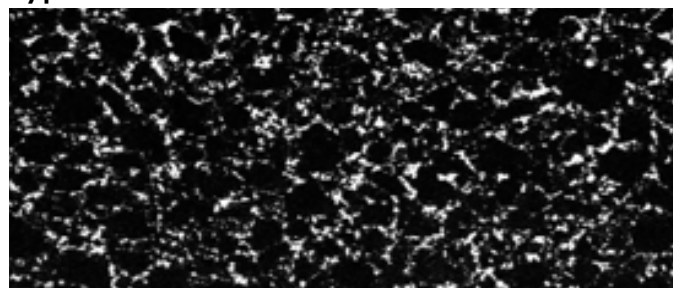


Grade: CTM302

DE BEERS GROUP

- Bi-modal 30 & 2 μm diamond grain size
- 10 - 13 % cobalt ratio (wt %)
- Highest wear resistance

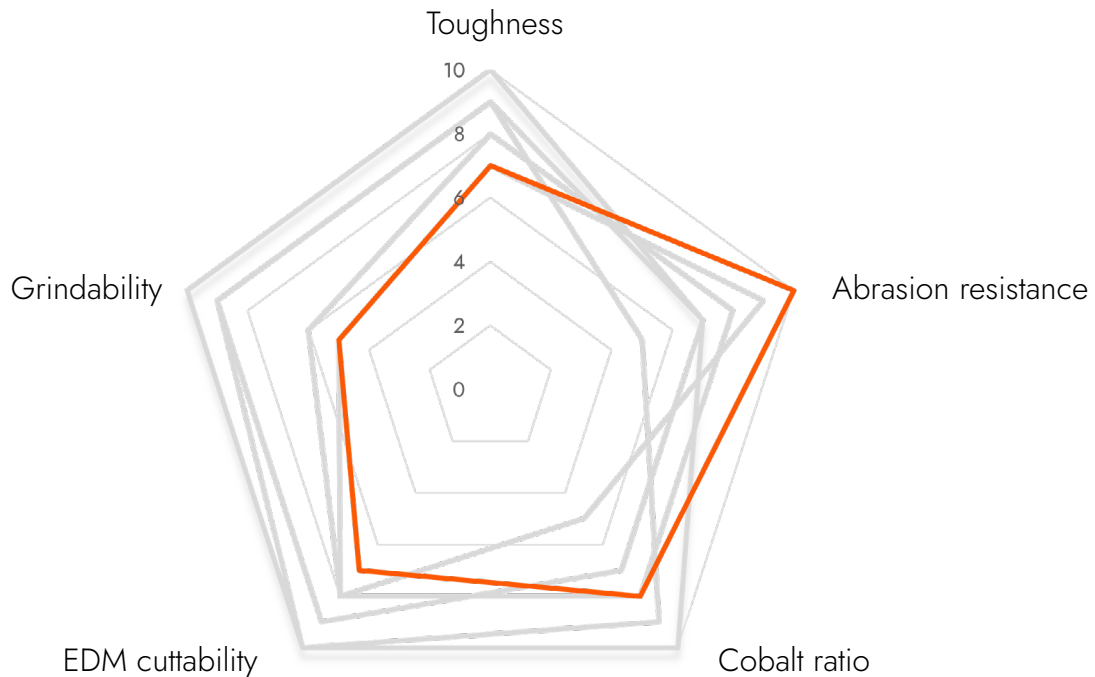
Typical microstructure



50 μm

Size and format available								
Maximum disc diameter: 76 mm				Maximum PCD certified area: 70 mm				
Overall height								
PCD layer thickness	0.8	1.0	1.2	1.4	1.6	2.0	3.18	8.0
0.5					✓	✓		
0.7							✓	
1.5							✓	✓

