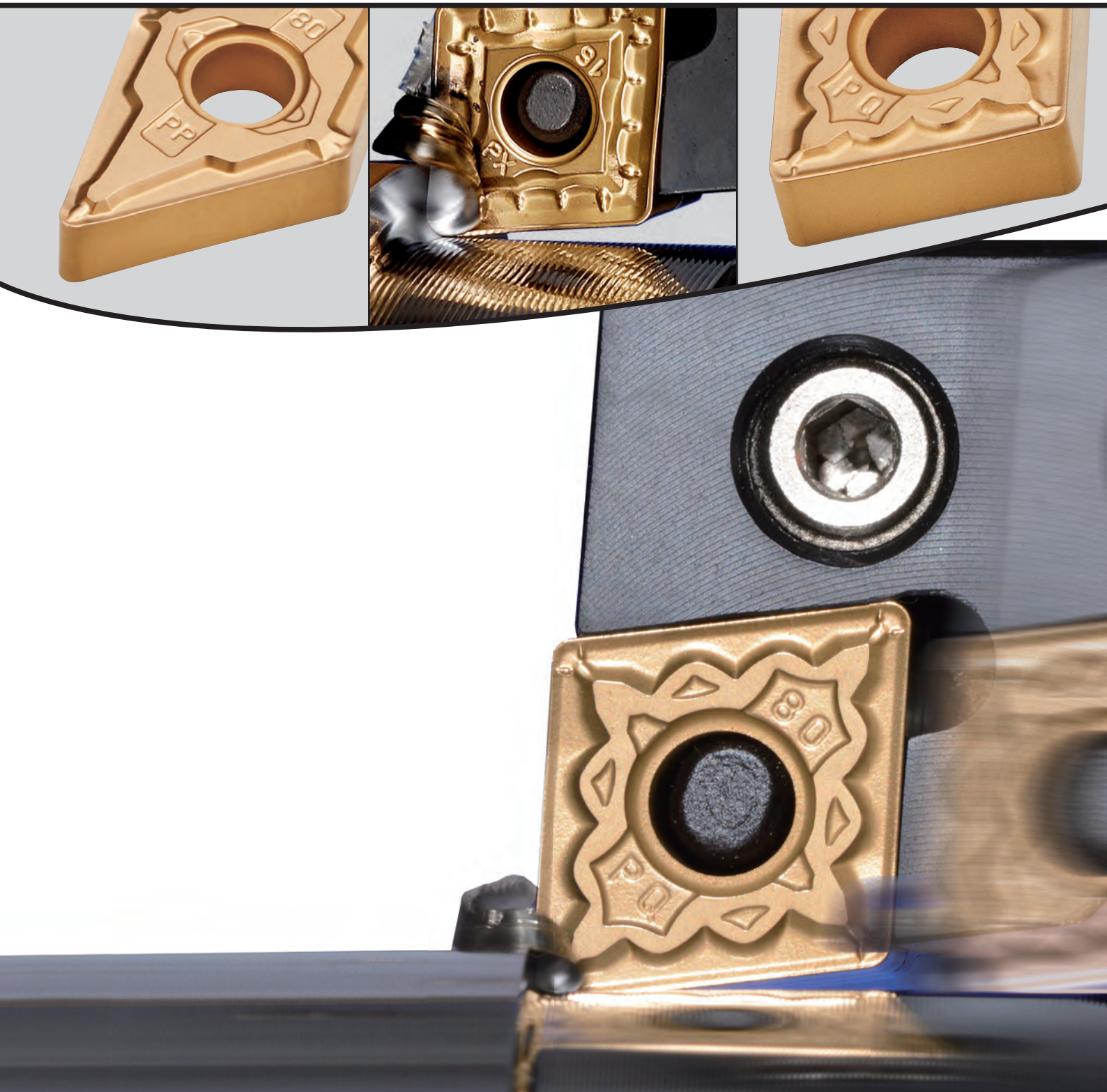


CA5 Series

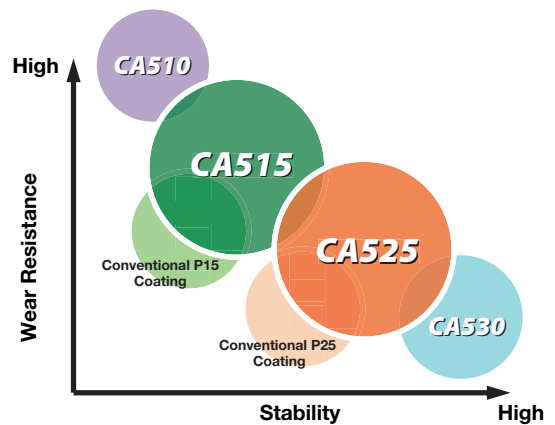
New CVD coated carbide for steel



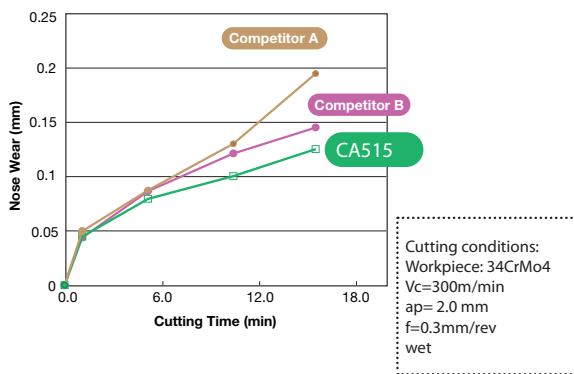
High adhesion strength of coating layer

"Ultra fine interface"

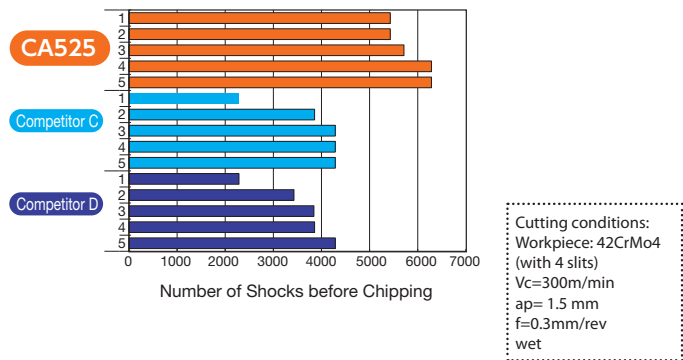
- Long tool life and stable machining by improved adhesion strength.
- 40% improved adhesion.
- CA515 for high speed machining.
- CA525 for stable machining and general purpose.



Wear resistance comparison



Fracture resistance comparison

