elementsix™
DE BEERS GROUP

Innovative and customisable synthetic diamond grit solutions for construction, stone & extraction

Unrivalled product offerings

Element Six offers a premium range of synthetic diamond grits and coating technologies for use in high performance tools to suit a wide array of applications within the construction, stone and extraction sectors.

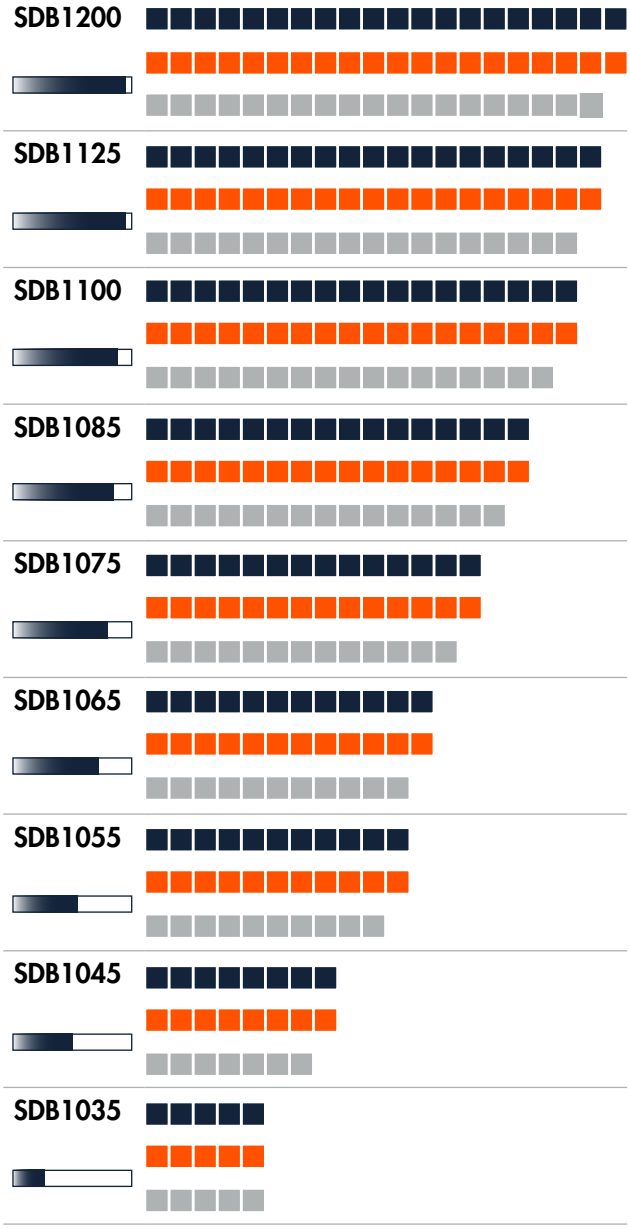
Each product has its own benefits thanks to its unique mix of strength, shape and wear characteristics, which can be further complemented by utilising our propriety coatings and encapsulation technologies.

Uncoated grits

SDB1000 Series

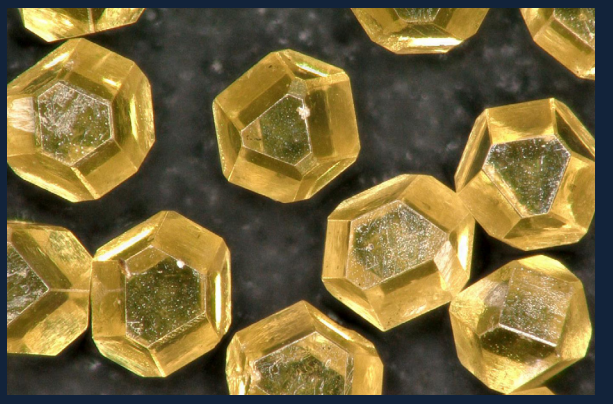
The SDB1000 Series is a range of sawgrits for general use in tools in the construction and stone industries. The range of different strength grades extends from US Mesh 25/30 to 70/80.

SDB1000 Series



SDB1200 premium solution

SDB1200 is a premium addition to the Series designed for the most challenging operations.

