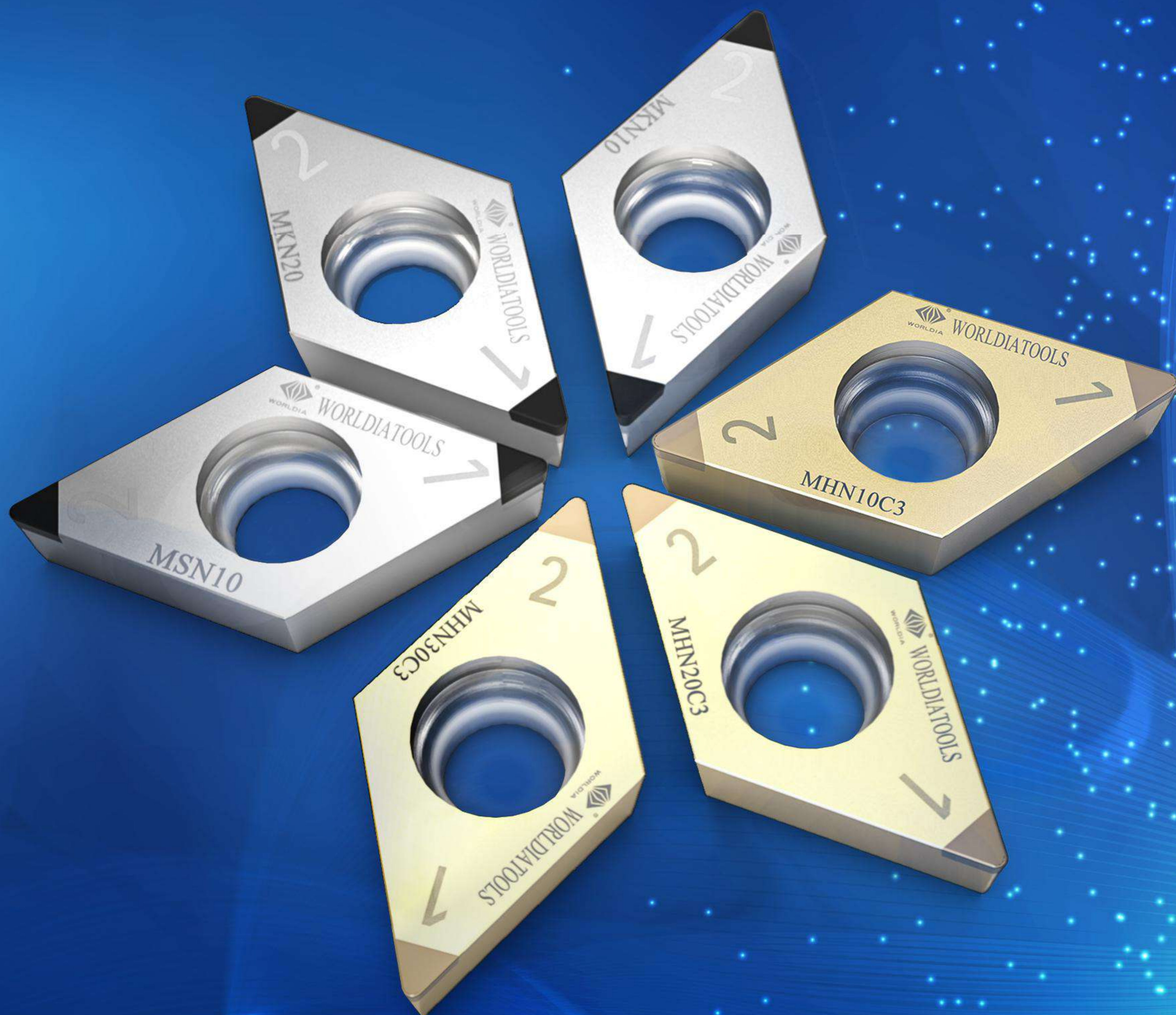




WORLDIA
MN-N2001

CBN Insert

6 material / 1 type, universal for hardened steel,
cast Iron, ductile iron and powder metallurgy.



WORLDIA MANANOVA

Easy Choice Fast Delivery

ManaNova

An easy choice in cutting world.



