



## 90° & LEAD ANGLE MILL FAMILY WITH A FINE ASSORTMENT OF OPTIONS!

### Multi-Purpose



### PCD Tip



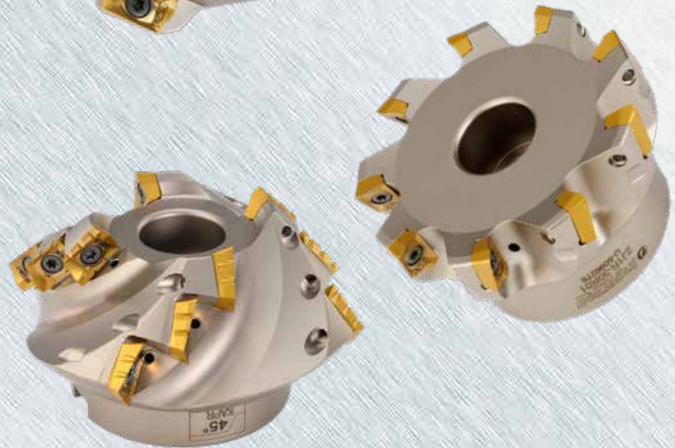
### Hard Steel



### Polished for Alum



### Chip Splitters



**Cutter Series:**  
12J1R / 2J1R / 12\_1R /  
22\_3R / 12L1R

**Insert Series:**  
BOCT13 / BODT13 / BOMT13 /  
ZOMT13

**Diameters:**  
Ø .750"-Ø 5.000"

**Depth of Cut:**  
.47" Max.

**Materials:**  
Aluminum, Iron, Steel, Stainless  
Steel, Hi-Temps, Titanium,  
Hard Steel

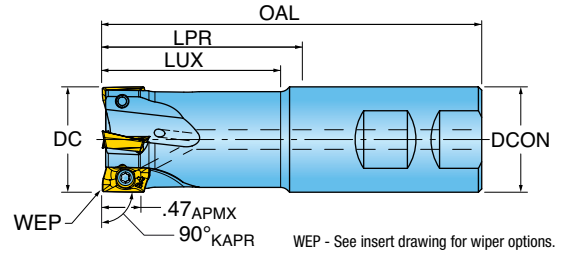
**PRODUCT  
ANNOUNCEMENT  
UPDATE  
2019**

### General Features:

- BOMT offers 2X positive rake and 2X face clearance when compared to APKT/AOMT; resulting in higher efficiency, less heat and more aggressive ramping capability.
- Ramping and helical interpolation capabilities inherent with cutter designs
- Diverse range of insert corner and grade options for a broad range of materials
- Cutters ported with coolant for use with non-ferrous, stainless steel, titanium and hi-temp alloy materials
- Carbide inserts equipped with 2 indexes; PCD with 1 index
- Inserts with integrated wiper flats typically produce surface finishes between 32-63 Ra

# HI<sup>o</sup>POS<sup>+</sup>™ SERIES: 12J1R (WELDON SHANK)

## 90° END MILL

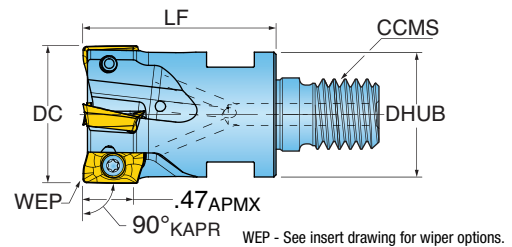


Part Number	DC Cutting Diameter	LUX Usable Length Max.	LPR Protruding Length	OAL Overall Length	ZEFF Effective Teeth	DCON Shank Diameter	CSP Coolant	RMPX Ramp Angle Max.
12J1R-0701284R01	0.750	1.22	1.25	3.25	2	0.750	Yes	6.3
12J1R-0702084R01	0.750	1.97	2.00	4.00	1	0.750	Yes	6.3
12J1R-0703084R01	0.750	2.97	3.00	5.00	2	0.750	Yes	6.3
12J1R-1001780R01	1.000	1.72	1.75	4.00	3	1.000	Yes	7.9
12J1R-1003780R01	1.000	3.72	3.75	6.00	3	1.000	Yes	7.9
12J1R-1202281R01	1.250	2.22	2.25	4.50	4	1.250	Yes	3.1
12J1R-1204281R01	1.250	4.22	4.25	6.50	4	1.250	Yes	3.1
12J1R-1501781R01	1.500	1.72	1.75	4.00	5	1.250	Yes	2.3
12J1R-1502281R01	1.500	2.22	2.25	4.50	4	1.250	Yes	2.3
12J1R-1504281R01	1.500	4.22	4.25	6.50	4	1.250	Yes	2.3

