

LASER SYSTEMS FOR METAL PROCESSING



FROM VISION TO INNOVATION

WELCOME TO ALPHA LASER

WE DEVELOP AND PRODUCE APPLICATION-ORIENTED LASER SYSTEMS THAT ALLOW OUR CUSTOMERS TO WELD, CUT AND HARDEN QUICKLY, EASILY AND PRECISELY.

Under its guiding principle *From Vision to Innovation*, ALPHA LASER has become the leading manufacturer of laser welding devices in skilled trades and small-series industrial production.

Since introducing its first mobile laser welding device in 2003, ALPHA LASER has been renowned worldwide as the inventor of mobile laser welding. We cultivate close partnerships with our users to implement new functions in the laser systems. This results in solutions that allow our customers to quickly meet the growing demands of their customers with optimal quality.

ALPHA LASER strives to serve its customers efficiently and with the utmost precision.



*Did you know that America isn't the only place where companies start in garages?
We started that way in 1994*

LASER WELDING

VERSATILE | EFFICIENT | ECONOMICAL

WHY LASER?

Manufacturing molds and tools can be expensive, and their service life can be shortened by wear, damage and corrosion. Laser welding and laser hardening can significantly increase the life of molds and tools. Laser deposition welding can also be used to make design changes, so that an old mold will not have to be replaced.

Laser systems from ALPHA LASER feature excellent performance and flexibility. With our robust, high-performance laser welding devices, we provide you a tool that allows complicated connections that are difficult or impossible with traditional joining technologies, even in the immediate vicinity of sensitive materials, such as plastic or glass. The good control of laser energy and exposure time allows welding of metallic materials with high melting temperatures and high thermal conductivity. It can even be used to connect different metals.

LASER SOURCES

The application determines the choice of a laser source. ALPHA LASER has Nd:YAG and fiber sources. Based on the application, we can therefore advise you in finding the best solution for your tasks. We can provide systems with 50 to 900 watts of laser power.

A wide range of accessories ensures that the laser system is ideally adapted to your task. We invite our customers to test the various laser sources and performance classes for materials processing in our new application center in Puchheim, Germany.

LASERS HAVE VERSATILE USES IN PRODUCTION AND REPAIR, ESPECIALLY IN THE THE FIELDS OF...

PRECISION ENGINEERING

Welding precision metal parts

TOOL AND MOLD MANUFACTURING

Repairing extensive, filigreed defects, both on small molds and tools weighing tons, along with design changes

MEDICAL TECHNOLOGY

Welding surgical instruments, passive and active implants and endoscopic components

SENSOR TECHNOLOGY

Welding of thermocouples, measurement sensors and pressure diaphragms

SHEET METAL PROCESSING

Welding electronic housings, stainless-steel parts for household appliances, architectural elements and sculptures

THE RESONATOR CLINCHES THE DECISION

Did you know that our resonators are milled from a single piece to provide the best beam quality? Sophisticated, rotatable beam deflection and movable objectives ensure you a comfortable work position while reaching any location to be welded.



SAMPLE APPLICATIONS



Repair of the worn sealing edge
of a mold insert made of Ampco
bronze



Targeted repair of
washed-out edges



Transmission components
(here a gear) are installed and
welded with very low heat effect



An edge eruption was welded on
the ejection side of an injection
molding tool



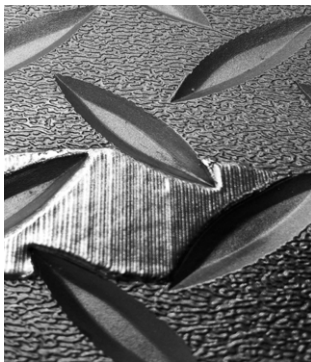
Laser welding is also used in producing serial parts
(here wind gauges)



Cladding with
ALFlak 900 F



Large-scale material application



Repair of a
scarred surface

ALPHA LASER MOBILE SYSTEMS

A CLASS IN THEMSELVES

LOW SET-UP TIMES | EXTREME FLEXIBILITY

Mobile laser welding has become an important branch of laser materials processing, because its advantages are obvious: Repairs and material application can be done on large machine parts or molds and tools weighing tons, directly on site. Thus, with a mobile laser, for example, repairs can be made in injection molding machines or complete mold halves with very little positioning effort.

