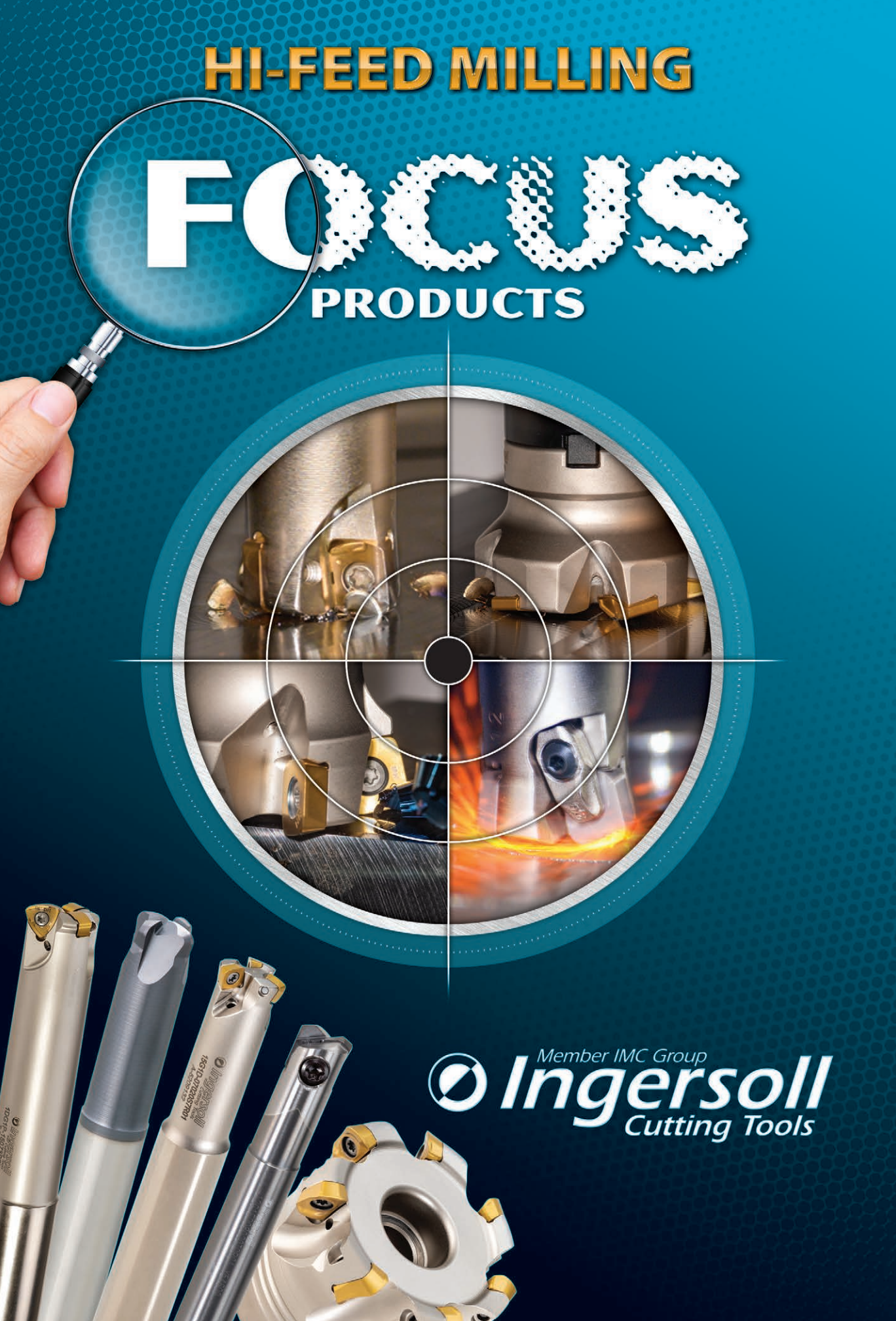
HI-FEED MILLING

FOCUS

PRODUCTS



Member IMC Group

Ingersoll Cutting Tools

A Focused Look at
Hi-Feed Milling

Ingersoll offers an extensive range of innovative Hi-Feed mills. With so many styles, it can be difficult to know which is best for your application. To assist, they have been organized in 3 different categories:

• Dedicated Hi-Feed mills were designed specifically for premium performance Hi-Feed roughing. They often have the largest assortment of insert IC's, grades and geometry options in order to fine tune for optimal production.

• Hybrid Hi-feed mills can bring value in two different styles. The first hybrid style has a common cutter that accommodates Hi-Feed, 90° and/or Backdraft inserts in the same pocket. The second hybrid style has a common insert that can be used in a hi-feed and another lead angle cutter.

• Solid Carbide Hi-Feed mills are offered in one-piece and modular styles

This focus brochure provides a brief overview of each Hi-Feed milling product . To view details and video of the product in action, scan the respective QR code located on each page.

Rockford, Illinois Campus

Dedicated Hi-Feed Indexable

FOR PERFORMANCE BASED ROUGHING APPLICATIONS

Page No.	Product Line	Series (End Mill / Face Mill)	Picture	Insert Size	No. of Cutting Edges	Ap Depth of Cut	Diameter Range	Materials	Axial Rake
6	**DiFeedWinV**	1TG1V / TG1V		6 mm	4	.040"	.625–2.500"	P M K S H	Negative
7	**DiPosFeed**	1TG1B		4 mm	4	.020"	.312–1.250" 10.0–32.0 mm	P M K S H	Negative
		1TG1F / TG1F		6 mm	4	.040"	.625–2.000" 16.0–63.0 mm		Negative
		1TG1G / TG_G		9 mm	4	.059"	1.000–3.000" 25.0–80.0 mm		Negative
		1TG1J / TG_J		11 mm	4	.078"	1.250–4.000" 30.0–100.0 mm		Negative
8	**GoldSFeed**	15G1B		4 mm	4	.024"	.375–.750"	P M K N S H	Positive
		15G1D / 5G1D		6 mm	4	.040"	.625–2.000"		Positive
		15G1F / 5G_F		9 mm	4	.060"	1.000–3.000"		Positive
		15M1P /5M_P		13 mm	4	.088"	1.250–5.000" 50.0–100.0 mm		Positive
		5G_Q		16 mm	4	.107"	2.500–10.000"		Positive
		5G_M		19 mm	4	.147"	3.000–7.000" 80.0–160.0 mm		Positive
9	**NanoFeed**	12G1D		6 mm	1	.012"	6.0 mm	P H	Positive
		12G1E		8 mm	1	.020"	8.0 mm		Positive
10	**NuMaxHF**	8G_A		15.5 mm	4	.058"	2.000–4.000"	P M H	Negative
11	**NuMaxHFA**	EG_J		12.7 mm	4	.070"	2.000–8.000"	P M H	Positive
12	**PowerFeed13+**	1DG1P / DG_P		13 mm	6	.078"	1.250 – 6.000"	P M K S H	Negative
		4W2A		13 mm	6	.078"	8.000 – 12.000"		Negative
13	**CeraSFeed (Ceramic)**	1ZG3D		6 mm	4	.039"	.625–1.250"	S	Negative
		1ZG3F / TG_Q		9 mm	4	.060"	1.00–2.000"		Negative
		DG_H		12 mm	6	.098"	2.000–3.000"		Negative

