



Insert Style:

RNGX12, RNGN12 (.500" IC insert)
RPGX12, RPGN12 (.500" IC insert)

Face Mills:

DW2H, DW1H (.500" IC insert)

End Mills:

1DB1H (.500" IC insert)

Grades:

IN76N

Applications:

Aero Space
Power Generation



HI-TEMPERATURE MILLING

Features and Benefits:

- SFM up to 33 times greater than solid carbide (60-90 SFM Carbide versus 3000 SFM Ceramic)
- Material Removal Rates 44 times higher
- Face mills & end mills with coarse- and fine-pitch options
- Single- and double-sided .500" IC button inserts
- New IN76N ceramic grade
- Material applications: Inconel, Rene, and more
- Super-secure clamping for dimple & flat rake face inserts

**PRODUCT
ANNOUNCEMENT
• UPDATE •
2019**

Ingersoll is pleased to introduce the new and improved Form-MasterCera+. The improvements include a superior grade addition IN76N and a new insert Clamping System.

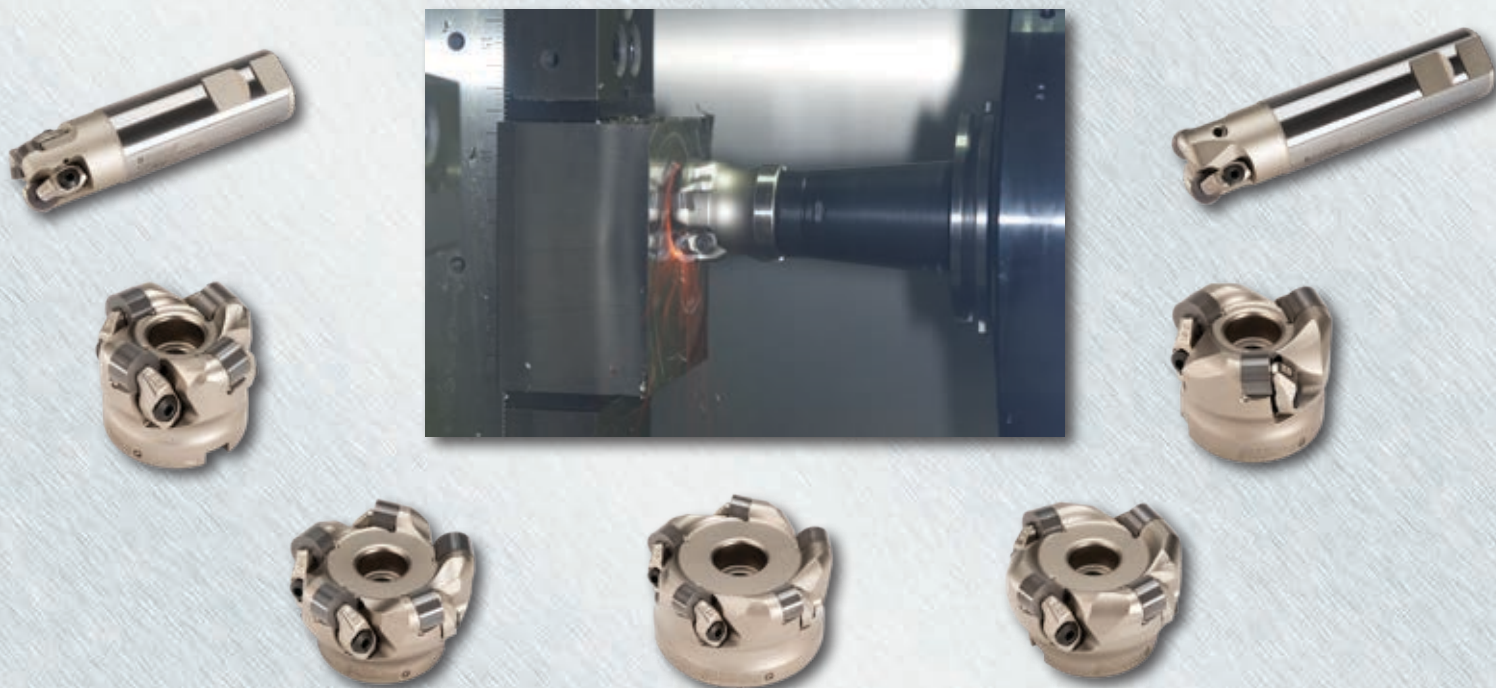
First, the new IN76N grade brings increased performance when milling high temperature, high nickel-based alloys such as Inconel, Nimonic and Waspaloy. IN76N provides excellent toughness and its anti-chipping capabilities make it a good choice for interrupted and continuous cutting. This new grade will be replacing the current IN72N grade. IN76N is:

