WORLDIA
MN-D2001

PCD Insert

Providing stable , universal , high efficient cutting effects

WORLDIA MANANOVA

Easy Choice Fast Delivery

ManaNova

An easy choice in cutting world.

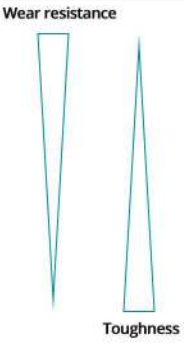
Product range overview of indexable inserts for ISO turning - Inserts description

Designation Key - Material designation

Example

M	N	D	10		
ManaNova	1	2	3	4	5

1	2	3	4	5
Application Materials	**Cutting Tool Material**	**Material Code**	**Coating**	**Coating Film Code**
P Steel	**D** PCD	**01**	**C** Coated	**1**
M Stainless Steel	**N** CBN	**05**	**Without** No coated	**2**
K Cast Iron		**10**		**Without**
S Exotic Alloy		**20**		
H Hardened Steel		**30**		
N Non-ferrous Metal		**32**		



GRADE COMPARISON TABLE

PCD

	ISO		WORLDIA	Kennametal	Kyocera	Sumitomo Electric	Mitsubishi Materials	Tungaloy	Seco Tools	Sandvik	Mapal
	Classification	Symbol									
Turning	N	N10	MND10	KD1405	KPD010	DA150	MD220	DX140	PCD20	CD10	PU660

Note: The above table is selected from a publication.We have not obtained approval from each company.

Product range overview of indexable inserts for ISO turning - Inserts description

Designation Key - Identification Code

ANSI	C	-	C	C	G	W	2	1.5	0.5	-	1	N
ISO	C	-	C	C	G	W	06	02	02	-	1	N
	1		2	3	4	5	6	7	8		9	10

1 Insert Style

Without	Standard
C	Chip breaker
L	Full Length
F	Full Face
W	Wiper
H	Heavy cutting

2 Insert Shape

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

3 Clearance Angle

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

4 Tolerances

G	ISO mm	ANSI inch
m	±0.025	±0.001
IC	±0.025	±0.001
S	±0.130	±0.005
R	±0.03	±0.001

5 Pattern Type

A	▭
N	▭
T	▭
W	▭
R	▭

6 Inscribed Circle Diameter

IC (mm) ISO	C	D	T	V	W	IC (inch) ANSI	Code
3.970						5/32	1.2
4.760			08			3/16	1.5
5.560			09			7/32	1.8
6.350	06	07	11	11		1/4	2
7.940						5/16	2.5
9.525	09	11	16	16		3/8	3
12.700		15			08	1/2	4
15.875						5/8	5

7 Insert Thickness

ISO	mm	ANSI	inch
01	= 1.59	1	1/16
02	= 2.38	1.5	3/32
T2	= 2.78		
03	= 3.18	2	1/8
T3	= 3.97	2.5	5/32
04	= 4.76	3	3/16
05	= 5.56	3.5	7/32
06	= 6.35	4	1/4
07	= 7.94	5	5/16
09	= 9.525	6	3/8

8 Nose Radius

ISO	mm	ANSI	inch
00	= 0.0	0	.000
01	= 2.1	0.2	.004
02	= 0.2	0.5	.008
04	= 0.4	1	1/64
08	= 0.8	2	1/32
12	= 1.2	3	3/64
16	= 1.6	4	1/16
20	= 2.0	5	5/64
24	= 2.4	6	3/32
28	= 2.8	7	7/64

