LEISTER®

Contamination-free Laser Welding

FOCUS | Mask Welding in Analytics and Diagnostics

Laser Welding Technology | Mechanical Engineering Industry

swiss made

Leister Welding Techniques in Analytics and Diagnostics

Laser Welding Complex Structures Under High Production Demands

For decades, Leister Technologies AG has been pioneering technology in the development, production and sales of innovative laser systems for a range of industrial applications in the medical engineering, electronics and automotive sectors. As your experienced and dependable partner, Leister offers individual advice, process development and system technology for your high requirements.

Leister. We know how.

Content

Precise Laser Plastic Welding

Leister laser systems are used around the world for industrial production of plastic parts in a range of sectors. If you need precise, durable and contamination-free welding for sensitive parts, you will find the perfect solution from Leister. Develop the optimal welding process and system concept for your production together with our experts.

Particle-free Plastic Welding

Laser welding is a precise process for permanently joining plastics. Leister offers a broad range of optics for diverse applications to securely weld your product. At the same time, optional process control will guarantee the desired welding quality.

Contamination-free Plastic Joining

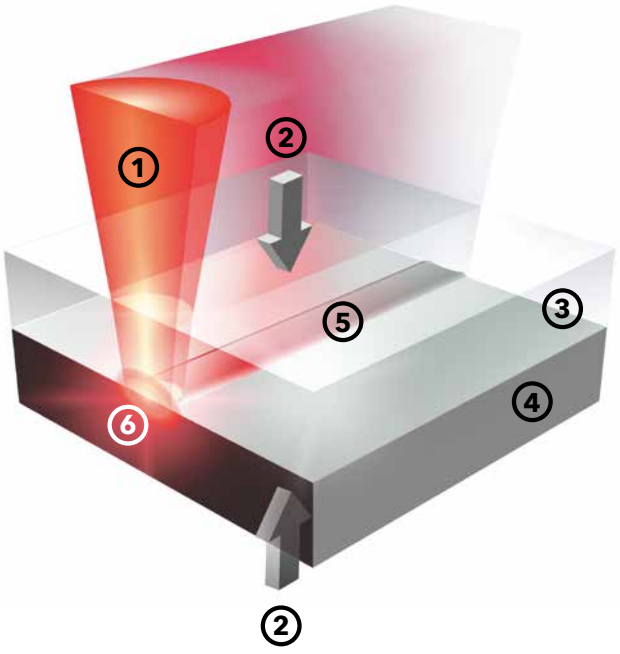
Laser transmission welding for contamination-free joining of thermoplastics has proven itself globally. The laser penetrates the polymer that is transparent to the radiation and is converted into heat when it comes into contact with the absorbent polymer. The absorbed energy melts the plastic. Simultaneously pressing together the parts with the right combination of energy, pressure and time generates a permanent weld. The welded material and the design of the part are also important when it comes to the weldability of the plastic components.

Advantages of Laser Transmission Welding of Plastics

- High weld precision and mechanical strength
- Contamination-free component bonding
- Optically perfect welding seam
- Less part deformation thanks to reduced thermal and mechanical load
- Process stability through quality control

Laser Transmission Welding Illustration

1. Laser beam
2. Joining pressure
3. Transparent joining partner
4. Absorbent joining partner
5. Weld seam
6. Heat Affected Zone



Individual Solutions for You

Leister offers comprehensive and expert support for evaluating and designing the optimum welding process for specific applications. Proposals for material selection, support with component design and selecting the welding procedure are initial steps that are tested in one of our global application centers during welding tests. These information will help when discussing the implementation. It goes without saying that our local specialists accompany you throughout installation and after delivery.

Customer proximity is essential when it comes to laser welding because it's all about finding the best solution for your individual requirements. So, Leister works with sales specialists and service partners around the globe to give you and your team expert advice and to configure your laser welding system together with you.

Set up a consultation with experts

① **Consulting**

② **Welding Tests**

③ **Planning and Implementation**

④ **Installation and Training**

⑤ **Service and Support**

Joining Fluidic Analysis Cassettes

Developers and manufacturers of products for analytics and diagnostics face the challenge of joining complex seam geometries in sensitive areas when designing analysis cassettes. Because there are various procedures available, our team of laser experts looked into the most appropriate procedures and presented them in a Whitepaper.

Mask Welding of Complex Component Geometries

Mask welding of plastics is a tried and tested welding procedure that has been extended to include 3D mask welding patented by Leister.

As demonstrated by the research for the Whitepaper, it is ideally suited for producing fluidic analysis cassettes with complex component geometry.

Leister offers expert specialist advice when it comes to selecting the most suitable laser welding system for your application.

Fluidic analysis cassettes

Request a free expertise now

Laser Optics

Integration systems

Turnkey systems

LineBeam AT+

The LineBeam AT+ is the ideal laser source for mask welding. It generates a laser line with the near constant power density distribution required for a consistent weld.

