



**coated PcBN
inserts**

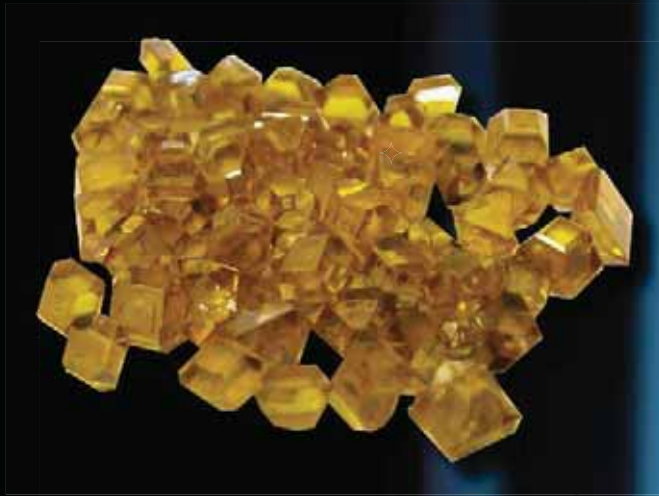


ultrahard

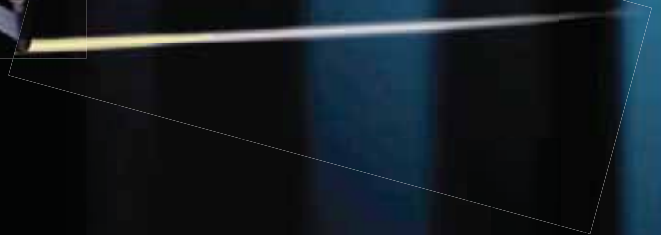
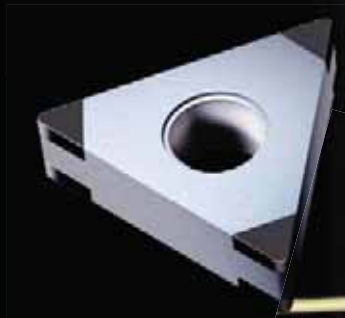
cutting materials



Edition 2010



2200 years
of research and
development from engraver to
high - tech - tool

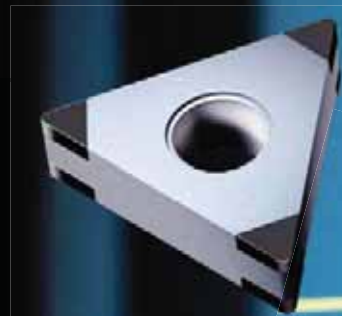




**Your partner for HSC-machining,
hard machining and high precision machining.**

Contents

Groups of Cutting Materials (DIN ISO 513)	5
Tipping modifications of all new coated PcBN-inserts	
ISO - Becker	6
Designation of tipped inserts for all our ultrahard	
cutting materials Comparison ISO - Becker	7
ISO Insert Nomenclature	8 - 9
New PcBN cutting materials in sandwich design	10 - 11
Ultrahard cutting materials, grades - materials -	
performance	12
New edge performance	13
Cutting data	14 - 17
Application field	18 - 19
CNGA Sandwich	20
CNGA 2-SC	20
CNGA 2-MC/S	21
CNGA 2-SC-Wiper	21
CNGA 2-MC/S-Wiper	22
CNGA 4-SC	22
CNGA 4-MC/S	23
CNGA 4-SC-Wiper	23
CNGA 4-MC/S-Wiper	24
DNGA 2-SC	24
DNGA 2-MC/S	25
DNGA 4-SC	25
DNGA 4-MC/S	26
RNGA Sandwich	26
RNGN Sandwich	27
SNGA Sandwich	27

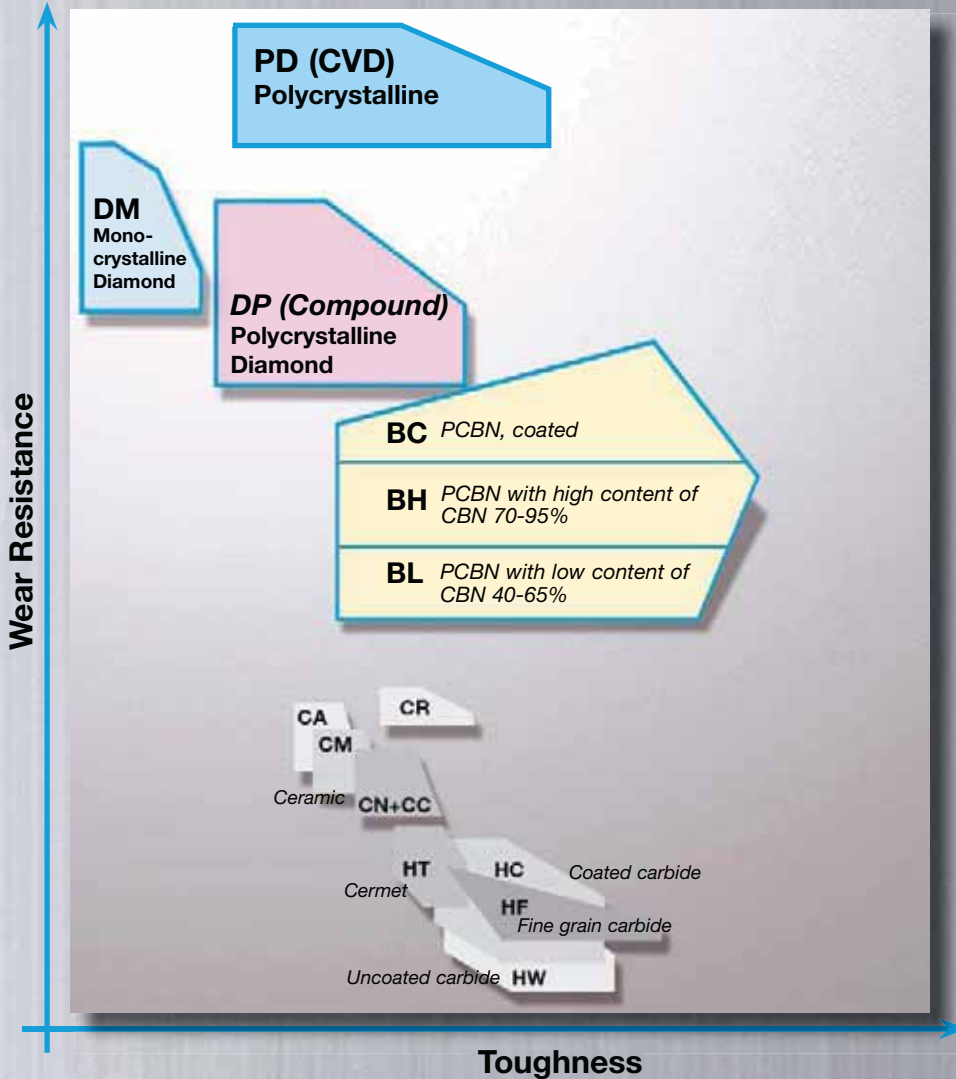


SNGA 8-SC	28
SNGN Sandwich	28
SNGN 8-SC	29
TNGA Sandwich	29
TNGA 3-MC/S	30
TNGA 6-SC	30
TNGA 6-MC/S	31
TNGN Sandwich	31
VNGA 4-SC	32
WNGA 6-SC	32
WNGA 6-SC-Wiper	33
CCGW 2-MC	34
CCGW 2-MC/S	34
CCGW 2-MC-Wiper	35
CCGW 2-MC/S-Wiper	35
DCGW 2-MC	36
DCGW 2-MC/S	36
TCGW 3-MC	37
VBGW 2-MC	38
VCGW 2-MC	38

ultrahard



cutting materials



General cutting material allocation

As for Norm DIN ISO 513 (2001) there are now additional ISO nomenclature for carbide (also cermet) and ceramic.

Furthermore new ident letters for the ultrahard cutting materials Polycrystalline Cubic Boron Nitride, Monocrystalline and Polycrystalline Diamond have been introduced.

Groups of Cutting Materials (DIN ISO 513)

<p>HW = Uncoated carbide</p> <p>HF = Fine grained carbide</p> <p>HT = Cermet, TiC or TiN</p> <p>HC = As above, but coated</p>	<p>DM = Monocrystalline Diamond</p> <p>DP = Polycrystalline Diamond -compound</p> <p>PD = CVD - thickfilm Diamond</p>
<p>CA = Ceramic, main content Al_2O_3</p> <p>CM = Mixed ceramic, main content Al_2O_3, plus components other than oxides</p> <p>CN = Siliconnitride ceramic, main content Si_3N_4</p> <p>CR = Ceramic, main content Al_2O_3 reinforced</p> <p>CC = Ceramics as above, but coated</p>	<p>BL= Polycrystalline Cubic Boron Nitride with low content of CBN</p> <p>BH= Polycrystalline Cubic Boron Nitride with high content of CBN</p> <p>BC= Polycrystalline Cubic Boron Nitride as above, but coated</p>



ISO-HardCut

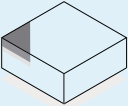
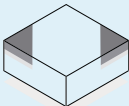
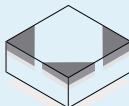
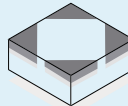
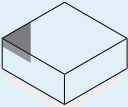
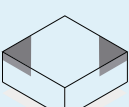
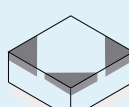
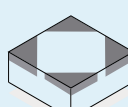
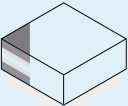
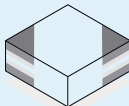
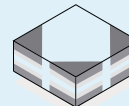
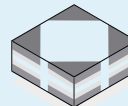
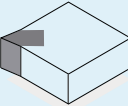
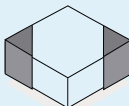
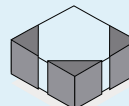
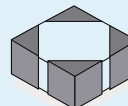
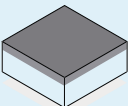
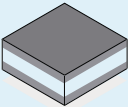
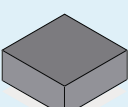


Tipping modifications of all new coated PcBN-inserts, ISO - BECKER.

