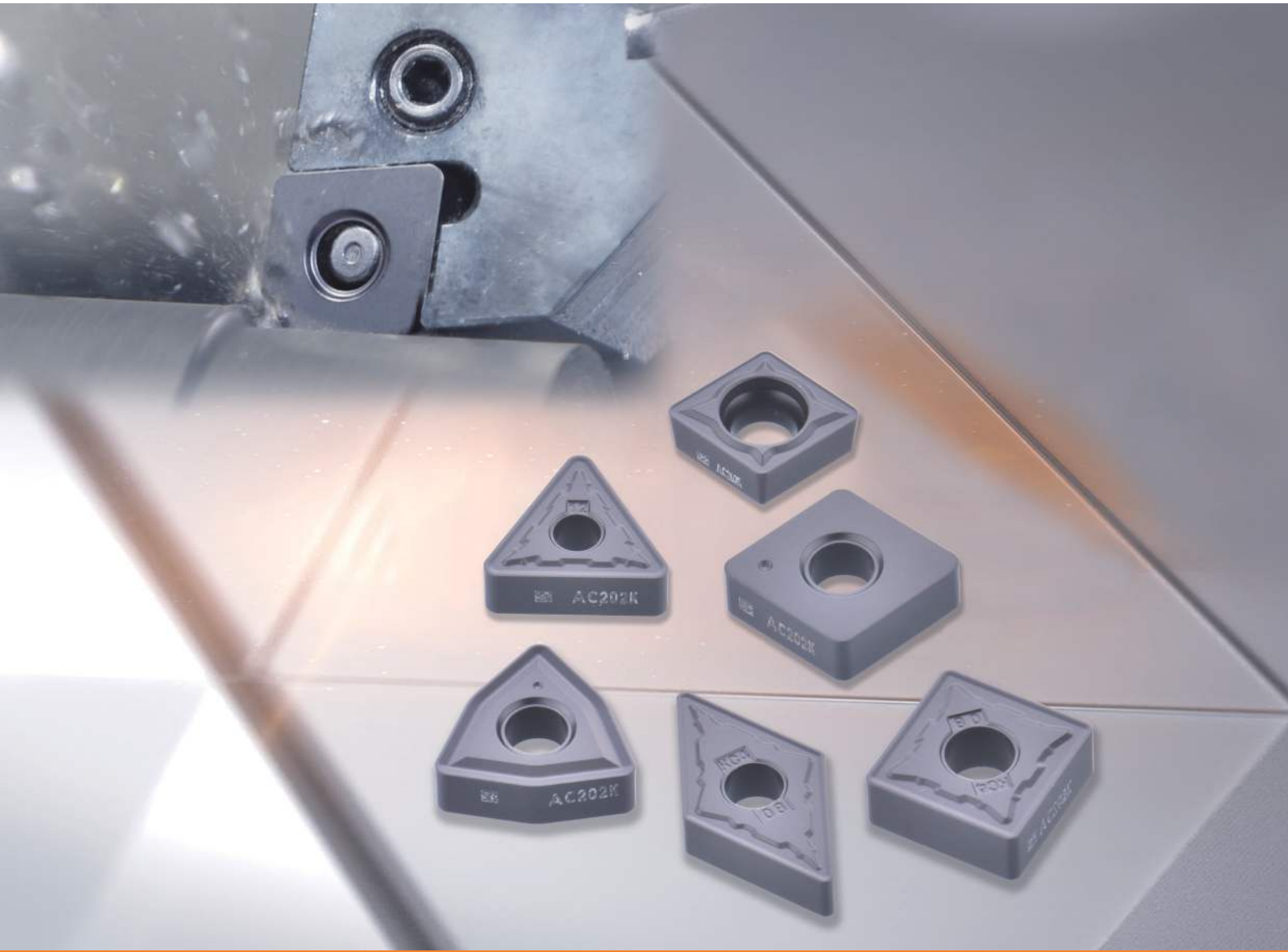
AC102K/AC202K

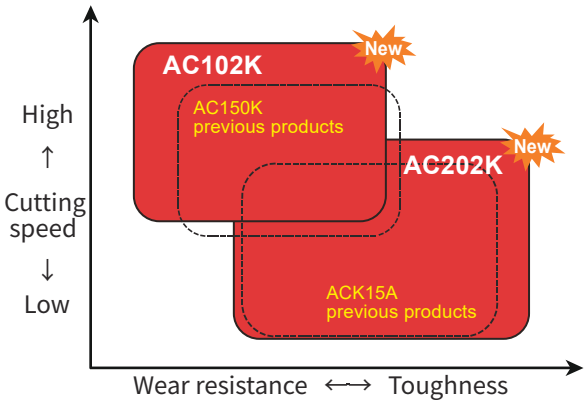
New generation of cast iron turning grade



