



COBORN



ENGINEERED SOLUTIONS FOR
THE DIAMOND INDUSTRY



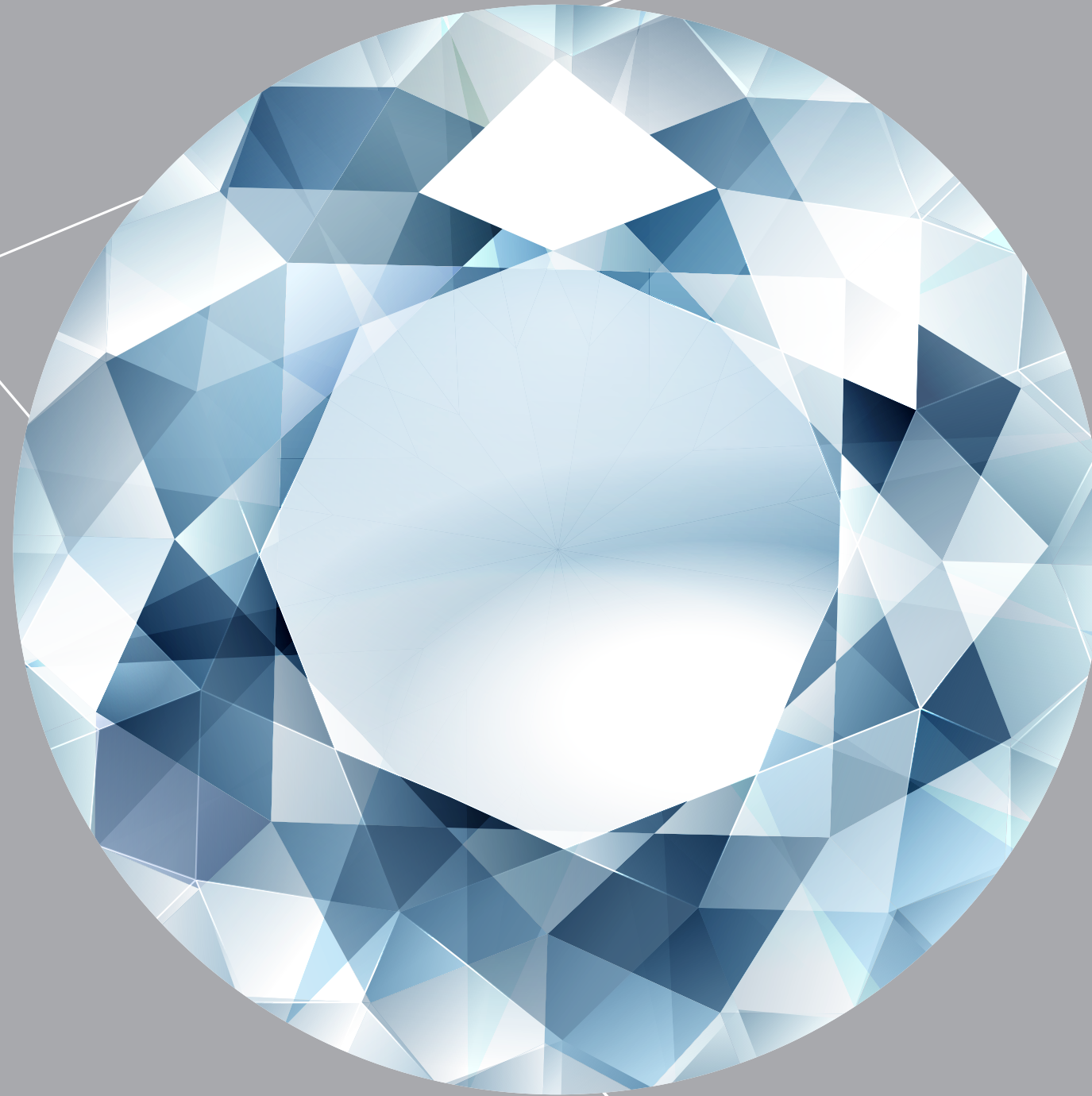
Established in 1941, Coborn Engineering initially manufactured high precision spindles and balancing systems. In 1962, we introduced our Scaife Spindles for Gem Polishing and, in 1963, started production of our Planetary Grinding (PG) machine for producing single crystal diamond tools (SCD). These products rapidly established our name in the global diamond industry. In 1978, Coborn designed the first Reciprocating Grinding (RG) machine for producing Polycrystalline Diamond (PCD) tools. The continuous development of our RG and PG machines to meet the needs of the ever-growing industrial diamond tool market remains the greatest factor behind our continuing success.