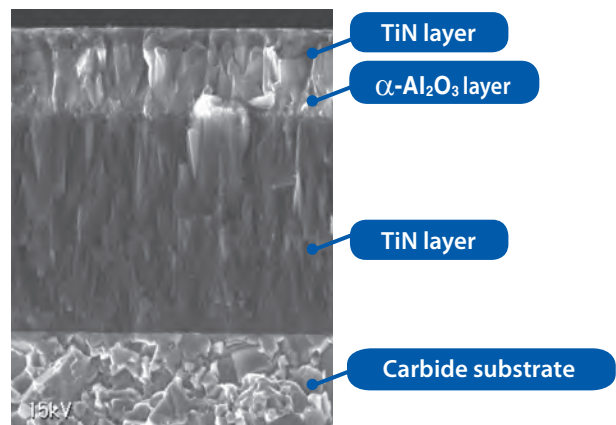


High hardness and toughness α -Al₂O₃-layer

- Long tool life by High-aspect ratio of α -Al₂O₃-layer

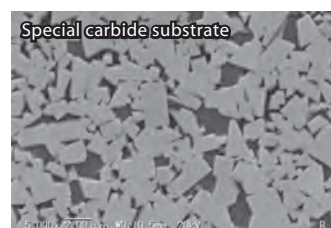
Smooth and flat surface provides low cutting force

- Sharp cutting and stable machining.
- Smooth and flat surface prevents adhesion and sudden breakage.

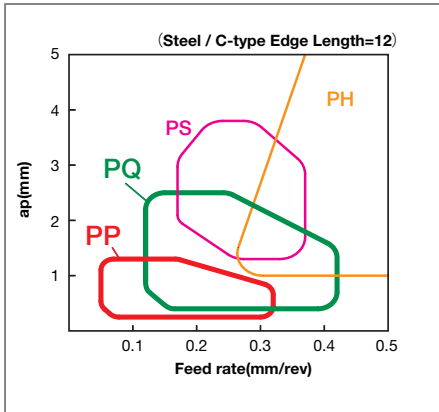


New carbide substrate

- Special carbide substrate with deformation resistance resulting in 10% improved hardness at high temperature.
- Suitable for high efficiency machining.