New cast iron turning grades AC102K/AC202K

With the newly developed coating technology and cutting edge treatment technology, the new grades fully cover gray cast iron and nodular cast iron high-speed machining to general machining, and achieve stable and longer tool life.

AC102K/AC202K application scope



• AC102K

Excellent wear resistance can be achieved in high-speed and high-efficient cast iron machining. By adopting ultra thick coating and nano structured coating technology, it can realize ultra-high speed machining at 600m/ min.

• AC202K

1st option for cast iron maching. The new nano-structured coating technology can form high-strength and high wear resistance CVD coating and realize stable long tool life during cast iron machining.

Application scope and cutting conditions

Workpiece materials	Application scope								
Cutting field	Finish machining ⟷							Rough machining	
ISO classification	K01	K05	K10	K15	K20	K25	K30	K35	K40
Grades	AC102K New								
			AC150K						
							AC202K New		
				ACK15A					

Rrecommended cutting speed-negative inserts

Materials			Brinell hardness (HB)	Tensile strength (N/mm²)	ACHTECK turning grade					
					Starting value of cutting speed Vc(m/min)					
ISO	Material classification				AC102K			AC202K		
					f (mm/rev)			f (mm/rev)		
					0.1	0.4	0.6	0.1	0.4	0.6
K	Malleable iron	Ferrite	200	400	320	215	160	240	160	130
		pearlite	260	700	290	175	125	200	120	95
	Grey cast iron	Low tensile strength	180	200	490	290	205	400	210	150
		High tensile strength /austenite	245	350	265	185	135	200	150	100
	Ductile iron	Ferrite	155	400	280	205	155	230	170	120
		pearlite	265	700	205	155	135	170	120	100

* This table only shows the general cutting conditions. The actual selection should be adjusted according to the machine rigidity, tool body, workpiece conditions, coolant and other factors. (F = mm / rev needs to be adjusted according to the insert radius)

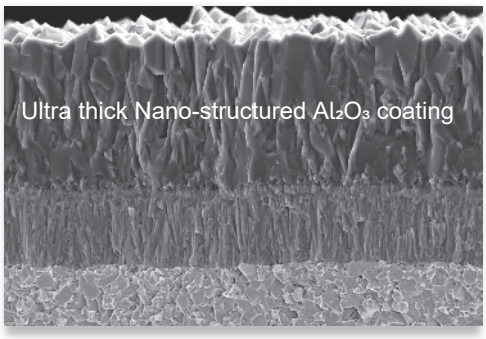
Recommended cutting speed-positive inserts

Materials			Brinell hardness (HB)	Tensile strength (N/mm²)	ACHTECK turning grade					
					Starting value of cutting speed Vc(m/min)					
ISO	Material classification				AC102K			AC202K		
					f (mm/rev)			f (mm/rev)		
					0.1	0.4	0.6	0.1	0.4	0.6
K	Malleable iron	Ferrite	200	400	280	180	130	230	150	120
		pearlite	260	700	250	155	115	190	120	95
	Grey cast iron	Low tensile strength	180	200	430	260	180	390	200	140
		High tensile strength /austenite	245	350	235	160	115	190	140	100
	Ductile iron	Ferrite	155	400	240	180	135	220	160	120
		pearlite	265	700	180	135	120	160	120	100

* This table only shows the general cutting conditions. The actual selection should be adjusted according to the machine rigidity, tool body, workpiece conditions, coolant and other factors. (F = mm / rev needs to be adjusted according to the insert radius)