9 Cutting Edges

1	single
2	double
3	triple

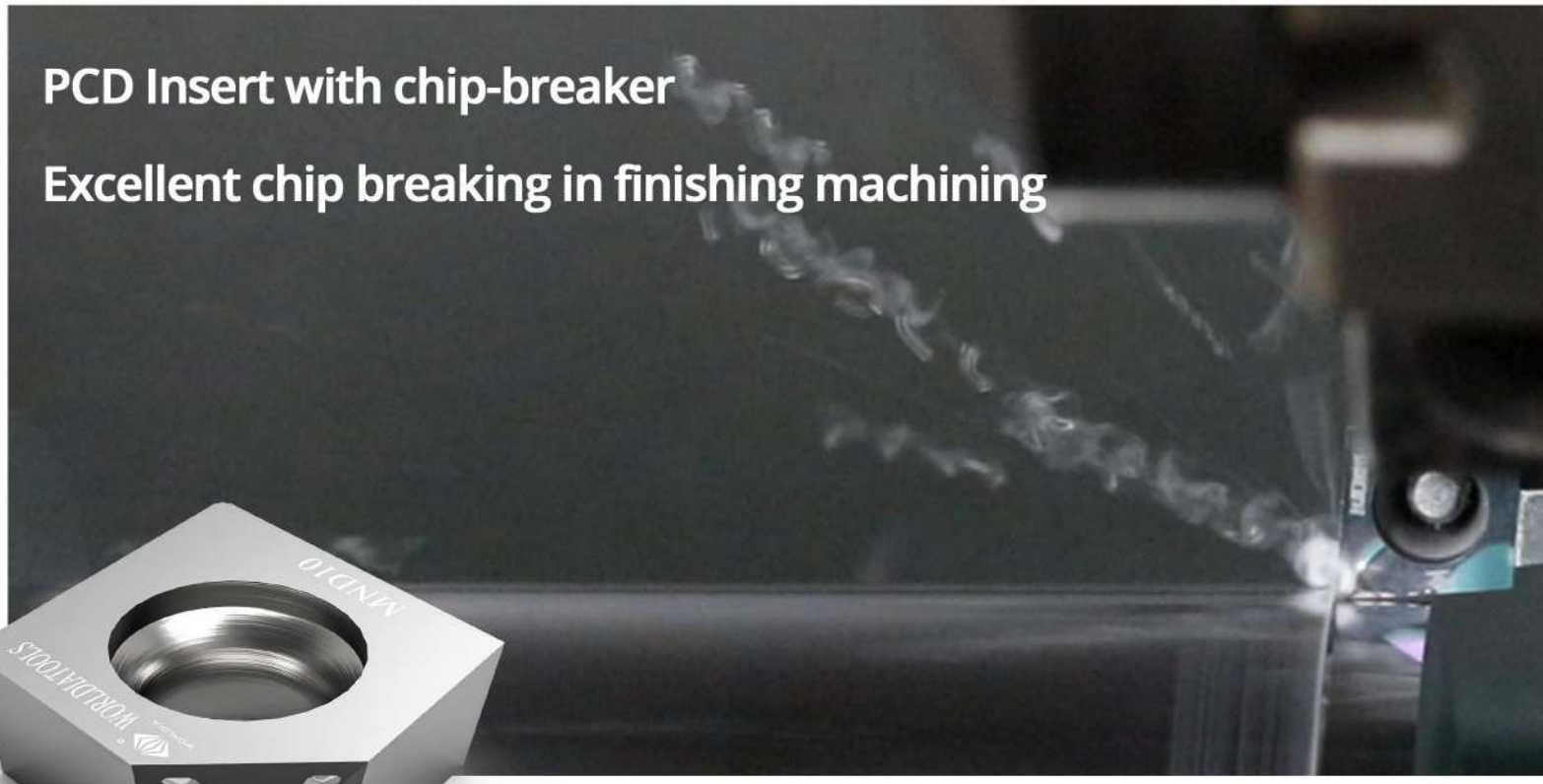
10 Cutting Direction

N	
R	
L	

Chip Control

Chip Breaking Tech

A reliable chip - control solution to help reducing stringy chipping - MANANOVA



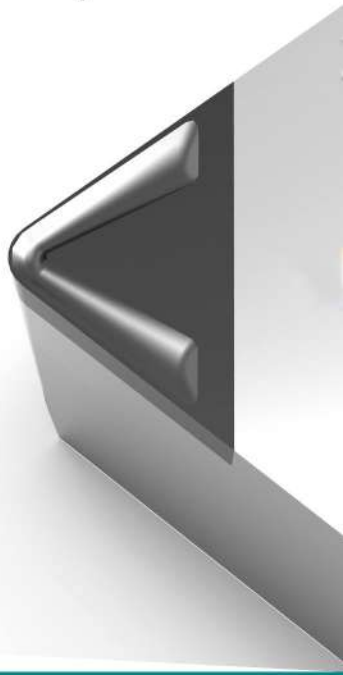
PCD Insert with chip-breaker

Excellent chip breaking in finishing machining

Material: A6061

Cutting conditions: Vc=400m/min f=0.1mm/rev ap=0.2mm

Insert type: CCGW09T308



PCD Insert

CCGW · CCGT

Providing stable , universal , high efficient cutting effects - MANANOVA EASY CHOICE

