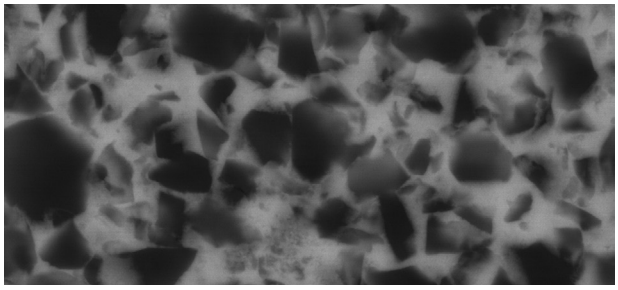
PCBN
Grade: DIA550

Key material characteristics

- Class: medium content
- 55% vol cBN
- 2 µm avg. grain size
- TiC/TiN binder



Typical microstructure of DIA550

For light to moderately interrupted hard turning and finish hard milling in both dry and wet conditions. Suitable for both conventional and high machining speeds.

Sizes and format available

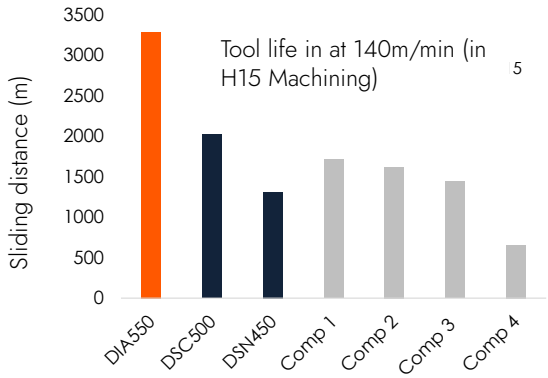
DIA550						
Conductive/non-conductive	conductive					
Outside disc diameter (mm)	95					
PCBN usable area (mm)	90					
PCBN layer	solid					
Overall thickness (+/- 0.05 mm)						
1.00	1.60	2.38	3.18	4.76	6.35	7.94
x	x	x	x	x	x	x
Other sizes and formats available on request						

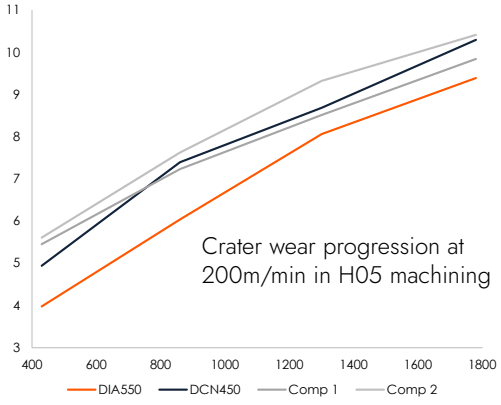
Application space

H15 - H25 Hard metals

Performance data

Four H15 tests undertaken, all showing comparable performance across experiments. 30% improvement in chemical wear and 50% improvement in flank wear versus internal 55%cBN Reference PcBN grade.



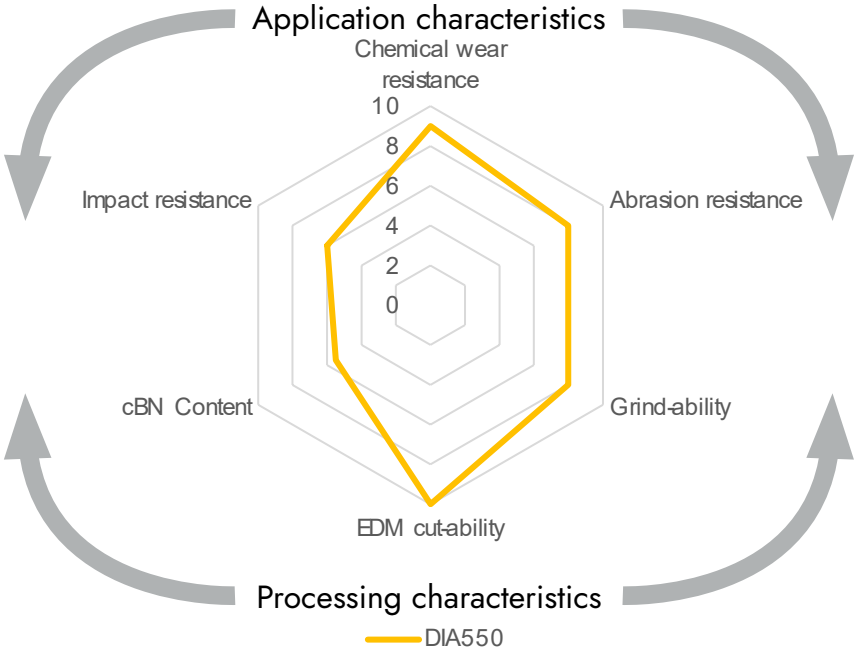


DIA550 Reference 55%

PCBN application guide

Workpiece material	Grade recommendations		Cutting conditions						Edge geometry guide			
			Cutting speed, Vc (m/min)		Feed, f (mm)		Depth of cut, ap (mm)		Chamfer angle, Yb	Chamfer width, by (mm)	Edge radius (um)	Nose radius (mm)
		Preferred choice grade	Min	Max	Min	Max	Min	Max	Recommended ranges			
Hardened steel	H15	1st	130	250	0.05	0.5	0.05	0.3	20 - 35	0.12 - 0.2	15 - 35	0.4 - 1.6

Characteristics



Mechanical properties

Property	Grade: DIA550	Description
cBN content, vol %	55	Amount of cBN within the product
cBN size, µm	~1.5	Average grain sizes of cBN
Binder chemistry	TiC/TiN	Type of binder used
Density, g/cm^3	4.08 ± 0.5	The substance's mass per unit of volume
Young's Modulus, E, GPa	643 ± 50	How easily the material stretches or deforms under applied stress
Hardness HV1, GPA	32.6 ± 2.0	The resistance to localised plastic deformation
Transverse Rupture Strength, TRS 3-point bend, MPa	1061 ± 150	The stress the material can withstand before it yields
Thermal diffusivity, mm^2/S	17.2 ± 5	Measures the ability of the material to conduct thermal energy relative to its ability to store thermal energy
Specific heat capacity, J/(g*K)	0.63 ± 0.05	The quantity of heat (J) absorbed per unit mass (kg) of the material when its temperature increased by 1 K (or 1 °C)
Thermal conductivity at 25 °C, W/(m*K)	43.3 ± 10	The measure of the material's ability to conduct heat

All property measurements are carried out, where possible, in accordance with relevant international standards. The data quoted is for comparative purposes only and should not be viewed as a product specification. Element Six is constantly striving to improve its products and, therefore, reserves the right to alter product properties without prior notice.

Items available

Full round disc

Item code	Item description	Overall thickness, mm (solid product)
295-200-0059-01	DIA550 R90.0-360-1.0 002	1.0
295-200-0057-01	DIA550 R90.0-360-1.6 002	1.6
295-200-0060-01	DIA550 R90.0-360-2.4 002	2.38
295-200-0061-01	DIA550 R90.0-360-3.2 002	3.18
295-200-0058-01	DIA550 R90.0-360-4.8 002	4.78

Additional sizes and shapes available upon request.

Contact: salesorders@e6.com
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