**AT THE CUTTING EDGE**

**ISMR SAYS:**
“With expertise in cutting and welding heads for high-power laser material processing, II-VI HIGHYAG now provides customised, application-specific consulting services in this field.”

**Dr. Robert Kuba, CEO of II-VI HIGHYAG, outlines trends in laser cutting markets and emphasises the importance of flexible operations**

II-VI HIGHYAG has a solid reputation as a laser material processing specialist. An important milestone in its twenty-year history was the development of a laser welding head for welding with solid-state lasers in fully automated production lines in the automotive industry. Laser cutting heads, laser light cables and beam combiners complete its product portfolio of tools for laser material processing. Its innovative laser processing heads and beam delivery systems enable the efficient use of the laser beam for demanding manufacturing applications such as advanced laser cutting, laser welding and laser brazing. According to the company, highly qualified employees with wide expertise in laser technology, optics and high-precision mechanics, form the most important pillar of the company’s growth. Since 2013, II-VI HIGHYAG has been a wholly-owned subsidiary of II-VI Incorporated. In January 2014, II-VI HIGHYAG moved its current corporate building in Kleinmachnow, just outside Berlin. The II-VI Incorporated booth at EuroBLECH (25-29 October 2016 in Hanover, Germany) housed the business divisions of II-VI HIGHYAG, II-VI Infrared, II-VI Photon, II-VI Laser Enterprise and II-VI SUWTECH to showcase a broad portfolio of products for laser material processing. ISMR visited the booth to speak to II-VI HIGHYAG CEO, Dr Robert Kuba.

A **flexible focus for cutting and welding**

“Here at EuroBLECH, we are showcasing our welding and cutting products. Cutting is a very important business for us. Job shops are a major part of our end customer base. They need the flexibility to process a range of materials with varying thicknesses from thin to very thick. Job shops appreciate one machine that can process different types, strengths and ranges of materials – flexibility is key. We bring this flexibility with our BIMO-FSC laser cutting head. It handles a wide range and thickness of materials that include aluminium, carbon steels and more. The key feature is the fully automated, machine-controlled adjustment of focus diameter and focus position. It guarantees efficient flat sheet cutting and high productivity in manufacturing,” Dr Kuba told ISMR.

**Customised consultancy**

As of July this year, II-VI HIGHYAG now provides customised, application-specific consulting services in its own application laboratories. Collaboratively, with customers, II-VI HIGHYAG’s application engineers develop system and process set-ups for mission-critical laser applications that require a high degree of customisation to meet performance and reliability requirements. Areas of expertise include laser welding, laser soldering, laser brazing and laser cutting. The application laboratories are equipped with II-VI HIGHYAG laser processing heads, direct diode and fibre lasers (up to 8 kW) and various drive systems in the form of industrial robots and gantry systems.

“Diode lasers could be the ‘next big thing’ in laser cutting markets – we have already designed our products to handle diode laser wavelengths. We observed, in tests with our BIMO-FSC, good results in speed and in cutting quality for this laser, although CO2 is not yet widely adopted as a laser cutting technology,” he told ISMR.

He also sees significantly increasing numbers of fibre laser installations in today’s job shops. “There is a very large installed base of CO2-laser cutting systems in the field today. However, the vast majority of new laser cutting installations employ fibre lasers because of their higher efficiency, lower cost and smaller footprint. Users who already have CO2 lasers will continue to work with them, but new installations today tend largely to be fibre lasers,” Kuba explained.

Laser welding heads, laser light cables, laser modules and laser optics, including fused silica optics, were also displayed on the II-VI booth at EuroBLECH. These optics can be supplied in different configurations, including aspheric lenses, spherical lenses and debris shields.

“There are definite synergies between the welding and cutting businesses. We are also showcasing a head with a flexible beam manipulation feature that is used for welding technology. One of our core competencies is our knowledge and expertise of optics design,” added Dr. Kuba.

**2016 has been a good year for us and we will register significant growth**

“I am proud to say that we have invested in and completed full-blown application laboratories with laser sources, tooling, a 3-axis gantry system, process monitoring systems and robots etc. for cutting and welding. The purpose is to test features for customer projects, R&D projects or feasibility studies. This is a great achievement for us,” explained Dr. Kuba.

Customers can review first-hand the feasibility of applications, fabricate samples and evaluate process windows, allowing processes to be optimised before they are transformed to serial production. The application laboratories are also used for validating process optimisation technologies developed by industry partners. Recent examples are the validation of laser welding process monitoring systems and the Inline Cahnert Imaging (ICI) technology, a method to measure the depth of the weld.

**An eye on 2017**

“2016 has been a good year for us and we will register significant growth. The markets are developing well. Europe has shown steady growth. China and South Korea are strongly picking up. Just recently, we opened an office in South Korea. We are still betting that the laser industry will develop in India, so we are keeping a close watch on this market as well. The US market has also been strong for us,” Kuba told ISMR.

“We invested significantly in our tailor-made facility near Berlin with the new application laboratories. We have also employed more people this year to help us meet our targets - all in all, I am very optimistic for the future.”