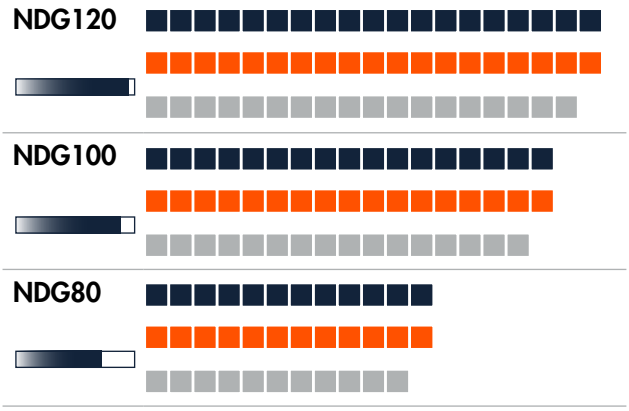


Maxigrit™

Maxigrit™ is a coarse synthetic grit range, designed for the toughest operations in the construction, stone and extraction industries. The sizing of the Maxigrit™ range is expressed in stone per carat (SPC).

Our indicator system helps you to select of the most appropriate diamond product for your specific application.

Maxigrit™ Series



Particle shape

Low — High

Crystallinity

Particle strength

- Room temperature
- 900°C
- 1100°C

Coated grit

Element Six has developed a range of coated grits to enhance the performance of diamond abrasive products in tooling solutions. Using an active coating technology, our process creates a strong chemical bond between the diamond surface and the metal coatings.

Our coatings are chemically bonded to the diamond particles and offer enhanced diamond retention in the bond matrix, protecting the diamond particles during the toolmakers sintering processes.

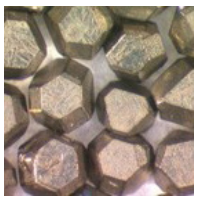
These coatings are metallurgically compatible with a wide range of bond formulations and sintering techniques.

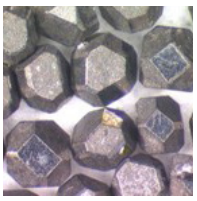

SDBTC for hot pressing of pre-alloyed cobalt replacement bonds

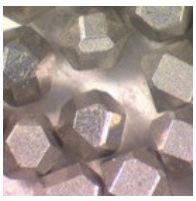

SDBTF for free sintering high cobalt, nickel or iron


SDBTB for infiltration sintering liquid phase bonds

We also have the capability to offer non-standard bespoke coatings to meet customers requirements – minimum order quantities may apply. Contact us at salesorders@e6.com to find out more.


