Henan UHD Ultrahard Tools Co., ltd

To select proper solutions

Since the first introduction as cutting tools materials, cubic boron nitride (CBN) has gradually became the preferred solution for difficult-to-machining materials. Its application fields included hard steel, cast iron, high temperature alloy and powdered metallurgy.

With high thermal stability, CBN inserts can resist to the high temperature of 1300℃, and at the same time, it can also maintain its cutting edge performance. This is why CBN inserts can provide long time stable tool life and high machining efficiency, and furthermore, it can ensure to get high surface roughness and this is the reason for replacing grinding by turning.

To select proper grades

Grades	CBN Content	Machining Mode	Workpiece Material	Application
WBN 01	90%	Interrupted Continuous	Grey cast iron Ductile cast iron Roughness forge	High surfacing wear, cutting, milling machinery large gear and rollers
WBN 02	90%	Interrupted Continuous	Hardened steel Roughness forge	Wheel power bearing, hard gear, mining machinery, automobile gear and axle
WBN 03	50%	Interrupted Continuous	Hardened steel Semi-finish/Finish	Ball nuts, transmission shaft and axle
WBN 05	50%	Interrupted Continuous	Hardened steel Ductile cast iron Semi-finish/finish	Gear, shaft and etc.
WBN 55	75%	Interrupted Continuous	Hardened steel Semi-finish/finish	Teeth and powder bearing, gear for strong machinery, ball nuts, gear for automobile

☆ Inserts can be customized with special requirements.

Choices of Cutter Tip Radius

1. Cutting tips are the brief effect working components for all kinds of cutting tools. With pure tip strength and heat dissipation, and for the cutting force and cutting heat are concentrated, and it is also with the quasi-continuous cutting speed, so the cutting tips are easily to be broken. Therefore, the durability of these tools depends directly on the dimension of tips.
2. Cutting tips directly influence the forming process of machining surface, and affecting the height of the remaining peak. In other words, tips have a direct effect on the roughness of the processed surface because of stress-raiser. When choosing the appropriate shape and parameters of the tip, it is necessary to consider the requirements of the tool durability and the processed surface. Usually, the cutter tip radius is the main parameter of other angles. It also directly affects the roughness of the processed surface, the shape of the cutting layer, the cutting temperature and the durability of the tool.

Choices of Cutting edge

For its high hardness and brittleness of CBN inserts, it is quite important for the cutting edge selecting in order to decrease cutting edge damage, and to increase inserts life for its tear strength. Let's discuss as follows:

Code	Cutting edge form	Drawings	Choice
4	sharp edge		Be suitable for equipment with good rigidity, for continuous finishing machining.
E	Honing edge		Can strengthen cutting edge and increase inserts tool life. Be suitable for continuous finishing machining.
T	Chamfering edge		Higher cutting edge strength, be suitable for interrupted finishing, semi-finishing and roughing according to different materials
S	Honing + chamfering edge		Much higher cutting edge strength, be suitable for interrupted finishing, semi-finishing and roughing according to different materials

☆ In general, cutting edge honing is E, leading depth 0.3mm/honing ; S= 0.3 × 0.12 ; E leading depth chamfering angle ,20°×0 ~ 0°,-20°

Catalogue

WBN Series Solid Inserts

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
WBN0604SN	6	9.525	4.76	0.4	TG100				
WBN0604EN	6	9.525	4.76	0.8	TG200				
WBN0604SN12	6	9.525	4.76	1.2	SG100				
WBN0604EN12	6	9.525	4.76	1.2	SG200				
WBN1204SN	12	12.7	4.76	0.4	SG300				
WBN1204EN	12	12.7	4.76	0.8	SG400				
WBN1204SN12	12	12.7	4.76	1.2	SG500				
WBN1204EN12	12	12.7	4.76	1.2					
WBN0707SN12	15	15.875	7.94	1.2					
WBN1207SN	12	12.7	7.94	0.8					
WBN1207EN	12	12.7	7.94	0.8					
WBN1207EN12	12	12.7	7.94	1.2					
WBN2009SN	20	25	9.52	0.8					
WBN2009EN	20	25	9.52	0.8					
WBN2009SN12	20	25	9.52	1.2					
WBN2009EN12	20	25	9.52	1.2					

