S A N I C O M

A

N

I

C

O

M

INDUSTRIAL TOOLS
METAL CUTTING

SAN / 08

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING

Chapter		Page
CONTENTS		2
ISO Designation of the inserts		3
SANICOM Grade Designation System		4
Turning Grade Overview		5
Turning Technical Data		6-7
Negative inserts		
	CN...	8
	DN...	9
	KN…	10
	SN...	10
	TN...	11
	VN...	12
	WN...	13
Positive inserts		
	CC...	14-15
	DC...	16-17
	EC...	18
	EP...	18
	RC...	19
	SC...	20
	SP…	20
	TC...	21
	TP…	22
	VB...	22
	VC...	18
	WC...	23
Milling Grade Overview		25
Milling Technical Data		
Milling inserts		
	ADKT..., APET..., APKT...	26
	RDLT..., RDLW..., RPGT...	26
	RPMT..., RPMW...	26
	SDMT..., SDHT..., SPHT...	27
	SEKT..., SEKN..., SEKR...	27
	SPKN..., SPKR...	27
	TPKN..., TPKR...	27

ISO DESIGNATION OF THE INSERTS
ISO BEZEICHNUNG DER PLATTEN
DESIGNATION ISO DES PLAQUETTES
ISO CODERING VAN DE PLATTEN

1	2	3	4	5	6	7	8	9	10
Insert shape Forme de la plaquette WSP Form Plaatvorm	Normal clearance Dépouille normale Freiwinkel Vrijloophoek	Tolerance class Classe de tolérance Toleranzklasse Tolerantieklasse	Fixing and geometry Brise-copeaux et fixation Befestigung-Geometrie Bevestiging-Uitvoering	Insert size Grandeur de la plaquette Größe der Platte Snijkantslengte	Insert thickness Epaisseur de la plaquette Plattendicke Dikte van de plaat	Insert corner Pointe de coupe Schneidenecke Radius	Cutting edge Traitement d'arête Schneide Snijkant	Cutting direction Direction de coupe Schneidrichtung Snijrichting	
C	N	M	G	12	04	08	CNMG 120408		

Manufacturer's optional symbol consisting of maximum three characters (numbers or letters) shall be separated from the standardised designation by a dash (-).
Symbole facultatif propre au fabricant, formé par une ou deux positions (chiffres ou lettres) . Doit être séparé de la désignation normalisée par un tiret (-).
Ein- oder zweistelliges freigestelltes Symbol (Ziffern oder Buchstaben) nach Wahl des Fabrikanten. Muß von den vorangehenden Symbolen durch einen Bindestrich (-) getrennt sein.
Een of twee vrije symbolen (cijfers of letters) naar keuze van de fabrikant, moet van het voorgaande symbool door een streep (-) gescheiden zijn.

Symb. = O

For other clearances requiring special specification

Pour autres dépouilles nécessitant une spécification

Fur andere Freiwinkel, die genaue Angaben erfordern

Afwijkende vrijloophoek als aangeven.

Tol. [mm]

d	m	s
±0.025	±0.005	±0.025 A 1)
±0.013	±0.005	±0.025 F 1)
±0.025	±0.013	±0.025 C 1)
±0.013	±0.013	±0.025 H
±0.025	±0.025	±0.025 E
±0.025	±0.025	±0.013 G
d≥±0.05 & ≤0.15 2)	±0.005	±0.025 J 1)
d≥±0.05 & ≤0.15 2)	±0.013	±0.025 K 1)
d≥±0.05 & ≤0.15 2)	±0.025	±0.025 L 1)
d≥±0.05 & ≤0.15 2)	d≥±0.08 & ≤0.20 2)	±0.13 M
d≥±0.05 & ≤0.15 2)	d≥±0.08 & ≤0.20 2)	±0.025 N
d≥±0.08 & ≤0.25 2)	d≥±0.12 & ≤0.38 2)	±0.135 U

1) Inserts with ground minor cutting edges
Plaquettes à arêtes de planage rectifiées
Platten mit geschliffenen Planfasen
Platen met geslepen fase
2) Dependent upon insert size
Selon grandeur de la plaquette
Je nach Plattengrosse
Afhankelijk van de plaatgroottte

Special execution
Exécution spéciale
Spezialausführung
Speciale uitvoering

Values given in mm.
Disregard any decimals. When the resulting symbol has only one digit, it shall be preceded by 0
(e.g 09 for 9,52 mm)
Indication des valeurs en mm.
Valeurs données sans décimals. Lorsque le symbole qui en résulte n'a qu'un seul chiffre, il sera précédé d'un 0.
(Ex. 09 pour 9,52 mm)
Die Werte sind in mm angegeben.
Ziffer hinter dem Komma unberücksichtigt. Bei einer einstelligen Kennzahl wird eine Null vorangesetzt.
(Beisp. 09 für 9,52 mm)
De afmetingen zijn in mm aangegeven.
Cijfers achter de komma worden niet aangegeven

s = 1,59 Symb. : 01
s = 1,98 Symb. : T1
s = 3,18 Symb. : 03
s = 3,97 Symb. : T3

a) Rounded corners
a) Plaquettes avec arrondis de pointe
a) Abgerundete Schneidecken
a) Radius snijkantshoek

r in,en (1/10) mm

b) Round inserts
b) Plaquettes rondes
b) Runde Platten
b) Ronde platen

Symbols: 00 for inserts with inch diameters given in mm.
MO for inserts with metric diameters.

Symboles: 00 pour diamètres converts d'une valeur en inch
MO pour diamètres métriques.

Symbole: 00 für Durchmesser mit mit Zollmaßen in mm umgerechnet.
M0 für Durchmesser in metrischen Maßen.

Symbool: 00 voor diameters met inch maten, in mm omgerekend.
M0 voor diameters in metrische maten

	1	2
A=	45°	3°
D=	60°	5°
E=	75°	7°
F=	85°	15°
P=	90°	20°
Z=	x	25°
		30°
		0°
		11°
		x

x other angle
autre angle
anderer Winkel
afwijkende hoek

Sharp edge
Arête vive
Scharf
Scherp

Rounded edge
Abgerundete Arêtes arrondies Schneidkanten.
Kantverrond

Camfered edge
Arêtes canfreinées
Gefaste Schneide
Met fase

Camfered and rounded edge.
Arêtes canfreinées et arrondies.
Gefaste und abgerundete Schneide.
Met fase en kantverronding.

Optional symbols - symboles facultatifs
Symbol freigestellt - facultatief symbool

Example * Exemple
Beispiel * Voorbeeld

Right hand cutting
Coupe à droite
Rechtsschneidend
Rechtssnijdend

Left hand cutting
Coupe à gauche
Linkssschneidend
Linkssnijdend

Right and left hand cutting.
Coupe à droite et à gauche.
Rechts und links schneidend.
Rechts en linkssnijdend

INDUSTRIAL TOOLS

Metal Cutting

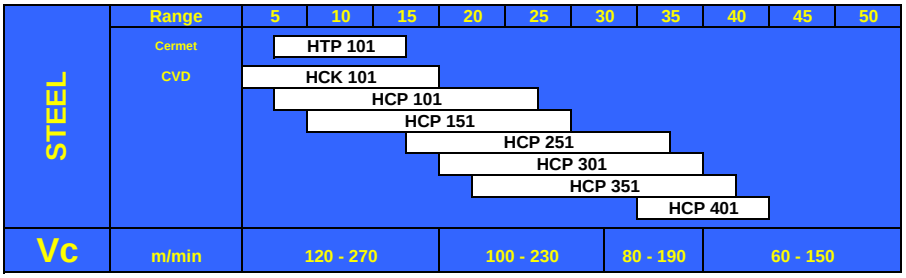
SANICOM Grade System

Example	**HC P 25 1 0..** 1 2 3 4 5		
1-	**Cutting material:**	**H = Tungsten Carbide**	**HC** - Carbide coated CVD **HP** - Carbide coated PVD **HW** - Carbide uncoated **HF -** Carbide fine graduation uncoated **HT** - Cermet uncoated
		C = Ceramics	**CW** - Ceramics uncoated **CC** - Ceramics coated CVD
2-	**ISO 513 Classification:**		**P** - Grade: General for working operation in STEEL **M** - Grade: General working operation in STAINLESS STEEL **K** - Grade: General working operation in CAST IRON **N -** Grade: General working operation in NON FERROUS STEEL **S -** Grade: General working operation in HIGH TEMP: ALLOYS **H** - Grade: General working opreation in HARD MATERIAL
3-	**ISO 513 Application range:**		0 to 50 thoughness increasing **05 - 10 - 15 - 20 - 25 - 30 - 35 - 40 - 45 - 50** 50 to 0 hardness increasing
4-	**Working operation**	**Turning**	**1**
		Milling	**2**
		Grooving	**3**
		Drilling	**4**
		Threading	**5**
5-	**SANICOM intern cotation**		**0 - 1 - 11 - 12 …..**

TURNING GRADE OVERVIEW IN STEEL OPERATION

TECHNICAL GUIDE

ISO 513



Finishing

Vc increasing
Vf small
ap small
Wear resistance increasing
Toughness decreasing

Roughing

Vc decreasing
Vf large
ap large
Wear resistance decreasing
Toughness increasing

HM - GRADE		SCALE 0-10=RANGE OF TN Toughness / WR Wear resistance 2	3	4	5	6	7	8	9	10	APPLICATION Cutting condition ⭘	⬯	⌑	◇	APPLICATION Machining condition F	M	R
HTP 101	TN	■	■	■							●	○			●	○	
	WR	■	■	■	■	■	■	■	■								
HCK 101	TN	■	■		■						●	●	○		○	○	○
	WR	■	■	■	■	■	■	■									
HCP 101	TN	■	■	■	■						●	●			●	●	
	WR	■	■	■	■	■	■	■	■								
HCP 151	TN	■	■	■	■						●	●	○		●	●	
	WR	■	■	■	■	■	■										
HCP 251	TN	■	■	■	■	■					○	●	○	○	○	●	○
	WR	■	■	■	■	■											
HCP 301	TN	■	■	■	■	■	■				○	●	●	○	○	●	●
	WR	■	■	■	■	■											
HCP 351	TN	■	■	■	■	■	■	■	■		○	○	●	●	○	●	●
	WR	■	■	■	■												
HCP 401	TN	■	■	■	■	■	■	■	■				●	●		○	●
	WR	■	■	■	■												

Cutting conditions		Machining conditions		Recommendation	
⭘	Excellent; continious cutting with continious thicknes of chips	**F**	Finishing	●	Ideal
⬯	Good; continious cutting with different thickness of chips	**M**	Medium machining	○	Stil recommended
⌑	Fair; lichty interrupted cutting	**R**	Roughing	–	Not recommended
◇	Difficult; heavy interrupted cutting				

TURNING CHIPBREAKERS OVERVIEW IN STEEL
OPERATION

STEEL

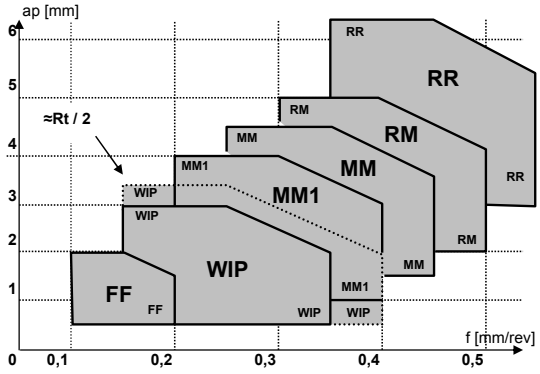
NEGATIVE INSERTS

	OPERATION					
	FINE FINISHING	FINISHING / SEMIFINISHING	SEMIFINISHING	MEDIUM	ROUGHING	HEAVY ROUGHING
CHIPBREAKERS	FF	WIP	MM1	MM	RM	RR

	FF	WIP	MM1	MM	RM	RR	
$ap_{min}=r\varepsilon \times \ldots$	0,75	0,75	1,20	1,25	2,00	3,10	[mm]
$ap_{max}=l \times \ldots$	0,20	0,27	0,30	0,33	0,40	0,50	[mm]
$f_{min}=r\varepsilon \times \ldots$	0,15	0,18	0,28	0,28	0,40	0,38	[mm]
$f_{max}=r\varepsilon \times \ldots$	0,30	0,45	0,50	0,52	0,65	0,75	[mm]
$A_{max}=ap_{max} \times f_{max}$	0,70	0,70	0,70	0,70	0,75	0,80	[mm^2]

Ex: CNMG 120408-MM **for** **CK60** **/** **K_r = 95°**

ap_{min} = 0.80 × 1.25	=	1,00	[mm]	»	1.00/25.4	=	0,04	[inch]
ap_{max} = 12 × 0.33	=	3,96	[mm]	»	3.96/25.4	=	0,16	[inch]
f_{min} = 0.80 × 0.28	=	0,22	[mm]	»	0.22/25.4	=	0,01	[inch]
f_{max}= 0.80 × 0.52	=	0,44	[mm]	»	0.44/25.4	=	0,02	[inch]
A_{max}=3.96×0.44×0.75	=	1,32	[mm^2]	»	1.32/25.4^2	=	0,002	[inch^2]