- Ideal for high temperature alloy machining and tougher when compared to the whisker ceramic grade
- Offering extreme toughness enabling higher feeds and heavier depths of cut
- Ideal for roughing milling applications
- Excellent in providing thermal shock resistance and thermal conductivity

Note: Due to the outstanding performance of the improved IN76N grade, Ingersoll's previous IN72N grade will be phased out as existing stock is depleted.

Second, there is a new updated Clamping System that allows for the secure clamping of flat and dimple type round ceramic button inserts (RNGX, RPGX, RNGN, RPGN). This new system will bring increased application flexibility to end-users. The Clamping Systems takes advantage of two different clamp assemblies. One clamp assembly type is for flat rake face style inserts and another is for dimple style inserts. Cutter bodies are supplied with clamping for flat rake face inserts. Dimple style clamps are optional and sold separately.

These new upgrades were thoughtfully engineered to provide end users with increased milling performance, application flexibility and increased productivity. Please note, the older Form-MasterCera cutter bodies and clamps are not compatible with the new Form-MasterCera+. Due to the new upgrades the older series Form-MasterCera will be phased out as existing stock is depleted.



SERIES 1DB1H

CERAMIC BUTTON END MILL



Ramping



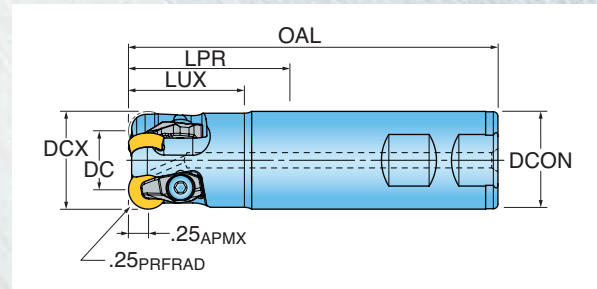
Channeling



Pocket



Facing



Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	LUX Usuable Length Max.	LPR Protruding Length	OAL Overall Length	ZEPP Effective Teeth	DCON Shank Dia.	CSP Coolant	RMPX Ramp Angle Max.	Insert Series
1DB1H-1201581R02	1.250	0.750	1.57	2.46	4.72	3	1.250	No*	0.2	RPGX / RPGN
1DB1H-1203181R02	1.250	0.750	1.57	3.26	5.51	2	1.250	No*	0.2	RPGX / RPGN

* Cutter bodies are supplied with through coolant holes for optional use of AIR ONLY.

