T12	18.30	25.50	45.0	●	0.05-0.13
MM EA200B12R1.0-3T12	20.00	3	12.00	1.00	T12	18.30	25.50	45.0	●	0.05-0.13
MM EA200B12R2.0-3T12	20.00	3	12.00	2.00	T12	18.30	25.50	45.0	●	0.05-0.13
MM EA200B12R3.0-3T12	20.00	3	12.00	3.00	T12	18.30	25.50	45.0	●	0.05-0.13
MM EA200B12R4.0-3T12	20.00	3	12.00	4.00	T12	18.30	25.50	45.0	●	0.05-0.13
MM EA250H19R0.5-3T15	25.00	3	19.00	0.50	T15	23.90	37.00	40.0	●	0.06-0.16
MM EA250H19R1.0-3T15	25.00	3	19.00	1.00	T15	23.90	37.00	40.0	●	0.06-0.16
MM EA250H19R3.0-3T15	25.00	3	19.00	3.00	T15	23.90	37.00	40.0	●	0.06-0.16

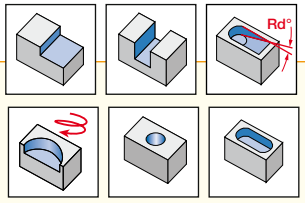
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

CHATTERFREE
MULTI-MASTER LINE

MM EA-CF

Interchangeable Solid Carbide Endmill Heads with Variable Helix for Machining Aluminum





ALUMINUM

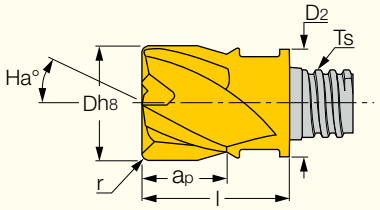
Designation	Dimensions D	Flute	ap	r	Ts	D2	l	Ha°	IC08	Recommended Machining Data fz (mm/t)
MM EA120H12R0.2CF-3T08	12.00	3	12.00	0.20	T08	11.70	23.00	40.0	●	0.04-0.11
MM EA160H16R0.2CF-3T10	16.00	3	16.00	0.20	T10	15.30	28.00	40.0	●	0.05-0.13
MM EA200H20R0.2CF-3T12	20.00	3	20.00	0.20	T12	18.30	34.00	40.0	●	0.05-0.13

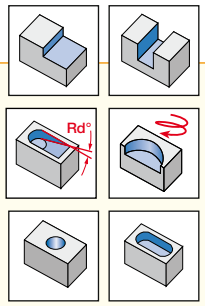
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-84 .

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ECU

3 Flute Undersized Interchangeable Solid Carbide Heads for Keyways (DIN 6885)



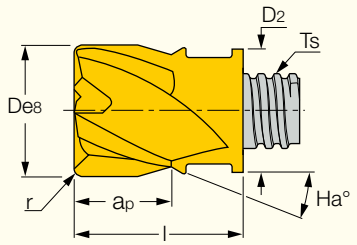


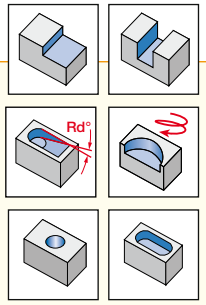
Designation	Dimensions D	Flute	ap	r	Ts	D2	l	Ha°	IC908	Recommended Machining Data fz (mm/t)
MM ECU077E04R020-3T05	7.70	3	4.00	0.20	T05	7.70	10.00	38.0	●	0.03-0.08
MM ECU097E05R030-3T06	9.70	3	5.00	0.30	T06	9.60	13.00	38.0	●	0.03-0.09
MM ECU117E07R030-3T08	11.70	3	7.00	0.30	T08	11.50	16.50	38.0	●	0.03-0.10
MM ECU157E08R030-3T10	15.70	3	8.00	0.30	T10	15.30	20.50	38.0	●	0.04-0.12
MM ECU197E12R040-3T12	19.70	3	12.00	0.40	T12	18.30	25.50	38.0	●	0.05-0.13

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM EC-3

3 Flute 45° Helix, Interchangeable Solid Carbide Endmill Heads



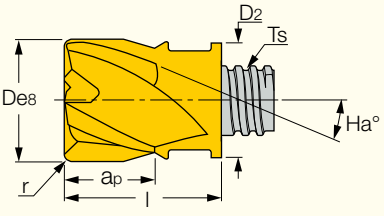


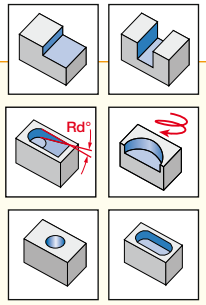
Designation	Dimensions D	Flute	a_p	r	Ts	D_2	l	H_a°	IC908	Recommended Machining Data f_z (mm/t)
MM EC080B05R000-3T05	8.00	3	5.00	0.00	T05	7.70	10.00	45.0	●	0.03-0.09
MM EC100B07R000-3T06	10.00	3	7.00	0.00	T06	9.60	13.00	45.0	●	0.03-0.10
MM EC100B12R000-3T06	10.00	3	12.00	0.00	T06	9.60	19.00	45.0	●	0.03-0.10
MM EC120B09R000-3T08	12.00	3	9.00	0.00	T08	11.70	16.50	45.0	●	0.04-0.11
MM EC.500B37R000-3T08	12.70	3	9.50	0.00	T08	12.40	16.50	45.0	●	0.05-0.10
MM EC.500B37R015-3T08	12.70	3	9.50	0.40	T08	12.40	16.50	45.0	●	0.05-0.10
MM EC.500B37R031-3T08	12.70	3	9.50	0.80	T08	12.40	16.50	45.0	●	0.05-0.10
MM EC.500B37R062-3T08	12.70	3	9.50	1.60	T08	12.40	16.50	45.0	●	0.05-0.10

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM EC-4

4 Flute Interchangeable Solid Carbide Endmill Heads,
30° and 45° Helix, Various Corner Radii



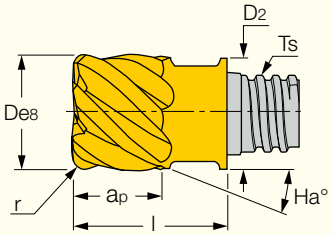


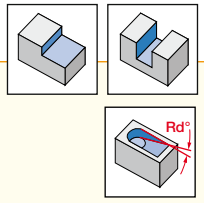
Designation	Dimensions D	r	Ha°	Flute	ap	Ts	D2	l	IC908	Recommended Machining Data fz (mm/t)
MM EC060B05R000-4T05	6.00	0.00	45.0	4	5.00	T05	7.70	10.00	●	0.03-0.07
MM EC080B05R000-4T05	8.00	0.00	45.0	4	5.00	T05	7.70	10.00	●	0.03-0.09
MM EC080B09R000-4T05	8.00	0.00	45.0	4	9.00	T05	7.70	15.00	●	0.03-0.09
MM EC080A05R0.5-4T05	8.00	0.50	30.0	4	5.00	T05	7.70	10.00	●	0.03-0.09
MM EC080A09R0.5-4T05	8.00	0.50	30.0	4	9.00	T05	7.70	15.00	●	0.03-0.09
MM EC080B05R0.5-4T05	8.00	0.50	45.0	4	5.00	T05	7.70	10.00	●	0.03-0.09
MM EC080A05R1.0-4T05	8.00	1.00	30.0	4	5.00	T05	7.70	10.00	●	0.03-0.09
MM EC080B05R1.0-4T05	8.00	1.00	45.0	4	5.00	T05	7.70	10.00	●	0.03-0.09
MM EC080A05R1.5-4T05	8.00	1.50	30.0	4	5.00	T05	7.70	10.00	●	0.03-0.09
MM EC080B05R1.5-4T05	8.00	1.50	45.0	4	5.00	T05	7.70	10.00	●	0.03-0.09
MM EC100B07R000-4T06	10.00	0.00	45.0	4	7.00	T06	9.60	13.00	●	0.03-0.10
MM EC100B12R000-4T06	10.00	0.00	45.0	4	12.00	T06	9.60	19.00	●	0.03-0.10
MM EC100A07R0.5-4T06	10.00	0.50	30.0	4	7.00	T06	9.60	13.00	●	0.03-0.10
MM EC100B07R0.5-4T06	10.00	0.50	45.0	4	7.00	T06	9.60	13.00	●	0.03-0.10
MM EC100A07R1.0-4T06	10.00	1.00	30.0	4	7.00	T06	9.60	13.00	●	0.03-0.10
MM EC100B07R1.0-4T06	10.00	1.00	45.0	4	7.00	T06	9.60	13.00	●	0.03-0.10
MM EC120B09R000-4T08	12.00	0.00	45.0	4	9.00	T08	11.70	16.50	●	0.04-0.11
MM EC120B14R000-4T08	12.00	0.00	45.0	4	14.00	T08	11.70	23.00	●	0.04-0.11
MM EC120A09R0.5-4T08	12.00	0.50	30.0	4	9.00	T08	11.70	16.50	●	0.04-0.11
MM EC120B09R0.5-4T08	12.00	0.50	45.0	4	9.00	T08	11.70	16.50	●	0.04-0.11
MM EC120A09R1.0-4T08	12.00	1.00	30.0	4	9.00	T08	11.70	16.50	●	0.04-0.11
MM EC120B09R1.0-4T08	12.00	1.00	45.0	4	9.00	T08	11.70	16.50	●	0.04-0.11
MM EC160B12R000-4T10	16.00	0.00	45.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160A12R0.5-4T10	16.00	0.50	30.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160B12R0.5-4T10	16.00	0.50	45.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160A12R1.0-4T10	16.00	1.00	30.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160B12R1.0-4T10	16.00	1.00	45.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160A12R1.5-4T10	16.00	1.50	30.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160B12R1.5-4T10	16.00	1.50	45.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160A12R2.0-4T10	16.00	2.00	30.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160B12R2.0-4T10	16.00	2.00	45.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160A12R3.0-4T10	16.00	3.00	30.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160B12R3.0-4T10	16.00	3.00	45.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160A12R4.0-4T10	16.00	4.00	30.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC160B12R4.0-4T10	16.00	4.00	45.0	4	12.00	T10	15.30	20.50	●	0.05-0.13
MM EC200B15R000-4T12	20.00	0.00	45.0	4	15.00	T12	18.30	25.50	●	0.05-0.13
MM EC200A15R0.5-4T12	20.00	0.50	30.0	4	15.00	T12	18.30	25.50	●	0.05-0.13
MM EC200A15R1.0-4T12	20.00	1.00	30.0	4	15.00	T12	18.30	25.50	●	0.05-0.13
MM EC200A15R2.0-4T12	20.00	2.00	30.0	4	15.00	T12	18.30	25.50	●	0.05-0.13
MM EC200A15R3.0-4T12	20.00	3.00	30.0	4	15.00	T12	18.30	25.50	●	0.05-0.13

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM EC-6

6 Flute Interchangeable Solid Carbide Endmill Heads,
30°and 45° Helix, Various Corner Radii



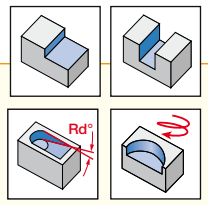


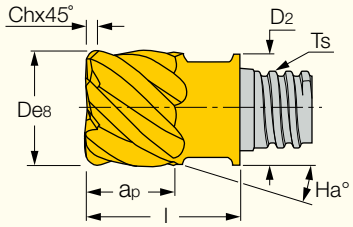
Designation	Dimensions D	Flute	a_p	r	Ts	D_2	l	H_a°	R_d°	IC908	Recommended Machining Data f_z (mm/t)
MM EC080A05R0.5-6T05	8.00	6	5.00	0.50	T05	7.70	10.00	30.0	6.0	●	0.03-0.09
MM EC080A05R1.0-6T05	8.00	6	5.00	1.00	T05	7.70	10.00	30.0	6.0	●	0.03-0.09
MM EC080A05R1.5-6T05	8.00	6	5.00	1.50	T05	7.70	10.00	30.0	6.0	●	0.03-0.09
MM EC080B05R0.5-6T05	8.00	6	5.00	0.50	T05	7.70	10.00	45.0	3.0	●	0.03-0.10
MM EC080B05R1.0-6T05	8.00	6	5.00	1.00	T05	7.70	10.00	45.0	3.0	●	0.03-0.09
MM EC080B05R1.5-6T05	8.00	6	5.00	1.50	T05	7.70	10.00	45.0	3.0	●	0.03-0.09
MM EC100A07R0.5-6T06	10.00	6	7.00	0.50	T06	9.60	13.00	30.0	6.0	●	0.03-0.10
MM EC100A07R1.0-6T06	10.00	6	7.00	1.00	T06	9.60	13.00	30.0	6.0	●	0.03-0.10
MM EC100A07R1.5-6T06	10.00	6	7.00	1.50	T06	9.60	13.00	30.0	6.0	●	0.03-0.10
MM EC100B07R0.5-6T06	10.00	6	7.00	0.50	T06	9.60	13.00	45.0	3.0	●	0.04-0.10
MM EC100B07R000-6T06	10.00	6	7.00	0.00	T06	9.60	13.00	45.0	3.0	●	0.03-0.10
MM EC100B07R1.0-6T06	10.00	6	7.00	1.00	T06	9.60	13.00	45.0	3.0	●	0.04-0.10
MM EC100B07R1.5-6T06	10.00	6	7.00	1.50	T06	9.60	13.00	45.0	3.0	●	0.03-0.10
MM EC100B12R1.5-6T06	10.00	6	12.00	1.50	T06	9.60	19.00	45.0	3.0	●	0.04-0.10
MM EC120A09R0.5-6T08	12.00	6	9.00	0.50	T08	11.70	16.50	30.0	6.0	●	0.04-0.11
MM EC120A09R1.0-6T08	12.00	6	9.00	1.00	T08	11.70	16.50	30.0	6.0	●	0.04-0.11
MM EC120B09R0.5-6T08	12.00	6	9.00	0.50	T08	11.70	16.50	45.0	3.0	●	0.04-0.10
MM EC120B09R000-6T08	12.00	6	9.00	0.00	T08	11.70	16.50	45.0	3.0	●	0.04-0.11
MM EC120B09R1.0-6T08	12.00	6	9.00	1.00	T08	11.70	16.50	45.0	3.0	●	0.04-0.10
MM EC120B09R1.5-6T08	12.00	6	9.00	1.50	T08	11.70	16.50	45.0	3.0	●	0.04-0.11
MM EC.500A37R015-6T08	12.70	6	9.50	0.40	T08	12.40	16.50	30.0	6.0	●	0.04-0.11
MM EC.500A37R030-6T08	12.70	6	9.50	0.76	T08	12.40	16.50	30.0	6.0	●	0.04-0.11
MM EC.500B37R000-6T08	12.70	6	9.50	0.00	T08	12.40	16.50	45.0	5.0	●	0.04-0.11
MM EC.500B37R015-6T08	12.70	6	9.50	0.40	T08	12.40	16.50	45.0	5.0	●	0.04-0.11
MM EC.500B37R031-6T08	12.70	6	9.50	0.80	T08	12.40	16.50	45.0	5.0	●	0.04-0.11
MM EC.500B37R060-6T08	12.70	6	9.50	1.50	T08	12.40	16.50	45.0	5.0	●	0.04-0.11

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-84

MM EC-D

6, 8, 10 Flute Interchangeable Solid Carbide Endmill Heads with 50° Helix, for Machining Hardened Steel



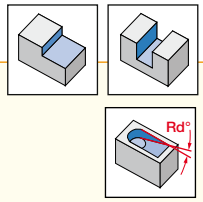


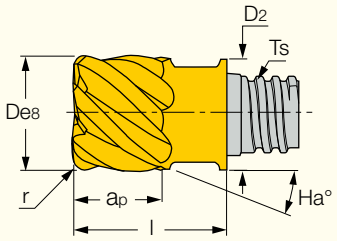
Designation	Dimensions D	Flute	ap	Ch	Ts	D2	l	Ha°	Rd°	IC903	Recommended Machining Data fz (mm/t)
MM EC080D05C01-6T05	8.00	6	5.00	0.10	T05	7.70	10.00	50.0	2.0	●	0.03-0.10
MM EC100D07C01-6T06	10.00	6	7.00	0.10	T06	9.60	13.00	50.0	2.0	●	0.03-0.10
MM EC120D09C01-6T08	12.00	6	9.00	0.10	T08	11.70	16.50	50.0	3.0	●	0.04-0.11
MM EC160D12C02-8T10	16.00	8	12.00	0.20	T10	15.30	20.50	50.0	3.0	●	0.05-0.13
MM EC200D15C02-10T12	20.00	10	15.00	0.20	T12	18.30	25.50	50.0	3.0	●	0.05-0.13

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM EC-8/MM EC-10

8, 10 Flute Interchangeable Solid Carbide Endmill Heads, 30° and 45° Helix, Various Corner Radii





Designation	Dimensions D	Flute	ap	r	Ts	D2	l	Ha°	Rd°	Coolant	IC908	Recommended Machining Data fz (mm/t)
MM EC160A12R0.5-8T10	16.00	8	12.00	0.50	T10	15.30	20.50	30.0	5.0	-	●	0.05-0.13
MM EC160A12R0.5-8T10H	16.00	8	12.00	0.50	T10	15.30	20.50	30.0	5.0	Y	●	0.05-0.13
MM EC160A12R1.0-8T10	16.00	8	12.00	1.00	T10	15.30	20.50	30.0	5.0	-	●	0.05-0.13
MM EC160A12R1.6-8T10	16.00	8	12.00	1.60	T10	15.30	20.50	30.0	5.0	-	●	0.05-0.13
MM EC160A12R2.0-8T10	16.00	8	12.00	2.00	T10	15.30	20.50	30.0	5.0	-	●	0.05-0.13
MM EC160B12R0.5-8T10	16.00	8	12.00	0.50	T10	15.30	20.50	45.0	5.0	-	●	0.05-0.13
MM EC160B12R1.0-8T10	16.00	8	12.00	1.00	T10	15.30	20.50	45.0	5.0	-	●	0.05-0.13
MM EC160B12R1.6-8T10	16.00	8	12.00	1.60	T10	15.30	20.50	45.0	5.0	-	●	0.05-0.13
MM EC160B12R2.0-8T10	16.00	8	12.00	2.00	T10	15.30	20.50	45.0	5.0	-	●	0.05-0.13
MM EC200A15R1.0-10T12	20.00	10	15.00	1.00	T12	18.30	25.50	30.0	3.0	-	●	0.05-0.13
MM EC200A15R2.0-10T12	20.00	10	15.00	2.00	T12	18.30	25.50	30.0	3.0	-	●	0.05-0.13
MM EC250A22R0.8-10T15	25.00	10	22.00	0.80	T15	23.90	37.00	30.0	3.0	-	●	0.05-0.13

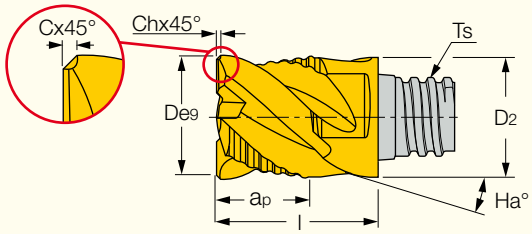
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

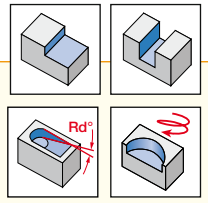
MULTI-MASTER • FINISHRED

INDEXABLE SOLID CARBIDE LINE — MULTI-MASTER LINE

MM EFS

Combination of Roughing and Finishing Interchangeable Solid Carbide Endmill Heads





Designation	Dimensions D	Flute	ap	Ch	Ts	D2	l	Ha°	IC908	Recommended Machining Data fz (mm/t)
MM EFS080B05-4T05	8.00	4	5.00	0.30	T05	7.70	10.00	45.0	●	0.03-0.08
MM EFS100B07-4T06	10.00	4	7.00	0.30	T06	9.60	13.00	45.0	●	0.03-0.09
MM EFS120B09-4T08	12.00	4	9.00	0.40	T08	11.70	16.50	45.0	●	0.04-0.10
MM EFS.500B37-4T08	12.70	4	9.40	0.40	T08	12.40	16.50	45.0	●	0.04-0.00
MM EFS160B12-4T10	16.00	4	12.00	0.60	T10	15.30	20.50	45.0	●	0.05-0.11
MM EFS200B15-4T12	20.00	4	15.00	0.60	T12	18.30	25.50	45.0	●	0.05-0.11
MM EFS250B22-4T15	25.00	4	22.00	0.60	T15	23.90	37.00	45.0	●	0.06-0.11
MM EFS1.00B86-4T15	25.40	4	22.00	0.60	T15	23.90	37.00	45.0	●	0.00-0.00

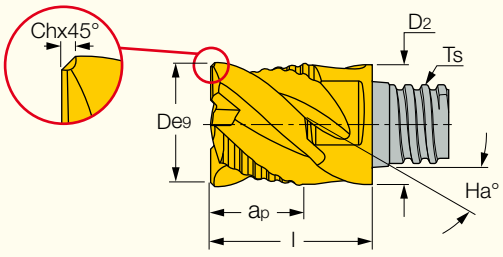
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

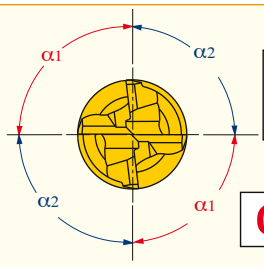
FINISHRED • CHATTERFREE

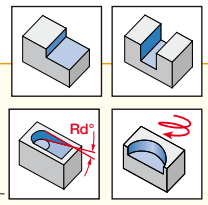
MULTI-MASTER LINE — MULTI-MASTER LINE

MM EFS-CF

4 Flute 38° Helix with Variable Pitch, Solid Carbide Heads for Chatter Free Roughing and Finishing Applications







$\alpha 1 \neq \alpha 2$

Designation	Dimensions D	Flute	ap	Ch	Ts	D2	l	Ha°	IC908	Recommended Machining Data fz (mm/t)
MM EFS060E05-4T05 CF	6.00	4	5.00	0.25	T05	7.70	10.00	38.0	●	0.03-0.08
MM EFS080E05-4T05 CF	8.00	4	5.00	0.3	T05	7.70	10.00	38.0	●	0.03-0.08
MM EFS100E07-4T06 CF	10.00	4	7.00	0.4	T06	9.60	13.00	38.0	●	0.03-0.09
MM EFS120E09-4T08 CF	12.00	4	9.00	0.5	T08	11.70	16.50	38.0	●	0.04-0.10
MM EFS.500E37-4T08 CF	12.70	4	9.50	0.5	T08	12.40	16.50	38.0	●	0.04-0.10
MM EFS160E12-4T10 CF	16.00	4	12.00	0.6	T10	15.30	20.50	38.0	●	0.05-0.11
MM EFS200E15-4T12 CF	20.00	4	16.00	0.6	T12	18.30	25.50	38.0	●	0.05-0.11
MM EFS250E22-4T15 CF	25.00	4	22.00	0.6	T15	23.90	37.00	38.0	●	0.06-0.11

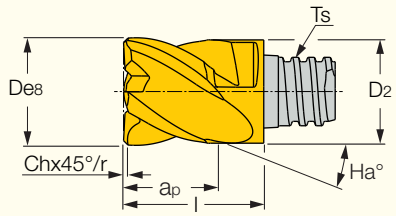
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

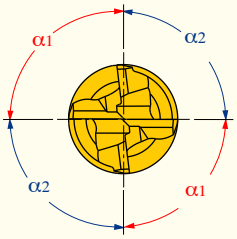
MULTI-MASTER • CHATTERFREE

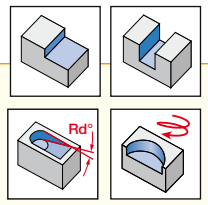
INDEXABLE SOLID CARBIDE LINE — MULTI-MASTER LINE

MM EC-CF

Interchangeable Solid Carbide Endmill Heads for Chatter Free Roughing and Finishing Operations







$\alpha 1 \neq \alpha 2$

Designation	Dimensions D	Ch	r	Flute	a_p	Ts	D_2	l	H_a°	IC908	Recommended Machining Data f_z (mm/t)
MM EC080E05C3CF-4T05	8.00	0.3	-	4	5.00	T05	7.70	10.00	38.0	●	0.03-0.09
MM EC080E05R05CF-4T05	8.00	-	0.50	4	5.00	T05	7.70	10.00	38.0	●	0.03-0.09
MM EC100E07C4CF-4T06	10.00	0.4	-	4	7.00	T06	9.60	13.00	38.0	●	0.03-0.10
MM EC100E07R05CF-4T06	10.00	-	0.50	4	7.00	T06	9.60	13.00	38.0	●	0.03-0.10
MM EC120E09C5CF-4T08	12.00	0.5	-	4	9.00	T08	11.70	16.50	38.0	●	0.04-0.11
MM EC120E09R05CF-4T08	12.00	-	0.50	4	9.00	T08	11.70	16.50	38.0	●	0.04-0.11
MM EC500E37C20CF-4T08	12.70	0.5	-	4	9.50	T08	12.40	16.50	38.0	●	0.04-0.11
MM EC500E37R31CF-4T08	12.70	-	0.78	4	9.50	T08	12.40	16.50	38.0	●	0.04-0.11
MM EC500E37R0-CF-4T08	12.70	-	-	4	9.50	T08	12.40	16.50	38.0	●	0.04-0.11
MM EC160E12C6CF-4T10	16.00	0.6	-	4	12.00	T10	15.30	20.50	38.0	●	0.05-0.13
MM EC160E12R05CF-4T10	16.00	-	0.50	4	12.00	T10	15.30	20.50	38.0	●	0.05-0.13
MM EC200E15C6CF-4T12	20.00	0.6	-	4	15.00	T12	18.30	25.50	38.0	●	0.05-0.17
MM EC200E15R05CF-4T12	20.00	-	0.50	4	15.00	T12	18.30	25.50	38.0	●	0.05-0.17
MM EC250E22C6CF-4T15	25.00	0.6	-	4	22.00	T15	23.90	37.00	38.0	●	0.06-0.17
MM EC250E22R05CF-4T15	25.00	-	0.50	4	22.00	T15	23.90	37.00	38.0	●	0.06-0.17

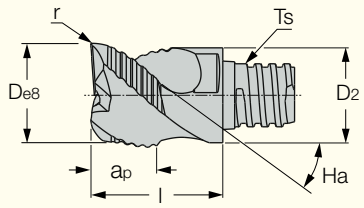
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

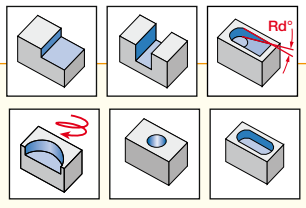
MULTI-MASTER

INDEXABLE SOLID CARBIDE LINE

MM ERA

Interchangeable Solid Carbide Rough Milling Heads, for Machining Aluminum





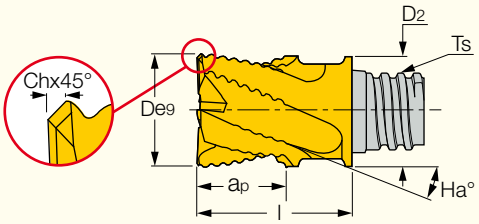
ALUMINUM

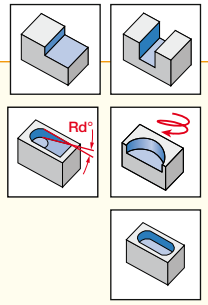
Designation	Dimensions D	Flute	a_p	r	Ts	D_2	l	H_a°	IC08	Recommended Machining Data f_z (mm/t)
MM ERA080B05R0.2-3T05	8.00	3	5.00	0.20	T05	7.70	10.00	45.0	●	0.03-0.15
MM ERA100B06R0.2-3T06	10.00	3	6.00	0.20	T06	9.60	13.00	45.0	●	0.05-0.20
MM ERA120B08R0.2-3T08	12.00	3	8.00	0.20	T08	11.70	16.50	45.0	●	0.07-0.22
MM ERA160B10R0.2-3T10	16.00	3	10.00	0.20	T10	15.30	20.50	45.0	●	0.07-0.25
MM ERA200B12R0.2-3T12	20.00	3	12.00	0.20	T12	18.30	25.50	45.0	●	0.07-0.25
MM ERA250B19R0.2-3T15	25.00	3	19.00	0.20	T15	23.90	37.00	45.0	●	0.07-0.25

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM ERS

Interchangeable Solid Carbide Rough Milling Heads, for High Metal Removal Rates





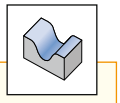
Designation	Dimensions D	Flute	a_p	Ts	D_2	l	Ch	H_a°	R_d°	IC908	Recommended Machining Data f_z (mm/t)
MM ERS080B05-4T05	8.00	4	5.00	T05	7.70	10.00	0.25	45.0	90.0	●	0.03-0.08
MM ERS080B09-4T05	8.00	4	9.00	T05	7.70	15.00	0.25	45.0	90.0	●	0.03-0.08
MM ERS100B07-4T06	10.00	4	7.00	T06	9.60	13.00	0.30	45.0	90.0	●	0.03-0.09
MM ERS120B09-4T08	12.00	4	9.00	T08	11.70	16.50	0.35	45.0	90.0	●	0.04-0.10
MM ERS120B09-4T08-H (1)	12.00	4	9.00	T08	11.70	16.50	0.35	45.0	90.0	●	0.04-0.10
MM ERS120B14-4T08	12.00	4	14.00	T08	11.70	23.00	0.35	45.0	90.0	●	0.04-0.10
MM ERS.500B37-4T08	12.70	4	9.50	T08	12.40	16.50	0.35	45.0	90.0	●	0.04-0.10
MM ERS160B12-5T10	16.00	5	12.00	T10	15.30	20.50	0.40	45.0	7.0	●	0.04-0.10
MM ERS160B12-5T10-H (1)	16.00	5	12.00	T10	15.30	20.50	0.40	45.0	7.0	●	0.04-0.10
MM ERS200B15-6T12	20.00	6	15.00	T12	18.30	25.50	0.40	45.0	3.0	●	0.05-0.11
MM ERS250B22-6T15	25.00	6	22.00	T15	23.90	37.00	0.50	45.0	3.0	●	0.05-0.11
MM ERS1.00B86-6T15	25.40	6	22.00	T15	23.90	37.00	0.50	45.0	3.0	●	0.04-0.10

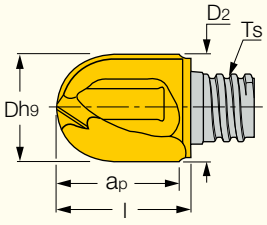
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

(1) With a central coolant hole

MM HCR

Interchangeable 2 Flute Solid Carbide Ball Nose Milling Heads





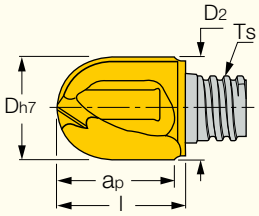
ECONOMICAL SOLUTION

Designation	Dimensions D	Flute	a_p	Ts	D_2	l	IC908
MM HCR080-2T05	8.00	2	7.80	T05	7.60	9.95	●
MM HCR100-2T06	10.00	2	10.00	T06	9.60	12.35	●
MM HCR120-2T08	12.00	2	11.45	T08	11.50	15.30	●
MM HCR.500-2T08	12.70	2	12.90	T08	11.50	16.40	●
MM HCR160-2T10	16.00	2	15.80	T10	15.20	19.10	●

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM HRF

Interchangeable 2 Flute Solid Carbide Ball Nose Finish Milling Heads

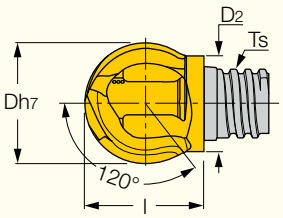


Designation	Dimensions D	ap	Flute	Ts	D2	l	Tough ↔ Hard IC908	IC903
MM HRF080-2T05	8.00	7.60	2	T05	7.60	9.95		●
MM HRF100-2T06	10.00	10.20	2	T06	9.60	12.35	●	●
MM HRF120-2T08	12.00	11.50	2	T08	11.50	15.30		●
MM HRF160-2T10	16.00	15.80	2	T10	15.20	19.10		●

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM HBR

Interchangeable 2 Flute High Precision, Ball Nose Solid Carbide Milling Heads



ECONOMICAL SOLUTION

Designation	Dimensions D	Flute	Ts	D2	l	IC908
MM HBR100-2T05	10.00	2	T05	7.60	10.00	●
MM HBR120-2T06	12.00	2	T06	9.60	11.60	●
MM HBR.500-2T06	12.70	2	T06	9.60	12.25	●
MM HBR160-2T08	16.00	2	T08	11.50	15.40	●
MM HBR200-2T10	20.00	2	T10	15.20	18.40	●
MM HBR250-2T12	25.00	2	T12	18.30	23.20	●
MM HBR1.00-2T12	25.40	2	T12	18.30	23.40	●

• For shanks, see pages B35-41 • For tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

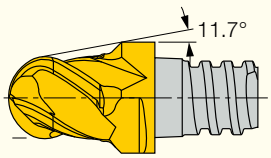
Spare Parts

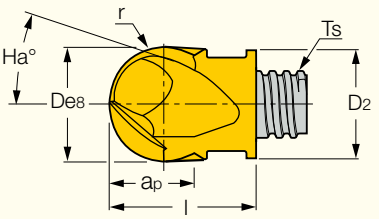
Designation	Wrench
MM HBR.375-2T05	MM KEY 6X4*
MM HBR100-2T05	MM KEY 6X4*
MM HBR120-2T06	MM KEY 10X7*
MM HBR.500-2T06	MM KEY 10X7*
MM HBR.625-2T08	MM KEY 13X8*
MM HBR160-2T08	MM KEY 13X8*
MM HBR.750-2T10	MM KEY 13X8*
MM HBR200-2T10	MM KEY 13X8*
MM HBR250-2T12	MM KEY 16X9*

MM EB

Interchangeable Solid Carbide Ball Nose Milling Heads

MM EB060E05-4T05



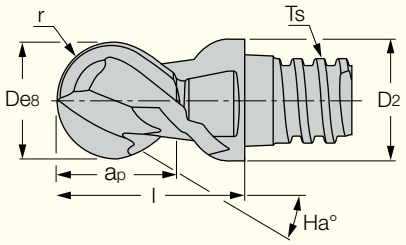


Designation	Dimensions D	Flute	a_p	r	Ts	D_2	l	H_a°	IC908
MM EB060E05-4T05	6.00	4	5.00	2.99	T05	8.00	10.00	38.0	●
MM EB080A05-2T05	8.00	2	5.00	3.98	T05	7.70	10.00	30.0	●
MM EB080A05-4T05	8.00	4	5.00	3.98	T05	7.70	10.00	30.0	●
MM EB100A07-2T06	10.00	2	7.00	4.98	T06	9.60	13.00	30.0	●
MM EB100A07-4T06	10.00	4	7.00	4.98	T06	9.60	13.00	30.0	●
MM EB120A09-2T08	12.00	2	9.00	5.98	T08	11.70	16.50	30.0	●
MM EB120A09-4T08	12.00	4	9.00	5.98	T08	11.70	16.50	30.0	●
MM EB.500A37-2T08	12.70	2	9.50	6.33	T08	12.40	16.50	30.0	●
MM EB.500A37-4T08	12.70	4	9.50	6.33	T08	12.40	16.50	30.0	●
MM EB160A09-2T10	16.00	2	9.00	7.98	T10	15.30	20.50	30.0	●
MM EB160A12-4T10	16.00	4	12.00	7.98	T10	15.30	20.50	30.0	●
MM EB200A15-4T12	20.00	4	15.00	9.97	T12	18.30	25.50	30.0	●
MM EB250A22-4T15	25.00	4	22.00	12.47	T15	23.90	37.00	30.0	●

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM EBA

2 Flute High Precision, Interchangeable Solid Carbide Ball Nose Heads, for Machining Aluminum



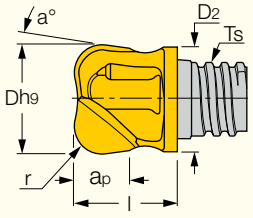
ALUMINUM

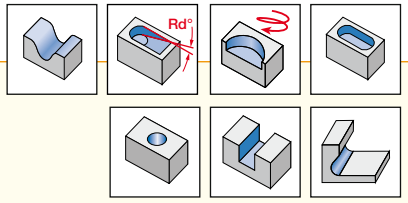
Designation	Dimensions D	Flute	a_p	r	$r^{\pm toler}$	Ts	D_2	l	H_a°	IC08
MM EBA080B05-2T05	8.00	2	5.00	3.98	0.010	T05	7.70	10.00	45.0	●
MM EBA100B07-2T06	10.00	2	7.00	4.98	0.010	T06	9.60	13.00	45.0	●
MM EBA120B09-2T08	12.00	2	9.00	5.98	0.012	T08	11.50	16.50	45.0	●
MM EBA.500B37-2T08	12.70	2	9.50	6.35	0.012	T08	12.40	16.50	45.0	●
MM EBA160B12-2T10	16.00	2	12.00	7.98	0.012	T10	15.30	20.50	45.0	●
MM EBA200B15-2T12	20.00	2	15.00	9.97	0.012	T12	18.30	25.50	45.0	●
MM EBA250B22-2T15	25.00	2	22.00	12.50	0.012	T15	23.90	37.00	45.0	●

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM HT

Torodial 2 Flute Interchangeable Solid Carbide Heads





ECONOMICAL SOLUTION

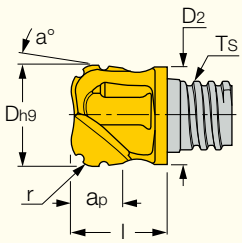
Designation	Dimensions									Tough ↔ Hard	
	D	Flute	a_p	r	T_m[1]	Ts	D_2	l	a°	IC908	IC903
MM HT100C08R0.5-2T06	10.00	2	7.00	0.50	r0-1.0	T06	9.60	12.45	5	●	
MM HT100C08R1.0-2T06	10.00	2	7.00	1.00	r0-1.0	T06	9.60	12.45	5	●	
MM HT100N06R2.0-2T06	10.00	2	6.00	2.00	r0-3.0	T06	9.60	12.40	7	●	
MM HT100N07R0.5-2T06	10.00	2	6.90	0.50	r0-1.0	T06	9.60	11.20	5		●
MM HT100N07R1.0-2T06	10.00	2	6.90	1.00	r0-1.0	T06	9.60	11.20	5		●
MM HT100N07R2.0-2T06	10.00	2	6.90	2.00	r0-3.0	T06	9.60	11.20	5		●
MM HT100N07R3.0-2T06	10.00	2	6.90	3.00	r2.7-4.0	T06	9.60	11.20	5		●
MM HT120N06R3.0-2T06	12.00	2	5.40	3.00	r2.7-4.0	T06	9.10	9.10	7	●	
MM HT120N06R4.0-2T06	12.00	2	5.10	4.00	r2.7-4.0	T06	11.50	9.10	7	●	
MM HT120N06R1.6-2T08	12.00	2	5.70	1.60	r1.3-r2.7	T08	11.50	11.10	7	●	●
MM HT120N06R2.0-2T08	12.00	2	5.90	2.00	r1.3-2.7	T08	11.50	11.10	7	●	●
MM HT120N06R2.5-2T08	12.00	2	5.50	2.50	r1.3-4.0	T08	11.50	11.10	7	●	
MM HT120N06R3.0-2T08	12.00	2	5.50	3.00	r2.7-4.4	T08	11.50	11.10	7	●	●
MM HT120N06R4.0-2T08	12.00	2	5.60	4.00	r2.7-4.4	T08	11.50	11.10	7	●	●
MM HT160N07R2.0-2T10	16.00	2	6.90	2.00	r1.5-4.0	T10	15.20	13.10	7	●	
MM HT160N07R3.0-2T10	16.00	2	7.20	3.00	r1.5-4.0	T10	15.20	13.40	7	●	
MM HT160N07R4.0-2T10	16.00	2	7.10	4.00	r1.5-4.0	T10	15.20	13.40	7	●	
MM HT160N08R5.0-2T10	16.00	2	8.00	5.00	r2.7-4.4	T10	15.20	20.20	7	●	●
MM HT200N11R3.0-2T12	20.00	2	10.80	3.00	r3.0-8.0	T12	18.30	17.00	7	●	
MM HT200N11R4.0-2T12	20.00	2	11.10	4.00	r3.0-8.0	T12	18.30	17.30	7	●	
MM HT200N11R5.0-2T12	20.00	2	11.10	5.00	r3.0-8.0	T12	18.30	17.30	7	●	
MM HT200N11R6.0-2T12	20.00	2	11.00	6.00	r3.0-8.0	T12	18.30	17.30	7	●	
MM HT200N11R8.0-2T12	20.00	2	10.90	8.00	r3.0-8.0	T12	18.30	17.30	7	●	

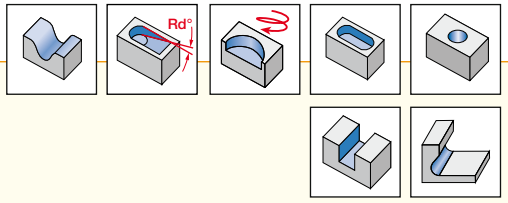
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

[1] Specially tailored radius range upon request

MM HT-NCSR

2 Flute Chip Splitting Toroidal, Solid Carbide Milling Heads





ECONOMICAL SOLUTION

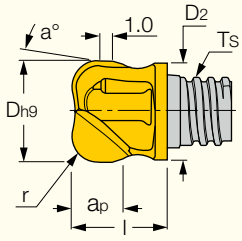
Designation	Dimensions D	Flute	ap	r	Tm(1)	Ts	D2	l	a°	IC908
MM HT120NCSR3.0-2T08	12.00	2	5.50	3.00	r2.7-4.4	T08	11.50	11.10	7	●

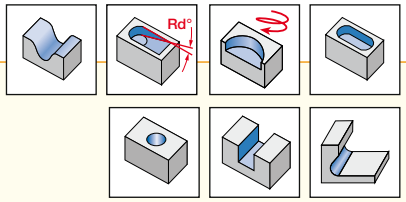
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

(1) Specially tailored radius range, available upon request.

MM HT-NWFR

2 Flute Toroidal Solid Carbide Milling Heads with a Side Tangential Wiper





ECONOMICAL SOLUTION

Designation	Dimensions D	Flute	ap	r	Tm(1)	Ts	D2	l	a°	IC908
MM HT120NWFR3.0-2T08	12.00	2	5.30	3.00	r2.7-4.4	T08	11.50	11.10	7	●

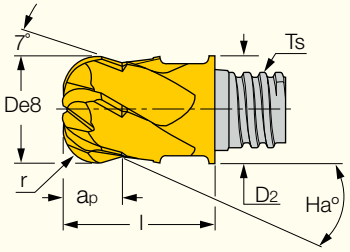
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

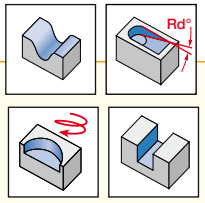
(1) Specially tailored radius range, available upon request.

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM ETR

Torodial 6 Flute Interchangeable Solid Carbide Heads





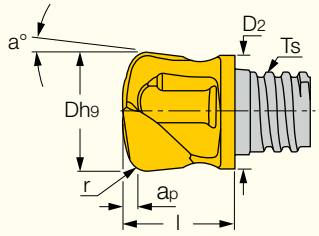
Designation	Dimensions D	Z	a_p	r	Ts	D_2	l	H_a°	R_d°	IC908
MM ETR080A04R2.0-6T05	8.00	6	5.00	2.00	T05	7.70	10.00	30.0	9.0	●
MM ETR100A05R3.0-6T06	10.00	6	7.00	3.00	T06	9.60	13.00	30.0	9.0	●
MM ETR120A07R4.0-6T08	12.00	6	9.00	4.00	T08	11.70	16.50	30.0	9.0	●
MM ETR160A09R5.0-6T10	16.00	6	12.00	5.00	T10	15.30	20.50	30.0	9.0	●

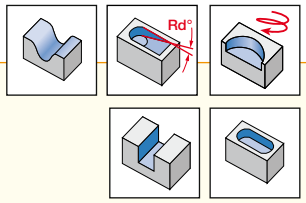
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MULTI-MASTER • FEEDMILL
INDEXABLE SOLID CARBIDE LINE

MM FF

2 Flute FEEDMILL Interchangeable Solid Carbide Heads,
for Milling at Very High Feed and Small D.O.C.





ECONOMICAL SOLUTION

Designation	Dimensions D	Z	$a_{p\ max}$	r(1)	Ts	D_2	l	a°	R_d°	Tough ↔ Hard IC908	IC903	Recommended Machining Data f_z (mm/t)
MM FF100R1.5-L12-2T06	10.00	2	0.60	2.00	T06	9.60	12.50	7	90.0	●		0.30-0.60
MM FF120R2.0-2T08	12.00	2	0.68	2.50	T08	11.50	11.10	7	90.0	●	●	0.50-1.00
MM FF500R08-L59-2T08	12.70	2	0.68	2.50	T08	11.50	15.00	5	90.0	●		0.50-1.00
MM FF160R2.0-L20-2T10	16.00	2	1.10	3.00	T10	15.20	20.20	7	90.0	●		0.55-1.10
MM FF160R2.0-2T10	16.00	2	1.10	3.00	T10	15.20	13.50	7	90.0	●		0.55-1.10
MM FF200R2.0-2T12	20.00	2	1.50	3.40	T12	18.30	17.40	5	90.0	●		0.75-1.50

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

(1) Should be used for programming

Machining Example:

Shank: MM S-B-L140-C16-T08
Milling head: MM FF 120R2.0-2T08
Workpiece material: SAE 4340 HRc 28

Plunging
ap = 2 mm
Vc = 80 mm
F = 0.24 m/min

Milling
ap = 0.7 mm
ae = 8 mm
Vc = 150 m/min
Fz = 1 mm/tooth
Vf = 7960 mm/min

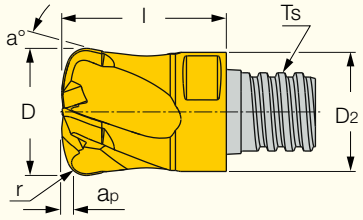
Machining Example:

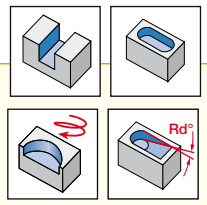
Shank: MM S-A-L070-W20-T10
Milling head: MM FF160R2.0-2T10 908
Workpiece material: P20 HRc 52

Milling
ap = 0.2 mm
ae = 6 mm
Vc = 150 m/min
Fz = 1.4 mm/tooth
Vf = 8355
T = 60 min

MM EFF

4, 6 Flute Solid Carbide Heads for Milling at Very High Feed and Small D.O.C.





Designation	Dimensions D	Z	a_p	Ts	D_2	l	a°	r(2)	Tough ↔ Hard IC908	IC903	Recommended Machining Data f_z (mm/t)
MM EFF080T3R1.62-4T05	8.00	4	0.40	T05	7.50	10.00	7	1.62		●	0.12-0.48
MM EFF100T4R2.01-4T06	10.00	4	0.50	T06	9.50	13.00	7	2.01		●	0.16-0.57
MM EFF120T4R1.8-4T08H (1)	12.00	4	0.60	T08	11.50	16.50	7	1.80	●		0.16-0.67
MM EFF120T4R2.47-4T08	12.00	4	0.60	T08	11.50	16.50	7	2.47		●	0.16-0.67
MM EFF127T4R2.59-4T08	12.70	4	0.60	T08	12.20	16.50	7	2.59		●	0.16-0.67
MM EFF160T5R2.2-4T10H (1)	16.00	4	0.80	T10	15.30	20.50	7	2.20	●		0.20-0.75
MM EFF160T5R3.25-4T10	16.00	4	0.80	T10	15.30	20.50	7	3.25		●	0.20-0.75
MM EFF200T6R4.02-4T12	20.00	4	1.00	T12	18.30	25.50	7	4.02		●	0.20-0.90
MM EFF250A7R3.1-6T15	25.00	6	1.20	T15	23.90	25.00	7	3.10		●	0.25-1.00
MM EFF254A7R3.63-6T15	25.40	6	1.20	T15	23.90	25.00	7	3.10		●	0.25-1.00

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

(1) With a central coolant hole (2) Should be used for programming

Machining Recommendations

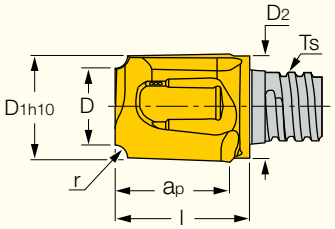
VDI 3323	Material Group(1)	Vc (m/min)	ap	ae	Fz (mm/t) vs. Tool Diameter (mm) 8	10	12	16	20	25
P	1	180	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	2	160	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	3	160	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	4	160	0.045xD	0.7xD	0.48	0.57	0.67	0.75	0.90	1.00
	5	150	0.045xD	0.7xD	0.43	0.50	0.57	0.65	0.75	0.87
	6	150	0.045xD	0.7xD	0.33	0.40	0.48	0.57	0.67	0.78
	7	140	0.045xD	0.7xD	0.33	0.40	0.48	0.57	0.67	0.78
	8	140	0.045xD	0.7xD	0.30	0.35	0.43	0.52	0.60	0.70
	9	140	0.045xD	0.7xD	0.30	0.35	0.43	0.52	0.60	0.70
	10	130	0.04xD	0.6xD	0.28	0.33	0.38	0.48	0.57	0.67
	11	120	0.04xD	0.6xD	0.25	0.30	0.35	0.43	0.52	0.62
M	12, 13	120	0.04xD	0.6xD	0.30	0.35	0.43	0.52	0.60	0.70
K	15-16	180	Apmax	0.7xD	0.45	0.52	0.60	0.70	0.80	0.90
	17-18	160	Apmax	0.7xD	0.38	0.45	0.52	0.60	0.70	0.80
H	38.1(2)	100	0.035xD	0.45xD	0.20	0.25	0.33	0.40	0.48	0.55
	38.2(3)	80	0.03xD	0.3xD	0.16	0.22	0.30	0.38	0.45	0.52
	39(4)	60	0.02xD	0.25xD	0.12	0.16	0.16	0.20	0.20	0.25

(1) ISCAR material group in accordance with VDI 3323 standard
(2) 45-49 HRc
(3) 50-55 HRc
(4) 56-63 HRc

ap - Depth of cut
ae - Width of cut

MM HR

Interchangeable 2 Flute Solid Carbide, Concave Radius Milling Heads



ECONOMICAL SOLUTION

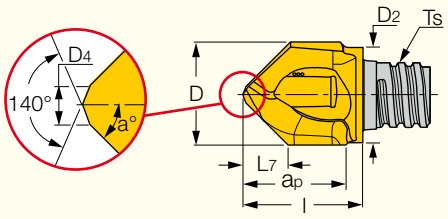
Designation	Dimensions									IC908
	D_1	r	Z	D	a_p	Ts	D_2	l	T_m[1]	
MM HR1.0/047-5.8-2T05	8.0	1.00	2	5.80	7.50	T05	7.60	10.60	r0.5-3.0	●
MM HR1.6/063-6.8-2T06	10.0	1.60	2	6.80	9.50	T06	9.60	12.50	r0.5-3.0	●
MM HR2.0/078-6.0-2T06	10.0	2.00	2	6.00	9.50	T06	9.60	12.50	r0.5-3.0	●
MM HR2.5/094-5.1-2T06	10.0	2.50	2	5.10	9.50	T06	9.60	12.50	r0.5-3.0	●
MM HR3.0/125-6.5-2T08	12.7	3.00	2	6.50	12.00	T08	11.50	15.60	r0.5-4.0	●
MM HR4.0/156-4.7-2T08	12.7	4.00	2	4.70	12.00	T08	11.50	15.60	r0.5-4.0	●
MM HR5.0/188-6.2-2T10	16.0	5.00	2	6.20	15.00	T10	15.20	19.10	r0.5-5.0	●
MM HR6.0/236-8.0-2T12	20.0	6.00	2	8.00	7.00	T12	18.30	17.40	r0.5-6.0	●

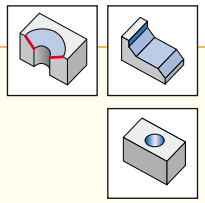
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

(1) Specially tailored radius range upon request.

MM HCD

2 Flute Interchangeable Solid Carbide Heads, for Chamfering, Countersinking and Spot Drilling





ECONOMICAL SOLUTION

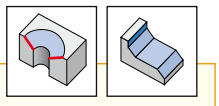
Designation	Dimensions										IC908
	D	Z	Dtol	a_p	Ts	D_2	l	a°	L_7	D_4	
MM HCD080-090-2T05 (1)	8.00	2	z9	7.00	T05	7.60	9.75	45	3.15	1.00	●
MM HCD083-090-2T05 (1)	8.30	2	z9	7.50	T05	7.60	10.00	45	3.56	1.00	●
MM HCD100-060-2T06	10.00	2	h10	9.30	T06	9.60	11.75	30	7.60	1.50	●
MM HCD100-090-2T06 (1)	10.00	2	z9	9.00	T06	9.60	11.75	45	4.40	1.50	●
MM HCD100-120-2T06	10.00	2	h10	9.50	T06	9.60	12.70	60	2.70	1.50	●
MM HCD104-090-2T06 (1)	10.40	2	z9	9.00	T06	9.60	11.75	45	4.60	1.50	●
MM HCD120-060-2T08	12.00	2	h10	11.00	T08	11.50	15.40	30	9.24	1.50	●
MM HCD120-090-2T08 (1)	12.00	2	z9	12.00	T08	11.50	15.50	45	5.30	1.50	●
MM HCD120-120-2T08	12.00	2	h10	11.65	T08	11.50	15.20	60	3.50	1.50	●
MM HCD124-090-2T08 (1)	12.40	2	z9	11.80	T08	11.50	15.50	45	5.50	1.50	●
MM HCD.500-080-2T08 (2)	12.70	2	z9	11.10	T08	12.20	15.50	40	6.80	1.50	●
MM HCD160-060-2T10	16.00	2	h10	16.20	T10	15.20	20.20	30	12.00	2.50	●
MM HCD160-090-2T10 (1)	16.00	2	z9	14.90	T10	15.20	18.80	45	7.10	1.50	●
MM HCD160-120-2T10	16.00	2	h10	15.50	T10	15.20	19.90	60	4.40	1.50	●
MM HCD165-090-2T10 (1)	16.50	2	z9	14.90	T10	15.20	18.80	45	7.10	1.50	●
MM HCD200-060-2T12	20.00	2	h10	18.20	T12	18.30	24.70	30	15.50	2.50	●
MM HCD200-090-2T12 (1)	20.00	2	z9	18.20	T12	18.30	24.70	45	9.40	1.50	●
MM HCD200-120-2T12	20.00	2	h10	14.65	T12	18.30	21.15	60	5.50	1.50	●

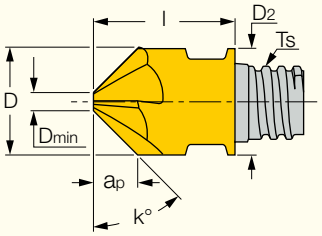
• For shanks, see pages B35-41 • Clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

(1) May be used for F-type (fine) countersink according to DIN 74. (2) Countersink according to American National and British standard flat screws.