Technical Data

Laser power	150–600 W	
Beam shape	Line	
Welding concept	Contour	
Laser line length	18.0–95.0 mm	0.7–3.74 in
Laser line width	1.0–2.0 mm	39.37–78.74 mil
Process monitoring	Laser power measurement	
Working distance	40–395 mm	1.57–15.55 in
Ambient temperature	10–40 °C	50.0–104.0 °F
Length	85.0 mm	3.34 in
Width	160.0 mm	6.29 in
Height	280.0 mm	11.02 in
Weight	4.5 kg	9.92 lb

Customized solution upon request

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Line Optic AT

Line Optic AT forms a line from a point laser beam. Different line lengths and widths are possible. The optical systems are used for mask welding of plastics, among other things.

Technical Data

Beam shape	Line	
Welding concept	Contour	
Laser line length	6.2–43.0 mm	0.24–1.69 in
Laser line width	0.3–1.5 mm	11.81–59.05 mil
Process monitoring	Fibre plug monitoring; Laser power measurement	
Working distance	34–254 mm	1.33–10.0 in
Ambient temperature	10–40 °C	50.0–104.0 °F
Length	45.0 mm	1.77 in
Width	115.0 mm	4.52 in
Height	210.0 mm	8.26 in
Weight	0.98 kg	2.16 lb

Customized solution upon request

Configure product

Line Optic BT

The Line Optic BT shapes the laser beam into a straight line and can be installed in all NOVOLAS™ Laser Systems. It is used for the mask welding of plastics and can be adjusted to customer requirements.

Technical Data

Beam shape	Line	
Welding concept	Contour	
Laser line length	6.2–43.0 mm	0.24–1.69 in
Laser line width	0.3–1.5 mm	11.81–59.05 mil
Process monitoring	Not available	
Working distance	34–254 mm	1.33–10.0 in
Ambient temperature	10–40 °C	50.0–104.0 °F
Length	45.0 mm	1.77 in
Width	45.0 mm	1.77 in
Height	121.0 mm	4.76 in
Weight	0.36 kg	0.79 lb

Customized solution upon request

Configure product

Line Optic M

The Line Optic M forms the laser beam into a straight line in different lengths and widths. It can be installed in all Leister S/M/L laser welding systems and can be adjusted according to customer specifications.

Technical Data

Beam shape	Line	
Welding concept	Contour	
Laser line length	6.4–43.0 mm	0.25–1.69 in
Laser line width	0.3–1.4 mm	11.81–55.11 mil
Process monitoring	Fibre plug monitoring; Laser power measurement	
Working distance	34–254 mm	1.33–10.0 in
Ambient temperature	10–40 °C	50.0–104.0 °F
Length	45.0 mm	1.77 in
Width	115.0 mm	4.52 in
Height	210.0 mm	8.26 in
Weight	0.98 kg	2.16 lb

Customized solution upon request

Configure product

Line Optic S

The Line Optic S forms the laser beam into a straight line. The optics fit all Leister S/M/L laser welding systems and can be adapted to the respective requirements in the production process.

Technical Data

Beam shape	Line	
Welding concept	Contour	
Laser line length	6.4–43.0 mm	0.25–1.69 in
Laser line width	0.3–1.4 mm	11.81–55.11 mil
Process monitoring	Not available	
Working distance	34–254 mm	1.33–10.0 in
Ambient temperature	10–40 °C	50.0–104.0 °F
Length	45.0 mm	1.77 in
Width	45.0 mm	1.77 in
Height	121.0 mm	4.76 in
Weight	0.36 kg	0.79 lb

Customized solution upon request

Configure product

BASIC M

The modular system BASIC M is a laser welding system for integration into industrial production plants. The basic configuration BASIC M includes the MAIN UNIT, optics, and a laser.

Technical Data

Wavelength	970–1100 nm	
Laser type	Diode laser; Fiber laser	
Beam guidance	Fiber coupled	
Laser power	47–300 W	
Coolant laser	Air; Air (Leister)	
Multilaser	Yes	
User interface	Leister HMI	
Control interface	Digital/Analog I/O	
Ambient temperature	15–35 °C	59.0–95.0 °F
Humidity	69 % at 35 °C/95 °F or 80 % at 32 °C/89.6 °F, non-condensing	
Laser class	Laser class 4	
Laser class Pilot laser	Laser class 2M	
Noise emission level	< 70 dB(A)	

Customized solution upon request

Configure product

NOVOLAS BASIC AT

The NOVOLAS™ BASIC AT welding system is designed for integration into complex production lines. Due to its flexible modular design, it can be easily configured for different requirements.

