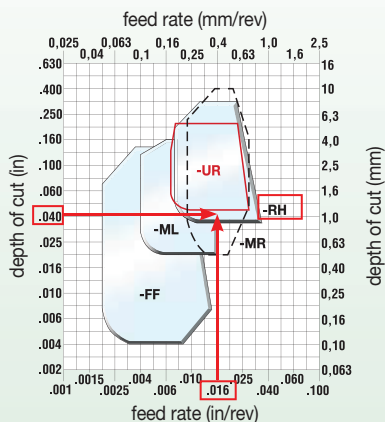
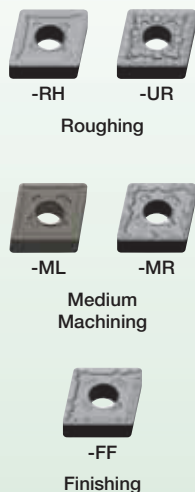


### ■ Step 1 • Select the insert geometry

#### Negative Inserts



P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

### ■ Step 2 • Select the grade

cutting condition		Negative Insert Geometry				Positive Insert Geometry		
		-FF	-ML	-MR	-UR	-RH	-FP	-MU
heavily interrupted cut		WP15CT	WP25CT	WP35CT/ WP25CT	WP35CT	WP35CT	WP25CT/ WS25PT	WP35CT
lightly interrupted cut		WP15CT	WP25CT	WP25CT	WP35CT	WP35CT	WP25CT	WP25CT
varying depth of cut, casting, or forging skin		WP15CT	WP15CT	WP15CT	WP25CT	WP25CT	WP15CT	WP15CT
smooth cut, pre-turned surface		WP15CT	WP15CT	WP15CT	WP25CT	WP25CT	WP15CT	WP15CT

### ■ Step 3 • Selecting the cutting speed

Low-Carbon (<0.3% C) and Free-Machining Steel										Starting Conditions	
material group	grade	135	180	225	275	320	360	410	455	495	m/min
P0/P1	WP15CT										395
	WP25CT										275
	WP35CT										210
	WS10PT										280

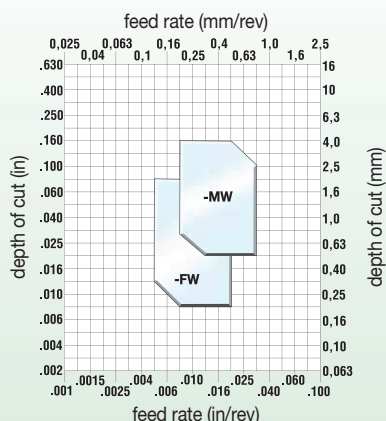
#### WIDIA Material Group Selection Guide:

To optimise speed recommendations, material subgroups have been added to each of the six workpiece material groups.

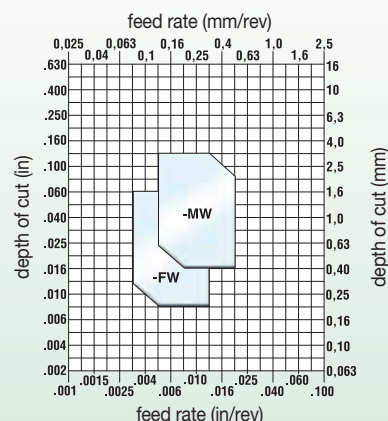
material	material group ISO code	number of material subgroups
steel	P	1–6
stainless steel	M	1–3
cast iron	K	1–3
non-ferrous materials	N	1–8
high-temp alloys	S	1–4
hardened materials	H	1

■ **Step 1 • Select the insert geometry**





**Negative Wiper Inserts**



**Positive Wiper Inserts**

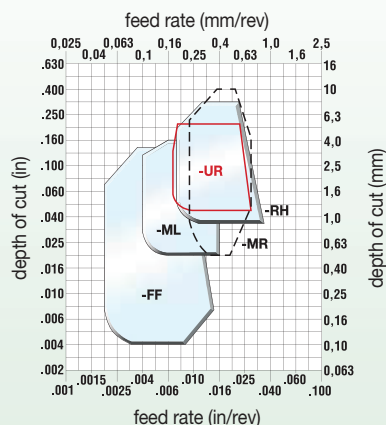
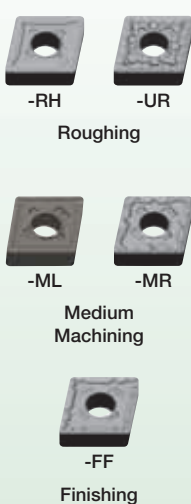


■ **Step 2 • Select the grade**

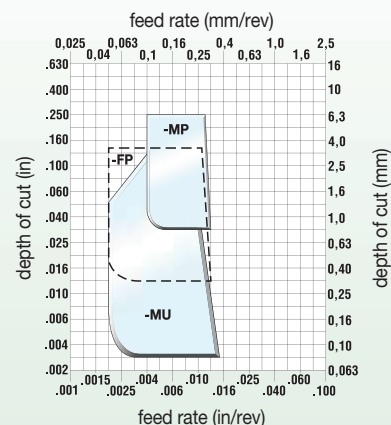
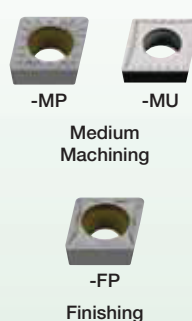
cutting condition		Negative Insert Geometry		Positive Insert Geometry	
		-FW	-MW	-FW	-MW
heavily interrupted cut		WP15CT	WP25CT	—	WP25CT
lightly interrupted cut		WP15CT	WP25CT	WP15CT	WP25CT
varying depth of cut, casting, or forging skin		WP15CT	WP15CT	WP15CT	WP15CT
smooth cut, pre-turned surface		WP15CT	WP15CT	WP15CT	WP15CT