Grade specification

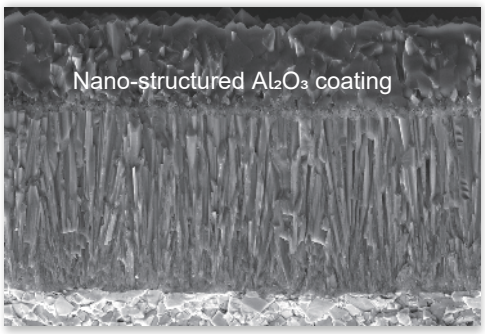
New coating with ultra thick Al_2O_3



AC102K

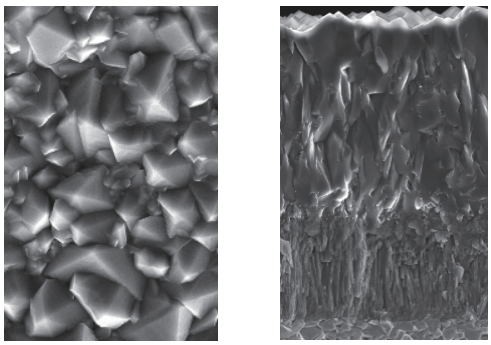
- The ultra thick Al_2O_3 and fine grain reinforced coating can effectively prevent flank wear, improve the wear resistance and realize high speed machining.
- Nano structured transition layer can improve coating adhesion which prevent coating peeling.
- The new substrate has high toughness and good impact resistance under complex working conditions.

Optimized crystal growth through the latest coating technology



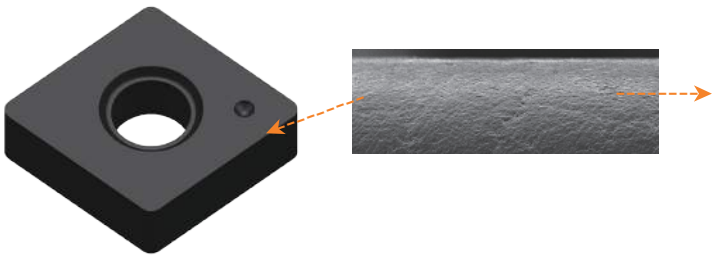
AC202K

- Controled Al_2O_3 crystal growth achieved better wear resistance.
- Columnar crystal structure MT-TiCN gives the coating higher toughness.
- The new substrate has high toughess and good impact resistance under complex working conditions.



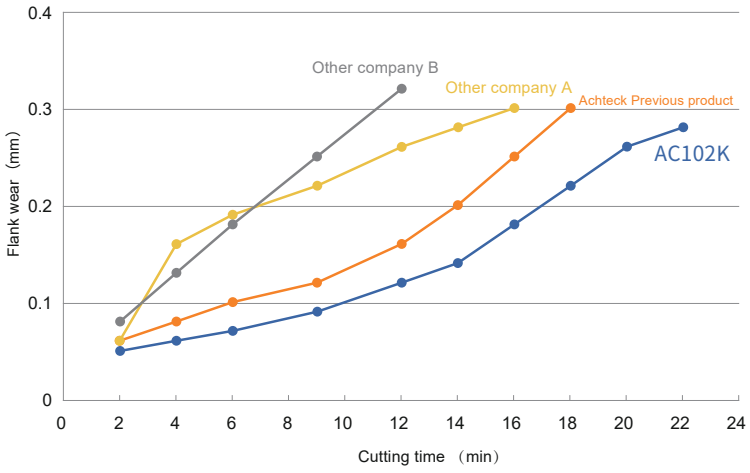
Optimized crystal growth

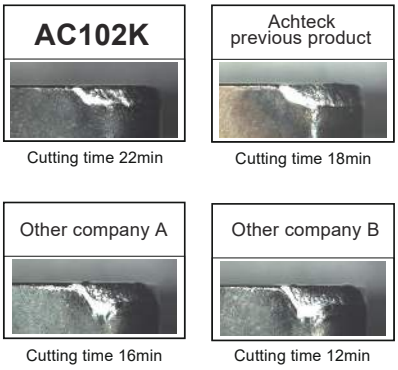
- New nano structured coating and optimized crystal growth technology can form high-strength and good wear resistance CVD coating.
- Excellent wear resistance can be achieved at high-speed and high-efficient cast iron machining.



