

Member IMC Group
Ingersoll
Cutting Tools

FINE GOLD

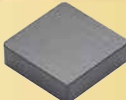
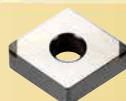
2013/2014

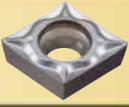


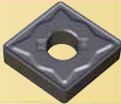
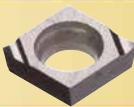
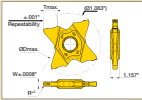
GOLD•RUSH

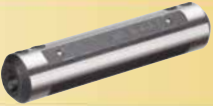
Milling	Description	Series	Page
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	HIPOS•TRIO 3H 90	1KJ1_, 1KJ1_ (TopOn), KJ	16
	DIPOS•HEXA 6D 90	1DJ1F, 1DJ1P, 1DJ1F, 1DJ1P (TopOn), DJ	20
	HI•QUAD	25J3P	24
	ISO•PLUS	DJ6T, DJ5T	26
	OCTO•PLUS	ON5H, ON6H, OP6N	28
	FORM•MASTER^F HIGH-FEED	1DG1H, 1DG1H (TopOn), DG6H	36
	HI•FEED^{MINI}	1TG1F, 1TG1F (TopOn), TG1F	40
	HI•QUAD^F	15M1P, 15M1PF (TopOn), 5M_P, 5G_M	44
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	ISO•PLUS	DD6H	52

Milling	Description	Series	Page
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	FORM•MASTER^R PROFILE	1DE1H, 1DE1H (TopOn), DE6H	68
	FINISH•BALL™ PROFILE	12A9, 12A5, 12A9 (TopOn), 12A8	72
	PRO•TRIO PROFILE	2TW7K	76
	GOLD•MAX^{4 FFIN}	EF6J	78
	GOLD•MAX⁸ QUAD TO FINE	VJ6K	80
	GOLD•MAX⁴ QUAD TO FINE	3EJ6_ (Axial), 3EJ6_ (Radial)	82
	THIN•MAX™ TANGENTIAL	3VJ5V (Axial), 3VJ5V (Radial)	86

Turning	Description	Series	Page
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	BLACK•RUSH GRADES	Turning grades for high speed machining of cast iron & alloy steel	104
	ToTURN™ WHISKER CERAMIC GRADE	Whisker reinforced ceramic grade TC430 for machining high strength & high temp alloys	108
	ToTURN™ NEW CBN GRADES	CBN grades TB610, TB670, TB730 for machining hardened steel & cast iron	112
	ToTURN™ PCD CHIPBREAKER	PCD-tipped inserts with CB chipbreaker	122
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	GOLD•DUTY	HB chipbreaker inserts for semi heavy turning	140
	GOLD•DUTY	External holders	142
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Turning	Description	Series	Page
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	ToFORCE CNMD/SNMD	Double sided H series chipbreaker for rough & finish machining	152
	ToTURN EM CHIPBREAKER	EM chipbreaker for stainless steel machining	158
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	ToTURN RCMX INSERTS	RA chipbreaker for positive round inserts	167
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Turning	Description	Series	Page
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	T•MINI™ INSERTS	Inserts for T•MINI boring bars	190
	C•ADAPTER™	External quick change holder for ISO turning	192
	COMBI•CLAMP™ DCLS	Multi-function clamp for use with Ingersoll's existing T-type holders	200
	GOLD•RUSH™ GRADES	GOLD•RUSH grades for T•CLAMP applications	202
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Turning	Description	Series	Page
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	T_oCLAMP TDIP	Precision inserts for internal turning & grooving	225
	T_oTHREAD™ NEW GRADE TT5080	TT5080 for lathe threading applications	226
	T_oTHREAD™ B-TYPE INSERTS	B-type threading inserts for excellent chip control and surface quality	230
	T_oCLAMP^{ULTRA+} TGBFR/L	Deep face grooving blade product expansion	234
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Turning	Description	Series	Page
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	TOCLAMP^{ULTRA+} NEW GRADE TT9080	New grade TT9080 phasing out grade TT9030	248
	TOGROOVE[™]	Grooving system for special forms	250
	TOCAP[™] NEW GROOVING INSERT	Multifunction tool for drilling, boring, facing, turning & grooving	252

Turning	Description	Series	Page
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	QUAD•TWIST DRILL	Indexable drill	276
	CHAMFERING RINGS	Replaceable tip drill shanks	286
	QUAD•DRILL+	QA adjustable drill	292
	DEEP•TWIST DEEP DRILL	HF series drills	298

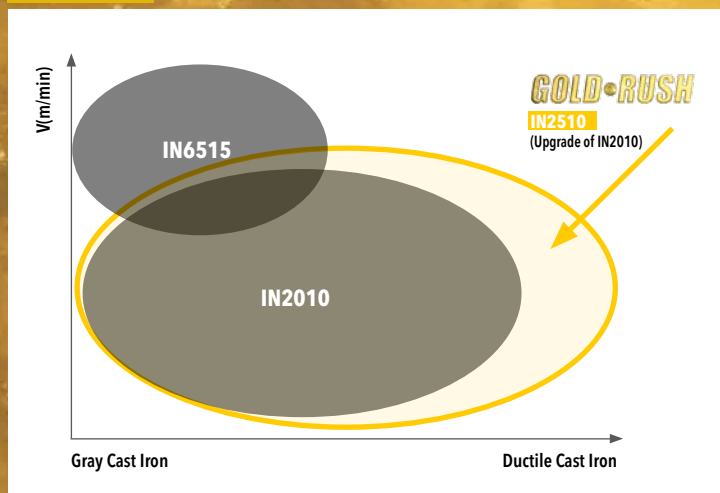


GOLD•RUSH Grades

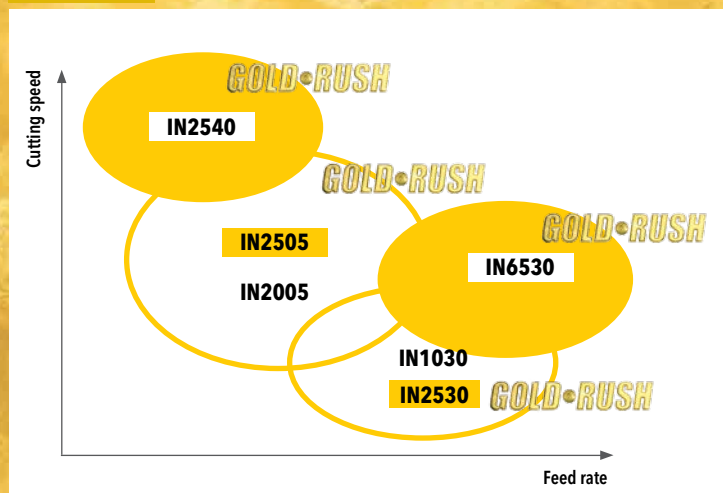
The ingenious solution that takes cutting tool materials to another level

- Stable and extended tool life in continuous and interrupted cutting operations
- Reduced cutting friction and minimized built-up edge on exotic materials
- High surface finish on the workpiece
- Improved adhesion and insert chipping resistance

CAST IRON

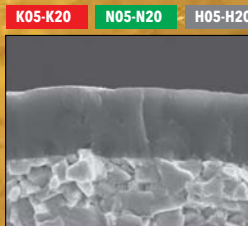


STEEL



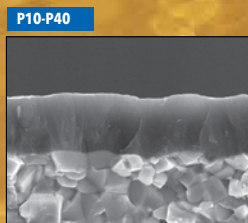
IN2510 (PVD)

- Grade with high wear resistance for general cast iron machining (Gray and Ductile cast iron milling)
- Extended tool life for medium and low speed machining
- Dedicated substrate for cast iron plus PVD coated grade with surface treatment after coating



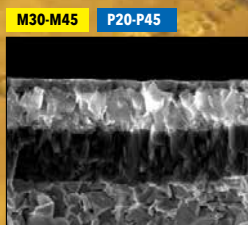
IN2540 (PVD)

- Excellent for alloy steels, mold steels and normal steels
- Has high wear, thermal crack resistance and high mechanical shock resistance
- Recommended for dry milling
- For medium to rough machining in Die & Mold application
- New yellow colored PVD coated grade with surface treatment after coating



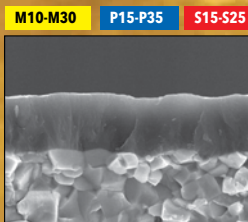
IN6530 (CVD)

- Grade for roughing of steels, alloy and stainless steels
- Excellent toughness with optimum wear resistance
- CVD coated grade with surface treatment after coating



IN2505 (PVD)

- Excellent for low carbon, low alloy steels, alloy steels, mold steels and stainless steels
- Has high wear resistance and optimum toughness
- For medium to finish machining in Mold & Die
- Sub-micron substrate
- New yellow colored PVD coated grade with surface treatment after coating



IN2530 (PVD)

- Grade for steel and stainless steel applications
- Good for medium to low speed application
- PVD coated grade with surface treatment after coating





CENTER CUTTING ENDMILLS

- Upgraded performance with AOMT1805 and AOMT1204 series inserts.
- Cutter diameters from 1.00" thru 1.50" with through the tool coolant.
- Drill, ramp and pocket in one tool.
- Ramping up to 30° angles (without peck or dwell).
- Large variety of corner radii.



HIPOST+ SERIES 12S1X, 12S1E

CENTER CUTTING ENDMILL



Facing



Shoulder



Channeling



Ramping



Pocketing



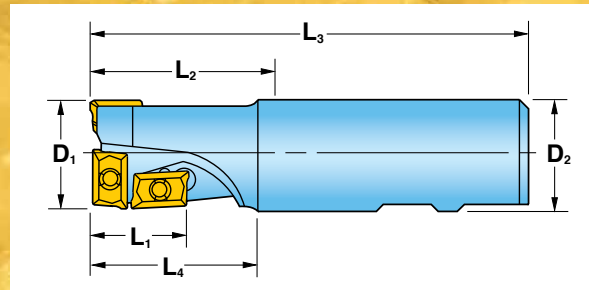
Corkscrew



Drilling



Coolant



D1 Nom. Diameter	Cutter Number	L1 Max DOC	L2 Extension Length	L3 Overall Length	L4 Projection Length	D2 Shank Size/Style	No. of Effective Flutes	No. of Total Flutes	No. of Inserts Center	No. of Inserts Side	Insert Size
1.000	12S1X-1001780R01	0.87	1.75	4.00	1.60	1.000" W	1	2	1	2	1204
1.250	12S1X-1202781R01	0.93	2.75	5.00	2.60	1.250" W	1	2	1	2	1204
1.500	12S1E-1502781R01	1.26	2.75	5.00	2.75	1.250" W	1	2	1	2	1805

*Overall Length is measured to the sharp corner of the insert.

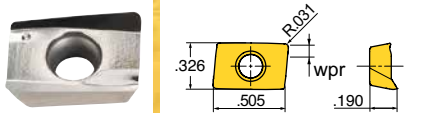
† Use side inserts with corner radii no larger than .031"R.

Operating Guidelines on page 90.

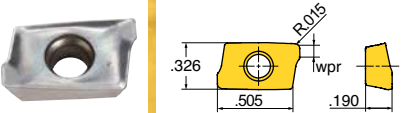


12MM INSERTS

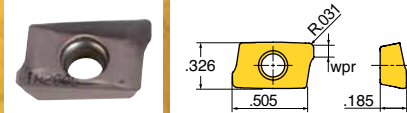
AOCT120408FR-P



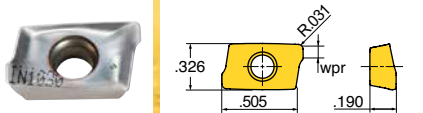
AOMT120404R



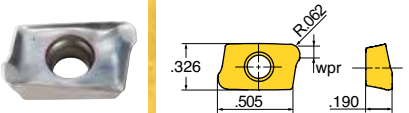
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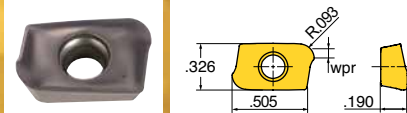
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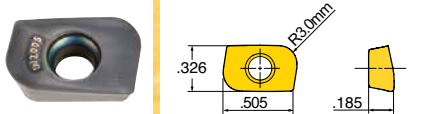
AOMT120416R



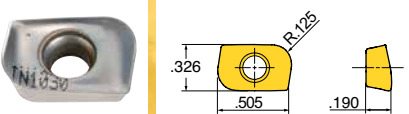
AOMT120424R



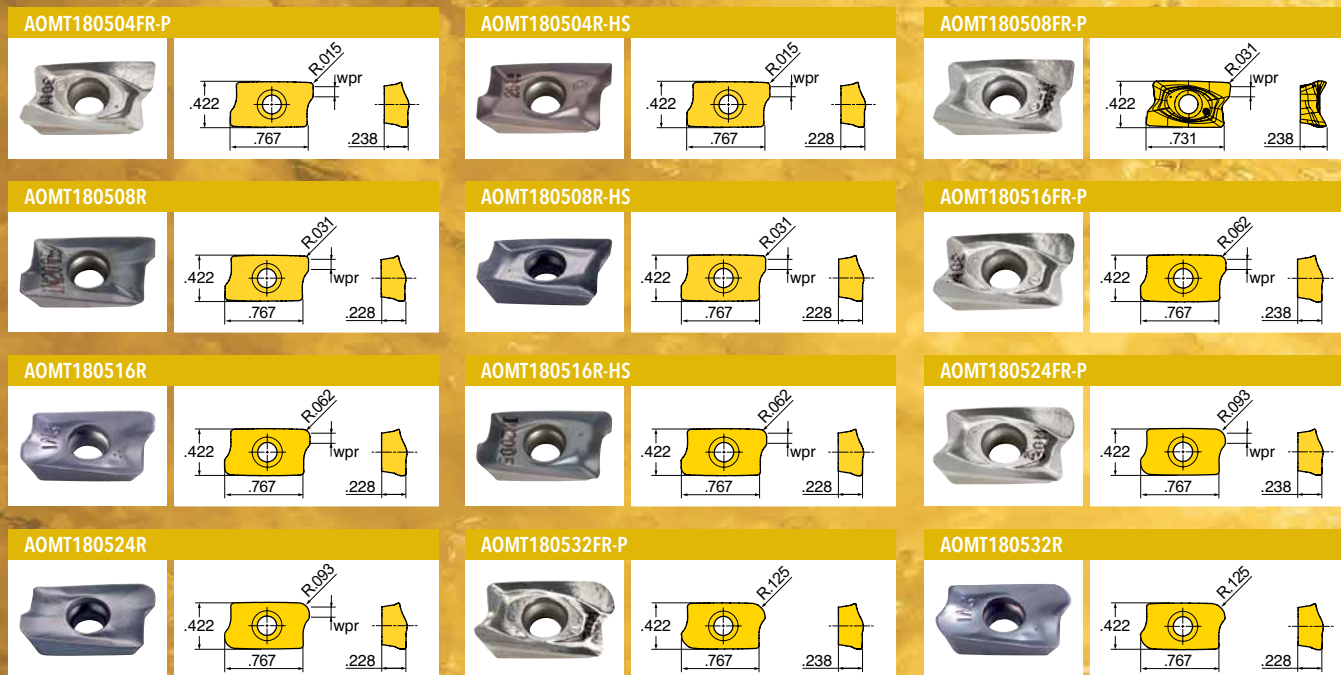
AOMT120430FR



AOMT120432R



Part Number	Corner	Application	Grade	IN1030	IN10K	IN2005	IN2040	IN2505	IN2510	IN2530	IN2540
AOMT120404R	0.015 R	Multi-Purpose		•		•					
AOMT120408R	0.031 R	Multi-Purpose		•		•		•	•	•	•
AOMT120416R	0.062 R	Multi-Purpose		•		•			•	•	•
AOMT120424R	0.093 R	Multi-Purpose				•					
AOMT120432R	0.125 R	Multi-Purpose		•		•	•				
AOMT120408FR	0.031 R	Hi-Temp/Ti				•				•	
AOMT120430FR	3.00 mm R	Multi-Purpose				•					
AOCT120408FR-P	0.031 R	Grd/Pol for Al			•						



Part Number	Corner	Application	Grade	IN05S	IN1030	IN2005	IN2015	IN2030	IN2040	IN30M
AOMT180508R	0.031 R	Multi-Purpose			•	•	•	•	•	
AOMT180516R	0.062 R	Multi-Purpose			•	•	•	•	•	
AOMT180524R	0.093 R	Multi-Purpose			•	•			•	
AOMT180532R	0.125 R	Multi-Purpose			•	•	•	•	•	
AOMT180504FR-P	0.015 R	Grd/Pol for Al	•							
AOMT180504R-HS	0.015 R	Hi-Temp/Ti						•		
AOMT180508FR-P	0.031 R	Grd/Pol for Al								•
AOMT180508R-HS	0.031 R	Hi-Temp/Ti				•		•		•
AOMT180516FR-P	0.062 R	Grd/Pol for Al								•
AOMT180516R-HS	0.062 R	Hi-Temp/Ti				•				
AOMT180524FR-P	0.093 R	Grd/Pol for Al								•
AOMT180532FR-P	0.125 R	Grd/Pol for Al								•

12MM



Screw



Driver

SM35-076-10

DS-T10T

18MM



Screw



Driver

SM40-093-20

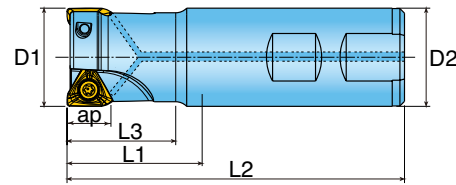
DS-T15T

- Diameter Range From .625" to 6.00"
- Hi Positive Design with 3 Cutting Edges for Performance and Economy
- Ramping Capability for Cutting Versatility
- Three Insert Sizes for Complete Diameter Coverage
- Full Range of Insert Radii with Ingersoll Premium Grades

MILLING SOLUTIONS RAISED TO A TRIPLE GOLD PERFORMANCE STANDARD

HIPOSOTRIO™ SERIES 1KJ1_

0 DEGREE LEAD ENDMILL



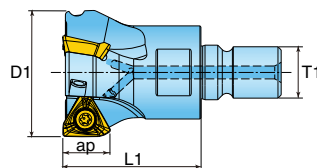
Cutter Number	D1 Effective Diameter	Number of Inserts	L1 Extension Length	L2 Overall Length	L3 Projection Length	D2 Shank Size/Style	Ramp Angle Using .031" R Insert	Insert Series	ap Cut Depth
1KJ1D-0601279R01	0.625	1	1.25	3.25	1.22	.625 W	4	TH_S06	.275
1KJ1D-0702084R01	0.725	2	2.00	4.00	1.80	.750 W	3.1	TH_S06	.275
1KJ1D-0701184R01	0.750	2	1.25	3.25	1.05	.750 W	3.1	TH_S06	.275
1KJ1D-0701784R01	0.750	2	1.75	3.75	1.55	.750 W	3.1	TH_S06	.275
1KJ1D-0703084R01	0.750	2	3.00	5.00	2.80	.750 W	3.1	TH_S06	.275
1KJ1D-0801784R01	0.875	2	1.75	3.75	1.75	.750 W	2.5	TH_S06	.275
1KJ1D-1001784R01	1.000	3	1.75	3.75	1.75	.750 W	2.15	TH_S06	.275
1KJ1D-1001780R01	1.000	3	1.75	4.00	1.55	1.00 W	2.15	TH_S06	.275
1KJ1D-1003780R01	1.000	3	3.75	6.00	3.375	1.00 W	N/A	TH_S06	.275
1KJ1D-1003784R01	1.000	3	3.75	6.00	3.55	.75 W	N/A	TH_S06	.275
1KJ1D-1201784R01	1.250	4	1.75	3.75	1.75	.750 W	1.5	TH_S06	.275
1KJ1D-1201780R01	1.250	5	1.75	4.00	1.75	1.00 W	1.5	TH_S06	.275
1KJ1D-1501784R01	1.500	5	1.75	3.75	1.75	.750 W	1.3	TH_S06	.275
1KJ1D-1501780R01	1.500	6	1.75	4.00	1.75	1.00 W	1.3	TH_S06	.275
1KJ1D-1502281R01	1.500	6	2.25	4.50	2.25	1.25 W	1.3	TH_S06	.275
1KJ1G-1201784R01	1.250	3	1.75	3.75	1.75	.750 W	2.3	TH_S10	.433
1KJ1G-1202281R01	1.250	2	2.25	4.50	2.05	1.25 W	2.3	TH_S10	.433
1KJ1G-1202281R02	1.250	3	2.25	4.50	2.05	1.25 W	2.3	TH_S10	.433
1KJ1G-1204281R01	1.250	3	4.25	6.50	4.05	1.25 W	N/A	TH_S10	.433
1KJ1G-1502281R01	1.500	3	2.25	4.50	2.20	1.25 W	1.8	TH_S10	.433
1KJ1G-1502281R02	1.500	4	2.25	4.50	2.20	1.25 W	1.8	TH_S10	.433
1KJ1G-1504281R01	1.500	3	4.25	6.50	4.25	1.25W	N/A	TH_S10	.433
1KJ1G-2002281R01	2.000	5	2.25	4.50	2.25	1.25 W	1.5	TH_S10	.433
1KJ1P-2002281R01	2.000	4	2.25	4.50	2.25	1.25 W	1.5	TH_S13	.590

Operating Guidelines on page 91-92.



HIPOS•TRIO™ SERIES 1KJ1_ (TOP•ON STYLE)

0 DEGREE LEAD ENDMILL



Cutter Number	D1 Nominal Diameter	Number of Inserts	L1 Extension Length	T1 Adaption	Wrench Size	Ramp Angle Using .031" R Insert	Insert Series	ap Cut Depth
1KJ1D-07015X6R01	0.750	2	1.50	M10	15mm	3.1	TH_S06	.275
1KJ1D-10015X7R01	1.000	2	1.50	M12	17mm	2.1	TH_S06	.275
1KJ1D-10015X7R02	1.000	3	1.50	M12	17mm	2.1	TH_S06	.275
1KJ1D-12017X8R01	1.250	3	1.75	M16	22mm	2.1	TH_S06	.275
1KJ1D-12017X8R02	1.250	5	1.75	M16	22mm	1.5	TH_S06	.275
1KJ1D-15017X8R01	1.500	5	1.75	M16	22mm	1.3	TH_S06	.275
*1KV1D-10015X7R01	1.000	3	1.50	M12	17mm	NA	TH_S06	.275
*1KV1D-12017X8R01	1.250	5	1.75	M16	22mm	NA	TH_S06	.275
1KJ1G-12017X8R01	1.250	3	1.50	M16	22mm	2.3	TH_S10	.433
1KJ1G-15017X8R01	1.500	4	1.75	M16	22mm	1.8	TH_S10	.433

* 3° Dovetail Endmill

Operating Guidelines on page 91-92.

0 DEGREE LEAD FACEMILL


Shoulder



Channel



Ramp



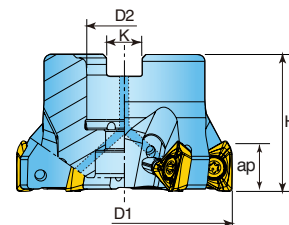
Corkscrew



Facing



Coolant



Cutter Number	D1 Effective Diameter	Number of Inserts	H Height	D2 Bore Diameter	Retention Bolt	Optional Coolant Bolt	K Keyway	Coolant	Ramp Angle Using .031" R Insert	Insert Series	ap Cut Depth
KJ5D-15R01	1.500	6	1.57	0.50	SD-04-85	-	0.25	Y	1	TH_S06	.275
KJ5D-20R01	2.000	7	1.57	0.75	SD-06-46	SD-06-89	0.31	Y	1	TH_S06	.275
KJ6D-30R01	3.000	9	1.75	1.00	SD-08-46	SD-08-92	0.38	Y	0.4	TH_S06	.275
KJ5G-20R01	2.000	5	1.57	0.75	SD-06-46	SD-06-89	0.31	Y	1.5	TH_S10	.433
KJ5G-25R01	2.500	6	1.57	0.75	SD-06-46	SD-06-89	0.31	Y	1.1	TH_S10	.433
KJ6G-30R01	3.000	5	1.75	1.00	SD-08-46	SD-08-92	0.38	Y	0.8	TH_S10	.433
KJ5G-30R01	3.000	8	1.75	1.00	SD-08-46	SD-08-92	0.38	Y	0.8	TH_S10	.433
KJ6G-40R01	4.000	8	1.75	1.50	-	-	0.62	N	0.6	TH_S10	.433
KJ5G-40R01	4.000	10	1.75	1.50	-	-	0.62	N	0.6	TH_S10	.433
KJ6G-50R01	5.000	11	2.00	1.50	-	-	0.62	N	0.5	TH_S10	.433
KJ6P-30R01	3.000	6	1.75	1.00	SD-08-46	SD-08-92	0.38	Y	1.3	TH_S13	.590
KJ6P-40R01	4.000	6	1.75	1.50	-	-	0.62	N	1	TH_S13	.590
KJ5P-40R01	4.000	8	1.75	1.50	-	-	0.62	N	1	TH_S13	.590
KJ6P-50R01	5.000	9	2.00	1.50	-	-	0.62	N	0.8	TH_S13	.590
KJ6P-60R01	6.000	8	2.00	1.50	-	-	0.62	N	0.6	TH_S13	.590
KJ5P-60R01	6.000	12	2.00	1.50	-	-	0.62	N	0.6	TH_S13	.590

Operating Guidelines on page 91-92.

HIPOSOTRIO™ INSERTS



Part Number	Application	R Corner	a Wiper	t Thick.	ap Cut Depth	Grade	IN10K	IN2505	IN2510	IN2530	IN2540
THLS060404R	Multi-Purpose	.015"R	.051	.157	.275			•			
THLS060408R	Multi-Purpose	.031"R	.035	.157	.275			•	•	•	•
THLS060416R	Multi-Purpose	.062"R	.022	.157	.275			•			
THLS060408FR	Hi-Temp	.031"R	.035	.157	.275			•		•	
THES060408R	Multi-Purpose, Ground Periphery	.031"R	.035	.157	.275			•			
THES060404FR-P	Ground/Polished for Aluminum	.015"R	.051	.157	.275		•				
THES060408FR-P	Ground/Polished for Aluminum	.031"R	.035	.157	.275		•				
THLS100508R	Multi-Purpose	.031"R	.063	.197	.433			•	•	•	•
THLS100516R	Multi-Purpose	.062"R	.032	.197	.433			•			
THLS100524R	Multi-Purpose	.093"R	.020	.197	.433			•			
THLS100508FR	Hi-Temp	.031"R	.063	.197	.433			•		•	
THES100508R	Multi-Purpose, Ground Periphery	.031"R	.063	.197	.433			•			
THES100516R	Multi-Purpose, Ground Periphery	.062"R	.031	.197	.433			•			
THES100508FR-P	Ground/Polished for Aluminum	.031"R	.063	.197	.433		•				
THLS130608R	Multi-Purpose	.031"R	.078	.236	.590			•	•	•	•
THLS130608FR	Hi-Temp	.031"R	.078	.236	.590			•		•	
THLS130616R	Multi-Purpose	.062"R	.047	.236	.590			•		•	
THLS130624R	Multi-Purpose	.093"R	.024	.236	.590			•			
THLS130632R	Multi-Purpose	.125"R	.020	.236	.590			•			
THES130608FR-P	Ground/Polished for Aluminum	.031"R	.078	.236	.590		•				

HIPOSOTRIO™ HARDWARE

	Insert Screw	Driver
KJ_D	SM25-065-R0	DS-T08W
KJ_G	SM40-100-R0	DS-T15T
KJ_P	SM45-120-R0	DS-T20T

DOUBLE SIDED POSITIVE INSERT WITH 6 CUTTING EDGES

- Diameter Range From 1.00" to 6.00"
- Helical Cutting Edge for 90 Degree Cutting
- Dovetail Insert Pocket Design Provides Increased Security and Insert Clamping
- Internal Coolant Supply
- Double Sided 6 Corner Insert



DIPOS[®]HEXA[™] SERIES 1DJ1F, 1DJ1P

0 DEGREE LEAD ENDMILL WITH 6 INDEXES

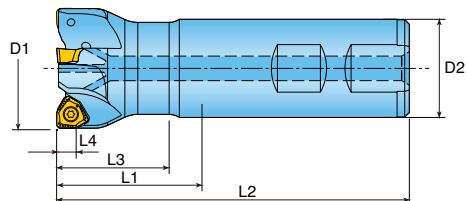


Shoulder

Channel

Facing

Coolant



Cutter Number	D1 Effective Diameter	L4 Length of Cut	L3 Projection Length	L1 Extension Length	L2 Overall Length	D2 Shank Size/Style	Number of Inserts	Insert Series
1DJ1F-1001584R01	1.000	.24	1.50	1.50	3.50	.750 W	2	WNGU09
1DJ1F-1001780R01	1.000	.24	1.55	1.75	4.00	1.00 W	2	WNGU09
1DJ1F-1003780R01	1.000	.24	3.55	3.75	6.00	1.00 W	2	WNGU09
1DJ1F-1201584R01	1.250	.24	1.50	1.50	3.50	.750 W	3	WNGU09
1DJ1F-1202281R01	1.250	.24	2.22	2.25	4.50	1.25 W	3	WNGU09
1DJ1F-1204281R01	1.250	.24	4.22	4.25	6.50	1.25 W	3	WNGU09
1DJ1F-1502281R01	1.500	.24	2.25	2.25	4.50	1.25 W	4	WNGU09

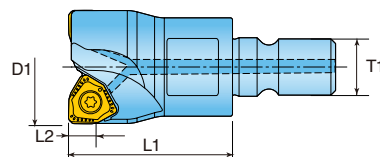
Cutter Number	D1 Effective Diameter	L4 Length of Cut	L3 Projection Length	L1 Extension Length	L2 Overall Length	D2 Shank Size/Style	Number of Inserts	Insert Series
1DJ1P-1202281R01	1.250	.36	2.22	2.25	4.50	1.25 W	2	WNGU13
1DJ1P-1204281R01	1.250	.36	4.22	4.25	6.50	1.25 W	2	WNGU13
1DJ1P-1502281R01	1.500	.36	2.22	2.25	4.50	1.25 W	3	WNGU13
1DJ1P-1504281R01	1.500	.36	4.22	4.25	6.50	1.25 W	3	WNGU13
1DJ1P-2002281R01	2.000	.36	2.22	2.25	4.50	1.25 W	5	WNGU13

Operating Guidelines on page 92.



DIPOS[®]HEXA[™] SERIES 1DJ1F, 1DJ1P (TOP-ON STYLE)

0 DEGREE LEAD ENDMILL WITH 6 INDEXES



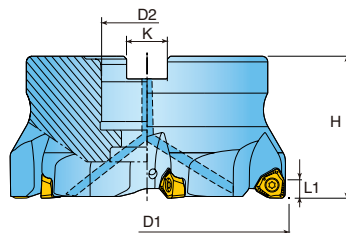
Cutter Number	D1 Effective Diameter	T1 Adaption	L1 Extension Length	L2 Length of Cut	Wrench Size	Number of Inserts	Insert Series
1DJ1F-10015X7R01	1.000	M12	1.50	.24	17mm	2	WNGU09
1DJ1F-12017X8R01	1.250	M16	1.75	.24	22mm	3	WNGU09
1DJ1F-15017X8R01	1.500	M16	1.75	.24	22mm	4	WNGU09

Cutter Number	D1 Effective Diameter	T1 Adaption	L1 Extension Length	L2 Length of Cut	Wrench Size	Number of Inserts	Insert Series
1DJ1P-12017X8R01	1.250	M16	1.75	.36	22mm	2	WNGU13
1DJ1P-15017X8R01	1.500	M16	1.75	.36	22mm	3	WNGU13
1DJ1P-15017X8R02	1.500	M16	1.75	.36	22mm	4	WNGU13

Operating Guidelines on page 92.

SERIES DJ_F, DJ_P

0 DEGREE LEAD FACEMILL WITH 6 INDEXES



Cutter Number	D1 Effective Diameter	Number of Inserts	H Height	L1 Length of Cut	D2 Bore Diameter	K Keyway	Retention Bolt	Optional Coolant Bolt	Insert Series
DJ5F-20R01	2.000	5	1.570	.24	0.750	0.312	SD-06-46	SD-06-89	WNGU09
DJ5F-20R02	2.000	6	1.570	.24	0.750	0.312	SD-06-46	SD-06-89	WNGU09
DJ5F-25R01	2.500	6	1.570	.24	0.750	0.312	SD-06-46	SD-06-89	WNGU09
DJ5F-30R01	3.000	7	1.750	.24	1.000	0.375	SD-08-46	SD-08-92	WNGU09
DJ5F-30R02	3.000	9	1.750	.24	1.000	0.375	SD-08-46	SD-08-92	WNGU09
DJ5F-40R01	4.000	11	2.375	.24	1.500	0.625	SD-12-82	SD-12-99	WNGU09
DJ6F-40R01	4.000	8	2.375	.24	1.500	0.625	SD-12-82	SD-12-99	WNGU09

Cutter Number	D1 Effective Diameter	Number of Inserts	H Height	L1 Length of Cut	D2 Bore Diameter	K Keyway	Retention Bolt	Optional Coolant Bolt	Insert Series
DJ5P-20R01	2.000	5	1.570	.36	0.750	0.312	SD-06-46	SD-06-89	WNGU13
DJ6P-20R01	2.000	4	1.570	.36	0.750	0.312	SD-06-46	SD-06-89	WNGU13
DJ5P-25R01	2.500	6	1.570	.36	0.750	0.312	SD-06-46	SD-06-89	WNGU13
DJ5P-30R01	3.000	7	1.750	.36	1.000	0.375	SD-08-46	SD-08-92	WNGU13
DJ5P-30R02	3.000	9	1.750	.36	1.000	0.375	SD-08-46	SD-08-92	WNGU13
DJ5P-40R01	4.000	8	2.375	.36	1.500	0.625	SD-12-82	SD-12-99	WNGU13
DJ5P-40R02	4.000	11	2.375	.36	1.500	0.625	SD-12-82	SD-12-99	WNGU13
DJ6P-60R01*	6.000	12	2.000	.36	1.500	0.625	-	-	WNGU13

* No Coolant Through
Operating Guidelines on page 92.

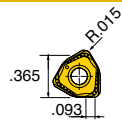
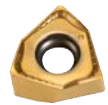
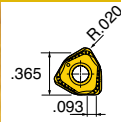
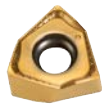
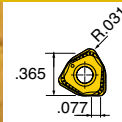
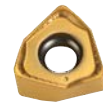
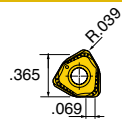
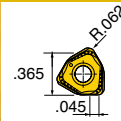
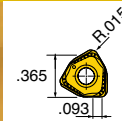
HARDWARE



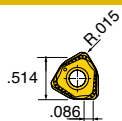
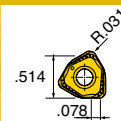
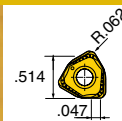
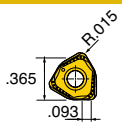
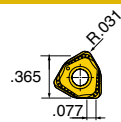
Insert Screw

Driver

WNGU09	SM30-085-10	DS-T09W
WNGU13	SM40-100-R0	DS-T15T

**DIPOSO[®]HEXA[™]**
6D 90**INSERTS****WNGU090404R****WNGU090405R****WNGU090408R****WNGU090410R****WNGU090416R****WNGU090404FR-P****WNGU090408FR-P**

Part Number	Application	Grade	IN2505	IN2510	IN2530	IN2540	IN10K
WNGU090404R	Multi-Purpose - .015" R		•				
WNGU090405R	Multi-Purpose - .020" R (.5mm R)		•				
WNGU090408R	Multi-Purpose - .031" R		•	•	•	•	
WNGU090410R	Multi-Purpose - .039" R (1.0mm R)		•				
WNGU090416R	Multi-Purpose - .062" R		•	•	•		
WNGU090404FR-P	Grd/Pol for Aluminum - .015" R						•
WNGU090408FR-P	Grd/Pol for Aluminum - .031" R						•

WNGU130604R**WNGU130608R****WNGU130616R****WNGU130604FR-P****WNGU130608FR-P**

Part Number	Application	Grade	IN2505	IN2510	IN2530	IN2540	IN10K
WNGU130604R	Multi-Purpose - .015" R		•				
WNGU130608R	Multi-Purpose - .031" R		•	•	•	•	
WNGU130616R	Multi-Purpose - .062" R		•	•	•	•	
WNGU130604FR-P	Grd/Pol for Aluminum - .015" R						•
WNGU130608FR-P	Grd/Pol for Aluminum - .031" R						•



LONG EDGE CUTTERS

- Extreme efficiency with most positive geometry in the market.
- Inserts offered with keen hi-temp and durable flat face geometries.
- Internal coolant supply.
- Well suited for Stainless Steel and Hi Temp Alloys.



HI-QUAD™ SERIES 25J3P

0 DEGREE LEAD EXT. FLUTE SHELL MILL



Shoulder



Facing



Slabbing



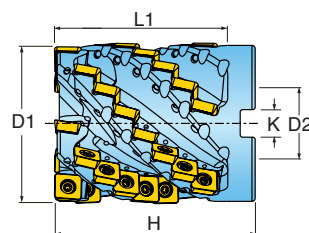
Channel



Coolant



Coolant

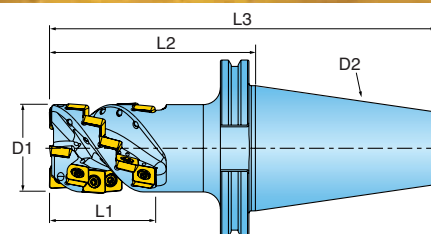
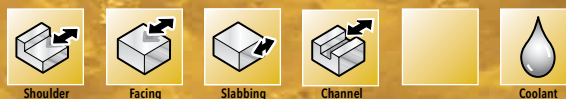


Cutter Number	D1 Effective Diameter	L1 Length of Cut	H Height	D2 Bore Diameter	K Keyway	# of Effective Inserts	# of Total Inserts	Retention Bolt
25J3P-20030D1R00	2.000	2.0	3.00	0.750	0.31	4	20	SD-06-79
25J3P-20030D1R01	2.000	2.0	3.00	0.750	0.31	3	15	SD-06-79
25J3P-30037D4R00	3.000	3.0	3.75	1.250	0.50	5	40	SD-10-54
25J3P-30050D4R10	3.000	4.0	5.00	1.250	0.50	5	55	SD-10-04
25J3P-40050D5R00	4.000	4.0	5.00	1.500	0.62	5	55	SD-12-79

Operating Guidelines on page 93.

HI-QUAD™ SERIES 25J3P

0 DEGREE LEAD EXT. FLUTE END MILL

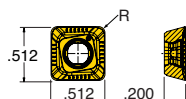


Cutter Number	D1 Effective Diameter	L1 Length of Cut	L2 Ext Length	L3 Overall Length	D2 Adaption	# of Effective Inserts	# of Total Inserts
25J3P-20045D1R00	2.000	2.3	4.50	8.50	ICT #50 V-Flange	3	18
25J3P-20062D1R00	2.000	4.0	6.25	10.25	ICT #50 V-Flange	4	44

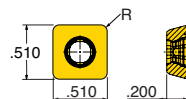
Operating Guidelines on page 93.

HI-QUAD™ INSERTS

SDMS



SDES



Part Number	Application	R Corner	Indexes	Grade	IN4005	IN4030	IN4035	IN4015
SDMS130512R-PP	Hi-Temp	R.047	4			X		
SDMS130516R-PP	Hi-Temp	R.062	4		X	X	X	X
SDES130508N-PF	Multi-Purpose Flat Top	R.031	4		X	X	X	X
SDES130516N-PF	Multi-Purpose Flat Top	R.062	4		X	X	X	X
SDES130524N-PF	Multi-Purpose Flat Top	R.093	4		X	X		
SDES130532N-PF	Multi-Purpose Flat Top	R.125	4		X	X		
SDES130564N-PF*	Multi-Purpose Flat Top	R.250	2		X	X		

*Cutter body to be relieved to accommodate large radius.

Side Station Options

SDMS130516R-PP	Hi-Temp	R.062	4	X	X	X	X
SDES130516N-PF	Multi-Purpose Flat Top	R.062	4	X	X	X	X

HI-QUAD™ HARDWARE



Insert Screw



Driver Handle



Insert Driver Blade



Optional Torque Wrench



Optional Insert Driver Blade

SM40-100-R0

DS-A00T

DS-T156B

DT-35-02

DS-T15B1

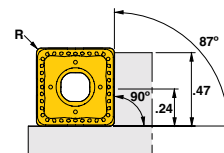
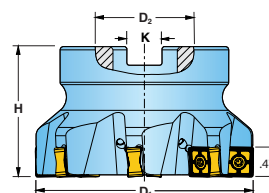
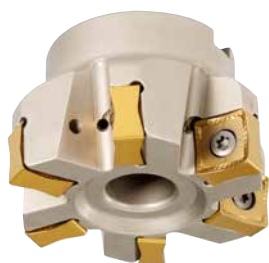
90° QUAD EXPANSION

- 8 Positive cutting edges with 90 degree shoulder
- .47" Max depth of cut
- .24" Depth of cut along 90 degree shoulder
- Medium and High Density cutter offerings
- 2.00-8.00 diameter range
- Cutters equipped with coolant through



ISOPLUS SERIES DJ6T, DJ5T

0 DEGREE LEAD FACEMILL WITH 8 INDEXES

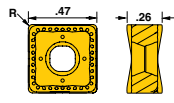


Cutter Number	Nominal Diameter	D1 Overall Diameter	D2 Bore Size	K Keyway	H Height	Number of Inserts	Coolant	Bolt Circle	SHCS	SHCS w/ Coolant Thru*
Medium Density										
DJ6T-20R01	2.000	2.025	0.75	0.31	1.570	5	Yes	-	SD-06-46	SD-06-89
DJ6T-25R01	2.500	2.523	0.75	0.31	1.570	6	Yes	-	SD-06-46	SD-06-89
DJ6T-30R01	3.000	3.021	1.00	0.37	1.750	7	Yes	-	SD-08-46	SD-08-92
DJ6T-40R01	4.000	4.020	1.50	0.62	2.375	8	Yes	-	SD-12-82	SD-12-99
DJ6T-50R01	5.000	5.018	1.50	0.62	2.375	10	Yes	-	SD-12-82	SD-12-99
DJ6T-60R01	6.000	6.018	1.50	0.62	2.375	12	No	-	-	-
DJ6T-80R01	8.000	8.016	2.50	1.00	2.375	14	No	4.00	-	-
High Density										
DJ5T-30R01	3.000	3.021	1.00	0.37	1.750	8	Yes	-	SD-08-46	SD-06-89
DJ5T-40R01	4.000	4.020	1.50	0.62	2.375	10	Yes	-	SD-12-82	SD-12-99
DJ5T-50R01	5.000	5.018	1.50	0.62	2.375	13	Yes	-	SD-12-82	SD-12-99
DJ5T-60R01	6.000	6.018	1.50	0.62	2.375	17	No	-	-	-
DJ5T-80R01	8.000	8.016	2.50	1.00	2.375	21	No	4.00	-	-

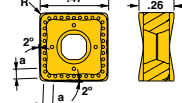
Operating Guidelines on page 94.