ISO	BECKER	Design	Grades	BECKER	ISO
E	SE		Coated sandwich PcBN grades, double-sided layer thickness approx. 0,7 - 0,8 mm	PBC-10S PBC-15S PBC-25S PBC-40S	BH-C BH-C BL-C BL-C
C	SC		Coated sandwich PcBN grades, double-sided layer thickness approx. 0,6 - 0,8 mm	PBC-10S PBC-15S PBC-25S PBC-40S	BH-C BH-C BL-C BL-C
A-S	MC		Coated sandwich PcBN grades, layer thickness approx. 0,6 - 0,8 mm	PBC-10S PBC-15S PBC-25S PBC-40S	BH-C BH-C BL-C BL-C
A-S	MC-S		Coated solid PcBN grades, double-sided layer thickness approx. 1,2 - 1,3 mm	SBC-25C SBC-40C	BL-C BL-C
A-S	MC-S		Coated solid PcBN grades, layer thickness approx. 1,3 mm	SBC-25C SBC-40C	BL-C BL-C



**Designation of tipped inserts for all our ultrahard cutting materials
Comparison ISO - BECKER.**

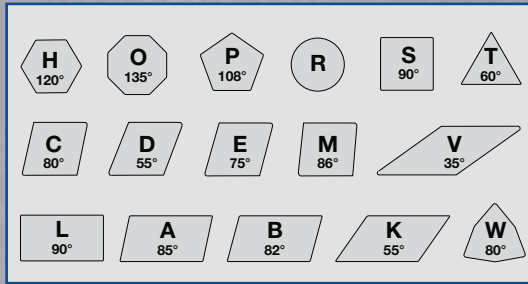
ISO	BECKER	Design	Number of tipped corners			Recommended max. depth of cut
			2	3	4	
A	EW MW MC PDC	 1 tipped corner, carbide reinforced				EW.....ap= 0,4 mm MW.....ap= 0,7 mm MC.....ap= 0,4 mm PDC.....ap= 2,5 mm
A-S	EWS MC-S MDC CVD	 1 tipped corner, solid grades				EWS.....ap= 0,8 mm MC-S.....ap= 0,8 mm MDC.....ap= 1,5 mm CVD.....ap= 2,0 mm
C	SC New	 2 tipped corner, carbide reinforced				SC.....ap= 0,5 mm
D	PC-S PC-S4 PC-M PC-M4	 1 tipped edge, solid grades				PC-S.....ap= 2,0 mm PC-S4....ap= 3,0 mm PC-M.....ap= 2,0 mm PC-M4...ap= 3,0 mm
F	VM	 FullFace				VM.....ap= 0,5 mm
E	SE New	 Double sided FullFace				SE.....ap= 0,5 mm
S	SBC	 Solid				SBC.....ap= 10 mm



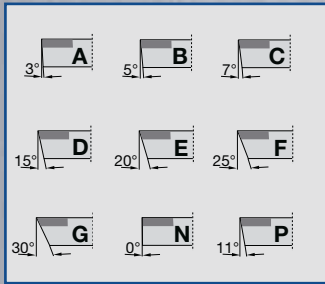
ISO-HardCut



1 Shape



2 Clearance



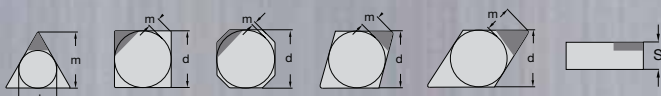
4 Insert type

N	
F	
R	
A	
G	
M	
W	
T	
X	Special Design

ISO Designation - Code

1 **C** 2 **N** 3 **G** 4 **A** 5 **12** 6 **04** 7 **08**

3 Tolerance Class

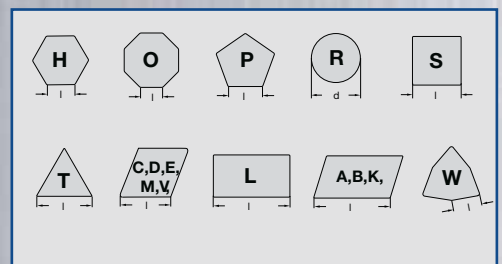


Tolerances in mm

	m	s	d		m	s	d ¹⁾
A	0,005	0,025	0,025	J	0,005	0,025	0,05 0,15
F	0,005	0,025	0,013	K	0,013	0,025	0,05 0,15
C	0,013	0,025	0,025	L	0,025	0,025	0,05 0,15
H	0,013	0,025	0,013	M ¹⁾	0,08 0,20	0,130	0,05 0,15
E	0,005	0,025	0,025	N ¹⁾	0,08 0,20	0,25	0,05 0,15
G	0,025	0,130	0,025	U ¹⁾	0,13 0,38	0,130	0,08 0,15

¹⁾ Exact tolerance is determined by size of insert.

5 Insert size

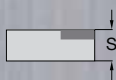


If less than 10 use 0 in first place
(Example: 9,525 mm = 09)

6 Thickness in mm

- 01 s = 1,59
- T1 s = 1,98
- 02 s = 2,38
- 03 s = 3,18
- T3 s = 3,97
- 04 s = 4,76
- 05 s = 5,56
- 06 s = 6,35

If less than 10 use 0 in first place
(Example: 3,18 mm = 03)



7 Corner configuration

Radius

- 00 = sharp corner
- 02 = 0,2 mm
- 04 = 0,4 mm
- 08 = 0,8 mm
- 12 = 1,2 mm
- 16 = 1,6 mm
- 00 = Round insert (inch)
- M0 = Round insert (metr.)



ultrahard

cutting materials



8 Wiper edge

W = Wiper edge,
right + left hand

WR = Wiper edge
right hand


WL = Wiper edge
left hand

10 Coated solid
PcBN grades

SBC-25C Hard turning, dry + wet
HRc = 48 - 65
 $a_p = 0,04 - 0,8 \text{ mm}$
 $R_a = 0,15 - 3,2 \mu$

SBC-40C Hard turning, dry + wet
HRc = 48 - 65
 $a_p = 0,05 - 0,8 \text{ mm}$
 $R_a = 0,1 - 3,2 \mu$

12 Tipping versions
solid PcBN grades

MC-S	
MC-S	

8



9



10



11



12



9 Cutting edge design

Cutting edge design
T-land + honing

Conditions A - H

See pages 14 - 17

10 Coated sandwich
PcBN grades

PBC-10S Grey cast iron (GG25)
Sintered powdered alloys
Super alloys

PBC-15S Nodular cast iron
Grey cast iron
Sintered powdered alloys
Super alloys

PBC-25S Hard turning, dry + wet
HRc = 48 - 62
 $a_p = 0,02 - 0,4 \text{ mm}$
 $R_a = 0,2 - 3,2 \mu$

PBC-40S Hard turning, dry + wet
HRc = 48 - 65
 $a_p = 0,05 - 0,4 \text{ mm}$
 $R_a = 0,1 - 3,2 \mu$

12 Tipping versions
Sandwich PcBN
grades

SE	
SC	
MC	

11 Cutting corners

Number of
cutting edges
2 - 8

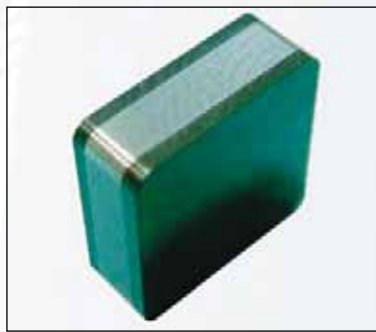


ISO-HardCut



New PcBN cutting materials in sandwich design

In the course of the technical development of ultrahard cutting materials we would like to present our new PcBN blanks in sandwich design and the inserts manufactured out of it with this supplement edition. This performance contains a hard metal core being double-sided tipped with a PcBN layer of approx. 0,8 mm thickness.



We manufacture all shapes of negative inserts in multiple corner tipping or double fullface type out of these blanks. As the production costs of these sandwich blanks are nearly identical to the introduced, one-sided tipped PcBN blanks there is a considerable price advantage per cutting edge or total layer.