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
WBN0604SN	6	9.525	4.76	0.4	TG100				
WBN0604EN	6	9.525	4.76	0.8	TG200				
WBN0604SN12	6	9.525	4.76	1.2	SG100				
WBN0604EN12	6	9.525	4.76	1.2	SG200				
WBN1204SN	12	12.7	4.76	0.4	SG300				
WBN1204EN	12	12.7	4.76	0.8	SG400				
WBN1204SN12	12	12.7	4.76	1.2	SG500				
WBN1204EN12	12	12.7	4.76	1.2					
WBN0707SN12	15	15.875	7.94	1.2					
WBN1207SN	12	12.7	7.94	0.8					
WBN1207EN	12	12.7	7.94	0.8					
WBN1207EN12	12	12.7	7.94	1.2					
WBN2009SN	20	25	9.52	0.8					
WBN2009EN	20	25	9.52	0.8					
WBN2009SN12	20	25	9.52	1.2					
WBN2009EN12	20	25	9.52	1.2					

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
CNGA120408S	12	12.7	4.76	0.8	TG100				
CNGA120408T	12	12.7	4.76	0.8	TG200				
CNGA120412S	12	12.7	4.76	1.2	SG100				
CNGA120412T	12	12.7	4.76	1.2	SG200				
CNMA120408S	12	12.7	4.76	0.8	SG300				
CNMA120408T	12	12.7	4.76	0.8	SG400				
CNMA120412S	12	12.7	4.76	1.2	SG500				
CNMA120412T	12	12.7	4.76	1.2					
CNMA120416S	12	12.7	4.76	1.6					
CNMA120416T	12	12.7	4.76	1.6					
CNMA120420S	12	12.7	4.76	2.0					
CNMA120420T	12	12.7	4.76	2.0					

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
TNMA160404S	11	9.525	4.76	0.4	TG100				
TNMA160404T	11	9.525	4.76	0.4	TG200				
TNMA160408S	11	9.525	4.76	0.8	SG100				
TNMA160408T	11	9.525	4.76	0.8	SG200				
TNMA160412S	11	9.525	4.76	1.2	SG300				
TNMA160412T	11	9.525	4.76	1.2	SG400				
TNMA160416S	11	9.525	4.76	1.6	SG500				
TNMA160416T	11	9.525	4.76	1.6					
TNMA160420S	11	9.525	4.76	2.0					
TNMA160420T	11	9.525	4.76	2.0					
TNMA160424S	11	9.525	4.76	2.4					
TNMA160424T	11	9.525	4.76	2.4					
TNMA160432S	11	9.525	4.76	3.2					
TNMA160432T	11	9.525	4.76	3.2					

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
TNMA160404S	11	9.525	4.76	0.4	TG100				
TNMA160404T	11	9.525	4.76	0.4	TG200				
TNMA160408S	11	9.525	4.76	0.8	SG100				
TNMA160408T	11	9.525	4.76	0.8	SG200				
TNMA160412S	11	9.525	4.76	1.2	SG300				
TNMA160412T	11	9.525	4.76	1.2	SG400				
TNMA160416S	11	9.525	4.76	1.6	SG500				
TNMA160416T	11	9.525	4.76	1.6					
TNMA160420S	11	9.525	4.76	2.0					
TNMA160420T	11	9.525	4.76	2.0					

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
CCGW060204S	6	6.35	3.97	0.4	TG100				
CCGW060204T	6	6.35	3.97	0.4	TG200				
CCGW060208S	6	6.35	3.97	0.8	SG100				
CCGW060208T	6	6.35	3.97	0.8	SG200				
CCGW120408S	12	12.7	4.76	0.8	SG300				
CCGW120408T	12	12.7	4.76	0.8	SG400				
CCGW120412S	12	12.7	4.76	1.2	SG500				
CCGW120412T	12	12.7	4.76	1.2					

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
TNMA160404S	11	9.525	4.76	0.4	TG100				
TNMA160404T	11	9.525	4.76	0.4	TG200				
TNMA160408S	11	9.525	4.76	0.8	SG100				
TNMA160408T	11	9.525	4.76	0.8	SG200				
TNMA160412S	11	9.525	4.76	1.2	SG300				
TNMA160412T	11	9.525	4.76	1.2	SG400				
TNMA160416S	11	9.525	4.76	1.6	SG500				
TNMA160416T	11	9.525	4.76	1.6					
TNMA160420S	11	9.525	4.76	2.0					
TNMA160420T	11	9.525	4.76	2.0					