- The new honing technology make the cutting edge stronger and improve the chipping resistance.
- The new post-treatment technology achieves smooth coating surface and offers more stable cutting.

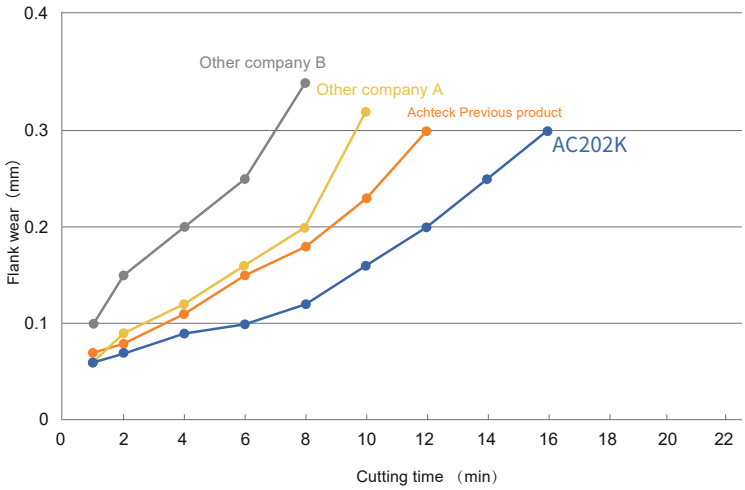
AC102K continuous machining

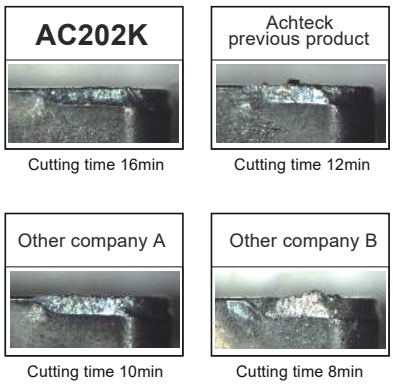




Material: GG25
Insert: CNMA 120408E-KD5 AC102K
Cutting speed: 400m/min
Feed: 0.3mm/rev
Cutting depth: 1.0mm
Cooling: dry

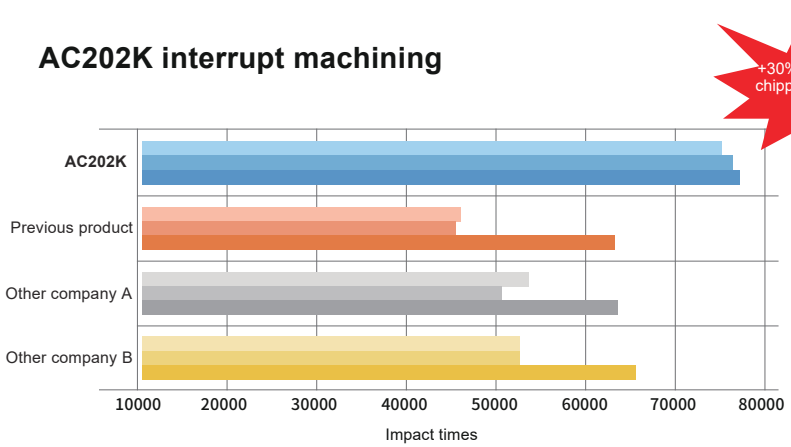
AC202K interrupt machining





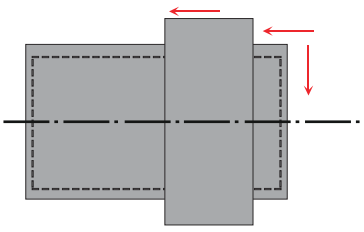
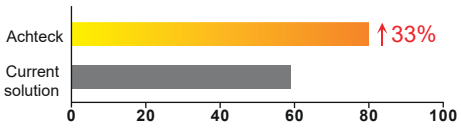
Material: GG25
Insert: CNMA 120408E-KD5 AC202K
Cutting speed: 300m/min
Feed: 0.3mm/rev
Cutting depth: 2.0mm
Cooling: dry

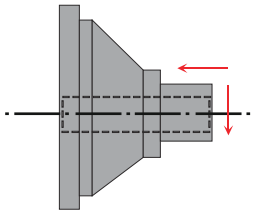
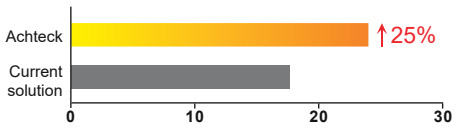
AC202K interrupt machining