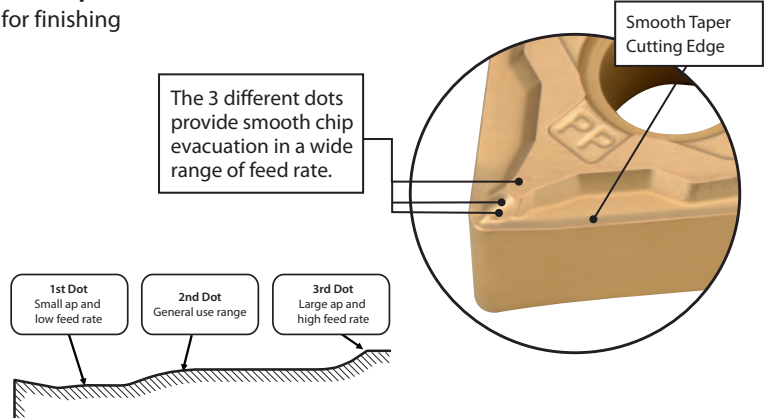


Chipbreaker for steel machining



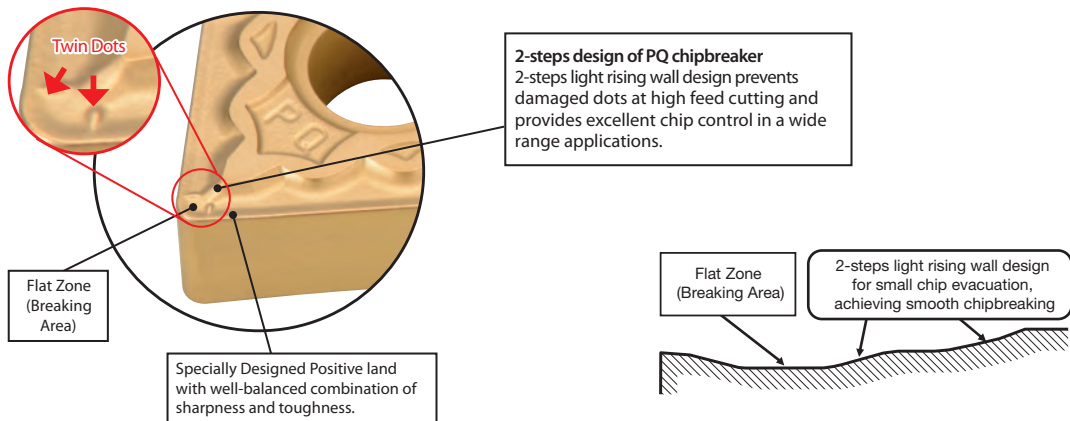
NEW

PP chipbreaker for finishing

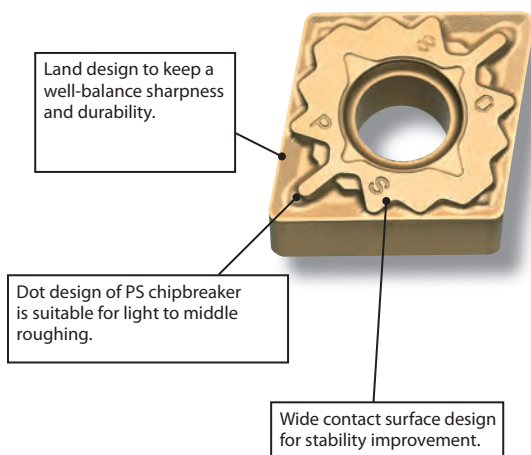


NEW

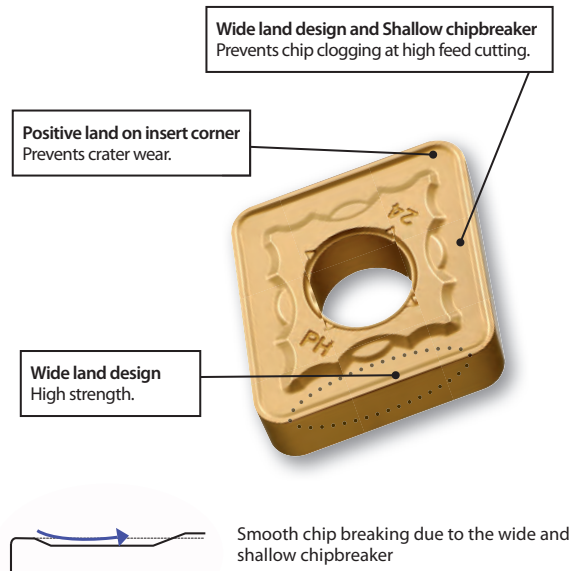
PQ chipbreaker for finishing to medium














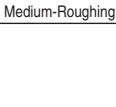

PS chipbreaker for Medium-Roughing




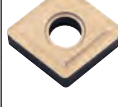







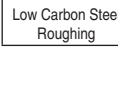



PH chipbreaker for Roughing















■ Negative Type Inserts

Shape	Description	Dimension				CVD Coated			
		I.C.	Thickness	Hole	Corner-R (r _c)	CA510	CA515	CA525	CA530
 Finishing With Wiper Edge	CNMG 120404WP 120408WP	12.70	4.76	5.16	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium With Wiper Edge	CNMG 120404WQ 120408WQ 120412WQ	12.70	4.76	5.16	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	CNMG 120402PP 120404PP 120408PP 120412PP	12.70	4.76	5.16	0.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	CNMG 120402GP 120404GP 120408GP	12.70	4.76	5.16	0.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	CNMG 120404PQ 120408PQ 120412PQ	12.70	4.76	5.16	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	CNMG 090404HQ 090408HQ	9.525	4.76	3.81	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	CNMG 120404HQ 120408HQ 120412HQ	12.70	4.76	5.16	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0.8					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1.2					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
 Finishing-Medium / Up facing	CNMG 120404CQ 120408CQ 120412CQ	12.70	4.76	5.16	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium / Up facing	CNMG 160608CQ 160612CQ	15.875	6.35	6.35	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium / Up facing	CNMG 120408CJ 120412CJ	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium / Up facing	CNMG 160612CJ 160616CJ	15.875	6.35	6.35	1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing	CNMG 090404GS 090408GS	9.525	4.76	3.81	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing	CNMG 120404GS 120408GS 120412GS	12.70	4.76	5.16	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing	CNMG 120412PS 120416PS	12.70	4.76	5.16	1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing	CNMG 160612PS 160616PS	15.875	6.35	6.35	1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Shape	Description	Dimension				CVD Coated			
		I.C.	Thickness	Hole	Corner-R (r _c)	CA510	CA515	CA525	CA530
 Medium-Roughing / High Feed	CNMG 120408PT 120412PT	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing / High Feed	CNMG 160608PT 160612PT 160616PT	15.875	6.35	6.35	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing / High Feed	CNMG 120408GT 120412GT	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	CNMG 120404 120408 120412	12.70	4.76	5.16	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	CNMG 160608 160612	15.875	6.35	6.35	0.8	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	CNMG 190612 190616	19.05	6.35	7.94	1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					2.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	CNMG 120408PH 120412PH 120416PH	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	CNMG 160608PH 160612PH 160616PH	15.875	6.35	6.35	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	CNMG 190608PH 190612PH 190616PH 190624PH	19.05	6.35	7.94	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Single Sided Roughing/High Feed	CNMM 120408PX 120412PX 120416PX	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					2.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Single Sided Roughing/High Feed	CNMM 160608PX 160612PX 160616PX	15.875	6.35	6.35	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Single Sided Roughing/High Feed	CNMM 190608PX 190612PX 190616PX 190624PX	19.05	6.35	7.94	0.8	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					2.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Finishing	CNMG 120404XP 120408XP	12.70	4.76	5.16	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Medium Cutting	CNMG 120404XQ 120408XQ	12.70	4.76	5.16	0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Roughing	CNMG 120408XS	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>










