Laser welding can really set you apart.
Conventional welding methods, such as spot- and arc welding, reached their mature state a long time ago. As laser welding starts where traditional welding techniques end, its use can really set you apart from the competition.

AWL laser welding machines are designed to offer the best price/performance balance. In order to meet your specific requirements, AWL has developed a large portfolio of machine configurations.

Why start with laser welding?
Laser welding is a versatile process which can be used to weld a variety of materials. Lasers are often used in high-volume production applications as they have high welding speeds and a level of automation that allows 24/7 operation.

Technical advantages of laser welding
- Deep narrow welds
- Low heat input
- Minimal distortion
- High joint completion rates
- Design flexibility
- Minimal use of consumables
- Ease of automation
- Cosmetic welds
- Variety of weld shapes

As market trends keep changing, innovations mature and customer demands and legislation effect your production, laser welding can open up a whole new world of possibilities.

Piet Mosterd, Managing Director AWL
Lightweight materials and higher output
The desire for higher output and the use of lightweight materials demands alternative joining methods. These demands can be met with laser welding as low heat input, high welding speed and short weld-to-weld times are characteristic for laser welding.

Cost savings
When using laser welding on products with high production volumes, long welding lengths and/or many sub parts, the cost savings are impressive. These savings are primarily created by the high welding speeds, the quick weld-to-weld times and the fast change-over times.

Uniform quality
The product design needed for successful laser welding, combined with accurate fixture clamping, makes a uniform quality possible. The parameters for laser welding are also easier to determine than, for example, with arc welding, resulting in a reduction of scrap rate.

Product design
With laser welding the accessibility of the weld is much easier in comparison with other welding methods. It also enables the development of new product designs, gaining maximum results in weight reduction of the (end) product and the reduction of waste materials.
“Within laser welding AWL is an expert in macro laser welding areas, such as key-hole welding, cosmetic laser welds and hybrid welds.”
Gerrit Bikker, Manager Engineering

Why do you need AWL?
Over the years AWL has gained a lot of experience in laser welding. As a system integrator we know all the sub components of the laser configuration and are able to really fine-tune the process.

Path accuracy
High welding speeds often interfere with the path accuracy, especially when welding curves/patterns. In close cooperation with ABB Robotics, we have tuned the programming software, which is now based on re-orientation from the wrist. This guarantees excellent path accuracy even at high welding speeds.

Our laser fixtures
With virtual engineering and 3D simulation we guarantee the reach ability and cycle time you desire. Our design starting point is the “datum story”, in order to achieve accurate part positioning and, in turn, high weld quality.

The specific characteristics for a laser fixture are the “zero gap tolerance” between the parts (except for zinc-coated plates, where dimpling is often used), the reach ability of the laser beam and the solid airflow movement.

In addition, Poka Yoke engineered, spatter protection, unloading assistance and nest intelligence are some of the other advantages of AWL’s high-end fixtures.

System integration
We are proud to say that we are a world-class system integrator. By using A-level equipment and components we are able to provide you with a machine that meets your needs, is efficient, cost-effective and reliable; whether you are looking for a standard configuration that consists of standardized building blocks (configure-to-order), or are in need of a customer-specific solution (engineering-to-order). Most projects are an ideal combination of these two philosophies and often include multiple processes and automated handling.

Turn key delivery
AWL has a clear strategy. We not only ensure that the machines and the fixtures are of an excellent quality, we also take responsibility for the complete process, from engineering to your machine being “up and running” at your facility.
PRIMARY CONFIGURATION: CHOOSE YOUR WELDING SYSTEM

AWL always supports its customers by defining the best suitable solution. For the primary configuration we focus on the following elements: product geometry, volume/output, production philosophy, preferred brands, number of operators and, of course, your budget. By taking all these elements into account, one of the following laser welding systems will be best suited for you.

Remote welding system
This configuration is very solid and offers high weld-to-weld times. A remote welding system is available for CO², Fibre and Disc laser. Primarily it is used for products that have welds close to each other (2½ D).

Robotised scan optics
This configuration uses a scan optic which is mounted on a robot. It offers great path accuracy while retaining high welding speeds and the opportunity to weave and mark. The short weld-to-weld times offer a high laser up-time. This solution is best suitable for products with welds close to each other (2½ D).

Fixed focussing optics with robots
This configuration consists of one or more robots with fixed optics. It offers good reach ability, high path accuracy and excellent flexibility. The advantage is even greater if you weld with multiple robots, also known as the “AWL beam switch management system”. As the beam switches from one optic to the other the laser source is fully utilized. Products that are suitable for this configuration have relatively long distances between the welds and the welds are at various angles (3D).

Next to these proven automated laser concepts AWL also offers special solutions such as CO² with guided optic, robotized diode laser and specials with solid state lasers.
Air-flow management
Clean air is crucial for a qualitative laser weld. Therefore AWL pays special attention to managing the flow of clean air in the laser casing and the fixture. AWL offers differentiated levels of air-flow management.

Fixture clamping
Clamping philosophies are different for every customer. The clamping solution is particularly crucial in laser welding due to the zero gap tolerance between the parts. AWL offers different proven clamping methods.

Safety
When dealing with lasers, safety becomes a major issue. AWL makes an extensive risk analysis and provides solid safety management on the maximum laser-on time. We use SafeMove to ensure a safe area and orientation, combined with the classic double walls (laser spy sensor). AWL machines of course comply with the latest directives.

Sophisticated controls
Because of our standard software building blocks (Siemens Totally integrated Automation-based), we have very robust, flexible operating software. Aside from this basic operating software, we can also integrate specific customer items with this standard. In addition the Human Machine Interface (HMI) makes operating the machine very intuitive by use of icons and colours.

SECONDARY CONFIGURATION ISSUES: DEFINE THE MACHINE
Choosing a welding system is the first step in configuring your machine. Just as important are the secondary configuration issues, which ultimately define your laser welding machine, all well-balanced to reach the optimal laser uptime and required output. During this process AWL can and will be your advisor and sounding board to ensure the optimum configuration for you.
Integrated logistics
Due to the high cycle times, operator involvement often becomes a bottleneck. An alternative is to use automated loading and unloading. AWL has a great deal of experience in integrated logistics.

Logistical systems
Depending on the required cycle time, number of operators and budget, a logistical system must be defined. Examples are:
- Rotating 2-, 3-, 4-index tables
- Slide table
- Shuttle track
- Compact system

Flexibility
Different customers, demand different levels of flexibility. As AWL machines are easily upgradeable, weld different product variants on one machine and require little change-over time for the intelligent fixtures, we are able to meet all these demands.

Production philosophy
As the laser welding machine is usually integrated in a complete production chain, your production philosophy has to be taken into consideration. Whether you use lean systems, are batch-oriented, use a robot philosophy or have limited floor space, we make sure the solution is tailored to your needs.

Integrated logistics
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Quality control
With conventional welding methods the operator is able to do an optical quality control, but with laser, due to the necessary automated loading/unloading, the operator is often taken out of the loop. Therefore in-process quality control for performance measurement, welding parameter monitoring and seam geometry measurement is becoming more dominant. Laser welding combined with this kind of quality control makes integrated rework possible.
AWL
Keeps you ahead in automated welding

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