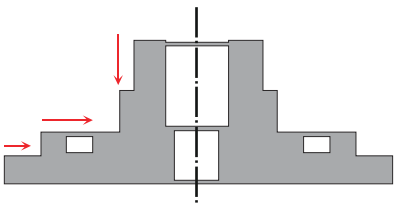
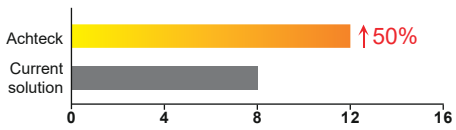


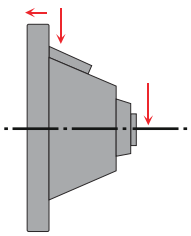
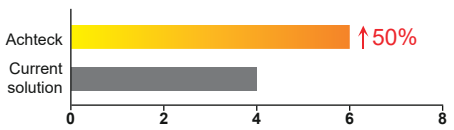
Cutting conditions
Material: GG25
Insert: CNMA 120408E-KD5 AC202K
Cutting speed: 300m/min
Feed: 0.25mm/rev
Cutting depth: 2.0mm
Cooling: wet

Case studies

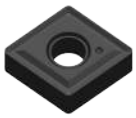
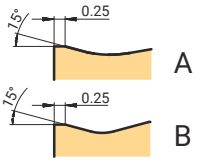
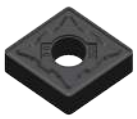
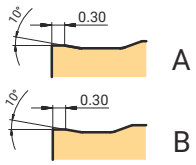
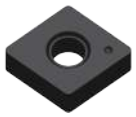
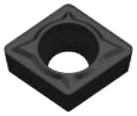
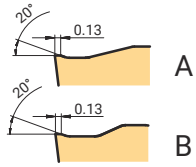
Insert	WNMG080408E-KC4 AC102K
Workpiece	
Material	GGG60
Machining type	Continuous machining
Cutting speed	400m/min
Feed	0.2mm/rev
Cutting depth	1.5-2.0mm
Coolant	Emulsion
Result	 Under the same cutting conditions, tool life is **33%** longer than the competitor's.

Insert	CNMG 120408E-PC4 AC102K
Workpiece	
Material	GG25
Machining type	Continuous machining
Cutting speed	300m/min
Feed	0.3mm/rev
Cutting depth	2.5mm
Coolant	Dry cutting
Result	 Under the same cutting conditions with dry cuting, tool life is **25%** longer than competitor's.

Insert	WNMG 080408E-KC4 AC202K
Workpiece	
Materials	GGG45
Machining type	Continuous machining
Cutting speed	200-350m/min
Feed	0.25mm/rev
Cutting depth	2.0mm
Coolant	Emulsion
Result	 Under the same cutting conditions, tool life is **50%** longer than the competitor's.

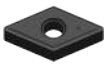
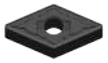
Insert	CNMG 120412E-KC4 AC202K
Workpiece	
Materials	GGG50
Machining type	Continuous machining
Cutting speed	300m/min
Feed	0.25-0.4mm/rev
Cutting depth	1.5mm
Coolant	Emulsion
Result	 Under the same cutting conditions, tool life is **33%** longer than the competitor's.

Geometry selection

Application		Geometry		Features	Chipbreaker cross section
Negative	Medium machining	PC4 		**1st option for cast iron medium machining** Full-around chip breaking design. It has high cutting edge strength and covers wide applications, 1st option for nodular cast iron machining.	
	Rough machining	KC4 		**1st option for cast iron machining** Used for cast iron rough machining. It has strong cutting edge, and offers reliable machining and stable performance.	
		KD5 		**1st option for gray cast iron rough machining, general purpose cast iron turning** High edge strength, suitable for interrupt and unstable cutting.	
Positive	Rough machining	KC2 		**General purpose cast iron turning geometry** Used for cast iron medium to medium-rough machining, simple and durable chip breaker design, wide application range.	
		KD5 		**Used for cast iron rough machining, with hard skin** Used for cast iron boring. It has strong edge and good edge chipping resistance.	