■ **Step 1 • Select the insert geometry**





**Negative Inserts**



**Positive Inserts**



■ **Step 2 • Select the grade**

cutting condition		Negative Insert Geometry					Positive Insert Geometry		
		-FF	-ML	-MR	-UR	-RH	-FP	-MU	-MP
heavily interrupted cut		WP15CT	WP25CT	WP35CT/ WP25CT	WP35CT	WP35CT	WP25CT/ WS25PT	WP35CT	WM35CT
lightly interrupted cut		WP15CT	WP25CT	WP25CT	WP35CT	WP35CT	WP25CT	WP25CT	WP25CT
varying depth of cut, casting, or forging skin		WP15CT	WP15CT	WP15CT	WP25CT/ WP15CT	WP25CT	WP15CT	WP25CT/ WP15CT	WP15CT
smooth cut, pre-turned surface		WP15CT	WP15CT	WP15CT	WP25CT/ WP15CT	WP25CT	WP15CT	WP25CT/ WP15CT	WP15CT

(continued)

**Step 3 • Select the cutting speed** *(continued)*
**Low-Carbon (<0.3% C) and Free-Machining Steel**

speed — m/min

Starting Conditions

material group	grade	135	180	225	275	320	360	410	455	495	m/min
P0/P1	WP15CT										395
	WP25CT										275
	WP35CT										210
	WS10PT										280
	WM35CT										280

**Medium- and High-Carbon Steels (<0.3% C)**

speed — m/min

Starting Conditions

material group	grade	135	180	225	275	320	360	410	455	495	m/min
P2	WP15CT										265
	WP25CT										195
	WP35CT										150
	WS10PT										200
	WM35CT										200

**Alloy Steels and Tool Steels (≤330 HB) (≤35 HRC)**

speed — m/min

Starting Conditions

material group	grade	135	180	225	275	320	360	410	455	495	m/min
P3	WP15CT										190
	WP25CT										155
	WP35CT										120
	WS10PT										155
	WM35CT										155

**Alloy steels and Tool Steels (340–450 HB) (36–48 HRC)**

speed — m/min

Starting Conditions

material group	grade	60	90	120	150	180	210	240	270	300	m/min
P4	WP15CT										145
	WP25CT										105
	WP35CT										95
	WS10PT										110
	WM35CT										110

**Ferritic, Martensitic, and PH Stainless Steels (≤330 HB) (≤35 HB)**

speed — m/min

Starting Conditions

material group	grade	120	150	180	210	240	270	300	330	360	m/min
P5	WP15CT										215
	WP25CT										195
	WP35CT										135
	WS10PT										200

**Ferritic, Martensitic, and PH Stainless Steels (340–450 HB) (36–48 HRC)**

speed — m/min

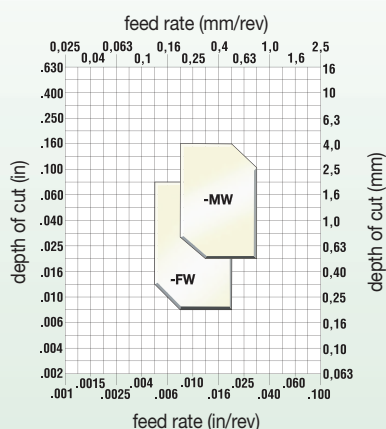
Starting Conditions

material group	grade	105	135	165	195	225	255	285	315	345	m/min
P6	WP15CT										180
	WP25CT										150
	WP35CT										105
	WS10PT										150

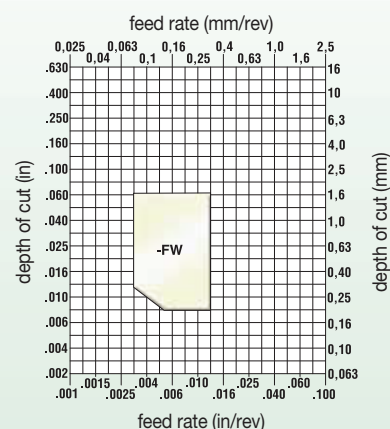
■ Step 1 • Select the insert geometry







**Negative Wiper Inserts**



**Positive Wiper Inserts**

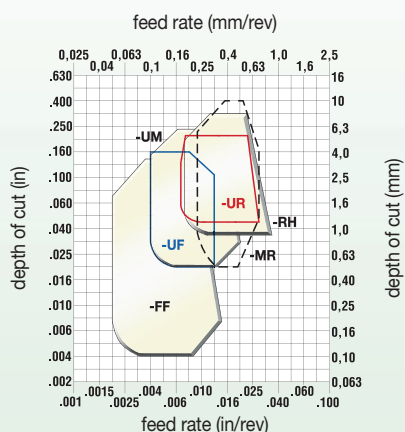
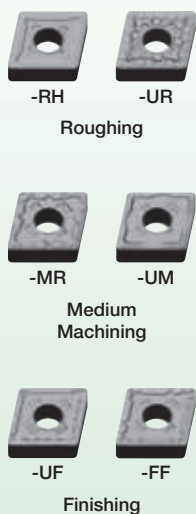


■ Step 2 • Select the grade

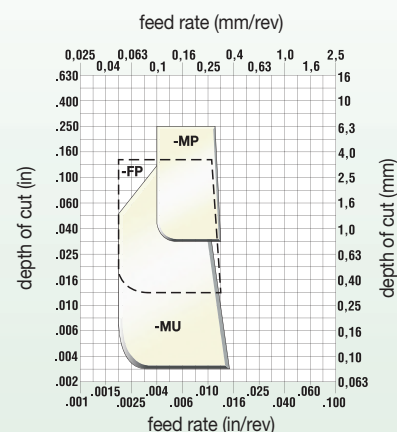
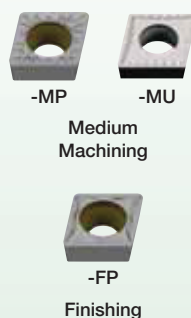
cutting condition		Negative Insert Geometry		Positive Insert Geometry
		-FW	-MW	-FW
heavily interrupted cut		WM15CT	WM15CT	WM15CT
lightly interrupted cut		WM15CT	WM25CT	WM15CT
varying depth of cut, casting, or forging skin		WM15CT	WM25CT	WM15CT
smooth cut, pre-turned surface		WM15CT	WM25CT	WM15CT

■ Step 1 • Select the insert geometry

**Negative Inserts**







**Positive Inserts**







(continued)