CC

80° Positive

7° Relief

Edge mark:

C - chipbreaker

L - full length

F - full face

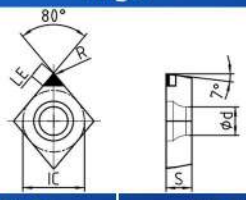
Application:

ISO N - Non-ferrous Metal

ISO O - Others

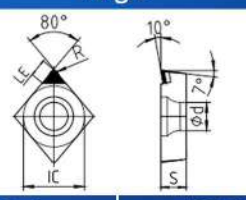
● WORLDIA Stocked Item

CCGW



Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
CCGW 21.50.5	CCGW 060202	1N	6.35	2.38	0.2	2.8	2.5		●		
CCGW 21.51	CCGW 060204	1N	6.35	2.38	0.4	2.8	2.5		●		
CCGW 32.50.5	CCGW 09T302	1N	9.525	3.97	0.2	4.4	2.5		●		
CCGW 32.51	CCGW 09T304	1N	9.525	3.97	0.4	4.4	2.5		●		
CCGW 32.52	CCGW 09T308	1N	9.525	3.97	0.8	4.4	2.5		●		
C-CCGW 21.50.5	C-CCGW 060202	1N	6.35	2.38	0.2	2.8	2.5		●		
C-CCGW 32.51	C-CCGW 09T304	1N	9.525	3.97	0.4	4.4	2.5		●		
F-CCGW 21.51	F-CCGW 060204	1N	6.35	2.38	0.4	2.8	2.5		●		

CCGT



Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
CCGT 21.50.5	CCGT 060202	1N	6.35	2.38	0.2	2.8	2.5		●		
CCGT 21.51	CCGT 060204	1N	6.35	2.38	0.4	2.8	2.5		●		
CCGT 32.50.5	CCGT 09T302	1N	9.525	3.97	0.2	4.4	2.5		●		
CCGT 32.51	CCGT 09T304	1N	9.525	3.97	0.4	4.4	2.5		●		
CCGT 32.52	CCGT 09T308	1N	9.525	3.97	0.8	4.4	2.5		●		

PCD Insert

DCGW · DCGT

Providing stable , universal , high efficient cutting effects - MANANOVA EASY CHOICE

DC

- 55° Positive
- 7° Relief

Edge mark:

- C - chipbreaker
- L - full length
- F - full face

Application:

- ISO N - Non-ferrous Metal
- ISO O - Others

● WORLDIA Stocked Item

DCGW

Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
DCGW 21.50.5	DCGW 070202	1N	6.35	2.38	0.2	2.8	2.5		●		
DCGW 21.51	DCGW 070204	1N	6.35	2.38	0.4	2.8	2.5		●		
DCGW 32.50.5	DCGW 11T302	1N	9.525	3.97	0.2	4.4	2.5		●		
DCGW 32.51	DCGW 11T304	1N	9.525	3.97	0.4	4.4	2.5		●		
DCGW 32.52	DCGW 11T308	1N	9.525	3.97	0.8	4.4	2.5		●		

DCGT

Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
DCGT 21.50.5	DCGT 070202	1N	6.35	2.38	0.2	2.8	2.5		●		
DCGT 21.51	DCGT 070204	1N	6.35	2.38	0.4	2.8	2.5		●		
DCGT 32.50.5	DCGT 11T302	1N	9.525	3.97	0.2	4.4	2.5		●		
DCGT 32.51	DCGT 11T304	1N	9.525	3.97	0.4	4.4	2.5		●		
DCGT 32.52	DCGT 11T308	1N	9.525	3.97	0.8	4.4	2.5		●		

PCD Insert

VCGW · VCGT

Providing stable , universal , high efficient cutting effects - MANANOVA EASY CHOICE

