# Hard diamond coatings build a bridge to the growing dental market


Milling zirconium oxide blanks for dental implants:
For its micro-tools, which are up to 0.3 millimeters thin, the leading Taiwanese tool manufacturer IDI Precision Machinery Ltd. relies exclusively on diamond coatings from CemeCon

New teeth within minutes from the CAD/CAM milling unit instead of the laboratory—current developments in dental technology open up innovative opportunities. And they call for superior technologies: Diamond-coated precision tools in the smallest dimensions are indispensable for the production of dentures from zirconium oxide blanks—for example from the leading Taiwanese manufacturer IDI.

The demand is huge: in Germany alone, around eight million people need dental implants every year; this number will continue to grow as the life expectancy of the population increases. Globally, expectations are equally “future-proof”: increasing prosperity is accompanied by the desire for aesthetic teeth in all economically growing regions of the world. As a result, the market for flawlessly manufactured dental implants is growing steadily and reliably.

## A change is visible in manufacturing of dental implants

The signs are pointing towards efficiency: what for a long time was almost artisanal manual work in the dental laboratory is now produced automatically. Dental laboratories, but above all dental practices themselves are increasingly relying on CAD/CAM milling units to produce crowns, bridges and inlays from zirconium oxide blanks with a precise fit. In a digitized process, the dentition is scanned and the data record is transferred directly into a milling program. The dental implant is then precisely milled from the

prefabricated blank—quickly, efficiently and to the highest quality.

The ceramic material zirconium oxide used in this process is durable, provides an aesthetic appearance and is highly compatible with the body. However, it is also very abrasive and therefore highly wear-intensive for the milling tools. Therefore, machining can only be carried out reliably and economically with diamond-coated tools. They are the only technically viable option in this area of application.

## A headstart thanks to a strong technology partner

For tool manufacturers who already use diamond coatings for their quality tools for machining graphite, this opens up a major market opportunity in dental technology. This is because they have the expertise of making carbide milling cutters down to a few tens of a millimeter and can transfer this expertise to dental applications.

The demanding dental technology market can also be perfectly served with high-performance coatings. In terms of tool geometries, cutting forces and dimensioning, the requirements of machining graphite and zirconium oxide are comparable. For CemeCon partners, the step into this constantly growing future market is therefore a small one. The transfer of knowledge to the new sector is quick and easy to implement.


## Proven in practice: Diamond coatings for the dental market

The example of the successful Taiwanese tool manufacturer IDI Precision Machinery Ltd. shows how rewarding the step into the dental market can be. As one of the leading manufacturers of CAD/CAM milling tools for mold making and dental technology, the company supplies the Asian market as well as the USA in particular. In the dental sector, IDI’s product range includes milling tools in diameters from 3 to 0.3

millimeters, each in precisely fitting variants for the milling units of common industry suppliers.

IDI relies entirely on quality from CemeCon for the diamond coating of its high-performance tools. IDI consistently uses the service of the world's largest coating center in Würselen for all tools and thus receives an outstanding coating quality. With perfectly coordinated logistics, the partners master the transportation routes that the tools have to cover from Taichung to Germany. The uniformity and homogeneity of the CemeCon coatings on the micro-tools ensure an otherwise unmatched high milling quality with the lowest possible tolerances. A powerful argument that IDI uses to impress its customers, who in turn convince their customers—dentists and dental technicians with specialist knowledge: Thanks to tools with CemeCon diamond coatings, they can rely on high-quality, geometrically accurate cutting results with maximum reliability and extremely easy handling.

CemeCon even coats tools with a diameter of just 0.2 millimeters for specific applications. This is where the world market leader for diamond coatings can put more than two decades of experience in the development of this technology to good use, even for the most specific requirements.

## Doing big business with micro-tools

CemeCon is very proud to be able to help its customers achieve success in new and future-oriented business areas. "The dental sector is much more than a niche market. It is a fast-growing technology driver that combines industrial thinking with medical requirements," summarizes Gerhard Hagedorn, CemeCon Product Management Diamond. "For tool manufacturers with experience in the mini and micro range for graphite processing, this offers the opportunity to transfer their expertise to another high-margin sales market—without reinventing the wheel." CemeCon is also happy to supply "newcomers" with the decisive coating materials for machining the highly abrasive material. In any case, the right tools with the right diamond coating create an excellent starting point for success.

## IDI Precision Machinery Ltd.

**IDI Tools (IDI Precision Machinery Ltd.)** is a leading high-precision toolmaker based in Taichung, Taiwan. Serving the mold-making and dental industries, IDI offers a comprehensive line-up of premium endmills engineered for milling graphite, zirconia, titanium, hardened steel, and stainless steel. The company is renowned for its engineering-driven culture and exacting manufacturing standards, with tool profile tolerances held to ±0.002 mm thanks to state-of-the-art grinding technologies and strict process controls. From custom machine design to sensitive laser detection and synthetic grinding media, every step is built to maximize tool performance and longevity. With advanced quality instrumentation and global distribution, IDI continues to deliver cutting-edge solutions for even the most challenging applications worldwide.

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Dentistry

Zirconium oxide

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