STEEL

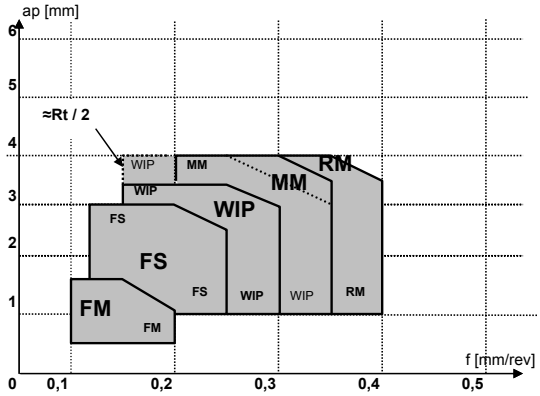
POSITIVE INSERTS

	OPERATION				
	FINE FINISHING	FINISHING / SEMIFINISHING	SEMIFINISHING	MEDIUM	ROUGHING
CHIPBREAKERS	FM	FS	WIP	MM	RM

	FM	FS	WIP	MM	RM	
$ap_{min}=r\varepsilon \times \ldots$	0,70	1,25	1,25	1,25	1,25	[mm]
$ap_{max}=l \times \ldots$	0,12	0,25	0,30	0,33	0,33	[mm]
$f_{min}=r\varepsilon \times \ldots$	0,08	0,16	0,20	0,25	0,28	[mm]
$f_{max}=r\varepsilon \times \ldots$	0,28	0,35	0,38	0,45	0,52	[mm]
$A_{max}=ap_{max} \times f_{max}$	0,65	1,00	0,75	0,75	0,75	[mm^2]

Ex: CNMG 120408-RM **for** **CK60** **/** **K_r = 95°**

ap_{min} = 0.80 × 1.25	=	1,00	[mm]	»	1.00/25.4	=	0,04	[inch]
ap_{max} = 12 × 0.33	=	3,96	[mm]	»	3.96/25.4	=	0,16	[inch]
f_{min} = 0.80 × 0.28	=	0,22	[mm]	»	0.22/25.4	=	0,01	[inch]
f_{max}= 0.80 × 0.52	=	0,44	[mm]	»	0.44/25.4	=	0,02	[inch]
A_{max}=4.00×0.42×0.75	=	1,26	[mm^2]	»	1.26/25.4^2	=	0,020	[inch^2]



General Formulas

Vc:	Cutting speed	[mm/min]	or	[inch/min]
d1:	Diameter	[mm]	or	[inch]
f:	Feed	[mm]	or	[inch]
n:	Revolutions/min	[rev./min.]		
Vf:	Feed rate	[mm/min]	or	[inch/min]
ap:	depth of cut	[mm]	or	[inch]

1inch = 25.4mm 1m/min = 3.28sfm
1 mm = 0.04inch 1 sfm = 0.305m/min

$$Vc = \frac{\Pi \times d1 \times n}{1000}$$ [mm/min] if Dc in [mm]

$$n = \frac{Vc \times 1000}{\Pi \times d1}$$ [rev./min.]

$Vf =$ f.N [mm/min] if f in [mm]

IMPORTANT:

The information you will find is based on our actual knowledge and experience. Seen the influence of some parameters by using our products, the user is not dispensed from making previous tests or verifications. No legal responsability may be associated with the characteristics or recommandations of a product for a case of application. The user has, under his own responsability, to respect all valid rights, laws and guidelines by using our products.

TURNING GRADE OVERVIEW IN STAINLESS STEEL OPERATION

TECHNICAL GUIDE

ISO 513

STAINLESS STEEL	Range	5	10	15	20	25	30	35	40	45	50
	Cermet	HTP 101									
	PVD			HPM 151							
				HPM 201							
	CVD				HCM 301						
						HCM 351					
Vc	m/min	100 - 220			80 - 180		60 - 140				

Finishing
Vc increasing
Vf small
ap small
Wear resistance increasing
Toughness decreasing

◀ ▶

Roughing
Vc decreasing
Vf large
ap large
Wear resistance decreasing
Toughness increasing

	SCALE 0-10=RANGE OF TN Toughness / WR Wear resistance									APPLICATION Cutting condition				APPLICATION Machining condition		
HM - GRADE	2	3	4	5	6	7	8	9	10	⭘	0	¤	◇	F	M	R
HTP 101 TN	■	■	■							●	○			●	○	
HTP 101 WR	■	■	■	■	■	■	■	■								
HPM 151 TN	■	■	■	■	■	■				○	●	○		●	●	
HPM 151 WR	■	■	■	■												
HPM 201 TN	■	■	■	■	■	■				●	○	○		●	○	
HPM 201 WR	■	■	■	■												
HCM 301 TN	■	■	■	■	■	■	■	■		○	○	●	●	○	○	●
HCM 301 WR	■	■	■	■	■	■										
HCM 351 TN	■	■	■	■	■	■	■	■		○	○	●	●	○	○	●
HCM 351 WR	■	■	■	■	■	■										

Cutting conditions		Machining conditions		Recommendation	
⭘	Excellent; continious cutting with continious thicknes of chips	F	Finishing	●	Ideal
0	Good; continious cutting with different thickness of chips	M	Medium machining	○	Stil recommended
¤	Fair; lichty interrupted cutting	R	Roughing	—	Not recommended
◇	Difficult; heavy interrupted cutting				

TURNING CHIPBREAKERS OVERVIEW IN STAINLESS STEEL OPERATION

STAINLESS STEEL

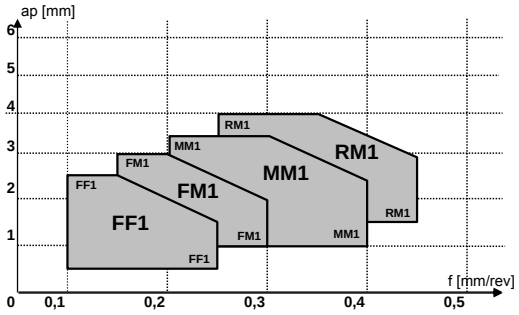
NEGATIVE INSERTS

	OPERATION			
	FINE FINISHING	FINISHING / SEMIFINISHING	MEDIUM	ROUGHING
CHIPBREAKERS	FF1	FM1	MM1	RM1

	FM1	MM1	MM1	RM1	
$ap_{min}=r\varepsilon \times \dots$	1,00	1,20	1,90	2,00	[mm]
$ap_{max}=l \times \dots$	0,24	0,35	0,31	0,31	[mm]
$f_{min}=r\varepsilon \times \dots$	0,15	0,28	0,38	0,31	[mm]
$f_{max}=r\varepsilon \times \dots$	0,30	0,50	0,58	0,58	[mm]
$A_{max}=ap_{max} \times f_{max}$	0,80	0,75	0,65	0,65	[mm^2]

Ex: CNMG 120408-MM1 **for** **304** **/** $K_r = 95°$

ap_{min} = 0.80 × 1.2	=	0,96	[mm]	»	0.96/25.4	=	0,04	[inch]
ap_{max} = 12 × 0.35	=	4,20	[mm]	»	4.20/25.4	=	0,17	[inch]
f_{min} = 0.80 × 0.28	=	0,20	[mm]	»	0.20/25.4	=	0,01	[inch]
f_{max}= 0.80 × 0.50	=	0,44	[mm]	»	0.44/25.4	=	0,02	[inch]
A_{max}=4.20×0.44×0.75	=	1,39	[mm^2]	»	$1.39/25.4^2$	=	0,002	[$inch^2$]



STAINLESS STEEL

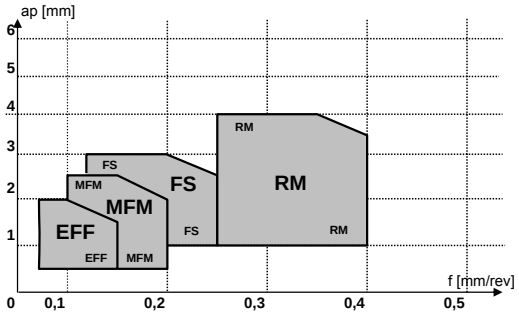
POSITIVE INSERTS

	OPERATION			
	FINE FINISHING	FINISHING / SEMIFINISHING	MEDIUM	ROUGHING
CHIPBREAKERS	EFF	MFM	FS	RM

	EFF	MFM	FS	RM	
$ap_{min}=r\varepsilon \times \dots$	0,50	0,50	1,25	1,25	[mm]
$ap_{max}=l \times \dots$	0,15	0,25	0,25	0,33	[mm]
$f_{min}=r\varepsilon \times \dots$	0,10	0,10	0,16	0,28	[mm]
$f_{max}=r\varepsilon \times \dots$	0,20	0,28	0,35	0,52	[mm]
$A_{max}=ap_{max} \times f_{max}$	0,50	0,50	1,00	0,75	[mm^2]

Ex: CNMG 120408-RM **for** **304** **/** $K_r = 95°$

ap_{min} = 0.80 × 1.25	=	1,00	[mm]	»	1.00/25.4	=	0,04	[inch]
ap_{max} = 12 × 0.33	=	4,00	[mm]	»	4.00/25.4	=	0,16	[inch]
f_{min} = 0.80 × 0.25	=	0,20	[mm]	»	0.20/25.4	=	0,01	[inch]
f_{max}= 0.80 × 0.52	=	0,42	[mm]	»	0.42/25.4	=	0,02	[inch]
A_{max}=4.00×0.42×0.75	=	1,26	[mm^2]	»	$1.26/25.4^2$	=	0,020	[$inch^2$]



General Formulas

Vc:	Cutting speed	[mm/m or	[inch/min]
d1:	Diameter	[mm] or	[inch]
f:	Feed	[mm] or	[inch]
n:	Revolutions/min	[rev./min.]	
Vf:	Feed rate	[mm/m or	[inch/min]
ap:	depth of cut	[mm] or	[inch]
1inch =	25.4mm	1m/mir 3.28sfm	
1 mm =	0.04inch	1 sfm = 0.305m/min	

$$Vc = \frac{\Pi \times d1 \times n}{1000}$$ [mm/min] if Dc in [mm]

$$n = \frac{Vc \times 1000}{\Pi \times d1}$$ [rev./min.]

$Vf =$ f.N [mm/min] if f in [mm]

TURNING GRADE OVERVIEW IN CAST IRON OPERATION

TECHNICAL GUIDE

ISO 513

CAST IRON	Range	5	10	15	20	25	30	35	40	45	50
	Uncoated	HWK 101									
			HFK 201								
	CVD	HCK 101									
		HCP 101									
			HCP 251								
Vc	m/min	100 - 270			60 - 150						

Finishing

Vc increasing
Vf small
ap small
Wear resistance increasing
Toughness decreasing

◀ ▶

Roughing

Vc decreasing
Vf large
ap large
Wear resistance decreasing
Toughness increasing

	SCALE 0-10=RANGE OF TN Toughness / WR Wear resistance									APPLICATION Cutting condition				APPLICATION Machining condition		
HM - GRADE	2	3	4	5	6	7	8	9	10	O	o	¤	◇	F	M	R
HWK 101 TN										●	○			●	○	
HWK 101 WR																
HFK 201 TN																
HFK 201 WR																
HCK 101 TN										●	●			●	●	○
HCK 101 WR																
HCP 101 TN										●	●			●	●	
HCP 101 WR																
HCP 251 TN										○	●	○	○	○	●	○
HCP 251 WR																

Cutting conditions		Machining conditions		Recommendation	
O	Excellent; continious cutting with continious thicknes of chips	F	Finishing	●	Ideal
o	Good; continious cutting with different thickness of chips	M	Medium machining	○	Stil recommended
¤	Fair; lichty interrupted cutting	R	Roughing	—	Not recommended
◇	Difficult; heavy interrupted cutting				

TURNING CHIPBREAKERS OVERVIEW IN CAST IRON OPERATION

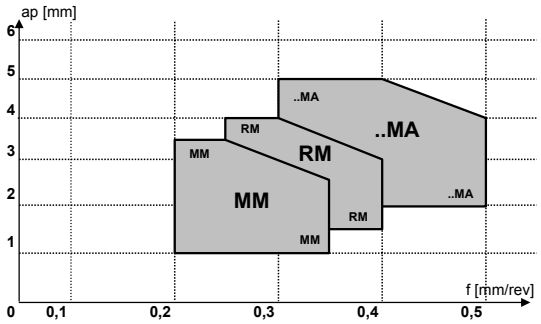
NEGATIVE INSERTS

CAST IRON

	OPERATION		
	FINISHING / SEMIFINISHING	MEDIUM	ROUGHING
CHIPBREAKERS	MM	RM	..MA

	MM	RM	..MA	
$ap_{min}=r\varepsilon \times \dots$	1,20	2,00	2,50	[mm]
$ap_{max}=l \times \dots$	0,30	0,35	0,42	[mm]
$f_{min}=r\varepsilon \times \dots$	0,28	0,32	0,37	[mm]
$f_{max}=r\varepsilon \times \dots$	0,50	0,50	0,62	[mm]
$A_{max}=ap_{max} \times f_{max}$	0,70	0,75	0,75	[mm^2]