Hybrid Hi-Feed Indexable

- COMMON CUTTER THAT ACCEPTS HI-FEED, 90°, ROUTER OR BACKDRAFT INSERTS ***OR***
- COMMON INSERTS THAT FIT HI-FEED AND LEAD ANGLE MILLS

Page No.	Product Line	Series (End Mill / Face Mill)	Picture	Insert Size	No. of Cutting Edges	Ap Depth of Cut	Diameter Range	Materials	Axial Rake
14	**HiPosSFeedV**	12J1A*		5 mm	2	.019"	.250–.500" 8.0–12.0 mm	P M K S H	Negative
15	**HiPosMicro**	12J1D		6 mm	2	.224"	.375–2.000" 9.5–40.0 mm	P M K S	Positive
16	**HiPosWinV**	1VF1X / VX_F		10 mm	2	.039"	.625–3.000"	P M K S H	Positive
17	**DiPosDuo**	1TJ1B		4 mm	4	.019"	.500–1.500" 10.0–25.0 mm	P M K S H	Negative
		1TJ1D / TJ1D		6 mm	4	.039"	.625–3.000" 16.0–40.0 mm		Negative
		1TJ1F / TJ_F*		9 mm	4	.059"	1.000–4.000" 20.0–80.0 mm		Negative
		1TJ1G / TJ_G*		11 mm	4	.078"	1.000–4.000" 25.0–100.0 mm		Negative
		1TJ1J / TJ_J*		14 mm	4	.118"	1.250–4.000" 50.0–125.0 mm		Negative
18	**DiPosQuadF**	DG6C		11 mm	8	.070"	2.000–4.000" 50.0–100.0 mm	P M K S H	Negative
		DG6K		14 mm	8	.100"	2.500–6.000" 63.0–125.0 mm		
19	**DiPosPenta**	1DP1C / DP6C		5 mm	10	.059"	.750–2.500"	P M K S	Positive
		1DP1P / DP6P		10 mm	10	.250"	1.500–3.000"		

* Housing corner modification required when using Hi-feed insert. See product bulletin for specifications.

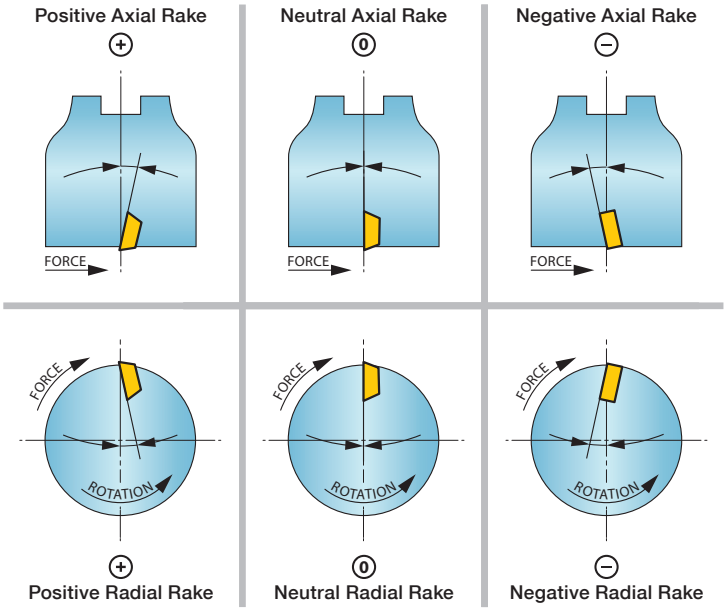
Solid Carbide Hi-Feed

Page No.	Product Line	Series (End Mill / Face Mill)	Picture	No. of Cutting Edges	Ap Depth of Cut	Diameter Range	Materials	Axial Rake
20	ChipSurfer (Modular)	45A		2	.020–.059"	.375–.750" 10.0–20.0 mm	P M K S H	Neutral
		47A_T_RA		4	.023–.039"	.500–.750" 8.0–20.0 mm		Positive
		48A_T_RX		6	.016–.061"	.500" 8.0–25.0 mm		Neutral
		48A_T_RA		6	.018–.047"	.500–1.000" 10.0–25.0 mm		Positive
21	Feed-Rounds	45A		2	.098–.197"	1.0–12.0 mm	P M K S H	Neutral
		47A		4	.012–.039"	.250–.750" 6.0–20.0 mm		Neutral
22	3n1 Rounds	45DRP		4–5	.011–.134"	.250–.750" 6.0–20.0 mm	P M K S H	Positive

Positive, Neutral and Negative Rake

Although carbide cuts all materials, the orientation (geometry) of the cutting edge significantly impacts performance. To assist with tool selection, this brochure references the product's prevailing geometry (Radial/Axial) based on the following principles:

- Positive geometry is best suited for Non-ferrous/SS/Ti/ Hi-Temp materials & Small platform (lower HP) machines.
- Neutral and Negative geometries find their place with Steels/Irons and Medium/Large platform (higher HP) machines
- Combination geometries aim to be more multi-purpose