VC

35° Positive

7° Relief

Edge mark:

C - chipbreaker

L - full length

F - full face

Application:

ISO N - Non-ferrous Metal

ISO O - Others

● WORLDIA Stocked Item

VCGW

Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
VCGW 220.5	VCGW 110302	1N	6.35	3.18	0.2	2.8	2.5		●		
VCGW 221	VCGW 110304	1N	6.35	3.18	0.4	2.8	2.5		●		
VCGW 330.5	VCGW 160402	1N	9.525	4.76	0.2	4.4	2.5		●		
VCGW 331	VCGW 160404	1N	9.525	4.76	0.4	4.4	2.5		●		
VCGW 332	VCGW 160408	1N	9.525	4.76	0.8	4.4	2.5		●		

VCGT

Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
VCGT 220.5	VCGT 110302	1N	6.35	3.18	0.2	2.8	2.5		●		
VCGT 221	VCGT 110304	1N	6.35	3.18	0.4	2.8	2.5		●		
VCGT 330.5	VCGT 160402	1N	9.525	4.76	0.2	4.4	2.5		●		
VCGT 331	VCGT 160404	1N	9.525	4.76	0.4	4.4	2.5		●		
VCGT 332	VCGT 160408	1N	9.525	4.76	0.8	4.4	2.5		●		

PCD Insert

VBGW · VBGT

Providing stable , universal , high efficient cutting effects - MANANOVA EASY CHOICE

VB

35° Positive

5° Relief

Edge mark:

C - chipbreaker

L - full length

F - full face

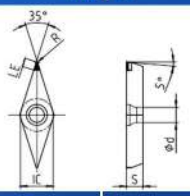
Application:

ISO N - Non-ferrous Metal

ISO O - Others

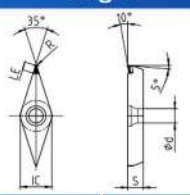
● WORLDIA Stocked Item

VBGW



Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
VBGW 330.5	VBGW 160402	1N	9.525	4.76	0.2	4.4	2.5		●		
VBGW 331	VBGW 160404	1N	9.525	4.76	0.4	4.4	2.5		●		
VBGW 332	VBGW 160408	1N	9.525	4.76	0.8	4.4	2.5		●		

VBGT



Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
VBGT 330.5	VBGT 160402	1N	9.525	4.76	0.2	4.4	2.5		●		
VBGT 331	VBGT 160404	1N	9.525	4.76	0.4	4.4	2.5		●		
VBGT 332	VBGT 160408	1N	9.525	4.76	0.8	4.4	2.5		●		

PCD Insert

TCGW · TCGT

Providing stable , universal , high efficient cutting effects - MANANOVA EASY CHOICE

TC

60° Positive

7° Relief

Edge mark:

C - chipbreaker

L - full length

F - full face

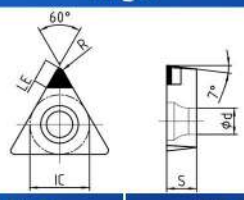
AppliCation:

ISO N - Non-ferrous Metal

ISO O - Others

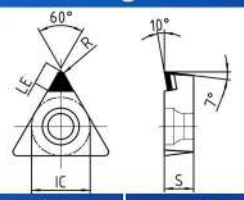
● WORLDIA Stocked Item

TCGW



Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
TCGW 1.81.50.5	TCGW 090202	1N	5.56	2.38	0.2	2.4	2.5		●		
TCGW 1.81.51	TCGW 090204	1N	5.56	2.38	0.4	2.4	2.5		●		
TCGW 220.5	TCGW 110302	1N	6.35	3.18	0.2	2.8	2.5		●		
TCGW 221	TCGW 110304	1N	6.35	3.18	0.4	2.8	2.5		●		
TCGW 222	TCGW 110308	1N	6.35	3.18	0.8	2.8	2.5		●		
TCGW 32.51	TCGW 16T304	1N	9.525	3.97	0.4	4.4	2.5		●		
TCGW 32.52	TCGW 16T308	1N	9.525	3.97	0.8	4.4	2.5		●		
L-TCGW 32.50.5	L-TCGW 16T302	1N	9.525	3.97	0.2	4.4	2.5		●		
L-TCGW 32.51	L-TCGW 16T304	1N	9.525	3.97	0.4	4.4	2.5		●		
L-TCGW 32.52	L-TCGW 16T308	1N	9.525	3.97	0.8	4.4	2.5		●		
F-TCGW 1.81.51	F-TCGW 090204	3N	5.56	2.38	0.4	2.4	2.5		●		