MM ECF

Interchangeable Solid Carbide Heads, for Chamfering and Countersinking



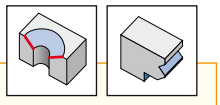


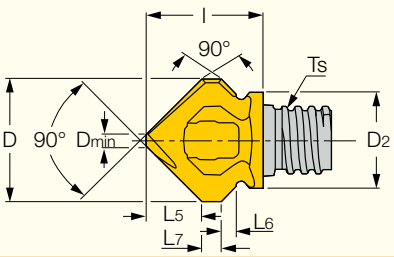
Designation	Dimensions D	Z	D min	a_p	Ts	D_2	l	K°	IC908
MM ECF45-100-4T06	10.00	4	1.95	4.00	T06	10.00	13.00	45	●
MM ECF60-100-4T06	10.00	4	1.60	7.30	T06	10.00	13.00	60	●
MM ECF45-120-4T08	12.00	4	1.95	5.00	T08	12.00	16.50	45	●
MM ECF45-.500-4T08	12.70	4	1.95	5.00	T08	12.70	16.50	45	●
MM ECF45-160-6T10	16.00	6	3.00	6.50	T10	16.00	20.50	45	●
MM ECF45-200-6T12	20.00	6	5.00	7.50	T12	18.30	25.50	45	●
MM ECF45-250-6T15	25.00	6	5.00	10.00	T15	23.90	37.00	45	●

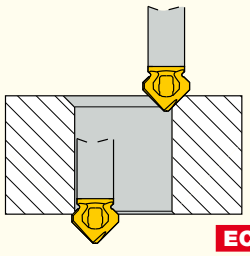
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM HDF

2 Flute Interchangeable Solid Carbide Heads, for Upper and Bottom Chamfering







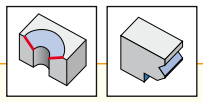
ECONOMICAL SOLUTION

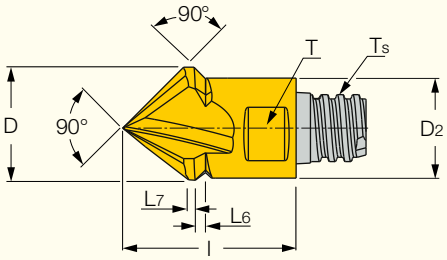
Designation	Dimensions D	Z	L_5	L_6	L_7	D min	Ts	D_2	l	IC908
MM HDF100-090-2T05	9.80	2	4.30	0.90	2.50	1.20	T05	7.60	10.80	●
MM HDF120-090-2T06	11.80	2	5.30	1.20	2.00	1.20	T06	9.30	11.20	●
MM HDF160-090-2T08	15.70	2	7.10	2.20	2.00	1.50	T08	11.50	14.00	●

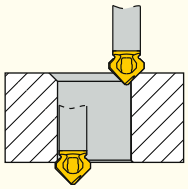
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM EDF

3 Flute Interchangeable Solid Carbide Heads, for Upper and Bottom Chamfering





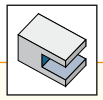


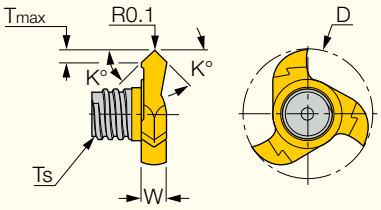
Designation	Dimensions							IC908
	D	D2	Z	L6	L7	l	Ts	
MM EDF094-090-76-3T05	9.40	7.70	3	0.90	1.00	12.50	T05	●
MM EDF116-090-95-3T06	11.60	9.60	3	1.00	1.00	16.50	T06	●

• Suitable for pecking applications. • For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

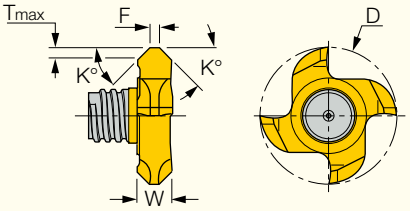
MM GRIT-K/P-45A

Interchangeable Solid Carbide Small Diameter 45° Chamfering Heads





MM GRIT 18



MM GRIT 22

Designation	Dimensions							IC528
	D	K°	Tmax	F	W	Ts	Z	
MM GRIT 18K-45A	17.70	45	1.40	-	3.40	T06	3	●
MM GRIT 18P-45A	17.70	45	1.40	-	3.40	T06	3	●
MM GRIT 22K-45A	21.70	45	1.70	1.50	5.50	T08	4	●
MM GRIT 22P-45A	21.70	45	1.70	1.50	5.50	T08	4	●

• Use carbide shanks for groove milling heads. • Each MM GRT shank is supplied with MM EGR clamping key. • Keys for other milling heads must be ordered separately. • MM GRT.. shanks serve mainly for MM GRIT.. slitting heads. • K-Type-For general steel machining. • P-Type-Positive geometry for soft and gummy materials. • For user guide, see pages C84-85.

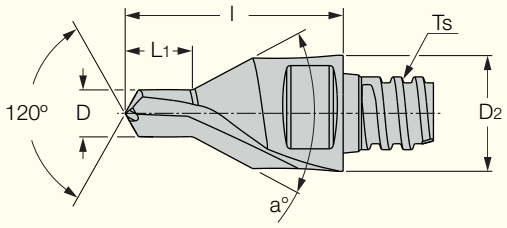
Spare Parts

Designation	Clamping Key
MM GRIT 18K-45A	MM EGR 16-18*
MM GRIT 18P-45A	MM EGR 16-18*
MM GRIT 22K-45A	MM EGR 20-22*
MM GRIT 22P-45A	MM EGR 20-22*

* Optional, should be ordered separately

MM ECS

Centering Drill (DIN 332), Interchangeable Solid Carbide Heads

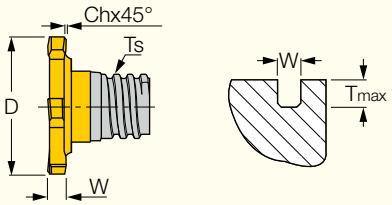


Designation	Dimensions D	D2	l	L1	Ts	a°	IC908
MM ECS-A3.15X08-2T05	3.28	8.00	15.00	4.6	T05	60	●
MM ECS-A4.00X10-2T06	4.12	10.00	19.00	5.9	T06	60	●
MM ECS-A5.00X12-2T08	5.13	12.00	23.00	7.2	T08	60	●
MM ECS-A6.30X16-2T10	6.46	16.00	28.00	8.9	T10	60	●

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

MM TS-N

Interchangeable Solid Carbide T-Slot Milling Heads with Chamfered Corners



Designation	Dimensions D-0.05	Z	W±0.02	Tmax	Ch	Ts	IC328
MM TS.500-N062P-06T05	12.70	6	1.58	2.25	0.15	T05	●
MM TS.500-N078P-06T05	12.70	6	1.98	2.25	0.15	T05	●
MM TS135-N20P-06T05	13.50	6	2.00	2.65	0.20	T05	●
MM TS135-N25P-06T05	13.50	6	2.50	2.65	0.20	T05	●

• For tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection • For shanks, see pages B35-41 • For user guide,see pages C85-86.

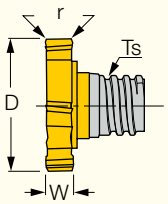
Spare Parts

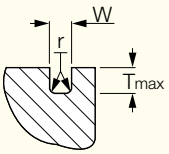
Designation	Key
MM TS-N	T-20/3*

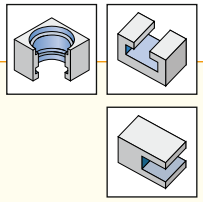
* Optional, should be ordered separately

MM TS-H

Interchangeable Solid Carbide T-Slot Milling Heads with Various Corner Radius





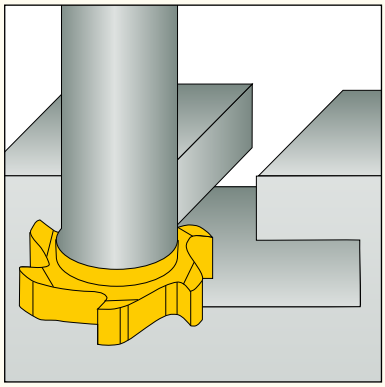


Designation	Dimensions D-0.05	Z	W±0.02	Tmax	r	Ts	IC328	Key
MM TS135-H30D-06T05	13.50	6	3.00	2.65	0.40	T05	●	T-20/3*
MM TS135-H40D-06T05	13.50	6	4.00	2.65	0.40	T05	●	T-20/3*
MM TS165-H40A-06T05	16.50	6	4.00	4.25	0.20	T05	●	T-20/3*
MM TS160-H20D-06T06	16.00	6	2.00	3.00	0.40	T06	●	T-20/3*
MM TS160-H30D-06T06	16.00	6	3.00	3.00	0.40	T06	●	T-25/3*
MM TS160-H40D-06T06	16.00	6	4.00	3.00	0.40	T06	●	T-25/3*
MM TS165-H20D-06T06	16.50	6	2.00	3.25	0.40	T06	●	T-20/3*
MM TS165-H30D-06T06	16.50	6	3.00	3.25	0.40	T06	●	T-25/3*
MM TS165-H40D-06T06	16.50	6	4.00	3.25	0.40	T06	●	T-25/3*
MM TS195-H60A-06T06	19.50	6	6.00	4.45	0.20	T06	●	T-25/3*
MM TS225-H60A-06T06	22.50	6	6.00	5.95	0.20	T06	●	T-25/3*
MM TS195-H40D-06T08	19.50	6	4.00	3.45	0.40	T08	●	T-30/3 L*
MM TS195-H50D-06T08	19.50	6	5.00	3.45	0.40	T08	●	T-30/3 L*
MM TS195-H60D-06T08	19.50	6	6.00	3.45	0.40	T08	●	T-30/3 L*
MM TS225-H40D-06T08	22.50	6	4.00	4.90	0.40	T08	●	T-40/3 L*
MM TS225-H50D-06T08	22.50	6	5.00	4.95	0.40	T08	●	T-40/3 L*
MM TS225-H60D-06T08	22.50	6	6.00	4.95	0.40	T08	●	T-40/3 L*
MM TS225-H80D-06T08	22.50	6	8.00	4.95	0.40	T08	●	T-40/3 L*
MM TS250-H50D-06T08	25.00	6	5.00	5.90	0.40	T08	●	T-50/3 L*
MM TS250-H60D-06T08	25.00	6	6.00	5.90	0.40	T08	●	T-50/3 L*
MM TS250-H80D-06T08	25.00	6	8.00	5.90	0.40	T08	●	T-50/3 L*
MM TS250-H50D-06T10	25.00	6	5.00	4.30	0.40	T10	●	T-50/3 L*
MM TS250-H60D-06T10	25.00	6	6.00	4.30	0.40	T10	●	T-50/3 L*
MM TS250-H80D-06T10	25.00	6	8.00	4.30	0.40	T10	●	T-50/3 L*

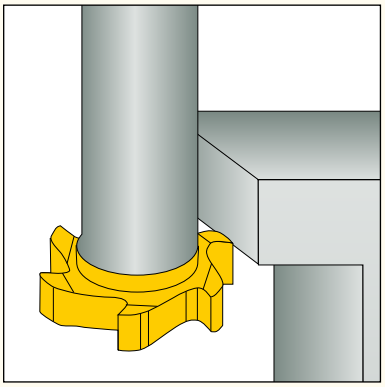
• For tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection • For shanks, see pages B35-41 • For user guide,see pages C72-84.

* Optional, should be ordered separately

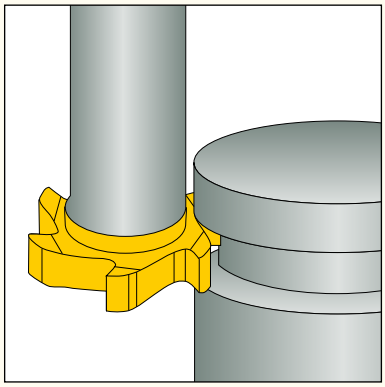
Typical Applications



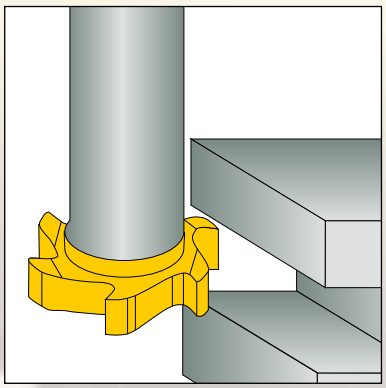
T Slot



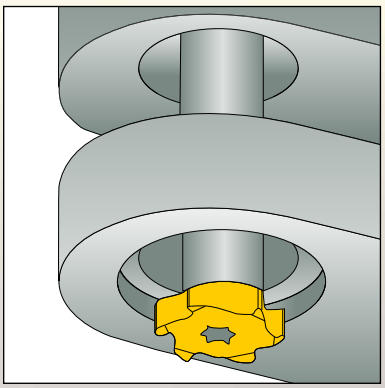
Bottom Deburring



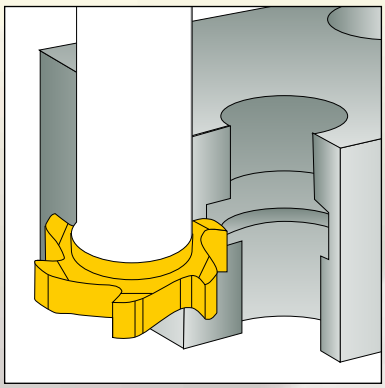
Circular Groove



Straight Groove



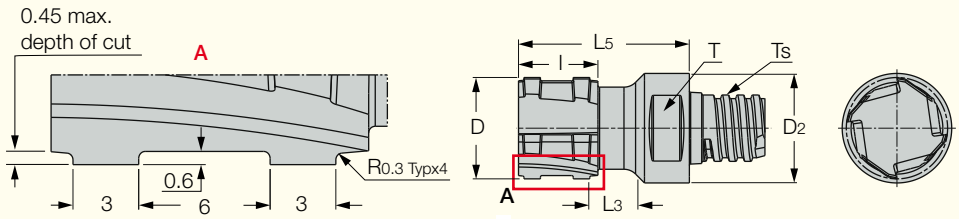
Bottom Circular Groove



Internal Circular Groove

MM TS-DG

Double-Groove Internal Grooving Heads with Threaded Connection, for Tube Sheets of Heat Exchangers



Designation	Dimensions									IC908
	D_4[1]	Z	D	Ts	L_5	L_3	I	D_2	T[2]	
MM TS155-04T10-8238	15.88	4	15.50	T10	30.20	8.40	14.10	16.00	13.0	●
MM TS185-04T12-8239	19.05	4	18.50	T12	31.20	8.80	14.50	20.00	16.0	●
MM TS245-04T15-8240	25.40	4	24.50	T15	37.40	11.00	14.40	23.90	20.0	●

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see pages C72-83.

[1] For minimum tube outer diameter (inch sizes). [2] Clamping wrench size (to be ordered separately).

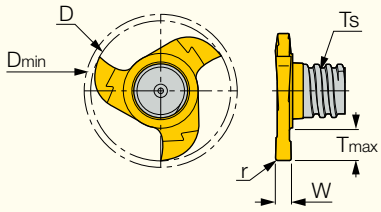
Spare Parts

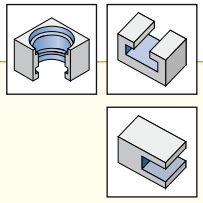
Designation	Wrench
MM TS155-04T10-8238	MM KEY 13X8*
MM TS185-04T12-8239	MM KEY 16X9*
MM TS245-04T15-8240	MM KEY 20*

* Optional, should be ordered separately

MM GRIT-16K/18P

Interchangeable Solid Carbide Small Diameter Groove Milling Heads





Designation	Dimensions							IC528
	D	W±0.02	Z	r	Tmax	D min(2)	Ts	
MM GRIT 16K-1.50-0.10	15.70	1.50	3	0.10	2.80	16.00	T06	●
MM GRIT 16P-1.50-0.10	15.70	1.50	3	0.10	2.80	16.00	T06	●
MM GRIT 16K-1.57-0.20	15.70	1.57	3	0.20	2.80	16.00	T06	●
MM GRIT 16K-2.00-0.20	15.70	2.00	3	0.20	2.80	16.00	T06	●
MM GRIT 16P-2.20-1.10	15.70	2.20	3	1.10	2.80	16.00	T06	●
MM GRIT 16K-2.39-0.20	15.70	2.39	3	0.20	2.80	16.00	T06	●
MM GRIT 16K-2.50-0.20	15.70	2.50	3	0.20	2.80	16.00	T06	●
MM GRIT 16K-3.00-0.20	15.70	3.00	3	0.20	2.80	16.00	T06	●
MM GRIT 16P-3.00-0.20	15.70	3.00	3	0.20	2.80	16.00	T06	●
MM GRIT 16K-3.17-0.20	15.70	3.17	3	0.20	2.80	16.00	T06	●
MM GRIT 18K-1.20-0.05 (1)	17.70	1.20	3	0.05	3.80	18.00	T06	●
MM GRIT 18P-1.20-0.60	17.70	1.20	3	0.60	3.80	18.00	T06	●
MM GRIT 18K-1.40-0.05 (1)	17.70	1.40	3	0.05	3.80	18.00	T06	●
MM GRIT 18K-1.50-0.10	17.70	1.50	3	0.10	3.80	18.00	T06	●
MM GRIT 18K-1.57-0.20	17.70	1.57	3	0.20	3.80	18.00	T06	●
MM GRIT 18K-1.70-0.05 (1)	17.70	1.70	3	0.05	3.80	18.00	T06	●
MM GRIT 18K-2.00-0.20	17.70	2.00	3	0.20	3.80	18.00	T06	●
MM GRIT 18P-2.00-1.00	17.70	2.00	3	1.00	3.80	18.00	T06	●
MM GRIT 18P-2.20-1.10	17.70	2.20	3	1.10	3.80	18.00	T06	●
MM GRIT 18K-2.39-0.20	17.70	2.39	3	0.20	3.80	18.00	T06	●
MM GRIT 18K-2.50-0.20	17.70	2.50	3	0.20	3.80	18.00	T06	●
MM GRIT 18K-3.00-0.20	17.70	3.00	3	0.20	3.80	18.00	T06	●
MM GRIT 18P-3.00-1.50	17.70	3.00	3	1.50	3.80	18.00	T06	●
MM GRIT 18K-3.17-0.20	17.70	3.17	3	0.20	3.80	18.00	T06	●

• Recommended for O-rings and retaining rings. • MM EGR clamping key is supplied with each MM GRT... shank. • Modification options on request. • Do not apply lubricant to the threaded connection. • Tightening torque: 1000 N x cm • For clamping instructions, see page B2 • For user guide, see pages C84-85 • For shanks, see pages B35-41. • K-For general steel machining. • P-Positive geometry for soft and gummy materials.

(1) For circle clips according to DIN 471/472 and ANSI B27.7M (2) Minimum bore diameter

K-Type-For general steel machining.

P-Type-Positive geometry for soft and gummy materials.

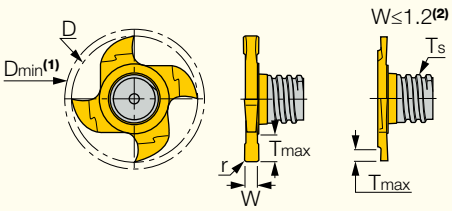
Spare Parts

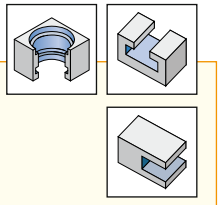
Designation	Clamping Key
MM GRIT-16K/18P	MM EGR 16-18*

* Optional, should be ordered separately

MM GRIT-22K/P,28K

Interchangeable Solid Carbide Small Diameter Groove Milling Heads





Designation	Dimensions D	W±0.02	Z	r	Tmax	D min(2)	Ts	IC528	Clamping Key
MM GRIT 22K-0.76-0.00 (1)	21.70	0.76	4	0.00	1.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-0.86-0.00 (1)	21.70	0.86	4	0.00	1.70	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-0.96-0.00 (1)	21.70	0.96	4	0.00	1.90	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-1.00-0.05	21.70	1.00	4	0.05	2.00	22.00	T08	●	MM EGR 20-22*
MM GRIT 22P-1.00-0.05	21.70	1.00	4	0.05	2.00	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-1.20-0.05 (1)	21.70	1.20	4	0.05	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-1.40-0.05 (1)	21.70	1.40	4	0.05	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-1.57-0.00	21.70	1.57	4	0.00	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-1.70-0.10 (1)	21.70	1.70	4	0.10	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22P-1.70-0.10 (1)	21.70	1.70	4	0.10	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-1.95-0.20 (1)	21.70	1.95	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-2.00-0.20	21.70	2.00	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22P-2.00-0.20	21.70	2.00	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-2.25-0.20 (1)	21.70	2.25	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-2.39-0.20	21.70	2.39	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-2.50-0.20	21.70	2.50	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22P-2.50-0.20	21.70	2.50	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-2.75-0.20 (1)	21.70	2.75	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-3.00-0.20	21.70	3.00	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22P-3.00-0.20	21.70	3.00	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-3.17-0.20	21.70	3.17	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-3.25-0.20 (1)	21.70	3.25	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22P-3.81-0.20	21.70	3.81	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-4.00-0.20	21.70	4.00	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22P-3.98-0.20	21.70	3.98	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22P-4.00-0.20	21.70	4.00	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22P-4.00-2.00	21.70	4.00	4	2.00	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-4.25-0.20 (1)	21.70	4.25	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-4.25-1.20 (1)	21.70	4.25	4	1.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-4.75-0.20	21.70	4.75	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-5.25-0.20 (1)	21.70	5.25	4	0.20	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 22K-6.00-3.00	21.70	6.00	4	3.00	4.50	22.00	T08	●	MM EGR 20-22*
MM GRIT 28K-2.50-0.2	27.70	2.50	6	0.20	6.00	28.00	T10	●	T-40/3 L*
MM GRIT 28K-5.25-0.2	27.70	5.25	6	0.20	6.00	28.00	T10	●	T-40/3 L*
MM GRIT 28K-10.0-0.2	27.70	10.00	6	0.20	6.00	28.00	T10	●	T-40/3 L*

• Recommended for O-rings and retaining rings. • MM EGR 20-22 clamping key is supplied with each MM GRT... shank, tightening torque: 1500 N x cm • MM GRIT 28 clamping key should be ordered separately, tightening torque: 2800 N x cm • Modification options on request. • Do not apply lubricant to the threaded connection. • For clamping instructions, see page B2 • For user guide, see pages C84-85. • For shanks, see pages B35-41.

(1) For circle clips according to DIN471/472 and ANSI B27.7M (2) Minimum bore diameter.

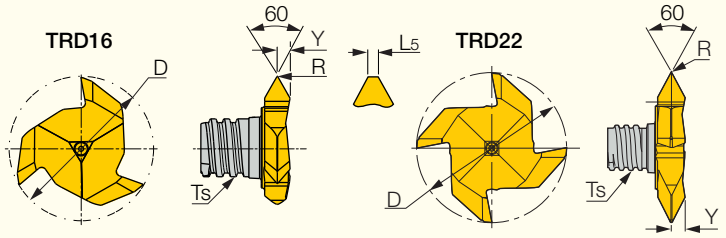
* Optional, should be ordered separately

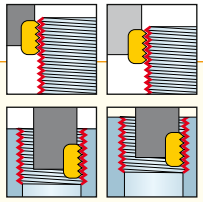
K-For general steel and cast iron machining.

P-Positive geometry for soft and gummy materials.

MM TRD-M

Interchangeable Solid Carbide Milling Heads, for 60° Partial Profile Thread Milling





Designation	Dimensions											IC528
	D	Z	TPI(1)	Pitch(2)	R	L_5	Y	Ts	T_h	D min	Standard	
MM TRD16-M60-05P-3T06	15.70	3	48.0	0.50	- (3)	0.05	1.15	T06	M20	19.05	ISO 68, DIN 13	●
MM TRD16-M60-15P-3T06	15.70	3	16.0	1.50	0.05	-	1.15	T06	M22	19.05	ISO 68, DIN 13	●
MM TRD22-M60-30P-4T08	21.70	4	8.0	3.00	0.20	-	2.80	T08	M36	31.00	ISO 68, DIN 13	●

• For shanks, see pages B35-41. • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection.

(1) For American National Thread (ANSI B1.1.74) (2) For ISO metric thread (ISO 68, DIN13, ANSI B 1.13M-1983) (3) flat

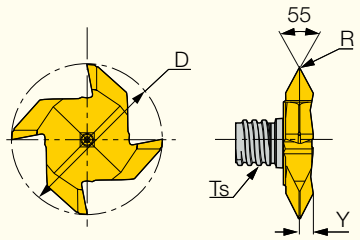
Spare Parts

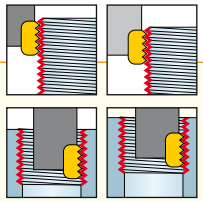
Designation	Clamping Key
MM TRD16-M60-05P-3T06	MM EGR 16-18*
MM TRD16-M60-15P-3T06	MM EGR 16-18*
MM TRD22-M60-30P-4T08	MM EGR 20-22*

* Optional, should be ordered separately

MM TRD-W

Interchangeable Solid Carbide Milling Heads, for 55° Partial Profile Thread Milling





Designation	Dimensions									IC528
	D	Z	R	Y	TPI max	Ts	T_h	D min	Standard	
MM TRD22-W55-14P-4T08	21.70	4	0.20	2.40	14	T08	G3/4	24.20	DIN ISO 228, B.S. 84	●

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection

Spare Parts

Designation	Clamping Key
MM TRD-W	MM EGR 20-22*

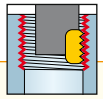
* Optional, should be ordered separately

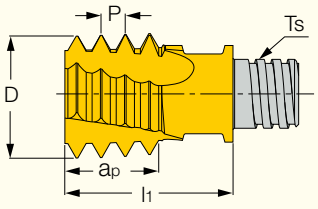
Identification Code

MT	10	D	6	0.75	ISO	MMT05
MULTI-MASTER Thread Mill	Cutting Dia.	No. of Flutes	Cutting Length	Pitch	Thread Profile ISO UN G (55°)	Connection Size

MT-ISO-MM

Carbide Milling Heads with a Threaded Connection for Internal ISO Metric Thread

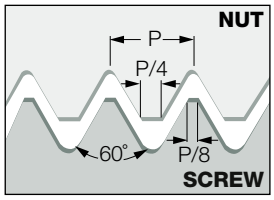




Application: General engineering

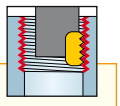
Designation	Dimensions								IC908
	Pitch	M Coarse	M Fine	D	Flute	a_p	l_1	Ts	
MT 10D6 0.75ISO-MMT05	0.75	-	≥12	10.00	4	6.00	13.35	T05	●
MT 10D6 1.0ISO-MMT05	1.00	-	≥12	10.00	4	6.00	13.35	T05	●
MT 10D6 1.5ISO-MMT05	1.50	-	≥14	10.00	4	6.00	13.35	T05	●
MT 12D7 1.5ISO-MMT06	1.50	-	≥16	12.00	4	7.50	17.05	T06	●
MT 12D8 2.0ISO-MMT06	2.00	M16	≥17	12.00	4	8.00	17.05	T06	●
MT 16F12 1.5ISO-MMT08	1.50	-	≥20	16.00	6	12.00	20.85	T08	●
MT 16E12 2.0ISO-MMT08	2.00	-	≥19	16.00	5	12.00	20.85	T08	●
MT 15E12 2.5ISO-MMT08	2.50	M20	≥22	15.40	5	12.50	20.85	T08	●
MT 16C12 3.0ISO-MMT08	3.00	M24	≥25	16.00	3	12.00	20.85	T08	●

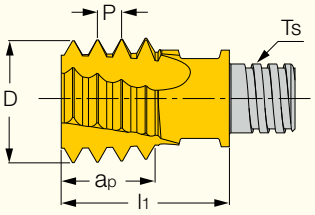
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see ISCAR Milling Tools catalog.



MT-UN-MM

Carbide Milling Heads with a Threaded Connection, for Internal UN Thread Profile

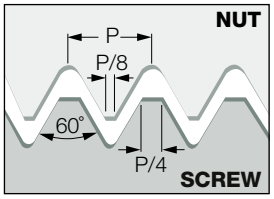




Application: General engineering

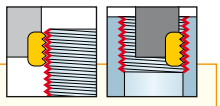
Designation	Dimensions									IC908
	TPI	UNC	UNF	UNEF	D	Flute	a_p	l_1	Ts	
MT 10D6 24UN-MMT05	24.0	-	-	9/16-5/8	10.00	4	5.30	13.35	T05	●
MT 10D6 20UN-MMT05	20.0	-	1/2	-	10.00	4	5.10	13.35	T05	●
MT 10D5 18UN-MMT05	18.0	-	9/16-5/8	1 1/8-1 5/8	10.00	4	5.60	13.35	T05	●
MT 12D8 16UN-MMT06	16.0	-	3/4	-	12.00	4	8.00	17.05	T06	●
MT 16E12 14UN-MMT08	14.0	-	7/8	-	16.00	5	12.70	20.85	T08	●
MT 16E12 12UN-MMT08	12.0	-	1-1 1/2	-	16.00	5	12.70	20.85	T08	●
MT 15D12 10UN-MMT08	10.0	3/4	-	-	15.30	4	12.70	20.85	T08	●
MT 16C11 9UN-MMT08	9.0	7/8	-	-	16.00	3	11.30	20.85	T08	●

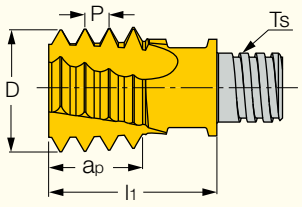
• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see ISCAR Milling Tools catalog.



MT-W-MM

Carbide Milling Heads with a Threaded Connection, for Internal and External 55° BSW Thread Profile

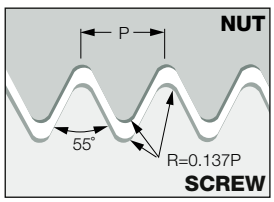




Application: General engineering fittings and pipe couplings

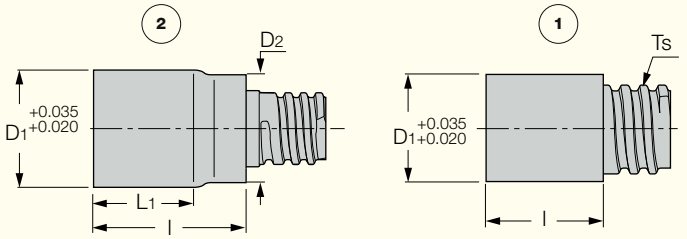
Designation	Dimensions							IC908
	TPI	BSP	D	Flute	a_p	l_1	Ts	
MT 10D6 19W-MMT05	19.0	G1/4-3/8	10.00	4	5.30	13.35	T05	●
MT 16D12 14W-MMT08	14.0	G1/2-7/8	16.00	4	12.70	20.85	T08	●
MT 16D11 11W-MMT08	11.0	G>=1	16.00	4	11.60	20.85	T08	●

• For shanks, see pages B35-41 • For clamping keys (should be ordered separately), tightening torques and clamping instructions, see page B2 • Do not apply lubricant to the threaded connection. • For user guide, see ISCAR Milling Tools catalog.



MM ESR-G

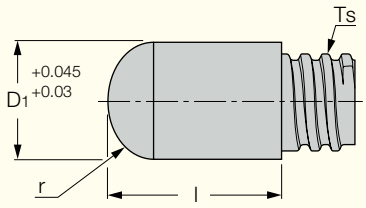
Interchangeable Solid Carbide Blank Heads



Designation	Dimensions D1	l	Ts	D2	L1	Fig	IC08
MM ESR-G 080-10 T05	8.0	10.50	T05	-	-	1	●
MM ESR-G 100-13 T05	10.0	13.35	T05	-	-	1	●
MM ESR-G.375-.56T06	9.5	13.35	T06	-	-	1	●
MM ESR-G 100-13 T06	10.0	13.35	T06	-	-	1	●
MM ESR-G 100-19 T06	10.0	19.45	T06	-	-	1	●
MM ESR-G 120-17 T06	12.0	17.05	T06	-	-	1	●
MM ESR-G 120-17 T08	12.0	17.05	T08	-	-	1	●
MM ESR-G 120-23 T08	12.0	23.00	T08	-	-	1	●
MM ESR-G.500-.67T08	12.7	17.06	T08	-	-	1	●
MM ESR-G.500-.91T08	12.7	23.40	T08	-	-	1	●
MM ESR-G 160-21 T08	16.0	20.85	T08	-	-	1	●
MM ESR-G.625-.83 T10	15.8	20.85	T10	-	-	1	●
MM ESR-G 160-21 T10	16.0	20.85	T10	-	-	1	●
MM ESR-G 164-24 T10	16.4	24.00	T10	-	-	1	●
MM ESR-G 200-26 T10	20.0	26.00	T10	18.30	16.8	2	●
MM ESR-G.750-1.02T12	19.0	26.00	T12	18.30	16.5	2	●
MM ESR-G 200-26 T12	20.0	26.00	T12	18.30	16.8	2	●
MM ESR-G 250-25 T15	25.0	25.60	T15	-	-	1	
MM ESR-G 250-37 T15	25.0	37.60	T15	-	-	1	●
MM ESR-G1.0-1.00 T15	25.4	25.60	T15	-	-	1	
MM ESR-G1.00-1.46T15	25.4	37.60	T15	-	-	1	●

MM ESB-G

Interchangeable Solid Carbide Ball Nose Blank Heads

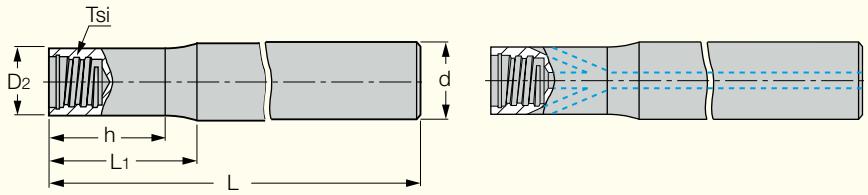


Designation	Dimensions D1	r	l	Ts	IC08
MM ESB-G 080-10 T05	8.0	4.15	10.35	T05	●
MM ESB-G.375-.56T06	9.5	4.90	13.35	T06	●
MM ESB-G 100-13 T06	10.0	5.20	13.35	T06	●
MM ESB-G 120-17 T08	12.0	6.20	17.09	T08	●
MM ESB-G.500-.67T08	12.7	6.50	17.05	T08	●
MM ESB-G 160-21 T10	16.0	8.15	20.85	T10	●

• Do not apply lubricant to the threaded connection.

MM S-A (Stepped Shanks)

Stepped Cylindrical Shanks for Interchangeable Milling Heads



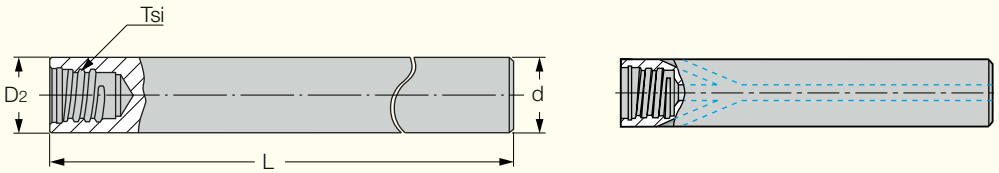
Designation	Tsi	d	D_2	Shank(1)	h	L_1	L	Shank m.	Coolant	Kg
MM S-A-L060-C08-T05	T05	8.00	7.60	C	12.50	15.0	60.00	S	N	0.02
MM S-A-L070-C08-T05-C	T05	8.00	7.60	C	18.00	20.0	70.00	C	N	0.04
MM S-A-L070-C08-T05-W	T05	8.00	7.60	C	18.90	20.0	70.00	W	N	0.07
MM S-A-L090-C08-T05-C	T05	8.00	7.60	C	38.00	40.0	90.00	C	N	0.06
MM S-A-L090-C08-T05-W	T05	8.00	7.60	C	38.90	40.0	90.00	W	N	0.07
MM S-A-L110-C08-T05-C	T05	8.00	7.60	C	57.90	60.0	110.00	C	N	0.02
MM S-A-L110-C08-T05-W	T05	8.00	7.60	C	58.90	60.0	110.00	W	N	0.09
MM S-A-L070-C10-T06-C	T06	10.00	9.60	C	18.00	20.0	70.00	C	N	0.01
MM S-A-L070-C10-T06-W-H	T06	10.00	9.60	C	18.90	20.0	70.00	W	Y	0.08
MM S-A-L075-C10-T06	T06	10.00	9.55	C	17.40	20.0	75.00	S	N	0.05
MM S-A-L075-C10-T06-H	T06	10.00	9.55	C	18.80	20.0	75.00	S	Y	0.04
MM S-A-L090-C10-T06-C	T06	10.00	9.60	C	38.00	40.0	90.00	C	N	0.01
MM S-A-L090-C10-T06-W	T06	10.00	9.55	C	17.20	20.0	90.00	W	N	0.12
MM S-A-L090-C10-T06-W-H	T06	10.00	9.60	C	39.00	40.0	90.00	W	Y	0.10
MM S-A-L110-C10-T06-C	T06	10.00	9.60	C	57.90	60.0	110.00	C	N	0.01
MM S-A-L110-C10-T06-W-H	T06	10.00	9.60	C	59.00	60.0	110.00	W	Y	0.12
MM S-A-L150-C10-T06-C	T06	10.00	9.60	C	98.50	100.0	150.00	C	N	0.15
MM S-A-L070-C12-T08-C	T08	12.00	11.50	C	17.90	20.0	70.00	C	N	0.11
MM S-A-L070-C12-T08-W-H	T08	12.00	11.50	C	18.70	20.0	70.00	W	Y	0.11
MM S-A-L090-C12-T08	T08	12.00	11.50	C	13.30	16.0	90.00	S	N	0.10
MM S-A-L090-C12-T08-H	T08	12.00	11.50	C	38.70	40.0	90.00	S	Y	0.08
MM S-A-L090-C12-T08-CH	T08	12.00	11.50	C	43.20	42.0	90.00	S	Y	0.07
MM S-A-L090-C12-T08-C	T08	12.00	11.50	C	37.00	40.0	90.00	C	N	0.11
MM S-A-L090-C12-T08-W-H	T08	12.00	11.50	C	38.70	40.0	90.00	W	Y	0.15
MM S-A-L110-C12-T08-W-H	T08	12.00	11.50	C	58.70	60.0	110.00	W	Y	0.18
MM S-A-L110-C12-T08-C	T08	12.00	11.50	C	57.80	60.0	110.00	C	N	0.11
MM S-A-L110-C12-T08-W	T08	12.00	11.50	C	17.00	20.0	110.00	W	N	0.09
MM S-A-L130-C12-T08-C	T08	12.00	11.50	C	77.80	80.0	130.00	C	N	0.19
MM S-A-L130-C12-T08-W-H	T08	12.00	11.50	C	78.70	80.0	130.00	W	Y	0.21
MM S-A-L070-C16-T10-W-H	T10	16.00	15.20	C	18.20	20.0	70.00	W	Y	0.21
MM S-A-L090-C16-T10-C	T10	16.00	15.20	C	37.50	40.0	90.00	C	N	0.21
MM S-A-L090-C16-T10-W-H	T10	16.00	15.20	C	38.20	40.0	90.00	W	Y	0.27
MM S-A-L100-C16-T10	T10	16.00	15.20	C	16.30	20.0	100.00	S	N	0.16
MM S-A-L100-C16-T10-H	T10	16.00	15.20	C	48.00	50.0	100.00	S	Y	0.13
MM S-A-L100-C16-T10-CH	T10	16.00	15.20	C	40.20	42.0	100.00	S	Y	0.14
MM S-A-L110-C16-T10-C	T10	16.00	15.20	C	58.00	60.0	110.00	C	N	0.27
MM S-A-L110-C16-T10-W-H	T10	16.00	15.20	C	58.20	60.0	110.00	W	Y	0.33
MM S-A-L130-C16-T10-C	T10	16.00	15.20	C	77.40	80.0	130.00	C	N	0.32
MM S-A-L130-C16-T10-W-H	T10	16.00	15.20	C	78.20	80.0	130.00	W	Y	0.39
MM S-A-L150-C16-T10-C	T10	16.00	15.20	C	97.40	100.0	150.00	C	N	0.02
MM S-A-L150-C16-T10-W-H	T10	16.00	15.20	C	98.20	100.0	150.00	W	Y	0.45
MM S-A-L090-C20-T12-C	T12	20.00	18.30	C	36.60	40.0	90.00	C	N	0.32
MM S-A-L090-C20-T12-W-H	T12	20.00	18.30	C	36.90	40.0	90.00	W	Y	0.41
MM S-A-L120-C20-T12	T12	20.00	18.30	C	20.30	25.0	120.00	S	N	0.44
MM S-A-L120-C20-T12-H	T12	20.00	18.30	C	66.70	70.0	120.00	S	Y	0.25
MM S-A-L130-C20-T12-C	T12	20.00	18.30	C	76.50	80.0	130.00	C	N	0.47
MM S-A-L130-C20-T12-W-H	T12	20.00	18.30	C	76.90	80.0	130.00	W	Y	0.59
MM S-A-L200-C20-T12-C	T12	20.00	18.30	C	116.50	120.0	200.00	C	N	0.76
MM S-A-L200-C20-T12-W-H	T12	20.00	18.30	C	116.90	120.0	200.00	W	Y	0.93
MM S-A-L120-C25-T15-C	T15	25.00	23.90	C	58.00	60.0	120.00	C	N	0.11
MM S-A-L120-C25-T15-W-H	T15	25.00	23.90	C	58.00	60.0	120.00	W	Y	0.89
MM S-A-L135-C25-T15	T15	25.00	23.90	C	33.00	35.0	135.00	S	N	0.47
MM S-A-L170-C25-T15-C	T15	25.00	23.90	C	98.00	100.0	170.00	C	N	0.96
MM S-A-L170-C25-T15-W-H	T15	25.00	23.90	C	98.00	100.0	170.00	W	Y	1.30
MM S-A-L175-C25-T15	T15	25.00	23.90	C	62.70	65.0	175.00	S	N	0.97
MM S-A-L210-C25-T15-W-H	T15	25.00	23.90	C	108.00	110.0	210.00	W	Y	1.61
MM S-A-L250-C25-T15-C	T15	25.00	23.90	C	148.00	150.0	250.00	C	N	1.45

• Shank material (Shank m.): S-steel, C-carbide, W-tungsten. • Do not apply lubricant to the threaded connection.

(1) C-Cylindrical

MM TS-A

Cylindrical Shanks for Interchangeable Milling Heads

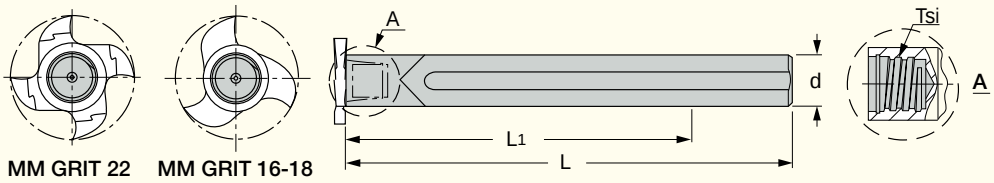


Designation	Tsi	d	D_2	L	Coolant	Kg
MM TS-A-L070-C08-T05	T05	8.00	8.00	70.00	N	0.03
MM TS-A-L080-C10-T06	T06	10.00	10.00	80.00	N	0.07
MM TS-A-L080-C10-T06-H	T06	10.00	10.00	80.00	Y	0.04
MM TS-A-L090-C12-T08	T08	12.00	12.00	90.00	N	0.12
MM TS-A-L090-C12-T08-H	T08	12.00	12.00	90.00	Y	0.08
MM TS-A-L100-C16-T10	T10	16.00	16.00	100.00	N	0.17
MM TS-A-L100-C16-T10-H	T10	16.00	16.00	100.00	Y	0.14

• Do not apply lubricant to the threaded connection

MM GRT (shanks)

Solid Carbide Cylindrical Shanks for Slitting and Grooving Interchangeable Milling Heads



Designation	Tsi	d	L_1	L	Shank(1)	Coolant
MM GRT-095-T06	T06	9.50	64.0	80.00	C	N
MM GRT-100-T06	T06	10.00	64.0	100.00	C	N
MM GRT-120C-T08	T08	12.00	78.0	100.00	C	Y
MM GRT-127C-T08	T08	12.70	96.0	120.00	C	Y

• L1=Maximum overhang. Check machining depth limit of endmill head when it has a smaller diameter than the shank diameter.

(1) C-Cylindrical

Spare Parts

Designation	Clamping Key
MM GRT-095-T06	MM EGR 16-18
MM GRT-100-T06	MM EGR 16-18
MM GRT-120C-T08	MM EGR 20-22
MM GRT-127C-T08	MM EGR 20-22

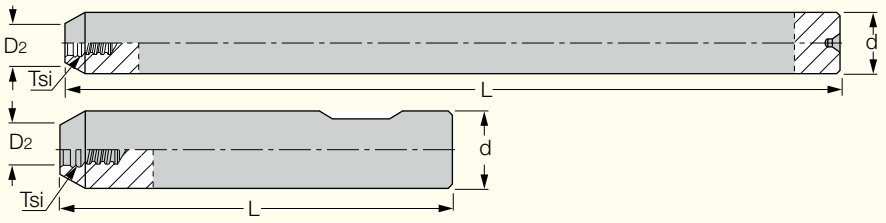
(1) C-Cylindrical

MM GRT... shanks serve mainly for MM GRIT... slitting heads. When mounting other types of milling heads, do not exceed maximum specified depth of cut for the particular milling head. Since the shank diameter is not relieved, it may touch a wall on the workpiece being machined.

Use carbide shanks for groove milling heads and for applications requiring high rigidity and precision. Each slitting shank is supplied with MM EGR clamping key. (page B2) Keys for other milling heads must be ordered separately.

MM S-A (Straight Shanks)

Shanks for Interchangeable Milling Heads



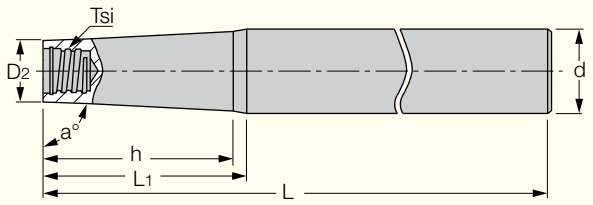
Designation	Tsi	d	D_2	Shank(2)	L	Shank m.	Kg
MM S-A-L055-W12-T05	T05	12.00	7.60	W	55.00	S	0.05
MM S-A-L065-W16-T06	T06	16.00	9.50	W	65.00	S	0.11
MM S-A-L065-W16-T08	T08	16.00	11.50	W	65.00	S	0.10
MM S-A-L070-W20-T10	T10	20.00	15.20	W	70.00	S	0.18
MM S-A-L075-W25-T12	T12	25.00	18.30	W	75.00	S	0.31
MM S-A-L100-W32-T15	T15	32.00	23.90	W	100.00	S	0.30
MM S-A-L150-C12-T05-B (1)	T05	12.00	7.60	C	150.00	S	0.12
MM S-A-L200-C16-T06-B (1)	T06	16.00	9.60	C	200.00	S	0.45
MM S-A-L250-C20-T08-B (1)	T08	20.00	11.50	C	250.00	S	0.60
MM S-A-L250-C25-T10-B (1)	T10	25.00	15.20	C	250.00	S	0.94

• Shank material (Shank m.) S-steel. • Do not apply lubricant to the threaded connection.

(1) "B" suffix - cylindrical shank which may be shortened. (2) C-Cylindrical, W-Weldon

MM S-B (85° Conical Shanks)

85° Conical Shanks for Interchangeable Milling Heads



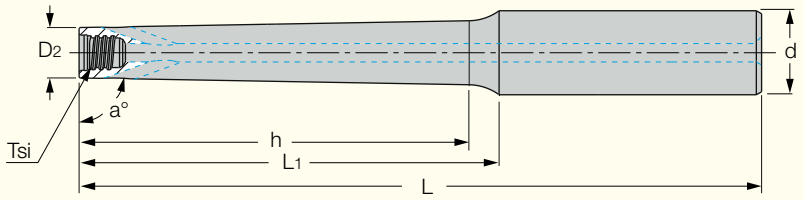
Designation	Tsi	a°	d	D_2	Shank(1)	h	L_1	L	Shank m.	Kg
MM S-B-L080-C12-T05	T05	85	12.00	7.60	C	-	25.0	80.00	S	0.06
MM S-B-L125-C16-T06	T06	85	16.00	9.60	C	31.50	34.0	125.00	S	0.26
MM S-B-L140-C20-T06-W	T06	85	20.00	9.60	C	-	60.0	140.00	W	0.63
MM S-B-L140-C16-T08	T08	85	16.00	11.50	C	19.20	22.0	140.00	S	0.22
MM S-B-L140-C20-T10	T10	85	20.00	15.20	C	-	27.5	140.00	S	0.34
MM S-B-L170-C25-T10	T10	85	25.00	15.20	C	-	56.0	170.00	S	0.16
MM S-B-L160-C25-T12	T12	85	25.00	18.30	C	-	40.0	160.00	S	0.11
MM S-B-L190-C32-T12	T12	85	32.00	18.30	C	-	80.0	190.00	S	0.56
MM S-B-L200-C32-T15	T15	85	32.00	23.90	C	-	50.0	200.00	S	0.30
MM S-B-L250-W40-T15	T15	85	40.00	23.90	W	-	100.0	250.00	S	2.05

• Shank material (Shank m.): S-steel, W-tungsten. • Do not apply lubricant to the threaded connection.

(1) C-Cylindrical, W-Weldon

MM S-D (89° Conical Shanks)

89° Conical Shanks for Interchangeable Milling Heads



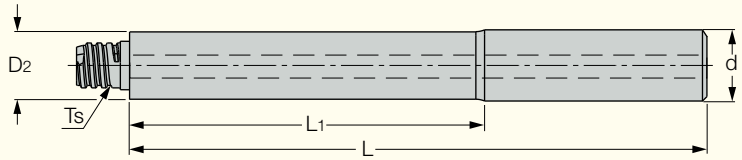
Designation	Tsi	a°	d	D2	h	L1	L	Shank m.	Coolant	Kg
MM S-D-L100-C12-T05	T05	89	12.00	7.60	29.50	35.0	100.00	S	N	0.15
MM S-D-L110-C12-T05-C	T05	89	12.00	7.60	54.70	60.0	110.00	C	N	0.13
MM S-D-L110-C12-T05-W-H	T05	89	12.00	7.60	55.70	60.0	110.00	W	Y	0.14
MM S-D-L130-C12-T05-C	T05	89	12.00	7.60	76.70	80.0	130.00	C	N	0.15
MM S-D-L130-C12-T05-W-H	T05	89	12.00	7.60	76.40	80.0	130.00	W	Y	0.16
MM S-D-L150-C16-T05-C	T05	89	16.00	7.60	90.10	100.0	150.00	C	N	0.02
MM S-D-L110-C12-T06-W-H	T06	89	12.00	9.60	58.80	60.0	110.00	W	Y	0.17
MM S-D-L130-C16-T06-W-H	T06	89	16.00	9.60	73.40	80.0	130.00	W	Y	0.29
MM S-D-L150-C16-T06-C	T06	89	16.00	9.60	94.10	100.0	150.00	C	N	0.11
MM S-D-L150-C16-T06-W-H	T06	89	16.00	9.60	93.80	100.0	150.00	W	Y	0.32
MM S-D-L160-C16-T06	T06	89	16.00	9.60	46.20	55.0	160.00	S	N	0.12
MM S-D-L170-C16-T06-C	T06	89	16.00	9.60	115.50	120.0	170.00	C	N	0.11
MM S-D-L170-C16-T06-W	T06	89	16.00	9.60	46.30	55.0	170.00	W	N	0.48
MM S-D-L130-C16-T08-C	T08	89	16.00	11.50	76.00	80.0	130.00	C	N	0.28
MM S-D-L130-C16-T08-W-H	T08	89	16.00	11.50	76.40	80.0	130.00	W	Y	0.32
MM S-D-L150-C16-T08-C	T08	89	16.00	11.50	96.40	100.0	150.00	C	N	0.11
MM S-D-L150-C16-T08-W-H	T08	89	16.00	11.50	96.70	100.0	150.00	W	Y	0.38
MM S-D-L170-C20-T08	T08	89	20.00	11.50	69.10	80.0	170.00	S	N	0.30
MM S-D-L170-C20-T08-C	T08	89	20.00	11.50	110.40	120.0	170.00	C	N	0.49
MM S-D-L170-C20-T08-W	T08	89	20.00	11.50	68.00	80.0	170.00	W	N	0.09
MM S-D-L170-C20-T08-W-H	T08	89	20.00	11.50	112.10	120.0	170.00	W	Y	0.53
MM S-D-L150-C20-T10-C	T10	89	20.00	15.20	96.10	120.0	150.00	C	N	0.08
MM S-D-L150-C20-T10-W-H	T10	89	20.00	15.20	96.80	100.0	150.00	W	Y	0.60
MM S-D-L170-C20-T10-C	T10	89	20.00	15.20	116.50	120.0	170.00	C	N	0.61
MM S-D-L170-C20-T10-W-H	T10	89	20.00	15.20	118.00	120.0	170.00	W	Y	0.73
MM S-D-L190-C20-T10	T10	89	20.00	15.20	72.30	80.0	190.00	S	N	0.20
MM S-D-L190-C20-T10-C	T10	89	20.00	15.20	-	140.0	190.00	C	N	0.67
MM S-D-L190-C20-T10-W-H	T10	89	20.00	15.20	-	140.0	190.00	W	Y	0.84
MM S-D-L210-C20-T10-C	T10	89	20.00	15.20	-	160.0	210.00	C	N	0.75
MM S-D-L210-C20-T10-W-H	T10	89	20.00	15.20	-	160.0	210.00	W	Y	0.93
MM S-D-L180-C25-T12-C	T12	89	25.00	18.30	114.20	120.0	180.00	C	N	0.91
MM S-D-L180-C25-T12-W-H	T12	89	25.00	18.30	114.60	120.0	180.00	W	Y	1.17
MM S-D-L200-C25-T12-W-H	T12	89	25.00	18.30	146.60	150.0	200.00	W	Y	1.36
MM S-D-L210-C25-T12	T12	89	25.00	18.30	93.40	100.0	210.00	S	N	0.66
MM S-D-L250-C25-T12-C	T12	89	25.00	18.30	135.60	140.0	250.00	C	N	1.40
MM S-D-L250-C25-160T12W-H	T12	89	25.00	18.30	157.20	160.0	250.00	W	Y	1.76
MM S-D-L250-C25-T12-W-H	T12	89	25.00	18.30	135.60	140.0	250.00	W	Y	1.80
MM S-D-L250-C32-T15	T15	89	32.00	23.90	90.10	100.0	250.00	S	N	1.35
MM S-D-L250-C32-T15-C	T15	89	32.00	23.90	143.30	150.0	250.00	C	N	2.30
MM S-D-L300-C32-T15-C	T15	89	32.00	23.90	195.70	200.0	300.00	C	N	1.20

• Shank material (Shank m.): S-steel, C-carbide, W-tungsten. • Do not apply lubricant to the threaded connection.

SHANKMASTER

TS S-A

Solid Carbide Cylindrial Shanks with Threaded Adaptation,
for Interchangeable Milling Heads



Designation	D_2	d	L_1	L	Ts	Shank(1)	Kg
TS S-A-L70-C12-T08-C	11.50	12.00	20.0	70.00	T08	C	0.25
TS S-A-L90-C12-T08-C	11.50	12.00	40.0	90.00	T08	C	0.17
TS S-A-L110-C12-T08-C	11.50	12.00	60.0	110.00	T08	C	0.07
TS S-A-L90-C16-T10-C	15.20	16.00	40.0	90.00	T10	C	0.25
TS S-A-L110-C16-T10-C	15.20	16.00	60.0	110.00	T10	C	0.33
TS S-A-L130-C16-T10-C	15.20	16.00	80.0	130.00	T10	C	0.41
TS S-A-L100-C20-T12-C	19.20	20.00	50.0	100.00	T12	C	0.50
TS S-A-L130-C20-T12-C	19.20	20.00	80.0	130.00	T12	C	0.67
TS S-A-L200-C20-T12-C	19.20	20.00	120.0	200.00	T12	C	0.97

(1) C-Cylindrical

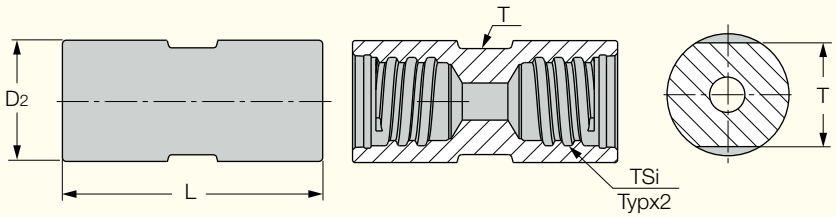
For adaptation see page B5.