Material characteristics

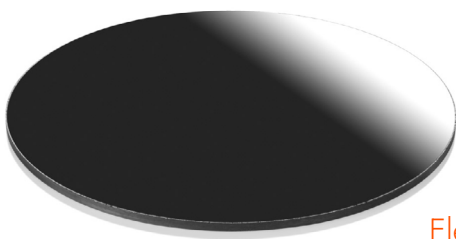


Physical and metallurgical properties

Property	Measurement	Applicable standard
Mean coefficient of thermal expansion ($10^{-6}/^{\circ}\text{C}$) for temperature range 150 $^{\circ}\text{C}$ to 500 $^{\circ}\text{C}$	3.5	ASTM E228-06
Transverse rupture strenght characteristic strength (MPa)	1521	ASTM C1239
Weibull modulus	6.4	
Fracture toughness mean ($\text{MPa}\cdot\text{m}^{1/2}$)	8.56 to 10.12	Shetty et al. (1995)
Elastic modulus (GPa)	883	ASTM E494
Poisson's ratio	0.109	
Density (g/cm^3)	3.91	Archimedes principle
Thermal conductivity ($\text{W}/\text{m}/\text{K}$) at 500 $^{\circ}\text{C}$	402.5	Calculated from thermal diffusivity, specific heat capacity and density
Knoop hardness (Indentation)(GPa)	50	ASTM C1326-03

	Superior	Advanced	Assured
Polish quality	P+	P1	P2
Overall height tolerance + mm	H+ 0.025	H1 0.05	H2 0.1
PCD layer tolerance + mm	L+ 0.1	L1 0.15	L2 0.2

Range	PCD layer (mm)	Certified area (mm)	Overall height (mm)	Nomenclature	Item number
Advanced	0.5	70	1.6	CTM302 R70-160-05 P1H1L1	215-200-0417-01
Advanced	0.5	70	1.6	CTM302 R70-160-05 P1H+L1	215-200-0418-01
Advanced	0.5	70	2.0	CTM302 R70-200-05 P1H1L1	215-200-0413-01
Advanced	0.7	70	1.6	CTM302 R70-160-07 P1H1L1	215-200-0428-01
Advanced	0.7	70	3.18	CTM302 R70-318-07 P1H1L1	215-200-0408-01
Advanced	0.5	70	3.18	CTM302 R70-318-07 U1H1L1	215-200-0433-01
Advanced	0.7	70	4.76	CTM302 R70-476-07 P1H1L1	215-200-0430-01
Advanced	0.7	70	8.0	CTM302 R70-800-07 P1H1L1	215-200-0421-01
Advanced	0.7	70	8.0	CTM302 R70-800-07 P1H1L1	215-200-0421-01
Advanced	1.5	70	8.0	CTM302 R70-800-15 P1H1L1	215-200-0411-01
Advanced	1.5	70	8.0	CTM302 R70-800-15 U1H1L1	215-200-0432-01
Assured	0.5	68	1.6	CTM302 R68-160-05 U1H2L1	215-200-0434-01
Assured	0.5	68	1.6	CTM302 R68-160-05 P2H2L1	215-200-0416-01
Assured	0.5	68	2.0	CTM302 R68-200-05 P2H2L1	215-200-0414-01
Assured	0.5	68	2.0	CTM302 R68-200-05 P2H2L1	215-200-0414-01
Assured	0.7	68	3.18	CTM302 R68-318-07 P2H2L1	215-200-0409-01



Element Six PCD disc and segments



Element Six is a global leader in the development and production of synthetic diamond and tungsten carbide solutions. For over 70 years, our innovation expertise has enabled a wide range of industries, from aerospace and mining, to semiconductors and sensing. Part of the De Beers Group, our primary manufacturing sites are located in the US, UK, Ireland, Germany and South Africa. Our sites in Ireland and Germany are ISO 50001 certified.

Through the De Beers Group, Element Six is a member of the UN Global Compact (UNGC). The UNGC drives business awareness and action towards the UN Sustainable Development Goals (SDGs), focussing on 10 principles around human rights, labour, environment and anti-corruption. Element Six works within the De Beers Group Building Forever commitment and Science Based Target Initiative (STBi), which is also based on the UNGC principles.

We incorporate and take responsibility for these principles through the Element Six Code of Conduct, Our Values, Responsibilities and Policies.

At Element Six, we have active communities working towards sustainability from a variety of angles, such as environmental impact, inclusion, diversity and community outreach, both internally and externally.

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