The mobility offers the user enormous flexibility and extremely short set-up times. These advantages provide cost reductions and competitive advantages.

ALM

ALFlak MAX

ALFlak mobile

ALFlak stationary

ALFlak fiber

ALM

THE NO. 1 MOBILE LASER

Extremely short set-up times allow a vast range of machine components, pressing tools and large molds to be repaired and modified with the ALM at any imaginable location.

The ALM's versatility is impressive. The workpiece can be transported to the laser, or the laser to the workpiece. This ensures mobility within the company or at the customer's.

The ALM is air cooled and requires no additional cooling systyem. Just move the laser to the workpiece, secure the laser area, aim the slim laser arm at the weld, and start welding.

The hydraulic brakes fix the laser arm exactly at the desired work position. Welding can be done manually using a joystick, semi-automatically, or using an external operating unit.

The laser device has a powerful and application-optimized SPC with new functions, and the user coordinate control is programmable within a range of 50 x 50 mm.

Additional flexibility is possible with the unique turn and tilt objective, which allows the laser beam to be moved continuously up to 40° from vertical to any direction.

The system fulfills performance level d.



ALM

TECHNICAL DATA	ALM 200	ALM 250	ALM 300
LASER			
Laser type / wave length	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm
Average power	200 W	250 W	300 W
Peak pulse power	9 kW	9 kW	9 kW
Pulse energy	90 J	90 J	90 J
Pulse duration	0.5 – 20 ms		
Pulse frequency	Single pulse - 100 Hz		
Operating mode	Pulsed		
Welding spot Ø	0.2 – 2.0 mm		
Focusing objective	150 mm, further according to lens data sheet		
Pulse shaping	Adjustability of power curve within a laser pulse		
Display and operation	Display with membrane keyboard Laser parameters can also be set using a multifunctional footswitch, motor controls can be set through a touchscreen or optional external operating unit		
OBSERVATION LENS			
	Leica microscope attachment with eyepieces for glasses wearers, 10x Optional 16x		
WORK AREA			
	The processing head can be freely positioned in the space and additionally moved using a joystick		
Movement speed (X, Y, Z)	0 – 25 mm/s		
Movement range (X, Y, Z)	120 x 110 x 800 mm		
Lowest working point	530 mm		
Highest working point	1590 mm		
Arm deflection	1300 mm		
EXTERNAL DIMENSIONS			
W x D x H	730 x 1410 x 1585		
Weight	320 kg		
EXTERNAL CONNECTIONS			
Electrical connection	3 x 400 V / 50-60 Hz / 3 x 16 A		
Extreme cooling		Prepared	Prepared
OPTIONS			
	Turn and tilt objective Rotary axis module with chuck, tiltable, for horizontal to vertical rotation External operating unit (remote control) TV system for demonstrating and observing the welding process Ergo wedge		



ALFlak MAX

ALFlak MAX

AN ESPECIALLY LONG REACH

With a laser arm almost 2.80 m long, the ALFlak Max offers an especially large movement radius – as a service provider or mold maker, this gives you even more flexibility for your applications.

Whether working on pressing tools, large molds or machine components, just move the ALFlak Max on its self-propelled caterpillar track to the workpiece, aim the laser arm at the weld, and start welding. Welding seams up to 340 mm are possible without relocation.

A rotatable laser head, the unique optional turn and tilt objective, and various focusing lenses ensure that you can reach almost any position on the workpiece with the laser beam.

The ALFlak Max comes in two versions: with a self-propelled caterpillar track or a model that can be moved manually.

The User Coordinate Controller offers additional ease of use for effortlessly teaching in a slope as a work surface.