WBB Series Soldering Inserts

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
CNMA0604N	6	9.525	4.76	0.8	TG100				
CNMA0604N	6	9.525	4.76	1.2	TG200				
CNMA1204N	12	12.7	4.76	0.8	SG100				
CNMA1204N	12	12.7	4.76	1.2	SG200				
CNMA1204N	12	12.7	4.76	1.6	SG300				
CNMA1204N	12	12.7	4.76	2.0	SG400				
CNMA1204N	12	12.7	4.76	2.4	SG500				
CNMA1204N	12	12.7	4.76	3.2					

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
CNMA0604N	12	12.7	4.76	0.8	TG100				
CNMA0604N	12	12.7	4.76	1.2	TG200				
CNMA1204N	12	12.7	4.76	1.6	SG100				
CNMA1204N	12	12.7	4.76	2.0	SG200				
CNMA1204N	12	12.7	4.76	2.4	SG300				
CNMA1204N	12	12.7	4.76	3.2	SG400				
					SG500				

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
TNMA160404	11	9.525	4.76	0.4	TG100				
TNMA160408	11	9.525	4.76	0.8	TG200				
TNMA160412	11	9.525	4.76	1.2	SG100				
TNMA160416	11	9.525	4.76	1.6	SG200				
TNMA160420	11	9.525	4.76	2.0	SG300				
TNMA160424	11	9.525	4.76	2.4	SG400				
TNMA160432	11	9.525	4.76	3.2	SG500				

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
TNMA160404	11	9.525	4.76	0.4	TG100				
TNMA160408	11	9.525	4.76	0.8	TG200				
TNMA160412	11	9.525	4.76	1.2	SG100				
TNMA160416	11	9.525	4.76	1.6	SG200				
TNMA160420	11	9.525	4.76	2.0	SG300				
TNMA160424	11	9.525	4.76	2.4	SG400				
TNMA160432	11	9.525	4.76	3.2	SG500				

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
WNMA080404	8	9.525	4.76	0.4	TG100				
WNMA080408	8	9.525	4.76	0.8	TG200				
WNMA080412	8	9.525	4.76	1.2	SG100				
WNMA080416	8	9.525	4.76	1.6	SG200				
WNMA080420	8	9.525	4.76	2.0	SG300				
WNMA080424	8	9.525	4.76	2.4	SG400				
WNMA080432	8	9.525	4.76	3.2	SG500				

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
WNMA080404	8	9.525	4.76	0.4	TG100				
WNMA080408	8	9.525	4.76	0.8	TG200				
WNMA080412	8	9.525	4.76	1.2	SG100				
WNMA080416	8	9.525	4.76	1.6	SG200				
WNMA080420	8	9.525	4.76	2.0	SG300				
WNMA080424	8	9.525	4.76	2.4	SG400				
WNMA080432	8	9.525	4.76	3.2	SG500				

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
WNMA080404	8	9.525	4.76	0.4	TG100				
WNMA080408	8	9.525	4.76	0.8	TG200				
WNMA080412	8	9.525	4.76	1.2	SG100				
WNMA080416	8	9.525	4.76	1.6	SG200				
WNMA080420	8	9.525	4.76	2.0	SG300				
WNMA080424	8	9.525	4.76	2.4	SG400				
WNMA080432	8	9.525	4.76	3.2	SG500				

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
CNMG120404	12	12.7	4.76	0.4	TG100				
CNMG120408	12	12.7	4.76	0.8	TG200				
CNMG120412	12	12.7	4.76	1.2	SG100				
CNMG120416	12	12.7	4.76	1.6	SG200				
CNMG120420	12	12.7	4.76	2.0	SG300				
CNMG120424	12	12.7	4.76	2.4	SG400				
CNMG120432	12	12.7	4.76	3.2	SG500				

ISO	Dimension				Cutting Edge Form	Grades			
	L	φ/C	S	r		S1	S2	X2	X3
CNMG120404	12	12.7	4.76	0.4	TG100				
CNMG120408	12	12.7	4.76	0.8	TG200				
CNMG120412	12	12.7	4.76	1.2	SG100				
CNMG120416	12	12.7	4.76	1.6	SG200				
CNMG120420	12	12.7	4.76	2.0	SG300				
CNMG120424	12	12.7	4.76	2.4	SG400				
CNMG120432	12	12.7	4.76	3.2	SG500				

