FEEDROUNDS™

Diameters:
0.250" – 0.750", 1mm - 20mm

Cutting Edge Length:
0.012" - 0.039", 0.006mm - 1.0mm

Overall Length:
2.50" – 4.00", 50mm - 104mm

Number of Flutes:
2 and 4

Corner Configurations:
0.039" - 0.118", 0.1mm - 17.7mm

Relief Radius:
0.220" - 0.665", 0.15mm - 4.02mm

Grade:
IN2006
IN2003

Series 45ARA / 45A...RA
2 and 4 Flute Hi-Feed End mills

NEW – Added range of 1mm to 5mm diameters with 2 flutes in grade IN2003

UPDATED DESIGN – Added range of 4mm to 12mm with 2 flutes in grade IN2006

UPDATED DESIGN – Added range of 6mm to 12mm with 4 flutes in grade IN2006

Ingersoll's Hi-Feed EndMills utilizes a special hybrid geometry cutting edge configuration that allows greatly increased feed rates. The resultant cutting forces are directed axially towards the spindle. This results in exceptional stability and enables machining at high feeds.

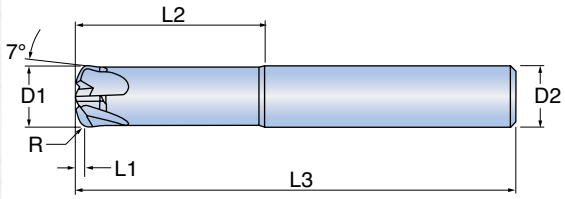
Features and Benefits

- 2 and 4 flutes for blistering feed rates
- New 2 flutes in grade IN2003 and IN2006. An ultra-fine grain substrate that is protected by our advanced coating technology
- An optimal solution for roughing operations
- Covers a wide range of applications including slotting, pocketing, helical interpolation and 3D contouring
- Useful for machining materials such as hardened steel up to 65 HRc, P20, H13, cast iron, stainless steel, titanium and high alloy temperature alloys.
- Feed Round can operate at feed rates up to 0.020" per tooth, at 0.012" to 0.04" depth of cut, providing a significant reduction in cycle time
- Feed rates obtained by the Feed Round is five to ten times higher, when compared to conventional ball nose end mills
- Shank diameters up to 7mm can successfully be applied on the Ingersoll Typhoon – coolant driven high feed compact spindles for small diameter tools on low RPM machine tool. The combination of high cutting speed and high feed on low RPM machine tools is a guaranteed winning solution.

Member IMC Group
Ingersoll Cutting Tools

FEEDOROUNDS™ SERIES 45A_RA

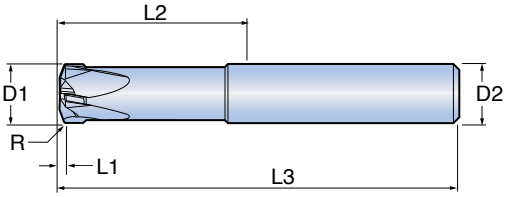
HI-FEED SOLID CARBIDE ENDMILLS, 2-FLUTES, IN2003



Cutter Number	D1 Diameter	Z Flutes	R Radius	L2 Height	L3 Overall Length	L1 Cut Length	D2 Shank Size/Style
45A01000T7RA015	1.00mm	2	0.1	3.00mm	50.00mm	0.06mm	6mm Cyl
45A02001T7RA030	2.00mm	2	0.3	6.00mm	50.00mm	0.12mm	6mm Cyl
45A03002T7RA050	3.00mm	2	0.4	6.00mm	50.00mm	0.20mm	6mm Cyl
45A04003T7RA070	4.00mm	2	0.5	12.00mm	57.00mm	0.20mm	6mm Cyl
45A05003T7RA090	5.00mm	2	0.6	15.00mm	57.00mm	0.90mm	6mm Cyl

FEEDOROUNDS™ SERIES 45A_RA METRIC

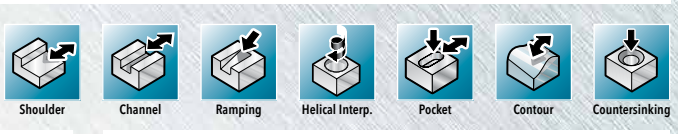
METRIC HI-FEED SOLID CARBIDE ENDMILLS, 4 FLUTES, IN2006

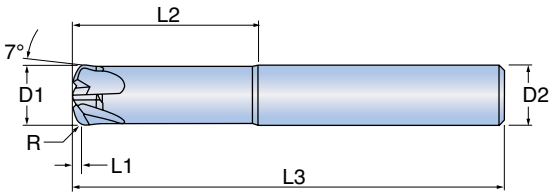


Cutter Number	D1 Diameter	Z Flutes	R Radius	L2 Height	L3 Overall Length	L1 Cut Length	D2 Shank Size/Style
47D06005T7RA520 IN2006	6.00mm	4	0.7mm	16.00mm	52.00mm	0.50mm	8mm Cyl
47D08005T0RA600 IN2006	8.00mm	4	0.9mm	24.00mm	60.00mm	0.50mm	8mm Cyl
47D10007T1RA680 IN2006	10.00mm	4	1.0mm	28.00mm	68.00mm	0.70mm	10mm Cyl
47D12008T2RA780 IN2006	12.00mm	4	1.4mm	33.00mm	78.00mm	0.80mm	12mm Cyl