SERIES DW_H

CERAMIC BUTTON FACE MILL



Ramping



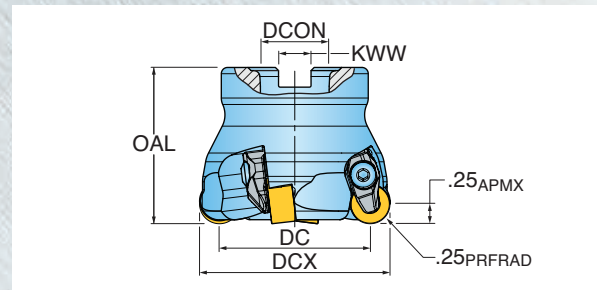
Channeling



Pocket



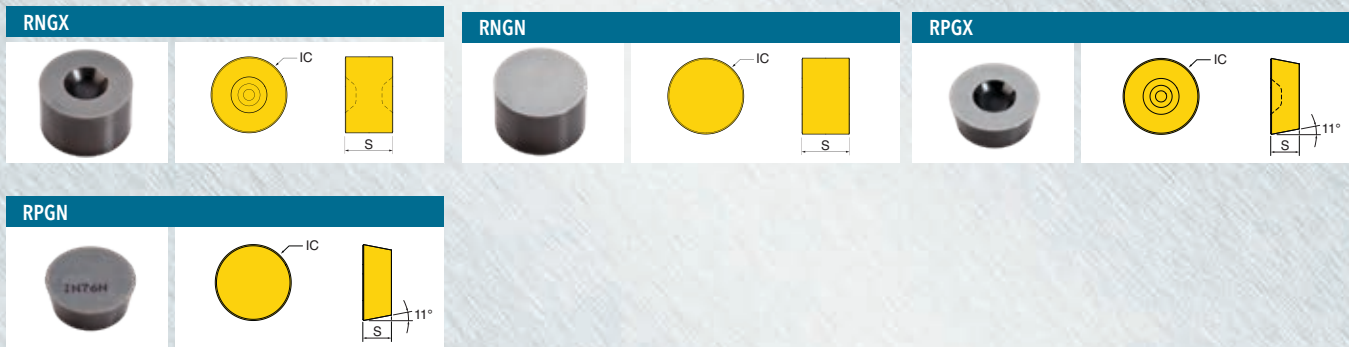
Facing



Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	OAL Overall Length	ZEPP Effective Teeth	DCON Shank Dia.	KWW Keyway	RMPX Ramp Angle Max.	CSP Coolant	Insert Series
DW2H-20R02	2.000	1.500	1.57	3	0.75	0.312	0.35	No*	RNGX / RNGN
DW1H-20R02	2.000	1.500	1.57	4	0.75	0.312	0.35	No*	RNGX / RNGN
DW2H-25R02	2.500	2.000	1.57	4	0.75	0.312	0.35	No*	RNGX / RNGN
DW1H-25R02	2.500	2.000	1.57	5	0.75	0.312	0.35	No*	RNGX / RNGN
DW2H-30R02	3.000	2.500	1.75	5	1.00	0.375	0.32	No*	RNGX / RNGN

* Cutter bodies are supplied with through coolant holes for optional use of AIR ONLY.