●: Standard Item □: Available in 1st Quarter 2014









Shape	Description	Dimension				CVD Coated			
		I.C.	Thickness	Hole	Corner-R (r _c)	CA510	CA515	CA525	CA530
 Finishing	DNMG 150402PP 150404PP 150408PP 150412PP	12.70	4.76	5.16	0.2 0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150602PP 150604PP 150608PP 150612PP	12.70	6.35	5.16	0.2 0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 110404GP 110408GP	9.525	4.76	3.81	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150402GP 150404GP 150408GP	12.70	4.76	5.16	0.2 0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150404PQ 150408PQ 150412PQ	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150604PQ 150608PQ 150612PQ	12.70	6.35	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	DNMG 110402HQ 110404HQ	9.525	4.76	3.81	0.2 0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150404HQ 150408HQ 150412HQ	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150604HQ 150608HQ 150612HQ	12.70	6.35	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium / Up facing	DNMG 150404CQ 150408CQ 150412CQ	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150604CQ 150608CQ 150612CQ	12.70	6.35	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium / Up facing	DNMG 150408CJ 150412CJ	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150608CJ 150612CJ	12.70	6.35	5.16	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing	DNMG 110404GS 110408GS	9.525	4.76	3.81	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150404GS 150408GS 150412GS	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150604GS 150608GS	12.70	6.35	5.16	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Shape	Description	Dimension				CVD Coated			
		I.C.	Thickness	Hole	Corner-R (r _c)	CA510	CA515	CA525	CA530
 Medium-Roughing	DNMG 150404PS 150408PS 150412PS	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150604PS 150608PS 150612PS 150616PS	12.70	6.35	5.16	0.4 0.8 1.2 1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150408PT 150412PT	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing / High Feed	DNMG 150608PT 150612PT	12.70	6.35	5.16	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150408GT 150412GT	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing / High Feed	DNMG 150608GT 150612GT	12.70	6.35	5.16	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150404 150408	12.70	4.76	5.16	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	DNMG 150608 150612	12.70	6.35	5.16	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150408PH 150412PH 150416PH	12.70	4.76	5.16	0.8 1.2 1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	DNMG 150608PH 150612PH 150616PH	12.70	6.35	5.16	0.8 1.2 1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMM 150408PX 150412PX 150416PX	12.70	4.76	5.16	0.8 1.2 1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Single Sided Roughing/High Feed	DNMM 150608PX 150612PX 150616PX	12.70	6.35	5.16	0.8 1.2 1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150404XP 150408XP	12.70	4.76	5.16	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Medium Cutting	DNMG 150404XQ 150408XQ	12.70	4.76	5.16	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DNMG 150408XS	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>