Ex: CNMG 120408-RM		for	GG25	/	K_r = 95°			
ap_{min} = 0.80 × 2.00	=	1,60	[mm]	»	1.6/25.4	=	0,06	[inch]
ap_{max} = 12 × 0.35	=	4,20	[mm]	»	4.2/25.4	=	0,19	[inch]
f_{min} = 0.80 × 0.32	=	0,25	[mm]	»	0.25/25.4	=	0,01	[inch]
f_{max}= 0.80 × 0.50	=	0,40	[mm]	»	0.4/25.4	=	0,02	[inch]
A_{max}=4.80×0.52×0.75	=	1,74	[mm^2]	»	$1.74/25.4^2$	=	0,003	[$inch^2$]



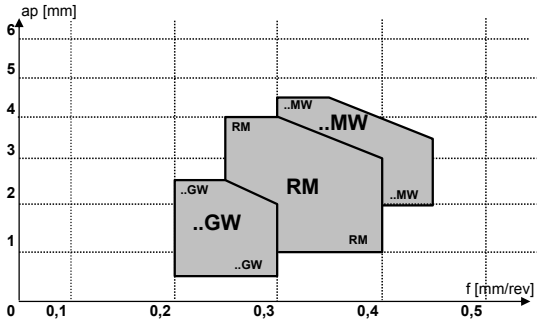
POSITIVE INSERTS

CAST IRON

	OPERATION		
	FINISHING / SEMIFINISHING	MEDIUM	ROUGHING
CHIPBREAKERS	..GW	RM	..MW

	..GW	RM	..MW	
$ap_{min}=r\varepsilon \times \dots$	2,50	1,25	2,50	[mm]
$ap_{max}=l \times \dots$	0,42	0,33	0,42	[mm]
$f_{min}=r\varepsilon \times \dots$	0,37	0,28	0,37	[mm]
$f_{max}=r\varepsilon \times \dots$	0,62	0,52	0,62	[mm]
$A_{max}=ap_{max} \times f_{max}$	0,75	0,75	0,75	[mm^2]

Ex: CNMG 120408-RM		for	GG25	/	K_r = 95°			
ap_{min} = 0.80 × 1.25	=	1,00	[mm]	»	1.00/25.4	=	0,04	[inch]
ap_{max} = 12 × 0.33	=	4,00	[mm]	»	4.00/25.4	=	0,16	[inch]
f_{min} = 0.80 × 0.28	=	0,23	[mm]	»	0.23/25.4	=	0,01	[inch]
f_{max}= 0.80 × 0.45	=	0,36	[mm]	»	0.36/25.4	=	0,01	[inch]
A_{max}=4.00×0.42×0.75	=	1,26	[mm^2]	»	$1.26/25.4^2$	=	0,020	[$inch^2$]



General Formulas

Vc:	Cutting speed	[mm/m or	[inch/min]
d1:	Diameter	[mm] or	[inch]
f:	Feed	[mm] or	[inch]
n:	Revolutions/min	[rev./min.]	
Vf:	Feed rate	[mm/m or	[inch/min]
ap:	depth of cut	[mm] or	[inch]
1inch =	25.4mm	1m/mir 3.28sfm	
1 mm =	0.04inch	1 sfm = 0.305m/min	

$$Vc = \frac{\Pi \times d1 \times n}{1000}$$ [mm/min] if Dc in [mm]

$$n = \frac{Vc \times 1000}{\Pi \times d1}$$ [rev./min.]

$Vf =$ f.N [mm/min] if f in [mm]

IMPORTANT:

The information you will find is based on our actual knowledge and experience. Seen the influence of some parameters by using our products, the user is not dispensed from making previous tests or verifications. No legal responsability may be associated with the characteristics or recommandations of a product for a case of application. The user has, under his own responsability, to respect all valid rights, laws and guidelines by using our products.

TURNING GRADE OVERVIEW IN NON-FERROUS OPERATION

TECHNICAL GUIDE

ISO 513

	Range	5	10	15	20	25	30	35	40	45	50
NON FERROUS	Uncoated	HWK 101									
				HWK 201							
					HFK 201						
Vc	m/min	200 - 600			150 - 400						

Finishing ◀ ▶ **Roughing**

Vc increasing — **Vc decreasing**
Vf small — **Vf large**
ap small — **ap large**
Wear resistance increasing — **Wear resistance decreasing**
Toughness decreasing — **Toughness increasing**

	SCALE 0-10=RANGE OF TN Toughness / WR Wear resistance									APPLICATION Cutting condition				APPLICATION Machining condition		
HM - GRADE	2	3	4	5	6	7	8	9	10	O	O	¤	◇	F	M	R
HWK 101 TN	■	■	■	■						●	○			●	○	
HWK 101 WR	■	■	■	■	■	■	■	■								
HWK 201 TN	■	■	■	■	■	■	■				●	●			●	
HWK 201 WR	■	■	■	■	■	■	■									
HFK 201 TN																
HFK 201 WR																

Cutting conditions		Machining conditions		Recommendation	
O	Excellent; continious cutting with continious thicknes of chips	F	Finishing	●	Ideal
O	Good; continious cutting with different thickness of chips	M	Medium machining	○	Stil recommended
¤	Fair; lichty interrupted cutting	R	Roughing	—	Not recommended
◇	Difficult; heavy interrupted cutting				

TURNING CHIPBREAKERS OVERVIEW IN NON-FERROUS OPERATION

NON-FERROUS

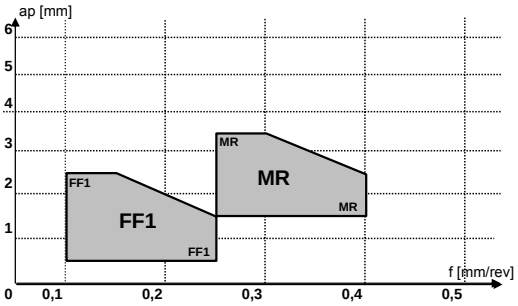
NEGATIVE INSERTS

	OPERATION	
	FINISHING / SEMIFINISHING	MEDIUM / ROUGHING
CHIPBREAKERS	FF1	MR

	FF1	MR	
$ap_{min}=r\varepsilon \times \dots$	0,60	1,90	[mm]
$ap_{max}=l \times \dots$	0,21	0,31	[mm]
$f_{min}=r\varepsilon \times \dots$	0,13	0,38	[mm]
$f_{max}=r\varepsilon \times \dots$	0,31	0,58	[mm]
$A_{max}=ap_{max} \times f_{max}$	0,65	0,65	[mm²]

Ex: CNMG 120408-MR **for** **AlMg1** $K_r = 95°$

ap_{min} = 0.80 × 1.90	=	1,50	[mm]	»	1.50/25.4	=	0,07	[inch]
ap_{max} = 12 × 0.31	=	3,70	[mm]	»	3.70/25.4	=	0,15	[inch]
f_{min} = 0.80 × 0.38	=	0,30	[mm]	»	0.30/25.4	=	0,01	[inch]
f_{max}= 0.80 × 0.58	=	0,46	[mm]	»	0.46/25.4	=	0,02	[inch]
A_{max}=3.70×0.46×0.65	=	1,10	[mm²]	»	1.10/25.4²	=	0,002	[inch²]



NON-FERROUS

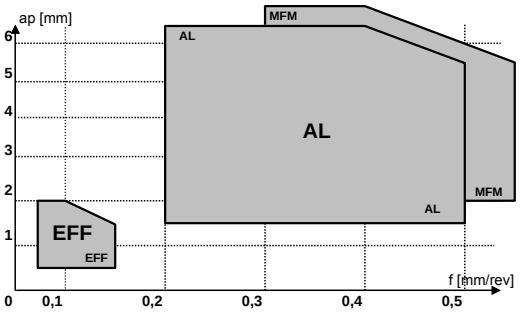
POSITIVE INSERTS

	OPERATION		
	FINISHING	SEMIFINISHING / MEDIUM	ROUGHING
CHIPBREAKERS	EFF	AL	MFM

	EFF	AL	MFM	
$ap_{min}=r\varepsilon \times \dots$	0,50	1,90	2,50	[mm]
$ap_{max}=l \times \dots$	0,15	0,55	0,63	[mm]
$f_{min}=r\varepsilon \times \dots$	0,10	0,25	0,37	[mm]
$f_{max}=r\varepsilon \times \dots$	0,20	0,63	0,75	[mm]
$A_{max}=ap_{max} \times f_{max}$	0,50	0,80	0,80	[mm²]

Ex: CCGT 120408-AL **for** **AlMg1** $K_r = 95°$

ap_{min} = 0.80 × 2.50	=	2,00	[mm]	»	2.0/25.4	=	0,08	[inch]
ap_{max} = 12 × 0.55	=	6,60	[mm]	»	6.60/25.4	=	0,26	[inch]
f_{min} = 0.80 × 0.25	=	0,20	[mm]	»	0.20/25.4	=	0,08	[inch]
f_{max}= 0.80 × 0.63	=	0,50	[mm]	»	0.50/25.4	=	0,02	[inch]
A_{max}=7×0.5×0.8	=	2,80	[mm²]	»	2.80/25.4²	=	0,004	[inch²]



General Formulas

Vc:	Cutting speed	[mm/m or	[inch/min]
d1:	Diameter	[mm] or	[inch]
f:	Feed	[mm] or	[inch]
n:	Revolutions/min	[rev./min.]	
Vf:	Feed rate	[mm/m or	[inch/min]
ap:	depth of cut	[mm] or	[inch]
1inch =	25.4mm	1m/mir 3.28sfm	
1 mm =	0.04inch	1 sfm = 0.305m/min	

$$Vc = \frac{\Pi \times d1 \times n}{1000}$$ [mm/min] if Dc in [mm]

$$n = \frac{Vc \times 1000}{\Pi \times d1}$$ [rev./min.]

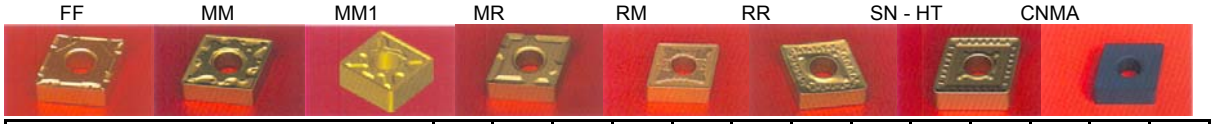
$Vf =$ f.N [mm/min] if f in [mm]

IMPORTANT:

The information you will find is based on our actual knowledge and experience. Seen the influence of some parameters by using our products, the user is not dispensed from making previous tests or verifications. No legal responsability may be associated with the characteristics or recommandations of a product for a case of application. The user has, under his own responsability, to respect all valid rights, laws and guidelines by using our products.

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION



NEGATIVE INSERTS CN ...			HWK 101	HFK 201	HCM 301	HCM 351	HPM 201	HCK 101	HCP 101	HCP 151	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451
FINISHING	0,1	CNGP 120401 FF1					•								
	0,2	CNGP 120402 FF1					•								
	0,2	CNGP 120402FN FF1		•											
	0,4	CNGP 120404 FF1					•								
	0,4	CNGP 120404FN FF1	•	•											
	0,8	CNGP 120408 FF1					•								
	0,8	CNGP 120408FN FF1	•	•											
	0,4	CNMG 120404 FF									•				
	0,8	CNMG 120408 FF									•				
	1,2	CNMG 120412 FF									•				
	0,4	CNMG 120404 FM1			•	•									
	0,8	CNMG 120408 FM1			•	•									
WIPER	0,4	CNMX 120404 WIP						•	•	•					
	0,8	CNMX 120408 WIP						•	•	•					
MEDIUM SOLICITATION	0,4	CNMG 090304 MM									•	•			
	0,8	CNMG 090308 MM									•	•	•		
	0,4	CNMG 120404 MM								•	•	•	•	•	•
	0,4	CNMG 120404 MM1			•	•									
	0,4	CNMG 120404 MR	•												
	0,8	CNMG 120408 MM								•	•	•	•	•	
	0,8	CNMG 120408 MR	•												
	0,8	CNMG 120408 MM1			•	•					•		•	•	
	1,2	CNMG 120412 MM									•	•	•		
	1,2	CNMG 120412 MR													
	1,2	CNMG 160612 MM								•					
LIGHT ROUGHING	0,8	CNMG 120408 RM						•	•	•	•	•	•		
	1,2	CNMG 120412 RM						•	•	•	•	•			
	0,8	CNMG 120408 RM1			•	•									
	1,2	CNMG 120412 RM1			•	•									
	0,8	CNMG 160608 RM						•			•		•		
	1,2	CNMG 160612 RM							•		•	•			
	1,6	CNMG 160616 RM								•	•		•		
	0,8	CNMG 190608 RM									•		•		
	1,2	CNMG 190612 RM									•		•		
	1,6	CNMG 190616 RM									•		•		
	2,4	CNMG 250924 RM													
ROUGHING	0,8	CNMM 120408 RR									•		•		
	1,2	CNMM 120412 RR									•				
	1,2	CNMM 160612 RR									•		•		
	1,6	CNMM 160616 RR									•				
	1,2	CNMM 190612 RR									•		•	•	
	1,6	CNMM 190616 RR									•		•		
CAST IRONS	0,4	CNMA 120404	•												
	0,8	CNMA 120408						•							
	1,2	CNMA 120412						•							
	1,2	CNMA 190612													
	1,6	CNMA 190616	•					•							

MATERIAL DESIGNATIONS							
P	•	STEELS			M	•	STAINLESS STEELS
K	•	CAST IRONS			N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FF MM MM1 RM MR MR DNMA ...

