

Press Release



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TRUMPF TRUDISK LASER HELPS CVE ENTER NEW MARKET

Cambridge Vacuum Engineering (CVE), a specialist in the design and manufacture of electron beam welding (EBW) machines, has built its very first laser-welding system. Now installed at an important customer in the automotive sector, the machine relies on a TRUMPF TruDisk 1000, a 1kW solid-state laser with optimised beam quality for welding metals, in this case steel and Inconel.

The origins of CVE can be traced back to the late 1950s when two Cambridge graduates founded the company. Through a process of subsequent breakaway groups and acquisitions, the CVE name emerged in the late 1980s. Despite the change of identity, the focus remained the same: EBW and vacuum furnaces, largely in support of aero-engine manufacture. Today the ISO9001-accredited company has circa 70 employees and is supported by facilities in the US and China.

"In recent years we've been supplying a lot more machines to automotive customers, some of which are beginning to make enquiries about EBW alternatives," reports Steve Horrex, Sales Director at CVE. "Traditionally, EBW works in a vacuum, which is great from a process quality perspective, but vacuum generation and maintenance is sometimes seen as burdensome. For this reason, laser welding is gaining attention in certain applications as it can operate using nothing more than a shield gas."

Indeed, the company recently received an enquiry for a fully automated, bespoke laser-welding system from an existing automotive customer. It would prove to be CVE's first laser-welding machine, marking the beginning of its association with TRUMPF. The machine is being used by a tier-one automotive supplier to weld small (approximately 50mm long) steel and Inconel parts together in reasonably high volumes.

"In this particular application, the join quality produced by laser welding with a shield gas was perfectly adequate," explains Mr Horrex. "TRUMPF was chosen for its track record in the automotive sector and its reputation for quality engineering. The customer's R&D centre also had a TRUMPF system, which definitely helped steer the purchase decision."

Laser welding is a technique known for its versatility and high productivity, especially when joining thin-section materials and welding at high speeds. Compared with other welding techniques, laser welding has relatively low heat input, resulting in low distortion, excellent mechanical properties and minimal post-weld machining.

Shield gasses protect the weld area from oxygen and water vapour. In addition, unlike **EBW**, no X-rays are produced, so the process does not require an expensive vacuum chamber. This fact also means that higher productivity can be achieved.

Says Mr Horrex: "TRUMPF turned out to be a good choice for the laser – we were particularly impressed with the expertise of their engineering team, which made the integration of the TruDisk 1000 with our system very smooth. As we were fairly new to the laser business it was good to find a partner with whom we could build trust. Following the successful installation and commissioning of the laser-welding machine, we're now quoting additional systems for the same customer, as well as machines for other clients. The TRUMPF laser has been a really good stepping stone to a new revenue stream."

Alongside machine reliability, traceability is vital to CVE's customer. The laser-welding system is required to provide full traceability of all weld parameters and process details. This data is then shared with the end user's MES (manufacturing execution system). With the TruDisk 1000, the extensive data captured by the laser's intelligent sensors mean that all important parameters can be monitored reliably, in line with Industry 4.0 practices.

Offering a compact footprint and increased robustness, the latest-generation TruDisk 1000 works economically in all laser states thanks to a new pulse function with greater energy efficiency and intelligent energy management.

"Moving forward, the end user is looking to introduce further new parts to the laser-welding machine," says Mr Horrex. "The tooling, work-holding and automation that we devised facilitates rapid component changeover, thus future-proofing the system."

There is little doubting the size of challenge that CVE has overcome with its new laser-welding machine. Going from a blank canvas to a successfully commissioned system in a matter of months is impressive enough. Throw a pandemic into the mix and the feat is even more monumental.

"CVE customers always get the full package, and this now extends to laser-welding machines," concludes Mr Horrex. "Combine our engineering and machine-building expertise with the brand reputation and quality of the TRUMPF TruDisk laser, and our customers have access to a very powerful combination."

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