ISO^oPLUS INSERTS

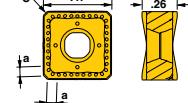
SNGU...N (Only corner)



SNGU...TN (Wiper w/R)



SNGU...ANTN (Wiper w/chamfer)



Part Number	Application	R Corner	a Wiper	Grade	IN2510	IN2530	IN2505	IN2540	IN6515	IN71N
SNGU130604N	Positive Geometry	.015R	-		•		•			
SNGU130608N	Positive Geometry	.031R	-							•
SNGU130608TN	Positive Geometry	.031R w/wiper	.047		•	•	•	•	•	
SNGU130616N	Positive Geometry	.062R	-			•	•	•	•	
SNGU1306ANTN	Positive Geometry	45 x .031 w/wiper	.047		•		•	•	•	

ISO^oPLUS HARDWARE



Insert Screw



Driver



Optional Torque Wrench



Bit for Torque Driver

SM40-100-R0

DS-T15T

DT-35-02

DS-T15B1

OCTOPLUS™

ECONOMY WITH 16 EDGES

- 16 Cutting Edges for all materials
- Anti-Notch geometry diffuses insert notching and part breakout in iron
- SiNi addresses High RPM applications in iron
- Durable Flat Top battles castings at any depth of cut



OCTOPLUS™ SERIES ON5H ON6H

45 DEGREE LEAD FACE MILL (SCREW HELD - 5MM INSERT) WITH 16 INDEXES



Lead Angle



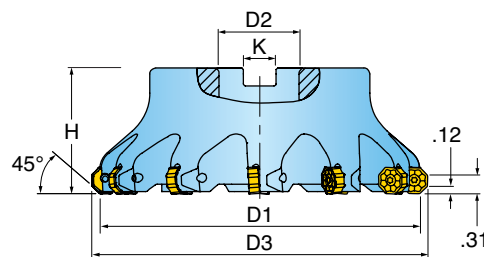
Chamfer



Facing



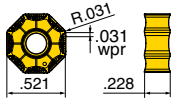
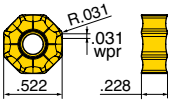
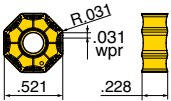
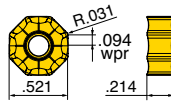
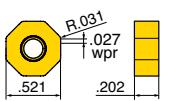
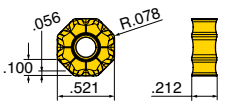
Coolant



Cutter Number	D1 Effective Diameter	D3 Overall Diameter	Number of Inserts	H Height	D2 Bore Dia.	K Keyway	Coolant
ON6H-15R01	1.500	1.83	4	1.570	0.500	0.250	Yes
ON5H-20R01	2.000	2.33	6	1.570	0.750	0.312	Yes
ON6H-20R01	2.000	2.33	4	1.570	0.750	0.312	Yes
ON6H-25R01	2.500	2.83	6	1.570	0.750	0.312	Yes
ON5H-30R01	3.000	3.33	10	1.750	1.000	0.375	Yes
ON6H-30R01	3.000	3.33	7	1.750	1.000	0.375	Yes
ON5H-40R01	4.000	4.33	12	2.375	1.500	0.625	Yes
ON6H-40R01	4.000	4.33	8	2.375	1.500	0.625	Yes
ON6H-50R01	5.000	5.33	10	2.375	1.500	0.625	Yes
ON5H-60R01	6.000	6.33	18	2.375	1.500	0.625	No
ON6H-60R01	6.000	6.33	12	2.375	1.500	0.625	No

Operating Guidelines on page 94.

OCTOPLUS™ 05 SERIES INSERTS

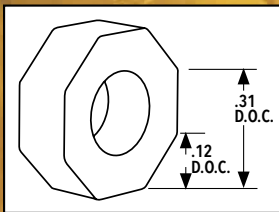
ONCU0505ANEN  	ONCU0505ANFN-P  	ONCU0505ANTN-HR  
ONCU0505ANTN-W  	ONCU0505ANN  	ONCU050520TN  

Part Number	Applications	Grade	IN10K	IN2010	IN2030	IN2035	IN2505	IN6515	IN70N	IN6510
ONCU0505ANN	SiNi for Iron								•	
ONCU050520TN	Anti-Notch						•	•		•
ONCU0505ANEN	Medium, pos. rake angle			•		•	•	•		
ONCU0505ANFN-P	Grd/Pol for Al		•							
ONCU0505ANTN-W	Wiper						•			
ONCU0505ANTN-HR	Positive Geometry			•	•		•			

OCTOPLUS™ HARDWARE

					
	Screw	Driver	Retention Bolt	(Optional) Coolant Bolt	
ON6H-15R01	SM40-100-10	DS-T15T	SD-04-86	-	
ON5H-20R01	SM40-100-10	DS-T15T	SD-06-46	SD-06-89	
ON6H-20R01	SM40-100-10	DS-T15T	SD-06-46	SD-06-89	
ON6H-25R01	SM40-100-10	DS-T15T	SD-06-46	SD-06-89	
ON5H-30R01	SM40-100-10	DS-T15T	SD-08-46	SD-08-92	
ON6H-30R01	SM40-100-10	DS-T15T	SD-08-46	SD-08-92	
ON5H-40R01	SM40-100-10	DS-T15T	SD-12-82	SD-12-99	
ON6H-40R01	SM40-100-10	DS-T15T	SD-12-82	SD-12-99	
ON6H-50R01	SM40-100-10	DS-T15T	SD-12-82	SD-12-99	
ON5H-60R01	SM40-100-10	DS-T15T	-	-	
ON6H-60R01	SM40-100-10	DS-T15T	-	-	

OCTOPLUS™ 05 SERIES INSERTS

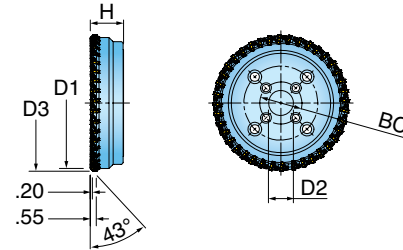


Cutter Series: ON5H/ON6H
Insert Series: ONCU05
1.50-6.00 Dia. Range
.12 DOC - 45 Degree Lead

	Part Number	Hone	Corner	Description
16 x .031" Int. Wiper R.031	ONCU0505ANTN-HR	J	R.031	MULTI-PURPOSE Universal insert geometry with landed edge. Integrated wiper flat for surface finishes between RA32-63. Whether it's steel, iron or titanium, this is an excellent first choice.
Indent .094 Crowned Wiper R.031	ONCU0505ANTN-W	J	R.031	MULTI-PURPOSE WIPER Wiper Insert with 8 indexes (4RH, 4LH) and longer wiper flats. When the advance per revolution does not exceed .094", place one wiper insert in one pocket to improve your surface finish by about 20 points. The indentation on the flank marks the edges that should contact the workpiece. To be married with ONCU0505ANTN-HR.
16 x .031" Int. Wiper R.031	ONCU0505ANEN	A	R.031	KEEN EDGE This keen, high positive chip former is beneficial when machining exotics or managing breakout on the workpiece. Integrated wiper flat produces good surface finishes.
16 x .031" Int. Wiper R.031	ONCU0505ANFN-P	S	R.031	NON-FERROUS Machining of aluminum and non-ferrous metals is the target for this up sharp and polished geometry. Integrated wiper flat produces good surface finishes.
16 x .027" Int. Wiper R.031	NEW! ONCU0505ANN	J	R.031	SiNi This 16 edged silicon nitride insert offers the best productivity when machining iron. Integrated wiper in place for good surface finishes.
Reinforced Edge R.078 .056 .100	NEW! ONCU050520TN	A	R.078	ANTI-NOTCH This unique design puts a keen edge at the corner to diffuse piece part breakout in iron AND adds a reinforced edge to resist notching between .059-.100 DOC. Large corner radius adds strength for roughing applications.

OCTOPLUS™ SERIES OP1N

45 DEGREE LEAD FACE MILL (WEDGE HELD - 9MM INSERT) WITH 16 INDEXES



Cutter Number	D1 Effective Diameter	D3 Overall Diameter	Number of Inserts	H Height	D2 Bore Dia.	K Keyway	Bolt Circle
OP1N-30R01	3.000	3.53	8	1.750	1.000	0.375	NA
OP1N-40R01	4.000	4.53	12	2.375	1.500	0.625	NA
OP1N-50R01	5.000	5.53	15	2.375	1.500	0.625	NA
OP1N-60R01	6.000	6.53	19	2.375	1.500	0.625	NA
OP1N-80L01	8.000	8.53	24	2.375	2.500	1.000	4.00
OP1N-80R01	8.000	8.53	24	2.375	2.500	1.000	4.00
OP1N-10L01	10.000	10.53	30	2.375	2.500	1.000	4.00
OP1N-10R01	10.000	10.53	30	2.375	2.500	1.000	4.00
OP1N-12L01	12.000	12.53	38	2.375	2.500	1.000	4.00, 7.00
OP1N-12R01	12.000	12.53	38	2.375	2.500	1.000	4.00, 7.00

Operating Guidelines on page 94.

OCTOPLUS™ HARDWARE



Driver

Wedge

Retention Bolt

Adjusting Screw

OP1N-30R01	DS-H04T	2M0813-01	SD-08-46	SB080-03
OP1N-40R01	DS-H04T	2M0813-01	SD-12-82	SB080-03
OP1N-50R01	DS-H04T	2M0813-01	SD-12-82	SB080-03
OP1N-60R01	DS-H04T	2M0813-01	SD-12-82	SB080-03
OP1N-80L01	DS-H04T	2M0813-01	-	SB080-03
OP1N-80R01	DS-H04T	2M0813-01	-	SB080-03
OP1N-10L01	DS-H04T	2M0813-01	-	SB080-03
OP1N-10R01	DS-H04T	2M0813-01	-	SB080-03
OP1N-12L01	DS-T20T	2M0813-01	-	SB080-03
OP1N-12R01	DS-H04T	2M0813-01	-	SB080-03

OCTOPLUS™ SERIES OP6N

45 DEGREE LEAD FACE MILL (SCREW HELD - 9MM INSERT) WITH 16 INDEXES



Lead Angle



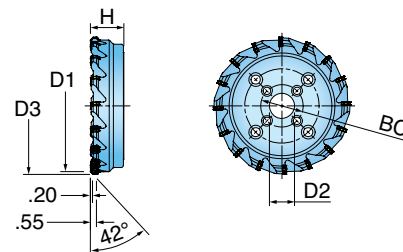
Chamfer



Facing



Coolant



Cutter Number	D1 Effective Diameter	D3 Overall Diameter	Number of Inserts	H Height	D2 Bore Dia.	K Keyway	Bolt Circle	Coolant
OP6N-25R01	2.500	3.04	5	1.570	0.750	0.312	NA	Yes
OP6N-30R01	3.000	3.54	6	1.750	1.000	0.375	NA	Yes
OP6N-40R01	4.000	4.54	7	2.375	1.500	0.625	NA	Yes
OP6N-50R01	5.000	5.54	8	2.375	1.500	0.625	NA	Yes
OP6N-60R01	6.000	6.54	10	2.375	1.500	0.625	NA	No
OP6N-80R01	8.000	8.54	12	2.375	2.500	1.000	4.00	No
OP6N-10R01	10.000	10.54	14	2.375	2.500	1.000	4.00	No
OP6N-12R01	12.000	12.54	16	2.375	2.500	1.000	4.00, 7.00	No

Operating Guidelines on page 94.

OCTOPLUS™ HARDWARE



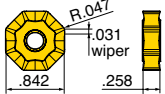
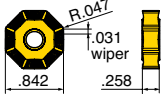
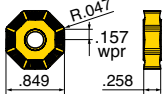
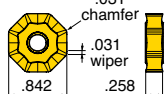
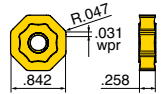
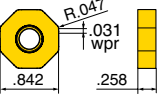
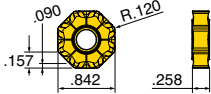
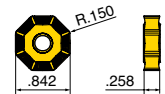
Driver

Retention Bolt

(Optional) Coolant Bolt

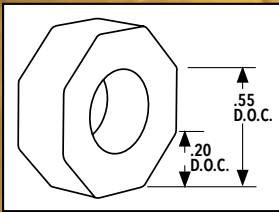
	Driver	Retention Bolt	(Optional) Coolant Bolt
OP6N-25R01	SM50-130-R0	DS-T20T	SD-06-46
OP6N-30R01	SM50-130-R0	DS-T20T	SD-08-46
OP6N-40R01	SM50-130-R0	DS-T20T	SD-12-82
OP6N-50R01	SM50-130-R0	DS-T20T	SD-12-82
OP6N-60R01	SM50-130-R0	DS-T20T	-
OP6N-80R01	SM50-130-R0	DS-T20T	-
OP6N-10R01	SM50-130-R0	DS-T20T	-
OP6N-12R01	SM50-130-R0	DS-T20T	-

OCTOPLUS™ 09 SERIES INSERTS

ONCU090612FN-P  	ONCU090612TN-HR  	ONCU090612TN-W  
ONCU0906ANFN-WE  	ONCQ090612TN  	ONCQ0906ANN  
ONCU0906ANTN-HR  	ONCU0906ANTN-W  	ONCU090630TN  
ONCU090638TN-HR  		

Part Number	Applications	Grade	IN10K	IN2004	IN2030	IN2035	IN2040	IN2505	IN2510	IN6510	IN6515	IN70N
ONCQ0906ANN	SiNi for Iron											X
ONCQ090612TN	Flat Top							X		X	X	
ONCU090630TN	Anti-Notch									X	X	
ONCU090612FN-P	Grd/Pol for Al		X									
ONCU090612TN-W	Wiper							X				
ONCU0906ANTN-W	Wiper								X			
ONCU090612TN-HR	Multi-Purpose				X		X	X				
ONCU0906ANFN-WE	Positive Geometry			X		X			X		X	
ONCU0906ANTN-HR	Pos. w/Land							X	X			

OCTOPLUS™ 09 SERIES INSERTS



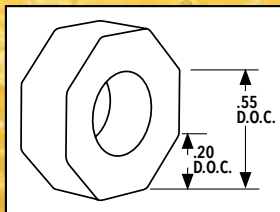
Cutter Series: OP6N RH
Insert Series: ONC_09
2.50-12.00 Dia. Range
.20 DOC
45 Degree Lead



Cutter Series: OP1N RH&LH
Insert Series: ONC_09
3.00-12.00 Dia. Range
.20 DOC
45 Degree Lead

	Part Number	Hone	Corner	Description
	ONCU090612TN-HR	J	R.047	MULTI-PURPOSE Universal insert with landed edge for machining steels, iron and hi-temp alloys. Also equipped with an integrated wiper flat to produce surface finishes between RA32-63. First choice for most applications.
	ONCU090612TN-HR	E	R.047	
	ONCU090612TN-W	J	R.047	MULTI-PURPOSE WIPER Wiper Insert with 8 indexes (4RH, 4LH) and longer wiper flats. When the advance per revolution does not exceed .157", place one wiper insert in one pocket to improve your surface finish by about 20 points. The indentation on the flank marks the edges that should contact the workpiece. To be married with ONCU090612TN-HR.
	ONCU090612FN-P	S	R.047	NON-FERROUS Up sharp and polished insert that targets aluminum and non-ferrous materials. Integrated wiper in place for good surface finishes. Also shows good results in bi-metal with grade IN04S.
	NEW! ONCQ090612TN	A	R.047	FLAT TOP Flat Top geometry with landed edge for heavy duty roughing. Integrated wiper in place for good surface finishes. If other positive geometries notch at the DOC, put this strong edge to work.
	NEW! ONCQ0906ANN	J	R.047	SiNi This 16 edged silicon nitride insert offers the best productivity when machining iron. Integrated wiper in place for good surface finishes.

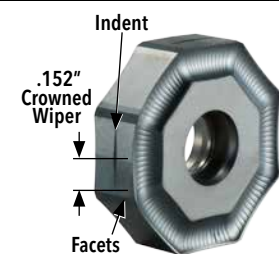
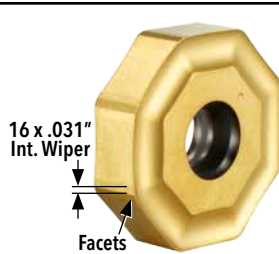
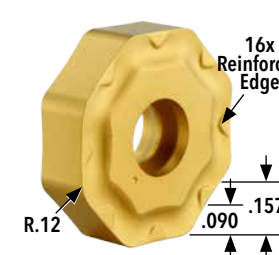
09 SERIES INSERTS



Cutter Series: OP6N RH
Insert Series: ONC_09
2.50-12.00 Dia. Range
.20 DOC
45 Degree Lead



Cutter Series: OP1N RH&LH
Insert Series: ONC_09
3.00-12.00 Dia. Range
.20 DOC
45 Degree Lead

	Part Number	Hone	Corner	Description
	NEW! ONCU0906ANTN-HR	J	Faceted	<u>FACETED MULTI-PURPOSE</u> A faceted corner with positive geometry helps avoid breakout on an iron workpiece. The landed edge adds strength.
	NEW! ONCU0906ANTN-W	J	Faceted	<u>FACETED WIPER</u> Wiper Insert with 8 indexes (4RH, 4LH) and longer wiper flats. When the advance per revolution does not exceed .152", place one wiper insert in one pocket to improve your surface finish by about 20 points. The indentation on the flank marks the edges that should contact the workpiece. To be married with ONCU0906ANTN-HR.
	ONCU0906ANFN-WE	A	Faceted	<u>KEEN EDGE</u> This keen, high positive chip former in combination with a faceted corner offers benefits when challenged with workpiece breakout. It also performs well in exotics
	NEW! ONCU090630TN	A	R.120	<u>ANTI-NOTCH</u> This unique design puts a positive edge at the corner to diffuse piece part breakout in iron AND adds a reinforced edge to resist notching between .090-.157 DOC. Large corner radius adds strength for roughing applications.
	NEW! ONCU090638TN-HR	E	R.150	<u>POSITIVE ROUGHER</u> The large corner radius and landed edge make this insert well suited for roughing applications in steel and iron

HIGH FEED CUTTERS

- Particularly Suitable for High Feed Machining
- Low Cutting Forces
- 6 Cutting Edges for Cost Effective Machining
- Excellent Chip Evacuation
- Through Coolant Cutter Bodies



FORMMASTERTM
HIGH-FEED

SERIES 1DG1H

HIGH FEED ENDMILL WITH 6 INDEXES



Ramping



Corkscrew



Pocket



Facing



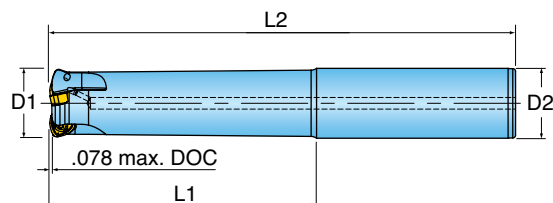
Contour



Plunging



Coolant



Cutter Number	D1 Nom. Dia.	L1 Extension Length	L2 Overall Length	D2 Shank Size/Style	Number of Inserts	Coolant Thru	Max. Ramp Angle
1DG1H-1202781R01	1.250	2.750	5.00	1.250" Weldon	2	Yes	3.0
1DG1H-1205759R01	1.250	4.750	8.00	1.250" Cylindrical	2	Yes	3.0
1DG1H-1503386R01	1.500	3.310	6.00	1.500" Weldon	3	Yes	1.7
1DG1H-1507355R01	1.500	5.727	10.00	1.500" Cylindrical	3	Yes	1.7

Operating Guidelines on page 95.



FORMMASTER[™] HIGH-FEED SERIES 1DG1H (TOP•ON STYLE)

HIGH FEED MODULAR ENDMILL WITH 6 INDEXES



Shoulder



Ramping



Corkscrew



Pocket



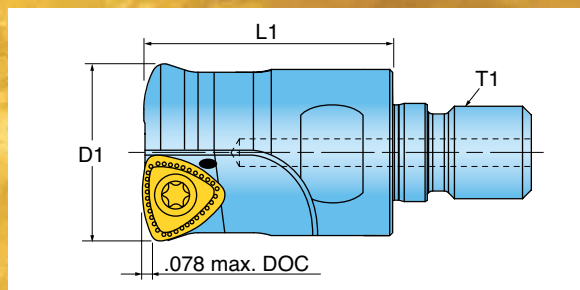
Contour



Plunging



Coolant



Cutter Number	D1 Nom. Dia.	Number of Inserts	L1 Extension Length	T1 Adaption	Max. Ramp Angle	Wrench Size
1DG1H-12017X8R01	1.250	2	1.75	M16	3	22mm
1DG1H-15017X8R01	1.500	3	1.75	M16	1.75	22mm

Operating Guidelines on page 95.



FORMoMASTER[™]
HIGH-FEED

SERIES DG6H

HIGH FEED FACEMILL WITH 6 INDEXES



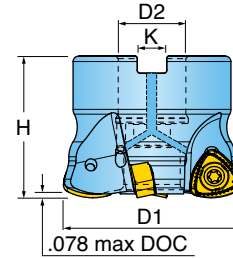
Ramping

Corkscrew

Pocket

Plunging

Coolant



Cutter Number	D1 Effective Diameter	Number of Inserts	H Height	D2 Bore Dia.	K Keyway	Ramp Angle
DG6H-20R01	2.000	3	1.570	0.750	0.312	1.0
DG6H-20R02	2.000	4	1.570	0.750	0.312	1.0
DG6H-20R03	2.000	5	1.570	0.750	0.312	1.0
DG6H-25R01	2.500	4	1.570	0.750	0.312	.5
DG6H-30R01	3.000	5	1.750	1.000	0.375	.5
DG6H-30R02	3.000	5	2.000	1.250	0.500	.5
DG6H-40R01	4.000	6	2.375	1.500	0.625	.4
DG6H-60R01	6.000	8	2.375	1.500	0.625	.2

Operating Guidelines on page 95.



FORMMASTER[™] INSERTS

UNEU1205R



Part Number	Application	Grade	IN2530	IN2505	IN2540	IN6530
UNEU1205R	High-Feed - 0.118" R*		•	•	•	•

*Program Radius



FORMMASTER[™] HARDWARE

				
	Screw	Driver	Retention Bolt	(Optional) Coolant Bolt
DG6H-20R01	SM40-120-20	DS-T15T	SD-06-46	SD-06-89
DG6H-20R02	SM40-120-20	DS-T15T	SD-06-46	SD-06-89
DG6H-25R01	SM40-120-20	DS-T15T	SD-06-46	SD-06-89
DG6H-30R01	SM40-120-20	DS-T15T	SD-08-46	SD-08-92
DG6H-30R02	SM40-120-20	DS-T15T	SD-10-47	SD-10-99
DG6H-40R01	SM40-120-20	DS-T15T	SD-12-82	SD-12-99
DG6H-60R01	SM40-120-20	DS-T15T	SD-12-82	SD-12-99

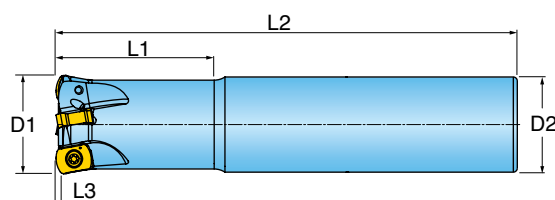
GENERAL MACHINING, DIE & MOLD, AEROSPACE

- Insert Technology provides 4 cutting edges per insert
- Robustly designed insert with exceptionally strong cutting edge
- Premium cutter bodies, with through coolant standard
- Ingersoll technology, designed to deliver economy, strength and performance
- Depth of cut up to .039" (1mm)



HI-FEED MINI SERIES 1TG1F

HIGH FEED ENDMILL WITH 4 INDEXES



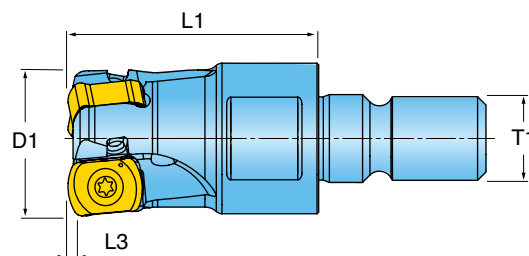
Cutter Number	D1 Nom. Dia.	L1 Extension Length	L2 Overall Length	L3 Max. DOC	D2 Shank Size/Style	Number of Inserts	Ramp Angle
1TG1F-06015ULR01	0.625	1.250	4.00	0.027	15.5mm Cyl	2	1.5
1TG1F-06015S6R01	0.625	1.260	4.00	0.027	.625" Cyl	2	1.5
1TG1F-07017UMR01	0.750	1.500	5.00	0.030	18.5mm Cyl	3	1.4
1TG1F-07017UMR02	0.750	1.500	6.25	0.027	18.5mm Cyl	3	1.4
1TG1F-07022S7R01	0.750	2.000	5.00	0.027	.750" Cyl	3	1.4
1TG1F-07032S7R01	0.750	3.000	6.25	0.027	.750" Cyl	3	1.4
1TG1F-08019UNR01	0.875	1.750	7.75	0.039	21.5mm Cyl	3	1.1
1TG1F-10022T5R01	1.000	2.000	7.00	0.039	25mm Cyl	4	.8
1TG1F-10022S1R01	1.000	2.000	10.00	0.039	1.000" Cyl	4	.8
1TG1F-10022T5R02	1.000	2.000	10.00	0.039	25mm Cyl	4	.8
1TG1F-10032S1R01	1.000	3.000	7.00	0.039	1.000" Cyl	4	.8
1TG1F-1203281R01	1.250	3.000	5.50	0.039	1.250" W	5	.6
1TG1F-12050E2R01	1.250	4.750	8.00	0.039	1.250" W	5	.6
1TG1F-15015E2R01	1.500	N/A	6.00	0.039	1.250" W	6	.5

Operating Guidelines on page 95.



HI•FEED^{MINI} SERIES 1TG1F (TOP•ON STYLE)

HIGH FEED MODULAR ENDMILL WITH 4 INDEXES



Cutter Number	D1 Nom. Dia.	M Adaption	L1 Extension Length	L3 Max. DOC	Number of Inserts	Wrench Size	Ramp Angle
1TG1F-06010X5R01	0.625	M8	0.98	0.027	2	10mm	.5
1TG1F-07011X6R01	0.750	M10	1.18	0.027	3	15mm	1.4
1TG1F-10013X7R01	1.000	M12	1.37	0.039	4	17mm	.8
1TG1F-12015X8R01	1.250	M16	1.57	0.039	5	22mm	.6
1TG1F-15015X8R10	1.500	M16	1.57	0.039	6	22mm	.5

Operating Guidelines on page 95.



HI-FEED^{MINI} SERIES TG1F

HIGH FEED FACEMILL WITH 4 INDEXES



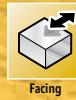
Ramping



Corkscrew



Pocket



Facing



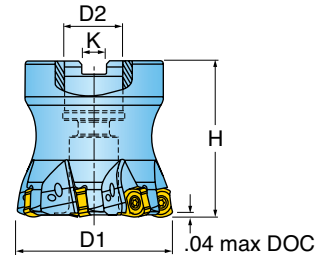
Contour



Channeling



Coolant

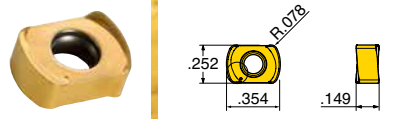


Cutter Number	D1 Eff. Dia.	Number of Inserts	H Height	D2 Bore Dia.	K Keyway	Max. Ramp Angle
TG1F-20R01	2.000	7	1.968	0.750	0.312	.3

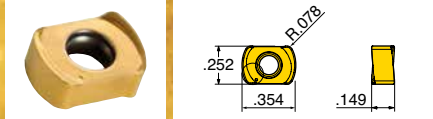
Operating Guidelines on page 95.

HI-FEED^{MINI} INSERTS

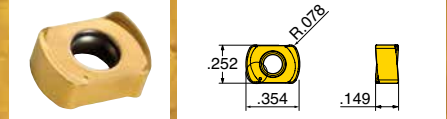
UNLU0603MOTR



UNLU0603MOTR-ML

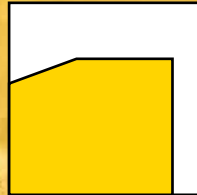


UNLU0603MOTR-MM

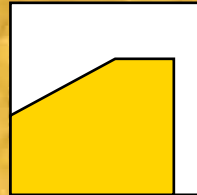


Part Number	Corner	Application	Grade	IN2030	IN2035	IN2505	IN2530	IN6530
UNLU0603MOTR	0.078 R	High-Feed		•	•	•	•	•
UNLU0603MOTR-ML	0.078 R	High-Feed			•	•	•	
UNLU0603MOTR-MM	0.078 R	High-Feed			•	•	•	

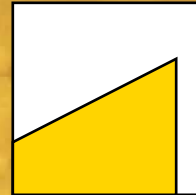
M



MM



ML



HI-FEED^{MINI} HARDWARE



Screw



Driver

TG1F/1TG1F

SM25-064-00

DS-T08W

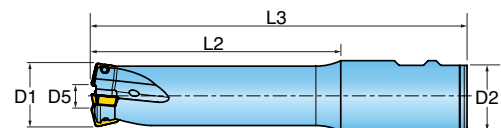
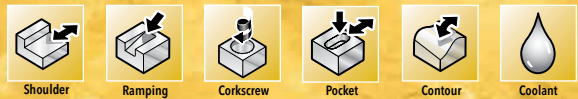
NEW QUAD FEED CUTTER 13MM AND 19MM IC INSERT SIZES

- Positive lead angle - High Feed Technology.
- Ultra-strong, super free cutting insert geometries.
- 4 indexes per insert.
- Up to 8 different insert geometry types.
- Application flexibility.
- Premium milling grades.
- Latest post coating treatment technology to ensure long lasting performance.



HIQUAD[®]F[™] SERIES 15M1P

13MM INSERTED CUTTERS, HIGH FEED



Cutter Number	Nom. Dia.	# of Inserts	L3 OAL	D2 Shank Style	Coolant	SDES1305MDR, SDMS1305MDR-PH, SDES1305MDR-001, SDES130515N-001, SDES130515N, SDMS130515R-PH, SDMS130512R-PP				SDES1305MPR, SDES1305MPR-001			
						D1 Program OD Dia.	D5 Effective Dia.	L2 Ext. Length	Max. Ramp Angle	D1 Program OD Dia.	D5 Effective Dia.	L2 Ext. Length	Max. Ramp Angle
15M1P-1202781R01	1.250	2	5.000	1.25 Weldon	yes	1.250	0.423	2.750	5.6	1.220	0.533	2.735	4.7
15M1P-1204759R01	1.250	2	8.000	1.25 Cylindrical	yes	1.250	0.423	4.750	5.6	1.220	0.533	4.735	4.7
15M1P-1502786R01	1.500	3	5.410	1.50 Weldon	yes	1.500	0.673	2.750	3.1	1.470	0.784	2.735	2.8
15M1P-1505386R01	1.500	3	8.000	1.50 Weldon	yes	1.500	0.673	5.340	3.1	1.470	0.784	5.325	2.8

Operating Guidelines on page 96.



SERIES 15M1P (TOP•ON STYLE)

13MM INSERTED CUTTERS, HIGH FEED



Shoulder



Ramping



Corkscrew



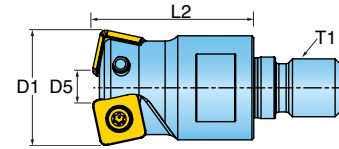
Pocket



Contour



Coolant



Cutter Number	Nom. Dia.	# of Inserts	T1 Adaption	Coolant	SDES1305MDR, SDMS1305MDR-PH, SDES1305MDR-001, SDES130515N-001, SDES130515N, SDMS130515R-PH, SDMS130512R-PP				SDES1305MPR, SDES1305MPR-001			
					D1 Program OD Dia.	D5 Effective Dia.	L2 Ext. Length	Max. Ramp Angle	D1 Program OD Dia.	D5 Effective Dia.	L2 Ext. Length	Max. Ramp Angle
15M1P-12017X8R01	1.250	2	M16	Yes	1.250	0.423	1.750	5.6	1.220	0.533	1.735	4.7

Operating Guidelines on page 60.



SERIES 15M1P (TOP•ON STYLE) - METRIC

Cutter Number	Nom. Dia.	# of Inserts	T1 Adaption	Coolant	SDES1305MDR, SDMS1305MDR-PH, SDES1305MDR-001, SDES130515N-001, SDES130515N, SDMS130515R-PH, SDMS130512R-PP				SDES1305MPR, SDES1305MPR-001			
					D1 Program OD Dia.	D5 Effective Dia.	L2 Ext. Length	Max. Ramp Angle	D1 Program OD Dia.	D5 Effective Dia.	L2 Ext. Length	Max. Ramp Angle
15M1P032043X8R00	32mm	2	M16	Yes	32mm	11mm	43mm	5.0	31.23mm	13.8mm	42.63mm	4.5
15M1P035043X8R00	35mm	2	M16	Yes	35mm	14.2mm	43mm	4.0	34.23mm	16.81mm	42.63mm	3.5
15M1P040043X8R00	40mm	2	M16	Yes	40mm	19mm	43mm	2.7	39.23mm	21.8mm	1.678mm	2.5

Operating Guidelines on page 96.



ENDMILL HARDWARE

Cutter Number			
15M1P-1202781R01	SM40-100-R0	DS-A00T	BLD T15/S7
15M1P-1204759R01	SM40-100-R0	DS-A00T	BLD T15/S7
15M1P-1502786R01	SM40-100-R0	DS-A00T	BLD T15/S7
15M1P-1505386R01	SM40-100-R0	DS-A00T	BLD T15/S7

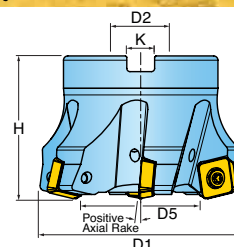
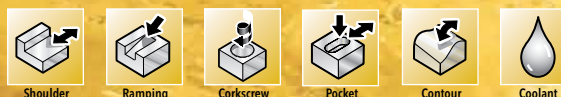


ENDMILL HARDWARE - METRIC

	SM40-100-R0	DS-A00T	BLD T15/S7

HIQUAD[®] SERIES 5M_P

13MM INSERTED CUTTERS, HIGH FEED



Cutter Number	Nom. Dia.	# of Inserts	D2 Bore Dia.	K Keyway	Coolant	SDES1305MDR, SDMS1305MDR-PH, SDES1305MDR-001, SDES130515N-001, SDES130515N, SDMS130515R-PH, SDMS130512R-PP				SDES1305MPR, SDES1305MPR-001			
						D1 Program OD Dia.	D5 Effective Dia.	H Height	Max. Ramp Angle	D1 Program OD Dia.	D5 Effective Dia.	H Height	Max. Ramp Angle
5M5P-20R01	2.000	5	0.750	0.312	yes	2.000	1.170	2.000	1.7	1.970	1.281	1.985	1.5
5M6P-20R01	2.000	4	0.750	0.312	yes	2.000	1.170	2.000	1.7	1.970	1.281	1.985	1.5
5M5P-25R01	2.500	6	0.750	0.312	yes	2.500	1.670	2.000	1.1	2.470	1.781	1.985	1.1
5M6P-25R01	2.500	5	0.750	0.312	yes	2.500	1.670	2.000	1.1	2.470	1.781	1.985	1.1
5M5P-30R01	3.000	8	1.000	0.375	yes	3.000	2.170	2.000	0.9	2.970	2.280	1.985	0.8
5M6P-30R01	3.000	6	1.000	0.375	yes	3.000	2.170	2.000	0.9	2.970	2.280	1.985	0.8
5M5P-30R02	3.000	8	1.250	0.500	yes	3.000	2.170	2.000	0.9	2.970	2.280	1.985	0.8
5M6P-30R02	3.000	6	1.250	0.500	yes	3.000	2.170	2.000	0.9	2.970	2.280	1.985	0.8
5M5P-40R01	4.000	10	1.500	0.625	yes	4.000	3.170	2.500	0.6	3.970	3.280	2.485	0.6
5M6P-40R01	4.000	8	1.500	0.625	yes	4.000	3.170	2.500	0.6	3.970	3.280	2.485	0.6
5M5P-50R01	5.000	11	1.500	0.625	yes	5.000	4.170	2.500	0.4	4.970	4.280	2.485	0.4
5M6P-50R01	5.000	9	1.500	0.625	yes	5.000	4.170	2.500	0.4	4.970	4.280	2.485	0.4

Operating Guidelines on page 96.

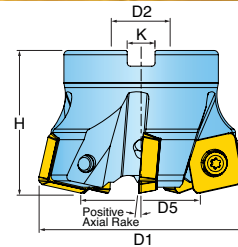
HIQUAD[®] SERIES 5M_P - METRIC

Cutter Number	Nom. Dia.	# of Inserts	D2 Bore Dia.	K Keyway	Coolant	SDES1305MDR, SDMS1305MDR-PH, SDES1305MDR-001, SDES130515N-001, SDES130515N, SDMS130515R-PH, SDMS130512R-PP				SDES1305MPR, SDES1305MPR-001			
						D1 Program OD Dia.	D5 Effective Dia.	H Height	Max. Ramp Angle	D1 Program OD Dia.	D5 Effective Dia.	H Height	Max. Ramp Angle
5M5P050R00	50mm	5	22mm	10.4mm	Yes	50mm	28.92mm	50mm	1.5	49.237mm	31.74mm	49.627mm	1.5
5M5P052R00	52mm	5	22mm	10.4mm	Yes	52mm	30.92mm	50mm	1.5	51.233mm	33.736mm	49.627mm	1.5
5M5P063R00	63mm	6	22mm	10.4mm	Yes	63mm	41.9mm	50mm	1	62.23mm	44.72mm	49.63mm	1
5M5P066R00	66mm	6	27mm	12.4mm	Yes	66mm	44.89mm	50mm	1	65.23mm	47.72mm	49.63mm	1
5M5P100R00	100mm	9	32mm	14.4mm	Yes	100mm	78.91mm	60mm	0.5	99.24mm	81.74mm	59.62mm	0.5
5M6P052R00	52mm	4	22mm	10.4mm	Yes	52mm	30.92mm	50mm	1.5	51.233mm	33.736mm	49.627mm	1.5
5M6P063R00	63mm	5	22mm	10.4mm	Yes	63mm	41.9mm	50mm	1	62.23mm	44.72mm	49.63mm	1
5M6P080R00	80mm	6	27mm	12.4mm	Yes	80mm	58.91mm	50mm	0.5	79.25mm	61.73mm	49.63mm	1
5M6P100R00	100mm	7	32mm	14.4mm	Yes	100mm	78.91mm	60mm	0.5	99.24mm	81.74mm	59.62mm	0.5

Operating Guidelines on page 96.

HIQUAD[®] SERIES 5G_M

19MM INSERTED CUTTERS, HIGH FEED



Cutter Number	Nom. Dia.	# of Inserts	D2 Bore Dia.	K Keyway	Coolant	SDES1906MDR, SDMS1906MDR-PH, SDES190620N, SDES190620N-001, SDMS190620R-PH				SDES1906MPR, SDES1906MPR-001			
						D1 Program OD Dia.	D5 Effective Dia.	H Height	Max. Ramp Angle	D1 Program OD Dia.	D5 Effective Dia.	H Height	Max. Ramp Angle
5G5M-30R01	3.000	6	1.00	0.375	yes	3.000	1.766	2.000	1.6	2.961	1.903	1.981	1.2
5G6M-30R01	3.000	5	1.00	0.375	no	3.000	1.755	2.000	1.6	2.961	1.894	1.981	1.2
5G5M-40R01	4.000	8	1.50	0.625	yes	4.000	2.769	2.500	1.0	3.961	2.906	2.481	0.8
5G6M-40R01	4.000	6	1.50	0.625	no	4.000	2.755	2.500	1.0	3.961	2.894	2.481	0.8
5G5M-50R01	5.000	9	1.50	0.625	yes	5.000	3.759	2.500	1.7	4.961	3.897	2.481	0.6
5G6M-50R01	5.000	7	1.50	0.625	no	5.000	3.755	2.500	0.7	4.961	3.894	2.481	0.6
5G5M-60R01	6.000	10	1.50	0.625	no	6.000	4.757	2.500	0.6	5.961	4.896	2.481	0.4
5G6M-60R01	6.000	8	1.50	0.625	no	6.000	4.755	2.500	0.6	5.961	4.894	2.481	0.4

Operating Guidelines on page 96.

HIQUAD[®] FACEMILL HARDWARE

Cutter Number					
	Screw	Driver	Driver Bit	Retention Bolt	Coolant Thru Retention Bolt
5G5M-30R01	SM60-135-R0	DS-T25T	n/a	SD-08-47	SD08-C9
5G6M-30R01	SM60-135-R0	DS-T25T	n/a	SD-08-47	-
5G5M-40R01	SM60-135-R0	DS-T25T	n/a	SD-12-82	SD12-99
5G6M-40R01	SM60-135-R0	DS-T25T	n/a	SD-12-82	-
5G5M-50R01	SM60-135-R0	DS-T25T	n/a	SD-12-82	SD12-99
5G6M-50R01	SM60-135-R0	DS-T25T	n/a	SD-12-82	-
5G5M-60R01	SM60-135-R0	DS-T25T	n/a	SD-12-82	-
5G6M-60R01	SM60-135-R0	DS-T25T	n/a	SD-12-82	-
5M5P-20R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-06-48	SD06-A6
5M6P-20R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-06-48	SD06-A6
5M6P-25R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-06-48	SD06-A6
5M5P-25R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-06-48	SD06-A6
5M5P-30R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-08-47	SD08-C9
5M6P-30R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-08-47	SD08-C9
5M5P-30R02	SM40-100-R0	DS-A00T	BLD T15/S7	SD-10-47	SD10-99
5M6P-30R02	SM40-100-R0	DS-A00T	BLD T15/S7	SD-10-47	SD10-99
5M5P-40R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-12-82	SD12-99
5M6P-40R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-12-82	SD12-99
5M5P-50R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-12-82	SD12-99
5M6P-50R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-12-82	SD12-99

Cutter Number				
	Screw	Driver	Driver Bit	Retention Bolt
5M5P050R00	SM40-100-R0	DS-A00T	BLDT15/S7	SD06-74
5M5P052R00	SM40-100-R0	DS-A00T	BLDT15/S7	SD06-74
5M5P063R00	SM40-100-R0	DS-A00T	BLDT15/S7	SD06-74
5M5P066R00	SM40-100-R0	DS-A00T	BLDT15/S7	SD07-40
5M5P100R00	SM40-100-R0	DS-A00T	BLDT15/S7	SD10-89
5M6P052R00	SM40-100-R0	DS-A00T	BLDT15/S7	SD06-74
5M6P063R00	SM40-100-R0	DS-A00T	BLDT15/S7	SD06-74
5M6P080R00	SM40-100-R0	DS-A00T	BLDT15/S7	SD08-A4
5M6P100R00	SM40-100-R0	DS-A00T	BLDT15/S7	SD10-89

SDMS130515R-PH 	SDMS1305MDR-PH 	SDES1305MDR
SDES130515N 	SDES130515N-001 	SDES1305MDR-001
SDES1305MPR-001 	SDES1305MPR 	

Insert Number	Applications	Max DOC	Program Corner Radius	Grade	IN2505	IN2530	IN4005	IN4030	IN4035
SDES1305MDR	Hi-Feed, Flat Face / Wiper - Facets	.078 (2mm)	.125		•	•			
SDES130515N	Hi-Feed, Flat Face / Corner Radius	.078 (2mm)	.125		•	•			
SDES130515N-001	Hi-Feed, Precision Flat Face / Corner Radius	.078 (2mm)	.125		•	•			
SDMS1305MDR-PH	Hi-Feed, Pos Precision / Wiper - Facets	.078 (2mm)	.125		•	•	•	•	•
SDMS130515R-PH	Hi-Feed, Pos Precision / Corner Radius	.078 (2mm)	.125		•	•	•	•	•
SDES1305MDR-001	Hi-Feed, Precision Flat Face / Wiper - Facets	.078 (2mm)	.125		•	•			
SDES1305MPR	Hi-Feed, Heavy Duty - Standard	.088 (2.24mm)	.140		•	•	•		•
SDES1305MPR-001	Hi-Feed, Heavy Duty - Precision	.088 (2.24mm)	.140		•	•	•	•	•

*Note: Please refer to the New Product Announcement for detailed programming information.

19MM INSERTS



Insert Number	Applications	Max DOC	Program Corner Radius	Grade	IN2505	IN2530	IN4005	IN4030	IN4035
SDES1906MDR	Hi-Feed, Flat Face / Wiper - Facets	.118 (3mm)	.180	•	•				
SDES190620N	Hi-Feed, Flat Face / Corner Radius	.118 (3mm)	.180	•	•				
SDES190620N-001	Hi-Feed, Precision Flat Face / Corner Radius	.118 (3mm)	.180	•	•				
SDMS1906MDR-PH	Hi-Feed, Pos Precision / Wiper - Facets	.118 (3mm)	.180	•	•	•	•	•	•
SDMS190620R-PH	Hi-Feed, Pos Precision / Corner Radius	.118 (3mm)	.180	•	•	•	•	•	•
SDES1906MPR	Hi-Feed, Heavy Duty - Standard	.147 (3.7mm)	.212	•	•	•			•
SDES1906MPR-001	Hi-Feed, Heavy Duty - Precision	.147 (3.7mm)	.212	•	•	•	•	•	•

*Note: Please refer to the New Product Announcement for detailed programming information.



PLUNGING CUTTERS

- Excels in general plunge roughing & long reach plunge applications.
- Inserts offered with clean shearing Hi-Temp Alloy geometry and strong Flat Top geometry.
- Internal coolant supply.



