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Caption: Mitsui Seiki introduces new laser drilling machine offering high-speed production and precision

Mitsui Seiki introduces 5-axis CNC laser drilling machine for high-speed, precision holemaking in tough alloys

[FRANKLIN LAKES, NJ – APRIL 2008] Mitsui Seiki has launched "VLD-300" a small, vertical, Nd:YAG laser drilling machine for 12-in. cube parts (300 mm x 300 mm x 300 mm in X, Y, Z axes). This machine was developed collaboratively with several aerospace engine component manufacturers who expressed a need for a higher-speed and more accurate laser-drilling machine than what was currently available on the market. It's common for some workpieces, primarily jet engine high temperature alloy parts, to require about 3,000 small diameter cooling airflow holes – each at a different angle – to be drilled in a non-contact manner. Laser is often the best option for speed and to minimize material stress. Inconel, Waspalloy, Hastalloy, and nickel-based titanium alloys are the typical materials.

After three years in research and development, the VLD-300 offers positioning accuracy and repeatability in X, Y, Z-axes of 0.00004" (0.001 mm). A axis positioning accuracy is ±6 arc seconds; repeatability ±3 arc seconds. C-axis accuracy is ±4arc seconds; repeatability ±2 arc seconds. X, Y, Z-axes cutting feed rate is 0.004 ~ 787" (0.1 ~ 20,000 mm) X, Y, Z-axes acceleration rate is 1.5g.

Mitsui Seiki partnered with a European laser company for the Nd:YAG version of this new machine. The VLD-300 is designed to also work with CO2, diode pump, and fiber lasers for different aerospace and other industry applications, such as certain electronics, medical, and automotive parts.

"What is unique about the Mitsui Seiki laser drilling machine is that it takes our traditional, highly precise and extremely repeatable machine tool building methodology and applies a laser rather mechanical drilling tools," says Tom Dolan, Vice President,

Mitsui Seiki USA. “That’s what customers wanted: a Mitsui Seiki machine with a laser, not a laser with machine tool features as secondary. Laser technology has come a long way over the past ten years, but precise motion control and high accuracy was lacking until now. Our innovative approach to machine tool building is applied to this small footprint machine, and this allowed us to incorporate a fairly simple, effective beam delivery system. The optic system has just one axis of motion, “Z”, and one bending mirror for easy maintenance and beam alignment simplicity.”

For rigidity and stability, the VLD-300 has a cast iron bed and linear motor drives. A dust collection system, combined with an interior work area of smooth, highly sloped surfaces, keeps cutting debris from contaminating the work zone and equipment. The Nd:YAG system offers a focal length of 200 mm or 300 mm with a height sensor for scanning and work offset probing. The machine is “automation ready” for devices such as pallets and robotic loading/unloading equipment. A Fanuc 310iM control features the Microsoft® Windows®-based platform and seamlessly controls the machine, laser, and the auxiliary equipment.

For more information, contact Mitsui Seiki, 563 Commerce Street, Franklin, NJ, (201) 337-1300, www.mitsuiseiki.com.

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