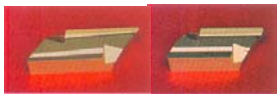
NEGATIVE INSERTS DN ...			HWK 101	HFK 201	HCM 301	HCM 351	HPM 201	HCK 101	HCP 201	HCP 151	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451
FINISHING	0,4	DNMG 110404 FF									●				
	0,8	DNMG 110408 FF													
	0,2	DNGP 150402 FF1					●								
	0,2	DNGP 150402FN FF1													
	0,4	DNGP 150404 FF1					●								
	0,4	DNGP 150404FN FF1		●											
	0,8	DNGP 150408 FF1					●								
	0,8	DNGP 150408FN FF1		●											
	0,4	DNMG 150404 FF													
	0,4	DNMG 150404 FM1													
	0,8	DNMG 150408 FF													
	0,8	DNMG 150408 FM1				●									
	0,2	DNGP 150602 FF1													
	0,4	DNGP 150604 FF1					●								
	0,8	DNGP 150608 FF1					●								
	0,4	DNMG 150604 FF													
	0,4	DNMG 150604 FM1			●	●									
	0,8	DNMG 150608 FF													
	0,8	DNMG 150608 FM1			●	●					●				
WIPER	0,4	DNMX 150404 WIP								●					
	0,8	DNMX 150408 WIP								●					
	0,4	DNMX 150604 WIP						●		●					
	0,8	DNMX 150608 WIP						●							
MEDIUM SOLICITATION	0,4	DNMG 110404 MM									● ●				
	0,8	DNMG 110408 MM								●	● ●		●		
	1,2	DNMG 110412 MM													
	0,4	DNMG 150404 MM									● ●		●		
	0,4	DNMG 150404 MM1					●								
	0,8	DNMG 150408 MM								●	● ●		●		
	0,8	DNMG 150408 MM1													
	1,2	DNMG 150412 MM									● ●		●		
	0,4	DNMG 150604 MM									● ●	●	●		
	0,4	DNMG 150604 MM1			●	●	●								
	0,8	DNMG 150608 MM								●	● ●	●	●		
	0,8	DNMG 150608 MM1			●	●	●								
	1,2	DNMG 150612 MM								●	● ●	●	●		
ROUGHING	0,8	DNMG 110408 RM													
	1,2	DNMG 110412 RM													
	0,8	DNMG 150408 RM									● ●		●		
	0,8	DNMG 150408 RM1				●									
	1,2	DNMG 150412 RM									● ●		●		
	0,8	DNMG 150608 RM						● ●			● ●	●			
	0,8	DNMG 150608 RM1			●	●									
	1,2	DNMG 150612 RM											●		
CAST IRONS	0,8	DNMA 150608	●												
	1,2	DNMA 150612													

MATERIAL DESIGNATIONS						
P	●	STEELS		M	●	STAINLESS STEELS
K	●	CAST IRONS		N	●	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

KNUX...11 KNUX...12

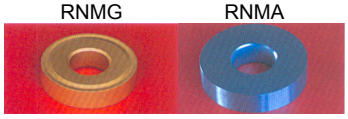


NEGATIVE INSERTS KN...			HWK 101	HFK 121	HFK 201	HCK 101	HCP 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
MEDIUM SOLICITATION	0,5	KNUX 160405 EL-N11						•		•	•	•				
	0,5	KNUX 160405 EL 12						•		•	•	•				
	0,5	KNUX 160405 ER-N11						•		•	•	•				
	0,5	KNUX 160405 ER 12						•		•	•	•				
	1,0	KNUX 160410 EL-N11						•		•	•	•				
	1,0	KNUX 160410 EL 12						•		•	•	•				
	1,0	KNUX 160410 ER-N11						•		•	•	•				
	1,0	KNUX 160410 ER 12						•		•	•	•				

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS
METAL CUTTING - TURNING OPERATION

RNMG RNMA



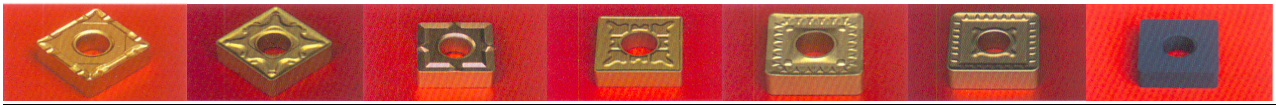
NEGATIVE INSERTS RN ...			HWK 101	HFK 201	HCM 351	HPM 201	HCK 101	HCP 101	HCP 201	HCP 151	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451
MEDIUM SOLICITATION		RNMG 120400													
		RNMG 150600													
		RNMG 190600													
		RNMG 250900													
		RNMA 310900													

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FF MM MR RM RR SN-HT SNMA ...



NEGATIVE INSERTS SN ...			HWK 101	HCM 301	HCM 351	HFK 201	HCK 101	HCP 101	HCP 151	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451	
FINE FINISHING	0,4	SNMG 120404 FF													
	0,8	SNMG 120408 FF													
	1,2	SNMG 120412 FF								●			●		
MEDIUM SOLICITATION	0,4	SNMG 120404 MM													
	0,8	SNMG 120408 MM								● ●	●	●			
	0,8	SNMG 120408 MM1		●	●										
	1,2	SNMG 120412 MM								● ●		●			
	1,2	SNMG 120412 MM1													
	1,2	SNMG 150612 MM							●	●			●		
	1,6	SNMG 150616 MM							●	●			●		
	0,8	SNMG 120408 RM					● ●	●		● ●		●			
	1,2	SNMG 120412 RM													
	0,8	SNMG 150608 RM													
	0,8	SNMG 150608 RM1			●										
	1,2	SNMG 150612 RM										●			
	1,6	SNMG 150616 RM													
	0,8	SNMG 190608 RM													
	1,2	SNMG 190612 RM								● ●					
	0,6	SNMG 190616 RM							●	● ●		●			
ROUGHING	0,8	SNMM 120408 RR										●			
	1,2	SNMM 120412 RR								●					
	1,2	SNMM 150612 RR								●					
	1,2	SNMM 150612 SN-HT													
	1,6	SNMM 150616 RR													
	1,6	SNMM 150616 SN-HT								●		●			
	2,4	SNMM 150624 RR								●					
	1,2	SNMM 190612 RR							●	●		●			
	1,6	SNMM 190616 RR							●	●		●	●		
	1,6	SNMM 190616 SN-HT								●		●			
	2,4	SNMM 190624 RR								●					
	2,4	SNMM 190624 SN-HT													
	2,4	SNMM 250724 SN-HT													
	1,4	SNMM 250924 SN-HT								●		●			
CAST IRONS	0,4	SNMA 090308											●		
	0,4	SNMA 120404													
	0,8	SNMA 120408					●								
	1,2	SNMA 120412					●								
	1,6	SNMA 120416													
	1,2	SNMA 150612													
	1,2	SNMA 190612													
	1,6	SNMA 190616	●												
	2,4	SNMA 250924 T					●								

MATERIAL DESIGNATIONS						
P	●	STEELS		M	●	STAINLESS STEELS
K	●	CAST IRONS		N	●	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

SNUN

NEGATIVE INSERTS SN...			HWK 101	HFK 121	HFK 201	HCK 101	HCP 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
MEDIUM SOLICITATION	0,4	SNUN 090304	•													
	0,8	SNUN 090308														
	0,4	SNUN 120404														
	0,8	SNUN 120408								•						
	0,8	SNUN 190408														
	1,2	SNUN 190412	•							•						

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS
METAL CUTTING - TURNING OPERATION

FF MM MM1 ER/EL RM MR TNMA ...

NEGATIVE INSERTS TN ...			HWK 101	HCM 301	HCM 351	HPM 201	HCK 101	HCP 101	HCP 151	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451	
FINE FINISHING	0,4	TNMG 160404 FF								•					
	0,8	TNMG 160408 FF								•					
	1,2	TNMG 160412 FF													
	0,4	TNMG 220404 FF						• •							
	0,8	TNMG 220408 FF						• •							
MEDIUM SOLICITATION	0,4	TNMG 160404 MM							•	• •	•	•			
	0,4	TNMG 160404 MM1			•	•									
	0,8	TNMG 160408 MM							•	• •	•	•	•		
	0,8	TNMG 160408 MM1			•					•		•			
	1,2	TNMG 160412 MM								•					
	1,2	TNMG 160412 MM1			•										
	0,4	TNMG 220404 MM								• •		•			
	0,8	TNMG 220408 MM								• •		•			
	0,8	TNMG 220408 MM1			•					•					
	1,2	TNMG 220412 MM1			•										
LIGHT ROUGHING	0,4	TNMG 160404 EL						•		•			•		
	0,4	TNMG 160404 ER						•		•			•		
	0,8	TNMG 160408 EL						•		•			•		
	0,8	TNMG 160408 ER						•		•			•		
	0,8	TNMG 160408 RM						• •		• •					
	1,2	TNMG 160412 RM													
	0,8	TNMG 220408 RM							•			•			
	1,2	TNMG 220412 RM													
ROUGHING	0,8	TNMM 160408 RR								•					
	0,8	TNMM 220408 RR								•					
CAST IRONS	0,4	TNMA 110304													
	0,4	TNMA 160404													
	0,8	TNMA 160408													
	1,2	TNMA 160412													
	0,4	TNMA 220404													
	0,8	TNMA 220408													
	1,2	TNMA 220412													
	1,6	TNMA 220416													
	1,6	TNMA 270616													

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FF MM MR

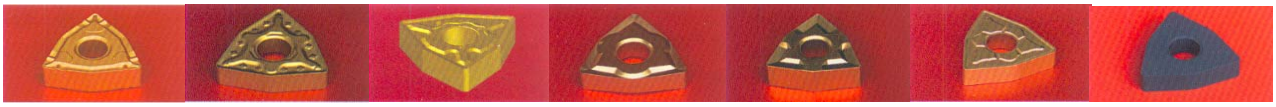
NEGATIVE INSERTS VN ...			HWK 101	HFK 201	HCM 351	HPM 201	HCK 101	HCP 101	HCP 201	HCP 151	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451
FINISHING	0,2	VNGP 160402 FF1				•									
	0,2	VNGP 160402FN FF1	•												
	0,4	VNGP 160404 FF1				•									
	0,4	VNGP 160404FN FF1	•	•											
	0,8	VNGP 160408 FF1													
	0,8	VNGP 160408FN FF1		•											
	0,4	VNMG 160404 FF									•				
	0,4	VNMG 160404 FM1			•										
	0,8	VNMG 160408 FF													
	0,8	VNMG 160408 FM1			•										
MEDIUM SOLICITATION	0,4	VNMG 160404 MM									• •			•	
	0,8	VNMG 160408 MM								•	• •	•	•	•	
LIGHT ROUGHING	0,4	VNMG 160404 MR													
	0,8	VNMG 160408 MR				•									

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FF MM MM1 MR RM1 RM WNMA



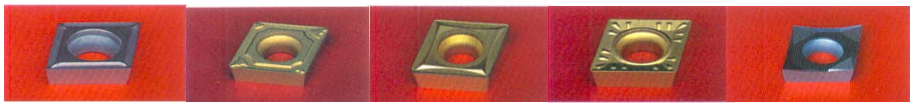
NEGATIVE INSERTS WNM ...			HWK 101	HCM 301	HCM 351	HPM 201	HCK 101	HCP 101	HCP 151	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451			
FINISHING	0,4	WNMG 060404 FF															
	0,8	WNMG 060408 FF															
	0,4	WNGP 080404 FF1				●											
	0,4	WNMG 080404 FF								●							
	0,8	WNGP 080408 FF1				●											
	0,8	WNMG 080408 FF															
	1,2	WNMG 080412 FF								●							
WIPER	0,4	WNMX 080404 WIP					● ●		●								
	0,8	WNMX 080408 WIP					● ●		●								
MEDIUM SOLICITATION	0,4	WNMG 060404 MM								● ●							
	0,8	WNMG 060408 MM								● ●		●					
	1,2	WNMG 060412 MM															
	0,4	WNMG 080404 MM									●	●					
	0,4	WNMG 080404 MM1		●	●												
	0,8	WNMG 080408 MM							●	● ●	●	●					
	0,8	WNMG 080408 MM1		●	●					● ●		●	●				
	1,2	WNMG 080412 MM								● ●	●						
	1,2	WNMG 080412 MM1															
LIGHT ROUGHING	0,4	WNMG 060404 MR	●														
	0,8	WNMG 060408 MR															
	0,4	WNMG 080404 MR	●														
	0,8	WNMG 080408 MR	●			●											
	0,8	WNMG 080408 RM1				●											
ROUGHING	0,8	WNMG 060408 RM															
	1,2	WNMG 060412 RM															
	0,8	WNMG 080408 RM					● ●			● ●		●					
	1,2	WNMG 080412 RM					● ●		●	● ●			●				
	1,6	WNMG 080416 RM										●					
CAST IRONS	0,8	WNMA 080408	●				●										
	1,2	WNMA 080412					●										