SDBTC


SDBTF


SDBTB

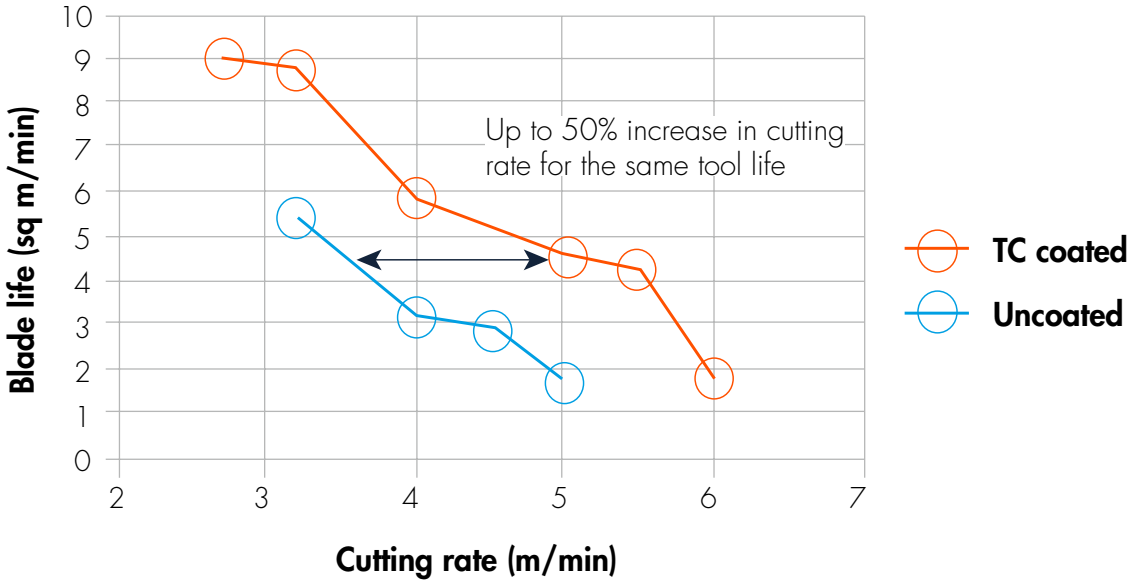
Enhanced retention in the bond

- Extends tool life by up to 50%
- Enhances particle protrusion for faster and more efficient cutting where cut rates can increase by up to 50% for the same tool life

An optimised sintering process

- Protects the diamond surface from any degradation caused at high temperatures in aggressive material bonds
- Enables the use of lower cost matrix materials, which can account for up to 50% of the tool cost

Tool life cutting rate test



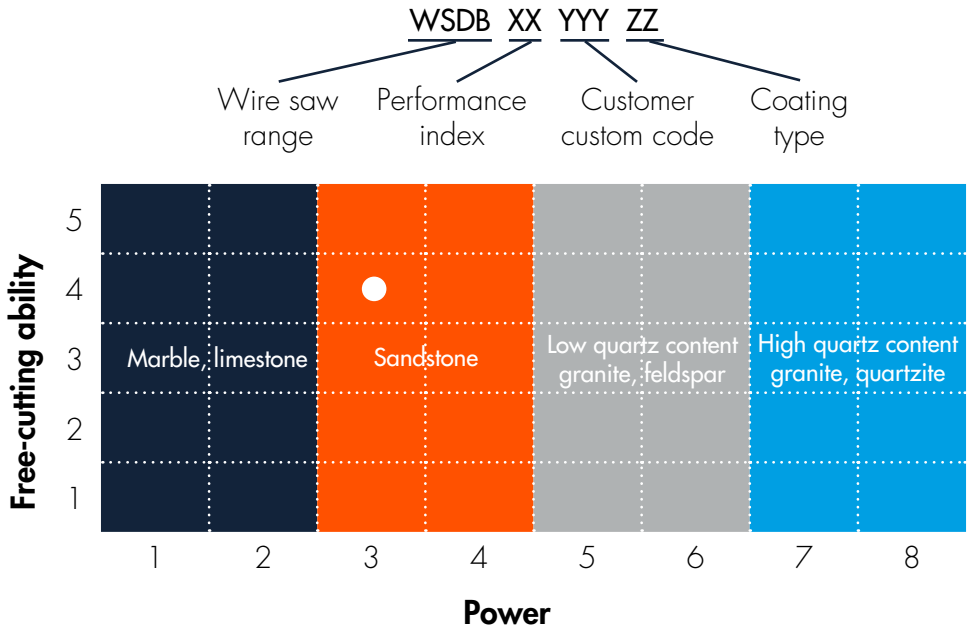
Our tests show a dramatic increase in cutting rates using protective coatings

Introducing the wire sawing range

Our customisable wire saw (WSDB) range has been developed to provide the optimal free cutting and tool life balance for customers. This bespoke product range can be utilised across all stone types as well as concrete applications.

Each individual product targets a specific area within the performance / material indicator shown on the right of the chart below.

Example: WSDB 34 CYY TC
Highlighted by the white dot in the chart.

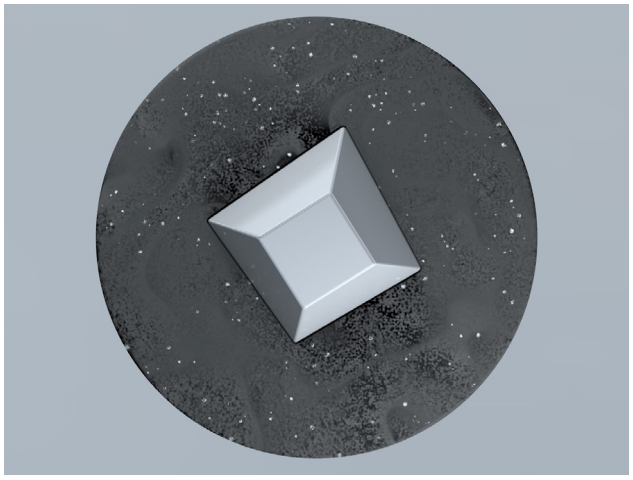


This range is available as both uncoated or with our standard coating offering.