S	N	G	N	12	04	08FB	SL	02020
①	②	③	④	⑤	⑥	⑦	⑧	⑨

R	C	M	V	20	10	00	PH	20010
①	②	③	④	⑤	⑥	⑦	⑧	⑨

1 Insert Shape

2 Main Cutting Edge Clearance Angle

Code	Clearance Angle
A	3°
B	5°
C	7°
N	0°
P	11°

3 Accuracy Grade

Code	Tolerance (mm)			Code	Tolerance (mm)		
	d	m	s		d	m	s
A	±0.025	±0.006	±0.025	J	±0.05~±0.15	±0.005	±0.025
F	±0.013	±0.006	±0.025	K	±0.05~±0.15	±0.013	±0.025
C	±0.025	±0.013	±0.025	L	±0.05~±0.15	±0.025	±0.025
H	±0.013	±0.013	±0.025	M	±0.05~±0.15	±0.08~±0.2	±0.13
E	±0.025	±0.025	±0.025	N	±0.05~±0.15	±0.08~±0.2	±0.025
G	±0.025	±0.025	±0.13	U	±0.08~±0.25	±0.13~±0.38	±0.013

4 Cutting edge and fixing form

Code	Fixing form	Cutting edge	Drawing
A G M	With hole	Double sided Single side	
N R F	Without hole	Double sided Single side	
W T	40°- 60° counter bore on single side	Single side	
V	Pyramid bottom	Single side	120°
Y	Cone bottom	Single side	120°
X	Special fixing form		

5 Cutting Edge Length

Incircle (mm)	Inserts Shape						
	C	D	R	S	T	V	W
6.35	06	07	06	06	11	11	04
9.525	09	11	09	09	16	16	06
12.7	12	15	12	12	22	22	08
15.875	16	19	15	15	27		
20			20	20			

S	N	G	N	12	04	08FB	SL	02020
①	②	③	④	⑤	⑥	⑦	⑧	⑨

R	C	M	V	20	10	00	PH	20010
①	②	③	④	⑤	⑥	⑦	⑧	⑨

6 Inserts Thickness

Code	Inserts Thickness (mm)	Code	Inserts Thickness (mm)
03	3.18	06	6.35
T3	3.97	T6	6.8
04	4.76	07	7.94
T4	4.96	10	10
05	5.56	12	12

7 Corner Shape

Corner Arc Code		Main Cutting Edge Angle		Wiper Length	
Code	Corner Arc Radius	Code	Angle	Code	Length (L)
00	No Arc	A	45°	A	0.2
04	0.4	D	60°	B	0.4
08	0.8	E	75°	C	0.6
10	1.0	F	85°	D	0.8
12	1.2	P	90°	F	1.0
16	1.6	Z	Special Angle		
20	2.0				

8 Cutting Edge Shape

Code	Cutting Edge Form		Drawing
F	Sharp Cutting Edge		
EL	Light	Honing	
E	Average	Honing	
EH	Heavy	Honing	
T	Chamfering		
SL	Light	Honing + Chamfering	
S	Average	Honing + Chamfering	
SH	Heavy	Honing + Chamfering	
Q	Double Chamferings		
PL	Light	Double Chamferings + Honing	
P	Average	Double Chamferings + Honing	
PH	Heavy	Double Chamferings + Honing	

9 Chamfering Code

Single Chamfering Code			
Width		Angle	
Code	b_r	Code	γ_M
005	0.05	05	5°
010	0.10	10	10°
015	0.15	15	15°
020	0.20	20	20°
025	0.25	25	25°
030	0.30	30	30°
050	0.50		
070	0.70		
100	1.00		
150	1.50		
200	2.00		

Double Chamferings Code				
Code	Width b_{r1}/mm	Angle γ_M	Width b_{r2}/mm	Angle γ_M
05015	0.50	15°	0.10	30°
07015	0.70	15°	0.15	30°
10015	1.00	15°	0.20	30°
15010	1.50	10°	0.25	30°
20010	2.00	10°	0.25	30°

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