NOTE: Cutter body must be relieved when using insert corner radii larger than R.078: Body R" = Insert R" - .02"

# HI<sup>o</sup>POS<sup>+</sup>™ SERIES: 12J1R (TOPON M-ADAPTION)

## 90° MODULAR END MILL

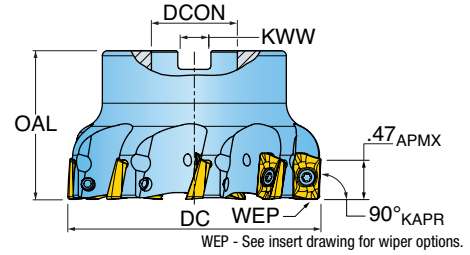


Part Number	DC Cutting Diameter	LF Functional Length	ZEFF Effective Teeth	CCMS Connection Code	DHUB Hub Diameter	CSP Coolant	RMPX Ramp Angle Max.
12J1R-07015X6R01	0.750	1.50	2	TopOn M10	0.69	Yes	6.3
12J1R-10015X7R01	1.000	1.50	3	TopOn M12	0.81	Yes	4.6
12J1R-12017X8R01	1.250	1.75	4	TopOn M16	1.13	Yes	3.1
12J1R-15017X8R01	1.500	1.75	5	TopOn M16	1.13	Yes	2.3

NOTE: Cutter body must be relieved when using insert corner radii larger than R.078: Body R" = Insert R" - .02"

# HIPOST<sup>™</sup> SERIES: 2J1R

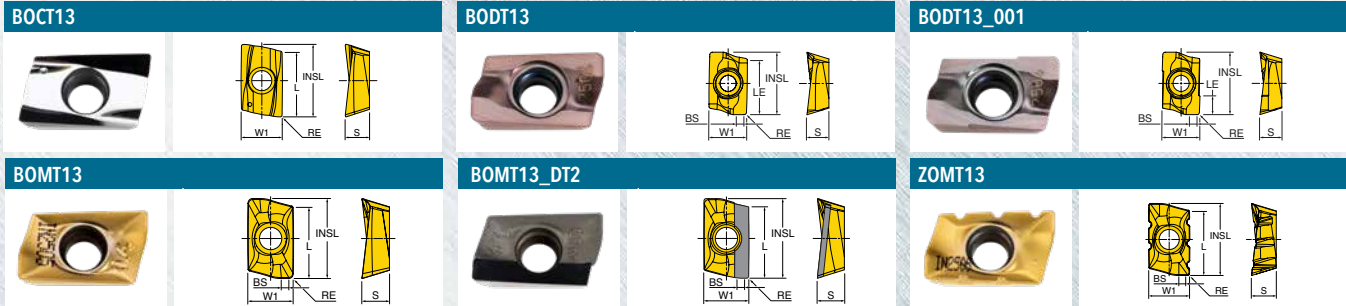
## 90° FACE MILL



Part Number	DC Cutting Diameter	OAL Overall Length	ZEFF Effective Teeth	DCON Bore Diameter	KWW Keyway	CSP Coolant	RMPX Ramp Angle Max.
2J1R-20R01	2.000	1.57	5	0.750	0.312	Yes	1.5
2J1R-20R02	2.000	1.57	6	0.750	0.312	Yes	1.5
2J1R-25R01	2.500	1.57	6	0.750	0.312	Yes	1.1
2J1R-30R01	3.000	1.75	9	1.000	0.375	Yes	.9
2J1R-40R01	4.000	2.38	11	1.500	0.625	Yes	.6
2J1R-50R01	5.000	2.38	13	1.500	0.625	Yes	.5

NOTE: Cutter body must be relieved when using insert corner radii larger than R.078: Body R" = Insert R" - .02"