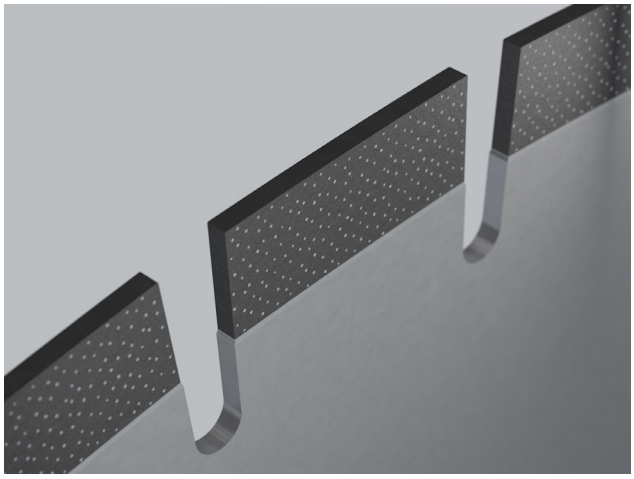
Encapsulation

Encapsulated diamond consists of a single diamond particle, coated or uncoated, where the metal bond matrix powder is built up around the diamond particle to form spherical pellets.

We can adjust the thickness (related to diamond concentration) and the strength of the pellet to optimise characteristics, which ensure compatibility with the tool maker's existing production system. Encapsulation also opens the potential to develop innovative segment designs.



Single diamond particle cross section



Improved diamond distribution

The benefits of encapsulated particles
Encapsulation delivers a regular distribution of synthetic diamond particles on tool segments without the use of placement machines. An even distribution of abrasive particles throughout a diamond impregnated tool is important for uniform wear and consistent tool performance. It also enables lower cost and cleaner handling of metal bond materials, avoiding wasteful and inefficient diamond clustering in segments. This, in turn, facilitates the automation of processes and can extend the range of what a placement machine can do.

Product offering

Range	Grade	Description & benefits
Uncoated 	**SDB1000 Series**	Standard range of diamond grit products including premium high strength solutions Proven quality and consistency
	Maxigrit™ Series	Coarse diamond grit family with carefully controlled particle sizing Highest degree of control over particle shape, size, strength and thermal properties
	WSDB	Bespoke offering for wire saw applications
Coated 	**TC, TF and TB** Available for SDB1000 and Maxigrit™ Series	Coatings offering Protection to the diamond during bit manufacture and improved diamond retention in the bit to prolong life, increasing cut rates
	 **SDBTC**	Hot press sintering High copper or pre-alloyed bond
	 **SDBTF**	Free sintering High iron, cobalt or nickel
	 **SDBTB**	Infiltration sintering Liquid phase bonds
	WSDB	Bespoke offering for wire saw applications
Encapsulation 	Bespoke diamond grade, size and concentration as well as bond composition	Enables an even distribution of diamond particles within a tool segment Minimises the customer's powder handling requirements and facilitates the automation of segment making processes

Minimum order quantities may apply. We have the capabilities to offer bespoke products to meet your requirements. Contact us at salesorders@e6.com to find out more.

elementsix™

DE BEERS GROUP

Element Six, part of the De Beers Group of Companies, designs, develops and produces synthetic diamond solutions and other supermaterials, and operates worldwide with manufacturing facilities in China, Germany, Ireland, South Africa, the UK and US.

Element Six solutions are used in applications such as cutting, grinding, drilling, shearing and polishing, while the extreme properties of synthetic diamond beyond hardness are opening up new applications in a wide array of industries such as optics, power transmission, water treatment, semiconductors and sensors.

Contact us

Element Six Ltd.
Shannon Airport, Shannon
Co. Clare, Ireland

T +353 61 460 146
E salesorders@e6.com

e6.com