
inserts

Inserts

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CANELA Easy grade

Three easy steps to choose a grade.

1st - Select group material (Steel, Stainless steel, Cast iron, Non ferrous materials, heat resistant alloys or hard materials).

2nd - Select suitability. Suitability of each grade is indicated by the height of each material segment.

3rd - Select machining application. Each segment is divided into three sections, each section indicates the machining application type: roughing, medium, finishing. The main application area of each insert is indicated by a black star and the extended applications are indicated by a white star.

1st step

Steel
Unalloyed steel
Alloyed steel
Cemented steel
Constructional steel

Stainless steel
Austenitic CrNi
Martensitic Cr
Ferritic Cr
Duplex

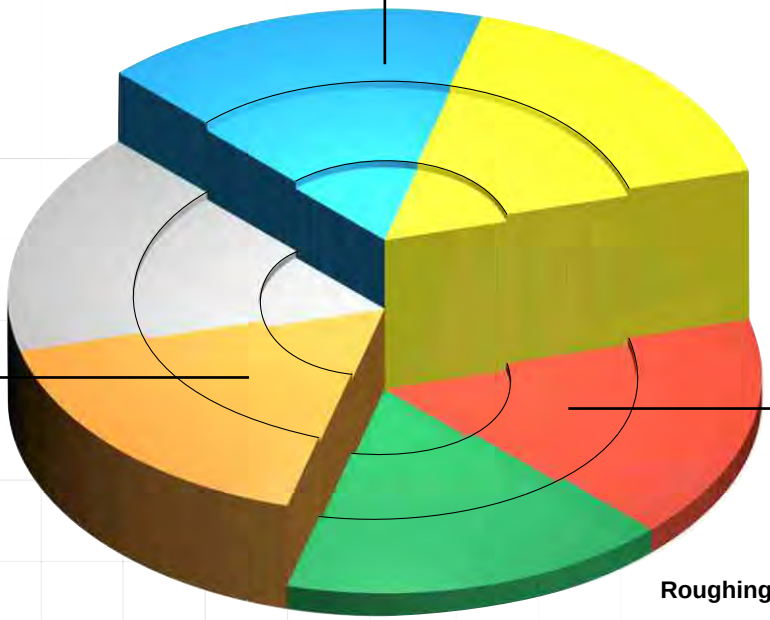
Cast iron
Grey cast iron
Sintered iron
Nodular cast iron
Chilled cast iron

Non ferrous metals
Aluminium alloys
Copper alloys

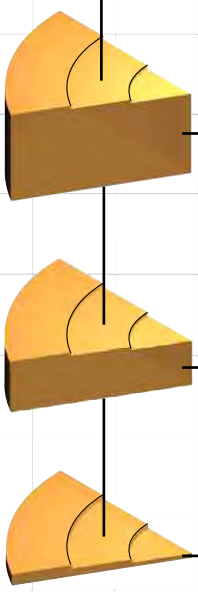
Non metal materials
Plastics
Others

Heat resistant alloys
Ti-alloys
Ni-Co base alloys

Hard materials
Hardened steels
Hard cast irons
Chilled castings



2nd step

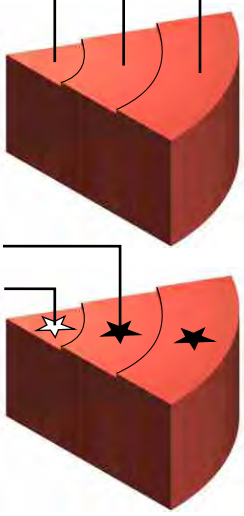


Most suitable

Suitable

Not suitable

3rd step



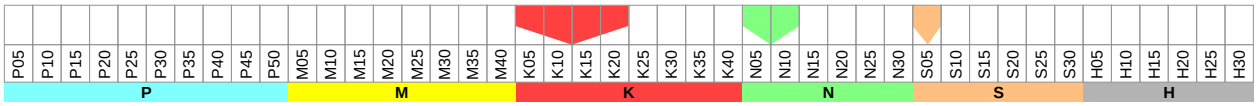
Roughing
Medium
Finishing

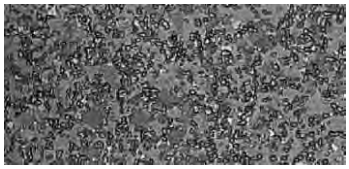
Main application
Complementary application

KM 15

Finishing grade in the K10 range. This carbide grade is for use on cast iron, aluminium and heat-resistant alloys. This grade works well on cobalt based alloys and synthetic materials and is suitable for finishing on heat-resistant alloys.

K10

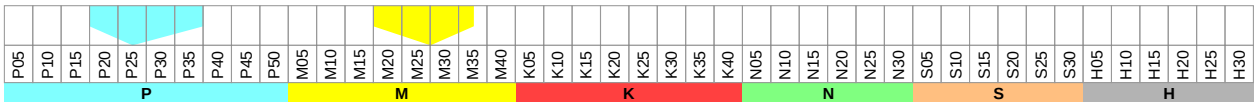


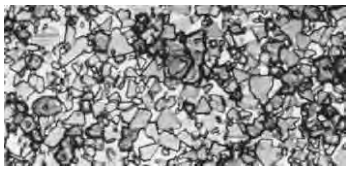


PM 25

General purpose uncoated grade in the P30 range. This tough, economical grade is suitable to work carbon steels, alloyed steels, tool steels and stainless steels.
PM25 provides toughness and resistance to deformation in roughing and semi-finishing applications.

P25 - M20

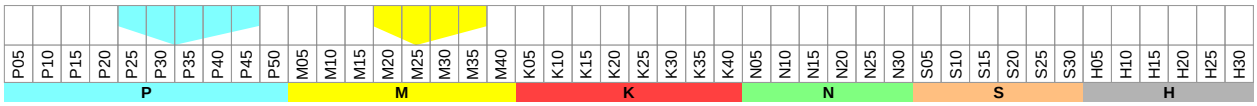


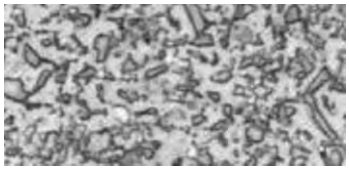


PM 40

Roughing grade in the P35 range. This tough grade is for structural, cast and tool steels.
It is recommended when toughness is more important than wear resistance.

P40 - M30

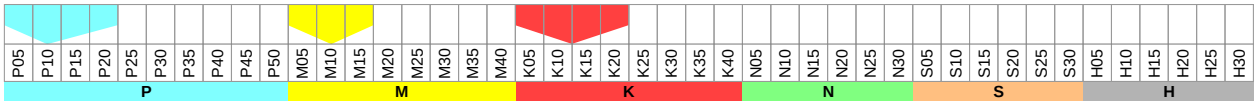


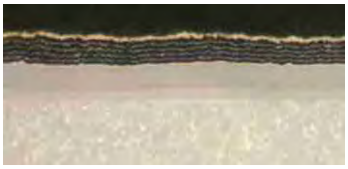


NC 25

NC 25 is a newly developed Cermet applicable for a wide range of cutting conditions as a standard grade for general machining of steel. It can successfully be used for a range of cutting speeds from (100 to 200 m/min) with better wear resistance than conventional TiC Cermet. It gives an excellent performance from semi-finish to finish operation of ductile cast iron at cutting speeds of 200 m/min. or less.

P15 - M10 - K10

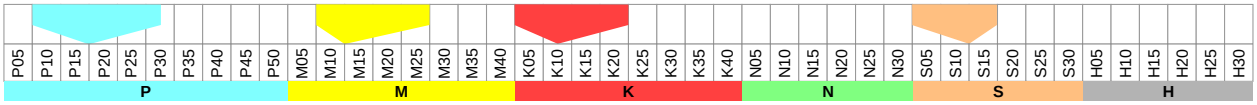


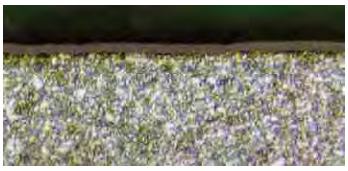


TIN 16

Wear resistant finishing to intermediate grade suitable for many applications on steel, cast iron, stainless steel and high temperature alloys. It is generally used at higher speeds where deformation may be a problem. The multi-layer coating includes TiCN and aluminium oxide.

P15 - M15 - K15

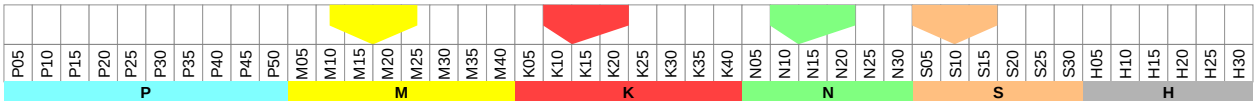


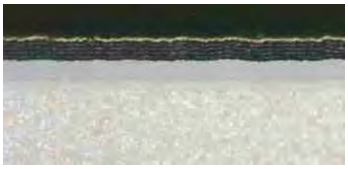


TIN 17

Coated TiAlN grade in the K20 range. This carbide grade is for use on cast iron, aluminium and heat-resistant alloys. This grade works well on cobalt based alloys and synthetic materials and is suitable for finishing on heat-resistant alloys.

K20 - M20

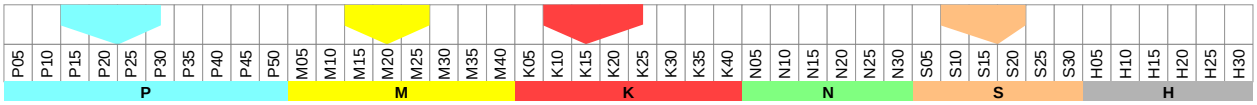




TIN 22

General purpose wear resistant grade. It has enriched substrate which has exceptionally good deformation as well as fracture resistance. The multi-layer coating includes aluminium oxide to add additional heat and wear resistance. It is used to machine steel and stainless steel at lower speeds than TIN16.

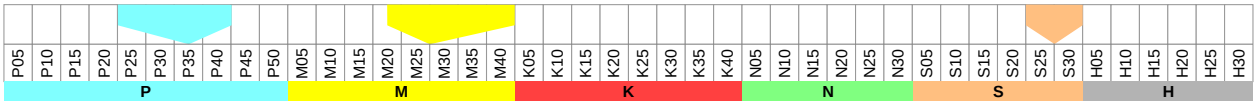
P20 - M20 - K20



TIN 32

General purpose wear resistant turning grade. The multi-layer coating includes aluminium oxide to add additional heat and wear resistance. It is used to machine steel at lower speeds than TIN16.
This turning grade is for demanding metal removal operations, including cutting through scale at low speeds through heavy interruption, and problem machining of stainless steel at low speed and poor rigidity.