HI-QUAD™ SERIES QHU

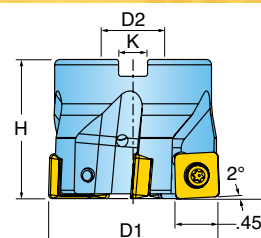
BACKDRAFT PLUNGE CUTTERS



Plunge



Coolant

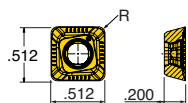


Cutter Number	D1 Effective Diameter	# of Inserts	H Height	D2 Bore Diameter	K Keyway	Retention Bolt	Optional Coolant Bolt
QHU-20015D1R01	2.000	5	1.570	0.750	0.31	SD-06-46	SD-06-89
QHU-20015D1R02	2.000	4	1.570	0.750	0.31	SD-06-46	SD-06-89
QHU-25015D1R01	2.500	5	1.570	0.750	0.31	SD-06-46	SD-06-89
QHU-30017D3R01	3.000	7	1.750	1.000	0.38	SD-08-46	SD-08-92
QHU-30017D3R02	3.000	5	1.750	1.000	0.38	SD-08-46	SD-08-92
QHU-40023D4R01	4.000	9	2.375	1.500	0.63	SD-12-82	SD-12-99
QHU-40023D4R02	4.000	7	2.375	1.500	0.63	SD-12-82	SD-12-99

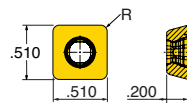
Operating Guidelines on page 96.

HI-QUAD™ INSERTS

SDMS



SDES



Part Number	Application	R Corner	Indexes	Grade	IN4005	IN4030	IN4035	IN4015
SDMS130512R-PP	Hi-Temp	R.047	4			•		
SDMS130516R-PP	Hi-Temp	R.062	4		•	•	•	•
SDES130508N-PF	Multi-Purpose Flat Top	R.031	4		•	•	•	•
SDES130516N-PF	Multi-Purpose Flat Top	R.062	4		•	•	•	•
SDES130524N-PF	Multi-Purpose Flat Top	R.093	4		•	•		
SDES130532N-PF	Multi-Purpose Flat Top	R.125	4		•	•		

*Cutter body to be relieved to accommodate large radius.

HI-QUAD™ HARDWARE



Insert Screw



Driver Handle



Insert Driver Blade



Optional Torque Wrench



Optional Insert Driver Blade

SM40-100-R0

DS-A00T

DS-T156B

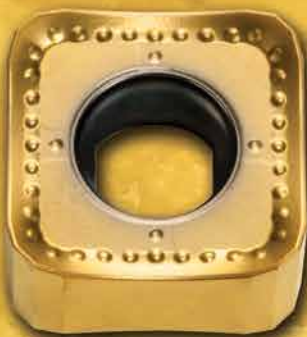
DT-35-02

DS-T15B1

ISOPLUS

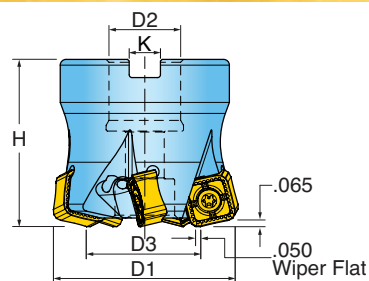
HI FEED MILL WITH 8 INDEXES

- Value with 8 strong cutting edges (4 + 4).
- Near net shape flexibility with .065 axial depth of cut capability.
- Chip evacuation via coolant through the tool capability.
- Deck surface finish capability with .050 integrated wiper flat.
- Clearance angles for corkscrew and ramping applications.
- Utilizes the same insert used on our 45° lead (series DN6H) and 15° lead (series DL6H) cutters.



ISOPLUS SERIES DD6H

HIGH FEED FACE MILL WITH 8 INDEXES

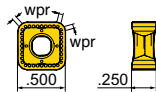


Cutter Number	D1 Effective Diameter	D3 Inner Diameter	D2 Bore Diameter	H Height	# of Effective Inserts	Keyway	Ramp Angle
DD6H-20R01	2.000	1.252	0.750	1.650	5	0.312	1.2
DD6H-25R01	2.500	1.752	.75	1.650	6	0.312	.80
DD6H-30R01	3.000	2.252	1.000	1.750	7	0.375	.66
DD6H-40R01	4.000	3.252	1.500	2.375	9	0.625	.45
DD6H-50R01	5.000	4.252	1.500	2.375	11	0.625	.20
DD6H-60R01	6.000	5.252	1.500	2.000	13	0.625	.10

Operating Guidelines on page 97.

ISOPLUS INSERT

SNGU1205ENN



Part Number	Program Corner Radius	Application	Grade	IN2035	IN2505	IN2510	IN2530	IN2540	IN6515
SNGU1205ENN	R.155	Multi-Purpose		•	•	•	•	•	•

ISOPLUS HARDWARE



Insert Screw



Driver Handle



Insert Driver Blade



Retention Bolt



Coolant Bolt (Optional)

	Insert Screw	Driver Handle	Insert Driver Blade	Retention Bolt	Coolant Bolt (Optional)
DD6H-20R01	SM40-100-R0	DS-A00T	DS-T156B	SD-06-47	SD-06-89
DD6H-25R01	SM40-100-R0	DS-A00T	DS-T156B	SD-06-46	SD-06-89
DD6H-30R01	SM40-100-R0	DS-A00T	DS-T156B	SD-08-46	SD-08-92
DD6H-40R01	SM40-100-R0	DS-A00T	DS-T156B	SD-12-82	SD-12-99
DD6H-50R01	SM40-100-R0	DS-A00T	DS-T156B	SD-12-82	SD-12-99
DD6H-60R01	SM40-100-R0	DS-A00T	DS-T156B	-	-

DIPOSOTETRA™

4D 90

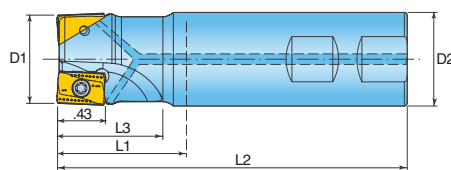
90 DEGREE LINE WITH 4 CUTTING EDGES

- High Density Cutter Maximizes Productivity
- High Positive Cutting Edges - Smooth Cutting Action
- Thick Insert Design - Stable and Reliable Performance
- Ground Edge & Top Polished Insert Available for Aluminum Machining



DIPOSOTETRA™ SERIES 1TJ1Q

0 DEGREE LEAD ENDMILL WITH 4 INDEXES



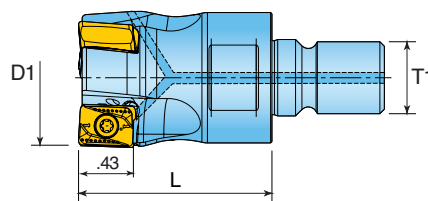
Cutter Number	D1 Effective Diameter	L1 Extension Length	L2 Overall Length	L3 Projection Length	D2 Shank Size/Style	# of Inserts	Ramp Angle
1TJ1Q-1001784R01	1.000	1.75	3.75	1.75	.750 W	2	1.09
1TJ1Q-1001780R01	1.000	1.75	4.00	1.55	1.00 W	2	1.09
1TJ1Q-1003780R01	1.000	3.75	6.00	3.55	1.00 W	2	1.09
1TJ1Q-1201784R01	1.250	1.75	3.75	1.75	.750 W	3	.73
1TJ1Q-1202281R01	1.250	2.25	4.50	2.22	1.25 W	3	.73
1TJ1Q-1204281R01	1.250	4.25	6.50	4.22	1.25 W	3	.73
1TJ1Q-1502281R01	1.500	2.25	4.50	2.25	1.25 W	4	.58
1TJ1Q-2002281R01	2.000	2.25	4.50	2.22	1.25 W	5	.40

Operating Guidelines on page 97.



DIPOSOTETRA™ SERIES 1TJ1Q (TOP•ON STYLE)

0 DEGREE LEAD ENDMILL WITH 4 INDEXES



Cutter Number	D1 Effective Diameter	T1 Adaption	L1 Extension Length	Number of Inserts	Wrench Size	Ramp Angle
1TJ1Q-10015X7R01	1.000	M12	1.50	2	17mm	1.09
1TJ1Q-12017X8R01	1.250	M16	1.75	3	22mm	.73
1TJ1Q-15017X8R01	1.500	M16	1.75	4	22mm	.58

Operating Guidelines on page 97.

**DIPOSOTETRA™**
4D 50**SERIES TJ5Q, TJ6Q****0 DEGREE LEAD FACEMILL WITH 4 INDEXES**

Shoulder



Ramping



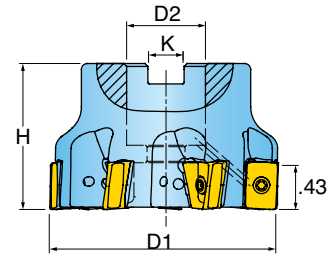
Corkscrew



Facing



Coolant

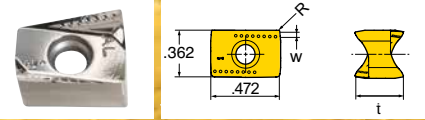


Cutter Number	D1 Effective Diameter	# of Inserts	H Height	D2 Bore Diameter	Retention Bolt	Optional Coolant Bolt	K Keyway	Ramp Angle
TJ5Q-20R01	2.000	6	1.570	0.75	SD-06-46	SD-06-89	0.31	.40
TJ6Q-20R01	2.000	3	1.570	0.75	SD-06-46	SD-06-89	0.31	.40
TJ6Q-25R01	2.500	6	1.570	0.75	SD-06-46	SD-06-89	0.31	.30
TJ5Q-30R01	3.000	9	1.750	1.00	SD-08-46	SD-08-92	0.38	.25
TJ6Q-30R01	3.000	7	1.750	1.00	SD-08-46	SD-08-92	0.38	.25
TJ5Q-40R01	4.000	11	2.375	1.50	SD-12-82	SD-12-99	0.62	.18
TJ6Q-40R01	4.000	7	2.375	1.50	SD-12-82	SD-12-99	0.62	.18

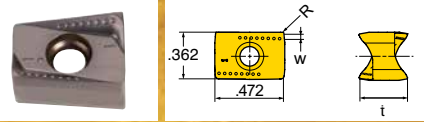
Operating Guidelines on page 97.

DIPOSOTETRA™ INSERTS

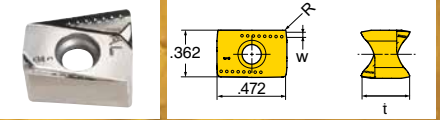
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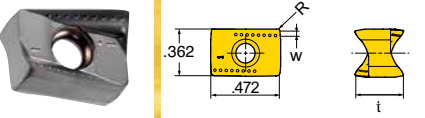
ANHU120604R



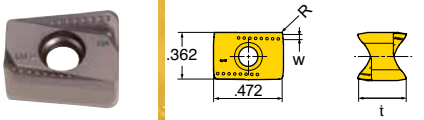
ANHU120608FR-P



ANHU120608R



ANHU120616R



Part Number	Application	R Corner	w Wiper	t Thick.	Grade	IN10K	IN2505	IN2510	IN2530	IN2540
ANHU120604R	Multi-Purpose	.015" R	0.060	0.338			•			
ANHU120608R	Multi-Purpose	.031" R	0.043	0.338			•	•	•	•
ANHU120616R	Multi-Purpose	.062" R	0.028	0.338			•		•	
ANHU120604FR-P	Ground/Polished for Alum.	.015" R	0.060	0.338		•				
ANHU120608FR-P	Ground/Polished for Alum.	.031" R	0.047	0.338		•				

DIPOSOTETRA™ HARDWARE

			
	Screw		
ANHU12	SM35-088-10	DS-T10T	

DIPOSOTETRA™

4D 90

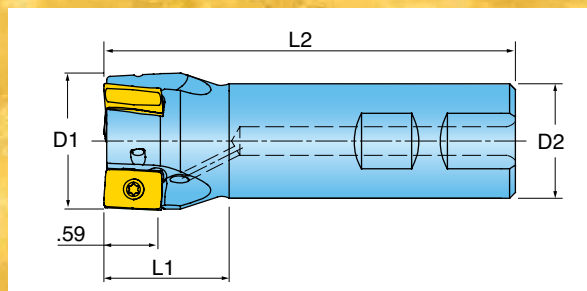
DOUBLE YOUR CUTTING EDGES FROM 2 TO 4!

- Two Sided Insert Adds Value by Doubling Your Cutting Edges!
- Thick and Robust Insert Adds Durability to Demanding Cutting Conditions
- Double Positive Geometry Benefits Machining Efficiency and Slices Super Alloy Materials
- Integrated Wiper Flat Produces Exceptional Surface Finishes
- Coolant Through the Tool Offered
- Various Corner Radii Offered



DIPOSOTETRA™ SERIES 1TJ1N

0 DEGREE LEAD ENDMILL WITH 4 INDEXES



Cutter Number	D1 Nominal Diameter	L1 Extension Length	L2 Overall Length	D2 Shank Size/Style	Number of Inserts	Ramp Angle
1TJ1N-1202281R01	1.250	2.25	4.50	1.250" Weldon	2	1.2
1TJ1N-1204281R01	1.250	4.25	6.50	1.250" Weldon	2	1.2
1TJ1N-1206281R01	1.250	6.25	8.50	1.250" Weldon	2	1.2
1TJ1N-1502281R01	1.500	2.25	4.50	1.250" Weldon	3	1.1
1TJ1N-1504281R01	1.500	4.25	6.50	1.250" Weldon	3	1.1
1TJ1N-2002281R01	2.000	2.25	4.50	1.250" Weldon	4	1.0

Operating Guidelines on page 97.



DIPOS•TETRA™ SERIES 1TJ1N (TOP•ON STYLE)

0 DEGREE LEAD ENDMILL WITH 4 INDEXES



Shoulder



Channel



Ramping



Corkscrew



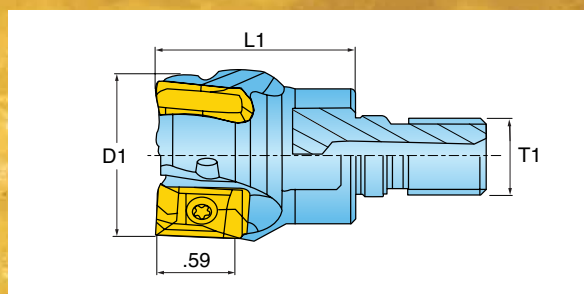
Facing



Coolant



Coolant



Cutter Number	D1 Nom. Dia.	T1 Adaption	L1 Extension Length	Number of Inserts	Wrench Size	Ramp Angle
1TJ1N-12015X8R01	1.250	M16	1.50	2	22mm	1.2
1TJ1N-15015X8R01	1.500	M16	1.50	3	22mm	1.1

Operating Guidelines on page 97.

SERIES TJ5N, TJ6N

0 DEGREE LEAD FACEMILL WITH 4 INDEXES



Shoulder



Channel



Ramping



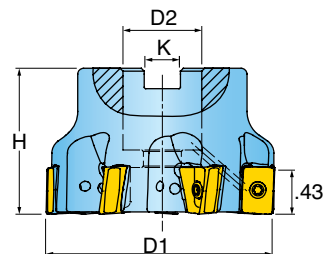
Corkscrew



Facing



Coolant



Cutter Number	D1 Nominal Diameter	Number of Inserts	H Height	D2 Bore Dia.	K Keyway	Bolt Circle Diameter	Ramp Angle
TJ5N-20R01	2.000	4	1.570	0.750	0.312	NA	1.0
TJ6N-20R01	2.000	3	1.570	0.750	0.312	NA	1.0
TJ5N-25R01	2.500	5	1.750	1.000	0.375	NA	.60
TJ5N-30R01	3.000	7	1.750	1.000	0.375	NA	.50
TJ6N-30R01	3.000	5	1.750	1.000	0.375	NA	.50
TJ5N-40R01	4.000	8	2.000	1.500	0.625	NA	.35
TJ6N-40R01	4.000	5	2.000	1.500	0.625	NA	.35
TJ5N-50R01	5.000	10	2.000	1.500	0.625	NA	.25
TJ6N-50R01	5.000	7	2.000	1.500	0.625	NA	.25
TJ5N-60R01	6.000	11	2.480	1.500	0.625	NA	.15
TJ6N-60R01	6.000	8	2.480	1.500	0.625	NA	.15
TJ5N-80R01	8.000	14	2.480	2.500	1.000	4.00	.05

Operating Guidelines on page 97.

DIPOS[®]TETRA[™] INSERTS

ANHU160704FR-P 	ANHU160704R 	ANHU160708FR
ANHU160708FR-P 	ANHU160708R 	ANHU160716R
ZNHU160708R 		

Part Number	Applications	Corner	Grade	IN10K	IN2510	IN2530	IN2505	IN2540	IN6515
ANHU160704FR-P	Ground/Polished for Alum.	0.015" R	•						
ANHU160704R	Multi-Purpose	0.015" R				•			
ANHU160708FR	Hi-Temp/Ti	0.031" R				•			
ANHU160708FR-P	Ground/Polished for Alum.	0.031" R	•						
ANHU160708R	Multi-Purpose	0.031" R			•	•	•	•	•
ANHU160716R	Multi-Purpose	0.062" R			•	•	•	•	
ZNHU160708R	Chip Splitters	0.031" R				•	•		

DIPOS[®]TETRA[™] HARDWARE

	Screw	Retention Bolt	Retention Bolt	(Optional) Coolant Bolt
1TJ1N	SM40-120-20	DS-T15T	-	-
TJ5N-20R01	SM40-120-20	DS-T15T	SD-06-46	SD-06-89
TJ6N-20R01	SM40-120-20	DS-T15T	SD-06-46	SD-06-89
TJ5N-25R01	SM40-120-20	DS-T15T	SD-08-46	SD-08-92
TJ5N-30R01	SM40-120-20	DS-T15T	-	-
TJ6N-30R01	SM40-120-20	DS-T15T	-	-
TJ5N-40R01	SM40-120-20	DS-T15T	-	-
TJ6N-40R01	SM40-120-20	DS-T15T	-	-
TJ5N-50R01	SM40-120-20	DS-T15T	-	-
TJ6N-50R01	SM40-120-20	DS-T15T	-	-
TJ5N-60R01	SM40-120-20	DS-T15T	-	-
TJ6N-60R01	SM40-120-20	DS-T15T	-	-
TJ5N-80R01	SM40-120-20	DS-T15T	-	-

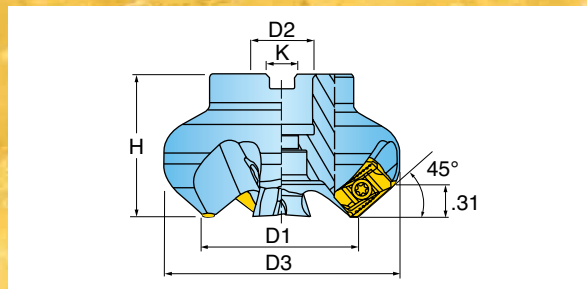
HIGH SHEAR 45° LEAD WITH 4 CUTTING EDGES

- Combination of High Positive Insert with 45° Entry Angle: Extremely Smooth and Silent Cutting Action
- High Helix 4 Corner Insert
- Excellent Surface Finish with Wide Wiper Flat
- Maximum .31" Depth of Cut



DIPOSOTETRA™ SERIES TN1N

45 DEGREE LEAD FACEMILL WITH 4 INDEXES



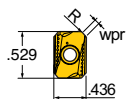
Cutter Number	D1 Nominal Diameter	D3 Overall Diameter	Number of Inserts	D2 Bore Dia.	H Height	K Keyway
TN1N-20R01	2.000	2.68	4	0.750	1.750	0.312
TN1N-30R01	3.000	3.68	5	1.000	1.750	0.375
TN1N-30R02	3.000	3.68	7	1.000	1.750	0.375
TN1N-40R01	4.000	4.67	6	1.500	2.375	0.625
TN1N-40R02	4.000	4.67	8	1.500	2.375	0.625
TN1N-60R01	6.000	6.67	10	1.500	2.375	0.625

Operating Guidelines on page 97.



DIPOSOTETRA™ INSERTS

ANHU1607ANR



Part Number	Applications	Wiper	R Corner	Grade	IN2510	IN2530	IN2540
ANHU1607ANR	Multi-Purpose	.062	0.015" R		•	•	•

DIPOSOTETRA™ HARDWARE



Screw



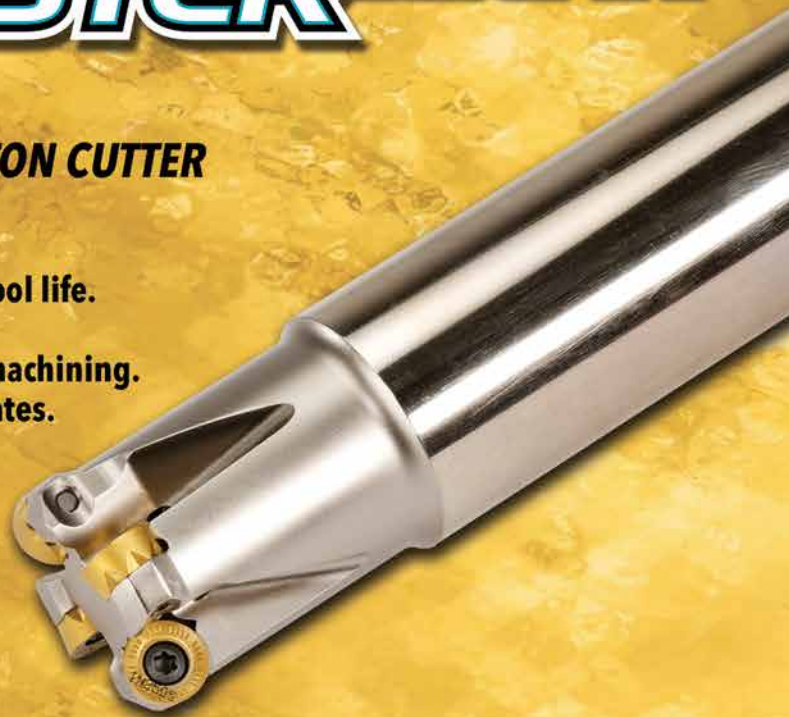
SM40-120-20

DS-T15T

FORMMASTERTM SHEAR

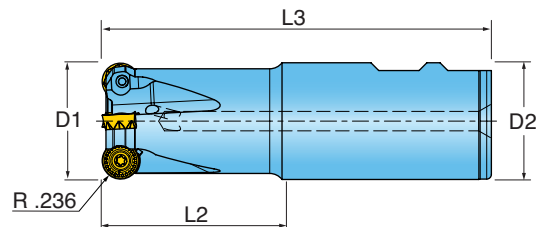
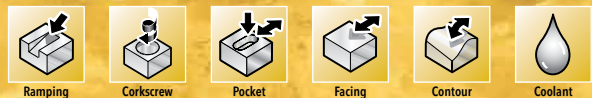
ULTRA-SHEAR HIGH PERFORMANCE BUTTON CUTTER

- Robust thick insert design.
- Larger, stronger insert geometries promote longer tool life.
- Strong clamping screw for demanding applications.
- Anti-rotating system, inserts will not rotate during machining.
- Ultra reliable machining performance at high feed rates.
- Premium milling grades to cut all materials.
- Latest post coating treatment technology to ensure long lasting performance.



FORMMASTERTM SHEAR SERIES 15B1B

12MM IC BUTTON CUTTERS



Cutter Number	D1 Nominal Diameter	L2 Extension Length	Number of Inserts	L3 Overall Length	D2 Shank Size/Style	Coolant Through	Max. Ramp Angle	Insert Series
15B1B02404480R00	24mm(.945)	1.750	2	4.000	1.00 Weldon	Yes	2.9	RJLT12
15B1B-1001780R01	1.000	1.750	2	4.500	1.00 Weldon	Yes	3.3	RJLT12
15B1B-10020S1R01	1.000	2.000	2	6.000	1.000 Cyl.	Yes	3.3	RJLT12
15B1B-1202781R01	1.250	2.750	3	5.000	1.25 Weldon	Yes	5.0	RJLT12
15B1B-12020S9R01	1.250	2.000	3	6.000	1.25 Cyl.	Yes	5.0	RJLT12
15B1B-1502386R01	1.500	2.340	4	5.000	1.500 Weldon	Yes	6.8	RJLT12
15B1B-15020S5R01	1.500	2.000	4	6.000	1.500 Cyl.	Yes	6.8	RJLT12

Operating Guidelines on page 98.



FORMMASTER[®]SHEAR™ SERIES 15B1B (TOP-ON STYLE)

12MM IC BUTTON CUTTERS



Ramping



Corkscrew



Pocket



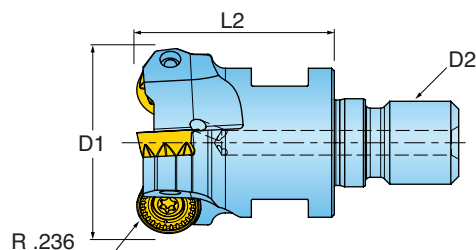
Facing



Contour



Coolant



Cutter Number	D1 Nominal Diameter	L2 Extension Length	D2 Thread Size	Number of Inserts	Coolant Through	Max. Ramp Angle	Insert Series	Wrench Size
15B1B024044X7R00	24mm(.945)	1.500	M12	2	Yes	2.9	RJLT12	17mm
15B1B-10015X7R01	1.000	1.500	M12	2	Yes	3.3	RJLT12	17mm
15B1B-12015X8R01	1.250	1.500	M16	3	Yes	5.0	RJLT12	22mm
15B1B-15015X8R01	1.500	1.500	M16	3	Yes	6.8	RJLT12	22mm

Operating Guidelines on page 98.

12MM AND 16MM IC BUTTON CUTTERS



Ramping



Corkscrew



Pocket



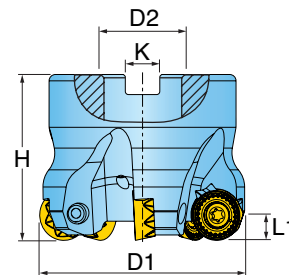
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Contour

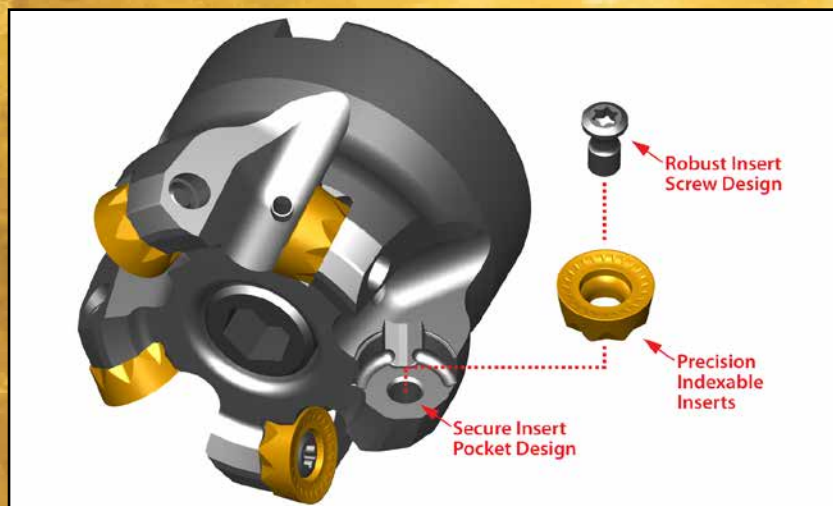


Coolant

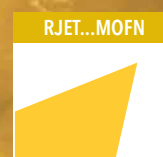
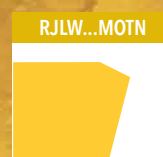
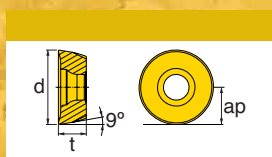
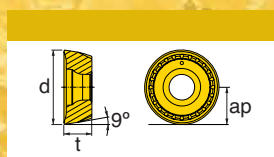


Cutter Number	D1 Nominal Diameter	D2 Bore Dia.	L1 Cut Length	H Height	Number of Insert	K Keyway	Coolant Through	Max. Ramp Angle	Insert Series
1A7H-20R01	2.000	0.750	0.236	1.570	5	0.312	Yes	6	RJLT12
1A7H-25R01	2.500	0.750	0.236	1.570	5	0.312	Yes	4	RJLT12
1A7H-30R01	3.000	1.000	0.236	1.750	6	0.375	Yes	3	RJLT12
1A7H-40R01	4.000	1.500	0.236	2.500	7	0.625	Yes	2	RJLT12
1A7H-50R01	5.000	1.500	0.236	2.500	8	0.625	No	1.75	RJLT12
1A7H-60R01	6.000	1.500	0.236	2.500	9	0.625	No	1.5	RJLT12
1A7K-20R01	2.000	0.750	0.315	1.570	4	0.312	Yes	9	RJLT16
1A7K-25R01	2.500	0.750	0.315	1.570	5	0.312	Yes	7	RJLT16
1A7K-30R01	3.000	1.000	0.315	1.750	5	0.375	Yes	5	RJLT16
1A7K-40R01	4.000	1.500	0.315	2.500	7	0.625	Yes	3.75	RJLT16
1A7K-50R01	5.000	1.500	0.315	2.500	7	0.625	No	2.75	RJLT16
1A7K-60R01	6.000	1.500	0.315	2.500	7	0.625	No	2	RJLT16

Operating Guidelines on page 98.



FORMMASTER[®]SHEAR[™] INSERTS



Insert Number	Description	d	t	Grade	IN1030	IN6530	IN2530	IN2540	IN2505	IN055
RJLT1204MON	Precision, Pos - 6.000 mm R	12mm	.189		•	•	•		•	
RJLT1204MOTN	Standard, Pos - 6.000 mm R	12mm	.189			•	•	•	•	
RJLW1204MOTN	Heavy Duty, Flt - 6.000 mm R	12mm	.189				•	•	•	
RJET1204MOFN	Grd/Pol for Al - 6.000 mm R	12mm	.189							•
RJLT1605MON	Precision, Pos - 8.000 mm R	16mm	.240			•	•		•	
RJLT1605MOTN	Standard, Pos - 8.000 mm R	16mm	.240		•	•	•	•	•	
RJLW1605MOTN	Heavy Duty, Flt - 8.000 mm R	16mm	.240			•		•	•	
RJET1605MOFN	Grd/Pol for Al - 8.000 mm R	16mm	.240							•

FORMMASTER[®]SHEAR[™] HARDWARE

Cutter Number	Insert Series					
		Screw		Driver Bit	Retention Bolt	
1A7H-20R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	SD06-46	SD-06-89
1A7H-25R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	SD06-46	SD-06-89
1A7H-30R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	SD08-46	SD-08-92
1A7H-40R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	SD-12-82	SD-12-99
1A7H-50R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	SD-12-82	n/a
1A7H-60R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	SD-12-82	n/a
1A7K-20R01	RJLT16	SM50-113-20	DS-A00T	BLD T20/S7	SD06-46	SD-06-89
1A7K-25R01	RJLT16	SM50-113-20	DS-A00T	BLD T20/S7	SD06-46	SD-06-89
1A7K-30R01	RJLT16	SM50-113-20	DS-A00T	BLD T20/S7	SD08-46	SD-08-92
1A7K-40R01	RJLT16	SM50-113-20	DS-A00T	BLD T20/S7	SD-12-82	SD-12-99
1A7K-50R01	RJLT16	SM50-113-20	DS-A00T	BLD T20/S7	SD-12-82	n/a
1A7K-60R01	RJLT16	SM50-113-20	DS-A00T	BLD T20/S7	SD-12-82	n/a
15B1B02404480R00	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B-1001780R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B-1002051R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B-1202781R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B-1202059R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B-1502386R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B-1502055R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B024044X7R00	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B-10015X7R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B-12015X8R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a
15B1B-15015X8R01	RJLT12	SM40-093-20	DS-A00T	BLD T15/S7	n/a	n/a

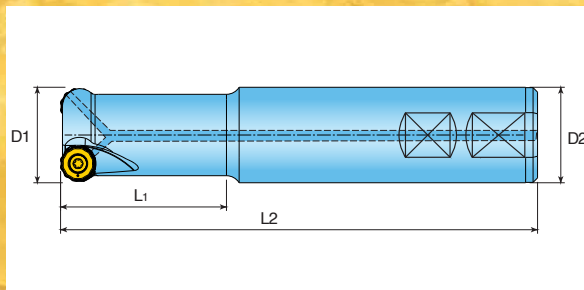
ECONOMICAL DOUBLE SIDED INSERT FOR MOLD & DIE

- Anti-Rotation Insert Clamping System
- Two Different Double Sided Insert Designs, Round & Serrated
- Free Cutting Geometry for All Materials
- Serrated Style Insert for Extended Reach Applications Provides Increased Stability
- Though the Tool Coolant, Delivered to the Cutting Edge



FORMMASTER[®] PROFILE SERIES 1DE1H

BUTTON ENDMILL WITH 8-16 INDEXES

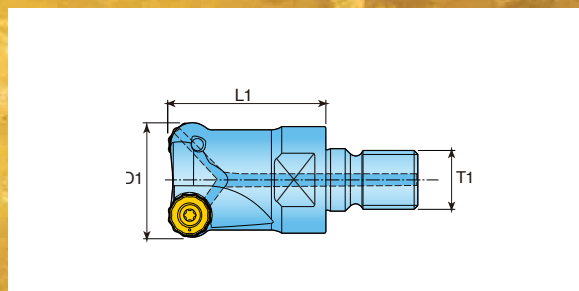


Cutter Number	D1 Nominal Diameter	L1 Extension Length	Number of Inserts	L2 Overall Length	D2 Shank Size/Style
1DE1H-1202781R01	1.250	2.750	3	5.000	1.250 Weldon
1DE1H-1202259R01	1.250	2.250	3	6.000	1.250 Cylindrical
1DE1H-1202059R01	1.250	2.000	3	9.000	1.250 Cylindrical
1DE1H-1502786R01	1.500	2.750	4	5.410	1.500 Weldon
1DE1H-1502255R01	1.500	2.250	4	6.000	1.500 Cylindrical
1DE1H-1502055R01	1.500	2.000	4	9.000	1.500 Cylindrical



FORMMASTER[®] PROFILE SERIES 1DE1H (TOP-ON STYLE)

BUTTON ENDMILL WITH 8-16 INDEXES



Cutter Number	D1 Nom. Dia.	L1 Extension Length	T1 Thread Size	Number of Inserts
1DE1H-12015X8R01	1.250	1.500	M16	3
1DE1H-15015X8R01	1.500	1.500	M16	4

Operating Guidelines on page 98.

BUTTON FACEMILL WITH 8-16 INDEXES



Ramping



Corkscrew



Pocket



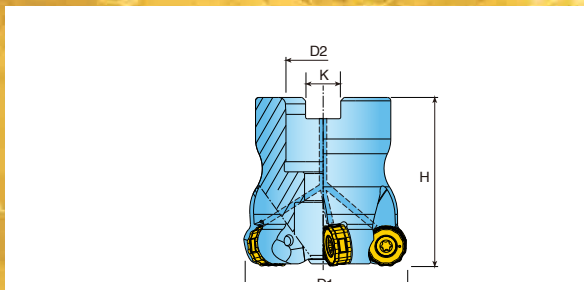
Facing



Contour



Coolant



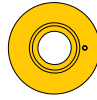
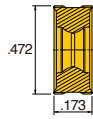
Cutter Number	D1 Nominal Diameter	Number of Inserts	L1 Max DOC	H Height	D2 Bore Diameter	K Keyway
DE6H-20R01	2.000	5	.236	1.750	0.750	0.312
DE6H-25R01	2.500	6	.236	1.750	0.750	0.312
DE6H-30R01	3.000	7	.236	1.750	1.000	0.375

Operating Guidelines on page 98.

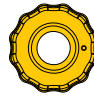
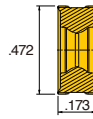


FORMoMASTER[®] PROFILE INSERTS

RNLU1205MON-M



RNLU1205MON-S



Part Number	Applications	Grade	IN6530	IN2530	IN2505						
-------------	--------------	-------	--------	--------	--------	--	--	--	--	--	--

RNLU1205MON-M* Standard - 6.000 mm R

• • •

RNLU1205MON-S** Serrated - 6.000 mm R

• • •

*16 Indexes (Achieved with DOC .070" or less.)

**8 Indexes



FORMoMASTER[®] HARDWARE



Screw



Driver

1DE1H / DE6H

SM40-110-00

DS-T15T



FINISH BALL™ SERIES 12A9, 12A5

BALL NOSE ENDMILL



Ramping



Corkscrew



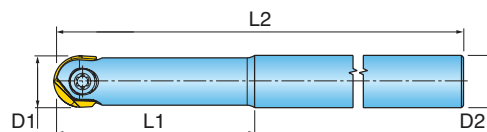
Pocket



Contour

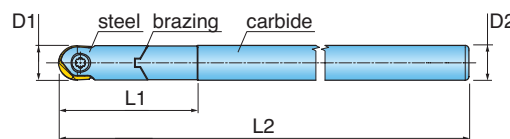


STEEL



Cutter Number	D1 Effective Diameter	D2 Shank Size/Style	L1 Extension	L2 Overall Length	Effective Cutting Edge	Insert Series
12A9F-03017S4R01	0.375	.500" Cylindrical	1.85	6.00	2	09
12A9H-05019S4R01	0.500	.500" Cylindrical	1.92	7.00	2	12
12A9K-06015S6R01	0.625	.625" Cylindrical	1.58	8.00	2	15
12A9M-07018S7R01	0.750	.750" Cylindrical	1.85	8.00	2	19
12A9R-10018S1R01	1.000	1.000" Cylindrical	1.81	8.00	2	25
12A9S-12030S9R01	1.250	1.250" Cylindrical	3.03	11.81	2	31

CARBIDE



Cutter Number	D1 Effective Diameter	D2 Shank Size/Style	L1 Extension	L2 Overall Length	Effective Cutting Edges	Insert Series
12A5F-03015S8R01	0.375	.375" Cylindrical	1.50	6.00	2	09
12A5H-05015S4R02	0.500	.500" Cylindrical	1.50	4.00	2	12
12A5H-05015S4R01	0.500	.500" Cylindrical	1.50	7.00	2	12
12A5K-06018S6R02	0.625	.625" Cylindrical	1.88	4.00	2	15
12A5K-06018S6R01	0.625	.625" Cylindrical	1.88	7.00	2	15
12A5M-07022S7R02	0.750	.750" Cylindrical	2.25	4.00	2	19
12A5M-07022S7R01	0.750	.750" Cylindrical	2.25	7.50	2	19

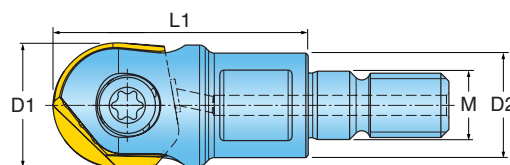
BALL NOSE CUTTING SYSTEM FOR DIE & MOLD COUNTOUR MILLING

- Ultra Stable Clamping System and Excellent Repeatability
- Through the Tool Coolant, Delivered to the Cutting Edge (Top•On)
- Premium Ground Cutter Bodies
- Die & Mold, Aero Space and General Purpose
- End Mill, Top-On (Modular) and Solid Carbide (Brazed Shanks)



FINISH•BALL™ SERIES 12A9 (TOP•ON STYLE)

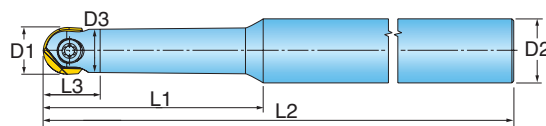
BALL NOSE ENDMILL



Cutter Number	D1 Effective Diameter	D2 Flange Diameter	T1 Thread Size	L1 Extension	Effective Cutting Edges	Wrench Size	Insert Series
12A9F-03011X5R01	.375	.510	M8	1.00	2	10mm	09
12A9H-05011X5R01	.500	.510	M8	1.00	2	10mm	12
12A9K-06015X5R01	.625	.510	M8	1.25	2	10mm	15
12A9M-07016X6R01	.750	.710	M10	1.25	2	15mm	19
12A9M-07021X7R01	.750	.830	M12	1.50	2	17mm	25
12A9R-10023X7R01	1.000	.975	M12	1.50	2	17mm	31
12A9R-10023X7R02	1.000	.820	M12	1.50	2		
12A9S-12063X8R01	1.250	1.140	M16	2.50	2		

Operating Guidelines on page 99.

BALL NOSE, TAPER STEEL CUTTER BODIES



Part Number	Ball Diameter (D1)	Ball Length (L1)	Ball Diameter (D3)	Ball Length (L3)	Shaft Diameter (D2)	Shaft Length (L2)	Flute Length (L4)	Flute Count
12A8F-03013S4R01	0.375	0.500	.34	1.35	3.50	.63	2	09
12A8F-03018S4R01	0.375	0.500	.34	1.88	6.00	.63	2	09
12A8H-05025S4R01	0.500	0.625	.41	2.50	6.00	.75	2	12
12A8M-07035S7R01	0.750	1.000	.67	3.50	7.50	1.00	2	19

Operating Guidelines on page 99.

HARDWARE	Screw	Driver	
12A9F-03017S4R01	SM30-083-B1	DS-TP10S	-
12A9H-05019S4R01	SM40-106-B1	DS-TP15S	-
12A9K-06015S6R01	SM50-139-B1	-	DS-T20T
12A9M-07018S7R01	SM60-167-B1	-	DS-T25T
12A9R-10018S1R01	SM70-210-B1	-	DS-T25T
12A9S-12030S9R01	SM80-250-B1	-	DS-T30T
12A5F-03015S8R01	SM30-083-B1	DS-TP10S	-
12A5H-05015S4R02	SM40-106-B1	DS-TP15S	-
12A5H-05015S4R01	SM40-106-B1	DS-TP15S	-
12A5K-06018S6R02	SM50-139-B1	-	DS-T20T
12A5K-06018S6R01	SM50-139-B1	-	DS-T20T
12A5M-07022S7R02	SM60-167-B1	-	DS-T25T
12A5M-07022S7R01	SM60-167-B1	-	DS-T25T
12A8F-03013S4R01	SM30-083-B1	DS-TP10S	-
12A8F-03018S4R01	SM30-083-B1	DS-TP10S	-
12A8H-05025S4R01	SM40-106-B1	DS-TP15S	-
12A8M-07035S7R01	SM60-167-B1	-	DS-T25T
12A9F-03011X5R01	SM30-083-B1	DS-TP10S	-
12A9H-05011X5R01	SM40-106-B1	DS-TP15S	-
12A9K-06015X5R01	SM50-139-B1	-	DS-T20T
12A9M-07016X6R01	SM60-167-B1	-	DS-T25T
12A9R-07021X7R01	SM60-167-B1	-	DS-T25T
12A9S-10023X7R01	SM70-210-B1	-	DS-T25T
12A9R-10023X7R02	SM70-210-B1	-	DS-T25T



FINISH BALL™ INSERTS

NQHG



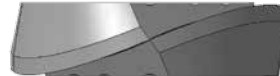
GQHG



Eff. Dia.	Part Number	Applications	R Corner	Grade	IN2005	IN2006	IN05S		
0.375	NQHG090200R-FM	Ball Nose, coolant through	0.188	•	•				
0.500	NQHG120300R-FM	Ball Nose, coolant through	0.250	•	•				
0.625	NQHG150400R-FM	Ball Nose, coolant through	0.312	•	•				
0.750	NQHG190500R-FM	Ball Nose, coolant through	0.375	•	•				
1.000	NQHG250600R-FM	Ball Nose, coolant through	0.500	•	•				
1.250	NQHG310700R-FM	Ball Nose, coolant through	0.625	•	•				
0.375	NQHG090200R-SM	Ball Nose, coolant through	0.188	•	•	•			
0.500	NQHG120300R-SM	Ball Nose, coolant through	0.250	•	•	•			
0.625	NQHG150400R-SM	Ball Nose, coolant through	0.312	•	•				
0.750	NQHG190500R-SM	Ball Nose, coolant through	0.375	•	•	•			
1.000	NQHG250600R-SM	Ball Nose, coolant through	0.500	•	•	•			
1.250	NQHG310700R-SM	Ball Nose, coolant through	0.625	•	•				
0.375	GQHG090208R01	Backdraft Blade, coolant through	0.031	•	•				
0.500	GQHG120308R01	Backdraft Blade, coolant through	0.031	•	•				
0.500	GQHG120316R01	Backdraft Blade, coolant through	0.062	•	•				
0.625	GQHG150408R01	Backdraft Blade, coolant through	0.031	•	•				
0.625	GQHG150416R01	Backdraft Blade, coolant through	0.062	•	•				
0.750	GQHG190508R01	Backdraft Blade, coolant through	0.031	•	•				
0.750	GQHG190516R01	Backdraft Blade, coolant through	0.062	•	•				
0.750	GQHG190532R01	Backdraft Blade, coolant through	0.125	•	•				
1.000	GQHG250608R01	Backdraft Blade, coolant through	0.031	•	•				
1.000	GQHG250616R01	Backdraft Blade, coolant through	0.062	•	•				
1.000	GQHG250632R01	Backdraft Blade, coolant through	0.125	•	•				



FM



SM



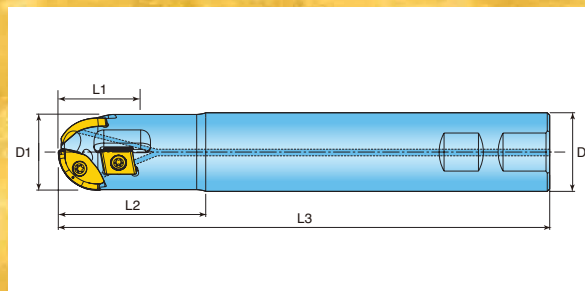
ROUGH BALL FOR TRIPLE FEED RATES!