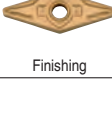


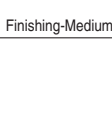
●: Standard Item □: Available in 1st Quarter 2014

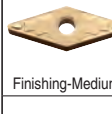








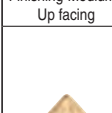



■ Negative Type Inserts

Shape	Description	Dimension				CVD Coated			
		I.C.	Thickness	Hole	Corner-R (r _c)	CA510	CA515	CA525	CA530
 Medium-Roughing	RNMG 090300	9.525	3.18	3.81	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	RNMG 120400	12.70	4.76	5.16	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	RNMG 150600	15.875	6.35	6.35	-	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NEW  Finishing-Medium	SNMG 120404PQ 120408PQ 120412PQ	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Finishing-Medium	SNMG 120404HQ 120408HQ 120412HQ	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Medium-Roughing	SNMG 120408PS 120412PS 120416PS	12.70	4.76	5.16	0.8 1.2 1.6	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Medium-Roughing / High Feed	SNMG 120408PT 120412PT	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
 Roughing	SNMG 090304 090308	9.525	3.18	3.81	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	SNMG 120408 120412 120416	12.70	4.76	5.16	0.8 1.2 1.6	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	SNMG 120408PH 120412PH 120416PH	12.70	4.76	5.16	0.8 1.2 1.6	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Roughing	SNMG 150612PH 150616PH	15.875	6.35	6.35	1.2 1.6	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	SNMG 190612PH 190616PH	19.05	6.35	7.94	1.2 1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	SNMM 120408PX 120412PX 120416PX	12.70	4.76	5.16	0.8 1.2 1.6	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Single Sided Roughing/High Feed	SNMM 150612PX 150616PX	15.875	6.35	6.35	1.2 1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	SNMM 190612PX 190616PX 190624PX	19.05	6.35	7.94	1.2 1.6 2.4	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	SNMG 120408XP	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Medium Cutting	SNMG 120408XQ	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Shape	Description	Dimension				CVD Coated			
		I.C.	Thickness	Hole	Corner-R (r _c)	CA510	CA515	CA525	CA530
 Low Carbon Steel Roughing	SNMG 120408XS	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NEW  Finishing	TNMG 160402PP 160404PP 160408PP 160412PP	9.525	4.76	3.81	0.2 0.4 0.8 1.2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Finishing	TNMG 160402GP 160404GP 160408GP	9.525	4.76	3.81	0.2 0.4 0.8	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
NEW  Finishing-Medium	TNMG 160404PQ 160408PQ 160412PQ	9.525	4.76	3.81	0.4 0.8 1.2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Finishing-Medium	TNMG 110404HQ 110408HQ	6.35	4.76	2.26	0.4 0.8	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	TNMG 160404HQ 160408HQ 160412HQ	9.525	4.76	3.81	0.4 0.8 1.2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	TNMG 160404CQ 160408CQ 160412CQ	9.525	4.76	3.81	0.4 0.8 1.2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Finishing-Medium / Up facing	TNMG 220408CQ 220412CQ	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	TNMG 110404GS 110408GS	6.35	4.76	2.26	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
 Medium-Roughing	TNMG 160404GS 160408GS	9.525	4.76	3.81	0.4 0.8	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	TNMG 160404PS 160408PS 160412PS	9.525	4.76	3.81	0.4 0.8 1.2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Medium-Roughing	TNMG 220404PS 220408PS 220412PS 220416PS	12.70	4.76	5.16	0.4 0.8 1.2 1.6	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	TNMG 160408PT 160412PT	9.525	4.76	3.81	0.8 1.2	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
	TNMG 160408GT 160412GT	9.525	4.76	3.81	0.8 1.2	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>








