HYPER·ROUNDS™

Diameters:
6mm to 20mm

Cutting Edge Length:
14mm to 45mm

Overall Length:
52mm to 125mm

Number of Flutes:
3

Radius:
Sharp

Helix Angle:
50 Degrees

Grade:
IN05S

NEW CONCEPT SOLID CARBIDE ENDMILL FOR HIGHLY EFFECTIVE ALUMINUM MACHINING

In today's machining environment, the surest path to improved competitiveness is by reducing workpiece delivery time via high speed machining without compromising on quality. Accordingly, tool shops require high speed machining and related tool investment focused on reducing machining time. For aluminum component machining, widely prevalent in the aerospace field, the requirement for high feed, speed and quick chip removal is crucial for cost effective production and effective delivery time.

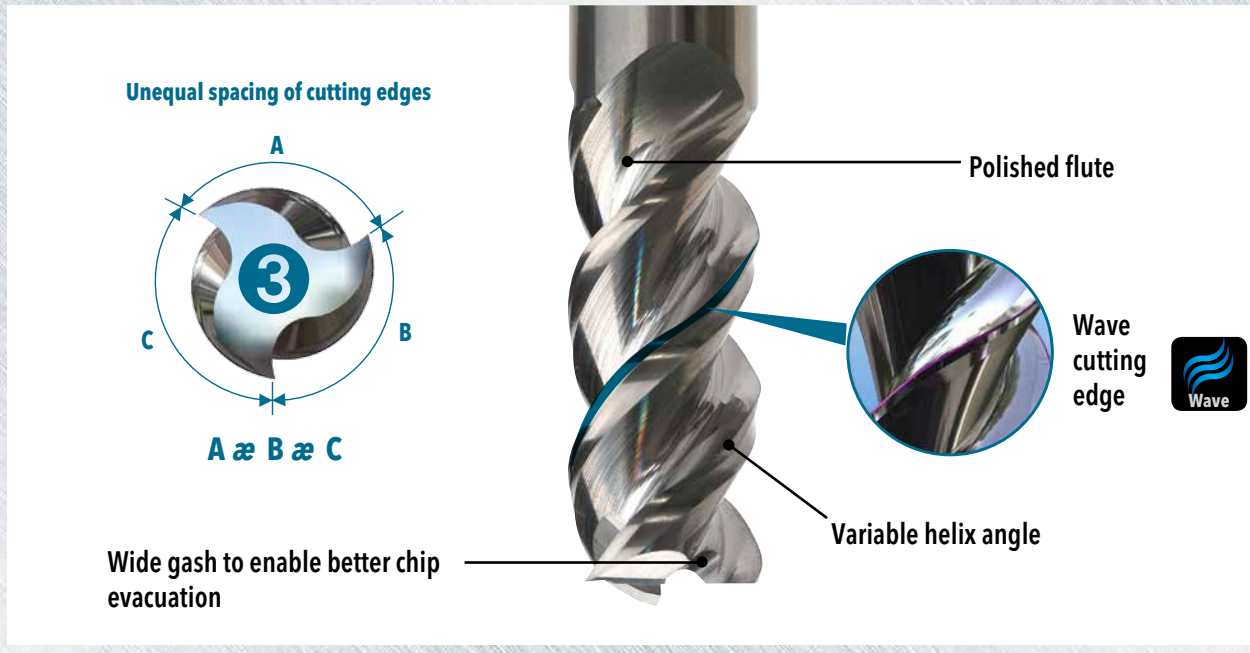
The HyperRounds Aluminim Endmill with wave cutting edges will enable end users to increase productivity and reduce delivery time.