- 3 Flute Design Enables Increased Feed Rates
- Unique Double-Sided Insert with 2 Cutting Edges
- Highly Stable Cutting Performance with Exceptionally Strong Cutting Edges
- Coolant Through Provides Excellent Chip Evacuation



PROTRIO SERIES 2TW7K

BALL NOSE ENDMILL, 3 FLUTES



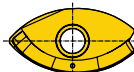
Cutter Number	D1 Effective Diameter	D2 Shank Size/Style	L1 Length of Cut	L2 Extension	L3 Overall Length	Effective Cutting Edges
2TW7K-1203781R01	1.250	1.250 Weldon	1.50	3.720	6.000	3
2TW7K-1205281R01	1.250	1.250 Weldon	1.50	5.220	7.500	3
2TW7K-1504386R01	1.500	1.500 Weldon	1.80	4.300	7.000	3
2TW7K-1506386R01	1.500	1.500 Weldon	1.80	6.300	9.000	3
2TW7K-2004782R01	2.000	2.000 Weldon	3.30	4.750	8.000	3
2TW7K-2007582R01	2.000	2.000 Weldon	3.30	7.750	11.000	3

Operating Guidelines on page 99.

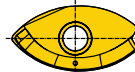


INSERTS

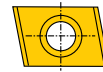
NCEU...R



NCEU...R-P



DCM



Cutter Dia.	Cutter Number	Center Ball Station	Side Ball Station	Side Station	Grade	IN2505	IN2530	IN6530
1.250	2TW7K-1203781R01	NCEU320500R (1)	NCEU320500R-P (2)	DCM323R01 (2)		•	•	•
1.250	2TW7K-1205281R01	NCEU320500R (1)	NCEU320500R-P (2)	DCM323R01 (2)		•	•	•
1.500	2TW7K-1504386R01	NCEU380600R (1)	NCEU380600R-P (2)	DCM323R01 (2)		•	•	•
1.500	2TW7K-1506386R01	NCEU380600R (1)	NCEU380600R-P (2)	DCM323R01 (2)		•	•	•
2.000	2TW7K-2004782R01	NCEU500700R (1)	NCEU500700R-P (2)	DCM324R01 (4)		•	•	•
2.000	2TW7K-2007582R01	NCEU500700R (1)	NCEU500700R-P (2)	DCM324R01 (4)		•	•	•

HARDWARE



Screw



Driver

2TW7K-1203781R01	SM40-093-20	DS-T15T
2TW7K-1205281R01	SM40-093-20	DS-T15T
2TW7K-1504386R01	SM40-120-00	DS-T15T
2TW7K-1506386R01	SM40-120-00	DS-T15T
2TW7K-2004782R01	SM50-113-20	DS-T20T
2TW7K-2007582R01	SM50-113-20	DS-T20T

GOLD^oMAX⁴ FFINTM

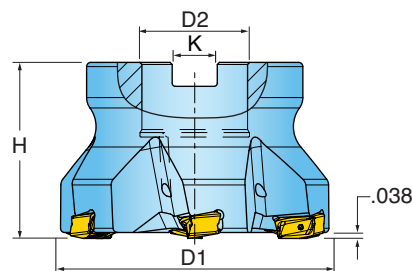
SUPER FINISHING FACE MILL

- Cutter diameters from Ø3.00" thru Ø8.00"
- High precision cutter bodies with tangentially mounted inserts offering (4) insert indexes.
- Micro Finishing possible at 4X's the typical axial depth of cut.
- Large elliptical wiper follows lead cutting edge.
- Multiple carbide grades for all material types.



GOLD^oMAX⁴ FFINTM SERIES EF6J

FINISHING FACEMILL

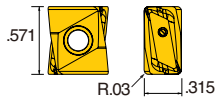


Cutter Number	D1 Nom. Diameter	# Effective Inserts	D2 Bore Diameter	D3 Effective Diameter	Max DOC	Bolt Circle	K Keyway	H Height	Coolant Thru	Insert Series
EF6J-03R01	3.000	5	1.000	2.243	0.038	-	0.380	1.750	Yes	DFH324L001
EF6J-04R01	4.000	6	1.500	3.234	0.038	-	0.630	2.500	Yes	DFH324L001
EF6J-05R01	5.000	7	1.500	4.237	0.038	-	0.630	2.500	Yes	DFH324L001
EF6J-06R01	6.000	9	1.500	5.234	0.038	-	0.630	2.500	Yes	DFH324L001
EF6J-08R01	8.000	9	2.500	7.235	0.038	4.000	1.010	2.500	Yes	DFH324L001

Operating Guidelines on page 100.

GOLD^oMAX⁴ FFIN™ INSERTS

DFH324



Insert Number	Corner Configuration	Application	Grade	IN2030	IN2505	IN2530	IN4015	IN4030
DFH324L001	4 x .030" R	Finishing Facemill		•	•	•	•	•

GOLD^oMAX⁴ FFIN™ HARDWARE



Screw



Driver



Retention Bolt

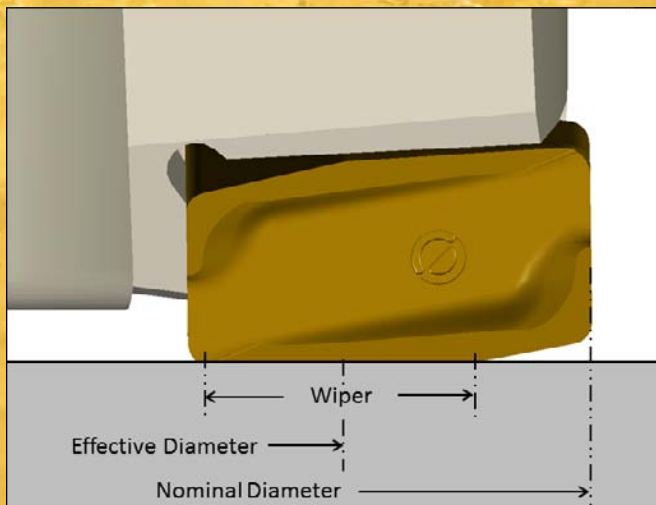


Coolant Plate

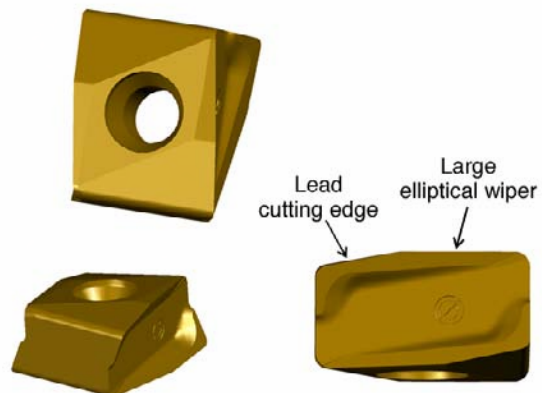


Coolant Plate Screw

EF6J-03R01	SM40-143-H0	DS-T15T	SD-08-46	-	-
EF6J-04R01	SM40-143-H0	DS-T15T	SD-12-82	-	-
EF6J-05R01	SM40-143-H0	DS-T15T	SD-12-82	-	-
EF6J-06R01	SM40-143-H0	DS-T15T	SD-12-82	-	-
EF6J-08R01	SM40-143-H0	DS-T15T	SD-10-70	CZ-0187	SE03-66



DFH324L001



GOLD[®]MAX⁸

DI-QUAD 90° LINE

DOUBLE-SIDED TANGENTIAL TECHNOLOGY

- Cutter Diameters from Ø2.00" thru Ø8.00"
- 8 Cutting Edges
- High Positive Geometry Produces True 90° Shoulders
- Unique Multifaceted Insert Offers High Efficiency and Productivity
- Stable Insert Seating Promotes Longer Tool Life

GOLD[®]MAX⁸ SERIES VJ6K

0 DEGREE LEAD FACEMILL



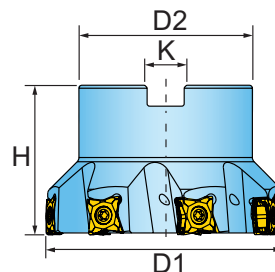
Shoulder



Facing



Slabbing



Cutter Number	D1 Nom. Diameter	Number of Inserts	H Height	D2 Bore Diameter	K Keyway	Bolt Circle
VJ6K-02R01	2.000	5	1.500	0.750	0.32	-
VJ6K-02R02	2.500	6	1.570	1.000	0.38	-
VJ6K-03R01	3.000	8	2.375	1.000	0.38	-
VJ6K-04R01	4.000	9	2.375	1.500	0.63	-
VJ6K-06R01	6.000	13	2.375	1.500	0.63	-
VJ6K-08R01	8.000	16	2.375	2.500	1.00	4.00

Operating Guidelines on page 100.



GOLD[®]MAX[®] INSERTS

SGM-44R001



Cutter Number	Corner Configuration	Application	Grade	IN2030	IN2530	IN4030
SGM-44R001	8 x .031R	Multi-Purpose		•	•	•

GOLD[®]MAX[®] HARDWARE

HARDWARE



Screw

SM40-120-20



Driver

DS-T15T

GOLD[®]MAX⁴

QUAD 90° LINE

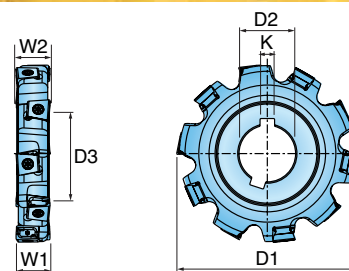
THE EVOLUTION OF TECHNOLOGY CONTINUES WITH SLOTTERS

- Cutter Diameters from Ø4.00" thru Ø10.00"
- 4 insert indexes available in .031", .062", .093" & .125" corner radii
- Axial & radial drive available in .625", .750" & 1.00" widths of cut
- Same insert for both right-hand & left-hand stations
- Multiple grades for all material types



GOLD[®]MAX⁴ SERIES 3EJ6

HEAVY DUTY AXIAL DRIVE SLOTTER



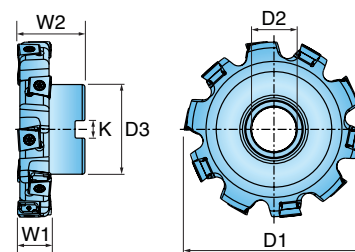
Cutter Number	W1 Cutter Width	D1 Nom. Diameter	D2 Bore Diameter	W2 Hub Width	D3 Hub Diameter	K Keyway	Total No. of Inserts	No. of Effective Inserts	Insert Series
3EJ6F-04062AG-01	0.625	4.000	1.250	0.595	2.25	0.312	10	5	DGM315
3EJ6J-04075AG-01	0.750	4.000	1.250	0.720	2.25	0.312	10	5	DGM325
3EJ6M-04100AG-01	1.000	4.000	1.250	0.970	2.25	0.312	8	4	DGM426
3EJ6F-05062AH-01	0.625	5.000	1.500	0.595	2.75	0.375	12	6	DGM315
3EJ6J-05075AH-01	0.750	5.000	1.500	0.720	2.75	0.375	12	6	DGM325
3EJ6M-05100AH-01	1.000	5.000	1.500	0.970	2.75	0.375	10	5	DGM426
3EJ6F-06062AH-01	0.625	6.000	1.500	0.595	3.50	0.375	14	7	DGM315
3EJ6J-06075AH-01	0.750	6.000	1.500	0.720	3.50	0.375	14	7	DGM325
3EJ6M-06100AH-01	1.000	6.000	1.500	0.970	3.50	0.375	12	6	DGM426
3EJ6F-08062AK-01	0.625	8.000	2.000	0.595	3.50	0.500	16	8	DGM315
3EJ6J-08075AK-01	0.750	8.000	2.000	0.720	3.50	0.500	16	8	DGM325
3EJ6M-08100AK-01	1.000	8.000	2.000	0.970	3.50	0.500	14	7	DGM426
3EJ6F-10062AK-01	0.625	10.000	2.000	0.595	3.50	0.500	18	9	DGM315
3EJ6J-10075AK-01	0.750	10.000	2.000	0.720	3.50	0.500	18	9	DGM325
3EJ6M-10100AK-01	1.000	10.000	2.000	0.970	3.50	0.500	16	8	DGM426

Operating Guidelines on page 101.



GOLD[®]MAX⁴ SERIES 3EJ6

HEAVY DUTY RADIAL DRIVE SLOTTER



Cutter Number	W1 Cutter Width	D1 Nom. Diameter	D2 Bore Diameter	W2 Hub Width	D3 Hub Diameter	K Keyway	Total No. of Inserts	No. of Effective Inserts	Insert Series
3EJ6F-0406257R01	0.625	4.000	1.000	1.500	2.00	0.375	10	5	DGM315
3EJ6J-0407557R01	0.750	4.000	1.000	1.500	2.00	0.375	10	5	DGM325
3EJ6M-0410057R01	1.000	4.000	1.000	1.500	2.00	0.375	8	4	DGM426
3EJ6F-0506257R01	0.625	5.000	1.000	1.500	2.75	0.375	12	6	DGM315
3EJ6J-0507557R01	0.750	5.000	1.000	1.500	2.75	0.375	12	6	DGM325
3EJ6M-0510057R01	1.000	5.000	1.000	1.500	2.75	0.375	10	5	DGM426
3EJ6F-0606258R01	0.625	6.000	1.500	2.000	2.75	0.625	14	7	DGM315
3EJ6J-0607558R01	0.750	6.000	1.500	2.000	2.75	0.625	14	7	DGM325
3EJ6M-0610058R01	1.000	6.000	1.500	2.000	3.81	0.625	12	6	DGM426
3EJ6F-0806258R01	0.625	8.000	1.500	2.000	3.81	0.625	16	8	DGM315
3EJ6J-0807558R01	0.750	8.000	1.500	2.000	3.81	0.625	16	8	DGM325
3EJ6M-0810058R01	1.000	8.000	1.500	2.000	3.81	0.625	14	7	DGM426
3EJ6F-1006261R01	0.625	10.000	2.500	2.000	4.87	1.000	18	9	DGM315
3EJ6J-1007561R01	0.750	10.000	2.500	2.000	4.87	1.000	18	9	DGM325
3EJ6M-1010061R01	1.000	10.000	2.500	2.000	4.87	1.000	16	8	DGM426

Operating Guidelines on page 101.

**GOLD[®]MAX⁴**
GOLD-SPRING**INSERTS****DGM315****DGM325****DGM426**

Part Number	R Corner	Applications	Grade	IN2505	IN2515	IN2530	IN2540	IN4005	IN4015	IN4030	IN4040
DGM315-001	0.031 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM315-002	0.062 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM315-003	0.093 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM315-004	0.125 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM325-001	0.031 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM325-002	0.062 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM325-003	0.093 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM325-004	0.125 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM426-001	0.031 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM426-002	0.062 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM426-003	0.093 R	Multi-Purpose		•	•	•	•	•	•	•	•
DGM426-004	0.125 R	Multi-Purpose		•	•	•	•	•	•	•	•



GOLD[®]MAX⁴
QUAD-POINT

HARDWARE

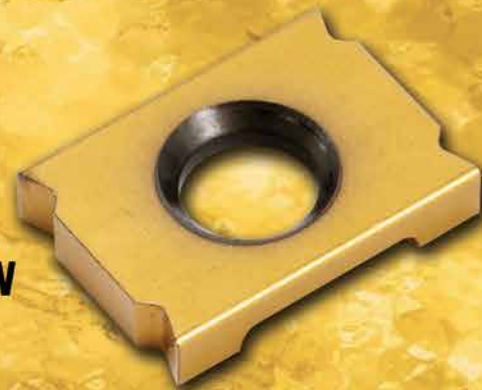


Screw



Driver

DGM315	SM40-143-H0	DS-T15T
DGM325	SM40-143-H0	DS-T15T
DGM426	SM50-160-10	DS-T20T



SUPER-MAX PERFORMANCE IN A THIN SLOTTER DESIGN

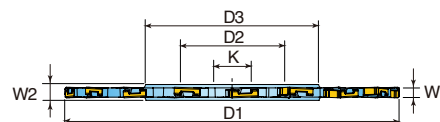
- Diameters from Ø3.00" thru Ø8.00"
- Cutting Widths Ranging From .125" thru .312"
- Same 4 Index Insert for Both RH and LH Stations
- Ridgid Bridge-Style Insert Mounting



THINOMAX™
TANGENTIAL

SERIES 3VJ5V

AXIAL DRIVE SLOTTER



Cutter Number	W1 Cutter Width	D1 Nom. Diameter	D2 Bore Diameter	W2 Hub Width	D3 Hub Diameter	K Keyway	Total # of Inserts	# of Effective Inserts	Insert Series
3VJ5V-03012AF-01	0.125	3.000	1.000	0.375	1.560	0.250	10	5	IEE211-001
3VJ5V-04012AF-01	0.125	4.000	1.000	0.375	1.750	0.250	14	7	IEE211-001
3VJ5V-03015AF-01	0.156	3.000	1.000	0.375	1.560	0.250	10	5	IEE311-001
3VJ5V-04015AF-01	0.156	4.000	1.000	0.375	1.750	0.250	12	6	IEE311-001
3VJ5V-06015AG-01	0.156	6.000	1.250	0.375	1.870	0.312	18	9	IEE311-001
3VJ5V-03018AF-01	0.187	3.000	1.000	0.375	1.560	0.250	10	5	IEE312-001
3VJ5V-04018AF-01	0.187	4.000	1.000	0.375	1.750	0.250	12	6	IEE312-001
3VJ5V-05018AG-01	0.187	5.000	1.250	0.375	1.870	0.312	14	7	IEE312-001
3VJ5V-06018AG-01	0.187	6.000	1.250	0.375	1.870	0.312	18	9	IEE312-001
3VJ5V-04025AF-01	0.250	4.000	1.000	0.375	1.750	0.250	10	5	IXE412-001
3VJ5V-05025AF-01	0.250	5.000	1.000	0.375	1.870	0.250	12	6	IXE412-001
3VJ5V-06025AG-01	0.250	6.000	1.250	0.375	1.870	0.312	14	7	IXE412-001
3VJ5V-08025AH-01	0.250	8.000	1.500	0.375	2.750	0.375	18	9	IXE412-001
3VJ5V-04031AG-01	0.312	4.000	1.250	0.375	1.870	0.312	10	5	IXE413-001
3VJ5V-05031AG-01	0.312	5.000	1.250	0.375	1.870	0.312	12	6	IXE413-001
3VJ5V-06031AG-01	0.312	6.000	1.250	0.375	1.870	0.312	14	7	IXE413-001
3VJ5V-08031AH-01	0.312	8.000	1.500	0.375	2.750	0.375	18	9	IXE413-001
3VJ5V-04037AG-01	0.375	4.000	1.250	0.345	1.870	0.312	10	5	IXE414-001
3VJ5V-06037AG-01	0.375	6.000	1.250	0.345	1.870	0.312	14	7	IXE414-001
3VJ5V-08037AH-01	0.375	8.000	1.500	0.345	2.750	0.375	18	9	IXE414-001



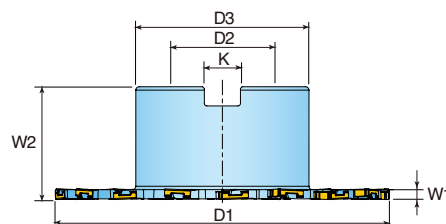
THINOMAX™
TANGENTIAL

SERIES 3VJ5V

RADIAL DRIVE SLOTTER



Slotting

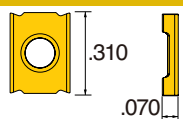
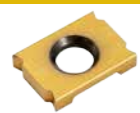


Cutter Number	W1 Cutter Width	D1 Nom. Diameter	D2 Bore Diameter	W2 Hub Width	D3 Hub Diameter	K Keyway	Total # of Inserts	# of Effective Inserts	Insert Series
3VJ5V-02012D1R01	0.125	2.500	0.750	1.375	1.180	0.312	8	4	IEE211-001
3VJ5V-03012D1R01	0.125	3.000	0.750	1.500	1.500	0.312	10	5	IEE211-001
3VJ5V-04012D3R01	0.125	4.000	1.000	1.500	1.750	0.375	14	7	IEE211-001
3VJ5V-02015D1R01	0.156	2.500	0.750	1.375	1.180	0.312	8	4	IEE311-001
3VJ5V-03015D1R01	0.156	3.000	0.750	1.500	1.500	0.312	10	5	IEE311-001
3VJ5V-04015D3R01	0.156	4.000	1.000	1.500	1.750	0.375	12	6	IEE311-001
3VJ5V-0601558R01	0.156	6.000	1.500	2.000	3.070	0.625	18	9	IEE311-001
3VJ5V-02018D1R01	0.187	2.500	0.750	1.375	1.180	0.312	8	4	IEE312-001
3VJ5V-03018D1R01	0.187	3.000	0.750	1.500	1.500	0.375	10	5	IEE312-001
3VJ5V-04018D3R01	0.187	4.000	1.000	1.500	1.750	0.375	12	6	IEE312-001
3VJ5V-05018D3R01	0.187	5.000	1.000	1.500	2.250	0.375	14	7	IEE312-001
3VJ5V-0601858R01	0.187	6.000	1.500	2.000	3.070	0.625	18	9	IEE312-001
3VJ5V-02025D1R01	0.250	2.500	0.750	1.500	1.180	0.312	6	3	IXE412-001
3VJ5V-03025D1R01	0.250	3.000	0.750	1.500	1.500	0.312	8	4	IXE412-001
3VJ5V-04025D3R01	0.250	4.000	1.000	1.500	1.750	0.312	10	5	IXE412-001
3VJ5V-05025D3R01	0.250	5.000	1.000	1.500	2.250	0.375	12	6	IXE412-001
3VJ5V-0602558R01	0.250	6.000	1.500	2.000	3.070	0.625	14	7	IXE412-001
3VJ5V-04031D3R01	0.312	4.000	1.000	1.500	1.750	0.375	10	5	IXE413-001
3VJ5V-0603158R01	0.312	6.000	1.500	2.000	3.070	0.625	14	7	IXE413-001
3VJ5V-0803158R01	0.312	8.000	1.500	2.000	3.800	0.625	18	9	IXE413-001
3VJ5V-04037D3R01	0.375	4.000	1.000	1.500	1.750	0.375	10	5	IXE414-001
3VJ5V-05037D3R01	0.375	5.000	1.000	1.500	2.250	0.375	12	6	IXE414-001
3VJ5V-0603758R01	0.375	6.000	1.500	2.000	3.070	0.625	14	7	IXE414-001
3VJ5V-0803758R01	0.375	8.000	1.500	2.000	3.800	0.625	18	9	IXE414-001

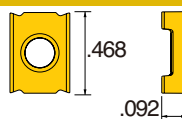
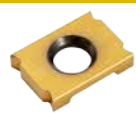
Operating Guidelines on page 101.

**THINOMAX™**
TANGENTIAL**INSERTS**

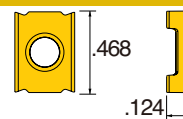
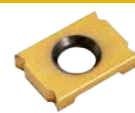
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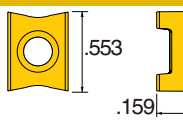
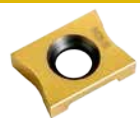
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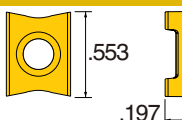
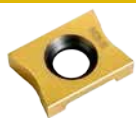
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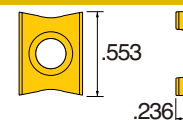
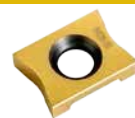
IXE412-00_



IXE413-00_



IXE414-00_



Insert Number	Corner Configuration	Application	Grade	IN2505	IN2515	IN2530	IN4005	IN4015	IN4030
IEE211-001	4 x .015" R	Multi-Purpose		•		•	•		•
IEE311-001	4 x .015" R	Multi-Purpose		•	•	•	•	•	•
IEE311-002	4 x .031" R	Multi-Purpose		•	•	•	•	•	•
IEE312-001	4 x .015" R	Multi-Purpose		•	•	•	•	•	•
IEE312-002	4 x .031" R	Multi-Purpose		•	•	•	•	•	•
IXE412-001	4 x .015" R	Multi-Purpose		•	•	•	•	•	•
IXE412-002	4 x .031" R	Multi-Purpose		•	•	•	•	•	•
IXE412-003	4 x .062" R	Multi-Purpose		•	•	•	•	•	•
IXE413-001	4 x .015" R	Multi-Purpose		•	•	•	•	•	•
IXE413-002	4 x .031" R	Multi-Purpose		•	•	•	•	•	•
IXE413-003	4 x .062" R	Multi-Purpose		•	•	•	•	•	•
IXE414-001	4 x .015" R	Multi-Purpose		•	•	•	•	•	•
IXE414-002	4 x .031" R	Multi-Purpose		•	•	•	•	•	•
IXE414-003	4 x .062" R	Multi-Purpose		•	•	•	•	•	•



Screw



Driver

IEE211	SM25-025-80	DS-T06F	M2.5 x .45MM x 2.5MM
IEE311	SM35-034-50	DS-T09W	M3.5 x .60MM x 3.4MM
IEE312	SM35-042-50	DS-T09W	M3.5 x .60MM x 4.2MM
IXE412	SM40-055-50	DS-T15T	M4.0 x .70MM x 5.5MM
IXE413	SM40-070-50	DS-T15T	M4.0 x .70MM x 7.0MM
IXE414	SM40-080-50	DS-T15T	M4.0 x .70MM x 8.0MM

HiPos + - 12mm I.C. - Series 12S1X		Brinnell Hardness	SFM	Feed per Insert	IN10K						Coolant	
Material					IN2005/2505	IN2510	IN1030	IN2530	IN2040/2540			
Aluminum	6061-T6, 7075-T6, 2024	-	1500-8000	.004 - .010	1	3	2				Yes	
Cast Iron	Gray	150 - 250	300 - 1000	.004 - .010		2	1				No	
	Nodular		300 - 600									
Steel	Low Carbon 1018, 8620	100 - 250	400 - 1000	.004 - .010		2		1	1*	3	No	
	High Carbon F-6180	250 - 400	350 - 500	.004 - .008								
	Alloyed Steel 4140, 4340	150 - 300	300 - 700	.004 - .010								
	Tool Steel A-6, D-1, D-2	Up to 300										
Stainless Steel	300 Series, 304, 316	-	300 - 700	.004 - .010		2		1	1*	3	May not be required at high speeds	
	400 Series, 15-5 PH, 17-4 PH	-	400 - 900									
	13-8 PH	-	200 - 400								Yes	
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy, Waspalloy	-	75-120	.003 - .006		2	3	1	1*		Yes	
Titanium	6AL-4V, Ti-10-2-3, Ti-5553	-	100 - 150	.005 - .008		2		1	1		Yes	

HiPos + - 18mm I.C. - Series 12S1E		Brinnell Hardness	SFM	Feed per Insert	IN10K	IN2005/2505	IN2510	IN1030	IN2530	IN2040/2540	Coolant
Material											
Aluminum	6061-T6, 7075-T6, 2024	-	1500-8000	.004 - .018	1	3	2				Yes
Cast Iron	Gray	150 - 250	300 - 1000	.004 - .018		2					No
	Nodular		300 - 600								
Steel	Low Carbon 1018, 8620	100 - 250	400 - 1000	.004 - .018		2		1	1*	3	No
	High Carbon F-6180	250 - 400	350 - 500	.004 - .015							
	Alloyed Steel 4140, 4340	150 - 300	300 - 700	.004 - .018							
	Tool Steel A-6, D-1, D-2	Up to 300									
Stainless Steel	300 Series, 304, 316	-	300 - 700	.004 - .018		2	3	1	1*		May not be required at high speeds
	400 Series, 15-5 PH, 17-4 PH	-	400 - 900								
	13-8 PH	-	200 - 400								
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy, Waspalloy	-	75-120	.003 - .006		1	3	2	2		Yes
Titanium	6AL-4V, Ti-10-2-3, Ti-5553	-	100 - 150	.005 - .008		2		1	1		Yes

HiPos Trio - 6mm I.C. - Series 1KJ1D, 1KV1D, KJ5D, KJ6D					IN10K	IN2505	IN2510	IN2530	IN2540	Coolant
Material	Brinnell Hardness	SFM	Feed per Insert							
Aluminum	6061 T6, 7075 T6, 2024	-	1500 - 8000	.003 - .006	1					Yes
Cast Iron	Gray	150 - 250	500 - 1200	.002 - .006		2	1			No
	Nodular		400 - 800							
Steel	Low Carbon 1018, 8620	150 - 250	600 - 1200	.002 - .006		2		1	3	No
	High Carbon F-6180, Nitralloy 52100	250 - 400	400 - 600	.002 .005						
	Alloyed Steel 4140, 4340, 6150	150 - 300	400 - 800							
	Tool Steel A-6, D-1, D-2, P20	Up to 300								
Stainless Steel	300 Series, 304, 316	-	400 - 800	.002 - .005		2		1	3	May not be required at high speeds
	400 Series 15-5 PH, 17-4 PH	Up to 320	500 - 1000							
	13-8 PH	-	200 - 400							Yes
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy, Waspalloy	-	75-120	.002 - .004		2	3	1		Yes
Titanium	6AL-4V	-	100 - 150	.002 - .005		2		1		Yes

HiPos Trio - 10mm I.C. - Series 1KJ1G, KJ5G, KJ6G					IN10K	IN2505	IN2510	IN2530	IN2540	
Material		Brinnell Hardness	SFM	Feed per Insert						Coolant
Aluminum	6061 T6, 7075 T6, 2024	-	1500 - 8000	.004 - .010	1					
Cast Iron	Gray	150 - 250	300 - 1000	.004 - .008		2	1			No
	Nodular		300 - 600							
Steel	Low Carbon 1018, 8620	150 - 250	400 - 1000	.004 - .008		2		1	3	No
	High Carbon F-6180, Nitralloy 52100	250 - 400	350 - 500	.004 - .006						
	Alloyed Steel 4140, 4340, 6150	150 - 300	300 - 700	.004 - .008						
	Tool Steel A-6, D-1, D-2, P20	Up to 300								
Stainless Steel	300 Series, 304, 316	-	300 - 700	.004 - .006		2		1	3	May not be required at high speeds
	400 Series 15-5 PH, 17-4 PH	Up to 320	400 - 900							
	13-8 PH	-	200 - 400							Yes
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy, Waspalloy	-	75-120	.003 - .005		2	3	1		Yes
Titanium	6AL-4V	-	100 - 150	.005 - .005		2		1		Yes

HiPos Trio - 13mm I.C. - Series 1KJ1P, KJ5P, KJ6P					IN10K	IN2505	IN2510	IN2530	IN2540	
Material		Brinnell Hardness	SFM	Feed per Insert						Coolant
Aluminum	6061 T6, 7075 T6, 2024	-	1500 - 8000	.004 - .010	1					
Cast Iron	Gray	150 - 250	300 - 1000	.004 - .010		2	1			No
	Nodular		300 - 600							
Steel	Low Carbon 1018, 8620	150 - 250	400 - 1000	.004 - .010		2		1	3	No
	High Carbon F-6180, Nitr alloy 52100	250 - 400	350 - 500	.004 - .008						
	Alloyed Steel 4140, 4340, 6150	150 - 300	300 - 700	.004 - .010						
	Tool Steel A-6, D-1, D-2, P20	Up to 300								
Stainless Steel	300 Series, 304, 316	-	300 - 700	.004 - .008		2		1		May not be required at high speeds
	400 Series 15-5 PH, 17-4 PH	Up to 320	400 - 900							Yes
	13-8 PH	-	200 - 400							
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy, Waspalloy	-	75-120	.003 - .006		2	3	1		Yes
Titanium	6AL-4V	-	100 - 150	.005 - .006		2		1		Yes

DiPos Hexa - Series 1DJ1F, DJ5F, 1DJ1P, DJ5P, DJ6P					IN10K	IN2505	IN2510	IN2530	IN2540	
Material	Brinnell Hardness	SFM	Feed per Insert							Coolant
Aluminum	6061 T6, 7075 T6, 2024	-	1500-8000	.004 - .010	1					
Cast Iron	Gray	150 - 250	300 - 1000	.004 - .010		2	1			No
	Nodular		300 - 600							
Steel	Low Carbon 1018, 8620	150 - 250	400 - 1000	.004 - .010		2		1	3	No
	High Carbon F-6180, Nitr alloy 52100	250 - 400	350 - 500	.004 - .008						
	Alloyed Steel 4140, 4340, 6150	150 - 300	300 - 700	.004 - .010						
	Tool Steel A-6, D-1, D-2, P20	Up to 300								
Stainless Steel	300 Series, 304, 316	-	300 - 700	.004 - .010		2		1		May not be required at high speeds
	400 Series 15-5 PH, 17-4 PH	Up to 320	400 - 900							
	13-8 PH	-	200 - 400							Yes
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy, Waspalloy	-	75-120	.003 - .006		2		1		Yes
Titanium	6AL-4V	-	100 - 150	.005 - .008		2		1		Yes

Hi-Quad Long Edge Cutters - Series 25J3P					IN4005	IN4030	IN4035	IN4015	Coolant
Material	Brinnell Hardness	SFM	Feed per Insert						
Aluminum	6061 T6, 7075 T6, 2024	-	1000 - 5000	.004 - .018				1	Yes
Cast Iron	Gray	150 - 250	300 - 800	.004 - .010	2			1	No
	Nodular		300 - 500						
Steel	Low Carbon 1018, 8620	100 - 250	400 - 800	.004 - .010	3	2	1		No
	High Carbon F-6180	250 - 400	350 - 500	.004 - .008					
	Alloyed Steel 4140, 4340	150 - 300	300 - 600	.004 - .010					
	Tool Steel A-6, D-1, D-2	Up to 300							
Stainless Steel	300 Series, 304, 316	-	300 - 450	.004 - .010	3	2	1		May not be required at high speeds
	400 Series 15-5 PH	Up to 320	350 - 500						Yes
	13-8 PH	-	200 - 400						
Nickel Alloys	Inconel, Hastelloy, Waspalloy	-	65-110	.003 - .006	3	2	1		Yes
Titanium	6AL-4V	-	90 - 120	.005 - .008	3	2	1		Yes

STARTING FEED RATE GUIDELINES FOR EXTENDED FLUTE MILL BASED ON WIDTH OF CUT

Material	Material Specification	Radial WOC	Feed Rate (APT)			
			2.00 Diameter	2.50 Diameter	3.00 Diameter	4.00 Diameter
Aluminum	7075 - T6, 6061 - T6, 2024	0.02	0.050	0.060	0.070	0.080
		Diameter / 8	0.015	0.015	0.015	0.015
		Diameter / 4	0.012	0.012	0.012	0.012
		Diameter / 2	0.010	0.010	0.010	0.010
Cast Iron	Gray / Nodular	0.02	0.035	0.048	0.056	0.064
		Diameter / 8	0.009	0.011	0.011	0.011
		Diameter / 4	0.007	0.008	0.008	0.008
		Diameter / 2	0.006	0.006	0.006	0.006
Steel	Low / Med Carbon 1018, 1045, 8620	0.02	0.035	0.048	0.056	0.064
		Diameter / 8	0.009	0.011	0.011	0.011
		Diameter / 4	0.007	0.008	0.008	0.008
		Diameter / 2	0.006	0.006	0.006	0.006
	Alloyed Steel, 4140, 4340, Tool Steel A-6, D-1, D-2	0.02	0.030	0.042	0.049	0.056
		Diameter / 8	0.008	0.009	0.009	0.009
		Diameter / 4	0.006	0.007	0.007	0.007
		Diameter / 2	0.005	0.005	0.005	0.005
Stainless Steel	300 Series, 304, 316, 13-8PH	0.02	0.030	0.042	0.049	0.056
		Diameter / 8	0.008	0.009	0.009	0.009
		Diameter / 4	0.006	0.007	0.007	0.007
		Diameter / 2	0.005	0.005	0.005	0.005
	400 Series 15-5PH, 17-4PH	0.02	0.035	0.048	0.056	0.064
		Diameter / 8	0.009	0.011	0.011	0.011
		Diameter / 4	0.007	0.008	0.008	0.008
		Diameter / 2	0.006	0.006	0.006	0.006
Nickel Alloys & Titanium	Inconel, Hastelloy, Waspalloy, 6AL-4V	0.02	0.030	0.042	0.049	0.056
		Diameter / 8	0.008	0.009	0.009	0.009
		Diameter / 4	0.006	0.007	0.007	0.007
		Diameter / 2	0.005	0.005	0.005	0.005

IsoPlus - Series DJ6T, DJ5T					IN2510	IN2530	IN2505	IN2540	IN6515	IN71N	Coolant
Material	Brinnell Hardness	SFM	Feed per Insert								
Aluminum	7075 - T6, 6061 - T6, 2024	-	1500-10000	.006-.012	1						Yes
Cast Iron	Gray	150-250	500-1000	.008-.010	1				2		No
			1800+	.005-.008					1		
	Nodular		400-800	.007-.009	2				1		
			1500+	.004-.007						1	
Steel	Low Carbon 1018, 8620	100-250	400-1000	.006-.010		1	3	2			No
	High Carbon F-6180	250-400	400-800								
	Alloyed Steel 4140, 4340	150-300	300-700								
	Tool Steel A-6, D-1, D-2	Up to 300	300-500								
Stainless Steel	300 Series, 304, 316	-	300-700	.005-.008		1	2				May not be required at high speeds
	400 Series 15-5 PH	Up to 320	400-700								
	13-8 PH	-	200-400								Yes
Nickel Alloys	Inconel, Hastelloy, Waspalloy	-	75-120	.003-.006		2	1				Yes
Titanium	6AL-4V	-	100-150	.004-.007		1	2				Yes

OctoPlus - Series ON5H, ON6H, OP6N					IN10K	IN2004	IN2005/2505	IN2030	IN2035	IN2040	IN6510/2510	IN6515	IN70N	Coolant
Material	Brinnell Hardness	SFM	Feed per Insert											
Aluminum	7075 - T6, 6061 - T6, 2024	-	1500-10000	.006-.012	1									Yes
Cast Iron	Gray	150-250	500-1000	.008-.016		3					1	2		No
			1800+	.005-.008							1			
	Nodular		400-800	.007-.014		3				2	1			
			1500+	.004-.007								1		
Steel	Low Carbon 1018, 8620	100-250	400-1000	.006-.015			2	1	3					No
	High Carbon F-6180	250-400	400-800	.006-.012										
	Alloyed Steel 4140, 4340	150-300	300-700											
	Tool Steel A-6, D-1, D-2	Up to 300	300-500											
Stainless Steel	300 Series, 304, 316	-	300-700	.005-.009			3	2	1	4				May not be required at high speeds
	400 Series 15-5 PH	Up to 320	400-700											
	13-8 PH	-	200-400											Yes
Nickel Alloys	Inconel, Hastelloy, Waspalloy	-	75-120	.003-.006			1	3	2					Yes
Titanium	6AL-4V	-	100-150	.004-.007			3	1	2					Yes

FormMaster F - Series 1DG1H, DG6H					IN2030	IN2505	IN2540	IN6530	
Material		Brinnell Hardness	SFM	Feed per Insert					Coolant
Steel	Mild 1018 - 1045	125 - 425	300 - 650	.035 - .157	1				No
	Low Alloy 4140, 8620, 4340	150 - 425			1	1	3	4	
	Med Alloy P20, S7, H13, O1, A2		300 - 700						
Stainless Steel	Free Machining 303, 416	150 - 425	200 - 550	.030 - .100	1	2	3	4	No
	300 Series 304, 310, 316								
	400 Series 410, 420, 15-5PH, 17-4 PH								
	PH Series 13-8								
Hardened Steel	ALL	-	200 - 400	.030 - .075	1	2			No

HiFeedMini - Series 1TG1F, TG1F					IN2030	IN2505	IN2540	IN6530	
Material		Brinnell Hardness	SFM	Feed per Insert					Coolant
Steel	Mild 1018 - 1045	125 - 425	500 - 1100	.010 - .035		1	2	2	No
	Low Alloy 4140, 8620, 4340	150 - 425	400 - 1000	.008 - .018	1	3	2	4	
	Med Alloy P20, S7, H13, O1, A2	150 - 425	300 - 900						
	High Alloy A7-D2	200 - 425	300 - 600	.005 - .015	1	2	3		
Stainless Steel	Free Machining 303, 416	150 - 425	300 - 800	.010 - .030	2	1		3	No
	300 Series 304, 310, 316	150 - 425	200 - 600	.005 - .015					
	400 Series 410, 420, 15-5PH, 17-4 PH	150 - 425							
	PH Series 13-8	150 - 425	200 - 500						
Hardened Steel	ALL	-	200 - 400	.002 - .010	1		2	3	No

HiQuadF - Series 15M1P, 5M_P, 5G_M					IN2505	IN2530	IN4005	IN4030	IN4035	Coolant
Material		Brinnell Hardness	SFM	Feed per Insert						
Steel	Mild 1018-1045	125-425	300-650	.025-.115	2		1		3	NO
	Low Alloy 4140, 8620, 4340	150-425			2		1		3	NO
	Med Alloy P20, S7, H13, O1, A2		300-700		2	3	1		3	NO
Stainless Steel	Free Machining 303, 416	150-425	220-550	.025-.110	5	3	4	1	2	NO
	300 Series 304, 310, 316				5	3	4	1	2	NO
	400 Series 410, 420, 15-5PH, 17-4 PH				5	3	4	1	2	YES
	PH Series 13-8				5	3	4	1	2	YES
Hardened Steel	ALL	-	200-400	.030-.050	2		1		3	NO
Titanium	6AL-4V	-	90-200	.030-.060	5	3	4	1	2	YES

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.

