IDENTIFICATION *of* NEWEN® FIXED-TURNING® SINGLE POINT CUTTERS

CONTOUR

- **F** FULL SIZE
- **T** TRUNCATED

- **S** SHARPENABLE
- **O** NON-SHARPENABLE

RELIEF ANGLES

- **C** 5°
- **B** 7°
- **A** 11°

- **N** CBN (Cubic Boron Nitride)
- **P** PCD (Polycrystalline Diamond)
- **K** CERMET (Metallic Ceramics)
- **G** COATED CARBIDE
- **H** CERAMICS

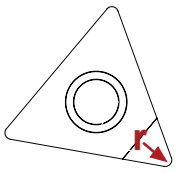
C N T R - T O A N - 4 11 2 04

N⁰	DESCRIPTION	APPLICATIONS	SUGGESTED CUTTING SPEEDS	REMARKS
1	**CBN** *Type 1*	Hardened Steels & Cast Irons, Stellites.	150 to 250 m/min	Very hard valve seats such as Well-Tite and Hardened steels.
2	**CBN** *Type 2*	Alloys which do not present any particular machining difficulties.	100 to 250 m/min	Steels and Standard Powder metals.
3	**PCD**	Beryllium, Aluminum, Copper, Bronze.	400 to 600 m/min	Do **NOT** use for ferrous materials.
4	**CERMET**	Very hard steels which do not present any particular machining difficulties.	80 to 350 m/min	Finish of very hard materials & Beryllium. Fragile for interrupted cuts.
5	**COATED CARBIDE**	Alloys which do not present any particular machining difficulties.	80 to 200 m/min	
6	**CBN** *Type 3*	Wide range of hardened steels, Cast Irons	150 to 200 m/min *Maximum cutting speed 200m/min*	Ceramic Coated - Enhanced edge strength and wear resistance. Good for finishing applications
7	**CBN** *Type 4*	Hard & heat resistant alloys, Stellites.	200 to 400 m/min	Extreme resistance to breakage & wear- Without protective chamfer on cutting edge.
8	**CBN** *Type 5*	Cast irons in general. Especially well suited for nodular cast iron.	150 to 250 m/min	Extreme breakage and wear resistance. For the high speed and high precision machining of cast iron.
9				

DIMENSIONS

- **06** 6mm
- **08** 8mm
- **11** 11mm

NOSE RADIUS



02	0,20mm
04	0,40mm
08	0,80mm

CUTTING ANGLES

1	Negative cut with protective chamfer.
2	Negative cut without protective chamfer.
3	Positive cut obtained from sintering.
4	Positive cut obtained from grinding.

These values are merely suggested values and must be validated with actual trials. Always make sure that the cutter rest properly against the tip holder.

