



REMOTE LASER WELDING SOLUTIONS

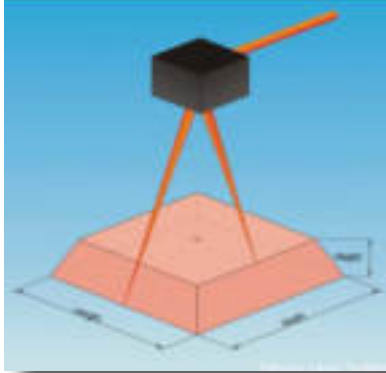


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SCANWELD®

A REMOTE LASER WELDING TECHNOLOGY OFFERING GREAT NEW OPPORTUNITIES

PRINCIPLES OF REMOTE WELDING



The major difference between slower conventional laser welding and remote welding is the way in which the beam is manipulated prior to reaching the work surface. *ScanWeld*® remote welding moves only lightweight mirrors and lenses to position the laser beam in the weld process volume. The beam is first sent through a focusing mechanism, which consists of either lenses or mirrors. The focusing beam is then directed to the work surface using two mirrors rotating about their axes. Dynamic translation of the focusing optics adjusts the focal length, allowing the laser beam to focus at any position in the process volume.

ADVANTAGES OF LASER WELDING

- High Welding Speeds
- Narrow Heat Affected Zone
- Minimal Part Distortion
- Joining of Dissimilar Metals
- Precise Placement of Weld
- Weld Depth Control
- Flexibility in Programming
- Non-contact Process

ADDED ADVANTAGES OF SCANWELD®

- Positioning Speeds up to 20 m/s (800 ips)
- High Speed Contour Welding
- Optimized Welding Strategy
- Flexibility in Tooling Design



Stitch and spot welding utilize the full capacity of ScanWeld®

SCANWELD® SERVICES

- Process development services are available from initial concept to system installation.
- Metallurgical Analysis
- Joint Design Considerations
- Design of Experiment
- Process Capability Study
- Tooling Design
- Pilot Production



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SCANWELD® EQUIPMENT

SPOT WELDING

ScanWeld can greatly increase production rates. The picture below shows 83 spot welds. The total cycle time for these spot welds was approximately 10 seconds. The thickness of the material is 1.5mm (0.060"). The spot welds are all the way through the material.



Spot welds



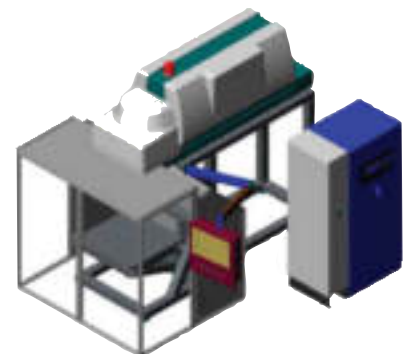
Stitch welds

The picture above shows several different kinds of stitch welds that can be easily programmed. Different weld patterns can be programmed and tested to determine what is best for the assembly.

ScanWeld® can be used as a stand-alone workstation as pictured below, or integrated into an automated production line.

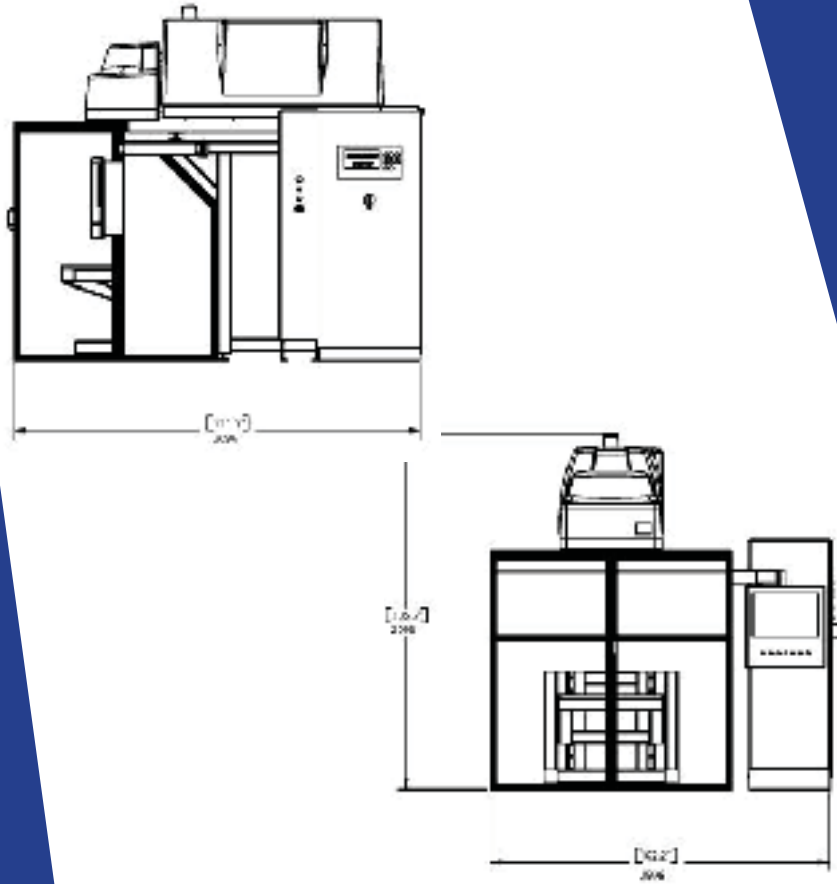
ScanWelds® cost effective workstations are available to improve productivity and automation of 2D or 2.5D welding. Types of 2D part assemblies that are excellent candidates for *ScanWeld*® are sheet metal assemblies and fabricated frames. Manufacturers supplying 2D welded sub-assemblies for medical, electronic, industrial, appliances, instrument, and automotive products have an opportunity to lower their production costs and improve flexibility with *ScanWeld*®.