INSERTS

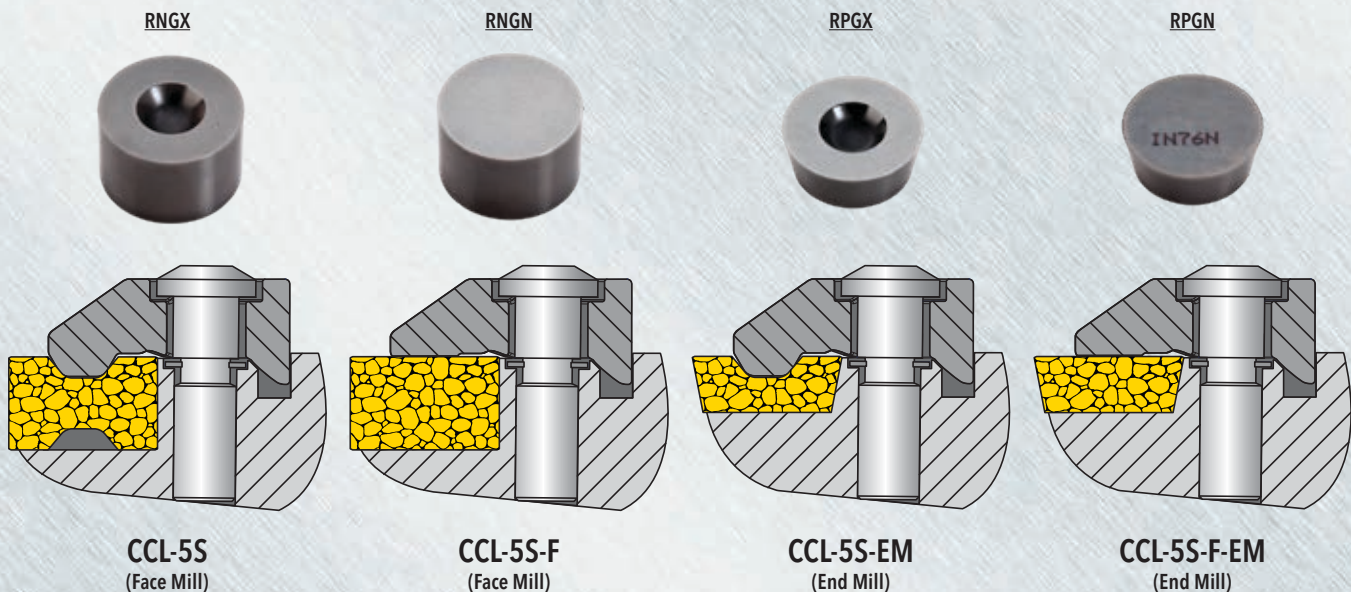


Part Number	Description	Application	IC Inscribed Circle Dia.	S Thickness	Grade IN76N
RNGX1207CH-T6	Double Sided Round, Dimple Style	Heavy Duty	0.500	0.312	•
RNGN1207FL-E04	Double Sided Round, Flat Style (ISO Type)	Multi-Purpose	0.500	0.312	•
RNGN1207FL-T6	Double Sided Round, Flat Style (ISO Type)	Multi-Purpose	0.500	0.312	•
RPGX1204CH-T6	Single Sided Round, Dimple Style	Heavy Duty	0.500	0.187	•
RPGN1204FL-E04	Single Sided Round, Flat Style (ISO Type)	Multi-Purpose	0.500	0.187	•
RPGN1204FL-T6	Single Sided Round, Flat Style (ISO Type)	Multi-Purpose	0.500	0.187	•

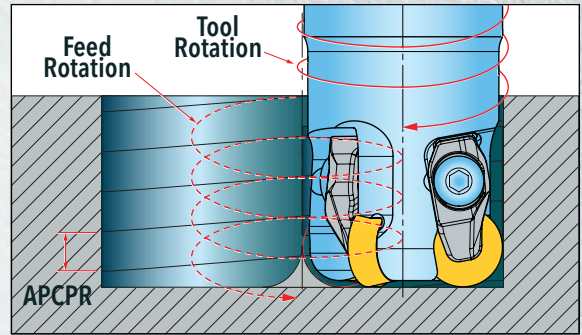
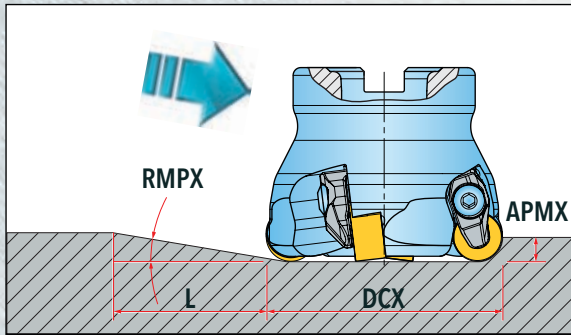
Edge Preparation

CH-E04: 0.0015~0.0019 honing only.
CH-T6: 0.004 x 20° land without honing.