## ■ Step 2 • Select the grade *(continued)*

cutting condition		Negative Insert Geometry					
		-FF	-UF	-MR	-UM	-RH	-UR
heavily interrupted cut		WS10PT	WM15CT	WM35CT	WM35CT	-	WM35CT
lightly interrupted cut		WS10PT	WM15CT	WM25CT	WM25CT	WM35CT	WM35CT/ WM25CT
varying depth of cut, casting, or forging skin		WM15CT	WM15CT/ WS10PT	WM15CT	WM15CT	WM35CT	WM25CT
smooth cut, pre-turned surface		WM15CT	WM15CT	WM15CT	WM15CT	-	WM15CT

cutting condition		Positive Insert Geometry		
		-FP	-MU	-MP
heavily interrupted cut		WM25CT	WM35CT/ WS25PT	WM25CT
lightly interrupted cut		WM25CT	WM25CT/ WS10PT	WM25CT
varying depth of cut, casting, or forging skin		WM25CT/ WM15CT	WM25CT	WM25CT/ WM15CT
smooth cut, pre-turned surface		WM15CT	WM25CT	WM15CT

## ■ Step 3 • Select the cutting speed

### Austenitic Stainless Steel

speed — m/min

 Starting Conditions 

material group	grade	90	135	180	225	270	315	200	360	405	450	m/min
M1	WM15CT											180
	WM25CT											150
	WM35CT											120
	WS10PT											215
	WS25PT											180

### Austenitic Stainless Steel

speed — m/min

 Starting Conditions 

material group	grade	90	135	180	225	270	315	200	360	405	450	m/min
M2	WM15CT											165
	WM25CT											140
	WM35CT											105
	WS10PT											200
	WS25PT											165

### Austenitic Stainless Steel: Duplex (Ferritic and Austenitic Mixture)

speed — m/min

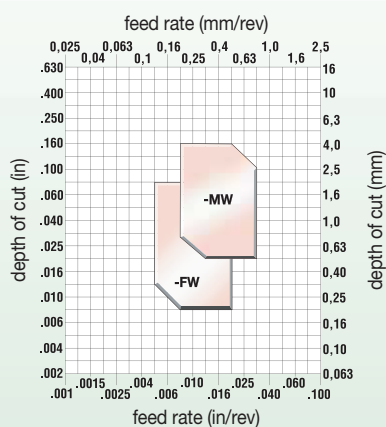
 Starting Conditions 

material group	grade	90	135	180	225	270	315	200	360	405	450	m/min
M3	WM15CT											150
	WM25CT											120
	WM35CT											90
	WS10PT											185
	WS25PT											150

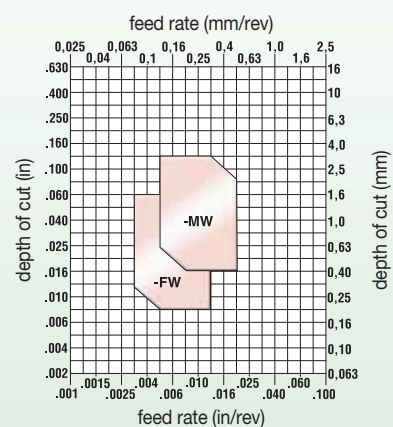
■ Step 1 • Select the insert geometry







**Negative Wiper Inserts**



**Positive Wiper Inserts**

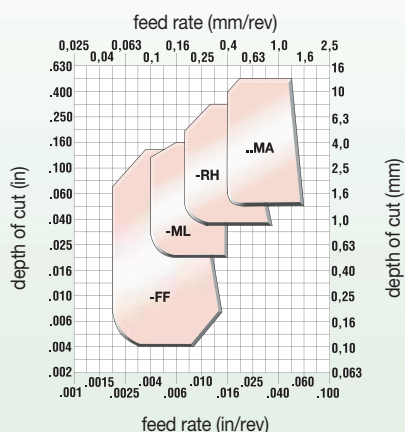


■ Step 2 • Select the grade

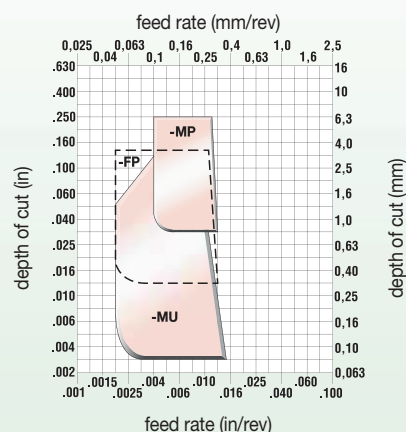
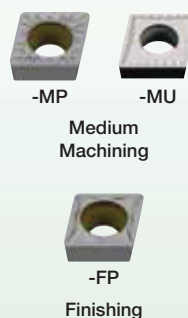
cutting condition		Negative Insert Geometry		Positive Insert Geometry	
		-FW	-MW	-FW	-MW
heavily interrupted cut		-	-	-	-
lightly interrupted cut		WK05CT	WK05CT	WK05CT	WK05CT
varying depth of cut, casting, or forging skin		WK05CT	WK05CT	WK05CT	WK05CT
smooth cut, pre-turned surface		WK05CT	WK05CT	WK05CT	WK05CT

■ Step 1 • Select the insert geometry

**Negative Inserts**







**Positive Inserts**



(continued)

**Step 2 • Select the grade** *(continued)*

cutting condition		Negative Insert Geometry				Positive Insert Geometry		
		-FF	-ML	-UR	..MA	-FP	-MU	-MP
heavily interrupted cut		WK20CT	WK20CT	WK20CT	WK20CT	WK20CT	WK20CT	WK20CT
lightly interrupted cut		WK20CT	WK20CT	WK20CT	WK20CT	WK20CT	WK20CT	WK20CT
varying depth of cut, casting, or forging skin		WK20CT	WK05CT	WK20CT	WK05CT	WK20CT	WK20CT	WK20CT
smooth cut, pre-turned surface		WK20CT	WK05CT	WS10PT	WK05CT	WK20CT	WK20CT/ WK05CT/ WS10PT	WK20CT

**Step 3 • Select the cutting speed**
**Grey Cast Iron**


speed – m/min

 Starting Conditions 

material group	grade	60	180	305	430	550	675	800	920	1040	1160	m/min
<b>K1</b>	WK05CT											450
	WK20CT											300