The new sandwich blanks are manufactured in 4 different grades:

PBC-10S (BH-C), 95 % content, special grade for machining grey cast iron und super alloys.

PBC-15S (BH-C), 90 % content, special grade for machining nodular cast iron and sintered powdered steel.

PBC-25S (BL-C), 65 % content, special grade for hard turning, favoured in continuous cut.

PBC-40S (BL-C), 55 % content, special grade for hard turning, favoured in interrupted cut.

The development of ultrahard cutting materials is practiced intensively worldwide and therefore constant progress in the machining is guaranteed. We committed ourselves to these developments to offer our customers the most suitable ultrahard cutting materials, tools manufactured out of it and tool systems for reground inserts.



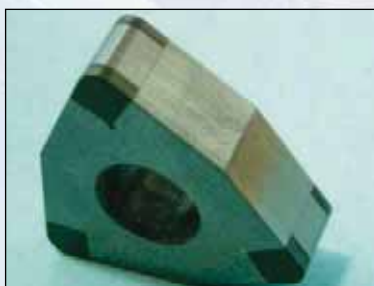
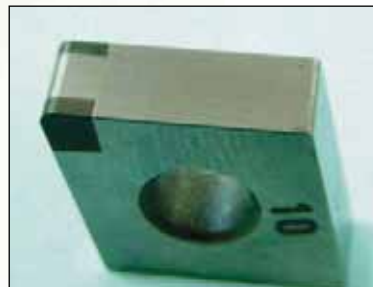
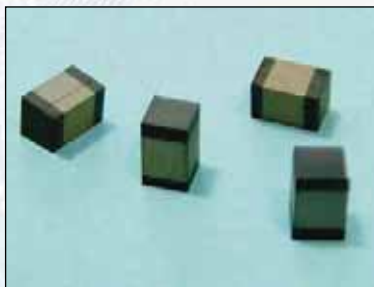
ultrahard

cutting materials



New PcBN cutting materials in sandwich design

Besides the manufacturing of double fullface inserts we cut rectangular segments out of the new sandwich blanks and braze them into the correspondingly prepared carbide blanks for negative inserts. This way we automatically have 2 cutting edges per brazed segment including in each case a big volume of PcBN cutting material. This manufacturing process both saves huge resources and is economically most reasonable. At the same time we refer to the possibility of regrinding.



With this supplement edition we furthermore present a lot of multiple edge and coated negative and positive inserts being tipped with our successful solid PcBN cutting materials for hard machining.

All PcBN inserts presented in the following are only manufactured in coated performance. Together with a completely new strategy of different edge preparation (T-land angles) per insert and PcBN grade we enlarge our application range and the total variety of utilization of our ultrahard cutting material PcBN to a so far unknown scale.



ISO-HardCut



Ultrahard cutting materials, grades - materials - performance.

BECKER	ISO	Composition - Performance	Application
PBC-10S	BH-C	Coated PcBN grade with a very high content of CBN (95%) in sandwich performance. Fine grain, higher wear resistance and toughness than PBC-10 in the HSC-range.	Grey cast iron (GG25) Sintered powdered alloys Super alloys
PBC-15S	BH-C	Coated PcBN grade with high content of CBN (90%) in sandwich performance. Fine grain, high wear resistance and toughness at lower cutting speed than with PBC-10S.	Nodular cast iron Grey cast iron Sintered powdered alloys Super alloys
PBC-25S	BL-C	Coated PcBN grade with low content of CBN (65%) in sandwich performance. Super fine grain, very high wear resistance, compressive resistance and toughness at hard turning in continuous cut.	Hard turning, dry + wet HRc = 48 - 62 $a_p = 0,02 - 0,4 \text{ mm}$ $R_a = 0,2 - 3,2 \mu$
PBC-40S	BL-C	Coated PcBN grade with low content of CBN (55%) in sandwich performance. Super fine grain, very high wear resistance, compressive resistance and toughness at hard turning in continuous to extremely interrupted cut.	Hard turning, dry + wet HRc = 48 - 65 $a_p = 0,05 - 0,4 \text{ mm}$ $R_a = 0,1 - 3,2 \mu$
SBC-25C	BL-C	Coated solid PcBN grade with low content of CBN (65%). Fine grain with very high wear resistance, compressive resistance and toughness at hard turning with depth of cut of 0,05 to 1 mm in continuous cut.	Hard turning, dry + wet HRc = 48 - 65 $a_p = 0,04 - 0,8 \text{ mm}$ $R_a = 0,15 - 3,2 \mu$
SBC-40C	BL-C	Coated solid PcBN grade with low content of CBN (65%). Super fine grain with extremely high wear resistance, compressive resistance and toughness at hard turning with depth of cut of 0,02 to 1 mm in continuous to extremely interrupted cut.	Hard turning, dry + wet HRc = 48 - 65 $a_p = 0,05 - 0,8 \text{ mm}$ $R_a = 0,1 - 3,2 \mu$



ultrahard

cutting materials



New edge performances.

With the release of this supplement edition we break new ground offering each type of insert per PcBN grade in 8 different cutting edge performances (micro cutting edge geometry) and exclusively coated. This enlarges the capability of our PcBN grades, especially regarding the hard turning but also for GG, sintered steel and super alloys to a so far unknown scale.

Furthermore the application possibilities increase as surface finish of Rz 0,5 – 0,8 μ can be easily reached. In extensive tests the chip removal and wear mechanism have been examined and the results obtained thereby have been transmitted on cutting speed, tool life and achievable surface qualities. This led to the decision to offer 8 different cutting edge conditions (micro cutting edge geometry) per PcBN grade.

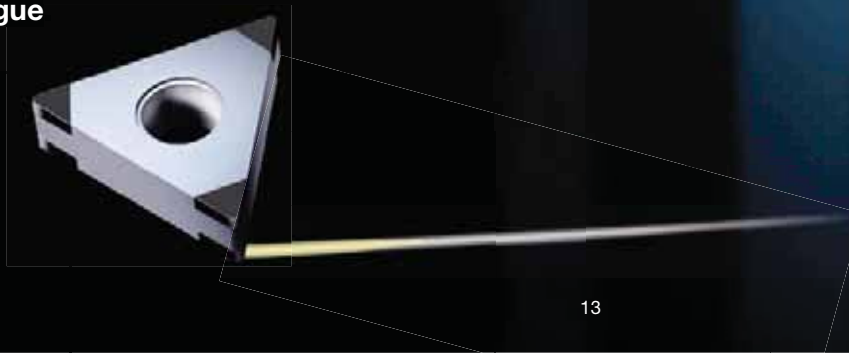
The different cutting edge conditions are called A to H. In all cases the performance 'A' has no negative chamfer and so – at continuous cut - is suited for the real HSC hard machining with cutting data up to $V_c = 380$ m/min at scallop heights of Ra 0,6 μ (wiper geometry). The performances 'B' to 'H' dispose of a negative chamfer with different chamfer angles up to 35°. Thus the capability of the cutting edges is clearly presented and must simply be allocated to the incoming application profiles.

In this context we would like to stress that the reached results strongly depend on the stability of the complete construction of the machine and the tension of the work pieces.

The following simple charts show that it is possible to reach at continuous cut highest cutting data with the cutting edge performance 'A' (without negative chamfer) with lowest surface quality at the same time, which may be sufficient in most cases. When using B to H performances the cutting speed reduces continuously and the surface finish increases at continuous and slightly to extremely interrupted cut.

All PcBN inserts indicated in this edition will exclusively be delivered in coated performance. This coating prevents a possible tribooxidation, adhesion or diffusion as it may appear by direct contact of the PcBN cutting materials with the different material grades, especially while using fluid coolant. So the wear resistance will be considerably increased.

At the same time we refer to the technical explanations and links in our current main catalogue





ISO-HardCut



Cutting data

Application range for PBC-10S										
GREY CAST IRON: GG20 - GG25 - GG30 - GG40										
Vc: m/min	Cutting edge design (T-land + honing)									
	A	B	C	D	E	F	G	H		
Cutting speed ↑ 1750 1500 1250 1000 750 500 300	Vc	Vc	Vc	Vc	Vc	Vc	Vc	Vc	Vc	
	Feed rate	f: 0,02-0,25	f: 0,04-0,25	f: 0,05-0,25	f: 0,05-0,40	f: 0,06-0,50	f: 0,08-0,35	f: 0,10-0,35	f: 0,12-0,35	Feed rate
	Depth of cut	ap: 0,02-0,25	ap: 0,03-0,3	ap: 0,06-0,4	ap: 0,06-0,4	ap: 0,08-0,5	ap: 0,08-0,4	ap: 0,1-0,4	ap: 0,12-0,4	Depth of cut
	Cutting conditions	← Continuous to heavily interrupted cut →								Cutting conditions