CLAMP DATA






RAMPING DATA



Part Number	DC Cutting Dia.	RMPX Ramp Angle Max.	Straight Ramp Down		Helical Ramp Down		
			APMX Depth of Cut Max.	L Length Min.	Min. Dia.	Max. Dia.	APMX/Rev.
1DB1H-1203181R02	1.250	17.2	0.236	0.748	1.539	-	0.200
					-	2.500	0.200
1DB1H-1201581R02	1.250	17.2	0.236	0.748	1.539	-	0.200
					-	2.500	0.200
DW2H-20R02	2.000	0.45	0.236	30.070	3.039	-	0.020
					-	4.000	0.040
DW1H-20R02	2.000	0.45	0.236	30.070	3.039	-	0.020
					-	4.000	0.040
DW2H-25R02	2.500	0.40	0.236	33.860	4.039	-	0.025
					-	5.000	0.045
DW1H-25R02	2.500	0.40	0.236	33.860	4.039	-	0.025
					-	5.000	0.045
DW2H-30R02	3.000	0.30	0.236	45.120	5.039	-	0.025
					-	6.000	0.040



HARDWARE

Part Number	Insert	 Clamp	Clamp Torque Specification	 Driver	 Retention Bolt
1DB1H-1203181R02	RPGX1204CH	CCL-5S ASSY-E/M TYPE	37 in. lbs.	L-W3	-
1DB1H-1203181R02	RPGX1204CH-T6	CCL-5S ASSY-E/M TYPE	37 in. lbs.	L-W3	-
1DB1H-1203181R02	RPGN1204FL-E04	CCL-5S-F ASSY-E/M TYPE	37 in. lbs.	L-W3	-
1DB1H-1203181R02	RPGN1204FL-T6	CCL-5S-F ASSY-E/M TYPE	37 in. lbs.	L-W3	-
1DB1H-1201581R02	RPGX1204CH	CCL-5S ASSY-E/M TYPE	37 in. lbs.	L-W3	-
1DB1H-1201581R02	RPGX1204CH-T6	CCL-5S ASSY-E/M TYPE	37 in. lbs.	L-W3	-
1DB1H-1201581R02	RPGN1204FL-E04	CCL-5S-F ASSY-E/M TYPE	37 in. lbs.	L-W3	-
1DB1H-1201581R02	RPGN1204FL-T6	CCL-5S-F ASSY-E/M TYPE	37 in. lbs.	L-W3	-
DW2H-20R02	RNGX1207CH	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW2H-20R02	RNGX1207CH-T6	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW2H-20R02	RNGN120700FL-E04	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW2H-20R02	RNGN120700FL-T6	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW1H-20R02	RNGX1207CH	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW1H-20R02	RNGX1207CH-T6	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW1H-20R02	RNGN120700FL-E04	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW1H-20R02	RNGN120700FL-T6	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW2H-25R02	RNGX1207CH	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW2H-25R02	RNGX1207CH-T6	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW2H-25R02	RNGN120700FL-E04	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW2H-25R02	RNGN120700FL-T6	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW1H-25R02	RNGX1207CH	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW1H-25R02	RNGX1207CH-T6	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW1H-25R02	RNGN120700FL-E04	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW1H-25R02	RNGN120700FL-T6	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-06-46
DW2H-30R02	RNGX1207CH	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-08-47
DW2H-30R02	RNGX1207CH-T6	CCL-5S ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-08-47
DW2H-30R02	RNGN120700FL-E04	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-08-47
DW2H-30R02	RNGN120700FL-T6	CCL-5S-F ASSY-CUTTER TYPE	37 in. lbs.	L-W3	SD-08-47

OPERATING GUIDELINES

Form Master Cera - DW2H, DW1H, 1DB1H				IN76N	Coolant
Material		SFM	Feed per Insert		
Super Alloys	Fe-Based Super Alloys	1000 - 3000	.002 - .008	1	No*
	Cobalt-Based Super Alloys	900 - 4000	.002 - .008	1	
	Nickel-Based Super Alloys		.002 - .008		

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

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