MATERIAL DESIGNATIONS						
P	●	STEELS		M	●	STAINLESS STEELS
K	●	CAST IRONS		N	●	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FF FM MM RM AL



POSITIVE INSERTS CC ...			HWK 101	HFK 201	HWK 201	HPM 151	HPM 201	HCM 301	HCM 351	HCK 101	HCP 151	HCP 201	HCP 251	HCP 301	HCP 351	HCP 401	HTP 101
FINE FINISHING	0,05	CCGT 0602005 EFF					●										
	0,1	CCGT 060201 EFF					●										
	0,2	CCGT 060202 EFF															
	0,4	CCGT 060204 EFF															
	0,05	CCGT 09T3005 EFF					●										
	0,1	CCGT 09T301 EFF					●										
	0,2	CCGT 09T302 EFF															
	0,4	CCGT 09T304 EFF															
	0,4	CCMT 060204 FF															● ●
	0,8	CCMT 060208 FF															● ●
	0,4	CCMT 09T304 FF															● ●
	0,8	CCMT 09T308 FF															● ●
FINISHING	0,2	CCGW 060202															
	0,4	CCGW 060204	●														
	0,4	CCGW 09T304		●													
	0,8	CCGW 09T308															
	0,4	CCGW 120404															
	0,8	CCGW 120408															
	0,2	CCMT 060202 FM											●		●		
	0,2	CCMT 060202 FS											●		●		
	0,4	CCMT 060204 FM											●			●	
	0,4	CCMT 060204 FS													●		
	0,8	CCMT 060208 FM															
	0,2	CCMT 09T302 FM											●			●	
	0,2	CCMT 09T302 FS															
	0,4	CCMT 09T304 FM											●		●		
	0,4	CCMT 09T304 FS											●		●		
	0,8	CCMT 09T308 FM															
	0,8	CCMT 09T308 FS															
	0,4	CCMT 120404 FS													●		
	0,8	CCMT 120408 FS													●		
	0,4	CCXT 060204 MFM				●											
	0,4	CCXT 09T304 MFM				●											
	0,8	CCXT 09T308 MFM				●											
WIPER	0,4	CCMX 09T304WIP												●			
	0,8	CCMX 09T308WIP												●			
MEDIUM SOLICITATION	0,2	CCMT 060202 MM															
	0,2	CCMT 060202 FS							●								
	0,4	CCMT 060204 MM								●	●		● ●		●		
	0,4	CCMT 060204 FS							●								
	0,8	CCMT 060208 MM								●			● ●				
	0,2	CCMT 09T302 FS							●								
	0,4	CCMT 09T304 MM								●	●		● ●		●		
	0,4	CCMT 09T304 FS							●								
	0,8	CCMT 09T308 MM								●	●		● ●		●		
	0,8	CCMT 09T308 FS							●								
	0,4	CCMT 120404 MM								●			● ●		●		
	0,4	CCMT 120404 FS															
	0,8	CCMT 120408 MM								●	●		● ●		●		
	0,8	CCMT 120408 FS															
	1,2	CCMT 120412 MM											● ●				

MATERIAL DESIGNATIONS						
P	●	STEELS		M	●	STAINLESS STEELS
K	●	CAST IRONS		N	●	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS
METAL CUTTING - TURNING OPERATION

FF FM MM RM AL

POSITIVE INSERTS CC ...			HWK 101	HFK 121	HWK 201	HFK 201	HPM 151	HCM 301	HCM 351	HCP 151	HCP 201	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451	HTP 101
ROUGHING	0,4	CCMT 060204 RM										•		•			
	0,8	CCMT 060208 RM										•			•	•	
	0,4	CCMT 09T304 RM						•	•			•	•	•			
	0,8	CCMT 09T308 RM						•	•			•	•	•	•	•	
	0,4	CCMT 120404 RM										•		•	•	•	
	0,8	CCMT 120408 RM							•			•		•			
	1,2	CCMT 120412 RM										•		•	•	•	
	0,2	CCMW 060202															
	0,4	CCMW 060204	•														
	0,4	CCMW 09T304															
	0,8	CCMW 09T308	•			•											
	0,4	CCMW 120404	•														
	0,8	CCMW 120408	•														
	0,2	CPGW 060202															
	0,4	CPGW 060204	•														
NON-FERROUS	0,05	CCGT 0602005 FN-FF				•											
	0,1	CCGT 060201 FN-FF				•											
	0,2	CCGT 060202FN-FF															
	0,4	CCGT 060204FN-FF															
	0,05	CCGT 09T3005FN-FF			•	•											
	0,1	CCGT 09T301FN-FF			•	•											
	0,2	CCGT 09T302FN-FF															
	0,4	CCGT 09T304FN-FF															
	0,1	CCGT 060201 AL		•													
	0,2	CCGT 060202 AL		•	•												
	0,4	CCGT 060204 AL		•	•												
	0,1	CCGT 09T301 AL		•													
	0,2	CCGT 09T302 AL		•	•												
	0,4	CCGT 09T304 AL		•	•												
	0,8	CCGT 09T308 AL		•													
	0,2	CCGT 120402 AL		•													
	0,4	CCGT 120404 AL		•	•												
	0,8	CCGT 120408 AL		•	•												
	0,4	CCXT 060204FN- MFM			•												
	0,4	CCXT 09T304FN- MFM			•												
	0,8	CCXT 09T308FN- MFM			•												

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS
METAL CUTTING - TURNING OPERATION

FF FM MM RM AL

POSITIVE INSERTS DC ...			HWK 101	HFK 121	HFK 201	HCM 301	HPM 151	HPM 201	HCM 351	HCP 151	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451	HTP 101		
FINE FINISHING	0,05	DCGT 0702005 EFF						•										
	0,1	DCGT 070201 EFF						•										
	0,2	DCGT 070202 EFF																
	0,4	DCGT 070204 EFF																
	0,05	DCGT 11T3005 EFF						•										
	0,1	DCGT 11T301 EFF						•										
	0,2	DCGT 11T302 EFF																
	0,4	DCGT 11T304 EFF																
	0,2	DCGT 070202 FF														•	•	
	0,4	DCGT 070204 FF														•	•	
	0,2	DCGW 070202			•											•	•	
	0,4	DCGW 070204														•	•	
	0,4	DCGW 11T304			•											•	•	
	0,8	DCGW 11T308														•	•	
	0,4	DCMT 070204 FF																
	0,4	DCMT 11T304 FF														•	•	
	0,8	DCMT 11T308 FF																
FINISHING	0,2	DCMT 070202 FM									•			•				
	0,4	DCMT 070204 FM									•			•				
	0,8	DCMT 070208 FM																
	0,2	DCMT 11T302 FM									•			•				
	0,4	DCMT 11T304 FM									•		•					
	0,8	DCMT 11T308 FM																
	0,2	DCMT 070202 FS							•									
	0,4	DCMT 070204 FS				•			•		•		•					
	0,2	DCMT 11T302 FS							•		•			•				
	0,4	DCMT 11T304 FS				•			•		•		•					
	0,8	DCMT 11T308 FS											•					
	0,4	DCXT 070204 MFM					•											
	0,4	DCXT 11T304 MFM					•											
	0,8	DCXT 11T308 MFM					•											
WIPER	0,4	DCMX 070204 WIP										•						
	0,4	DCMX 11T304 WIP										•						
	0,8	DCMX 11T308 WIP										•						

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M

INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FF FM MM RM AL

POSITIVE INSERTS DC ...			HWK 101	HFK 121	HWK 201	HFK 201	HCK 101	HPM 151	HCM 301	HCM 351	HCP 151	HCP 251	HCP 301	HCP 351	HCP 401	HCP 451	HTP 101	
MEDIUM SOLICITATION	0,2	DCMT 070202 FS							•	•								
	0,4	DCMT 070204 FS							•	•								
	0,4	DCMT 070204 MM	•									•						
	0,2	DCMT 11T302 FS								•								
	0,4	DCMT 11T304 FS								•								
	0,4	DCMT 11T304 MM									•	•		•				
	0,8	DCMT 11T308 FS								•								
	0,8	DCMT 11T308 MM									•	•		•				
ROUGHING	0,2	DCMT 070202 RM																
	0,4	DCMT 070204 RM					•					•		•				
	0,8	DCMT 070208 RM										•			•			
	0,2	DCMT 11T302 RM																
	0,4	DCMT 11T304 RM							•	•		•	•	•				
	0,8	DCMT 11T308 RM					•		•	•		•	•	•				
	0,2	DCMW 070202																
	0,4	DCMW 070204																
	0,4	DCMW 11T304	•															
	0,8	DCMW 11T308																
	0,4	DCMW 150404																
	0,8	DCMW 150408																
NON-FERROUS	0,05	DCGT 0702005 FN-FF			•	•												
	0,1	DCGT 070201 FN-FF				•												
	0,05	DCGT 070201 AL		•														
	0,2	DCGT 070202 AL		•														
	0,4	DCGT 070204 AL		•														
	0,05	DCGT 11T3005 FN-FF				•												
	0,1	DCGT 11T301 FN-FF			•	•												
	0,1	DCGT 11T301 AL			•													
	0,2	DCGT 11T302 AL		•														
	0,4	DCGT 11T304 AL		•														
	0,8	DCGT 11T308 AL		•														
	0,4	DCXT 070204 FN-MFM			•													
	0,4	DCXT 11T304 FN-MFM			•													
	0,8	DCXT 11T308 FN-MFM			•													

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

ECMT...EN-MM ECMT...GC ECMT...EN-MR EPMT...EN-MM EPMT…FF

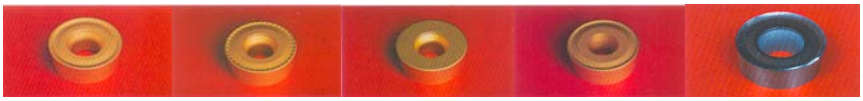
POSITIVE INSERTS EC … , EP …			HWK 101	HFK 121	HFK 201	HCK 101	HCP 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
MEDIUM SOLICITATION	0,4	ECMT 12T304 EN-MM						•		•	•					
	0,8	ECMT 12T308 EN-MM						•		•	•					
	0,8	ECMT 12T308 GC				•				•	•					
	1,2	ECMT 12T312 EN-MM									•					
	0,8	ECMT 16M608 EN-MM									•					
	1,2	ECMT 16M612 EN-MR									•					
	1,6	ECMT 16M616 EN-MR									•					
	0,8	ECMW 12T304 EN	•	•												
	0,8	ECMW 12T308 EN	•													
	1,2	ECMW 16M612														
MEDIUM SOLICITATION	0,2	EPMT 060202 EN-MM							•	•	•					
	0,4	EPMT 060204 EN-MM						•		•	•					
	0,2	EPMT 08M302 EN-MM						•	•	•	•					
	0,4	EPMT 08M304 EN-MM						•	•	•	•					
	0,4	EPMT 08M304 FF												•		
	0,8	EPMT 08M308 EN-MM						•		•	•					
	0,4	EPMW 040204 EN		•	•											
	0,2	EPMW 08M302 EN		•	•											
	0,4	EPMW 08M304 EN		•	•											

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

RCMT...EN | RCMT...SN-XR | RCMW | RCMX | RCGT…AL



POSITIVE INSERTS RC ...			HWK 101	HFK 121	HWK 201	HCK 101	HPM 151	HCP 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
MEDIUM SOLICITATION		RCMT 0602MO RM															
		RCXT 08T3MO MFM			•		•										
		RCMT 0803MO RM															
		RCMT 10T3MO RM															
		RCMT 1204MO RM															
		RCMT 1606MO SN-XR															
		RCMT 2006MO SN-XR															
		RCMT 2507MO SN-XR															
		RCMT 3209MO															
MEDIUM SOLICITATION		RCMW 1204MO EN															
		RCMW 1606MO EN															
		RCMW 2006MO EN															
		RCMW 2507MO EN															
		RCMW 3209MO															
MEDIUM SOLICITATION		RCMX 1003MO															
		RCMX 1204MO															
		RCMX 1606MO															
		RCMX 2006MO															
		RCMX 2507MO															
		RCMX 3209MO															
NON - FERROUS		RCGT 0602MO AL		•	•												
		RCGT 0803MO AL		•	•												
		RCGT 1003MO AL		•	•												
		RCGT 1204MO AL		•	•												