Application range for PBC-10S										
SUPER ALLOYS: Inconell 718, Nimonic, Hastelloy, Waspaloy										
Vc: m/min	Cutting edge design (T-land + honing)									
	A	B	C	D	E	F	G	H		
Cutting speed ↑ 700 600 500 400 300 200 100	Vc	Vc	Vc	Vc	Vc	Vc	Vc	Vc	Vc	
	Feed rate	f: 0,02-0,25	f: 0,04-0,25	f: 0,05-0,25	f: 0,05-0,40	f: 0,06-0,50	f: 0,08-0,35	f: 0,10-0,35	f: 0,12-0,35	Feed rate
	Depth of cut	ap: 0,02-0,25	ap: 0,03-0,3	ap: 0,06-0,4	ap: 0,06-0,4	ap: 0,08-0,4	ap: 0,08-0,4	ap: 0,1-0,4	ap: 0,12-0,4	Depth of cut
	Cutting conditions	← Continuous to medium interrupted cut →								Cutting conditions

ultrahard



cutting materials



Cutting data

Application range for PBC-15S
NODULAR CAST IRON: GGG30 - GGG40 - GGG50 - GGG60

Vc: m/min	Cutting edge design (T-land + honing)									
	A	B	C	D	E	F	G	H		
1750										
1500										
1250	Vc	Vc	Vc	Vc	Vc	Vc	Vc	Vc	Vc	
1000										
750										
500										
250										
Feed rate	f: 0,02-0,25	f: 0,04-0,25	f: 0,05-0,25	f: 0,05-0,35	f: 0,06-0,35	f: 0,08-0,35	f: 0,10-0,35	f: 0,12-0,35	Feed rate	
Depth of cut	ap: 0,02-0,25	ap: 0,03-0,3	ap: 0,06-0,4	ap: 0,06-0,4	ap: 0,08-0,5	ap: 0,08-0,4	ap: 0,1-0,4	ap: 0,12-0,4	Depth of cut	
Cutting conditions	← Continuous to medium interrupted cut →								Cutting conditions	

Application range for PBC-15S
SINTERED POWDERED STEEL: Sint D11- Sint D39

Vc: m/min	Cutting edge design (T-land + honing)									
	A	B	C	D	E	F	G	H		
800										
700										
600	Vc	Vc	Vc	Vc	Vc	Vc	Vc	Vc	Vc	
500										
400										
300										
200										
Feed rate	f: 0,02-0,25	f: 0,04-0,25	f: 0,05-0,25	f: 0,05-0,35	f: 0,06-0,35	f: 0,08-0,35	f: 0,10-0,35	f: 0,12-0,35	Feed rate	
Depth of cut	ap: 0,02-0,25	ap: 0,03-0,3	ap: 0,06-0,4	ap: 0,06-0,4	ap: 0,08-0,4	ap: 0,08-0,4	ap: 0,1-0,4	ap: 0,12-0,4	Depth of cut	
Cutting conditions	← Continuous to heavily interrupted cut →								Cutting conditions	



ISO-HardCut



Cutting data

Application range for PBC-25S									
Hardturning, favoured in continuous cut, ap = 0,02 - 0,4 mm, HRc 48 - 62									
Vc: m/min	Cutting edge design (T-land + honing)								Ra (μ)
	A	B	C	D	E	F	G	H	
350									0,1 μ
300									0,2 μ
250	Vc							Ra	0,4 μ
200		Vc							0,8 μ
150	Ra		Vc	Ra	Vc	Ra	Vc	Ra	1,6 μ
100		Ra							3,2 μ
50									6,4 μ
Feed rate	f: 0,02-0,15	f: 0,03-0,15	f: 0,04-0,20	f: 0,05-0,25	f: 0,06-0,25	f: 0,06-0,25	f: 0,06-0,20	f: 0,06-0,20	Feed rate
Depth of cut	ap: 0,02-0,25	ap: 0,03-0,3	ap: 0,06-0,4	ap: 0,06-0,4	ap: 0,08-0,4	ap: 0,08-0,4	ap: 0,1-0,4	ap: 0,12-0,4	Depth of cut
Cutting conditions	← Continuous cut →								Cutting conditions

Application range for PBC-40S									
Hardturning, favoured in interrupted cut, ap = 0,05 - 0,4 mm, HRc 48 - 65									
Vc: m/min	Cutting edge design (T-land + honing)								Ra (μ)
	A	B	C	D	E	F	G	H	
350									0,1 μ
300									0,2 μ
250									0,4 μ
200	Vc							Ra	0,8 μ
150		Vc							1,6 μ
100	Ra		Vc	Ra	Vc	Ra	Vc	Ra	3,2 μ
50		Ra							6,4 μ
Feed rate	f: 0,02-0,12	f: 0,03-0,15	f: 0,05-0,20	f: 0,06-0,20	f: 0,06-0,25	f: 0,06-0,25	f: 0,08-0,20	f: 0,08-0,20	Feed rate
Depth of cut	ap: 0,05-0,25	ap: 0,06-0,3	ap: 0,08-0,3	ap: 0,08-0,3	ap: 0,10-0,4	ap: 0,10-0,4	ap: 0,15-0,4	ap: 0,20-0,4	Depth of cut
Cutting conditions	← very slightly →		← slightly →		← medium →		← heavily →		Cutting conditions
← Interrupted cut →									



ultrahard

cutting materials



Cutting data

Application range for SBC-25C									
Hardturning, favoured in continuous Cut, ap = 0,04 - 0,8 mm, HRc 48 - 65									
Vc: m/min	Cutting edge design (T-land + honing)								Ra (μ)
	A	B	C	D	E	F	G	H	
350									0,1 μ
300	Vc	Vc					Ra	Ra	0,2 μ
250	Vc	Vc	Vc			Ra	Ra	Ra	0,4 μ
200		Vc	Vc	Vc	Ra	Vc	Ra		0,8 μ
150	Ra	Ra	Ra	Vc	Ra	Vc	Vc	Vc	1,6 μ
100	Ra								3,2 μ
50									6,4 μ
Feed rate	f: 0,02-0,20	f: 0,03-0,20	f: 0,03-0,20	f: 0,05-0,20	f: 0,06-0,25	f: 0,08-0,25	f: 0,08-0,25	f: 0,08-0,25	Feed rate
Depth of cut	ap: 0,04-0,5	ap: 0,05-0,5	ap: 0,05-0,8	ap: 0,08-0,8	ap: 0,08-0,8	ap: 0,12-0,8	ap: 0,15-0,8	ap: 0,2-0,8	Depth of cut
Cutting conditions	← Continuous cut →								Cutting conditions

Application range for SBC-40C									
Hardturning, favoured in interrupted Cut, ap = 0,05 - 0,8 mm, HRc 48 - 65									
Vc: m/min	Cutting edge design (T-land + honing)								Ra (μ)
	A	B	C	D	E	F	G	H	
350									0,1 μ
300	Vc	Vc					Ra	Ra	0,2 μ
250	Vc	Vc	Vc			Ra	Ra	Ra	0,4 μ
200		Vc	Vc	Vc	Ra	Vc	Ra		0,8 μ
150	Ra	Ra	Ra	Vc	Ra	Vc	Vc	Vc	1,6 μ
100	Ra								3,2 μ
50									6,4 μ
Feed rate	f: 0,02-0,20	f: 0,03-0,20	f: 0,03-0,20	f: 0,05-0,25	f: 0,06-0,25	f: 0,06-0,25	f: 0,06-0,25	f: 0,06-0,25	Feed rate
Depth of cut	ap: 0,05-0,5	ap: 0,05-0,5	ap: 0,05-0,8	ap: 0,08-0,8	ap: 0,10-0,8	ap: 0,12-0,8	ap: 0,15-0,8	ap: 0,20-0,8	Depth of cut
Cutting conditions	← very slightly →		← slightly →		← medium →		← heavily →		Cutting conditions
← Interrupted cut →									



ISO-HardCut

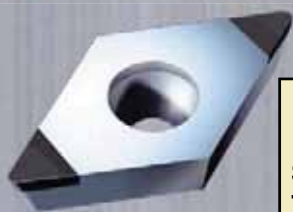
Application field

PBC 10S, for high cutting speed and long tool life in machining of grey cast irons



For example: drive wheel, GG 25, diameter 480 mm
Used insert type: DCGW 11T308-D-10S-2MC
Superfinishing: $V_c = 1.430$ m/min, $a_p = 0,3 - 0,5$ mm, $f = 0,20$ mm
Tool life: 280 parts
For comparison only: coated carbide insert: 26 parts, $V_c = 300$ m/min

PBC 15S, for extremely high tool life in machining of nodular cast irons



For example: bearing, GGG 60, diameter 200 mm
Used insert type: DCGW 11T308-D-15S-2MC
Superfinishing: $V_c = 900$ m/min, $a_p = 0,3$ mm, $f = 0,28$ mm
Tool life: 120 parts
For comparison only: coated carbide insert: 15 parts, $V_c = 220$ m/min

ultrahard

cutting materials



Application field

**PBC 25S, favoured in continuous cut,
Hardness: HRc 48 - 62
best surface finish**



**For example: drive shaft HRc 60, Mat: 1.2332 - 47CrMo4
Used insert Type: CNGA 120408-E-25S-4SC
Superfinishing: $V_c = 180\text{m/min}$, $a_p = 0,25\text{ mm}$ $f = 0,08\text{ mm}$
Surface finish: $R_a 0,18\ \mu$
Tool life: turning length = 3.218 m**