SHANKMASTER • MULTI-MASTER

INDEXABLE SOLID CARBIDE LINE

TS CAB

Steel Adapters with Internal Thread on Both Sides,
for Connecting MULTI-MASTER Milling Heads



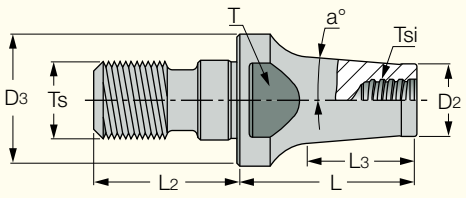
Designation	Tsi	L	D_2	T(1)	Kg
TS CAB T08T08-25/1.0-H	T08	25.00	11.50	10.0	0.02
TS CAB T10T10-35/1.4-H	T10	35.00	15.20	13.0	0.04
TS CAB T12T12-43/1.7-H	T12	43.00	18.30	16.0	0.08

(1) Clamping wrench size

For adaptation see page B5.

MM CAB

Adapters for Connecting FLEXFIT Shanks and MULTI-MASTER Milling Heads



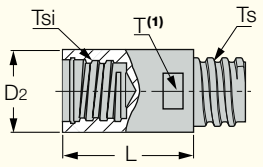
Designation	Tsi	Ts	L	L_3	D_2	D_3	L_2	T(1)	a°	Kg
MM CAB T06M06-16/.63	T06	M06	16.00	11.60	9.30	9.70	14.50	8.0	1.5	0.01
MM CAB T06M08-16/.63	T06	M08	16.00	13.70	9.60	13.00	17.50	11.0	6	0.02
MM CAB T06M08-25/1.0	T06	M08	25.00	11.30	9.30	13.00	17.50	11.0	1.5	0.02
MM CAB T06M10-25/1.0	T06	M10	25.00	16.60	9.60	18.00	20.00	11.0	5	0.04
MM CAB T08M08-16/.63	T08	M08	16.00	5.40	11.70	13.00	17.50	11.0	11.4	0.08
MM CAB T08M08-25/1.0	T08	M08	25.00	19.50	11.70	13.00	17.50	11.0	1.5	0.03
MM CAB T08M10-20/.75	T08	M10	20.00	11.30	11.70	18.00	20.00	13.0	7	0.03
MM CAB T08M10-25/1.0	T08	M10	25.00	14.20	11.70	18.00	20.00	11.0	1.5	0.03
MM CAB T08M12-20/.75	T08	M12	20.00	9.30	11.70	21.00	22.00	13.0	7	0.05
MM CAB T08M12-25/1.0	T08	M12	25.00	12.50	11.70	21.00	22.00	13.0	1.5	0.04

• Do not apply lubricant to the threaded connection. • For adaptation see page B5 (1) Clamping wrench size

MULTI-MASTER
INDEXABLE SOLID CARBIDE LINE

MM CAB-T-T

MULTI-MASTER Shank Extensions



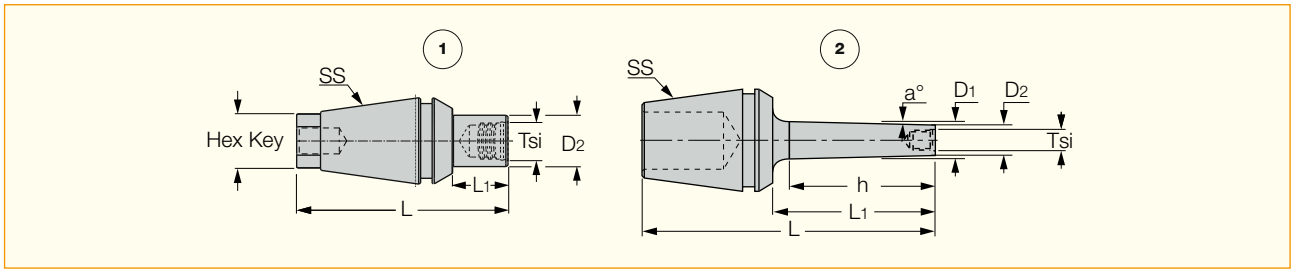
Designation	D_2	Ts	Tsi	L	T(1)	Kg
MM CAB T05T05-25/1.0-C	7.60	T05	T05	25.40	6.0	0.12
MM CAB T06T06-25/1.0-C	9.30	T06	T06	25.40	8.0	0.02
MM CAB T08T08-25/1.0-C	11.50	T08	T08	25.40	10.0	0.02
MM CAB T10T10-38/1.5-C	15.20	T10	T10	38.10	13.0	0.08
MM CAB T12T12-38/1.5-C	18.30	T12	T12	38.10	16.0	0.11
MM CAB T15T15-45/1.77-C	23.90	T15	T15	45.00	20.0	-

• Clamping key should be ordered separately. • For adaptation see page B5

(1) Clamping wrench size

MM S-ER

Shanks for MULTI-MASTER Solid Carbide Heads with ER Collet Adaptation



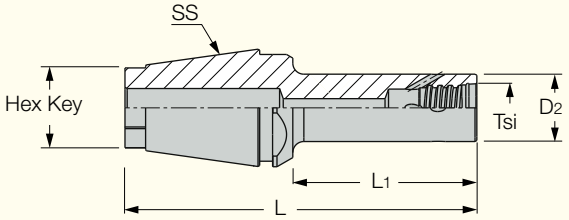
Designation	SS	Tsi	a°	D_2	D_1	h	L_1	L	Key(1)	Fig
MM S-A-H004-ER11-T05	ER11	T05	-	7.60	-	-	4.0	26.50	6.35	1
MM S-A-H10.5-ER11-T05	ER11	T05	-	7.60	-	-	10.5	33.00	6.35	1
MM S-A-H004-ER16-T05	ER16	T05	-	7.60	-	-	4.0	36.60	7.94	1
MM S-A-H004-ER16-T06	ER16	T06	-	9.00	-	-	4.0	36.60	7.94	1
MM S-A-H004-ER16-T08	ER16	T08	-	11.50	-	-	4.0	36.60	7.94	1
MM S-A-H10.5-ER16-T05	ER16	T05	-	7.60	-	-	10.5	43.10	7.94	1
MM S-A-H10.5-ER16-T06	ER16	T06	-	9.00	-	-	10.5	43.10	7.94	1
MM S-A-H013-ER16-T08	ER16	T08	-	11.50	-	-	13.0	45.60	7.94	1
MM S-A-H004-ER20-T05	ER20	T05	-	7.60	-	-	4.0	40.60	11.11	1
MM S-A-H004-ER20-T06	ER20	T06	-	9.00	-	-	4.0	40.60	11.11	1
MM S-A-H004-ER20-T08	ER20	T08	-	11.50	-	-	4.0	40.60	11.11	1
MM S-A-H004-ER20-T10	ER20	T10	-	15.20	-	-	4.0	40.60	11.11	1
MM S-A-H10.5-ER20-T05	ER20	T05	-	7.60	-	-	10.5	47.10	11.11	1
MM S-A-H10.5-ER20-T06	ER20	T06	-	9.00	-	-	10.5	47.10	11.11	1
MM S-A-H013-ER20-T08	ER20	T08	-	11.50	-	-	13.0	49.60	11.11	1
MM S-A-H016-ER20-T10	ER20	T10	-	15.20	-	-	16.0	52.60	11.11	1
MM S-A-H004-ER25-T05	ER25	T05	-	7.60	-	-	4.0	44.60	14.29	1
MM S-A-H004-ER25-T06	ER25	T06	-	9.00	-	-	4.0	44.60	14.29	1
MM S-A-H10.5-ER25-T06	ER25	T06	-	9.00	-	-	10.5	51.10	14.29	1
MM S-A-H004-ER25-T08	ER25	T08	-	11.50	-	-	4.0	44.60	14.29	1
MM S-A-H10.5-ER25-T08	ER25	T08	-	11.50	-	-	10.5	51.10	14.29	1
MM S-A-H004-ER25-T10	ER25	T10	-	15.20	-	-	4.0	44.60	14.29	1
MM S-A-H10.5-ER25-T10	ER25	T10	-	15.20	-	-	10.5	51.10	14.29	1
MM S-A-H004-ER25-T12	ER25	T12	-	18.30	-	-	4.0	44.60	14.29	1
MM S-A-H10.5-ER25-T12	ER25	T12	-	18.30	-	-	10.5	51.10	14.29	1
MM S-A-H025-ER32-T06	ER32	T06	-	9.60	10.0	18.00	25.0	65.00	-	2
MM S-B-H025-ER32-T06	ER32	T06	5	9.60	13.5	22.30	25.0	65.00	-	2
MM S-B-H050-ER32-T06	ER32	T06	5	9.60	17.9	47.30	50.0	90.00	-	2
MM S-B-H075-ER32-T06	ER32	T06	5	9.60	22.6	74.10	75.0	115.00	-	2
MM S-D-H050-ER32-T06	ER32	T06	1	9.60	11.2	45.00	50.0	90.00	-	2

• Do not apply lubricant to the threaded connection. • For adaptation see page B5.

(1) Inch size spanners (displayed in mm)

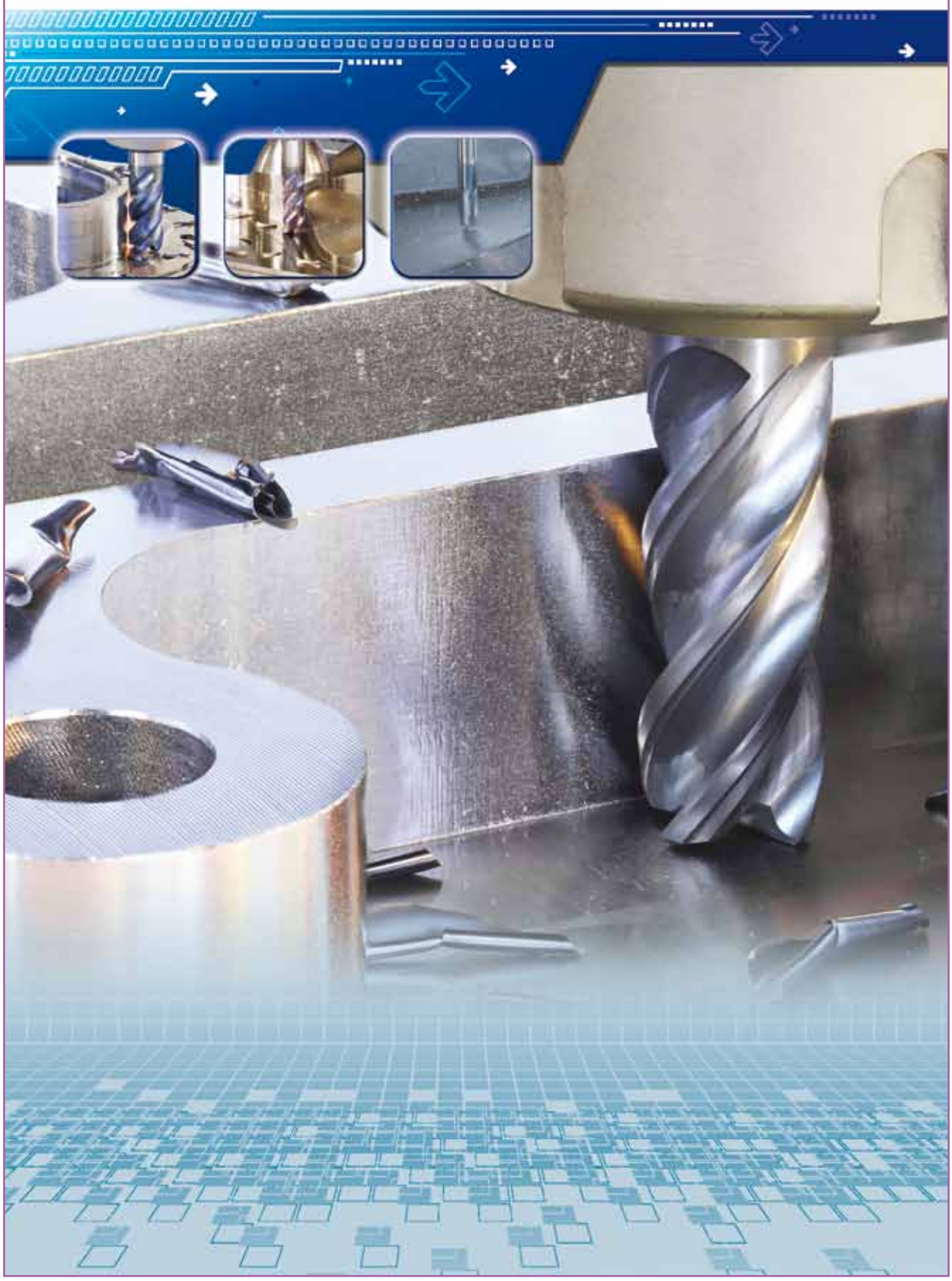
MM S-ER-H

Shanks for MULTI-MASTER Solid Carbide Heads with ER Collet Adaptation and Coolant Holes



Designation	SS	Tsi	D_2	L_1	L	Key(1)	Kg	Coolant
MM S-A-H025-ER32-T05-H	ER32	T05	7.62	25.0	69.60	19.05	0.21	Y
MM S-A-H040-ER32-T05-H	ER32	T05	7.62	40.0	85.60	19.05	0.21	Y
MM S-A-H025-ER32-T06-H	ER32	T06	9.00	25.0	69.60	19.05	0.59	Y
MM S-A-H040-ER32-T06-H	ER32	T06	9.00	40.0	85.60	19.05	0.22	Y
MM S-A-H025-ER32-T08-H	ER32	T08	11.50	25.0	69.60	19.05	0.20	Y
MM S-A-H050-ER32-T08-H	ER32	T08	11.50	50.0	94.60	19.05	0.20	Y
MM S-A-H025-ER32-T10-H	ER32	T10	15.20	25.0	69.60	19.05	0.20	Y
MM S-A-H050-ER32-T10-H	ER32	T10	15.20	50.0	94.60	19.05	0.25	Y
MM S-A-H025-ER32-T12-H	ER32	T12	18.30	25.0	69.60	19.05	0.22	Y
MM S-A-H050-ER32-T12-H	ER32	T12	18.30	50.0	94.60	19.05	0.22	Y
MM S-A-H025-ER32-T15-H	ER32	T15	23.90	25.0	69.60	19.05	0.20	Y
MM S-A-H050-ER32-T15-H	ER32	T15	23.90	50.0	94.60	19.05	0.29	Y

SOLID ENDMILLS



Member IMC Group

Table of Contents

(1) **Provides high surface finish in roughing machining conditions**
(2) **MULTI-MASTER interchangeable milling heads**

Table of Contents

(2) **MULTI-MASTER interchangeable milling heads**

Table of Contents

Table of Contents

(2) **MULTI-MASTER interchangeable milling heads**

Table of Contents

(2) **MULTI-MASTER interchangeable milling heads**

Identification System

Solid Carbide Endmills

1	2	3	4	5		6	7	8	9	10	11	12	13
E	C	-	B	4		8	-	20	/30	W	8	R1.0	-	72

1	2	3	6	4	7		5	9	10	11	12	13
E	C	C	080	B	20	-	3	C	08	R1.0	-	72

1 Solid Carbide Endmill Code

2 Endmill Type
- C - Square Endmill
- T - Tapered
- B - Ball Nose
- SB- Sphere
- FS - FINISHRED
- CP - Chip Splitter
- R/RF/RC/CR - Rougher
- FF - FEEDMILL

3 Design (Optional)
- - =new description
- A - Aluminum
- C - Chamfer
- H - Finish
- S - Short
- L - Long
- XL - Extra Long
- U - Undersized
- T - Tapered
- CS- Chamfer+Short

4 Helix Angle
- T - 20°
- A - 30°
- E - 38°
- B - 45°
- D - 50°
- F - 55°
- S - Straight
- H - Different Helix

5 No. of Flutes
- 2 - 2 Flutes
- 3 - 3 Flutes
- 4 - 4 Flutes
- 5 - 5 Flutes
- 6 - 6 Flutes
- 7 - 7 Flutes

6 Cutting Diameter (mm)

7 Effective Cutting Length
20=20 mm

8 Length of Neck/Angle Neck
30=30 mm
1.5°=1° 30'

9 Shank Type
- C - Cylindrical
- W - Weldon

10 Shank Diameter

11 R=Corner Radius
CF=Chatter Free
S=Sharp Corner

12 Workpiece Material
-General
- * T = High Temp Alloys
- * S = Stainless Steel
- L - Steel Low Hardness = <45 HRc
- M - Steel Medium Hardness = <55 HRc
- H - Steel High Hardness = >55 HRc
- * A = Aluminum

13 Overall Length
72=72 mm

* For special tools

Tolerances

Diameter Range	Cutting Diameter øD to e8	Shank ød to h6
<3	-0.014 to 0.028	0 to -0.007
3-6	-0.020 to 0.038	0 to -0.008
6-10	-0.025 to 0.047	0 to -0.009
10-18	-0.032 to 0.059	0 to -0.011
18-30	-0.040 to 0.073	0 to -0.013

ISCAR Premium PVD Coated Grades

ISCAR has achieved remarkable gains in metal removal rates and tool life with solid carbide endmills with a PVD coating, on a very tough submicron substrate. These new materials provide high toughness and resistance to micro-cracks and chipping.

- TiCN on a submicron substrate = IC300
- TiAlN on a submicron substrate = IC900
- TiAlN on ultra-fine grain substrate = IC903

IC300

- Low surface friction gives excellent chip flow, eliminates built-up edge and micro-cracks, reduces cutting forces, and ensures a quality surface.
- Surface hardness 3000 HV with high toughness adds to wear resistance and higher speeds.
- High productivity, especially on steel, hardened steel and stainless steel and for unfavorable conditions.

IC900

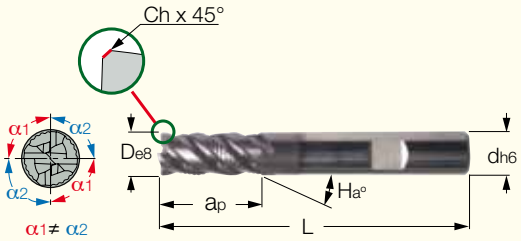
- High thermal and chemical stability.
- High hardness 3500 HV makes higher speeds, machining of harder materials, and dry machining possible. The TiAlN coating can be applied at 800ºC.
- Recommended for hardened steel, high-temperature and steel alloys.
- Improves and expedites finishing on dies and molds.
- Longer tool life in high speed machining.

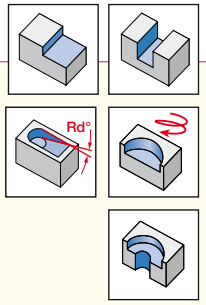
IC903

- Excellent for machining hard steel up to 70 HRc and high temperature alloys.
- The small grain size improves cutting edge strength and tends to chip less.

EFS-E44

Combination of Roughing and Finishing Solid Carbide Endmill
with Variable Pitch for Chatter Free Milling





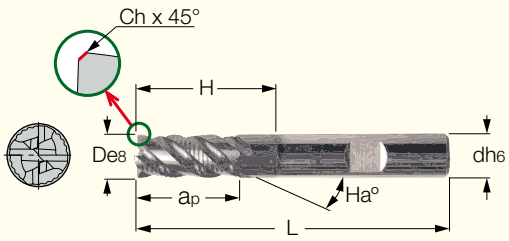
Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank[1]	Ch	IC900	Recommended Machining Data fz (mm/t)
EFS-E44 06-14C06CF57	6.00	6.00	14.00	57.00	4	38.0	5.0	C	0.25	●	0.03-0.06
EFS-E44 06-14W06CF57	6.00	6.00	14.00	57.00	4	38.0	5.0	W	0.25	●	0.03-0.06
EFS-E44 08-18C08CF63	8.00	8.00	18.00	63.00	4	38.0	5.0	C	0.30	●	0.03-0.08
EFS-E44 08-18W08CF63	8.00	8.00	18.00	63.00	4	38.0	5.0	W	0.30	●	0.03-0.08
EFS-E44 10-22C10CF72	10.00	10.00	22.00	72.00	4	38.0	5.0	C	0.40	●	0.03-0.09
EFS-E44 10-22W10CF72	10.00	10.00	22.00	72.00	4	38.0	5.0	W	0.40	●	0.03-0.09
EFS-E44 12-26C12CF83	12.00	12.00	26.00	83.00	4	38.0	5.0	C	0.50	●	0.04-0.10
EFS-E44 12-26W12CF83	12.00	12.00	26.00	83.00	4	38.0	5.0	W	0.50	●	0.04-0.10
EFS-E44 14-30C14CF83	14.00	14.00	30.00	83.00	4	38.0	5.0	C	0.50	●	0.04-0.11
EFS-E44 14-30W14CF83	14.00	14.00	30.00	83.00	4	38.0	5.0	W	0.50	●	0.04-0.11
EFS-E44 16-34C16CF92	16.00	16.00	34.00	92.00	4	38.0	5.0	C	0.60	●	0.05-0.11
EFS-E44 16-34W16CF92	16.00	16.00	34.00	92.00	4	38.0	5.0	W	0.60	●	0.05-0.11
EFS-E44 20-42C20CF104	20.00	20.00	42.00	104.00	4	38.0	5.0	C	0.60	●	0.05-0.11
EFS-E44 20-42W20CF104	20.00	20.00	42.00	104.00	4	38.0	5.0	W	0.60	●	0.05-0.11
EFS-E44 25-52C25CF121	25.00	25.00	52.00	121.00	4	38.0	5.0	C	0.60	●	0.06-0.11
EFS-E44 25-52W25CF121	25.00	25.00	52.00	121.00	4	38.0	5.0	W	0.60	●	0.06-0.11

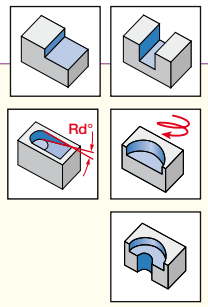
• For user guide, see pages C72-84

[1] C-Cylindrical, W-Weldon

EFS-B44

Combination of Roughing and Finishing Solid Carbide Endmill in a Single Tool





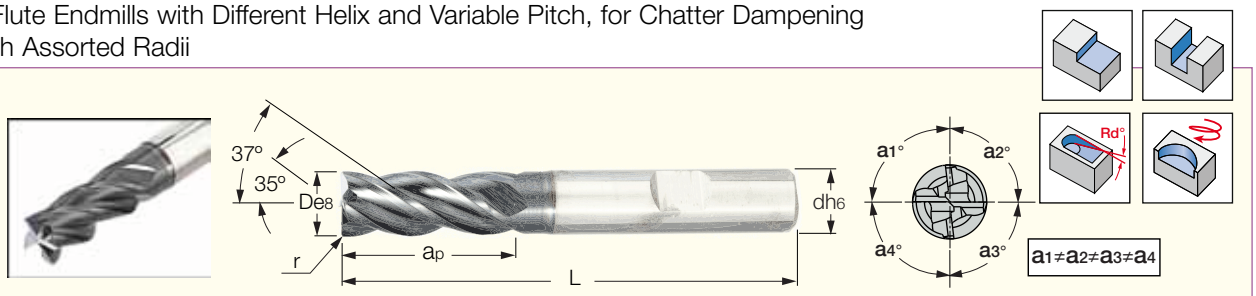
Designation	Dimensions D	d	a_p	H	L	Flute	H_a°	R_d°	Shank(1)	Ch	Tough ↔ Hard IC300	IC900	Recommended Machining Data fz (mm/t)
EFS-B44 06-14/20C06-57	6.00	6.00	14.00	20.00	57.00	4	45.0	5.0	C	0.25		●	0.03-0.06
EFS-B44 06-14/20W06-57	6.00	6.00	14.00	20.00	57.00	4	45.0	5.0	W	0.25		●	0.03-0.06
EFS-B44 06-14C06-57	6.00	6.00	14.00	-	57.00	4	45.0	5.0	C	0.25	●	●	0.03-0.06
EFS-B44 06-14W06-57	6.00	6.00	14.00	-	57.00	4	45.0	5.0	W	0.25	●	●	0.03-0.06
EFS-B44 08-18/26C08-63	8.00	8.00	18.00	26.00	63.00	4	45.0	5.0	C	0.30		●	0.03-0.08
EFS-B44 08-18/26W08-63	8.00	8.00	18.00	26.00	63.00	4	45.0	5.0	W	0.30		●	0.03-0.08
EFS-B44 08-18C08-63	8.00	8.00	18.00	-	63.00	4	45.0	5.0	C	0.30	●	●	0.03-0.08
EFS-B44 08-18W08-63	8.00	8.00	18.00	-	63.00	4	45.0	5.0	W	0.30	●	●	0.03-0.08
EFS-B44 10-22/32C10-72	10.00	10.00	22.00	32.00	72.00	4	45.0	5.0	C	0.30		●	0.03-0.09
EFS-B44 10-22/32W10-72	10.00	10.00	22.00	32.00	72.00	4	45.0	5.0	W	0.30		●	0.03-0.09
EFS-B44 10-22C10-72	10.00	10.00	22.00	-	72.00	4	45.0	5.0	C	0.30	●	●	0.03-0.09
EFS-B44 10-22W10-72	10.00	10.00	22.00	-	72.00	4	45.0	5.0	W	0.30	●	●	0.03-0.09
EFS-B44 12-26/38C12-83	12.00	12.00	26.00	38.00	83.00	4	45.0	5.0	C	0.40		●	0.04-0.10
EFS-B44 12-26/38W12-83	12.00	12.00	26.00	38.00	83.00	4	45.0	5.0	W	0.40		●	0.04-0.10
EFS-B44 12-26C12-83	12.00	12.00	26.00	-	83.00	4	45.0	5.0	C	0.40		●	0.04-0.10
EFS-B44 12-26W12-83	12.00	12.00	26.00	-	83.00	4	45.0	5.0	W	0.40	●	●	0.04-0.10
EFS-B44 14-30C14-83	14.00	14.00	30.00	-	83.00	4	45.0	5.0	C	0.40	●	●	0.04-0.11
EFS-B44 14-30W14-83	14.00	14.00	30.00	-	83.00	4	45.0	5.0	W	0.40	●	●	0.04-0.11
EFS-B44 16-34/50C16-100	16.00	16.00	34.00	50.00	100.00	4	45.0	5.0	C	0.60		●	0.05-0.11
[illegible]													
EFS-B44 16-34C16-92	16.00	16.00	34.00	-	92.00	4	45.0	5.0	C	0.60	●	●	0.05-0.11
[illegible]													
EFS-B44 20-42/62C20-125	20.00	20.00	42.00	62.00	125.00	4	45.0	5.0	C	0.60		●	0.05-0.11
EFS-B44 20-42/62W20-125	20.00	20.00	42.00	62.00	125.00	4	45.0	5.0	W	0.60		●	0.05-0.11
EFS-B44 20-42C20-104	20.00	20.00	42.00	-	104.00	4	45.0	5.0	C	0.60	●	●	0.05-0.11
EFS-B44 20-42W20-104	20.00	20.00	42.00	-	104.00	4	45.0	5.0	W	0.60	●	●	0.05-0.11
EFS-B44 25-52C25-121	25.00	25.00	52.00	-	121.00	4	45.0	5.0	C	0.60	●	●	0.06-0.11
EFS-B44 25-52W25-121	25.00	25.00	52.00	-	121.00	4	45.0	5.0	W	0.60	●	●	0.06-0.11

• IC300 should be mainly used for machining exotic materials • For user guide, see pages C72-84

(1) C-Cylindrical, W-Weldon

EC-H4M-CFR

4 Flute Endmills with Different Helix and Variable Pitch, for Chatter Dampening with Assorted Radii



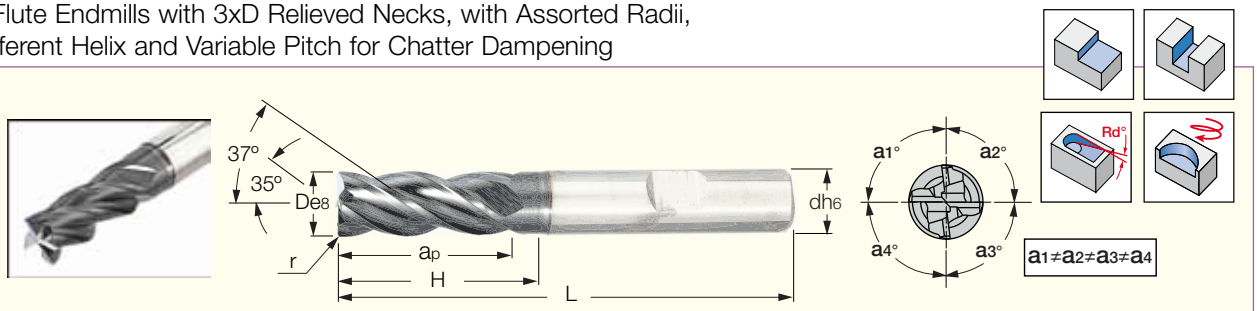
Designation	Dimensions D	d	ap	L	Flute	r	Rd°	Shank(1)	IC900	Recommended Machining Data fz (mm/t)
EC-H4M 06-12C06CFR0.2-57	6.00	6.00	12.00	57.00	4	0.20	5.0	C	●	0.03-0.06
EC-H4M 06-12W06CFR0.2-57	6.00	6.00	12.00	57.00	4	0.20	5.0	W	●	0.03-0.06
EC-H4M 08-16C08CFR0.4-63	8.00	8.00	16.00	63.00	4	0.40	5.0	C	●	0.03-0.08
EC-H4M 08-16W08CFR0.4-63	8.00	8.00	16.00	63.00	4	0.40	5.0	W	●	0.03-0.08
EC-H4M 10-20C10CFR0.5-72	10.00	10.00	20.00	72.00	4	0.50	5.0	C	●	0.03-0.09
EC-H4M 10-20W10CFR0.5-72	10.00	10.00	20.00	72.00	4	0.50	5.0	W	●	0.03-0.09
EC-H4M 12-24C12CFR0.6-83	12.00	12.00	24.00	83.00	4	0.60	5.0	C	●	0.04-0.10
EC-H4M 12-24W12CFR0.6-83	12.00	12.00	24.00	83.00	4	0.60	5.0	W	●	0.04-0.10
EC-H4M 14-28C14CFR0.7-83	14.00	14.00	28.00	83.00	4	0.70	5.0	C	●	0.04-0.11
EC-H4M 14-28W14CFR0.7-83	14.00	14.00	28.00	83.00	4	0.70	5.0	W	●	0.04-0.11
EC-H4M 16-32C16CFR0.8-92	16.00	16.00	32.00	92.00	4	0.80	5.0	C	●	0.05-0.11
EC-H4M 16-32W16CFR0.8-92	16.00	16.00	32.00	92.00	4	0.80	5.0	W	●	0.05-0.11
EC-H4M 20-40C20CFR1.0-104	20.00	20.00	40.00	104.00	4	1.00	5.0	C	●	0.05-0.11
EC-H4M 20-40W20CFR1.0-104	20.00	20.00	40.00	104.00	4	1.00	5.0	W	●	0.05-0.11
EC-H4M 25-50C25CFR1.2-121	25.00	25.00	50.00	121.00	4	1.20	5.0	C	●	0.06-0.11
EC-H4M 25-50W25CFR1.2-121	25.00	25.00	50.00	121.00	4	1.20	5.0	W	●	0.06-0.11

• For user guide, see pages C14,C72-83

(1) C-Cylindrical, W-Weldon

EC-H4L-CFR (Relieved neck)

4 Flute Endmills with 3xD Relieved Necks, with Assorted Radii, Different Helix and Variable Pitch for Chatter Dampening



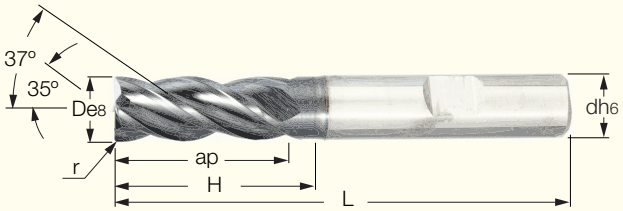
Designation	Dimensions D	d	ap	H	L	Flute	r	Rd°	Shank(1)	IC900	Recommended Machining Data fz (mm/t)
EC-H4L 06-12/20C6CFR.2-57	6.00	6.00	12.00	20.00	57.00	4	0.20	5.0	C	●	0.03-0.06
EC-H4L 06-12/20W6CFR.2-57	6.00	6.00	12.00	20.00	57.00	4	0.20	5.0	W	●	0.03-0.06
EC-H4L 08-16/26C8CFR.4-63	8.00	8.00	16.00	26.00	63.00	4	0.40	5.0	C	●	0.03-0.08
EC-H4L 08-16/26W8CFR.4-63	8.00	8.00	16.00	26.00	63.00	4	0.40	5.0	W	●	0.03-0.08
EC-H4L 10-20/32C10CFR.5	10.00	10.00	20.00	32.00	72.00	4	0.50	5.0	C	●	0.03-0.09
EC-H4L 10-20/32W10CFR.5	10.00	10.00	20.00	32.00	72.00	4	0.50	5.0	W	●	0.03-0.09
EC-H4L 12-24/38C12CFR.6	12.00	12.00	24.00	38.00	83.00	4	0.60	5.0	C	●	0.04-0.10
EC-H4L 12-24/38W12CFR.6	12.00	12.00	24.00	38.00	83.00	4	0.60	5.0	W	●	0.04-0.10
EC-H4L 16-32/50C16CFR.8	16.00	16.00	32.00	50.00	100.00	4	0.80	5.0	C	●	0.05-0.11
EC-H4L 16-32/50W16CFR.8	16.00	16.00	32.00	50.00	100.00	4	0.80	5.0	W	●	0.05-0.11
EC-H4L 20-40/60C20CFR1.0	20.00	20.00	40.00	60.00	110.00	4	1.00	5.0	C	●	0.05-0.11
EC-H4L 20-40/60W20CFR1.0	20.00	20.00	40.00	60.00	110.00	4	1.00	5.0	W	●	0.05-0.11

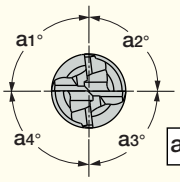
• For user guide, see pages C14,C72-83

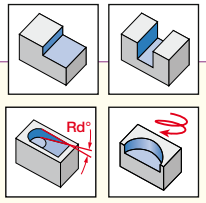
(1) C-Cylindrical, W-Weldon

EC-H4XL-CFR (Relieved neck)

4 Flute Endmills with 4xD Relieved Necks, with Assorted Radii,
Different Helix and Variable Pitch for Chatter Dampening







$a_1 \neq a_2 \neq a_3 \neq a_4$

Designation	Dimensions D	d	a_p	H	L	Flute	r	R_d°	Shank[1]	IC900	Recommended Machining Data fz (mm/t)
EC-H4XL 06-12/25C06CFR.2	6.00	6.00	12.00	25.00	61.00	4	0.20	5.0	C	●	0.03-0.06
EC-H4XL 06-12/25W06CFR.2	6.00	6.00	12.00	25.00	61.00	4	0.20	5.0	W	●	0.03-0.06
EC-H4XL 08-16/32C08CFR.4	8.00	8.00	16.00	32.00	68.00	4	0.40	5.0	C	●	0.03-0.08
EC-H4XL 08-16/32W08CFR.4	8.00	8.00	16.00	32.00	68.00	4	0.40	5.0	W	●	0.03-0.08
EC-H4XL 10-20/40C10CFR.5	10.00	10.00	20.00	40.00	80.00	4	0.50	5.0	C	●	0.03-0.09
EC-H4XL 10-20/40W10CFR.5	10.00	10.00	20.00	40.00	80.00	4	0.50	5.0	W	●	0.03-0.09
EC-H4XL 12-24/50C12CFR.6	12.00	12.00	24.00	50.00	95.00	4	0.60	5.0	C	●	0.04-0.10
EC-H4XL 12-24/50W12CFR.6	12.00	12.00	24.00	50.00	95.00	4	0.60	5.0	W	●	0.04-0.10
EC-H4XL 16-32/64C16CFR.8	16.00	16.00	32.00	64.00	115.00	4	0.80	5.0	C	●	0.05-0.11
EC-H4XL 16-32/64W16CFR.8	16.00	16.00	32.00	64.00	115.00	4	0.80	5.0	W	●	0.05-0.11
EC-H4XL 20-40/75C20CFR1.0	20.00	20.00	40.00	75.00	125.00	4	1.00	5.0	C	●	0.05-0.11
EC-H4XL 20-40/75W20CFR1.0	20.00	20.00	40.00	75.00	125.00	4	1.00	5.0	W	●	0.05-0.11

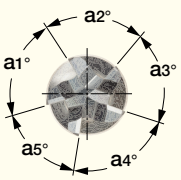
• For user guide, see pages C14,C72-83 .

[1] C-Cylindrical, W-Weldon

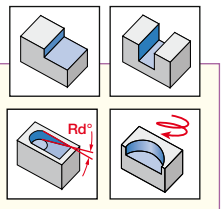
CHATTERFREE
SOLID MILL LINE

EC-H5M-CFR

5 Flute Endmills with Different Helix (36 - 38°) and Variable Pitch for Chatter Dampening with Assorted Radii



$a_1 \neq a_2 \neq a_3 \neq a_4 \neq a_5$



Designation	Dimensions D	d	a_p	L	Flute	r	R_d°	Shank(1)	IC900	Recommended Machining Data fz (mm/t)
EC-H5M 04-09C06CFR0.2-57	4.00	6.00	9.00	57.00	5	0.20	5.0	C	●	0.02-0.04
EC-H5M 05-11C06CFR0.2-57	5.00	6.00	11.00	57.00	5	0.20	5.0	C	●	0.02-0.04
EC-H5M 06-13C06CFR0.2-57	6.00	6.00	13.00	57.00	5	0.20	5.0	C	●	0.03-0.07
EC-H5M 06-13W06CFR0.2-57	6.00	6.00	13.00	57.00	5	0.20	5.0	W	●	0.03-0.07
EC-H5M 08-19C08CFR0.4-63	8.00	8.00	19.00	63.00	5	0.40	5.0	C	●	0.03-0.09
EC-H5M 08-19W08CFR0.4-63	8.00	8.00	19.00	63.00	5	0.40	5.0	W	●	0.03-0.09
EC-H5M 10-22C10CFR0.5-72	10.00	10.00	22.00	72.00	5	0.50	5.0	C	●	0.03-0.10
EC-H5M 10-22W10CFR0.5-72	10.00	10.00	22.00	72.00	5	0.50	5.0	W	●	0.03-0.10
EC-H5M 12-26C12CFR0.6-83	12.00	12.00	26.00	83.00	5	0.60	5.0	C	●	0.04-0.11
EC-H5M 12-26W12CFR0.6-83	12.00	12.00	26.00	83.00	5	0.60	5.0	W	●	0.04-0.11
EC-H5M 16-32C16CFR0.8-92	16.00	16.00	32.00	92.00	5	0.80	5.0	C	●	0.05-0.13
EC-H5M 16-32W16CFR0.8-92	16.00	16.00	32.00	92.00	5	0.80	5.0	W	●	0.05-0.13
EC-H5M 20-38C20CFR1-104	20.00	20.00	38.00	104.00	5	1.00	5.0	C	●	0.05-0.17
EC-H5M 20-38W20CFR1-104	20.00	20.00	38.00	104.00	5	1.00	5.0	W	●	0.05-0.17

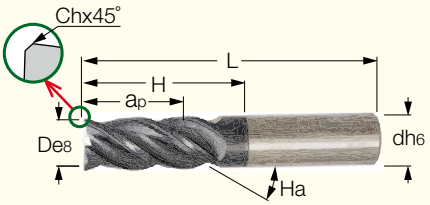
• For user guide, see pages C14,C72-83 .

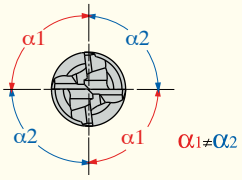
(1) C-Cylindrical, W-Weldon

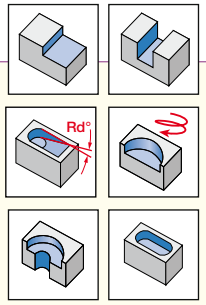
CHATTERFREE
SOLID MILL LINE

EC-E4L-CF

4 Flute Endmills, 38° Helix, Variable Pitch for Chatter Dampening
with 3xD Relieved Necks







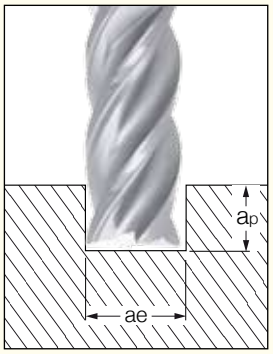
Designation	Dimensions										Tough ↔ Hard		Recommended Machining Data
	D	d	a_p	H	L	Flute	H_a°	R_d°	Shank[1]	Ch	IC300	IC900	fz (mm/t)
EC-E4L 03-8/11C06CF57	3.00	6.00	8.00	11.00	57.00	4	38.0	5.0	C	0.10	●	●	0.02-0.05
EC-E4L 04-10/14C06CF57	4.00	6.00	10.00	14.00	57.00	4	38.0	5.0	C	0.15	●	●	0.02-0.05
EC-E4L 05-12/17C06CF57	5.00	6.00	12.00	17.00	57.00	4	38.0	5.0	C	0.18	●	●	0.02-0.06
EC-E4L 06-14/20C06CF57	6.00	6.00	14.00	20.00	57.00	4	38.0	5.0	C	0.25	●	●	0.03-0.07
EC-E4L 06-14/20W06CF57	6.00	6.00	14.00	20.00	57.00	4	38.0	5.0	W	0.25	●	●	0.03-0.07
EC-E4L 08-18/26C08CFS63	8.00	8.00	18.00	26.00	63.00	4	38.0	5.0	C	0		●	0.03-0.08
EC-E4L 08-18/26C08CF63	8.00	8.00	18.00	26.00	63.00	4	38.0	5.0	C	0.30	●	●	0.03-0.09
EC-E4L 08-18/26W08CF63	8.00	8.00	18.00	26.00	63.00	4	38.0	5.0	W	0.30	●	●	0.03-0.09
EC-E4L 10-22/32C10CFS72	10.00	10.00	22.00	32.00	72.00	4	38.0	5.0	C	0		●	0.03-0.09
EC-E4L 10-22/32C10CF72	10.00	10.00	22.00	32.00	72.00	4	38.0	5.0	C	0.40	●	●	0.03-0.10
EC-E4L 10-22/32W10CF72	10.00	10.00	22.00	32.00	72.00	4	38.0	5.0	W	0.40		●	0.03-0.10
EC-E4L 10-22/32W10CF72 30	10.00	10.00	22.00	32.00	72.00	4	38.0	5.0	W	0.40	●		0.03-0.10
EC-E4L 12-26/38C12CFS83	12.00	12.00	26.00	38.00	83.00	4	38.0	5.0	C	0		●	0.04-0.10
EC-E4L 12-26/38C12CF83	12.00	12.00	26.00	38.00	83.00	4	38.0	5.0	C	0.50	●	●	0.04-0.11
EC-E4L 12-26/38W12CF83	12.00	12.00	26.00	38.00	83.00	4	38.0	5.0	W	0.50	●	●	0.04-0.11
EC-E4L 16-34/50C16CF100	16.00	16.00	34.00	50.00	100.00	4	38.0	5.0	C	0.60	●	●	0.05-0.13
EC-E4L 16-34/50W16CF100	16.00	16.00	34.00	50.00	100.00	4	38.0	5.0	W	0.60	●	●	0.05-0.13
EC-E4L 20-42/60C20CF110	20.00	20.00	42.00	60.00	110.00	4	38.0	5.0	C	0.60	●	●	0.05-0.17
EC-E4L 20-42/60W20CF110	20.00	20.00	42.00	60.00	110.00	4	38.0	5.0	W	0.60	●	●	0.05-0.17
EC-E4L 25-50/65C25CF121	25.00	25.00	52.00	65.00	121.00	4	38.0	5.0	C	0.60		●	0.05-0.17
EC-E4L 25-50/65W25CF121	25.00	25.00	52.00	65.00	121.00	4	38.0	5.0	W	0.60		●	0.05-0.17

• IC300 should be mainly used for machining exotic materials • For user guide, see pages C14,C72-83

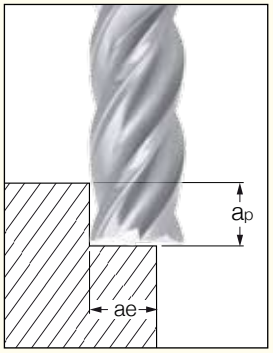
[1] C-Cylindrical, W-Weldon

Recommended Feed - CHATTERFREE Solid Carbide Endmills

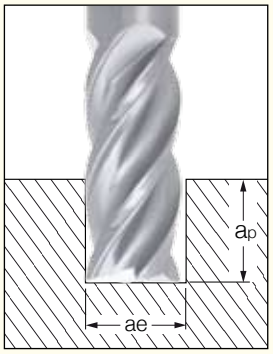
D mm	Slotting	ae=D ap=0.5-1XD
	Fz(min)	Fz(max)
6	0.025	0.06
8	0.03	0.08
10	0.03	0.09
12	0.035	0.1
16	0.05	0.12
20	0.05	0.15



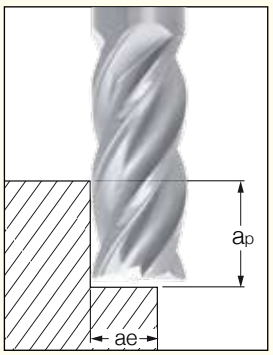
D mm	Side Milling	a_e=DX0.75/0.45 a_p=0.5-1 XD
	Fz(min)	Fz(max)
6	0.025	0.07
8	0.03	0.09
10	0.03	0.1
12	0.035	0.11
16	0.05	0.13
20	0.05	0.17



D mm	Slotting	a_e=D ap=1-2XD
	Fz(min)	Fz(max)
6	0.025	0.05
8	0.03	0.05
10	0.03	0.05
12	0.035	0.06
16	0.04	0.07
20	0.05	0.08



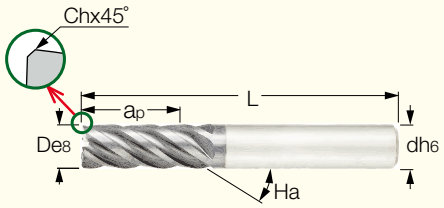
D mm	Side Milling	a_e=DX0.75/0.45 a_p=1-2 XD
	Fz(min)	Fz(max)
6	0.025	0.06
8	0.03	0.08
10	0.03	0.09
12	0.035	0.1
16	0.05	0.11
20	0.05	0.11

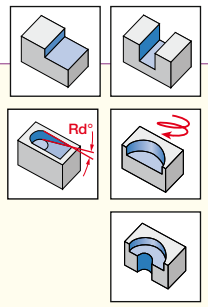


CHATTERFREE
SOLID MILL LINE

EC-E5L-CF

5 Flute Endmills, 38° Helix, Variable Pitch Medium Length (3xD)





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	Ch	IC900	Recommended Machining Data fz (mm/t)
EC-E5L 06-15C06CF57	6.00	6.00	15.00	57.00	5	38.0	5.0	C	0.20	●	0.03-0.07
EC-E5L 06-15W06CF57	6.00	6.00	15.00	57.00	5	38.0	5.0	W	0.20	●	0.03-0.07
EC-E5L 08-20C08CF63	8.00	8.00	20.00	63.00	5	38.0	5.0	C	0.25	●	0.03-0.09
EC-E5L 08-20W08CF63	8.00	8.00	20.00	63.00	5	38.0	5.0	W	0.25	●	0.03-0.09
EC-E5L 10-25C10CF72	10.00	10.00	25.00	72.00	5	38.0	5.0	C	0.30	●	0.03-0.10
EC-E5L 10-25W10CF72	10.00	10.00	25.00	72.00	5	38.0	5.0	W	0.30	●	0.03-0.10
EC-E5L 12-30C12CF83	12.00	12.00	30.00	83.00	5	38.0	5.0	C	0.40	●	0.04-0.11
EC-E5L 12-30W12CF83	12.00	12.00	30.00	83.00	5	38.0	5.0	W	0.40	●	0.04-0.11
EC-E5L 16-40C16CF100	16.00	16.00	40.00	100.00	5	38.0	5.0	C	0.50	●	0.05-0.13
EC-E5L 16-40W16CF100	16.00	16.00	40.00	100.00	5	38.0	5.0	W	0.50	●	0.05-0.13
EC-E5L 20-50C20CF125	20.00	20.00	50.00	125.00	5	38.0	5.0	C	0.50	●	0.05-0.17
EC-E5L 20-50W20CF125	20.00	20.00	50.00	125.00	5	38.0	5.0	W	0.50	●	0.05-0.17

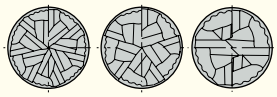
• For user guide, see pages C14,C72-83

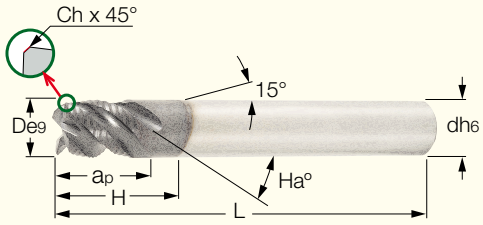
(1) C-Cylindrical, W-Weldon

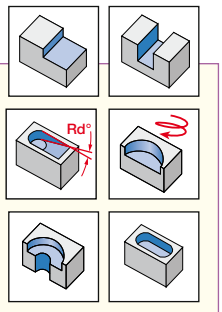
SOLIDSHRED

ECR-B-S

4-7 Flute, 45° Helix Short Length (1xD) Solid Carbide Roughing Endmills







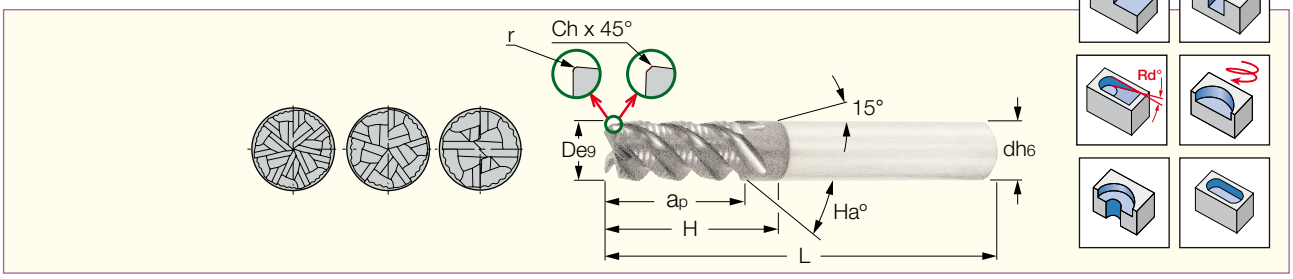
Designation	Dimensions D	d	a_p	H	L	Flute	H_a°	R_d°	Shank(1)	Ch	IC900	Recommended Machining Data fz (mm/t)
ECR-B4S 05-05C06-57	5.00	6.00	5.00	10.00	57.00	4	45.0	5.0	C	0.20	●	0.02-0.05
ECR-B4S 05-05W06-57	5.00	6.00	5.00	10.00	57.00	4	45.0	5.0	W	0.20	●	0.02-0.05
ECR-B4S 06-06C06-57	6.00	6.00	6.00	-	57.00	4	45.0	5.0	C	0.25	●	0.03-0.06
ECR-B4S 06-06W06-57	6.00	6.00	6.00	-	57.00	4	45.0	5.0	W	0.25	●	0.03-0.06
ECR-B4S 07-07C08-63	7.00	8.00	7.00	-	63.00	4	45.0	5.0	C	0.25	●	0.03-0.07
ECR-B4S 08-08C08-63	8.00	8.00	8.00	-	63.00	4	45.0	5.0	C	0.25	●	0.03-0.08
ECR-B4S 08-08W08-63	8.00	8.00	8.00	-	63.00	4	45.0	5.0	W	0.25	●	0.03-0.08
ECR-B4S 10-10C10-72	10.00	10.00	10.00	-	72.00	4	45.0	5.0	C	0.30	●	0.03-0.09
ECR-B4S 10-10W10-72	10.00	10.00	10.00	-	72.00	4	45.0	5.0	W	0.30	●	0.03-0.09
ECR-B4S 12-12C12-83	12.00	12.00	12.00	-	83.00	4	45.0	5.0	C	0.35	●	0.04-0.10
ECR-B4S 12-12W12-83	12.00	12.00	12.00	-	83.00	4	45.0	5.0	W	0.35	●	0.04-0.10
ECR-B5S 16-16C16-92	16.00	16.00	16.00	-	92.00	5	45.0	5.0	C	0.40	●	0.05-0.11
ECR-B5S 16-16W16-92	16.00	16.00	16.00	-	92.00	5	45.0	5.0	W	0.40	●	0.05-0.11
ECR-B7S 20-20C20-104	20.00	20.00	20.00	-	104.00	7	45.0	5.0	C	0.40	●	0.05-0.11
ECR-B7S 20-20W20-104	20.00	20.00	20.00	-	104.00	7	45.0	5.0	W	0.40	●	0.05-0.11

• First choice in roughing applications. •For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