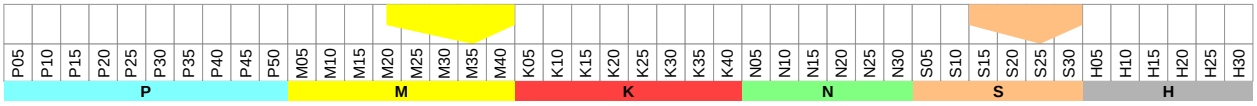
P30 - M20

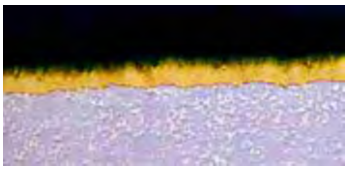


TIN 35

New coated grade developed to machine stainless steel and heat-resistance alloys. This grade is only used in combination with the CS chipbreaker. First choice for stainless steel applications.

M25

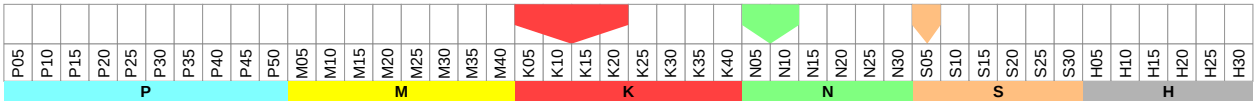




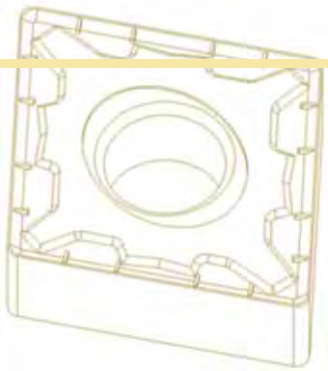
ZR 10

Micrograin grade with a extremely hard single zirconium layer for machining aluminium, copper alloys and plastics.

K10



Grade chart

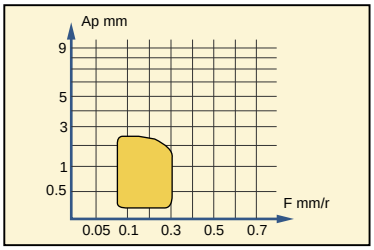


Basic geometries	Complementary geometries
CF - Canela Finishing	**CFC** - Canela Finishing Cermet
CM - Canela Medium	**CFM** - Canela Finishing Medium
CR - Canela Roughing	**CMC** - Canela Medium Cermet
CS - Canela Stainless steel	**CMF** - Canela Medium Finishing
	CMR - Canela Medium Roughing

-CF Geometry

CF chipbreakers are engineered for light finishing operations at high speeds in the 0,08 mm to 0,3 mm feed range at depths of cut between (0,2 to 2,5 mm).

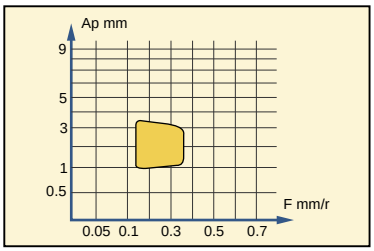
Main application area: Cutting depth (Ap): 0,2 - 2,5 mm
Feed (f): 0,08 - 0,3 mm



-CM Geometry

CM chipbreakers provide a positive rake angle with land for high edge strength in medium duty applications on a wide range of materials.
Recommended for general purpose use on all types of steel.

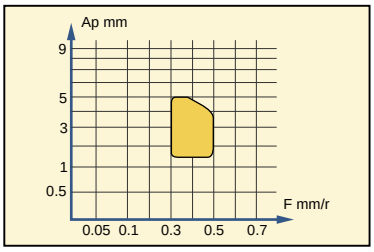
Main application area: Cutting depth (Ap): 1,0 - 3,5 mm
Feed (f): 0,15 - 0,35 mm



-CR Geometry

The strongest chipbreaker for double-sided inserts.
The CR chipbreaker is suitable for high feed rates and depths of cut that normally require single-sided inserts.
Ther chipbreaker has a wide negative T land, which gives high edge strength.

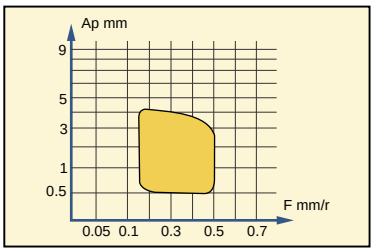
Main application area: Cutting depth (Ap): 1,5 - 5 mm
Feed (f): 0,3 - 0,5 mm



-CS Geometry

First choice for stainless steel.
CS chipbreaker provide excellent chip control with low cutting forces.

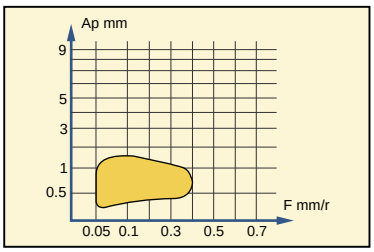
Main application area: Cutting depth (Ap): 0,5 - 4,0 mm
Feed (f): 0,15 - 0,5 mm



-CFC Geometry

CFC chipbreakers combined with the performance of Cermets provide for efficient chip control in finishing and light machining operations.
Recommended for finishing steels and cast iron.

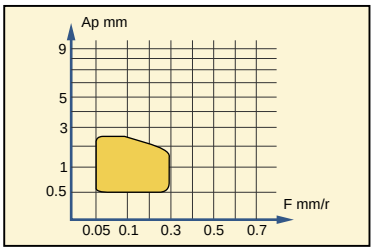
Main application area: Cutting depth (Ap): 0,2 - 1,5 mm
Feed (f): 0,05 - 0,4 mm



-CFM Geometry

Double sided insert for semi-finishing and light roughing.
12° Positive cutting angle wich reduces the cutting forces on the working piece. Chipbreaker with differential profile which reduces the contact zone and so improves thermal diffusion.
Excellent performance in steel and materials which work harden.

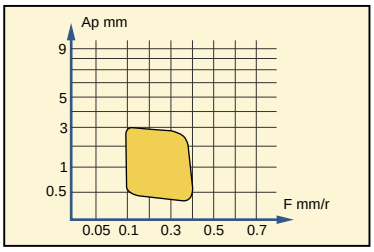
Main application area: Cutting depth (Ap): 0,5 - 2,5 mm
Feed (f): 0,05 - 0,25 mm



-CMC Geometry

Double sided insert for finishing and light roughing.
Positive cutting angle and reinforced edge, wich ensures a smooth chip control. Optimum resting surface, which ensures maximum stability and effective thermal dissipation.
Special geometry for Cermet inserts.

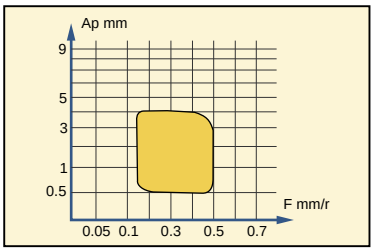
Main application area: Cutting depth (Ap): 0,3 - 3,0 mm
Feed (f): 0,1 - 0,4 mm



-CMF Geometry

CMF chipbreaker provide excellent chip control with low cutting forces and very free cutting action over a broad range of light duty applications.
Recommended for light duty use on carbon, alloy, and stainless steels.

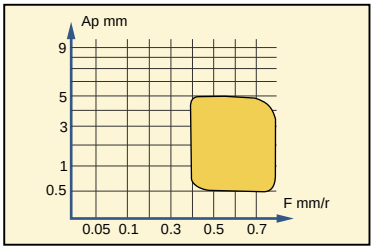
Main application area: Cutting depth (Ap): 0,5 - 4,0 mm
Feed (f): 0,15 - 0,5 mm



-CMR Geometry

Double sided insert for semi-finishing and light roughing.
12° Positive cutting angle wich reduces the cutting forces on the working piece. Chipbreaker with differential profile which reduces the contact zone and so improves thermal diffusion.
Excellent performance in steel and materials which work harden.

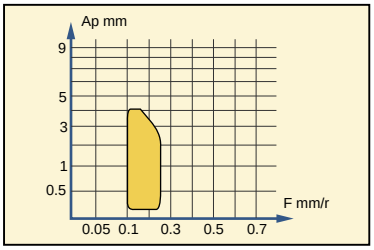
Main application area: Cutting depth (Ap): 0,5 - 5,0 mm
Feed (f): 0,4 - 0,8 mm



..NGP Geometry

For medium duty machining of tough work materials, above all chrome-nickel based alloys.
Minimises tendency for these materials to adhere to the insert.

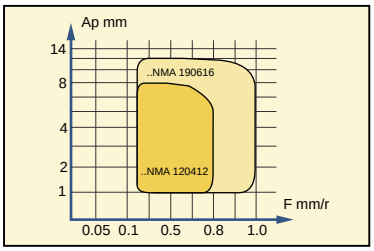
Main application area: Cutting depth (Ap): 0,1 - 4 mm
Feed (f): 0,1 - 0,25 mm



..NMA Geometry

Double sided insert for short chipping materials.
Strong cutting edge.

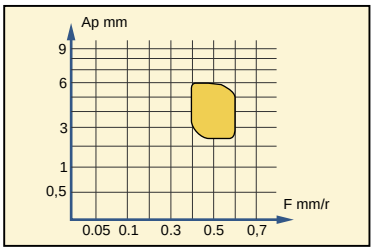
Main application area: Cutting depth (Ap): 1 - 12 mm
Feed (f): 0,2 - 1 mm



..NMM Geometry

Chipbreaker for single-sided inserts.
It has a positive cutting edge which gives rise to low cutting forces.

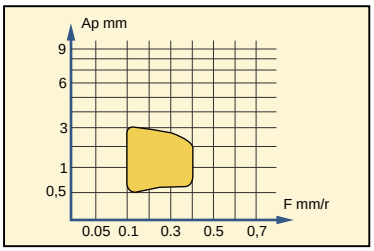
Main application area: Cutting depth (Ap): 2,5 - 6 mm
Feed (f): 0,4 - 0,6 mm



..NMX Geometry

Light duty pos/neg inserts provide excellent chip control in light feed ranges using high positive shear angles.
Recommended for machining of steels and other materials.

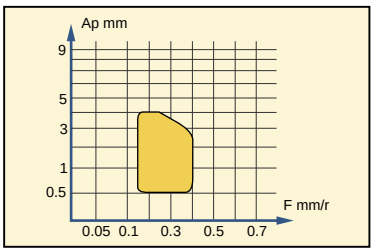
Main application area: Cutting depth (Ap): 0,5 - 3 mm
Feed (f): 0,1 - 0,4 mm



-03 Geometry

Light to medium-duty machining operations. Low cutting forces and reduced power requirements thanks to positive rake angle.
Good chip control over a wide range.
Also used on short-chipping cast-iron materials.

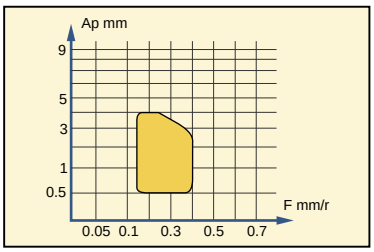
Main application area: Cutting depth (Ap): 0,5 - 4 mm
Feed (f): 0,15 - 0,4 mm



-33 Geometry

Geometry providing chip control in the finishing and medium duty range.
Positive rake reduces cutting forces and power consumption.
Can also be used on low-strength and stainless steels.

