



WORLDIA

股票代码:688028

MN-D2004 EN

PCD Insert

Providing stable , universal , high efficient
cutting effects



WORLDIA MANANOVA

Easy Choice Fast Delivery

ManaNova

An easy choice in cutting world



Contents

ISO Turning 03

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

Chip Control 05

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

PCD Insert 06

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

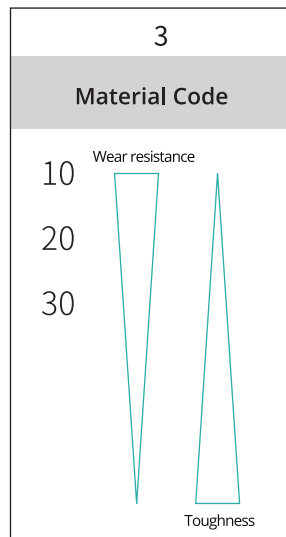
Key Definition - Material designation

Example

M	N	D	10
ManaNova	1	2	3

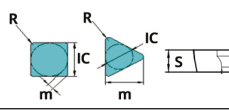
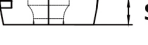
1
Application Materials
P Steel
M Stainless Steel
K Cast Iron
S Powder metallurgy
H Hardened Steel
N Non-ferrous Metal

2
Cutting Tool Material
D PCD
N CBN



Key Definition - 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	2	3	4	5
Insert Style	Insert Shape	Clearance Angle	Tolerances	Pattern Type
Without Standard C Chip breaker L Full Length F Full Face S Solid W Wiper H Heavy cutting	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°	A 3° F 25° B 5° G 30° C 7° N 0° D 15° P 11° E 20°	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 	A  N  T  W  R 
6	7	8	9	10
Inscribed Circle Diameter	Insert Thickness	Nose Radius	Cutting Edges	Cutting Direction
IC (mm) C D T V W IC (inch) Code ISO      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 12 15 08 1/2 4 15.875 5/8 5	 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	 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	1 single  2 double  3 triple  :	10 Cutting Direction N  R  L 

PCD Insert with chip-breaker

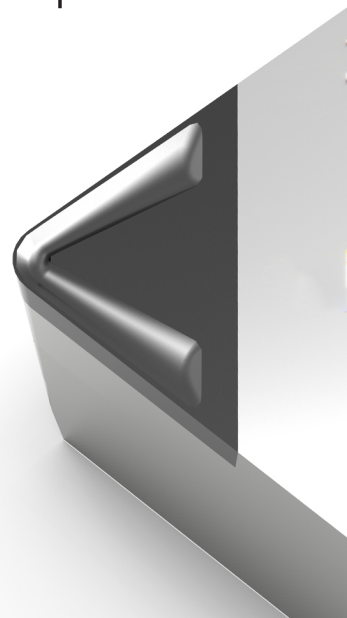
Excellent chip breaking in finishing machining



Material: A6061

Cutting conditions: $V_c=400\text{m/min}$ $f=0.1\text{mm/rev}$ $a_p=0.2\text{mm}$

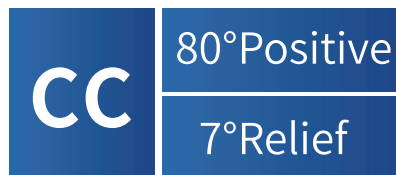
Insert type: CCGW09T308



PCD Insert

CCGW-CCGT

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



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			
			Tips	IC mm	S mm	R mm	Φd mm	LE mm	MND 01	MND 10	MND 32	CVD
	ANSI Code	ISO Code										
	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	2N	6.35	2.38	0.4	2.8	6.4	●			

CCGT	Angle		Dimensions						Grade			
			Tips	IC mm	S mm	R mm	Φd mm	LE mm	MND 01	MND 10	MND 32	CVD
	ANSI Code	ISO Code										
	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

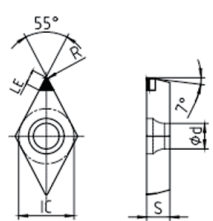
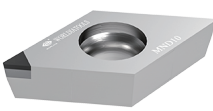
Edge mark:

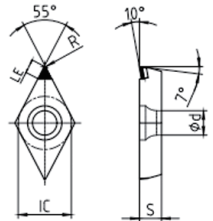
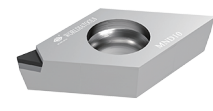
C - chipbreaker
L - full length
F - full face

Application:

ISO N - Non-ferrous Metal
ISO O - Others

• WORLDIA Stocked Item

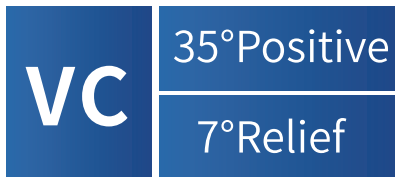
DCGW	Angle		Dimensions						Grade			
			Tips	IC mm	S mm	R mm	ϕd mm	LE mm	MND 01	MND 10	MND 32	CVD
	ANSI Code	ISO Code										
	DCGW 21.50.5	DCGW 070202	1N	6.35	2.38	0.2	2.8	2.5	●			
	DCGW 21.51	DCGW 070204	1N	6.35	2.38	0.4	2.8	2.5	●			
	DCGW 32.50.5	DCGW 11T302	1N	9.525	3.97	0.2	4.4	2.5	●			
	DCGW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