Designation Key - Material designation

Example

M	H	N	10	C
ManaNova	1	2	3	4





1	2	3	4
Application Materials	Cutting Tool Material	Material Code	Coating
P Steel	D PCD	10	C Coated
M Stainless Steel	N CBN	20	Without No coated
K Cast Iron		30	
S Powder metallurgy			
H Hardened Steel			
N Non-ferrous Metal			

















Material Introduction - Easy choice for CBN Grade

ISO H: Hardened Steel

ISO K: Cast Iron

ISO S: Powder Metallurgy

-  Continuous cutting
-  Light interrupted cutting
-  Medium interrupted cutting
-  Heavy interrupted cutting

CBN Grade	ISO H			ISO K		ISO S
	MHN10C	MHN20C	MHN30C	MKN10	MKN20	MSN10
	Smooth	Moderate	Toughness	Cast Iron	Ductile Iron	Powder Metallurgy
%	45 ~ 55	60 ~ 70	85 ~ 95	85 ~ 95	60 ~ 70	60 ~ 70
Grain size	1 ~ 2 μm	1 ~ 2 μm	2 ~ 3 μm	2 ~ 3 μm	1 ~ 2 μm	1 ~ 2 μm
Bond	TiC	TiN	Co W	Co W	TiCN	TiCN
Hardness	2600HV ~ 2800HV	3000HV ~ 3200HV	3900HV ~ 4200HV	3900HV ~ 4200HV	2700HV ~ 2900HV	2700HV ~ 2900HV
First Choice		 		   	   	   

-  Continuous
-  Light interrupted
-  Medium interrupted
-  Heavy interrupted

Designation Key - Identification Code

ANSI	C	-	C	C	G	W	2	1.5	0.5	-	1	N
	1		2	3	4	5	6	7	8		9	10
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
S	Solid
W	Wiper
H	Heavy cutting

2			
Insert Shape			
A	85°	M	86°
B	82°	O	135°
C	80°	P	108°
D	55°	R	90°
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)	C	D	T	V	W	IC (inch)	Code
ISO						ANSI	
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

7			
Insert Thickness			
			S
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		
		R
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	

CBN Insert

CCGW · CNGA

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

CC	80° Positive
	7° Relief

Application material:

- H - Hardened Steel
- K - Cast Iron
- K₁ - Ductile iron (NCI)
- S - Powder metallurgy

Symbol mark:

- Continuous
- ⊕ Light interrupted
- ⊗ Medium interrupted
- ⊛ Heavy interrupted

CCGW	Angle		Dimensions						Grade					
			Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
	ANSI Code	ISO Code							Coated MHN 10	Coated MHN 20	Coated MHN 30	MKN 10	MKN 20	MSN 10
All Stocked	CCGW21.50.5	CCGW 060202	2N	6.35	2.38	0.2	2.8	2.2						
	CCGW21.51	CCGW 060204	2N	6.35	2.38	0.4	2.8	2.2						
	CCGW21.52	CCGW 060208	2N	6.35	2.38	0.8	2.8	2.2						
	CCGW32.50.5	CCGW 09T302	2N	9.525	3.97	0.2	4.4	2.2						
	CCGW32.51	CCGW 09T304	2N	9.525	3.97	0.4	4.4	2.2						
	CCGW32.52	CCGW 09T308	2N	9.525	3.97	0.8	4.4	2.2						
	CCGW32.53	CCGW 09T312	2N	9.525	3.97	1.2	4.4	2.2						



CN	80°
	Negative

Application material:

- H - Hardened Steel
- K - Cast Iron
- K₁ - Ductile iron (NCI)
- S - Powder metallurgy

Symbol mark:

- Continuous
- ⊕ Light interrupted
- ⊗ Medium interrupted
- ⊛ Heavy interrupted

CNGA	Angle		Dimensions						Grade					
			Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
	ANSI Code	ISO Code							Coated MHN 10	Coated MHN 20	Coated MHN 30	MKN 10	MKN 20	MSN 10
All Stocked	CNGA431	CNGA 120404	2N	12.7	4.76	0.4	5.16	2.2						
	CNGA432	CNGA 120408	2N	12.7	4.76	0.8	5.16	2.2						
	CNGA432	CNGA 120408	4N	12.7	4.76	0.8	5.16	2.2						