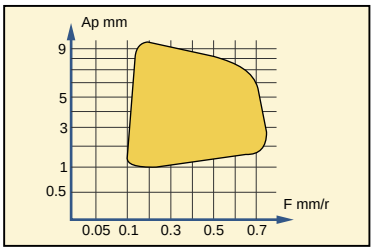
Main application area: Cutting depth (Ap): 0,5 - 4 mm
Feed (f): 0,15 - 0,4 mm



-AL Geometry

Geometry can be used for turning aluminium, light alloys, non ferrous metals, high-melting metals, plastics, glass fiber reinforced plastics, laminated board, carbon and fine ceramics.

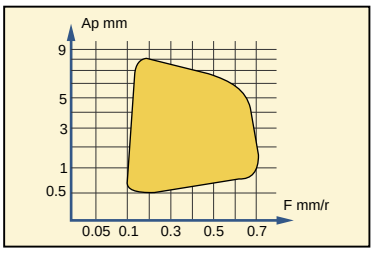
Main application area: Cutting depth (Ap): 1 - 10 mm
Feed (f): 0,1 - 0,75 mm



-AP Geometry

Geometry can be used for turning aluminium, light alloys, non ferrous metals, high-melting metals, plastics, glass fiber reinforced plastics, laminated board, carbon and fine ceramics.

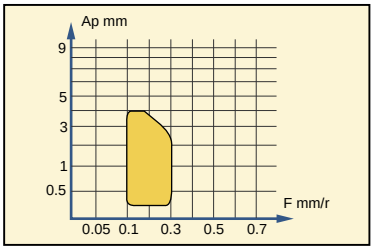
Main application area: Cutting depth (Ap): 0,5 - 8 mm
Feed (f): 0,1 - 0,7 mm



..MW Geometry

Double sided insert for short chipping materials.
Strong cutting edge.

Main application area: Cutting depth (Ap): 0,2 - 4 mm
Feed (f): 0,1 - 0,3 mm



Basic geometries (steel)

1 - Select geometry

-CFC

▼▼▼▼ **Super finishing**

-CF

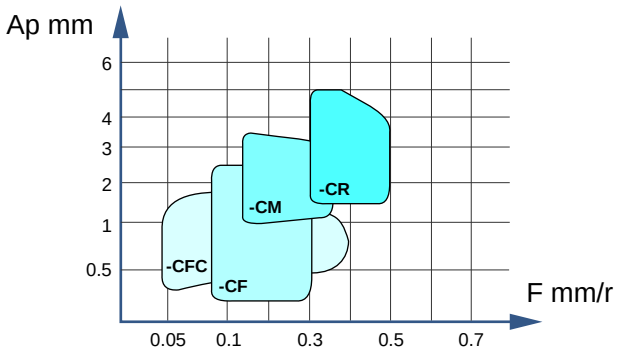
▼▼▼ **Finishing**

-CM

▼▼ **Medium machining**

-CR

▼ **Roughing**



2 - Select grade

Cutting condition

	▼▼▼▼ Super finishing	▼▼▼ Finishing	▼▼ Medium machining	▼ Roughing
Interrupted cut	-	TIN32	TIN32	PM25 - TIN32
Inconsistent cut	NC25	TIN16	TIN16 - TIN22	TIN22 - TIN32
Consistent cut	NC25	TIN16	TIN16	TIN22 - TIN32

3 - Select cutting speed

Proceed to page B.77 for cutting data

Complementary geometries (steel)

1 - Select geometry

-CFM

▼▼▼ **Finishing**

-CMF

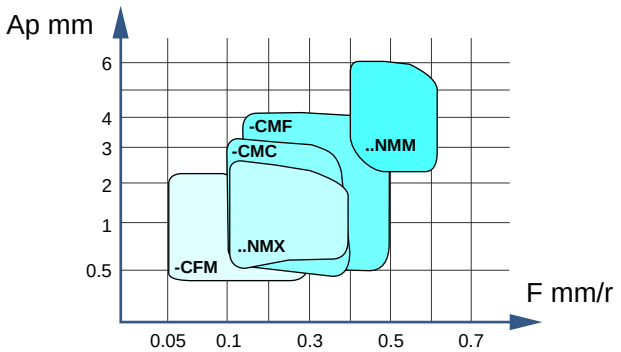
-CMC

..NMX

▼▼ **Medium machining**

..NMM

▼ **Roughing**



2 - Select grade

Cutting condition

	▼▼▼ Finishing	▼▼ Medium machining	▼ Roughing
Interrupted cut	TIN32	TIN32	TIN32
Inconsistent cut	TIN16 - TIN32	NC25 - TIN22 - TIN32	TIN32
Consistent cut	TIN16	NC25 - TIN16 - TIN32	TIN32

3 - Select cutting speed

Proceed to page B.77 for cutting data

Basic geometries (Stainless steel)

1 - Select geometry


-CFC

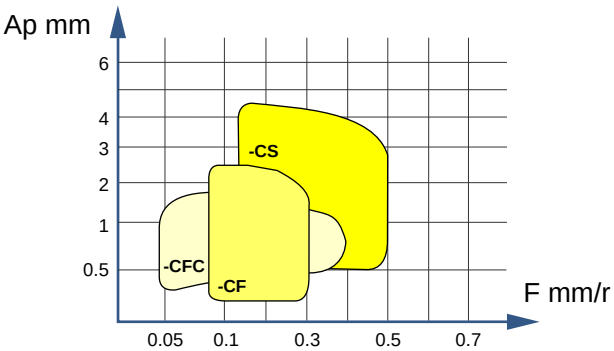

-CF


-CS


-CS


-CS

▼▼▼▼ **Super finishing** ▼▼▼ **Finishing** ▼▼ **Medium machining** ▼ **Roughing**



2 - Select grade

Cutting condition	▼▼▼▼ Super finishing	▼▼▼ Finishing	▼▼ Medium machining	▼ Roughing
Interrupted cut	-	TIN32 - TIN35	TIN32 - TIN35	TIN35
Inconsistent cut	NC25	TIN16 - TIN32 - TIN35	TIN32 - TIN35	TIN35
Consistent cut	NC25	TIN16 - TIN32 - TIN35	TIN32 - TIN35	TIN35

3 - Select cutting speed

Proceed to page B.77 for cutting data

Complementary geometries (Stainless steel)

1 - Select geometry


-CFM

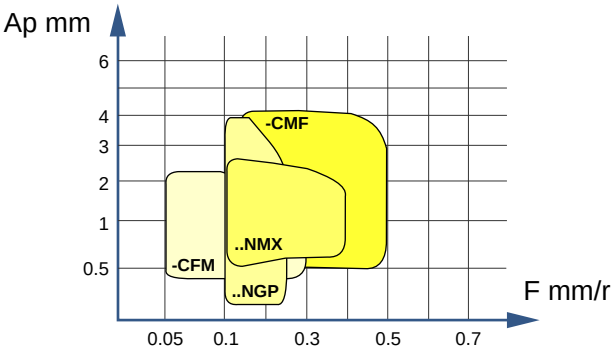

..NGP


-CMF


..NGP


..NMX

▼▼▼ **Finishing** ▼▼ **Medium machining**



2 - Select grade

Cutting condition	▼▼▼ Finishing	▼▼ Medium machining
Interrupted cut	TIN32	TIN32
Inconsistent cut	TIN17 - TIN32	NC25 - TIN17 - TIN32
Consistent cut	TIN17 - TIN32	NC25 - TIN17 - TIN32

3 - Select cutting speed

Proceed to page B.77 for cutting data

Basic geometries (Cast iron)

1 - Select geometry

-CFC

▼▼▼▼ **Super finishing**

-CF

▼▼▼ **Finishing**

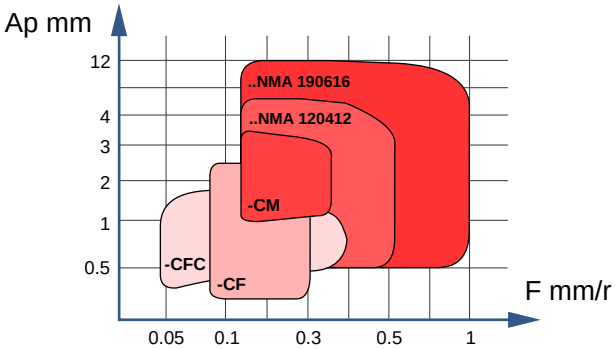
..NMA

-CM

▼▼ **Medium machining**

..NMA

▼ **Roughing**



2 - Select grade

Cutting condition

	▼▼▼▼ Super finishing	▼▼▼ Finishing	▼▼ Medium machining	▼ Roughing
Interrupted cut	-	TIN16	TIN16 - TIN17	TIN16 - TIN17
Inconsistent cut	NC25	TIN16	TIN16 - TIN17	TIN16 - TIN17
Consistent cut	NC25	TIN16	TIN16 - TIN17	TIN16 - TIN17

3 - Select cutting speed

Proceed to page B.77 for cutting data

Complementary geometries (Cast iron)

1 - Select geometry

..NGP

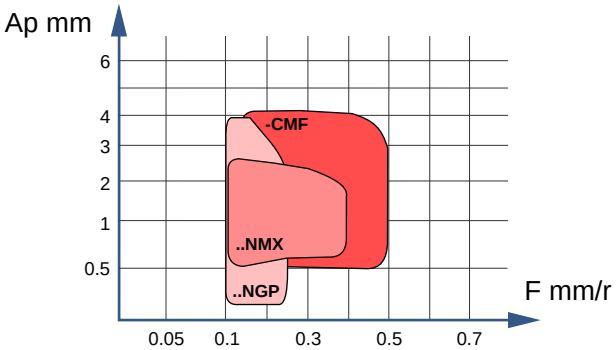
▼▼▼ **Finishing**

-CMF

..NMX

▼▼ **Medium machining**

..NGP



2 - Select grade

Cutting condition

	▼▼▼ Finishing	▼▼ Medium machining
Interrupted cut	TIN16 - TIN17	NC25 - TIN16 - TIN17
Inconsistent cut	NC25 - TIN16 - TIN17	NC25 - TIN16 - TIN17
Consistent cut	NC25 - TIN16 - TIN17	NC25 - TIN16 - TIN17

3 - Select cutting speed

Proceed to page B.77 for cutting data

Basic geometries (Non ferrous materials)