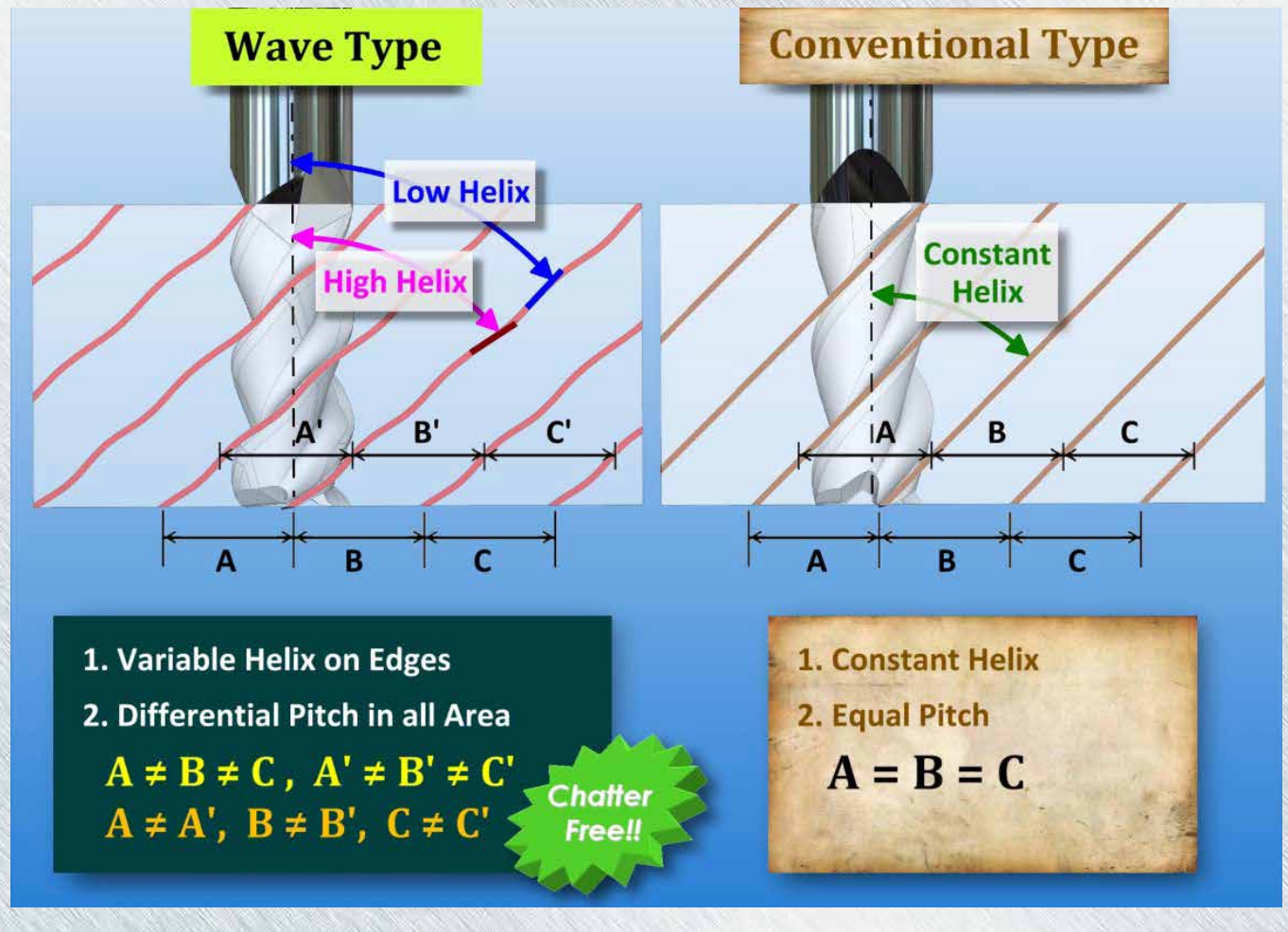
Features

- Chatter free and lower cutting load credit to unique cutting edge wave, variable helix angle and unequal spacing of cutting edges
- Better chip evacuation credit to wide gash and polished flutes
- Enables high productivity in high speed end milling of aluminum and non-ferrous materials
- Optimally designed for both rough milling and finish milling
- Available in standard and medium length types

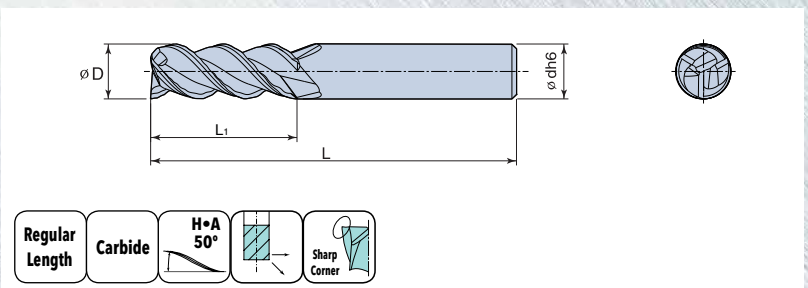
Member IMC Group
Ingersoll Cutting Tools