ECR-B-M/ECR-B-M...R

4-7 Flute, 45° Helix Medium Length (2xD) Solid Carbide Roughing Endmills



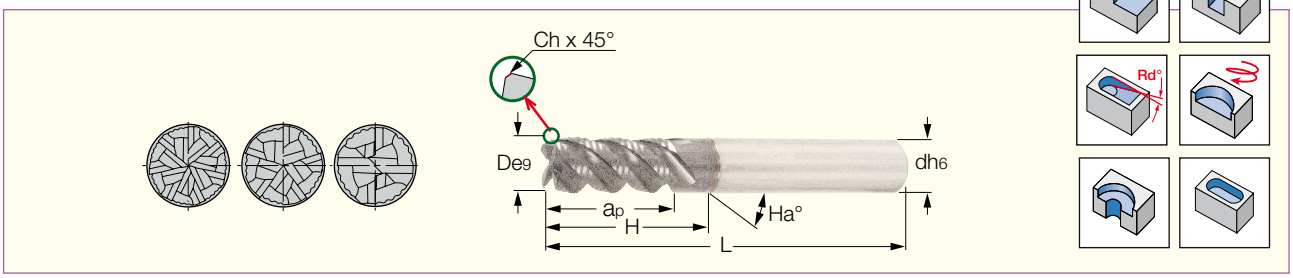
Designation	Dimensions											IC900	Recommended Machining Data
	D	d	a_p	H	L	Flute	H_a°	R_d°	Shank(1)	r	Ch		fz (mm/t)
ECR-B4M 05-10C06-57	5.00	6.00	10.00	15.00	57.00	4	45.0	5.0	C	-	0.20	●	0.02-0.05
ECR-B4M 05-10W06-57	5.00	6.00	10.00	15.00	57.00	4	45.0	5.0	W	-	0.20	●	0.02-0.05
ECR-B4M 06-12C06-57	6.00	6.00	12.00	-	57.00	4	45.0	5.0	C	-	0.25	●	0.03-0.06
ECR-B4M 06-12W06-57	6.00	6.00	12.00	-	57.00	4	45.0	5.0	W	-	0.25	●	0.03-0.06
ECR-B4M 08-16C08-63	8.00	8.00	16.00	-	63.00	4	45.0	5.0	C	-	0.25	●	0.03-0.08
ECR-B4M 08-16W08-63	8.00	8.00	16.00	-	63.00	4	45.0	5.0	W	-	0.25	●	0.03-0.08
ECR-B4M 10-20C10-72	10.00	10.00	20.00	-	72.00	4	45.0	5.0	C	-	0.30	●	0.03-0.09
ECR-B4M 10-20C10-72R1.0	10.00	10.00	20.00	-	72.00	4	45.0	5.0	C	1.00	-	●	0.03-0.09
ECR-B4M 10-20W10-72	10.00	10.00	20.00	-	72.00	4	45.0	5.0	W	-	0.30	●	0.03-0.09
ECR-B4M 10-20W10-72R1.0	10.00	10.00	20.00	-	72.00	4	45.0	5.0	W	1.00	-	●	0.03-0.09
ECR-B4M 12-24C12-83	12.00	12.00	24.00	-	83.00	4	45.0	5.0	C	-	0.35	●	0.04-0.10
ECR-B4M 12-24C12-83R1.2	12.00	12.00	24.00	-	83.00	4	45.0	5.0	C	1.20	-	●	0.04-0.10
ECR-B4M 12-24W12-83	12.00	12.00	24.00	-	83.00	4	45.0	5.0	W	-	0.35	●	0.04-0.10
ECR-B4M 12-24W12-83R1.2	12.00	12.00	24.00	-	83.00	4	45.0	5.0	W	1.20	-	●	0.04-0.10
ECR-B5M 16-32C16-92	16.00	16.00	32.00	-	92.00	5	45.0	5.0	C	-	0.40	●	0.05-0.11
ECR-B5M 16-32C16-92R1.6	16.00	16.00	32.00	-	92.00	5	45.0	5.0	C	1.60	-	●	0.05-0.11
ECR-B5M 16-32W16-92	16.00	16.00	32.00	-	92.00	5	45.0	5.0	W	-	0.40	●	0.05-0.11
ECR-B5M 16-32W16-92R1.6	16.00	16.00	32.00	-	92.00	5	45.0	5.0	W	1.60	-	●	0.05-0.11
ECR-B7M 20-40C20-104	20.00	20.00	40.00	-	104.00	7	45.0	5.0	C	-	0.40	●	0.05-0.11
ECR-B7M 20-40W20-104	20.00	20.00	40.00	-	104.00	7	45.0	5.0	W	-	0.40	●	0.05-0.11

• First choice in roughing applications. • For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

ECR-B-L

4-7 Flute, 45° Helix Solid Carbide Roughing Endmills with 3xD Relieved Necks



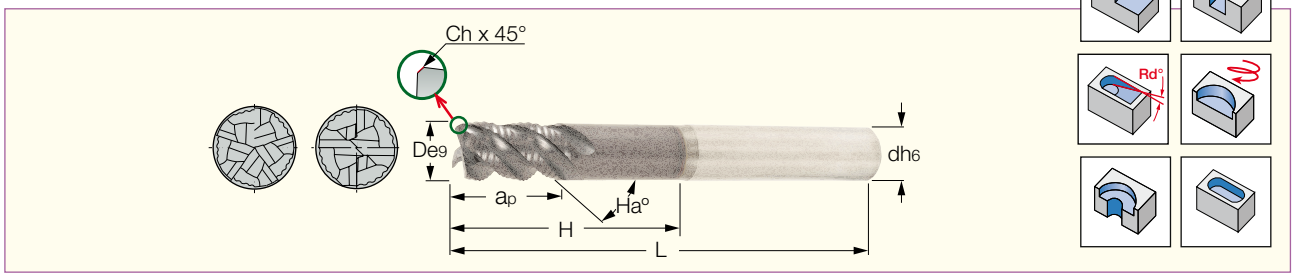
Designation	Dimensions D	d	ap	H	L	Flute	Ha°	Rd°	Shank(1)	Ch	Tough ↔ Hard IC300	IC900	Recommended Machining Data fz (mm/t)
ECR-B4L 06-12/18C06-57	6.00	6.00	12.00	18.00	57.00	4	45.0	5.0	C	0.25		●	0.03-0.06
ECR-B4L 06-12/18W06-57	6.00	6.00	12.00	18.00	57.00	4	45.0	5.0	W	0.25	●		0.03-0.06
ECR-B4L 06-12/18W06-57 90	6.00	6.00	12.00	18.00	57.00	4	45.0	5.0	W	0.25		●	0.03-0.06
ECR-B4L 08-16/24C08-63	8.00	8.00	16.00	24.00	63.00	4	45.0	5.0	C	0.25		●	0.03-0.08
ECR-B4L 08-16/24W08-63	8.00	8.00	16.00	24.00	63.00	4	45.0	5.0	W	0.25	●		0.03-0.08
ECR-B4L 08-16/24W08-63 90	8.00	8.00	16.00	24.00	63.00	4	45.0	5.0	W	0.25		●	0.03-0.08
ECR-B4L 10-20/30C10-72	10.00	10.00	20.00	30.00	72.00	4	45.0	5.0	C	0.30		●	0.03-0.09
ECR-B4L 10-20/30W10-72 30	10.00	10.00	20.00	30.00	72.00	4	45.0	5.0	W	0.30	●		0.03-0.09
ECR-B4L 10-20/30W10-72 90	10.00	10.00	20.00	30.00	72.00	4	45.0	5.0	W	0.30		●	0.03-0.09
ECR-B4L 12-24/36C12-83	12.00	12.00	24.00	36.00	83.00	4	45.0	5.0	C	0.35		●	0.04-0.10
ECR-B4L 12-24/36W12-83	12.00	12.00	24.00	36.00	83.00	4	45.0	5.0	W	0.35		●	0.04-0.10
ECR-B5L 16-32/48C16-100	16.00	16.00	32.00	48.00	100.00	5	45.0	5.0	C	0.40		●	0.05-0.11
ECR-B5L 16-32/48W16-100	16.00	16.00	32.00	48.00	100.00	5	45.0	5.0	W	0.40		●	0.05-0.11
ECR-B7L 20-40/60C20-110	20.00	20.00	40.00	60.00	110.00	7	45.0	5.0	C	0.40		●	0.05-0.11
ECR-B7L 20-40/60W20-110	20.00	20.00	40.00	60.00	110.00	7	45.0	5.0	W	0.40		●	0.05-0.11

• First choice in roughing applications. • For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

ECR-B-X

4-5 Flute, 45° Helix Solid Carbide Roughing Endmills with 4xD Relieved Necks



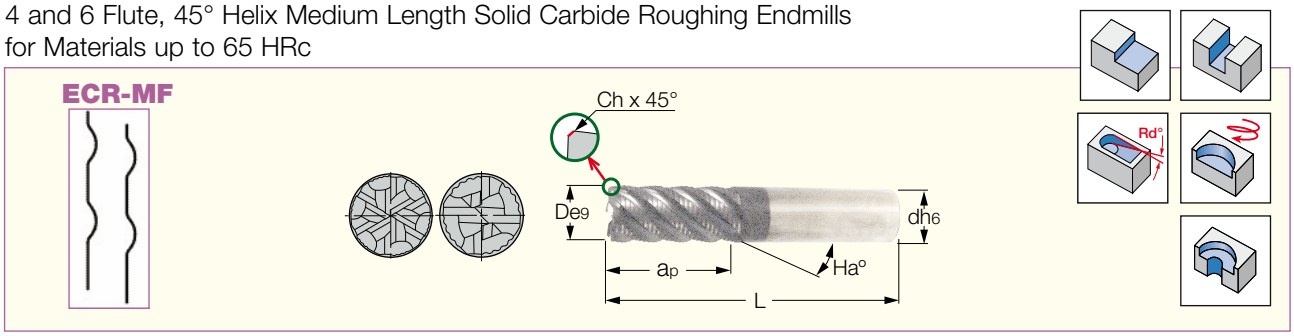
Designation	Dimensions D	d	ap	H	L	Flute	Ha°	Rd°	Shank(2)	Ch	IC900	Recommended Machining Data fz (mm/t)
ECR-B4X 08-12/32C08-68 (1)	8.00	8.00	12.00	32.00	68.00	4	45.0	5.0	C	0.25	●	0.03-0.08
ECR-B4X 08-12/32W08-68 (1)	8.00	8.00	12.00	32.00	68.00	4	45.0	5.0	W	0.25	●	0.03-0.08
ECR-B4X 10-15/40C10-80 90 (1)	10.00	10.00	15.00	40.00	80.00	4	45.0	5.0	C	0.30	●	0.03-0.09
ECR-B4X 10-15/40W10-80 90 (1)	10.00	10.00	15.00	40.00	80.00	4	45.0	5.0	W	0.30	●	0.03-0.09
ECR-B4X 12-18/48C12-100 (1)	12.00	12.00	18.00	48.00	100.00	4	45.0	5.0	C	0.35	●	0.04-0.10
ECR-B4X 12-18/48W12-100 (1)	16.00	16.00	18.00	48.00	100.00	4	45.0	5.0	W	0.35	●	0.05-0.11
ECR-B5X 16-24/64C16-115	16.00	16.00	24.00	64.00	115.00	5	45.0	5.0	C	0.40	●	0.05-0.11
ECR-B5X 16-24/64W16-115	16.00	16.00	24.00	64.00	115.00	5	45.0	5.0	W	0.40	●	0.05-0.11

• First choice in roughing applications. • For user guide, see pages C72-83.

(1) This tool can plunge and recess. (2) C-Cylindrical, W-Weldon

ECR-B-MF

4 and 6 Flute, 45° Helix Medium Length Solid Carbide Roughing Endmills
for Materials up to 65 HRc



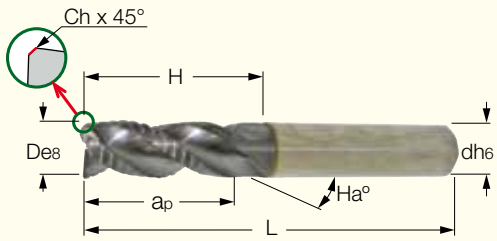
Designation	Dimensions									IC900	Recommended Machining Data
	D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	Ch		fz (mm/t)
ECR-B4MF 06-14C06-57	6.00	6.00	14.00	57.00	4	45.0	5.0	C	0.25	●	0.03-0.06
ECR-B4MF 06-14W06-57	6.00	6.00	14.00	57.00	4	45.0	5.0	W	0.25	●	0.03-0.06
ECR-B4MF 08-18C08-63	8.00	8.00	18.00	63.00	4	45.0	5.0	C	0.30	●	0.03-0.08
ECR-B4MF 08-18W08-63	8.00	8.00	18.00	63.00	4	45.0	5.0	W	0.30	●	0.03-0.08
ECR-B4MF 10-22C10-72	10.00	10.00	22.00	72.00	4	45.0	5.0	C	0.30	●	0.03-0.09
ECR-B4MF 10-22W10-72	10.00	10.00	22.00	72.00	4	45.0	5.0	W	0.30	●	0.03-0.09
ECR-B4MF 12-26C12-83	12.00	12.00	26.00	83.00	4	45.0	5.0	C	0.40	●	0.04-0.10
ECR-B4MF 12-26W12-83	12.00	12.00	26.00	83.00	4	45.0	5.0	W	0.40	●	0.04-0.10
ECR-B4MF 14-30C14-83	14.00	14.00	30.00	83.00	4	45.0	5.0	C	0.40	●	0.04-0.11
ECR-B4MF 14-30W14-83	14.00	14.00	30.00	83.00	4	45.0	5.0	W	0.40	●	0.04-0.11
ECR-B6MF 16-34C16-92	16.00	16.00	34.00	92.00	6	45.0	5.0	C	0.50	●	0.05-0.11
ECR-B6MF 16-34W16-92	16.00	16.00	34.00	92.00	6	45.0	5.0	W	0.50	●	0.05-0.11
ECR-B6MF 20-42C20-104	20.00	20.00	42.00	104.00	6	45.0	5.0	C	0.70	●	0.05-0.11
ECR-B6MF 20-42W20-104	20.00	20.00	42.00	104.00	6	45.0	5.0	W	0.70	●	0.05-0.11
ECR-B6MF 25-52C25-121	25.00	25.00	52.00	121.00	6	45.0	5.0	C	0.90	●	0.06-0.11
ECR-B6MF 25-52W25-121	25.00	25.00	52.00	121.00	6	45.0	5.0	W	0.90	●	0.06-0.11

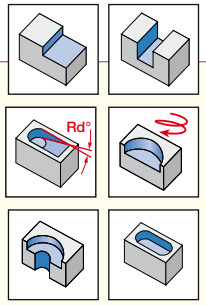
• The rougher's cutting edge profile has shallow serrations. • This is a very durable design which leaves only a small amount of material for the finishing cut. • For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

ECP-E3L

3 Flute, 38° Helix Solid Carbide Roughing Endmills with Chip Splitting Cutting Edges, for High Stock Removal Rates





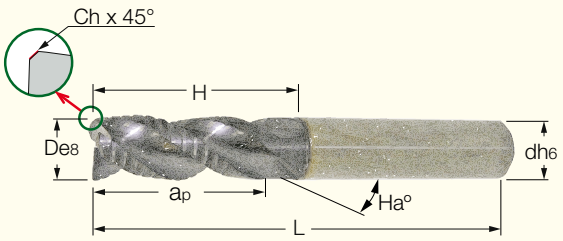
Designation	Dimensions D	d	a_p	H	L	Flute	H_a°	Shank(1)	Ch	IC900	Recommended Machining Data fz (mm/t)
ECP-E3L 05-12/17C06S57	5.00	6.00	12.00	17.00	57.00	3	38.0	C	0.20	●	0.02-0.05
ECP-E3L 05-12/17W06S57	5.00	6.00	12.00	17.00	57.00	3	38.0	W	0.20	●	0.02-0.05
ECP-E3L 06-14/20C06S57	6.00	6.00	14.00	20.00	57.00	3	38.0	C	0.30	●	0.03-0.06
ECP-E3L 06-14/20W06S57	6.00	6.00	14.00	20.00	57.00	3	38.0	W	0.30	●	0.03-0.06
ECP-E3L 08-18/26C08S63	8.00	8.00	18.00	26.00	63.00	3	38.0	C	0.40	●	0.03-0.08
ECP-E3L 08-18/26W08S63	8.00	8.00	18.00	26.00	63.00	3	38.0	W	0.40	●	0.03-0.08
ECP-E3L 10-22/32C10S72	10.00	10.00	22.00	32.00	72.00	3	38.0	C	0.40	●	0.03-0.09
ECP-E3L 10-22/32W10S72	10.00	10.00	22.00	32.00	72.00	3	38.0	W	0.40	●	0.03-0.09
ECP-E3L 12-26/38C12S83	12.00	12.00	26.00	38.00	83.00	3	38.0	C	0.40	●	0.04-0.10
ECP-E3L 12-26/38W12S83	12.00	12.00	26.00	38.00	83.00	3	38.0	W	0.40	●	0.04-0.10
ECP-E3L 14-30/44C14S100	14.00	14.00	30.00	44.00	100.00	3	38.0	C	0.50	●	0.05-0.11
ECP-E3L 14-30/44W14S100	14.00	14.00	30.00	44.00	100.00	3	38.0	W	0.50	●	0.05-0.11
ECP-E3L 16-34/50C16S100	16.00	16.00	34.00	50.00	100.00	3	38.0	C	0.50	●	0.05-0.11
ECP-E3L 16-34/50W16S100	16.00	16.00	34.00	50.00	100.00	3	38.0	W	0.50	●	0.05-0.11
ECP-E3L 20-42/62C20S125	20.00	20.00	42.00	62.00	125.00	3	38.0	C	0.50	●	0.05-0.11
ECP-E3L 20-42/62W20S125	20.00	20.00	42.00	62.00	125.00	3	38.0	W	0.50	●	0.05-0.11

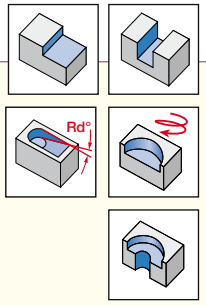
• Most recommended for machining stainless steel. • For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

ECP-E4L

4 Flute, 38° Helix Solid Carbide Roughing Endmills with Chip Splitting Cutting Edges, for High Stock Removal Rates





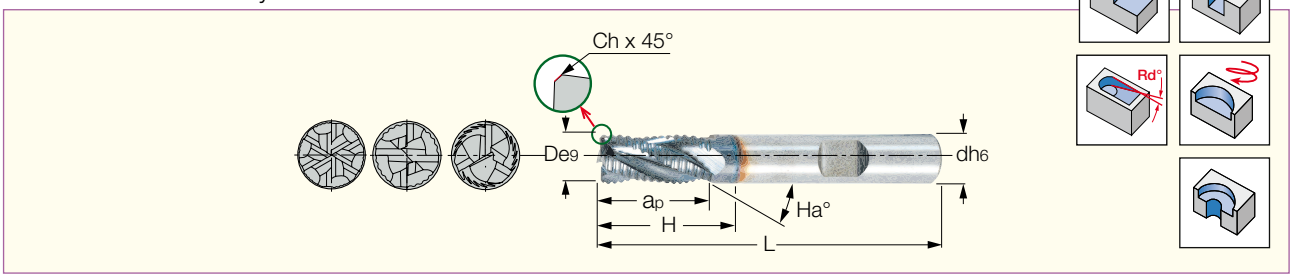
Designation	Dimensions D	d	a_p	H	L	Flute	H_a°	Shank(1)	Ch	IC900	Recommended Machining Data fz (mm/t)
ECP-E4L 05-12/17C06S57	5.00	6.00	12.00	17.00	57.00	4	38.0	C	0.20	●	0.02-0.05
ECP-E4L 05-12/17W06S57	5.00	6.00	12.00	17.00	57.00	4	38.0	W	0.20	●	0.02-0.05
ECP-E4L 06-14/20C06S57	6.00	6.00	14.00	20.00	57.00	4	38.0	C	0.30	●	0.03-0.06
ECP-E4L 06-14/20W06S57	6.00	6.00	14.00	20.00	57.00	4	38.0	W	0.30	●	0.03-0.06
ECP-E4L 08-18/26C08S63	8.00	8.00	18.00	26.00	63.00	4	38.0	C	0.40	●	0.03-0.08
ECP-E4L 08-18/26W08S63	8.00	8.00	18.00	26.00	63.00	4	38.0	W	0.40	●	0.03-0.08
ECP-E4L 10-22/32C10S72	10.00	10.00	22.00	32.00	72.00	4	38.0	C	0.40	●	0.03-0.09
ECP-E4L 10-22/32W10S72	10.00	10.00	22.00	32.00	72.00	4	38.0	W	0.40	●	0.03-0.09
ECP-E4L 12-26/38C12S83	12.00	12.00	26.00	38.00	83.00	4	38.0	C	0.40	●	0.04-0.10
ECP-E4L 12-26/38W12S83	12.00	12.00	26.00	38.00	83.00	4	38.0	W	0.40	●	0.04-0.10
ECP-E4L 14-30/44C14S100	14.00	14.00	30.00	44.00	100.00	4	38.0	C	0.50	●	0.04-0.11
ECP-E4L 14-30/44W14S100	14.00	14.00	30.00	44.00	100.00	4	38.0	W	0.50	●	0.04-0.11
ECP-E4L 16-34/50C16S100	16.00	16.00	34.00	50.00	100.00	4	38.0	C	0.50	●	0.05-0.12
ECP-E4L 16-34/50W16S100	16.00	16.00	34.00	50.00	100.00	4	38.0	W	0.50	●	0.05-0.12
ECP-E4L 20-42/62C20S125	20.00	20.00	42.00	62.00	125.00	4	38.0	C	0.50	●	0.05-0.15
ECP-E4L 20-42/62W20S125	20.00	20.00	42.00	62.00	125.00	4	38.0	W	0.50	●	0.05-0.15

• Most recommended for machining stainless steel. • For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

ERF-A/E-3,4,6

3, 4, 6 Flute, 30° and 38° Helix Solid Carbide Roughing Endmills, for Maximum Stock Removal of Alloy Steel



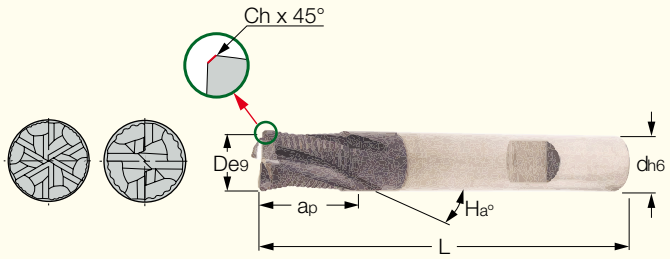
Designation	Dimensions D	d	a_p	H	L	Flute	H_a°	R_d°	Shank[2]	Ch	IC900	Recommended Machining Data fz (mm/t)
ERF040E08-3C06	4.00	6.00	8.00	13.00	57.00	3	38.0	5.0	C	0.25	●	0.02-0.05
ERF050E10-3C06	5.00	6.00	10.00	17.00	57.00	3	38.0	5.0	C	0.30	●	0.02-0.05
ERF060E13-3C06	6.00	6.00	13.00	21.00	57.00	3	38.0	5.0	C	0.30	●	0.03-0.06
ERF060E13-3W06	6.00	6.00	13.00	21.00	57.00	3	38.0	5.0	W	0.30	●	0.03-0.06
ERF070E20-3C08	7.00	8.00	20.00	26.00	63.00	3	38.0	5.0	C	0.30	●	0.03-0.07
ERF080E20-3C08	8.00	8.00	20.00	28.00	63.00	3	38.0	5.0	C	0.30	●	0.03-0.08
ERF080E20-3W08	8.00	8.00	20.00	28.00	63.00	3	38.0	5.0	W	0.30	●	0.03-0.08
ERF090A22-4C10	9.00	10.00	22.00	30.00	72.00	4	30.0	5.0	C	0.30	●	0.03-0.08
ERF100A22-4C10	10.00	10.00	22.00	30.00	72.00	4	30.0	5.0	C	0.30	●	0.03-0.09
ERF100A22-4W10	10.00	10.00	22.00	30.00	72.00	4	30.0	5.0	W	0.30	●	0.03-0.09
ERF110A25-4C12	11.00	12.00	25.00	32.00	83.00	4	30.0	5.0	C	0.30	●	0.03-0.09
ERF120A25-4C12	12.00	12.00	25.00	37.00	83.00	4	30.0	5.0	C	0.40	●	0.04-0.10
ERF120A25-4W12	12.00	12.00	25.00	37.00	83.00	4	30.0	5.0	W	0.40	●	0.04-0.10
ERF130A25-4C14	13.00	14.00	25.00	-	83.00	4	30.0	5.0	C	0.40	●	0.04-0.10
ERF140A25-4C14	14.00	14.00	25.00	37.00	83.00	4	30.0	5.0	C	0.50	●	0.04-0.11
ERF140A25-4W14	14.00	14.00	25.00	37.00	83.00	4	30.0	5.0	W	0.50	●	0.04-0.11
ERF150A32-4C16	15.00	16.00	32.00	-	92.00	4	30.0	5.0	C	0.40	●	0.04-0.11
ERF160A32-4C16	16.00	16.00	32.00	44.00	92.00	4	30.0	5.0	C	0.50	●	0.05-0.11
ERF160A32-4W16	16.00	16.00	32.00	44.00	92.00	4	30.0	5.0	W	0.50	●	0.05-0.11
ERF180A32-4C18	18.00	18.00	32.00	44.00	92.00	4	30.0	5.0	C	0.50	●	0.05-0.11
ERF180A32-4W18	18.00	18.00	32.00	44.00	92.00	4	30.0	5.0	W	0.50	●	0.05-0.11
ERF200A38-4C20	20.00	20.00	38.00	55.00	104.00	4	30.0	5.0	C	0.60	●	0.05-0.11
ERF200A38-4W20	20.00	20.00	38.00	55.00	104.00	4	30.0	5.0	W	0.60	●	0.05-0.11
ERF250A45-6C25 [1]	25.00	25.00	45.00	64.00	121.00	6	30.0	5.0	C	0.60	●	0.06-0.11
ERF250A45-6W25 [1]	25.00	25.00	45.00	64.00	121.00	6	30.0	5.0	W	0.60	●	0.06-0.11

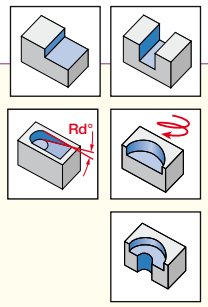
• For user guide, see pages C72-83.

[1] No center cutting [2] C-Cylindrical, W-Weldon

ECR-T-M

4 Flute, 20° Helix Medium Length Solid Carbide Roughing Endmills, for High Stock Removal Rates





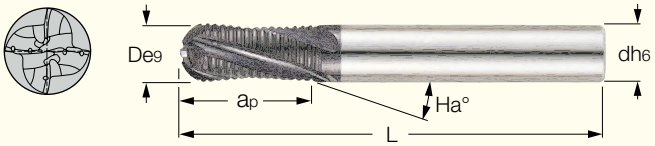
Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	Ch	IC900	Recommended Machining Data fz (mm/t)
ECR-T4M 06-10-C06-57	6.00	6.00	10.00	57.00	4	20.0	5.0	C	0.30	●	0.03-0.06
ECR-T4M 06-10-W06-57	6.00	6.00	10.00	57.00	4	20.0	5.0	W	0.30	●	0.03-0.06
ECR-T4M 08-16-C08-63	8.00	8.00	16.00	63.00	4	20.0	5.0	C	0.40	●	0.03-0.08
ECR-T4M 08-16-W08-63	8.00	8.00	16.00	63.00	4	20.0	5.0	W	0.40	●	0.03-0.08
ECR-T4M 10-20-C10-72	10.00	10.00	20.00	72.00	4	20.0	5.0	C	0.40	●	0.03-0.09
ECR-T4M 10-20-W10-72	10.00	10.00	20.00	72.00	4	20.0	5.0	W	0.40	●	0.03-0.09
ECR-T4M 12-24-C12-83	12.00	12.00	24.00	83.00	4	20.0	5.0	C	0.40	●	0.04-0.10
ECR-T4M 12-24-W12-83	12.00	12.00	24.00	83.00	4	20.0	5.0	W	0.40	●	0.04-0.10
ECR-T4M 16-32-C16-92	16.00	16.00	32.00	92.00	4	20.0	5.0	C	0.50	●	0.05-0.11
ECR-T4M 16-32-W16-92	16.00	16.00	32.00	92.00	4	20.0	5.0	W	0.50	●	0.05-0.11
ECR-T4M 20-40-C20-104	20.00	20.00	40.00	104.00	4	20.0	5.0	C	0.50	●	0.05-0.11
ECR-T4M 20-40-W20-104	20.00	20.00	40.00	104.00	4	20.0	5.0	W	0.50	●	0.05-0.11

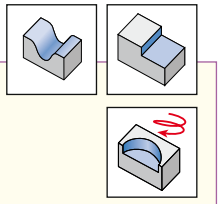
• For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

EBRF-T

3, 4 Flute, 20° Helix Long Solid Carbide Roughing Ball Nose, for Materials up to 55 HRc





HARD MATERIALS

Designation	Dimensions D	d	a_p	L	Flute	H_a°	Shank(1)	IC903
EBRF-T3 06-16C06M57	6.00	6.00	16.00	57.00	3	20.0	C	●
EBRF-T3 08-16C08M63	8.00	8.00	16.00	63.00	3	20.0	C	●
EBRF-T4 10-22C10M72	10.00	10.00	22.00	72.00	4	20.0	C	●
EBRF-T4 12-26C12M83	12.00	12.00	26.00	83.00	4	20.0	C	●
EBRF-T4 14-26C14M83	14.00	14.00	26.00	83.00	4	20.0	C	●
EBRF-T4 16-32C16M92	16.00	16.00	32.00	92.00	4	20.0	C	●
EBRF-T4 18-32C18M92	18.00	18.00	32.00	92.00	4	20.0	C	●
EBRF-T4 20-38C20M104	20.00	20.00	38.00	104.00	4	20.0	C	●

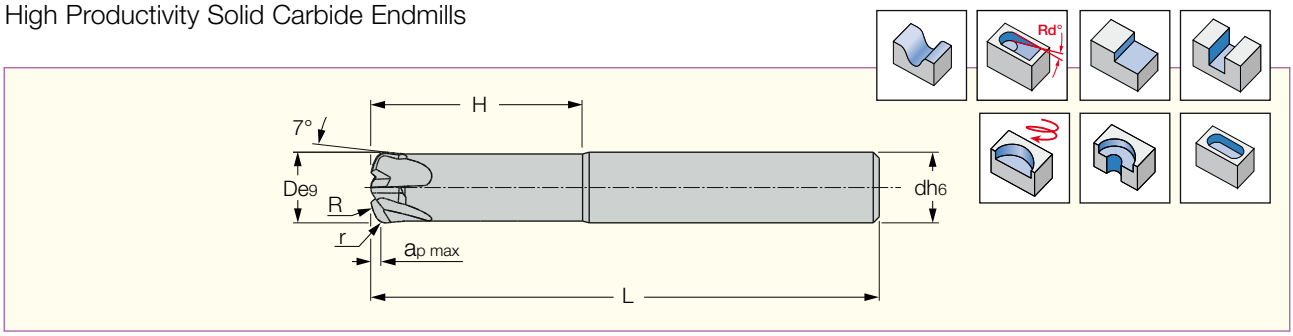
• For user guide, see pages C72-83.

(1) C-Cylindrical

FEEDMILL

EFF-S4

High Productivity Solid Carbide Endmills



Designation	Dimensions D	d	L	H	r(1)	R	ap max	IC903	Recommended Machining Data fz (mm/t)
EFF-S4-06 030/20C06R1.0M	6.00	6.00	57.00	20.00	1.23	5.3	0.30	●	0.10-0.30
EFF-S4-08 035/26C08R1.3M	8.00	8.00	63.00	26.00	1.62	7.0	0.40	●	0.10-0.40
EFF-S4-10 040/30C10R1.6M	10.00	10.00	72.00	30.00	2.01	8.8	0.50	●	0.15-0.50
EFF-S4-12 045/34C12R2.0M	12.00	12.00	83.00	34.00	2.47	10.6	0.60	●	0.15-0.50
EFF-S4-16 055/42C16R2.6M	16.00	16.00	92.00	42.00	3.25	14.0	0.80	●	0.20-0.60
EFF-S4-20 060/46C20R3.2M	20.00	20.00	104.00	46.00	4.02	17.7	1.00	●	0.20-0.70

• For user guide, see pages C72-83.

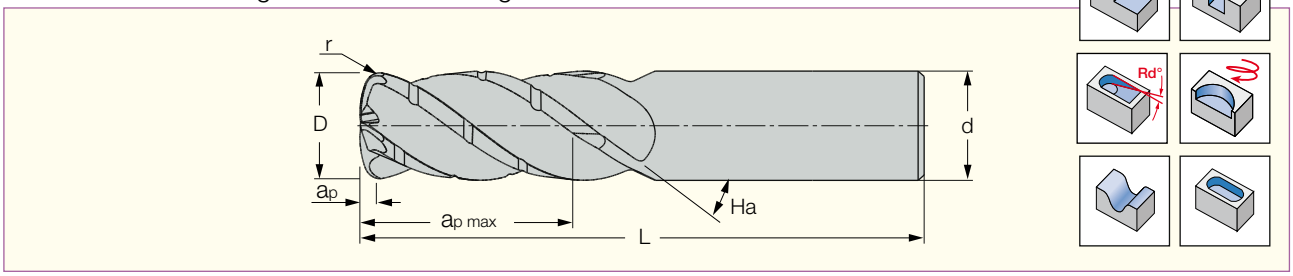
(1) Should be used for programming

FEEDMILL • CHATTERFREE

SOLID MILL LINE

EFP-E4, 5CF

Sold Carbide Roughing Endmills with Chip Splitting Cutting Edges, Variable Pitch and Large Radius Frontal Edge



Designation	Dimensions D	d	L	r(1)	Flute	Ha°	ap(2)	Fzl (min)(3)	Fzl (max)(3)	ap max	Fzh (min)(4)	Fzh (max)(4)	Rd°	IC903
EFP-E4CF 06-12C06R1.0M57	6.00	6.00	57.00	1.00	4	38.0	0.30	0.10	0.30	12.00	0.02	0.07	5.0	●
EFP-E4CF 08-16C08R1.4M63	8.00	8.00	63.00	1.40	4	38.0	0.40	0.10	0.40	16.00	0.03	0.10	5.0	●
EFP-E4CF 10-20C10R1.7M72	10.00	10.00	72.00	1.70	4	38.0	0.50	0.15	0.50	20.00	0.03	0.10	5.0	●
EFP-E5CF 10-24C10R1.7M72	10.00	10.00	72.00	1.70	5	38.0	0.50	0.15	0.50	24.00	0.03	0.11	5.0	●
EFP-E4CF 12-25C12R2.0M83	12.00	12.00	83.00	2.00	4	38.0	0.60	0.15	0.50	24.00	0.04	0.10	5.0	●
EFP-E5CF 12-32C12R2.0M83	12.00	12.00	83.00	2.00	5	38.0	0.60	0.15	0.50	32.00	0.04	0.11	5.0	●
EFP-E4CF 16-32C16R2.7M92	16.00	16.00	92.00	2.70	4	38.0	0.80	0.20	0.60	32.00	0.05	0.12	5.0	●
EFP-E5CF 16-40C16R2.7M92	16.00	16.00	92.00	2.70	5	38.0	0.80	0.20	0.60	40.00	0.05	0.12	5.0	●
EFP-E4CF 20-40C20R3.4M104	20.00	20.00	104.00	3.40	4	38.0	1.00	0.20	0.70	40.00	0.05	0.12	5.0	●
EFP-E5CF 20-48C20R3.4M104	20.00	20.00	104.00	3.40	5	38.0	1.00	0.20	0.70	48.00	0.05	0.12	5.0	●

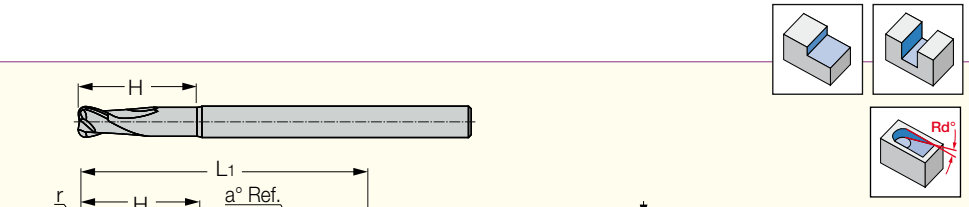
• For user guide, see pages C14,C72-83 .

(1) Used for programming (2) Maximum D.O.C. for high feed milling (FEEDMILL) (3) The displyed feed refers to small D.O.C. (FEEDMILL) (4) Recommended for up to 2xD D.O.C.

SOLIDMILL
PREMIUM LINE

ETR-A2

2 Flute Toroidal Endmills



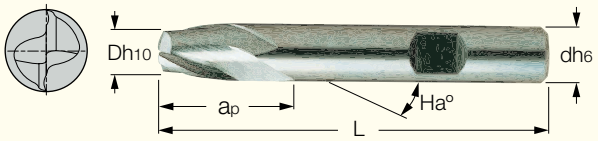
Designation	Dimensions D	r	d	D2	ap	H	L1	L	a°	Rd°	IC900	Recommended Machining Data fz (mm/t)
ETR-A2 02-2/08C06R.5M80	2.00	0.50	6.00	1.90	2.00	8.00	40.0	80.00	3.6	5.0	●	0.01-0.03
ETR-A2 03-2/12C06R.5M80	3.00	0.50	6.00	2.80	2.00	12.00	40.0	80.00	3.3	5.0	●	0.01-0.04
ETR-A2 04-3/16C06R1M80	4.00	1.00	6.00	3.70	3.00	16.00	40.0	80.00	2.8	5.0	●	0.02-0.05
ETR-A2 06-4/25C06R2M80	6.00	2.00	6.00	5.60	4.00	25.00	-	80.00	-	5.0	●	0.03-0.07
ETR-A2 06-4/25C08R2M100	6.00	2.00	8.00	5.60	4.00	25.00	66.0	100.00	2	5.0	●	0.03-0.07
ETR-A2 08-4/32C08R2M100	8.00	2.00	8.00	7.60	4.00	32.00	-	100.00	-	5.0	●	0.03-0.09
ETR-A2 08-4/32C10R2M120	8.00	2.00	10.00	7.60	4.00	32.00	66.0	120.00	2	5.0	●	0.03-0.09
ETR-A2 10-6/40C10R3M120	10.00	3.00	10.00	9.60	6.00	40.00	-	120.00	-	5.0	●	0.03-0.10
ETR-A2 10-6/40C12R3M160	10.00	3.00	12.00	9.60	6.00	40.00	110.0	158.00	1	5.0	●	0.03-0.10

• For user guide, see pages C72-83.

SOLIDMILL
TEC LINE

EC-A2 (Economical-Short)

Economical Type 2 Flute, 30° Helix Center Cutting Short Solid Carbide Endmills



Designation	Dimensions D	ap	d	L	Flute	Ha°	Rd°	Shank(1)	Tough ↔ Hard IC08	IC900	Recommended Machining Data fz (mm/t)
EC-A2 02-03W06E50	2.00	3.00	6.00	50.00	2	30.0	5.0	W	●	●	0.01-0.03
EC-A2 03-04W06E50	3.00	4.00	6.00	50.00	2	30.0	5.0	W	●	●	0.01-0.04
EC-A2 035-04W06E50	3.50	4.00	6.00	50.00	2	30.0	5.0	W	●	●	0.01-0.04
EC-A2 04-05W06E54	4.00	5.00	6.00	54.00	2	30.0	5.0	W	●	●	0.02-0.05
EC-A2 045-05W06E54	4.50	5.00	6.00	54.00	2	30.0	5.0	W	●	●	0.02-0.05
EC-A2 05-06W06E54	5.00	6.00	6.00	54.00	2	30.0	5.0	W	●	●	0.02-0.06
EC-A2 06-07W06E54	6.00	7.00	6.00	54.00	2	30.0	5.0	W	●	●	0.03-0.07
EC-A2 07-08W08E58	7.00	8.00	8.00	58.00	2	30.0	5.0	W	●	●	0.03-0.08
EC-A2 08-09W08E58	8.00	9.00	8.00	58.00	2	30.0	5.0	W	●	●	0.03-0.09
EC-A2 09-10W10E66	9.00	10.00	10.00	66.00	2	30.0	5.0	W	●	●	0.03-0.09
EC-A2 10-11W10E66	10.00	11.00	10.00	66.00	2	30.0	5.0	W	●	●	0.03-0.10
EC-A2 12-12W12E73	12.00	12.00	12.00	73.00	2	30.0	5.0	W	●	●	0.04-0.11
EC-A2 14-14W14E75	14.00	14.00	14.00	75.00	2	30.0	5.0	W	●	●	0.04-0.12
EC-A2 16-16W16E82	16.00	16.00	16.00	82.00	2	30.0	5.0	W	●	●	0.05-0.13
EC-A2 18-18W18E84	18.00	18.00	18.00	84.00	2	30.0	5.0	W	●	●	0.05-0.13
EC-A2 20-20W20E92	20.00	20.00	20.00	92.00	2	30.0	5.0	W	●	●	0.05-0.13

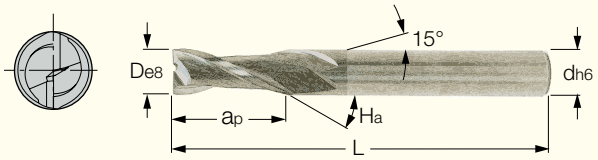
• For user guide, see pages C72-83.

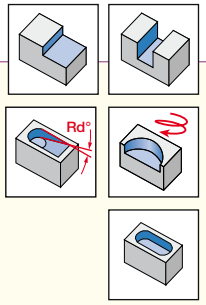
(1) W-Weldon

SOLIDMILL
PREMIUM LINE

EC-A-2

2 Flute, 30 and 45° Helix Medium Length Solid Carbide Slot / Drill Endmills





Designation	Dimensions								Tough ↔ Hard			Recommended Machining Data
	D	d	a_p	L	Flute	H_a°	R_d°	Shank[1]	IC08	IC300	IC900	fz (mm/t)
EC020B07-2C03	2.00	3.00	7.00	38.00	2	45.0	5.0	C	●	●		0.01-0.03
EC020B07-2C06	2.00	6.00	7.00	57.00	2	45.0	5.0	C		●	●	0.01-0.03
EC025A07-2C03	2.50	3.00	7.00	38.00	2	30.0	5.0	C	●	●		0.01-0.03
EC030A10-2C03	3.00	3.00	10.00	38.00	2	30.0	5.0	C	●	●		0.01-0.04
EC030A10-2C06	3.00	6.00	10.00	57.00	2	30.0	5.0	C		●	●	0.01-0.04
EC035A12-2C04	3.50	4.00	12.00	50.00	2	30.0	5.0	C	●	●		0.01-0.04
EC040A12-2C04	4.00	4.00	12.00	50.00	2	30.0	5.0	C	●	●		0.02-0.05
EC040A12-2C06	4.00	6.00	12.00	57.00	2	30.0	5.0	C		●	●	0.02-0.05
EC045A14-2C06	4.50	6.00	14.00	57.00	2	30.0	5.0	C	●	●		0.02-0.05
EC050A14-2C05	5.00	5.00	14.00	50.00	2	30.0	5.0	C	●	●		0.02-0.06
EC050A14-2C06	5.00	6.00	14.00	57.00	2	30.0	5.0	C		●	●	0.02-0.06
EC055A16-2C06	5.50	6.00	16.00	57.00	2	30.0	5.0	C		●		0.02-0.06
EC060A16-2C06	6.00	6.00	16.00	57.00	2	30.0	5.0	C	●	●		0.03-0.07
EC060A16-2W06	6.00	6.00	16.00	57.00	2	30.0	5.0	W			●	0.03-0.07
EC065A20-2C07	6.50	7.00	20.00	60.00	2	30.0	5.0	C		●		0.03-0.07
EC070A20-2C07	7.00	7.00	20.00	60.00	2	30.0	5.0	C	●	●		0.03-0.08
EC080A20-2C08	8.00	8.00	20.00	63.00	2	30.0	5.0	C	●	●	●	0.03-0.09
EC080A20-2W08	8.00	8.00	20.00	63.00	2	30.0	5.0	W			●	0.03-0.09
EC085A22-2C10	8.50	10.00	22.00	72.00	2	30.0	5.0	C		●		0.03-0.09
EC100A22-2C10	10.00	10.00	22.00	72.00	2	30.0	5.0	C	●	●	●	0.03-0.10
EC100A22-2W10	10.00	10.00	22.00	72.00	2	30.0	5.0	W			●	0.03-0.10
EC120A25-2C12	12.00	12.00	25.00	83.00	2	30.0	5.0	C	●	●	●	0.04-0.11
EC120A25-2W12	12.00	12.00	25.00	83.00	2	30.0	5.0	W			●	0.04-0.11
EC140A25-2C14	14.00	14.00	25.00	83.00	2	30.0	5.0	C	●	●	●	0.04-0.12
EC140A25-2W14	14.00	14.00	25.00	83.00	2	30.0	5.0	W			●	0.04-0.12
EC160A32-2C16	16.00	16.00	32.00	92.00	2	30.0	5.0	C	●	●	●	0.05-0.13
EC160A32-2W16	16.00	16.00	32.00	92.00	2	30.0	5.0	W			●	0.05-0.13
EC180A32-2C18	18.00	18.00	32.00	92.00	2	30.0	5.0	C	●	●		0.05-0.13
EC200A38-2C20	20.00	20.00	38.00	104.00	2	30.0	5.0	C	●	●	●	0.05-0.13

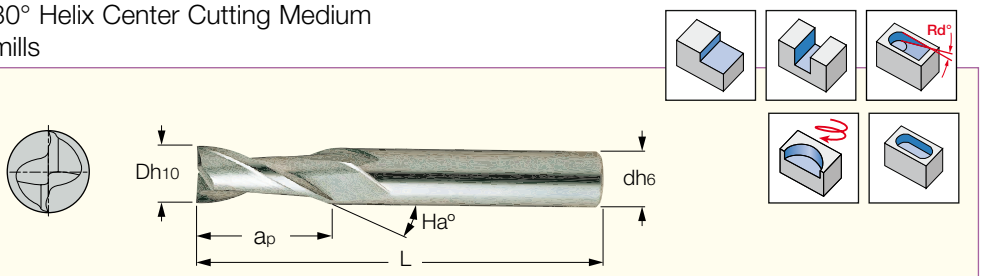
• For user guide, see pages C72-83.

[1] C-Cylindrical, W-Weldon

SOLIDMILL
TEC LINE

EC-A2 (Economical-Medium)

Economical Type 2 Flute, 30° Helix Center Cutting Medium Length Solid Carbide Endmills



Designation	Dimensions								Tough ↔ Hard		Recommended Machining Data
	D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	IC08	IC900	fz (mm/t)
EC-A2 01-03C04E50	1.00	4.00	3.00	50.00	2	30.0	5.0	C	●	●	0.00-0.01
EC-A2 015-045C04E50	1.50	4.00	4.50	50.00	2	30.0	5.0	C	●	●	0.00-0.02
EC-A2 02-08C02E32	2.00	2.00	8.00	32.00	2	30.0	5.0	C	●	●	0.01-0.03
EC-A2 025-08C025E32	2.50	2.50	8.00	32.00	2	30.0	5.0	C	●	●	0.01-0.03
EC-A2 03-12C03E38	3.00	3.00	12.00	38.00	2	30.0	5.0	C	●	●	0.01-0.04
EC-A2 035-12C035E32	3.50	3.50	12.00	32.00	2	30.0	5.0	C	●	●	0.01-0.04
EC-A2 04-12C04E50	4.00	4.00	12.00	50.00	2	30.0	5.0	C	●	●	0.02-0.05
EC-A2 045-14C045E50	4.50	4.50	14.00	50.00	2	30.0	5.0	C	●	●	0.02-0.05
EC-A2 05-14C05E50	5.00	5.00	14.00	50.00	2	30.0	5.0	C	●	●	0.02-0.06
EC-A2 055-16C055E50	5.50	5.50	16.00	50.00	2	30.0	5.0	C	●	●	0.02-0.06
EC-A2 06-16C06E50	6.00	6.00	16.00	50.00	2	30.0	5.0	C	●	●	0.03-0.07
EC-A2 07-20C07E60	7.00	7.00	20.00	60.00	2	30.0	5.0	C	●	●	0.03-0.08
EC-A2 08-20C08E63	8.00	8.00	20.00	63.00	2	30.0	5.0	C	●	●	0.03-0.09
EC-A2 09-20C09E60	9.00	9.00	20.00	60.00	2	30.0	5.0	C	●	●	0.03-0.09
EC-A2 10-22C10E72	10.00	10.00	22.00	72.00	2	30.0	5.0	C	●	●	0.03-0.10
EC-A2 12-22C12E70	12.00	12.00	22.00	70.00	2	30.0	5.0	C	●	●	0.04-0.11
EC-A2 14-25C14E75	14.00	14.00	25.00	75.00	2	30.0	5.0	C	●	●	0.04-0.12
EC-A2 16-25C16E75	16.00	16.00	25.00	75.00	2	30.0	5.0	C	●	●	0.05-0.13
EC-A2 20-32C20E100	20.00	20.00	32.00	100.00	2	30.0	5.0	C	●	●	0.05-0.13

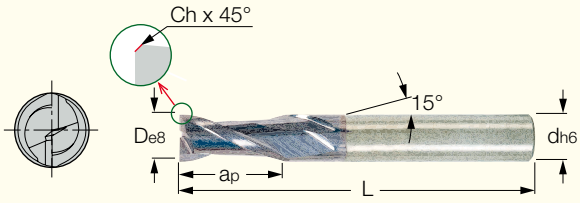
• For user guide, see pages C72-83.

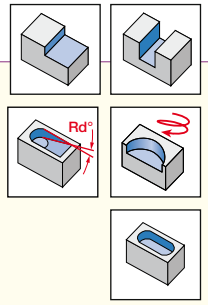
(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

ECC-A-2

2 Flute, 30° Helix Medium Length Solid Carbide Slot / Drill Endmills with Chamfered Corners





Designation	Dimensions D	d	Flute	ap	L	Rd°	Shank(1)	Ch	Tough ↔ Hard IC300	IC900	Recommended Machining Data fz (mm/t)
ECC020B07-2C03	2.00	3.00	2	7.00	38.00	5.0	C	0.10	●	●	0.01-0.03
ECC025A07-2C03	2.50	3.00	2	7.00	38.00	5.0	C	0.10	●	●	0.01-0.03
ECC030A10-2C03	3.00	3.00	2	10.00	38.00	5.0	C	0.10	●	●	0.01-0.04
ECC035A12-2C04	3.50	4.00	2	12.00	50.00	5.0	C	0.10	●	●	0.01-0.04
ECC040A12-2C04	4.00	4.00	2	12.00	50.00	5.0	C	0.15	●	●	0.02-0.05
ECC050A14-2C05	5.00	5.00	2	14.00	50.00	5.0	C	0.15	●	●	0.02-0.06
ECC060A16-2C06	6.00	6.00	2	16.00	57.00	5.0	C	0.15	●	●	0.03-0.07
ECC060A16-2W06	6.00	6.00	2	16.00	57.00	5.0	W	0.15		●	0.03-0.07
ECC080A20-2C08	8.00	8.00	2	20.00	63.00	5.0	C	0.15	●	●	0.03-0.09
ECC100A22-2C10	10.00	10.00	2	22.00	72.00	5.0	C	0.25	●	●	0.03-0.10
ECC100A22-2W10	10.00	10.00	2	22.00	72.00	5.0	W	0.25		●	0.03-0.10
ECC120A25-2C12	12.00	12.00	2	25.00	83.00	5.0	C	0.25	●	●	0.04-0.11
ECC120A25-2W12	12.00	12.00	2	25.00	83.00	5.0	W	0.25		●	0.04-0.11
ECC160A32-2C16	16.00	16.00	2	32.00	92.00	5.0	C	0.25	●	●	0.05-0.13
ECC200A38-2C20	20.00	20.00	2	38.00	104.00	5.0	C	0.25		●	0.05-0.13
ECC200A38-2W20	20.00	20.00	2	38.00	104.00	5.0	W	0.25		●	0.05-0.13

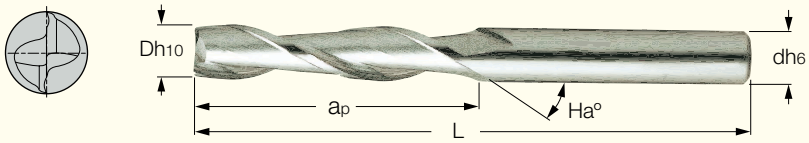
• For user guide, see pages C72-83.

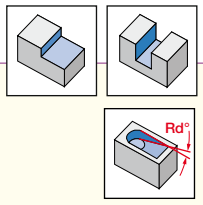
(1) C-Cylindrical, W-Weldon

SOLIDMILL
TEC LINE

EC-A2(Economical-Extra Long)

Economical Type 2 Flute, 30° Helix Center Cutting Extra Long Solid Carbide Endmills





Designation	Dimensions D	d	ap	L	Flute	Ha°	Rd°	Shank(1)	Tough ↔ Hard IC08	IC900	Recommended Machining Data fz (mm/t)
EC-A2 03-30C03E75	3.00	3.00	30.00	75.00	2	30.0	5.0	C	●	●	0.01-0.04
EC-A2 04-30C04E75	4.00	4.00	30.00	75.00	2	30.0	5.0	C	●	●	0.02-0.05
EC-A2 05-40C05E100	5.00	5.00	40.00	100.00	2	30.0	5.0	C	●	●	0.02-0.06
EC-A2 06-50C06E150	6.00	6.00	50.00	150.00	2	30.0	5.0	C	●	●	0.03-0.07
EC-A2 08-50C08E150	8.00	8.00	50.00	150.00	2	30.0	5.0	C	●	●	0.03-0.09
EC-A2 10-60C10E150	10.00	10.00	60.00	150.00	2	30.0	5.0	C	●	●	0.03-0.10
EC-A2 12-75C12E150	12.00	12.00	75.00	150.00	2	30.0	5.0	C	●	●	0.04-0.11
EC-A2 14-65C14E150	14.00	14.00	65.00	150.00	2	30.0	5.0	C	●	●	0.04-0.12
EC-A2 16-65C16E150	16.00	16.00	65.00	150.00	2	30.0	5.0	C	●	●	0.05-0.13
EC-A2 18-65C18E150	18.00	18.00	65.00	150.00	2	30.0	5.0	C	●	●	0.05-0.13
EC-A2 20-65C20E150	20.00	20.00	65.00	150.00	2	30.0	5.0	C	●	●	0.05-0.13

• For user guide, see pages C72-83.

