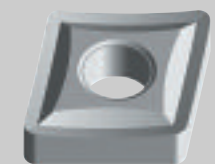
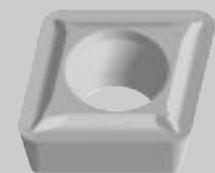
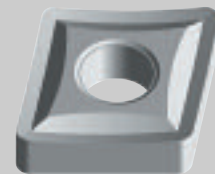
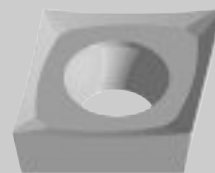


*Engineering Your
Competitive Edge*



A PRODUCT OF KENAMETAL INC.



Inserts

For High-Temp Alloys, Stainless Steels, and Aluminum

Decimal Equivalent Chart

Size	Decimal Inches	Size	Decimal Inches	Size	Decimal Inches	Size	Decimal Inches	Size	Decimal Inches
107	0.0019	57	0.0430	9/64	0.1406	6.60mm	0.2598	7/16	0.4375
106	0.0023	1.10mm	0.0433	3.60mm	0.1417	G	0.2610	11.20mm	0.4409
105	0.0027	1.15mm	0.0453	27	0.1440	6.70mm	0.2638	11.50mm	0.4528
104	0.0031	56	0.0465	3.70mm	0.1457	17/64	0.2656	29/64	0.4531
103	0.0035	3/64	0.0469	26	0.1470	6.75mm	0.2657	11.80mm	0.4646
102	0.0039	1.20mm	0.0472	3.75mm	0.1476	H	0.2660	15/32	0.4688
101	0.0043	1.25mm	0.0492	25	0.1495	6.80mm	0.2677	12.00mm	0.4724
100	0.0047	1.30mm	0.0512	3.80mm	0.1496	6.90mm	0.2717	12.20mm	0.4803
99	0.0051	55	0.0520	24	0.1520	I	0.2720	31/64	0.4844
98	0.0055	1.35mm	0.0531	3.90mm	0.1535	7.00mm	0.2756	12.50mm	0.4921
97	0.0059	54	0.0550	23	0.1540	J	0.2770	1/2	0.5000
96	0.0063	1.40mm	0.0551	5/32	0.1562	7.10mm	0.2795	12.80mm	0.5039
95	0.0067	1.45mm	0.0571	22	0.1570	K	0.2810	13.00mm	0.5118
94	0.0071	1.50mm	0.0591	4.00mm	0.1575	9/32	0.2812	33/64	0.5156
93	0.0075	53	0.0595	21	0.1590	7.20mm	0.2835	13.20mm	0.5197
92	0.0079	1.55mm	0.0610	20	0.1610	7.25mm	0.2854	17/32	0.5312
0.20mm	0.0079	1/16	0.0625	4.10mm	0.1614	7.30mm	0.2874	13.50mm	0.5315
91	0.0083	1.60mm	0.0630	4.20mm	0.1654	L	0.2900	13.80mm	0.5433
90	0.0087	52	0.0635	19	0.1660	7.40mm	0.2913	35/64	0.5469
0.22mm	0.0087	1.65mm	0.0650	4.25mm	0.1673	M	0.2950	14.00mm	0.5512
89	0.0091	1.70mm	0.0669	4.30mm	0.1693	7.50mm	0.2953	14.25mm	0.5610
88	0.0095	51	0.0670	18	0.1695	19/64	0.2969	9/16	0.5625
0.25mm	0.0098	1.75mm	0.0689	11/64	0.1719	7.60mm	0.2992	14.50mm	0.5709
87	0.0100	50	0.0700	17	0.1730	N	0.3020	37/64	0.5781
86	0.0105	1.80mm	0.0709	4.40mm	0.1732	7.70mm	0.3031	14.75mm	0.5807
85	0.0110	1.85mm	0.0728	16	0.1770	7.75mm	0.3051	15.00mm	0.5906
0.28mm	0.0110	49	0.0730	4.50mm	0.1772	7.80mm	0.3071	19/32	0.5938
84	0.0115	1.90mm	0.0748	15	0.1800	7.90mm	0.3110	15.25mm	0.6004
0.30mm	0.0118	48	0.0760	4.60mm	0.1811	5/16	0.3125	39/64	0.6094
83	0.0120	1.95mm	0.0768	14	0.1820	8.00mm	0.3150	15.50mm	0.6102
82	0.0125	5/64	0.0781	13	0.1850	O	0.3160	15.75mm	0.6201
0.32mm	0.0126	47	0.0785	4.7mm	0.1850	8.10mm	0.3189	5/8	0.6250
81	0.0130	2.00mm	0.0787	4.75mm	0.1870	8.20mm	0.3228	16.00mm	0.6299
80	0.0135	2.05mm	0.0807	3/16	0.1875	P	0.3230	16.25mm	0.6398
0.35mm	0.0138	46	0.0810	4.8mm	0.1890	8.25mm	0.3248	41/64	0.6406
79	0.0145	45	0.0820	12	0.1890	8.30mm	0.3268	16.50mm	0.6496
0.38mm	0.0150	2.10mm	0.0827	11	0.1910	21/64	0.3281	21/32	0.6562
1/64	0.0156	2.15mm	0.0846	4.90mm	0.1929	8.40mm	0.3307	16.75mm	0.6594
0.40mm	0.0157	44	0.0860	10	0.1935	Q	0.3320	17.00mm	0.6693
78	0.0160	2.20mm	0.0866	9	0.1960	8.50mm	0.3346	43/64	0.6719
0.42mm	0.0165	2.25mm	0.0886	5.00mm	0.1969	8.60mm	0.3386	17.25mm	0.6791
0.45mm	0.0177	43	0.0890	8	0.1990	R	0.3390	11/16	0.6875
77	0.0180	2.30mm	0.0906	5.10mm	0.2008	8.70mm	0.3425	17.50mm	0.6890
0.48mm	0.0189	2.35mm	0.0925	7	0.2010	11/32	0.3438	45/64	0.7031
0.50mm	0.0197	42	0.0935	13/64	0.2031	8.75mm	0.3445	18.00mm	0.7087
76	0.0200	3/32	0.0938	6	0.2040	8.80mm	0.3465	23/32	0.7188
75	0.0210	2.40mm	0.0945	5.20mm	0.2047	S	0.3480	18.50mm	0.7283
0.55mm	0.0217	41	0.0960	5	0.2055	8.90mm	0.3504	47/64	0.7344
74	0.0225	2.45mm	0.0965	5.25mm	0.2067	9.00mm	0.3543	19.00mm	0.7480
0.60mm	0.0236	40	0.0980	5.30mm	0.2087	T	0.3580	3/4	0.7500
73	0.0240	2.50mm	0.0984	4	0.2090	9.10mm	0.3583	49/64	0.7656
0.62mm	0.0244	39	0.0995	5.40mm	0.2126	23/64	0.3594	19.50mm	0.7677
72	0.0250	38	0.1015	3	0.2130	9.20mm	0.3622	25/32	0.7812
0.65mm	0.0256	2.60mm	0.1024	5.50mm	0.2165	9.25mm	0.3642	20.00mm	0.7874
71	0.0260	37	0.1040	7/32	0.2188	9.30mm	0.3661	51/64	0.7969
0.70mm	0.0276	2.70mm	0.1063	5.60mm	0.2205	U	0.3680	20.50mm	0.8071
70	0.0280	36	0.1065	2	0.2211	9.40mm	0.3701	13/16	0.8125
69	0.0292	2.75mm	0.1083	5.70mm	0.2244	9.50mm	0.3740	21.00mm	0.8268
0.75mm	0.0295	7/64	0.1094	5.75mm	0.2264	3/8	0.3750	53/64	0.8281
68	0.0310	35	0.1100	1	0.2280	V	0.3770	27/32	0.8438
1/32	0.0312	2.80mm	0.1102	5.80mm	0.2283	9.60mm	0.3780	21.50mm	0.8465
0.80mm	0.0315	34	0.1110	5.90mm	0.2323	9.70mm	0.3819	55/64	0.8594
67	0.0320	33	0.1130	A	0.2340	9.75mm	0.3839	22.00mm	0.8661
66	0.0330	2.90mm	0.1142	15/64	0.2344	9.80mm	0.3858	7/8	0.8750
0.85mm	0.0335	32	0.1160	6.00mm	0.2362	W	0.3860	22.50mm	0.8858
65	0.0350	3.00mm	0.1181	B	0.2380	9.90mm	0.3898	57/64	0.8906
0.90mm	0.0354	31	0.1200	6.10mm	0.2402	25/64	0.3906	23.00mm	0.9055
64	0.0360	3.10mm	0.1220	C	0.2420	10.00mm	0.3937	29/32	0.9062
63	0.0370	1/8	0.1250	6.20mm	0.2441	X	0.3970	59/64	0.9219
0.95mm	0.0374	3.20mm	0.1260	D	0.2460	10.20mm	0.4016	23.50mm	0.9252
62	0.0380	3.25mm	0.1280	6.25mm	0.2461	Y	0.4040	15/16	0.9375
61	0.0390	30	0.1285	6.30mm	0.2480	13/32	0.4062	24.00mm	0.9449
1.00mm	0.0394	3.30mm	0.1299	E	0.2500	Z	0.4130	61/64	0.9531
60	0.0400	3.40mm	0.1339	1/4	0.2500	10.50mm	0.4134	24.50mm	0.9646
59	0.0410	29	0.1360	6.40mm	0.2520	27/64	0.4219	31/32	0.9688
1.05mm	0.0413	3.50mm	0.1378	6.50mm	0.2559	10.80mm	0.4252	25.00mm	0.9843
58	0.0420	28	0.1405	F	0.2570	11.00mm	0.4331	63/64	0.9844
								1"	1.0000



Significantly decrease machine downtime with fewer tool changes...for greater productivity and profitability!
Our inserts are specifically designed to handle the challenges of machining high-temperature alloys, stainless steels, and aluminum.

- **Combination edge prep, chip control geometry, and coating technology over high-strength base carbide grade.**
- **Excellent wear life and tool performance.**
- **Positive rake geometries reduce cutting forces...high edge sharpness minimizes work hardening.**

We engineered these inserts with higher edge and structural strength. That means you can machine at faster feed rates for greater productivity...while maintaining long tool life in high-strength materials.

The index on the next page is referenced by material group numbers. This reference is general in nature and should be used only as a suggested starting point in tool selection. See page 23 for more detail on most suitable grades and speed recommendations. Contact *RTW* Technical support at 1-800-643-3620 for specific application information.