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FM MM RM AL

POSITIVE INSERTS SC ...			HWK 101	HFK 121	HWK 201	HCK 101	HCM 351	HCP 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
FINE FINISHING	0,4	SCMT 09T304 FF										•	•				
	0,8	SCMT 09T308 FF										•					
FINISHING	0,4	SCMT 09T304 FM															
	0,8	SCMT 09T308 FM															
	0,4	SCMT 120404 FM															
	0,8	SCMT 120408 FM															
MEDIUM SOLICITATION	0,4	SCMT 09T304 MM								•	•	•					
	0,8	SCMT 09T308 MM				•				•		•					
	0,4	SCMT 120404 MM									•	•					
	0,8	SCMT 120408 MM				•					•						
	1,2	SCMT 120412 MM				•											
ROUGHING	0,4	SCMT 09T304 RM				• •	•				• •		•				
	0,8	SCMT 09T308 RM				• •	•						•				
	0,4	SCMT 120404 RM				• •	•				• •						
	0,8	SCMT 120408 RM				• •	•				• •	•					
	1,2	SCMT 120412 RM				• •	•										
	0,4	SCMW 060204															
	0,4	SCMW 09T304	•														
	0,8	SCMW 09T308															
	0,8	SCMW 120408															
	1,2	SCMW 120412															
NON-FERROUS	0,4	SCGT 09T304 AL		•	•												
	0,8	SCGT 09T308 AL		•													
	0,8	SCGT 120408 AL		•	•												

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

SPMR SPMR...ELR SPUN

POSITIVE INSERTS SP...			HWK 101	HFK 121	HFK 201	HCK 101	HCP 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
MEDIUM SOLICITATION	0,4	SPMR 090304								•	•	•				
	0,8	SPMR 090308								•	•	•				
	0,4	SPMR 120404								•	•	•				
	0,8	SPMR 120408								•	•	•				
	1,2	SPMR 120412								•	•	•				
	0,8	SPMR 120308 EL						•				•				
	0,8	SPMR 120308 ER						•				•				
MEDIUM SOLICITATION	0,4	SPUN 090304	•							•						
	0,8	SPUN 090308	•							•		•				
	0,4	SPUN 120304	•							•		•				
	0,8	SPUN 120308	•		•			•	•	•		•				
	1,2	SPUN 120312	•		•											
	1,6	SPUN 120316	•		•											
	0,8	SPUN 120408								•						
	1,6	SPUN 120416														
	1,2	SPUN 150412	•													
	1,2	SPUN 190412	•							•						

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FF FM MM RM AL

POSITIVE INSERTS TC ...			HWK 101	HFK 121	HWK 201	HFK 201	HCK 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
FINE FINISHING	0,2	TCGT 110202 FF												● ●		
	0,4	TCGT 110204 FF												● ●		
	0,4	TCGW 110204	●		●									● ●		
	0,8	TCGW 110208	●		●											
	0,4	TCMT 110204 FF												● ●		
FINISHING	0,2	TCMT 110202 FM							●	●		● ●				
	0,4	TCMT 110204 FM							●	●		● ●				
	0,8	TCMT 110208 FM							●	●		● ●				
	0,2	TCMT 16T302 FM							●	●		● ●				
	0,4	TCMT 16T304 FM							●	●		● ●				
	0,8	TCMT 16T308 FM							●	●		● ●				
MEDIUM SOLICITATION	0,4	TCMT 110204 MM					●		●	● ●		● ●				
	0,8	TCMT 110208 MM					●			●		● ●				
	0,4	TCMT 16T304 MM					●			● ●	● ●					
	0,8	TCMT 16T308 MM					●		●	● ●	● ●	● ●				
	0,4	TCMT 220404 MM														
	0,8	TCMT 220408 MM														
ROUGHING	0,2	TCMT 110202 RM														
	0,4	TCMT 110204 RM								●		● ●				
	0,8	TCMT 110208 RM								●		● ●				
	0,2	TCMT 16T302 RM														
	0,4	TCMT 16T304 RM								●	● ●	● ●				
	0,8	TCMT 16T308 RM								●		● ●				
	1,2	TCMT 16T312 RM								●		● ●				
	0,4	TCMW 110204			●											
NON-FERROUS	0,2	TCGT 06T102 AL		●	●											
	0,2	TCGT 090202 AL		●	●											
	0,4	TCGT 090204 AL		●	●											
	0,2	TCGT 110202 AL		●	●	●										
	0,4	TCGT 110204 AL		●	●											
	0,1	TCGT 16T301 AL		●	●											
	0,2	TCGT 16T302 AL		●	●											
	0,4	TCGT 16T304 AL		●												
	0,8	TCGT 16T308 AL		●												

MATERIAL DESIGNATIONS						
P	●	STEELS		M	●	STAINLESS STEELS
K	●	CAST IRONS		N	●	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

TPMR TPMR...EL/ER TPUN

POSITIVE INSERTS TP...			HWK 101	HFK 121	HFK 201	HCK 101	HCP 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
MEDIUM SOLICITATION	0,4	TPMR 110304						•	•	•	•	•				
	0,4	TPMR 110304 EL						•				•				
	0,4	TPMR 110304 ER						•				•				
	0,8	TPMR 110308						•		•	•	•				
	0,4	TPMR 160304						•	•	•	•	•				
	0,4	TPMR 160304 EL						•				•				
	0,4	TPMR 160304 ER						•				•				
	0,8	TPMR 160308						•		•	•	•				
	0,8	TPMR 160308 EL										•				
	0,8	TPMR 160308 ER										•				
MEDIUM SOLICITATION	0,4	TPUN 110304	•		•		•	•		•		•				
	0,8	TPUN 110308	•					•		•		•				
	0,4	TPUN 160304	•		•		•	•		•		•				
	0,8	TPUN 160308	•					•		•		•				
	1,2	TPUN 160312	•		•					•						
	0,4	TPUN 220404	•							•						
	0,8	TPUN 220408	•					•		•						
	1,2	TPUN 220412	•							•						

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

VBMT

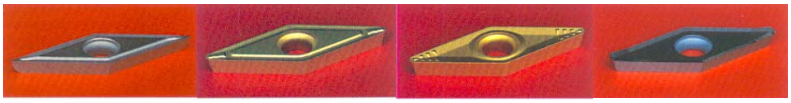
POSITIVE INSERTS VB ...			HWK 101	HFK 121	HFK 201	HCK 101	HCP 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
MEDIUM SOLICITATION	0,4	VBMT 160404						•	•	•	•					
	0,8	VBMT 160408						•	•	•	•					

MATERIAL DESIGNATIONS						
P	•	STEELS		M	•	STAINLESS STEELS
K	•	CAST IRONS		N	•	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FF FM RM AL



POSITIVE INSERTS VC ...			HFK 201	HFK 121	HWK 201	HFK 201	HPM 151	HPM 201	HCM 301	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
FINE FINISHING	0,2	VCGT 110202 FF													● ●		
	0,05	VCGT 1103005 EFF															
	0,1	VCGT 110301 EFF						●									
	0,2	VCGT 110302 EFF															
	0,2	VCGT 110304 EFF															
	0,4	VCGT 110304 FF													● ●		
	0,05	VCGT 1604005 EFF															
	0,1	VCGT 160401 EFF						●									
	0,2	VCGT 160402 EFF															
	0,4	VCGT 160404 EFF															
	0,2	VCGW 110302				●											
	0,2	VCGW 110304				●											
	0,4	VCXT 160404 MFM					●										
	0,8	VCXT 160408 MFM					●										
	1,2	VCXT 160412 MFM					●										
	3,00	VCXT 220530 MFM					●										
FINISHING	0,2	VCMT 110302 FM								●	●		● ●				
	0,4	VCMT 110304 FM								●	●		● ●				
	0,8	VCMT 110308 FM								●	●		● ●				
	0,4	VCMT 160404 FM								●	●		● ●				
	0,8	VCMT 160408 FM								●	●		● ●				
MEDIUM SOLICITATION	0,2	VCMT 110302 FS										●					
	0,4	VCMT 110304 FS							●								
	0,4	VCMT 110304 MM									● ●		● ●				
	0,8	VCMT 110308 MM									● ●						
	0,4	VCMT 160404 FS							●			●					
	0,4	VCMT 160404 MM									● ●	● ●					
	0,8	VCMT 160408 FS							●			●					
	0,8	VCMT 160408 MM									● ●						
	1,2	VCMT 160412 MM															
ROUGHING	0,2	VCMT 110302 RM															
	0,4	VCMT 110304 RM							●		●		● ●				
	0,8	VCMT 110308 RM									●		● ●				
	0,4	VCMT 160404 RM							●		●	●	● ●				
	0,8	VCMT 160408 RM							●		●		● ●				
	1,2	VCMT 160412 RM									●	●					
NON-FERROUS	0,1	VCGT 110301 FN-FF				●											
	0,1	VCGT 070201 AL															
	0,2	VCGT 070202 AL															
	0,4	VCGT 070204 AL															
	0,1	VCGT 110301 AL															
	0,2	VCGT 110302 AL		●	●												
	0,4	VCGT 110304 AL		●													
	0,8	VCGT 110308 AL															
	0,1	VCGT 160401 AL		●													
	0,2	VCGT 160402 AL		●	●												
	0,4	VCGT 160404 AL		●	●												
	0,8	VCGT 160408 AL		●													

MATERIAL DESIGNATIONS						
P	●	STEELS		M	●	STAINLESS STEELS
K	●	CAST IRONS		N	●	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - TURNING OPERATION

FF FM RM AL

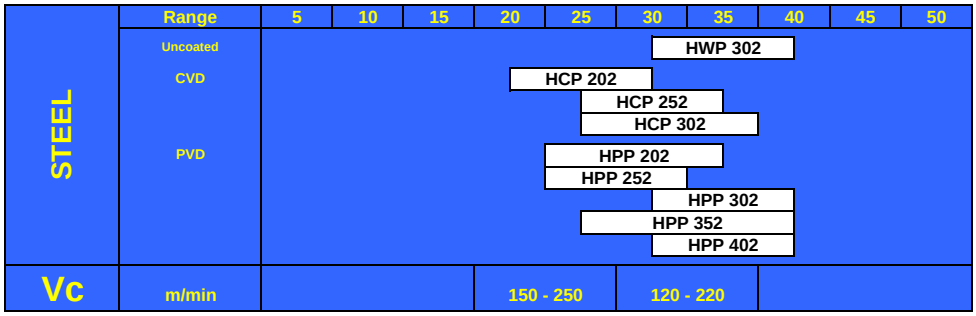
POSITIVE INSERTS WC ...			HWK 101	HFK 121	HWK 201	HCK 101	HCP 101	HCP 201	HCP 151	HCP 251	HCP 351	HCP 401	HCP 451	HTP 101		
FINE FINISHING	0,05	WCGT 06T3005 EFF												● ●		
	0,1	WCGT 06T301 EFF														
	0,2	WCGT 040202 FF												● ●		
	0,4	WCMT 020104 FF												● ●		
	0,4	WCMT 040204 FF												● ●		
	0,2	WCGT 06T302 EFF														
	0,2	WCGT 06T302 FF												● ●		
	0,4	WCMT 06T304 EFF														
	0,4	WCMT 06T304 FF												● ●		
FINISHING	0,1	WCGW 06T301														
	0,2	WCGW 06T302														
	0,4	WCGW 06T304														
	0,2	WCMT 040202 FM							●	●		● ●				
	0,4	WCMT 040204 FM							●	●		● ●				
	0,8	WCMT 040208 FM							●	●		● ●				
	0,2	WCMT 06T302 FM							●	●		● ●				
	0,4	WCMT 06T304 FM							●	●		● ●				
	0,8	WCMT 06T308 FM							●	●		● ●				
	0,4	WCMT 080404 FM							●	●		● ●				
	0,8	WCMT 080408 FM							●	●		● ●				
MEDIUM SOLICITATION	0,4	WCMT 040204 MM								●		● ●				
	0,4	WCMT 06T304 MM								●		● ●				
	0,8	WCMT 06T308 MM								●						
	0,4	WCMT 080404 MM								●						
	0,8	WCMT 080408 MM								●						
	1,2	WCMT 080412 MM														
ROUGHING	0,2	WCMT 040202 RM														
	0,4	WCMT 040204 RM														
	0,8	WCMT 040208 RM								●		● ●				
	0,2	WCMT 06T302 RM														
	0,4	WCMT 06T304 RM									● ●					
	0,8	WCMT 06T308 RM								● ●	● ●					
	0,4	WCMT 080404 RM								● ●						
	0,8	WCMT 080408 RM								● ●						
	1,2	WCMT 080412 RM														
NON-FERROUS	0,2	WCGT 040202 AL		●	●											
	0,4	WCGT 040204 AL		●												
	0,2	WCGT 06T302 AL		●	●											
	0,4	WCGT 06T304 AL		●	●											
	0,4	WCGT 080408 AL		●	●											
	0,8	WCGT 080408 AL		●												