HiQuad Plungers - Series QHU, 5J1P					IN4005	IN4030	IN4035	IN4015	
Material		Brinnell Hardness	SFM	Feed per Insert					Coolant
Aluminum	6061 T6, 7075 T6, 2024	-	1500 - 8000	.004 - .010				1	Yes
Cast Iron	Gray	150 - 250	250 - 800	.005 - .012	2			1	No
	Nodular		200 - 800						
Steel	Low Carbon 1018, 8620	100 - 250	250 - 800	.004 - .012	2	1			No
	High Carbon F-6180	250 - 400	200 - 700	.005 - .012					
	Alloyed Steel 4140, 4340	150 - 300	250 - 700						
	Tool Steel A-6, D-1, D-2	Up to 300							
Stainless Steel	300 Series, 304, 316	-	250 - 600	.004 - .008	3	2	1		May not be required at high speeds
	400 Series 15-5 PH	Up to 320	300 - 700	.005 - .010					
	13-8 PH	-	200 - 250	.004 - .008					Yes
Nickel Alloys	Inconel, Hastelloy, Waspalloy	-	75-120	.004 - .008	3	2	1		Yes
Titanium	6AL-4V	-	100 - 150	.004 - .008	3	2	1		Yes

IsoPlus High Feed - Series DD6H					IN2530	IN2505	IN2540	IN2510	IN6515	IN2035	Coolant
Material		Brinnell Hardness	SFM	Feed per Insert							
Cast Iron	Gray	150-250	600-1000	.030-.130				1	2		No
	Nodular		150-250					2	1		
Steel	Mild 1018, 1045	125-425	300-650	.025-.115	1	2	3				No
	Low Alloy 4140, 4340, 8620	150-425									
	Med Alloy P20, S7, H13, A2		300-700								
Stainless Steel	300 Series, 304, 316	Up to 320	200-550	.025-.110	2	3	4			1	May not be required at high speeds
	400 Series, 15-5 PH, 17-4 PH										
	13-8 PH										
Hardened Steel	All	-	200-400	.030-.050	2	1					No
Nickel Alloys	Inconel, Hastelloy, Waspalloy	-	75-120	.030-.080		3	2			1	Yes
Titanium	6AL-4V	-	100-150	.030-.060		2	3			1	Yes

DiPos TETRA - Series 1TJ1Q, TJ5Q, TJ6Q, 1TJ1N, TJ5N, TJ6N, TN1N					IN10K	IN2505	IN2510	IN2530	IN2540	IN6515	
Material		Brinnell Hardness	SFM	Feed per Insert							Coolant
Aluminum	6061-T6, 7075-T6, 2024	-	1500 - 8000	.004 - .018	1						Yes
Cast Iron	Gray	150 - 250	300 - 1000	.004 - .009		3	1			2	No
	Nodular		300 - 600			3	2			1	
Steel	Low Carbon 1018, 8620	150 - 250	400 - 1000	.004 - .009	2		1	3		No	
	High Carbon F-6180, Nitr alloy 52100	250 - 400	350 - 500	.004 - .007							
	Alloyed Steel 4140, 4340, 6150	150 - 300	300 - 700	.004 - .009							
	Tool Steel A-6, D-1, D-2, P20	Up to 300									
Stainless Steel	300 Series, 304, 316	-	300 - 550	.004 - .009	2		1	3		May not be required at high speeds	
	400 Series 15-5 PH, 17-4 PH	Up to 320	350 - 600							Yes	
	13-8 PH	-	200 - 400								
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy, Waspalloy	-	75-120	.003 - .006		2		1		Yes	
Titanium	6AL-4V	-	100 - 150	.005 - .008		2		1		Yes	

FormMasterShear - Series 15B1B, 1A7_					IN1030	IN6530	IN2530	IN2540	IN2505	IN055	Coolant
Material		Brinnell Hardness	SFM	Feed per Insert							
Aluminum	6061-T6, 7075-T6		1300-1650	.0075 - .047						1	YES
Cast Iron	Gray	190-220	360 - 690	.005 - .022		3	2		1		NO
	Nodular	140-200	140-200			3	2		1		NO
Steel	Low Carbon 1018-8620	85-175	721 - 985	.005 - .024			2		1		NO
	High Carbon F-6180	175 - 225	490 - 820	.005 - .024			2		1		NO
	Alloyed Steel 4140	275-325	325 - 590	.005 - .022			2	3	1		NO
	Tool Steel P20-H13	200-250	275 - 495	.005 - .022			2		1		NO
Stainless Steel	300 Series, 304, 316	-	360 - 590	.005 - .021	3	2	1		4		OPTIONAL
	400 Series 15-5 PH, 17-4 PH	-	360 - 720	.005 - .021	3	2	1		4		OPTIONAL
	13-8 PH	-	200 - 600	.005 - .015	3	2	1		4		OPTIONAL
Nickel Alloys	Inconel 600, 706, 718,	-	80 - 150	.004 - .017		2	1		3		YES
Titanium	903, Hastelloy	-	115 - 195	.004 - .017		2	1		3		YES

FormMaster R - Series 1DE1H, DE6H					Feed per Insert		IN2505	IN6530	IN2530	Coolant
Material		Brinnell Hardness	SFM	RNLU1205 MON-S	RNLU1205 MON-M					
Cast Iron	Gray	150 - 250	500 - 800	.007 - .020	.015 - .035	2	1		No	
	Nodular		450 - 800							
Steel	Low Carbon 1018, 8620	150 - 250	500 - 700	.007 - .020	.015 - .035	1	3	2	No	
	High Carbon F-6180	250 - 400	450 - 500	.007 - .020	.015 - .040	1	3	2		
	Alloyed Steel 4140	150 - 300								
	Tool Steel P20 - H13	Up to 300								
Stainless Steel	300 Series, 304, 316	Up to 320	250 - 500	.005 - .015	.010 - .020	2	3	1	Yes	
	400 Series 15-5 PH, 17-4 PH									
	13-8 PH									
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy	-	50 - 250	.003 - .015	.003 - .012	2	3	1	Yes	
Titanium	6AL-4V	-	50 - 250	.003 - .008	.003 - .008	2		1	Yes	

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.

FinishBall - Series 12A9, 12A5, 12A8					IN2005	IN2006	IN055	
Material		Brinnell Hardness	SFM	Feed per Insert				Coolant
Aluminum	6061-T6, 7075-T6	-	1000 - 8000	.003 - .006	2		1	Yes
Cast Iron	Gray	150 - 250	500 - 1200	.002 - .006	1			No
	Nodular		400 - 800					
Steel	Low Carbon 1018, 8620	150 - 250	600 - 1200	.002 - .006	1			No
	High Carbon F-6180	250 - 400*	400 - 600	.002 - .005	2	1		
	Alloyed Steel 4140	150 - 300	400 - 800		1	2		
	Tool Steel P20 - H13	Up to 460*			2	1		
Stainless Steel	300 Series, 304, 316	-	400 - 800	.002 - .005	1	2		No
	400 Series 15-5 PH, 17-4 PH	Up to 320	500-1000					Yes
	13-8 PH	-	200 - 400					
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy	75-120	75-120	.002 - .004	1	2		Yes
Titanium	6AL-4V	-	80 - 150	.002 - .005	1	2		Yes

*58 Rc & Above use IN2006

Pro-Trio - Series 2TW7K					IN2505	IN2530	IN6530	Coolant
Material		Brinnell Hardness	SFM	Feed per Insert				
Cast Iron	Gray	-	785-1250	.004-.020	1	2	3	No
	Nodular		590-940					
Steel	Low Carbon 1018, 8620	85-175	650-1150	.004-.020	1	2	3	No
	High Carbon F-6180	175-225	590-1050	.004-.016				
	Alloyed Steel 4140	275-325	390-820	.002-.014				
	Tool Steel P20 - H13	200-250	330-660	.006-.016				
Stainless Steel	300 Series, 304, 316	-	590-918	.003-.014	2	1	3	No
	400 Series 15-5 PH, 17-4 PH	-	650-985	.002-.018				Yes
	13-8 PH	-	200-400	.003-.015				
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy	-	65-265	.002-.008	2	1	3	Yes
Titanium	6AL-4V	-	130-360	.002-.012	2	1	3	Yes

*58 Rc & Above use IN2006

GoldMax4FFin - Series EF6J				Brinnell Hardness	SFM	Feed per Insert	IN2505	IN2530	IN4015	IN4030	Coolant
Material											
Cast Iron	Gray	150 - 250	800 - 1200	.025 - .050	2		1				
	Nodular		500 - 900								
Steel	Carbon Steel 1018, A-36, 1045	100 - 250	600 - 900	.025 - .050	1	3		2	No		
	Alloyed Steel 4140, 4340, 8620	150 - 300	500 - 800								
	Tool Steel A2, 01, P20, H13										
	Tool Steel D-2, M2									200 - 400	300 - 500
Stainless Steel	Free Machining 303, 416	150 - 250	500 - 800	.025 - .050	3	2		1	Yes		
	300 Series, 304, 316		300 - 500	.015 - .030							
	400 Series 15-5 PH										
	13-8 PH	200 - 400									
Nickel Alloys	Inconel 600, 706, 718, 903, Hastelloy, Waspalloy	200 - 350	75-150	.010 - .030	3	2		1	Yes		
Titanium	6AL-4V, Ti-10-2-3, Ti-5553	250 - 450	75 - 200	.020 - .040	3	2		1	Yes		

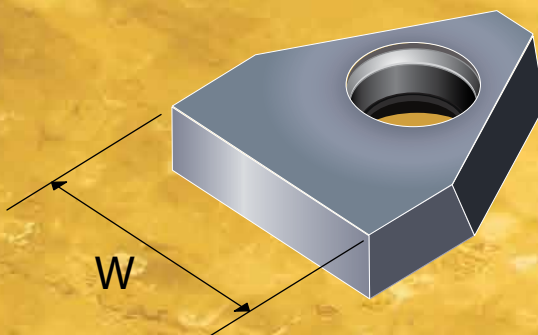
GoldMax 8 - Series VJ6V					IN2030	IN2530	IN4030	
Material		Brinnell Hardness	SFM	Feed per Insert				Coolant
Aluminum	6061-T6, 7075-T6, 2024	-	1500 - 8000	.004 - .016	1			Yes
Cast Iron	Gray	150 - 250	400 - 750	.004 - .012	2	3	1	No
	Nodular		300 - 650					
Steel	Low Carbon 1018, 8620	100 - 250	350 - 650	.004 - .012	2	3	1	No
	High Carbon F-6180	250 - 400	300 - 600	.004 - .008				
	Alloyed Steel 4140, 4340	150 - 300	250 - 500	.004 - .008				
	Tool Steel A2, 01, D2, P20	Up to 300						
Stainless Steel	300 Series, 304, 316	-	250 - 450	.004 - .010	2	3	1	May not be required at high speeds
	400 Series, 15-5 PH	Up to 320	300 - 600					
	13-8 PH	-	200 - 400					Yes
Nickel Alloys	Inconel, Hastelloy, Waspalloy	-	75-120	.003 - .006	2	3	1	Yes
Titanium	6-4, 10-2-3, 5-5-5-3	-	75 - 200	.003 - .006	2	3	1	Yes

*IN6515 preferred for higher SFM



INSERT FOR WIDE GROOVING APPLICATIONS

- Perfect for applications like ball bearings, taper roller bearings and miniature machined parts.
- Insert holder shank size*:
Inch: .500, .625, .750, 1.000, 1.250
Metric: 12x12, 16x16, 20x20, 25x25, 32x32
- Carbide Grades**:
P40A for Steel
K10 for Cast Iron
- Blank Widths (W):
10mm, 15mm, 20mm, 25mm



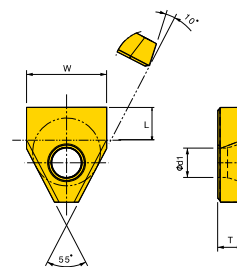
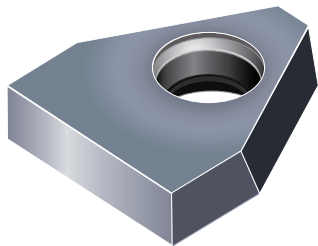
* Holders custom designed and manufactured to match insert form.

** Coated grades can also be provided.

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FINE GOLD 2013/2014

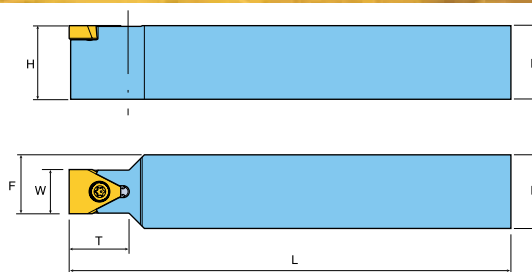
TGUX Semi-Finished Blank for External Profiles



Designation	W		T		D1		L		Grade	
	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	K10	P40A
TGUX1004	10.2	0.402	4.76	0.188	5.5	0.217	5.85	0.230	•	•
TGUX1504	15.2	0.598	4.76	0.188	5.5	0.217	5.85	0.230	•	•
TGUX2006	20.2	0.795	6.35	0.250	6	0.236	9.35	0.368	•	•
TGUX2506	25.2	0.992	6.35	0.250	6	0.236	9.25	0.364	•	•

• Marked: Standard items

TTLEN Holders



Designation	Dimensions (inch)						Inserts	Screw	Wrench	Torque
	H	B	F	T	L	W				
TTLEN12.7K10	0.500	0.500	0.45	0.79	5.0	0.394	TGUX1004...	TS40B100I	T-15	40
TTLEN15.9K10	0.625	0.625	0.51	0.79	5.0	0.394				
TTLEN19M10	0.750	0.750	0.57	0.79	6.0	0.394				
TTLEN25.4M10	1.000	1.000	0.70	0.79	6.0	0.394				
TTLEN15.9K15	0.625	0.625	0.61	0.79	5.0	0.591	TGUX1504...	TS45120I	T-20	44
TTLEN19M15	0.750	0.750	0.67	0.79	6.0	0.591				
TTLEN25.4M15	1.000	1.000	0.80	0.79	6.0	0.591				
TTLEN19K20	0.750	0.750	0.77	1.38	5.0	0.787	TGUX2006...	TS45120I	T-20	44
TTLEN25.4M20	1.000	1.000	0.89	1.38	6.0	0.787				
TTLEN31.8P20	1.250	1.250	1.02	1.38	7.0	0.787				
TTLEN19K25	0.750	0.750	0.87	1.38	5.0	0.984	TGUX2506...	TS45120I	T-20	44
TTLEN25.4M25	1.000	1.000	0.99	1.38	6.0	0.984				
TTLEN31.8P25	1.250	1.250	1.12	1.38	7.0	0.984				

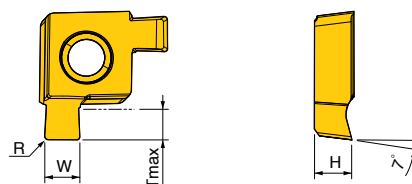


GROOVING WITH THE NEW STANDARD HOLDER

- Double ended insert.
- New holder design will accept standard XCMT insert or new XCMT-GV grooving insert.
- Pocket design protects the edge not in use.
- Smooth chip evacuation with thru coolant.
- Economical solution to add even more capability to an existing multifunctional tool.



XCMT GV

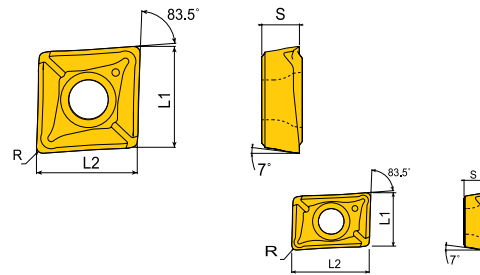


DESIGNATION	Dimensions (Inch)				Grade	TT9080
	W	Tmax	R	H		
XCMT 05R-200020 GV	0.079	0.071	0.008	0.090	•	
XCMT 06R-200020 GV	0.079	0.079	0.008	0.104	•	
XCMT 07R-250020 GV	0.098	0.079	0.008	0.134	•	
XCMT 08R-250020 GV	0.098	0.098	0.008	0.138	•	
XCMT 10R-300030 GV	0.118	0.118	0.012	0.171	•	
XCMT 13R-350030 GV	0.138	0.138	0.012	0.204	•	
XCMT 17R-400040 GV	0.157	0.157	0.016	0.236	•	

XCMT TC



Right hand shown (XCMT 0401)

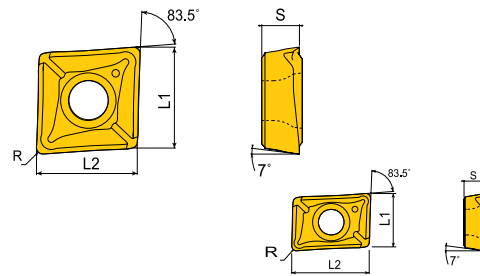


ANSI DESIGNATION	ISO DESIGNATION	Dimensions (Inch)				Grade	TT6030	TT8020	TT9030/ TT9080
		L1	L2	t	R				
XCMT040104LTC	XCMT040104LTC	0.173	0.252	0.067	0.016			•	•
XCMT040104RTC	XCMT040104RTC	0.173	0.252	0.067	0.016			•	•
XCMT050204TC	XCMT050204TC	0.220	0.220	0.083	0.016			•	•
XCMT060204TC	XCMT060204TC	0.252	0.252	0.094	0.016			•	•
XCMT070304TC	XCMT070304TC	0.295	0.295	0.125	0.016			•	•
XCMT080304TC	XCMT080304TC	0.331	0.331	0.125	0.016			•	•
XCMT10T304TC	XCMT10T304TC	0.413	0.413	0.156	0.016	•	•	•	•
XCMT10T308TC	XCMT10T308TC	0.413	0.413	0.156	0.031			•	•
XCMT130404 TC	XCMT130404TC	0.528	0.528	0.187	0.016				•
XCMT130408TC	XCMT130408TC	0.528	0.528	0.187	0.031			•	•
XCMT170508TC	XCMT170508TC	0.685	0.685	0.219	0.031			•	•

XCGT TA

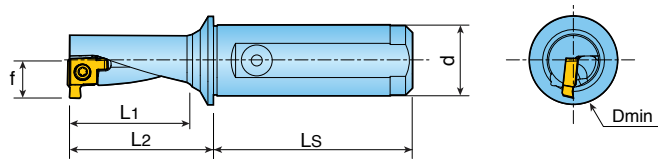


Right hand shown (XCGT 0401)



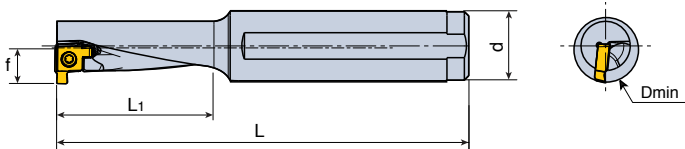
ANSI DESIGNATION	ISO DESIGNATION	Dimensions Inch (mm)				Grade	K10
		L1	L2	t	R		
XCGT040104LTA	XCGT040104LTA	0.252	0.173	0.187	0.016		•
XCGT040104RTA	XCGT040104RTA	0.252	0.173	0.187	0.016		•
XCGT050204TA	XCGT050204TA	0.225	0.220	0.083	0.016		•
XCGT060204TA	XCGT060204TA	0.252	0.252	0.094	0.016		•
XCGT070304TA	XCGT070304TA	0.295	0.295	0.125	0.016		•
XCGT080304TA	XCGT080304TA	0.331	0.331	0.125	0.016		•
XCGT10T304TA	XCGT10T304TA	0.413	0.413	0.156	0.016		•
XCGT130404TA	XCGT130404TA	0.528	0.528	0.187	0.016		•
XCGT170508TA	XCGT170508TA	0.689	0.689	0.219	0.031		•

2.25XD HOLDER



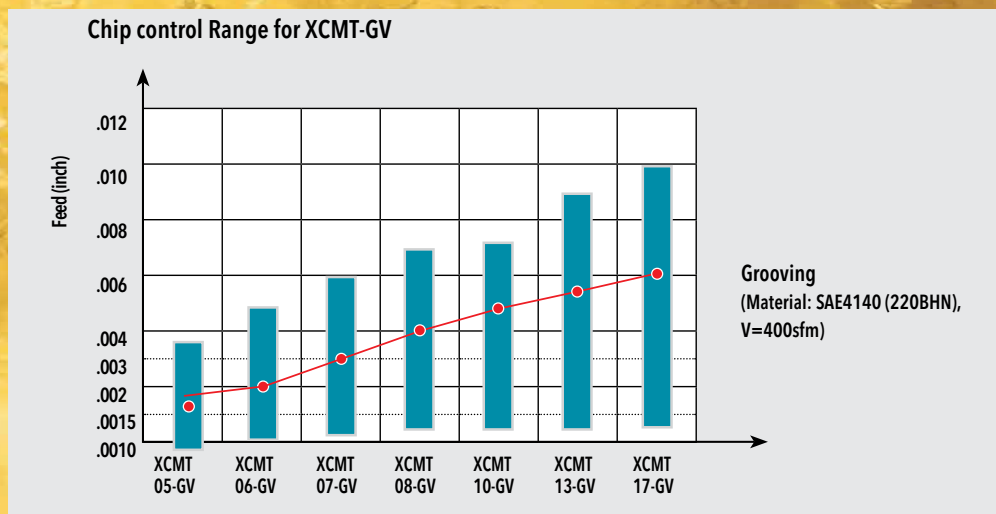
DESIGNATION	f	d	Dimensions (mm)				Screw	Wrench	Insert	Pipe Thread
			L1	L2	LS	Dmin				
TCAP 10R/L-2.25DN-IN-GV	.280	.500	.886	1.083	1.654	.472	TS 20038I/HG-P	T 6P	XCMT 05R/L200020GV	NPT 1/16
TCAP 12R/L-2.25DN-IN-GV	.335	.625	1.063	1.299	1.772	.571	TS 22052I/HG-P	T 7P	XCMT 06R/L200020GV	NPT 1/8
TCAP 14R/L-2.25DN-IN-GV	.374	.625	1.240	1.516	1.772	.650	TS 25064I/HG-P	T 8P	XCMT 07R/L250020GV	NPT 1/8
TCAP 16R/L-2.25DN-IN-GV	.437	.750	1.417	1.732	1.968	.748	TS 30100I/HG-P	T 9P	XCMT 08R/L250020GV	NPT 1/8
TCAP 20R/L-2.25DN-IN-GV	.520	1.000	1.772	2.165	2.205	.925	TS 35088I/HG-P	T 10P	XCMT 10R/L300030GV	NPT 1/8
TCAP 25R/L-2.25DN-IN-GV	.650	1.250	2.224	2.716	2.402	1.142	TS 45A100I/HG	T 20	XCMT 13R/L350030GV	NPT 1/8
TCAP 32R/L-2.25DN-IN-GV	.807	1.500	2.835	3.386	2.913	1.437	TS 45A100I/HG	T 20	XCMT 17R/L400040GV	NPT 1/8

3.0XD HOLDER

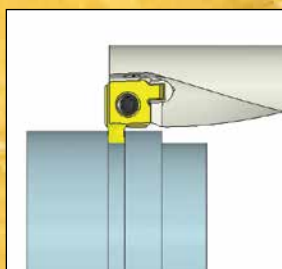


DESIGNATION	f	d	Dimensions (mm)			Screw	Wrench	Insert	Pipe Thread
			L1	L	Dmin				
TCAP 10R/L-3.0DN-IN-GV	.280	.500	.886	3.228	.472	TS 20038I/HG-P	T 6P	XCMT 05R/L200020GV	NPT 1/16
TCAP 12R/L-3.0DN-IN-GV	.335	.625	1.063	3.740	.571	TS 22052I/HG-P	T 7P	XCMT 06R/L200020GV	NPT 1/8
TCAP 14R/L-3.0DN-IN-GV	.374	.625	1.240	3.937	.650	TS 25064I/HG-P	T 8P	XCMT 07R/L250020GV	NPT 1/8
TCAP 16R/L-3.0DN-IN-GV	.437	.750	1.417	4.331	.748	TS 30100I/HG-P	T 9P	XCMT 08R/L250020GV	NPT 1/8
TCAP 20R/L-3.0DN-IN-GV	.520	1.000	1.772	5.118	.925	TS 35088I/HG-P	T 10P	XCMT 10R/L300030GV	NPT 1/8
TCAP 25R/L-3.0DN-IN-GV	.650	1.250	2.224	5.906	1.142	TS 45A100I/HG	T 20	XCMT 13R/L350030GV	NPT 1/8
TCAP 32R/L-3.0DN-IN-GV	.807	1.500	2.835	7.283	1.437	TS 45A100I/HG	T 20	XCMT 17R/L400040GV	NPT 1/8

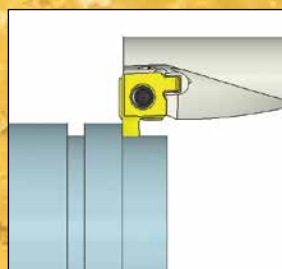
RECOMMENDED CUTTING CONDITIONS



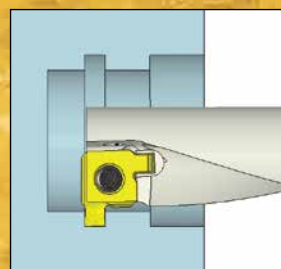
APPLICATION



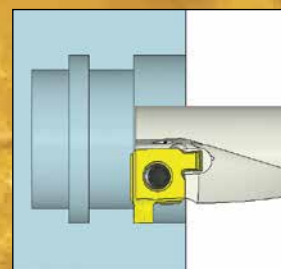
External Groove



External Turning



Internal Groove



Internal Turning





GOLD RUSH GRADES FOR HOLEMAKING

The ingenious solution that takes cutting tool materials to another level

Features

- Improved adhesion and insert chipping resistance
- Stable and extended tool life in continuous and interrupted cutting operations
- Reduced cutting friction and minimized built-up edge on exotic materials
- High quality surface finish on the work pieces



GOLD RUSH GRADES FOR HOLEMAKING APPLICATIONS

IN1030 (PVD) CAST IRON, STAINLESS, TITANIUM

Great for tough, slower speed applications. A good option when machine rigidity is an issue.

IN2505 (PVD) GENERAL PURPOSE

An improvement over the current IN2005 grade, IN2505 has a multi-layered PVD coating for a wide variety of materials.

IN6505 (CVD) STEEL APPLICATIONS

A 10µm thick layer has been added to the CVD coating that enhances toughness and wear resistance. It makes this grade suitable for high speed steel machining.

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GOLD•TWIST™

REPLACEABLE TIP DRILLS

Ingersoll Cutting Tool Company is proud to announce the expansion of **GOLD•TWIST** : The Next Generation of Replaceable Tip Drills. This new design is a standard product line with tip diameters ranging from .2756" - 1.0197" (7mm ~ 25.9mm) in 0.004" (.1mm) increments and drill bodies available in 1.5xD, 3xD, 5xD and 8xD length to diameter ratios.

The precision bodies have an improved pocket design and innovative clamping system that provide stable performance after multiple tip indexes. These drill bodies also feature twisted coolant holes, polished flutes, and a PVD-coating that allows smooth chip evacuation and prolonged body life. Each body accepts a range of tips that covers .040" (1mm).

The drill tips are offered in grade IN2505 which features a multi-layered PVD coating that provides excellent performance, improved wear resistance and increased tool life in a wide range of applications. With three cutting geometries, the "P" for Steel and General Purpose, the "M" geometry for Stainless Steels and Exotics and the "K" geometry for Irons, we can better meet our customers' needs.

Ingersoll's **GOLD•TWIST** Drilling Line is excellent in higher speed applications, providing guaranteed performance and excellent results in a unique, rigid and fast-indexing clamping system. The result is a product that combines cost efficiency and higher productivity in all your drilling applications.

• Twisted coolant hole with optimum flute design

• Polished flute for smooth chip evacuation

• PVD coated body for prolonged body life

- Innovative quick change system
- New IN2505 grade - Long tool life

• One drill body can cover 5-10 different tip diameters

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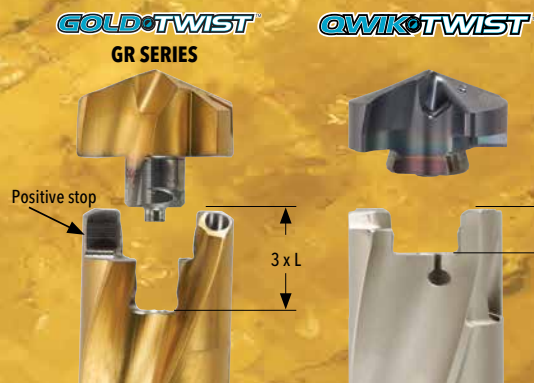
FINE GOLD 2013/2014

DRILL BODY COMPARISON: GOLD TWIST VS. QWIK TWIST

The new Gold Twist pocket design's contact/clamping area is three times deeper than our current Qwik Twist drill.

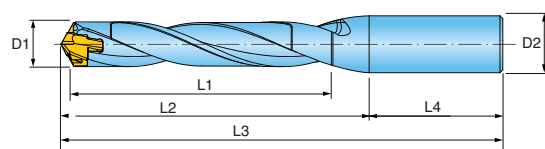
The accuracy of the added cylinder to the clamping area improves rigidity and helps reduce internal stresses.

The two precision ground positive stop locations improve the drilling tips' position and support.



CYLINDRICAL SHANKS

1.5XD



1.5XD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700010S4R01	0.2756	0.2913	0.43	0.500	N/A	0.99	1.77	2.760	7	KTD6.0-D9.9
TD0750011S4R01	0.2953	0.3110	0.44	0.500	N/A	1.02	1.77	2.790	7.5	KTD6.0-D9.9
TD0800012S4R01	0.3150	0.3504	0.47	0.500	N/A	1.10	1.77	2.870	8	KTD6.0-D9.9
TD0900013S4R01	0.3543	0.3898	0.55	0.500	N/A	1.15	1.77	2.920	9	KTD6.0-D9.9
TD1000015S6R01	0.3937	0.4291	0.59	0.625	N/A	1.23	1.89	3.120	10	KTD10.0-19.9
TD1100016S6R01	0.4331	0.4685	0.67	0.625	N/A	1.30	1.89	3.190	11	KTD10.0-19.9
TD1200018S6R01	0.4724	0.5079	0.71	0.625	N/A	1.38	1.89	3.270	12	KTD10.0-19.9
TD1300019S6R01	0.5118	0.5472	0.79	0.625	N/A	1.46	1.89	3.350	13	KTD10.0-19.9
TD1400021S6R01	0.5512	0.5866	0.83	0.625	N/A	1.62	1.89	3.510	14	KTD10.0-19.9
TD1500022S7R01	0.5906	0.6260	0.91	0.750	N/A	1.82	1.97	3.790	15	KTD10.0-19.9
TD1600024S7R01	0.6299	0.6654	0.94	0.750	N/A	1.94	1.97	3.910	16	KTD10.0-19.9
TD1700025S7R01	0.6693	0.7047	1.02	0.750	N/A	2.06	1.97	4.030	17	KTD10.0-19.9
TD1800027S1R01	0.7087	0.7441	1.06	1.000	N/A	2.19	2.20	4.390	18	KTD10.0-19.9
TD1900028S1R01	0.7480	0.7835	1.14	1.000	N/A	2.30	2.20	4.500	19	KTD10.0-19.9
TD2000030S1R01	0.7874	0.8228	1.18	1.000	N/A	2.43	2.20	4.630	20	KTD20.0-D26.9
TD2100031S1R01	0.8268	0.8622	1.26	1.000	N/A	2.55	2.20	4.750	21	KTD20.0-D26.9
TD2200033S1R01	0.8661	0.9016	1.30	1.000	N/A	2.67	2.20	4.870	22	KTD20.0-D26.9
TD2300034S9R01	0.9055	0.9409	1.38	1.250	N/A	2.79	2.36	5.150	23	KTD20.0-D26.9
TD2400036S9R01	0.9449	0.9803	1.42	1.250	N/A	2.91	2.36	5.270	24	KTD20.0-D26.9
TD2500037S9R01	0.9843	1.0197	1.50	1.250	N/A	3.03	2.36	5.390	25	KTD20.0-D26.9

CYLINDRICAL SHANKS

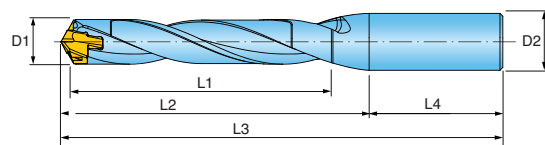
3XD



Drilling



Coolant



3xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700021S4R01	0.2756	0.2913	0.83	0.500	N/A	1.40	1.77	3.170	7	KTD6.0-D9.9
TD0750022S4R01	0.2953	0.3110	0.89	0.500	N/A	1.46	1.77	3.230	7.5	KTD6.0-D9.9
TD0800024S4R01	0.3150	0.3307	0.94	0.500	N/A	1.55	1.77	3.320	8	KTD6.0-D9.9
TD0850025S4R01	0.3346	0.3504	1.00	0.500	N/A	1.61	1.77	3.380	8.5	KTD6.0-D9.9
TD0900027S4R01	0.3543	0.3701	1.06	0.500	N/A	1.69	1.77	3.460	9	KTD6.0-D9.9
TD0950028S4R01	0.3740	0.3898	1.12	0.500	N/A	1.74	1.77	3.510	9.5	KTD6.0-D9.9
TD1000030S6R01	0.3937	0.4094	1.18	0.625	N/A	1.82	1.89	3.710	10	KTD10.0-19.9
TD1050031S6R01	0.4134	0.4291	1.26	0.625	N/A	1.88	1.89	3.770	10.5	KTD10.0-19.9
TD1100033S6R01	0.4331	0.4488	1.30	0.625	N/A	1.95	1.89	3.840	11	KTD10.0-19.9
TD1150034S6R01	0.4528	0.4685	1.38	0.625	N/A	2.01	1.89	3.900	11.5	KTD10.0-19.9
TD1200036S6R01	0.4724	0.4882	1.42	0.625	N/A	2.09	1.89	3.980	12	KTD10.0-19.9
TD1250037S6R01	0.4921	0.5079	1.46	0.625	N/A	2.15	1.89	4.040	12.5	KTD10.0-19.9
TD1300039S6R01	0.5118	0.5276	1.54	0.625	N/A	2.23	1.89	4.120	13	KTD10.0-19.9
TD1350040S6R01	0.5315	0.5472	1.61	0.625	N/A	2.29	1.89	4.180	13.5	KTD10.0-19.9
TD1400042S6R01	0.5512	0.5669	1.65	0.625	N/A	2.44	1.89	4.330	14	KTD10.0-19.9
TD1450043S6R01	0.5709	0.5866	1.73	0.625	N/A	2.50	1.89	4.390	14.5	KTD10.0-19.9
TD1500045S7R01	0.5906	0.6260	1.77	0.750	N/A	2.70	1.97	4.670	15	KTD10.0-19.9
TD1600048S7R01	0.6299	0.6654	1.89	0.750	N/A	2.89	1.97	4.860	16	KTD10.0-19.9
TD1700051S7R01	0.6693	0.7047	2.01	0.750	N/A	3.07	1.97	5.040	17	KTD10.0-19.9
TD1800054S1R01	0.7087	0.7441	2.13	1.000	N/A	3.25	2.20	5.450	18	KTD10.0-19.9
TD1900057S1R01	0.7480	0.7835	2.24	1.000	N/A	3.43	2.20	5.630	19	KTD10.0-19.9
TD2000060S1R01	0.7874	0.8228	2.36	1.000	N/A	3.61	2.20	5.810	20	KTD20.0-D26.9
TD2100063S1R01	0.8268	0.8622	2.48	1.000	N/A	3.79	2.20	5.990	21	KTD20.0-D26.9
TD2200066S1R01	0.8661	0.9016	2.60	1.000	N/A	3.97	2.20	6.170	22	KTD20.0-D26.9
TD2300069S9R01	0.9055	0.9409	2.72	1.250	N/A	4.15	2.36	6.510	23	KTD20.0-D26.9
TD2400072S9R01	0.9449	0.9803	2.83	1.250	N/A	4.33	2.36	6.690	24	KTD20.0-D26.9
TD2500075S9R01	0.9843	1.0197	2.95	1.250	N/A	4.51	2.36	6.870	25	KTD20.0-D26.9

CYLINDRICAL SHANKS

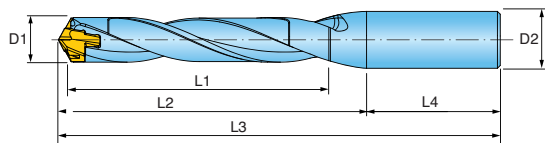
5XD



Drilling



Coolant



5xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700035S4R01	0.2756	0.2913	1.38	0.500	N/A	1.95	1.77	3.720	7	KTD6.0-D9.9
TD0750037S4R01	0.2953	0.3110	1.48	0.500	N/A	2.05	1.77	3.820	7.5	KTD6.0-D9.9
TD0800040S4R01	0.3150	0.3307	1.57	0.500	N/A	2.18	1.77	3.950	8	KTD6.0-D9.9
TD0850042S4R01	0.3346	0.3504	1.67	0.500	N/A	2.28	1.77	4.050	8.5	KTD6.0-D9.9
TD0900045S4R01	0.3543	0.3701	1.77	0.500	N/A	2.39	1.77	4.160	9	KTD6.0-D9.9
TD0950047S4R01	0.3740	0.3898	1.87	0.500	N/A	2.49	1.77	4.260	9.5	KTD6.0-D9.9
TD1000050S6R01	0.3937	0.4094	1.97	0.625	N/A	2.61	1.89	4.500	10	KTD10.0-19.9
TD1050052S6R01	0.4134	0.4291	2.09	0.625	N/A	2.70	1.89	4.590	10.5	KTD10.0-19.9
TD1100055S6R01	0.4331	0.4488	2.17	0.625	N/A	2.82	1.89	4.710	11	KTD10.0-19.9
TD1150057S6R01	0.4528	0.4685	2.28	0.625	N/A	2.92	1.89	4.810	11.5	KTD10.0-19.9
TD1200060S6R01	0.4724	0.4882	2.36	0.625	N/A	3.03	1.89	4.920	12	KTD10.0-19.9
TD1250062S6R01	0.4921	0.5079	2.44	0.625	N/A	3.13	1.89	5.020	12.5	KTD10.0-19.9
TD1300065S6R01	0.5118	0.5276	2.56	0.625	N/A	3.25	1.89	5.140	13	KTD10.0-19.9
TD1350067S6R01	0.5315	0.5472	2.68	0.625	N/A	3.35	1.89	5.240	13.5	KTD10.0-19.9
TD1400070S6R01	0.5512	0.5669	2.76	0.625	N/A	3.55	1.89	5.440	14	KTD10.0-19.9
TD1450072S6R01	0.5709	0.5866	2.87	0.625	N/A	3.65	1.89	5.540	14.5	KTD10.0-19.9
TD1500075S7R01	0.5906	0.6260	2.95	0.750	N/A	3.89	1.97	5.860	15	KTD10.0-19.9
TD1600080S7R01	0.6299	0.6654	3.15	0.750	N/A	4.15	1.97	6.120	16	KTD10.0-19.9
TD1700085S7R01	0.6693	0.7047	3.35	0.750	N/A	4.41	1.97	6.380	17	KTD10.0-19.9
TD1800090S1R01	0.7087	0.7441	3.54	1.000	N/A	4.67	2.20	6.870	18	KTD10.0-19.9
TD1900095S1R01	0.7480	0.7835	3.74	1.000	N/A	4.92	2.20	7.120	19	KTD10.0-19.9
TD2000100S1R01	0.7874	0.8228	3.94	1.000	N/A	5.18	2.20	7.380	20	KTD20.0-D26.9
TD2100105S1R01	0.8268	0.8622	4.13	1.000	N/A	5.44	2.20	7.640	21	KTD20.0-D26.9
TD2200110S1R01	0.8661	0.9016	4.33	1.000	N/A	5.70	2.20	7.900	22	KTD20.0-D26.9
TD2300115S9R01	0.9055	0.9409	4.53	1.250	N/A	5.96	2.36	8.320	23	KTD20.0-D26.9
TD2400120S9R01	0.9449	0.9803	4.72	1.250	N/A	6.22	2.36	8.580	24	KTD20.0-D26.9
TD2500125S9R01	0.9843	1.0197	4.92	1.250	N/A	6.48	2.36	8.840	25	KTD20.0-D26.9

CYLINDRICAL SHANKS

8XD



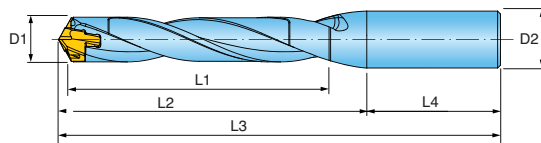
Drilling



Coolant



NOTE: We strongly recommend the use of a 1.5:1 or 3:1 Gold•Twist drill of the same diameter to drill a centering starter hole. The use of a centering starter hole improves hole location, accuracy, roundness, straightness and surface finish.



8xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700056S4R01	0.2756	0.2913	2.20	0.500	N/A	2.78	1.77	4.550	7	KTD6.0-D9.9
TD0750060S4R01	0.2953	0.3110	2.28	0.500	N/A	2.94	1.77	4.710	7.5	KTD6.0-D9.9
TD0800064S4R01	0.3150	0.3307	2.52	0.500	N/A	3.13	1.77	4.900	8	KTD6.0-D9.9
TD0850068S4R01	0.3346	0.3504	2.68	0.500	N/A	3.32	1.77	5.090	8.5	KTD6.0-D9.9
TD0900072S4R01	0.3543	0.3701	2.83	0.500	N/A	3.46	1.77	5.230	9	KTD6.0-D9.9
TD0950076S4R01	0.3740	0.3898	2.99	0.500	N/A	3.65	1.77	5.420	9.5	KTD6.0-D9.9
TD1000080S6R01	0.3937	0.4094	3.15	0.625	N/A	3.79	1.89	5.680	10	KTD10.0-19.9
TD1050084S6R01	0.4134	0.4291	3.31	0.625	N/A	3.94	1.89	5.830	10.5	KTD10.0-19.9
TD1100088S6R01	0.4331	0.4488	3.46	0.625	N/A	4.12	1.89	6.010	11	KTD10.0-19.9
TD1150092S6R01	0.4528	0.4685	3.62	0.625	N/A	4.28	1.89	6.170	11.5	KTD10.0-19.9
TD1200096S6R01	0.4724	0.4882	3.78	0.625	N/A	4.45	1.89	6.340	12	KTD10.0-19.9
TD1250100S6R01	0.4921	0.5079	3.94	0.625	N/A	4.61	1.89	6.500	12.5	KTD10.0-19.9
TD1300104S6R01	0.5118	0.5276	4.09	0.625	N/A	4.79	1.89	6.680	13	KTD10.0-19.9
TD1350108S6R01	0.5315	0.5472	4.25	0.625	N/A	4.94	1.89	6.830	13.5	KTD10.0-19.9
TD1400112S6R01	0.5512	0.5669	4.41	0.625	N/A	5.20	1.89	7.090	14	KTD10.0-19.9
TD1450116S6R01	0.5709	0.5866	4.57	0.625	N/A	5.36	1.89	7.250	14.5	KTD10.0-19.9
TD1500120S7R01	0.5906	0.6260	4.72	0.750	N/A	5.66	1.97	7.630	15	KTD10.0-19.9
TD1600128S7R01	0.6299	0.6654	5.04	0.750	N/A	6.04	1.97	8.010	16	KTD10.0-19.9
TD1700136S7R01	0.6693	0.7047	5.35	0.750	N/A	6.41	1.97	8.380	17	KTD10.0-19.9
TD1800144S1R01	0.7087	0.7441	5.67	1.000	N/A	6.79	2.20	8.990	18	KTD10.0-19.9
TD1900152S1R01	0.7480	0.7835	5.98	1.000	N/A	7.17	2.20	9.370	19	KTD10.0-19.9
TD2000160S1R01	0.7874	0.8228	6.30	1.000	N/A	7.54	2.20	9.740	20	KTD20.0-D26.9
TD2100168S1R01	0.8268	0.8622	6.61	1.000	N/A	7.92	2.20	10.120	21	KTD20.0-D26.9
TD2200176S1R01	0.8661	0.9016	6.93	1.000	N/A	8.30	2.20	10.500	22	KTD20.0-D26.9
TD2300184S9R01	0.9055	0.9409	7.24	1.250	N/A	8.68	2.36	11.040	23	KTD20.0-D26.9
TD2400192S9R01	0.9449	0.9803	7.56	1.250	N/A	9.06	2.36	11.420	24	KTD20.0-D26.9
TD2500200S9R01	0.9843	1.0197	7.87	1.250	N/A	9.43	2.36	11.790	25	KTD20.0-D26.9

WELDON & ISO9766 SHANKS

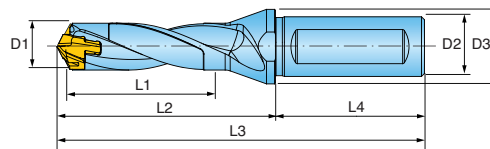
1.5XD



Drilling



Coolant



1.5xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700010B9R01	0.2756	0.2913	0.43	0.500	0.63	0.99	1.77	2.760	7	KTD6.0-D9.9
TD0750011B9R01	0.2953	0.3110	0.44	0.500	0.63	1.02	1.77	2.790	7.5	KTD6.0-D9.9
TD0800012B9R01	0.3150	0.3504	0.47	0.500	0.63	1.10	1.77	2.870	8	KTD6.0-D9.9
TD0900013B9R01	0.3543	0.3898	0.55	0.500	0.63	1.15	1.77	2.920	9	KTD6.0-D9.9
TD1000015C0R01	0.3937	0.4291	0.59	0.625	0.79	1.23	1.89	3.120	10	KTD10.0-19.9
TD1100016C0R01	0.4331	0.4685	0.67	0.625	0.79	1.30	1.89	3.190	11	KTD10.0-19.9
TD1200018C0R01	0.4724	0.5079	0.71	0.625	0.79	1.38	1.89	3.270	12	KTD10.0-19.9
TD1300019C0R01	0.5118	0.5472	0.79	0.625	0.79	1.46	1.89	3.350	13	KTD10.0-19.9
TD1400021C0R01	0.5512	0.5866	0.83	0.625	0.79	1.62	1.89	3.510	14	KTD10.0-19.9
TD150002218R01	0.5906	0.6260	0.91	0.750	0.98	1.82	1.97	3.790	15	KTD10.0-19.9
TD160002418R01	0.6299	0.6654	0.94	0.750	0.98	1.94	1.97	3.910	16	KTD10.0-19.9
TD170002518R01	0.6693	0.7047	1.02	0.750	0.98	2.06	1.97	4.030	17	KTD10.0-19.9
TD1800027C8R01	0.7087	0.7441	1.06	1.000	1.26	2.19	2.20	4.390	18	KTD10.0-19.9
TD1900028C8R01	0.7480	0.7835	1.14	1.000	1.26	2.30	2.20	4.500	19	KTD10.0-19.9
TD2000030C8R01	0.7874	0.8228	1.18	1.000	1.26	2.43	2.20	4.630	20	KTD20.0-D26.9
TD2100031C8R01	0.8268	0.8622	1.26	1.000	1.26	2.55	2.20	4.750	21	KTD20.0-D26.9
TD2200033C8R01	0.8661	0.9016	1.30	1.000	1.26	2.67	2.20	4.870	22	KTD20.0-D26.9
TD2300034B7R01	0.9055	0.9409	1.38	1.250	1.65	2.79	2.36	5.150	23	KTD20.0-D26.9
TD2400036B7R01	0.9449	0.9803	1.42	1.250	1.65	2.91	2.36	5.270	24	KTD20.0-D26.9
TD2500037B7R01	0.9843	1.0197	1.50	1.250	1.65	3.03	2.36	5.390	25	KTD20.0-D26.9

WELDON & ISO9766 SHANKS

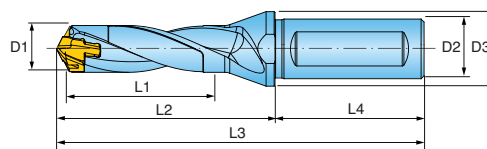
3XD



Drilling



Coolant



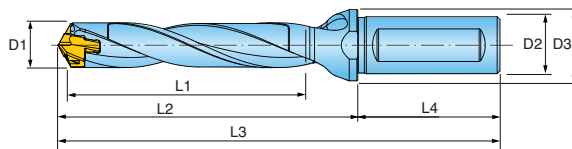
3xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700021B9R01	0.2756	0.2913	0.83	0.500	0.63	1.40	1.77	3.170	7	KTD6.0-D9.9
TD0750022B9R01	0.2953	0.3110	0.89	0.500	0.63	1.46	1.77	3.230	7.5	KTD6.0-D9.9
TD0800024B9R01	0.3150	0.3307	0.94	0.500	0.63	1.55	1.77	3.320	8	KTD6.0-D9.9
TD0850025B9R01	0.3346	0.3504	1.00	0.500	0.63	1.61	1.77	3.380	8.5	KTD6.0-D9.9
TD0900027B9R01	0.3543	0.3701	1.06	0.500	0.63	1.69	1.77	3.460	9	KTD6.0-D9.9
TD0950028B9R01	0.3740	0.3898	1.12	0.500	0.63	1.74	1.77	3.510	9.5	KTD6.0-D9.9
TD1000030C0R01	0.3937	0.4094	1.18	0.625	0.79	1.82	1.89	3.710	10	KTD10.0-19.9
TD1050031C0R01	0.4134	0.4291	1.26	0.625	0.79	1.88	1.89	3.770	10.5	KTD10.0-19.9
TD1100033C0R01	0.4331	0.4488	1.30	0.625	0.79	1.95	1.89	3.840	11	KTD10.0-19.9
TD1150034C0R01	0.4528	0.4685	1.38	0.625	0.79	2.01	1.89	3.900	11.5	KTD10.0-19.9
TD1200036C0R01	0.4724	0.4882	1.42	0.625	0.79	2.09	1.89	3.980	12	KTD10.0-19.9
TD1250037C0R01	0.4921	0.5079	1.46	0.625	0.79	2.15	1.89	4.040	12.5	KTD10.0-19.9
TD1300039C0R01	0.5118	0.5276	1.54	0.625	0.79	2.23	1.89	4.120	13	KTD10.0-19.9
TD1350040C0R01	0.5315	0.5472	1.61	0.625	0.79	2.29	1.89	4.180	13.5	KTD10.0-19.9
TD1400042C0R01	0.5512	0.5669	1.65	0.625	0.79	2.44	1.89	4.330	14	KTD10.0-19.9
TD1450043C0R01	0.5709	0.5866	1.73	0.625	0.79	2.50	1.89	4.390	14.5	KTD10.0-19.9
TD150004518R01	0.5906	0.6260	1.77	0.750	0.98	2.70	1.97	4.670	15	KTD10.0-19.9
TD160004818R01	0.6299	0.6654	1.89	0.750	0.98	2.89	1.97	4.860	16	KTD10.0-19.9
TD170005118R01	0.6693	0.7047	2.01	0.750	0.98	3.07	1.97	5.040	17	KTD10.0-19.9
TD1800054C8R01	0.7087	0.7441	2.13	1.000	1.26	3.25	2.20	5.450	18	KTD10.0-19.9
TD1900057C8R01	0.7480	0.7835	2.24	1.000	1.26	3.43	2.20	5.630	19	KTD10.0-19.9
TD2000060C8R01	0.7874	0.8228	2.36	1.000	1.26	3.61	2.20	5.810	20	KTD20.0-D26.9
TD2100063C8R01	0.8268	0.8622	2.48	1.000	1.26	3.79	2.20	5.990	21	KTD20.0-D26.9
TD2200066C8R01	0.8661	0.9016	2.60	1.000	1.26	3.97	2.20	6.170	22	KTD20.0-D26.9
TD2300069B7R01	0.9055	0.9409	2.72	1.250	1.65	4.15	2.36	6.510	23	KTD20.0-D26.9
TD2400072B7R01	0.9449	0.9803	2.83	1.250	1.65	4.33	2.36	6.690	24	KTD20.0-D26.9
TD2500075B7R01	0.9843	1.0197	2.95	1.250	1.65	4.51	2.36	6.870	25	KTD20.0-D26.9

WELDON & ISO9766 SHANKS

5XD



Coolant



5xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700035B9R01	0.2756	0.2913	1.38	0.500	0.63	1.95	1.77	3.720	7	KTD6.0-D9.9
TD0750037B9R01	0.2953	0.3110	1.48	0.500	0.63	2.05	1.77	3.820	7.5	KTD6.0-D9.9
TD0800040B9R01	0.3150	0.3307	1.57	0.500	0.63	2.18	1.77	3.950	8	KTD6.0-D9.9
TD0850042B9R01	0.3346	0.3504	1.67	0.500	0.63	2.28	1.77	4.050	8.5	KTD6.0-D9.9
TD0900045B9R01	0.3543	0.3701	1.77	0.500	0.63	2.39	1.77	4.160	9	KTD6.0-D9.9
TD0950047B9R01	0.3740	0.3898	1.87	0.500	0.63	2.49	1.77	4.260	9.5	KTD6.0-D9.9
TD1000050C0R01	0.3937	0.4094	1.97	0.625	0.79	2.61	1.89	4.500	10	KTD10.0-19.9
TD1050052C0R01	0.4134	0.4291	2.09	0.625	0.79	2.70	1.89	4.590	10.5	KTD10.0-19.9
TD1100055C0R01	0.4331	0.4488	2.17	0.625	0.79	2.82	1.89	4.710	11	KTD10.0-19.9
TD1150057C0R01	0.4528	0.4685	2.28	0.625	0.79	2.92	1.89	4.810	11.5	KTD10.0-19.9
TD1200060C0R01	0.4724	0.4882	2.36	0.625	0.79	3.03	1.89	4.920	12	KTD10.0-19.9
TD1250062C0R01	0.4921	0.5079	2.44	0.625	0.79	3.13	1.89	5.020	12.5	KTD10.0-19.9
TD1300065C0R01	0.5118	0.5276	2.56	0.625	0.79	3.25	1.89	5.140	13	KTD10.0-19.9
TD1350067C0R01	0.5315	0.5472	2.68	0.625	0.79	3.35	1.89	5.240	13.5	KTD10.0-19.9
TD1400070C0R01	0.5512	0.5669	2.76	0.625	0.79	3.55	1.89	5.440	14	KTD10.0-19.9
TD1450072C0R01	0.5709	0.5866	2.87	0.625	0.79	3.65	1.89	5.540	14.5	KTD10.0-19.9
TD150007518R01	0.5906	0.6260	2.95	0.750	0.98	3.89	1.97	5.860	15	KTD10.0-19.9
TD160008018R01	0.6299	0.6654	3.15	0.750	0.98	4.15	1.97	6.120	16	KTD10.0-19.9
TD170008518R01	0.6693	0.7047	3.35	0.750	0.98	4.41	1.97	6.380	17	KTD10.0-19.9
TD1800090C8R01	0.7087	0.7441	3.54	1.000	1.26	4.67	2.20	6.870	18	KTD10.0-19.9
TD1900095C8R01	0.7480	0.7835	3.74	1.000	1.26	4.92	2.20	7.120	19	KTD10.0-19.9
TD2000100C8R01	0.7874	0.8228	3.94	1.000	1.26	5.18	2.20	7.380	20	KTD20.0-D26.9
TD2100105C8R01	0.8268	0.8622	4.13	1.000	1.26	5.44	2.20	7.640	21	KTD20.0-D26.9
TD2200110C8R01	0.8661	0.9016	4.33	1.000	1.26	5.70	2.20	7.900	22	KTD20.0-D26.9
TD2300115B7R01	0.9055	0.9409	4.53	1.250	1.65	5.96	2.36	8.320	23	KTD20.0-D26.9
TD2400120B7R01	0.9449	0.9803	4.72	1.250	1.65	6.22	2.36	8.580	24	KTD20.0-D26.9
TD2500125B7R01	0.9843	1.0197	4.92	1.250	1.65	6.48	2.36	8.840	25	KTD20.0-D26.9

WELDON & ISO9766 SHANKS

8XD



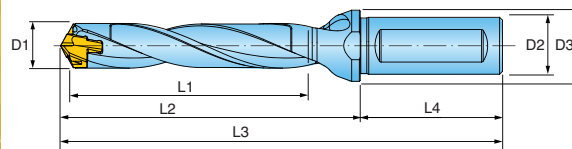
Drilling



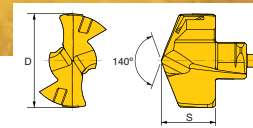
Coolant



NOTE: We strongly recommend the use of a 1.5:1 or 3:1 Gold•Twist drill of the same diameter to drill a centering starter hole. The use of a centering starter hole improves hole location, accuracy, roundness, straightness and surface finish.

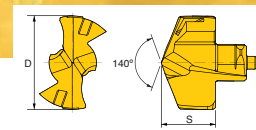


8xD	D1 Tip Diameter Range		L1 DOC	D2 Shank Dia.	D3 Fig Dia.	L2 Ext.	L4 Shank Length	L3 OAL	Pocket Size	Key
TD0700056B9R01	0.2756	0.2913	0.43	0.500	0.63	0.99	1.77	2.760	7	KTD6.0-D9.9
TD0750060B9R01	0.2953	0.3110	2.28	0.500	0.63	2.94	1.77	4.710	7.5	KTD6.0-D9.9
TD0800064B9R01	0.3150	0.3307	2.52	0.500	0.63	3.13	1.77	4.900	8	KTD6.0-D9.9
TD0850068B9R01	0.3346	0.3504	2.68	0.500	0.63	3.32	1.77	5.090	8.5	KTD6.0-D9.9
TD0900072B9R01	0.3543	0.3701	2.83	0.500	0.63	3.46	1.77	5.230	9	KTD6.0-D9.9
TD0950076B9R01	0.3740	0.3898	2.99	0.500	0.63	3.65	1.77	5.420	9.5	KTD6.0-D9.9
TD1000080C0R01	0.3937	0.4094	3.15	0.625	0.79	3.79	1.89	5.680	10	KTD10.0-19.9
TD1050084C0R01	0.4134	0.4291	3.31	0.625	0.79	3.94	1.89	5.830	10.5	KTD10.0-19.9
TD1100088C0R01	0.4331	0.4488	3.46	0.625	0.79	4.12	1.89	6.010	11	KTD10.0-19.9
TD1150092C0R01	0.4528	0.4685	3.62	0.625	0.79	4.28	1.89	6.170	11.5	KTD10.0-19.9
TD1200096C0R01	0.4724	0.4882	3.78	0.625	0.79	4.45	1.89	6.340	12	KTD10.0-19.9
TD1250100C0R01	0.4921	0.5079	3.94	0.625	0.79	4.61	1.89	6.500	12.5	KTD10.0-19.9
TD1300104C0R01	0.5118	0.5276	4.09	0.625	0.79	4.79	1.89	6.680	13	KTD10.0-19.9
TD1350108C0R01	0.5315	0.5472	4.25	0.625	0.79	4.94	1.89	6.830	13.5	KTD10.0-19.9
TD1400112C0R01	0.5512	0.5669	4.41	0.625	0.79	5.20	1.89	7.090	14	KTD10.0-19.9
TD1450116C0R01	0.5709	0.5866	4.57	0.625	0.79	5.36	1.89	7.250	14.5	KTD10.0-19.9
TD150012018R01	0.5906	0.6260	4.72	0.750	0.98	5.66	1.97	7.630	15	KTD10.0-19.9
TD160012818R01	0.6299	0.6654	5.04	0.750	0.98	6.04	1.97	8.010	16	KTD10.0-19.9
TD170013618R01	0.6693	0.7047	5.35	0.750	0.98	6.41	1.97	8.380	17	KTD10.0-19.9
TD1800144C8R01	0.7087	0.7441	5.67	1.000	1.26	6.79	2.20	8.990	18	KTD10.0-19.9
TD1900152C8R01	0.7480	0.7835	5.98	1.000	1.26	7.17	2.20	9.370	19	KTD10.0-19.9
TD2000160C8R01	0.7874	0.8228	6.30	1.000	1.26	7.54	2.20	9.740	20	KTD20.0-D26.9
TD2100168C8R01	0.8268	0.8622	6.61	1.000	1.26	7.92	2.20	10.120	21	KTD20.0-D26.9
TD2200176C8R01	0.8661	0.9016	6.93	1.000	1.26	8.30	2.20	10.500	22	KTD20.0-D26.9
TD2300184B7R01	0.9055	0.9409	7.24	1.250	1.65	8.68	2.36	11.040	23	KTD20.0-D26.9
TD2400192B7R01	0.9449	0.9803	7.56	1.250	1.65	9.06	2.36	11.420	24	KTD20.0-D26.9
TD2500200B7R01	0.9843	1.0197	7.87	1.250	1.65	9.43	2.36	11.790	25	KTD20.0-D26.9



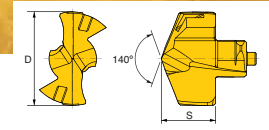
TIPS

"P" Geometry Steel	"M" Geometry Stainless Steel	"K" Geometry Cast Iron	(D) Diameter		S Dim (inch)	Pocket Size	Grade
(mm)	(inch)						
TPA0700R01	TMA0700R01	TKA0700R01	7.0	0.2756	0.181	7	IN2505
TPA0710R01	TMA0710R01	TKA0710R01	7.1	0.2795	0.181	7	IN2505
TPA0720R01	TMA0720R01	TKA0720R01	7.2	0.2835	0.181	7	IN2505
TPA0730R01	TMA0730R01	TKA0730R01	7.3	0.2874	0.181	7	IN2505
TPA0740R01	TMA0740R01	TKA0740R01	7.4	0.2913	0.181	7	IN2505
TPA0750R01	TMA0750R01	TKA0750R01	7.5	0.2953	0.181	7.5	IN2505
TPA0760R01	TMA0760R01	TKA0760R01	7.6	0.2992	0.181	7.5	IN2505
TPA0770R01	TMA0770R01	TKA0770R01	7.7	0.3031	0.181	7.5	IN2505
TPA0780R01	TMA0780R01	TKA0780R01	7.8	0.3071	0.181	7.5	IN2505
TPA0790R01	TMA0790R01	TKA0790R01	7.9	0.3110	0.181	7.5	IN2505
TPA0800R01	TMA0800R01	TKA0800R01	8.0	0.3150	0.213	8	IN2505
TPA0810R01	TMA0810R01	TKA0810R01	8.1	0.3189	0.213	8	IN2505
TPA0820R01	TMA0820R01	TKA0820R01	8.2	0.3228	0.213	8	IN2505
TPA0830R01	TMA0830R01	TKA0830R01	8.3	0.3268	0.213	8	IN2505
TPA0840R01	TMA0840R01	TKA0840R01	8.4	0.3307	0.213	8	IN2505
TPA0850R01	TMA0850R01	TKA0850R01	8.5	0.3346	0.213	8.5	IN2505
TPA0860R01	TMA0860R01	TKA0860R01	8.6	0.3386	0.213	8.5	IN2505
TPA0870R01	TMA0870R01	TKA0870R01	8.7	0.3425	0.213	8.5	IN2505
TPA0880R01	TMA0880R01	TKA0880R01	8.8	0.3465	0.213	8.5	IN2505
TPA0890R01	TMA0890R01	TKA0890R01	8.9	0.3504	0.213	8.5	IN2505
TPA0900R01	TMA0900R01	TKA0900R01	9.0	0.3543	0.228	9	IN2505
TPA0910R01	TMA0910R01	TKA0910R01	9.1	0.3583	0.228	9	IN2505
TPA0920R01	TMA0920R01	TKA0920R01	9.2	0.3622	0.228	9	IN2505
TPA0930R01	TMA0930R01	TKA0930R01	9.3	0.3661	0.228	9	IN2505
TPA0940R01	TMA0940R01	TKA0940R01	9.4	0.3701	0.228	9	IN2505
TPA0950R01	TMA0950R01	TKA0950R01	9.5	0.3740	0.228	9.5	IN2505
TPA0960R01	TMA0960R01	TKA0960R01	9.6	0.3780	0.228	9.5	IN2505
TPA0970R01	TMA0970R01	TKA0970R01	9.7	0.3819	0.228	9.5	IN2505
TPA0980R01	TMA0980R01	TKA0980R01	9.8	0.3858	0.228	9.5	IN2505
TPA0990R01	TMA0990R01	TKA0990R01	9.9	0.3898	0.228	9.5	IN2505
TPA1000R01	TMA1000R01	TKA1000R01	10.0	0.3937	0.244	10	IN2505
TPA1010R01	TMA1010R01	TKA1010R01	10.1	0.3976	0.244	10	IN2505
TPA1020R01	TMA1020R01	TKA1020R01	10.2	0.4016	0.244	10	IN2505
TPA1030R01	TMA1030R01	TKA1030R01	10.3	0.4055	0.244	10	IN2505
TPA1040R01	TMA1040R01	TKA1040R01	10.4	0.4094	0.244	10	IN2505
TPA1050R01	TMA1050R01	TKA1050R01	10.5	0.4134	0.244	10.5	IN2505
TPA1060R01	TMA1060R01	TKA1060R01	10.6	0.4173	0.244	10.5	IN2505
TPA1070R01	TMA1070R01	TKA1070R01	10.7	0.4213	0.244	10.5	IN2505
TPA1080R01	TMA1080R01	TKA1080R01	10.8	0.4252	0.244	10.5	IN2505
TPA1090R01	TMA1090R01	TKA1090R01	10.9	0.4291	0.244	10.5	IN2505
TPA1100R01	TMA1100R01	TKA1100R01	11.0	0.4331	0.260	11	IN2505
TPA1110R01	TMA1110R01	TKA1110R01	11.1	0.4370	0.260	11	IN2505
TPA1120R01	TMA1120R01	TKA1120R01	11.2	0.4409	0.260	11	IN2505
TPA1130R01	TMA1130R01	TKA1130R01	11.3	0.4449	0.260	11	IN2505
TPA1140R01	TMA1140R01	TKA1140R01	11.4	0.4488	0.260	11	IN2505
TPA1150R01	TMA1150R01	TKA1150R01	11.5	0.4528	0.260	11.5	IN2505
TPA1160R01	TMA1160R01	TKA1160R01	11.6	0.4567	0.260	11.5	IN2505
TPA1170R01	TMA1170R01	TKA1170R01	11.7	0.4606	0.260	11.5	IN2505
TPA1180R01	TMA1180R01	TKA1180R01	11.8	0.4646	0.260	11.5	IN2505
TPA1190R01	TMA1190R01	TKA1190R01	11.9	0.4685	0.260	11.5	IN2505
TPA1200R01	TMA1200R01	TKA1200R01	12.0	0.4724	0.275	12	IN2505
TPA1210R01	TMA1210R01	TKA1210R01	12.1	0.4764	0.275	12	IN2505
TPA1220R01	TMA1220R01	TKA1220R01	12.2	0.4803	0.275	12	IN2505



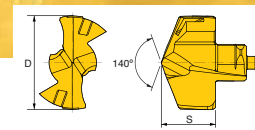
TIPS

"P" Geometry Steel	"M" Geometry Stainless Steel	"K" Geometry Cast Iron	(D) Diameter		S Dim (inch)	Pocket Size	Grade
(mm)	(inch)	(mm)	(inch)	(inch)			
TPA1230R01	TMA1230R01	TKA1230R01	12.3	0.4843	0.275	12	IN2505
TPA1240R01	TMA1240R01	TKA1240R01	12.4	0.4882	0.275	12	IN2505
TPA1250R01	TMA1250R01	TKA1250R01	12.5	0.4921	0.275	12.5	IN2505
TPA1260R01	TMA1260R01	TKA1260R01	12.6	0.4961	0.275	12.5	IN2505
TPA1270R01	TMA1270R01	TKA1270R01	12.7	0.5000	0.275	12.5	IN2505
TPA1280R01	TMA1280R01	TKA1280R01	12.8	0.5039	0.275	12.5	IN2505
TPA1290R01	TMA1290R01	TKA1290R01	12.9	0.5079	0.275	12.5	IN2505
TPA1300R01	TMA1300R01	TKA1300R01	13.0	0.5118	0.299	13	IN2505
TPA1310R01	TMA1310R01	TKA1310R01	13.1	0.5157	0.299	13	IN2505
TPA1320R01	TMA1320R01	TKA1320R01	13.2	0.5197	0.299	13	IN2505
TPA1330R01	TMA1330R01	TKA1330R01	13.3	0.5236	0.299	13	IN2505
TPA1340R01	TMA1340R01	TKA1340R01	13.4	0.5276	0.299	13	IN2505
TPA1350R01	TMA1350R01	TKA1350R01	13.5	0.5315	0.299	13.5	IN2505
TPA1360R01	TMA1360R01	TKA1360R01	13.6	0.5354	0.299	13.5	IN2505
TPA1370R01	TMA1370R01	TKA1370R01	13.7	0.5394	0.299	13.5	IN2505
TPA1380R01	TMA1380R01	TKA1380R01	13.8	0.5433	0.299	13.5	IN2505
TPA1390R01	TMA1390R01	TKA1390R01	13.9	0.5472	0.299	13.5	IN2505
TPA1400R01	TMA1400R01	TKA1400R01	14.0	0.5512	0.321	14	IN2505
TPA1410R01	TMA1410R01	TKA1410R01	14.1	0.5551	0.321	14	IN2505
TPA1420R01	TMA1420R01	TKA1420R01	14.2	0.5591	0.321	14	IN2505
TPA1430R01	TMA1430R01	TKA1430R01	14.3	0.5630	0.321	14	IN2505
TPA1440R01	TMA1440R01	TKA1440R01	14.4	0.5669	0.321	14	IN2505
TPA1450R01	TMA1450R01	TKA1450R01	14.5	0.5709	0.321	14.5	IN2505
TPA1460R01	TMA1460R01	TKA1460R01	14.6	0.5748	0.321	14.5	IN2505
TPA1470R01	TMA1470R01	TKA1470R01	14.7	0.5787	0.321	14.5	IN2505
TPA1480R01	TMA1480R01	TKA1480R01	14.8	0.5827	0.321	14.5	IN2505
TPA1490R01	TMA1490R01	TKA1490R01	14.9	0.5866	0.321	14.5	IN2505
TPA1500R01	TMA1500R01	TKA1500R01	15.0	0.5906	0.344	15	IN2505
TPA1510R01	TMA1510R01	TKA1510R01	15.1	0.5945	0.344	15	IN2505
TPA1520R01	TMA1520R01	TKA1520R01	15.2	0.5984	0.344	15	IN2505
TPA1530R01	TMA1530R01	TKA1530R01	15.3	0.6024	0.344	15	IN2505
TPA1540R01	TMA1540R01	TKA1540R01	15.4	0.6063	0.344	15	IN2505
TPA1550R01	TMA1550R01	TKA1550R01	15.5	0.6102	0.344	15	IN2505
TPA1560R01	TMA1560R01	TKA1560R01	15.6	0.6142	0.344	15	IN2505
TPA1570R01	TMA1570R01	TKA1570R01	15.7	0.6181	0.344	15	IN2505
TPA1580R01	TMA1580R01	TKA1580R01	15.8	0.6220	0.344	15	IN2505
TPA1590R01	TMA1590R01	TKA1590R01	15.9	0.6260	0.344	15	IN2505
TPA1600R01	TMA1600R01	TKA1600R01	16.0	0.6299	0.366	16	IN2505
TPA1610R01	TMA1610R01	TKA1610R01	16.1	0.6339	0.366	16	IN2505
TPA1620R01	TMA1620R01	TKA1620R01	16.2	0.6378	0.366	16	IN2505
TPA1630R01	TMA1630R01	TKA1630R01	16.3	0.6417	0.366	16	IN2505
TPA1640R01	TMA1640R01	TKA1640R01	16.4	0.6457	0.366	16	IN2505
TPA1650R01	TMA1650R01	TKA1650R01	16.5	0.6496	0.366	16	IN2505
TPA1660R01	TMA1660R01	TKA1660R01	16.6	0.6535	0.366	16	IN2505
TPA1670R01	TMA1670R01	TKA1670R01	16.7	0.6575	0.366	16	IN2505
TPA1680R01	TMA1680R01	TKA1680R01	16.8	0.6614	0.366	16	IN2505
TPA1690R01	TMA1690R01	TKA1690R01	16.9	0.6654	0.366	16	IN2505
TPA1700R01	TMA1700R01	TKA1700R01	17.0	0.6693	0.390	17	IN2505
TPA1710R01	TMA1710R01	TKA1710R01	17.1	0.6732	0.390	17	IN2505
TPA1720R01	TMA1720R01	TKA1720R01	17.2	0.6772	0.390	17	IN2505
TPA1730R01	TMA1730R01	TKA1730R01	17.3	0.6811	0.390	17	IN2505
TPA1740R01	TMA1740R01	TKA1740R01	17.4	0.6850	0.390	17	IN2505
TPA1750R01	TMA1750R01	TKA1750R01	17.5	0.6890	0.390	17	IN2505



TIPS

"P" Geometry Steel	"M" Geometry Stainless Steel	"K" Geometry Cast Iron	(D) Diameter		S Dim (inch)	Pocket Size	Grade
(mm)	(inch)	(mm)	(inch)	(inch)			
TPA1760R01	TMA1760R01	TKA1760R01	17.6	0.6929	0.390	17	IN2505
TPA1770R01	TMA1770R01	TKA1770R01	17.7	0.6968	0.390	17	IN2505
TPA1780R01	TMA1780R01	TKA1780R01	17.8	0.7008	0.390	17	IN2505
TPA1790R01	TMA1790R01	TKA1790R01	17.9	0.7047	0.390	17	IN2505
TPA1800R01	TMA1800R01	TKA1800R01	18.0	0.7087	0.413	18	IN2505
TPA1810R01	TMA1810R01	TKA1810R01	18.1	0.7126	0.413	18	IN2505
TPA1820R01	TMA1820R01	TKA1820R01	18.2	0.7165	0.413	18	IN2505
TPA1830R01	TMA1830R01	TKA1830R01	18.3	0.7205	0.413	18	IN2505
TPA1840R01	TMA1840R01	TKA1840R01	18.4	0.7244	0.413	18	IN2505
TPA1850R01	TMA1850R01	TKA1850R01	18.5	0.7283	0.413	18	IN2505
TPA1860R01	TMA1860R01	TKA1860R01	18.6	0.7323	0.413	18	IN2505
TPA1870R01	TMA1870R01	TKA1870R01	18.7	0.7362	0.413	18	IN2505
TPA1880R01	TMA1880R01	TKA1880R01	18.8	0.7402	0.413	18	IN2505
TPA1890R01	TMA1890R01	TKA1890R01	18.9	0.7441	0.413	18	IN2505
TPA1900R01	TMA1900R01	TKA1900R01	19.0	0.7480	0.433	19	IN2505
TPA1905R01	TMA1905R01	TKA1905R01	19.05	0.7500	0.433	19	IN2505
TPA1910R01	TMA1910R01	TKA1910R01	19.1	0.7520	0.433	19	IN2505
TPA1920R01	TMA1920R01	TKA1920R01	19.2	0.7559	0.433	19	IN2505
TPA1930R01	TMA1930R01	TKA1930R01	19.3	0.7598	0.433	19	IN2505
TPA1940R01	TMA1940R01	TKA1940R01	19.4	0.7638	0.433	19	IN2505
TPA1950R01	TMA1950R01	TKA1950R01	19.5	0.7677	0.433	19	IN2505
TPA1960R01	TMA1960R01	TKA1960R01	19.6	0.7717	0.433	19	IN2505
TPA1970R01	TMA1970R01	TKA1970R01	19.7	0.7756	0.433	19	IN2505
TPA1980R01	TMA1980R01	TKA1980R01	19.8	0.7795	0.433	19	IN2505
TPA1990R01	TMA1990R01	TKA1990R01	19.9	0.7835	0.433	19	IN2505
TPA2000R01	TMA2000R01	TKA2000R01	20.0	0.7874	0.344	20	IN2505
TPA2010R01	TMA2010R01	TKA2010R01	20.1	0.7913	0.344	20	IN2505
TPA2020R01	TMA2020R01	TKA2020R01	20.2	0.7953	0.344	20	IN2505
TPA2030R01	TMA2030R01	TKA2030R01	20.3	0.7992	0.344	20	IN2505
TPA2040R01	TMA2040R01	TKA2040R01	20.4	0.8031	0.344	20	IN2505
TPA2050R01	TMA2050R01	TKA2050R01	20.5	0.8071	0.344	20	IN2505
TPA2060R01	TMA2060R01	TKA2060R01	20.6	0.8110	0.344	20	IN2505
TPA2070R01	TMA2070R01	TKA2070R01	20.7	0.8150	0.344	20	IN2505
TPA2080R01	TMA2080R01	TKA2080R01	20.8	0.8189	0.344	20	IN2505
TPA2090R01	TMA2090R01	TKA2090R01	20.9	0.8228	0.344	20	IN2505
TPA2100R01	TMA2100R01	TKA2100R01	21.0	0.8268	0.366	21	IN2505
TPA2110R01	TMA2110R01	TKA2110R01	21.1	0.8307	0.366	21	IN2505
TPA2120R01	TMA2120R01	TKA2120R01	21.2	0.8346	0.366	21	IN2505
TPA2130R01	TMA2130R01	TKA2130R01	21.3	0.8386	0.366	21	IN2505
TPA2140R01	TMA2140R01	TKA2140R01	21.4	0.8425	0.366	21	IN2505
TPA2150R01	TMA2150R01	TKA2150R01	21.5	0.8465	0.366	21	IN2505
TPA2160R01	TMA2160R01	TKA2160R01	21.6	0.8504	0.366	21	IN2505
TPA2170R01	TMA2170R01	TKA2170R01	21.7	0.8543	0.366	21	IN2505
TPA2180R01	TMA2180R01	TKA2180R01	21.8	0.8583	0.366	21	IN2505
TPA2190R01	TMA2190R01	TKA2190R01	21.9	0.8622	0.366	21	IN2505
TPA2200R01	TMA2200R01	TKA2200R01	22.0	0.8661	0.390	22	IN2505
TPA2210R01	TMA2210R01	TKA2210R01	22.1	0.8701	0.390	22	IN2505
TPA2220R01	TMA2220R01	TKA2220R01	22.2	0.8740	0.390	22	IN2505
TPA2222R01	TMA2222R01	TKA2222R01	22.22	0.8750	0.390	22	IN2505
TPA2230R01	TMA2230R01	TKA2230R01	22.3	0.8780	0.390	22	IN2505
TPA2240R01	TMA2240R01	TKA2240R01	22.4	0.8819	0.390	22	IN2505



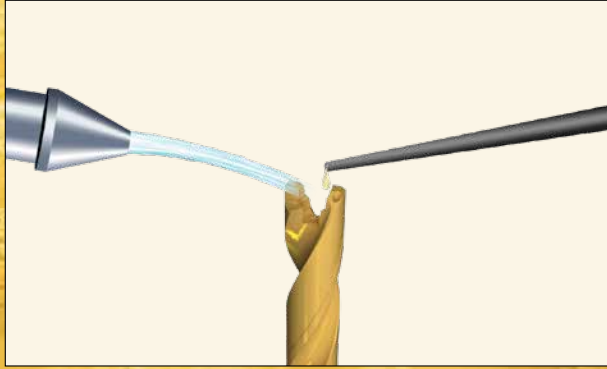
TIPS

"P" Geometry Steel	"M" Geometry Stainless Steel	"K" Geometry Cast Iron	(D) Diameter		S Dim (inch)	Pocket Size	Grade
(mm)	(inch)						
TPA2250R01	TMA2250R01	TKA2250R01	22.5	0.8858	0.390	22	IN2505
TPA2260R01	TMA2260R01	TKA2260R01	22.6	0.8898	0.390	22	IN2505
TPA2270R01	TMA2270R01	TKA2270R01	22.7	0.8937	0.390	22	IN2505
TPA2280R01	TMA2280R01	TKA2280R01	22.8	0.8976	0.390	22	IN2505
TPA2290R01	TMA2290R01	TKA2290R01	22.9	0.9016	0.390	22	IN2505
TPA2300R01	TMA2300R01	TKA2300R01	23.0	0.9055	0.413	23	IN2505
TPA2310R01	TMA2310R01	TKA2310R01	23.1	0.9094	0.413	23	IN2505
TPA2320R01	TMA2320R01	TKA2320R01	23.2	0.9134	0.413	23	IN2505
TPA2330R01	TMA2330R01	TKA2330R01	23.3	0.9173	0.413	23	IN2505
TPA2340R01	TMA2340R01	TKA2340R01	23.4	0.9213	0.413	23	IN2505
TPA2350R01	TMA2350R01	TKA2350R01	23.5	0.9252	0.413	23	IN2505
TPA2360R01	TMA2360R01	TKA2360R01	23.6	0.9291	0.413	23	IN2505
TPA2370R01	TMA2370R01	TKA2370R01	23.7	0.9331	0.413	23	IN2505
TPA2380R01	TMA2380R01	TKA2380R01	23.8	0.9370	0.413	23	IN2505
TPA2390R01	TMA2390R01	TKA2390R01	23.9	0.9409	0.413	23	IN2505
TPA2400R01	TMA2400R01	TKA2400R01	24.0	0.9449	0.433	24	IN2505
TPA2410R01	TMA2410R01	TKA2410R01	24.1	0.9488	0.433	24	IN2505
TPA2420R01	TMA2420R01	TKA2420R01	24.2	0.9528	0.433	24	IN2505
TPA2430R01	TMA2430R01	TKA2430R01	24.3	0.9567	0.433	24	IN2505
TPA2440R01	TMA2440R01	TKA2440R01	24.4	0.9606	0.433	24	IN2505
TPA2450R01	TMA2450R01	TKA2450R01	24.5	0.9646	0.433	24	IN2505
TPA2460R01	TMA2460R01	TKA2460R01	24.6	3.9685	0.433	24	IN2505
TPA2470R01	TMA2470R01	TKA2470R01	24.7	0.9724	0.433	24	IN2505
TPA2480R01	TMA2480R01	TKA2480R01	24.8	0.9764	0.433	24	IN2505
TPA2490R01	TMA2490R01	TKA2490R01	24.9	0.9803	0.433	24	IN2505
TPA2500R01	TMA2500R01	TKA2500R01	25.0	0.9843	0.433	25	IN2505
TPA2510R01	TMA2510R01	TKA2510R01	25.1	0.9882	0.433	25	IN2505
TPA2520R01	TMA2520R01	TKA2520R01	25.2	0.9921	0.433	25	IN2505
TPA2530R01	TMA2530R01	TKA2530R01	25.3	0.9961	0.433	25	IN2505
TPA2540R01	TMA2540R01	TKA2540R01	25.4	1.0000	0.433	25	IN2505
TPA2550R01	TMA2550R01	TKA2550R01	25.5	1.0039	0.433	25	IN2505
TPA2560R01	TMA2560R01	TKA2560R01	25.6	1.0079	0.433	25	IN2505
TPA2570R01	TMA2570R01	TKA2570R01	25.7	1.0118	0.433	25	IN2505
TPA2580R01	TMA2580R01	TKA2580R01	25.8	1.0157	0.433	25	IN2505
TPA2590R01	TMA2590R01	TKA2590R01	25.9	1.0197	0.433	25	IN2505

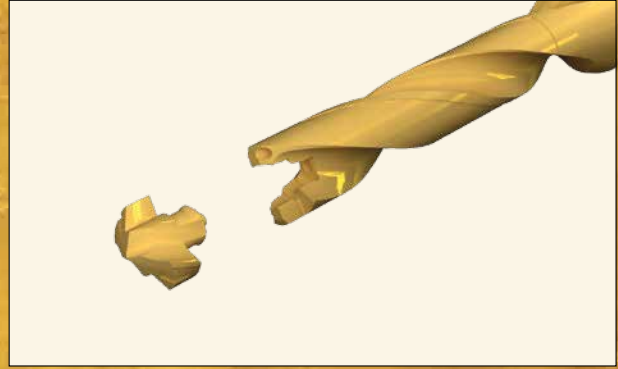
* Aluminum geometry available as a special: TNA designation



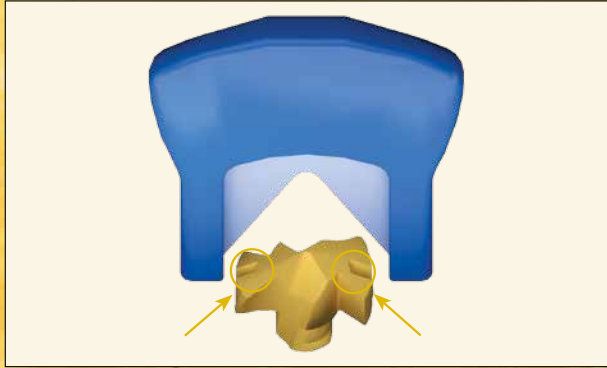
SET UP (DRILLING TIP MOUNTING PROCEDURE)



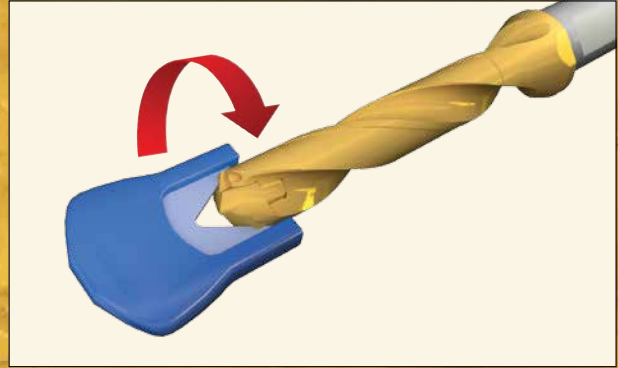
1. Clean the pocket and put oil



2. Mount the drill tip on the pocket



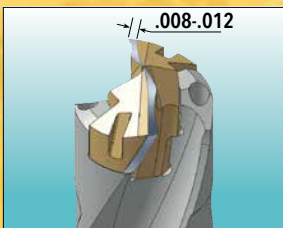
3. Insert key into the slots on tip



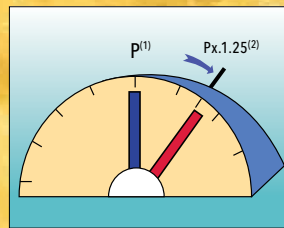
4. Tighten the tip by rotating the key CW

INDICATION OF HEAD WEAR

Wear Limit

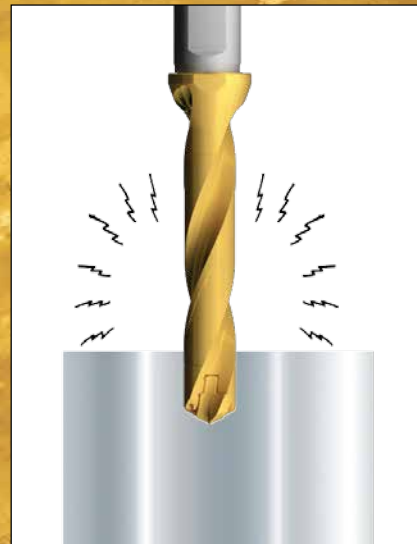


Power Restriction

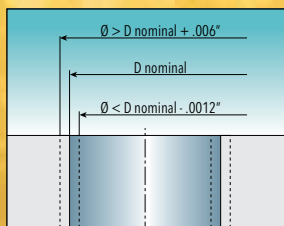


(1) New drilling head
(2) Worn-out drilling head

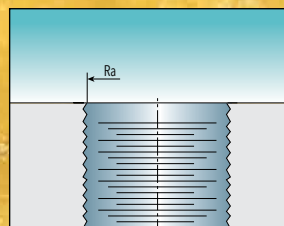
Vibration Noise Drastically Increases



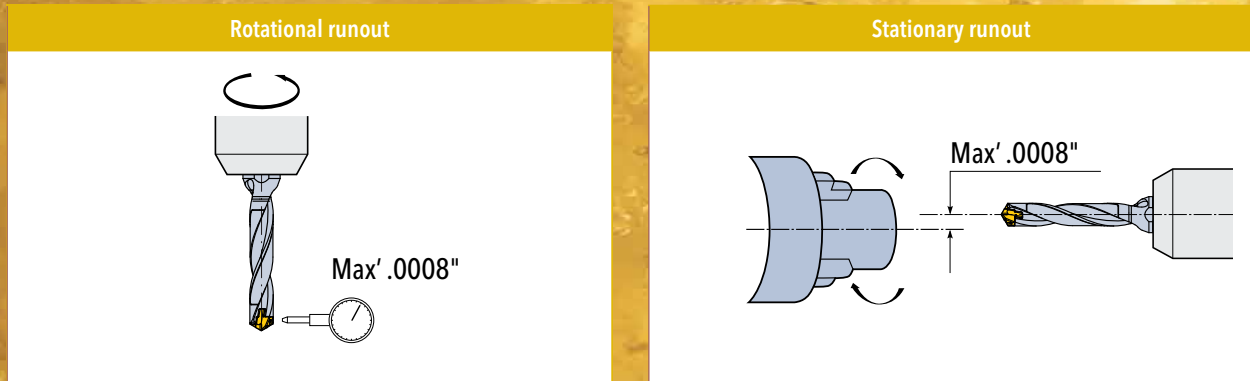
Diameter Change



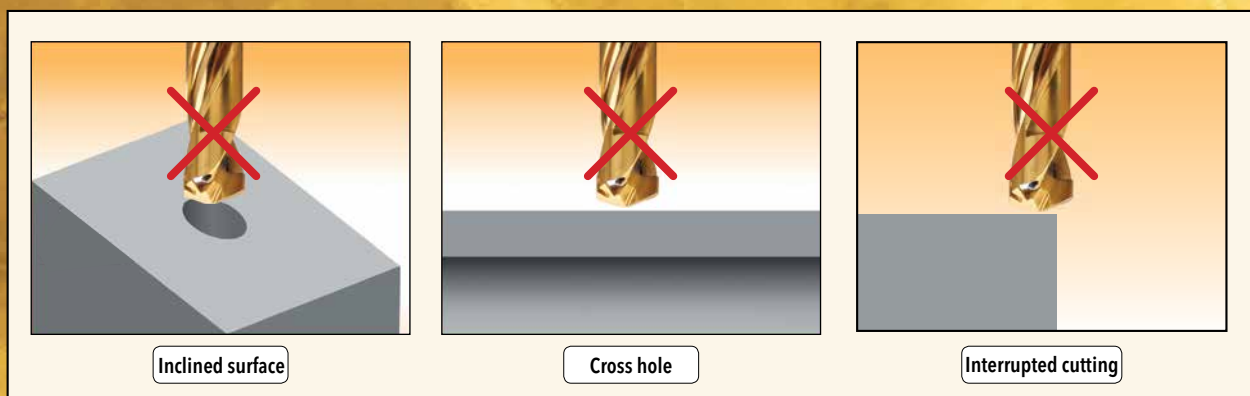
Surface Finish Declines



MAXIMUM RUNOUT



DRILLING LIMITATION



COOLANT RECOMMENDATIONS



RECOMMENDED PILOTING PROCEDURE FOR 8XD OR 12XD

1. Prior to using 8xD or 12xD drills, it is recommended to drill pilot holes from 0.5xD~1.5xD using a short drill (**GOLD•TWIST** 1.5xD holder is recommended).
2. Approach the pre-hole at reduced speed and feed until 2~5mm from it's bottom depth.
3. Increase up to recommended speed and maintain feed rate for 2~3 seconds applying coolant.
4. Start drilling at the recommended feed rate.