The typical *ScanWeld*® Workstation for 2D – 2.5D welding consists of a laser resonator, beam scanner, beam focus, process controller, adjustable tooling platform, and protective enclosure. Support services include a water heat exchanger, compressed air, machine vision, and part loading automation. The customer places tooling for the part assembly on the tooling platform. The desired weld pattern is loaded into the process controller from a CAD file. The job is ready to run once the operator assigns weld process parameters to the weld pattern.



ScanWeld® System

WORKSTATION TECHNICAL SPECIFICATIONS



For North America contact:

LasX Industries, Inc.
4817 White Bear Parkway
White Bear Lake, MN 55110
USA

Tel. 651-407-0011
Fax 651-407-0110

kklingbeil@lasx.com

sales contact:
Kevin Klingbeil

For Europe contact:

Omega Laser Scanners B.V.
Chroomsteden 5
7547 TL Enschede
The Netherlands

Tel. +31-(0)53-4283111
Fax +31-(0)53-4284970

m.bolwerk@omegalaser.com

sales contact:
Maurice Bolwerk

Process Volume (XxYxZ):

Standard: 750mm x 750mm x 100mm (30" x 30" x 4")

Other sizes available

Positioning Speed:

Up to 20 m/s (800 ips)

Positioning Accuracy:

$\pm 0.15\text{mm}$ ($\pm 0.006"$)

Laser:

Standard: 2500W CO₂

Other power levels available

Electrical Power:

400/480 VAC – 40kVA

Cooling Water Capacity:

35kW

Options:

Vision Registration

Tooling and Fixturing

Process Development



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PROCESS DEVELOPMENT SERVICES

Let the experienced staff at ScanWeld® develop the right process for your needs. We have the necessary experience to perform metallurgical analysis to process capability studies to satisfy your requirements. We can perform the tasks necessary to create the right process for you.

The ScanWeld® team likes to start off by discussing with you what our technology has to offer. During this discussion we will talk about the material specifications and the joint design that you are currently using and offer suggestions to enhance the process performance. Sample welds may be performed during this phase to determine weldability of the materials.

A written proposal for process development, analysis, tooling, etc. will be presented to you. Once the weldability of the material and joint design has been addressed, the development of the process begins. The process speed, laser power, etc. will be determined to meet the requirements specified for your product. Analysis of the laser weld will be done as well, which can include but is not limited to tensile testing, hardness testing, weld penetration, weld width, etc. so that a standard for your process can be established. Often times, 1 to 100 parts will be produced during this phase. The logistics for design and fabrication of tooling can be handled by you with consultation from our knowledgeable team at ScanWeld®, or we can take care of it for you.

After the process has been established, we will have a design meeting with you to determine the specifications of the system for your product. We understand the financial constraints of today's market so we therefore leave it open for you to determine whether to purchase a standard system or to have us design automation into the system for you. The ScanWeld® module was developed specifically for easy integration into your production line.

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White Bear Lake, MN
55110

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Fax 651-407-0110

kklingbeil@lasx.com
www.scanweld.com



SPOT WELDING

ScanWeld[®] offers manufacturers cost effective laser spot welding equipment to lower their production costs and improve flexibility.

Positioning time between welds can be virtually eliminated with positioning speeds of up to 20m/s (800ips).



The photo above shows 83 spot welds that were done in 10 seconds. The spot welds are through penetration in 0.060" thick material. Virtually any spot weld design imaginable can be programmed into the workstation. With the flexibility of *ScanWeld*[®], multiple spot weld designs can be used throughout the process as well as different laser weld parameters. Different weld designs may give the assembly different strengths. The weld pattern and design can be optimized to meet the needs of each assembly.



The photo above shows examples of welds that can be done quickly with the laser welding equipment offered by *ScanWeld*[®]. Four different laser spot weld designs are shown, a spiral pattern, triangle, sine wave and a circle. All four designs were processed within the same weld sequence.

Advantages of Remote Laser Welding

- *High positioning speeds*
- *High welding speeds*
- *Narrow heat affected zone*
- *Minimal part distortion*
- *Joining of dissimilar metals*
- *Precise placement of weld*
- *Weld depth control*
- *Flexibility in programming*
- *Non-contact process*

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