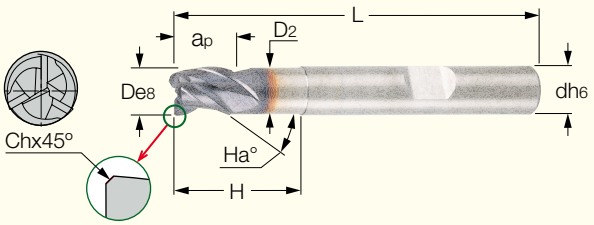
(1) C-Cylindrical

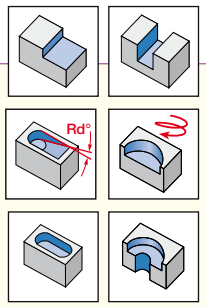
Member IMC Group

SOLIDMILL
PREMIUM LINE

ECS/ECCS-E-3

3 Flute, 38° Helix Short Solid Carbide Slot / Drill Endmills with Chamfered Corners





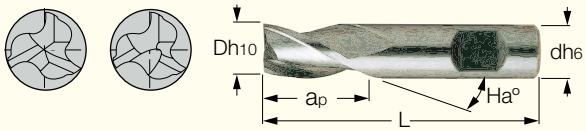
Designation	Dimensions											Tough ↔ Hard		Recommended Machining Data
	D	d	a_p	H	D_2	L	Flute	H_a°	R_d°	Shank(1)	Ch	IC300	IC900	fz (mm/t)
ECS020E03-3W06-57	2.00	6.00	3.00	7.00	1.90	57.00	3	38.0	5.0	W	-		●	0.01-0.03
ECS025E03-3W06-57	2.50	6.00	3.00	7.00	2.40	57.00	3	38.0	5.0	W	-		●	0.01-0.03
ECS030E04-3W06-57	3.00	6.00	4.00	10.00	2.90	57.00	3	38.0	5.0	W	-		●	0.01-0.04
ECS035E04-3W06-57	3.50	6.00	4.00	12.00	3.40	57.00	3	38.0	5.0	W	-		●	0.01-0.04
ECS040E05-3W06-57	4.00	6.00	5.00	12.00	3.90	57.00	3	38.0	5.0	W	-	●	●	0.02-0.05
ECS050E06-3W06-57	5.00	6.00	6.00	14.00	4.90	57.00	3	38.0	5.0	W	-		●	0.02-0.06
ECCS060E07-3W06-57	6.00	6.00	7.00	16.00	5.90	57.00	3	38.0	5.0	W	0.15		●	0.03-0.07
ECCS070E08-3W08-63	7.00	8.00	8.00	20.00	6.70	63.00	3	38.0	5.0	W	0.15		●	0.03-0.08
ECCS080E09-3W08-63	8.00	8.00	9.00	20.00	7.60	63.00	3	38.0	5.0	W	0.15		●	0.03-0.09
ECCS090E10-3W10-72	9.00	10.00	10.00	20.00	8.60	72.00	3	38.0	5.0	W	0.15		●	0.03-0.09
ECCS100E11-3W10-72	10.00	10.00	11.00	22.00	9.50	72.00	3	38.0	5.0	W	0.25		●	0.03-0.10
ECCS120E12-3W12-83	12.00	12.00	12.00	25.00	11.30	83.00	3	38.0	5.0	W	0.25		●	0.04-0.11
ECCS140E14-3W14-83	14.00	14.00	14.00	32.00	13.30	83.00	3	38.0	5.0	W	0.25		●	0.04-0.12
ECCS160E16-3W16-92	16.00	16.00	16.00	32.00	15.20	92.00	3	38.0	5.0	W	0.25		●	0.05-0.13
ECCS180E18-3W18-92	18.00	18.00	18.00	38.00	17.20	92.00	3	38.0	5.0	W	0.25		●	0.05-0.13
ECCS200E20-3W20-104	20.00	20.00	20.00	38.00	19.00	104.00	3	38.0	5.0	W	0.25		●	0.05-0.13

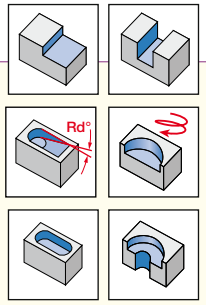
• For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

EC-A3/E3 (Economical-Short)

Economical Type 3 Flute, 30° and 38° Helix Center Cutting Short Solid Carbide Endmills





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	Tough ↔ Hard IC08	IC900	Recommended Machining Data fz (mm/t)
EC-A3 005-015C03E38	0.50	3.00	1.50	38.00	3	30.0	5.0	C	●	●	0.00-0.01
EC-A3 006-015C03E38	0.60	3.00	1.50	38.00	3	30.0	5.0	C	●	●	0.00-0.01
EC-A3 008-02C03E38	0.80	3.00	2.00	38.00	3	30.0	5.0	C	●	●	0.00-0.01
EC-A3 01-02C03E38	1.00	3.00	2.00	38.00	3	30.0	5.0	C	●		0.00-0.01
EC-A3 012-02C03E38	1.20	3.00	2.00	38.00	3	30.0	5.0	C	●	●	0.00-0.01
EC-A3 015-02C03E38	1.50	3.00	2.00	38.00	3	30.0	5.0	C	●	●	0.00-0.02
EC-A3 018-02C03E38	1.80	3.00	2.00	38.00	3	30.0	5.0	C	●	●	0.01-0.03
EC-E3 02-04C06E35	2.00	6.00	4.00	35.00	3	38.0	5.0	C	●	●	0.01-0.03
EC-E3 025-05C06E36	2.50	6.00	5.00	36.00	3	38.0	5.0	C	●	●	0.01-0.03
EC-E3 03-05C06E36	3.00	6.00	5.00	36.00	3	38.0	5.0	C	●	●	0.01-0.04
EC-A3 035-06W06E37	3.50	6.00	6.00	37.00	3	30.0	5.0	W	●	●	0.01-0.04
EC-E3 04-07C06E39	4.00	6.00	7.00	38.00	3	38.0	5.0	C	●	●	0.02-0.05
EC-A3 045-08W06E38	4.50	6.00	8.00	38.00	3	30.0	5.0	W	●	●	0.02-0.05
EC-A3 05-08W06E39	5.00	6.00	8.00	39.00	3	30.0	5.0	W	●		0.02-0.06
EC-E3 05-08C06E39	5.00	6.00	8.00	39.00	3	30.0	5.0	C		●	0.02-0.06
EC-A3 055-08W06E39	5.50	6.00	8.00	39.00	3	30.0	5.0	W	●	●	0.02-0.06
EC-A3 0575-08W06E39	5.75	6.00	8.00	39.00	3	30.0	5.0	W	●	●	0.02-0.06
EC-E3 06-08C06E39	6.00	6.00	8.00	39.00	3	38.0	5.0	C	●	●	0.03-0.07
EC-A3 0675-10W08E42	6.75	8.00	10.00	42.00	3	30.0	5.0	W	●	●	0.03-0.07
EC-A3 07-10W08E42	7.00	8.00	10.00	42.00	3	30.0	5.0	W	●	●	0.03-0.08
EC-A3 0775-10W08E42	7.75	8.00	10.00	42.00	3	30.0	5.0	W	●	●	0.03-0.08
EC-E3 08-11C08E43	8.00	8.00	11.00	43.00	3	38.0	5.0	C	●	●	0.03-0.09
EC-A3 087-11W10E48	8.70	10.00	11.00	48.00	3	30.0	5.0	W	●	●	0.03-0.09
EC-A3 09-11W10E48	9.00	10.00	11.00	48.00	3	30.0	5.0	W	●	●	0.03-0.09
EC-A3 097-11W10E48	9.70	10.00	11.00	48.00	3	30.0	5.0	W	●	●	0.03-0.09
EC-E3 10-13C10E50	10.00	10.00	13.00	50.00	3	38.0	5.0	C	●	●	0.03-0.10
EC-E3 12-15C12E55	12.00	12.00	15.00	55.00	3	30.0	5.0	C	●	●	0.04-0.11
EC-A3 14-15W14E58	14.00	14.00	15.00	58.00	3	30.0	5.0	W	●	●	0.04-0.12
EC-A3 16-18W16E62	16.00	16.00	18.00	62.00	3	30.0	5.0	W	●	●	0.05-0.13
EC-A3 18-20W18E70	18.00	18.00	20.00	70.00	3	30.0	5.0	W	●	●	0.05-0.13
EC-A3 20-22W20E75	20.00	20.00	22.00	75.00	3	30.0	5.0	W	●	●	0.05-0.13

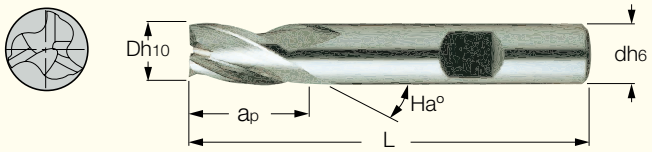
• For user guide, see pages C72-83.

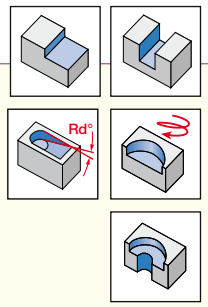
(1) C-Cylindrical, W-Weldon

SOLIDMILL
TEC LINE

EC-A3/E3 (Economical-Medium)

Economical Type 3 Flute, 30° and 38° Helix, Center Cutting,
Medium Length Solid Carbide Endmills





Designation	Dimensions								Tough ↔ Hard		Recommended Machining Data
	D	d	a_p	L	Flute	H_a°	R_d°	Shank[1]	IC08	IC900	fz (mm/t)
EC-E3 02-08C02E32	2.00	2.00	8.00	32.00	3	38.0	5.0	C	●	●	0.01-0.03
EC-E3 025-08C025E32	2.50	2.50	8.00	32.00	3	38.0	5.0	C	●	●	0.01-0.03
EC-E3 03-12C03E38	3.00	3.00	12.00	38.00	3	38.0	5.0	C	●	●	0.01-0.04
EC-A3 035-12C035E32	3.50	3.50	12.00	32.00	3	30.0	5.0	C	●	●	0.01-0.04
EC-E3 04-12C04E50	4.00	4.00	12.00	50.00	3	38.0	5.0	C	●	●	0.02-0.05
EC-A3 045-14C045E50	4.50	4.50	14.00	50.00	3	30.0	5.0	C	●	●	0.02-0.05
EC-E3 05-14C05E50	5.00	5.00	14.00	50.00	3	38.0	5.0	C	●	●	0.02-0.06
EC-A3 055-16C055E50	5.50	5.50	16.00	50.00	3	30.0	5.0	C	●	●	0.02-0.06
EC-E3 06-16C06E50	6.00	6.00	16.00	50.00	3	38.0	5.0	C	●	●	0.03-0.07
EC-A3 07-20C07E60	7.00	7.00	20.00	60.00	3	30.0	5.0	C		●	0.03-0.08
EC-E3 07-20C07E60	7.00	7.00	20.00	60.00	3	38.0	5.0	C	●		0.03-0.08
EC-E3 08-20C08E63	8.00	8.00	20.00	63.00	3	38.0	5.0	C	●	●	0.03-0.09
EC-A3 09-20C09E60	9.00	9.00	20.00	60.00	3	30.0	5.0	C	●	●	0.03-0.09
EC-E3 10-22C10E72	10.00	10.00	22.00	72.00	3	38.0	5.0	C	●	●	0.03-0.10
EC-E3 12-22C12E73	12.00	12.00	22.00	73.00	3	38.0	5.0	C	●	●	0.04-0.11
EC-A3 14-25C14E75	14.00	14.00	25.00	75.00	3	30.0	5.0	C	●	●	0.04-0.12
EC-A3 16-25C16E75	16.00	16.00	25.00	75.00	3	30.0	5.0	C	●	●	0.05-0.13
EC-E3 20-32C20E104	20.00	20.00	32.00	104.00	3	38.0	5.0	C	●	●	0.05-0.13

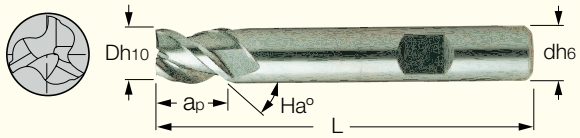
• For user guide, see pages C72-83.

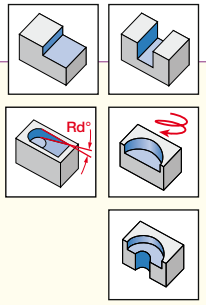
[1] C-Cylindrical

SOLIDMILL
TEC LINE

EC-B3 (Economical-Short)

Economical Type 3 Flute, 45° Helix Center Cutting Short Solid Carbide Endmills





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank[1]	Tough ↔ Hard IC08	IC900	Recommended Machining Data fz (mm/t)
EC-B3 015-03C03E38	1.50	3.00	3.00	38.00	3	45.0	5.0	C	●	●	0.00-0.02
EC-B3 02-03W06E50	2.00	6.00	3.00	50.00	3	45.0	5.0	W	●	●	0.01-0.03
EC-B3 03-04W06E50	3.00	6.00	4.00	50.00	3	45.0	5.0	W	●	●	0.01-0.04
EC-B3 035-04W06E50	3.50	6.00	4.00	50.00	3	45.0	5.0	W	●	●	0.01-0.04
EC-B3 04-05W06E54	4.00	6.00	5.00	54.00	3	45.0	5.0	W	●	●	0.02-0.05
EC-B3 045-05W06E54	4.50	6.00	5.00	54.00	3	45.0	5.0	W	●	●	0.02-0.05
EC-B3 05-06C06E57	5.00	6.00	6.00	54.00	3	45.0	5.0	C	●	●	0.02-0.06
EC-B3 06-07W06E54	6.00	6.00	7.00	54.00	3	45.0	5.0	W	●	●	0.03-0.07
EC-B3 07-08W08E58	7.00	8.00	8.00	58.00	3	45.0	5.0	W	●	●	0.03-0.08
EC-B3 08-09W08E58	8.00	8.00	9.00	58.00	3	45.0	5.0	W	●	●	0.03-0.09
EC-B3 09-10W10E66	9.00	10.00	10.00	66.00	3	45.0	5.0	W	●	●	0.03-0.09
EC-B3 10-11W10E66	10.00	10.00	11.00	66.00	3	45.0	5.0	W	●	●	0.03-0.10
EC-B3 12-12W12E73	12.00	12.00	12.00	73.00	3	45.0	5.0	W	●	●	0.04-0.11
EC-B3 14-14W14E75	14.00	14.00	14.00	75.00	3	45.0	5.0	W	●	●	0.04-0.12
EC-B3 16-16W16E82	16.00	16.00	16.00	82.00	3	45.0	5.0	W	●	●	0.05-0.13
EC-B3 18-18W18E84	18.00	18.00	18.00	84.00	3	45.0	5.0	W	●	●	0.05-0.13
EC-B3 20-20W20E92	20.00	20.00	20.00	92.00	3	45.0	5.0	W	●	●	0.05-0.13

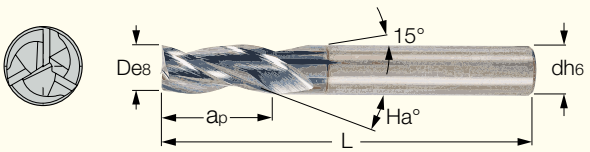
• For user guide, see pages C72-83.

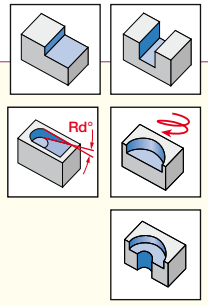
(1) C-Cylindrical, W-Weldon

SOLIDMILL
PREMIUM LINE

EC-E-3

3 Flute, 38° Helix Medium Length Solid Carbide Endmills





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank[1]	Tough ↔ Hard IC08	IC300	IC900	Recommended Machining Data fz (mm/t)
EC010E025-3C03	1.00	3.00	2.50	38.00	3	38.0	5.0	C		●	●	0.01-0.01
EC015E04-3C04	1.50	4.00	4.00	50.00	3	38.0	5.0	C		●	●	0.01-0.02
EC025E07-3C03	2.50	3.00	7.00	38.00	3	38.0	5.0	C			●	0.01-0.03
EC030E10-3C03	3.00	3.00	10.00	38.00	3	38.0	5.0	C	●	●	●	0.01-0.04
EC030E10-3C06	3.00	6.00	10.00	57.00	3	38.0	5.0	C		●	●	0.01-0.04
EC035E12-3C04	3.50	4.00	12.00	50.00	3	38.0	5.0	C	●	●	●	0.01-0.04
EC040E12-3C04	4.00	4.00	12.00	50.00	3	38.0	5.0	C	●	●	●	0.02-0.05
EC040E12-3C06	4.00	6.00	12.00	57.00	3	38.0	5.0	C			●	0.02-0.05
EC045E14-3C06	4.50	6.00	14.00	57.00	3	38.0	5.0	C	●	●	●	0.02-0.05
EC050E14-3C05	5.00	5.00	14.00	50.00	3	38.0	5.0	C	●	●	●	0.02-0.06
EC050E14-3C06	5.00	6.00	14.00	57.00	3	38.0	5.0	C			●	0.02-0.06
EC050E14-3W06	5.00	6.00	14.00	57.00	3	38.0	5.0	W			●	0.02-0.06
EC060E16-3C06	6.00	6.00	16.00	57.00	3	38.0	5.0	C	●	●	●	0.03-0.07
EC060E16-3W06	6.00	6.00	16.00	57.00	3	38.0	5.0	W			●	0.03-0.07
EC070E20-3C07	7.00	7.00	20.00	60.00	3	38.0	5.0	C	●	●	●	0.03-0.08
EC080E20-3C08	8.00	8.00	20.00	63.00	3	38.0	5.0	C	●	●	●	0.03-0.09
EC080E20-3W08	8.00	8.00	20.00	63.00	3	38.0	5.0	W		●	●	0.03-0.09
EC100E22-3C10	10.00	10.00	22.00	72.00	3	38.0	5.0	C	●	●	●	0.03-0.10
EC100E22-3W10	10.00	10.00	22.00	72.00	3	38.0	5.0	W		●	●	0.03-0.10
EC120E25-3C12	12.00	12.00	25.00	73.00	3	38.0	5.0	C	●	●	●	0.04-0.11
EC120E25-3W12	12.00	12.00	25.00	83.00	3	38.0	5.0	W		●	●	0.04-0.11
EC140E25-3C14	14.00	14.00	25.00	83.00	3	38.0	5.0	C			●	0.04-0.12
EC140E25-3W14	14.00	14.00	25.00	83.00	3	38.0	5.0	W			●	0.04-0.12
EC160E32-3C16	16.00	16.00	32.00	92.00	3	38.0	5.0	C	●		●	0.05-0.13
EC160E32-3W16	16.00	16.00	32.00	92.00	3	38.0	5.0	W			●	0.05-0.13
EC180E32-3C18	18.00	18.00	32.00	92.00	3	38.0	5.0	C			●	0.05-0.13
EC180E32-3W18	18.00	18.00	32.00	92.00	3	38.0	5.0	W			●	0.05-0.13
EC200E38-3C20	20.00	20.00	38.00	104.00	3	38.0	5.0	C			●	0.05-0.13
EC200E38-3W20	20.00	20.00	38.00	104.00	3	38.0	5.0	W			●	0.05-0.13

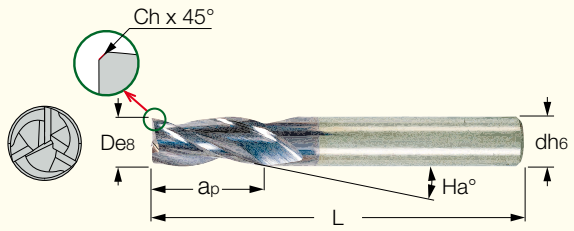
• Multi-purpose endmill. • Suitable for deep slotting. • For user guide, see pages C72-83.

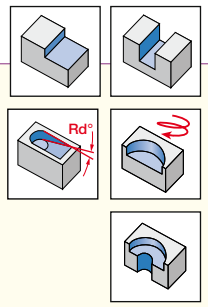
[1] C-Cylindrical, W-Weldon

SOLIDMILL
PREMIUM LINE

ECC-E-3

3 Flute, 38° Helix Medium Length Slot / Drill Solid Carbide Endmills with Chamfered Corners





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	Ch	Tough ↔ Hard IC300	IC900	Recommended Machining Data fz (mm/t)
ECC020B07-3C03	2.00	3.00	7.00	38.00	3	45.0	5.0	C	0.10	●		0.01-0.03
ECC025E07-3C03	2.50	3.00	7.00	38.00	3	38.0	5.0	C	0.10	●		0.01-0.03
ECC030E10-3C03	3.00	3.00	10.00	38.00	3	38.0	5.0	C	0.10	●	●	0.01-0.04
ECC035E12-3C04	3.50	4.00	12.00	50.00	3	38.0	5.0	C	0.10		●	0.01-0.04
ECC040E12-3C04	4.00	4.00	12.00	50.00	3	38.0	5.0	C	0.15	●	●	0.02-0.05
ECC050E14-3C05	5.00	5.00	14.00	50.00	3	38.0	5.0	C	0.15	●	●	0.02-0.06
ECC060E16-3C06	6.00	6.00	16.00	57.00	3	38.0	5.0	C	0.15	●	●	0.03-0.07
ECC060E16-3W06	6.00	6.00	16.00	57.00	3	38.0	5.0	W	0.15		●	0.03-0.07
ECC080E20-3C08	8.00	8.00	20.00	63.00	3	38.0	5.0	C	0.15	●	●	0.03-0.09
ECC080E20-3W08	8.00	8.00	20.00	63.00	3	38.0	5.0	W	0.15	●	●	0.03-0.09
ECC100E22-3C10	10.00	10.00	22.00	72.00	3	38.0	5.0	C	0.25	●	●	0.03-0.10
ECC100E22-3W10	10.00	10.00	22.00	72.00	3	38.0	5.0	W	0.25		●	0.03-0.10
ECC120E25-3C12	12.00	12.00	25.00	83.00	3	38.0	5.0	C	0.25	●	●	0.04-0.11
ECC120E25-3W12	12.00	12.00	25.00	83.00	3	38.0	5.0	W	0.25	●	●	0.04-0.11
ECC160A32-3W16	16.00	16.00	32.00	92.00	3	38.0	5.0	W	0.25	●		0.05-0.13
ECC160E32-3C16	16.00	16.00	32.00	92.00	3	38.0	5.0	C	0.25		●	0.05-0.13
ECC160E32-3W16	16.00	16.00	32.00	92.00	3	38.0	5.0	W	0.25		●	0.05-0.13
ECC200E38-3C20	20.00	20.00	38.00	104.00	3	38.0	5.0	C	0.25	●	●	0.05-0.13
ECC200E38-3W20	20.00	20.00	38.00	104.00	3	38.0	5.0	W	0.25		●	0.05-0.13

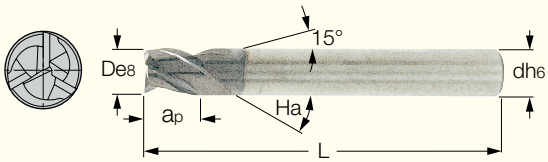
• Multi-purpose endmill • Suitable for deep slotting • For user guide, see pages C72-83.

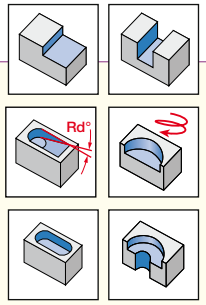
(1) C-Cylindrical, W-Weldon

SOLIDMILL
PREMIUM LINE

ECU-E-3

3 Flute, 38° Helix Short Undersized Slot / Drill Solid Carbide Endmills





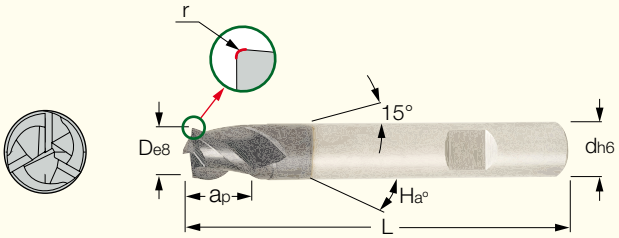
Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	IC900	Recommended Machining Data fz (mm/t)
ECU028E04-3W06-57	2.80	6.00	4.00	57.00	3	38.0	5.0	W	●	0.01-0.04
ECU038E05-3W06-57	3.80	6.00	5.00	57.00	3	38.0	5.0	W	●	0.01-0.04
ECU048E06-3W06-57	4.80	6.00	6.00	57.00	3	38.0	5.0	W	●	0.02-0.05
ECU057E07-3W06-57	5.70	6.00	7.00	57.00	3	38.0	5.0	W	●	0.02-0.06
ECU067E08-3W08-63	6.70	8.00	8.00	63.00	3	38.0	5.0	W	●	0.03-0.07
ECU077E09-3W08-63	7.70	8.00	9.00	63.00	3	38.0	5.0	W	●	0.03-0.08
ECU097E11-3W10-72	9.70	10.00	11.00	72.00	3	38.0	5.0	W	●	0.03-0.09
ECU117E12-3W12-73	11.70	12.00	12.00	73.00	3	38.0	5.0	W	●	0.03-0.10
ECU137E16-3W14-83	13.70	14.00	14.00	83.00	3	38.0	5.0	W	●	0.04-0.11
ECU157E16-3W16-92	15.70	16.00	16.00	92.00	3	38.0	5.0	W	●	0.04-0.12
ECU177E18-3W18-92	17.70	18.00	18.00	92.00	3	38.0	5.0	W	●	0.05-0.13
ECU197E20-3W20-104	19.70	20.00	20.00	104.00	3	38.0	5.0	W	●	0.05-0.13

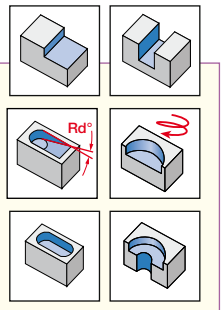
• Undersized short design for keyholes • For user guide, see pages C72-83.

(1) W-Weldon

ECU-E-3-R

3 Flute, 38° Helix Short Undersized Slot / Drill Solid Carbide Endmills
with Various Radii According to DIN 6885





Designation	Dimensions D	d	a_p	r	L	Flute	H_a°	R_d°	Shank(1)	IC900	Recommended Machining Data fz (mm/t)
ECU038E05-3W06R01L57	3.80	6.00	5.00	0.10	57.00	3	38.0	5.0	W	●	0.01-0.04
ECU048E06-3W06R02L57	4.80	6.00	6.00	0.20	57.00	3	38.0	5.0	W	●	0.02-0.05
ECU057E07-3W06R02L57	5.70	6.00	7.00	0.20	57.00	3	38.0	5.0	W	●	0.02-0.06
ECU077E09-3W08R02L63	7.70	8.00	9.00	0.20	63.00	3	38.0	5.0	W	●	0.03-0.08
ECU097E11-3W10R03L72	9.70	10.00	11.00	0.30	72.00	3	38.0	5.0	W	●	0.03-0.09
ECU117E12-3W12R03L83	11.70	12.00	12.00	0.30	83.00	3	38.0	5.0	W	●	0.03-0.10

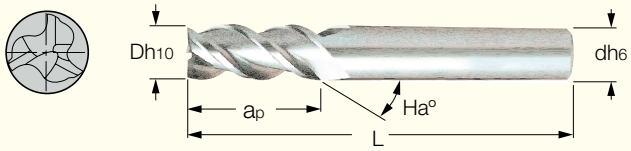
• For user guide, see pages C72-83.

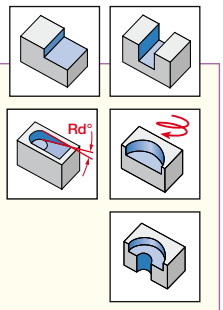
(1) W-Weldon

SOLIDMILL
TEC LINE

EC-B3 (Economical-Medium)

Economical Type 3 Flute, 45° Helix Center Cutting Medium Length Solid Carbide Endmills





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	Tough ↔ Hard IC08	IC900	Recommended Machining Data fz (mm/t)
EC-B3 03-08C06E50	3.00	6.00	8.00	50.00	3	45.0	5.0	C	●	●	0.01-0.04
EC-B3 04-11C06E50	4.00	6.00	11.00	50.00	3	45.0	5.0	C	●	●	0.02-0.05
EC-B3 05-13C06E50	5.00	6.00	13.00	50.00	3	45.0	5.0	C	●	●	0.02-0.06
EC-B3 06-13C06E50	6.00	6.00	13.00	50.00	3	45.0	5.0	C	●	●	0.03-0.07
EC-B3 08-19C08E63	8.00	8.00	19.00	63.00	3	45.0	5.0	C	●	●	0.03-0.09
EC-B3 10-22C10E72	10.00	10.00	22.00	72.00	3	45.0	5.0	C	●	●	0.03-0.10
EC-B3 12-26C12E73	12.00	12.00	26.00	73.00	3	45.0	5.0	C	●	●	0.04-0.11
EC-B3 14-26C14E75	14.00	14.00	26.00	75.00	3	45.0	5.0	C	●	●	0.04-0.12
EC-B3 16-25C16E75	16.00	16.00	25.00	75.00	3	45.0	5.0	C	●	●	0.05-0.13
EC-B3 20-32C20E100	20.00	20.00	32.00	100.00	3	45.0	5.0	C	●	●	0.05-0.13

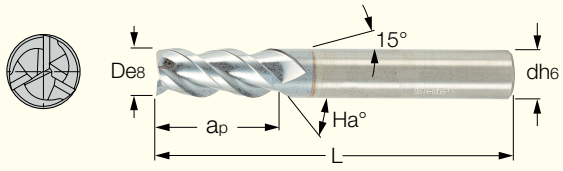
• For user guide, see pages C72-83.

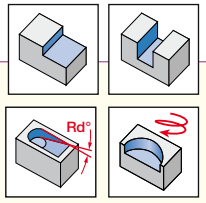
(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EC-B-3

3 Flute, 45° Helix Medium Length Slot / Drill Solid Carbide Endmills





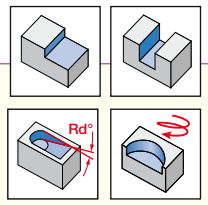
Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank[1]	Tough ↔ Hard IC08	IC300	IC900	Recommended Machining Data fz (mm/t)
EC020B07-3C03	2.00	3.00	7.00	38.00	3	45.0	5.0	C	●	●	●	0.01-0.03
EC020B07-3C06	2.00	6.00	7.00	57.00	3	45.0	5.0	C		●	●	0.01-0.03
EC025B07-3C03	2.50	3.00	7.00	38.00	3	45.0	5.0	C	●		●	0.01-0.03
EC030B10-3C03	3.00	3.00	10.00	38.00	3	45.0	5.0	C		●	●	0.01-0.04
EC030B10-3C06	3.00	6.00	10.00	57.00	3	45.0	5.0	C		●	●	0.01-0.04
EC040B12-3C04	4.00	4.00	12.00	50.00	3	45.0	5.0	C		●	●	0.02-0.05
EC040B12-3C06	4.00	6.00	12.00	57.00	3	45.0	5.0	C		●	●	0.02-0.05
EC050B14-3C05	5.00	5.00	14.00	50.00	3	45.0	5.0	C		●	●	0.02-0.06
EC050B14-3C06	5.00	6.00	14.00	57.00	3	45.0	5.0	C		●	●	0.02-0.06
EC060B16-3C06	6.00	6.00	16.00	57.00	3	45.0	5.0	C		●	●	0.03-0.07
EC060B16-3W06	6.00	6.00	16.00	57.00	3	45.0	5.0	W			●	0.03-0.07
EC070B16-3C07	7.00	7.00	16.00	60.00	3	45.0	5.0	C		●	●	0.03-0.08
EC080B20-3C08	8.00	8.00	20.00	63.00	3	45.0	5.0	C		●	●	0.03-0.09
EC080B20-3W08	8.00	8.00	20.00	63.00	3	45.0	5.0	W			●	0.03-0.09
EC090B20-3C09	9.00	9.00	20.00	67.00	3	45.0	5.0	C		●	●	0.03-0.09
EC100B22-3C10	10.00	10.00	22.00	72.00	3	45.0	5.0	C		●	●	0.03-0.10
EC100B22-3W10	10.00	10.00	22.00	72.00	3	45.0	5.0	W		●	●	0.03-0.10
EC120B25-3C12	12.00	12.00	25.00	83.00	3	45.0	5.0	C		●	●	0.04-0.11
EC120B25-3W12	12.00	12.00	25.00	83.00	3	45.0	5.0	W		●	●	0.04-0.11
EC140B25-3C14	14.00	14.00	25.00	83.00	3	45.0	5.0	C		●	●	0.04-0.12
EC140B25-3W14	14.00	14.00	25.00	83.00	3	45.0	5.0	W			●	0.04-0.12
EC160B32-3C16	16.00	16.00	32.00	92.00	3	45.0	5.0	C		●	●	0.05-0.13
EC160B32-3W16	16.00	16.00	32.00	92.00	3	45.0	5.0	W		●	●	0.05-0.13
EC180B32-3C18	18.00	18.00	32.00	92.00	3	45.0	5.0	C			●	0.05-0.13
EC180B32-3W18	18.00	18.00	32.00	92.00	3	45.0	5.0	W			●	0.05-0.13
EC200B38-3C20	20.00	20.00	38.00	104.00	3	45.0	5.0	C		●	●	0.05-0.13
EC200B38-3W20	20.00	20.00	38.00	104.00	3	45.0	5.0	W		●	●	0.05-0.13

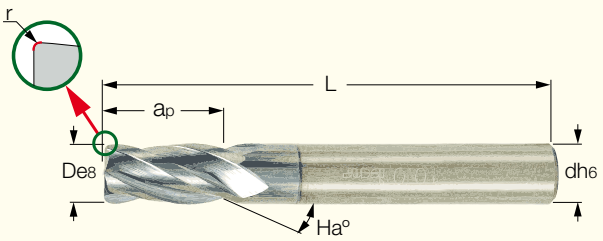
• Excellent for deep slotting and shouldering. • For user guide, see pages C72-83.

[1] C-Cylindrical, W-Weldon

EC-B-3...R

3 Flute, 45° Helix Medium Length Slot / Drill Solid Carbide Endmills with Various Radii





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	r	IC900	Recommended Machining Data fz (mm/t)
EC060B13-3C06R0.5	6.00	6.00	13.00	57.00	3	45.0	5.0	C	0.50	●	0.03-0.07
EC060B13-3C06R1.0	6.00	6.00	13.00	57.00	3	45.0	5.0	C	1.00	●	0.03-0.07
EC080B20-3C08R1	8.00	8.00	20.00	63.00	3	45.0	5.0	C	1.00	●	0.03-0.09
EC080B20-3C08R1.5	8.00	8.00	20.00	63.00	3	45.0	5.0	C	1.50	●	0.03-0.09
EC080B20-3C08R2	8.00	8.00	20.00	63.00	3	45.0	5.0	C	2.00	●	0.03-0.09
EC080B20-3C080R0.5	8.00	8.00	20.00	63.00	3	45.0	5.0	C	0.50	●	0.03-0.09
EC100B22-3C10R0.5	10.00	10.00	22.00	72.00	3	45.0	5.0	C	0.50	●	0.03-0.10
EC100B22-3C10R1	10.00	10.00	22.00	72.00	3	45.0	5.0	C	1.00	●	0.03-0.10
EC100B22-3C10R1.5	10.00	10.00	22.00	72.00	3	45.0	5.0	C	1.50	●	0.03-0.10
EC100B22-3C10R2	10.00	10.00	22.00	72.00	3	45.0	5.0	C	2.00	●	0.03-0.10
EC100B22-3C10R3	10.00	10.00	22.00	72.00	3	45.0	5.0	C	3.00	●	0.03-0.10
EC120B25-3C12R0.5	12.00	12.00	25.00	83.00	3	45.0	5.0	C	0.50	●	0.04-0.11
EC120B25-3C12R1	12.00	12.00	25.00	83.00	3	45.0	5.0	C	1.00	●	0.04-0.11
EC120B25-3C12R1.5	12.00	12.00	25.00	83.00	3	45.0	5.0	C	1.50	●	0.04-0.11
EC120B25-3C12R2	12.00	12.00	25.00	83.00	3	45.0	5.0	C	2.00	●	0.04-0.11
EC120B25-3C12R3	12.00	12.00	25.00	83.00	3	45.0	5.0	C	3.00	●	0.04-0.11
EC160B32-3C16R0.5	16.00	16.00	32.00	92.00	3	45.0	5.0	C	0.50	●	0.05-0.13
EC160B32-3C16R1	16.00	16.00	32.00	92.00	3	45.0	5.0	C	1.00	●	0.05-0.13
EC160B32-3C16R2	16.00	16.00	32.00	92.00	3	45.0	5.0	C	2.00	●	0.05-0.13
EC160B32-3C16R3	16.00	16.00	32.00	92.00	3	45.0	5.0	C	3.00	●	0.05-0.13
EC200B38-3C20R0.5	20.00	20.00	38.00	104.00	3	45.0	5.0	C	0.50	●	0.05-0.13
EC200B38-3C20R1	20.00	20.00	38.00	104.00	3	45.0	5.0	C	1.00	●	0.05-0.13
EC200B38-3C20R2	20.00	20.00	38.00	104.00	3	45.0	5.0	C	2.00	●	0.05-0.13
EC200B38-3C20R3	20.00	20.00	38.00	104.00	3	45.0	5.0	C	3.00	●	0.05-0.13
EC200B38-3C20R4	20.00	20.00	38.00	104.00	3	45.0	5.0	C	4.00	●	0.05-0.13

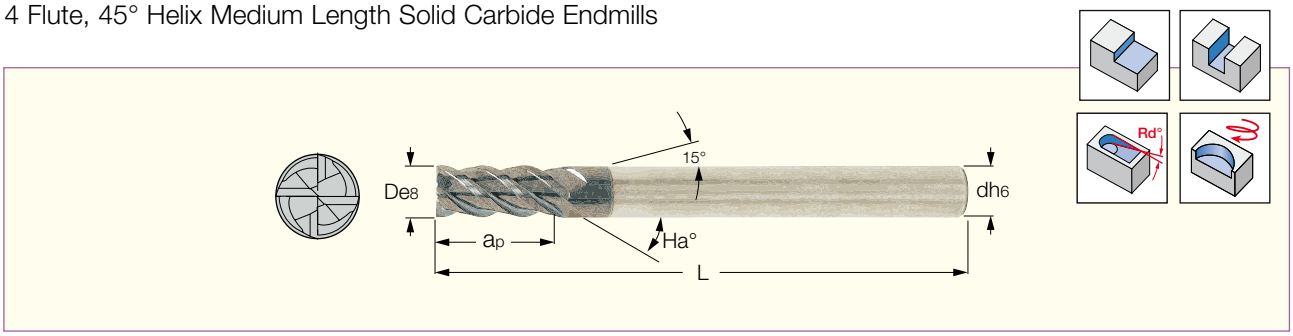
• For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EC-B-4

4 Flute, 45° Helix Medium Length Solid Carbide Endmills



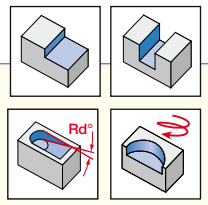
Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	IC900	Recommended Machining Data fz (mm/t)
EC020B07-4C03	2.00	3.00	7.00	38.00	4	45.0	5.0	C	●	0.01-0.03
EC020B07-4C06	2.00	6.00	7.00	57.00	4	45.0	5.0	C	●	0.01-0.03
EC030B10-4C03	3.00	3.00	10.00	38.00	4	45.0	5.0	C	●	0.01-0.04
EC030B10-4C06	3.00	6.00	10.00	57.00	4	45.0	5.0	C	●	0.01-0.04
EC040B12-4C04	4.00	4.00	12.00	50.00	4	45.0	5.0	C	●	0.02-0.05
EC040B12-4C06	4.00	6.00	12.00	57.00	4	45.0	5.0	C	●	0.02-0.05
EC050B14-4C05	5.00	5.00	14.00	50.00	4	45.0	5.0	C	●	0.02-0.06
EC050B14-4C06	5.00	6.00	14.00	57.00	4	45.0	5.0	C	●	0.02-0.06
EC060B16-4C06	6.00	6.00	16.00	57.00	4	45.0	5.0	C	●	0.03-0.07
EC060B16-4W06	6.00	6.00	16.00	57.00	4	45.0	5.0	W	●	0.03-0.07
EC070B16-4C07	7.00	7.00	16.00	60.00	4	45.0	5.0	C	●	0.03-0.08
EC080B20-4C08	8.00	8.00	20.00	63.00	4	45.0	5.0	C	●	0.03-0.09
EC080B20-4W08	8.00	8.00	20.00	63.00	4	45.0	5.0	W	●	0.03-0.09
EC090B20-4C09	9.00	9.00	20.00	67.00	4	45.0	5.0	C	●	0.03-0.09
EC100B22-4C10	10.00	10.00	22.00	72.00	4	45.0	5.0	C	●	0.03-0.10
EC100B22-4W10	10.00	10.00	22.00	72.00	4	45.0	5.0	W	●	0.03-0.10
EC120B25-4C12	12.00	12.00	25.00	83.00	4	45.0	5.0	C	●	0.04-0.11
EC120B25-4W12	12.00	12.00	25.00	83.00	4	45.0	5.0	W	●	0.04-0.11
EC140B25-4C14	14.00	14.00	25.00	83.00	4	45.0	5.0	C	●	0.04-0.12
EC140B25-4W14	14.00	14.00	25.00	83.00	4	45.0	5.0	W	●	0.04-0.12
EC160B32-4C16	16.00	16.00	32.00	92.00	4	45.0	5.0	C	●	0.05-0.13
EC160B32-4W16	16.00	16.00	32.00	92.00	4	45.0	5.0	W	●	0.05-0.13
EC180B32-4C18	18.00	18.00	32.00	92.00	4	45.0	5.0	C	●	0.05-0.13
EC200B38-4C20	20.00	20.00	38.00	104.00	4	45.0	5.0	C	●	0.05-0.13
EC200B38-4W20	20.00	20.00	38.00	104.00	4	45.0	5.0	W	●	0.05-0.13

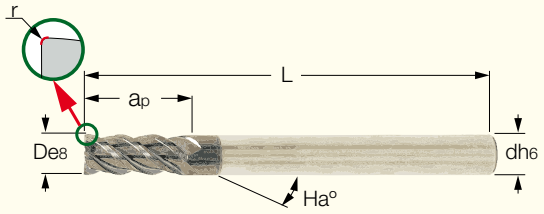
• For user guide, see pages C72-83..

(1) C-Cylindrical, W-Weldon

EC-B-4...R

4 Flute, 45° Helix Medium Length Solid Carbide Endmills with Various Radii





Designation	Dimensions									IC900	Recommended Machining Data
	D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	r		fz (mm/t)
EC060B16-4C06R0.5	6.00	6.00	16.00	57.00	4	45.0	5.0	C	0.50	●	0.03-0.07
EC060B16-4C06R1	6.00	6.00	16.00	57.00	4	45.0	5.0	C	1.00	●	0.03-0.07
EC080B20-4C08R0.5	8.00	8.00	20.00	63.00	4	45.0	5.0	C	0.50	●	0.03-0.09
EC080B20-4C08R1	8.00	8.00	20.00	63.00	4	45.0	5.0	C	1.00	●	0.03-0.09
EC080B20-4C08R1.5	8.00	8.00	20.00	63.00	4	45.0	5.0	C	1.50	●	0.03-0.09
EC080B20-4C08R2	8.00	8.00	20.00	63.00	4	45.0	5.0	C	2.00	●	0.03-0.09
EC100B22-4C10R0.5	10.00	10.00	22.00	72.00	4	45.0	5.0	C	0.50	●	0.03-0.10
EC100B22-4C10R1	10.00	10.00	22.00	72.00	4	45.0	5.0	C	1.00	●	0.03-0.10
EC100B22-4C10R1.5	10.00	10.00	22.00	72.00	4	45.0	5.0	C	1.50	●	0.03-0.10
EC100B22-4C10R2	10.00	10.00	22.00	72.00	4	45.0	5.0	C	2.00	●	0.03-0.10
EC100B22-4C10R3	10.00	10.00	22.00	72.00	4	45.0	5.0	C	3.00	●	0.03-0.10
EC120B25-4C12R0.5	12.00	12.00	25.00	83.00	4	45.0	5.0	C	0.50	●	0.04-0.11
EC120B25-4C12R1	12.00	12.00	25.00	83.00	4	45.0	5.0	C	1.00	●	0.04-0.11
EC120B25-4C12R1.5	12.00	12.00	25.00	83.00	4	45.0	5.0	C	1.50	●	0.04-0.11
EC120B25-4C12R2	12.00	12.00	25.00	83.00	4	45.0	5.0	C	2.00	●	0.04-0.11
EC120B25-4C12R3	12.00	12.00	25.00	83.00	4	45.0	5.0	C	3.00	●	0.04-0.11
EC160B32-4C16R0.5	16.00	16.00	32.00	92.00	4	45.0	5.0	C	0.50	●	0.05-0.13
EC160B32-4C16R1	16.00	16.00	32.00	92.00	4	45.0	5.0	C	1.00	●	0.05-0.13
EC160B32-4C16R1.5	16.00	16.00	32.00	92.00	4	45.0	5.0	C	1.50	●	0.05-0.13
EC160B32-4C16R2	16.00	16.00	32.00	92.00	4	45.0	5.0	C	2.00	●	0.05-0.13
EC160B32-4C16R2.5	16.00	16.00	32.00	92.00	4	45.0	5.0	C	2.50	●	0.05-0.13
EC160B32-4C16R3	16.00	16.00	32.00	92.00	4	45.0	5.0	C	3.00	●	0.05-0.13
EC200B38-4C20R0.5	20.00	20.00	38.00	104.00	4	45.0	5.0	C	0.50	●	0.05-0.13
EC200B38-4C20R1	20.00	20.00	38.00	104.00	4	45.0	5.0	C	1.00	●	0.05-0.13
EC200B38-4C20R1.5	20.00	20.00	38.00	104.00	4	45.0	5.0	C	1.50	●	0.05-0.13
EC200B38-4C20R2	20.00	20.00	38.00	104.00	4	45.0	5.0	C	2.00	●	0.05-0.13
EC200B38-4C20R2.5	20.00	20.00	38.00	104.00	4	45.0	5.0	C	2.50	●	0.05-0.13
EC200B38-4C20R3	20.00	20.00	38.00	104.00	4	45.0	5.0	C	3.00	●	0.05-0.13
EC200B38-4C20R4	20.00	20.00	38.00	104.00	4	45.0	5.0	C	4.00	●	0.05-0.13
EC200B38-4C20R5	20.00	20.00	38.00	104.00	4	45.0	5.0	C	5.00	●	0.05-0.13

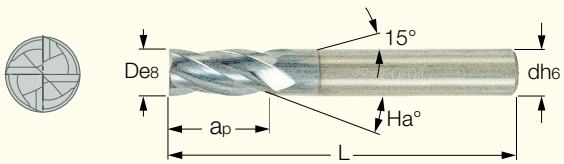
• For user guide, see pages C72-83.

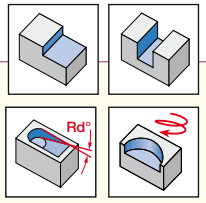
(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EC-A-4

4 Flute, 30° Helix Medium Length Solid Carbide Endmills





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank[1]	Tough ↔ Hard IC08	IC300	IC900	Recommended Machining Data fz (mm/t)
EC020A07-4C03	2.00	3.00	7.00	38.00	4	30.0	5.0	C		●	●	0.01-0.03
EC025A07-4C03	2.50	3.00	7.00	38.00	4	30.0	5.0	C			●	0.01-0.03
EC030A10-4C03	3.00	3.00	10.00	38.00	4	30.0	5.0	C		●	●	0.01-0.04
EC030A10-4C06	3.00	6.00	10.00	57.00	4	30.0	5.0	C			●	0.01-0.04
EC035A12-4C04	3.50	4.00	12.00	50.00	4	30.0	5.0	C			●	0.01-0.04
EC040A12-4C04	4.00	4.00	12.00	50.00	4	30.0	5.0	C		●	●	0.02-0.05
EC040A12-4C06	4.00	6.00	12.00	57.00	4	30.0	5.0	C			●	0.02-0.05
EC045A14-4C06	4.50	6.00	14.00	57.00	4	30.0	5.0	C			●	0.02-0.05
EC050A14-4C05	5.00	5.00	14.00	50.00	4	30.0	5.0	C		●	●	0.02-0.06
EC050A14-4C06	5.00	6.00	14.00	57.00	4	30.0	5.0	C			●	0.02-0.06
EC060A16-4C06	6.00	6.00	16.00	57.00	4	30.0	5.0	C	●	●	●	0.03-0.07
EC060A16-4W06	6.00	6.00	16.00	57.00	4	30.0	5.0	W			●	0.03-0.07
EC070A20-4C07	7.00	7.00	20.00	60.00	4	30.0	5.0	C			●	0.03-0.08
EC075A20-4C08	7.50	8.00	20.00	63.00	4	30.0	5.0	C			●	0.03-0.08
EC080A20-4C08	8.00	8.00	20.00	63.00	4	30.0	5.0	C	●	●	●	0.03-0.09
EC080A20-4W08	8.00	8.00	20.00	63.00	4	30.0	5.0	W			●	0.03-0.09
EC100A22-4C10	10.00	10.00	22.00	72.00	4	30.0	5.0	C	●	●	●	0.03-0.10
EC100A22-4W10	10.00	10.00	22.00	72.00	4	30.0	5.0	W			●	0.03-0.10
EC120A25-4C12	12.00	12.00	25.00	83.00	4	30.0	5.0	C	●	●	●	0.04-0.11
EC120A25-4W12	12.00	12.00	25.00	83.00	4	30.0	5.0	W			●	0.04-0.11
EC140A25-4C14	14.00	14.00	25.00	83.00	4	30.0	5.0	C	●		●	0.04-0.12
EC140A32-4C14	14.00	14.00	32.00	83.00	4	30.0	5.0	C		●	●	0.04-0.12
EC160A32-4C16	16.00	16.00	32.00	92.00	4	30.0	5.0	C	●	●	●	0.05-0.13
EC160A32-4W16	16.00	16.00	32.00	92.00	4	30.0	5.0	W			●	0.05-0.13
EC160A40-4C16-92	16.00	16.00	40.00	92.00	4	30.0	5.0	C			●	0.05-0.13
EC180A32-4C18	18.00	18.00	32.00	92.00	4	30.0	5.0	C			●	0.05-0.13
EC200A38-4C20	20.00	20.00	38.00	104.00	4	30.0	5.0	C			●	0.05-0.13
EC200A38-4W20	20.00	20.00	38.00	104.00	4	30.0	5.0	W			●	0.05-0.13

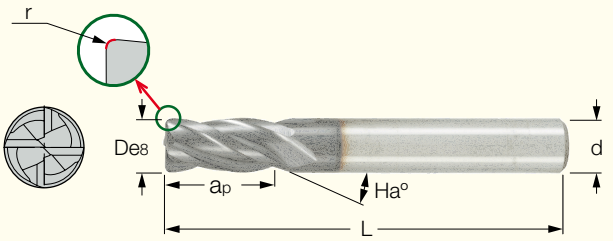
• For user guide, see pages C72-83.

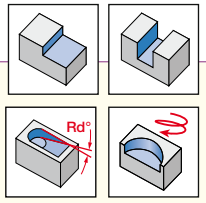
[1] C-Cylindrical, W-Weldon

SOLIDMILL
PREMIUM LINE

EC-A-4...R

4 Flute, 30° Helix Medium Length Solid Carbide Endmills with Various Radii





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	r	IC900	Recommended Machining Data fz (mm/t)
EC030A10-4C03R0.6	3.00	3.00	10.00	38.00	4	30.0	5.0	C	0.60	●	0.01-0.04
EC030A10-4C03R0.8	3.00	3.00	10.00	38.00	4	30.0	5.0	C	0.80	●	0.01-0.04
EC030A10-4C04R0.4	3.00	4.00	10.00	50.00	4	30.0	5.0	C	0.40	●	0.01-0.04
EC035A12-4C04R0.4	3.50	4.00	12.00	50.00	4	30.0	5.0	C	0.40	●	0.01-0.04
EC040A07-4C04R0.4	4.00	4.00	7.00	50.00	4	30.0	5.0	C	0.40	●	0.02-0.05
EC040A10-4C04R1.0	4.00	4.00	10.00	50.00	4	30.0	5.0	C	1.00	●	0.02-0.05
EC040A12-4C04R0.4	4.00	4.00	12.00	50.00	4	30.0	5.0	C	0.40	●	0.02-0.05
EC040A12-4C04R0.8	4.00	4.00	12.00	50.00	4	30.0	5.0	C	0.80	●	0.02-0.05
EC050A14-4C05R0.5	5.00	5.00	14.00	50.00	4	30.0	5.0	C	0.50	●	0.02-0.06
EC050A20-4C05R0.8	5.00	5.00	20.00	50.00	4	30.0	5.0	C	0.80	●	0.02-0.06
EC060A16-4C06R0.4	6.00	6.00	16.00	57.00	4	30.0	5.0	C	0.40	●	0.03-0.07
EC060A16-4C06R0.8	6.00	6.00	16.00	57.00	4	30.0	5.0	C	0.80	●	0.03-0.07
EC080A20-4C08R0.8	8.00	8.00	20.00	63.00	4	30.0	5.0	C	0.80	●	0.03-0.09

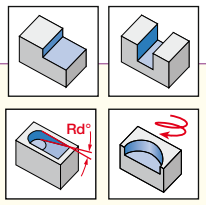
• For user guide, see pages C72-83.

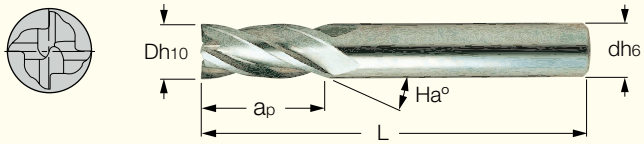
(1) C-Cylindrical

SOLIDMILL
TEC LINE

EC-A4 (Economical-Medium)

Economical Type 4 Flute, 30° Helix Center Cutting Medium Length Solid Carbide Endmills





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	Tough ↔ Hard IC08	IC900	Recommended Machining Data fz (mm/t)
EC-A4 02-08C02E32	2.00	2.00	8.00	32.00	4	30.0	5.0	C	●		0.01-0.03
EC-A4 025-08C025E32	2.50	2.50	8.00	32.00	4	30.0	5.0	C	●		0.01-0.03
EC-A4 03-12C03E38	3.00	3.00	12.00	38.00	4	30.0	5.0	C	●	●	0.01-0.04
EC-A4 035-12C035E32	3.50	3.50	12.00	32.00	4	30.0	5.0	C	●		0.01-0.04
EC-A4 04-12C04E50	4.00	4.00	12.00	50.00	4	30.0	5.0	C	●	●	0.02-0.05
EC-A4 045-14C045E50	4.50	4.50	14.00	50.00	4	30.0	5.0	C	●		0.02-0.05
EC-A4 05-14C05E50	5.00	5.00	14.00	50.00	4	30.0	5.0	C	●	●	0.02-0.06
EC-A4 055-16C055E50	5.50	5.50	16.00	50.00	4	30.0	5.0	C	●	●	0.02-0.06
EC-A4 06-16C06E50	6.00	6.00	16.00	50.00	4	30.0	5.0	C	●	●	0.03-0.07
EC-A4 07-20C07E60	7.00	7.00	20.00	60.00	4	30.0	5.0	C	●	●	0.03-0.08
EC-A4 08-20C08E63	8.00	8.00	20.00	63.00	4	30.0	5.0	C	●	●	0.03-0.09
EC-A4 09-20C09E60	9.00	9.00	20.00	60.00	4	30.0	5.0	C	●	●	0.03-0.09
EC-A4 10-22C10E72	10.00	10.00	22.00	72.00	4	30.0	5.0	C	●	●	0.03-0.10
EC-A4 12-22C12E73	12.00	12.00	22.00	73.00	4	30.0	5.0	C	●	●	0.04-0.11
EC-A4 14-25C14E83	14.00	14.00	25.00	83.00	4	30.0	5.0	C	●	●	0.04-0.12
EC-A4 16-25C16E82	16.00	16.00	25.00	82.00	4	30.0	5.0	C	●	●	0.05-0.13
EC-A4 20-32C20E104	20.00	20.00	32.00	104.00	4	30.0	5.0	C	●	●	0.05-0.13

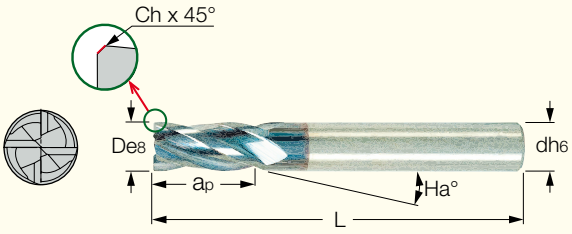
• For user guide, see pages C72-83.