ISO	Material	Condition	Tensile Strength Rm (N/mm²)	Hardness (HB)	Matl No.	Cutting Speed Vc (SFM)	Feed vs Drill Diameter					
							D= 7-9.9mm (.275-.390")	D= 10-11.9mm (.394-.469")	D= 12-13.9mm (.472-.547")	D= 14-15.9mm (.551-.626")	D= 16-19.9mm (.630-.783")	D= 20-25.9mm (.787-1.019")
							IPR (inches/rev)					
P	Non-alloy steel <0.25% C & cast steel, > = 0.25% C free cutting <0.55% C steel > = 0.55% C	Annealed	420	125	1	260-360-460	.005 .007 .009	.006 .008 .011	.007 .009 .012	.008 .011 .014	.010 .014 .018	.010 .014 .018
		Annealed	650	190	2	260-345-430						
		Quenched & Tempered	850	250	3	260-330-400						
		Annealed	750	220	4	230-295-360						
		Quenched & Tempered	1000	300	5	165-230-300						
	Low alloy steel & cast steel (less than 5% alloying elements)	Annealed	600	200	6	230-315-400	.005 .007 .010	.006 .008 .011	.006 .009 .013	.007 .010 .014	.009 .012 .016	.010 .014 .018
		Quenched & Tempered	930	275	7	230-295-360						
			1000	300	8	165-230-300						
			1200	350	9	135-180-230						
	High alloy steel, cast steel, & tool steel	Annealed	680	200	10	165-230-300	.005 .006 .008	.005 .006 .007	.006 .008 .010	.007 .009 .011	.008 .010 .012	.009 .011 .013
		Quenched & Tempered	1100	325	11	130-200-265						
M	Stainless steel & cast stainless steel	Ferritic/martensitic	680	200	12	130-180-230	.004 .005 .006	.005 .006 .007	.006 .007 .008	.006 .008 .009	.006 .008 .010	.007 .009 .012
		Martensitic	820	240	13	130-180-230						
		Austenitic	600	180	14	100-165-230						
K	GreyCast Iron (GG)	Ferritic		160	15	300-410-525	.006 .009 .012	.008 .011 .014	.010 .013 .016	.012 .015 .018	.014 .018 .022	.014 .018 .024
		Pearlitic		250	16	265-360-460						
	Cast Iron Nodular (GGG)	Ferritic		180	17	300-450-600						
		Pearlitic		260	18	265-360-460						
	Malleable Cast Iron	Ferritic		130	19	300-410-525						
		Pearlitic		230	20	265-360-460						
N	Aluminum - wrought alloy	Not cureable		60	21	300-510-725	.008 .011 .014	.010 .013 .016	.012 .015 .018	.014 .017 .020	.016 .020 .024	.018 .022 .028
		Cured		100	22	300-510-725						
	Aluminum - cast, alloyed <=12% Si >12% Si	Not cureable		75	23	300-510-725						
		Cured		90	24	300-510-725						
		High temperature		130	25	265-400-525						
	Copper alloys > 1% Pb	Free cutting		110	26	300-510-725						
		Brass		90	27	300-510-725						
		Electrolitic copper		100	28	300-510-725						
	Non-metallic	Duro & fiber plastics			29	-						
		Hard rubber			30	-						
S	High temp alloys Fe based Ni or Co based	Annealed		200	31	100-150-200	.002 .003 .004	.003 .004 .005	.004 .005 .006	.005 .006 .007	.005 .006 .008	.006 .007 .009
		Cured		280	32	70-115-165						
		Annealed		250	33	70-115-165						
		Cured		350	34	70-115-165						
		Cast		320	35	70-115-165						
	Titanium, Ti alloys		Rm 400		36	70-115-165	.002 .004 .005	.003 .004 .006	.004 .006 .007	.005 .007 .008	.006 .007 .009	.006 .008 .010
		Alpha+beta alloys cured	Rm 1050		37	70-115-165						
H	Hardened steel	Hardened		55 HRC	38	70-115-165	.002 .004 .005	.003 .004 .006	.004 .006 .007	.005 .007 .008	.006 .007 .009	.006 .008 .010
		Hardened		60 HRC	39	70-115-165						
	Chilled cast iron	Cast		400	40	-	-	-	-	-	-	-
	Cast iron nodular	Hardened		55 HRC	41	-	-	-	-	-	-	-

* Feed Rates are based on Two Effective - DO NOT DOUBLE.

AN ECONOMICAL DRILL/CHAMFER COMBO SOLUTION FOR INCH AND METRIC TAP SIZES

Drill Body Features

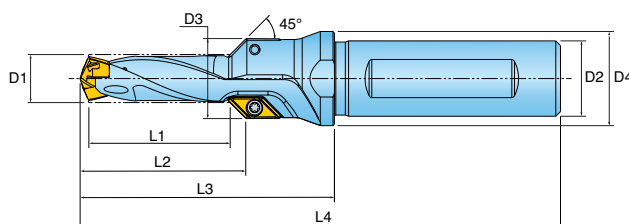
- Cost effective solution that replaces the high cost of special solid carbide step drills
- A twisted through coolant channel for smooth chip evacuation & high penetration rates
- Two symmetrically designed standard chamfering inserts firmly seated for optimal performance via balanced cutting
- Eliminates the need for solid carbide drill regrinding

Insert Features

- Widely capable KOMT insert is designed for both chamfering and countersinking
- Indexable inserts include two cutting edges for optimum chip control
- Capable of machining a wide range of workpiece materials
- Indexable inserts mean economy and flexibility over a wide range of applications

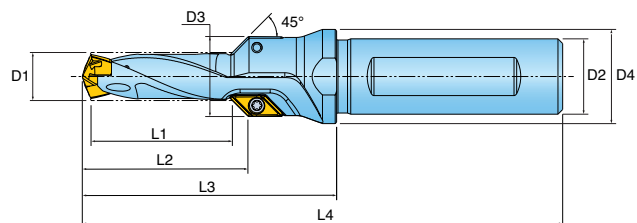


METRIC BODIES



BODY	Thread	D1	D3	L1	Dimensions (inch)					Pocket Size
					L2	L3	D2	D4	L4	
TC0850026JCR01	M10	.335 (8.5mm)	.610	1.024	1.20	1.96	.472 (12.0mm)	.630	3.73	8.5
TC1020030JDR01	M12	.402 (10.2mm)	.669	1.181	1.36	2.13	.630 (16.0mm)	.787	4.02	10
TC1200035JDR01	M14	.472 (12.0mm)	.748	1.378	1.56	2.40	.630 (16.0mm)	.787	4.29	12
TC1400039JER01	M16	.551 (14.0mm)	.827	1.535	1.71	2.72	.787 (20.0mm)	.984	4.69	14
TC1750042JER01	M20	.689 (17.5mm)	.965	1.653	1.83	2.83	.787 (20.0mm)	1.062	4.80	17
TC2100048JFR01	M24	.827 (21.0mm)	1.102	1.890	2.07	3.15	.984 (25.0mm)	1.259	5.35	21

INCH BODIES

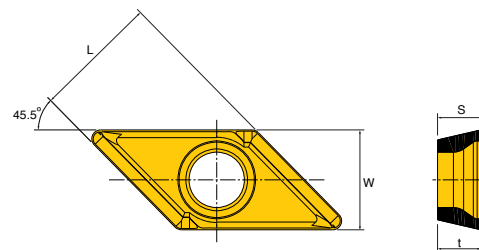


BODY	Thread	D1	D3	L1	Dimensions (inch)			D2	D4	L4	Pocket Size
					L2	L3					
TC0790025B9R01	3/8 UNC	.311 (7.9mm)	.590	1.000	1.18	1.97		.500 (12.7mm)	.630	3.74	7.5
TC0850025B9R01	3/8 UNF	.335 (8.5mm)	.610	1.000	1.18	2.01		.500 (12.7mm)	.630	3.78	8.5
TC0940026B9R01	7/16 UNC	.370 (9.4mm)	.650	1.059	1.24	2.13		.500 (12.7mm)	.709	3.90	9, 9.5
TC0990026B9R01	7/16 UNF	.390 (9.9mm)	.669	1.059	1.24	2.13		.500 (12.7mm)	.709	3.90	9
TC1080026C0R01	1/2 UNC	.425 (10.8mm)	.709	1.059	1.24	2.17		.625 (15.88mm)	.787	4.06	10.5
TC1150026C0R01	1/2 UNF	.453 (11.5mm)	.728	1.059	1.24	2.20		.625 (15.88mm)	.787	4.09	11.5
TC1230026C0R01	9/16 UNC	.484 (12.3mm)	.768	1.059	1.24	2.24		.625 (15.88mm)	.866	4.13	12
TC1300026C0R01	9/16 UNF	.512 (13.0mm)	.787	1.059	1.24	2.28		.625 (15.88mm)	.866	4.17	13
TC137003018R01	5/8 UNC	.539 (13.7mm)	.807	1.201	1.38	2.40		.750 (19.05mm)	.984	4.37	13.5
TC146003018R01	5/8 UNF	.575 (14.6mm)	.827	1.201	1.38	2.44		.750 (19.05mm)	.984	4.41	14.5
TC167003518R01	3/4 UNC	.658 (16.7mm)	.925	1.402	1.58	2.76		.750 (19.05mm)	.984	4.73	16
TC175003518R01	3/4 UNF	.689 (17.5mm)	.965	1.402	1.58	2.83		.750 (19.05mm)	.984	4.80	17
TC1950041C8R01	7/8 UNC	.768 (19.5mm)	1.043	1.650	1.83	3.15		1.000 (25.4mm)	1.260	5.35	19
TC2050041C8R01	7/8 UNF	.807 (20.5mm)	1.083	1.650	1.83	3.23		1.000 (25.4mm)	1.260	5.43	20

INSERT



IN2005, IN2505



DESIGNATION	W	L	Dimensions (inch)		S	t	Screw	Wrench
KOMT050104R	.177	.223			.085	.077	TS220461	TD7P



QUADOTWIST™ DRILL

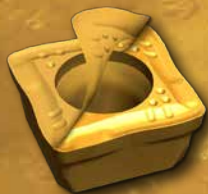
NEW GENERATION OF INDEXABLE DRILL

- 4 cornered economical insert design.
- Grade IN2505 can be used for both inboard and outboard pockets.
- Improved machinability due to ideally configured cutting edge.
- Applicable to most materials including low carbon and mild steel.
- Twisted coolant design provides for excellent chip evacuation and better hole quality.
- Enhanced insert durability with new grade (IN2505).
- New extended length shank (R02).
 - Allows two set screw contact for lathe applications.
 - Cut-off notch added for ease of shortening in rotating applications, if necessary.



IN2505 (PVD) - GENERAL PURPOSE

- Sub-micron grade with high hardness and toughness
- New Multi-layered coating for higher chipping resistance
- Post-coat surface treatment improves chipping resistance and reduces cutting forces
- First choice for general applications



IN6505 (CVD) - STEEL APPLICATION

- Multi-layered CVD coating along with post coat surface treatment provides excellent wear resistance and improves chipping resistance
- Peripheral (Outboard) pocket only



IN1030 (PVD) - CAST IRON, STAINLESS, TITANIUM

- Tough, slower speed applications
- More forgiving when machine rigidity is an issue.



R02

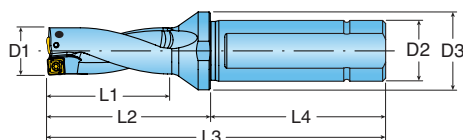
R01



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FINE GOLD 2013/2014

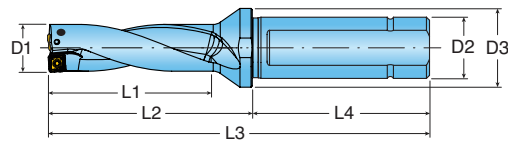
QR SERIES INDEXABLE DRILL



2xD Bodies			Dimensions (inch)						Insert	Screw	Torx	Plug
Drill Number	D1 (mm)	D1 (inch)	D2 Shank Dia	D3 Fig Dia	L1 Max. DOC	L2 Ext From Holder	L3 OAL	L4 Shank Lgth				
* QR0143029N5R02	14.3	0.563	1.00	1.26	1.13	2.13	5.28	3.16	SOMT050204SK	SM20-043-00	TD 6P	PF-0012
* QR0150030N5R02	15.0	0.591			1.19	2.24	5.39	3.16				
* QR0159032N5R02	15.9	0.626			1.25	2.36	5.51	3.16				
* QR0167033N5R02	16.7	0.658			1.31	2.44	5.59	3.16	SOMT060204SK	TS 220521/HG-P	TD 7P	PF-0012
* QR0175035N5R02	17.5	0.689			1.38	2.56	5.71	3.16				
* QR0183037N5R02	18.3	0.721			1.44	2.56	5.71	3.16				
* QR0191038N5R02	19.1	0.750			1.50	2.64	5.79	3.16	SOMT070306SK	TS 220521/HG-P	TD 7P	PF-0012
* QR0198040N5R02	19.8	0.781			1.56	2.80	5.94	3.16				
* QR0206041N5R02	20.6	0.813			1.63	2.87	6.02	3.16				
* QR0214042N5R02	21.4	0.843			1.25	1.77	1.69	2.95	6.10	3.16	SOMT08T306SK	SO 25065I
* QR0222044N5R02	22.2	0.875	1.75	2.95			6.10	3.16				
* QR0230046N6R02	23.0	0.906	1.81	3.19			6.34	3.16				
* QR0238048N6R02	23.8	0.938	1.88	3.31			6.46	3.16	SOMT09T306SK	SM35-088-60	TD 10	PF-0013
* QR0246049N6R02	24.6	0.969	1.94	3.43			6.57	3.16				
* QR0250050N5R02	25.0	0.984	1.97	3.43			6.58	3.16				
* QR0254051N6R02	25.4	1.000	2.00	3.50			6.65	3.16	SOMT10T306SK	SM35-088-60	TD 10	PF-0013
* QR0262052N6R02	26.2	1.031	2.06	3.50			6.65	3.16				
QR0270054N6R02	27.0	1.063	2.13	3.58			6.73	3.16				
QR0278056N6R02	27.8	1.094	1.25	1.77			2.19	3.70	6.85	3.16	SOMT11T308SK	SM35-088-60
QR0286058N6R02	28.6	1.125			2.25	3.78	6.93	3.16				
QR0294058N6R02	29.4	1.156			2.31	3.98	7.13	3.16				
QR0302060N6R02	30.2	1.187			2.37	3.98	7.13	3.16				
QR0310062N6R02	31.0	1.219			2.44	4.09	7.24	3.16				
QR0318063N6R02	31.8	1.250	1.25	1.77	2.50	4.17	7.32	3.16	SOMT12T308SK	SM35-088-60	TD 10	PF-0013
QR0325065N6R02	32.5	1.281			2.56	4.29	7.44	3.16				
QR0333067N6R02	33.3	1.312			2.62	4.29	7.44	3.16				
QR0341068N6R02	34.1	1.343			2.69	4.37	7.52	3.16				
QR0349070N6R02	34.9	1.375			2.75	4.49	7.64	3.16				
QR0357071N6R02	35.7	1.406	1.25	2.16	2.81	4.61	7.76	3.16	SOMT130408SK	SE02-82	TD 15	PF-0013
QR0365073N6R02	36.5	1.437			2.87	4.72	7.87	3.16				
QR0373075N6R02	37.3	1.468			2.94	4.72	7.87	3.16				
QR0381076N6R02	38.1	1.500			3.00	4.84	7.99	3.16				
QR0389078N6R02	38.9	1.531			3.06	4.92	8.07	3.16				
QR0397079N6R02	39.7	1.562	1.50	2.36	3.12	5.04	8.19	3.16	SOMT140408SK	SE02-82	TD 15	PF-0013
QR0405081N6R02	40.5	1.594			3.12	5.16	8.31	3.16				
QR0413083N6R02	41.3	1.625			3.25	5.16	8.31	3.16				
QR0428086N7R02	42.8	1.687			3.37	5.35	8.50	3.16				
QR0437087N7R02	43.7	1.719			3.44	5.43	8.58	3.16				
QR0445089N7R02	44.5	1.750	1.50	2.36	3.50	5.59	8.74	3.16	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0452090N7R02	45.2	1.781			3.56	5.59	8.74	3.16				
QR0460092N7R02	46.0	1.813			3.63	5.71	8.86	3.16				
QR0476095N7R02	47.6	1.875			3.75	5.91	9.06	3.16				
QR0492098N7R02	49.2	1.937			3.87	5.98	9.13	3.16				
QR0500100N7R02	50.0	1.969	1.50	2.36	3.94	6.10	9.25	3.16	SOMT160510SK	SM50-113-20	TD 20	PF-0013
QR0508102N7R02	50.8	2.000			4.00	6.22	9.37	3.16				
QR0516104N7R02	51.6	2.031			4.06	6.34	9.44	3.16				

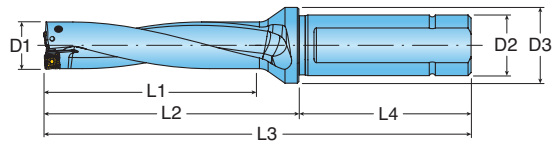
* Standard shank (R01) will be phased out and replaced by R02.
Brass Coolant Plugs, PF-0012 & PF-0013, are sold separately.

QR SERIES INDEXABLE DRILL



3xD Bodies			Dimensions (inch)						Insert	Screw	Torx	Plug
Drill Number	D1 (mm)	D1 (inch)	D2 Shank Dia	D3 Fig Dia	L1 Max. DOC	L2 Ext From Holder	L3 OAL	L4 Shank Lgth				
*QR0143043N5R02	14.3	0.563	1.00	1.26	1.69	2.68	5.83	3.16	SOMT050204SK	SM20-043-00	TD 6P	PF-0012
*QR0150045N5R02	15.0	0.591			1.78	2.83	5.98	3.16				
*QR0159048N5R02	15.9	0.626			1.87	2.99	6.14	3.16				
*QR0167050N5R02	16.7	0.658			1.97	3.11	6.26	3.16				
*QR0175053N5R02	17.5	0.689			2.06	3.27	6.42	3.16	SOMT060204SK	TS 22052I/HG-P	TD 7P	PF-0012
*QR0183055N5R02	18.3	0.721			2.16	3.27	6.42	3.16				
*QR0191057N5R02	19.1	0.750			2.25	3.39	6.54	3.16				
*QR0198059N5R02	19.8	0.781			2.34	3.58	6.73	3.16				
*QR0206062N5R02	20.6	0.813			2.44	3.70	6.85	3.16	SOMT070306SK	TS 22052I/HG-P	TP 7P	PF-0012
*QR0214064N5R02	21.4	0.843			2.53	3.82	6.97	3.16				
*QR0222067N5R02	22.2	0.875	2.63	3.82	6.97	3.16						
*QR0230069N6R02	23.0	0.906	2.72	4.09	7.24	3.16						
*QR0238071N6R02	23.8	0.938	1.25	1.77	2.81	4.25	7.40	3.16	SOMT08T306SK	SO 25065I	DS-T07S	PF-0013
*QR0246074N6R02	24.6	0.969			2.91	4.41	7.56	3.16				
*QR0250075N5R02	25.0	0.984			2.95	4.41	7.56	3.16				
*QR0254076N6R02	25.4	1.000			3.00	4.53	7.68	3.16				
*QR0262079N6R02	26.2	1.031			3.09	4.53	7.68	3.16				
QR0270081N6R02	27.0	1.063	1.25	1.77	3.19	4.65	7.80	3.16	SOMT09T306SK	SM35-088-60	TD 10	PF-0013
QR0278083N6R02	27.8	1.094			3.28	4.80	7.95	3.16				
QR0286086N6R02	28.6	1.125			3.38	4.92	8.07	3.16				
QR0294088N6R02	29.4	1.156			3.47	5.16	8.30	3.16				
QR0302090N6R02	30.2	1.187			3.56	5.16	8.30	3.16				
QR0310093N6R02	31.0	1.219	1.25	1.77	3.66	5.31	8.46	3.16	SOMT10T306SK	SM35-088-60	TD 10	PF-0013
QR0318095N6R02	31.8	1.250			3.75	5.43	8.58	3.16				
QR0325098N6R02	32.5	1.281			3.84	5.59	8.74	3.16				
QR0333100N6R02	33.3	1.312			3.94	5.59	8.74	3.16				
QR0341102N6R02	34.1	1.343			4.03	5.71	8.86	3.16				
QR0349105N6R02	34.9	1.375	1.25	2.16	4.13	5.87	9.02	3.16	SOMT11T308SK	SM35-088-60	TD 10	PF-0013
QR0357107N6R02	35.7	1.406			4.22	6.02	9.17	3.16				
QR0365110N6R02	36.5	1.437			4.31	6.18	9.33	3.16				
QR0373112N6R02	37.3	1.468			4.41	6.18	9.33	3.16				
QR0381114N6R02	38.1	1.500			4.50	6.34	9.49	3.16				
QR0389117N6R02	38.9	1.531	1.25	2.16	4.59	6.46	9.61	3.16	SOMT130408SK	SE02-82	TD 15	PF-0013
QR0397119N6R02	39.7	1.562			4.69	6.61	9.76	3.16				
QR0405122N6R02	40.5	1.594			4.69	6.77	9.92	3.16				
QR0413124N6R02	41.3	1.625			4.87	6.77	9.92	3.16				
QR0428128N7R02	42.8	1.687			5.06	7.05	10.20	3.16				
QR0437131N7R02	43.7	1.719	1.50	2.36	1.50	2.36	5.16	7.17	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0445134N7R02	44.5	1.750			5.25	7.36	10.51	3.16				
QR0452136N7R02	45.2	1.781			5.34	7.36	10.51	3.16				
QR0460138N7R02	46.0	1.813			5.44	7.52	10.67	3.16				
QR0476143N7R02	47.6	1.875			5.63	7.80	10.94	3.16				
QR0492148N7R02	49.2	1.937	1.50	2.36	5.81	7.91	11.06	3.16	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0500150N7R02	50.0	1.969			5.91	8.07	11.22	3.16				
QR0508152N7R02	50.8	2.000			6.00	8.23	11.38	3.16				

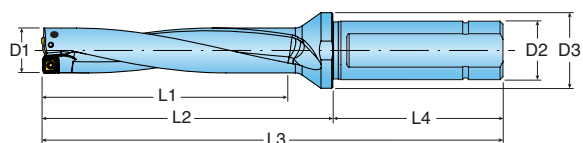
QR SERIES INDEXABLE DRILL



4xD Bodies			Dimensions (inch)						Insert	Screw	Torx	Plug
Drill Number	D1 (mm)	D1 (inch)	D2 Shank Dia	D3 Fig Dia	L1 Max. DOC	L2 Ext From Holder	L3 OAL	L4 Shank Lgth				
*QR0143057N5R02	14.3	0.563	1.00	1.26	2.25	3.23	6.38	3.16	SOMT050204SK	SM20-043-00	TD 6P	PF-0012
*QR0150060N5R02	15.0	0.591			2.37	3.43	6.57	3.16				
*QR0159064N5R02	15.9	0.626			2.50	3.62	6.77	3.16				
*QR0167067N5R02	16.7	0.658			2.63	3.78	6.93	3.16				
*QR0175070N5R02	17.5	0.689			2.75	3.98	7.13	3.16	SOMT060204SK	TS 220521/HG-P	TD 7P	PF-0012
*QR0183073N5R02	18.3	0.721			2.87	3.98	7.13	3.16				
*QR0191076N5R02	19.1	0.750			3.00	4.13	7.28	3.16				
*QR0198079N5R02	19.8	0.781			3.13	4.37	7.52	3.16				
*QR0206082N5R02	20.6	0.813	1.25	1.77	3.25	4.53	7.68	3.16	SOMT070306SK	TS 220521/HG-P	TP 7P	PF-0012
*QR0214086N5R02	21.4	0.843			3.37	4.69	7.83	3.16				
*QR0222089N5R02	22.2	0.875			3.50	4.69	7.83	3.16				
*QR0230092N6R02	23.0	0.906			3.62	5.00	8.15	3.16				
*QR0238095N6R02	23.8	0.938			3.75	5.20	8.35	3.16	SOMT08T306SK	SO 25065I	DS-T07S	PF-0013
*QR0246098N6R02	24.6	0.969			3.87	5.39	8.54	3.16				
*QR0250100N5R02	25.0	0.984			3.94	5.39	8.54	3.16				
*QR0254102N6R02	25.4	1.000			4.00	5.55	8.70	3.16				
*QR0262105N6R02	26.2	1.031	1.25	1.77	4.13	5.55	8.70	3.16	SOMT09T306SK	SM35-088-60	TD 10	PF-0013
QR0270108N6R02	27.0	1.063			4.25	5.71	8.86	3.16				
QR0278111N6R02	27.8	1.094			4.38	5.91	9.06	3.16				
QR0286114N6R02	28.6	1.125			4.50	6.06	9.21	3.16				
QR0294118N6R02	29.4	1.156			4.62	6.34	9.49	3.16	SOMT11T308SK	SM35-088-60	TD 10	PF-0013
QR0302120N6R02	30.2	1.187			4.75	6.34	9.49	3.16				
QR0310124N6R02	31.0	1.219			4.87	6.54	9.69	3.16				
QR0318127N6R02	31.8	1.250			5.00	6.69	9.84	3.16				
QR0325130N6R02	32.5	1.281	1.25	1.77	5.13	6.89	10.04	3.16	SOMT130408SK	SE02-82	TD 15	PF-0013
QR0333133N6R02	33.3	1.312			5.25	6.89	10.04	3.16				
QR0341136N6R02	34.1	1.343			5.37	7.05	10.20	3.16				
QR0349140N6R02	34.9	1.375			5.50	7.24	10.39	3.16				
QR0357143N6R02	35.7	1.406			5.62	7.44	10.59	3.16	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0365146N6R02	36.5	1.437			5.75	7.64	10.79	3.16				
QR0373149N6R02	37.3	1.468			5.87	7.64	10.79	3.16				
QR0381152N6R02	38.1	1.500			6.00	7.83	10.98	3.16				
QR0389156N6R02	38.9	1.531	1.50	2.36	6.13	7.99	11.14	3.16	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0397159N6R02	39.7	1.562			6.25	8.19	11.34	3.16				
QR0405162N6R02	40.5	1.594			6.25	8.39	11.54	3.16				
QR0413165N6R02	41.3	1.625			6.50	8.39	11.54	3.16				
QR0428171N7R02	42.8	1.687			6.75	8.74	11.89	3.16	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0437175N7R02	43.7	1.719			1.50	2.36	6.87	8.90				
QR0445178N7R02	44.5	1.750			7.00	9.13	12.28	3.16				
QR0452181N7R02	45.2	1.781			7.13	9.13	12.28	3.16				
QR0460184N7R02	46.0	1.813	1.50	2.36	7.25	9.33	12.48	3.16	SOMT150510SK	SM50-113-20	TD 20	PF-0013
QR0476190N7R02	47.6	1.875			7.50	9.69	12.83	3.16				
QR0492197N7R02	49.2	1.937			7.75	9.84	12.99	3.16				
QR0500200N7R02	50.0	1.969			7.87	10.04	13.19	3.16				
QR0508203N7R02	50.8	2.000			8.00	10.24	13.39	3.16				

* Standard shank (R01) will be phased out and replaced by R02.
Brass Coolant Plugs, PF-0012 & PF-0013, are sold separately.

QR SERIES INDEXABLE DRILL

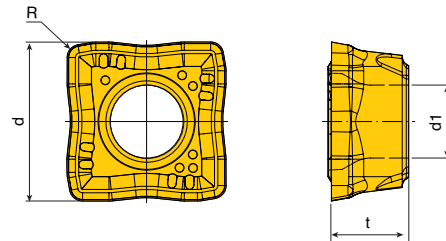


5xD Bodies			Dimensions (inch)						Insert	Screw	Torx	Plug
Drill Number	D1 (mm)	D1 (inch)	D2 Shank Dia	D3 Fig Dia	L1 Max. DOC	L2 Ext From Holder	L3 OAL	L4 Shank Lgth				
*QR0143072N5R02	14.3	0.563	1.00	1.26	2.81	3.78	6.94	3.16	SOMT050204SK	SM20-043-00	TD 6P	PF-0012
*QR0150075N5R02	15.0	0.591			2.96	4.02	7.17	3.16				
*QR0159080N5R02	15.9	0.626			3.13	4.25	7.40	3.16				
*QR0167083N5R02	16.7	0.658			3.29	4.45	7.60	3.16				
*QR0175087N5R02	17.5	0.689			3.44	4.69	7.84	3.16				
*QR0183091N5R02	18.3	0.721			3.59	4.69	7.84	3.16				
*QR0191095N5R02	19.1	0.750	1.25	1.77	3.75	4.88	8.03	3.16	SOMT060204SK	TS 220521/HG-P	TD 7P	PF-0012
*QR0198099N5R02	19.8	0.781			3.91	5.16	8.31	3.16				
*QR0206103N5R02	20.6	0.813			4.07	5.35	8.50	3.16				
*QR0214107N5R02	21.4	0.843			4.22	5.55	8.70	3.16				
*QR0222111N5R02	22.2	0.875			4.38	5.55	8.70	3.16				
*QR0230115N6R02	23.0	0.906			4.53	5.91	9.06	3.16	SOMT070306SK	TS 220521/HG-P	TP 7P	PF-0012
*QR0238119N6R02	23.8	0.938	1.25	1.77	4.69	6.14	9.29	3.16				
*QR0246123N6R02	24.6	0.969			4.85	6.38	9.53	3.16				
*QR0250125N5R02	25.0	0.984			4.85	6.38	9.53	3.16				
*QR0254127N6R02	25.4	1.000			5.00	6.57	9.72	3.16				
*QR0262131N6R02	26.2	1.031			5.16	6.57	9.72	3.16				
QR0270135N6R02	27.0	1.063	1.25	1.77	5.31	6.77	9.92	3.16	SOMT08T306SK	SO 25065I	DS-T07S	PF-0013
QR0278139N6R02	27.8	1.094			5.47	7.01	10.15	3.16				
QR0286143N6R02	28.6	1.125			5.63	7.20	10.34	3.16				
QR0294147N6R02	29.4	1.156			5.78	7.52	10.64	3.16				
QR0302151N6R02	30.2	1.187			5.94	7.52	10.68	3.16				
QR0310155N6R02	31.0	1.219			6.09	7.76	10.90	3.16				
QR0318159N6R02	31.8	1.250	1.25	1.77	6.25	7.95	11.09	3.16	SOMT09T306SK	SM35-088-60	TD 10	PF-0013
QR0325163N6R02	32.5	1.281			6.41	8.19	11.32	3.16				
QR0333167N6R02	33.3	1.312			6.56	8.19	11.35	3.16				
QR0341171N6R02	34.1	1.343			6.72	8.39	11.54	3.16				
QR0349175N6R02	34.9	1.375			6.88	8.62	11.77	3.16				
QR0357179N6R02	35.7	1.406			7.03	8.86	12.00	3.16				
QR0365182N6R02	36.5	1.437	1.25	2.16	7.19	9.09	12.24	3.16	SOMT11T308SK	SM35-088-60	TD 10	PF-0013
QR0373186N6R02	37.3	1.468			7.34	9.09	12.24	3.16				
QR0381191N6R02	38.1	1.500			7.50	9.33	12.26	3.16				
QR0389194N6R02	38.9	1.531			7.66	9.53	12.67	3.16				
QR0397198N6R02	39.7	1.562			7.81	9.76	12.91	3.16				
QR0405202N6R02	40.5	1.594			7.81	10.00	13.15	3.16				
QR0413206N6R02	41.3	1.625	1.25	2.16	8.13	10.00	13.15	3.16	SOMT130408SK	SE02-82	TD 15	PF-0013

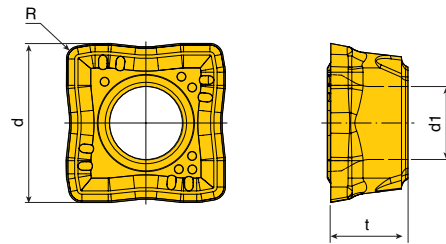
* Standard shank (R01) will be phased out and replaced by R02.
Brass Coolant Plugs, PF-0012 & PF-0013, are sold separately.

SOMT SK

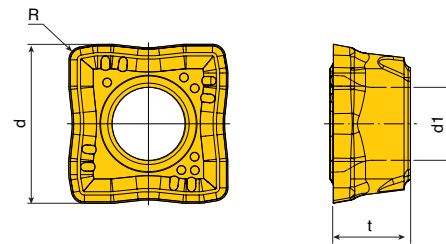
GRADE: IN2505
For General Purpose



GRADE: IN6505
For Steel Applications
For Peripheral Pockets Only



GRADE: IN1030
For Cast Iron, Stainless
and Titanium Applications



Designation	Dimension (inch)				Tool Diameter Range
	d	t	R	d1	
SOMT 050204 SK	0.193	0.094	0.016	0.089	14.00mm(.5512") - 16.49mm(.6492")
SOMT 060204 SK	0.224	0.094	0.016	0.102	16.50mm(.6496") - 19.49mm(.7673")
SOMT 070306 SK	0.268	0.110	0.024	0.102	19.50mm(.7677") - 22.49mm(.8854")
SOMT 08T306 SK	0.311	0.156	0.024	0.112	22.50mm(.8858") - 26.49mm(1.0429")
SOMT 09T308 SK	0.362	0.156	0.031	0.149	26.50mm(1.0433") - 31.49mm(1.2397")
SOMT 11T308 SK	0.433	0.156	0.031	0.149	31.50mm(1.2401") - 36.99mm(1.4563")
SOMT 130408 SK	0.504	0.173	0.031	0.173	37.00mm(1.4567") - 43.49mm(1.7122")
SOMT 150510 SK	0.590	0.189	0.039	0.212	43.50mm(1.7126") - 50.00mm(1.9685")

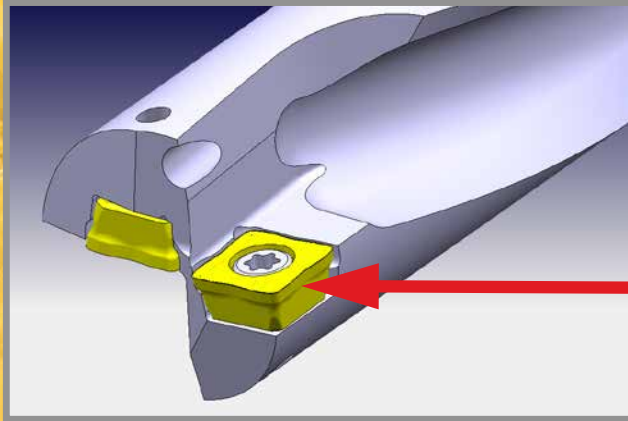
All QuadTwist inserts available in Grades IN1030, IN2505 and IN6505.

RADIAL ADJUSTMENT

Drill Diameter	Insert	Max. Radial (X)	Max. Dia
0.563" (14.3mm)	SOMT 050204 SK	0.015	0.593
0.594" (15.0mm)		0.013	0.620
0.626" (15.9mm)		0.011	0.648
0.657" (16.7mm)	SOMT 060204 SK	0.018	0.693
0.688" (17.5mm)		0.013	0.714
0.719" (18.3mm)		0.011	0.741
0.750" (19.1mm)	SOMT 070306 SK	0.010	0.770
0.781" (19.8mm)		0.020	0.821
0.813" (20.6mm)		0.015	0.843
0.843" (21.4mm)	SOMT 08T306 SK	0.011	0.865
0.875" (22.2mm)		0.008	0.891
0.906" (23.0mm)		0.025	0.956
0.938" (23.8mm)	SOMT 09T308 SK	0.022	0.982
0.969" (24.6mm)		0.018	1.005
0.984" (25.0mm)		0.015	1.014
1.000" (25.4mm)	SOMT 11T308 DP	0.015	1.030
1.031" (26.2mm)		0.011	1.053
1.063" (27.0mm)		0.028	1.119
1.094" (27.8mm)	SOMT 130408 DP	0.024	1.142
1.125" (28.6mm)		0.015	1.155
1.156" (29.4mm)		0.015	1.186
1.187" (30.2mm)	SOMT 150510 DP	0.011	1.209
1.219" (31.0mm)		0.008	1.235
1.250" (31.8mm)		0.035	1.320
1.281" (32.5mm)	SOMT 150510 DP	0.031	1.343
1.312" (33.3mm)		0.031	1.374
1.343" (34.1mm)		0.028	1.399
1.375" (34.9mm)	SOMT 150510 DP	0.024	1.423
1.406" (35.7mm)		0.015	1.436

Drill Diameter	Insert	Max. Radial (X)	Max. Dia
1.437" (36.5mm)	SOMT 130408 DP	0.047	1.531
1.468" (37.3mm)		0.047	1.562
1.500" (38.1mm)		0.039	1.578
1.531" (38.9mm)	SOMT 150510 DP	0.035	1.601
1.562" (39.7mm)		0.028	1.618
1.594" (40.5mm)		0.024	1.642
1.625" (41.3mm)	SOMT 150510 DP	0.024	1.673
1.687" (42.8mm)		0.012	1.711
1.719" (43.7mm)		0.047	1.813
1.750" (44.5mm)	SOMT 150510 DP	0.043	1.836
1.781" (45.2mm)		0.043	1.867
1.813" (46.0mm)		0.039	1.891
1.875" (47.6mm)	SOMT 150510 DP	0.028	1.931
1.937" (49.2mm)		0.024	1.985
1.969" (50.0mm)		0.020	2.009
2.000" (50.8mm)	SOMT 150510 DP	0.015	2.030

4 CORNERED INSERT DESIGN



2XD, 3XD AND 4XD RECOMMENDED CUTTING CONDITIONS

ISO	Material	Condition	Tensile Strength Rm (N/mm²)	Hardness (HB)	Matl No.	Cutting Speed Vc (SFM)	Feed v.s. Drill Diameter In/Rev Drill Length 2, 3, 4xD							
							SOMT 05 0.551-.645 (inch)	SOMT 06 0.649-.763 (inch)	SOMT 07 0.767-.882 (inch)	SOMT 08 0.886-1.039 (inch)	SOMT 09 1.063-1.220 (inch)	SOMT 11 1.250-1.460 (inch)	SOMT 13 1.437-1.687 (inch)	SOMT 15 1.719-2.000 (inch)
P	Non-alloy steel <0.25% C & cast steel, > = 0.25% C free cutting C steel > = 0.55% C	Annealed	420	125	1	700-1200	.002-.003	.002-.003	.002-.004	.002-.004	.003-.004	.003-.005	.003-.005	.003-.005
		Annealed	650	190	2	600-950	.003-.004	.003-.004	.003-.005	.003-.005	.003-.006	.003-.006	.003-.0065	.003-.0065
		Quenched & Tempered	850	250	3	450-800	.003-.005	.003-.005	.003-.006	.003-.006	.004-.006	.004-.006	.004-.007	.004-.007
		Annealed	750	220	4	450-800	.003-.005	.003-.005	.003-.006	.003-.006	.004-.007	.004-.007	.004-.007	.004-.007
		Quenched & Tempered	1000	300	5	450-800	.003-.005	.003-.005	.003-.006	.003-.006	.004-.007	.004-.007	.004-.007	.004-.007
	Low alloy steel & cast steek (less than 5% alloying elements)	Annealed	600	200	6	450-800	.003-.006	.003-.006	.003-.007	.003-.007	.004-.007	.004-.009	.004-.009	.004-.0095
		Quenched & Tempered	930	275	7	325-600	.003-.006	.003-.006	.003-.008	.003-.008	.004-.008	.004-.0085	.004-.0085	.004-.0085
			1000	300	8	325-600	.003-.006	.003-.006	.003-.008	.003-.008	.004-.008	.004-.0085	.004-.0085	.004-.0085
			1200	350	9	325-600	.003-.006	.003-.006	.003-.008	.003-.008	.004-.008	.004-.0085	.004-.0085	.004-.0085
	High alloy steel, cast steel, & tool steel	Annealed	680	200	10	450-675	.002-.005	.0025-.005	.0025-.005	.003-.006	.004-.007	.004-.007	.004-.008	.004-.008
		Quenched & Tempered	1100	325	11	325-525	.0025-.005	.0025-.005	.003-.006	.003-.006	.0035-.007	.0035-.008	.004-.008	.004-.008
M	Stainless steel & cast stainless steel	Ferritic/ martensitic	680	200	12	500-800	.0025-.005	.0025-.005	.003-.006	.003-.006	.003-.007	.0035-.008	.004-.008	.004-.008
		Martensitic	820	240	13	500-800	.0025-.005	.0025-.005	.003-.006	.003-.006	.003-.007	.0035-.008	.004-.008	.004-.008
		Austenitic	600	180	14	500-800	.0025-.005	.0025-.005	.003-.006	.003-.006	.003-.007	.0035-.008	.004-.008	.004-.008
K	GreyCast Iron (GG)	Ferritic		160	15	525-850	.003-.007	.003-.007	.004-.008	.004-.008	.004-.008	.004-.008	.004-.0085	.004-.0085
		Pearlitic		250	16	525-850	.003-.007	.003-.007	.004-.008	.004-.008	.004-.008	.004-.008	.004-.0085	.004-.0085
	Cast Iron Nodular (GGG)	Ferritic		180	17	525-850	.003-.007	.003-.007	.004-.008	.004-.008	.004-.008	.004-.008	.004-.0085	.004-.0085
		Pearlitic		260	18	525-850	.003-.007	.003-.007	.004-.008	.004-.008	.004-.008	.004-.008	.004-.0085	.004-.0085
	Malleable Cast Iron	Ferritic		130	19	400-725	.003-.0055	.003-.0055	.004-.006	.004-.006	.004-.0065	.004-.007	.004-.007	.004-.007
		Pearlitic		230	20	400-725	.003-.0055	.003-.0055	.004-.006	.004-.006	.004-.0065	.004-.007	.004-.007	.004-.007
N	Aluminum - wrought alloy	Not cureable		60	21	650-1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
		Cured		100	22	650-1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
	Aluminum - Si cast, alloyed	Not cureable		75	23	650-1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
		Cured		90	24	650-1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
		High temperature		130	25	650-1150	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.0035-.007	.0035-.007	.004-.0075	.004-.0075
	1% Pb Copper alloys	Free cutting		110	26	490-825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
		Brass		90	27	490-825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
		Electrolitic copper		100	28	490-825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
	Non-metallic	Duro & fiber plastics			29	490-825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
		Hard rubber			30	490-825	.0025-.006	.0025-.006	.003-.0065	.003-.0065	.004-.007	.004-.007	.004-.008	.004-.008
S	Fe based High temp alloys	Annealed		200	31	100-200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
		Cured		280	32	100-200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
		Annealed		250	33	100-200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
		Cured		350	34	100-200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
		Cast		320	35	100-200	.002-.003	.002-.003	.002-.0035	.002-.0035	.003-.004	.003-.004	.003-.005	.003-.005
	Titanium, Ti alloys		Rm 400		36	165-265	.0025-.0035	.0025-.0035	.003-.004	.003-.004	.003-.004	.003-.004	.003-.004	.003-.004
		Alpha+beta alloys cured	Rm 1050		37	165-265	.0025-.0035	.0025-.0035	.003-.004	.003-.004	.003-.004	.003-.004	.003-.004	.003-.004
H	Hardened steel	Hardened		55 HRC	38	100-200	.002-.0035	.002-.0035	.002-.004	.002-.004	.002-.0045	.002-.0045	.002-.0045	.002-.0045
		Hardened		60 HRC	39	100-200	.002-.0035	.002-.0035	.002-.004	.002-.004	.002-.0045	.002-.0045	.002-.0045	.002-.0045
	Chilled cast iron	Cast		400	40	100-200	.002-.0035	.002-.0035	.002-.004	.002-.004	.002-.0045	.002-.0045	.002-.0045	.002-.0045
	Cast iron nodular	Hardened		55 HRC	41	100-200	.002-.0035	.002-.0035	.002-.004	.002-.004	.002-.0045	.002-.0045	.002-.0045	.002-.0045

CHAMFERING RINGS

FOR



- Available for 3xD, 5xD & 8xD GOLD•TWIST and 3xD & 4xD QUAD•TWIST & QUAD•DRILL+
- Adjustable step length
- Reduces cycle time by combining two operations into one



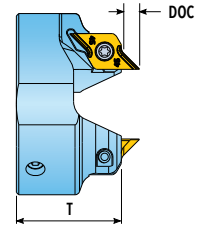
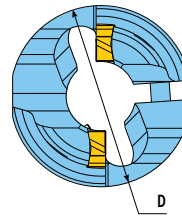
Ingersoll, the supplier of cost competitive, high productivity indexable drill lines, now introduces chamfering rings to promote machining convenience for end-users in hole making applications.