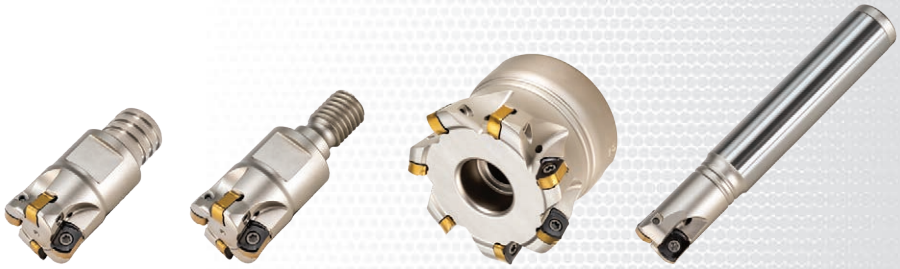


DIFEEDWIN V™

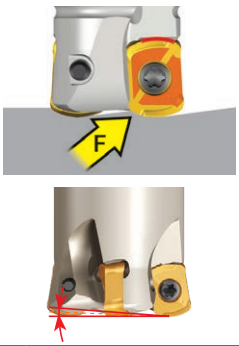
Next-Gen Radius Style, Hi-Feed Performance with New V-Bottom Clamping

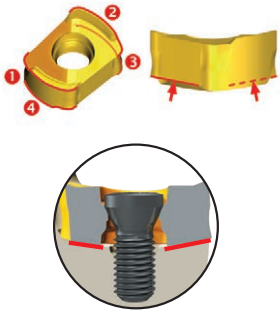
Product Details

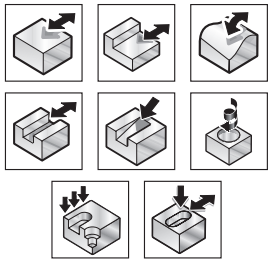
UNLV06

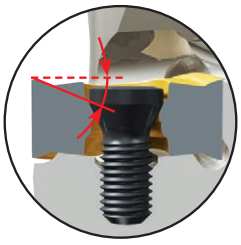


1	Up to 4x Higher Ramping Angle	2	V Bottom Clamping for Maximum Rigidity	3	Various Applications	4	Positive Rake Face for Optimal Chip Formation



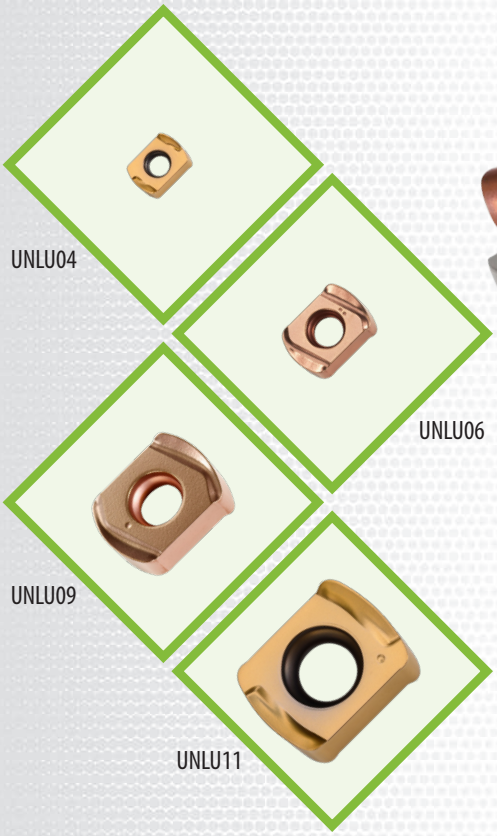






Radius Style Geometry Offers Utmost Durability in Demanding Applications

Product Details



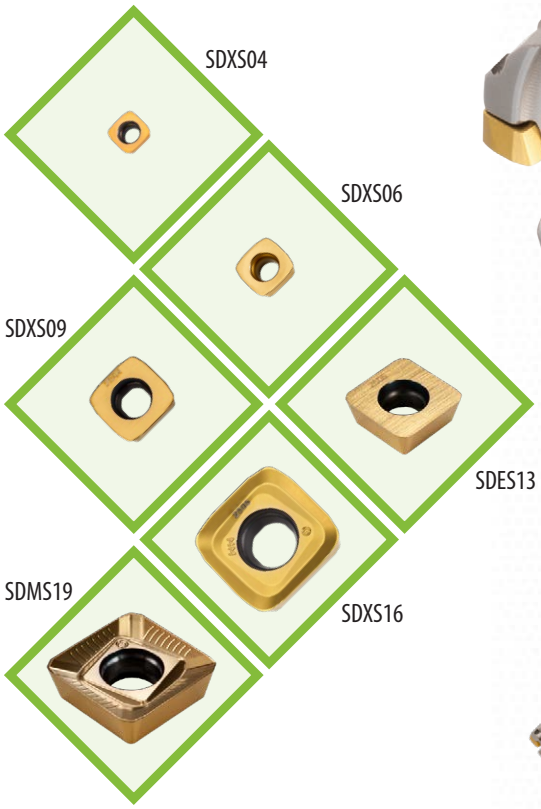
1 Great for Long Reach Applications

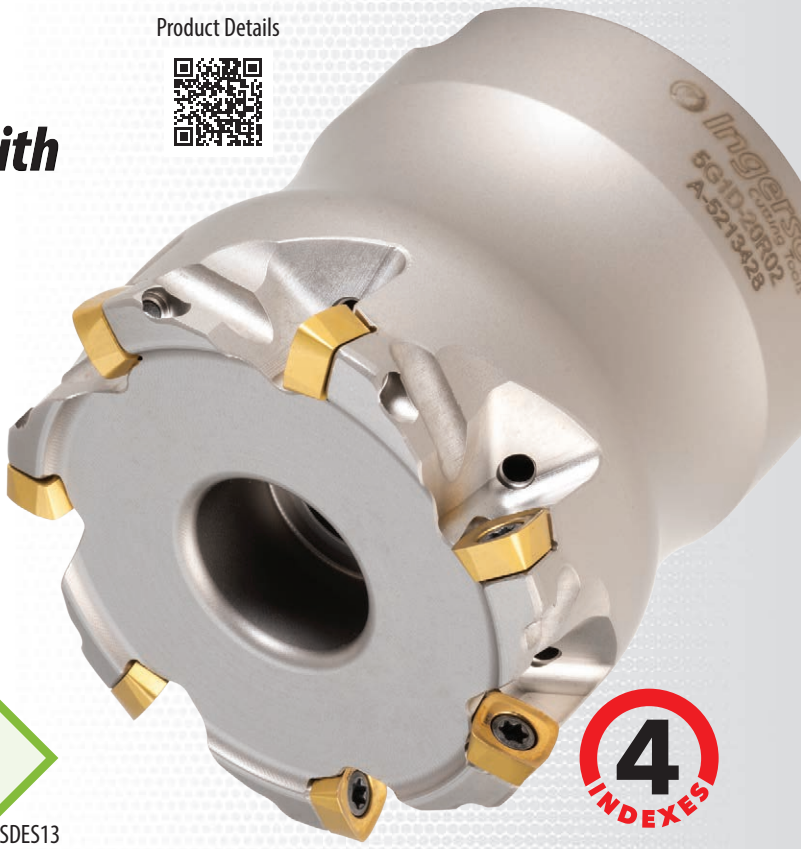
2 Inserts Offer 4 Edges for Cost-Effective Machining & Economy