MATERIAL DESIGNATIONS						
P	●	STEELS		M	●	STAINLESS STEELS
K	●	CAST IRONS		N	●	ALUMINIUM & ALLOYS

MILLING GRADE OVERVIEW IN STEEL OPERATION

TECHNICAL GUIDE

ISO 513



Finishing

Vc increasing
Vf small
ap small
Wear resistance increasing
Toughness decreasing

Roughing

Vc decreasing
Vf large
ap large
Wear resistance decreasing
Toughness increasing

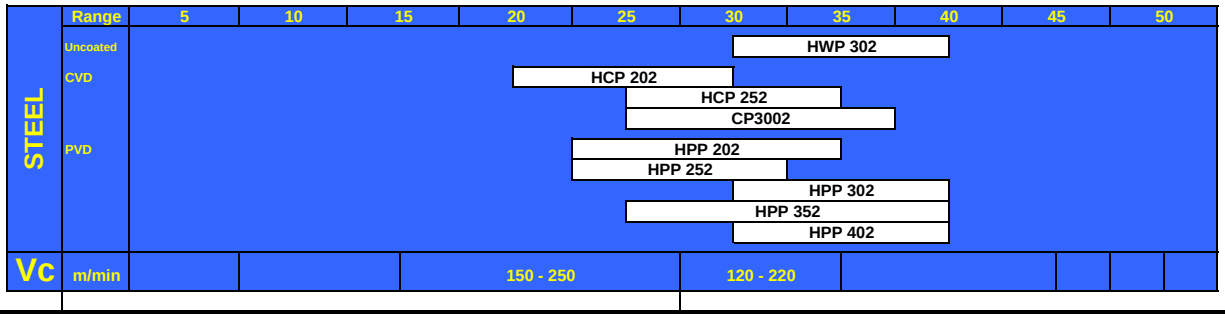
HM - GRADE		SCALE 0-10=RANGE OF TN Toughness / WR Wear resistance 2	3	4	5	6	7	8	9	10	APPLICATION Cutting condition DRY	WET	APPLICATION Machining condition F	M	R
HWP 302	TN	■	■	■	■	■	■	■				●		●	○
	WR	■	■												
HCP 202	TN	■	■	■	■	■					●	○	○	●	○
	WR	■	■	■	■	■	■	■							
HCP 252	TN	■	■	■	■	■	■	■			○	●	○	●	●
	WR	■	■	■	■	■									
HCP 302	TN														
	WR														
HPP 202	TN	■	■	■	■	■	■	■	■						
	WR	■	■	■	■	■									
HPP 252	TN	■	■	■	■	■					●	○	●	●	○
	WR	■	■	■	■	■	■	■							
HPP 302	TN	■	■	■	■	■	■	■	■		●	○	○	●	●
	WR	■	■	■	■	■	■								
HPP 352	TN	■	■	■	■	■	■	■			●	○	●	●	○
	WR	■	■	■	■	■									
HPP 402	TN														
	WR														

Cutting conditions	Machining conditions		Recommendation
DRY = without COOLING	F	Finishing	● Ideal
	M	Medium machining	○ Stil recommended
WET = with COOLING	R	Roughing	– Not recommended

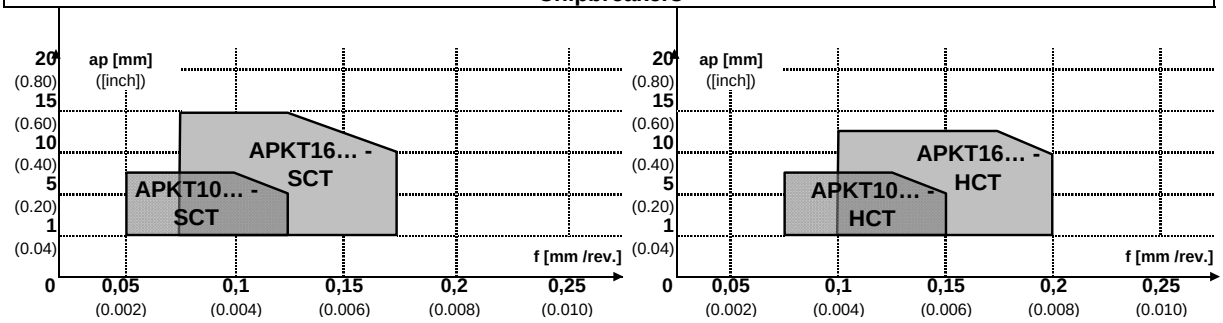
MILLING TEHNICAL GUIDE
OVERVIEW IN STEEL OPERATION

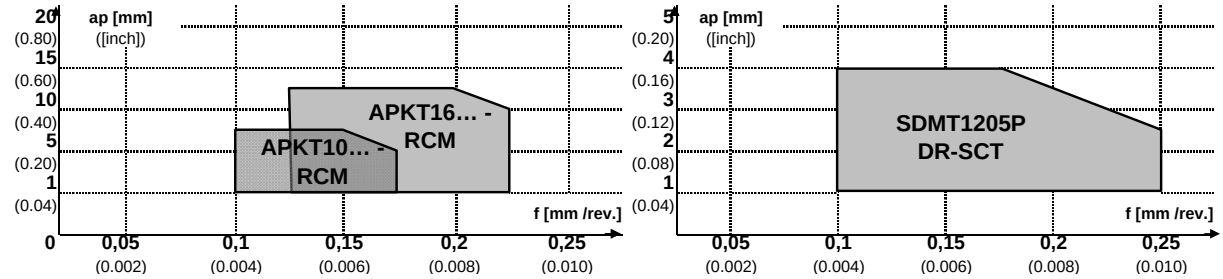
Technical guide

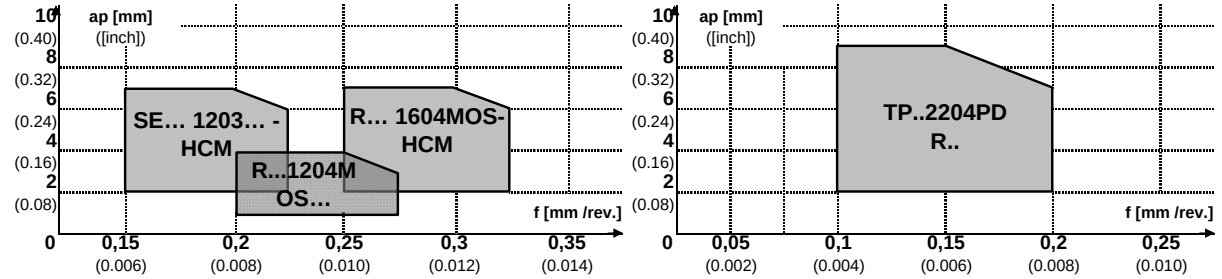
Grade



Chipbreakers







IMPORTANT:

The information you will find is based on our actual knowledge and experience. Seen the influence of some parameters by using our products, the user is not dispensed from making previous tests or verifications. No legal responsability may be associated with the characteristics or recommandations of a product for a case of application. The user has, under his own responsability, to respect all valid rights, laws and guidelines by using our products.

MILLING GRADE OVERVIEW IN STAINLESS STEEL OPERATION

TECHNICAL GUIDE

ISO 513

STAINLESS STEEL	Range	5	10	15	20	25	30	35	40	45	50
	Uncoated		HWM 102								
					HWP 302						
	CVD						HCP 252				
					HCP 302						
	PVD								HPP 202		
						HPP 252					
							HPP 302				
									HPP 352		
							HPP 402				
Vc	m/min		150 - 250		120 - 220						

Finishing

Vc increasing
Vf small
ap small
Wear resistance increasing
Toughness decreasing

◀ ▶

Roughing

Vc decreasing
Vf large
ap large
Wear resistance decreasing
Toughness increasing

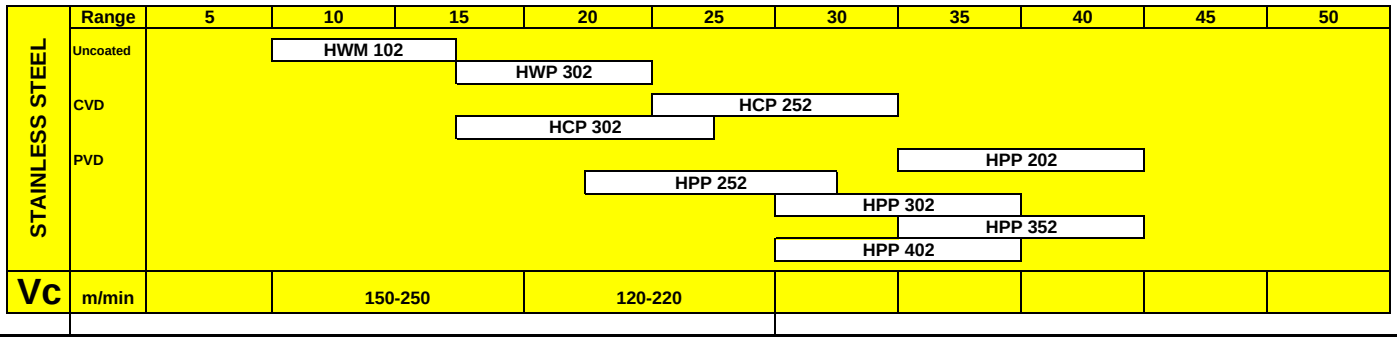
HM - GRADE		SCALE 0-10=RANGE OF TN Toughness / WR Wear resistance 2	3	4	5	6	7	8	9	10	APPLICATION Cutting condition DRY	WET	APPLICATION Machining condition F	M	R
HWM 102	TN														
	WR														
HWP 302	TN	■	■	■	■	■	■	■				●		●	○
	WR	■	■	■											
HCP 252	TN	■	■	■	■	■	■	■			○	●	○	●	●
	WR	■	■	■	■	■									
HCP 302	TN														
	WR														
HPP 202	TN	■	■	■	■	■	■	■	■		●	○	○	●	○
	WR	■	■	■	■	■									
HPP 252	TN	■	■	■	■	■					●	○	●	●	○
	WR	■	■	■	■	■	■	■							
HPP 302	TN														
	WR														
HPP 352	TN	■	■	■	■	■	■	■			●	○	●	●	○
	WR	■	■	■	■	■									
HPP 402	TN														
	WR														

Cutting conditions	Machining conditions		Recommendation
DRY = without COOLING	F	Finishing	● Ideal
	M	Medium machining	○ Stil recommended
WET = with COOLING	R	Roughing	— Not recommended

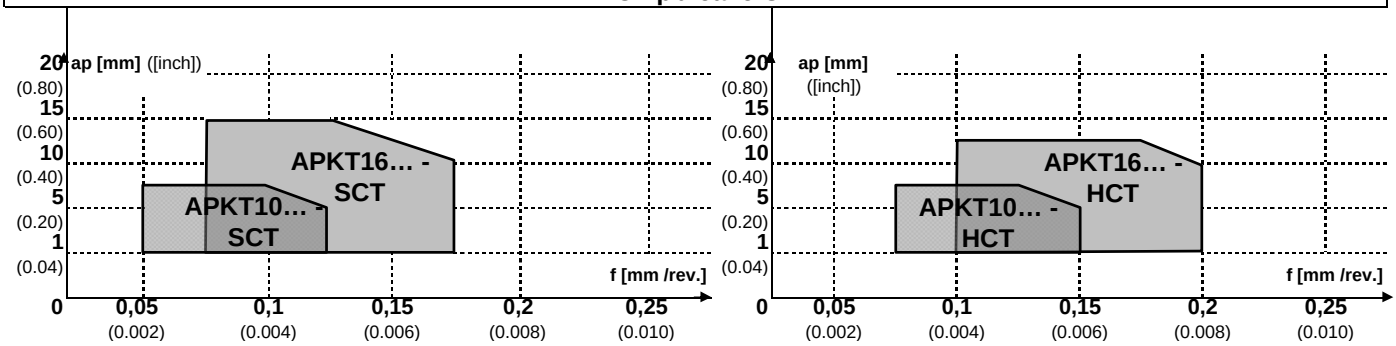
MILLING TEHNICAL GUIDE OVERVIEW IN STAINLESS STEEL OPERATION

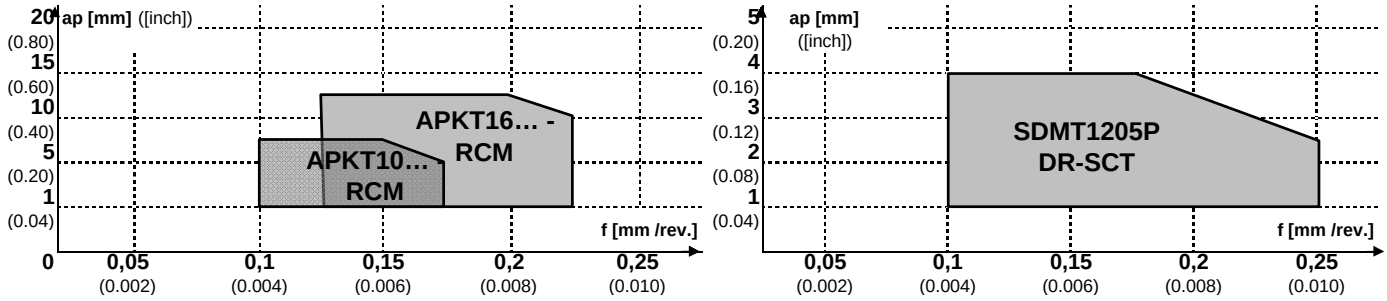
Technical guide

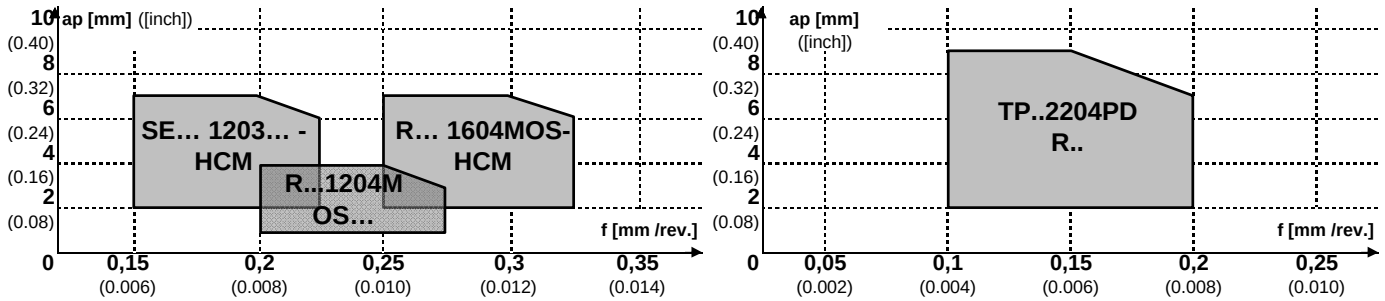
Grade



Chipbreakers







IMPORTANT:

The information you will find is based on our actual knowledge and experience. Seen the influence of some parameters by using our products, the user is not dispensed from making previous tests or verifications. No legal responsability may be associated with the characteristics or recommandations of a product for a case of application. The user has, under his own responsability, to respect all valid rights, laws and guidelines by using our products.