1 - Select geometry


..NGP


-CFM

▼▼▼ Finishing


..NGP

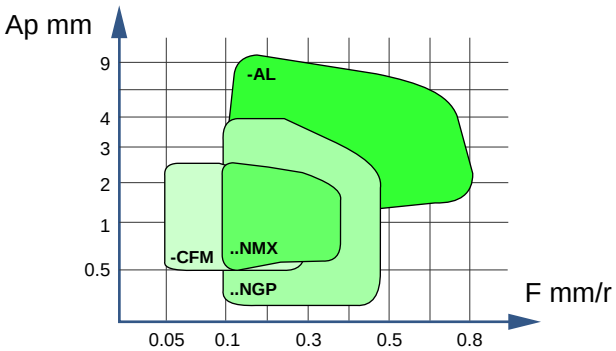

..NMX

▼▼ Medium machining


..NGP


..NMX

▼ Roughing




-AL / -AP

Positive inserts

2 - Select grade

Cutting condition	▼▼▼ Finishing	▼▼ Medium machining	▼ Roughing
Interrupted cut	KM15 - TIN16 - TIN17 - ZR10	NC25 - TIN17 - ZR10	NC25 - TIN17 - ZR10
Inconsistent cut	KM15 - TIN16 - TIN17 - ZR10	NC25 - TIN17 - ZR10	NC25 - TIN17 - ZR10
Consistent cut	KM15 - TIN16 - TIN17 - ZR10	NC25 - TIN17 - ZR10	NC25 - TIN17 - ZR10

3 - Select cutting speed

Proceed to page B.77 for cutting data

Basic geometries (Heat resistant alloys)

1 - Select geometry


..NGP

▼▼▼ Finishing


-CM

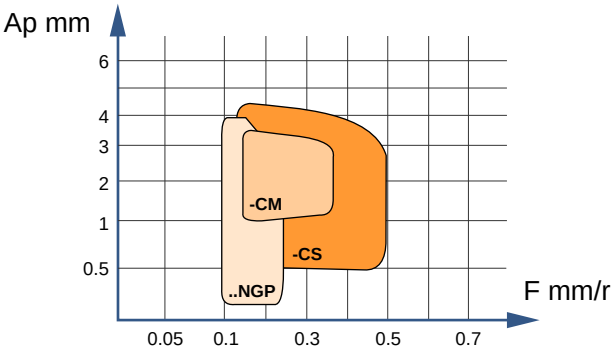

-CS

▼▼ Medium machining


..NGP


-CS

▼ Roughing



2 - Select grade

Cutting condition	▼▼▼ Finishing	▼▼ Medium machining	▼ Roughing
Interrupted cut	TIN17	TIN17 - TIN32 - TIN35	TIN35
Inconsistent cut	TIN17	TIN17 - TIN32 - TIN35	TIN35
Consistent cut	TIN17	TIN17 - TIN32 - TIN35	TIN35

3 - Select cutting speed

Proceed to page B.77 for cutting data

Insert shape

35°	V
55°	D
75°	E
80°	C
86°	M
55°	K
82°	B
85°	A
90°	L
108°	P
120°	H
135°	O
-	R
90°	S
60°	T
80°	W

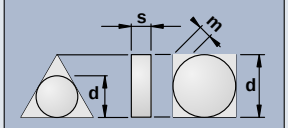
Clearance angle

3°	A
5°	B
7°	C
15°	D
20°	E
25°	F
30°	G
0°	N
11°	P

Clearance angles not included with in the standard for which particular information is necessary.

Tolerances

d	m	s	
0,025	0,005	0,025	A
0,013	0,005	0,025	F
0,025	0,013	0,025	C
0,013	0,013	0,025	H
0,025	0,025	0,025	E
0,025	0,025	0,13	G
0,05-0,15	0,005	0,025	J
0,05-0,15	0,013	0,025	K
0,05-0,15	0,025	0,025	L
0,05-0,15	0,08-0,20	0,13	M
0,05-0,15	0,08-0,20	0,025	N
0,08-0,25	0,13-0,38	0,13	U



Form of top surface

	N
	R
	F
	A
	M
	G
	W
	T
	Q
	U
	B
	H
	C
	J
Special version	X

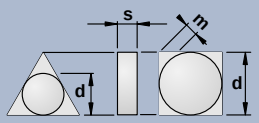
C

N

M

G

A	0,0010	0,0002	0,001
F	0,0005	0,0002	0,001
C	0,0010	0,0005	0,001
H	0,0005	0,0005	0,001
E	0,0010	0,0010	0,001
G	0,0010	0,0010	0,005
J	0,002 to 0,006*	0,0002	0,001
K	0,002 to 0,006*	0,0005	0,001
L	0,002 to 0,006*	0,0010	0,001
M	0,002 to 0,006*	0,003 to 0,008*	0,005
N	0,002 to 0,006*	0,003 to 0,008*	0,001
U	0,003 to 0,010*	0,005 to 0,015*	0,005
	d	m	s



** Depends on insert size*

Tolerance (inches)

N / R / F	E
A / M / G	D
X	X
IK > 1/4"	**IK < 1/4"**

Symbols as above
Changes at inscribed circle IK < 1/4"

Form of top surface

Edge cutting length

06	5/32	3,96	**03**
09	7/32	5,56	**05**
11	1/4	6,35	**06**
16	3/8	9,52	**09**
22	1/2	12,7	**12**
27	5/8	15,8	**15**
33	3/4	19,0	**19**
44	1	25,4	**25**
mm	mm	inch	mm
06	10	16	25
08	12	20	32

Insert thickness

1/16	1,59	**01**
3/32	2,38	**02**
1/8	3,18	**03**
5/32	3,97	**T3**
3/16	4,76	**04**
7/32	5,56	**05**
1/4	6,35	**06**
5/16	7,94	**07**
3/8	9,52	**09**
inch	mm	

Corner radius

00	0,0	**12**	1,2
M0	0,0	**16**	1,6
02	0,2	**20**	2,0
04	0,4	**24**	2,4
08	0,8	**32**	3,2

Inserts with corner radius

Inserts with secondary cutting edge

A	45°	**F**	85°
D	60°	**P**	90°
E	75°		

Angle of main cutting edge to secondary cutting angle

A	3°	**F**	25°
B	5°	**G**	30°
C	7°	**N**	0°
D	15°	**P**	11°
E	20°	**Z**	Special

Clearance angle

Cutting edge

- **F** *Sharp*
- **E** *Honed*
- **T** *Chamfered*
- **S** *Chamfered and honet*
- **K** *Double-chamfered*
- **P** *Double-chamfered and honet*

Cutting direction

- **R**
- **L**
- **N**

12 04 08

4 3 2

1/4	**2**
3/8	**3**
1/2	**4**
5/8	**5**
3/4	**6**
1	**8**

Cutting edge length (inch)

1/16	**1**
1/8	**2**
3/16	**3**
1/4	**4**
5/16	**5**
3/8	**6**

Insert thickness (inch)

max. 0,004	**0**
1/64	**1**
1/32	**2**
3/64	**3**
1/16	**4**
5/64	**5**
3/32	**6**
7/64	**7**
1/8	**8**
-	**X**

Corner radius (inch)

For special forms of the chip groove in the 10° position manufacturer specific chip grooves and designations can be indicated.