**Ductile, Compacted Graphite, and Malleable Cast Irons**  
 (<600 MPa tensile strength)


speed – m/min

 Starting Conditions 

material group	grade	90	135	180	225	275	320	360	410	460	500	m/min
<b>K2</b>	WS10PT											200
	WK05CT											360
	WK20CT											240

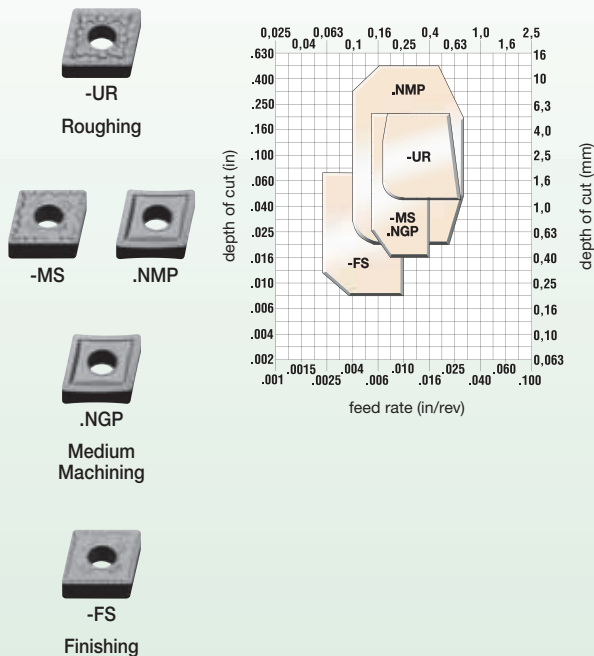
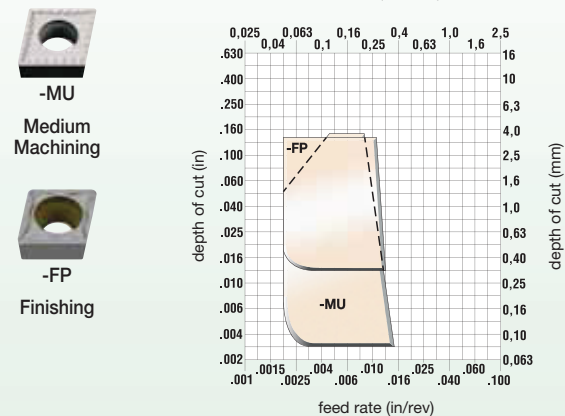
**Ductile, Malleable, and Austempered Cast Irons**  
 (>600 MPa tensile strength)

speed – m/min

 Starting Conditions 

material group	grade	90	135	180	225	275	320	360	410	460	500	m/min
<b>K3</b>	WS10PT											150
	WK05CT											240
	WK20CT											210

**■ Step 1 • Select the insert geometry**






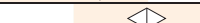
**Negative Inserts**

**Positive Inserts**

**■ Step 2 • Select the grade**

cutting condition		Negative Insert Geometry				Positive Insert Geometry	
		-FS	-NGP/-NMP	-MS	-UR	-FP	-MU
heavily interrupted cut		WS25PT	WS25PT	WS25PT	WS25PT/ WM35CT	WS25PT/ WM15CT	WS25PT
lightly interrupted cut		WS10PT	WS10PT	WS25PT	WS25PT/ WM25CT	WS25PT	WS25PT
varying depth of cut, casting, or forging skin		WS10PT	WS10PT	WS10PT	WS25PT	WS10PT	WS10PT
smooth cut, pre-turned surface		WS10PT/ WU10HT	WS10PT/ WU10HT	WS10PT	WS10PT	WS10PT	WS10PT






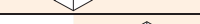
(continued)









**■ Step 3 • Select the cutting speed** *(continued)*
**Iron-Based, Heat-Resistant Alloys**  
 (135–320 HB) (≤34 HRC)

material group	grade	speed — m/min										Starting Conditions 
		15	45	75	105	140	170	200	230	290	310	m/min
S1	WU10HT											30
	WS10PT											55
	WS25PT											40
	WM15CT											55
	WM25CT/WM35CT											40





**Cobalt-Based, Heat-Resistant Alloys (150–425 HB) (≤45 HRC)**

material group	grade	speed — m/min										Starting Conditions 
		15	45	75	105	140	170	200	230	290	310	m/min
S2	WU10HT											35
	WS10PT											60
	WS25PT											30
	WM15CT											60
	WM25CT/WM35CT											30

**Nickel-Based, Heat-Resistant Alloys**  
 (140–475 HB) (≤48 HRC)

material group	grade	speed — m/min										Starting Conditions 
		15	45	75	105	140	170	200	230	290	310	m/min
S3	WU10HT											40
	WS10PT											70
	WS25PT											40
	WM15CT											70
	WM25CT/WM35CT											40

**Titanium and Titanium Alloys (110–450 HB) (≤48 HRC)**

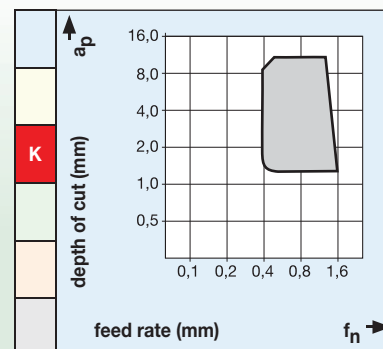
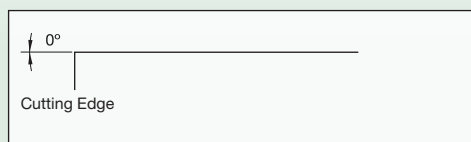
material group	grade	speed — m/min										Starting Conditions 
		15	45	75	105	140	170	200	230	290	310	m/min
S4	WU10HT											45
	WM15CT											70
	WM25CT/WM35CT											55

## ■ Negative Inserts

### ..MA



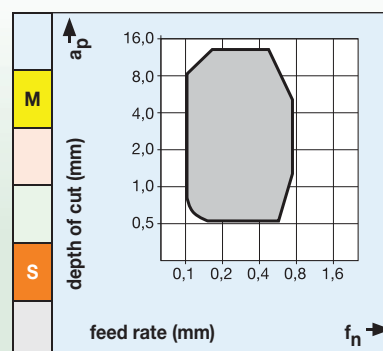
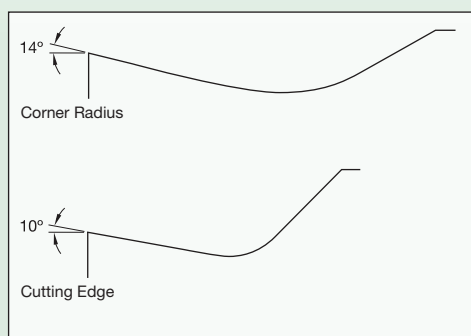
Flat top geometry for machining cast iron. For finishing to roughing applications.