CBN Insert

DCGW · DNGA

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

DC	55° Positive
	7° Relief

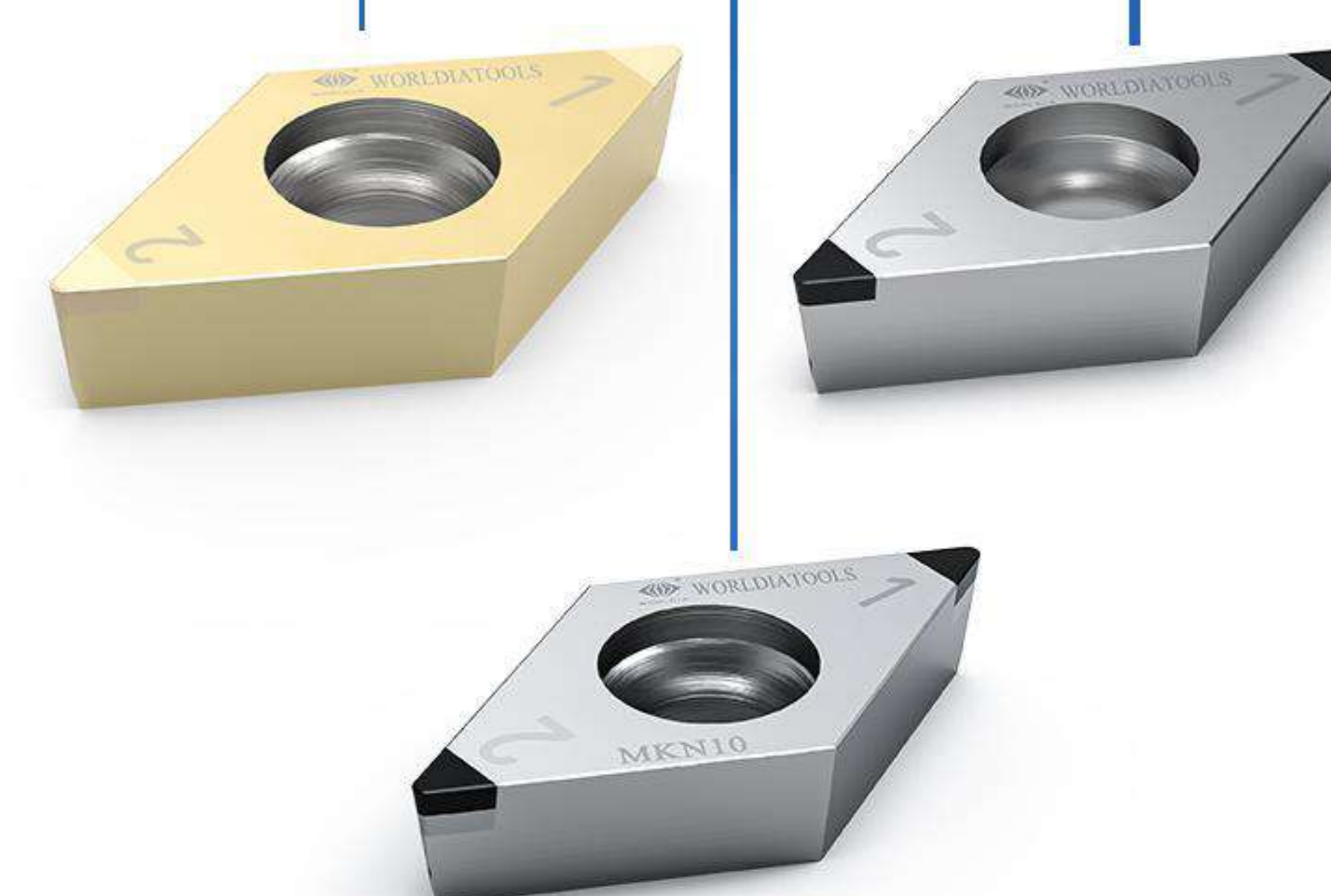
Application material:

- H - Hardened Steel
- K - Cast Iron
- K₁ - Ductile iron (NCI)
- S - Powder metallurgy

Symbol mark:

- Continuous
- ◐ Light interrupted
- ◑ Medium interrupted
- ◒ Heavy interrupted

DCGW	Angle		Dimensions					Grade						
			Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
	ANSI Code	ISO Code							Coated MHN 10	Coated MHN 20	Coated MHN 30	MKN 10	MKN 20	MSN 10
All Stocked	DCGW21.51	DCGW 070204	2N	6.35	2.38	0.4	2.8	2.2						
	DCGW21.52	DCGW 070208	2N	6.35	2.38	0.8	2.8	2.2						
	DCGW32.50.5	DCGW 11T302	2N	9.525	3.97	0.2	4.4	2.2						
	DCGW32.51	DCGW 11T304	2N	9.525	3.97	0.4	4.4	2.2						
	DCGW32.52	DCGW 11T308	2N	9.525	3.97	0.8	4.4	2.2						