FEATURES


Unequal spacing of cutting edges
A
B
C
3
A æ B æ C
Polished flute
Wave cutting edge
Wave
Variable helix angle
Wide gash to enable better chip evacuation

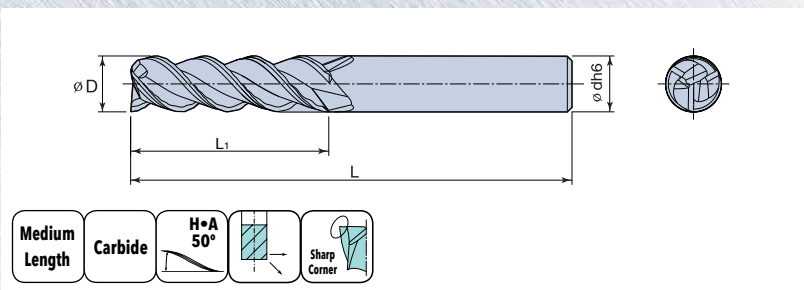

Wave Type
Conventional Type
Low Helix
High Helix
Constant Helix
A'
B'
C'
A
B
C
1. Variable Helix on Edges
2. Differential Pitch in all Area
A ≠ B ≠ C , A' ≠ B' ≠ C'
A ≠ A', B ≠ B', C ≠ C'
Chatter Free!!
1. Constant Helix
2. Equal Pitch
A = B = C

46J REGULAR LENGTH



Designation	Dimension				Radius	Shank	# of Flutes	Ha°	Grade
	D	d	L1	L					
46J00614T7RW052	6.000	6.000	14.000	52.000	Sharp	Cylindrical	3	50.0	IN05S
46J00814T0RW060	8.000	8.000	14.000	60.000	Sharp	Cylindrical	3	50.0	IN05S
46J01019T1RW068	10.000	10.000	19.000	68.000	Sharp	Cylindrical	3	50.0	IN05S
46J01222T2RW076	12.000	12.000	22.000	76.000	Sharp	Cylindrical	3	50.0	IN05S
46J01424U8RW085	14.000	14.000	24.000	85.000	Sharp	Cylindrical	3	50.0	IN05S
46J01630T3RW090	16.000	16.000	30.000	90.000	Sharp	Cylindrical	3	50.0	IN05S
46J01834U2RW110	18.000	18.000	34.000	110.000	Sharp	Cylindrical	3	50.0	IN05S
46J02038T4RW110	20.000	20.000	38.000	110.000	Sharp	Cylindrical	3	50.0	IN05S