Group	Material	Group	Material
1	Ferritic, Martensitic Stainless Steel (Cast or Forged) 403, 410, 416, 502,504	7	Titanium and Titanium Alloys PURE :Ti98.8, Ti99.9 ALLOYED : Ti-5A12Sn, Ti6Al4V
2	Austenitic Stainless Steel 201, 209, 303, 304, 316	8	Low Silicon Aluminum (<12% Si) - 2024-T4, 2014-T6, 6061-T6
3	Precipitating & ASTM Stainless Steels 17-4 PH, 15-5 PH, Nitronic 50, A296 CF-3	9	High Silicon Aluminum (>12% Si) - A380, A390, A380-1
4	Iron-Based Hi-Temp Alloy A286, Discoloy, Monel 400, Nimonic 75	10	Non-Ferrous Alloys (Copper, Brass, Zinc)
5	Cobolt Base Hi-Temp Alloy Stellite, Haynes 21/25/188	11	Non-Ferrous - Tungsten Alloys
6	Nickel-Base Hi-Temp Alloy Inconel, 601/625/718, Hastelloy C , Waspoloy, Rene 95		

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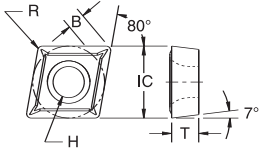
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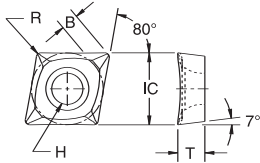
Notes

CCGT-DF



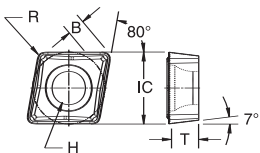
RTW DESC	CQ6	R321	R323	I.C.	THK	R	B	H
CCGT 21.50 DF	0702466	0702474	0702482	1/4	3/32	0.004	0.0672	0.110
CCGT 21.50.5 DF	0702467	0702475	0702483	1/4	3/32	0.008	0.0650	0.110
CCGT 21.51 DF	0702468	0702476	0702484	1/4	3/32	1/64	0.0608	0.110
CCGT 21.52 DF	0702469	0702477	0702485	1/4	3/32	1/32	0.0521	0.110
CCGT 32.50 DF	0702470	0702478	0702486	3/8	5/32	0.004	0.1020	0.173
CCGT 32.50.5 DF	0702471	0702479	0702487	3/8	5/32	0.008	0.0998	0.173
CCGT 32.51 DF	0702472	0702480	0702488	3/8	5/32	1/64	0.0955	0.173
CCGT 32.52 DF	0702473	0702481	0702489	3/8	5/32	1/32	0.0868	0.173

CCGT-SP



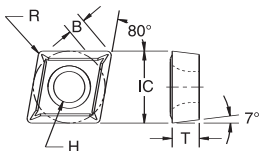
RTW DESC	CQ6	R321	R323	I.C.	THK	R	B	H
CCGT 21.50.5 SP	0702432	0702438	0702444	1/4	3/32	0.008	0.0650	0.110
CCGT 21.51 SP	0702433	0702439	0702445	1/4	3/32	1/64	0.0608	0.110
CCGT 21.52 SP	-	-	0702446	1/4	3/32	1/32	0.0521	0.110
CCGT 32.50.5 SP	0702434	0702440	0702447	3/8	5/32	0.008	0.0998	0.173
CCGT 32.51 SP	0702435	0702441	0702448	3/8	5/32	1/64	0.0955	0.173
CCGT 32.52 SP	-	-	0702449	3/8	5/32	1/32	0.0868	0.173
CCGT 430 SP	-	-	0702450	1/2	3/16	0.004	0.1367	0.216
CCGT 430.5 SP	-	-	0702451	1/2	3/16	0.008	0.1345	0.216
CCGT 431 SP	0702436	0702442	0702452	1/2	3/16	1/64	0.1302	0.216
CCGT 432 SP	0702437	0702443	0702453	1/2	3/16	1/32	0.1216	0.216

CCMT-CI



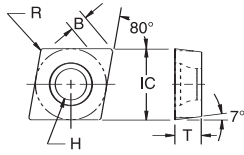
RTW DESC	R243	I.C.	THK	R	B	H
CCMT 21.50.5 CI	0701265	1/4	3/32	0.008	0.0650	0.110
CCMT 21.51 CI	0701260	1/4	3/32	1/64	0.0608	0.110
CCMT 21.52 CI	0701261	1/4	3/32	1/32	0.0521	0.110
CCMT 32.50.5 CI	0701262	3/8	5/32	0.008	0.0998	0.175
CCMT 32.51 CI	0701263	3/8	5/32	1/64	0.0955	0.175
CCMT 32.52 CI	0701264	3/8	5/32	1/32	0.0868	0.175

CCMT-DF



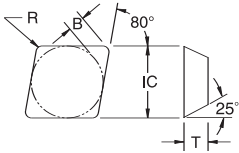
RTW DESC	CQ6	R321	R323	RTC4010	I.C.	THK	R	B	H
CCMT 21.50.5 DF	0702490	0702495	0702503	0702512	1/4	3/32	0.008	0.0650	0.110
CCMT 21.51 DF	0702491	0702496	0702504	0702513	1/4	3/32	1/64	0.0608	0.110
CCMT 21.52 DF	-	0702497	0702505	0702514	1/4	3/32	1/32	0.0521	0.110
CCMT 32.50.5 DF	0702492	0702498	0702506	0702515	3/8	5/32	0.008	0.0998	0.173
CCMT 32.51 DF	0702493	0702499	0702507	0702516	3/8	5/32	1/64	0.0955	0.173
CCMT 32.52 DF	0702494	0702500	0702508	0702517	3/8	5/32	1/32	0.0868	0.173
CCMT 431 DF	-	0702501	0702509	0702518	1/2	3/16	1/64	0.1302	0.217
CCMT 432 DF	-	0702502	0702510	0702519	1/2	3/16	1/32	0.1216	0.217
CCMT 433 DF	-	-	0702511	-	1/2	3/16	3/64	0.1129	0.217

CCMT-GP



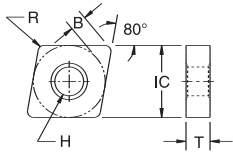
RTW DESC	CQ2	CQ23	R321	I.C.	THK	R	B	H
CCMT 21.50.5E GP	-	-	096339	1/4	3/32	0.008	0.066	0.110
CCMT 21.50.5F GP	096466	-	-	1/4	3/32	0.008	0.066	0.110
CCMT 21.51E GP	-	-	096297	1/4	3/32	1/64	0.061	0.110
CCMT 21.51F GP	-	096300	-	1/4	3/32	1/64	0.061	0.110
CCMT 21.52F GP	-	096305	-	1/4	3/32	1/32	0.052	0.110
CCMT 32.50.5F GP	-	080940	096242	3/8	5/32	0.008	0.100	0.175
CCMT 32.51E GP	-	-	096126	3/8	5/32	1/64	0.096	0.175
CCMT 32.51F GP	-	096310	-	3/8	5/32	1/64	0.096	0.175
CCMT 32.52E GP	-	-	096120	3/8	5/32	1/64	0.096	0.175
CCMT 32.52F GP	-	096317	-	3/8	5/32	1/32	0.087	0.175
CCMT 431F GP	-	096324	-	1/2	3/16	1/64	0.130	0.217
CCMT 432F GP	-	096331	-	1/2	3/16	1/32	0.122	0.217

CFG



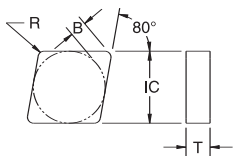
RTW DESC	CQ2	CQ23	I.C.	THK	R	B
CFG 4620.2F	083032	071332	0.464	1/8	0.004	0.128
CFG 4621F	083037	071333	0.464	1/8	1/64	0.120
CFG 4622F	083042	071334	0.464	1/8	1/32	0.112
CFG 4623F	083047	-	0.464	1/8	3/64	0.103

CNGA-T



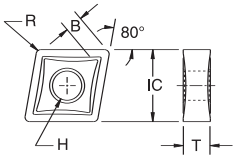
RTW DESC	CS912	CN953	RD2010	I.C.	THK	R	B	H
CNGA 432	-	-	0700792	1/2	3/16	1/32	0.122	0.203
CNGA 432T0820	-	096040	-	1/2	3/16	1/32	0.122	0.203
CNGA 433	096330	-	-	1/2	3/16	3/64	0.113	0.203
CNGA 433T0420	096333	-	-	1/2	3/16	3/64	0.113	0.203
CNGA 433T0820	-	096062	-	1/2	3/16	3/64	0.113	0.203
CNGA 434	096338	-	-	1/2	3/16	1/16	0.104	0.203
CNGA 434T0420	096341	-	-	1/2	3/16	1/16	0.104	0.203
CNGA 434T0820	-	096063	-	1/2	3/16	1/16	0.104	0.203
CNGA 543T0820	-	096064	-	5/8	1/4	3/64	0.148	0.250
CNGA 544T0820	-	096065	-	5/8	1/4	1/16	0.139	0.250
CNGA 643T0820	-	096067	-	3/4	1/4	3/64	0.182	0.312
CNGA 644T0820	-	096068	-	3/4	1/4	1/16	0.174	0.312

CNG-T



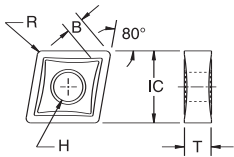
RTW DESC	CS912	CN953	I.C.	THK	R	B
CNG 432T0820	-	096034	1/2	3/16	1/32	0.122
CNG 433T0420	096326	-	1/2	3/16	3/64	0.113
CNG 433T0820	-	096035	1/2	3/16	3/64	0.113
CNG 434T0820	-	096037	1/2	3/16	1/16	0.104
CNG 453T0820	-	096039	1/2	5/16	3/64	0.113

CNGG-DP



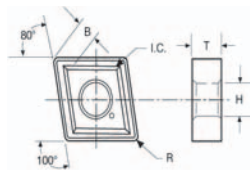
RTW DESC	CQ23	R321	I.C.	THK	R	B	H
CNGG 430.2F DP	090648	090651	1/2	3/16	0.004	0.137	0.203
CNGG 430.5F DP	081088	081089	1/2	3/16	0.008	0.135	0.203
CNGG 431F DP	090649	090652	1/2	3/16	1/64	0.130	0.203
CNGG 432F DP	090650	090653	1/2	3/16	1/32	0.122	0.203

CNGP

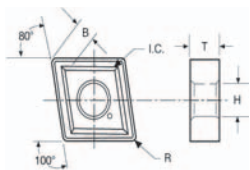


RTW DESC	R321	R323	I.C.	THK	R	B	H
CNGP 331	0702416	-	3/8	3/16	1/64	0.0955	0.150
CNGP 332	0702417	-	3/8	3/16	1/32	0.0868	0.150
CNGP 430	0702418	0702423	1/2	3/16	0.004	0.1367	0.203
CNGP 430.5	0702419	0702424	1/2	3/16	0.008	0.1345	0.203
CNGP 431	0702420	0702425	1/2	3/16	1/64	0.1302	0.203
CNGP 432	0702421	0702426	1/2	3/16	1/32	0.1216	0.203
CNGP 433	0702422	0702427	1/2	3/16	3/64	0.1129	0.203