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



Edge mark:

C - chipbreaker
L - full length
F - full face

Application:

ISO N - Non-ferrous Metal
ISO O - Others

• WORLDIA Stocked Item

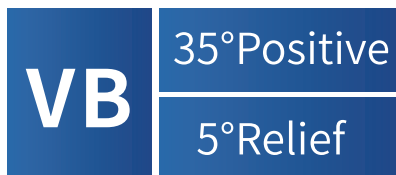
VCGW	Angle		Dimensions						Grade			
	ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	Φd mm	LE mm	MND 01	MND 10	MND 32	CVD
	VCGW 220.5	VCGW 110302	1N	6.35	3.18	0.2	2.8	2.5	●			
	VCGW 221	VCGW 110304	1N	6.35	3.18	0.4	2.8	2.5	●			
	VCGW 330.5	VCGW 160402	1N	9.525	4.76	0.2	4.4	2.5	●			
	VCGW 331	VCGW 160404	1N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

VC GT	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
	VC GT 220.5	VC GT 110302	1N	6.35	3.18	0.2	2.8	2.5	●			
	VC GT 221	VC GT 110304	1N	6.35	3.18	0.4	2.8	2.5	●			
	VC GT 330.5	VC GT 160402	1N	9.525	4.76	0.2	4.4	2.5	●			
	VC GT 331	VC GT 160404	1N	9.525	4.76	0.4	4.4	2.5	●			
	VC GT 332	VC GT 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



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

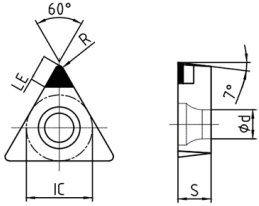
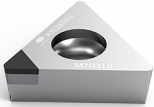
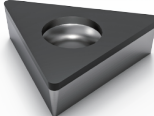
Edge mark:

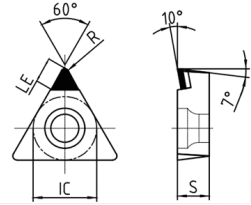
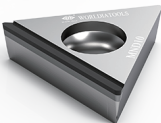
C - chipbreaker
L - full length
F - full face

Application:

ISO N - Non-ferrous Metal
ISO O - Others

• WORLDIA Stocked Item

TCGW	Angle		Dimensions						Grade			
			Tips	IC mm	S mm	R mm	Φd mm	LE mm	MND 01	MND 10	MND 32	CVD
	ANSI Code	ISO Code										
	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	2N	9.525	3.97	0.2	4.4	16.2	●			
	L-TCGW 32.51	L-TCGW 16T304	2N	9.525	3.97	0.4	4.4	15.9	●			
	L-TCGW 32.52	L-TCGW 16T308	2N	9.525	3.97	0.8	4.4	15.3	●			
	F-VBGW 1.81.51	F-VBGW 090204	3N	5.56	2.38	0.4	2.4	9	●			

TCGT	Angle		Dimensions						Grade			
			Tips	IC mm	S mm	R mm	Φd mm	LE mm	MND 01	MND 10	MND 32	CVD
	ANSI Code	ISO Code										
	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	2N	9.525	3.97	0.4	4.4	15.9	●			

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

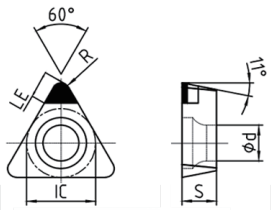
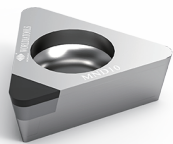
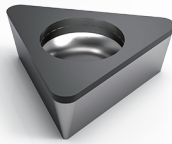
F - full face

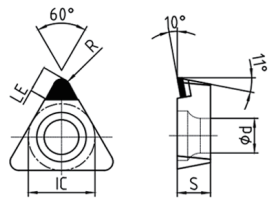
Application:

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	Ød 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 160408	3N	9.525	3.18	0.8	3.3	15.3	•			

TPGT	Angle		Dimensions						Grade			
												
	ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	Ød 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	•			

The relationship between nose radius, feed rate and Ra.

$$\therefore h = r\epsilon - (r\epsilon^2 - (0.5 \times f)^2) 0.5 = \text{Scallop Height}$$

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

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

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) $\leq$					
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

[illegible]

[illegible]

As a Worldia ManaNova customer

you can get benefit from: Online store service

Local distributor support

Fast delivery

What we focus on is

Maximize the convenience for end users of using the product.

Email: info@worldia-tools.com

International Department office:

No.2 Industry Road, Dachang Chaobaihe

Industrial Park, Langfang City, Hebei Province

065300 China

www.worldia-tools.com

www.store.worldia-tools.com