CCGT-AL

80° Rhombic Positive
Page A.18 7°

CCGT-AP

80° Rhombic Positive
Page A.18 7°

CCMT-03

80° Rhombic Positive
Page A.18 7°

CCMW

80° Rhombic Positive
Page A.18 7°

CNGP

80° Rhombic Negative
Page A.18 0°

CNMA

80° Rhombic Negative
Page A.19 0°

CNMG-CF

80° Rhombic Negative
Page A.19 0°

CNMG-CFC

80° Rhombic Negative
Page A.19 0°

CNMG-CFM

80° Rhombic Negative
Page A.19 0°

CNMG-CM

80° Rhombic Negative
Page A.19 0°

CNMG-CMC

80° Rhombic Negative
Page A.20 0°

CNMG-CMF

80° Rhombic Negative
Page A.20 0°

CNMG-CMR

80° Rhombic Negative
Page A.20 0°

CNMG-CR

80° Rhombic Negative
Page A.20 0°

CNMG-CS

80° Rhombic Negative
Page A.20 0°

CNMM

80° Rhombic Negative
Page A.21 0°

DCGT-AL

55° Rhombic Positive
Page A.21 7°

DCGT-AP

55° Rhombic Positive
Page A.21 7°

DCMT-03

55° Rhombic Positive
Page A.21 7°

DCMW

55° Rhombic Positive
Page A.21 7°

DNGP

55° Rhombic Negative
Page A.22 0°

DNMA

55° Rhombic Negative
Page A.22 0°

DNMG-CF

55° Rhombic Negative
Page A.22 0°

DNMG-CFC

55° Rhombic Negative
Page A.22 0°

DNMG-CFM

55° Rhombic Negative
Page A.22 0°

DNMG-CM

55° Rhombic Negative
Page A.23 0°

DNMG-CMC

55° Rhombic Negative
Page A.23 0°

DNMG-CMF

55° Rhombic Negative
Page A.23 0°

DNMG-CMR

55° Rhombic Negative
Page A.23 0°

DNMG-CS

55° Rhombic Negative
Page A.23 0°

DNMX

55° Rhombic Negative
Page A.24 0°

ECMT

75° Rhombic Positive
Page A.24 7°

EPMT

75° Rhombic Positive
Page A.24 11°

EPMW

75° Rhombic Positive
Page A.24 11°

EPMX

75° Rhombic Positive
Page A.24 11°

GXGP-AL

Double-ended
Page A.25

KNUX

KNUX Negative
Page A.24 0°

RCGT-AL

Round Positive
Page A.25 7°

RCGT-AP

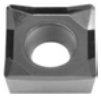
Round Positive
Page A.25 7°

RCMT

Round Positive
Page A.25 7°

RNMG

Round Negative
Page A.26 0°

SCGT-AL

Square Positive Page A.26 7°

SCMT-03

Square Positive Page A.26 7°

SCMT-39

Square Positive Page A.26 7°

SCMW

Square Positive Page A.26 7°

SNMA

Square Negative Page A.27 0°

SNMG-CFM

Square Negative Page A.27 0°

SNMG-CMR

Square Negative Page A.27 0°

SNMG-CR

Square Negative Page A.27 0°

SNMM

Square Negative Page A.27 0°

SPMR-33

Square Positive Page A.28 11°

SPMT

Square Positive Page A.28 11°

SPUN

Square Positive Page A.28 11°

TCGT-AL

Triangular Positive Page A.28 7°

TCMT-03

Triangular Positive Page A.28 7°

TCMW

Triangular Positive Page A.29 7°

TNMA

Triangular Negative Page A.29 0°

TNMG-CF

Triangular Negative Page A.29 0°

TNMG-CFC

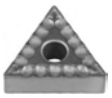
Triangular Negative Page A.29 0°

TNMG-CFM

Triangular Negative Page A.29 0°

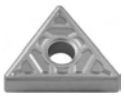
TNMG-CM

Triangular Negative Page A.30 0°

TNMG-CMC

Triangular Negative Page A.30 0°

TNMG-CMF

Triangular Negative Page A.30 0°

TNMG-CMR

Triangular Negative Page A.30 0°

TNMG-CS

Triangular Negative Page A.30 0°

TNMX

Triangular Positive Page A.31 11°

TPMN

Triangular Positive Page A.31 11°

TPMR-33

Triangular Positive Page A.31 11°

TPUN

Triangular Positive Page A.31 11°

TPUX

Triangular Negative Page A.32 11°

VBMT

35° Rhombic Positive Page A.32 5°

VCGT-AL

35° Rhombic Positive Page A.32 7°

VCGT-AL

35° Rhombic Positive Page A.32 7°

VCGT-AP

35° Rhombic Positive Page A.32 7°

VCGT-AP

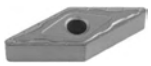
35° Rhombic Positive Page A.33 7°

VCMT-03

35° Rhombic Positive Page A.33 7°

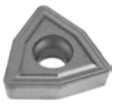
VNGP

35° Rhombic Negative Page A.33 0°

VNMG

35° Rhombic Negative Page A.33 0°

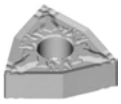
VNMG-CMC

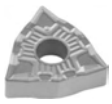
35° Rhombic Negative Page A.33 0°

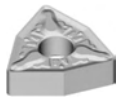
WCMX

80º Trigon Positive Page A.34 7°

WNMA

80º Trigon Negative Page A.34 0°

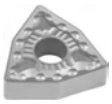
WNMG-CF

80º Trigon Negative Page A.34 0°

WNMG-CFM

80º Trigon Negative Page A.34 0°

WNMG-CM

80º Trigon Negative Page A.35 0°

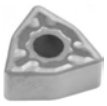
WNMG-CMC

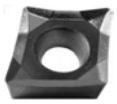
80º Trigon Negative Page A.35 0°

WNMG-CMF

80º Trigon Negative Page A.35 0°

WNMG-CMR

80º Trigon Negative Page A.35 0°

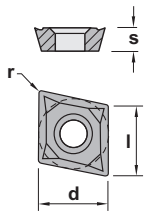
WNMG-CS

80º Trigon Negative Page A.35 0°



Positive 7° clearance - 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CCGT-AL

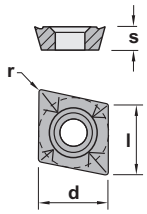


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CCGT 060202-AL	6,45	2,38	6,35	0,2	●									○
CCGT 060204-AL	6,45	2,38	6,35	0,4	●									○
CCGT 09T302-AL	9,65	3,97	9,52	0,2	●									○
CCGT 09T304-AL	9,65	3,97	9,52	0,4	●									○
CCGT 09T308-AL	9,65	3,97	9,52	0,8	●									○
CCGT 120402-AL	12,90	4,76	12,70	0,2	●									○
CCGT 120404-AL	12,90	4,76	12,70	0,4	●									○
CCGT 120408-AL	12,90	4,76	12,70	0,8	●									○

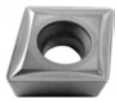
Positive 7° clearance - 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CCGT-AP



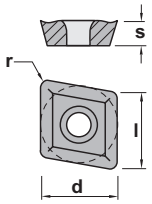
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CCGT 060202-AP	6,45	2,38	6,35	0,2	●									○
CCGT 060204-AP	6,45	2,38	6,35	0,4	●									○
CCGT 09T302-AP	9,65	3,97	9,52	0,2	●									○
CCGT 09T304-AP	9,65	3,97	9,52	0,4	●									○
CCGT 09T308-AP	9,65	3,97	9,52	0,8	●									○
CCGT 120402-AP	12,90	4,76	12,70	0,2	●									○
CCGT 120404-AP	12,90	4,76	12,70	0,4	●									○
CCGT 120408-AP	12,90	4,76	12,70	0,8	●									○



Positive 7° clearance - 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CCMT-03

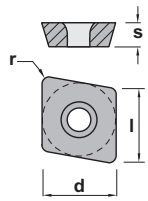


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CCMT 060202-03	6,45	2,38	6,35	0,2		●			●					
CCMT 060204-03	6,45	2,38	6,35	0,4	●	●		●	●			●	●	
CCMT 080304-03	8,05	3,18	7,94	0,4	●	●			●					
CCMT 080308-03	8,05	3,18	7,94	0,8		●			●					
CCMT 09T304-03	9,65	3,97	9,52	0,4	●	●		●	●			●	●	
CCMT 09T308-03	9,65	3,97	9,52	0,8	●	●		●	●				●	
CCMT 120408-03	12,90	4,76	12,70	0,8		●			●			●		

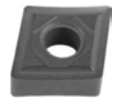
Positive 7° clearance - 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CCMW



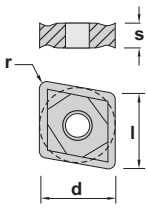
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CCMW 060202	6,45	2,38	6,35	0,2		●								
CCMW 060204	6,45	2,38	6,35	0,4		●								
CCMW 080304	8,05	3,18	7,94	0,4		●								
CCMW 09T304	9,65	3,97	9,52	0,4		●								
CCMW 09T308	9,65	3,97	9,52	0,8		●								
CCMW 120408	12,90	4,76	12,70	0,8		●								



Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNGP

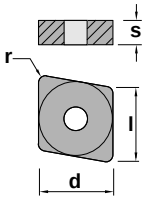


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNGP 120404	12,90	4,76	12,70	0,4						●				
CNGP 120408	12,90	4,76	12,70	0,8						●				

Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMA

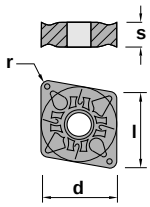


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMA 120408	12,90	4,76	12,70	0,8	●					●				
CNMA 120412	12,90	4,76	12,70	1,2						○				

Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMG-CF

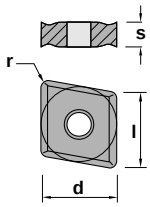


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMG 120404-CF	12,90	4,76	12,70	0,4					●			●		

Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMG-CFC

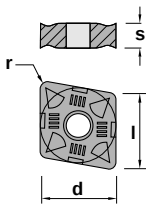


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMG 120404-CFC	12,90	4,76	12,70	0,4				●						

Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMG-CFM

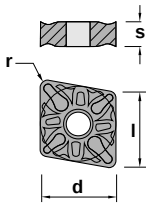


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMG 120404-CFM	12,90	4,76	12,70	0,4					●					

Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMG-CM



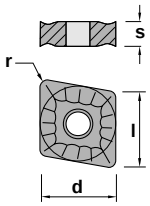
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMG 120408-CM	12,90	4,76	12,70	0,8					●			●		

Inserts

Negative 80° rhombic insert

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMG-CMC

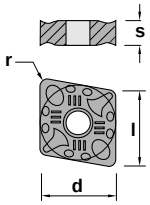


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMG 120408-CMC	12,90	4,76	12,70	0,8				●						

Negative 80° rhombic insert

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMG-CMF

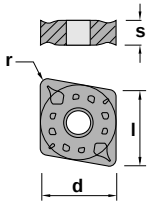


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMG 120408-CMF	12,90	4,76	12,70	0,8					●			●		

Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMG-CMR

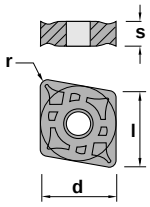


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMG 090304-CMR	9,65	3,18	9,52	0,4					●					
CNMG 090308-CMR	9,65	3,18	9,52	0,8							●			
CNMG 120408-CMR	12,90	4,76	12,70	0,8		●			●		●	●		
CNMG 120412-CMR	12,90	4,76	12,70	1,2							●			

Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMG-CR

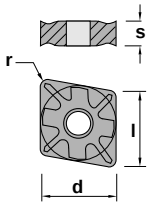


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMG 120408-CR	12,90	4,76	12,70	0,8								●		
CNMG 120412-CR	12,90	4,76	12,70	1,2								●		
CNMG 160608-CR	16,10	6,35	15,88	0,8								○		
CNMG 160612-CR	16,10	6,35	15,88	1,2								○		
CNMG 190612-CR	19,30	6,35	19,05	1,2								○		
CNMG 190616-CR	19,30	6,35	19,05	1,6								○		

Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMG-CS

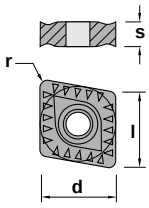


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMG 090304-CS	9,65	3,18	9,52	0,4									●	
CNMG 090308-CS	9,65	3,18	9,52	0,8									●	
CNMG 120404-CS	12,90	4,76	12,70	0,4									●	
CNMG 120408-CS	12,90	4,76	12,70	0,8									●	

Negative 80° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

CNMM

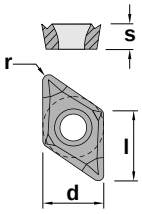


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
CNMM 120408	12,90	4,76	4,76	0,8								○		
CNMM 120412	12,90	4,76	4,76	1,2								○		
CNMM 160612	16,10	6,35	6,35	1,2								○		
CNMM 190608	19,30	6,35	6,35	0,8								○		
CNMM 190612	19,30	6,35	6,35	1,2								○		

Positive 7° clearance - 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DCGT-AL

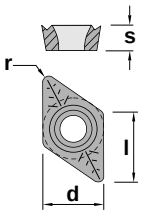


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DCGT 070202-AL	7,75	2,38	6,35	0,2	●									○
DCGT 070204-AL	7,75	2,38	6,35	0,4	●									○
DCGT 11T302-AL	11,60	3,97	9,52	0,2	●									○
DCGT 11T304-AL	11,60	3,97	9,52	0,4	●									○
DCGT 11T308-AL	11,60	3,97	9,52	0,8	●									○

Positive 7° clearance - 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DCGT-AP

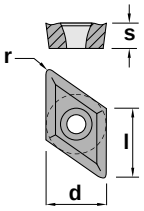


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DCGT 070202-AP	7,75	2,38	6,35	0,2	●									○
DCGT 070204-AP	7,75	2,38	6,35	0,4	●									○
DCGT 11T302-AP	11,60	3,97	9,52	0,2	●									○
DCGT 11T304-AP	11,60	3,97	9,52	0,4	●									○
DCGT 11T308-AP	11,60	3,97	9,52	0,8	●									○

Positive 7° clearance - 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DCMT-03

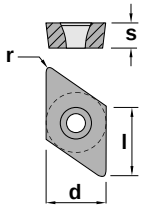


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DCMT 070204-03	7,75	2,38	6,35	0,4	○	●		●	●			●	●	
DCMT 11T304-03	11,60	3,97	9,52	0,4	○	●		●	●			●	●	
DCMT 11T308-03	11,60	3,97	9,52	0,8		○		●	●			●	●	
DCMT 150408-03	15,50	4,76	12,70	0,8		○			○					

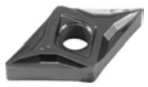
Positive 7° clearance - 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DCMW



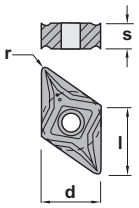
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DCMW 11T304	11,60	3,97	9,52	0,4	●									
DCMW 11T308	11,60	3,97	9,52	0,8	●									
DCMW 150408	15,50	4,76	12,70	0,8	●									



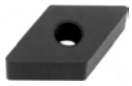
Negative 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNGP



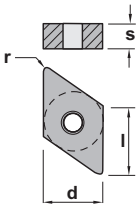
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNGP 150404	15,50	4,76	12,70	0,4						●				
DNGP 150408	15,50	4,76	12,70	0,8						●				



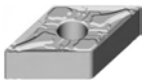
Negative 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMA



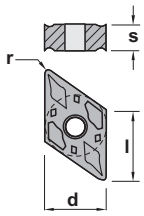
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMA 150608	15,50	6,35	12,70	0,8						○				
DNMA 150612	15,50	6,35	12,70	1,2						○				



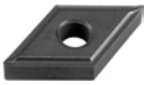
Negative 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMG-CF



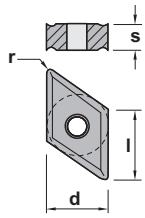
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMG 150604-CF	15,50	6,35	12,70	0,4					●			●		



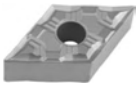
Negative 55° rhombic insert

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMG-CFC



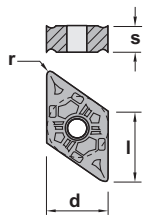
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMG 150404-CFC	15,50	4,76	12,70	0,4				●						



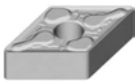
Negative 55° rhombic insert.