●: Standard Item □: Available in 1st Quarter 2014

Shape Right-hand shown	Description	Dimension				CVD Coated			
		I.C.	Thickness	Hole	Corner-R (r _c)	CA510	CA515	CA525	CA530
 Roughing	TNMG 160404 160408 160412	9.525	4.76	3.81	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TNMG 220408 220412	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	TNMG 160408PH 160412PH	9.525	4.76	3.81	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TNMG 220408PH 220412PH 220416PH	12.70	4.76	5.16	0.8 1.2 1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Single Sided Roughing/High Feed	TNMM 160408PX 160412PX	9.525	4.76	3.81	0.8 1.2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TNMM 220408PX 220412PX 220416PX	12.70	4.76	5.16	0.8 1.2 1.6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Finishing	TNMG 160404XP 160408XP	9.525	4.76	3.81	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Medium Cutting	TNMG 160404XQ 160408XQ	9.525	4.76	3.81	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Roughing	TNMG 160408XS	9.525	4.76	3.81	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium-Roughing	TNMG 160404%-ST 160408%-ST	9.525	4.76	3.81	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	VNMG 160402PP 160404PP 160408PP 160412PP	9.525	4.76	3.81	0.2 0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	VNMG 160402GP 160404GP 160408GP	9.525	4.76	3.81	0.2 0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	VNMG 160404VF 160408VF 160412VF	9.525	4.76	3.81	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	VNMG 160404PQ 160408PQ 160412PQ	9.525	4.76	3.81	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Shape Right-hand shown	Description	Dimension				CVD Coated			
		I.C.	Thickness	Hole	Corner-R (r _c)	CA510	CA515	CA525	CA530
 Finishing-Medium	VNMG 160404HQ 160408HQ 160412HQ	9.525	4.76	3.81	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Roughing	VNMG 160404 160408	9.525	4.76	3.81	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing With Wiper Edge	WNMG 080404WP 080408WP	12.70	4.76	5.16	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium With Wiper Edge	WNMG 080404WQ 080408WQ 080412WQ	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	WNMG 080402PP 080404PP 080408PP 080412PP	12.70	4.76	5.16	0.2 0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	WNMG 080404PQ 080408PQ 080412PQ	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	WNMG 06T304HQ 06T308HQ	9.525	3.97	3.81	0.4 0.8	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	WNMG 060404HQ 060408HQ	9.525	4.76	3.81	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	WNMG 080404HQ 080408HQ 080412HQ	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium / Up facing	WNMG 080404CQ 080408CQ 080412CQ	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium / Up facing	WNMG 080408CJ 080412CJ	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	WNMG 060404GS 060408GS	9.525	4.76	3.81	0.4 0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	WNMG 080404GS 080408GS 080412GS	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	WNMG 080404PS 080408PS 080412PS 080416PS	12.70	4.76	5.16	0.4 0.8 1.2 1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>









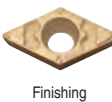

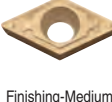
●: Standard Item □: Available in 1st Quarter 2014










■ Negative Type Inserts

Shape	Description	Dimension				CVD Coated			
		I.C.	Thickness	Hole	Corner-R (r _c)	CA510	CA515	CA525	CA530
 Medium-Roughing / High Feed	WNMG 080408PT 080412PT	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
 Medium-Roughing / High Feed	WNMG 080408GT 080412GT	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
 Roughing	WNMG 080404 080408 080412	12.70	4.76	5.16	0.4 0.8 1.2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Roughing	WNMG 080408PH 080412PH	12.70	4.76	5.16	0.8 1.2	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 Low Carbon Steel Finishing	WNMG 080404XP 080408XP	12.70	4.76	5.16	0.4 0.8	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
 Low Carbon Steel Medium Cutting	WNMG 080404XQ 080408XQ	12.70	4.76	5.16	0.4 0.8	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
 Low Carbon Steel Roughing	WNMG 080408XS	12.70	4.76	5.16	0.8	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