DN	55°
	Negative

Application material:

- H - Hardened Steel
- K - Cast Iron
- K₁ - Ductile iron (NCI)
- S - Powder metallurgy

Symbol mark:

- Continuous
- ◐ Light interrupted
- ◑ Medium interrupted
- ◒ Heavy interrupted

CNGA	Angle		Dimensions					Grade						
			Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
	ANSI Code	ISO Code							Coated MHN 10	Coated MHN 20	Coated MHN 30	MKN 10	MKN 20	MSN 10
All Stocked	DNGA431	DNGA 150404	2N	12.7	4.76	0.4	5.16	2.2						
	DNGA432	DNGA 150408	2N	12.7	4.76	0.8	5.16	2.2						
	DNGA433	DNGA 150412	2N	12.7	4.76	1.2	5.16	2.2						
	DNGA441	DNGA 150604	2N	12.7	6.35	0.4	5.16	2.2						
	DNGA442	DNGA 150608	2N	12.7	6.35	0.8	5.16	2.2						



CBN Insert

TCGW · TNGA

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

TC	60° Positive
	7° Relief

Application material:

- H - Hardened Steel
- K - Cast Iron
- K₁- Ductile iron (NCI)
- S - Powder metallurgy

Symbol mark:

- Continuous
- ⊕ Light interrupted
- ⊗ Medium interrupted
- ⊛ Heavy interrupted

TCGW	Angle		Dimensions					Grade						
			Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
	ANSI Code	ISO Code							Coated MHN 10	Coated MHN 20	Coated MHN 30	MKN 10	MKN 20	MSN 10

All Stocked

TCGW1.81.51	TCGW 090204	3N	5.56	2.38	0.4	2.8	2.2
TCGW1.81.52	TCGW 090208	3N	5.56	2.38	0.8	2.8	2.2
TCGW21.51	TCGW 110204	3N	6.35	2.38	0.4	2.8	2.2
TCGW21.52	TCGW 110208	3N	6.35	2.38	0.8	2.8	2.2
TCGW221	TCGW 110304	3N	6.35	3.18	0.4	2.8	2.2
TCGW222	TCGW 110308	3N	6.35	3.18	0.8	2.8	2.2



TN	60°
	Negative

Application material:

- H - Hardened Steel
- K - Cast Iron
- K₁- Ductile iron (NCI)
- S - Powder metallurgy