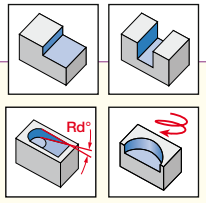
(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

ECC-A-4

4 Flute, 30° Helix Medium Length Solid Carbide Endmills with Chamfered Corners





Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank[1]	Ch	Tough ↔ Hard IC300	IC900	Recommended Machining Data fz (mm/t)
ECC020B07-4C03	2.00	3.00	7.00	38.00	4	45.0	5.0	C	0.10		●	0.01-0.03
ECC025A07-4C03	2.50	3.00	7.00	38.00	4	30.0	5.0	C	0.10		●	0.01-0.03
ECC030A10-4C03	3.00	3.00	10.00	38.00	4	30.0	5.0	C	0.10	●	●	0.01-0.04
ECC035A12-4C04	3.50	4.00	12.00	50.00	4	30.0	5.0	C	0.10		●	0.01-0.04
ECC040A12-4C04	4.00	4.00	12.00	50.00	4	30.0	5.0	C	0.15	●	●	0.02-0.05
ECC050A14-4C05	5.00	5.00	14.00	50.00	4	30.0	5.0	C	0.15		●	0.02-0.06
ECC060A16-4C06	6.00	6.00	16.00	57.00	4	30.0	5.0	C	0.15		●	0.03-0.07
ECC060A16-4W06	6.00	6.00	16.00	57.00	4	30.0	5.0	W	0.15		●	0.03-0.07
ECC080A20-4C08	8.00	8.00	20.00	63.00	4	30.0	5.0	C	0.15	●	●	0.03-0.09
ECC080A20-4W08	8.00	8.00	20.00	63.00	4	30.0	5.0	W	0.15		●	0.03-0.09
ECC100A22-4C10	10.00	10.00	22.00	72.00	4	30.0	5.0	C	0.25		●	0.03-0.10
ECC100A22-4W10	10.00	10.00	22.00	72.00	4	30.0	5.0	W	0.25		●	0.03-0.10
ECC120A25-4C12	12.00	12.00	25.00	83.00	4	30.0	5.0	C	0.25		●	0.04-0.11
ECC120A25-4W12	12.00	12.00	25.00	83.00	4	30.0	5.0	W	0.25		●	0.04-0.11
ECC160A32-4C16	16.00	16.00	32.00	92.00	4	30.0	5.0	C	0.25		●	0.05-0.13
ECC160A32-4W16	16.00	16.00	32.00	92.00	4	30.0	5.0	W	0.25		●	0.05-0.13
ECC200A38 4W20	20.00	20.00	38.00	104.00	4	30.0	5.0	W	0.25		●	0.05-0.13
ECC200A38-4C20	20.00	20.00	38.00	104.00	4	30.0	5.0	C	0.25		●	0.05-0.13
ECC200A38-4W20	20.00	20.00	38.00	104.00	4	30.0	5.0	W	0.25	●		0.05-0.13

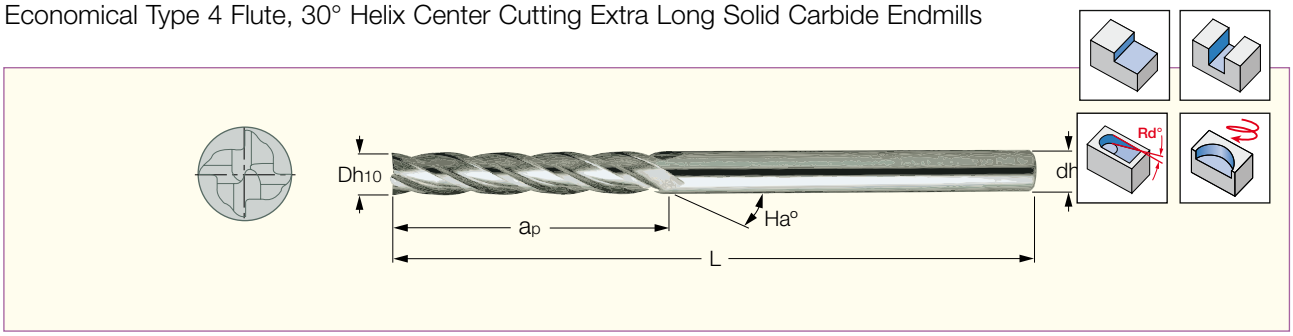
• For user guide, see pages C72-83.

[1] C-Cylindrical, W-Weldon

SOLIDMILL
TEC LINE

EC-A4(Economical-Extra Long)

Economical Type 4 Flute, 30° Helix Center Cutting Extra Long Solid Carbide Endmills



Designation	Dimensions								Tough ↔ Hard		Recommended Machining Data
	D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	IC08	IC900	fz (mm/t)
EC-A4 03-30C03E75	3.00	3.00	30.00	75.00	4	30.0	5.0	C	●	●	0.01-0.04
EC-A4 04-30C04E75	4.00	4.00	30.00	75.00	4	30.0	5.0	C	●	●	0.02-0.05
EC-A4 05-40C05E100	5.00	5.00	40.00	100.00	4	30.0	5.0	C	●	●	0.02-0.06
EC-A4 06-50C06E150	6.00	6.00	50.00	150.00	4	30.0	5.0	C	●	●	0.03-0.07
EC-A4 08-50C08E150	8.00	8.00	50.00	150.00	4	30.0	5.0	C	●	●	0.03-0.09
EC-A4 10-60C10E150	10.00	10.00	60.00	150.00	4	30.0	5.0	C	●	●	0.03-0.10
EC-A4 12-75C12E150	12.00	12.00	75.00	150.00	4	30.0	5.0	C	●	●	0.04-0.11
EC-A4 14-65C14E150	14.00	14.00	65.00	150.00	4	30.0	5.0	C	●	●	0.04-0.12
EC-A4 16-65C16E150	16.00	16.00	65.00	150.00	4	30.0	5.0	C	●	●	0.05-0.13
EC-A4 18-65C18E150	18.00	18.00	65.00	150.00	4	30.0	5.0	C	●	●	0.05-0.13
EC-A4 20-65C20E150	20.00	20.00	65.00	150.00	4	30.0	5.0	C	●	●	0.05-0.13

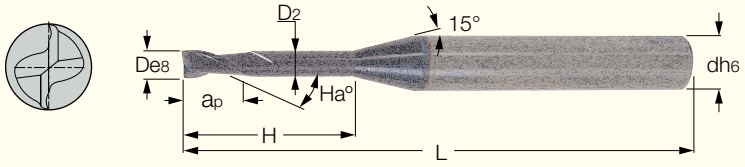
• For user guide, see pages C72-83.

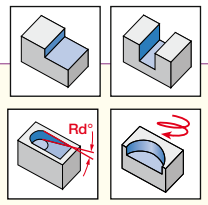
(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EC-A2 (Rib Processing)

2 Flute, 30° Helix Solid Carbide Endmills, for Rib Processing on Hard Materials up to 65 HRc





HARD MATERIALS

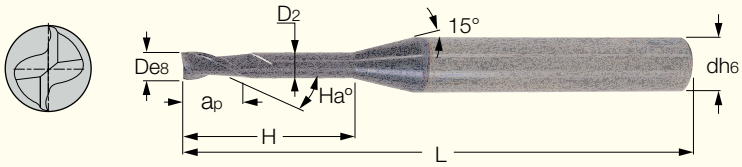
Designation	Dimensions										IC903	Recommended Machining Data
	D	d	a_p	H	L	D_2	Flute	H_a°	R_d°	Shank(1)		fz (mm/t)
EC-A2 004-006/02C4M45	0.40	4.00	0.60	2.00	45.00	0.37	2	30.0	3.0	C	●	0.01-0.01
EC-A2 004-006/03C4M45	0.40	4.00	0.60	3.00	45.00	0.37	2	30.0	3.0	C	●	0.01-0.01
EC-A2 004-006/04C4M45	0.40	4.00	0.60	4.00	45.00	0.37	2	30.0	3.0	C	●	0.01-0.01
EC-A2 004-006/05C4M45	0.40	4.00	0.60	5.00	45.00	0.37	2	30.0	3.0	C	●	0.01-0.01
EC-A2 005-007/02C4M45	0.50	4.00	0.70	2.00	45.00	0.45	2	30.0	3.0	C	●	0.01-0.01
EC-A2 005-007/04C4M45	0.50	4.00	0.70	4.00	45.00	0.45	2	30.0	3.0	C	●	0.01-0.01
EC-A2 005-007/06C4M45	0.50	4.00	0.70	6.00	45.00	0.45	2	30.0	3.0	C	●	0.01-0.01
EC-A2 005-007/08C4M45	0.50	4.00	0.70	8.00	45.00	0.45	2	30.0	3.0	C	●	0.01-0.01
EC-A2 006-009/02C4M45	0.60	4.00	0.90	2.00	45.00	0.55	2	30.0	3.0	C	●	0.01-0.02
EC-A2 006-009/04C4M45	0.60	4.00	0.90	4.00	45.00	0.55	2	30.0	3.0	C	●	0.01-0.02
EC-A2 006-009/06C4M45	0.60	4.00	0.90	6.00	45.00	0.55	2	30.0	3.0	C	●	0.01-0.02
EC-A2 006-009/08C4M45	0.60	4.00	0.90	8.00	45.00	0.55	2	30.0	3.0	C	●	0.01-0.02
EC-A2 006-009/10C4M45	0.60	4.00	0.90	10.00	45.00	0.55	2	30.0	3.0	C	●	0.01-0.02
EC-A2 007-010/02C4M45	0.70	4.00	1.00	2.00	45.00	0.65	2	30.0	3.0	C	●	0.01-0.03
EC-A2 007-010/04C4M45	0.70	4.00	1.00	4.00	45.00	0.65	2	30.0	3.0	C	●	0.01-0.03
EC-A2 007-010/08C4M45	0.70	4.00	1.00	8.00	45.00	0.65	2	30.0	3.0	C	●	0.01-0.03
EC-A2 007-010/10C4M45	0.70	4.00	1.00	10.00	45.00	0.65	2	30.0	3.0	C	●	0.01-0.03
EC-A2 008-012/04C4M45	0.80	4.00	1.20	4.00	45.00	0.75	2	30.0	3.0	C	●	0.01-0.03
EC-A2 008-012/06C4M45	0.80	4.00	1.20	6.00	45.00	0.75	2	30.0	3.0	C	●	0.01-0.03
EC-A2 008-012/08C4M45	0.80	4.00	1.20	8.00	45.00	0.75	2	30.0	3.0	C	●	0.01-0.03
EC-A2 008-012/10C4M45	0.80	4.00	1.20	10.00	45.00	0.75	2	30.0	3.0	C	●	0.01-0.03
EC-A2 008-012/12C4M45	0.80	4.00	1.20	12.00	45.00	0.75	2	30.0	3.0	C	●	0.01-0.03
EC-A2 009-0135/06C4M45	0.90	4.00	1.35	6.00	45.00	0.85	2	30.0	3.0	C	●	0.01-0.03
EC-A2 009-0135/08C4M45	0.90	4.00	1.35	8.00	45.00	0.85	2	30.0	3.0	C	●	0.01-0.03
EC-A2 009-0135/10C4M45	0.90	4.00	1.35	10.00	45.00	0.85	2	30.0	3.0	C	●	0.01-0.03
EC-A2 009-0135/15C4M50	0.90	4.00	1.35	15.00	50.00	0.85	2	30.0	3.0	C	●	0.01-0.03
EC-A2 010-015/04C4M45	1.00	4.00	1.50	4.00	45.00	0.97	2	30.0	3.0	C	●	0.01-0.01
EC-A2 010-015/06C4M45	1.00	4.00	1.50	6.00	45.00	0.97	2	30.0	3.0	C	●	0.01-0.01
EC-A2 010-015/08C4M45	1.00	4.00	1.50	8.00	45.00	0.95	2	30.0	3.0	C	●	0.01-0.01
EC-A2 010-015/10C4M45	1.00	4.00	1.50	10.00	45.00	0.95	2	30.0	3.0	C	●	0.01-0.01
EC-A2 010-015/12C4M45	1.00	4.00	1.50	12.00	45.00	0.93	2	30.0	3.0	C	●	0.01-0.01
EC-A2 010-015/16C4M50	1.00	4.00	1.50	16.00	50.00	0.93	2	30.0	3.0	C	●	0.01-0.01
EC-A2 010-015/20C4M55	1.00	4.00	1.50	20.00	55.00	0.93	2	30.0	3.0	C	●	0.01-0.01
EC-A2 012-018/06C4M45	1.20	4.00	1.80	6.00	45.00	1.17	2	30.0	3.0	C	●	0.01-0.01
EC-A2 012-018/08C4M45	1.20	4.00	1.80	8.00	45.00	1.15	2	30.0	3.0	C	●	0.01-0.01
EC-A2 012-018/10C4M45	1.20	4.00	1.80	10.00	45.00	1.15	2	30.0	3.0	C	●	0.01-0.01
EC-A2 012-018/12C4M45	1.20	4.00	1.80	12.00	45.00	1.13	2	30.0	3.0	C	●	0.01-0.01
EC-A2 012-018/16C4M50	1.20	4.00	1.80	16.00	50.00	1.13	2	30.0	3.0	C	●	0.01-0.01
EC-A2 014-021/06C4M45	1.40	4.00	2.10	6.00	45.00	1.35	2	30.0	3.0	C	●	0.01-0.01
EC-A2 014-021/08C4M45	1.40	4.00	2.10	8.00	45.00	1.35	2	30.0	3.0	C	●	0.01-0.01
EC-A2 014-021/10C4M45	1.40	4.00	2.10	10.00	45.00	1.35	2	30.0	3.0	C	●	0.01-0.01
EC-A2 015-023/06C4M45	1.50	4.00	2.30	6.00	45.00	1.47	2	30.0	3.0	C	●	0.01-0.02
EC-A2 015-023/08C4M45	1.50	4.00	2.30	8.00	45.00	1.45	2	30.0	3.0	C	●	0.01-0.02
EC-A2 015-023/10C4M45	1.50	4.00	2.30	10.00	45.00	1.45	2	30.0	3.0	C	●	0.01-0.02
EC-A2 015-023/12C4M45	1.50	4.00	2.30	12.00	45.00	1.41	2	30.0	3.0	C	●	0.01-0.02
EC-A2 015-023/14C4M50	1.50	4.00	2.30	14.00	50.00	1.41	2	30.0	3.0	C	●	0.01-0.02
EC-A2 015-023/16C4M50	1.50	4.00	2.30	16.00	50.00	1.41	2	30.0	3.0	C	●	0.01-0.02
EC-A2 015-023/20C4M55	1.50	4.00	2.30	20.00	55.00	1.41	2	30.0	3.0	C	●	0.01-0.02
EC-A2 016-024/06C4M45	1.60	4.00	2.40	6.00	45.00	1.57	2	30.0	3.0	C	●	0.01-0.02
EC-A2 016-024/08C4M45	1.60	4.00	2.40	8.00	45.00	1.55	2	30.0	3.0	C	●	0.01-0.02

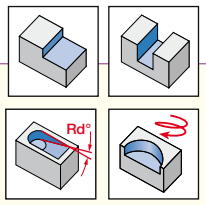
• For user guide, see pages C72-83.

(1) C-Cylindrical

EC-A2 (Rib Processing) (continued)

2 Flute, 30° Helix Solid Carbide Endmills, for Rib Processing
on Hard Materials up to 65 HRc





HARD MATERIALS

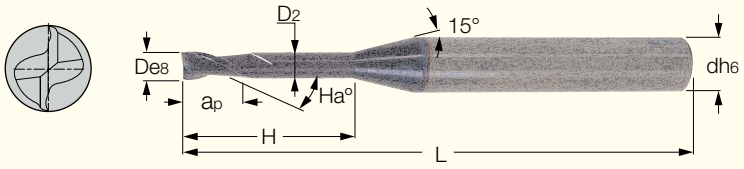
Designation	Dimensions D	d	a_p	H	L	D_2	Flute	H_a°	R_d°	Shank(1)	IC903	Recommended Machining Data fz (mm/t)
EC-A2 016-024/10C4M45	1.60	4.00	2.40	10.00	45.00	1.55	2	30.0	3.0	C	•	0.01-0.02
EC-A2 016-024/12C4M45	1.60	4.00	2.40	12.00	45.00	1.53	2	30.0	3.0	C	•	0.01-0.02
EC-A2 016-024/14C4M50	1.60	4.00	2.40	14.00	50.00	1.53	2	30.0	3.0	C	•	0.01-0.02
EC-A2 016-024/18C4M55	1.60	4.00	2.40	18.00	55.00	1.53	2	30.0	3.0	C	•	0.01-0.02
EC-A2 016-024/26C4M60	1.60	4.00	2.40	26.00	60.00	1.53	2	30.0	3.0	C	•	0.01-0.02
EC-A2 018-027/06C4M45	1.80	4.00	2.70	6.00	45.00	1.77	2	30.0	3.0	C	•	0.01-0.03
EC-A2 018-027/08C4M45	1.80	4.00	2.70	8.00	45.00	1.75	2	30.0	3.0	C	•	0.01-0.03
EC-A2 018-027/10C4M45	1.80	4.00	2.70	10.00	45.00	1.75	2	30.0	3.0	C	•	0.01-0.03
EC-A2 018-027/12C4M45	1.80	4.00	2.70	12.00	45.00	1.73	2	30.0	3.0	C	•	0.01-0.03
EC-A2 018-027/14C4M50	1.80	4.00	2.70	14.00	50.00	1.73	2	30.0	3.0	C	•	0.01-0.03
EC-A2 018-027/16C4M50	1.80	4.00	2.70	16.00	50.00	1.71	2	30.0	3.0	C	•	0.01-0.03
EC-A2 018-027/18C4M55	1.80	4.00	2.70	18.00	55.00	1.71	2	30.0	3.0	C	•	0.01-0.03
EC-A2 018-027/20C4M55	1.80	4.00	2.70	20.00	55.00	1.69	2	30.0	3.0	C	•	0.01-0.03
EC-A2 018-027/25C4M60	1.80	4.00	2.70	25.00	60.00	1.69	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/06C4M45	2.00	4.00	3.00	6.00	45.00	1.97	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/08C4M45	2.00	4.00	3.00	8.00	45.00	1.95	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/10C4M45	2.00	4.00	3.00	10.00	45.00	1.95	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/12C4M45	2.00	4.00	3.00	12.00	45.00	1.93	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/14C4M50	2.00	4.00	3.00	14.00	50.00	1.93	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/16C4M50	2.00	4.00	3.00	16.00	50.00	1.91	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/18C4M55	2.00	4.00	3.00	18.00	55.00	1.91	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/20C4M55	2.00	4.00	3.00	20.00	55.00	1.89	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/25C4M60	2.00	4.00	3.00	25.00	60.00	1.89	2	30.0	3.0	C	•	0.01-0.03
EC-A2 020-030/30C4M70	2.00	4.00	3.00	30.00	70.00	1.89	2	30.0	3.0	C	•	0.01-0.03
EC-A2 025-037/08C4M45	2.50	4.00	3.70	8.00	45.00	2.40	2	30.0	3.0	C	•	0.01-0.03
EC-A2 025-037/10C4M45	2.50	4.00	3.70	10.00	45.00	2.40	2	30.0	3.0	C	•	0.01-0.03
EC-A2 025-037/12C4M45	2.50	4.00	3.70	12.00	45.00	2.40	2	30.0	3.0	C	•	0.01-0.03
EC-A2 025-037/14C4M50	2.50	4.00	3.70	14.00	50.00	2.40	2	30.0	3.0	C	•	0.01-0.03
EC-A2 025-037/16C4M55	2.50	4.00	3.70	16.00	55.00	2.40	2	30.0	3.0	C	•	0.01-0.03
EC-A2 025-037/18C4M55	2.50	4.00	3.70	18.00	55.00	2.40	2	30.0	3.0	C	•	0.01-0.03
EC-A2 025-037/20C4M60	2.50	4.00	3.70	20.00	60.00	2.40	2	30.0	3.0	C	•	0.01-0.03
EC-A2 025-037/25C4M70	2.50	4.00	3.70	25.00	70.00	2.40	2	30.0	3.0	C	•	0.01-0.03
EC-A2 025-037/30C4M80	2.50	4.00	3.70	30.00	80.00	2.40	2	30.0	3.0	C	•	0.01-0.03
EC-A2 030-045/08C6M45	3.00	6.00	4.50	8.00	45.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/10C6M45	3.00	6.00	4.50	10.00	45.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/12C6M45	3.00	6.00	4.50	12.00	45.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/14C6M50	3.00	6.00	4.50	14.00	50.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/16C6M55	3.00	6.00	4.50	16.00	55.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/18C6M55	3.00	6.00	4.50	18.00	55.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/20C6M60	3.00	6.00	4.50	20.00	60.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/25C6M65	3.00	6.00	4.50	25.00	65.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/30C6M70	3.00	6.00	4.50	30.00	70.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/35C6M80	3.00	6.00	4.50	35.00	80.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 030-045/40C6M90	3.00	6.00	4.50	40.00	90.00	2.85	2	30.0	3.0	C	•	0.01-0.04
EC-A2 040-060/12C6M50	4.00	6.00	6.00	12.00	50.00	3.80	2	30.0	3.0	C	•	0.02-0.05
EC-A2 040-060/16C6M60	4.00	6.00	6.00	16.00	60.00	3.80	2	30.0	3.0	C	•	0.02-0.05
EC-A2 040-060/20C6M60	4.00	6.00	6.00	20.00	60.00	3.80	2	30.0	3.0	C	•	0.02-0.05
EC-A2 040-060/25C6M70	4.00	6.00	6.00	25.00	70.00	3.80	2	30.0	3.0	C	•	0.02-0.05
EC-A2 040-060/30C6M70	4.00	6.00	6.00	30.00	70.00	3.80	2	30.0	3.0	C	•	0.02-0.05
EC-A2 040-060/35C6M80	4.00	6.00	6.00	35.00	80.00	3.80	2	30.0	3.0	C	•	0.02-0.05
EC-A2 040-060/40C6M90	4.00	6.00	6.00	40.00	90.00	3.80	2	30.0	3.0	C	•	0.02-0.05

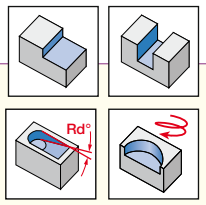
• For user guide, see pages C72-83.

(1) C-Cylindrical

EC-A2 (Rib Processing) (continued)

2 Flute, 30° Helix Solid Carbide Endmills, for Rib Processing on Hard Materials up to 65 HRc





HARD MATERIALS

Designation	Dimensions D	d	a_p	H	L	D_2	Flute	H_a°	R_d°	Shank(1)	IC903	Recommended Machining Data fz (mm/t)
EC-A2 040-060/45C6M90	4.00	6.00	6.00	45.00	90.00	3.80	2	30.0	3.0	C	●	0.02-0.05
EC-A2 040-060/50C6M100	4.00	6.00	6.00	50.00	100.00	3.80	2	30.0	3.0	C	●	0.02-0.05
EC-A2 050-075/16C6M60	5.00	6.00	7.50	16.00	60.00	4.80	2	30.0	3.0	C	●	0.02-0.06
EC-A2 050-075/20C6M60	5.00	6.00	7.50	20.00	60.00	4.80	2	30.0	3.0	C	●	0.02-0.06
EC-A2 050-075/25C6M70	5.00	6.00	7.50	25.00	70.00	4.80	2	30.0	3.0	C	●	0.02-0.06
EC-A2 050-075/30C6M80	5.00	6.00	7.50	30.00	80.00	4.80	2	30.0	3.0	C	●	0.02-0.06
EC-A2 050-075/35C6M80	5.00	6.00	7.50	35.00	80.00	4.80	2	30.0	3.0	C	●	0.02-0.06
EC-A2 050-075/40C6M80	5.00	6.00	7.50	40.00	80.00	4.80	2	30.0	3.0	C	●	0.02-0.06
EC-A2 050-075/50C6M110	5.00	6.00	7.50	50.00	110.00	4.80	2	30.0	3.0	C	●	0.02-0.06
EC-A2 060-090/20C6M80	6.00	6.00	9.00	20.00	80.00	5.70	2	30.0	3.0	C	●	0.02-0.06
EC-A2 060-090/30C6M90	6.00	6.00	9.00	30.00	90.00	5.70	2	30.0	3.0	C	●	0.02-0.06
EC-A2 060-090/40C6M100	6.00	6.00	9.00	40.00	100.00	5.60	2	30.0	3.0	C	●	0.02-0.06
EC-A2 060-090/50C6M110	6.00	6.00	9.00	50.00	110.00	5.60	2	30.0	3.0	C	●	0.02-0.06

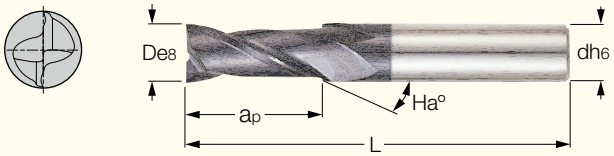
• For user guide, see pages C72-83.

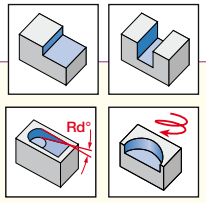
(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EC-A2 (Medium Length)

2 Flute, 30° Helix Medium Length, Solid Carbide Endmills,
for Hard Materials up to 65 HRc





HARD MATERIALS

Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	IC903	Recommended Machining Data fz (mm/t)
EC-A2 010-025C06-40	1.00	6.00	2.50	40.00	2	30.0	5.0	C	●	0.00-0.01
EC-A2 015-040C06-40	1.50	6.00	4.00	40.00	2	30.0	5.0	C	●	0.00-0.02
EC-A2 020-060C06-40	2.00	6.00	6.00	40.00	2	30.0	5.0	C	●	0.01-0.03
EC-A2 025-080C06-40	2.50	6.00	8.00	40.00	2	30.0	5.0	C	●	0.01-0.03
EC-A2 030-080C06-45	3.00	6.00	8.00	45.00	2	30.0	5.0	C	●	0.01-0.04
EC-A2 035-10C06M45	3.50	6.00	10.00	45.00	2	30.0	5.0	C	●	0.01-0.04
EC-A2 040-11C06-45	4.00	6.00	11.00	45.00	2	30.0	5.0	C	●	0.02-0.05
EC-A2 045-11C06-45	4.50	6.00	11.00	45.00	2	30.0	5.0	C	●	0.02-0.05
EC-A2 050-13C06-50	5.00	6.00	13.00	50.00	2	30.0	5.0	C	●	0.02-0.06
EC-A2 055-13C06-50	5.50	6.00	13.00	50.00	2	30.0	5.0	C	●	0.02-0.06
EC-A2 060-13C06-50	6.00	6.00	13.00	50.00	2	30.0	5.0	C	●	0.03-0.07
EC-A2 065-16C08-60	6.50	8.00	16.00	60.00	2	30.0	5.0	C	●	0.03-0.07
EC-A2 070-16C08-60	7.00	8.00	16.00	60.00	2	30.0	5.0	C	●	0.03-0.08
EC-A2 075-16C08-60	7.50	8.00	16.00	60.00	2	30.0	5.0	C	●	0.03-0.08
EC-A2 080-19C08-60	8.00	8.00	19.00	60.00	2	30.0	5.0	C	●	0.03-0.09
EC-A2 085-19C10-70	8.50	10.00	19.00	70.00	2	30.0	5.0	C	●	0.03-0.09
EC-A2 090-19C10-70	9.00	10.00	19.00	70.00	2	30.0	5.0	C	●	0.03-0.09
EC-A2 095-19C10-70	9.50	10.00	19.00	70.00	2	30.0	5.0	C	●	0.03-0.09
EC-A2 100-22C10-70	10.00	10.00	22.00	70.00	2	30.0	5.0	C	●	0.03-0.10
EC-A2 105-22C12-75	10.50	12.00	22.00	75.00	2	30.0	5.0	C	●	0.03-0.10
EC-A2 110-22C12-75	11.00	12.00	22.00	75.00	2	30.0	5.0	C	●	0.03-0.10
EC-A2 115-22C12-75	11.50	12.00	22.00	75.00	2	30.0	5.0	C	●	0.03-0.10
EC-A2 120-26C12-75	12.00	12.00	26.00	75.00	2	30.0	5.0	C	●	0.04-0.11
EC-A2 130-26C12-85	13.00	12.00	26.00	85.00	2	30.0	5.0	C	●	0.04-0.11
EC-A2 140-26C14-85	14.00	14.00	26.00	85.00	2	30.0	5.0	C	●	0.04-0.12
EC-A2 150-26C16-90	15.00	16.00	26.00	90.00	2	30.0	5.0	C	●	0.04-0.12
EC-A2 160-32C16-100	16.00	16.00	32.00	100.00	2	30.0	5.0	C	●	0.05-0.13
EC-A2 170-32C16-100	17.00	16.00	32.00	100.00	2	30.0	5.0	C	●	0.05-0.13
EC-A2 180-32C18-100	18.00	18.00	32.00	100.00	2	30.0	5.0	C	●	0.05-0.13
EC-A2 190-32C20-100	19.00	20.00	32.00	100.00	2	30.0	5.0	C	●	0.05-0.13
EC-A2 200-38C20-105	20.00	20.00	38.00	105.00	2	30.0	5.0	C	●	0.05-0.13
EC-A2 220-38C20-105	22.00	20.00	38.00	105.00	2	30.0	5.0	C	●	0.05-0.13
EC-A2 240-45C25-120	24.00	25.00	45.00	120.00	2	30.0	5.0	C	●	0.05-0.13
EC-A2 250-45C25-120	25.00	25.00	45.00	120.00	2	30.0	5.0	C	●	0.05-0.13

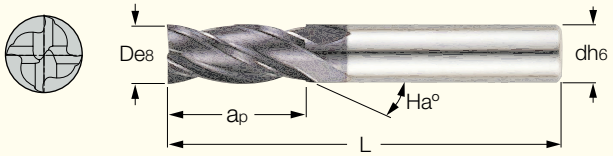
• For user guide, see pages C72-83.

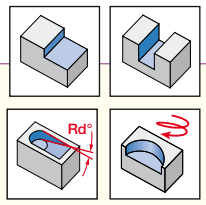
(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EC-A4

4 Flute, 30° Helix Medium Length Solid Carbide Endmills,
for Hard Materials up to 65 HRc





HARD MATERIALS

Designation	Dimensions D	d	a_p	L	Flute	H_a°	R_d°	Shank(1)	IC903	Recommended Machining Data fz (mm/t)
EC-A4 020-060C06-50	2.00	6.00	6.00	50.00	4	30.0	5.0	C	●	0.01-0.03
EC-A4 025-080C06-50	2.50	6.00	8.00	50.00	4	30.0	5.0	C	●	0.01-0.03
EC-A4 030-080C06-50	3.00	6.00	8.00	50.00	4	30.0	5.0	C	●	0.01-0.04
EC-A4 035-10C06-50	3.50	6.00	10.00	50.00	4	30.0	5.0	C	●	0.01-0.04
EC-A4 040-11C06-50	4.00	6.00	11.00	50.00	4	30.0	5.0	C	●	0.02-0.05
EC-A4 045-11C06-50	4.50	6.00	11.00	50.00	4	30.0	5.0	C	●	0.02-0.05
EC-A4 050-13C06-50	5.00	6.00	13.00	50.00	4	30.0	5.0	C	●	0.02-0.06
EC-A4 055-13C06-50	5.50	6.00	13.00	50.00	4	30.0	5.0	C	●	0.02-0.06
EC-A4 060-13C06-50	6.00	6.00	13.00	50.00	4	30.0	5.0	C	●	0.03-0.07
EC-A4 065-16C08-63	6.50	8.00	16.00	63.00	4	30.0	5.0	C	●	0.03-0.07
EC-A4 070-16C08-63	7.00	8.00	16.00	63.00	4	30.0	5.0	C	●	0.03-0.08
EC-A4 075-16C08-63	7.50	8.00	16.00	63.00	4	30.0	5.0	C	●	0.03-0.08
EC-A4 080-19C08-63	8.00	8.00	19.00	63.00	4	30.0	5.0	C	●	0.03-0.09
EC-A4 085-19C10-72	8.50	10.00	19.00	72.00	4	30.0	5.0	C	●	0.03-0.09
EC-A4 090-19C10-72	9.00	10.00	19.00	72.00	4	30.0	5.0	C	●	0.03-0.09
EC-A4 095-19C10-70	9.50	10.00	19.00	70.00	4	30.0	5.0	C	●	0.03-0.09
EC-A4 100-22C10-72	10.00	10.00	22.00	72.00	4	30.0	5.0	C	●	0.03-0.10
EC-A4 105-22C12-75	10.50	12.00	22.00	75.00	4	30.0	5.0	C	●	0.03-0.10
EC-A4 110-22C12-75	11.00	12.00	22.00	75.00	4	30.0	5.0	C	●	0.03-0.10
EC-A4 115-22C12-75	11.50	12.00	22.00	75.00	4	30.0	5.0	C	●	0.03-0.10
EC-A4 120-26C12-73	12.00	12.00	26.00	73.00	4	30.0	5.0	C	●	0.04-0.11
EC-A4 130-26C12-85	13.00	12.00	26.00	85.00	4	30.0	5.0	C	●	0.04-0.11
EC-A4 140-26C12-85	14.00	12.00	26.00	85.00	4	30.0	5.0	C	●	0.04-0.12
EC-A4 140-26C14-83	14.00	14.00	26.00	83.00	4	30.0	5.0	C	●	0.04-0.12
EC-A4 140-26C16-85	14.00	16.00	26.00	85.00	4	30.0	5.0	C	●	0.04-0.12
EC-A4 150-26C16-92	15.00	16.00	26.00	92.00	4	30.0	5.0	C	●	0.04-0.12
EC-A4 160-32C16-92	16.00	16.00	32.00	92.00	4	30.0	5.0	C	●	0.05-0.13
EC-A4 170-32C16-100	17.00	16.00	32.00	100.00	4	30.0	5.0	C	●	0.05-0.13
EC-A4 180-32C18-100	18.00	18.00	32.00	100.00	4	30.0	5.0	C	●	0.05-0.13
EC-A4 190-32C20-100	19.00	20.00	32.00	100.00	4	30.0	5.0	C	●	0.05-0.13
EC-A4 200-38C20-104	20.00	20.00	38.00	104.00	4	30.0	5.0	C	●	0.05-0.13
EC-A4 220-38C20-105	22.00	20.00	38.00	105.00	4	30.0	5.0	C	●	0.05-0.13
EC-A4 240-45C25-120	24.00	25.00	45.00	120.00	4	30.0	5.0	C	●	0.05-0.13
EC-A4 250-45C25-120	25.00	25.00	45.00	120.00	4	30.0	5.0	C	●	0.05-0.13

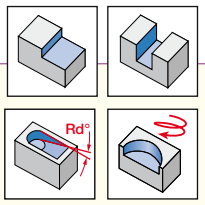
• For user guide, see pages C72-83.

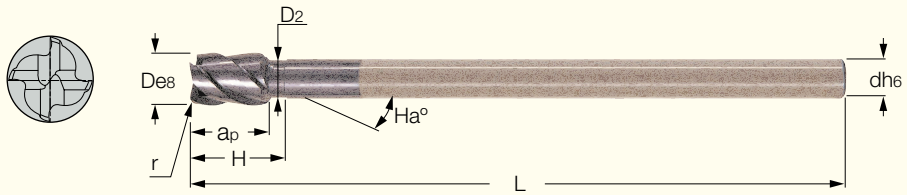
(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EC-B4-R

4 Flute, 45° Helix Extra-Long Solid Carbide Endmills with Various Corner Radii, for Hardened Steel





HARD MATERIALS

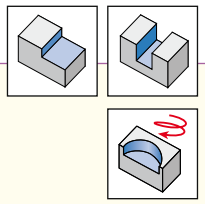
Designation	Dimensions D	d	r	a_p	H	D_2	L	Flute	H_a°	R_d°	Shank(1)	IC903	Recommended Machining Data fz (mm/t)
EC-B4 10-15C08R.5M130	10.00	8.00	0.50	15.00	19.2	7.50	130.00	4	45.0	5.0	C	●	0.03-0.10
EC-B4 10-15C08R1M130	10.00	8.00	1.00	15.00	19.2	7.50	130.00	4	45.0	5.0	C	●	0.03-0.10
EC-B4 12-18C10R.5M150	12.00	10.00	0.50	18.00	22.2	9.50	150.00	4	45.0	5.0	C	●	0.04-0.11
EC-B4 12-18C10R1M150	12.00	10.00	1.00	18.00	22.2	9.50	150.00	4	45.0	5.0	C	●	0.04-0.11
EC-B4 14-21C12R.5M160	14.00	12.00	0.50	21.00	25.2	11.50	160.00	4	45.0	5.0	C	●	0.04-0.12
EC-B4 14-21C12R1M160	14.00	12.00	1.00	21.00	25.2	11.50	160.00	4	45.0	5.0	C	●	0.04-0.12
EC-B4 18-27C16R0.5M180	18.00	16.00	0.50	27.00	31.2	15.50	180.00	4	45.0	5.0	C	●	0.05-0.13
EC-B4 18-27C16R1M180	18.00	16.00	1.00	27.00	31.2	15.50	180.00	4	45.0	5.0	C	●	0.05-0.13
EC-B4 22-33C20R.5M200	22.00	20.00	0.50	33.00	37.2	19.50	200.00	4	45.0	5.0	C	●	0.05-0.13
EC-B4 22-33C20R1M200	22.00	20.00	1.00	33.00	37.2	19.50	200.00	4	45.0	5.0	C	●	0.05-0.13

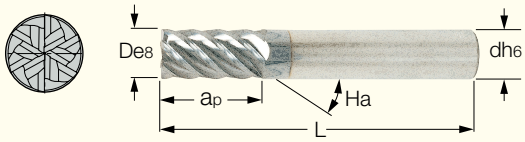
• For user guide, see pages C72-83.

(1) C-Cylindrical

ECH-B-6

6 Flute, 45° Helix Medium Length Solid Carbide Endmills, for Finishing of Hard Materials up to 65 HRc





HARD MATERIALS

Designation	Dimensions D	d	a_p	L	Flute	H_a°	Shank(1)	Tough ↔ Hard IC900	IC903	Recommended Machining Data fz (mm/t)
ECH060B16-6C06	6.00	6.00	16.00	57.00	6	45.0	C	●	●	0.03-0.07
ECH060B16-6W06	6.00	6.00	16.00	57.00	6	45.0	W	●		0.03-0.07
ECH080B20-6C08	8.00	8.00	20.00	63.00	6	45.0	C	●	●	0.03-0.09
ECH080B20-6W08	8.00	8.00	20.00	63.00	6	45.0	W	●		0.03-0.09
ECH100B22-6C10	10.00	10.00	22.00	72.00	6	45.0	C	●	●	0.03-0.10
ECH100B22-6W10	10.00	10.00	22.00	72.00	6	45.0	W	●		0.03-0.10
ECH120B25-6C12	12.00	12.00	25.00	83.00	6	45.0	C	●	●	0.04-0.11
ECH120B25-6W12	12.00	12.00	25.00	83.00	6	45.0	W	●		0.04-0.11
ECH160B32-6C16	16.00	16.00	32.00	92.00	6	45.0	C	●	●	0.05-0.13
ECH160B32-6W16	16.00	16.00	32.00	92.00	6	45.0	W	●		0.05-0.13
ECH200B38-6C20	20.00	20.00	38.00	104.00	6	45.0	C	●	●	0.05-0.13
ECH200B38-6W20	20.00	20.00	38.00	104.00	6	45.0	W	●		0.05-0.13

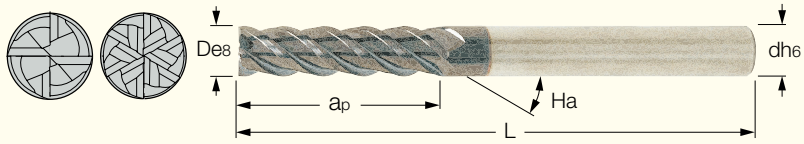
• Use IC903 for machining hardened steel up to 65 HRc • For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

SOLIDMILL
PREMIUM LINE

ECL-B-4/6

4 & 6 Flute, 45° Helix Long Solid Carbide Endmills



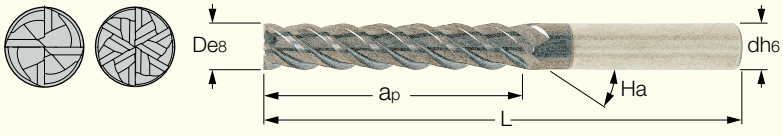
Designation	Dimensions D	d	ap	L	Flute	Ha°	Shank(1)	IC900	Recommended Machining Data fz (mm/t)
ECL060B24-4C06	6.00	6.00	24.00	65.00	4	45.0	C	●	0.03-0.07
ECL060B24-4W06	6.00	6.00	24.00	65.00	4	45.0	W	●	0.03-0.07
ECL080B32-4C08	8.00	8.00	32.00	80.00	4	45.0	C	●	0.03-0.09
ECL080B32-4W08	8.00	8.00	32.00	80.00	4	45.0	W	●	0.03-0.09
ECL100B40-4C10	10.00	10.00	40.00	100.00	4	45.0	C	●	0.03-0.10
ECL100B40-4W10	10.00	10.00	40.00	100.00	4	45.0	W	●	0.03-0.10
ECL120B48-4C12	12.00	12.00	48.00	100.00	4	45.0	C	●	0.04-0.11
ECL120B48-4W12	12.00	12.00	48.00	100.00	4	45.0	W	●	0.04-0.11
ECL140B50-4C14	14.00	14.00	50.00	100.00	4	45.0	C	●	0.04-0.12
ECL140B50-4W14	14.00	14.00	50.00	100.00	4	45.0	W	●	0.04-0.12
ECL160B56-6C16	16.00	16.00	56.00	115.00	6	45.0	C	●	0.05-0.13
ECL160B56-6W16	16.00	16.00	56.00	115.00	6	45.0	W	●	0.05-0.13
ECL200B60-6C20	20.00	20.00	60.00	125.00	6	45.0	C	●	0.05-0.13
ECL200B60-6W20	20.00	20.00	60.00	125.00	6	45.0	W	●	0.05-0.13

• Smooth cutting in extra long depth • For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

ECXL-B-4/6

4 & 6 Flute, 45° Helix Extra Long Solid Carbide Endmills



Designation	Dimensions D	d	ap	L	Flute	Ha°	Shank(1)	IC900	Recommended Machining Data fz (mm/t)
ECXL100B60-4C10	10.00	10.00	60.00	110.00	4	45.0	C	●	0.03-0.10
ECXL100B60-4W10	10.00	10.00	60.00	110.00	4	45.0	W	●	0.03-0.10
ECXL120B72-4C12	12.00	12.00	72.00	150.00	4	45.0	C	●	0.04-0.11
ECXL120B72-4W12	12.00	12.00	72.00	150.00	4	45.0	W	●	0.04-0.11
ECXL160B80-6C16	16.00	16.00	80.00	150.00	6	45.0	C	●	0.05-0.13
ECXL160B80-6W16	16.00	16.00	80.00	150.00	6	45.0	W	●	0.05-0.13
ECXL200B80-6C20	20.00	20.00	80.00	150.00	6	45.0	C	●	0.05-0.13

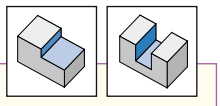
• Smooth cutting in extra long depth. • For user guide, see pages C72-83.

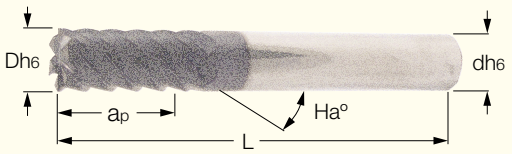
(1) C-Cylindrical, W-Weldon

SOLIDMILL
PREMIUM LINE

EC-D6

6 Flute, 50° Helix Medium Length Solid Carbide Endmills, for Finishing of Hard Materials up to 65 HRc





HARD MATERIALS

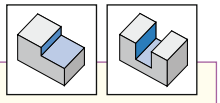
Designation	Dimensions D	d	ap	L	Flute	Ha°	Shank(1)	Rd°	Tough ↔ Hard IC900	IC903	Recommended Machining Data fz (mm/t)
EC-D6 06-13C06H57	6.00	6.00	13.00	57.00	6	50.0	C	5.0		●	0.03-0.07
EC-D6 08-20C08H63	8.00	8.00	20.00	63.00	6	50.0	C	5.0		●	0.03-0.09
EC-D6 10-22C10H72	10.00	10.00	22.00	72.00	6	50.0	C	5.0	●	●	0.03-0.10
EC-D6 12-25C12H83	12.00	12.00	25.00	83.00	6	50.0	C	5.0		●	0.04-0.11
EC-D6 12-25W12H83	12.00	12.00	25.00	83.00	6	50.0	W	5.0		●	0.04-0.11
EC-D6 14-30C14H83	14.00	14.00	30.00	83.00	6	50.0	C	5.0		●	0.04-0.12
EC-D6 16-32C16H92	16.00	16.00	32.00	92.00	6	50.0	C	5.0		●	0.05-0.13
EC-D6 20-38C20H104	20.00	20.00	38.00	104.00	6	50.0	C	5.0		●	0.05-0.13
EC-D6 20-38W20H104	20.00	20.00	38.00	104.00	6	50.0	W	5.0		●	0.05-0.13

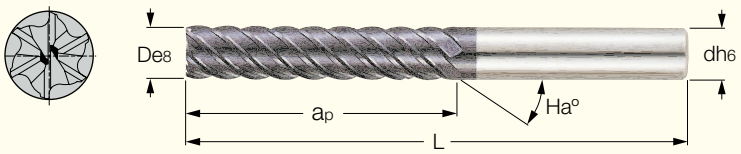
• For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

EC-B6

6 Flute, 45° Helix Extra Long Solid Carbide Endmills, for Finishing of Hard Materials up to 65 HRc





HARD MATERIALS

Designation	Dimensions D	d	ap	L	Flute	Ha°	Shank(1)	IC903	Recommended Machining Data fz (mm/t)
EC-B6 060-026C06-70	6.00	6.00	26.00	70.00	6	45.0	C	●	0.03-0.07
EC-B6 080-036C08-90	8.00	8.00	36.00	90.00	6	45.0	C	●	0.03-0.09
EC-B6 100-46C10-100	10.00	10.00	46.00	100.00	6	45.0	C	●	0.03-0.10
EC-B6 120-56C12-110	12.00	12.00	56.00	110.00	6	45.0	C	●	0.04-0.11
EC-B6 160-66C16-130	16.00	16.00	66.00	130.00	6	45.0	C	●	0.05-0.13
EC-B6 200-76C20-140	20.00	20.00	76.00	140.00	6	45.0	C	●	0.05-0.13
EC-B6 250-92C25-180	25.00	25.00	92.00	180.00	6	45.0	C	●	0.05-0.13

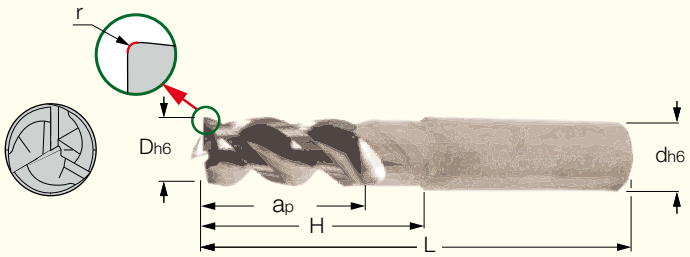
• For user guide, see pages C72-83.

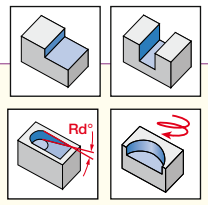
(1) C-Cylindrical

CHATTERFREE
SOLID MILL LINE

ECA-H3-CF

Solid Carbide Endmills with Different Helix 3, 4 and 5xD Neck Relief for Machining Aluminum





ALUMINUM

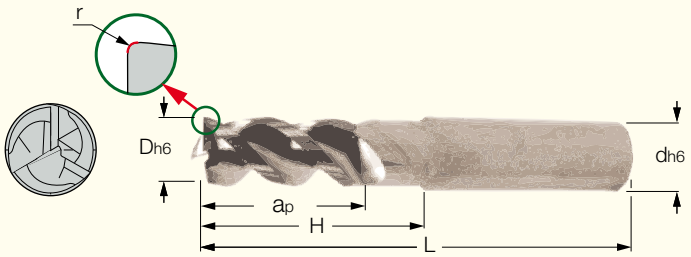
Designation	Dimensions									IC08	Recommended Machining Data
	D	d	a_p	H	L	r	Flute	R_d°	Shank(1)		fz (mm/t)
ECA-H3 03-07/12C06CF-R01	3.00	6.00	7.00	12.00	57.00	0.10	3	5.0	C	●	0.03-0.05
ECA-H3 04-10/16C06CF-R02	4.00	6.00	10.00	16.00	57.00	0.20	3	5.0	C	●	0.03-0.05
ECA-H3 05-12/20C06CF-R02	5.00	6.00	12.00	20.00	57.00	0.20	3	5.0	C	●	0.03-0.06
ECA-H3 06-09/18C06CF-R02	6.00	6.00	9.00	18.00	57.00	0.20	3	5.0	C	●	0.03-0.07
ECA-H3 06-09/18C06CF-R04	6.00	6.00	9.00	18.00	57.00	0.40	3	5.0	C	●	0.03-0.07
ECA-H3 06-09/18C06CF-R08	6.00	6.00	9.00	18.00	57.00	0.80	3	5.0	C	●	0.03-0.07
ECA-H3 06-09/30C06CF-R02	6.00	6.00	9.00	30.00	65.00	0.20	3	5.0	C	●	0.03-0.07
ECA-H3 06-09/30C06CF-R04	6.00	6.00	9.00	30.00	65.00	0.40	3	5.0	C	●	0.03-0.07
ECA-H3 06-09/30C06CF-R08	6.00	6.00	9.00	30.00	65.00	0.80	3	5.0	C	●	0.03-0.07
ECA-H3 06-14/24C06CF-R02	6.00	6.00	14.00	24.00	60.00	0.20	3	5.0	C	●	0.03-0.07
ECA-H3 08-12/24C08CF-R02	8.00	8.00	12.00	24.00	63.00	0.20	3	5.0	C	●	0.03-0.09
ECA-H3 08-12/24C08CF-R04	8.00	8.00	12.00	24.00	63.00	0.40	3	5.0	C	●	0.03-0.09
ECA-H3 08-12/24C08CF-R08	8.00	8.00	12.00	24.00	63.00	0.80	3	5.0	C	●	0.03-0.09
ECA-H3 08-12/40C08CF-R02	8.00	8.00	12.00	40.00	79.00	0.20	3	5.0	C	●	0.03-0.09
ECA-H3 08-12/40C08CF-R04	8.00	8.00	12.00	40.00	79.00	0.40	3	5.0	C	●	0.03-0.09
ECA-H3 08-12/40C08CF-R08	8.00	8.00	12.00	40.00	79.00	0.80	3	5.0	C	●	0.03-0.09
ECA-H3 08-18/32C08CF-R02	8.00	8.00	18.00	32.00	68.00	0.20	3	5.0	C	●	0.03-0.09
ECA-H3 10-15/30C10CF-R02	10.00	10.00	15.00	30.00	72.00	0.20	3	5.0	C	●	0.03-0.10
ECA-H3 10-15/30C10CF-R04	10.00	10.00	15.00	30.00	72.00	0.40	3	5.0	C	●	0.03-0.10
ECA-H3 10-15/30C10CF-R08	10.00	10.00	15.00	30.00	72.00	0.80	3	5.0	C	●	0.03-0.10
ECA-H3 10-15/30C10CF-R16	10.00	10.00	15.00	30.00	72.00	1.60	3	5.0	C	●	0.03-0.10
ECA-H3 10-15/50C10CF-R02	10.00	10.00	15.00	50.00	100.00	0.20	3	5.0	C	●	0.03-0.10
ECA-H3 10-15/50C10CF-R04	10.00	10.00	15.00	50.00	100.00	0.40	3	5.0	C	●	0.03-0.10
ECA-H3 10-15/50C10CF-R08	10.00	10.00	15.00	50.00	100.00	0.80	3	5.0	C	●	0.03-0.10
ECA-H3 10-15/50C10CF-R16	10.00	10.00	15.00	50.00	100.00	1.60	3	5.0	C	●	0.03-0.10
ECA-H3 10-22/40C10CF-R02	10.00	10.00	22.00	40.00	80.00	0.20	3	5.0	C	●	0.03-0.10
ECA-H3 12-18/36C12CF-R02	12.00	12.00	18.00	36.00	83.00	0.20	3	5.0	C	●	0.04-0.11
ECA-H3 12-18/36C12CF-R04	12.00	12.00	18.00	36.00	83.00	0.40	3	5.0	C	●	0.04-0.11
ECA-H3 12-18/36C12CF-R08	12.00	12.00	18.00	36.00	83.00	0.80	3	5.0	C	●	0.04-0.11
ECA-H3 12-18/36C12CF-R16	12.00	12.00	18.00	36.00	83.00	1.60	3	5.0	C	●	0.04-0.11
ECA-H3 12-18/36C12CF-R20	12.00	12.00	18.00	36.00	83.00	2.00	3	5.0	C	●	0.04-0.11
ECA-H3 12-18/60C12CF-R02	12.00	12.00	18.00	60.00	100.00	0.20	3	5.0	C	●	0.04-0.11
ECA-H3 12-18/60C12CF-R04	12.00	12.00	18.00	60.00	100.00	0.40	3	5.0	C	●	0.04-0.11
ECA-H3 12-18/60C12CF-R08	12.00	12.00	18.00	60.00	100.00	0.80	3	5.0	C	●	0.04-0.11
ECA-H3 12-18/60C12CF-R16	12.00	12.00	18.00	60.00	100.00	1.60	3	5.0	C	●	0.04-0.11
ECA-H3 12-18/60C12CF-R20	12.00	12.00	18.00	60.00	100.00	2.00	3	5.0	C	●	0.04-0.11
ECA-H3 12-26/48C12CF-R02	12.00	12.00	26.00	48.00	100.00	0.20	3	5.0	C	●	0.04-0.11
ECA-H3 16-24/48C16CF-R02	16.00	16.00	24.00	48.00	92.00	0.20	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/48C16CF-R04	16.00	16.00	24.00	48.00	92.00	0.40	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/48C16CF-R08	16.00	16.00	24.00	48.00	92.00	0.80	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/48C16CF-R16	16.00	16.00	24.00	48.00	92.00	1.60	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/48C16CF-R20	16.00	16.00	24.00	48.00	92.00	2.00	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/48C16CF-R32	16.00	16.00	24.00	48.00	92.00	3.20	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/48C16CF-R40	16.00	16.00	24.00	48.00	92.00	4.00	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/48C16CF-R50	16.00	16.00	24.00	48.00	92.00	5.00	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/80C16CF-R02	16.00	16.00	24.00	80.00	128.00	0.20	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/80C16CF-R04	16.00	16.00	24.00	80.00	128.00	0.40	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/80C16CF-R08	16.00	16.00	24.00	80.00	128.00	0.80	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/80C16CF-R16	16.00	16.00	24.00	80.00	128.00	1.60	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/80C16CF-R20	16.00	16.00	24.00	80.00	128.00	2.00	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/80C16CF-R32	16.00	16.00	24.00	80.00	128.00	3.20	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/80C16CF-R40	16.00	16.00	24.00	80.00	128.00	4.00	3	5.0	C	●	0.05-0.13
ECA-H3 16-24/80C16CF-R50	16.00	16.00	24.00	80.00	128.00	5.00	3	5.0	C	●	0.05-0.13

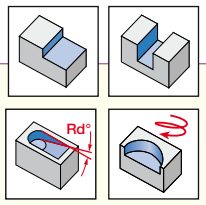
• For user guide, see pages C72-83.