MILLING GRADE OVERVIEW IN CAST IRON OPERATION

TECHNICAL GUIDE

ISO 513											
CAST IRON	Range	5	10	15	20	25	30	35	40	45	50
	Uncoated	HFK 121									
				HFK 201							
	CVD	HCK 152									
					HCP 202						
Vc	m/min		170 - 290		100 - 250						

Finishing

Vc increasing
Vf small
ap small
Wear resistance increasing
Toughness decreasing

◀ ▶

Roughing

Vc decreasing
Vf large
ap large
Wear resistance decreasing
Toughness increasing

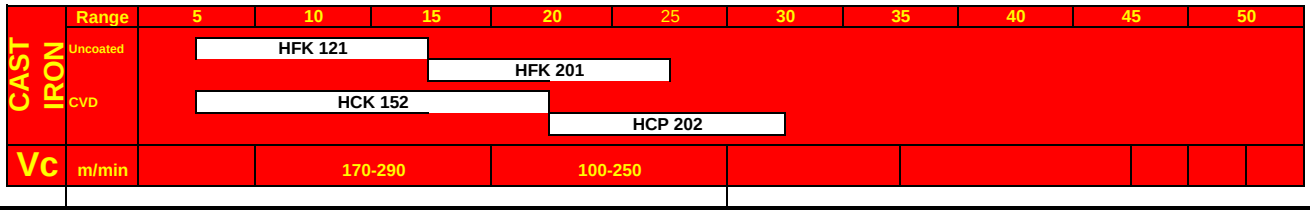
		SCALE 0-10=RANGE OF TN Toughness / WR Wear resistance									APPLICATION Cutting condition		APPLICATION Machining condition		
HM - GRADE		2	3	4	5	6	7	8	9	10	DRY	WET	F	M	R
HFK 121	TN	■	■									●	●		
	WR	■	■	■	■	■	■	■							
HWP 302	TN														
	WR														
HCK 152	TN	■	■	■	■	■					●	●	●	●	
	WR	■	■	■	■	■	■								
HCP 202	TN	■	■	■	■	■					●	○	○	●	○
	WR	■	■	■	■	■	■	■							

Cutting conditions	Machining conditions		Recommendation
DRY = without COOLING	F	Finishing	● Ideal
	M	Medium machining	○ Stil recommended
WET = with COOLING	R	Roughing	– Not recommended

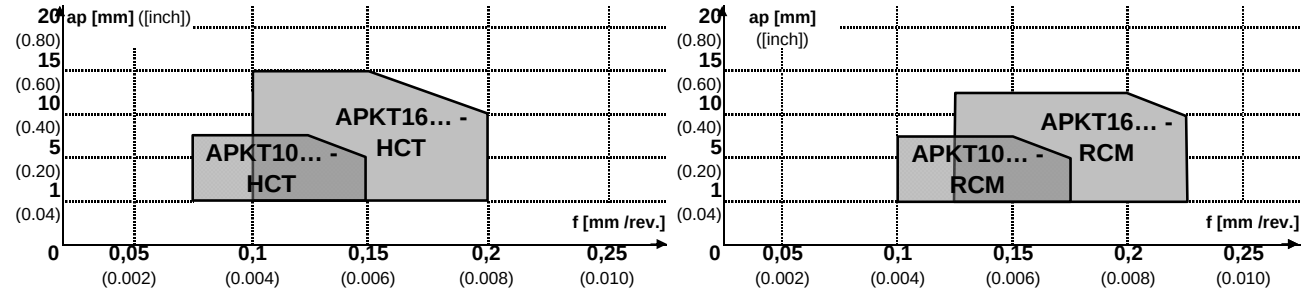
MILLING TEHNICAL GUIDE
OVERVIEW IN CAST IRON OPERATION

Technical guide

Grade



Chipbreakers



IMPORTANT:

The information you will find is based on our actual knowledge and experience. Seen the influence of some parameters by using our products, the user is not dispensed from making previous tests or verifications. No legal responsability may be associated with the characteristics or recommandations of a product for a case of application. The user has, under his own responsability, to respect all valid rights, laws and guidelines by using our products.

MILLING GRADE OVERVIEW IN NON FERROUS OPERATION

TECHNICAL GUIDE

ISO 513											
NON FERROUS	Range	5	10	15	20	25	30	35	40	45	50
	Uncoated	HFK 121									
				HFK 201							
Vc	m/min		300 - 600		300 - 500						

Finishing

Vc increasing
Vf small
ap small
Wear resistance increasing
Toughness decreasing

◀ ▶

Roughing

Vc decreasing
Vf large
ap large
Wear resistance decreasing
Toughness increasing

		SCALE 0-10=RANGE OF TN Toughness / WR Wear resistance									APPLICATION Cutting condition		APPLICATION Machining condition		
HM - GRADE		2	3	4	5	6	7	8	9	10	DRY	WET	F	M	R
HFK 121	TN	■	■	■	■							●	●		
	WR	■	■	■	■	■	■	■	■						
HFK 201	TN	■	■	■	■	■	■	■							
	WR	■	■	■	■	■	■	■							

Cutting conditions	Machining conditions		Recommendation
DRY = without COOLING	F	Finishing	● Ideal
	M	Medium machining	○ Stil recommended
WET = with COOLING	R	Roughing	— Not recommended

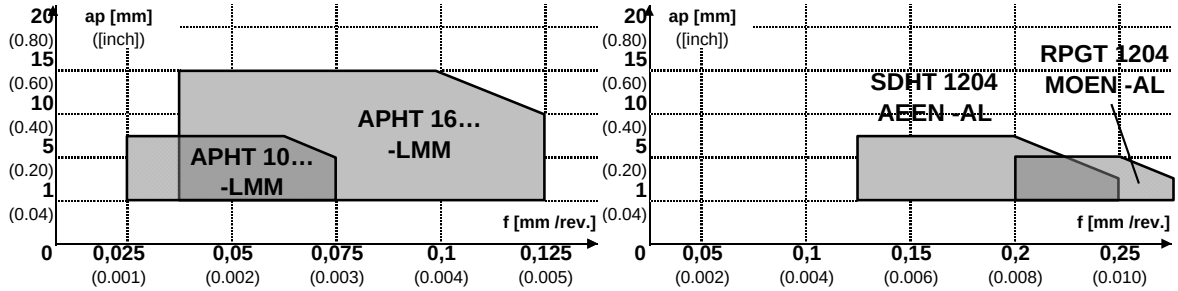
MILLING TEHNICAL GUIDE
OVERVIEW IN NON FERROUS OPERATION

Technical guide

Grade

NON FERROUS	Range	5	10	15	20	25	30	35	40	45	50
	Uncoated		HFK 121		HFK 201						
Vc	m/min		170-290		100-250						

Chipbreakers



IMPORTANT:

The information you will find is based on our actual knowledge and experience. Seen the influence of some parameters by using our products, the user is not dispensed from making previous tests or verifications. No legal responsibility may be associated with the characteristics or recommendations of a product for a case of application. The user has, under his own responsibility, to respect all valid rights, laws and guidelines by using our products.

S A N I C O M

INDUSTRIAL TOOLS

METAL CUTTING - MILLING OPERATION

INSERTS: AD..., AP..., RD..., RP...				HFK 121	HFK 201	HWP 302	HCK 101	HCK 152	HCP 101	HCP 202	HCP 252	HCP 302	HPP 202	HPP 252	HPP 302	HPP 352	HPP 402	
HELICOIDAL	FINISHING	0,8	ADKT 1505PDER-SCM										●			●		
		0,5	APKT 1003PDER-SCT								●●	●	●			●		
		0,8	APKT 1604PDER-SCT								●●	●	●			●		
			APET 0803PDFR-XE	●	●													
			APET 1003PDFR-XE															
			APET 1604PDFR-XE	●	●													
	MEDIUM		APHT 1003PDFR-LMM	●	●													
			APHT 1604PDFR-LMM	●	●													
		0,8	ADKT 1505PDER-HCM							●●				●	●	●		
		0,5	APKT 1003PDER-HCT							●●			●			●		
		0,5	APKT 1003PDER-HCM							●●				●	●	●		
		0,8	APKT 1604PDER-HCT							●●			●			●		
		0,8	APKT 1604PDER-HCM					●		●●				●		●		
		0,8	ADKT 1505PDER-SCM										●●	●●	●●	●●		
		0,5	APKT 1003PDER-SCM										●●	●●	●●	●●		
		0,8	APKT 1604PDER-SCM										●●	●●	●●	●●		
	ROUGHING	1,6	ADKT 150516-RCM					●								●●		
		2,4	ADKT 150524-RCM					●								●●		
		3,2	ADKT 150532-RCM					●								●●		
		1,6	APKT 100316-RCM					●			●●					●●		
		3,0	APKT 100330-RCM							●●								
		1,6	APKT 160416-RCM					●								●●		
		2,4	APKT 160424-RCM					●			●●					●●		
		3,2	APKT 160432-RCM					●			●●					●●		
	FINISHING		RDLT 1003MOS-SCM							●				●		●●		
			RDLT 12T3MOS-SCM							●				●		●●		
			RDLT 1604MOS-SCM							●				●		●●		
			RPGT 0602MOEN-AL		●													
			RPGT 0803MOEN-AL		●													
			RPGT 10T3MOEN-AL		●													
			RPGT 1204MOEN-AL		●													
	MEDIUM		RPMT 1204MOSN			●●						●					●●	
			RDLW 1003MOS-HCM					●		●●				●		●		
			RDLW 12T3MOS-HCM							●●				●		●		
			RDLW 1604MOS-11			●												
			RPMW 1204MOSN			●						●						

MATERIAL DESIGNATIONS						
P	●	STEELS		M	●	STAINLESS STEELS
K	●	CAST IRONS		N	●	ALUMINIUM & ALLOYS

S A N I C O M
INDUSTRIAL TOOLS

METAL CUTTING - MILLING OPERATION

INSERTS: SD..., SE..., SP..., TP...			HFK 121	HFK 201	HWP 302	HCK 101	HCK 152	HCP 101	HCP 202	HCP 252	HCP 302	HPP 202	HPP 252	HPP 302	HPP 352	HPP 402
	FINISHING	SDMT 1205PDER-SCM							●						● ●	
		SDMT 1205PDER-SCT													● ●	
		SDHT 09T3AEEN-AL		●												
		SDHT 1204AEEN-AL		●												
		SPHT 0603ADEN-AL		●												
	MEDIUM	SEKT 1204AFER-SCM							●				●		● ●	
		SEKR 1203AFSN-SCM							●				●		● ●	
		SEKR 1504AFSN-SCM							●				●		● ●	
		SPKR 1203EDER-SCM							●				●		● ●	
		SEKN 1203AFSN-HCM							● ●				●		●	
		SEKN 1504AFSN-11									●					
		SEKR 1203AFSN-HCM							● ●						●	
		SPKN 1203EDR-HCM					●		● ●				●		●	
		SPKR 1203EDER-SCM							●				●		● ●	
	FINISHING	TPKN 1603PDR-HCM							● ●				●		●	
		TPKN 2204PDR-HCM							● ●				●		●	
	MEDIUM	TPKR 1603PDSR-SCM							●				●		● ●	
		TPKR 2204PDSR-SCM							●				●		● ●	

MATERIAL DESIGNATIONS						
P	●	STEELS		M	●	STAINLESS STEELS
K	●	CAST IRONS		N	●	ALUMINIUM & ALLOYS