●: Standard Item □: Available in 1st Quarter 2014







Positive Type Inserts






Shape	Description	Dimension					CVD Coated			
		I.C.	Thickness	Hole	Corner-R (rc)	Relief Angle	CA510	CA515	CA525	CA530
 Finishing-Medium	CCMT 060202GK 060204GK	6.35	2.38	2.8	0.2 0.4	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	CCMT 09T302GK 09T304GK	9.525	3.97	4.4	0.2 0.4	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	CCMT 120404GK 120408GK 120412GK	12.70	4.76	5.5	0.4 0.8 1.2	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	CCMT 060202HQ 060204HQ	6.35	2.38	2.8	0.2 0.4	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	CCMT 09T302HQ 09T304HQ 09T308HQ	9.525	3.97	4.4	0.2 0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium	CCMT 09T308	9.525	3.97	4.4	0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	CPMT 080204GP	7.94	2.38	3.3	0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	CPMT 090304GP 090308GP	9.525	3.18	4.4	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	CPMH 080204HQ 080208HQ	7.94	2.38	3.5	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	CPMH 090304HQ 090308HQ	9.525	3.18	4.5	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium	CPMH 080204 080208	7.94	2.38	3.5	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	CPMH 090304 090308	9.525	3.18	4.5	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Finishing	CPMT 080204XP	7.94	2.38	3.3	0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	CPMT 090304XP 090308XP	9.525	3.18	4.4	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Medium	CPMT 090304XQ 090308XQ	9.525	3.18	4.4	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	DCMT 070202GP 070204GP	6.35	2.38	2.8	0.2 0.4	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DCMT 11T304GP 11T308GP	9.525	3.97	4.4	0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	DCMT 070202GK 070204GK 070208GK	6.35	2.38	2.8	0.2 0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DCMT 11T302GK 11T304GK 11T308GK	9.525	3.97	4.4	0.2 0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DCMT 070202HQ 070204HQ 070208HQ	6.35	2.38	2.8	0.2 0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	DCMT 11T302HQ 11T304HQ 11T308HQ	9.525	3.97	4.4	0.2 0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Shape	Description	Dimension					CVD Coated			
		I.C.	Thickness	Hole	Corner-R (rc)	Relief Angle	CA510	CA515	CA525	CA530
 Low Carbon Steel Finishing	DCMT 070204XP	6.35	2.38	2.8	0.4	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DCMT 11T302XP 11T304XP 11T308XP	9.525	3.97	4.4	0.2 0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	DCMT 11T304XQ 11T308XQ	9.525	3.97	4.4	0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Medium	DCMT 11T304XQ 11T308XQ	9.525	3.97	4.4	0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium	RCMX 1003M0	10.0	3.18	3.6	-	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	RCMX 1204M0	12.0	4.76	4.2	-	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	SCMT 09T304HQ 09T308HQ	9.525	3.97	4.4	0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium	SPMR 090304 090308	9.525	3.18	-	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	SPMR 120304 120308	12.70	3.18	-	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	TBMT 060102DP 060104DP	3.97	1.59	2.3	0.2 0.4	5°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	TCMT 110204HQ 110208HQ	6.35	2.38	2.8	0.4 0.8	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	TPMT 090204GP	5.56	2.38	2.8	0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TPMT 110304GP 110308GP	6.35	3.18	3.3	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TPMT 160304GP	9.525	3.18	4.4	0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	TPMT 090202HQ 090204HQ	5.56	2.38	2.8	0.2 0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TPMT 110302HQ 110304HQ 110308HQ	6.35	3.18	3.3	0.2 0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TPMT 160304HQ 160308HQ	9.525	3.18	4.4	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

●: Standard Item □: Available in 1st Quarter 2014

Positive Type Inserts

Shape	Description	Dimension				CVD Coated				
		I.C.	Thickness	Hole	Corner-R (rc)	Relief Angle	CA510	CA515	CA525	CA530
 Low Carbon Steel Finishing	TPMT 090204XP	5.56	2.38	2.8	0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TPMT 110304XP 110308XP	6.35	3.18	3.3	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TPMT 160304XP 160308XP	9.525	3.18	4.4	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Low Carbon Steel Medium	TPMT 110304XQ 110308XQ	6.35	3.18	3.3	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TPMT 160304XQ 160308XQ	9.525	3.18	4.4	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	TPMR 160304GP	9.525	3.18	-	0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	TPMR 110304HQ 110308HQ	6.35	3.18	-	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TPMR 160304HQ 160308HQ	9.525	3.18	-	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Medium	TPMR 110304 110308	6.35	3.18	-	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	TPMR 160304 160308	9.525	3.18	-	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing	VBMT 110304GP	6.35	3.18	2.8	0.4	5°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	VBMT 160404GP 160408GP	9.525	4.76	4.4	0.4 0.8	5°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Shape Left-hand shown	Description	Dimension				CVD Coated				
		I.C.	Thickness	Hole	Corner-R (rc)	Relief Angle	CA510	CA515	CA525	CA530
 Finishing	VBMT 110302VF 110304VF 110308VF	6.35	3.18	2.8	0.2 0.4 0.8	5°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	VBMT 160402VF 160404VF 160408VF 160412VF	9.525	4.76	4.4	0.2 0.4 0.8 1.2	5°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	VBMT 110304HQ 110308HQ	6.35	3.18	2.8	0.4 0.8	5°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	VBMT 160404HQ 160408HQ 160412HQ	9.525	4.76	4.4	0.4 0.8 1.2	5°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	VCMT 080202VF 080204VF	4.76	2.38	2.3	0.2 0.4	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	VCMT 080202HQ 080204HQ	4.76	2.38	2.3	0.2 0.4	7°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	WBMT 060102%-DP 060104%-DP	WBMT 060102%-DP 060104%-DP	3.97	1.59	2.3	0.2 0.4	5°	<input type="checkbox"/>	L	L
WBMT 080202%-DP 080204%-DP		4.76	2.38	2.3	0.2 0.4	5°	<input type="checkbox"/>	L	L	<input type="checkbox"/>
 Finishing	WPMT 110204GP	6.35	2.38	2.8	0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	WPMT 160304GP	9.525	3.18	4.4	0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Finishing-Medium	WPMT 110202HQ 110204HQ	6.35	2.38	2.8	0.2 0.4	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	WPMT 160304HQ 160308HQ	9.525	3.18	4.4	0.4 0.8	11°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

