Vacuum is not a burden - it is a feature

Electron Beam VS Laser In Vacuum

Highlighting the characteristics and benefits of Micro Electron Beam and Laser in Vacuum welding.

Laser and micro Electron Beam systems can both produce sub 50 µm spots with high power densities, but selection of an ideal welding technique is determined by the material(s) of the work piece. For insulating and magnetic materials, welding with electron beam can often be challenging due to surface charging and/or beam distortion. The FOCUS LaVa system brings the power of laser welding into a vacuum environment, enabling ultra clean deep penetration welding at much lower temperatures than at atmosphere. Since the boiling point of materials is pressure dependant, temperatures up to 1000°C lower than under atmospheric conditions are achieved when operating the laser under vacuum conditions.

FOCUS LaVa L95

Laser welding efficiency is limited when the workpiece reflects initially a large percentage of the laser light. The reflectivity of the material can be a problem when working with precious metals or joining dissimilar materials, where a well-adjusted temperature gradient across the material interface is required to minimize formation of intermetallic phases.

For these materials, the FOCUS Micro Electron Beam is the preferred solution, where energy absorption is independent of the workpiece material and that the operator is able to precisely vary the power from 50 W to 2 kW. A similarly broad power range with a laser platform would require multiple laser sources and would still not be able to match the single Watt, fine power control of an Electron Beam.

FOCUS MEBW-60 L135

The spot size can be continuously varied from 25 µm to greater than 1 mm with large 100 kHz deflection frequencies, when compared to 1 kHz for regular laser source mirrors.

With our experience in both forms of in-vacuum welding FOCUS has an integrated dual-source platform for a research institute to study a wide range of joining and machining technologies.

Our unrivalled experience at FOCUS in electron beam and Laser in Vacuum welding allows us to advise and support our customers when considering the best welding tool configuration for their needs, optimising performance, cycle times and cost.

For more information please vist
www.focus-powerbeam.com *or contact us!*

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