TECHNICAL DATA	ALFlak MAX 250	ALFlak MAX 300
LASER		
Laser type / wave length	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm
Average power	250 W	300 W
Peak pulse power	9 kW	9 kW
Pulse energy	90 J	90 J
Pulse duration	0.5 – 20 ms	
Pulse frequency	Single pulse - 100 Hz	
Operating mode	Pulsed	
Welding spot Ø	0.2 – 2.0 mm	
Focusing objective	150 mm, further according to lens data sheet	
Pulse shaping	Adjustability of power curve within a laser pulse	
Display and operation	Display with membrane keyboard Laser parameters can also be set using a multifunctional footswitch, WINLaserNC software through external PC	
OBSERVATION LENS		
	Leica microscope attachment with eyepieces for glasses wearers, 10x Optional 16x	
WORK AREA		
Movement speed	0 – 25 mm/s	
Movement range (X, Y, Z)	320 x 330 x 370 mm	
Lowest working point in mm	415 mm	
Highest working point in mm	1910 mm	
Arm deflection	2700 mm	
EXTERNAL DIMENSIONS		
W x D x H in mm	1200 x 1200 x 1300	
Weight	with caterpillar track approx. 910 kg, without caterpillar track approx. 610 kg	
EXTERNAL CONNECTIONS		
Electrical connection	3 X 400 V / 50-60 Hz / 3 X 16 A	
Extreme cooling	Prepared	Prepared
OPTIONS		
	Turn and tilt objective	
	Rotary axis module with chuck, tiltable, for horizontal to vertical rotation	
	TV system for demonstrating and observing the welding process	
	Ergo wedge	

ALFlak

SELF-PROPELLED, ROBUST, PROGRAMMABLE

The ALFlak's laser arm projects a great distance to effortlessly reach its welding position, even in deep or complex molds. Welding seams up to 500 mm are possible without relocation. Your advantage: The welding process can be performed without constant repositioning.

The ALFlak comes in two versions: with a self-propelled caterpillar track or a model that can be moved manually. Choose the laser source that fits your requirements: You can choose Nd:YAG 200 W or 300 W laser sources or fiber lasers with output of 300, 450, 600 or 900 W.

If your needs change later, you can equip your ALFlak with a 300 W or 450 W fiber source to double the output.

NEW: Now also available with the option powder deposit welding (cladding) for ALFlak 450/600/900 F.

TECHNICAL DATA	ALFlak 200	ALFlak 300	ALFlak 300 F	ALFlak 450 F	ALFlak 600 F	ALFlak 900 F
LASER						
Laser type / wave length	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Fiber laser, 1070 nm	Fiber laser, 1070 nm	Fiber laser, 1070 nm	Fiber laser, 1070 nm
Average power	200 W	300 W	300 W	450 W	600 W	900 W
CW power			300 W	450 W	600 W	900 W
Peak pulse power	9 kW	9 kW	3 kW	4.5 kW	6 kW	9 kW
Pulse energy	90 J	90 J	30 J	45 J	60 J	90 J
Pulse duration	0.2 – 20 ms		0.2 ms – CW			
Pulse frequency	Single pulse - 100 Hz		Single pulse - 100 Hz			
Operating modes	Pulsed		Pulsed CW			
Welding spot Ø	0.2-2.0 mm / 0.01-1.0 mm with micro welding option		0.1 – 3.0 mm		0,3 – 3,5 mm	
Focusing objective	150 mm, further according to lens data sheet					
Pulse shaping	Adjustability of power curve within a laser pulse					
Display and operation	Display with membrane keyboard Laser parameters can also be set using a multifunctional footswitch. WINLaserNC software through external PC					
OBSERVATION LENS						
WORK AREA	Leica microscope attachment with eyepieces for glasses wearers, 10x Optional 16x					
Movement speed (X, Y, Z)	0 – 25 mm/s					
Movement range (X, Y, Z)	320 x 330 x 370 mm		320 x 330 x 370 mm			
Lowest working point in mm	200 mm		565 mm			
Highest working point in mm	1500 mm		1780 mm			
Arm deflection in mm	1500		Approx. 1400 mm			
EXTERNAL DIMENSIONS						
W x D x H (basic part incl. chassis)	1200 x 1200 x 1100 mm		1200 x 1030 x 1150 mm			
Weight	With caterpillar track approx. 850 kg, without caterpillar track 550 kg		With caterpillar track approx. 910 kg, without caterpillar track approx. 610 kg			
EXTERNAL CONNECTIONS						
Electrical connection	3 x 400 V / 50-60 Hz / 3 x 16 A					
Extreme cooling		Prepared			Lens water cooling and sealing air integrated	
OPTIONS						
	Turn and tilt objective Micro welding function Rotary axis module with chuck, tiltable, for horizontal to vertical rotation TV system for demonstrating and observing the welding process Ergo wedge LAfet® programmable laser wire feed system rotary joint (standard is the ball joint)		Turn and tilt objective Rotary axis module with chuck, tiltable for horizontal to vertical rotation TV system for demonstrating and observing the welding process Ergo wedge LAfet® programmable laser wire feed system		Turn and tilt objective with water cooling Powder Nozzle and Powder Conveyor (for ALFlak 450 - 900 F)	