CNMG-DI

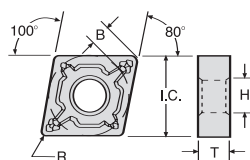


RTW DESC	R243	I.C.	THK	R	B	H
CNMG 432 DI	0701211	1/2	3/16	1/32	0.1216	0.203
CNMG 433 DI	0701212	1/2	3/16	3/64	0.1129	0.203
CNMG 643 DI	0701213	3/4	1/4	3/64	0.1823	0.312
CNMG 644 DI	0701214	3/4	1/4	1/16	0.1737	0.312



CNMG-GI

RTW DESC	R243	I.C.	THK	R	B	H
CNMG 542 GI	0701209	5/8	1/4	1/32	0.1563	0.250
CNMG 543 GI	0701210	5/8	1/4	3/64	0.1467	0.250



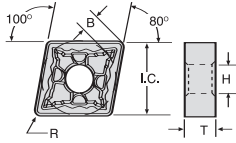
CNMG-JI

RTW DESC	R243	I.C.	THK	R	B	H
CNMG 431 JI	0701215	1/2	3/16	1/64	0.1302	0.203
CNMG 432 JI	0701216	1/2	3/16	1/32	0.1216	0.203
CNMG 433 JI	0701217	1/2	3/16	3/64	0.1129	0.203



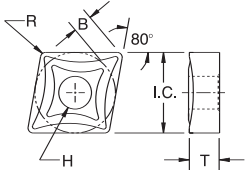
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CNMG-LM



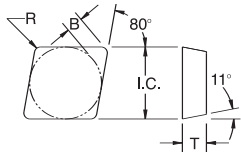
RTW DESC	R243	I.C.	THK	R	B	H
CNMG 543 LM	0701218	5/8	1/4	3/64	0.1467	0.250
CNMG 643 LM	0701219	3/4	1/4	3/64	0.1823	0.312
CNMG 644 LM	0701220	3/4	1/4	1/16	0.1737	0.312

CNMS



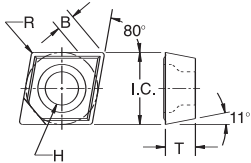
RTW DESC	R321	RD2010	I.C.	THK	R	B	H
CNMS 432	0702428	0700771	1/2	3/16	1/32	0.1216	0.203
CNMS 542	0702429	-	5/8	1/4	1/32	0.1563	0.250
CNMS 642	0702430	-	3/4	1/4	1/32	0.1910	0.312
CNMS 643	0702431	-	3/4	1/4	3/64	0.1823	0.312

CPG-T



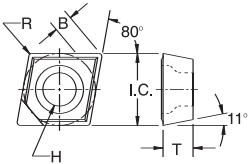
RTW DESC	CN953	RD2010	I.C.	THK	R	B
CPG 421	-	0700794	1/2	1/8	1/64	0.1302
CPG 422	-	0700795	1/2	1/8	1/32	0.1216
CPG 422T0820	096069	-	1/2	1/8	1/32	0.1216

CPGB



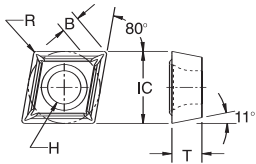
RTW DESC	RD2010	I.C.	THK	R	B	H
CPGB 32505	0700777	3/8	5/32	0.008	0.0998	0.173
CPGB 3251	0700775	3/8	5/32	1/64	0.0955	0.173
CPGB 3252	0700776	3/8	5/32	1/32	0.0868	0.173

CPGM



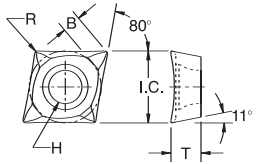
RTW DESC	RD2010	I.C.	THK	R	B	H
CPGM 21505	0700789	1/4	3/32	0.008	0.0650	0.110
CPGM 2151	0700787	1/4	3/32	1/64	0.0608	0.110
CPGM 2152	0700788	1/4	3/32	1/32	0.0521	0.110

CPGT-DF



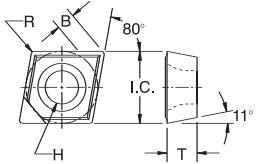
RTW DESC	CQ6	R321	R323	I.C.	THK	R	B	H
CPGT 21.50 DF	0702520	0702527	0702532	1/4	3/32	0.004	0.0672	0.110
CPGT 21.50.5 DF	0702521	0702528	0702533	1/4	3/32	0.008	0.0650	0.110
CPGT 21.51 DF	0702522	0702529	0702534	1/4	3/32	1/64	0.0608	0.110
CPGT 21.52 DF	0702523	-	0702535	1/4	3/32	1/32	0.0521	0.110
CPGT 32.50.5 DF	0702524	0702530	0702536	3/8	5/32	0.008	0.0998	0.173
CPGT 32.51 DF	0702525	0702531	0702537	3/8	5/32	1/64	0.0955	0.173
CPGT 32.52 DF	0702526	-	0702538	3/8	5/32	1/32	0.0868	0.173

CPGT-SP



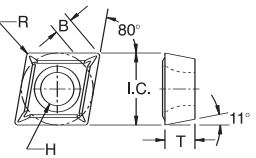
RTW DESC	CQ6	R321	R323	I.C.	THK	R	B	H
CPGT 21.50.5 SP	-	0702456	0702460	1/4	3/32	0.008	0.0650	0.110
CPGT 21.51 SP	-	0702457	0702461	1/4	3/32	1/64	0.0608	0.110
CPGT 21.52 SP	-	-	0702462	1/4	3/32	1/32	0.0521	0.110
CPGT 32.50.5 SP	0702454	0702458	0702463	3/8	5/32	0.008	0.0998	0.173
CPGT 32.51 SP	0702455	0702459	0702464	3/8	5/32	1/64	0.0955	0.173
CPGT 32.52 SP	-	-	0702465	3/8	5/32	1/32	0.0868	0.173

CPGW



RTW DESC	RD2010	I.C.	THK	R	B	H
CPGW 21505	0700764	1/4	3/32	0.008	0.0650	0.110
CPGW 2151	0700766	1/4	3/32	1/64	0.0608	0.110
CPGW 2152	0700765	1/4	3/32	1/32	0.0521	0.110
CPGW 3251	0700763	3/8	5/32	1/64	0.0955	0.173
CPGW 3252	0700762	3/8	5/32	1/32	0.0868	0.173

CPMT-DF

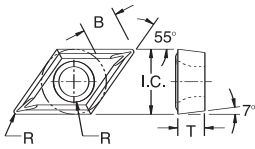


RTW DESC	CQ6	R321	R323	RTC4010	I.C.	THK	R	B	H
CPMT 21.50.5 DF	0702539	0702545	0702551	0702557	1/4	3/32	0.008	0.0650	0.110
CPMT 21.51 DF	0702540	0702546	0702552	0702558	1/4	3/32	1/64	0.0608	0.110
CPMT 21.52 DF	0702541	0702547	0702553	0702559	1/4	3/32	1/32	0.0521	0.110
CPMT 32.50.5 DF	0702542	0702548	0702554	0702560	3/8	5/32	0.008	0.0998	0.173
CPMT 32.51 DF	0702543	0702549	0702555	0702561	3/8	5/32	1/64	0.0955	0.173
CPMT 32.52 DF	0702544	0702550	0702556	0702562	3/8	5/32	1/32	0.0868	0.173



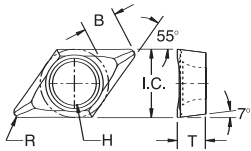
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DCGT-DF



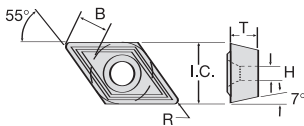
RTW DESC	R321	R323	I.C.	THK	R	B	H
DCGT 21.50 DF	0702606	0702609	1/4	3/32	0.004	0.1410	0.110
DCGT 32.50 DF	0702607	0702610	3/8	5/32	0.004	0.2139	0.173
DCGT 432 DF	0702608	0702611	1/2	3/16	1/32	0.2550	0.217

DCGT-SP



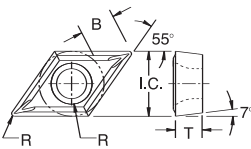
RTW DESC	CQ6	R321	R323	I.C.	THK	R	B	H
DCGT 21.50.5 SP	0702576	0702581	0702586	1/4	3/32	0.008	0.1364	0.110
DCGT 21.51 SP	0702577	0702582	0702587	1/4	3/32	1/64	0.1275	0.110
DCGT 21.52 SP	-	-	0702588	1/4	3/32	1/32	0.1093	0.110
DCGT 32.50.5 SP	0702578	0702583	0702589	3/8	5/32	0.008	0.2092	0.173
DCGT 32.51 SP	0702579	0702584	0702590	3/8	5/32	1/64	0.2004	0.173
DCGT 32.52 SP	0702580	0702585	0702591	3/8	5/32	1/32	0.1821	0.173

DCMT-CI



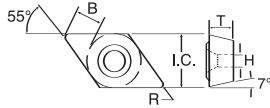
RTW DESC	R243	I.C.	THK	R	B	H
DCMT 21.50.5 CI	0701276	1/4	3/32	0.008	0.1364	0.110
DCMT 21.51 CI	0701277	1/4	3/32	1/64	0.1275	0.110
DCMT 21.52 CI	0701278	1/4	3/32	1/32	0.1090	0.110
DCMT 32.50.5 CI	0701279	3/8	5/32	0.008	0.2092	0.175
DCMT 32.51 CI	0701280	3/8	5/32	1/64	0.2004	0.175
DCMT 32.52 CI	0701281	3/8	5/32	1/32	0.1821	0.175

DCMT-DF



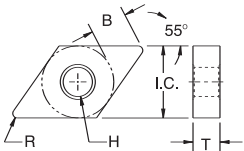
RTW DESC	CQ6	R321	R323	RTC4010	I.C.	THK	R	B	H
DCMT 21.50.5 DF	0702612	0702617	0702625	0702633	1/4	3/32	0.008	0.1364	0.110
DCMT 21.51 DF	0702613	0702618	0702626	0702634	1/4	3/32	1/64	0.1275	0.110
DCMT 32.50.5 DF	0702614	0702619	0702627	0702635	3/8	5/32	0.008	0.2092	0.173
DCMT 32.51 DF	0702615	0702620	0702628	0702636	3/8	5/32	1/64	0.2004	0.173
DCMT 32.52 DF	0702616	0702621	0702629	0702637	3/8	5/32	1/32	0.1821	0.173
DCMT 32.53 DF	-	0702622	0702630	0702638	3/8	5/32	3/64	0.1639	0.173
DCMT 431 DF	-	0702623	0702631	0702639	1/2	3/16	1/64	0.2732	0.217
DCMT 432 DF	-	0702624	0702632	0702640	1/2	3/16	1/32	0.2550	0.217