(1) C-Cylindrical

ECA-H3-CF (continued)

Solid Carbide Endmills with Different Helix 3, 4 and 5xD Neck Relief for Machining Aluminum





ALUMINUM

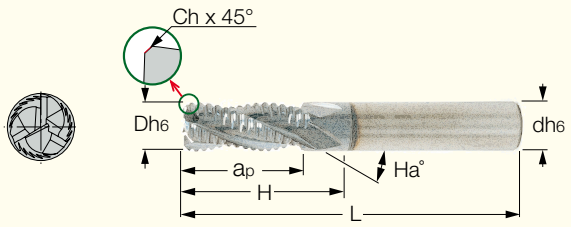
Designation	Dimensions									IC08	Recommended Machining Data
	D	d	a_p	H	L	r	Flute	R_d°	Shank(1)		fz (mm/t)
ECA-H3 16-34/64C16CF-R02	16.00	16.00	34.00	64.00	115.00	0.20	3	5.0	C	●	0.05-0.13
ECA-H3 20-30/60C20CF-R02	20.00	20.00	30.00	60.00	110.00	0.20	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/60C20CF-R04	20.00	20.00	30.00	60.00	110.00	0.40	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/60C20CF-R08	20.00	20.00	30.00	60.00	110.00	0.80	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/60C20CF-R16	20.00	20.00	30.00	60.00	110.00	1.60	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/60C20CF-R20	20.00	20.00	30.00	60.00	110.00	2.00	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/60C20CF-R32	20.00	20.00	30.00	60.00	110.00	3.20	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/60C20CF-R40	20.00	20.00	30.00	60.00	110.00	4.00	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/60C20CF-R50	20.00	20.00	30.00	60.00	110.00	5.00	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/100C20CF-R02	20.00	20.00	30.00	100.00	150.00	0.20	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/100C20CF-R04	20.00	20.00	30.00	100.00	150.00	0.40	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/100C20CF-R08	20.00	20.00	30.00	100.00	150.00	0.80	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/100C20CF-R16	20.00	20.00	30.00	100.00	150.00	1.60	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/100C20CF-R20	20.00	20.00	30.00	100.00	150.00	2.00	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/100C20CF-R32	20.00	20.00	30.00	100.00	150.00	3.20	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/100C20CF-R40	20.00	20.00	30.00	100.00	150.00	4.00	3	5.0	C	●	0.05-0.14
ECA-H3 20-30/100C20CF-R50	20.00	20.00	30.00	100.00	150.00	5.00	3	5.0	C	●	0.05-0.14
ECA-H3 20-42/80C20CF-R02	20.00	20.00	42.00	80.00	130.00	0.20	3	5.0	C	●	0.05-0.14
ECA-H3 25-38/75C25CF-R02	25.00	25.00	38.00	75.00	130.00	0.20	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/75C25CF-R04	25.00	25.00	38.00	75.00	130.00	0.40	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/75C25CF-R08	25.00	25.00	38.00	75.00	130.00	0.80	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/75C25CF-R16	25.00	25.00	38.00	75.00	130.00	1.60	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/75C25CF-R20	25.00	25.00	38.00	75.00	130.00	2.00	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/75C25CF-R32	25.00	25.00	38.00	75.00	130.00	3.20	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/75C25CF-R40	25.00	25.00	38.00	75.00	130.00	4.00	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/75C25CF-R50	25.00	25.00	38.00	75.00	130.00	5.00	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/125C25CF-R02	25.00	25.00	38.00	125.00	185.00	0.20	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/125C25CF-R04	25.00	25.00	38.00	125.00	185.00	0.40	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/125C25CF-R08	25.00	25.00	38.00	125.00	185.00	0.80	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/125C25CF-R16	25.00	25.00	38.00	125.00	185.00	1.60	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/125C25CF-R20	25.00	25.00	38.00	125.00	185.00	2.00	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/125C25CF-R32	25.00	25.00	38.00	125.00	185.00	3.20	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/125C25CF-R40	25.00	25.00	38.00	125.00	180.00	4.00	3	5.0	C	●	0.05-0.15
ECA-H3 25-38/125C25CF-R50	25.00	25.00	38.00	125.00	180.00	5.00	3	5.0	C	●	0.05-0.15
ECA-H3 25-52/100C25CF-R02	25.00	25.00	52.00	100.00	158.00	0.20	3	5.0	C	●	0.05-0.15

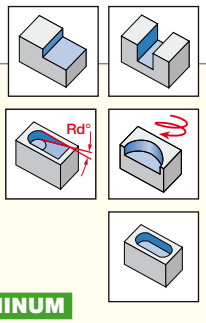
• For user guide, see pages C72-83.

(1) C-Cylindrical

ERC-E-3

3 Flute, 38° Helix Medium Length Solid Carbide Roughing Endmills for Aluminum





ALUMINUM

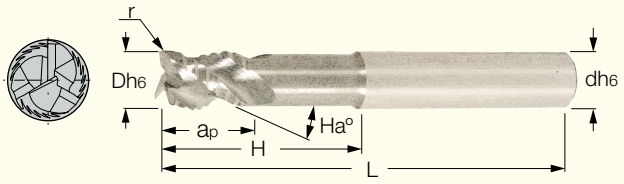
Designation	Dimensions										Tough ↔ Hard		Recommended Machining Data
	D	d	a_p	H	L	Flute	H_a°	R_d°	Shank[1]	Ch	IC08	IC300	fz (mm/t)
ERC060E13-3C06	6.00	6.00	13.00	21.00	57.00	3	38.0	5.0	C	0.50	●		0.03-0.07
ERC060E13-3W06	6.00	6.00	13.00	21.00	57.00	3	38.0	5.0	W	0.50	●	●	0.03-0.07
ERC080E20-3C08	8.00	8.00	20.00	28.00	63.00	3	38.0	5.0	C	0.50	●		0.03-0.15
ERC080E20-3W08	8.00	8.00	20.00	28.00	63.00	3	38.0	5.0	W	0.50	●	●	0.03-0.15
ERC100E22-3C10	10.00	10.00	22.00	30.00	72.00	3	38.0	5.0	C	0.60	●		0.05-0.20
ERC100E22-3W10	10.00	10.00	22.00	30.00	72.00	3	38.0	5.0	W	0.60	●	●	0.05-0.20
ERC120E25-3C12	12.00	12.00	25.00	37.00	83.00	3	38.0	5.0	C	0.60	●		0.07-0.22
ERC120E25-3W12	12.00	12.00	25.00	37.00	83.00	3	38.0	5.0	W	0.60	●	●	0.07-0.22
ERC140E25-3C14	14.00	14.00	25.00	37.00	83.00	3	38.0	5.0	C	0.60	●		0.07-0.22
ERC140E25-3W14	14.00	14.00	25.00	37.00	83.00	3	38.0	5.0	W	0.60		●	0.07-0.22
ERC160E32-3C16	16.00	14.00	32.00	44.00	92.00	3	38.0	5.0	C	0.60	●		0.07-0.25
ERC160E32-3W16	16.00	14.00	32.00	44.00	92.00	3	38.0	5.0	W	0.60	●	●	0.07-0.25
ERC180E32-3W18	18.00	18.00	32.00	44.00	92.00	3	38.0	5.0	W	0.60		●	0.07-0.25
ERC200E38-3C20	20.00	20.00	38.00	55.00	104.00	3	38.0	5.0	C	0.70	●		0.07-0.25
ERC200E38-3W20	20.00	20.00	38.00	55.00	104.00	3	38.0	5.0	W	0.70	●	●	0.07-0.25
ERC250E45-3C25	25.00	25.00	45.00	64.00	121.00	3	38.0	5.0	C	0.70	●		0.07-0.25
ERC250E45-3W25	25.00	25.00	45.00	64.00	121.00	3	38.0	5.0	W	0.70		●	0.07-0.25

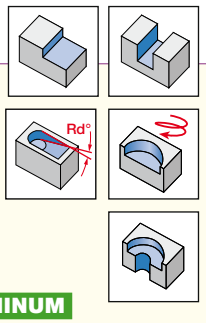
• For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

ECR-B3-R

3 Flute, 45° Helix Solid Carbide Roughing Endmills,
for High Stock Removal Rates on Aluminum





ALUMINUM

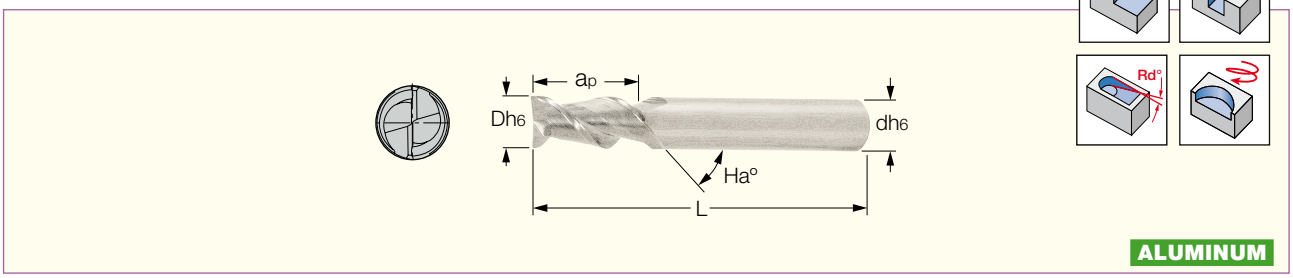
Designation	Dimensions										IC08	Recommended Machining Data
	D	d	H	L	Flute	H_a°	R_d°	a_p	Shank[1]	r		fz (mm/t)
ECR-B3 06-09/21C06R02A57	6.00	6.00	21.00	57.00	3	45.0	20.0	9.00	C	0.20	●	0.03-0.07
ECR-B3 06-09/21W06R02A57	6.00	6.00	21.00	57.00	3	45.0	20.0	9.00	W	0.20	●	0.03-0.07
ECR-B3 06-09/30C06R02A65	6.00	6.00	30.00	65.00	3	45.0	20.0	9.00	C	0.20	●	0.03-0.07
ECR-B3 06-09/30W06R02A65	6.00	6.00	30.00	65.00	3	45.0	20.0	9.00	W	0.20	●	0.03-0.07
ECR-B3 08-12/27C08R02A63	8.00	8.00	27.00	63.00	3	45.0	20.0	12.00	C	0.20	●	0.03-0.15
ECR-B3 08-12/27W08R02A63	8.00	8.00	27.00	63.00	3	45.0	20.0	12.00	W	0.20	●	0.03-0.15
ECR-B3 08-12/40C08R02A78	8.00	8.00	40.00	78.00	3	45.0	20.0	12.00	C	0.20	●	0.03-0.15
ECR-B3 08-12/40W08R02A78	8.00	8.00	40.00	78.00	3	45.0	20.0	12.00	W	0.20	●	0.03-0.15
ECR-B3 10-12/31C10R02A72	10.00	10.00	31.00	72.00	3	45.0	20.0	12.00	C	0.20	●	0.05-0.20
ECR-B3 10-12/31W10R02A72	10.00	10.00	31.00	72.00	3	45.0	20.0	12.00	W	0.20	●	0.05-0.20
ECR-B3 10-12/50C10R02A100	10.00	10.00	50.00	100.00	3	45.0	20.0	12.00	C	0.20	●	0.05-0.20
ECR-B3 10-12/50W10R02A100	10.00	10.00	50.00	100.00	3	45.0	20.0	12.00	W	0.20	●	0.05-0.20
ECR-B3 12-12/37C12R02A83	12.00	12.00	37.00	83.00	3	45.0	20.0	12.00	C	0.20	●	0.07-0.22
ECR-B3 12-12/37W12R02A83	12.00	12.00	37.00	83.00	3	45.0	20.0	12.00	W	0.20	●	0.07-0.22
ECR-B3 12-14/55C12R02A100	12.00	12.00	55.00	100.00	3	45.0	20.0	14.00	C	0.20	●	0.07-0.22
ECR-B3 12-14/55W12R02A100	12.00	12.00	55.00	100.00	3	45.0	20.0	14.00	W	0.20	●	0.07-0.22
ECR-B3 16-14/43C16R02A92	16.00	16.00	43.00	92.00	3	45.0	20.0	14.00	C	0.20	●	0.07-0.25
ECR-B3 16-14/43W16R02A92	16.00	16.00	43.00	92.00	3	45.0	20.0	14.00	W	0.20	●	0.07-0.25
ECR-B3 16-18/80C16R02A150	16.00	16.00	80.00	150.00	3	45.0	20.0	18.00	C	0.20	●	0.07-0.25
ECR-B3 16-18/80W16R02A150	16.00	16.00	80.00	150.00	3	45.0	20.0	18.00	W	0.20	●	0.07-0.25
ECR-B3 20-17/53C20R02A104	20.00	20.00	53.00	104.00	3	45.0	20.0	17.00	C	0.20	●	0.07-0.25
ECR-B3 20-17/53W20R02A104	20.00	20.00	53.00	104.00	3	45.0	20.0	17.00	W	0.20	●	0.07-0.25
ECR-B3 20-22/80C20R02A150	20.00	20.00	80.00	150.00	3	45.0	20.0	22.00	C	0.20	●	0.07-0.25
ECR-B3 20-22/80W20R02A150	20.00	20.00	80.00	150.00	3	45.0	20.0	22.00	W	0.20	●	0.07-0.25

• For user guide, see pages C72-83.

(1) C-Cylindrical, W-Weldon

ECA-B-2

2 Flute, 45° Helix Medium Length Solid Carbide Endmills, for Machining Aluminum



ALUMINUM

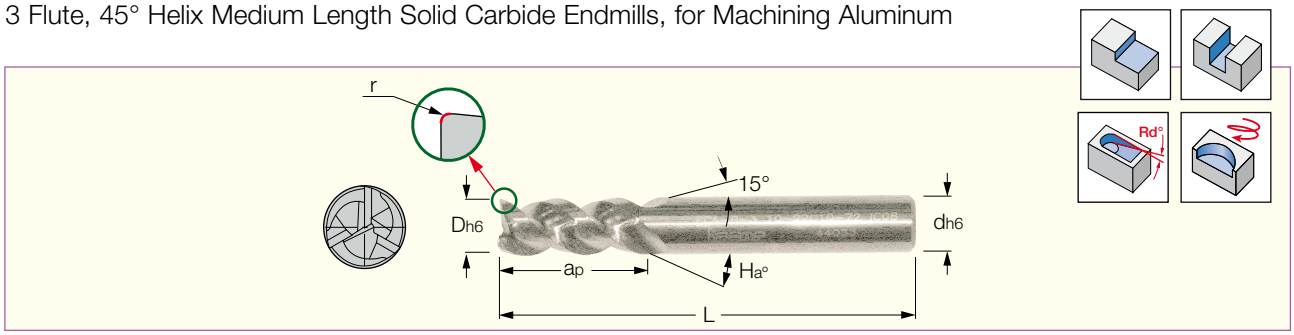
Designation	Dimensions D	d	ap	L	Flute	Ha°	Rd°	Shank(1)	IC08	Recommended Machining Data fz (mm/t)
ECA040B12-2C06	4.00	6.00	12.00	57.00	2	45.0	5.0	C	●	0.02-0.05
ECA050B14-2C06	5.00	6.00	14.00	57.00	2	45.0	5.0	C	●	0.02-0.06
ECA060B16-2C06	6.00	6.00	16.00	57.00	2	45.0	5.0	C	●	0.03-0.07
ECA080B20-2C08	8.00	8.00	20.00	63.00	2	45.0	5.0	C	●	0.03-0.09
ECA100B22-2C10	10.00	10.00	22.00	72.00	2	45.0	5.0	C	●	0.03-0.10
ECA120B25-2C12	12.00	12.00	25.00	83.00	2	45.0	5.0	C	●	0.04-0.11
ECA160B32-2C16	16.00	16.00	32.00	92.00	2	45.0	5.0	C	●	0.05-0.13
ECA200B38-2C20	20.00	20.00	38.00	104.00	2	45.0	5.0	C	●	0.05-0.13

• For user guide, see pages C72-83.

(1) C-Cylindrical

ECA-B-3

3 Flute, 45° Helix Medium Length Solid Carbide Endmills, for Machining Aluminum



Designation	Dimensions D	d	ap	L	Flute	Ha°	Rd°	Shank(1)	r	IC08	Recommended Machining Data fz (mm/t)
ECA-B-3 04-12C06-57	4.00	6.00	12.00	57.00	3	45.0	5.0	C	0.10	●	0.02-0.05
ECA-B-3 04-12W06-57	4.00	6.00	12.00	57.00	3	45.0	5.0	W	0.10	●	0.02-0.05
ECA-B-3 05-14C06-57	5.00	6.00	14.00	57.00	3	45.0	5.0	C	0.20	●	0.02-0.06
ECA-B-3 05-14W06-57	5.00	6.00	14.00	57.00	3	45.0	5.0	W	0.20	●	0.02-0.06
ECA-B-3 06-16C06-57	6.00	6.00	16.00	57.00	3	45.0	5.0	C	0.20	●	0.03-0.07
ECA-B-3 06-16W06-57	6.00	6.00	16.00	57.00	3	45.0	5.0	W	0.20	●	0.03-0.07
ECA-B-3 08-20C08-63	8.00	8.00	21.50	63.00	3	45.0	5.0	C	0.20	●	0.03-0.09
ECA-B-3 08-20W08-63	8.00	8.00	21.50	63.00	3	45.0	5.0	W	0.20	●	0.03-0.09
ECA-B-3 10-22C10-72	10.00	10.00	23.50	72.00	3	45.0	5.0	C	0.20	●	0.03-0.10
ECA-B-3 10-22W10-72	10.00	10.00	23.50	72.00	3	45.0	5.0	W	0.20	●	0.03-0.10
ECA-B-3 12-25C12-83	12.00	12.00	25.00	83.00	3	45.0	5.0	C	0.20	●	0.04-0.11
ECA-B-3 12-25W12-83	12.00	12.00	25.00	83.00	3	45.0	5.0	W	0.20	●	0.04-0.11
ECA-B-3 14-30C14-83	14.00	14.00	30.00	83.00	3	45.0	5.0	C	0.20	●	0.04-0.12
ECA-B-3 14-30W14-83	14.00	14.00	30.00	83.00	3	45.0	5.0	W	0.20	●	0.04-0.12
ECA-B-3 16-32C16-92	16.00	16.00	32.00	92.00	3	45.0	5.0	C	0.20	●	0.05-0.13
ECA-B-3 16-32W16-92	16.00	16.00	32.00	92.00	3	45.0	5.0	W	0.20	●	0.05-0.13
ECA-B-3 20-38C20-104	20.00	20.00	38.00	104.00	3	45.0	5.0	C	0.20	●	0.05-0.13
ECA-B-3 20-38W20-104	20.00	20.00	38.00	104.00	3	45.0	5.0	W	0.20	●	0.05-0.13

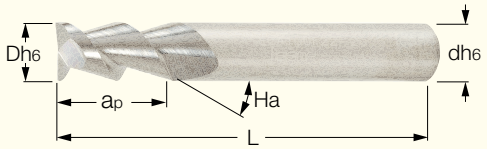
• For user guide, see pages C72-83.

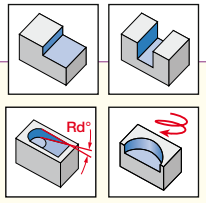
(1) C-Cylindrical, W-Weldon

SOLIDMILL
PREMIUM LINE

ECA-F-2

2 Flute, 55° Helix Medium Length Solid Carbide Endmills for Machining Aluminum





ALUMINUM

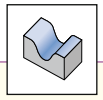
Designation	Dimensions D	d	ap	L	Flute	Ha°	Rd°	Shank(1)	IC08	Recommended Machining Data fz (mm/t)
ECA040F11-2C04	4.00	4.00	11.00	50.00	2	55.0	5.0	C	●	0.02-0.05
ECA060F13-2C06	6.00	6.00	13.00	57.00	2	55.0	5.0	C	●	0.03-0.07
ECA080F20-2C08	8.00	8.00	20.00	63.00	2	55.0	5.0	C	●	0.03-0.09
ECA100F22-2C10	10.00	10.00	22.00	72.00	2	55.0	5.0	C	●	0.03-0.10
ECA120F25-2C12	12.00	12.00	25.00	83.00	2	55.0	5.0	C	●	0.04-0.11
ECA160F32-2C16	16.00	16.00	32.00	92.00	2	55.0	5.0	C	●	0.05-0.13
ECA200F38-2C20	20.00	20.00	38.00	104.00	2	55.0	5.0	C	●	0.05-0.13
ECA250F45-2C25	25.00	25.00	45.00	121.00	2	55.0	5.0	C	●	0.05-0.13

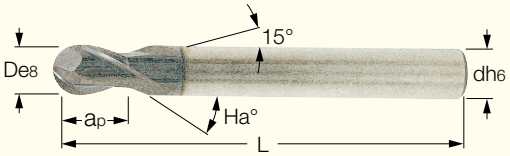
• For user guide, see pages C72-83.

(1) C-Cylindrical

EB-A-2

2 Flute, 30° Helix Short Solid Carbide Ball Nose Endmills





HARD MATERIALS

Designation	Dimensions D	d	ap	L	Flute	Ha°	Shank(1)	Tough ↔ Hard IC08	IC300	IC900	IC903
EB020A04-2C03	2.00	3.00	4.00	38.00	2	30.0	C		●	●	●
EB030A05-2C03	3.00	3.00	5.00	38.00	2	30.0	C		●	●	
EB030A05-2C06	3.00	6.00	5.00	57.00	2	30.0	C	●		●	●
EB040A07-2C04	4.00	4.00	7.00	50.00	2	30.0	C			●	
EB040A07-2C06	4.00	6.00	7.00	57.00	2	30.0	C	●		●	●
EB050A08-2C05	5.00	5.00	8.00	50.00	2	30.0	C		●	●	
EB050A08-2C06	5.00	6.00	8.00	57.00	2	30.0	C	●	●	●	●
EB060A08-2C06	6.00	6.00	8.00	57.00	2	30.0	C	●	●	●	●
EB080A11-2C08	8.00	8.00	11.00	63.00	2	30.0	C	●	●	●	●
EB100A13-2C10	10.00	10.00	13.00	72.00	2	30.0	C			●	●
EB120A14-2C12	12.00	12.00	14.00	83.00	2	30.0	C			●	●
EB160A16-2C16	16.00	16.00	16.00	92.00	2	30.0	C			●	●
EB200A20-2C20	20.00	20.00	20.00	104.00	2	30.0	C			●	

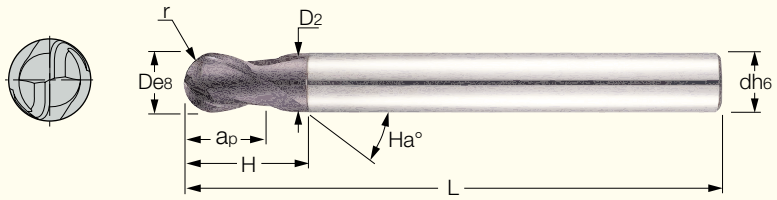
• Short and stable design for profiling (roughing). • For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EB-A2 (Stub Cut Length)

2 Flute, 30° Helix Stub Cut Length, Ball Nose Solid Carbide Endmills,
for Materials up to 55-70 HRc



HARD MATERIALS

Designation	Dimensions										IC903
	D	r(1)	d	ap	L	H	D2	Flute	Ha°	Shank(2)	
EB-A2 01-01/02C04H50	1.00	0.50	4.00	1.00	50.00	2.20	0.95	2	30.0	C	●
EB-A2 012-012/02C04H50	1.20	0.60	4.00	1.20	50.00	2.60	1.10	2	30.0	C	●
EB-A2 015-015/03C04H50	1.50	0.75	4.00	1.50	50.00	3.00	1.40	2	30.0	C	●
EB-A2 02-02/04C06H50	2.00	1.00	6.00	2.00	50.00	4.00	1.90	2	30.0	C	●
EB-A2 03-03/06C06H60	3.00	1.50	6.00	3.00	60.00	6.00	2.90	2	30.0	C	●
EB-A2 04-04/08C06H70	4.00	2.00	6.00	4.00	70.00	8.00	3.90	2	30.0	C	●
EB-A2 05-05/10C06H80	5.00	2.50	6.00	5.00	80.00	10.00	4.90	2	30.0	C	●
EB-A2 06-06/12C06H90	6.00	3.00	6.00	6.00	90.00	12.00	5.90	2	30.0	C	●
EB-A2 07-07/14C08H90	7.00	3.50	8.00	7.00	90.00	14.00	6.90	2	30.0	C	●
EB-A2 08-08/16C08H100	8.00	4.00	8.00	8.00	100.00	16.00	7.90	2	30.0	C	●
EB-A2 09-09/18C10H100	9.00	4.50	10.00	9.00	100.00	18.00	8.90	2	30.0	C	●
EB-A2 10-10/20C10H100	10.00	5.00	10.00	10.00	100.00	20.00	9.90	2	30.0	C	●
EB-A2 12-12/24C12H110	12.00	6.00	12.00	12.00	110.00	24.00	11.90	2	30.0	C	●
EB-A2 14-14/28C14H110	14.00	7.00	14.00	14.00	110.00	28.00	13.80	2	30.0	C	●
EB-A2 16-16/32C16H140	16.00	8.00	16.00	16.00	140.00	32.00	15.80	2	30.0	C	●
EB-A2 18-18/36C18H140	18.00	9.00	18.00	18.00	140.00	36.00	17.80	2	30.0	C	●
EB-A2 20-20/40C20H160	20.00	10.00	20.00	20.00	160.00	40.00	19.80	2	30.0	C	●
EB-A2 25-25/50C25H180	25.00	12.50	25.00	25.00	180.00	50.00	24.80	2	30.0	C	●

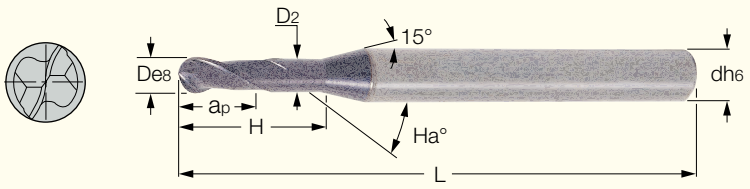
• For user guide, see pages C72-83.

(1) ±0.01 tolerance (2) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EB-A2 (Rib Processing)

2 Flute, 30° Helix Rib Processing Solid Carbide Ball Nose Endmills, for Materials up to 65 HRc



HARD MATERIALS

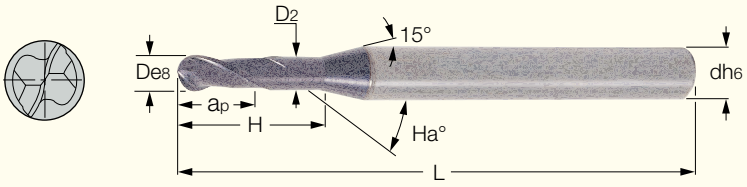
Designation	Dimensions									IC903
	D	d	a_p	L	H	D_2	Flute	H_a°	Shank(1)	
EB-A2 004-006/01C4M45	0.40	4.00	0.60	45.00	1.00	0.36	2	30.0	C	●
EB-A2 004-006/02C4M45	0.40	4.00	0.60	45.00	2.00	0.36	2	30.0	C	●
EB-A2 004-006/03C4M45	0.40	4.00	0.60	45.00	3.00	0.36	2	30.0	C	●
EB-A2 005-007/02C4M45	0.50	4.00	0.70	45.00	2.00	0.45	2	30.0	C	●
EB-A2 005-007/04C4M45	0.50	4.00	0.70	45.00	4.00	0.45	2	30.0	C	●
EB-A2 005-007/06C4M45	0.50	4.00	0.70	45.00	6.00	0.45	2	30.0	C	●
EB-A2 005-007/08C4M45	0.50	4.00	0.70	45.00	8.00	0.45	2	30.0	C	●
EB-A2 006-009/02C4M45	0.60	4.00	0.90	45.00	2.00	0.55	2	30.0	C	●
EB-A2 006-009/04C4M45	0.60	4.00	0.90	45.00	4.00	0.55	2	30.0	C	●
EB-A2 006-009/06C4M45	0.60	4.00	0.90	45.00	6.00	0.55	2	30.0	C	●
EB-A2 006-009/08C4M45	0.60	4.00	0.90	45.00	8.00	0.55	2	30.0	C	●
EB-A2 008-012/02C4M45	0.80	4.00	1.20	45.00	2.00	0.75	2	30.0	C	●
EB-A2 008-012/04C4M45	0.80	4.00	1.20	45.00	4.00	0.75	2	30.0	C	●
EB-A2 008-012/06C4M45	0.80	4.00	1.20	45.00	6.00	0.75	2	30.0	C	●
EB-A2 008-012/08C4M45	0.80	4.00	1.20	45.00	8.00	0.75	2	30.0	C	●
EB-A2 008-012/10C4M45	0.80	4.00	1.20	45.00	10.00	0.75	2	30.0	C	●
EB-A2 010-015/03C4M45	1.00	4.00	1.50	45.00	3.00	0.97	2	30.0	C	●
EB-A2 010-015/04C4M45	1.00	4.00	1.50	45.00	4.00	0.97	2	30.0	C	●
EB-A2 010-015/05C4M45	1.00	4.00	1.50	45.00	5.00	0.97	2	30.0	C	●
EB-A2 010-015/06C4M45	1.00	4.00	1.50	45.00	6.00	0.97	2	30.0	C	●
EB-A2 010-015/07C4M45	1.00	4.00	1.50	45.00	7.00	0.95	2	30.0	C	●
EB-A2 010-015/08C4M45	1.00	4.00	1.50	45.00	8.00	0.95	2	30.0	C	●
EB-A2 010-015/10C4M45	1.00	4.00	1.50	45.00	10.00	0.95	2	30.0	C	●
EB-A2 010-015/12C4M45	1.00	4.00	1.50	45.00	12.00	0.93	2	30.0	C	●
EB-A2 010-015/14C4M50	1.00	4.00	1.50	50.00	14.00	0.93	2	30.0	C	●
EB-A2 010-015/16C4M50	1.00	4.00	1.50	50.00	16.00	0.93	2	30.0	C	●
EB-A2 010-015/20C4M55	1.00	4.00	1.50	55.00	20.00	0.93	2	30.0	C	●
EB-A2 012-018/08C4M45	1.20	4.00	1.80	45.00	8.00	1.17	2	30.0	C	●
EB-A2 012-018/12C4M45	1.20	4.00	1.80	45.00	12.00	1.13	2	30.0	C	●
EB-A2 014-021/08C4M45	1.40	4.00	2.10	45.00	8.00	1.35	2	30.0	C	●
EB-A2 014-021/16C4M50	1.40	4.00	2.10	50.00	16.00	1.31	2	30.0	C	●
EB-A2 015-015/03C04M50	1.50	4.00	1.50	50.00	3.00	1.47	2	30.0	C	●
EB-A2 015-023/06C4M45	1.50	4.00	2.30	45.00	6.00	1.47	2	30.0	C	●
EB-A2 015-023/08C4M45	1.50	4.00	2.30	45.00	8.00	1.45	2	30.0	C	●
EB-A2 015-023/10C4M45	1.50	4.00	2.30	45.00	10.00	1.45	2	30.0	C	●
EB-A2 015-023/12C4M45	1.50	4.00	2.30	45.00	12.00	1.43	2	30.0	C	●
EB-A2 015-023/16C4M50	1.50	4.00	2.30	50.00	16.00	1.41	2	30.0	C	●
EB-A2 015-023/20C4M55	1.50	4.00	2.30	55.00	20.00	1.39	2	30.0	C	●
EB-A2 016-024/08C4M45	1.60	4.00	2.40	45.00	8.00	1.55	2	30.0	C	●
EB-A2 016-024/12C4M45	1.60	4.00	2.40	45.00	12.00	1.53	2	30.0	C	●
EB-A2 016-024/16C4M50	1.60	4.00	2.40	50.00	16.00	1.51	2	30.0	C	●
EB-A2 016-024/20C4M55	1.60	4.00	2.40	55.00	20.00	1.49	2	30.0	C	●
EB-A2 018-027/08C4M45	1.80	4.00	2.70	45.00	8.00	1.75	2	30.0	C	●
EB-A2 018-027/12C4M45	1.80	4.00	2.70	45.00	12.00	1.73	2	30.0	C	●
EB-A2 018-027/16C4M50	1.80	4.00	2.70	50.00	16.00	1.71	2	30.0	C	●
EB-A2 020-030/04C4M45	2.00	4.00	3.00	45.00	4.00	1.97	2	30.0	C	●
EB-A2 020-030/06C4M45	2.00	4.00	3.00	45.00	6.00	1.97	2	30.0	C	●
EB-A2 020-030/10C4M45	2.00	4.00	3.00	45.00	10.00	1.93	2	30.0	C	●
EB-A2 020-030/12C4M50	2.00	4.00	3.00	50.00	12.00	1.93	2	30.0	C	●

• For user guide, see pages C72-83.

(1) C-Cylindrical

EB-A2 (Rib Processing) (continued)

2 Flute, 30° Helix Rib Processing Solid Carbide Ball Nose Endmills,
for Materials up to 65 HRc



HARD MATERIALS

Designation	Dimensions									IC903
	D	d	a_p	L	H	D_2	Flute	H_a°	Shank(1)	
EB-A2 020-030/14C4M50	2.00	4.00	3.00	50.00	14.00	1.93	2	30.0	C	●
EB-A2 020-030/16C4M50	2.00	4.00	3.00	50.00	16.00	1.91	2	30.0	C	●
EB-A2 020-030/20C4M55	2.00	4.00	3.00	55.00	20.00	1.89	2	30.0	C	●
EB-A2 020-030/25C4M60	2.00	4.00	3.00	60.00	25.00	1.89	2	30.0	C	●
EB-A2 020-030/30C4M70	2.00	4.00	3.00	70.00	30.00	1.89	2	30.0	C	●
EB-A2 030-045/08C6M50	3.00	6.00	4.50	50.00	8.00	2.85	2	30.0	C	●
EB-A2 030-045/10C6M50	3.00	6.00	4.50	50.00	10.00	2.85	2	30.0	C	●
EB-A2 030-045/12C6M50	3.00	6.00	4.50	50.00	12.00	2.85	2	30.0	C	●
EB-A2 030-045/16C6M55	3.00	6.00	4.50	55.00	16.00	2.85	2	30.0	C	●
EB-A2 030-045/20C6M60	3.00	6.00	4.50	60.00	20.00	2.85	2	30.0	C	●
EB-A2 030-045/25C6M65	3.00	6.00	4.50	65.00	25.00	2.85	2	30.0	C	●
EB-A2 030-045/30C6M70	3.00	6.00	4.50	70.00	30.00	2.85	2	30.0	C	●
EB-A2 030-045/35C6M80	3.00	6.00	4.50	80.00	35.00	2.85	2	30.0	C	●
EB-A2 040-060/10C6M60	4.00	6.00	6.00	60.00	10.00	3.80	2	30.0	C	●
EB-A2 040-060/12C6M60	4.00	6.00	6.00	60.00	12.00	3.80	2	30.0	C	●
EB-A2 040-060/16C6M60	4.00	6.00	6.00	60.00	16.00	3.80	2	30.0	C	●
EB-A2 040-060/20C6M65	4.00	6.00	6.00	65.00	20.00	3.80	2	30.0	C	●
EB-A2 040-060/25C6M70	4.00	6.00	6.00	70.00	25.00	3.80	2	30.0	C	●
EB-A2 040-060/30C6M70	4.00	6.00	6.00	70.00	30.00	3.80	2	30.0	C	●
EB-A2 040-060/35C6M80	4.00	6.00	6.00	80.00	35.00	3.80	2	30.0	C	●
EB-A2 040-060/40C6M90	4.00	6.00	6.00	90.00	40.00	3.80	2	30.0	C	●
EB-A2 040-060/45C6M90	4.00	6.00	6.00	90.00	45.00	3.80	2	30.0	C	●
EB-A2 040-060/50C6M100	4.00	6.00	6.00	100.00	50.00	3.80	2	30.0	C	●
EB-A2 050-075/16C6M60	5.00	6.00	7.50	60.00	16.00	4.80	2	30.0	C	●
EB-A2 050-075/20C6M60	5.00	6.00	7.50	60.00	20.00	4.80	2	30.0	C	●
EB-A2 050-075/25C6M70	5.00	6.00	7.50	70.00	25.00	4.80	2	30.0	C	●
EB-A2 050-075/30C6M80	5.00	6.00	7.50	80.00	30.00	4.80	2	30.0	C	●
EB-A2 050-075/35C6M80	5.00	6.00	7.50	80.00	35.00	4.80	2	30.0	C	●
EB-A2 060-090/20C6M80	6.00	6.00	9.00	80.00	20.00	5.80	2	30.0	C	●
EB-A2 060-090/30C6M90	6.00	6.00	9.00	90.00	30.00	5.80	2	30.0	C	●
EB-A2 060-090/40C6M100	6.00	6.00	9.00	100.00	40.00	5.80	2	30.0	C	●
EB-A2 060-090/50C6M110	6.00	6.00	9.00	110.00	50.00	5.80	2	30.0	C	●

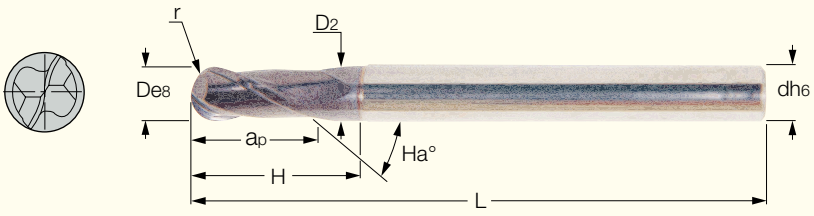
• For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EB-A2 (Long with Neck)

2 Flute, 30° Helix Long Solid Carbide, Ball Nose Endmills with Neck for Materials up to 65 HRc



HARD MATERIALS

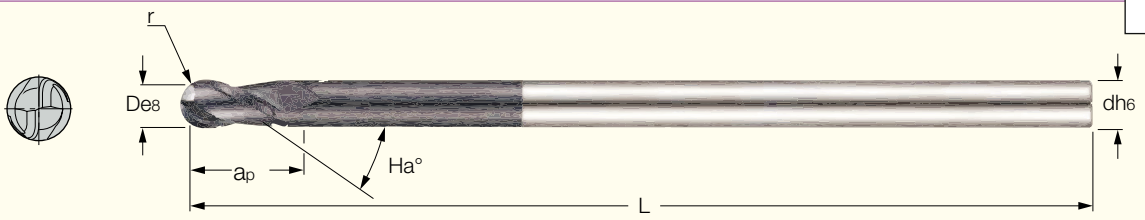
Designation	Dimensions D	r	d	a_p	L	H	D_2	Flute	H_a°	Shank(1)	IC903
EB-A2 03-08C06M70	3.00	1.50	6.00	8.00	70.00	-	-	2	30.0	C	●
EB-A2 04-08C06M70	4.00	2.00	6.00	8.00	70.00	-	-	2	30.0	C	●
EB-A2 05-12C06M80	5.00	2.50	6.00	12.00	80.00	-	-	2	30.0	C	●
EB-A2 06-12/22C06M80	6.00	3.00	6.00	12.00	80.00	22.00	5.80	2	30.0	C	●
EB-A2 07-14C08M90	7.00	3.50	8.00	14.00	90.00	-	-	2	30.0	C	●
EB-A2 08-14/27C08M90	8.00	4.00	8.00	14.00	90.00	27.00	7.80	2	30.0	C	●
EB-A2 10-18/31C10M100	10.00	5.00	10.00	18.00	100.00	31.00	9.80	2	30.0	C	●
EB-A2 12-22/35C12M110	12.00	6.00	12.00	22.00	110.00	35.00	11.80	2	30.0	C	●
EB-A2 14-26C12M120	14.00	7.00	12.00	26.00	120.00	-	-	2	30.0	C	●
EB-A2 16-30/50C16M140	16.00	8.00	16.00	30.00	140.00	50.00	15.80	2	30.0	C	●
EB-A2 18-34C16M140	18.00	9.00	16.00	34.00	140.00	-	-	2	30.0	C	●
EB-A2 20-38/58C20M160	20.00	10.00	20.00	38.00	160.00	58.00	19.80	2	30.0	C	●
EB-A2 25-55/75C25M180	25.00	12.50	25.00	55.00	180.00	75.00	24.80	2	30.0	C	●

• For user guide, see pages C72-83.

(1) C-Cylindrical

EB-A2 (Extra Long)

2 Flute, 30° Helix Extra Long Solid Carbide Ball Nose Endmills, for Materials up to 65 HRc



HARD MATERIALS

Designation	Dimensions D	r	d	a_p	L	Flute	H_a°	Shank(1)	IC903
EB-A2 02-06C03M80	2.00	1.00	3.00	6.00	80.00	2	30.0	C	●
EB-A2 03-08C03M100	3.00	1.50	3.00	8.00	100.00	2	30.0	C	●
EB-A2 04-08C04M100	4.00	2.00	4.00	8.00	100.00	2	30.0	C	●
EB-A2 05-10C06M120	5.00	2.50	6.00	10.00	120.00	2	30.0	C	●
EB-A2 06-10C06M120	6.00	3.00	6.00	10.00	120.00	2	30.0	C	●
EB-A2 08-14C08M140	8.00	4.00	8.00	14.00	140.00	2	30.0	C	●
EB-A2 10-18C10M180	10.00	5.00	10.00	18.00	180.00	2	30.0	C	●
EB-A2 12-22C12M200	12.00	6.00	12.00	22.00	200.00	2	30.0	C	●
EB-A2 16-30C16M250	16.00	8.00	16.00	30.00	250.00	2	30.0	C	●
EB-A2 20-38C20M250	20.00	10.00	20.00	38.00	250.00	2	30.0	C	●

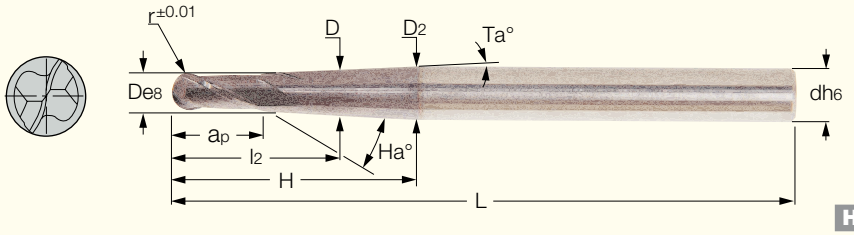
• For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EB-A2 (Tapered Flute & Neck)

2 Flute, 30° Helix Tapered Flute and Neck, Solid Carbide Ball Nose Endmills
for Materials up to 65 HRc



HARD MATERIALS

Designation	Dimensions												IC903
	D	r	d	a_p	l_2	H	D_2	$T_a°$	L	Flute	$H_a°$	Shank(1)	
EB-A2 01-02/04/1.5C06M60	1.00	0.50	6.00	2.00	4.0	23.00	2.00	1.5	60.00	2	30.0	C	●
EB-A2 01-02/04/3.0C06M80	1.00	0.50	6.00	2.00	4.0	42.00	5.00	3.0	80.00	2	30.0	C	●
EB-A2 01-02/04/5.0C06M60	1.00	0.50	6.00	2.00	4.0	23.00	4.30	5.0	60.00	2	30.0	C	●
EB-A2 02-04/06/1.5C06M60	2.00	1.00	6.00	4.00	6.0	23.00	2.90	1.5	60.00	2	30.0	C	●
EB-A2 02-04/06/3.0C06M80	2.00	1.00	6.00	4.00	6.0	41.00	5.70	3.0	80.00	2	30.0	C	●
EB-A2 02-04/06/5.0C06M60	2.00	1.00	6.00	4.00	6.0	23.00	5.00	5.0	60.00	2	30.0	C	●
EB-A2 03-06/08/1.5C06M90	3.00	1.50	6.00	6.00	8.0	52.00	5.30	1.5	90.00	2	30.0	C	●
EB-A2 03-06/08/3.0C06M70	3.00	1.50	6.00	6.00	8.0	32.00	5.60	3.0	70.00	2	30.0	C	●
EB-A2 04-08/10/1.5C06M90	4.00	2.00	6.00	8.00	10.0	49.00	6.00	1.5	90.00	2	30.0	C	●
EB-A2 04-08/10/3.0C06M70	4.00	2.00	6.00	8.00	10.0	28.00	6.00	3.0	70.00	2	30.0	C	●
EB-A2 05-10/12/1.5C08M110	5.00	2.50	8.00	10.00	12.0	61.00	7.60	1.5	110.00	2	30.0	C	●
EB-A2 05-10/12/3.0C08M90	5.00	2.50	8.00	10.00	12.0	41.00	8.00	3.0	90.00	2	30.0	C	●
EB-A2 06-12/15/1.5C08M110	6.00	3.00	8.00	12.00	15.0	53.00	8.00	1.5	110.00	2	30.0	C	●
EB-A2 06-12/15/3.0C08M90	6.00	3.00	8.00	12.00	15.0	34.00	8.00	3.0	90.00	2	30.0	C	●
EB-A2 08-14/17/1.5C10M120	8.00	4.00	10.00	14.00	17.0	55.00	10.00	1.5	120.00	2	30.0	C	●
EB-A2 08-14/17/3.0C10M100	8.00	4.00	10.00	14.00	17.0	36.00	10.00	3.0	100.00	2	30.0	C	●
EB-A2 10-18/21/1.5C12M130	10.00	5.00	12.00	18.00	21.0	59.00	12.00	1.5	130.00	2	30.0	C	●
EB-A2 10-18/21/3.0C12M110	10.00	5.00	12.00	18.00	21.0	40.00	12.00	3.0	110.00	2	30.0	C	●
EB-A2 12-22/25/1.5C16M160	12.00	6.00	16.00	22.00	25.0	83.00	15.00	1.5	160.00	2	30.0	C	●
EB-A2 12-22/25/3.0C16M140	12.00	6.00	16.00	22.00	25.0	63.00	16.00	3.0	140.00	2	30.0	C	●

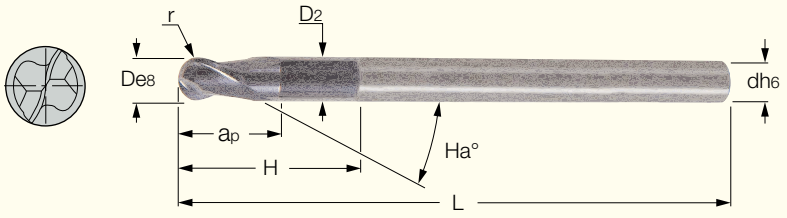
• For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EB-A2 (Precision Stub Cut)

2 Flute, 30° Helix High Precision Ball Nose, Stub Cut Length,
for Materials up to 65 HRc



HARD MATERIALS

Designation	Dimensions										IC903
	D	r	d	a_p	H	L	D_2	Flute	H_a°	Shank[1]	
EB-A2 01-01/02C04M50	1.00	0.50	4.00	1.00	2.20	50.00	0.95	2	30.0	C	●
EB-A2 01-01/02C06M50	1.00	0.50	6.00	1.00	2.20	50.00	0.95	2	30.0	C	●
EB-A2 012-012/02C04M50	1.20	0.60	4.00	1.20	2.60	50.00	1.10	2	30.0	C	●
EB-A2 02-02/04C06M50	2.00	1.00	6.00	2.00	4.00	50.00	1.90	2	30.0	C	●
EB-A2 025-025/05C06M60	2.50	1.30	6.00	2.50	5.00	60.00	2.40	2	30.0	C	●
EB-A2 03-03/06C06M60	3.00	1.50	6.00	3.00	6.00	60.00	2.90	2	30.0	C	●
EB-A2 04-04/08C06M70	4.00	2.00	6.00	4.00	8.00	70.00	3.90	2	30.0	C	●
EB-A2 05-05/10C06M80	5.00	2.50	6.00	5.00	10.00	80.00	4.90	2	30.0	C	●
EB-A2 06-06/12C06M90	6.00	3.00	6.00	6.00	12.00	90.00	5.90	2	30.0	C	●
EB-A2 07-07/14C08M90	7.00	3.50	8.00	7.00	14.00	90.00	6.90	2	30.0	C	●
EB-A2 08-08/16C08M100	8.00	4.00	8.00	8.00	16.00	100.00	7.90	2	30.0	C	●
EB-A2 09-09/18C10M100	9.00	4.50	10.00	9.00	18.00	100.00	8.90	2	30.0	C	●
EB-A2 10-10/20C10M100	10.00	5.00	10.00	10.00	20.00	100.00	9.90	2	30.0	C	●
EB-A2 12-12/24C12M110	12.00	6.00	12.00	12.00	24.00	110.00	11.90	2	30.0	C	●
EB-A2 14-14/28C14M110	14.00	7.00	14.00	14.00	28.00	110.00	13.80	2	30.0	C	●
EB-A2 16-16/32C16M140	16.00	8.00	16.00	16.00	32.00	140.00	15.80	2	30.0	C	●
EB-A2 18-18/36C18M140	18.00	9.00	18.00	18.00	36.00	140.00	17.80	2	30.0	C	●
EB-A2 25-25/50C25M180	25.00	12.50	25.00	25.00	50.00	180.00	24.80	2	30.0	C	●

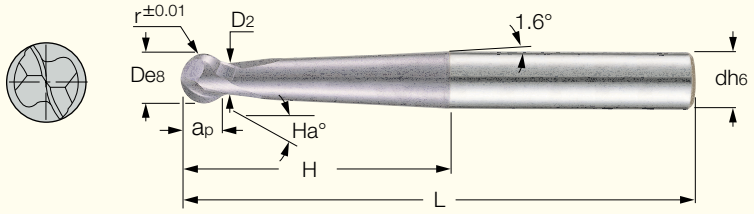
• For user guide, see pages C72-83.

[1] C-Cylindrical

SOLIDMILL
PREMIUM LINE

ESB-A2

2 Flute, 30° Helix Spherical Long Solid Carbide Ball Nose Endmills for Materials up to 65 HRc



HARD MATERIALS

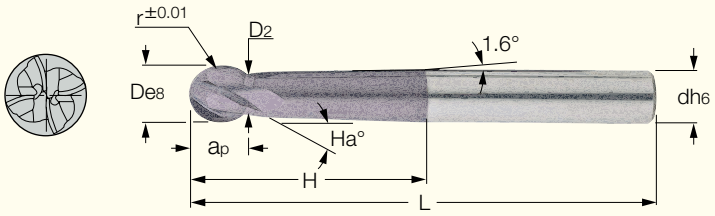
Designation	Dimensions D	r	d	a_p	H	D_2	L	Flute	H_a°	Shank(1)	IC903
ESB-A2 03 02/30C06M80	3.00	1.50	6.00	2.30	30.0	2.50	80.00	2	30.0	C	●
ESB-A2 04 03/30C06M80	4.00	2.00	6.00	3.10	30.0	3.30	80.00	2	30.0	C	●
ESB-A2 05 03/38C06M80	5.00	2.50	6.00	3.90	38.0	4.10	80.00	2	30.0	C	●
ESB-A2 06 04/28C06M100	6.00	3.00	6.00	4.90	28.0	4.70	100.00	2	30.0	C	●
ESB-A2 08 06/33C08M100	8.00	4.00	8.00	6.30	33.0	6.50	100.00	2	30.0	C	●
ESB-A2 10 07/40C10M100	10.00	5.00	10.00	7.90	40.0	8.20	100.00	2	30.0	C	●
ESB-A2 12 09/49C12M100	12.00	6.00	12.00	9.50	49.0	9.80	100.00	2	30.0	C	●
ESB-A2 16 12/59C16M150	16.00	8.00	16.00	12.40	59.0	13.40	150.00	2	30.0	C	●

• For user guide, see pages C72-83.

(1) C-Cylindrical

ESB-A4

4 Flute, 30° Helix Spherical Long Solid Carbide Ball Nose Endmills, for Materials up to 65 HRc



HARD MATERIALS

Designation	Dimensions D	r	d	a_p	H	D_2	L	Flute	H_a°	Shank(1)	IC903
ESB-A4 05 3/38C06M80	5.00	2.50	6.00	3.90	38.0	4.10	80.00	4	30.0	C	●
ESB-A4 06 4/28C06M100	6.00	3.00	6.00	4.90	28.0	4.70	100.00	4	30.0	C	●
ESB-A4 08 6/33C08M100	8.00	4.00	8.00	6.30	33.0	6.30	100.00	4	30.0	C	●
ESB-A4 10 7/40C10M100	10.00	5.00	10.00	7.90	40.0	8.20	100.00	4	30.0	C	●
ESB-A4 12 9/49C12M100	12.00	6.00	12.00	9.50	49.0	9.80	100.00	4	30.0	C	●
ESB-A4 16 12/59C16M150	16.00	8.00	16.00	12.40	59.0	13.40	150.00	4	30.0	C	●

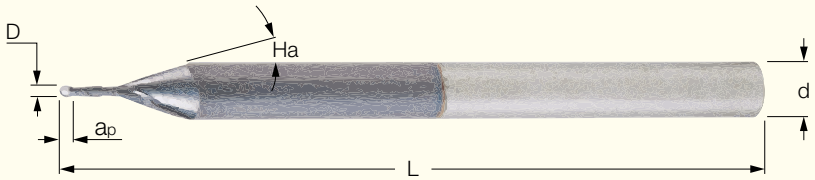
• For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EBM-A-2

2 Flute, 30° Helix Medium Length Solid Carbide Miniature Ball Nose Endmills



Designation	Dimensions								Tough ↔ Hard	
	D	r	d	a_p	L	Flute	H_a°	Shank[1]	IC08	IC900
EBM004A008-2C03	0.40	0.20	3.00	0.80	38.00	2	30.0	C	●	●
EBM005A010-2C03	0.50	0.25	3.00	1.00	38.00	2	30.0	C	●	●
EBM006A012-2C03	0.60	0.30	3.00	1.20	38.00	2	30.0	C	●	●
EBM007A014-2C03	0.70	0.35	3.00	1.40	38.00	2	30.0	C	●	●
EBM008A016-2C03	0.80	0.40	3.00	1.60	38.00	2	30.0	C	●	●
EBM010A025-2C04	1.00	0.50	4.00	2.50	50.00	2	30.0	C	●	●
EBM011A025-2C04	1.00	0.55	4.00	2.50	50.00	2	30.0	C	●	●
EBM012A030-2C04	1.20	0.60	4.00	3.00	50.00	2	30.0	C	●	●
EBM016A040-2C04	1.60	0.80	4.00	4.00	50.00	2	30.0	C	●	●
EBM020A060-2C04	2.00	1.00	4.00	6.00	50.00	2	30.0	C	●	●

• Short and stable design for profiling (roughing). • For user guide, see pages C72-83.

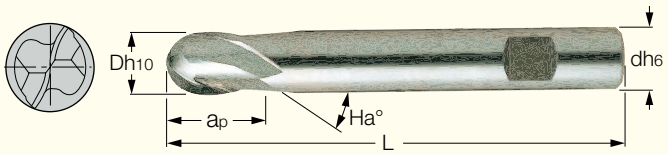
(1) C-Cylindrical

D	Tolerance
D≤0.6	D 0.000 -0.010
0.6<D≤2	D 0.000 -0.012

SOLIDMILL
TEC LINE

EB-A2 (Economical)

Economical Type 2 Flute, 30° Helix Ball Nose Solid Carbide Endmills



Designation	Dimensions							Tough ↔ Hard	
	D	d	a_p	L	Flute	H_a°	Shank[1]	IC08	IC900
EB-A2 02-06C03E38	2.00	3.00	6.00	38.00	2	30.0	C	●	●
EB-A2 02-04C06E48	2.00	6.00	4.00	48.00	2	30.0	C	●	●
EB-A2 025-04C06E48	2.50	6.00	4.00	48.00	2	30.0	C	●	●
EB-A2 03-04C06E48	3.00	6.00	4.00	48.00	2	30.0	C	●	●
EB-A2 03-07W06E57	3.00	6.00	7.00	57.00	2	30.0	W	●	●
EB-A2 04-06C06E50	4.00	6.00	6.00	50.00	2	30.0	C	●	●
EB-A2 04-08W06E57	4.00	6.00	8.00	57.00	2	30.0	W	●	●
EB-A2 05-07C06E51	5.00	6.00	7.00	51.00	2	30.0	C	●	●
EB-A2 05-10W06E57	5.00	6.00	10.00	57.00	2	30.0	W	●	●
EB-A2 06-07C06E51	6.00	6.00	7.00	51.00	2	30.0	C	●	●
EB-A2 06-10W06E57	6.00	6.00	10.00	57.00	2	30.0	W	●	●
EB-A2 08-09C08E59	8.00	8.00	9.00	59.00	2	30.0	C	●	●
EB-A2 08-16W08E63	8.00	8.00	16.00	63.00	2	30.0	W	●	●
EB-A2 10-10C10E60	10.00	10.00	10.00	60.00	2	30.0	C	●	●
EB-A2 10-19W10E72	10.00	10.00	19.00	72.00	2	30.0	W	●	●
EB-A2 12-14C12E71	12.00	12.00	14.00	71.00	2	30.0	C	●	●
EB-A2 12-22W12E83	12.00	12.00	22.00	83.00	2	30.0	W	●	●
EB-A2 14-14C14E71	14.00	14.00	14.00	71.00	2	30.0	C	●	●
EB-A2 14-22W14E83	14.00	14.00	22.00	83.00	2	30.0	W	●	●
EB-A2 16-16C16E76	16.00	16.00	16.00	76.00	2	30.0	C	●	●
EB-A2 16-26W16E92	16.00	16.00	26.00	92.00	2	30.0	W	●	●
EB-A2 18-18C18E76	18.00	18.00	18.00	76.00	2	30.0	C	●	●
EB-A2 18-26W18E92	18.00	18.00	26.00	92.00	2	30.0	W	●	●
EB-A2 20-20C20E82	20.00	20.00	20.00	82.00	2	30.0	C	●	●
EB-A2 20-32W20E104	20.00	20.00	32.00	104.00	2	30.0	W	●	●

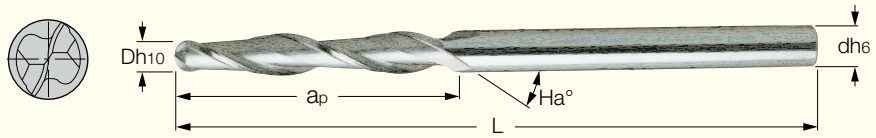
• For user guide, see pages C72-83.