GRADE	MATERIAL		CUTTING SPEED RANGE	AVERAGE FEED RATE	AVERAGE CUTTING DEPTH	DRY CUT	WET CUT
Tungsten Carbide	• Cast Iron • Steel • Powdered Metal	Hardness < 40HRC	**50 to 100 m/min** *164 to 328 ft/min*	*ROUGH FEED:* **0.2 / 0.3 mm/rev** *.0079 / .0118 "/rev* *FINISH FEED:* **0.08 mm/rev** *.0031 "/rev*	*ROUGH DEPTH:* **0.3 / 0.5 mm/rev** *.0118" / .0197 "/rev* *FINISH DEPTH:* **0.05 to 0.1 mm/rev** *.0020 to .0039 "/rev*	Acceptable	Recommended in difficult cases
CERMET with positive cut obtained from sintering	• Aluminum • Copper Berrylium • Non Ferrous Metals • FIXED-TURNING® Applications		**100 to 200 m/min** *328 to 656 ft/min*	*ROUGH FEED:* **.15 mm/rev** *.0059 "/rev* *FINISH FEED:* **0.05 mm/rev** *.0020 "/rev*	*ROUGH DEPTH:* **0.10 to 0.25 mm/rev** *.0039 to .0098 "/rev* *FINISH DEPTH:* **0.05 mm/rev** *.0020 "/rev*	Acceptable if the metal shaving does not stick to the tool.	Recommended in case of metal shaving sticking
CBN Coated CBN	• Tempered Cast Iron • Treated Steel • Powdered Metal	Hardness > 40HRC	**90 to 180 m/min** *295 to 590 ft/min*	*ROUGH FEED:* **.12 mm/rev** *.0047 "/rev* *FINISH FEED:* **0.02 mm/rev** *.0079 "/rev*	*ROUGH DEPTH:* **0.10 to 0.25mm/rev** *.0039 to .0098 "/rev* *FINISH DEPTH:* **0.04 mm/rev** *.0016 "/rev*	Yes	Desirable in case of metal shaving sticking
CBN for cast irons	• Tempered Cast Iron - Very Hard		**150 to 300 m/min** *492 to 984 ft/min*	*ROUGH FEED:* **.15 mm/rev** *.0059 "/rev* *FINISH FEED:* **0.02 mm/rev** *.0079 "/rev*	*ROUGH DEPTH:* **0.20 mm/rev** *.0079 "/rev* *FINISH DEPTH:* **0.08 mm/rev** *.0031 "/rev*	Yes	Yes
PCD	• Non Ferrous Materials		**300+ m/min** *984+ ft/min*	*ROUGH FEED:* **.15 mm/rev** *.0059 "/rev* *FINISH FEED:* **0.02 mm/rev** *.0079 "/rev*	*ROUGH DEPTH:* **0.15 mm/rev** *.0059 "/rev* *FINISH DEPTH:* **0.02 mm/rev** *.0079 "/rev*	Yes	Yes

COOLANT:
Abundant coolant is mandatory for the reaming of guides. One need a water extendible coolant (8%) for chip evacuation, temperature control and reamer protection. For valve seat machining applications, the coolant is recommended when one machines steels and cast irons heavily alloyed and any light alloys that tend to stick to the cutter.

CUTTING SPEED:
The cutting speed is expressed in meter per minute or foot per minute. **It corresponds to the distance travelled by the tip of the tool in one minute.**

Example:
For a valve seat with a diameter of 40mm (.04m) (.1312 feet) and a Spindle Rotation of 1500 RPM :
A- ***Cutting Speed in meter per minute*** =
Valve seat diameter (Meter) x 3.14 X Spindle Rotation (RPM) = .04 x 3.14 x 1500 = **188.4m/min**
B- ***Cutting Speed in foot per minute*** =
Valve seat diameter (Foot) x 3.14 x Spindle Rotation (RPM) = .1312 x 3.14 x 1500 = **617.95 feet/min**

How to calculate RPM from meter or foot per minute

1) Convert the cutting speed expressed in meter to millimeters or foot to inches: 160meter/min = 160,000 mm/min (524.9 feet/min = 6298.8 inch/min)
2) Divide this value by the average circumference of the valve seat: (circumference = 40mm x3.14 = 125.6mm) 160,000/125.6 = 1274 RPM or [6298.8/(1.575X3.14) = 1274 RPM]