3 Pos-Neg Geometry is First Choice for These Materials (See pg. 5)

Broadest Insert I.C. Geometry Offering with Positive Rake for Efficient Machining

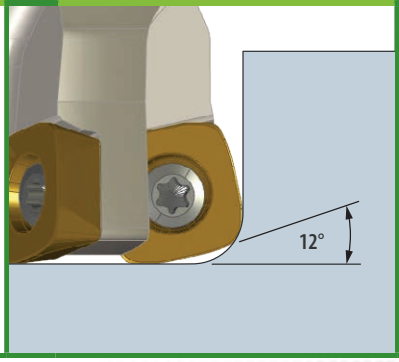
Product Details





1 Pos-Pos Geometry is First Choice for These Materials (See pg. 5)

2 12° Lead Angle to Produce 5x Feed Rates



3 Inserts Include Multiple Corner Configurations

MR Reinforced Cutting Edge

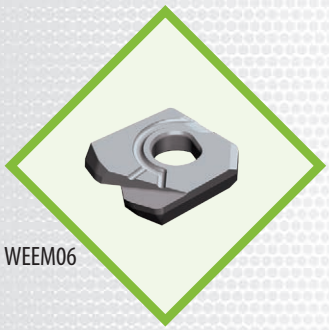
MM Positive Geometry

MR1 Keen Edge

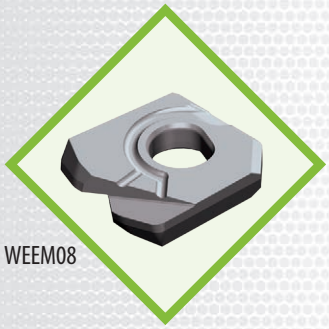
NANOFEED™

Nano Sized Blade Style Line for Hi-Feed Machining, Great for Picking Out Corners!

Product Details



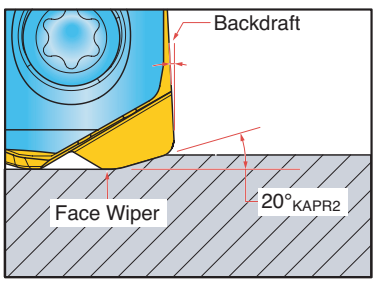
WEEM06



WEEM08

Steel Body Carbide Body

1 Angular Style with Face Wiper



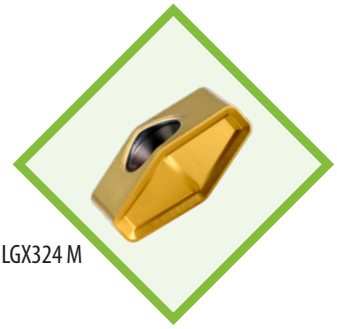
2 Internal Coolant System Through the Top of the Insert

3 One Screw Fastening for Rigidity and Strength

6 mm 8 mm

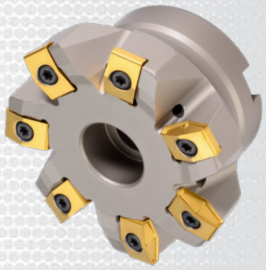
Angular Style Face Mills with Strong, Tangential Inserts that Allow for Excellent Ramping Ability