FEEDOROUNDS™ SERIES 47A_RA

HI-FEED SOLID CARBIDE ENDMILLS, 4-FLUTES, IN2006

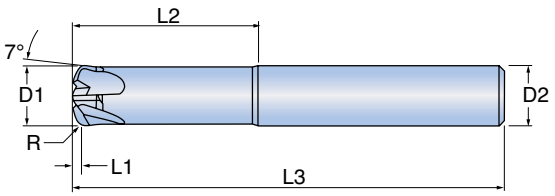




Cutter Number	D1 Diameter	Z Flutes	R Radius	L2 Height	L3 Overall Length	L1 Cut Length	D2 Shank Size/Style
47A-2500R6RA03 IN2006	0.250	4	0.039	0.750	2.50	0.01	.250" Cyl
47A-3100R7RA05 IN2006	0.312	4	0.051	1.000	2.50	0.02	.312" Cyl
47A-3700R8RA06 IN2006	0.375	4	0.059	1.200	3.00	0.02	.375" Cyl
47A-5000S4RA07 IN2006	0.500	4	0.083	1.300	3.00	0.02	.500" Cyl
47A-6200S6RA10 IN2006	0.625	4	0.102	1.650	3.50	0.03	.625" Cyl
47A-7500S1RA11 IN2006	0.750	4	0.118	1.800	4.00	0.04	.750" Cyl

FEEDOROUNDS™ SERIES 47A_RA METRIC

METRIC HI-FEED SOLID CARBIDE ENDMILLS, 4-FLUTES, IN2006

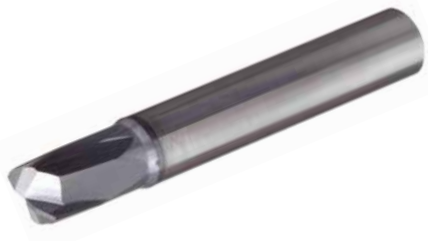


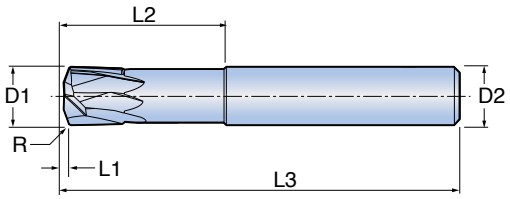
Cutter Number	D1 Diameter	Z Flutes	R Radius	L2 Height	L3 Overall Length	L1 Cut Length	D2 Shank Size/Style
47A06003T7RA010 IN2006	6.00mm	4	1.23	20.00mm	57.00mm	0.30mm	6mm Cyl
47A08004T0RA013 IN2006	8.00mm	4	1.62	26.00mm	63.00mm	0.40mm	8mm Cyl
47A10005T1RA016 IN2006	10.00mm	4	2.1	30.00mm	72.00mm	0.50mm	10mm Cyl
47A12006T2RA020 IN2006	12.00mm	4	2.47	34.00mm	83.00mm	0.60mm	12mm Cyl
47A16008T3RA026 IN2006	16.00mm	4	3.25	42.00mm	92.00mm	0.80mm	16mm Cyl
47A20010T4RA032 IN2006	20.00mm	4	4.02	46.00mm	104.00mm	1.00mm	20mm Cyl

FEEDROUNDS™ SERIES 45D_RA METRIC

METRIC HI-FEED SOLID CARBIDE ENDMILLS, 2 FLUTES, IN2006

Shoulder Contour





Cutter Number	D1 Diameter	Z Flutes	R Radius	L2 Height	L3 Overall Length	L1 Cut Length	D2 Shank Size/Style
45D04003T7RA470 IN2006	4.00mm	2	0.2mm	10.00mm	47.00mm	0.30mm	6mm Cyl
45D06005T7RA520 IN2006	6.00mm	2	0.35mm	16.00mm	52.00mm	0.50mm	6mm Cyl
45D08005T0RA600 IN2006	8.00mm	2	0.5mm	22.00mm	60.00mm	0.50mm	8mm Cyl
45D10007T1RA680 IN2006	10.00mm	2	0.65mm	28.00mm	68.00mm	0.70mm	10mm Cyl
45D12008T2RA760 IN2006	12.00mm	2	1.2mm	33.00mm	76.00mm	0.80mm	12mm Cyl