Stephen Westlake Managing Director

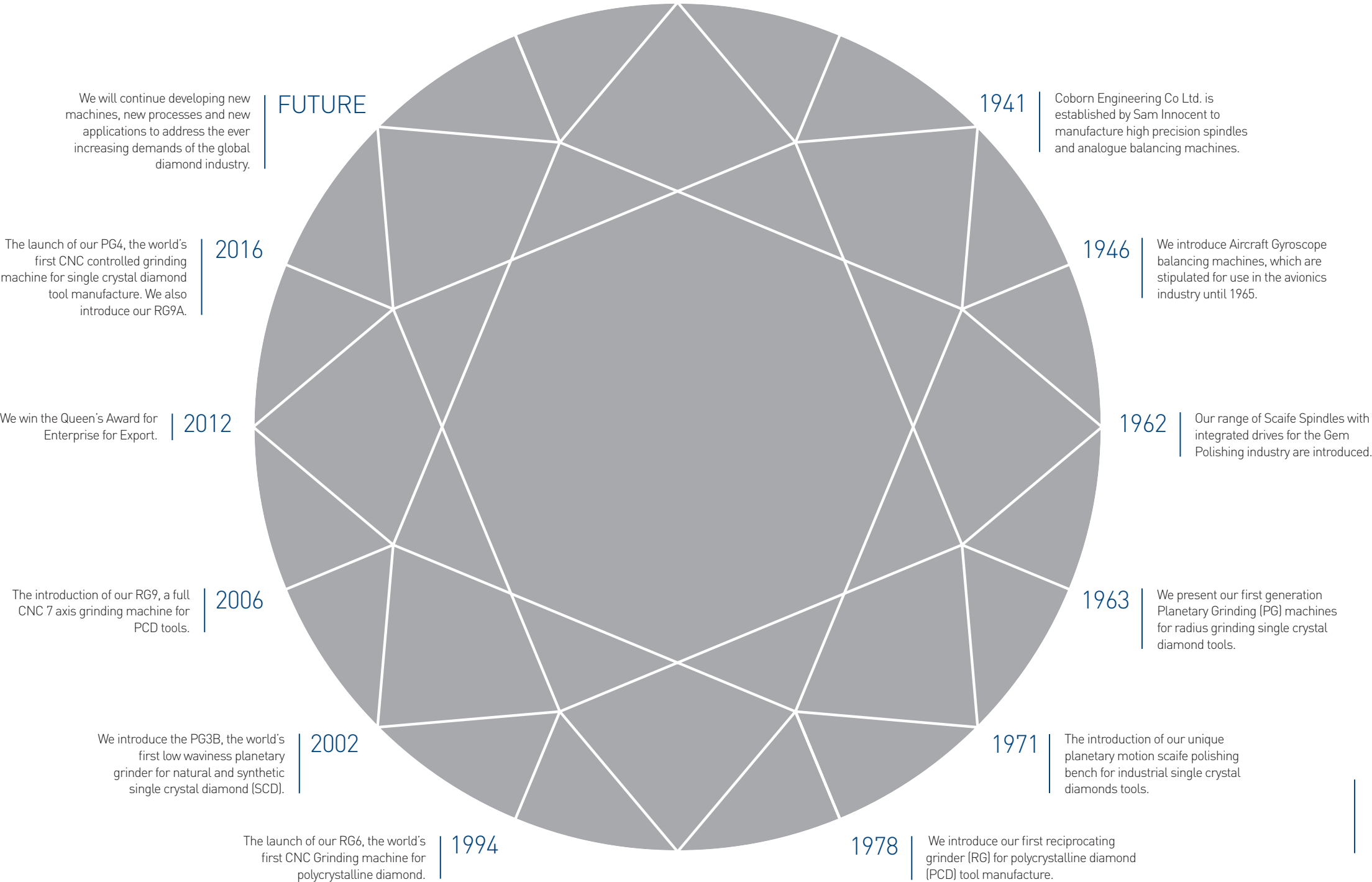
ENGINEERED SOLUTIONS

Coborn has a unique, global position supplying specialised, individually built, high-precision equipment to the polycrystalline diamond industry, single crystal diamond and the gemstone industries, with over 90% of machines being exported throughout the world.