ALFlak stationary



ALFlak mobile



ALFlak fiber

The ALFlak flexible laser system for deposition and contour welding has you optimally equipped. Whether you want to make repairs and modifications or produce in series, you can effortlessly process sheet metal, aluminum, stainless steel and sectional steel.

OPEN SYSTEMS

WORK WITHOUT LIMITATIONS

An important criterion for optimal welding results is the stability of the movement system, because exact laser focusing is possible only with high stability. This is why our laser work benches are especially sturdy.

During welding, the workpieces can be precisely controlled on 3 axes with the AL-T 500. With the AL-T Basis, the laser head is moved over the workpiece. In addition, there is an optional rotating axis for circular welding. These open systems allow welding of the largest and smallest workpieces, without limitation.

We will be glad to advise you on laser safety and we offer a comprehensive range of safety accessories



ALFlak movement system
with AL 500



AL-T 500 with AL 500



AL-T Basis C with AL-F

AL SERIES

FLEXIBLE FITTINGS

AL series lasers are extremely flexible when it comes to power, laser source and equipment. The AL can therefore be individually configured and optimally adapted to changing requirements.

AL series devices work excellently with AL-T workbenches.

However, you can also integrate the AL into your existing machine assembly. Nd:YAG laser sources are available with 75 to 500 watts of power. Your advantage: The laser power actually gets to the workpiece.

These compact laser welding devices can even perform very fine welding tasks. The cooling system is integrated into the laser on all devices. However, the AL 500 requires additional external cooling.



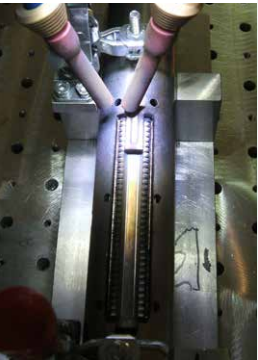
TECHNICAL DATA	AL 75	AL 120	AL 150	AL 200	AL 300	AL 500
LASER						
Laser type / wave length	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm
Average power	75 W	120 W	150 W	200 W	300 W	500 W
Peak pulse power	7 kW	9 kW	9 kW	9 kW	9 kW	15 kW
Pulse energy	60 J	75 J	75 J	90 J	90 J	100 J
Pulse duration	0.5 – 20 ms					
Pulse frequency	-50 Hz		-100 Hz			
Operating mode	Pulsed					
Welding spot Ø	0.2 – 2.0 mm With micro welding function (optional) < 100 µm					0.2-2 / 0.5-2.5 / 1.0-3 mm
Focusing objective	150 mm, further according to lens data sheet					
Pulse shaping	Adjustability of power curve within a laser pulse					
Display and operation	Display with membrane keyboard Laser parameters can also be set using a multifunctional footswitch, Interface for triggering WINLaserNC software through an external PC					
OBSERVATION LENS						
Leica microscope attachment with eyepieces for glasses wearers, 10x Optional 16x						
POWER SUPPLY UNIT						
W × D × H (basic component) in mm	820 x 400 x 910					1060 x 570 x 1000
Weight	120 kg					180 kg
LASER BEAM SOURCE						
With focusing unit (length x Ø)	900 x 120 mm			1100 x 120 mm		800 x 120 mm
Weight	approx. 18 kg			approx. 20 kg		approx. 25 kg
EXTERNAL CONNECTIONS						
Electrical connection	200-240 V / 50-60 Hz / 16 A		3 x 400 V / 50-60 Hz / 3 x 16 A			3 x 400 V / 50-60 Hz / 3 x 32 A
Extreme cooling					Prepared	Required
Turn and tilt objective						
Micro welding function (for AL 75-AL 300)						
Rotary axis module with chuck, tiltable, for horizontal to vertical rotation						
TV system for demonstrating and observing the welding process						
Ergo wedge						
LAfet® programmable laser wire feed system						
OPTIONS						