Product Details



LGX324 M

LGX324 ML

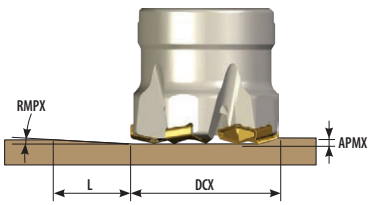


1 Pos-Neg Geometry is First Choice for These Materials (See pg. 5)

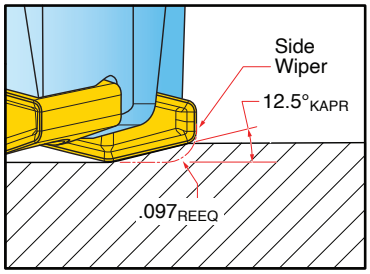
P Steel

K Cast Iron

2 Diamond Shaped Insert Allows for Steep Ramping Up to 3°

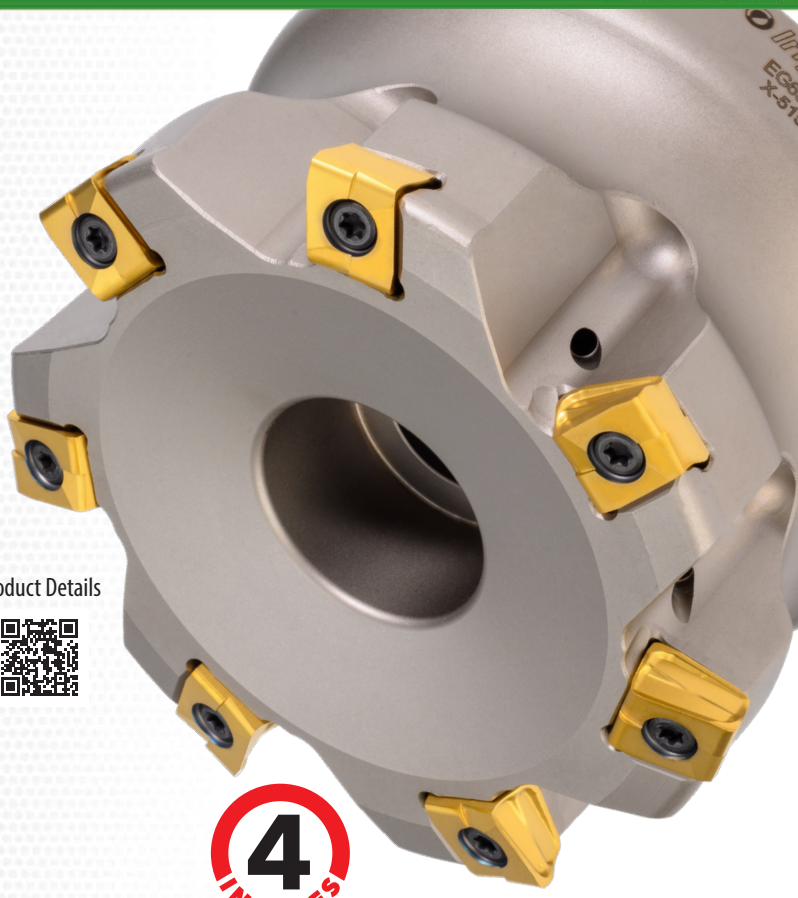


3 Side Wipers for Excellent Wall Finishing



NUMAX HFA™

Large Diameter Angular Style Mills with Positive Geometry & Wipers for Smooth Finishes on the Face & Side Wall

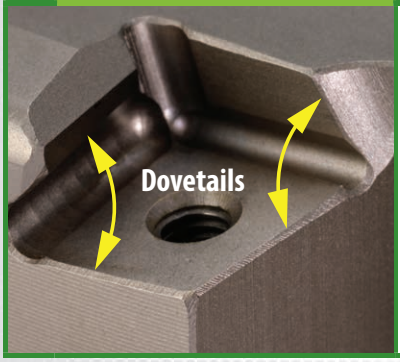


Product Details

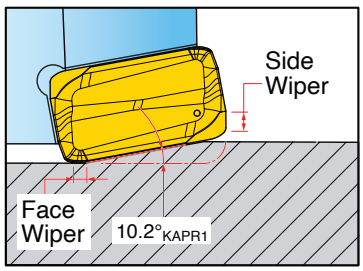
DPM324

4 INDEXES

1 New Double Dovetail Seating Design Improves Edge Life & Insert Stability



2 Angular Style with Side and Face Wipers



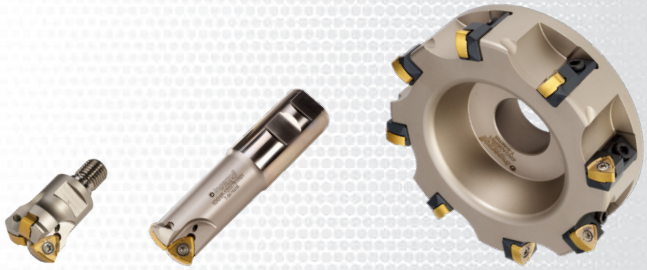
3 Pos-Pos Geometry is First Choice for These Materials (See pg. 5)

POWERFEED13+™

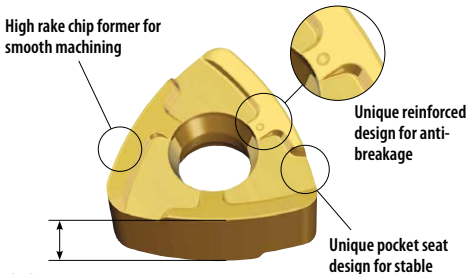
Work-Horse Mill with 6-Edge Economy & Robust Radius Style Inserts, Well Suited for Medium & Large Platform Machines

Product Details

UNEU13



1 Insert Designed for Stable Machining



2 Pos-Neg Geo. is First Choice in These Materials (See pg. 5)

3 Great for Long Reach Applications

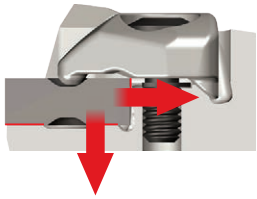
CERASFEED™

Ceramic Radius Style Inserts Provide Fast & Sustainable Hi-Feed Performance for HRSA Materials

Product Details

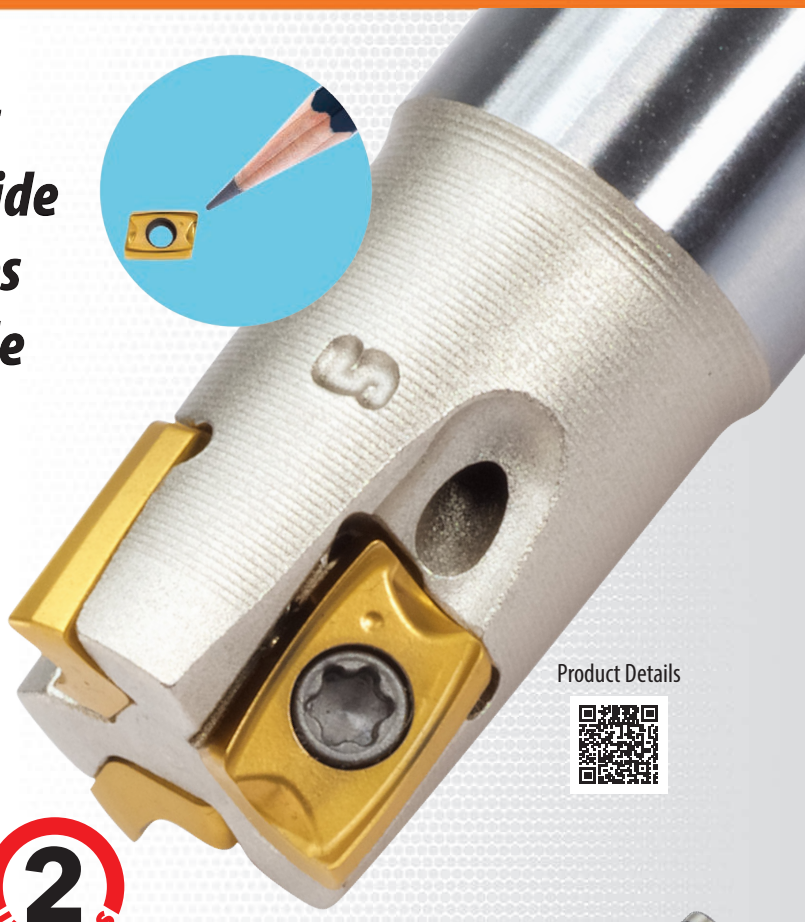
1	2	3	4
Speeds Up to 36x Greater than Carbide	Strong Double-Sided Insert	Rigid Clamping	Airblast Hole Through Wedge