[1] C-Cylindrical, W-Weldon

SOLIDMILL
TEC LINE

EB-A2(Economical-Extra Long)

Economical Type 2 Flute, 30° Helix Ball Nose Extra Long Solid Carbide Endmills



Designation	Dimensions D	d	a_p	L	Flute	H_a°	Shank(1)	Tough ↔ Hard IC08	IC900
EB-A2 03-30C03E75	3.00	3.00	30.00	75.00	2	30.0	C	●	●
EB-A2 04-30C04E75	4.00	4.00	30.00	75.00	2	30.0	C	●	●
EB-A2 05-40C05E100	5.00	5.00	40.00	100.00	2	30.0	C	●	●
EB-A2 06-50C06E150	6.00	6.00	50.00	150.00	2	30.0	C	●	●
EB-A2 08-50C08E150	8.00	8.00	50.00	150.00	2	30.0	C	●	●
EB-A2 10-60C10E150	10.00	10.00	60.00	150.00	2	30.0	C	●	●
EB-A2 12-75C12E150	12.00	12.00	75.00	150.00	2	30.0	C	●	●
EB-A2 14-75C14E150	14.00	14.00	75.00	150.00	2	30.0	C	●	●
EB-A2 16-75C16E150	16.00	16.00	75.00	150.00	2	30.0	C	●	●
EB-A2 18-75C18E150	18.00	18.00	75.00	150.00	2	30.0	C	●	●
EB-A2 20-75C20E150	20.00	20.00	75.00	150.00	2	30.0	C	●	●

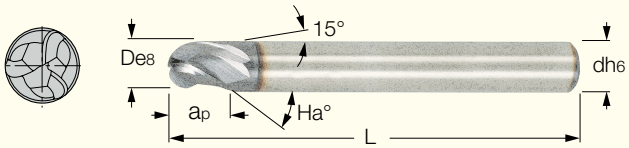
• For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EB-A-3

3 Flute, 30° Helix Short Solid Carbide Ball Nose Endmills



Designation	Dimensions D	d	a_p	L	Flute	H_a°	Shank(1)	IC900
EB016A020-3C03	1.60	3.00	2.00	38.00	3	30.0	C	●
EB030A05-3C03	3.00	3.00	5.00	38.00	3	30.0	C	●
EB030A05-3C06	3.00	6.00	5.00	57.00	3	30.0	C	●
EB040A07-3C04	4.00	4.00	7.00	50.00	3	30.0	C	●
EB040A07-3C06	4.00	6.00	7.00	57.00	3	30.0	C	●
EB050A08-3C05	5.00	5.00	8.00	50.00	3	30.0	C	●
EB050A08-3C06	5.00	6.00	8.00	57.00	3	30.0	C	●
EB060A08-3C06	6.00	6.00	8.00	57.00	3	30.0	C	●
EB080A11-3C08	8.00	8.00	11.00	63.00	3	30.0	C	●
EB100A13-3C10	10.00	10.00	13.00	72.00	3	30.0	C	●
EB120A14-3C12	12.00	12.00	14.00	83.00	3	30.0	C	●
EB200A20-3C20	20.00	20.00	20.00	104.00	3	30.0	C	●

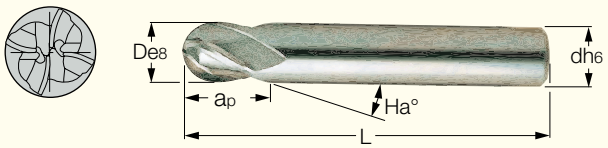
• Short and stable design for profiling (roughing). • For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
TEC LINE

EB-A4 (Economical-Short)

Economical Type 4 Flute, 30° Helix Ball Nose Short Solid Carbide Endmills



Designation	Dimensions D	d	a_p	L	Flute	H_a°	Shank(1)	Tough ↔ Hard IC08	IC900
EB-A4 02-04C06E48	2.00	6.00	4.00	48.00	4	30.0	C	●	●
EB-A4 03-04C06E48	3.00	6.00	4.00	48.00	4	30.0	C	●	●
EB-A4 04-06C06E50	4.00	6.00	6.00	50.00	4	30.0	C	●	●
EB-A4 05-07C06E51	5.00	6.00	7.00	51.00	4	30.0	C	●	●
EB-A4 06-07C06E51	6.00	6.00	7.00	51.00	4	30.0	C	●	●
EB-A4 08-09C08E59	8.00	8.00	9.00	59.00	4	30.0	C	●	●
EB-A4 10-10C10E60	10.00	10.00	10.00	60.00	4	30.0	C	●	●
EB-A4 12-14C12E71	12.00	12.00	14.00	71.00	4	30.0	C	●	●
EB-A4 14-14C14E71	14.00	14.00	14.00	71.00	4	30.0	C	●	●
EB-A4 16-16C16E76	16.00	16.00	16.00	76.00	4	30.0	C	●	●
EB-A4 18-18C18E76	18.00	18.00	18.00	76.00	4	30.0	C	●	●
EB-A4 20-20C20E82	20.00	20.00	20.00	82.00	4	30.0	C	●	●

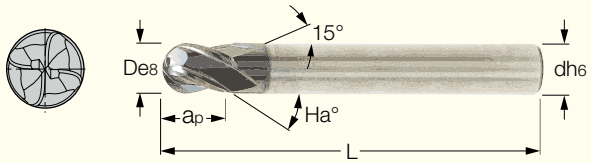
• For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EB-A-4 (Short Length)

4 Flute, 30° Helix Short Solid Carbide Ball Nose Endmills



Designation	Dimensions D	d	a_p	L	Flute	H_a°	Shank(1)	IC900
EB020A03/06-4C03L38	2.00	3.00	3.00	38.00	4	30.0	C	●
EB030A05-4C03	3.00	3.00	5.00	38.00	4	30.0	C	●
EB030A05-4C06	3.00	6.00	5.00	57.00	4	30.0	C	●
EB040A07-4C04	4.00	4.00	7.00	50.00	4	30.0	C	●
EB040A07-4C06	4.00	6.00	7.00	50.00	4	30.0	C	●
EB050A08-4C06	5.00	6.00	8.00	57.00	4	30.0	C	●
EB060A08-4C06	6.00	6.00	8.00	57.00	4	30.0	C	●
EB080A11-4C08	8.00	8.00	11.00	63.00	4	30.0	C	●
EB100A13-4C10	10.00	10.00	13.00	72.00	4	30.0	C	●
EB120A14-4C12	12.00	12.00	14.00	83.00	4	30.0	C	●
EB140A14-4C14	14.00	14.00	14.00	83.00	4	30.0	C	●
EB160A16-4C16	16.00	16.00	16.00	92.00	4	30.0	C	●
EB200A20-4C20	20.00	20.00	20.00	104.00	4	30.0	C	●

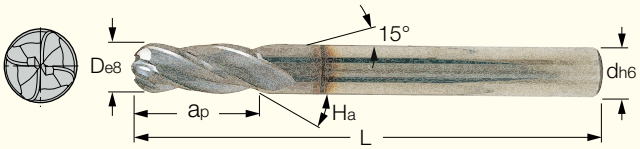
• Short and stable design for profiling (finishing). • For user guide, see pages C72-83.

(1) C-Cylindrical

SOLIDMILL
PREMIUM LINE

EB-A-4 (Medium Length)

4 Flute, 30° Helix Medium Length Solid Carbide Ball Nose Endmills



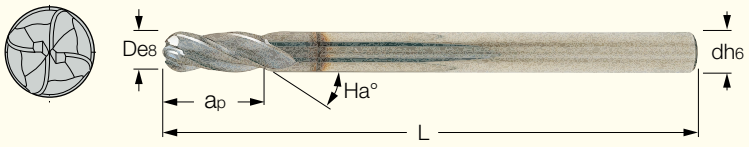
Designation	Dimensions D	d	a_p	L	Flute	H_a°	Shank(1)	IC900
EB030A08-4C04	3.00	4.00	8.00	50.00	4	30.0	C	●
EB040A12-4C04	4.00	4.00	12.00	50.00	4	30.0	C	●
EB050A14-4C05	5.00	5.00	14.00	50.00	4	30.0	C	●
EB060A16-4C06	6.00	6.00	16.00	57.00	4	30.0	C	●
EB080A20-4C08	8.00	8.00	20.00	63.00	4	30.0	C	●
EB090A11-4C09	9.00	9.00	11.00	63.00	4	30.0	C	●
EB100A22-4C10	10.00	10.00	22.00	72.00	4	30.0	C	●
EB120A25-4C12	12.00	12.00	25.00	83.00	4	30.0	C	●
EB160A32-4C16	16.00	16.00	32.00	92.00	4	30.0	C	●
EB200A38-4C20	20.00	20.00	38.00	104.00	4	30.0	C	●

• For user guide, see pages C72-83.

(1) C-Cylindrical

EBL-A-4

4 Flute, 30° Helix Long Solid Carbide Ball Nose Endmills



Designation	Dimensions D	d	a_p	L	Flute	H_a°	Shank(1)	IC900
EBL040A12-4C04	4.00	4.00	12.00	80.00	4	30.0	C	●
EBL060A16-4C06	6.00	6.00	16.00	100.00	4	30.0	C	●
EBL070A16-4C07	7.00	7.00	16.00	100.00	4	30.0	C	●
EBL080A20-4C08	8.00	8.00	20.00	100.00	4	30.0	C	●
EBL090A20-4C09	9.00	9.00	20.00	100.00	4	30.0	C	●
EBL100A22-4C10	10.00	10.00	22.00	100.00	4	30.0	C	●
EBL120A25-4C12	12.00	12.00	25.00	100.00	4	30.0	C	●
EBL160A32-4C16	16.00	16.00	32.00	125.00	4	30.0	C	●

• Profiling in deep cavities • For user guide, see pages C72-83.

(1) C-Cylindrical

ECF../45

45° Chamfering and Countersinking Solid Carbide Endmills

Designation	Dimensions						IC900
	D_5	d	a_p	L	Flute	Shank[1]	
ECF D-1.5/45-4C04	1.00	4.00	1.50	50.00	4	C	●
ECF D-2/45-4C06	2.00	6.00	2.00	57.00	4	C	●
ECF D-3/45-4C08	2.00	8.00	3.00	63.00	4	C	●
ECF D-4/45-4C10	2.00	10.00	4.00	72.00	4	C	●
ECF D-5/45-4C12	2.00	12.00	5.00	83.00	4	C	●

• For user guide, see pages C72-83.

(1) C-Cylindrical

Grade Priorities for Solid Carbide Endmills

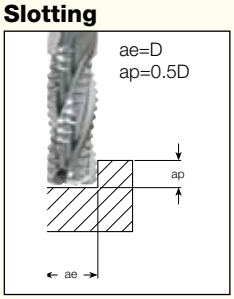
Material Groups	ISO P	ISO H	ISO M	ISO S	ISO K	ISO N
	1 - 11	38 - 41	12 - 14	31 - 37	15 - 20	21 - 28
	Steel	Hard Steel	Stainless Steel	High Temp.	Cast Iron	Nonferrous
	Harder IC903 IC900/IC908 Tougher	Harder IC903 IC900/IC908 Tougher	Harder IC900/IC908 IC300 Tougher	Harder IC903 IC900/IC908 IC300 IC08 Tougher	Harder IC903 IC900/IC908 Tougher	Harder IC900/IC908 IC08 Tougher

In most cases the best performance can be attained without using coolant for specific grades. However, it should be noted that if for any reason coolant must be used, it could possibly affect tool life and sometimes cause insert failure, due to thermal shock.

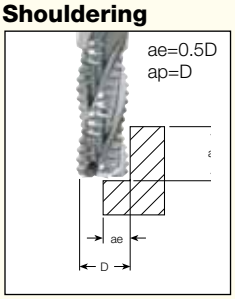
■ First choice

Recommended Feeds for SOLIDSHRED Rougher Endmills

Slotting



Shouldering

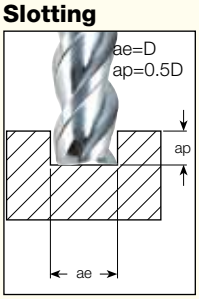


Dmm	Fz (min)	Fz (max)	Dmm	Fz (min)	Fz (max)
1	0.006	0.01	1	0.006	0.014
1.3	0.006	0.02	1.3	0.006	0.024
1.5	0.006	0.04	1.5	0.006	0.044
1.8	0.01	0.05	1.8	0.010	0.056
2	0.01	0.06	2	0.010	0.066
2.3	0.01	0.06	2.3	0.010	0.066
2.5	0.01	0.06	2.5	0.010	0.066
2.8	0.02	0.07	2.8	0.02	0.076
3	0.02	0.08	3	0.02	0.088
3.3	0.02	0.08	3.3	0.02	0.088
4	0.03	0.09	4	0.03	0.098
4.3	0.03	0.09	4.3	0.03	0.098
5	0.04	0.10	5	0.04	0.110
6	0.05	0.12	6	0.05	0.132
7	0.06	0.14	7	0.06	0.154
8	0.06	0.16	8	0.06	0.176
9	0.06	0.16	9	0.06	0.176
10	0.06	0.18	10	0.06	0.196
12	0.07	0.20	12	0.07	0.216
14	0.08	0.22	14	0.08	0.238
16	0.10	0.24	16	0.10	0.260
18	0.10	0.26	18	0.10	0.280
20	0.10	0.30	20	0.10	0.340
25	0.12	0.30	25	0.12	0.360

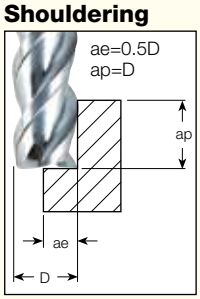
High Speed Cutting on Hard Materials
(up to 60 HRc)
Apply small depth of cut
(0.1-0.3 mm) at 80-160 m/min

Recommended Feeds for Solid Carbide and MULTI-MASTER Endmills

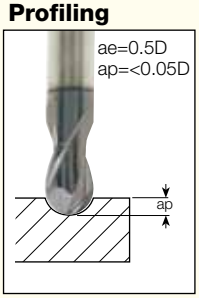
Slotting

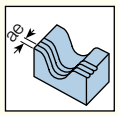


Shouldering



Profiling





Slotting			Shouldering / Profiling	
Dmm	Fz (min)	Fz (max)	Fz (min)	Fz (max)
1	0.003	0.005	0.003	0.007
1.3	0.003	0.010	0.003	0.012
1.5	0.003	0.020	0.003	0.022
1.8	0.005	0.025	0.005	0.028
2	0.005	0.030	0.005	0.033
2.3	0.005	0.030	0.005	0.033
2.5	0.005	0.030	0.005	0.030
2.8	0.010	0.035	0.010	0.038
3	0.010	0.040	0.010	0.044
3.3	0.015	0.040	0.010	0.044
4	0.015	0.045	0.015	0.049
4.3	0.020	0.045	0.015	0.049
5	0.025	0.050	0.020	0.055
6	0.030	0.060	0.025	0.066
7	0.030	0.070	0.030	0.077
8	0.030	0.080	0.030	0.088
9	0.030	0.080	0.030	0.088
10	0.035	0.090	0.030	0.098
12	0.040	0.10	0.035	0.108
14	0.050	0.11	0.04	0.119
16	0.050	0.12	0.05	0.130
18	0.050	0.13	0.05	0.140
20	0.050	0.15	0.05	0.170
25	0.060	0.15	0.06	0.180

For grade priorities for solid carbide endmills, see page C72.

Machining Data for Solid Carbide and MULTI-MASTER Endmills

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material(1) No.
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		Pearlitic/ferritic		180	15
			Pearlitic/martensitic		260	16
	Ductile cast iron (nodular)		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 grade priorities for solid carbide endmills, see page C72.

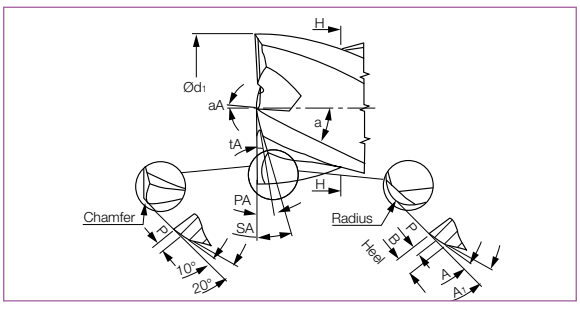
(1) For workpiece materials list, see pages D4-39.

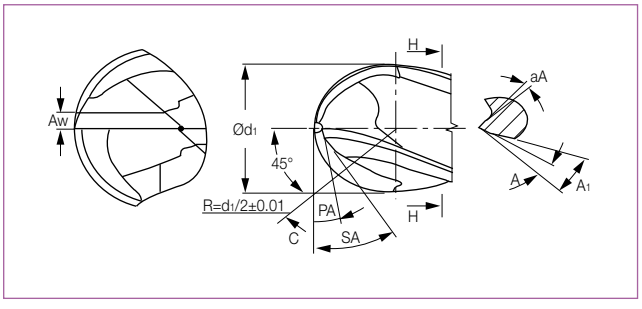
Solid Carbide Endmills

No.	IC900	IC903	IC300	IC08
1	260 - 280	260 - 280	210 - 220	180 - 200
2	200 - 230	200 - 230	160 - 180	140 - 160
3	160 - 220	160 - 220	130 - 180	110 - 150
4	160 - 220	160 - 220	130 - 180	110 - 150
5	140 - 180	140 - 180	110 - 140	100 - 130
6	160 - 220	160 - 220	130 - 180	110 - 150
7	120 - 180	120 - 180	100 - 140	80 - 130
8	130 - 180	130 - 180	100 - 140	90 - 130
9	140 - 180	140 - 180	110 - 140	100 - 130
10	130 - 180	130 - 180	100 - 140	90 - 130
11	70 - 120	70 - 120	60 - 100	50 - 80
12	80 - 160	80 - 160	60 - 130	60 - 110
13	60 - 150	60 - 150	50 - 120	40 - 100
14	60 - 120	60 - 120	50 - 100	40 - 80
15	80 - 260	80 - 250	60 - 210	60 - 180
16	130 - 240	130 - 240	100 - 190	90 - 170
17	150 - 280	150 - 270	120 - 220	100 - 200
18	90 - 280	90 - 270	70 - 220	60 - 200
19	150 - 280	150 - 270	120 - 220	100 - 200
20	140 - 240	140 - 240	110 - 190	100 - 170
21				800 - 900
22				700 - 800
23				800 - 900
24				750 - 850
25				400 - 450
26				500 - 550
27				500 - 550
28				350 - 380
29				
30				
31	20 - 40	20 - 40	20 - 30	10 - 20
32	20 - 40	20 - 30	20 - 20	10 - 20
33	20 - 50	20 - 30	20 - 20	20 - 50
34	20 - 70	20 - 30	20 - 20	20 - 50
35	30 - 70	30 - 80	20 - 60	20 - 50
36	30 - 70	30 - 80	20 - 60	20 - 30
37	30 - 70	30 - 80	20 - 60	20 - 30
38	30 - 50	30 - 60	20 - 40	40 - 60
39	30 - 40	30 - 40	20 - 30	20 - 30
40	60 - 80	70 - 90	50 - 60	65 - 75
41	30 - 50	30 - 60	20 - 40	40 - 45

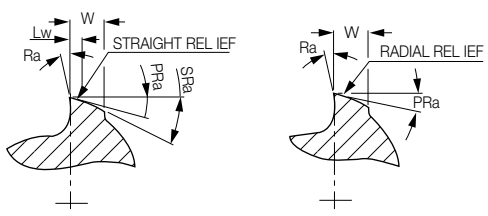
Regrinding Instructions for Solid Carbide Endmills

	d_1 [µ m]	d_1 [µ in]	**a	*Ra	*Pra/Rra	*SRa	**t_A	*a_A	*P_A
Square End *									
2 Flute * General Use	< 7	< .3	30	10	10	-	2	7	8
	> 7	> .3	30	8	10	-	2	7	8
3 Flute * General Use	< 7	< .3	38-45	9	10	-	2	5	7
	> 7	> .3	38-45	7	10	-	2	5	7
4 Flute * General Use	< 7	< .3	30-45	7	10	-	1.5	5	7
	> 7	> .3	30-45	7	10	-	1.5	5	7
6 Flute ECH... * General Use	< 7	< .3	45	8	10	-	1.5	6	7
	> 7	> .3	45	7	9	-	1.5	5	7
6 Flute EC-D6 Hard Mater.*	-	-	50	-12	10	-	1	-2	7
Ball End									
2 Flute * General Use	< 7	< .3	30	7	11	24	-	3	13
	> 7	> .3	30	7	11	24	-	3	13
3 Flute * General Use	< 7	< .3	30	7	11	24	-	3	11
	> 7	> .3	30	7	11	24	-	3	11
4 Flute General Use	< 7	< .3	30	7	11	24	-	3	13
	> 7	> .3	30	7	11	24	-	3	13
Square End + Radius *									
3 Flute * General Use	< 7	< .3	38-45	9	12	25	3	6	12
	> 7	> .3	38-45	7	12	24	3	5	12
4 Flute * General Use	< 7	< .3	30-45	8	12	26	3	5	12
	> 7	> .3	30-45	7	12	24	4	5	12
6 Flute * General Use	< 7	< .3	45	8	12	22	4	5	12
	> 7	> .3	45	7	11	22	4	5	11
10 Flute * (MM) General Use	-	-	30	7	10	16	4	3	10
Roughers *									
ERF-A-3..6 * General Use *	< 7	< .3	30-38	9	8	-	2.5	6	7
	> 7	> .3	30-38	8	8	-	2.5	6	7
EBRF-T3...4 * General Use	<7	< .3	20	6	8	-	-	3	12
	> 7	> .3	20	6	8	-	-	3	12
ECR-B-4/5/7 * Stainless Steel/General Use	<7	< .3	45	9	7.5	-	3	5	7
	>7	> .3	45	8	8	-	3	5	7
ECR-T4... * PH /General Use	<7	< .3	20	9	7.5	-	2	5	7
	>7	> .3	20	8	7.5	-	2	5	7
ERC-E3 * Aluminum	< 7	< .3	38	16	10	-	2	10	10
	> 7	> .3	38	16	11	-	2	10	10
ECR-B3 3 Flute Aluminum*	-	-	45	16	11	-	4	10	10
Aluminum *									
ECA-B-2 * 2 Flute Aluminum	< 7	< .3	45-55	16	11	25	5	10	11
	> 7	> .3	45-55	16	11	25	5	10	11
ECA-B-3 * 3 Flute Aluminum	< 7	< .3	45	16	10	-	4	10	10
	> 7	> .3	45	16	10	-	4	10	10
Chip Splitters									
ECP-E3/4 * Stainless Steel/Gen Use	< 7	< .3	38	8	8	-	3	6	7
	> 7	> .3	38	8	8	-	3	6	7
FINISHRED									
EFS-B44 * General Use ***	< 7	< .3	45	3	7.5	-	1.5	2	7
	> 7	> .3	45	3	7.5	-	1.5	2	7
CHATTERFREE									
EC-E4...CF * General Use	< 7	< .3	38	4	3	9****	3	2	7
	> 7	> .3	38	4	3	8****	3	2	7
CHATTERFREE									
EC-E5...CF * General Use	< 7	< .3	38	7	8	-	3	2	7
	> 7	> .3	38	6	8	-	3	2	7



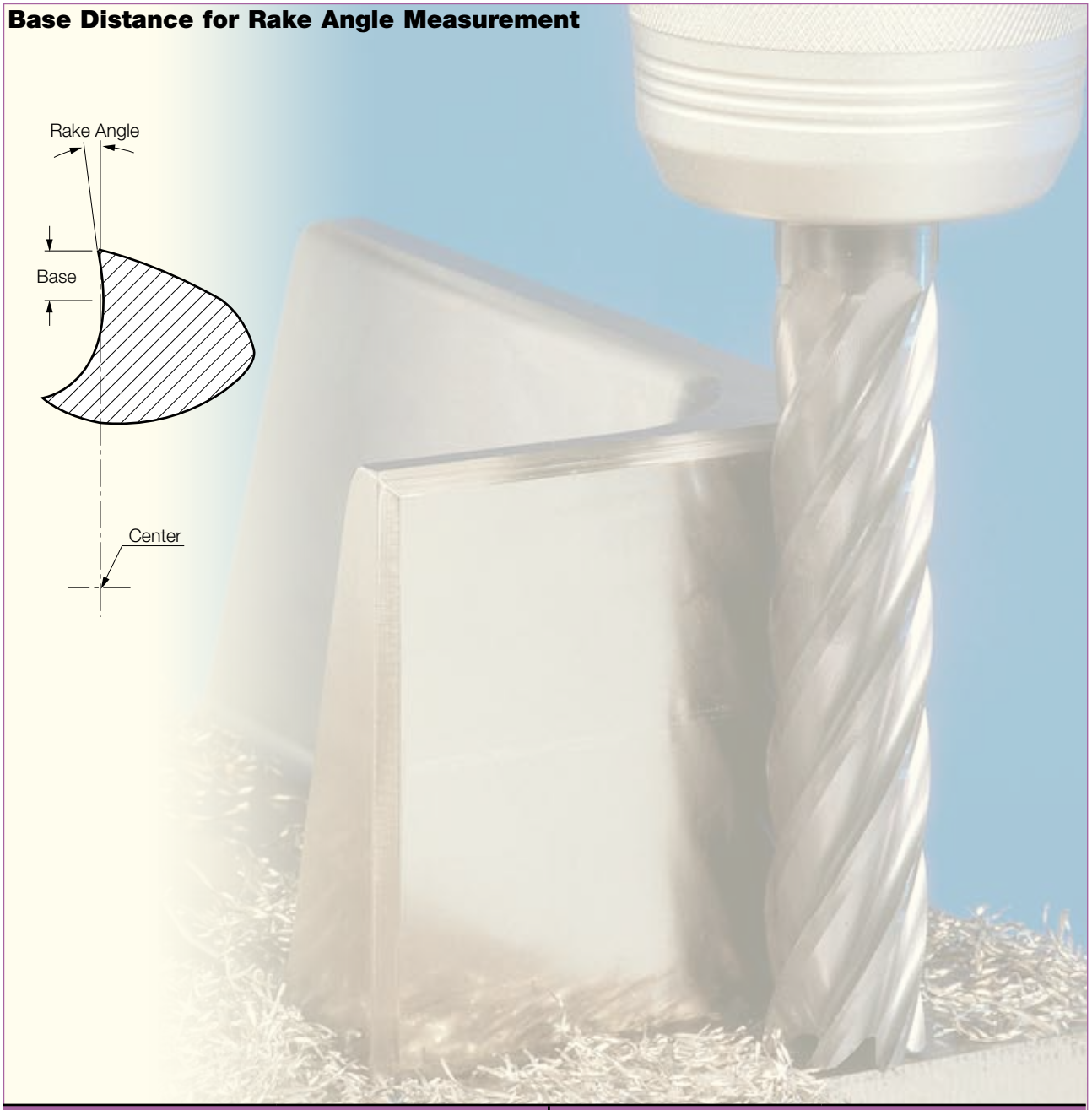


*S_A	W	*A	*A_1	L_W	A_W	P	B	Radius
17	0.18*d1	12.0	-	-	0.10*d1	-	-	-
17	0.175*d1	12.0	-	-	0.10*d1	-	-	-
17	0.175*d1	12.0	-	-	0.10*d1	-	-	-
17	0.16*d1	12.0	-	-	0.10*d1	-	-	-
16	0.17*d1	12.0	-	-	0.10*d1	-	-	-
16	0.16*d1	12.0	-	-	0.10*d1	-	-	-
17	0.14*d1	-	-	-	0.08*d1	-	-	-
17	0.13*d1	-	-	-	0.08*d1	-	-	-
-	0.19*d1	-	-	-	-	-	-	-
24	0.175*d1	12.0	24	0.06*d1	0.06*d1	0.06*d1	0.22*d1	-
24	0.165*d1	12.0	24	0.05*d1	0.05*d1	0.05*d1	0.17*d1	-
24	0.175*d1	11.0	24	0.06*d1	0.06*d1	0.08*d1	0.165*d1	-
24	0.165*d1	11.0	24	0.05*d1	0.05*d1	0.05*d1	0.170*d1	-
24	0.175*d1	12.0	24	0.06*d1	0.06*d1	0.06*d1	0.165*d1	-
24	0.165*d1	12.0	24	0.05*d1	0.05*d1	0.05*d1	0.170*d1	-
22	0.175*d1	12.0	23.5	0.06*d1	0.10*d1	0.08*d1	0.157*d1	-
22	0.165*d1	12.0	23	0.05*d1	0.10*d1	0.075*d1	0.148*d1	-
22	0.175*d1	12.0	24	0.06*d1	0.10*d1	0.08*d1	0.157*d1	-
22	0.165*d1	12.0	23	0.05*d1	0.10*d1	0.075*d1	0.148*d1	-
22	0.14*d1	12.0	22	0.06*d1	0.10*d1	0.08*d1	0.126*d1	-
22	0.13*d1	11.0	22	0.05*d1	0.10*d1	0.075*d1	0.117*d1	-
16	0.10*d1	10.0	16	0.04*d1	0.045*d1	0.04*d1	-	R
17	0.21*d1	-	-	-	0.10*d1	-	-	-
17	0.21*d1	-	-	-	0.08*d1	-	-	-
26	0.19*d1	12.0	26	0.06*d1	0.06*d1	0.06*d1	0.18*d1	-
25	0.22*d1	12.0	25	0.053*d1	0.053*d1	0.053*d1	0.25*d1	-
17	0.22*d1	13.0	-	-	0.10*d1	-	-	-
16	0.24/0.20/0.14*d1	12.0	-	-	0.08*d1	-	-	-
16	0.32*d1	12.0	-	-	0.09*d1	-	-	-
16	0.3*d1	11.0	-	-	0.09*d1	-	-	-
22	0.2*d1	-	-	-	0.10*d1	-	-	-
22	0.2*d1	-	-	-	0.09*d1	-	-	-
22	0.24*d1	10.0	-	-	0.10*d1	-	-	R0.2
24	0.17*d1	-	-	0.06*d1	0.10*d1	0.08*d1	0.153*d1	-
24	0.19*d1	-	-	0.05*d1	0.10*d1	0.075*d1	0.171*d1	-
22	0.26*d1	10.0	-	-	0.10*d1	-	-	R0.2
22	0.24*d1	10.0	-	-	0.10*d1	-	-	R0.2
17	0.27*d1	14.0	-	-	0.10*d1	-	-	-
17	0.27*d1	12.0	-	-	0.10*d1	-	-	-
16	0.27*d1	12.0	-	-	0.10*d1	-	-	-
16	0.27*d1	12.0	-	-	0.10*d1	-	-	-
17	0.17*d1/0.23*d1	13.0	-	0.008*d1/0.04*d1	0.075*d1	-	-	-
17	0.15*d1/0.23*d1	13.0	-	0.006*d1/0.04*d1	0.075*d1	-	-	-
16	0.17*d1/0.21*d1	12.0	-	-	0.085*d1	-	-	-
16	0.17*d1/0.21*d1	12.0	-	-	0.08*d1	-	-	-



Regrinding Instructions for Solid Carbide Endmills (continued)

Base Distance for Rake Angle Measurement



Tool Diameter		Base Distance	
mm	in	mm	in
0.5<d1≤0.7	.02<d1≤.03	0.03	.001181
0.7<d1≤0.8	.03<d1≤.032	0.04	.001574
0.8<d1≤1.0	.032<d1≤.04	0.05	.001968
1.0<d1≤1.2	.04<d1≤.05	0.065	.002559
1.2<d1≤1.4	.05<d1≤.055	0.075	.002952
1.4<d1≤1.6	.055<d1≤.063	0.085	.003346
1.6<d1≤2	.063<d1≤.08	0.1	.003937
2<d1≤4	.08<d1≤.158	0.2	.007874
4<d1≤6.35	.158<d1≤.25	0.3	.01181
6.35<d1≤8	.25<d1≤.315	0.4	.01574
8<d1≤13	.315<d1≤.512	0.5	.01968
13<d1≤21	.512<d1≤.827	0.6	.02362
21<d1≤27	.827<d1≤1.063	0.7	.02755
27<d1≤	1.063<d1	0.8	.03149

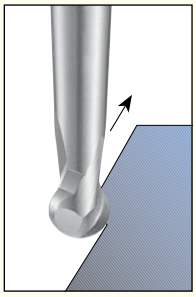
Ball Nose

- For die & mold making, turbine manufacturing and aircraft industry, etc.
- Useful for intricate-shaped surfaces.
- Profiling of up to 70 HRc high hardened steels and alloy steels, nickel based alloys, titanium alloys.
- Ultra-fine grain carbide which increases both toughness and hardness.
- Suitable for dry and high speed cutting.
- Special sphere shaped tool geometry provides increased tool life and enables higher speed and feed operations.

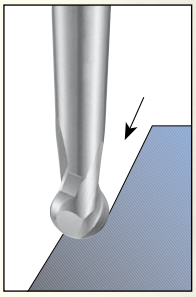
Milling Features

Operating angle 208°-212°

- Excellent surface roughness and high milling process.
- Enables milling with high speed and feed in back milling mode.



Favorable
Back Milling ✔

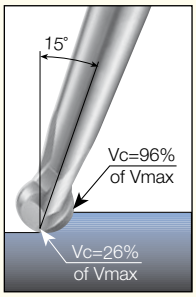


Unfavorable
Steep Ramping

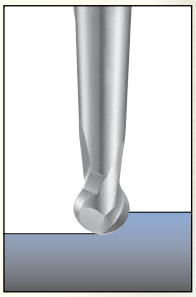
Operating Recommendations

It is recommended to machine with the tool inclined at a 15° angle. This technique eliminates cutting at nearly zero speed at the tool axis. Cutting is more efficient, and tool life substantially improves.

- Decreased cutting force.
- Excellent surface roughness and brightness.

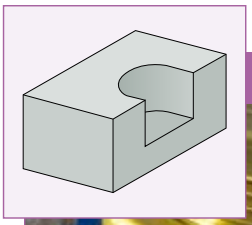


Favorable
Profiling ✔

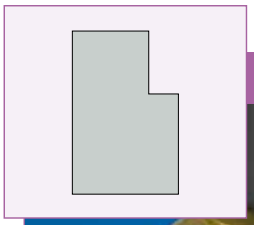


Unfavorable
Profiling

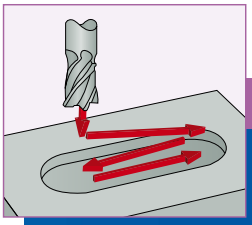
Popular Endmill Applications



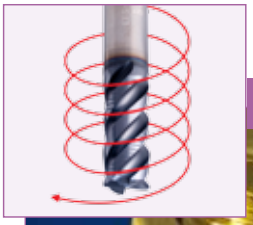
Slotting



Shouldering



Ramping Down



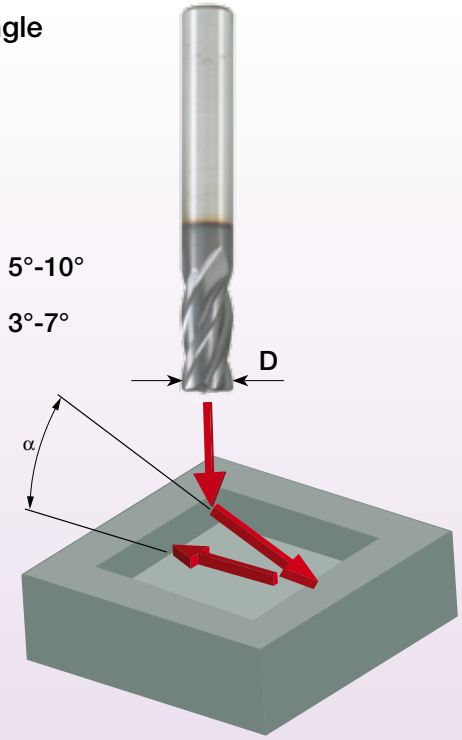
Helical Interpolation

Recommendations for Popular Applications

Recommended Rampdown Angle

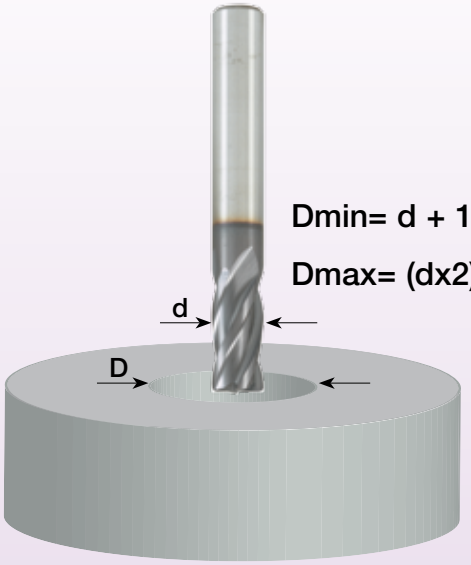
A D ≤ 10 mm α= 5°-10°

B D > 10 mm α= 3°-7°



Helical Milling

Recommended for
Faster and Better Chip Evacuation



Dmin= d + 1 mm

Dmax= (dx2) -1 mm

Influence of Tool Diameter on Chip Removal Rate

When using the same or similar cutting parameters, higher metal removal rates can be achieved with the smallest tool diameter, compared with a larger tool diameter.
Therefore, when selecting an endmill diameter, it is recommended to choose the smallest tool diameter suitable for the required application.

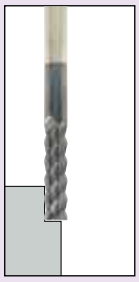
Following are two machining examples demonstrating the above recommendation:

Roughing

Designation		EFS-B44 20-42C20-104	EFS-B44 12-26C12-83
Diameter	D (mm)	**20**	**12**
Depth of cut	ap (mm)	12	12
Width of cut	ae (mm)	5	5
No. of teeth	z	6	4
Feed per tooth	fz (mm)	0.05	0.065
Cutting speed	Vc (m/min)	50	50
Table feed	Vf (mm/min)	**239**	**345**

44% Higher Table Feed

Finishing



Designation		EC 200B38-4C20	ECL 100B40-4C10
Diameter	D (mm)	**20**	**10**
Depth of cut	ap (mm)	30	30
Width of cut	ae (mm)	0.5	0.5
No. of teeth	z	4	4
Feed per tooth	fz (mm)	0.07	0.07
Cutting speed	Vc (m/min)	100	100
Table feed	Vf (mm/min)	**445**	**890**

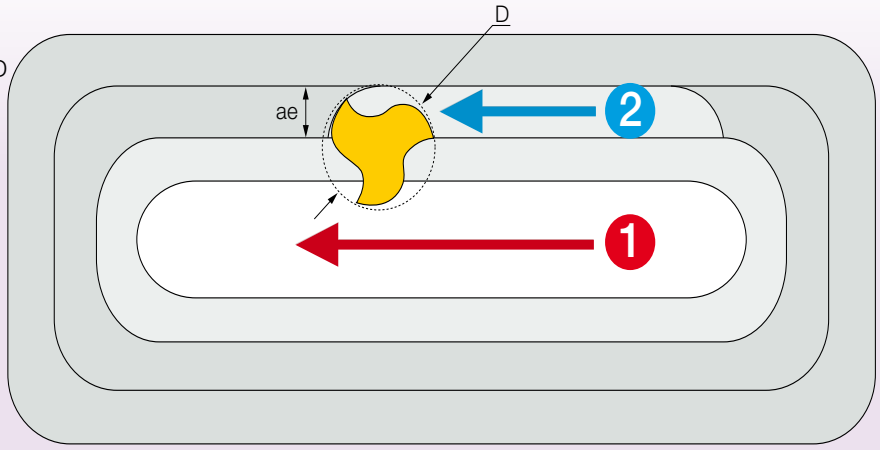
50% Higher Table Feed

Pocket Milling

1 Recommended Method
Open the pocket in the middle

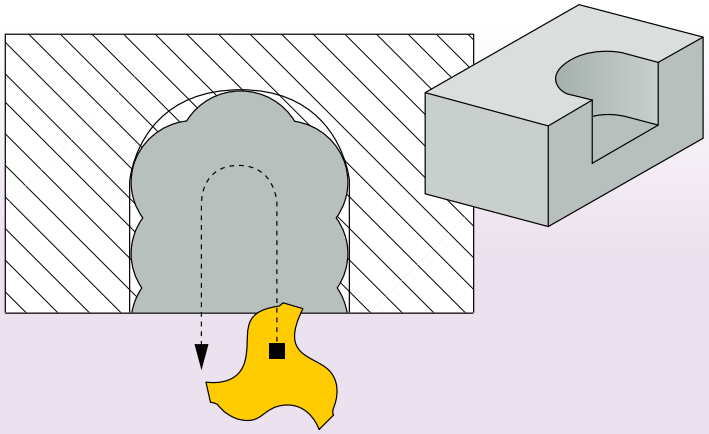
2 Proceed with shoulder milling
Width of cut ae = 40-60% x D

Features
- Better chip evacuation
- No mismatch in the corners
- Constant operation
- Less vibration
- Longer tool life



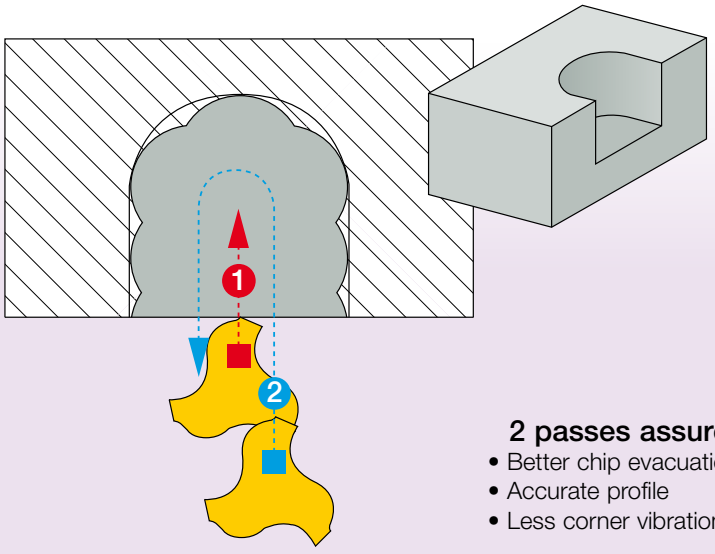
Roughing Side Pockets

Conventional Method



- Poor chip evacuation
- May cause chipping

Alternative Recommended Method



2 passes assure:
- Better chip evacuation
- Accurate profile
- Less corner vibration

Machining Data for MULTI-MASTER Groove Milling Heads

ISO	Material		Condition	Tensile Strength [N/mm2]	Hardness HB	Material(1) No.
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		Ferritic		160	15
			Pearlitic		250	16
	Ductile cast iron (nodular)		Pearlitic/ferritic		180	17
			Pearlitic/martensitic		260	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 D4-39.

MM-TS			MM-GRIT K-TYPE			MM-GRIT P-TYPE		
Speed	Feed		Speed	Feed mm/t		Speed	Feed mm/t	
V m/min	Fz (min)	Fz (max)	V m/min	Fz (min)	Fz (max)	V m/min	Fz (min)	Fz (max)
110-140	0.08	0.20	110-160	0.05	0.15	-	-	-
100-120	0.08	0.18	100-150	0.05	0.15	-	-	-
70-100	0.08	0.15	80-100	0.05	0.15	-	-	-
70-100	0.08	0.15	80-100	0.05	0.15	-	-	-
60-80	0.08	0.15	60-80	0.05	0.15	-	-	-
100-120	0.08	0.15	110-150	0.05	0.15	-	-	-
90-120	0.08	0.15	100-120	0.05	0.15	-	-	-
80-110	0.08	0.15	70-110	0.05	0.15	-	-	-
70-100	0.05	0.12	70-100	0.05	0.15	-	-	-
60-80	0.05	0.18	60-80	0.05	0.15	-	-	-
55-70	0.08	0.15	55-70	0.05	0.15	-	-	-
100-130	0.06	0.12	100-130	0.03	0.15	100-130	0.03	0.10
100-120	0.08	0.15	100-130	0.03	0.15	100-130	0.03	0.10
80-120	0.05	0.10	90-120	0.03	0.12	90-120	0.03	0.10
160-220	0.10	0.20	160-220	0.03	0.12	-	-	-
120-200	0.10	0.15	120-200	0.03	0.12	-	-	-
100-140	0.10	0.20	-	-	-	-	-	-
80-100	0.10	0.15	-	-	-	-	-	-
180-250	0.10	0.20	180-250	0.03	0.15	-	-	-
160-220	0.10	0.15	160-220	0.03	0.15	-	-	-
800-1200	0.10	0.20	-	-	-	800-1200	0.05	0.15
800-1200	0.10	0.20	-	-	-	800-1200	0.05	0.15
-	-	-	-	-	-	600-1000	0.05	0.15
-	-	-	-	-	-	500-1000	0.05	0.15
-	-	-	-	-	-	200-400	0.05	0.15
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	30-40	0.02	0.12	-	-	-
25-35	0.05	0.12	25-40	0.02	0.12	-	-	-
25-35	0.05	0.12	25-40	-	-	-	0.01	0.12
25-35	0.05	0.12	25-40	-	-	-	0.01	0.12
40-60	0.05	0.12	25-40	-	-	-	0.01	0.12
40-60	0.05	0.12	40-60	-	-	-	0.05	0.12
40-60	0.05	0.10	40-60	-	-	-	0.05	0.10

MATERIALS AND GRADES

Member IMC Group

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		Pearlitic/ferritic		1150	0.20	180	15
			Pearlitic/martensitic		1350	0.28	260	16
	Ductile cast iron (nodular)		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

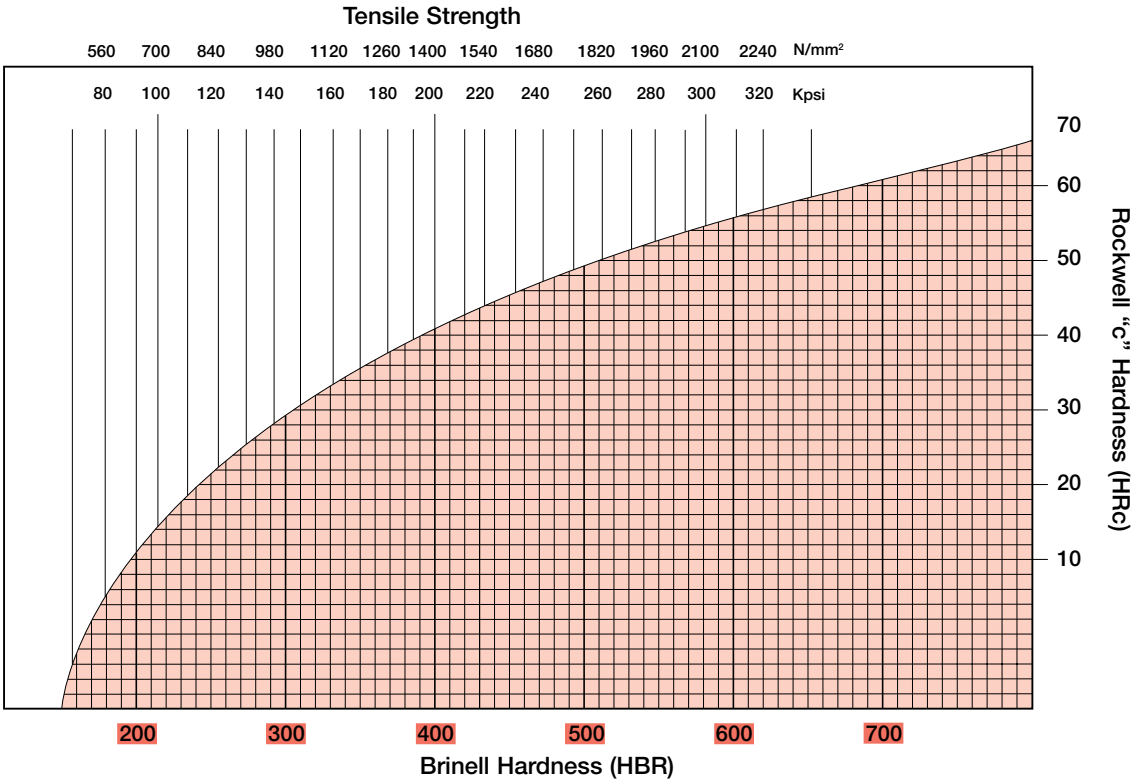
Steel Stainless Steel Cast Iron

Nonferrous High Temp. Alloys Hardened Steel

(1) Specific cutting force for 1 mm² chip section.
(2) Chip thickness factor.

MATERIAL GROUPS

Hardness Conversion Table



ISCAR SOLID CARBIDE and MULTI-MASTER Grades Chart

Grades	ISO	Coating Layers	
IC908/IC900	P15-P40 M20-M30 K05-K25 S15-S25 H10-H25	AL-TEC	TiN TiAlN
	A tough, submicron PVD TiAlN coated grade. Suitable for milling heat resistant alloys, austenitic stainless steel, hard alloys and carbon steel at medium to high cutting speeds.		
IC903	H01-H10 P05-P15 M10-M20 S10-S20	AL-TEC	TiAlN
	Ultra-fine grain carbide with 12% cobalt, TiAlN PVD coated grade. Used for up to 62 HRC hardened steel, titanium, nickel-based alloys and stainless steel at high speeds and medium feeds. A tough and highly wear resistant grade.		
IC300 PVD COATED	M20-M40 S15-S25 P25-P50		TiCN TiN
	A tough submicron TiN/TiCN PVD coated grade. Suitable for milling heat resistant alloys, austenitic stainless steel and carbon steel at unfavorable conditions, at low to medium cutting speeds.		
IC08	N10-N25 M10-M30 S10-S30		
	An uncoated, fine grain carbide grade. Used for stainless steel and high temperature alloys at low to medium cutting speeds.		

PVD COATED UNCOATED

ISCAR MATERIAL GROUPS

According to VDI 3323 Standard

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain BS	EN
12		1.4418	X4 CrNiMo16 5		
12	XM 8; 430 Ti; 439	1.4510			
12	430tl	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	x20cRmOnl 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	x2cRnl18 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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 cRnImO 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 cRnImO 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				

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According to VDI 3323 Standard

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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		x15cRnIsl2 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	

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Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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				

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Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

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According to VDI 3323 Standard

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	DIN	Great Britain 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

Mtl. No.	USA AISI/SAE	GERMANY Werkstoff	GERMANY DIN	Great Britain BS	Great Britain 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					

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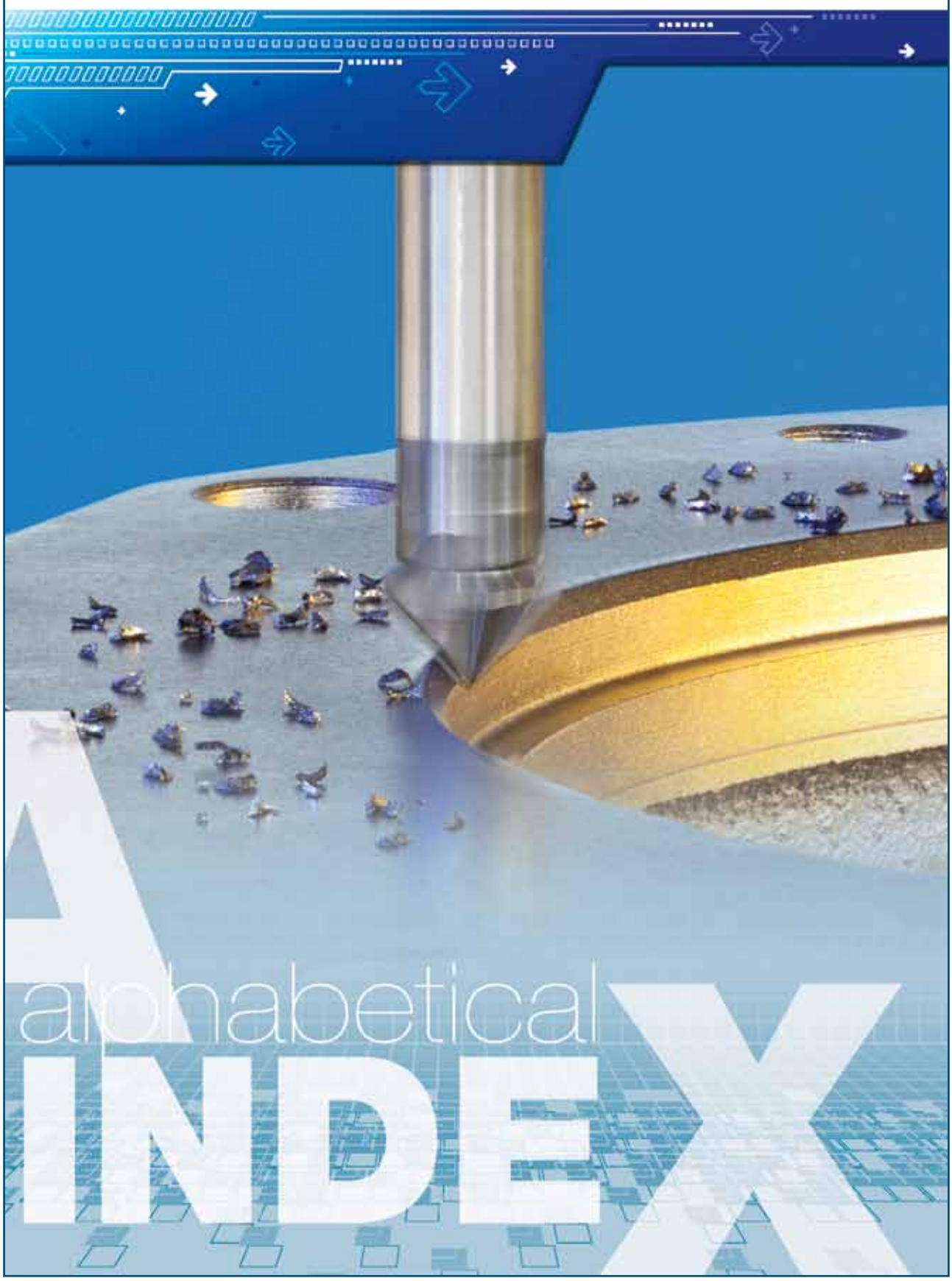
INDEX



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E

E

E

M

M

M	MT-UN-MM	B33
	MT-W-MM	B33
	MULTI-MASTER	A2
T	TS CAB	B39
	TS S-A	B39

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