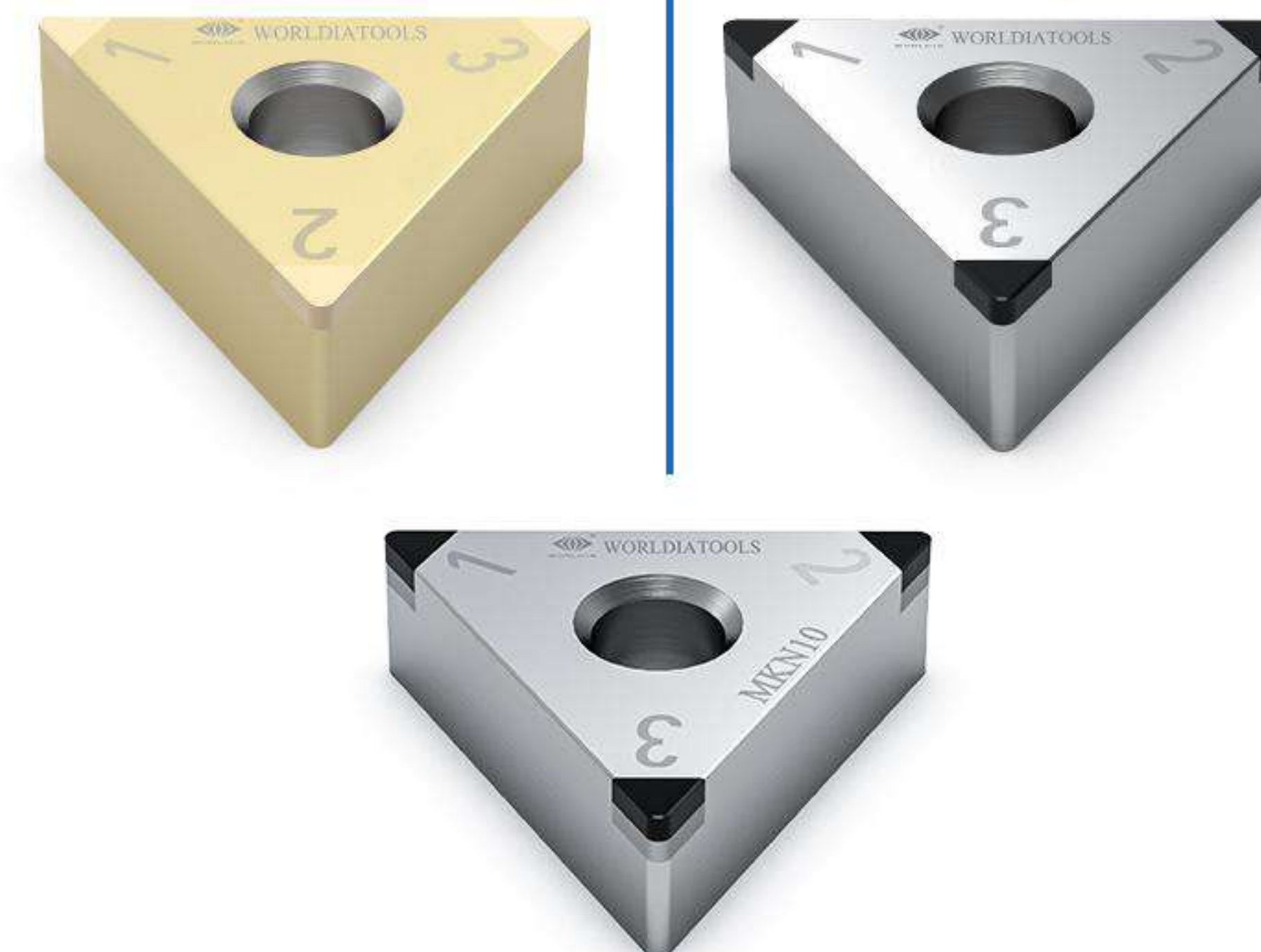
Symbol mark:

- Continuous
- ⊕ Light interrupted
- ⊗ Medium interrupted
- ⊛ Heavy interrupted

TNGA	Angle		Dimensions					Grade						
			Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
	ANSI Code	ISO Code							Coated MHN 10	Coated MHN 20	Coated MHN 30	MKN 10	MKN 20	MSN 10

All Stocked

TNGA332	TNGA 160408	3N	9.525	4.76	0.8	3.81	2.2
TNGA333	TNGA 160412	3N	9.525	4.76	1.2	3.81	2.2



CBN Insert

TPGW

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

TP

60° Positive

11° Relief

Application material:

H - Hardened Steel

K - Cast Iron

K₁ - Ductile iron (NCI)

S - Powder metallurgy

Symbol mark:

● Continuous

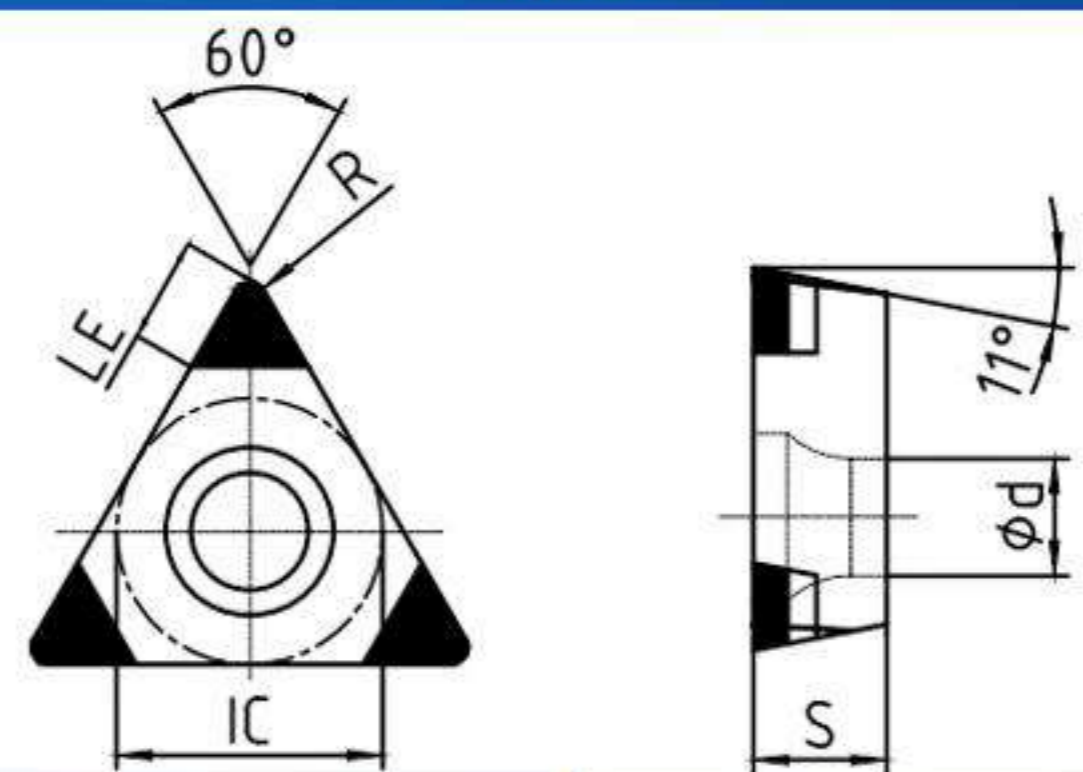
◐ Light interrupted

◑ Medium interrupted

◒ Heavy interrupted

TPGW

Angle



Dimensions

Grade

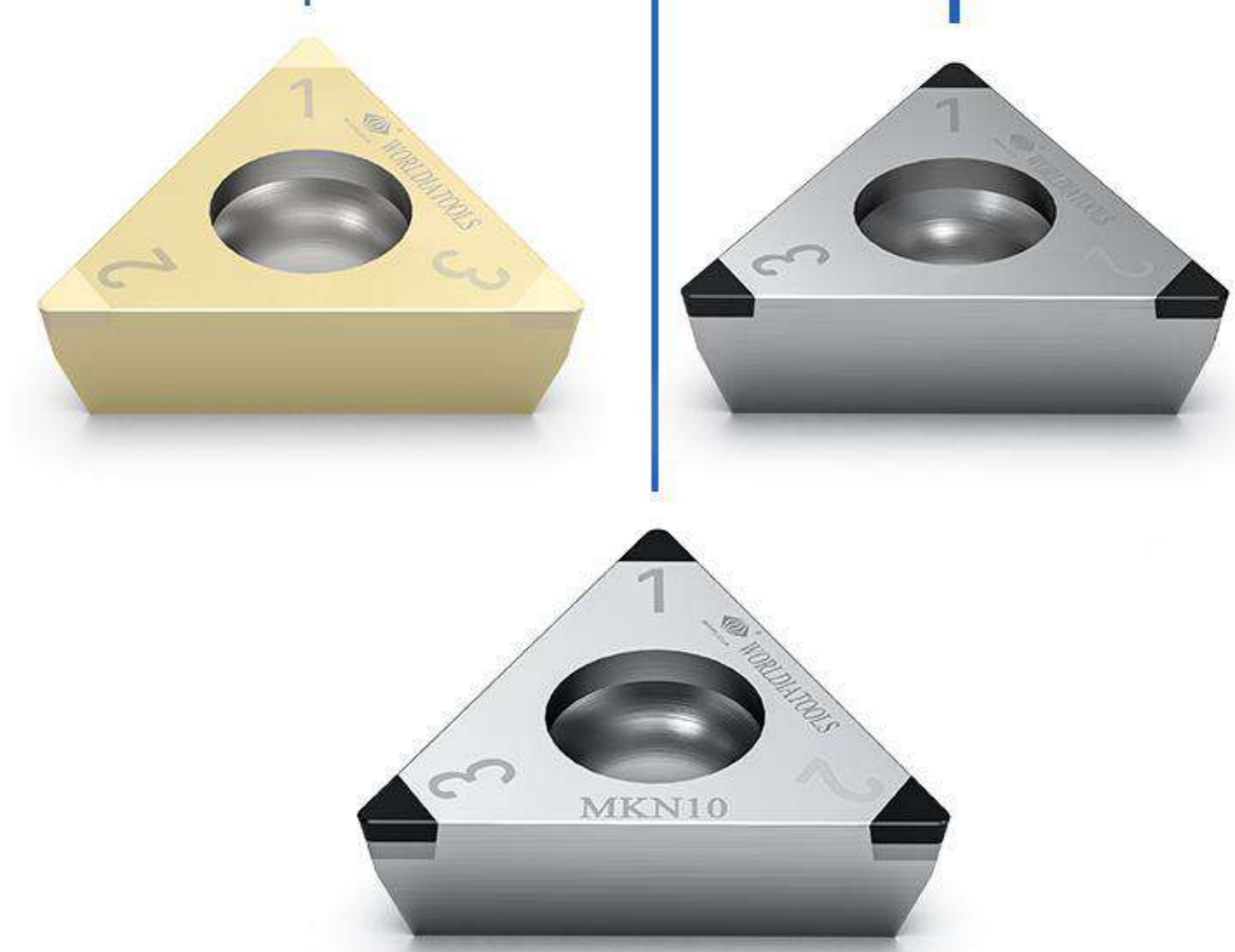
Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
						Coated MHN 10	Coated MHN 20	Coated MHN 30	MKN 10	MKN 20	MSN 10