DCMT-GP



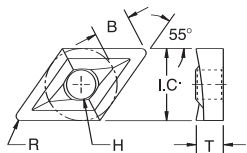
RTW DESC	CQ2	CQ23	R321	I.C.	THK	R	B	H
DCMT 21.50.5E GP	-	-	096405	1/4	3/32	0.008	0.137	0.110
DCMT 21.50.5F GP	096470	-	-	1/4	3/32	0.008	0.137	0.110
DCMT 21.51E GP	-	-	096421	1/4	3/32	1/64	0.128	0.110
DCMT 21.51F GP	-	096345	-	1/4	3/32	1/64	0.128	0.110
DCMT 21.52F GP	-	096350	-	1/4	3/32	1/32	0.109	0.110
DCMT 32.51E GP	-	-	096475	3/8	5/32	1/64	0.200	0.173
DCMT 32.51F GP	-	096355	-	3/8	5/32	1/64	0.200	0.173
DCMT 32.52E GP	-	-	096476	3/8	5/32	1/32	0.182	0.173
DCMT 32.52F GP	-	096360	-	3/8	5/32	1/32	0.182	0.173

DNGA-T



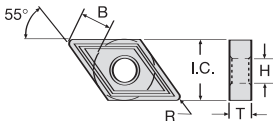
RTW DESC	CS912	CN953	RD2010	I.C.	THK	R	B	H
DNGA 432	-	-	0700780	1/2	3/16	1/32	0.255	0.203
DNGA 432T0820	-	096070	-	1/2	3/16	1/32	0.255	0.203
DNGA 433	-	-	0700781	1/2	3/16	3/64	0.237	0.203
DNGA 433T0420	096344	-	-	1/2	3/16	3/64	0.237	0.203
DNGA 433T0820	-	096071	-	1/2	3/16	3/64	0.237	0.203
DNGA 434T0820	-	096073	-	1/2	3/16	1/16	0.219	0.203
DNGA 443T0820	-	096074	-	1/2	1/4	3/64	0.237	0.203

DNGP



RTW DESC	R321	R323	I.C.	THK	R	B	H
DNGP 331	0702563	-	3/8	3/16	1/64	0.2004	0.150
DNGP 430	0702564	0702568	1/2	3/16	0.004	0.2868	0.203
DNGP 430.5	0702565	0702569	1/2	3/16	0.008	0.2821	0.203
DNGP 431	0702566	0702570	1/2	3/16	1/64	0.2732	0.203
DNGP 432	0702567	0702571	1/2	3/16	1/32	0.2550	0.203
DNGP 441	-	0702572	1/2	1/4	1/64	0.2732	0.203
DNGP 442	-	0702573	1/2	1/4	1/32	0.2550	0.203

DNMG-DI

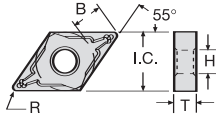


RTW DESC	R243	I.C.	THK	R	B	H
DNMG 432 DI	0701221	1/2	3/16	1/32	0.2550	0.203
DNMG 433 DI	0701222	1/2	3/16	3/64	0.2368	0.203



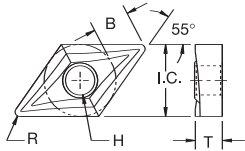
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DNMG-JI



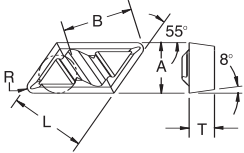
RTW DESC	R243	I.C.	THK	R	B	H
DNMG 431 JI	0701223	1/2	3/16	1/64	0.2732	0.203
DNMG 432 JI	0701224	1/2	3/16	1/32	0.2550	0.203
DNMG 433 JI	0701225	1/2	3/16	3/64	0.2368	0.203

DNMS



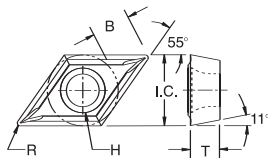
RTW DESC	R321	RD2010	I.C.	THK	R	B	H
DNMS 432	0702574	0700782	1/2	3/16	1/32	0.2550	0.203
DNMS 542	0702575	-	5/8	1/4	1/32	0.3278	0.250

DPGR



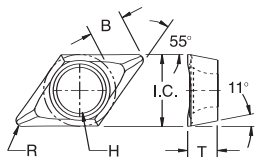
RTW DESC	RD2010	I.C.	THK	R	B
DPGR 431	0700779	1/2	3/16	1/64	0.2728
DPGR 432	0700778	1/2	3/16	1/32	0.2553

DPGT-DF



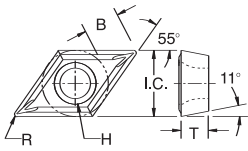
RTW DESC	R321	R323	RD2010	I.C.	THK	R	B	H
DPGT 21.50 DF	0702641	0702648	0702655	1/4	3/32	0.004	0.1410	0.110
DPGT 21.50.5 DF	0702642	0702649	0702656	1/4	3/32	0.008	0.1364	0.110
DPGT 21.51 DF	0702643	0702650	0702657	1/4	3/32	1/64	0.1275	0.110
DPGT 32.50 DF	0702644	0702651	0702658	3/8	5/32	0.004	0.2139	0.173
DPGT 32.50.5 DF	0702645	0702652	0702659	3/8	5/32	0.008	0.2092	0.173
DPGT 32.51 DF	0702646	0702653	0702660	3/8	5/32	1/64	0.2004	0.173
DPGT 32.52 DF	0702647	0702654	0702661	3/8	5/32	1/32	0.1821	0.173

DPGT-SP



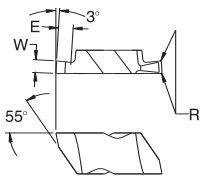
RTW DESC	CQ6	R321	R323	I.C.	THK	R	B	H
DPGT 21.50.5 SP	0702592	0702597	0702601	1/4	3/32	0.008	0.1364	0.110
DPGT 21.51 SP	0702593	0702598	0702602	1/4	3/32	1/64	0.1275	0.110
DPGT 21.52 SP	0702594	-	0702603	1/4	3/32	1/32	0.1093	0.110
DPGT 32.51 SP	0702595	0702599	0702604	3/8	5/32	1/64	0.2004	0.173
DPGT 32.52 SP	0702596	0702600	0702605	3/8	5/32	1/32	0.1821	0.173

DPMT-DF



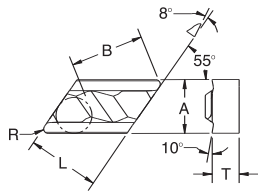
RTW DESC	R321	R323	RTC4010	I.C.	THK	R	B	H
DPMT 21.50.5 DF	0702662	0702667	0702672	1/4	3/32	0.008	0.1364	0.110
DPMT 21.51 DF	0702663	0702668	0702673	1/4	3/32	1/64	0.1275	0.110
DPMT 32.50.5 DF	0702664	0702669	0702674	3/8	5/32	0.008	0.2092	0.173
DPMT 32.51 DF	0702665	0702670	0702675	3/8	5/32	1/64	0.2004	0.173
DPMT 32.52 DF	0702666	0702671	0702676	3/8	5/32	1/32	0.1821	0.173

PowrNotch



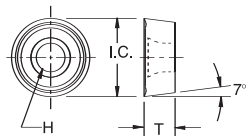
RTW DESC	R321	RD2010	W+/- .001	R	E+/- .005	A	T	B+/- .0015	Gage Dia
PG 3062L	-	0700797	.062	.005/.010	.094	.344	.195	.4050	.3750
PG 3062R	-	0700796	.062	.005/.010	.094	.344	.195	.4050	.3750
PG 3094L	-	0700807	.094	.005/.010	.150	.344	.195	.4050	.3750
PG 3094R	-	0700806	.094	.005/.010	.150	.344	.195	.4050	.3750
PGP 3125L	-	0700803	.125	.005/.010	.150	.344	.195	.4050	.3750
PGP 3125R	-	0700804	.125	.005/.010	.150	.344	.195	.4050	.3750

PowrNotch Profiling



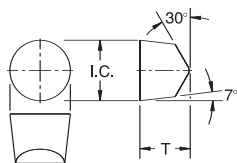
RTW DESC	R321	RD2010	W+/- .001	R	E+/- .005	A	T	B+/- .0015	Gage Dia
PPR 50.5	0701021	-	-	.004	-	0.250	.125	.3712	-
PPR 51	0701027	-	-	.0156	-	0.250	.125	.3677	-

RCGT-SP



RTW DESC	CQ6	R321	R323	I.C.	THK	H
RCGT 0803 M0 SP	0702677	0702680	0702683	0.315	1/8	0.134
RCGT 10T3 M0 SP	0702678	0702681	0702684	0.394	5/32	0.173
RCGT 1204 M0 SP	0702679	0702682	0702685	0.472	3/16	0.173

RCGV

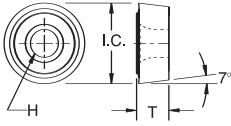


RTW DESC	CS912	CN953	I.C.	THK
RCGV 35	096352	-	3/8	5/16
RCGV 45	096354	-	1/2	5/16
RCGV 45T0420	096391	-	1/2	5/16
RCGV 45T0820	-	096076	1/2	5/16



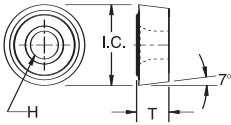
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RCMT

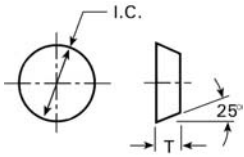


RTW DESC	CQ23	R321	I.C.	THK	H
RCMT 32.5E	-	096490	3/8	5/32	0.154
RCMT 32.5F	096452	-	3/8	5/32	0.154
RCMT 43F	096457	-	1/2	3/16	0.176

RCMT-MO

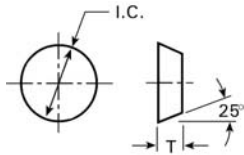


RTW DESC	CQ6	R321	R323	I.C.	THK	H
RCMT 0602 M0	0702686	0702693	0702701	0.236	3/32	0.110
RCMT 0803 M0	0702687	0702694	0702702	0.315	1/8	0.134
RCMT 10T3 M0	0702688	0702695	0702703	0.394	5/32	0.173
RCMT 1204 M0	0702689	0702696	0702704	0.472	3/16	0.173
RCMT 1605 M0	0702690	0702697	0702705	0.630	7/32	0.217
RCMT 2006 M0	0702691	0702698	0702706	0.787	1/4	0.256
RCMT 21.5 00	-	0702699	0702707	1/4	3/32	0.110
RCMT 32.5 00	0702692	0702700	0702708	3/8	5/32	0.173



RFG

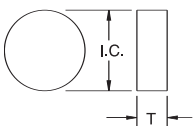
RTW DESC	CQ2	I.C.	THK
RFG 21F	083106	5/16	3/32



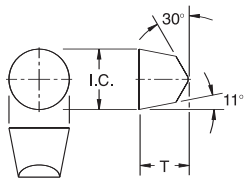
RFHN

RTW DESC	R321	I.C.	THK
RFHN53FLN	0700334	5/8	3/16

RNG-T



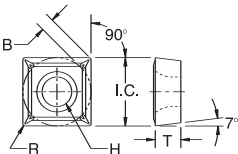
RTW DESC	CS912	CN953	I.C.	THK
RNG 43	096399	-	1/2	3/16
RNG 43T0820	-	096077	1/2	3/16
RNG 45	096402	-	1/2	5/16
RNG 45T0420	096406	-	1/2	5/16
RNG 45T0820	-	096079	1/2	5/16