As an equipment supplier, Coborn is at the heart of the global diamond industry's exciting growth and development

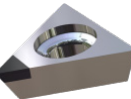
CELEBRATING
OVER 75 YEARS
OF ENGINEERING
EXCELLENCE



80% of all high value diamonds are polished on a Coborn scaife

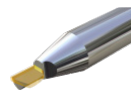
HARD MATERIALS - PROCESSING SOLUTIONS

Coborn's machines are designed for processing the world's two hardest and most extreme materials: diamond (or 'cubic carbon') and its structurally similar sister cubic boron nitride (cBN). Our machines can also easily grind and shape traditional hard tool materials, such as cemented carbide and ceramics. Numerous forms and formats of diamond and cBN are now available and each has required the engineering of a specialist processing solution.



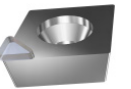
PCD Tooling

Polycrystalline diamond (PCD) is composed of fine synthetic diamond powder which has been fused by HPHT into coherent blocks or bonded as a flat or a shaped layer on a carbide substrate. PCD is only slightly less hard than SCD but hardness and wear resistance is the same in all directions. Its greatest application is in cutting tools for non-ferrous work pieces in mass production.



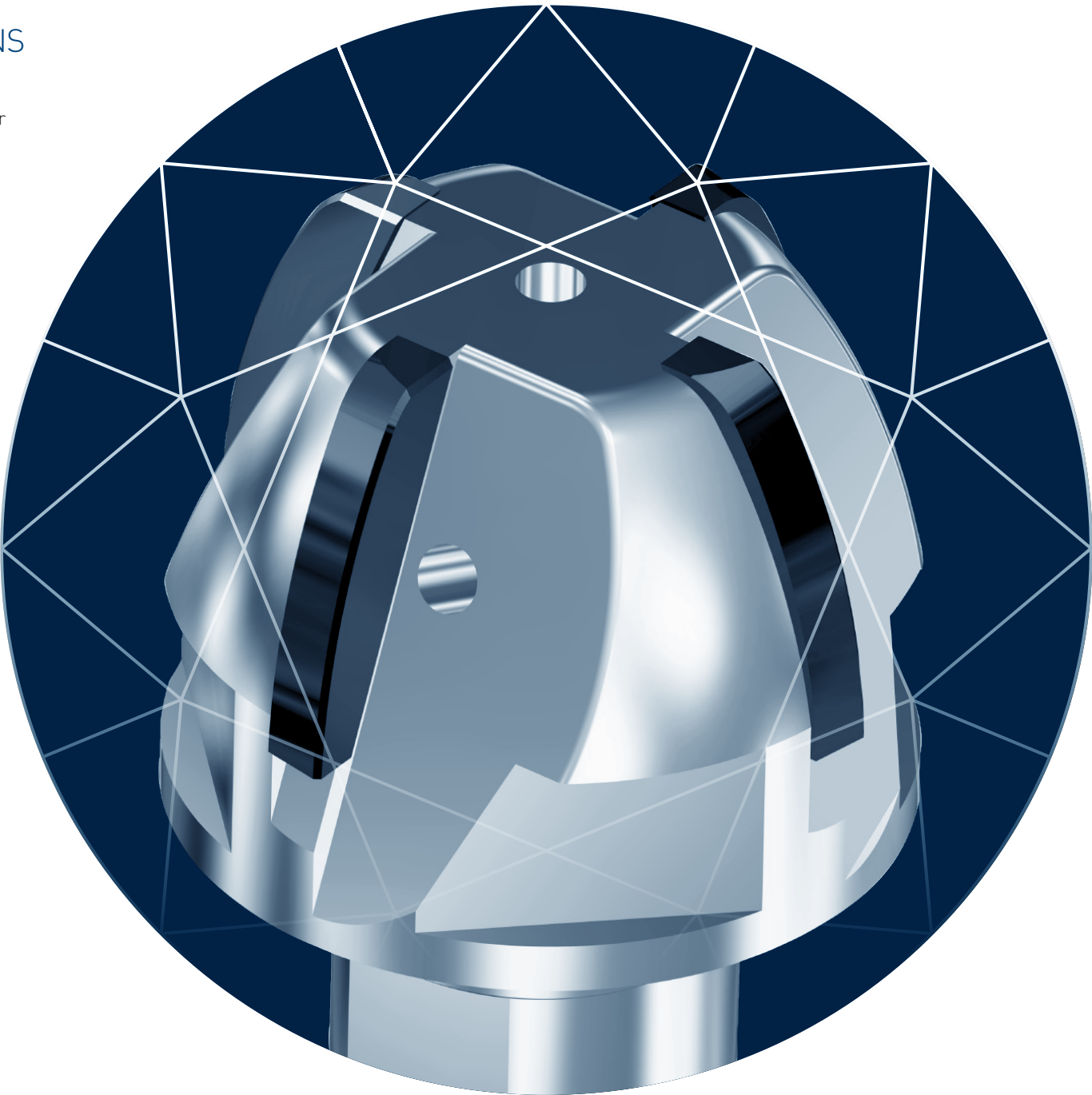
MCD Tooling

Mono Crystal Diamond (MCD) is the term usually used when referring to synthetic single crystals of diamond made by high pressure, high temperature (HPHT) techniques. The crystals are typically slightly yellow rather than white/transparent in colour. These crystals require machines for lapping, grinding and polishing into cutting tools, wire drawing dies, dressers and heat spreaders for example.



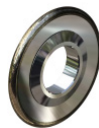
SCD

Single crystal diamond (SCD) may be natural, mined diamond or laboratory grown, synthetic diamond. SCD is the hardest material known and, being brittle, is sensitive to shock and vibrations. In the form of large crystals, rather than powder, the term SCD usually refers to mined diamond. Its main applications are for gem jewellery and as nano-scale precision cutting tools for use in the hi-tech electronic and optical industries.



Pcbn