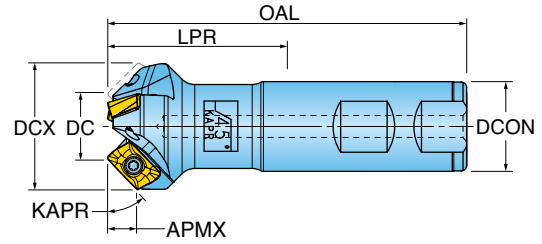
# HIPOST<sup>™</sup> INSERTS



Part Number	Application	RE Corner Radius	BS Wiper Length	L Cutting Edge Length	INSL Length	W1 Width	S Thickness	IH Insert Hand	Grade	IN10K	IN2005	IN2035	IN2504	IN2505	IN2530	IN4030	IN90D
BOCT130404FR-P	Grd/Pol for Al	0.015 R	-	0.490	0.557	0.320	0.189	Right	•								
BOCT130408FR-P	Grd/Pol for Al	0.031 R	-	0.490	0.555	0.319	0.187	Right	•								
BODT130408R	Neutral; Precision	0.031 R	0.076	0.490	0.558	0.320	0.190	Right		•		•					
BODT130408R-001	Neutral; Precision	0.031 R	0.076	0.170	0.558	0.319	0.190	Right		•		•					
BOMT130404R	Multi-Purpose	0.015 R	0.067	0.490	0.558	0.320	0.190	Right				•		•	•	•	
BOMT130408R	Multi-Purpose	0.031 R	0.051	0.490	0.558	0.320	0.190	Right				•		•	•	•	
BOMT130416R	Multi-Purpose	0.062 R	0.019	0.490	0.561	0.320	0.190	Right						•	•		
BOMT130420R	Multi-Purpose	0.078 R	-	0.490	0.561	0.320	0.190	Right						•	•		
BOMT130424R	Multi-Purpose	0.093 R	-	0.490	0.560	0.320	0.190	Right						•	•		
BOMT130431R	Multi-Purpose	0.125 R	-	0.480	0.546	0.320	0.180	Right				•		•	•		
BOMT130440R	Multi-Purpose	0.156 R	-	0.480	0.538	0.320	0.183	Right						•			
BOMT130404R-DT2	PCD Tipped	0.015 R	0.055	0.490	0.557	0.320	0.190	Right									•
ZOMT130404R	Positive-Splitters	0.015 R	0.067	0.490	0.558	0.320	0.190	Right						•	•		
ZOMT130408R	Positive-Splitters	0.031 R	0.051	0.490	0.561	0.320	0.190	Right						•			

# HIPOST<sup>™</sup> SERIES: 12\_1R

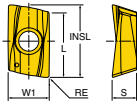
## CHAMFER END MILL



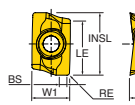
Part Number	DC Cutting Diameter	DCX Cutting Dia. Max.	KAPR Cutting Edge Angle	APMX Depth of Cut Max.	LPR Projection Length	OAL Overall Length	ZEFF Effective Teeth	DCON Shank Diameter
12M1R-0701780R01	0.750	1.220	60	0.40	1.75	4.00	3	1.000
12N1R-0701780R01	0.750	1.408	45	0.32	1.75	4.00	3	1.000
12P1R-0701780R01	0.750	1.546	30	0.22	1.75	4.00	3	1.000
12Q1R-0701780R01	0.750	1.641	15	0.12	1.75	4.00	3	1.000
12L1R-0801780R01	0.875	1.123	75	0.46	1.75	4.00	3	1.000