RPGV

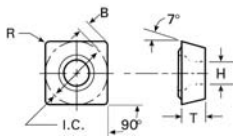
RTW DESC	CS912	I.C.	THK
RPGV 45T0420	096409	1/2	5/16

SCMT-DF



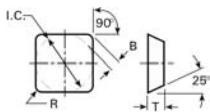
RTW DESC	R321	R323	RTC4010	I.C.	THK	R	B	H
SCMT 32.51 DF	0702714	0702717	0702722	3/8	5/32	1/64	0.0712	0.173
SCMT 32.52 DF	0702715	0702718	0702723	3/8	5/32	1/32	0.0647	0.173
SCMT 431 DF	-	0702719	0702724	1/2	3/16	1/64	0.0971	0.217
SCMT 432 DF	0702716	0702720	0702725	1/2	3/16	1/32	0.0906	0.217
SCMT 433 DF	-	0702721	0702726	1/2	3/16	3/64	0.0841	0.217

SCMT-GP



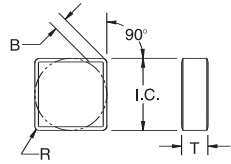
RTW DESC	CQ23	R321	I.C.	THK	R	B	H
SCMT 32.51E GP	-	096491	3/8	5/32	1/64	0.071	0.175
SCMT 32.51F GP	096396	-	3/8	5/32	1/64	0.071	0.175
SCMT 32.52E GP	-	096639	3/8	5/32	1/32	0.065	0.175
SCMT 32.52F GP	096403	-	3/8	5/32	1/32	0.065	0.175
SCMT 431F GP	096410	-	1/2	3/16	1/64	0.097	0.217
SCMT 432F GP	096417	-	1/2	3/16	1/32	0.091	0.217
SCMT 433F GP	096424	-	1/2	3/16	3/64	0.084	0.217

SFG



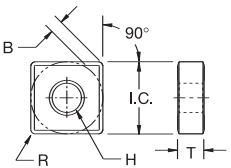
RTW DESC	CQ2	CQ23	I.C.	THK	R	B
SFG 211F	083132	-	5/16	3/32	0.010	0.061
SFG 320.2F	083137	-	3/8	1/8	0.004	0.076
SFG 321F	083143	-	3/8	1/8	1/64	0.071
SFG 322F	083149	071338	3/8	1/8	1/32	0.065
SFG 421F	083167	-	1/2	1/8	1/64	0.097
SFG 422F	083173	-	1/2	1/8	1/32	0.091
SFG 423F	083179	-	1/2	1/8	3/64	0.084

SNG-T

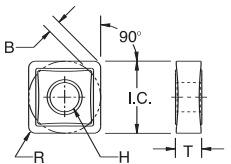


RTW DESC	CN953	CS912	I.C.	THK	R	B
SNG 322T0820	096080	-	3/8	1/8	1/32	0.065
SNG 432T0820	096081	-	1/2	3/16	1/32	0.091
SNG 433	-	096414	1/2	3/16	3/64	0.084
SNG 433T0420	-	096416	1/2	3/16	3/64	0.084
SNG 433T0820	096082	-	1/2	3/16	3/64	0.084
SNG 434T0820	096083	-	1/2	3/16	1/16	0.078
SNG 454T0820	096085	-	1/2	5/16	1/16	0.078
SNG 634T0820	096086	-	3/4	3/16	1/16	0.129
SNG 644	-	096419	3/4	1/4	1/16	0.130

SNGA-T



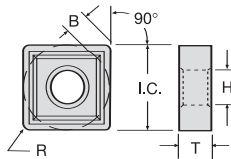
RTW DESC	CN953	CS912	I.C.	THK	R	B	H
SNGA 432T0820	096087	-	1/2	3/16	1/32	0.091	0.203
SNGA 433	-	096425	1/2	3/16	3/64	0.084	0.203
SNGA 433T0420	-	096426	1/2	3/16	3/64	0.084	0.203
SNGA 433T0820	096088	-	1/2	3/16	3/64	0.084	0.203
SNGA 434T0820	096089	-	1/2	3/16	1/16	0.078	0.203
SNGA 543T0820	096091	-	5/8	1/4	3/64	0.110	0.250
SNGA 544T0820	096092	-	5/8	1/4	1/16	0.103	0.250
SNGA 644T0820	096093	-	3/4	1/4	1/16	0.130	0.312



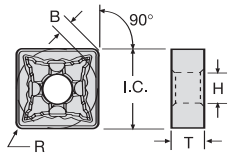
SNGP

RTW DESC	R323	I.C.	THK	R	B	H
SNGP 431	0702709	1/2	3/16	1/64	0.0971	0.203
SNGP 432	0702710	1/2	3/16	1/32	0.0906	0.203

SNMG-DI

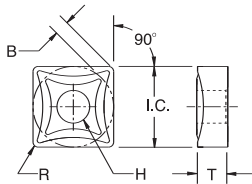


RTW DESC	R243	I.C.	THK	R	B	H
SNMG 432 DI	0701226	1/2	3/16	1/32	0.0906	0.203
SNMG 433 DI	0701227	1/2	3/16	3/64	0.0841	0.203
SNMG 643 DI	0701228	3/4	1/4	3/64	0.1359	0.312
SNMG 644 DI	0701229	3/4	1/4	1/16	0.1294	0.312



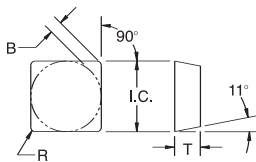
SNMG-LM

RTW DESC	R243	I.C.	THK	R	B	H
SNMG 643 LM	0701230	3/4	1/4	3/64	0.1359	0.312
SNMG 644 LM	0701231	3/4	1/4	1/16	0.1294	0.312



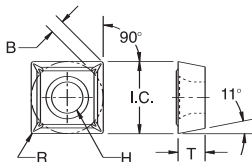
SNMS

RTW DESC	R321	I.C.	THK	R	B	H
SNMS 432	0702711	1/2	3/16	1/32	0.0906	0.203
SNMS 433	0702712	1/2	3/16	3/64	0.0841	0.203
SNMS 643	0702713	3/4	1/4	3/64	0.1359	0.312



SPG-T

RTW DESC	CN953	RD2010	I.C.	THK	R	B
SPG 422	-	0700770	1/2	1/8	1/32	0.0906
SPG 422T0820	096094	-	1/2	1/8	1/32	0.0921
SPG 423T0820	096095	-	1/2	1/8	3/64	0.084
SPG 432T0820	096097	-	1/2	3/16	1/32	0.091
SPG 433T0820	096098	-	1/2	3/16	3/64	0.084
SPG 434T0820	096099	-	1/2	3/16	1/16	0.078
SPG 634T0820	096100	-	3/4	3/16	1/16	0.130



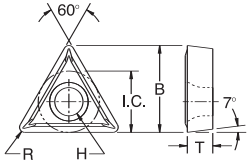
SPGT-DF

RTW DESC	R321	R323	I.C.	THK	R	B	H
SPGT 32.51 DF	0702727	0702730	3/8	5/32	1/64	0.0712	0.173
SPGT 32.52 DF	0702728	0702731	3/8	5/32	1/32	0.0647	0.173
SPGT 432 DF	0702729	-	1/2	3/16	1/32	0.0906	0.217



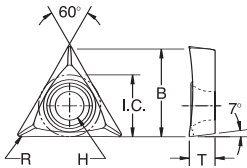
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TCGT-DF



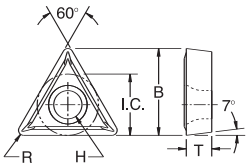
RTW DESC	R323	I.C.	THK	R	B	H
TCGT 21.50 DF	0702768	1/4	3/32	0.004	0.3710	0.110
TCGT 21.51 DF	0702769	1/4	3/32	1/64	0.3594	0.110
TCGT 32.50 DF	0702770	3/8	5/32	0.004	0.5585	0.173
TCGT 32.50.5 DF	0702771	3/8	5/32	0.008	0.5545	0.173
TCGT 32.51 DF	0702772	3/8	5/32	1/64	0.5469	0.173
TCGT 32.52 DF	0702773	3/8	5/32	1/32	0.5313	0.173

TCGT-SP



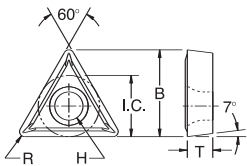
RTW DESC	CQ6	R321	R323	I.C.	THK	R	B	H
TCGT 21.50.5 SP	-	0702745	0702749	1/4	3/32	0.008	0.3670	.110
TCGT 21.51 SP	0702742	0702746	0702750	1/4	3/32	1/64	0.3594	.110
TCGT 21.52 SP	-	-	0702751	1/4	3/32	1/32	0.3438	.110
TCGT 32.50.5 SP	-	-	0702752	3/8	5/32	0.008	0.5545	.173
TCGT 32.51 SP	0702743	0702747	0702753	3/8	5/32	1/64	0.5469	.173
TCGT 32.52 SP	0702744	0702748	0702754	3/8	5/32	1/32	0.5313	.173

TCMT-CI



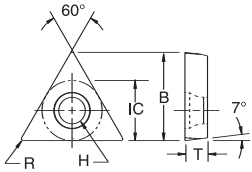
RTW DESC	R243	I.C.	THK	R	B	H
TCMT 21.50.5 CI	0701285	1/4	3/32	0.008	0.3670	0.110
TCMT 21.51 CI	0701286	1/4	3/32	1/64	0.3594	0.110
TCMT 21.52 CI	0701287	1/4	3/32	1/32	0.3438	0.110
TCMT 32.51 CI	0701288	3/8	5/32	1/64	0.5469	0.175
TCMT 32.52 CI	0701289	3/8	5/32	1/32	0.5312	0.175

TCMT-DF



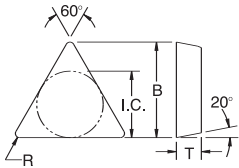
RTW DESC	R321	R323	RTC4010	I.C.	THK	R	B	H
TCMT 21.50.5 DF	0702774	0702782	0702790	1/4	3/32	0.008	0.3670	0.110
TCMT 21.51 DF	0702775	0702783	0702791	1/4	3/32	1/64	0.3594	0.110
TCMT 21.52 DF	0702776	0702784	0702792	1/4	3/32	1/32	0.3438	0.110
TCMT 32.50.5 DF	0702777	0702785	0702793	3/8	5/32	0.008	0.5545	0.173
TCMT 32.51 DF	0702778	0702786	0702794	3/8	5/32	1/64	0.5469	0.173
TCMT 32.52 DF	0702779	0702787	0702795	3/8	5/32	1/32	0.5313	0.173
TCMT 32.53 DF	0702780	0702788	0702796	3/8	5/32	3/64	0.5156	0.173
TCMT 432 DF	0702781	0702789	-	1/2	3/16	1/32	0.7188	0.217