**PBC 40S, favoured in interrupted cut
Hardness: HRc 48 - 65
highest tool life**

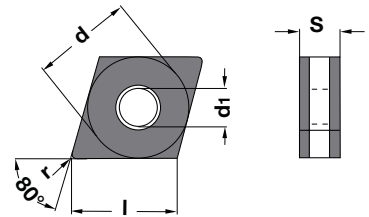


**For example: Gear HRc 58, Mat: 1.3523 - 19MnCr5
Used insert type: CNGA 120408-G-40S-4SC
Superfinishing: $V_c = 230\text{m/min}$, $a_p = 0,22\text{ mm}$, $f = 0,16\text{ mm}$
Surface finish: $R_a 0,40\ \mu$
Tool life: turning length = 4.280 m**



ISO-HardCut

CNGA Sandwich

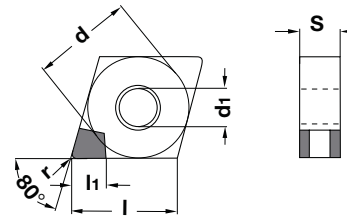


Insert size	PcBN-Grade:				Dimensions																																			
	PBC-10S																																							
Sandwich	T-land:											PBC-15S				PBC-25S				PBC-40S																				
CNGA-SE	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r		
120408-SE	■		■						■	■	■	■	■	■			■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■	12,70	5,12	4,76	12,9		0,8
120412-SE	■		■						■	■	■	■	■	■			■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■						1,2

■ = ex stock (subject to prior sale)

Ordering example: CNGA 120412-G-15S-SE

CNGA 2-SC



Insert size	PcBN-Grade:				Dimensions																																			
	PBC-10S																																							
CNGA-2SC	T-land:											PBC-15S				PBC-25S				PBC-40S																				
CNGA-2SC	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r		
120404-2SC	■				■	■	■		■	■	■	■	■	■	■		■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■	12,70	5,13	4,76	12,9	2,8	0,4
120408-2SC	■			■	■	■	■		■	■	■	■	■	■	■		■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■					2,5	0,8
120412-2SC	■			■	■	■	■		■	■	■	■	■	■	■		■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■					2,2	1,2

■ = ex stock (subject to prior sale)

Ordering example: CNGA 120412-E-10S-2SC

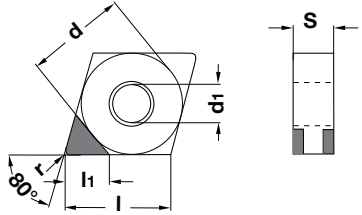


ultrahard

cutting materials



CNGA 2-MC/S

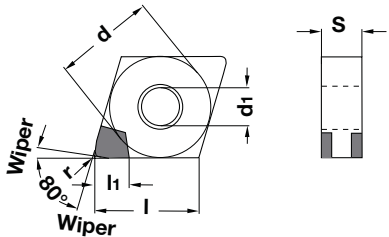


Insert size	PcBN-Grade:								PcBN-Grade:								Dimensions					
	SBC-25C								SBC-40C													
	T-land:								T-land:													
CNGA-2MC/S	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
120404-2MC/S	■			■	■	■	■	■													2,8	0,4
120408-2MC/S		■			■	■	■	■									12,70	5,13	4,76	12,9	2,5	0,8
120412-2MC/S			■	■	■	■	■	■													2,2	1,2

■ = ex stock (subject to prior sale)

Ordering example: CNGA 120412-H-25C-2MC/S

CNGA 2-SC-Wiper



Insert size	PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								Dimensions					
	PBC-10S								PBC-15S								PBC-25S								PBC-40S													
	T-land:								T-land:								T-land:								T-land:													
Wiper	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
CNGA-2SC																																					2,8	0,4
120404W-2SC	■				■	■	■																										12,70	5,13	4,76	12,9	2,5	0,8
120408W-2SC	■	■			■	■	■	■																														

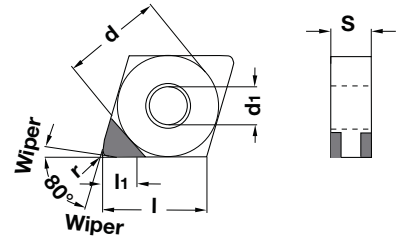
■ = ex stock (subject to prior sale)

Ordering example: CNGA 120404W-C-40S-2SC



ISO-HardCut

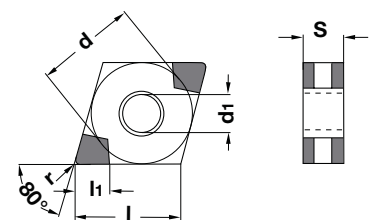
CNGA 2-MC/S-Wiper



Insert size	PcBN-Grade: SBC-25C								PcBN-Grade: SBC-40C								Dimensions					
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H						
CNGA-2MC/S		■		■	■	■	■	■									d	d1	s	l	l1	r
120404W-2MC/S		■		■	■	■	■	■									12,70	5,13	4,76	12,9	2,8	0,4
120408W-2MC/S		■		■	■	■	■	■													2,5	0,8

■ = ex stock (subject to prior sale) **Ordering example:** CNGA 120404W-D-25C-2MC/S

CNGA 4-SC



Insert size	PcBN-Grade: PBC-10S								PcBN-Grade: PBC-15S								PcBN-Grade: PBC-25S								PcBN-Grade: PBC-40S								Dimensions					
	T-land:								T-land:								T-land:								T-land:													
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H						
CNGA-4SC																																d	d1	s	l	l1	r	
120404-4SC																																			2,8	0,4		
120408-4SC																															12,70	5,13	4,76	12,9	2,5	0,8		
120412-4SC																																			2,2	1,2		

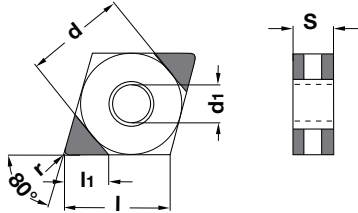
■ = ex stock (subject to prior sale) **Ordering example:** CNGA 120408-C-25S-4SC

ultrahard

cutting materials



CNGA 4-MC/S

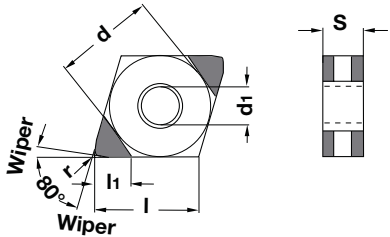


Insert size	PcBN-Grade:								PcBN-Grade:								Dimensions					
	SBC-25C								SBC-40C													
	T-land:								T-land:													
CNGA-4MC/S	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
120404-4MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	4,76	12,9	2,8	0,4
120408-4MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	4,76	12,9	2,5	0,8
120412-4MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	4,76	12,9	2,2	1,2

■ = ex stock (subject to prior sale)

Ordering example: CNGA 120408-E-40C-4MC/S

CNGA 4-SC-Wiper



Insert size	PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								Dimensions					
	PBC-10S								PBC-15S								PBC-25S								PBC-40S													
	T-land:								T-land:								T-land:								T-land:													
Wiper	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
CNGA-4SC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	4,76	12,9	2,8	0,4
120404W-4SC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	4,76	12,9	2,5	0,8
120408W-4SC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	4,76	12,9	2,5	0,8

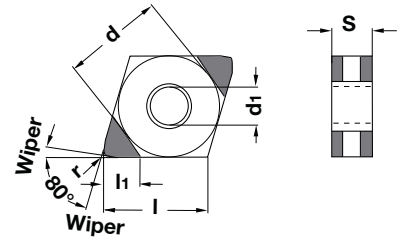
■ = ex stock (subject to prior sale)

Ordering example: CNGA 120404W-D-15S-4SC



ISO-HardCut

CNGA 4-MC/S-Wiper

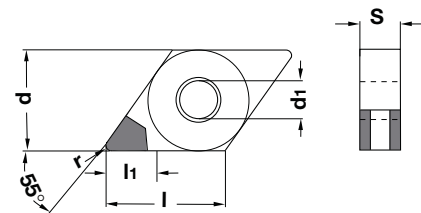


Insert size	PcBN-Grade:								PcBN-Grade:								Dimensions					
	SBC-25C								SBC-40C													
Wiper	T-land:								T-land:													
CNGA-4MC/S	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d ₁	s	l	l ₁	r
120404W-4MC/S	■	■	■	■	■	■			■	■	■	■	■	■	■	■	12,70	5,13	4,76	12,9	2,8	0,4
120408W-4MC/S	■	■	■	■	■	■			■	■	■	■	■	■	■	■					2,5	0,8

■ = ex stock (subject to prior sale)

Ordering example: CNGA 120408W-G-40C-4MC/S

DNGA 2-SC



Insert size	PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								Dimensions					
	PBC-10S								PBC-15S								PBC-25S								PBC-40S													
	T-land:								T-land:								T-land:								T-land:													
DNGA-2SC	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d ₁	s	l	l ₁	r
150404-2SC	■				■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	4,76	15,5	2,8	0,4
150408-2SC	■			■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					2,5	0,8
150604-2SC	■				■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	6,35	15,5	2,8	0,4
150608-2SC	■			■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					2,5	0,8