ANSI Code

ISO Code

All Stocked

TPGW1.51.51	TPGW 080204	3N	4.76	2.38	0.4	2.4	2.2
TPGW1.51.52	TPGW 080208	3N	4.76	2.38	0.8	2.4	2.2
TPGW1.81.50.5	TPGW 090202	3N	5.56	2.38	0.2	2.8	2.2
TPGW1.81.51	TPGW 090204	3N	5.56	2.38	0.4	2.8	2.2
TPGW21.51	TPGW 110204	3N	6.35	2.38	0.4	2.8	2.2
TPGW21.52	TPGW 110208	3N	6.35	2.38	0.8	2.8	2.2
TPGW220.5	TPGW 110302	3N	6.35	3.18	0.2	3.3	2.2
TPGW221	TPGW 110304	3N	6.35	3.18	0.4	3.3	2.2



CBN Insert

VCGW · VNGA

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

VC	35° Positive
	7° Relief

Application material:

- H - Hardened Steel
- K - Cast Iron
- K₁ - Ductile iron (NCI)
- S - Powder metallurgy

Symbol mark:

- Continuous
- ◐ Light interrupted
- ◑ Medium interrupted
- ◒ Heavy interrupted

VCGW	Angle		Dimensions					Grade						
			Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
	ANSI Code	ISO Code							Coated MHN 10	Coated MHN 20	Coated MHN 30	MKN 10	MKN 20	MSN 10
All Stocked	VCGW221	VCGW 110304	2N	6.35	3.18	0.4	2.8	2.2						
	VCGW222	VCGW 110308	2N	6.35	3.18	0.8	2.8	2.2						
	VCGW331	VCGW 160404	2N	9.525	4.76	0.4	4.4	2.2						
	VCGW332	VCGW 160408	2N	9.525	4.76	0.8	4.4	2.2						



VN	35°
	Negative

Application material:

- H - Hardened Steel
- K - Cast Iron
- K₁ - Ductile iron (NCI)
- S - Powder metallurgy

Symbol mark:

- Continuous
- ◐ Light interrupted
- ◑ Medium interrupted
- ◒ Heavy interrupted

VNGA	Angle		Dimensions					Grade						
			Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
	ANSI Code	ISO Code							Coated MHN 10	Coated MHN 20	Coated MHN 30	MKN 10	MKN 20	MSN 10
All Stocked	VNGA330.5	VNGA160402	2N	9.525	4.76	0.2	3.81	2.2						
	VNGA331	VNGA160404	2N	9.525	4.76	0.4	3.81	2.2						
	VNGA332	VNGA160408	2N	9.525	4.76	0.8	3.81	2.2						
	VNGA333	VNGA160412	2N	9.525	4.76	1.2	3.81	2.2						



CBN Insert

WNGA

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

WN	80°
	Negative

Application material:

- H - Hardened Steel
- K - Cast Iron
- K₁ - Ductile iron (NCI)
- S - Powder metallurgy