Like diamond, cBN powder can be fused into coherent blocks or as layers on a carbide substrate to give polycrystalline cBN (Pcbn). Pcbn is typically a mixture of cBN particles and a ceramic binder. Its key advantage is better stability than PCD in contact with ferrous (iron) work piece materials.



CVD Diamond

Chemical vapour deposition (CVD) is a relatively new way of growing synthetic diamond (e.g. cubic carbon) from a carbon rich gas. Large plates can be produced in both polycrystalline and single crystal forms. As with SCD and PCD, machines are needed to lap these diamond plates flat and to produce useful shaped products such as cutting tools, dresser rolls, hi-tech windows and substrates.



Gem Diamond

Gem diamonds are 'forever' we are told. Whether the gem is made from natural (SCD) or synthetic (MCD/CVD) diamond, the four 'Cs' – colour, carat, clarity and cut – summarise the key characteristics of each individual stone. The first three are characteristics of the material itself. Cut is where precision lapping and polishing machines (and skill) are vitally important. The accuracy of perfectly polished facets internally reflecting light ensure the diamond expresses that all important sparkle.

TECHNOLOGY SOLUTIONS

Coborn provides individual standard machines through to bespoke engineered solutions as well as the support and guidance needed so customers can process ultra-hard materials. We continue to work closely with our customers to ensure we're offering the latest and best technology and equipment combined with in-house hardware and software design anywhere in the world.

RG Series

The Reciprocating Grinding series of machines are primarily designed for grinding Polycrystalline Diamond (PCD) and Polycrystalline Cubic Boron Nitride (PcBN). The machines range from manual entry level to fully autonomous systems for lights out production, with tooling and accessory options to cover all applications.

PG Series

The Planetary Grinding series of machines are specifically designed for grinding single crystal diamond. The planetary motion of the wheel allows the grinding direction to be changed so the 'soft' direction of the diamond can be found. The choice of machine depends on the application and the level of accuracy required.