TCMT-GP



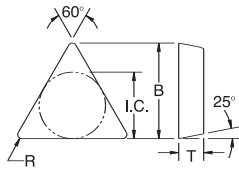
RTW DESC	CQ2	CQ23	R321	I.C.	THK	R	B	H
TCMT 21.50.5E GP	-	-	096764	1/4	3/32	0.008	0.367	0.110
TCMT 21.50.5F GP	096474	-	-	1/4	3/32	0.008	0.367	0.110
TCMT 21.51E GP	-	-	096792	1/4	3/32	1/64	0.359	0.110
TCMT 21.51F GP	-	096365	-	1/4	3/32	1/64	0.359	0.110
TCMT 21.52E GP	-	-	096816	1/4	3/32	1/32	0.344	0.110
TCMT 21.52F GP	-	096370	-	1/4	3/32	1/32	0.344	0.110
TCMT 32.51E GP	-	-	096884	3/8	5/32	1/64	0.547	0.175
TCMT 32.51F GP	-	096375	-	3/8	5/32	1/64	0.547	0.175
TCMT 32.52E GP	-	-	096892	3/8	5/32	1/32	0.531	0.175
TCMT 32.52F GP	-	096382	-	3/8	5/32	1/32	0.531	0.175
TCMT 432F GP	-	096389	-	1/2	3/16	1/32	0.719	0.217

TEGE



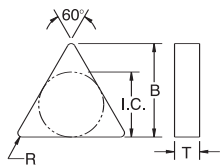
RTW DESC	CQ2	CQ23	I.C.	THK	R	B
TEGE 730.2F	072907	-	7/32	3/32	0.004	0.324
TEGE 731F	083430	071339	7/32	3/32	1/64	0.312

TFG



RTW DESC	CQ2	CQ23	I.C.	THK	R	B
TFG 320.2F	083435	-	3/8	1/8	0.004	0.559
TFG 321F	083441	071340	3/8	1/8	1/64	0.546
TFG 322F	083447	071341	3/8	1/8	1/32	0.531
TFG 323F	083453	-	3/8	1/8	3/64	0.516

TNG-T

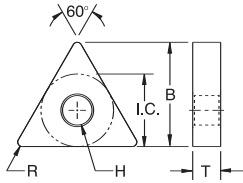


RTW DESC	CN953	I.C.	THK	R	B
TNG 434T0820	096101	1/2	3/16	1/16	0.688



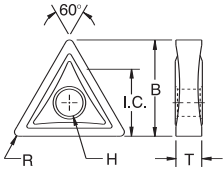
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TNGA-T



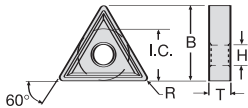
RTW DESC	CS912	CN953	I.C.	THK	R	B	H
TNGA 332T0820	-	096103	3/8	3/16	1/32	0.531	0.150
TNGA 334T0820	-	096104	3/8	3/16	1/16	0.500	0.150
TNGA 432T0820	-	096105	1/2	3/16	1/32	0.719	0.203
TNGA 433	096427	-	1/2	3/16	3/64	0.703	0.203
TNGA 433T0420	096428	-	1/2	3/16	3/64	0.703	0.203
TNGA 434T0820	-	096106	1/2	3/16	1/16	0.688	0.203

TNGP



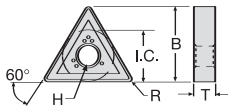
RTW DESC	R321	R323	I.C.	THK	R	B	H
TNGP 330.5	0702732	0702735	3/8	3/16	0.008	0.5545	0.150
TNGP 331	0702733	0702736	3/8	3/16	1/64	0.5469	0.150
TNGP 332	0702734	0702737	3/8	3/16	1/32	0.5312	0.150

TNMG-DI



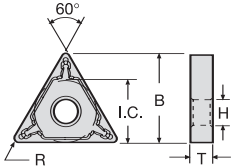
RTW DESC	R243	I.C.	THK	R	B	H
TNMG 432 DI	0701234	1/2	3/16	1/32	0.7188	0.203
TNMG 433 DI	0701235	1/2	3/16	3/64	0.7031	0.203

TNMG-GI

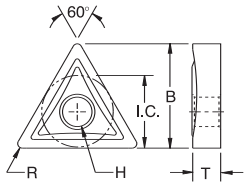


RTW DESC	R243	I.C.	THK	R	B	H
TNMG 542 GI	0701232	5/8	1/4	1/32	0.9062	0.250
TNMG 543 GI	0701233	5/8	1/4	3/64	0.8906	0.250

TNMG-JI



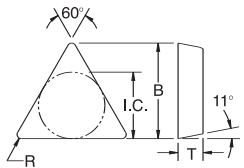
RTW DESC	R243	I.C.	THK	R	B	H
TNMG 432 JI	0701236	1/2	3/16	1/32	0.7188	0.203
TNMG 433 JI	0701237	1/2	3/16	3/64	0.7031	0.203



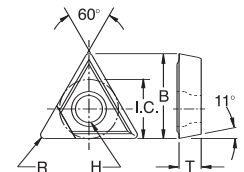
TNMS

RTW DESC	R321	RD2010	I.C.	THK	R	B	H
TNMS 331	0702738	0700772	3/8	3/16	1/64	0.5469	0.150
TNMS 332	0702739	-	3/8	3/16	1/32	0.5312	0.150
TNMS 431	0702740	-	1/2	3/16	1/64	0.7344	0.203
TNMS 432	0702741	0700793	1/2	3/16	1/32	0.7188	0.203

TPG-T



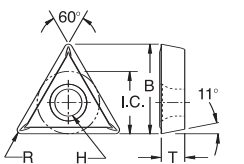
RTW DESC	CN953	RD2010	I.C.	THK	R	B
TPG 221	-	0700774	1/4	1/8	1/64	0.3594
TPG 222	-	0700773	1/4	1/8	1/32	0.3438
TPG 321	-	0700768	3/8	1/8	1/64	0.5469
TPG 322	-	0700767	3/8	1/8	1/32	0.5312
TPG 322T0820	096107	-	3/8	1/8	1/32	0.5312
TPG 323	-	0700769	3/8	1/8	3/64	0.5160
TPG 323T0820	096109	-	3/8	1/8	3/64	0.5160
TPG 431	-	0700799	1/2	3/16	1/64	0.7344
TPG 432	-	0700798	1/2	3/16	1/32	0.7188
TPG 432T0820	096110	-	1/2	3/16	1/32	0.7190
TPG 433	-	0700800	1/2	3/16	3/64	0.7031



TPGM

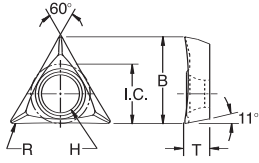
RTW DESC	RD2010	I.C.	THK	R	B	H
TPGM 2151	0700802	1/4	3/32	1/64	0.3594	0.110
TPGM 2152	0700801	1/4	3/32	1/32	0.3438	0.110

TPGT-DF



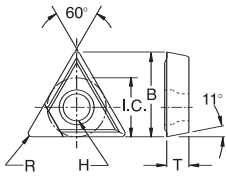
RTW DESC	R321	R323	I.C.	THK	R	B	H
TPGT 21.50 DF	0702797	0702802	1/4	3/32	0.004	0.3710	0.110
TPGT 21.50.5 DF	0702798	0702803	1/4	3/32	0.008	0.3670	0.110
TPGT 21.51 DF	0702799	0702804	1/4	3/32	1/64	0.3594	0.110
TPGT 21.52 DF	-	0702805	1/4	3/32	1.32	0.3438	0.110
TPGT 32.51 DF	0702800	0702806	3/8	5/32	1/64	0.5469	0.173
TPGT 32.52 DF	0702801	0702807	3/8	5/32	1/32	0.5313	0.173

TPGT-SP



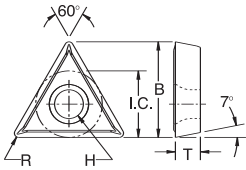
RTW DESC	CQ6	R321	R323	I.C.	THK	R	B	H
TPGT 21.50.5 SP	-	0702757	0702762	1/4	3/32	0.008	0.3670	0.110
TPGT 21.51 SP	0702755	0702758	0702763	1/4	3/32	1/64	0.3594	0.110
TPGT 21.52 SP	-	-	0702764	1/4	3/32	1/32	0.3438	0.110
TPGT 32.50.5 SP	-	0702759	0702765	3/8	5/32	0.008	0.5545	0.173
TPGT 32.51 SP	0702756	0702760	0702766	3/8	5/32	1/64	0.5469	0.173
TPGT 32.52 SP	-	0702761	0702767	3/8	5/32	1/32	0.5313	0.173

TPGW



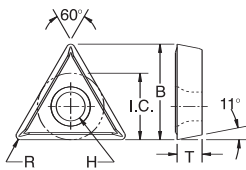
RTW DESC	RD2010	I.C.	THK	R	B	H
TPGW 21505	0700785	1/4	3/32	0.008	0.3670	0.110
TPGW 2151	0700784	1/4	3/32	1/64	0.3594	0.110
TPGW 2152	0700786	1/4	3/32	1/32	0.3438	0.110

TPMT-CI



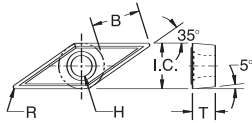
RTW DESC	R243	I.C.	THK	R	B	H
TPMT 21.51 CI	0701315	1/4	3/32	1/64	0.3594	0.110
TPMT 21.52 CI	0701316	1/4	3/32	1/32	0.3438	0.110
TPMT 32.51 CI	0701317	3/8	5/32	1/64	0.5469	0.175
TPMT 32.52 CI	0701318	3/8	5/32	1/32	0.5312	0.175

TPMT-DF



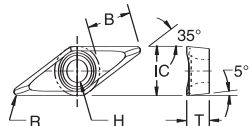
RTW DESC	R321	R323	RTC4010	I.C.	THK	R	B	H
TPMT 21.50.5 DF	0702808	0702815	0702822	1/4	3/32	0.008	0.3670	0.110
TPMT 21.51 DF	0702809	0702816	0702823	1/4	3/32	1/64	0.3594	0.110
TPMT 21.52 DF	0702810	0702817	0702824	1/4	3/32	1/32	0.3438	0.110
TPMT 32.51 DF	0702811	0702818	0702825	3/8	5/32	1/64	0.5469	0.173
TPMT 32.52 DF	0702812	0702819	0702826	3/8	5/32	1/32	0.5313	0.173
TPMT 32.53 DF	0702813	0702820	0702827	3/8	5/32	3/64	0.5156	0.173
TPMT 432 DF	0702814	0702821	-	1/2	3/16	1/32	0.7188	0.217