### .NMP



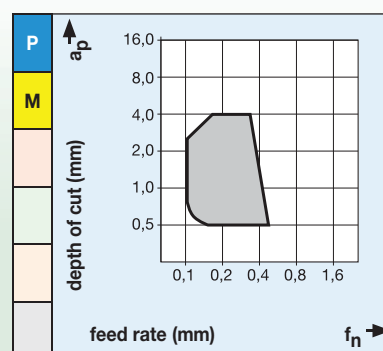
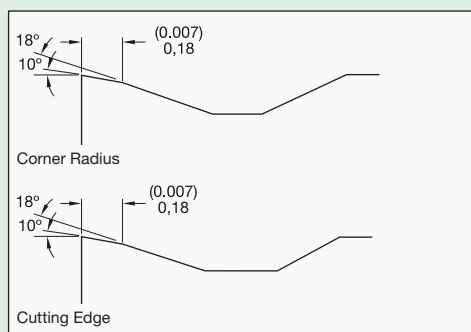
For medium-duty machining of tough work materials, such as chrome- and nickel-based alloys. Minimises tendency for materials to adhere to insert.



### 4



Semi-finishing geometry for light- to medium-duty steel machining. Reduced back forces result from adjusted inclination angle. Well-suited for positive, vibration-prone parts.

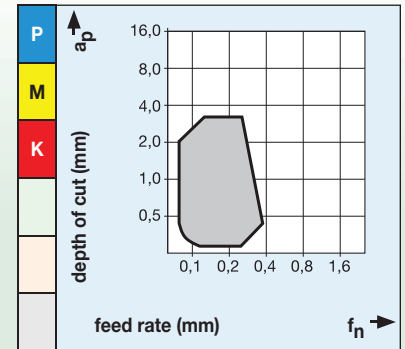
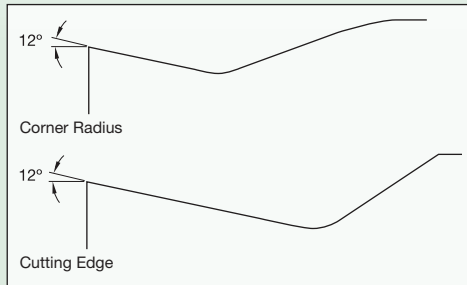


(continued)

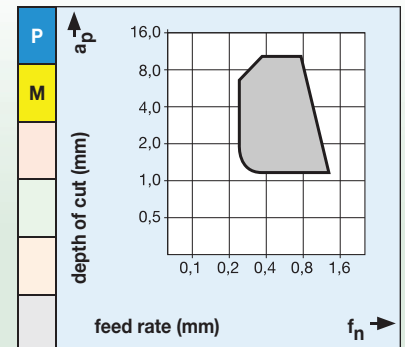
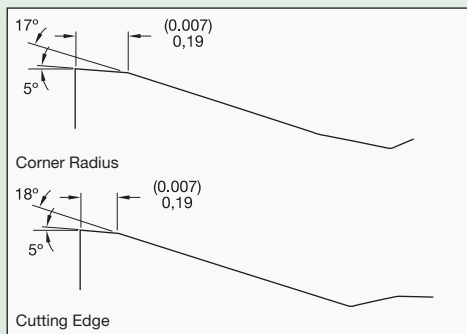
## Negative Inserts *(continued)*

**22**

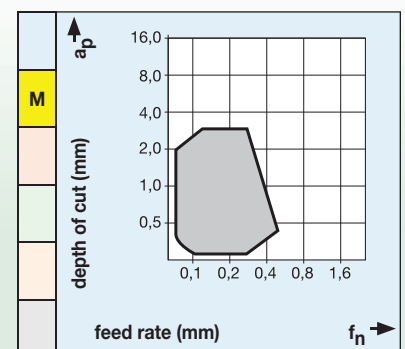
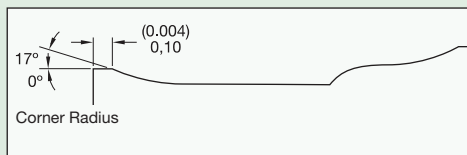

For finish turning, producing smooth, accurate surfaces. Very good chip control, especially at low depths of cut.


**65**


Rough-turning geometry with chip control extending to the medium-duty range. Positive rake angle lowers cutting forces, reducing power requirements. Used on low-tensile and stainless steels.


**CT**


Designed for outward copy turning. Where other geometries produce long chips, the unique distribution of the cut results in good chip control.

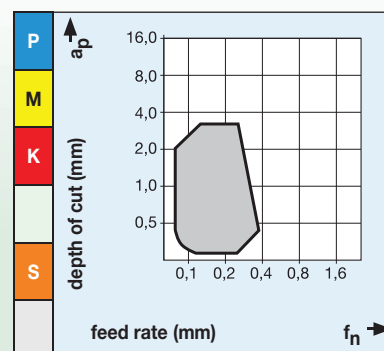
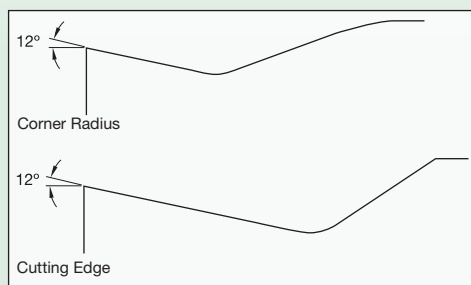