■ = ex stock (subject to prior sale)

Ordering example: DNGA 150408-E-15S-2SC

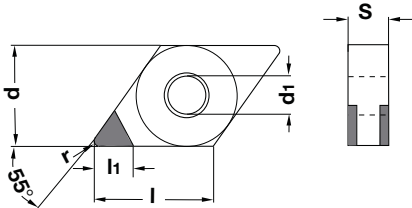


ultrahard

cutting materials



DNGA 2-MC/S

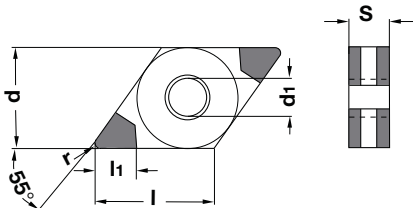


Insert size	PcBN-Grade:								PcBN-Grade:								Dimensions					
	SBC-25C								SBC-40C													
	T-land:								T-land:													
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
DNGA-2MC/S																					2,8	0,4
150604-2MC/S																	12,70	5,13	6,35	15,5	2,5	0,8
150612-2MC/S																					2,2	1,2

■ = ex stock (subject to prior sale)

Ordering example: DNGA 150612-F-40C-2MC/S

DNGA 4-SC



Insert size	PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								Dimensions					
	PBC-10S								PBC-15S								PBC-25S								PBC-40S													
	T-land:								T-land:								T-land:								T-land:													
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
DNGA-4SC																																					2,8	0,4
150404-4SC																																	12,70	5,13	4,76	15,5	2,5	0,8
150408-4SC																																					2,8	0,4
150604-4SC																																	12,70	5,13	6,35	15,5	2,5	0,8
150608-4SC																																					2,8	0,4

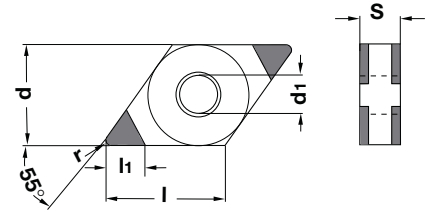
■ = ex stock (subject to prior sale)

Ordering example: DNGA 150604-D-40S-4SC



ISO-HardCut

DNGA 4-MC/S

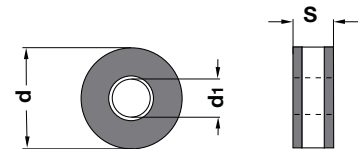


Insert size	PcBN-Grade:								PcBN-Grade:								Dimensions					
	SBC-25C								SBC-40C													
	T-land:								T-land:													
DNGA-4MC/S	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
150604-4MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	6,35	15,5	2,8	0,4
150608-4MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	2,5					0,8	
150612-4MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	2,2					1,2	

■ = ex stock (subject to prior sale)

Ordering example: DNGA 150608-E-25C-4MC/S

RNGA Sandwich



Insert size	PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								Dimensions					
	PBC-10S								PBC-15S								PBC-25S								PBC-40S													
	T-land:								T-land:								T-land:								T-land:													
RNGA-SE	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
120400-SE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	4,76			

■ = ex stock (subject to prior sale)

Ordering example: RNGA 120400-D-15S-SE

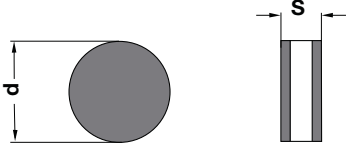


ultrahard

cutting materials



RNGN Sandwich

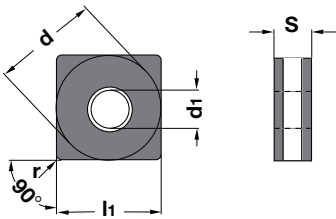


Insert size	PcBN-Grade: PBC-10S								PcBN-Grade: PBC-15S								PcBN-Grade: PBC-25S								PcBN-Grade: PBC-40S								Dimensions					
	T-land:								T-land:								T-land:								T-land:													
Sandwich	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
RNGA-SE	■	■		■					■	■	■	■					■	■	■						■	■	■	■	■	■	■	■	9,52		3,18			
090300-SE	■	■		■					■	■	■	■					■	■	■						■	■	■	■	■	■	■	■	12,70		3,18			
120300-SE	■	■		■					■	■	■	■					■	■	■						■	■	■	■	■	■	■	■	12,70		4,76			
120400-SE	■	■		■					■	■	■	■					■	■	■						■	■	■	■	■	■	■	■						

■ = ex stock (subject to prior sale)

Ordering example: RNGN 120400-E-40S-SE

SNGA Sandwich



Insert size	PcBN-Grade: PBC-10S								PcBN-Grade: PBC-15S								PcBN-Grade: PBC-25S								PcBN-Grade: PBC-40S								Dimensions					
	T-land:								T-land:								T-land:								T-land:													
Sandwich	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
SNGA-SE	■	■		■					■	■	■	■					■	■	■						■	■	■	■	■	■	■	■	12,70	5,13	4,76		12,7	0,8
120408-SE	■	■		■					■	■	■	■					■	■	■						■	■	■	■	■	■	■	■						1,2
120412-SE	■	■		■					■	■	■	■					■	■	■						■	■	■	■	■	■	■	■						

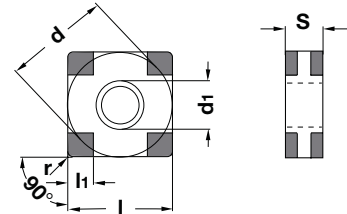
■ = ex stock (subject to prior sale)

Ordering example: SNGA 120408-D-15S-SE



ISO-HardCut

SNGA 8-SC

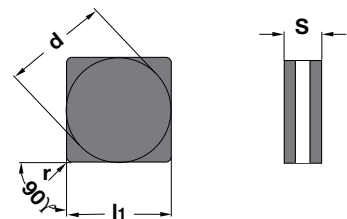


Insert size	PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		Dimensions																													
	PBC-10S		PBC-15S		PBC-25S		PBC-40S																															
	T-land:		T-land:		T-land:		T-land:																															
SNGA-8SC	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
120408-8SC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70	5,13	4,76	12,70	2,8	0,8		
120412-8SC	■			■	■	■	■	■		■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■					2,6	1,2		

■ = ex stock (subject to prior sale)

Ordering example: SNGA 120412-G-40S-8SC

SNGN Sandwich



Insert size	PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		Dimensions																													
	PBC-10S		PBC-15S		PBC-25S		PBC-40S																															
	T-land:		T-land:		T-land:		T-land:																															
Sandwich	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
SNGN-SE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52		3,18		9,52	0,8		
090308-SE	■	■		■					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70		3,18		12,7	0,8		
120308-SE	■	■		■					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70		4,76		12,7	0,8		
120408-SE	■	■		■					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70		4,76		12,7	1,2		
120412-SE	■	■		■					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								

■ = ex stock (subject to prior sale)

Ordering example: SNGN 090308-F-25S-SE



page 5-9

page 10-12

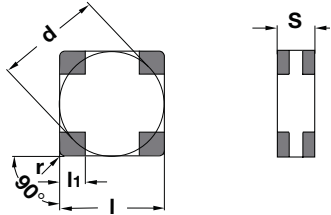
page 13-17

ultrahard

cutting materials



SNGN 8-SC

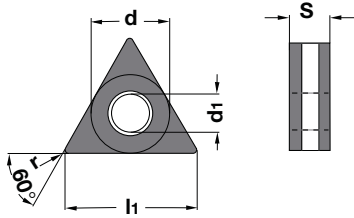


Insert size	PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		Dimensions																													
	PBC-10S		PBC-15S		PBC-25S		PBC-40S																															
	T-land:		T-land:		T-land:		T-land:																															
SNGN-8SC	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	h1	r
120408-8SC	■	■	■	■	■	■			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12,70		4,76	12,70	2,8	0,8		
120412-8SC	■			■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					2,6	1,2			

■ = ex stock (subject to prior sale)

Ordering example: SNGN 120408-H-40S-8SC

TNGA Sandwich



Insert size	PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		Dimensions																													
	PBC-10S		PBC-15S		PBC-25S		PBC-40S																															
	T-land:		T-land:		T-land:		T-land:																															
Sandwich	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	h1	r
TNGA-SE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6,35	2,26	3,18		11,0	0,4			
110304-SE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■						0,8			
110308-SE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
160404-SE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■						0,4			
160408-SE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52	3,81	4,76		16,5	0,8			
160412-SE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■						1,2			

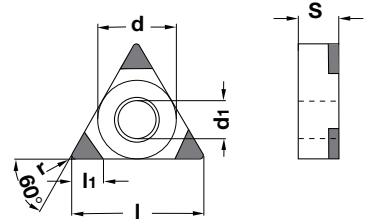
■ = ex stock (subject to prior sale)