AL FIBER

ONE SYSTEM – 4 POSSIBLE LASER HEADS

The AL is now also available with a fiber laser. The fiber source is highly energy efficient. For reproducible welds, output monitoring keeps an eye on the welding process.

The AL-F's possibilities range from mobile welding with a laser pistol and video goggles to manual welding viewed through a microscope or fully automatic welding processes observed through a camera.



TECHNICAL DATA	AL 300 F	AL 450 F	AL 600 F	AL 900 F
LASER				
Laser type / wave length	Fiber laser, 1070 nm	Fiber laser, 1070 nm	Fiber laser, 1070 nm	Fiber laser, 1070 nm
Average power	300 W	450 W	600 W	900 W
CW power	300 W	450 W	600 W	900 W
Peak pulse power	3 kW	4.5 kW	6 kW	9 kW
Pulse energy	30 J	45 J	60 J	90 J
Pulse duration	0.2 ms – CW			
Pulse frequency	Single pulse – 100 Hz			
Beam parameter product at 50 µm	5 – 15 mm * mrad			
Operating modes	Pulsed / CW			
Welding spot Ø	0.1 – 3.0 mm		0.3 - 3.5 mm	
Focusing objective	150 mm, further according to lens data sheet			
Pulse shaping	Adjustability of power curve within a laser pulse			
Display and operation	Laser parameters set through touchscreen or multifunctional footswitch AL-T Basis C triggered through laser touchscreen			
OBSERVATION LENS	Leica microscope attachment with eyepieces for glasses wearers, 10x Optional 16x			
EXTERNAL DIMENSIONS				
Power supply unit W × D × H in mm	550 x 600 x 1200			
Weight	approx. 100 kg			
LASER BEAM SOURCE				
With focusing unit (length x Ø)	Because various lenses are possible upon request			
ELECTRICAL CONNECTIONS				
Electrical connection	200-240 V / 50-60 Hz / 16 A		3 x 400 V / 50-60 Hz / 3 x 16 A	
Extreme cooling			Lens water cooling integrated	
OPTIONS (DEPENDENT ON BASIC CONFIGURATION)				
	Turn and tilt objective			
	Rotary axis module with chuck, tiltable, for horizontal to vertical rotation			
	TV system for demonstrating and observing the welding process			
	Ergo wedge			
	LAfet® – programmable laser wire feed system			

AL-T

TABLES FOR AL SERIES LASERS

AL-T BASIS

The AL-T Basis is used when a wide range of different workpieces has to be processed flexibly, but programmed welding is not required. The resonator holder can be rotated 360°, and the resonator slid longitudinally.

AL-T 500

The AL-T 500 processing table is extremely stable and therefore outstanding for series production. Welding tasks can be performed by joystick, semi-automatically or automatically using WINLaserNC software.

AL-T BASIS C

The workbench for our series AL-F fiber laser. The bench is offered with or without a work plate, as preferred. The workbench is controlled and operated through the laser's operating elements. The welding process can be performed by joystick, semi-automatically or automatically.