# HIPOST<sup>™</sup> 12\_1R INSERTS

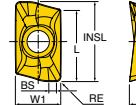
### BOCT13



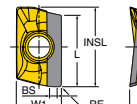
### BODT13



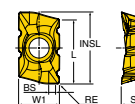
### BOMT13



### BOMT13\_DT2



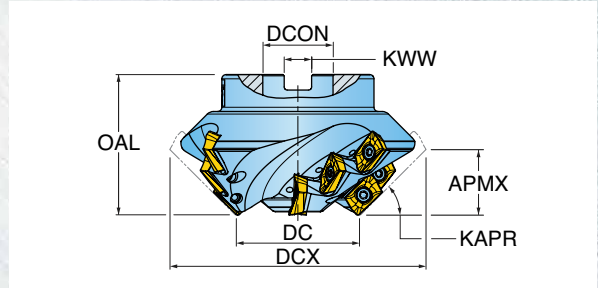
### ZOMT13



Part Number	Application	RE Corner Radius	BS Wiper Length	L Cutting Edge Length	INSL Length	W1 Width	S Thickness	IH Insert Hand	Grade	IN10K	IN2005	IN2035	IN2504	IN2505	IN2530	IN4030	IN6535	IN90D
BOCT130404FR-P	Grd/Pol for Al	0.015 R	-	0.490	0.557	0.320	0.189	Right	•									
BOCT130408FR-P	Grd/Pol for Al	0.031 R	-	0.490	0.555	0.319	0.187	Right	•									
BODT130408R	Neutral; Precision	0.031 R	0.076	0.490	0.558	0.320	0.190	Right		•		•						
BOMT130404R	Multi-Purpose	0.015 R	0.067	0.490	0.558	0.320	0.190	Right			•		•	•	•			
BOMT130408R	Multi-Purpose	0.031 R	0.051	0.490	0.558	0.320	0.190	Right			•	•	•	•	•			
BOMT130416R	Multi-Purpose	0.062 R	0.019	0.490	0.561	0.320	0.190	Right					•	•			•	
BOMT130404R-DT2	PCD Tipped	0.015 R	0.055	0.490	0.557	0.320	0.190	Right										•
ZOMT130404R	Positive-Splitters	0.015 R	0.067	0.490	0.558	0.320	0.190	Right						•	•			
ZOMT130408R	Positive-Splitters	0.031 R	0.051	0.490	0.561	0.320	0.190	Right						•				

# HIPOST<sup>™</sup> SERIES: 22\_3R

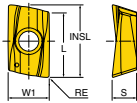
## CHAMFER SHELL MILL



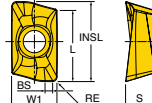
Part Number	DC Cutting Diameter	DCX Cutting Dia. Max.	KAPR Cutting Edge Angle	APMX Depth of Cut Max.	OAL Overall Length	ZNF Face Insert Count	ZNP Peripheral Insert Count	NOF Flute Count	DCON Shank Diameter	KWW Keyway
22L3R-17020D3R01	1.750	2.445	75	1.29	2.00	4	8	4	1.000	0.375
22M3R-17020D3R01	1.750	3.082	60	1.15	2.00	4	8	4	1.000	0.375
22N3R-17020D3R01	1.750	3.621	45	0.93	2.00	4	8	4	1.000	0.375
22P3R-17020D4R01	1.750	4.034	30	0.66	2.00	4	8	4	1.250	0.500
22Q3R-17020D4R01	1.750	4.305	15	0.34	2.00	4	8	4	1.250	0.500

# HIPOST<sup>™</sup> 22\_3R INSERTS

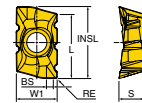
### BOCT13



### BOMT13



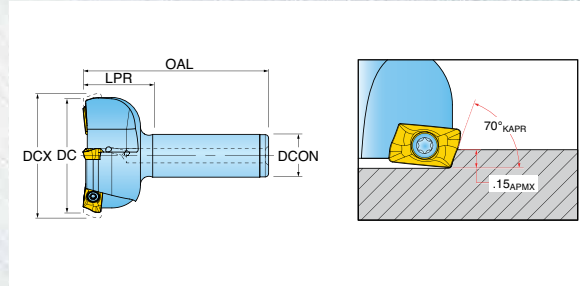
### ZOMT13



Part Number	Application	RE Corner Radius	BS Wiper Length	L Cutting Edge Length	INSL Length	W1 Width	S Thickness	IH Insert Hand	Grade						
									IN10K	IN2035	IN2504	IN2505	IN2530	IN4030	
BOCT130404FR-P	Grd/Pol for Al	0.015 R	-	0.490	0.557	0.320	0.189	Right	•						
BOCT130408FR-P	Grd/Pol for Al	0.031 R	-	0.490	0.555	0.319	0.187	Right	•						
BOMT130404R	Multi-Purpose	0.015 R	0.067	0.490	0.558	0.320	0.190	Right		•		•	•	•	
BOMT130408R	Multi-Purpose	0.031 R	0.051	0.490	0.558	0.320	0.190	Right		•	•	•	•	•	
ZOMT130404R	Positive-Splitters	0.015 R	0.067	0.490	0.558	0.320	0.190	Right				•	•		
ZOMT130408R	Positive-Splitters	0.031 R	0.051	0.490	0.561	0.320	0.190	Right				•			