Ingersoll chamfering rings can be used to drill and chamfer in a single operation to minimize cycle time as well as reduce inventory of special combination tools.

All chamfering rings are compatible with GOLD•TWIST, QUAD•TWIST and QUAD•DRILL+ bodies to control drilling depth. The specially treated, multi-layered PVD coated CRNG inserts enable stable machining and long tool life.

CHAMFERING RINGS

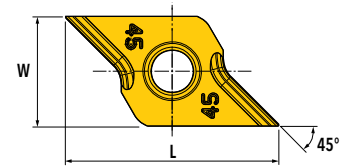
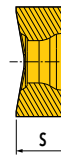
45° CHAMFERING RING - 2 EFFECTIVE INSERTS



Description	D (inch)	T (inch)	Fits Gold Twist Series	Fits Quad Twist Series	Fits Quad Drill+ Series	Maximum Chamfer Size
			Dia. Range (mm)	Dia. Range (mm)	Dia. Range (mm)	
CB140R02	1.50	.866	13.5 - 14.4	13.5 - 14.4	13.5 - 14.4	.118 x 45°
CB150R02	1.50	.866	14.5 - 15.9	14.5 - 15.4	14.5 - 15.4	.118 x 45°
CB160R02	1.65	.906	16.0 - 16.9	15.5 - 16.4	15.5 - 16.4	.118 x 45°
CB170R02	1.65	.906	17.0 - 17.9	16.5 - 17.4	16.5 - 17.4	.118 x 45°
CB180R02	1.65	.906	18.0 - 18.9	17.5 - 18.4	17.5 - 18.4	.118 x 45°
CB190R02	1.65	.945	19.0 - 19.9	18.5 - 19.4	18.5 - 19.4	.118 x 45°
CB200R02	1.65	.945	20.0 - 20.9	19.5 - 20.4	19.5 - 20.4	.118 x 45°

NOTE: For use with GOLD•TWIST 3, 5 & 8xD and QUAD•TWIST & QUAD•DRILL+ 3 & 4xD.

INSERTS



Designation	L	W	S	Grade
CRNG-0802-45CD	.583	.295	.144	IN2505

HARDWARE

Description	Insert Screw	Torx	Clamping Screw	Wrench
CB140R02	SO 25065I	DS-T07S	SHM4x0.7x12 ⁽¹⁾	L-W3
CB150R02	SO 25065I	DS-T07S	SHM4x0.7x12 ⁽¹⁾	L-W3
CB160R02	SO 25065I	DS-T07S	SHM5x0.8x16 ⁽²⁾	L-W4
CB170R02	SO 25065I	DS-T07S	SHM5x0.8x16 ⁽²⁾	L-W4
CB180R02	SO 25065I	DS-T07S	SHM5x0.8x16 ⁽²⁾	L-W4
CB190R02	SO 25065I	DS-T07S	SHM5x0.8x16 ⁽²⁾	L-W4
CB200R02	SO 25065I	DS-T07S	SHM5x0.8x16 ⁽²⁾	L-W4

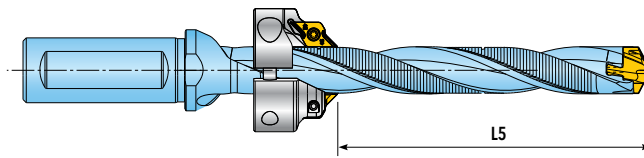
⁽¹⁾ Clamping torque: 4 [N•m] 36 [lbf-in]

⁽²⁾ Clamping torque: 7-8 [N•m] 84-96 [lbf-in]

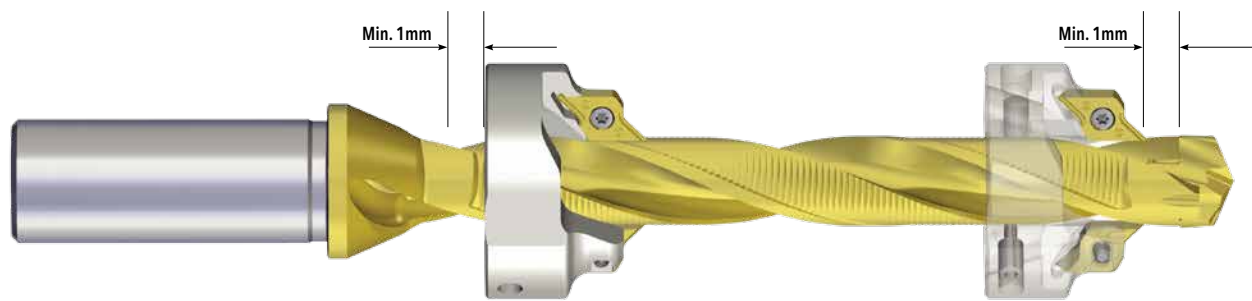
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CHAMFERING RINGS

FOR **GOLD TWIST**
DRILL-BITS

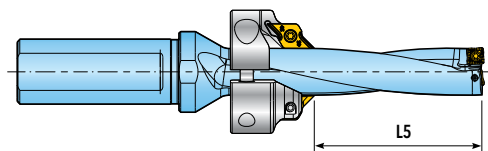


L:D	Body Designation		Ring Designation	L5 (min) inch	L5 (max) inch
	Cylindrical Shank	Shank with Flat			
3	TD1400042S6R01	TD1400042C0R01	CB140R02	0.630	0.866
	TD1450043S6R01	TD1450043C0R01	CB140R02	0.630	0.866
	TD1500045S7R01	TD150004518R01	CB150R02	0.670	0.984
	TD1600048S7R01	TD160004818R01	CB160R02	0.709	1.102
	TD1700051S7R01	TD170005118R01	CB170R02	0.748	1.22
	TD1800054S1R01	TD1800054C8R01	CB180R02	0.787	1.339
	TD1900057S1R01	TD1900057C8R01	CB190R02	0.827	1.457
	TD2000060S1R01	TD2000060C8R01	CB200R02	0.866	1.575
5	TD1400070S6R01	TD1400070C0R01	CB140R02	0.787	1.969
	TD1450072S6R01	TD1450072C0R01	CB140R02	0.787	1.969
	TD1500075S7R01	TD150007518R01	CB150R02	0.906	2.165
	TD1600080S7R01	TD160008018R01	CB160R02	1.024	2.362
	TD1700085S7R01	TD170008518R01	CB170R02	1.142	2.559
	TD1800090S1R01	TD1800090C8R01	CB180R02	1.260	2.756
	TD1900095S1R01	TD1900095C8R01	CB190R02	1.378	2.953
	TD2000100S1R01	TD2000100C8R01	CB200R02	1.496	3.15
8	TD1400112S6R01	TD1400112C0R01	CB140R02	1.890	3.622
	TD1450116S6R01	TD1450116C0R01	CB140R02	1.890	3.622
	TD1500120S7R01	TD150012018R01	CB150R02	2.087	3.937
	TD1600128S7R01	TD160012818R01	CB160R02	2.283	4.252
	TD1700136S7R01	TD170013618R01	CB170R02	2.480	4.567
	TD1800144S1R01	TD1800144C8R01	CB180R02	2.677	4.882
	TD1900152S1R01	TD1900152C8R01	CB190R02	2.874	5.197
	TD2000160S1R01	TD2000160C8R01	CB200R02	3.071	5.512

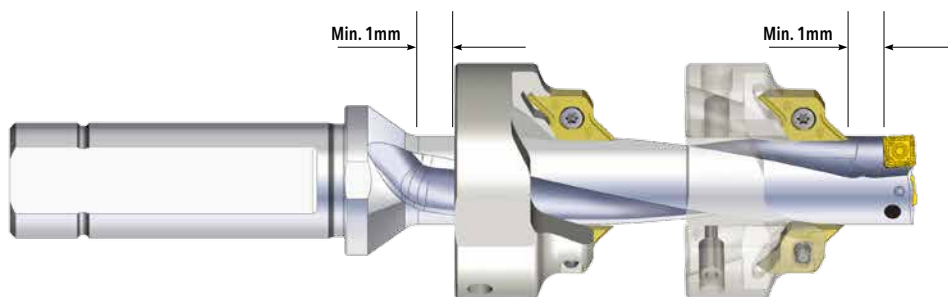


CHAMFERING RINGS

FOR **QUAD•TWIST™** **QUAD•DRILL+™**



L:D	Body Designation		Ring Designation	L5 (min) inch	L5 (max) inch
	QUAD•TWIST	QUAD•DRILL+			
3	QR0143043N5R01/R02	Q0143043N5R01/R02	CB140R02	0.551	0.709
	QR0150045N5R01/R02	Q0150045N5R01/R02	CB150R02	0.591	0.827
	QR0159048N5R01/R02	Q0159048N5R01/R02	CB160R02	0.630	0.945
	QR0167050N5R01/R02	Q0167050N5R01/R02	CB170R02	0.670	1.062
	QR0175053N5R01/R02	Q0175053N5R01/R02	CB180R02	0.709	1.181
	QR0183055N5R01/R02	Q0183055N5R01/R02	CB180R02	0.709	1.181
	QR0191057N5R01/R02	Q0191057N5R01/R02	CB190R02	0.748	1.299
	QR0198059N5R01/R02	Q0198059N5R01/R02	CB200R02	0.787	1.417
4	QR0143057N5R01/R02	Q0143057N5R01/R02	CB140R02	0.630	1.260
	QR0150060N5R01/R02	Q0150060N5R01/R02	CB150R02	0.748	1.417
	QR0159064N5R01/R02	Q0159064N5R01/R02	CB160R02	0.866	1.575
	QR0167067N5R01/R02	Q0167067N5R01/R02	CB170R02	0.984	1.732
	QR0175070N5R01/R02	Q0175070N5R01/R02	CB180R02	1.102	1.890
	QR0183073N5R01/R02	Q0183073N5R01/R02	CB180R02	1.102	1.890
	QR0191076N5R01/R02	Q0191076N5R01/R02	CB190R02	1.220	2.047
	QR0198079N5R01/R02	Q0198079N5R01/R02	CB200R02	1.339	2.204



CHAMFERING RINGS

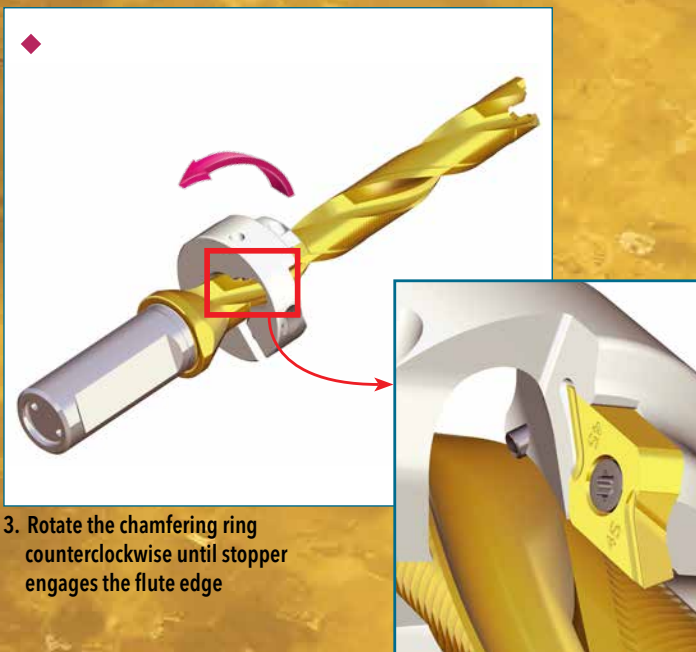
ASSEMBLY OF CHAMFERING RING



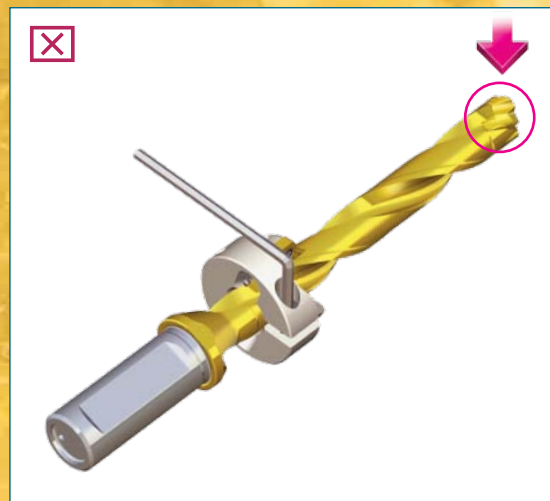
1. Insert the chamfering ring on to the drill body.
The stopper must be inside the flute.



2. Slide the chamfering ring to the desired position.

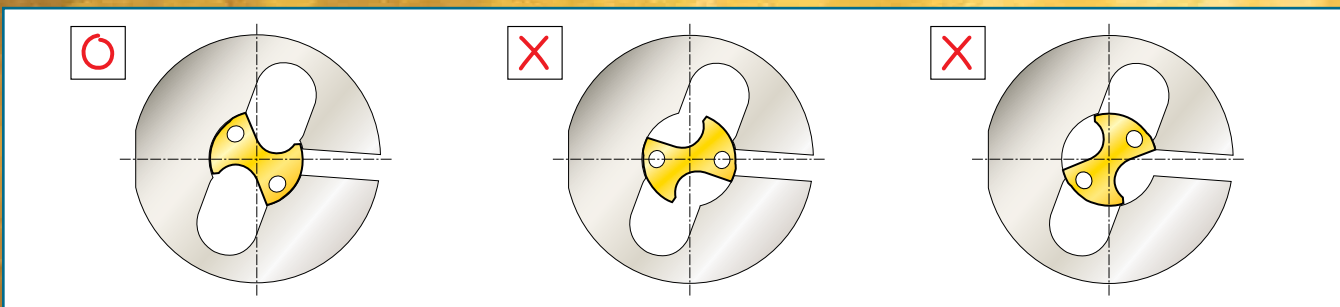


3. Rotate the chamfering ring
counterclockwise until stopper
engages the flute edge



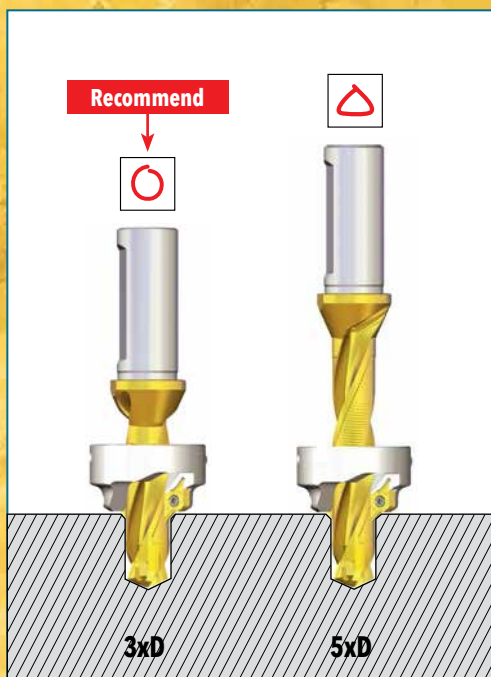
4. Tighten the chamfering ring and clamp the drill head.

**When the chamfering ring is clamped correctly,
the drill flute will be aligned with the chamfering ring flute.**

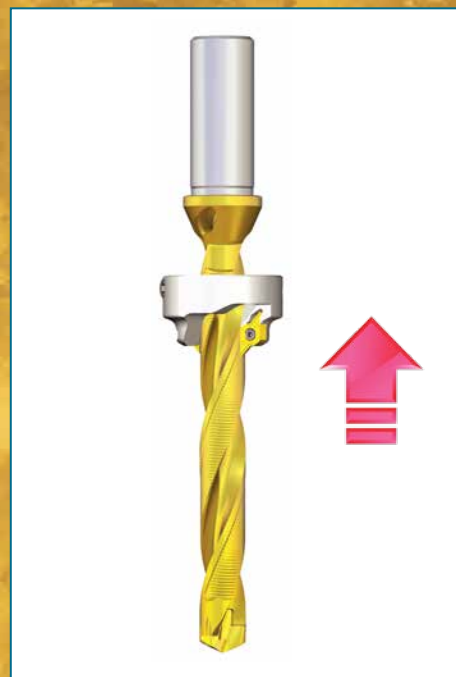


CHAMFERING RINGS

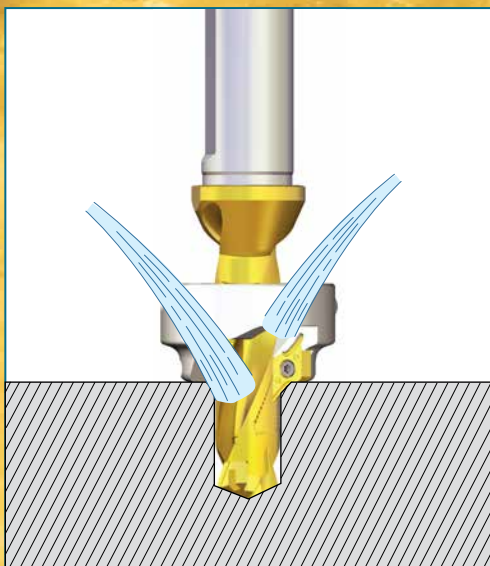
RECOMMENDATIONS FOR STABLE MACHINING



1. If possible, always use a short holder.
If not, reduce the cutting speed to minimize vibration.



2. Mount the chamfering ring as close as possible to the drilling shank.



3. For better insert life, apply external coolant to the insert and internal coolant to the drill tip.

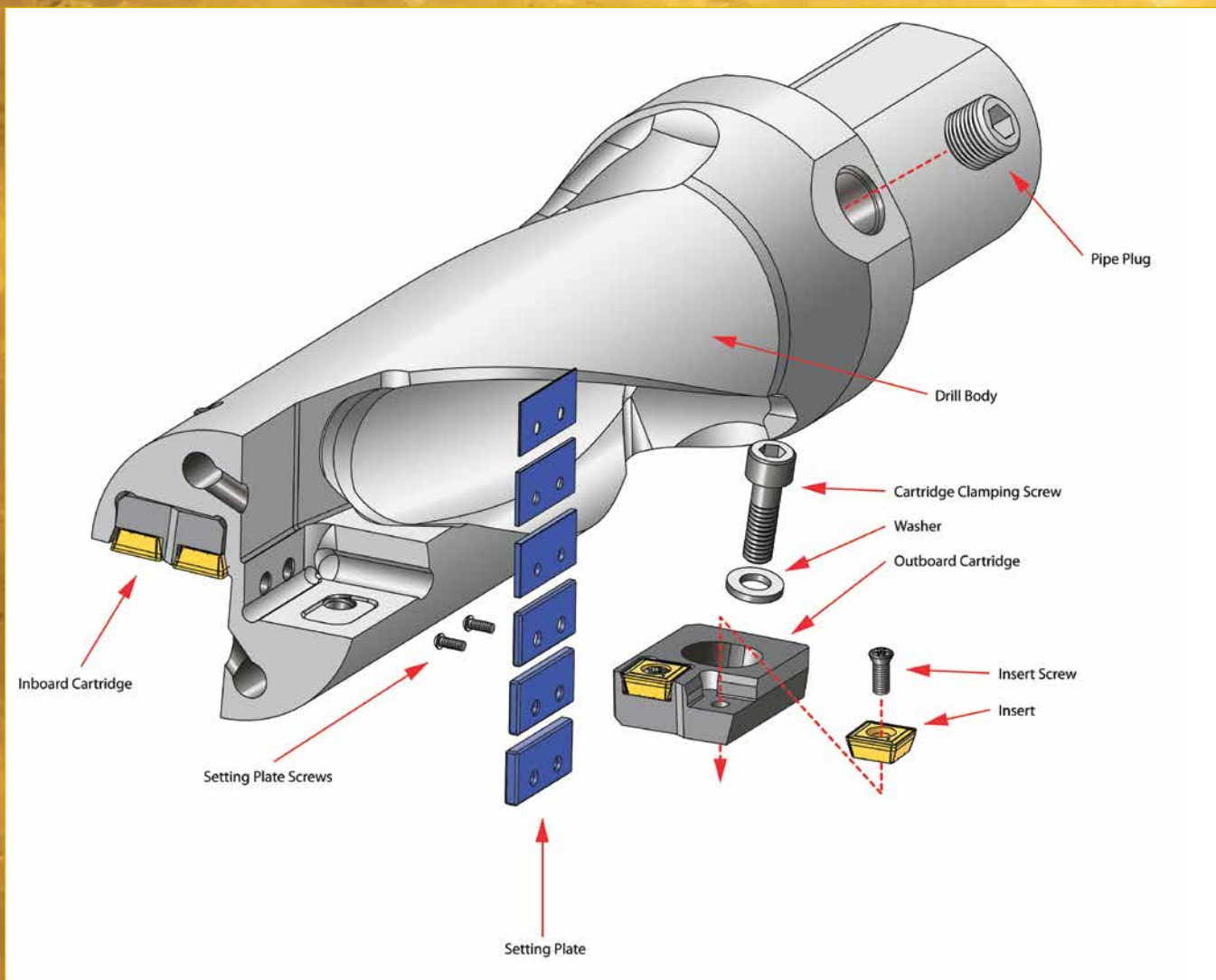


QA ADJUSTABLE DRILLS

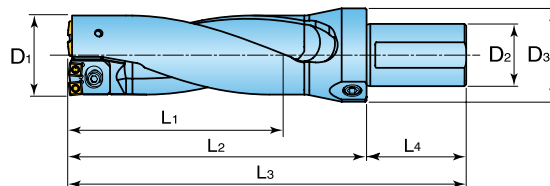
NEW GENERATION OF INDEXABLE DRILL

- Adjustability enables multiple diameters with the same body.
- Five drill bodies cover (17) standard sizes.
- Minimum Drill inventory for Cost savings.
- Two coolant access ports, side port specifically for non-rotational lathe drilling applications.
- Cartridge design protects the drill body - a significant feature on larger size expensive drill bodies.
- 4 inserts per body: 2 cartridges per body, 2 inserts per cartridges.

• QUADODRILL+ SERIES QA DRILL ASSEMBLY



2XD ADJUSTABLE CARTRIDGE DRILL SERIES QA



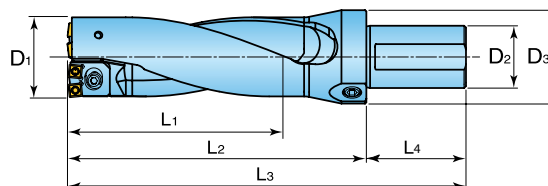
Drill Number	Dimensions (inch)						# of inserts	Setting Plates		Cartridge	
	D1	L1	L2	L3	L4	D2		Part Number	Plate Thickness	Outboard	Inboard
QA0540111N8R01	2.125	4.41	5.98	9.23	3.25	2.000 Universal	4	-	-	55E223R01	55E213R01
	2.188							DS07-080-01	.031		
QA0572121N8R01	2.250	4.82	6.69	9.94	3.25	2.000 Universal	4	-	-	55F243R02	55F233R01
	2.313							DS09-080-01	.031		
QA0619130N8R01	2.375	5.13	7.17	10.42	3.25	2.000 Universal	4	DS09-159-01	.063	55F263R01	55F243R03
	2.438							-	-		
QA0667143N8R01	2.500	5.67	7.99	11.24	3.25	2.000 Universal	4	DS09-080-01	.031	55G294R01	55G264R01
	2.563							DS09-159-01	.063		
QA0730159N8R01	2.625	6.25	8.27	11.52	3.25	2.000 Universal	4	-	-	55H314R00	55H294R00
	2.688							DS11-080-01	.031		
	2.750	6.25	8.27	11.52	3.25	2.000 Universal	4	DS11-159-01	.063	55H314R00	55H294R00
	2.813							DS11-238-01	.094		
	2.875	6.25	8.27	11.52	3.25	2.000 Universal	4	-	-	55H314R00	55H294R00
	2.938							DS11-080-01	.031		
	3.000	6.25	8.27	11.52	3.25	2.000 Universal	4	DS11-159-01	.063	55H314R00	55H294R00
	3.063							DS11-238-01	.094		
	3.125							DS11-320-01	.125		

*Each drill includes all hardware. Order inserts separately.

HARDWARE

Drill Diameter Size Range	Outboard Cartridge	Inboard Cartridge	Cartridge Mounting Screw	Cartridge Mounting Screw Washer	Allen Wrench	Insert Screw	Insert Screw Wrench	Setting Plate Screws	Setting Plate Screw Wrench
2.125-2.188	55E223R01	55E213R01	SD040-16 (M4 X 0.7 X 16MM SHCS)	WA004-01 (4.3MM X 8MM)	L-W3 (3MM)	SM25-064-00	DS-T08W (Tx-08)	SM20-043-00	DS-TP06S (TxP-06)
2.250-2.375	55F243R02	55F233R01	SD050-16 (M5 X 0.8 X 16MM SHCS)	WA005-01 (5.5MM X 10MM)	L-W4 (4MM)	SM35-088-60	DS-T10T (Tx-10)	SM30-055-10	DS-T09W (Tx-09)
2.437-2.563	55F263R01	55F243R03	SD050-16 (M5 X 0.8 X 16MM SHCS)	WA005-01 (5.5MM X 10MM)	L-W4 (4MM)	SM35-088-60	DS-T10T (Tx-10)	SM30-055-10	DS-T09W (Tx-09)
2.625-2.813	55G294R01	55G264R01	SD060-20 (M6 X 1 X 20MM SHCS)	WA006-01 (6.4 MM X 12MM)	L-W5 (5MM)	SM40-093-20	DS-T15T (Tx-15)	SM30-055-10	DS-T09W (Tx-09)
2.875-3.125	55H314R00	55H294R00	SD060-20 (M6 X 1 X 20MM SHCS)	WA006-01 (6.4 MM X 12MM)	L-W5 (5MM)	SM40-093-20	DS-T15T (Tx-15)	SM30-055-10	DS-T09W (Tx-09)

3XD ADJUSTABLE CARTRIDGE DRILL SERIES QA



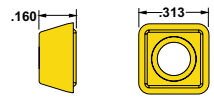
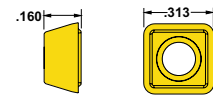
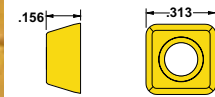
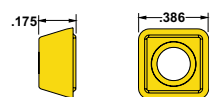
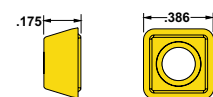
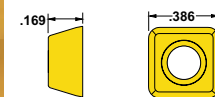
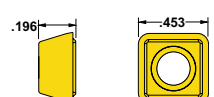
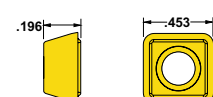
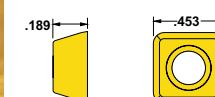
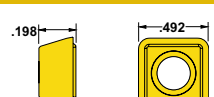
Drill Number	D1	Dimensions (inch)						# of inserts	Setting Plates		Cartridge	
		L1	L2	L3	L4	D2	D3		Part Number	Plate Thickness	Outboard	Inboard
QA0540167N8R01	2.125 2.188	6.61	8.19	11.44	3.25	2.000 Universal	2.365	4	- DS07-080-01	- .031	55E223R01	55E213R01
QA0572181N8R01	2.250 2.313 2.375	7.23	9.13	12.38	3.25	2.000 Universal	2.365	4	- DS09-080-01 DS09-159-01	- .031 .063	55F243R02	55F233R01
QA0619195N8R01	2.438 2.500 2.563	7.69	9.76	13.01	3.25	2.000 Universal	2.365	4	- DS09-080-01 DS09-159-01	- .031 .063	55F263R01	55F243R03
QA0667214N8R01	2.625 2.688 2.750 2.813	8.50	10.87	14.12	3.25	2.000 Universal	2.365	4	- DS11-080-01 DS11-159-01 DS11-238-01	- .031 .063 .094	55G294R01	55G264R01
QA0730238N8R01	2.875 2.938 3.000 3.063 3.125	9.38	11.42	14.67	3.25	2.000 Universal	2.365	4	- DS11-080-01 DS11-159-01 DS11-238-01 DS11-320-01	- .031 .063 .094 .125	55H314R00	55H294R00

*Each drill includes all hardware. Order inserts separately.

HARDWARE

Drill Diameter Size Range	Outboard Cartridge	Inboard Cartridge	Cartridge Mounting Screw	Cartridge Mounting Screw Washer	Allen Wrench	Insert Screw	Insert Screw Wrench	Setting Plate Screws	Setting Plate Screw Wrench
2.125-2.188	55E223R01	55E213R01	SD040-16 (M4 X 0.7 X 16MM SHCS)	WA004-01 (4.3MM X 8MM)	L-W3 (3MM)	SM25-064-00	DS-T08W (Tx-08)	SM20-043-00	DS-TP06S (TxP-06)
2.250-2.375	55F243R02	55F233R01	SD050-16 (M5 X 0.8 X 16MM SHCS)	WA005-01 (5.5MM X 10MM)	L-W4 (4MM)	SM35-088-60	DS-T10T (Tx-10)	SM30-055-10	DS-T09W (Tx-09)
2.437-2.563	55F263R01	55F243R03	SD050-16 (M5 X 0.8 X 16MM SHCS)	WA005-01 (5.5MM X 10MM)	L-W4 (4MM)	SM35-088-60	DS-T10T (Tx-10)	SM30-055-10	DS-T09W (Tx-09)
2.625-2.813	55G294R01	55G264R01	SD060-20 (M6 X 1 X 20MM SHCS)	WA006-01 (6.4 MM X 12MM)	L-W5 (5MM)	SM40-093-20	DS-T15T (Tx-15)	SM30-055-10	DS-T09W (Tx-09)
2.875-3.125	55H314R00	55H294R00	SD060-20 (M6 X 1 X 20MM SHCS)	WA006-01 (6.4 MM X 12MM)	L-W5 (5MM)	SM40-093-20	DS-T15T (Tx-15)	SM30-055-10	DS-T09W (Tx-09)

INSERTS

SPLT07T308N-PH  	SPLT07T308N  	SDGT07T308-HP  
SHLT090408N-PH1  	SHLT090408N  	SHGT090408-HP  
SHLT110408N-PH1  	SHLT110408N  	SHGT110408-HP  
SPLT120408-PH  		

Drill Diameter Range	Insert Number (n)	Cast Iron Inserts Grade IN2010 only (s)	Aluminum Inserts Grade IN10K only (l)	Corner	Grades	1030	2005	2010	6520	10K
2.125-2.188	SPLT07T308N-PH	SPLT07T308N	SDGT07T308-HP	.030R		•	•	•	•	•
2.250-2.563	SHLT090408N-PH1	SHLT090408N	SHGT090408-HP	.030R		•	•	•	•	•
2.625-2.813	SHLT110408N-PH1	SHLT110408N	SHGT110408-HP	.030R		•	•	•	•	•
2.875-3.125	SPLT120408N-PH	-	-	.030R			•			

Grade	Application
IN2005	General Purpose
IN1030	For use in unstable conditions, low SFM
IN6520	Peripheral pocket only, more wear resistance
IN2010	Cast iron applications
IN10K	Aluminum, non-ferrous materials

CARTRIDGE-STYLE (DIA. OVER 2.125") RECOMMENDED CUTTING CONDITIONS

ISO	Material	Condition	Tensile Strength Rm (N/mm ²)	Hardness (HB)	Matl No.	Cutting Speed Vc (SFM)	Feed vs. Drill Diameter Inch/Rev Drill Length 2xD, 3xD			
							Ø 2.125 (inch)	Ø 2.250-2.750 (inch)	Ø 2.875-3.000 (inch)	Ø 3.250 (inch)
P	Non-alloy steel <0.25% C & cast steel, >= 0.25% C free cutting <0.55% C steel >= 0.55% C	Annealed	420	125	1	800-1000	.002-.003	.002-.003	.002-.004	.002-.004
		Annealed	650	190	2	800-1000	.003-.004	.003-.004	.003-.005	.003-.005
		Quenched & Tempered	850	250	3	500-800	.003-.005	.003-.005	.003-.006	.003-.006
		Annealed	750	220	4	800-1000	.003-.005	.003-.005	.003-.006	.003-.006
		Quenched & Tempered	1000	300	5	600-800	.003-.005	.003-.005	.003-.006	.003-.006
	Low alloy steel & cast steel (less than 5% alloying elements)	Annealed	600	200	6	500-800	.003-.006	.003-.006	.003-.007	.003-.007
		Quenched & Tempered	930	275	7	400-700	.003-.006	.003-.006	.003-.008	.003-.008
			1000	300	8	400-600	.003-.006	.003-.006	.003-.008	.003-.008
			1200	350	9	300-550	.003-.006	.003-.006	.003-.008	.003-.008
	High alloy steel, cast steel, & tool steel	Annealed	680	200	10	400-600	.002-.005	.0025-.005	.0025-.005	.003-.006
		Quenched & Tempered	1100	325	11	400-550	.0025-.005	.0025-.005	.003-.006	.003-.006
M	Stainless steel & cast stainless steel	Ferritic/Martensitic	680	200	12	550-800	.0035-.007	.004-.008	.005-.085	.003-.006
		Martensitic	820	240	13	500-700	.0035-.007	.004-.008	.005-.085	.003-.006
		Austenitic	600	180	14	500-700	.0035-.007	.004-.008	.005-.085	.003-.006
K	GreyCast Iron (GG)	Ferritic		160	15	500-800	.006-.0095	.007-.012	.007-.013	.0085-.014
		Pearlitic		250	16	500-800	.006-.0095	.007-.012	.007-.013	.0085-.014
	Cast Iron Nodular (GGG)	Ferritic		180	17	600-800	.006-.0095	.007-.012	.007-.013	.0085-.014
		Pearlitic		260	18	600-800	.006-.0095	.007-.012	.007-.013	.0085-.014
	Malleable Cast Iron	Ferritic		130	19	600-800	.006-.0095	.007-.012	.007-.013	.0085-.014
		Pearlitic		230	20	500-700	.006-.0095	.007-.012	.007-.013	.0085-.014
N	Aluminum - wrought alloy	Not cureable		60	21	1300-2000	.005-.0095	.006-.011	.0065-.011	.007-.012
		Cured		100	22	1000-1300	.005-.0095	.006-.011	.0065-.011	.007-.012
	Aluminum - cast, alloyed ≤ 12% Si ≥ 12% Si	Not cureable		75	23	1300-2000	.005-.0095	.006-.011	.0065-.011	.007-.012
		Cured		90	24	1000-1300	.005-.0095	.006-.011	.0065-.011	.007-.012
		High temperature		130	25	1000-1300	.005-.0095	.006-.011	.0065-.011	.007-.012
	Copper alloys ≥ 1% Pb	Free cutting		110	26	800-1000	.005-.0095	.006-.011	.0065-.011	.007-.012
		Brass		90	27	750-900	.005-.0095	.006-.011	.0065-.011	.007-.012
		Electrolitic copper		100	28	800-1000	.005-.0095	.006-.011	.0065-.011	.007-.012
	Non-metallic	Duro & fiber plastics			29					
		Hard rubber			30					
S	High temp alloys Fe based Ni or Co based	Annealed		200	31	100-250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Cured		280	32	100-250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Annealed		250	33	100-250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Cured		350	34	100-250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Cast		320	35	100-250	.0035-.0085	.005-.010	.006-.011	.007-.0115
	Titanium, Ti alloys		Rm 400		36	100-250	.0035-.0085	.005-.010	.006-.011	.007-.0115
		Alpha+beta alloys cured	Rm 1050		37	100-200	.0035-.0085	.005-.010	.006-.011	.007-.0115
H	Hardened steel	Hardened		55 HRC	38	50-150	.001-.0035	.0025-.0035	.0025-.0035	.0025-.0045
		Hardened		60 HRC	39	50-150	.001-.0035	.0025-.0035	.0025-.0035	.0025-.0045
	Chilled cast iron	Cast		400	40	50-150	.001-.0035	.0025-.0035	.0025-.0035	.0025-.0045
	Cast iron nodular	Hardened		55 HRC	41	50-150	.001-.0035	.0025-.0035	.0025-.0035	.0025-.0045



HF SERIES DEEP DRILL

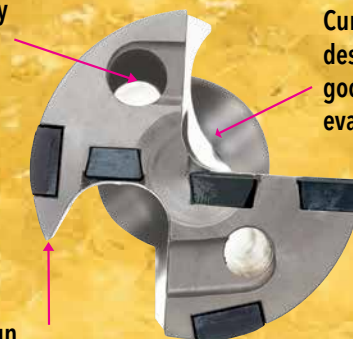


INSERT GRADE APPLICATIONS

IN6542	P25	P20-30	CVD 3-Layered	Steel Alloyed Steel Steel Coating
IN1510	M30	K15-25 M35-40 P30-40 S15-25	PVD-TiCN	Stainless HRSA Cast iron
IN2005	P30	M10-30 P15-35	PVD-TiAlN	Multipurpose

Large coolant hole
facilitates excellent
coolant supply

Curved flute
design for
good chip
evacuation

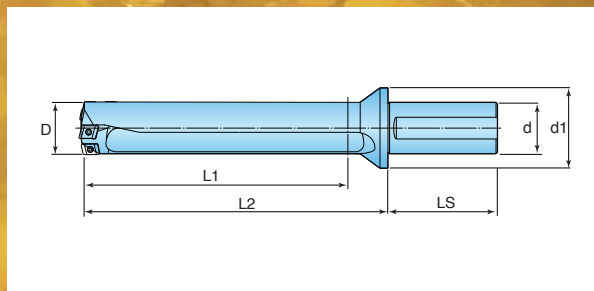


Optimal design
to reduce chip jamming

INSERTS

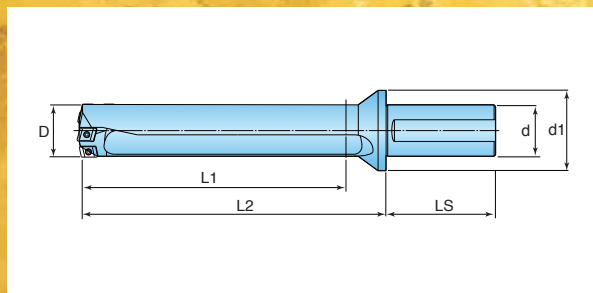
D	Outer	Insert Inner	Center	Guide Pad
30 - 33	NPMT06504R2	NPMT06504R2	NPMT06504L2	PAD-GO-07CD
33.01 - 36	NPMT06504R2	NPMT06504R2	NPMT0804L2	PAD-GO-07CD
36.01 - 39	NPMT0804R2	NPMT06504R2	NPMT0804L2	PAD-GO-07CD
39.01 - 42	NPMT0804R2	NPMT0804R2	NPMT0804L2	PAD-GO-08CD
42.01 - 45	NPMT0804R2	NPMT0804R2	NPMT09504L2	PAD-GO-08CD
45.01 - 48	NPMT09504R2	NPMT0804R2	NPMT09504L2	PAD-GO-10CD
48.01 - 51	NPMT09504R2	NPMT09504R2	NPMT09504L2	PAD-GO-10CD
51.01 - 57	NPMT09504R2	NPMT09504R2	NPMT12504L2	PAD-GO-10CD
57.01 - 63	NPMT12504R2	NPMT09504R2	NPMT12504L2	PAD-GO-12CD
63.01 - 69	NPMT12504R2	NPMT12504R2	NPMT12504L2	PAD-GO-12CD

HF SERIES DEEP DRILL



Description	D"	D mm	Dimensions (inch)					
			L1	L2	LS	d	d1	L/D
HF0300420N6R01	1.181	30	16.54	17.68	2.36	1.25	1.77	14
HF0310420N6R01	1.220	31	16.54	17.68	2.36	1.25	1.77	13
HF0318420N7R01	1.250	31.8	16.54	17.68	2.76	1.50	2.17	13
HF0320420N7R01	1.260	32	16.54	17.68	2.76	1.50	2.17	13
HF0330420N7R01	1.299	33	16.54	17.68	2.76	1.50	2.17	12
HF0340420N7R01	1.339	34	16.54	17.72	2.76	1.50	2.17	12
HF0350420N7R01	1.378	35	16.54	17.72	2.76	1.50	2.17	12
HF0360420N7R01	1.417	36	16.54	17.72	2.76	1.50	2.17	12
HF0370420N7R01	1.457	37	16.54	17.83	2.76	1.50	2.17	11
HF0380420N7R01	1.496	38	16.54	17.83	2.76	1.50	2.17	11
HF0381420N7R01	1.500	38.1	16.54	17.83	2.76	1.50	2.17	11
HF0390420N7R01	1.535	39	16.54	17.83	2.76	1.50	2.17	10
HF0400420N7R01	1.575	40	16.54	17.87	2.76	1.50	2.17	10
HF0410420N7R01	1.614	41	16.54	17.87	2.76	1.50	2.17	10
HF0420420N7R01	1.654	42	16.54	17.87	2.76	1.50	2.17	10
HF0430420N7R01	1.693	43	16.54	17.95	2.76	1.50	2.17	9
HF0440420N7R01	1.732	44	16.54	17.95	2.76	1.50	2.17	9
HF0445420N7R01	1.750	44.5	16.54	17.95	2.76	1.50	2.17	9
HF0450420N7R01	1.772	45	16.54	17.95	2.76	1.50	2.17	9
HF0460420N7R01	1.811	46	16.54	18.07	2.76	1.50	2.17	9
HF0470420N7R01	1.850	47	16.54	18.07	2.76	1.50	2.17	8
HF0480420N7R01	1.890	48	16.54	18.07	2.76	1.50	2.17	8
HF0490420N7R01	1.929	49	16.54	18.15	2.76	1.50	2.17	8

HF SERIES DEEP DRILL



Description	D"	D mm	Dimensions (inch)					
			L1	L2	LS	d	d1	L/D
HF0500420N7R01	1.969	50	16.54	18.15	2.76	1.50	2.17	8
HF0508420N7R01	2.000	50.8	16.54	18.15	2.76	1.50	2.17	8
HF0510420N7R01	2.008	51	16.54	18.15	2.76	1.50	2.17	8
HF0520420N7R01	2.047	52	16.54	18.27	2.76	1.50	-	8
HF0530420N7R01	2.087	53	16.54	18.27	2.76	1.50	-	7
HF0540420N7R01	2.126	54	16.54	18.27	2.76	1.50	-	7
HF0550420N7R01	2.165	55	16.54	18.27	2.76	1.50	-	7
HF0560420N7R01	2.205	56	16.54	18.27	2.76	1.50	-	7
HF0570420N7R01	2.244	57	16.54	18.27	2.76	1.50	-	7
HF0571420N7R01	2.248	57.1	16.54	18.27	2.76	1.50	-	7
HF0580420N7R01	2.283	58	16.54	18.50	2.76	1.50	-	7
HF0590420N7R01	2.323	59	16.54	18.50	2.76	1.50	-	7
HF0600420N7R01	2.362	60	16.54	18.50	2.76	1.50	-	7
HF0610420N7R01	2.402	61	16.54	18.50	2.76	1.50	-	6
HF0620420N7R01	2.441	62	16.54	18.50	2.76	1.50	-	6
HF0630420N7R01	2.48	63	16.54	18.50	2.76	1.50	-	6
HF0635420N7R01	2.500	63.5	16.54	18.50	2.76	1.50	-	6
HF0640420N7R01	2.520	64	16.54	18.62	2.76	1.50	-	6
HF0650420N7R01	2.559	65	16.54	18.62	2.76	1.50	-	6
HF0660420N7R01	2.598	66	16.54	18.62	2.76	1.50	-	6
HF0670420N7R01	2.638	67	16.54	18.62	2.76	1.50	-	6
HF0680420N7R01	2.677	68	16.54	18.62	2.76	1.50	-	6
HF0690420N7R01	2.716	69	16.54	18.62	2.76	1.50	-	6