

SYNOVA

DaVinci to Revolutionize Diamond Manufacturing Process



Bernold Richerzhagen

President & CEO - SYNOVA SA

In an exclusive interview with Mr Bernold Richerzhagen, President and CEO, SYNOVA SA, the New Jeweller International Bureau got a chance to learn about the company's technological prowess in the Diamond Industry. Mr Richerzhagen also opines on the DaVinci Diamond Factory which is pitted to transform the very process of Diamond Manufacturing in the near future. Excerpts:

SYNOVA has an established equity in the diamonds and jewellery sector and has been servicing the sector for some time. Tell us about some of the key factors that have helped SYNOVA build its reputation in the Industry?

Synova was founded in 1997 and its focus was primarily on high-precision 5-axis machining of sensitive material. We joined the diamond industry only 10 years ago.

Synova's technology, the patented water jet guided laser, proved to be ideal for cutting diamonds; for the first time it was possible to laser cut a diamond with parallel kerfs, which drastically reduced weight loss. In addition, the lack of thermal stress, the surface finish and the speed made the Laser MicroJet the ideal solution for machining diamonds.

Since then, we have brought a breath of fresh air to the traditional diamond industry because we have a different perspective and believe that the industry needs to adopt the latest technologies applied in other industries such as automotive or semiconductor.

Over the years, Synova's DCS series has become the reference in the industry for high-precision laser cutting. Our CNC machines have proven to be reliable and easy to use. And now the latest and most exciting development is DaVinci Diamond Factory, the first fully automated laser shaping machine. DaVinci transforms rough diamonds into

brilliant cut diamonds with 57 facets in one step and the production time is drastically reduced. With DaVinci it only takes about 75 minutes to completely shape a one-carat polished stone. And besides round brilliants we can now also cut fancy and custom shapes.

Laser MicroJet is one of the key technology products launched by SYNOVA. Apart from other Industries tell us about the importance of Laser MicroJet for the Diamond sector?

Two main characteristics of a water jet guided laser allow unprecedented performance when cutting diamonds: the parallel laser beam and the cooling by water jet. Parallel kerfs mean far less loss of precious diamond material and the water cooling prevents heat damage enabling us to cut tension stones. In addition, there is an excellent surface finish, a thinner carbon layer and a higher cutting speed than any conventional laser can achieve.

SYNOVA has strategic partnerships with OEMs. Tell us about the importance of these partnerships?

It depends on the industry. In the metal and semiconductor industries we have our own machines but cooperate with selected OEM partners, which are licensed to integrate our technology. One example of such a partnership is Makino, a renowned Japanese manufacturer of EDM and machining centers.

How important is Research & Development for a technology company like SYNOVA to succeed? Can you talk about SYNOVA's R&D initiatives and related investments? Tell us about your R&D partnerships as well.

R&D is very important for a high-tech company such as Synova. A large portion of our margin is reinvested in research and development of new solutions that are later patented.

R&D at the university level led to the original invention of the Laser MicroJet. The industrialization was then carried out within Synova. Synova's R&D team consists of several



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brilliant laser engineers and physicists who have developed a lot of Industry 4.0 solutions, meaning intelligent sensors. These include innovations such as breakthrough sensors, water jet stability sensors, pulse shape sensors, positioning sensors, jet angle correction sensors, etc.

From the beginning, Synova has worked together with private and public universities and institutes. We have a longstanding relationship with the Fraunhofer Institute for Laser Technology in Aachen, Germany, and with the material research center Empa in Thun, Switzerland. Synova also cooperates with other universities in



Switzerland, Germany, the UK, China and Japan.

Is it true that Artificial Intelligence is the next big thing for the Diamond Industry? If so, how will the Diamond sector benefit from AI and what are the segments of the Industry that AI will influence?

Synova will use AI in processing data collected by the machine's many sensors. Machine learning will make our machines smarter allowing them, for example, to predict the lifetime of wear parts for just-in-time ordering and replacement. We are also investing in digital twin technology, which allows us to test new software programs without utilizing valuable machine time.

What is your future plan to expand your operations in other regions to service the Diamond Industry? Please explain the activities that you would set up in various countries.

Part of our expansion strategy is the establishment of so-called DaVinci Labs around the globe to showcase our all-in-one solution, the "Diamond Factory". DaVinci will revolutionize diamond manufacturing by replacing what has been done by hand for centuries.

The gain in speed, ease, quality and value is so tremendous that the entire market will undoubtedly follow this trend. There will be some skepticism and hesitation, but it was the same when Carl Benz's cars began replacing horse-drawn carriages at the end of the 19th century, giving birth to new,

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world-changing industries.

We are also planning to set up DaVinci service centers with partner companies and thinking about new ways of making the technology available to everyone who has the foresight to benefit from it. One of the first DaVinci labs will be established at the Almas tower in Dubai and more information on this and other developments will be coming in the next few months. ■