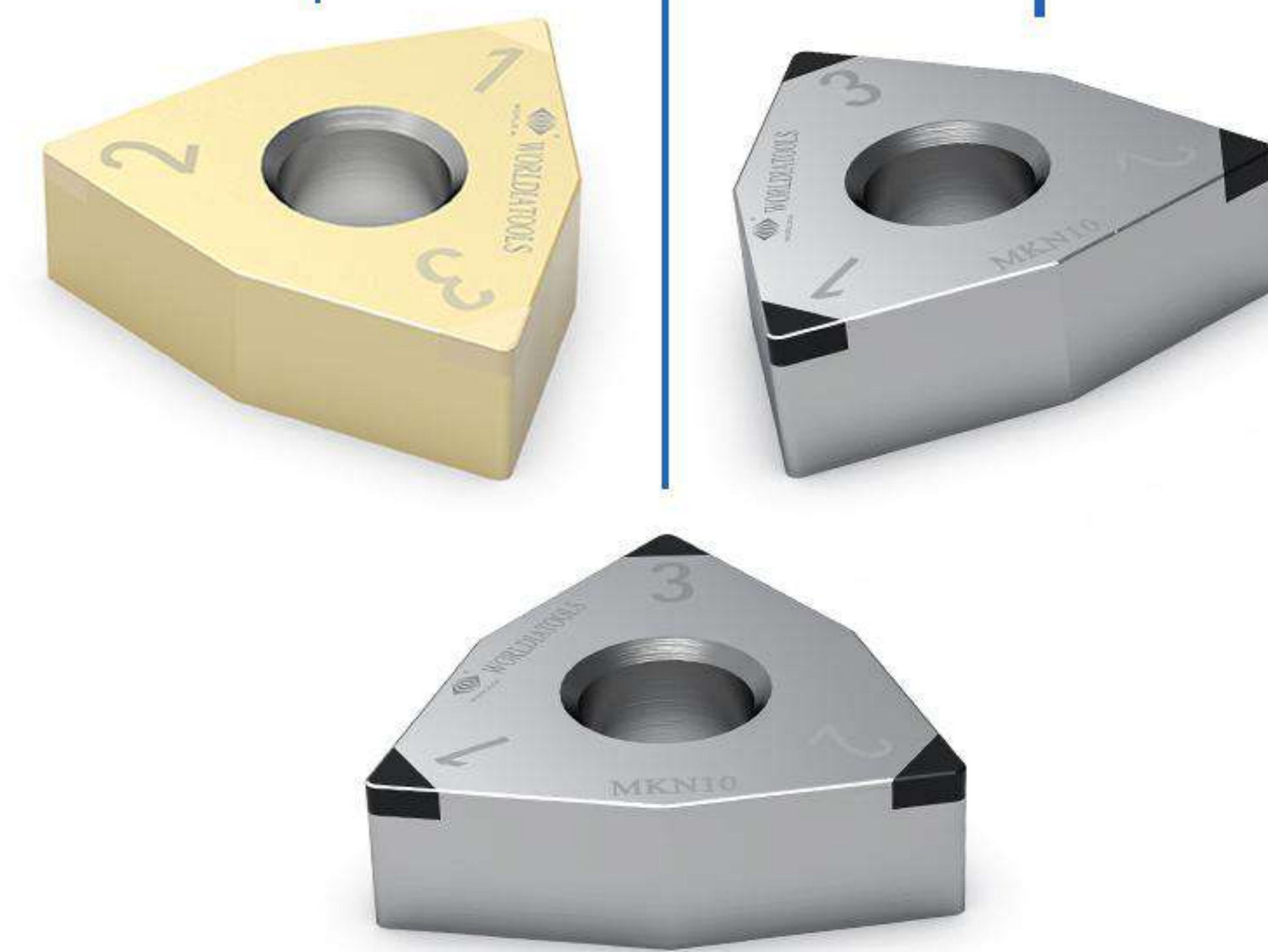
Symbol mark:

- Continuous
- ◐ Light interrupted
- ◑ Medium interrupted
- ◒ Heavy interrupted

WNGA	Angle		Dimensions					Grade						
	ANSI Code	ISO Code	Tips	IC mm	S mm	R mm	φd mm	LE mm	H	H	H	K	K ₁	S
									Coated	Coated	Coated			
									MHN	MHN	MHN	MKN	MKN	MSN
									10	20	30	10	20	10

All Stocked

WNGA431	WNGA080404	3N	12.7	4.76	0.4	5.16	2.2
WNGA432	WNGA080408	3N	12.7	4.76	0.8	5.16	2.2



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