# HI•POS+™ SERIES: 12L1R

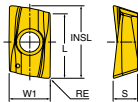
## 70° ROUGHING END MILL



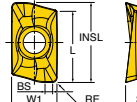
Part Number	DC Cutting Diameter	DCX Cutting Dia. Max.	KAPR Cutting Edge Angle	APMX Depth of Cut Max.	LPR Projection Length	OAL Overall Length	ZEFF Effective Teeth	DCON Shank Diameter	CSP Coolant
12L1R-20012S7R01	2.000	2.170	70	0.15	1.25	3.25	3	0.750	Yes

# HI•POS+™ 12L1R INSERTS

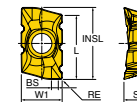
### BOCT13



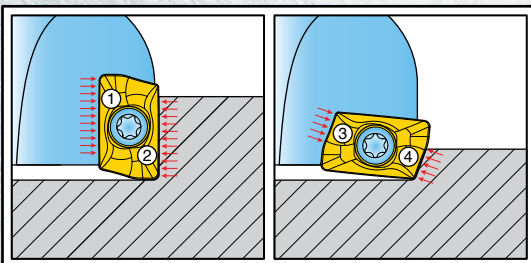
### BOMT13



### ZOMT13



Part Number	Application	RE Corner Radius	BS Wiper Length	L Cutting Edge Length	INSL Length	W1 Width	S Thickness	IH Insert Hand	Grade	IN10K	IN2035	IN2504	IN2505	IN2530	IN4030	IN6535
BOCT130404FR-P	Grd/Pol for Al	0.015 R	-	0.490	0.557	0.320	0.189	Right	•							
BOCT130408FR-P	Grd/Pol for Al	0.031 R	-	0.490	0.555	0.319	0.187	Right	•							
BOMT130404R	Multi-Purpose	0.015 R	0.067	0.490	0.558	0.320	0.190	Right		•		•	•	•	•	
BOMT130408R	Multi-Purpose	0.031 R	0.051	0.490	0.558	0.320	0.190	Right		•		•	•	•	•	
BOMT130416R	Multi-Purpose	0.062 R	0.019	0.490	0.561	0.320	0.190	Right					•	•		
BOMT130420R	Multi-Purpose	0.078 R	-	0.490	0.561	0.320	0.190	Right					•	•		
BOMT130424R	Multi-Purpose	0.093 R	-	0.490	0.560	0.320	0.190	Right					•	•		
BOMT130431R	Multi-Purpose	0.125 R	-	0.480	0.546	0.320	0.180	Right			•		•	•		
BOMT130440R	Multi-Purpose	0.156 R	-	0.480	0.538	0.320	0.183	Right					•			
ZOMT130404R	Positive-Splitters	0.015 R	0.067	0.490	0.558	0.320	0.190	Right						•	•	
ZOMT130408R	Positive-Splitters	0.031 R	0.051	0.490	0.561	0.320	0.190	Right						•		



When using the Hi•Pos+ milling family, it is possible to make use of all four cutting edges. The first 2 edges can be used in any Hi•Pos+ 90° or lead angle endmill or facemill, then use edges 3 and 4 in 12L endmills or 2L facemills