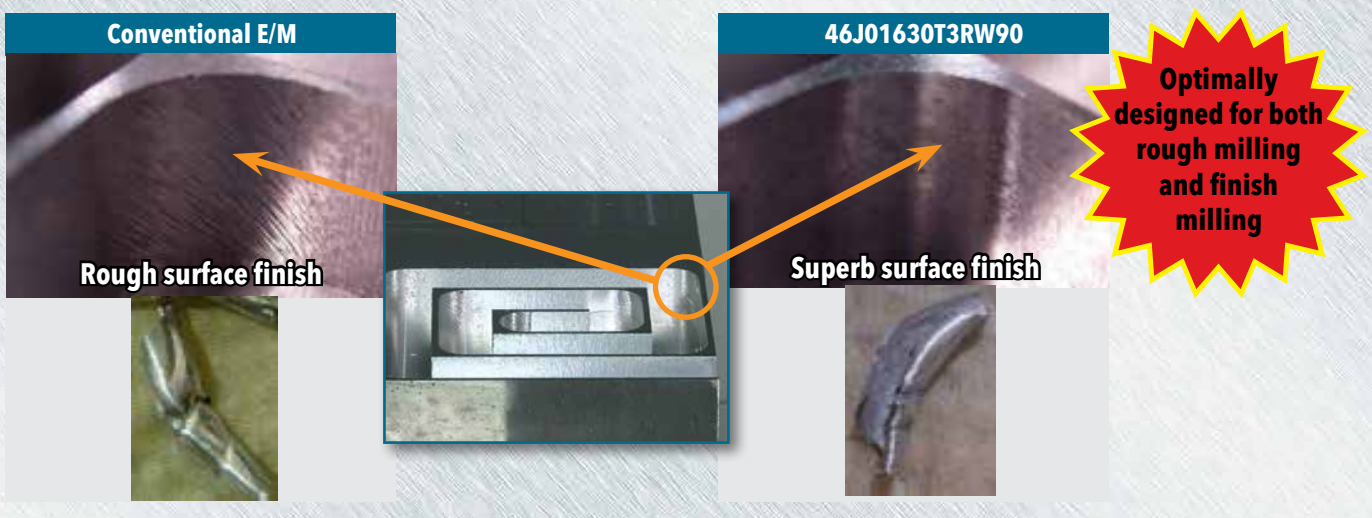
46J MEDIUM LENGTH



Designation	Dimension				Radius	Shank	# of Flutes	Ha°	Grade
	D	d	L1	L					
46J00620T7RW065	6.000	6.000	20.000	65.000	Sharp	Cylindrical	3	50.0	IN05S
46J00820T0RW075	8.000	8.000	20.000	75.000	Sharp	Cylindrical	3	50.0	IN05S
46J01025T1RW080	10.000	10.000	25.000	80.000	Sharp	Cylindrical	3	50.0	IN05S
46J01230T2RW095	12.000	12.000	30.000	95.000	Sharp	Cylindrical	3	50.0	IN05S
46J01435U8RW110	14.000	14.000	35.000	110.000	Sharp	Cylindrical	3	50.0	IN05S
46J01640T3RW110	16.000	16.000	40.000	110.000	Sharp	Cylindrical	3	50.0	IN05S
46J01845U2RW125	18.000	18.000	45.000	125.000	Sharp	Cylindrical	3	50.0	IN05S
46J02045T4RW125	20.000	20.000	45.000	125.000	Sharp	Cylindrical	3	50.0	IN05S

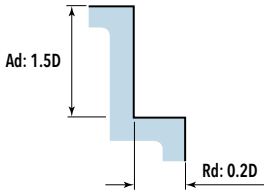
COMPARISON TEST

Vc: 500 m/min
fz: 0.12mm/tooth
Ad: 12mm
Rd: 16mm
Workpiece: Aluminum alloy



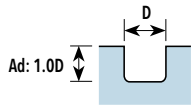
RECOMMENDED CUTTING CONDITIONS

Material	Pure Aluminum		Aluminum Alloys		Aluminum Cast	
Diameter	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
6	16000	1600	13000	1000	13000	1000
8	12000	1800	9900	1200	9900	1200
10	9500	2000	8000	1400	8000	1400
12	8000	2200	6700	1600	6700	1600
14	6800	2300	5700	1700	5700	1700
16	6000	2300	5000	1700	5000	1700
18	5300	2400	4400	1800	4400	1800
20	4800	2400	4000	1800	4000	1800



※ Reduce feed by 20% for **46J Regular Length**

Material	Pure Aluminum		Aluminum Alloys		Aluminum Cast	
Diameter	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
6	13800	1100	11700	900	11700	900
8	10500	1200	8800	1000	8800	1000
10	8500	1300	7000	1050	7000	1050
12	6900	1500	5850	1300	5850	1300
14	5950	1600	5000	1350	5000	1350
16	5200	1600	4400	1350	4400	1350
18	4600	1800	3900	1500	3900	1500
20	4200	1800	3500	1500	3500	1500



※ Reduce feed by 20% for **46J Medium Length**

CASE STUDIES

Study 1

Application: Aerospace-Pocketing

Workpiece: Aluminum alloy(AL7050)

		Competitor	HYPER-ROUNDS™
Tool designation		Ø12, 3 flutes	46J01230T2RW095
Speed	Vc (m/min)	320(8,500 RPM)	320(8,500 RPM)
Feed	fz (mm/tooth)	0.13	0.13
	F (mm/min)	3315	3315
Ad (mm)		24	24
Rd (mm)		1.5	1.5
Coolant		Wet	Wet
Result		Vibration & burr	No vibration, superb surface finish

Study 2

Application: Aerospace-Slotting

Workpiece: Aluminum alloy(AL7050)

		Competitor	HYPER-ROUNDS™
Tool designation		Ø12, 3 flutes	46J01222T2RW76
Speed	Vc (m/min)	105(2,800 RPM)	105(2,800 RPM)
Feed	fz (mm/tooth)	0.12	0.12
	F (mm/min)	1008	1008
Ad (mm)		12	12
Rd (mm)		12	12
Coolant		Wet	Wet
Result		After 30m Vibration & Breakage	After 30m No vibration & No breakage