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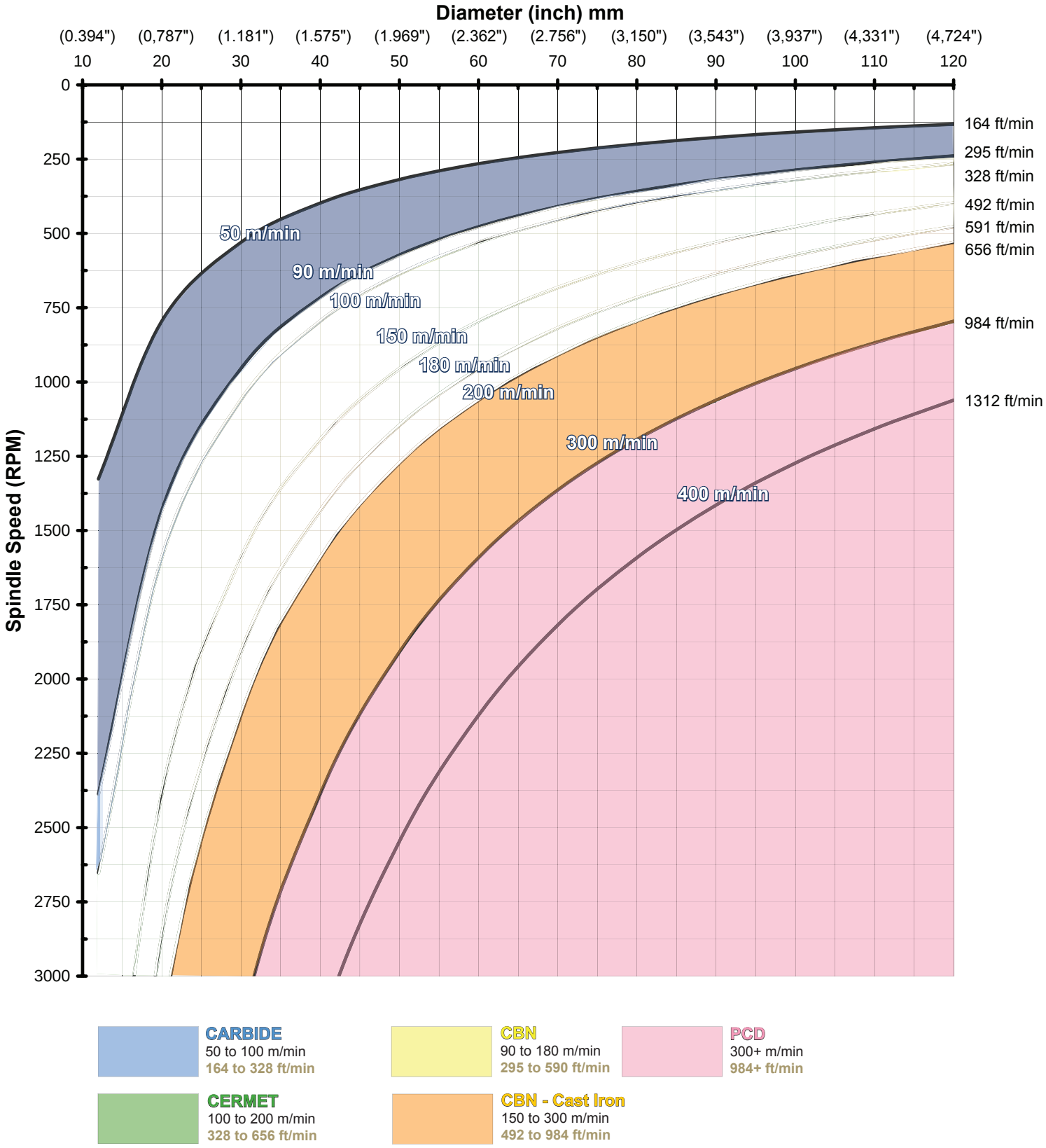
Diameter (inch) mm
(0.394") (0,787") (1.181") (1.575") (1.969") (2.362") (2.756") (3,150") (3,543") (3,937") (4,331") (4,724")
10 20 30 40 50 60 70 80 90 100 110 120
Spindle Speed (RPM)
0 250 500 750 1000 1250 1500 1750 2000 2250 2500 2750 3000
164 ft/min
295 ft/min
328 ft/min
492 ft/min
591 ft/min
656 ft/min
984 ft/min
1312 ft/min
50 m/min
90 m/min
100 m/min
150 m/min
180 m/min
200 m/min
300 m/min
400 m/min
CARBIDE
50 to 100 m/min
164 to 328 ft/min
CBN
90 to 180 m/min
295 to 590 ft/min
PCD
300+ m/min
984+ ft/min
CERMET
100 to 200 m/min
328 to 656 ft/min
CBN - Cast Iron
150 to 300 m/min
492 to 984 ft/min