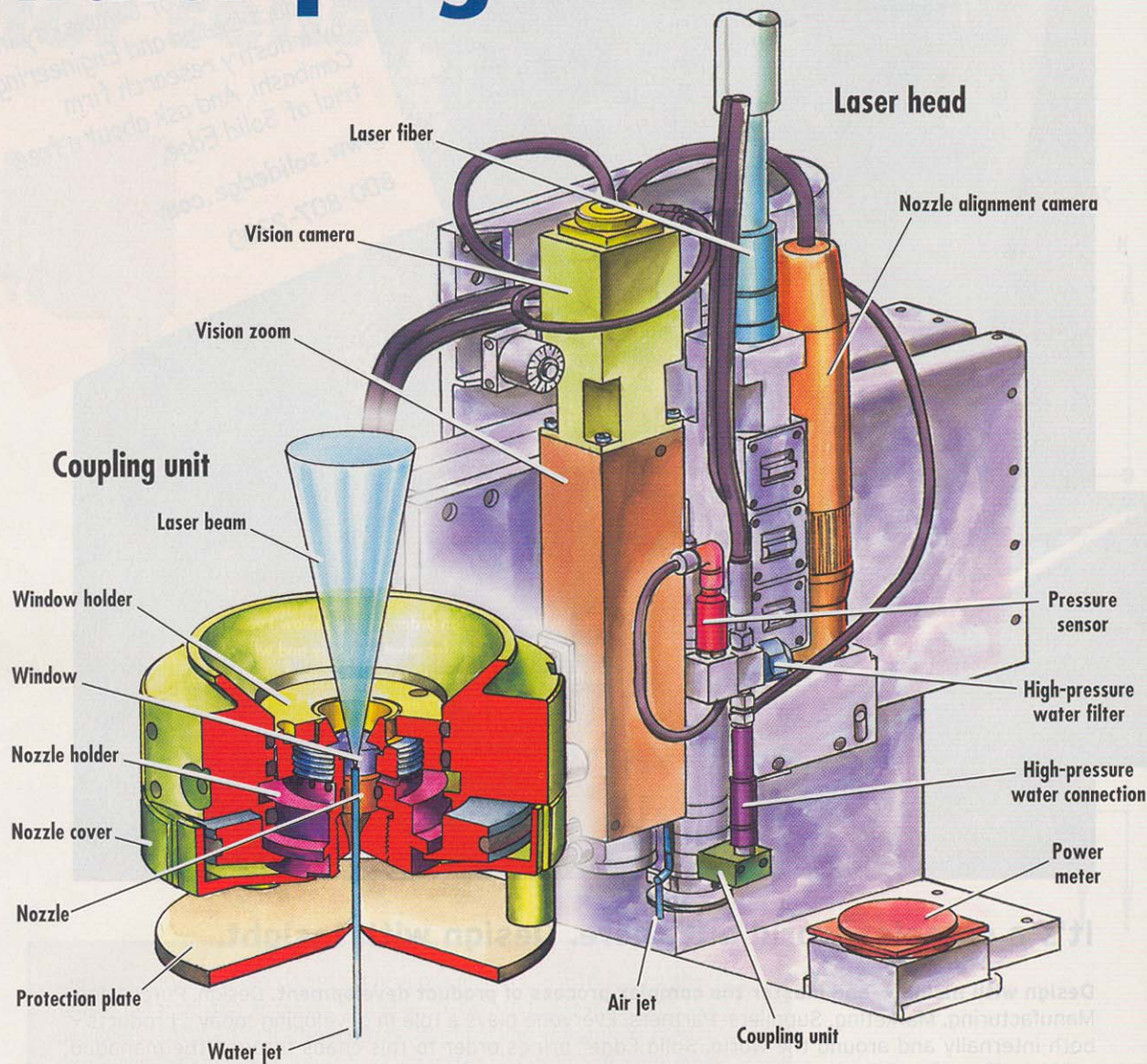


Laser cutter uses water-jet guidance



Cutting hard, brittle, and abrasive materials such as ceramics presents several problems. Diamond cutting wheels wear out, use large amounts of liquid coolant, take considerable time, and cannot machine thin gaps. Electronic-discharge machining (EDM) only works on electrically conductive materials, not

ceramics, diamonds, or silicon nitrides. And laser cutting produces rough edges, conical kerfs filled with particles, and can thermally damage the rest of the substrate. One alternative is the Laser-Microjet from **Synova SA**, Ecubens, Switzerland, (www.synova.ch). It focuses a laser-cutting beam

using a stream of low-pressure water. The water guides the laser using total internal reflection at the air/water interface, similar to how fiber optics transmit light. The pulsed laser and water flow are brought together in a chamber designed to couple the two, letting the water act as a variable-length, optical

waveguide. The resulting beam makes narrow, parallel, and burr-free cuts. Water also prevents thermal damage and carries the laser beam to the bottom of the kerf. Tolerances on cutting are an order of magnitude greater than with conventional laser-cutting processes.

Circle 402