●: Standard Item □: Available in 1st Quarter 2014

Case studies

42CrMo4 (Alloy steel)	
<ul style="list-style-type: none"> · Cover · Vc=140~150m/min · ap=3.0~3.5mm · f=0.35~0.4mm/rev · Wet · CNMG120408PT 	
CA515	10pcs/edge
Competitor E (CVD Coated)	7pcs/edge
<ul style="list-style-type: none"> · CA515 shows 1.4 times longer tool life compare to Competitor E's CVD coated carbide 	

15CrMo5 (Alloy steel)	
<ul style="list-style-type: none"> · Gear · Vc=380m/min · ap=1.5~2.0mm · f=0.3~0.4mm/rev · Wet · WNMG080408PQ 	
CA515	430pcs/edge
Competitor F (CVD Coated)	380pcs/edge
<ul style="list-style-type: none"> · CA515 shows longer tool life compare to Competitor F's CVD coated carbide. 	

1.0040 (Rolled steel)	
<ul style="list-style-type: none"> · Machine Part · Vc=170m/min · ap=0.75mm · f=0.2mm/rev · Wet · CNMG120408PQ 	
CA525	more than 1400 pcs/edge
Competitor G (CVD Coated) Molded Chipbreaker	800-1000pcs/edge
<ul style="list-style-type: none"> · CA525 shows 1.4 times longer tool life compare to Competitor G's CVD coated carbide. · Smooth chip control. 	

20CrMo5 (Alloy steel)	
<ul style="list-style-type: none"> · Shaft · Vc=120m/min · ap=2.0mm · f=0.25mm/rev · Dry · TNMG160408R-ST 	
CA525	10pcs/edge
Competitor H (CVD Coated)	2pcs/edge
<ul style="list-style-type: none"> · CA525 shows 5 times longer tool life compare to Competitor H's CVD coated carbide. 	

C45 (Carbon steel)	
<ul style="list-style-type: none"> · Shaft · Vc=250m/min · ap=3.0mm · f=0.3mm/rev · Wet · CNMG120408PS 	
CA525	10pcs/edge
Competitor I (CVD Coated)	6pcs/edge
Competitor J (PVD Coated)	× Instant Breakage
<ul style="list-style-type: none"> · CA525 shows 1.6 times longer tool life compare to Competitor I's CVD coated carbide. · Competitor J's PVD coated carbide could not complete 1 piece before breakage. 	

20CrMo5 (Alloy steel)	
<ul style="list-style-type: none"> · Flange Shaft · Vc=260~280m/min · ap=0.6mm · f=0.3~0.5mm/rev · Wet · CNMG120408PQ 	
CA525	180 pcs/edge
Competitor K (CVD Coated)	150pcs/edge
<ul style="list-style-type: none"> · CA525 shows 1.2 times longer tool life compare to Competitor K's CVD coated carbide. 	

C45 (Carbon steel)	
<ul style="list-style-type: none"> · Shaft · Vc=100m/min · ap=2.0~4.0mm · f=0.4mm/rev · Wet · WNMG080408PS 	
CA525	70 pcs/edge
Conventional L (CVD Coated)	40pcs/edge
<ul style="list-style-type: none"> · CA525 shows 1.7 times longer tool life compare to Conventional L's CVD coated carbide. 	

20Cr4 (Alloy steel)	
<ul style="list-style-type: none"> · Shaft · Vc=90m/min · ap=2.0~3.0mm · f=0.32mm/rev · Wet · WNMG080408PS 	
CA525	260 pcs/edge
Conventional M (CVD Coated)	190pcs/edge
<ul style="list-style-type: none"> · CA525 shows 1.3 times longer tool life compare to Conventional M's CVD coated carbide. 	

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