PL Series

The Planetary Lapping series provide a solution for polishing the surface of PCD discs to a flat, mirror finish. They can also be used to polish CVD and PcBN. The machine consists of a number of independent work heads presenting the material to a horizontally mounted planetary motion grinding wheel.



Coborn is wholly focused on providing engineered solutions for every aspect of the processing of diamonds and superhard materials

DB Series

The Dynamic Balancing series of machines offer the facility for single or two plane dynamic balancing of components. The machines are extremely simple to operate with the imbalance amount (milligrams) and position (angular) being indicated within seconds of operation. The machines can be supplied with standard or custom tooling depending on application requirements.

FG Series

The Form Grinder series has been designed specifically to meet the needs of toolmakers supplying the jewellery and horological industries. The machines have a number of features that make it ideally suited for either free form or profile grinding natural or synthetic diamond in either 2 or 4 point orientation.

PS Series

The Planetary Scaife series of machines have been developed as the industry has evolved to polish facets on single crystal diamond tools. They can also be used in gem diamond polishing. The bench combines the high speed rotation of a scaife plate with a relatively slow, smooth, horizontal planetary motion giving an automatic self zoning action.

GLOBAL PARTNERS

Coborn works closely with our international network of partners to provide the best engineered solutions for the global diamond industry. Contact us if you're looking for the ideal diamond tooling partner.

UK

Coborn UK,
Chesham Close, Cedar Road, Romford,
Essex RM7 7PJ, UK

tel: +44 (0)1708 744666
email: sales@coborn.com
web: www.coborn.com

Germany

Techno Team GmbH, Mahdenstraße 11,
72138 Kirchentellinsfurt

tel: +49 7121 680 856 31
email: info@technoteam.de
web: www.tecnoteam.de

USA

Precision International Corp.
2191 S 30th Street, Haines City
Florida, 33844, USA

tel: +1 860 243 0341
email: info@precint.com
web: www.precint.com

Taiwan and SE Asia

Corremax International Co. Ltd,
4G09, No.5, Sec. 5, Hsinyi Road, Taipei City,
110 Taiwan, R.O.C.110

tel: +886 2 2345 2929
email: info@corremax.com.tw
web: www.corremax.com

China

Corremax (Chongqing) Trade Co. Ltd,
Chongqing, China: No.198 B2, Tongxi Road, Caijiagang Town,
Beibei District, Chongqing,China, 400707

tel: +86 23 68266979
email: info@corremax.com.tw
web: www.corremax.com



Coborn provides machines,
technical support and services
all around the world. This is
only possible through our global
network of partners

India

Quanteq-Solutions Ltd,
The Old Vicarage,
Damsells Mill Lane,
Sheepscombe, Gloucestershire,
GL6 7RH, UK

tel: +44 1452 810705
email: peter.heath@qs-diamondtechnology.com
web: www.qs-diamondtechnology.com

Korea

Sewon eng. Ltd,
#101 Daerung TechnoTown VI,
648, Seobusaet-gil, Gurmcheon-ku
Seoul 153-774, Korea

tel: +82 2 2108 5561-4
email: info@sewoneng.net
web: www.sewoneng.net

Japan

Tokyo Sangyo Co., Ltd
2-1, Otemachi 2 Chome,
Chiyoda-ku, Tokyo, 100-0004,
Japan

tel: +81-(0)3 5203-7689
email: h@tsce.eu
web: www.tscom.co.jp

Poland

MC DIAM sp. z o.o.
Aleja Lotników 12,
02-668 Warszawa,
Poland

tel: +48 15 832 97 55
email: w.skop@mcdiam.com.pl
web: www.mcdiam.com.pl

Turkey

Erde Dis Tic. Ltd. Sti.
Egitim Mahallesi Kasap Ismail Sok.
Aydin Is Merk, No. 6 D: 4-5 34722
Hasanpasa-Kadikoy, Istanbul, Turkey

tel: +90 216 330 2400
email: erde@erdeticaret.com.tr
web: www.erdeticaret.com.tr



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Coborn Engineering Ltd Chesham Close, Cedar Road Romford, Essex RM7 7PJ, UK
Tel: +44 (0)1708 744666 Email: sales@coborn.com

coborn.com



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