*(continued)*

■ **Negative Inserts** *(continued)*

**FF**



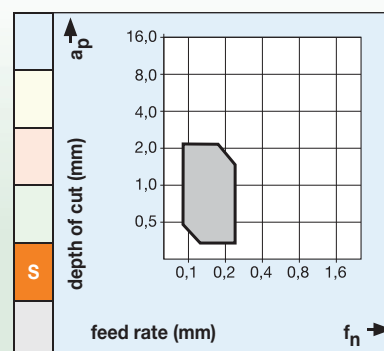
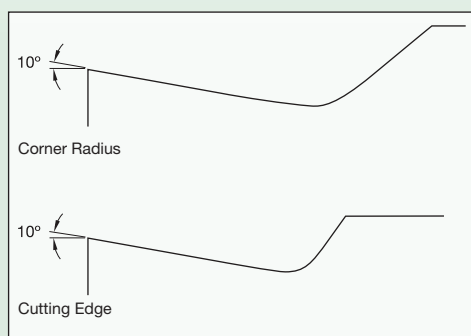
For finish turning, producing smooth, accurate surfaces.  
Very good chip control, especially at low depths of cut.



**FS**



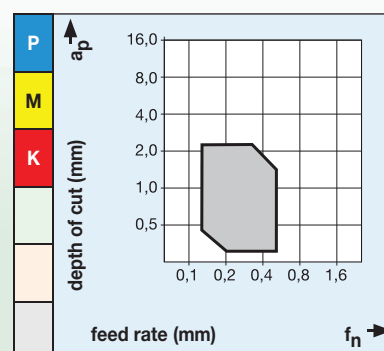
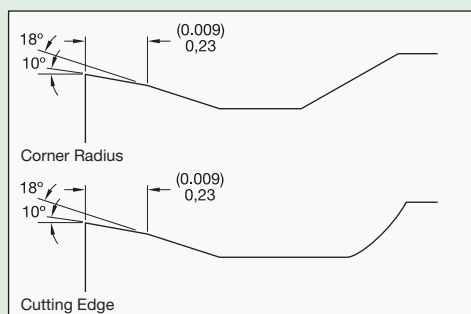
For finishing applications. Ground periphery with positive cutting edge ideally suited for high-temp alloys. Micro finished edge on the ground periphery adds just a slight hone for improved edge integrity and reliability.



**FW**



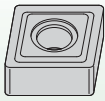
Wiper geometry for finishing when good surface finish is needed using high feed rates.  
First choice for high-performance finishing.



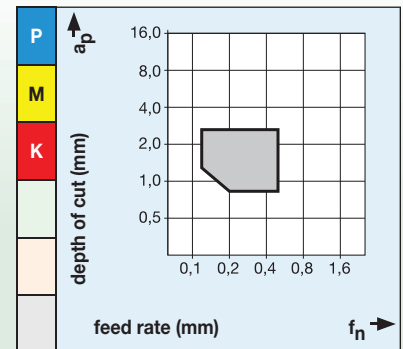
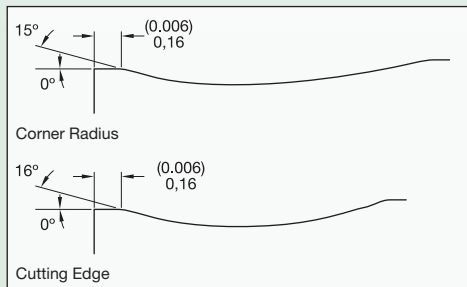
*(continued)*

## ■ Negative Inserts *(continued)*

### MG



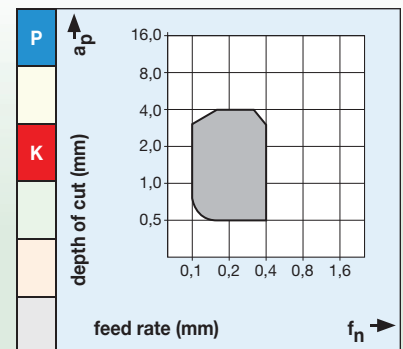
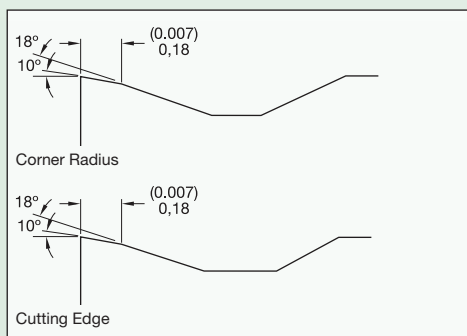
For light machining to light roughing.



### ML



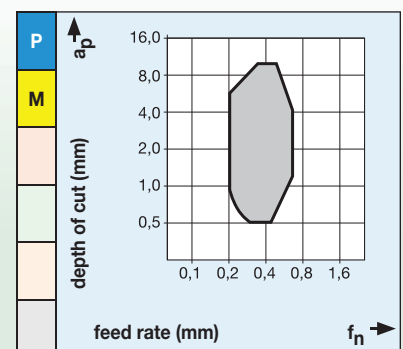
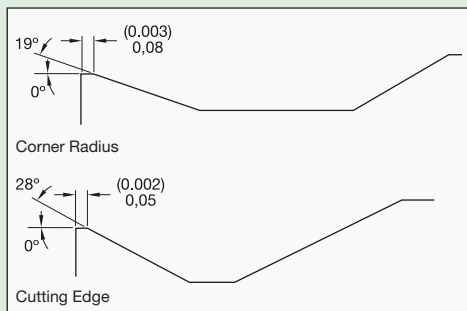
For finishing to medium machining with a negative, stable cutting edge.



### MR



For medium to light roughing of steels, difficult-to-machine high-alloy titanium, and aluminium materials. High strength to deal with heavy chip deformation.