VBGT-DF



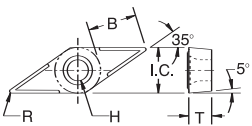
RTW DESC	R321	R323	I.C.	THK	R	B	H
VBGT 220 DF	0702847	0702853	1/4	1/8	0.004	0.2814	0.110
VBGT 220.5 DF	0702848	0702854	1/4	1/8	0.008	0.2721	0.110
VBGT 221 DF	0702849	0702855	1/4	1/8	1/64	0.2544	0.110
VBGT 330 DF	0702850	0702856	3/8	3/16	0.004	0.4267	0.173
VBGT 330.5 DF	0702851	0702857	3/8	3/16	0.008	0.4174	0.173
VBGT 331 DF	0702852	0702858	3/8	3/16	1/64	0.3997	0.173

VBGT-SP



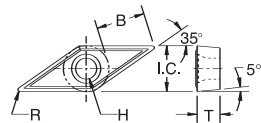
RTW DESC	CQ6	R321	R323	I.C.	THK	R	B	H
VBGT 220.5 SP	-	-	0702843	1/4	1/8	0.008	0.2721	0.110
VBGT 221 SP	-	-	0702844	1/4	1/8	1/64	0.2544	0.110
VBGT 331 SP	0702839	0702841	0702845	3/8	3/16	1/64	0.3997	0.173
VBGT 332 SP	0702840	0702842	0702846	3/8	3/16	1/32	0.3634	0.173

VBMT-CI



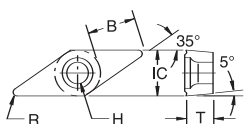
RTW DESC	R243	I.C.	THK	R	B	H
VBMT 331 CI	0701292	3/8	3/16	1/64	0.3997	0.175
VBMT 332 CI	0701293	3/8	3/16	1/32	0.3634	0.175

VBMT-DF



RTW DESC	CQ6	R321	R323	RTC4010	I.C.	THK	R	B	H
VBMT 220.5 DF	0702859	0701195	0702871	0702877	1/4	1/8	0.008	0.2721	0.110
VBMT 221 DF	0702860	0701198	0702872	0702878	1/4	1/8	1/64	0.2544	0.110
VBMT 222 DF	0702861	0701201	0702873	0702879	1/4	1/8	1/32	0.2180	0.110
VBMT 330.5 DF	0702862	0702868	0702874	0702880	3/8	3/16	0.008	0.4174	0.173
VBMT 331 DF	0702863	0702869	0702875	0702881	3/8	3/16	1/64	0.3997	0.173
VBMT 332 DF	0702864	0702870	0702876	0702882	3/8	3/16	1/32	0.3634	0.173

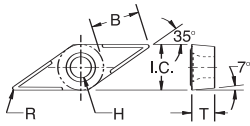
VBMT-GP



RTW DESC	CQ23	R321	I.C.	THK	R	B	H
VBMT 331E GP	-	096078	3/8	3/16	1/64	0.400	0.175
VBMT 331F GP	096431	-	3/8	3/16	1/64	0.400	0.175
VBMT 332E GP	-	096072	3/8	3/16	1/32	0.363	0.175
VBMT 332F GP	096438	-	3/8	3/16	1/32	0.363	0.175
VBMT 333E GP	-	096066	3/8	3/16	3/64	0.327	0.175
VBMT 333F GP	096445	-	3/8	3/16	3/64	0.327	0.175

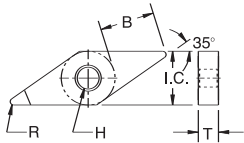


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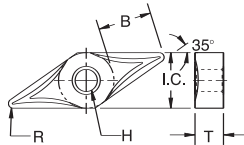
VCMT-CI

RTW DESC	R243	I.C.	THK	R	B	H
VCMT 331 CI	0701290	3/8	3/16	1/64	0.3997	0.175
VCMT 332 CI	0701291	3/8	3/16	1/32	0.3634	0.175



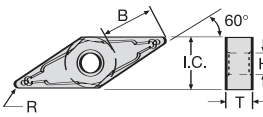
VNGA

RTW DESC	RD2010	I.C.	THK	R	B	H
VNGA 332	0700783	3/8	3/16	1/32	0.3634	0.150
VNGA 432	0700805	1/2	3/16	1/32	0.5087	0.203



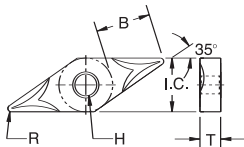
VNGP

RTW DESC	R321	R323	I.C.	THK	R	B	H
VNGP 330	0702828	0702833	3/8	3/16	0.004	0.4267	0.150
VNGP 330.5	0702829	0702834	3/8	3/16	0.008	0.4174	0.150
VNGP 431	0702830	0702835	1/2	3/16	1/64	0.5450	0.203
VNGP 432	0702831	0702836	1/2	3/16	1/32	0.5087	0.203
VNGP 433	0702832	-	1/2	3/16	3/64	0.4724	0.203



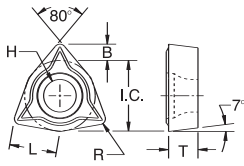
VNMG-JI

RTW DESC	R243	I.C.	THK	R	B	H
VNMG 331 JI	0701242	3/8	3/16	1/64	0.3997	0.150
VNMG 332 JI	0701243	3/8	3/16	1/32	0.3634	0.150



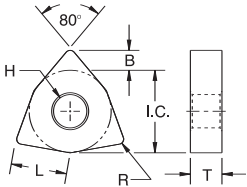
VNMS

RTW DESC	R321	RD2010	I.C.	THK	R	B	H
VNMS 331	0702837	0700791	3/8	3/16	1/64	0.3997	0.150
VNMS 332	0702838	0700790	3/8	3/16	1/32	0.3634	0.150



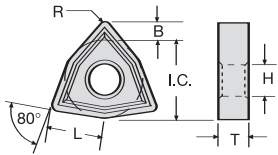
WCMT-DF

RTW DESC	R321	R323	RTC4010	I.C.	THK	R	B	H
WCMT 21.51 DF	0702883	0702885	0702887	1/4	3/32	1/64	0.0608	0.110
WCMT 32.52 DF	0702884	0702886	0702888	3/8	5/32	1/32	0.0868	0.173



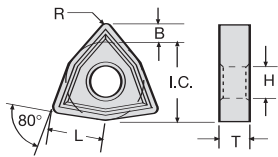
WNGA-T

RTW DESC	CN953	I.C.	THK	R	B	H
WNGA 433T0820	096111	1/2	3/16	3/64	0.113	0.203
WNGA 434T0820	096112	1/2	3/16	1/16	0.104	0.203



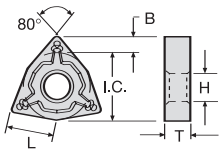
WNGG-DP

RTW DESC	CQ23	R321	I.C.	THK	R	B	H
WNGG 430.2F DP	081035	081036	1/2	3/16	0.004	0.137	0.203
WNGG 430.5F DP	081086	081087	1/2	3/16	0.008	0.135	0.203
WNGG 431F DP	081059	081060	1/2	3/16	1/64	0.130	0.203
WNGG 432F DP	081061	081062	1/2	3/16	1/32	0.122	0.203



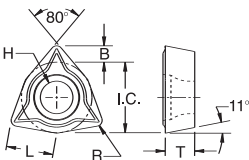
WNMG-DI

RTW DESC	R243	I.C.	THK	R	B	H
WNMG 432 DI	0701238	1/2	3/16	1/32	0.1216	0.203
WNMG 433 DI	0701239	1/2	3/16	3/64	0.1129	0.203



WNMG-JI

RTW DESC	R243	I.C.	THK	R	B	H
WNMG 432 JI	0701240	1/2	3/16	1/32	0.1216	0.203
WNMG 433 JI	0701241	1/2	3/16	3/64	0.1129	0.203




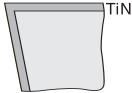


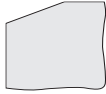

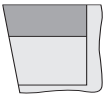



WPMT-DF

RTW DESC	R321	R323	RTC4010	I.C.	THK	R	B	H
WPMT 21.51 DF	0702889	0702892	0702895	1/4	3/32	1/64	0.0608	0.110
WPMT 32.51 DF	0702890	0702893	0702896	3/8	5/32	1/64	0.0955	0.173
WPMT 32.52 DF	0702891	0702894	0702897	3/8	5/32	1/32	0.0868	0.173

Technical Guide

Grade Information

UNCOATED	 <p>CQ2</p>	<p>Composition: Uncoated general purpose grade Application: Machining non-ferrous metals, cast irons, high temperature alloys, plastics & non metals. Also for machining hardened steels</p>	C2
	 <p>CQ6</p>	<p>Composition: A hard, low binder content, unalloyed WC/Co fine-grained grade. Application: Exceptional edge wear resistance combined with very high strength for machining titanium, cast irons, austenitic stainless steels, non-ferrous metals, non-metals, and most high-temperature alloys. Superior thermal deformation and depth of cut notch resistance.</p>	C3-C4 K05-K20 M10-M20
	 <p>CQ23</p>	<p>Composition: Uncoated general purpose grade Application: For finish to light rough machining of aluminum, high temperature alloys, stainless steels, irons, plastics & other non-metals</p>	C3
PVD COATED	 <p>R321</p>	<p>Composition: A PVD TiN coating over a very wear-resistant unalloyed carbide substrate. Application: For general purpose machining of high-temperature alloys, aerospace materials, refractory metals and 200 or 300 series stainless steels. The thin, uniformly dense, smooth coating increases wear resistance and reduces problems with built-up edge. It also provides an unusually good combination of properties for cutting difficult-to-machine materials and aluminum. The substrate offers superior thermal deformation resistance, depth of cut notch resistance, and edge strength. Performs at higher speeds than uncoated grades. Most ground periphery inserts have a sharp edge.</p>	C2-C4 K05-K20 M10-M25 P10-P20
	 <p>R323</p>	<p>Composition: A PVD TiAlN coating over a very deformation-resistant unalloyed, carbide substrate. Application: The R323 grade is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials and super alloys under stable conditions. It also performs well machining hardened and short chipping materials.</p>	C3-C4 K05-K20 M10-M20 P10-P20
	 <p>R243</p>	<p>Composition: PVD TiAlN coated carbide combined with super tough substrate. Well balanced wear resistance and toughness. Application: For low to medium speed general turning and milling of super alloys. Also for general turning of stainless steels.</p>	P20-P35 M15-M35
SILICON NITRIDE CERAMICS	 <p>CS912</p>	<p>Composition: An advanced sialon grade. application: Good mechanical shock resistance combined with edge wear resistance. Application: For general purpose machining of iron base high-temperature alloys.</p>	C4 M05-M20 K05-K15
	 <p>CN953</p>	<p>Composition: Pure silicon nitride grade. application: Maximum toughness. Application: Used at high feed rates for rough machining of gray cast iron, including machining through interruptions. For machining nickel & cobalt base hi-temp alloys.</p>	C2 K15-K35 M15-M30
PCD	 <p>RD2010</p>	<p>Composition: A polycrystalline diamond tip (PCD) brazed onto a carbide substrate. Application: The RD2010 grade is for general purpose turning. The cutting tool material contains a binder in addition to diamond particles. This makes the RD2010 grade suitable for rouging to finishing all types of highly abrasive workpieces, including non-ferrous metals and non-metallics. Use as your first choice on high content silicon aluminum alloys (hypereutectic). Will generally produce good surface finishes. Provides the best mechanical shock resistance of the diamond tool materials. The cutting edge is sharp. This grade operates at very high speeds</p>	C4 K03-K20
CERMET	 <p>RTC4010</p>	<p>Composition: A multi-layered, PVD TiN/TiCN/TiN, coated cermet turning grade. Application: Ideal for high-speed finishing to medium machining of most carbon and alloy steels and stainless steels. Performs very well in cast and ductile iron applications too. Provides long and consistent tool life and will produce excellent workpiece finishes.</p>	C3 C7 K10-K20 M10-M20 P10-P20