TECHNICAL DATA	AL-T BASIS	AL-T BASIS C for fiber systems	AL-T 500
EXTERNAL DIMENSIONS			
W x D x H in mm	950 x 1250 x 850	950 x 1250 x 850	1200 x 1360 x 1260
Weight	230 kg	230 kg	550 kg
Mounting plate (W x D) in mm	800 x 740	800 x 740	600 x 475
workpiece weight	(Height above ground: 830 mm) max. 100 kg	(Height above ground: 830 mm) max. 100 kg	(Height above ground: min/max 710/1030 mm) max. 400 kg
WORK AREA			
Machine axes	X, Y, Z, rotating axis optional.		
Movement speed (X, Y, Z)	max. 25 mm/s	max. 25 mm/s	max. 25 mm/s
Movement range (X, Y, Z)	400 x 210 x 300 mm	400 x 210 x 300 mm	490 x 400 x 350 (Z extendable to 500)
EXTERNAL CONNECTIONS			
Electrical connection	200-240 V / 50-60 Hz / 16 A or 3 x 400 V / 50-60 Hz / 3 x 16 A (depending on the laser)	Electrical feed through the laser system	3 x 400 V / 50-60 Hz / 3 x 16 A or 3 x 400 V / 50-60 Hz / 3 x 32 A (depending on the laser)
extraction	External	External	Integrated (H14 filter) or external
OPERATION	By joystick, multifunctional footswitch	By joystick, multifunctional footswitch, or the laser system's touch screen	By joystick, multifunctional footswitch, WINLaserNC software
OPTIONS	Rotary axis module with chuck, tiltable, for horizontal to vertical rotation Magnetic workpiece holder for free positioning of workpieces Tilt joint for resonator - can be tilted 30° downward or 10° upward	Rotary axis module with chuck, tiltable, for horizontal to vertical rotation Magnetic workpiece holder for free positioning of workpieces Also supplied without sloping column and table plate	Rotary axis module with chuck, tiltable, for horizontal to vertical rotation Magnetic workpiece holder for free positioning of workpieces LAfet® - programmable laser wire feed system WINLaserNC software for automatic mode for producing serial parts Positioning accuracy +/- 0.05 mm Repeat accuracy +/- 0.01 mm



AL-T Basis



AL-T Basis C



AL-T 500

AL-TW

THE WORK BENCH WITH AN INTEGRATED FIBER LASER

The AL-TW laser system can be equipped with 300, 450, 600 or 900 W laser sources. The laser source is integrated into the work bench. With the modular device concept, you can also use a wide range of objectives and focal distances, optimally adapted to your special welding jobs.

The open AL-TW system allows welding of the largest and smallest workpieces, without limitation.

Whether deposition welding, repairs, series production, medical technology components or sensors, we offer you the right laser performance and plenty of accessories. If your needs change later, you can upgrade the 300- and 450-watt models to double the performance.

The laser and movement system are easily operated from a side console with an intuitive touch screen. You can choose to weld manually with the quick-reacting joystick, semi-automatically or automatically with WINLaserNC software.

NEW: Now also available with the option powder deposit welding (cladding) for AL-TW 450/600/900 F.