SiAlON Grade IN76N



HIPOSSFEEDV™

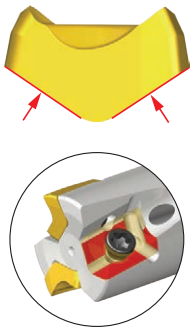
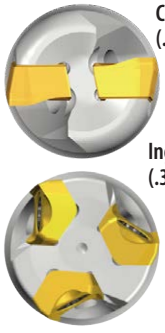
Mini Indexables That Out-Value Solid Carbide with Similar Densities Per Diameter, Flexible insert Styles, and Coolant Through



Product Details

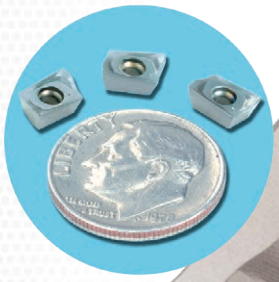
UNKT05

2 INDEXES

1 Unique V-Shape Provides Increased Rigidity & Stability	2 Same Cutter Body Uses 90°, Hi-Feed & Backdraft Inserts	3 Finer Pitch Maximizes Productivity	4 Pos-Neg Geometry is First Choice for These Materials
		 Competitor (.375", 2-eff) Ingersoll (.375", 3-eff)	(See pg. 5) 

HIPOS μ™

Our Highest Positive Mini-Indexable with 90° and Hi-Feed Insert Options



Product Details

UOMT06

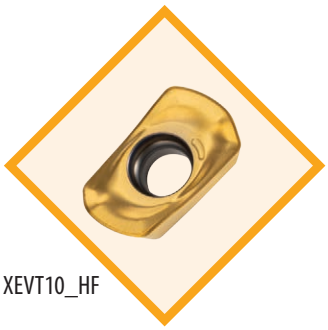
2 INDEXES

1 Diverse Range of Cutter Adaptions for all Machines & Applications	2 Same Cutter Body Uses 90° and Hi-Feed Inserts	3 Pos-Pos Geometry is First Choice for These Materials (See pg. 5)
		

HIPOS WINV™

Aero-Centric Mill with V-Bottom Insert; Aluminum Router, 90° or Hi-Feed Mill – You Decide!

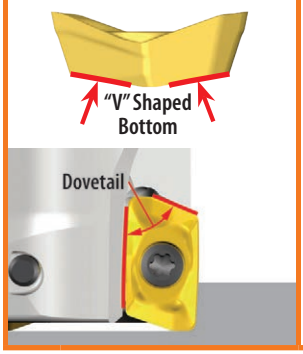
Product Details



XEVT10_HF

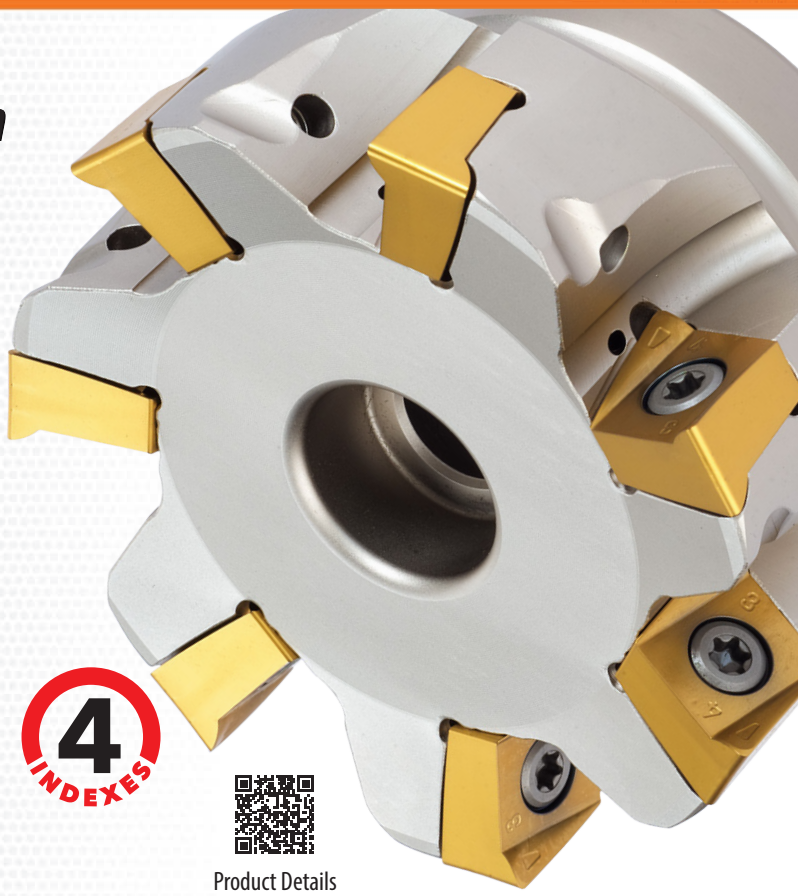
2 INDEXES

Balanced

1 Secure Insert Clamping	2 High Ramping Angle	3 Same Cutter Body Uses 90° and Hi-Feed Inserts	4 Pos-Pos Geometry is First Choice for These Materials
			(See pg. 5) 