TCGT



Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
TCGT 1.81.50.5	TCGT 090202	1N	5.56	2.38	0.2	2.4	2.5		●		
TCGT 1.81.51	TCGT 090204	1N	5.56	2.38	0.4	2.4	2.5		●		
TCGT 220.5	TCGT 110302	1N	6.35	3.18	0.2	2.8	2.5		●		
TCGT 221	TCGT 110304	1N	6.35	3.18	0.4	2.8	2.5		●		
TCGT 222	TCGT 110308	1N	6.35	3.18	0.8	2.8	2.5		●		
L-TCGT 32.51	L-TCGT 16T304	1N	9.525	3.97	0.4	4.4	2.5		●		

PCD Insert

TPGW · TPGT

Providing stable , universal , high efficient cutting effects - MANANOVA EASY CHOICE

TP

60° Positive

11° Relief

Edge mark:

C - chipbreaker

L - full length

F - full face

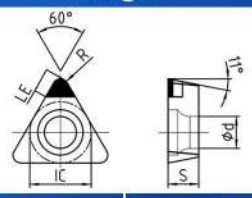
Application:

ISO N - Non-ferrous Metal

ISO O - Others

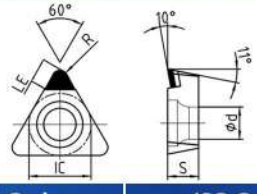
● WORLDIA Stocked Item

TPGW



Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
TPGW 220.5	TPGW 110302	1N	6.35	3.18	0.2	3.3	2.5		●		
TPGW 221	TPGW 110304	1N	6.35	3.18	0.4	3.3	2.5		●		
TPGW 222	TPGW 110308	1N	6.35	3.18	0.8	3.3	2.5		●		
TPGW 330.5	TPGW 160402	1N	9.525	4.76	0.2	4.4	2.5		●		
TPGW 331	TPGW 160404	1N	9.525	4.76	0.4	4.4	2.5		●		
F-TPGW 222	F-TPGW 110308	3N	6.35	3.18	0.8	3.3	2.5		●		

TPGT



Angle		Dimensions						Grade			
ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	MND 01	MND 10	MND 32	CVD
TPGT 22.50.5	TPGT 110302	1N	6.35	3.18	0.2	3.3	2.5		●		
TPGT 22.51	TPGT 110304	1N	6.35	3.18	0.4	3.3	2.5		●		
TPGT 22.52	TPGT 110308	1N	6.35	3.18	0.8	3.3	2.5		●		
TPGT 330.5	TPGT 160402	1N	9.525	4.76	0.2	4.4	2.5		●		
TPGT 331	TPGT 160404	1N	9.525	4.76	0.2	4.4	2.5		●		

Feed rate recommendation to get ideal cutting effects - MANANOVA EASY CHOICE

The relationship between nose radius,feed rate and Ra.

$\because$ $h = r\varepsilon - (r\varepsilon^2 - (0.5 \times f)^2) 0.5$ = Scallop Height

$\because$ $Ra = (0.25 \sim 0.33) h$

$\therefore$ $f_{MAX} = (Ra \times r\varepsilon / 50) \frac{1}{2}$

Feed rate recommendation:

Nose radius (mm)	Ra μm					
	0.2	0.4	0.8	1.6	3.2	6.4
	Feed Rate f (mm/rev) ≤					
0.2	0.028	0.040	0.057	0.080	0.113	0.160
0.4	0.040	0.057	0.080	0.113	0.160	0.226
0.8	0.057	0.080	0.113	0.160	0.226	0.320
1.2	0.069	0.098	0.139	0.196	0.277	0.392
1.6	0.080	0.113	0.160	0.226	0.320	0.453
2.4	0.098	0.139	0.196	0.277	0.392	0.554

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