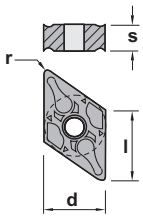
Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMG-CFM



	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMG 150404-CFM	15,50	4,76	12,70	0,4					●					
DNMG 150604-CFM	15,50	6,35	12,70	0,4					●					



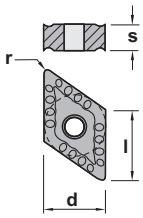


Negative 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMG-CM

	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMG 150608-CM	15,50	6,35	12,70	0,8					●			●		

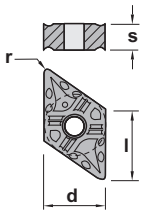


Negative 55° rhombic insert

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMG-CMC

	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMG 150408-CMC	15,50	4,76	12,70	0,8				●						

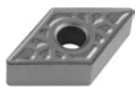


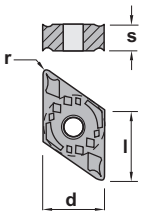
Negative 55° rhombic insert

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMG-CMF

	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMG 150608-CMF	15,50	6,35	12,70	0,8					●			●		



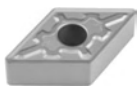


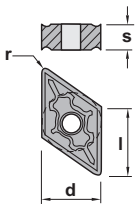
Negative 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMG-CMR

	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMG 110404-CMR	11,60	4,76	9,52	0,4					●					
DNMG 110408-CMR	11,60	4,76	9,52	0,8							●			
DNMG 150408-CMR	15,50	4,76	12,70	0,8							●			
DNMG 150608-CMR	15,50	6,35	12,70	0,8							●	●		
DNMG 150612-CMR	15,50	6,35	12,70	1,2								●		
DNMG 190608-CMR	19,40	6,35	15,88	0,8							○	○		
DNMG 190612-CMR	19,40	6,35	15,88	1,2							○	○		



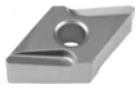


Negative 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMG-CS

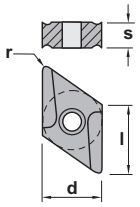
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMG 110404-CS	11,60	4,76	9,52	0,4									●	
DNMG 110408-CS	11,60	4,76	9,52	0,8									●	
DNMG 150604-CS	15,50	6,35	12,70	0,4									●	
DNMG 150608-CS	15,50	6,35	12,70	0,8									●	



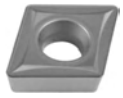
Negative 55° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

DNMX



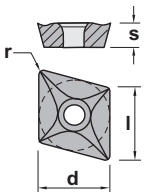
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
DNMX 150604R-22	6,57	2,38	6,35	0,4					●					
DNMX 150608R-22	8,20	3,18	7,93	0,4					●					



Positive 7° clearance - 75° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

ECMT

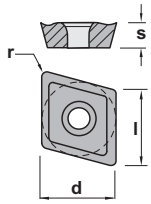


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
ECMT 060204	6,57	2,38	6,35	0,4					●					
ECMT 080304	8,20	3,18	7,93	0,4					●					
ECMT 120404	12,40	4,00	12,00	0,4		○			●					
ECMT 120408	12,40	4,00	12,00	0,8	○	○			●					
ECMT 120412	12,40	4,00	12,00	1,2		○								

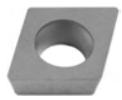
Positive 11° clearance - 75° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

EPMT



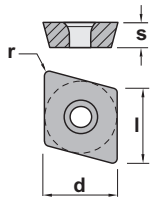
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
EPMT 080302-30	8,28	3,00	8,00	0,2		○								
EPMT 080304-30	8,28	3,00	8,00	0,4		●			●					
EPMT 080308-30	8,28	3,00	8,00	0,8		●			●					



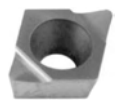
Positive 11° clearance - 75° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

EPMW



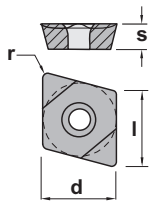
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
EPMW 040204	4,92	2,38	4,76	0,4		●			●					
EPMW 080304	8,28	3,00	8,00	0,4		○								
EPMW 080308	8,28	3,00	8,00	0,8		○								



Positive 11° clearance - 75° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

EPMX

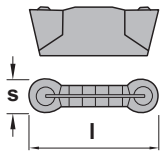


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
EPMX 040204	4,92	2,38	4,76	0,4		●								

Double ended insert

Normally available for immediate delivery ●
Only available in a limited quantity ○

GXGP-AL

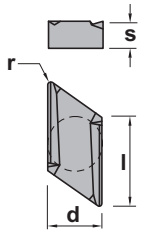


	l	s	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
GXGP-253.0-AL	31,00	6,00	●									○
GXGP-254.0-AL	31,00	8,00	●									○

Negative KNUX insert

Normally available for immediate delivery ●
Only available in a limited quantity ○

KNUX

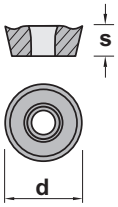


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
KNUX 160405L-21	16,00	4,76	9,52	0,5		●			●			●		
KNUX 160405L-32	16,00	4,76	9,52	0,5		●			●					
KNUX 160405R-21	16,00	4,76	9,52	0,5		●			●			●		
KNUX 160405R-32	16,00	4,76	9,52	0,5		●			●					
KNUX 160410L-21	16,00	4,76	9,52	1,0		●						●		
KNUX 160410L-32	16,00	4,76	9,52	1,0		●						●		
KNUX 160410R-21	16,00	4,76	9,52	1,0		●			○			●		
KNUX 160410R-32	16,00	4,76	9,52	1,0								●		

Positive 7° clearance - Round insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

RCGT-AL

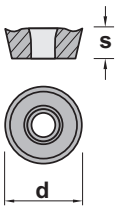


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
RCGT 0803M0-AL	-	3,18	8,00	-	●									○
RCGT 1003M0-AL	-	3,18	10,00	-	●									○

Positive 7° clearance - Round insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

RCGT-AP

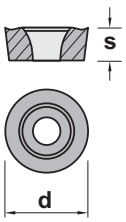


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
RCGT 0803M0-AP	-	3,18	8,00	-	●									○

Positive 7° clearance - Round insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

RCMT

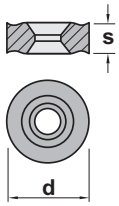


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
RCMT 0602M0	-	2,38	6,00	-					●					
RCMT 0803M0	-	3,18	8,00	-					●					
RCMT 1003M0	-	3,18	10,00	-		●			●					
RCMT 10T3M0	-	3,97	10,00	-		●			●					
RCMT 1204M0	-	4,76	12,00	-	○	●			●					
RCMT 1606M0-30	-	6,35	16,00	-		○								
RCMT 2006M0-30	-	6,35	20,00	-		○								

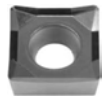
Negative round insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

RNMG



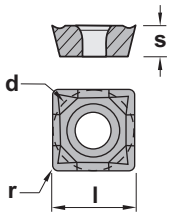
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
RNMG 090300	-	3,18	9,52	-		○					○			
RNMG 120400	-	4,76	12,70	-		○					○			
RNMG 150600	-	6,35	15,88	-								○		
RNMG 190600	-	6,35	19,05	-								○		
RNMG 250900	-	9,52	25,40	-								○		



Positive 7° clearance - Square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SCGT-AL

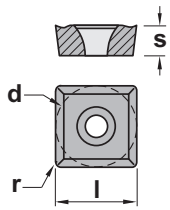


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SCGT 09T304-AL	9,52	3,97	9,52	0,4	●									○
SCGT 09T308-AL	9.52	3,97	9,52	0,8	●									○
SCGT 120408-AL	12,70	4,76	12,70	0,8	●									○

Positive 7° clearance - Square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SCMT-03

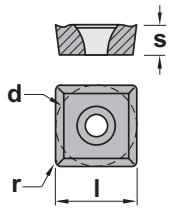


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SCMT 09T304-03	9,52	3,97	9,52	0,4	○	●			○					
SCMT 09T308-03	9,52	3,97	9,52	0,8	○	●			●					
SCMT 120408-03	12,70	4,76	12,70	0,8		●			●					
SCMT 120412-03	12,70	4,76	12,70	1,2		●			○					

Positive 7° clearance - Square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SCMT-39

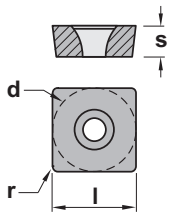


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SCMT 09T304-39	9,52	3,97	9,52	0,4		●								
SCMT 09T308-39	9,52	3,97	9,52	0,8	○	●								
SCMT 120404-39	12,70	4,76	12,70	0,4		●								
SCMT 120408-39	12,70	4,76	12,70	0,8	○	●								
SCMT 120412-39	12,70	4,76	12,70	1,2		●								
SCMT 120612-39	12,70	6,35	12,70	1,2		●								

Positive 7° clearance - Square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SCMW

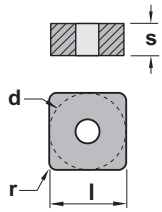


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SCMW 09T308	9,52	3,97	9,52	0,8		○								
SCMW 120408	12,70	4,76	12,70	0,8	○	○								
SCMW 120412	12,70	4,76	12,70	1,2		○								

Negative square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SNMA

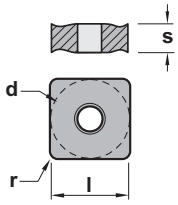


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SNMA 120404	12,70	4,76	12,70	0,4						○				
SNMA 120408	12,70	4,76	12,70	0,8						○				
SNMA 120412	12,70	4,76	12,70	1,2						○				
SNMA 120416	12,70	4,76	12,70	1,6						○				
SNMA 190612	19,05	6,35	19,05	1,2						○				
SNMA 190616	19,05	6,35	19,05	1,6						○				

Negative square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SNMG-CFM

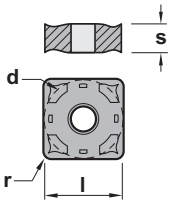


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SNMG 120404-CFM	12,70	4,76	12,70	0,4					●					