Ordering example: TNGA 110308-F-25S-SE



ISO-HardCut

TNGA 3-MC/S

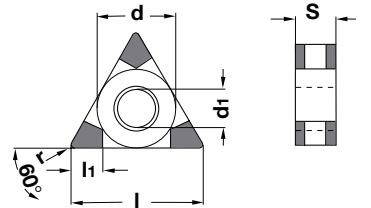


Insert size	PcBN-Grade:								PcBN-Grade:								Dimensions					
	SBC-25C								SBC-40C													
	T-land:								T-land:													
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
TNGA-3MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52	3,81	4,76	16,5	2,8	0,4
160404-3MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					2,5	0,8
160408-3MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					2,2	1,2

■ = ex stock (subject to prior sale)

Ordering example: TNGA 160412-G-40C-3MC/S

TNGA 6-SC



Insert size	PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								Dimensions					
	PBC-10S								PBC-15S								PBC-25S								PBC-40S													
	T-land:								T-land:								T-land:								T-land:													
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
TNGA-6SC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52	3,81	4,76	16,5	2,8	0,4
160404-6SC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					2,5	0,8
160408-6SC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					2,2	1,2

■ = ex stock (subject to prior sale)

Ordering example: TNGA 160408-D-40S-6SC



page 5-9

page 10-12

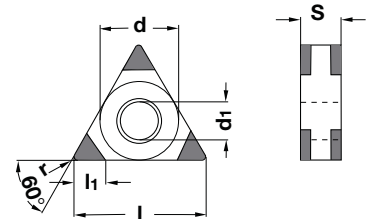
page 13-17

ultrahard

cutting materials



TNGA 6-MC/S

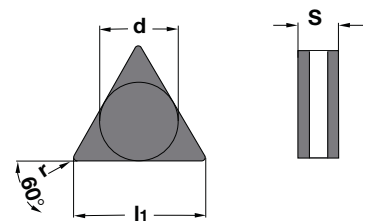


Insert size	PcBN-Grade:								PcBN-Grade:								Dimensions					
	SBC-25C								SBC-40C													
	T-land:								T-land:													
TNGA-6MC/S	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
160404-6MC/S	■	■	■	■	■						■	■	■	■	■	■	9,52	3,81	4,76	16,5	2,8	0,4
160408-6MC/S	■	■	■	■	■	■					■	■	■	■	■	2,5					0,8	
160412-6MC/S	■	■	■	■	■	■					■	■	■	■	■	2,2					1,2	

■ = ex stock (subject to prior sale)

Ordering example: TNGN 160404-A-25C-6MC/S

TNGN Sandwich



Insert size	PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								Dimensions					
	PBC-10S								PBC-15S								PBC-25S								PBC-40S													
	T-land:								T-land:								T-land:								T-land:													
TNGN-SE	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
110304-SE	■		■		■						■		■		■				■		■		■				■		■		■		6,35		3,18		11,0	0,4
110308-SE	■		■		■						■		■		■				■		■		■				■		■		■							0,8
160404-SE	■		■		■						■		■		■				■		■		■				■		■		■		9,52		4,76		16,5	0,4
160408-SE	■		■		■						■		■		■				■		■		■				■		■		■							0,8
160412-SE	■		■		■						■		■		■				■		■		■				■		■		■							1,2

■ = ex stock (subject to prior sale)

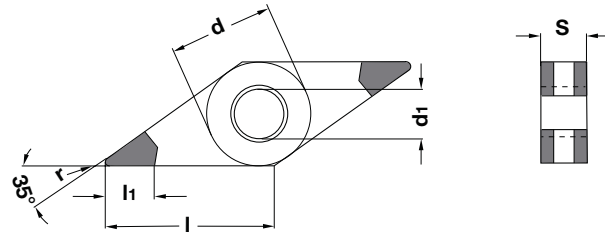
Ordering example: TNGN 160412-D-15S-SE





ISO-HardCut

VNGA 4-SC

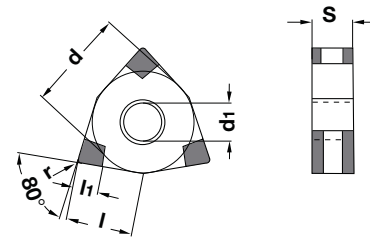


Insert size	PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		Dimensions																													
	PBC-10S		PBC-15S		PBC-25S		PBC-40S																															
	T-land:		T-land:		T-land:		T-land:																															
VNGA-4SC	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
160404-4SC	■				■	■	■	■		■	■	■	■	■	■	■		■	■	■	■	■	■	■									9,52	3,81	4,76	16,6	2,8	0,4
160408-4SC	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■		■	■	■	■	■	■	■													2,2	0,8

■ = ex stock (subject to prior sale)

Ordering example: VNGA 160408-C-25S-4SC

WNGA 6-SC



Insert size	PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		Dimensions																													
	PBC-10S		PBC-15S		PBC-25S		PBC-40S																															
	T-land:		T-land:		T-land:		T-land:																															
WNGA-6SC	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
080404-6SC	■									■	■	■	■	■	■	■		■	■	■	■	■	■	■									12,70	5,13	4,76	8,5	2,8	0,4
080408-6SC	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■		■	■	■	■	■	■	■													2,5	0,8
080412-6SC	■									■	■	■	■	■	■	■		■	■	■	■	■	■	■													2,2	1,2

■ = ex stock (subject to prior sale)

Ordering example: WNGA 080408-E-10S-6SC

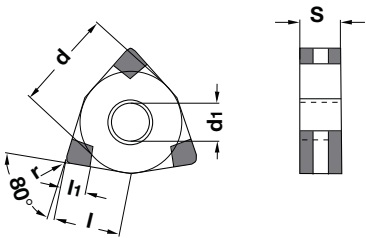
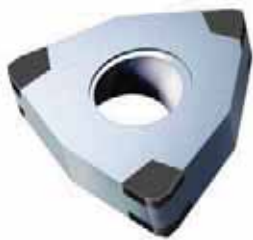


ultrahard

cutting materials



WNGA 6-SC-Wiper



Insert size	PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								Dimensions						
	PBC-10S								PBC-15S								PBC-25S								PBC-40S														
Wiper	T-land:								T-land:								T-land:								T-land:														
WNGA-6SC	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	h	r	
080404W-6SC	■				■	■	■			■	■	■	■	■	■	■			■	■	■	■	■	■	■									12,70	5,13	4,76	8,5	2,8	0,4
080408W-6SC	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■													2,5	0,8

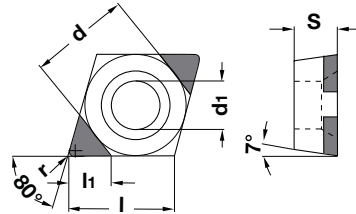
■ = ex stock (subject to prior sale)

Ordering example: WNGA 080404W-D-40S-6SC



ISO-HardCut

CCGW 2-MC

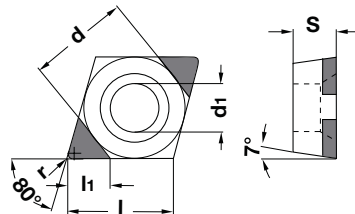


Insert size	PcBN-Grade:				PcBN-Grade:				PcBN-Grade:				PcBN-Grade:				Dimensions																					
	PBC-10S				PBC-15S				PBC-25S				PBC-40S																									
	T-land:				T-land:				T-land:				T-land:																									
CCGW-2MC	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
060202-2MC	■	■	■	■					■				■	■			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6,35	2,8	2,38	6,45	3,2	0,2
060204-2MC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6,35	2,8	2,38	6,45	2,8	0,4
060208-2MC		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6,35	2,8	2,38	6,45	2,4	0,8
09T302-2MC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52	4,4	3,97	9,7	3,2	0,2
09T304-2MC		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52	4,4	3,97	9,7	2,8	0,4
09T308-2MC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52	4,4	3,97	9,7	2,4	0,8

■ = ex stock (subject to prior sale)

Ordering example: CCGW 060208-F-25S-2MC

CCGW 2-MC/S



Insert size	PcBN-Grade:				PcBN-Grade:				Dimensions													
	SBC-25C				SBC-40C																	
	T-land:				T-land:																	
CCGW-2MC/S	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r
060202-2MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6,35	2,8	2,38	6,45	3,2	0,2
060204-2MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6,35	2,8	2,38	6,45	2,8	0,4
060208-2MC/S		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	6,35	2,8	2,38	6,45	2,4	0,8
09T302-2MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52	4,4	3,97	9,7	3,2	0,2
09T304-2MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52	4,4	3,97	9,7	2,8	0,4
09T308-2MC/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	9,52	4,4	3,97	9,7	3,4	0,8

■ = ex stock (subject to prior sale)

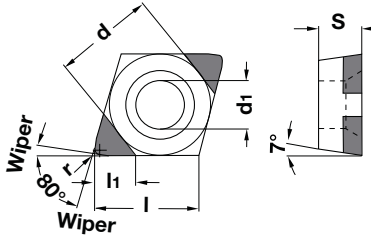
Ordering example: CCGW 09T304-C-40C-2MC/S

ultrahard

cutting materials



CCGW 2-MC-Wiper

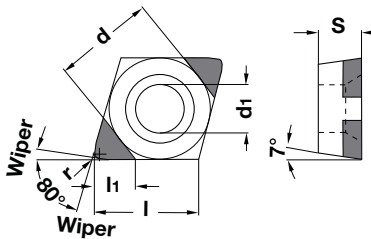


Insert size	PcBN-Grade: PBC-10S								PcBN-Grade: PBC-15S								PcBN-Grade: PBC-25S								PcBN-Grade: PBC-40S								Dimensions					
	T-land:								T-land:								T-land:								T-land:													
Wiper	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	h1	r
CCGW-2MC																																						
060202W-2MC																																	6,35	2,8	2,38	6,45	3,2	0,2
060204W-2MC																																					2,8	0,4
09T304W-2MC																																					2,8	0,4
09T308W-2MC																																	9,52	4,4	3,97	9,7	2,4	0,8