DIPOS DUO™

All Purpose Mills with True Radius Hi-Feed, 90° and Backdraft Insert Option



4 INDEXES

Product Details

1 Same Cutter Body Uses 90°, Back-Draft and Hi-Feed Inserts

2 Smoother Side Wall Finish When Compared to Traditional Hi-Feed Inserts

Traditional Hi-Feed Insert

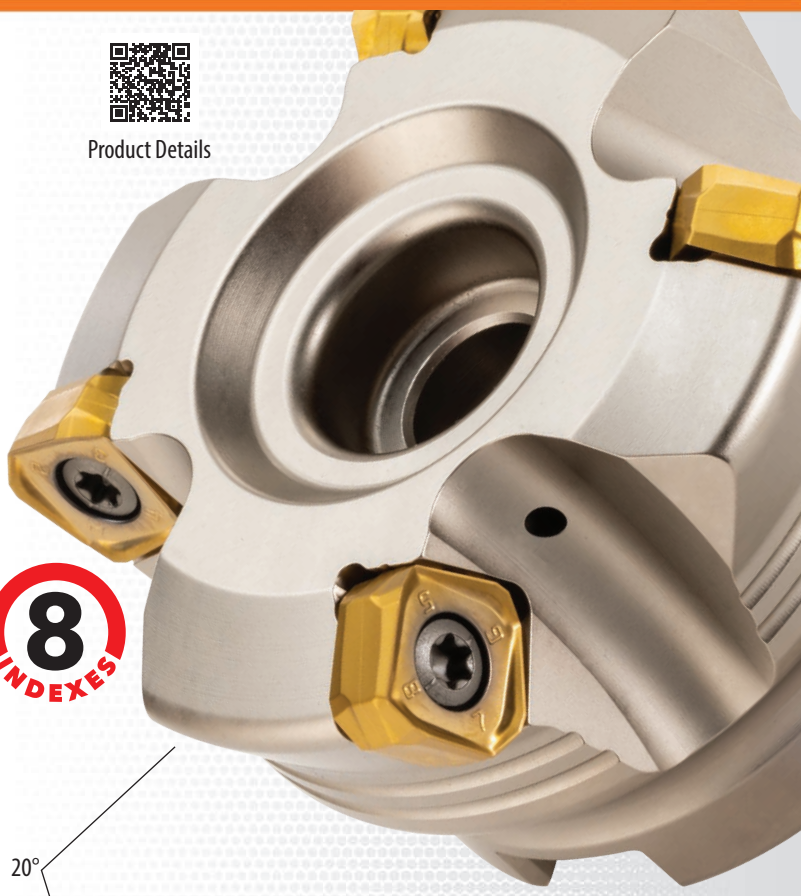
True Large Radius Hi-Feed Insert

3 Pos-Neg Geometry is First Choice for These Materials (See pg. 5)

DIPOSQUADF™

Hi-Feed and 45° Face Mills That Share the Same High-Strength, 8-Edge Insert. Best Suited for Facing

Product Details



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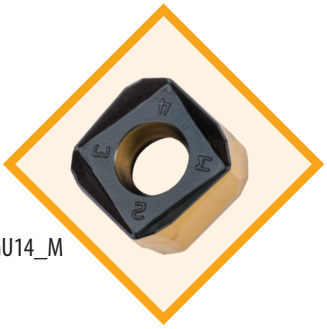

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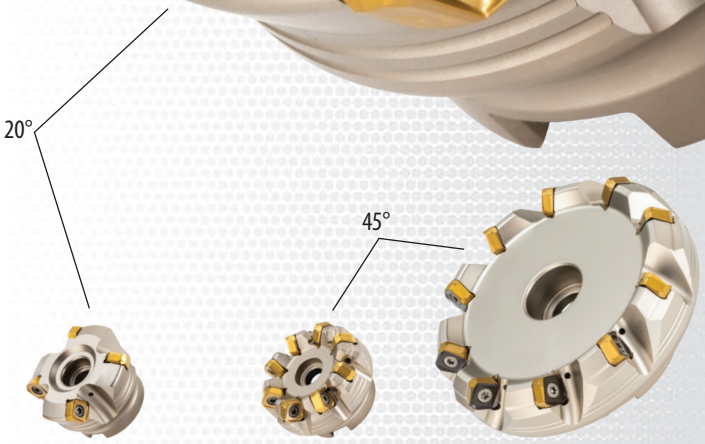
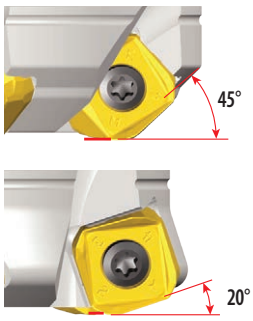
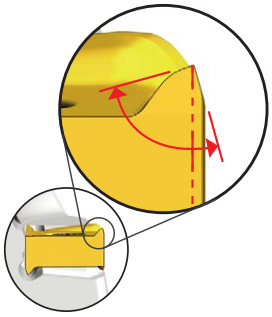


1 Single Insert Populates 45° and 20° Cutters



2 Neg-Pos Geometry is First Choice for These Materials (See pg. 5)

3 Reinforced Cutting Edge



DIPOSPENTA™

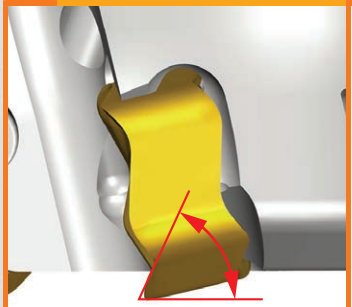
Unique Hybrid Insert That Can Cut 65° and Hi-Feed with 10 Cutting Edges

Product Details

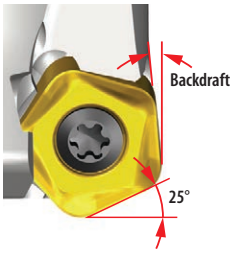
PNCU05

PNCU10

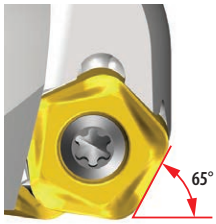
1 Hi-Pos Geometry Promotes Smooth Machining



2 Same Insert Fits Hi-Feed and 65° Mills



High Feed



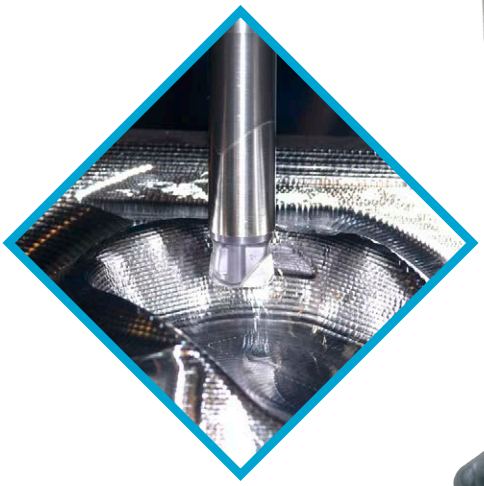
Facing

3 Pos-Pos Geo. is First Choice for These Materials (See pg. 5)

CHIPSURFER™

Product Details

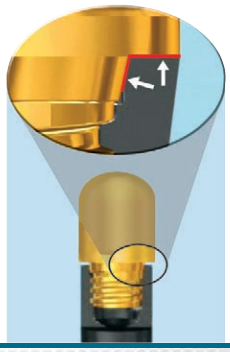
Solid Carbide Modular Hi-Feed Tips with Positive & Neutral Geometry That Adapt to Steel, Heavy Metal, Carbide and Anti-Vibe Shanks



