

MATERIALS PROCESSING

Water-guided laser cuts precisely

Synova, the Swiss pioneer of water-jet guided lasers, has teamed up with fibre laser specialist IPG Photonics to create a cutting tool that it says is maintenance free and makes "exceptional quality" cuts.

The main applications of the system are cutting metal stents, stencils and silicon wafers. Synova says that its system can cut 50 μm -thick silicon at a speed of 200 mm/s and can make 25 000 holes per hour in 50 μm -thick stainless steel.

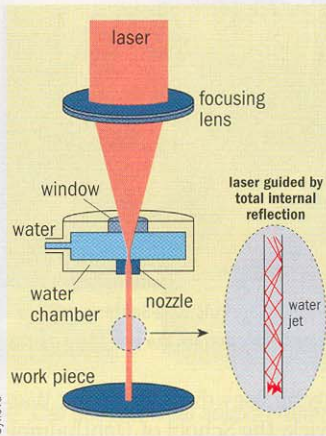
The system, which is now commercially available, couples a beam from a pulsed fibre laser with a thin (30–60 μm diameter) jet of water that is directed at the work piece. The water cools the work piece and removes debris as the laser cuts, to give a minimal heat-affected zone



Synova says that its water-guided laser is suitable for cutting metal stents and stencils, or slicing silicon wafers.

and smooth, clean edges.

The 1060 nm IPG fibre laser inside the Synova system has an average power of 100 W and emits



A thin water jet guides the laser pulses to the work piece. The water jet helps cool the work piece and removes debris.

pulses between 100 ns and 1 μs duration at a repetition rate of 20–50 kHz.

Until recently Synova used

Nd:YAG lasers, but the company realized that fibre lasers could offer benefits owing to their compact size, beam quality and stability.

"Due to the exceptional beam quality of the fibre laser thinner, water jets can be used, enabling very accurate, faster cutting," explained a spokesperson for Synova. "But the decisive argument was the maintenance-free aspect."

Synova was founded in 1996 and is located in Lausanne, Switzerland. Its founders developed the water-guided laser technology during the early 1990s while working at the nearby Swiss Federal Institute for Technology (EPFL) (*OLE* October 1997 p37). Today, the firm has approximately 40 staff and says that it has the capability to supply up to 300 machines per year.