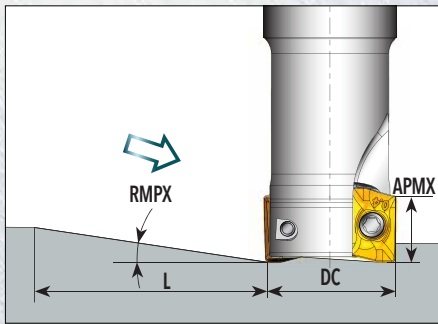
	Insert Screw	Driver Handle	Driver Bit	Torque Driver Handle	Preset Torque Bit	Torque Driver Bit	Wrench	Retention Bolt	Coolant Bolt
12J1R-0701284R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-0702084R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-0703084R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-1001780R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-1003780R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-1202281R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-1204281R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-1501781R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-1502281R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-1504281R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12J1R-07015X6R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	615MM	-	-
12J1R-10015X7R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	617MM	-	-
12J1R-12017X8R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	622MM	-	-
12J1R-15017X8R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	622MM	-	-
2J1R-20R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	SD-06-46	SD-06-89
2J1R-20R02	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	SD-06-46	SD-06-89
2J1R-25R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	SD-06-46	SD-06-89
2J1R-30R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	SD-08-46	SD-08-92
2J1R-40R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	SD-12-82	SD-12-99
2J1R-50R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	SD-12-82	SD-12-99
12M1R-0701780R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12N1R-0701780R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12P1R-0701780R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12Q1R-0701780R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12L1R-0801780R01	SM35-076-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
22L3R-17020D3R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
22M3R-17020D3R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
22N3R-17020D3R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
22P3R-17020D4R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
22Q3R-17020D4R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-
12L1R-20012S7R01	SM35-088-10	DS-A00T	DS-T106B	DS-A00-.25-T	DT-30-.25	DS-T10B1	-	-	-

# HIPOST<sup>+</sup> OPERATING GUIDELINES

Series 12J1R, 2J1R, 12_1R, 22_3R, 12L1R					IN10K	IN2035/6535	IN2504	IN2505/6535	IN2530	IN4030	IN90D	Coolant
Material	Brinell Hardness	SFM	Feed per Insert									
Aluminum	6061-T6, 7075-T6, 2024	-	1500 - 5000	.003-.008	1						1	Yes
Cast Iron	Gray	150 - 250	300 - 1000	.004-.007				1		2		No
	Nodular		300 - 600					1		2		
Steel	Low Carbon 1018, 8620	100 - 250	400 - 1000	.004-.007								No
	High Carbon F-6180	250 - 400	350 - 500									
	Alloyed Steel 4140, 4340	150 - 300	300 - 700					3	2	1		
	Tool Steel A-6, D-1, D-2	Up to 300										
Stainless Steel	300 Series, 304, 316	-	300 - 550	.004-.006								May not be required at high speeds
	400 Series 15-5 PH	Up to 320	350 - 600			1		4	3	2		
	13-8 PH	-	200 - 400									
Nickel Alloys	Inconel, Hastelloy, Waspalloy	-	75-120	.003-.005		1		2	4	3		Yes
Titanium	6AL-4V	-	100 - 150	.003-.005		1		4	3	2		Yes
Hard < 54 HRC	All	-	300 - 450	.002-.004			1	2				No
Hard < 63 HRC	All	-	150 - 300	.002-.003			1	2				No

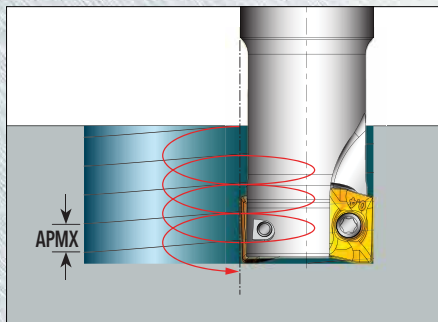
## HIPOST<sup>+</sup> RAMPING DATA

Straight ramping



DC Cutter Diameter	RMPX Ramp Angle Max.	APMX Depth of Cut Max.	L
0.750	7.0	0.47	3.8
1.000	7.9	0.47	3.3
1.250	5.0	0.47	5.3
1.500	3.2	0.47	8.4
2.000	2.1	0.47	12.8
2.500	1.4	0.47	19.2
3.000	1.0	0.47	26.9
4.000	0.8	0.47	33.7
5.000	0.6	0.47	44.9

Helical ramping



DC Cutter Diameter (Using R.031 Insert)	Min. Dia. Milled Hole (Bottom with Cusp)	APMX / Rev.	Max. Dia. Milled Hole (Flat Bottom)	APMX / Rev.
0.750	1.01	0.09	1.46	0.28
1.000	1.41	0.20	1.96	0.40
1.250	1.91	0.18	2.46	0.33
1.500	2.41	0.16	2.96	0.26
2.000	3.41	0.16	3.96	0.22
2.500	4.41	0.14	4.96	0.18
3.000	5.41	0.13	5.96	0.16
4.000	7.41	0.14	7.96	0.16
5.000	9.41	0.14	9.96	0.15