Negative square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SNMG-CMR

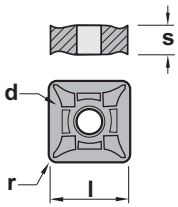


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SNMG 120408-CMR	12,70	4,76	12,70	0,8		○					●	●		

Negative square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SNMG-CR

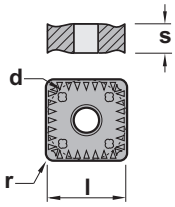


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SNMG 120412-CR	12,70	4,76	12,70	1,2								●		
SNMG 150612-CR	15,88	6,35	15,88	1,2								○		
SNMG 190616-CR	19,05	6,35	19,05	1,6								○		
SNMG 250724-CR	25,40	7,94	25,40	2,4								○		

Negative square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SNMM

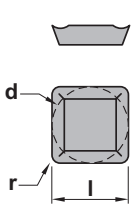


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SNMM 190612	19,05	6,35	19,05	1,2								○		
SNMM 190616	19,05	6,35	19,05	1,6								○		
SNMM 250724	25,40	7,94	25,40	2,4								○		

Positive 11° clearance - Square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SPMR-33

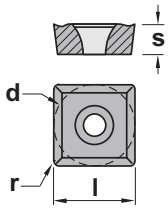


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SPMR 090304-33	9,52	3,18	9,52	0,4					●					
SPMR 090308-33	9,52	3,18	9,52	0,8							●			
SPMR 120304-33	12,70	3,18	12,70	0,4					●					
SPMR 120308-33	12,70	3,18	12,70	0,8		●					●			

Positive 11° clearance - Square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SPMT

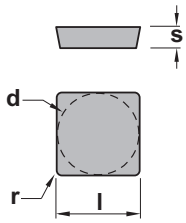


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	TL40
SPMT 060304	6,35	3,18	6,35	0,4										●
SPMT 070308	7,94	3,18	7,94	0,8										●
SPMT 090308	9,52	3,18	9,52	0,8										●
SPMT 120408	12,70	4,76	12,70	0,8										●

Positive 11° clearance - Square insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

SPUN

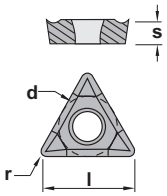


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
SPUN 090304E	9,52	3,18	9,52	0,4		○								
SPUN 090308E	9,52	3,18	9,52	0,8		●								
SPUN 090308F	9,52	3,18	9,52	0,8	○									
SPUN 120304E	12,70	3,18	12,70	0,4		●								
SPUN 120308E	12,70	3,18	12,70	0,8		●								
SPUN 120308F	12,70	3,18	12,70	0,8	●									
SPUN 120312E	12,70	3,18	12,70	1,2		●								
SPUN 120408E	12,70	4,76	12,70	0,8		○								
SPUN 150408E	15,88	4,76	15,88	0,8		○								
SPUN 150412E	15,88	4,76	15,88	1,2		○								
SPUN 190412E	19,05	4,76	19,05	1,2		○								

Positive 7° clearance - Triangular insert for aluminium and soft materials.
Extra positive cutting angle. Suitable for finishing stainless steel.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TCGT-AL

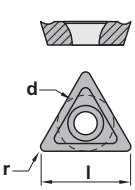


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TCGT 110202-AL	11,00	2,38	6,35	0,2	●									○
TCGT 110204-AL	11,00	2,38	6,35	0,4	●									○
TCGT 16T302-AL	16,50	3,97	9,52	0,2	●									○
TCGT 16T304-AL	16,50	3,97	9,52	0,4	●									○
TCGT 16T308-AL	16,50	3,97	9,52	0,8	●									○

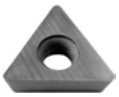
Positive 7° clearance - Triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TCMT-03



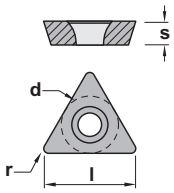
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TCMT 090204-03	9,62	2,38	5,55	0,4	○				●					
TCMT 110204-03	11,00	2,38	6,35	0,4	●	●			●				●	
TCMT 16T304-03	16,50	3,97	9,52	0,4	○	●			●			●	●	
TCMT 16T308-03	16,50	3,97	9,52	0,8	●	●			●			●	●	
TCMT 220408-03	22,00	4,76	12,70	0,8		○								
TCMT 220412-03	22,00	4,76	12,70	1,2		○								



Positive 7° clearance - Triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TCMW

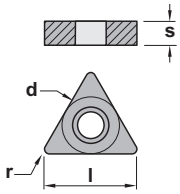


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TCMW 110204	11,00	2,38	6,35	0,4	○	●								
TCMW 16T304	16,50	3,97	9,52	0,4	●									
TCMW 16T308	16,50	3,97	9,52	0,8	●	●								

Negative triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMA

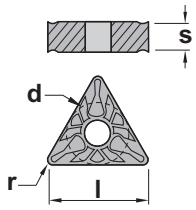


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMA 160404	16,50	4,76	9,52	0,4						○				
TNMA 160408	16,50	4,76	9,52	0,8						○				
TNMA 160412	16,50	4,76	9,52	1,2						○				
TNMA 220408	22,00	4,76	12,70	0,8						○				
TNMA 220412	22,00	4,76	12,70	1,2						○				
TNMA 220416	22,00	4,76	12,70	1,6						○				

Negative triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMG-CF

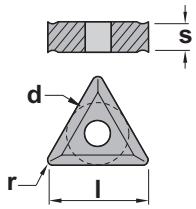


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMG 160404-CF	16,50	4,76	9,52	0,4					●			●		

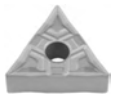
Negative triangular insert

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMG-CFC



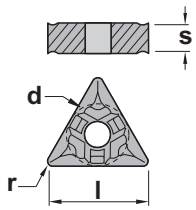
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMG 160404-CFC	16,50	4,76	9,52	0,4				●						



Negative triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMG-CFM

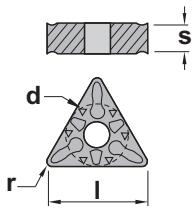


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMG 160404-CFM	16,50	4,76	9,52	0,4					●					
TNMG 220404-CFM	22,00	4,76	12,70	0,4					●					

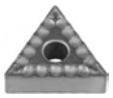
Negative triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMG-CM



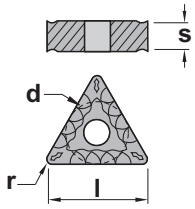
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMG 160408-CM	16,50	4,76	9,52	0,8					●			●		



Negative triangular insert

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMG-CMC

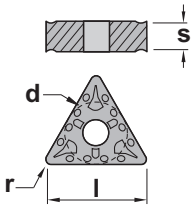


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMG 160408-CMC	16,50	4,76	9,52	0,8				●						

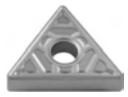
Negative triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMG-CMF



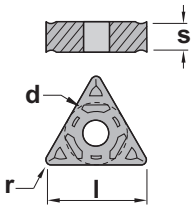
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMG 160408-CMF	16,50	4,76	9,52	0,8					●			●		



Negative triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMG-CMR

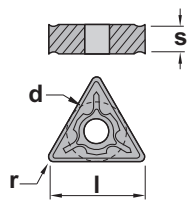


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMG 160408-CMR	16,50	4,76	9,52	0,8		●					●	●		
TNMG 160412-CMR	16,50	4,76	9,52	1,2								●		
TNMG 220408-CMR	22,00	4,76	12,70	0,8		○					●	●		
TNMG 220412-CMR	22,00	4,76	12,70	1,2								●		

Negative triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMG-CS

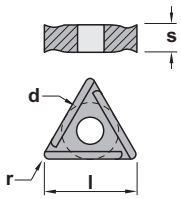


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMG 160404-CS	16,50	4,76	9,52	0,4									●	
TNMG 160408-CS	16,50	4,76	9,52	0,8									●	

Negative triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TNMX

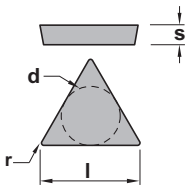


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TNMX 160404 R	16,50	4,76	9,52	0,4				●						
TNMX 160408 R	16,50	4,76	9,52	0,8				●						
TNMX 160404 L	16,50	4,76	9,52	0,4				●						
TNMX 160408 L	16,50	4,76	9,52	0,8				●						

Positive 11° clearance - Triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TPMN

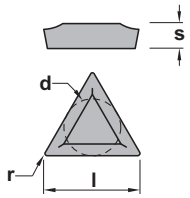


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TPMN 160308	16,50	3,18	9,52	0,8				●						

Positive 11° clearance - Triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TPMR-33

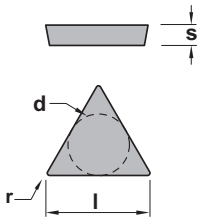


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TPMR 090204-33	9,62	2,38	5,55	0,4					●					
TPMR 110304-33	11,00	3,18	6,35	0,4		●			●					
TPMR 110308-33	11,00	3,18	6,35	0,8		●					●			
TPMR 160304-33	16,50	3,18	9,52	0,4		●			●			●		
TPMR 160308-33	16,50	3,18	9,52	0,8		●			●			●		

Positive 11° clearance - Triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TPUN

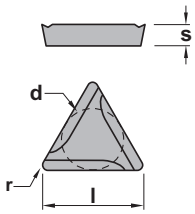


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TPUN 110204E	11,00	2,38	6,35	0,4		●								
TPUN 110204F	11,00	2,38	6,35	0,4	○									
TPUN 110208E	11,00	2,38	6,35	0,8		●								
TPUN 110304E	11,00	3,18	6,35	0,4		●								
TPUN 110308E	11,00	3,18	6,35	0,8		●								
TPUN 110308F	11,00	3,18	6,35	0,8	○									
TPUN 160304E	16,50	3,18	9,52	0,4		●			○					
TPUN 160304F	16,50	3,18	9,52	0,4	●									
TPUN 160308T	16,50	3,18	9,52	0,8		●								
TPUN 160308E	16,50	3,18	9,52	0,8		●			○					
TPUN 160308F	16,50	3,18	9,52	0,8	●									
TPUN 160312E	16,50	3,18	9,52	1,2		●								
TPUN 160312F	16,50	3,18	9,52	1,2	○									
TPUN 220408E	22,00	4,76	12,70	0,8		●								
TPUN 220408F	22,00	4,76	12,70	0,8	●									
TPUN 220412E	22,00	4,76	12,70	1,2		●								
TPUN 220412F	22,00	4,76	12,70	1,2	●									

Positive 11° clearance - Triangular insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