Negative inserts

Insert	Product code	Dimmension(mm)				Grade	
		r	d	l	s	AC102K	AC202K
	CNMG 120404E-PC4	0.4	12.7	12.9	4.76	●	●
	120408E-PC4	0.8	12.7	12.9	4.76	●	●
	120412E-PC4	1.2	12.7	12.9	4.76	●	●
	160608E-PC4	0.8	15.875	16.1	6.35	○	○
	160612E-PC4	1.2	15.875	16.1	6.35	●	●
	160616E-PC4	1.6	15.875	16.1	6.35	●	●
	190608E-PC4	0.8	19.05	19.3	6.35	○	○
	190612E-PC4	1.2	19.05	19.3	6.35	○	○
	190616E-PC4	1.6	19.05	19.3	6.35	○	○
	CNMG 090308E-KC4	0.8	9.525	9.67	3.18	○	○
	120404E-KC4	0.4	12.7	12.9	4.76	●	●
	120408E-KC4	0.8	12.7	12.9	4.76	●	●
	120412E-KC4	1.2	12.7	12.9	4.76	●	●
	120416E-KC4	1.6	12.7	12.9	4.76	●	●
	160608E-KC4	0.8	15.875	16.1	6.35	●	●
	160612E-KC4	1.2	15.875	16.1	6.35	●	●
	160616E-KC4	1.6	15.875	16.1	6.35	●	●
	190608E-KC4	0.8	19.05	19.3	6.35	●	●
	190612E-KC4	1.2	19.05	19.3	6.35	●	●
	190616E-KC4	1.6	19.05	19.3	6.35	●	●
	190624E-KC4	2.4	19.05	19.3	6.35	●	●
	CNMA 120404E-KD5	0.4	12.7	12.9	4.76	●	●
	120408E-KD5	0.8	12.7	12.9	4.76	●	●
	120412E-KD5	1.2	12.7	12.9	4.76	●	●
	120416E-KD5	1.6	12.7	12.9	4.76	●	●
	160608E-KD5	0.8	15.875	16.1	6.35	●	●
	160612E-KD5	1.2	15.875	16.1	6.35	●	●
	160616E-KD5	1.6	15.875	16.1	6.35	●	●
	160620E-KD5	2.0	15.875	16.1	6.35	●	●
	190608E-KD5	0.8	19.05	19.3	6.35	○	●
	190612E-KD5	1.2	19.05	19.3	6.35	●	●
	190616E-KD5	1.6	19.05	19.3	6.35	●	●

Insert	Product code	Dimmension(mm)				Grade	
		r	d	l	s	AC102K	AC202K
	DNMG 150404E-PC4	0.4	12.7	15.5	4.76	●	●
	150408E-PC4	0.8	12.7	15.5	4.76	●	●
	150412E-PC4	1.2	12.7	15.5	4.76	●	●
	150604E-PC4	0.4	12.7	15.5	6.35	○	○
	150608E-PC4	0.8	12.7	15.5	6.35	●	●
	150612E-PC4	1.2	12.7	15.5	6.35	●	●
	DNMG 110404E-KC4	0.4	9.525	11.62	4.76	○	●
	110408E-KC4	0.8	9.525	11.62	4.76	●	●
	150404E-KC4	0.4	12.7	15.5	4.76	●	●
	150408E-KC4	0.8	12.7	15.5	4.76	●	●
	150412E-KC4	1.2	12.7	15.5	4.76	●	●
	150604E-KC4	0.4	12.7	15.5	6.35	●	●
	150608E-KC4	0.8	12.7	15.5	6.35	●	●
	150612E-KC4	1.2	12.7	15.5	6.35	●	●
	DNMA 150404E-KD5	0.4	12.7	15.5	4.76	○	●
	150408E-KD5	0.8	12.7	15.5	4.76	●	●
	150412E-KD5	1.2	12.7	15.5	4.76	●	●
	150604E-KD5	0.4	12.7	15.5	6.35	○	●
	150608E-KD5	0.8	12.7	15.5	6.35	●	●
	150612E-KD5	1.2	12.7	15.5	6.35	●	●
	SNMG 120404E-PC4	0.4	12.7	12.7	4.76	○	○
	120408E-PC4	0.8	12.7	12.7	4.76	●	●
	120412E-PC4	1.2	12.7	12.7	4.76	●	●