ROUND LINE - HIGH FEED END MILL (4 FLUTE) OPERATING GUIDELINES Series 45A

Workpiece Material	Diameter / Programming radius in	cutting speed Vc in/min	feed per tooth fz (in)	recommended cutting depth ap (in)	
Unalloyed steel **P**	.250 R.040	650 - 950	.012	.012	
	.312 R.065	650 - 950	.015	.015	
	.375 R.080	650 - 950	.020	.020	
	.500 R.100	650 - 950	.020	.025	
	.625 R.125	650 - 950	.025	.030	
	.750 R.160	650 - 950	.030	.040	
	1.00 R.145	650 - 950	.030	.045	
High Carbon steel **P**	.250 R.040	600 - 850	.012	.012	
	.312 R.065	600 - 850	.015	.015	
	.375 R.080	600 - 850	.020	.020	
	.500 R.100	600 - 850	.020	.025	
	.625 R.125	600 - 850	.025	.030	
	.750 R.160	600 - 850	.030	.040	
	1.00 R.145	600 - 850	.030	.045	
Alloyed / Tool steel < 1400N/mm² **P**	.250 R.040	500 - 700	.012	.008	
	.312 R.065	500 - 700	.015	.012	
	.375 R.080	500 - 700	.020	.015	
	.500 R.100	500 - 700	.020	.020	
	.625 R.125	500 - 700	.025	.025	
	.750 R.160	500 - 700	.030	.030	
	1.00 R.145	500 - 700	.030	.040	
Stainless steel **M**	.250 R.040	450 - 650	.012	.008	
	.312 R.065	450 - 650	.015	.012	
	.375 R.080	450 - 650	.020	.015	
	.500 R.100	450 - 650	.020	.020	
	.625 R.125	450 - 650	.025	.025	
	.750 R.160	450 - 650	.030	.030	
	1.00 R.145	450 - 650	.030	.040	
Gray cast iron **K**	.250 R.040	650 - 950	.012	.012	
	.312 R.065	650 - 950	.015	.015	
	.375 R.080	650 - 950	.020	.020	
	.500 R.100	650 - 950	.020	.025	
	.625 R.125	650 - 950	.025	.030	
	.750 R.160	650 - 950	.030	.040	
	1.00 R.145	650 - 950	.030	.045	
Cast alloys **K**	.250 R.040	500 - 700	.012	.008	
	.312 R.065	500 - 700	.015	.012	
	.375 R.080	500 - 700	.020	.015	
	.500 R.100	500 - 700	.020	.020	
	.625 R.125	500 - 700	.025	.025	
	.750 R.160	500 - 700	.030	.030	
	1.00 R.145	500 - 700	.030	.040	

ROUND LINE - HIGH FEED END MILL (4 FLUTE) OPERATING GUIDELINES Series 45A

Workpiece Material	Diameter / Programming radius in	cutting speed Vc in/min	feed per tooth fz (in)	recommended cutting depth ap (in)	
Super alloys **S**	.250 R.040	130 - 250	.008	.004	
	.312 R.065	130 - 250	.008	.008	
	.375 R.080	130 - 250	.012	.012	
	.500 R.100	130 - 250	.012	.012	
	.625 R.125	130 - 250	.015	.020	
	.750 R.160	130 - 250	.015	.020	
	1.00 R.145	130 - 250	.018	.020	
Hardened steel < 50 HRC	.250 R.040	300 - 450	.012	.004	
	.312 R.065	300 - 450	.012	.008	
	.375 R.080	300 - 450	.015	.012	
	.500 R.100	300 - 450	.015	.012	
	.625 R.125	300 - 450	.020	.020	
	.750 R.160	300 - 450	.020	.020	
	1.00 R.145	300 - 450	.020	.020	
Hardened steel < 58 HRC	.250 R.040	150 - 250	.008	.004	
	.312 R.065	150 - 250	.008	.008	
	.375 R.080	150 - 250	.012	.008	
	.500 R.100	150 - 250	.012	.012	
	.625 R.125	150 - 250	.015	.015	
	.750 R.160	150 - 250	.015	.015	
	1.00 R.145	150 - 250	.015	.015	

Typhoon
HSM Jet Spindles

Plug & Play

As easy to connect as any other tool in your magazine.

HSM Jet Spindle is available in several mounting adaptation types as:

- ER32 collet chuck with a special tightening nut, suitable for all standard tool holders with an ER32 seat.
- Integral options with various adaptations: HSK A63, C 5 & 6, BT 30 & 40, CAT 40 & DIN69871 40

The HSM Jet Spindle is compatible with standard ER11 collets for tool clamping.

4-5 times faster

40,000 rpm
on your machine

Coolant driven spindle

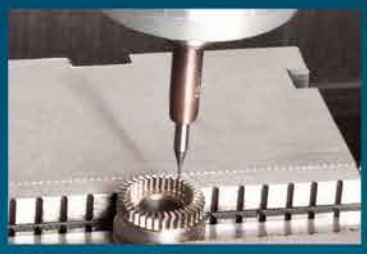
The system uses the existing machine coolant flow, to rotate the HSM Jet spindle without an additional energy source.

Wireless real time rpm monitoring

Real time rpm monitoring allows to optimize the cutting tool's machining conditions according to the actual rotational speed in the workpiece.

Wireless connection

Wide range of applications



Milling

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Drilling

Grinding

Chamfering

Engraving & Chamfering

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