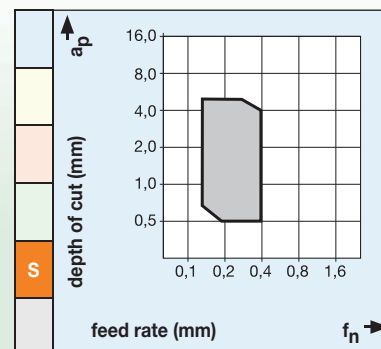
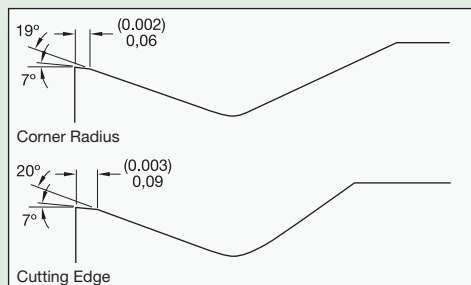
*(continued)*

## ■ Negative Inserts *(continued)*

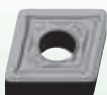
### MS



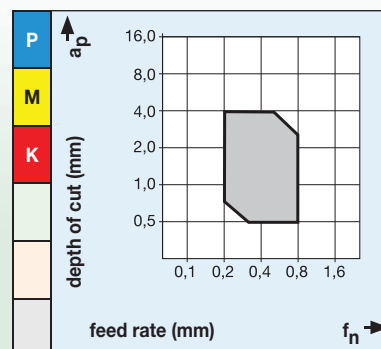
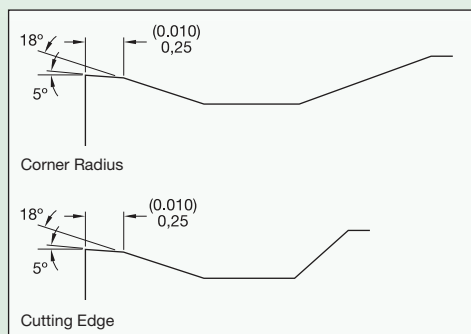
For medium machining in high-temp materials. Utilises a micro-finished edge preparation to increase edge toughness.



### MW



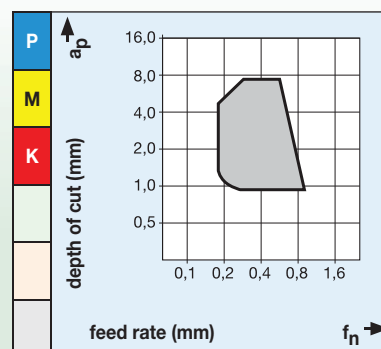
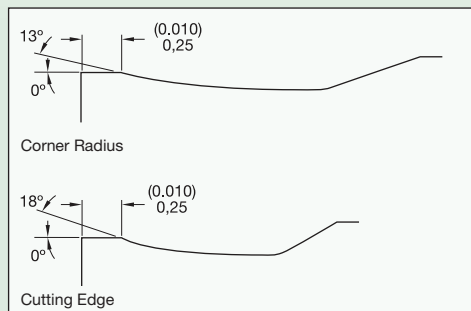
Wiper geometry for light to medium turning with high feed rates. Feed twice as high as with edges with full corner radii to produce same surface finish.



### RH



For medium-duty to roughing. Outstanding chip control. High edge strength for interrupted cuts, forging skin, or scale. Preferred for all cast iron, such as grey, malleable, and nodular.



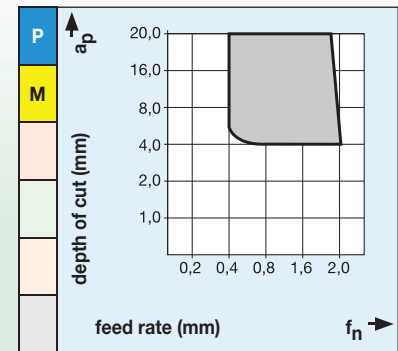
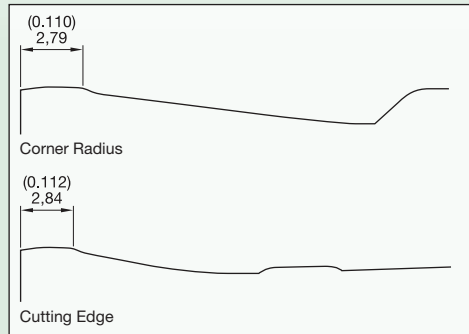
*(continued)*

## ■ Negative Inserts *(continued)*

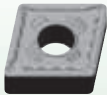
### SR



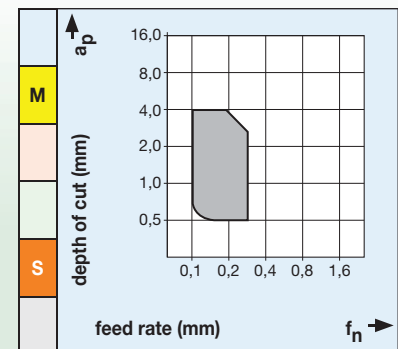
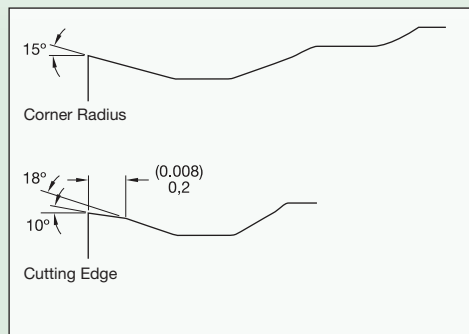
A super roughing geometry. The SR has a strong cutting edge to support high cutting loads in roughing applications. Can produce high metal removal rates.



### UF



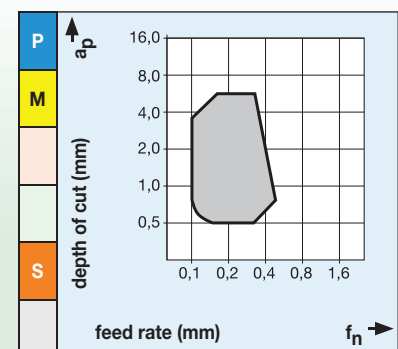
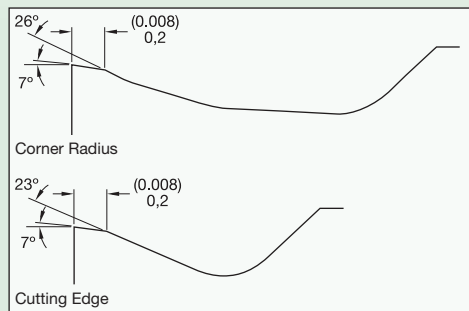
For finishing with a positive cutting edge for reduced cutting forces and superior surface quality.



### UM



For medium-duty turning operations. Soft-cutting chipbreaker. Used in applications producing varying chip sections, such as profile or copy turning. Good dimensional accuracy. For soft steel materials and stainless steels.