● Stocked ○ Non-stocked

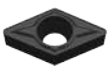
Negative inserts

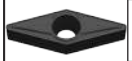
Insert	Product code	Dimmension(mm)				Grade	
		r	d	l	s	AC102K	AC202K
	SNMG 090304E-KC4	0.4	9.525	9.525	3.18	○	○
	090308E-KC4	0.8	9.525	9.525	3.18	○	●
	120404E-KC4	0.4	12.7	12.7	4.76	●	●
	120408E-KC4	0.8	12.7	12.7	4.76	●	●
	120412E-KC4	1.2	12.7	12.7	4.76	●	●
	150608E-KC4	0.8	15.875	15.875	6.35	●	●
	150612E-KC4	1.2	15.875	15.875	6.35	●	●
	150616E-KC4	1.6	15.875	15.875	6.35	●	●
	190608E-KC4	0.8	19.05	19.05	6.35	●	●
	190612E-KC4	1.2	19.05	19.05	6.35	●	●
	190616E-KC4	1.6	19.05	19.05	6.35	●	●
	190624E-KC4	2.4	19.05	19.05	6.35	○	●
	SNMA 120408E-KD5	0.8	12.7	12.7	4.76	●	●
	120412E-KD5	1.2	12.7	12.7	4.76	●	●
	120416E-KD5	1.6	12.7	12.7	4.76	●	●
	150612E-KD5	1.2	15.875	15.875	6.35	○	●
	150616E-KD5	1.6	15.875	15.875	6.35	●	●
	190612E-KD5	1.2	19.05	19.05	6.35	●	●
	190616E-KD5	1.6	19.05	19.05	6.35	●	●
	TNMG 160404E-PC4	0.4	9.525	16.5	4.76	●	●
	160408E-PC4	0.8	9.525	16.5	4.76	●	●
	160412E-PC4	1.2	9.525	16.5	4.76	●	●
	220412E-PC4	1.2	12.7	22.0	4.76	○	○
	TNMG 110304E-KC4	0.4	6.35	11.0	3.18	○	○
	160404E-KC4	0.4	9.525	16.5	4.76	●	●
	160408E-KC4	0.8	9.525	16.5	4.76	●	●
	160412E-KC4	1.2	9.525	16.5	4.76	●	●
	160416E-KC4	1.6	9.525	16.5	4.76	●	●
	220412E-KC4	1.2	12.7	22.0	4.76	●	●
	220416E-KC4	1.6	12.7	22.0	4.76	●	●

Insert	Product code	Dimmension(mm)				Grade	
		r	d	l	s	AC102K	AC202K
	TNMA 160404E-KD5	0.4	9.525	16.5	4.76	●	●
	160408E-KD5	0.8	9.525	16.5	4.76	●	●
	160412E-KD5	1.2	9.525	16.5	4.76	●	●
	160416E-KD5	1.6	9.525	16.5	4.76	○	○
	220408E-KD5	0.8	12.7	22.0	4.76	●	●
	220412E-KD5	1.2	12.7	22.0	4.76	●	●
	220416E-KD5	1.6	12.7	22.0	4.76	●	●
	VNMG 160404E-PC4	0.4	9.525	16.5	4.76	●	●
	160408E-PC4	0.8	9.525	16.5	4.76	●	●
	160412E-PC4	1.2	9.525	16.5	4.76	●	●
	VNMG 160404E-KC4	0.4	9.525	16.5	4.76	●	●
	160408E-KC4	0.8	9.525	16.5	4.76	●	●
	160412E-KC4	1.2	9.525	16.5	4.76	●	●
	WNMG 080404E-PC4	0.4	12.7	8.7	4.76	●	●
	080408E-PC4	0.8	12.7	8.7	4.76	●	●
	080412E-PC4	1.2	12.7	8.7	4.76	●	●
	WNMG 060404E-KC4	0.4	9.525	6.52	4.76	●	●
	060408E-KC4	0.8	9.525	6.52	4.76	●	●
	080404E-KC4	0.4	12.7	8.7	4.76	●	●
	080408E-KC4	0.8	12.7	8.7	4.76	●	●
	080412E-KC4	1.2	12.7	8.7	4.76	●	●
	080416E-KC4	1.2	12.7	8.7	4.76	●	●
	WNMA 080404E-KD5	0.4	12.7	8.7	4.76	●	●
	080408E-KD5	0.8	12.7	8.7	4.76	●	●
	080412E-KD5	1.2	12.7	8.7	4.76	●	●
	080416E-KD5	1.6	12.7	8.7	4.76	●	●