■ = ex stock (subject to prior sale)

Ordering example: CCGW 060202W-D-40S-2MC

CCGW 2-MC/S-Wiper



Insert size	PcBN-Grade: SBC-25C								PcBN-Grade: SBC-40C								Dimensions					
	T-land:								T-land:													
Wiper	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	h1	r
CCGW-2MC/S																						
060202W-2MC/S																	6,35	2,8	2,38	6,45	3,2	0,2
060204W-2MC/S																					2,8	0,4
09T304W-2MC/S																					2,8	0,4
09T308W-2MC/S																	9,52	4,4	3,97	9,7	2,4	0,8

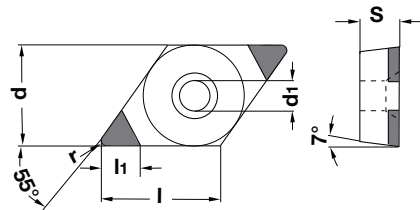
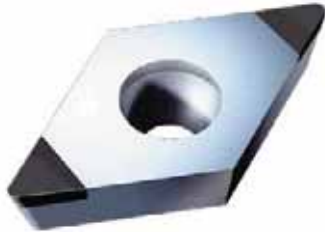
■ = ex stock (subject to prior sale)

Ordering example: CCGW 09T308W-C-25C-2MC/S



ISO-HardCut

DCGW 2-MC

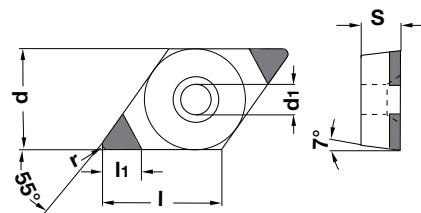
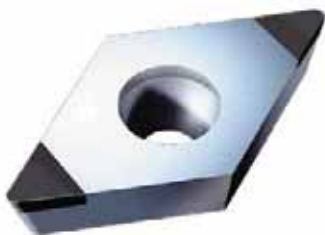


Insert size	PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		PcBN-Grade:		Dimensions																																	
	PBC-10S		PBC-15S		PBC-25S		PBC-40S																																			
	T-land:		T-land:		T-land:		T-land:																																			
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	h1	r				
DCGW-2MC	■								■								■												■								6,35	2,8	2,38	7,75	3,4	0,2
070202-2MC	■								■								■												■								6,35	2,8	2,38	7,75	3,0	0,4
070204-2MC	■								■								■												■								6,35	2,8	2,38	7,75	2,6	0,8
070208-2MC	■								■								■												■								9,52	4,4	3,97	11,6	3,4	0,2
11T302-2MC	■								■								■												■								9,52	4,4	3,97	11,6	3,0	0,4
11T304-2MC	■								■								■												■								9,52	4,4	3,97	11,6	2,6	0,8
11T308-2MC	■								■								■												■								9,52	4,4	3,97	11,6	3,0	0,4

■ = ex stock (subject to prior sale)

Ordering example: DCGW 11T304-D-15S-2MC

DCGW 2-MC/S



Insert size	PcBN-Grade:		PcBN-Grade:		Dimensions																									
	SBC-25C		SBC-40C																											
	T-land:		T-land:																											
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	h1	r								
DCGW-2MC/S	■								■								■								6,35	2,8	2,38	7,75	3,4	0,2
070202-2MC/S	■								■								■								6,35	2,8	2,38	7,75	3,0	0,4
070204-2MC/S	■								■								■								6,35	2,8	2,38	7,75	2,6	0,8
070208-2MC/S	■								■								■								9,52	4,4	3,97	11,6	3,4	0,2
11T302-2MC/S	■								■								■								9,52	4,4	3,97	11,6	3,0	0,4
11T304-2MC/S	■								■								■								9,52	4,4	3,97	11,6	2,6	0,8
11T308-2MC/S	■								■								■								9,52	4,4	3,97	11,6	3,0	0,4

■ = ex stock (subject to prior sale)

Ordering example: DCGW 070202-C-40C-2MC/S

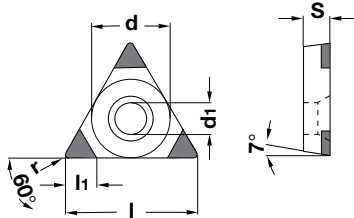


ultrahard

cutting materials



TCGW 3-MC



Insert size	PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								PcBN-Grade:								Dimensions											
	PBC-10S								PBC-15S								PBC-25S								PBC-40S																			
	T-land:								T-land:								T-land:								T-land:																			
TCGW-3MC	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	h	r						
090202-3MC	■																																						5,56	2,5	2,38	9,6	2,6	0,2
090204-3MC																																											2,2	0,4
090208-3MC																																											1,8	0,8
110202-3MC	■																																						6,35	2,8	2,38	11,0	2,9	0,2
110204-3MC																																											2,5	0,4
110208-3MC																																											2,1	0,8
16T304-3MC	■																																						9,52	4,4	3,97	16,5	3,2	0,4
16T308-3MC																																											2,7	0,8

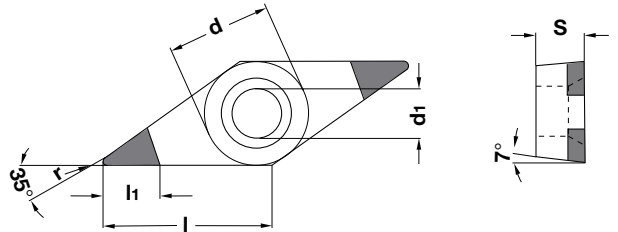
■ = ex stock (subject to prior sale)

Ordering example: TCGW 110204-B-15S-3MC



ISO-HardCut

VBGW 2-MC

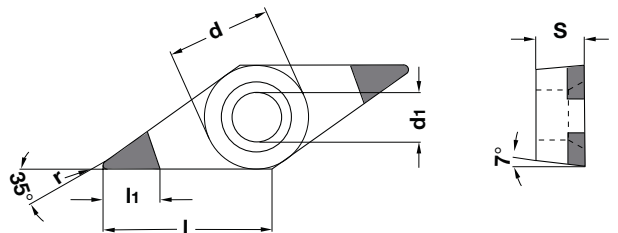


Insert size	PcBN-Grade:				PcBN-Grade:				PcBN-Grade:				PcBN-Grade:				Dimensions																										
	PBC-10S				PBC-15S				PBC-25S				PBC-40S																														
	T-land:				T-land:				T-land:				T-land:																														
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r					
160404-2MC	■	■	■	■	■				■	■	■	■	■	■			■	■			■	■	■	■						■	■	■	■	■	■	■	■	9,52	4,4	4,76	16,6	3,1	0,4
160408-2MC		■	■	■	■				■	■	■	■	■	■			■				■	■	■	■						■	■	■	■	■	■	■	■					2,5	0,8

■ = ex stock (subject to prior sale)

Ordering example: VBGW 160408-F-40S-2MC

VCGW 2-MC



Insert size	PcBN-Grade:				PcBN-Grade:				PcBN-Grade:				PcBN-Grade:				Dimensions																										
	PBC-10S				PBC-15S				PBC-25S				PBC-40S																														
	T-land:				T-land:				T-land:				T-land:																														
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	d	d1	s	l	l1	r					
110304-2MC	■	■	■	■	■				■	■	■	■	■	■			■	■			■	■	■	■						■	■	■	■	■	■	■	■	6,35	2,9	3,18	11,1	3,1	0,4
110308-2MC		■	■	■	■				■	■	■	■	■	■			■				■	■	■	■						■	■	■	■	■	■	■	■					2,5	0,8
160404-2MC	■	■	■	■	■				■	■	■	■	■	■			■	■			■	■	■	■						■	■	■	■	■	■	■	■	9,52	4,4	4,76	16,6	3,1	0,4
160408-2MC		■	■	■	■				■	■	■	■	■	■			■				■	■	■	■						■	■	■	■	■	■	■	■					2,5	0,8

■ = ex stock (subject to prior sale)

Ordering example: VCGW 110304-E-25S-2MC

Please observe
our full range of tools
with ultrahard cutting materials



FormCut
MonoCut
MiniCut
ISO-HardCut
MillCut



BECKER Diamantwerkzeuge GmbH
D- 82178 Puchheim / München, Benzstraße 13, Germany
Telefon: +49 (0) 89 89 02 28-0, Telefax: +49 (0) 89 89 02 28-30
becker@beckerdiamant.de, www.beckerdiamant.de