Technical Data

Wavelength	800–2000 nm	
Laser type	Diode laser; Fiber laser	
Beam guidance	Fiber coupled	
Laser power	40–600 W	
Coolant laser	Air; Deionized water	
Multilaser	Yes	
User interface	Leister HMI	
Control interface	Digital/Analog I/O; RS232; RS422/485	
Phases	1x	
Frequency	50/60 Hz	
Voltage	210–250 V	
Power	3600 W	
Ambient temperature	10–35 °C	50.0–95.0 °F
Humidity	69% at 35°C/95°F or 80% at 32°C/89.6°F, non-condensing	
Length	800.0 mm	31.49 in
Width	553.0 mm	21.77 in
Height	700.0 mm	27.55 in
Weight	100.0 kg	220.46 lb
Laser class	Laser class 4	
Laser class Pilot laser	Laser class 2M	
Noise emission level	< 70 dB(A)	

Customized solution upon request

Configure product

NOVOLAS BASIC AT COMPACT

The compact, affordable laser welding system NOVOLAS™ BASIC AT COMPACT is designed for integration in production lines and production cells. It has a modular design and can be adapted to various requirements.

Technical Data

Wavelength	800–1100 nm	
Laser type	Diode laser; Fiber laser	
Beam guidance	Fiber coupled	
Laser power	40–200 W	
Coolant laser	Air	
Multilaser	No	
User interface	Leister HMI	
Control interface	Digital/Analog I/O; RS232; RS422/485	
Phases	1x	
Frequency	50/60 Hz	
Voltage	100–250 V	
Power	600 W	
Ambient temperature	10–35 °C	50.0–95.0 °F
Humidity	69% at 35°C/95°F or 80% at 32°C/89.6°F, non-condensing	
Length	500.0 mm	19.68 in
Width	553.0 mm	21.77 in
Height	322.0 mm	12.67 in
Weight	35.0 kg	77.16 lb
Laser class	Laser class 4	
Laser class Pilot laser	Laser class 2M	
Noise emission level	< 70 dB(A)	

Customized solution upon request

Configure product

NOVOLAS WS-AT

The NOVOLAS™ WS-AT is a modular, universally applicable laser welding system. It can be equipped in a variety of ways as a manual workstation and can be adapted to customer-specific applications and processes.

Technical Data

Wavelength	800–2000 nm	
Laser type	Diode laser; Fiber laser	
Beam guidance	Direct; Fiber coupled	
Laser power	40–600 W	
Coolant laser	Air; Deionized water	
Multilaser	Yes	
Welding range (X-direction)	400 mm	15.74 in
Welding range (Y-direction)	300 mm	11.81 in
Number of linear axis	Max. 3	
Rotary axis	Yes	
Robot	No	
Indexing table positions	0	
Clamping concept	Electrical; Pneumatic	
User interface	Leister HMI	
Control interface	CAN; Customer specific; Digital/Analog I/O; Ethercat; OPC UA; Profibus; Profinet	
Required air pressure	5.3 bar	76.87 psi
Phases	1x	
Voltage	210–250 V	
Frequency	50/60 Hz	
Power	3600 W	
Ambient temperature	10–35 °C	50.0–95.0 °F
Humidity	69% at 35°C/95°F or 80% at 32°C/89.6°F, non-condensing	
Length	1230.0 mm	48.42 in
Width	1310.0 mm	51.57 in
Height	2260.0 mm	88.97 in
Weight	450.0 kg	992.08 lb
Approvals	CE	
Laser class	Laser class 2M	
Laser class Pilot laser	Laser class 2M	
Noise emission level	< 70 dB(A)	

Customized solution upon request

Configure product

MAXI

MAXI is a modular, universally applicable laser welding system and specializes in large components. It can be equipped in many different ways as a manual workstation and can be adapted to customer-specific applications and processes.

Technical Data

Wavelength	800–2000 nm	
Laser type	Diode laser; Fiber laser	
Beam guidance	Direct; Fiber coupled	
Laser power	40–600 W	
Coolant laser	Air; Deionized water	
Multilaser	Yes	
Welding range (X-direction)	1170 mm	46.06 in
Welding range (Y-direction)	750 mm	29.52 in
Number of linear axis	On request	
Rotary axis	Yes	
Robot	Yes	
Indexing table positions	2	
Clamping concept	Electrical; Pneumatic	
User interface	Leister HMI	
Control interface	CAN; Customer specific; Digital/Analog I/O; Ethercat; OPC UA; Profibus; Profinet	
Required air pressure	5.3 bar	76.87 psi
Phases	3x	
Voltage	360–440 V	
Frequency	50/60 Hz	
Power	6400 W	
Ambient temperature	10–35 °C	50.0–95.0 °F
Humidity	69% at 35°C/95°F or 80% at 32°C/89.6°F, non-condensing	
Length	1500.0 mm	59.05 in
Width	1760.0 mm	69.29 in
Height	2200.0 mm	86.61 in
Weight	1350.0 kg	2976.24 lb
Approvals	CE	
Laser class	Laser class 2M	
Laser class Pilot laser	Laser class 2M	
Noise emission level	< 70 dB(A)	

Customized solution upon request

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