● Stocked ○ Non-stocked

Positive inserts

Insert	Product code	Dimmension(mm)				Grade	
		r	d	l	s	AC102K	AC202K
	CCMT 060204E-KC2	0.4	6.35	6.45	2.38	●	●
	060208E-KC2	0.8	6.35	6.45	2.38	●	●
	09T304E-KC2	0.4	9.525	9.67	3.97	●	●
	09T308E-KC2	0.8	9.525	9.67	3.97	●	●
	120404E-KC2	0.4	12.7	12.9	4.76	●	●
	120408E-KC2	0.8	12.7	12.9	4.76	●	●
	120412E-KC2	1.2	12.7	12.9	4.76	●	●
	CCMW 060204E-KD5	0.4	6.35	6.45	2.38	●	●
	09T304E-KD5	0.4	9.525	9.67	3.97	●	●
	09T308E-KD5	0.8	9.525	9.67	3.97	●	●
	120404E-KD5	0.4	12.7	12.9	4.76	●	●
	120408E-KD5	0.8	12.7	12.9	4.76	●	●
	120412E-KD5	1.2	12.7	12.9	4.76	●	●
	DCMT 070204E-KC2	0.4	6.35	7.75	2.38	●	●
	070208E-KC2	0.8	6.35	7.75	2.38	○	○
	11T304E-KC2	0.4	9.525	11.62	3.97	●	●
	11T308E-KC2	0.8	9.525	11.62	3.97	●	●
	11T312E-KC2	1.2	9.525	11.62	3.97	○	○
	DCMW 070204E-KD5	0.4	6.35	7.75	2.38	●	●
	070208E-KD5	0.8	6.35	7.75	2.38	○	○
	11T304E-KD5	0.4	9.525	11.62	3.97	●	●
	11T308E-KD5	0.8	9.525	11.62	3.97	○	●

Insert	Product code	Dimmension(mm)				Grade	
		r	d	l	s	AC102K	AC202K
	SCMT 09T304E-KC2	0.4	9.525	9.525	3.97	●	●
	09T308E-KC2	0.8	9.525	9.525	3.97	●	●
	120404E-KC2	0.4	12.7	12.7	4.76	○	○
	120408E-KC2	0.8	12.7	12.7	4.76	●	●
	120412E-KC2	1.2	12.7	12.7	4.76	●	●
	SCMW 09T304E-KD5	0.4	9.525	9.525	3.97	●	●
	09T308E-KD5	0.8	9.525	9.525	3.97	●	●
	120404E-KD5	0.4	12.7	12.7	4.76	○	○
	120408E-KD5	0.8	12.7	12.7	4.76	●	●
	TCMT 090204E-KC2	0.4	5.56	9.63	2.38	●	●
	090208E-KC2	0.8	5.56	9.63	2.38	●	●
	110204E-KC2	0.4	6.35	11.0	2.38	●	●
	110208E-KC2	0.8	6.35	11.0	2.38	●	●
	16T304E-KC2	0.4	9.525	16.5	3.97	●	●
	16T308E-KC2	0.8	9.525	16.5	3.97	●	●
	16T312E-KC2	1.2	9.525	16.5	3.97	●	●
	TCMW 110204E-KD5	0.4	6.35	11.0	2.38	●	●
	110208E-KD5	0.8	6.35	11.0	2.38	○	●
	16T304E-KD5	0.4	9.525	16.5	3.97	○	●
	16T308E-KD5	0.8	9.525	16.5	3.97	●	●
	VBMT 160404E-KC2	0.4	9.525	16.61	4.76	●	○
	160408E-KC2	0.8	9.525	16.61	4.76	●	●
	160412E-KC2	1.2	9.525	16.61	4.76	●	●

● Stocked ○ Non-stocked