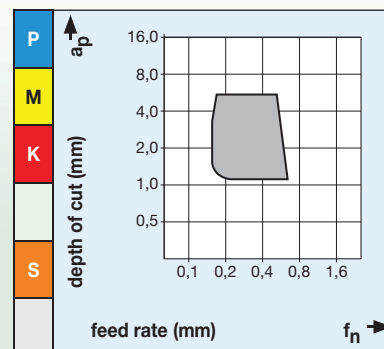
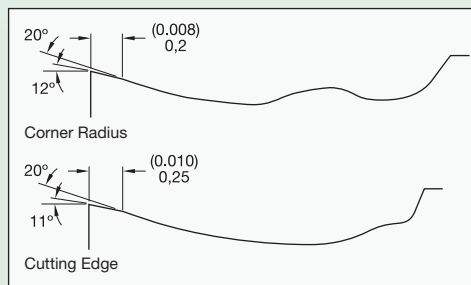
*(continued)*

## Negative Inserts (continued)

### UR



Roughing geometry with smooth chip forming and improved coolant flow for increased tool life. Positive geometry reduces cutting forces and improves depth-of-cut notching resistance. Ideally suitable for stainless steel applications and for smooth machining of steel.

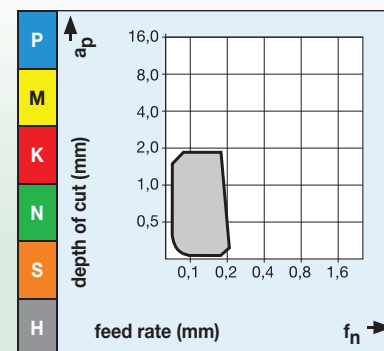
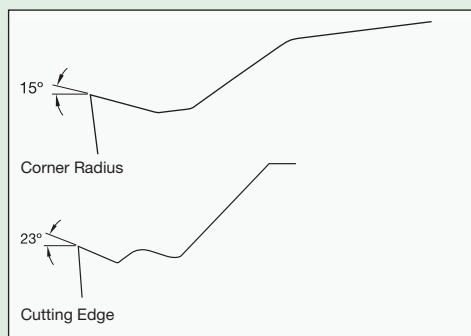


## Positive Inserts

### 2



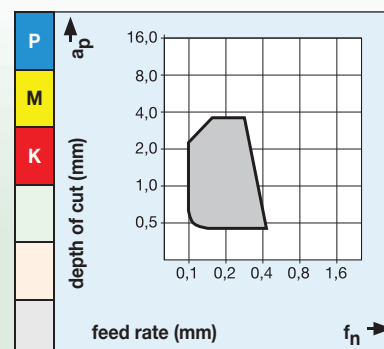
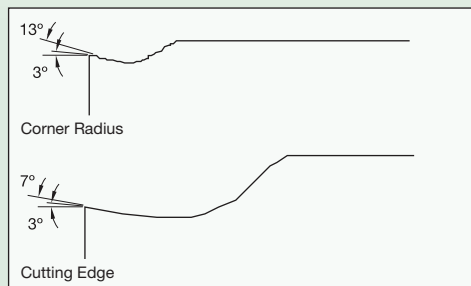
Sharp edge for finish machining. Good chip control with very small chip sections. High dimensional accuracy and smooth surface finishes. Inserts with .008" corner radius precision-ground on all sides.



### 41



Preferred for light- to medium-duty machining. Low cutting forces and reduced power requirements due to positive rake angle. Good chip control over a wide range. Also used on short-chipping cast iron.



(continued)

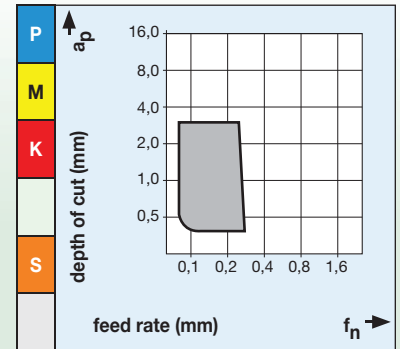
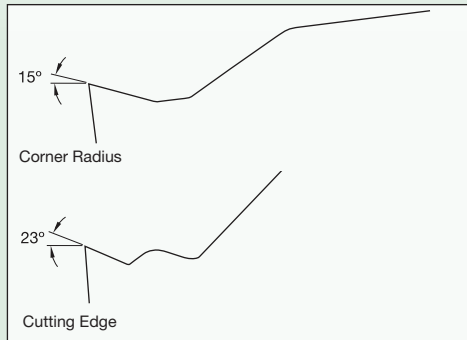


## ■ Positive Inserts (continued)

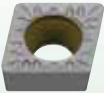
### FP



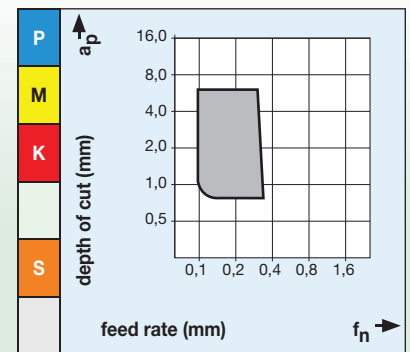
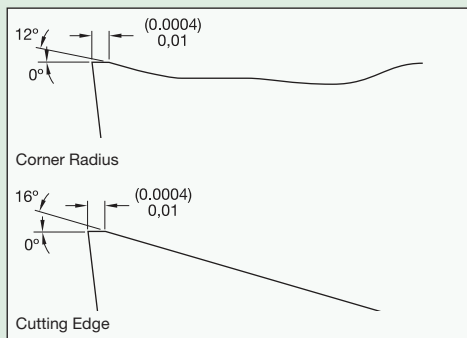
For finishing to medium turning operations with optimal chip control over a wide range of cutting conditions and workpiece materials.



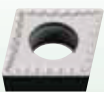
### MP



For medium to rough turning with reduced cutting forces and improved chip control for high feed rates. Suitable for high metal removal rates and spindling applications.



### MU



A medium universal geometry with a soft cutting action due to its positive geometry. Has a versatile application range and is suited for turning unstable components and for boring applications.