Technical Guide

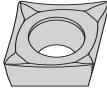

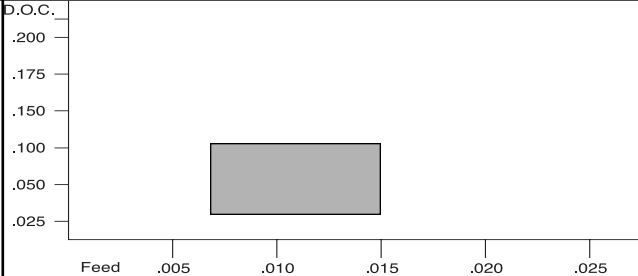
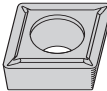

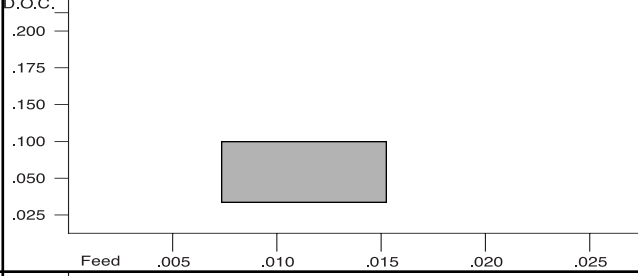
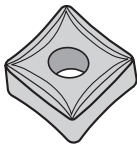
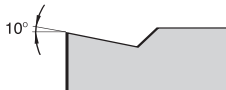
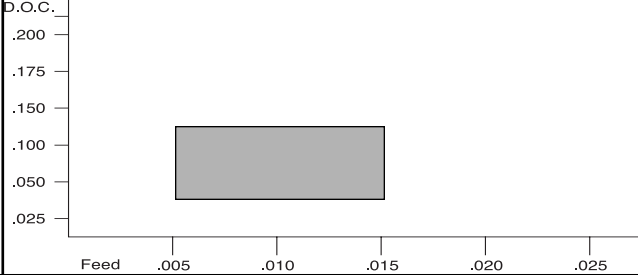


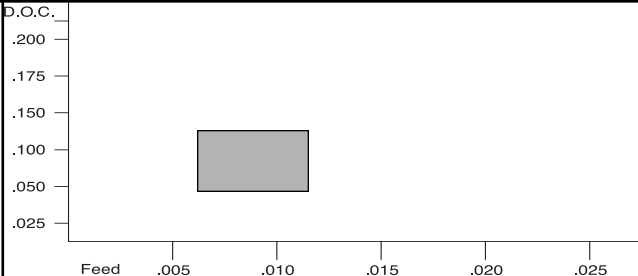

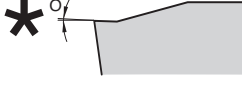
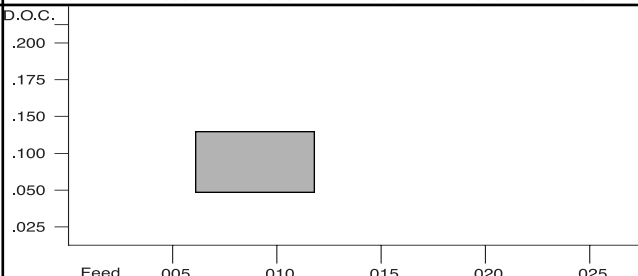
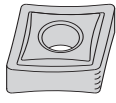
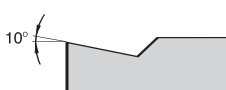
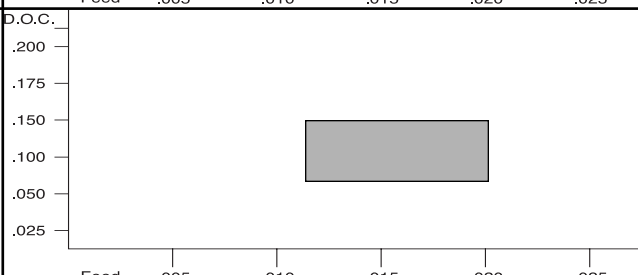


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Recommended Speeds

Material Group	Machining Condition	PVD TiAlN		PVD TiN	Uncoated			Coated Cermet	Silicon Nitride		PCD
		R323	R243	R321	CQ6	CQ23	CQ2	RTC4010	CS912	CN953	RD2010
1	Finishing	350-700	300-600	300-600				400-800			
	Medium	300-600	275-525	275-525				300-700			
	Roughing	275-450	250-400	250-400							
2	Finishing	400-750	300-550	350-693	200-350	200-325	175-300	300-600			
	Medium	350-700	275-500	300-650	175-300	175-300	150-275	250-550			
	Roughing	300-650	250-400	250-600	150-275	150-250	125-225				
3	Finishing	275-500	250-475	250-475				400-800			
	Medium	250-475	225-450	225-450				300-700			
	Roughing	225-450	200-400	200-400							
4	Finishing	225-375	200-300	175-275	30-180	25-170	25-150		225-750		
	Medium	200-250	175-225	150-200	25-150	20-140	20-130		200-600		
	Roughing		125-190								
5	Finishing	175-300	120-200	125-250	30-160	25-150	25-140		500-1100	300-800	
	Medium	150-275	125-175	110-150	25-140	20-135	20-125		400-1000	275-700	
	Roughing		75-100								
6	Finishing	175-300	100-150	125-150	50-200	40-175	30-150		500-1050	600-1100	
	Medium	150-275	50-100	100-150	40-150	35-125	25-125		400-1000	550-1000	
	Roughing	125-200	50-90								
7	Finishing	150-325	130-300	130-300	80-240	70-225	60-200				
	Medium	135-275	120-250	120-250	70-225	60-200	50-175				
	Roughing	125-250	110-200	110-200	60-200	50-175	40-150				
8	Finishing	800-4000	750-3500	700-3200	700-3000	700-3000	700-2500				1500-9000
	Medium	750-3800	700-3400	650-3000	650-2800	650-2700	650-2300				1500-9000
	Roughing	700-3600	650-3200	625-2800	600-2600	600-2600	600-2200				
9	Finishing										1100-3000
	Medium										1100-3000
	Roughing										
10	Finishing	450-1500	400-1300	450-1800	375-1750	370-1700	350-1600				1000-3000
	Medium	375-1300	375-1200	400-1700	360-1600	350-1500	335-1400				950-2800
	Roughing			360-1500	350-1450	325-1400	300-1350				900-2600
11	Finishing	300-500	200-400	300-500	225-400	200-375	175-350				
	Medium	200-400	175-375	250-450	200-390	175-375	150-300				
	Roughing		150-350	200-400	175-375	150-350	125-275				

Group	Material	Group	Material
1	Ferritic, Martensitic Stainless Steel (Cast or Forged) 403, 410, 416, 502,504	7	Titanium and Titanium Alloys PURE :Ti98.8, Ti99.9 ALLOYED : Ti-5A12Sn, Ti6Al-4V
2	Austenitic Stainless Steel 201, 209, 303, 304, 316	8	Low Silicon Aluminum (<12% Si) - 2024-T4, 2014-T6, 6061-T6
3	Precipitating & ASTM Stainless Steels 17-4 PH, 15-5 PH, Nitronic 50, A296 CF-3	9	High Silicon Aluminum (>12% Si) - A380, A390, A380-1
4	Iron-Based Hi-Temp Alloy A286, Inconel, Monel 400, Nimonic 75	10	Non-Ferrous Alloys (Copper, Brass, Zinc)
5	Cobalt Base Hi-Temp Alloy Stellite, Haynes 21/25/188	11	Non-Ferrous - Tungsten Alloys
6	Nickel-Base Hi-Temp Alloy Inconel, 601/625/718, Hastelloy C , Waspaloy, Rene 95		

Operation	Insert Style	Insert Geometry	Profile	Application Range
fine finishing	GT-SP precision ground			 <p>D.O.C. vs Feed graph for GT-SP. D.O.C. ranges from 0.025 to 0.200. Feed ranges from 0.005 to 0.025. Application range is approximately 0.007 to 0.015.</p>
finishing	GT-DF precision ground			 <p>D.O.C. vs Feed graph for GT-DF. D.O.C. ranges from 0.025 to 0.200. Feed ranges from 0.005 to 0.025. Application range is approximately 0.007 to 0.015.</p>
finishing	GG-DP precision ground			 <p>D.O.C. vs Feed graph for GG-DP. D.O.C. ranges from 0.025 to 0.200. Feed ranges from 0.005 to 0.025. Application range is approximately 0.007 to 0.015.</p>
finishing	-CI			 <p>D.O.C. vs Feed graph for -CI. D.O.C. ranges from 0.025 to 0.200. Feed ranges from 0.005 to 0.025. Application range is approximately 0.007 to 0.015.</p>
finishing	-DI			 <p>D.O.C. vs Feed graph for -DI. D.O.C. ranges from 0.025 to 0.200. Feed ranges from 0.005 to 0.025. Application range is approximately 0.007 to 0.015.</p>
medium machining	--GP			 <p>D.O.C. vs Feed graph for --GP. D.O.C. ranges from 0.025 to 0.200. Feed ranges from 0.005 to 0.025. Application range is approximately 0.012 to 0.020.</p>

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Operation	Insert Style	Insert Geometry	Profile	Application Range
medium machining	MT MT-MO GT-SP		*MT = 3 deg. *MT-MO = 5 deg. *GT-SP = 15 deg. 	D.O.C. .200 .175 .150 .100 .050 .025 Call Technical Support for application information Feed .005 .010 .015 .020 .025
medium machining	MT-GP		3° 	D.O.C. .200 .175 .150 .100 .050 .025 Feed .005 .010 .015 .020 .025
medium machining	MT-DF		5° 	D.O.C. .200 .175 .150 .100 .050 .025 Feed .005 .010 .015 .020 .025
medium machining	-JI		8° 	D.O.C. .200 .175 .150 .100 .050 .025 Feed .005 .010 .015 .020 .025
roughing	-LM		0° 	D.O.C. .200 .175 .150 .100 .050 .025 Feed .005 .010 .015 .020 .025
roughing	_MS		20° 	D.O.C. .200 .175 .150 .100 .050 .025 Feed .005 .010 .015 .020 .025
roughing	-GI		0° 	D.O.C. .200 .175 .150 .100 .050 .025 Feed .005 .010 .015 .020 .025



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