TPUX

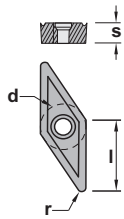


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
TPUX 110304L	11,00	3,18	6,35	0,4	○	●								
TPUX 110304R	11,00	3,18	6,35	0,4	○	●								
TPUX 160304L	16,50	3,18	9,52	0,4	○	●								
TPUX 160304R	16,50	3,18	9,52	0,4	○	●								
TPUX 160308L	16,50	3,18	9,52	0,8	○	●								
TPUX 160308R	16,50	3,18	9,52	0,8	○	●								
TPUX 220408L	22,00	4,76	12,70	0,8		○								
TPUX 220408R	22,00	4,76	12,70	0,8	○	○								

Positive 5° clearance - 35° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

VBMT

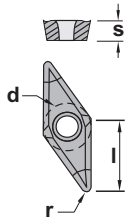


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
VBMT 160404	16,50	4,76	9,52	0,4					●					
VBMT 160408	16,50	4,76	9,52	0,8					●					

Positive 7° clearance - 35° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

VCGT-AL

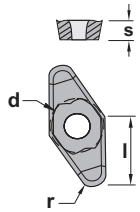


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
VCGT 160404-AL	16,50	4,76	9,52	0,4	●									○
VCGT 160408-AL	16,50	4,76	9,52	0,8	●									○
VCGT 160412-AL	16,50	4,76	9,52	1,2	●									○

Positive 7° clearance - 35° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

VCGT-AL

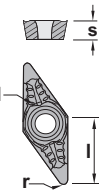


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
VCGT 220530-AL	22,10	5,56	12,70	3,0	●									○

Positive 7° clearance - 35° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

VCGT-AP

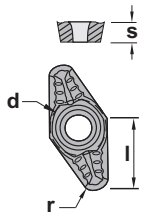


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
VCGT 160404-AP	16,50	4,76	9,52	0,4	●									○
VCGT 160408-AP	16,50	4,76	9,52	0,8	●									○
VCGT 160412-AP	16,50	4,76	9,52	1,2	●									○

Positive 7° clearance - 35° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

VCGT-AP

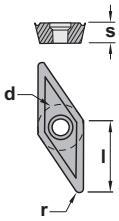


	l	s	d	r	KM15	PM25	PM40	NC25	TiN16	TiN17	TiN22	TiN32	TiN35	ZR10
VCGT 220530-AP	22,10	5,56	12,70	3,0	●									○

Positive 7° clearance - 35° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

VCMT-03

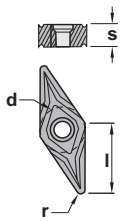


	l	s	d	r	KM15	PM25	PM40	NC25	TiN16	TiN17	TiN22	TiN32	TiN35	ZR10
VCMT 110304-03	11,00	3,18	6,35	0,4					●					
VCMT 130304-03	13,00	3,18	8,00	0,4					●					
VCMT 160404-03	16,50	4,76	9,52	0,4					●				●	
VCMT 160408-03	16,50	4,76	9,52	0,8							●		●	

Negative 35° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

VNGP

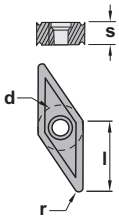


	l	s	d	r	KM15	PM25	PM40	NC25	TiN16	TiN17	TiN22	TiN32	TiN35	ZR10
VNGP 160404	16,50	4,76	9,52	0,4						●				
VNGP 160408	16,50	4,76	9,52	0,8						●				

Negative 35° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

VNMG

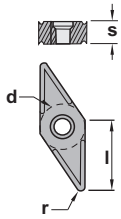


	l	s	d	r	KM15	PM25	PM40	NC25	TiN16	TiN17	TiN22	TiN32	TiN35	ZR10
VNMG 160408	16,50	4,76	9,52	0,8					●					
VNMG 220408	22,00	4,76	12,70	0,8							●			

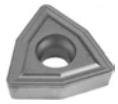
Negative 35° rhombic insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

VNMG-CMC



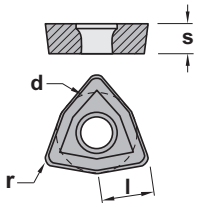
	l	s	d	r	KM15	PM25	PM40	NC25	TiN16	TiN17	TiN22	TiN32	TiN35	ZR10
VNMG 160404-CMC	16,50	4,76	9,52	0,4				●						
VNMG 160408-CMC	16,50	4,76	9,52	0,8				●						



Positive 7º clearance - 80º Trigon insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

WCMX

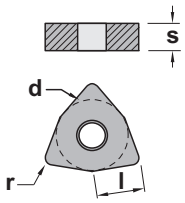


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
WCMX 030208	3,46	2,38	5,56	0,8								●		
WCMX 040208	3,99	2,38	6,35	0,8								●		
WCMX 050308	5,07	3,18	7,94	0,8								●		
WCMX 06T308	6,14	3,97	9,52	0,8								●		
WCMX 080412	8,14	4,76	12,70	1,2								●		

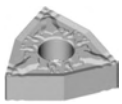
Negative 80º trigon insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

WNMA



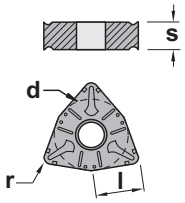
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
WNMA 080408	8,14	4,76	12,70	0,8						○				
WNMA 080412	8,14	4,76	12,70	1,2						○				



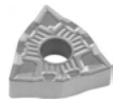
Negative 80º trigon insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

WNMG-CF



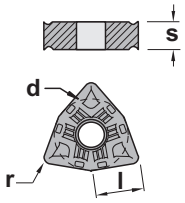
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
WNMG 080404-CF	8,14	4,76	12,70	0,4					●			●		



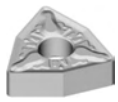
Negative 80º trigon insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

WNMG-CFM



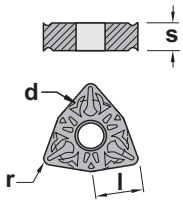
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
WNMG 080404-CFM	8,14	4,76	12,70	0,4					●					



Negative 80º trigon insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

WNMG-CM

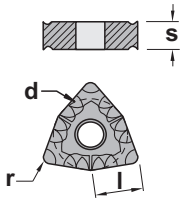


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
WNMG 080408-CM	8,14	4,76	12,70	0,8					●			●		

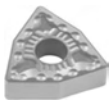
Negative 80º trigon insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

WNMG-CMC



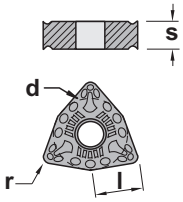
	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
WNMG 080408-CMC	8,14	4,76	12,70	0,8				●						



Negative 80º trigon insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

WNMG-CMF

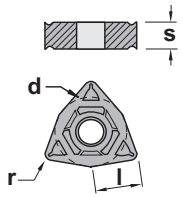


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
WNMG 080408-CMF	8,14	4,76	12,70	0,8					●			●		

Negative 80º trigon insert.

Normally available for immediate delivery ●
Only available in a limited quantity ○

WNMG-CMR

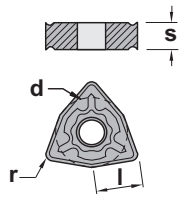


	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
WNMG 060404-CMR	6,45	4,76	9,52	0,4					●					
WNMG 060408-CMR	6,45	4,76	9,52	0,8							●			
WNMG 080408-CMR	8,14	4,76	12,70	0,8							●	●		
WNMG 080412-CMR	8,14	4,76	12,70	1,2							●			

Negative 80º trigon insert.

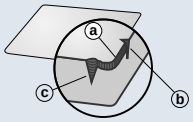
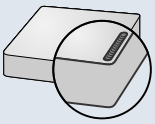
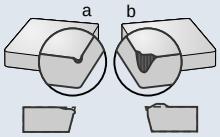
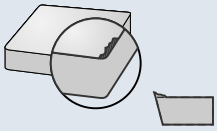
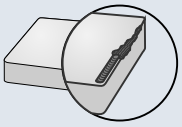
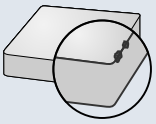
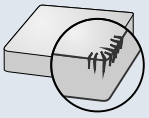
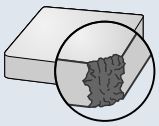
Normally available for immediate delivery ●
Only available in a limited quantity ○

WNMG-CS



	l	s	d	r	KM15	PM25	PM40	NC25	TIN16	TIN17	TIN22	TIN32	TIN35	ZR10
WNMG 060404-CS	6,45	4,76	9,52	0,4									●	
WNMG 060408-CS	6,45	4,76	9,52	0,8									●	
WNMG 080404-CS	8,14	4,76	12,70	0,4									●	
WNMG 080408-CS	8,14	4,76	12,70	0,8									●	
WNMG 080412-CS	8,14	4,76	12,70	1,2									●	

Turning insert wear and tool life

	Problem	*Cause and Remedy*
Flank and notch wear 	★ Rapid flank wear causing poor surface finish or out of tolerance (a). ★ Notch wear causing poor surface finish and risk of	☆ A too high cutting speed or insufficient wear resistance (a). ☆ Oxidation or excessive attrition wear caused by a hard surface (b,c) Reduce the cutting speed. Select a more wear resistant grade. Select an Al_2O_3 coated grade for steel machining.
Crater wear 	★ Excessive crater wear causing a weakened edge. Cutting edge break through on the trailing edge causes poor surface finish.	☆ Diffusion wear due to too high cutting temperatures on the rake face. Select an Al_2O_3 coated grade. Select a positive insert geometry.
Plastic deformation 	★ Plastic deformation (edge depression (a) or flank impression (b)) leading to poor chip control and poor surface finish. Risk of excessive flank wear leading	☆ A too high cutting temperature in combination with a high pressure. Select a harder grade with better resistance to plastic deformation. (a) Reduce cutting speed.
Built-up edge 	★ Built-up edge (B.U.E.) causing poor surface finish and cutting edge frittering when the B.U.E. is torn away.	☆ Workpiece material is welded to the insert due to: -low cutting speed. -relative cutting geometry. -"sticky" material, e.g. certain stainless steels and pure aluminium. Increase cutting speed. Select a positive geometry. Increase cutting speed drastically. If tool life turns out to be short,apply
Chip hammering 	★ The part of the cutting edge not in cut is damaged through chip hammering. Both the top side and the support for the insert, can be damaged.	☆ The chips are of an excessive length and are deflected against the cutting edge. Change the feed slightly. Select an alternative insert geometry.
Frittering 	★ Small cutting edge fractures (frittering) causing poor surface finish and excessive flank wear.	☆ Grade too brittle. ☆ Insert geometry too weak. ☆ Built-up edge. Select a tougher grade. Select an insert with a stronger geometry. Increase cutting speed or select a positive geometry.
Thermal cracks 	★ Small cracks perpendicular to the cutting edge causing frittering and poor surface finish.	☆ Thermal cracks due to temperature variations caused by: -Intermittent machining. -Varying coolant supply. Select a tougher grade with better resistant to thermal shocks.
Insert breakage 	★ Insert breakage that damages not only the insert but also the shim and workpiece.	☆ Grade too brittle. ☆ Excessive load on the insert. ☆ Insert geometry too weak. ☆ Insert size is too small. Select a tougher grade. Reduce the feed and/or the depth of the cut. Select a stronger geometry, preferably a single sided insert. Select a thicker/larger insert.