1 Change Tips in Seconds on the Machine

2 2, 4 and 6 Flute Options

3 ±0.0005 Tip Repeatability with True Simultaneous Fit Connection



FEEDROUNDS™

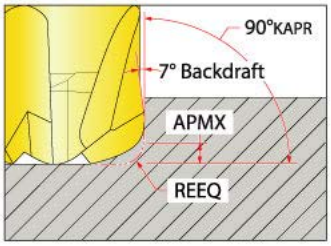
Small Diameter Radius Style Hi-Feed Mills with Neutral Geometry for Utmost Edge Strength

Product Details

4 Flute 2 Flute

1 Stubby and Long Lengths

2 Strong Radius Style Contour

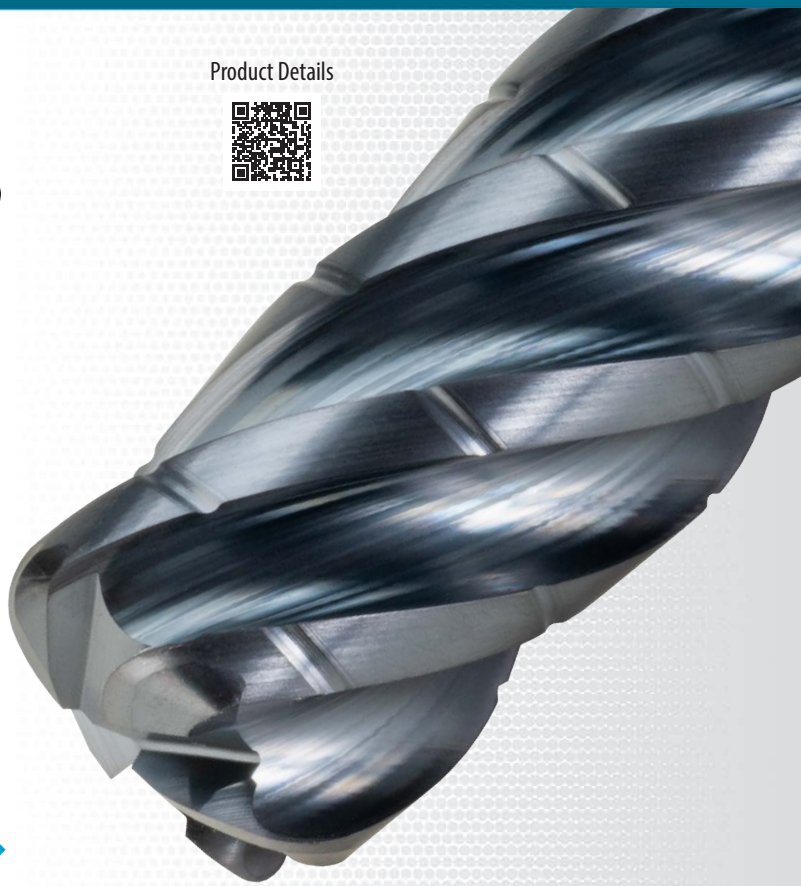


3 Neutral Geometry is First Choice for These Materials (See pg. 5)

3N1 ROUNDS™

A Hybrid Mill that Combines Hi-Feed Tip Geometry and 90° Shouldering

Product Details



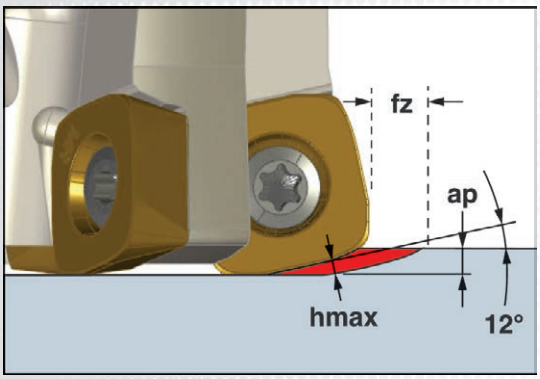
4 Flute 5 Flute

1 Positive Geometry & 38° Helix Angle is First Choice for Materials (See pg. 5)

2 3 Features in 1 Tool!

Feed Rate Multiplier/Chip Thinning

Hi-Feed Mills are designed to run at much higher feed rates than traditional lead angle mills due to chip thinning. As illustrated below, shallow Lead Angles produce a chip thickness (hmax) that is thinner than the programmed Feed Per Tooth (fz).



When programming and troubleshooting, understanding chip thickness (hmax) will affect productivity and tool life. When using indexable inserts, the minimum chip thickness (hmax) to target is .003" and the maximum varies based on insert design. That said, each Lead Angle has a correlating "Feed Rate Multiplier" that can be used for quick calculations. Below is a reference for Ingersoll's "Angular" Hi-Feed Mills.

Multiplier X Chip Thickness = Feed per Tooth

NuMaxHFA (10°)	5.5X
GoldSFeed (12°)	5X
NuMaxHF (12.5°)	4.5X
DiPosQuadF (20°)	3X
NanoFeed (20°)	3X
DiPosPenta (26°)	2.3X

For precise Chip Thinning calculations, consider Ingersoll's Online Machining App.

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Ingersoll Cutting Tools

USA
Marketing & Technology Center
845 South Lyford Road
Rockford, IL 61108-2749 USA
Tel: 815-387-6600
Email: info@ingersoll-imc.com
www.ingersoll-imc.com

Canada
Ingersoll Cutting Tools Canada
845 South Lyford Road
Rockford, IL 61108-2749 USA
Tel: 800-892-6859
Email: info@ingersoll-imc.com
www.ingersoll-imc.com

México
Ingersoll Cutting Tools de México
Blvd. José Musa de León 2127
Col. Los Pinos
Saltillo, Coa 25198
Tel: 52-844-485-3220
Email: info@ingersoll-imc.com
www.ingersoll-imc.com

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