



CASE STUDY

EBTECH INDUSTRIES

LASER WELDING CELL

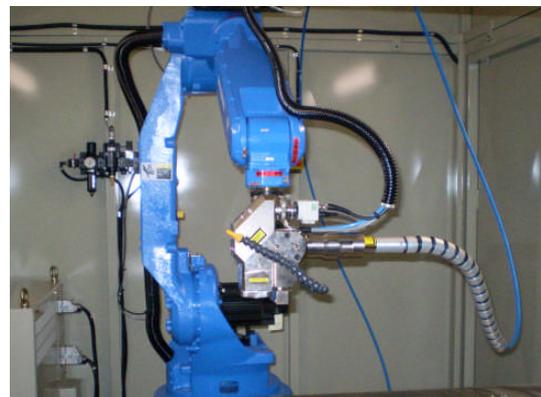
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Recently, Ebtech Industries Pty Ltd has installed a GSI JK450HP Nd:YAG Pulsed Laser System supplied by Raymax Lasers®. The system was purchased to fill a requirement for a hi-tech welding process that fits between the current electron beam welding process and general welding processes such as TIG and MIG. Since installing the system from Raymax Lasers®, the laser processing capability is developing and resulting in increasing sales of components and jobs that can be processed by Laser Welding.

Ebtech Industries Pty Ltd is a Melbourne based engineering job shop that specializes in hi-tech welding and marking processes. Established for over 30 years, Ebtech Industries Pty Ltd provides electron beam welding and laser marking services to the Automotive, Aviation, Manufacturing and General Engineering industries. The current electron beam welding process is not suitable for high volume components and requires a long setup time and vacuum for optimum performance. This was resulting in delays and added processing times. Coupled with the unsatisfactory results for small/thin components, Ebtech Industries Pty Ltd looked for a more suitable process to augment the electron beam welding process capability.

The search for solutions to the issues about three years ago and settled on the laser welding process. Raymax Lasers® was approached early in the search and a number of different laser sources and integration solutions were investigated. During the investigation, Laser Power, Type (YAG or Diode, Pulsed or CW) and materials handling methods were examined. After an exhaustive evaluation period, culminating in a visit to the Raymax Lasers® principle, GSI, by Mike Jenkins of Ebtech Industries Pty Ltd, the GSI JK Series lasers were selected as the preferred laser source supplier.

Based on the applications and targeted markets, the GSI JK450HP – a 450W Average Power Pulsed Nd:YAG Laser System was selected as the preferred system. The GSI JK450HP, supplied by Raymax Lasers®, is the latest technology in pulsed Nd:YAG laser systems with a peak pulse power of 10kW and frequency 1000hz. Like all GSI products, the JK450HP is engineered for production environments and is a laser for general engineering purposes, thus capable of processes such as welding, drilling and cutting. The laser is delivered via a fibre optic cable to welding or cutting optics that focus the laser for the process.



GSI JK450 Laser Welding Head and Robot



Laser Welding Cell

After selecting the Raymax Lasers® supplied GSI JK450HP Laser System, the integration options were evaluated. The choices included Robot vs. X-Y-Z Motion Stages and Local vs. International integration. Due to the safety requirements of a 450W laser system, the entire work area required complete enclosure and double interlocks. Eventually, a Motoman robot and cell supplied by Robotic Automation was selected.

The solution selected was the GSI JK450HP Pulsed Nd:YAG laser system with a fibre optic cable and welding/cutting optics. A Motoman 20kg Payload robot was selected to manipulate the working optics. The working optics and robot were completely enclosed inside a work cell with full interlocks for safety installed. Raymax Lasers® provided the laser system including installation, commissioning and training while Robotic Automation provided the integration for the robot, robotic control systems and work cell enclosure.

The GSI JK450HP Laser System installed by Raymax Lasers® is capable of welding and cutting various materials including carbon steel, stainless steel, nickel alloys, aluminium, titanium and many other metals. The reach of the robot allows components that can fit into a cubic metre to be cut or welded. In addition, a rotary chuck is included allowing circumferential welding and cutting of round jobs. Since the system was commissioned by Raymax Lasers® there has been a steady increase in interest and jobs for the GSI JK450HP Laser Processing cell. In addition, laser welding applications knowledge and capability is increasing with Raymax Lasers® and GSI assistance and is resulting in more work for Ebtech Industries Pty Ltd.

The results from the Raymax Lasers® installation of the GSI JK450HP Laser Processing Cell have been an increase in work for the equipment and Ebtech Industries Pty Ltd. The addition of the Laser Welding Process to the Ebtech Industries Pty Ltd workshop is allowing Ebtech Industries Pty Ltd to perform more detailed welding and cutting that was not possible with the Electron Beam Process and would have been previously outsourced or gone to other workshops. The Laser Welding Cell has provided Ebtech Industries Pty Ltd with a more flexible welding process and has added to the hi-tech welding and cutting capabilities.



Examples of Ebtech Welded Products

For More information, please call Raymax Lasers® on 02 9979 7646.