TECHNICAL DATA	AL-TW 300 F	AL-TW 450 F	AL-TW 600 F	AL-TW 900 F
LASER				
Laser type / wave length	Fiber laser, 1070 nm	Fiber laser, 1070 nm	Fiber laser, 1070 nm	Fiber laser, 1070 nm
Average power	300 W	450 W	600 W	900 W
CW power	300 W	450 W	600 W	900 W
Peak pulse power	3 kW	4.5 kW	6 kW	9 kW
Pulse energy	30 J	45 J	60 J	90 J
Pulse duration	0.2 ms – CW			
Pulse frequency	Single pulse - 100 Hz			
Beam parameter product at 50 µm fiber	5 – 15 mm * mrad			
Operating modes	Pulsed / CW			
Welding spot Ø	0.1 – 3.0 mm		0.3 - 3.5 mm	
Focusing objective	150 mm, further according to lens data sheet			
Pulse shaping	Adjustability of power curve within a laser pulse			
Display and operation	Touchscreen. Laser parameters can also be set using a multifunctional footswitch, WINLaserNC software can be operated through a touchscreen			
OBSERVATION LENS	Leica microscope attachment with eyepieces for glasses wearers, 10x, Optional 16x			
WORK AREA				
Machine axes	X, Y, Z rotating axis optional. Workpiece movement motorized with joystick			
Movement speed (X, Y, Z)	0.05 – 25 mm/s			
Movement range (X, Y, Z)	490 x 400 x 350 mm			
EXTERNAL DIMENSIONS				
WxDxH (basic component) in mm	1200 x 1360 x 1260 mm			
Weight	670 kg + console with 100 kg			
EXTERNAL CONNECTIONS				
Electrical connection	3 x 400 V / 50-60 Hz / 3 x 16 A			
Extreme cooling	Lens water cooling and sealing air optional		Lens water cooling and sealing air integrated	
Smoke exhaustion	Connectible externally			
Turn and tilt objective				
Rotary axis module with chuck, tiltable, for horizontal to vertical rotation				
TV system for demonstrating and observing the welding process				
Ergo wedge				
LAfet® - programmable laser wire feed system				
Powder Nozzle and Powder Conveyor (for AL-TW 450 - 900 F)				
OPTIONS				



CLOSED SYSTEMS

LASER WELDING DEVICES FOR ANY WORK ENVIRONMENT

OPTIMAL PROTECTION

Thanks to their closed, laser-proof working chambers, the ALW, ALV, ALS and VL systems are workstations with all-around laser protection. Without any further safety precautions, they can be used in any imaginable production environment.

We have placed great value on ergonomics. All of our systems are comfortable seated workplace to support low-fatigue, high-concentration work.

With our lasers, the indicated laser power actually gets to the workpiece



ALV 100



ALW 100/150



ALW 200/300



ALW 300 open

ALW

ERGONOMIC SEATED WORKPLACE

ALW 200/300

The movement system's stability is an important criterion for optimal welding results. Only this can ensure exact focusing. The ALW's stable steel construction ensures a highly precise movement mechanism, so that the ALW 200/300 is ideal for automatic applications.

During welding, the workpieces up to 350/400 kg can be moved precisely on 3 axes (X, Y and Z). In addition, there is an optional rotating axis for circular welding.

Even demanding materials like aluminum, precious metals, titanium or sensitive alloys can be processed easily with the powerful ALW 200/300.

The system fulfills performance level d.

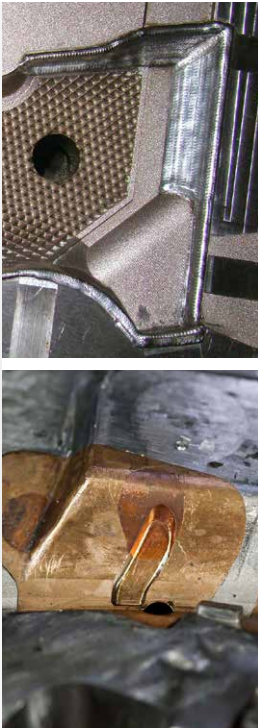
ALW 100/150

With 100 or 150 watts, this ALW is mainly used when the primary tasks include repairs and deposition welding in tool and mold manufacturing, but programmed welding is not required.



ALW 100 open

ALW 200



TECHNICAL DATA	ALW 100	ALW 150	ALW 200	ALW 300
LASER				
Laser type / wave length	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm
Average power	100 W	150 W	200 W	300 W
Peak pulse power	9 kW	10 kW	9 kW	9 kW
Pulse energy	75 J	100 J	90 J	90 J
Pulse duration	0.5 – 20 ms			
Pulse frequency	Single pulse - 15 Hz	Single pulse - 20 Hz	Single pulse - 100 Hz	Single pulse - 100 Hz
Operating mode	Pulsed			
Welding spot Ø	0.2 – 2.0 mm With micro welding function (optional) < 100 µm			
Focusing objective	150 mm, further according to lens data sheet			
Pulse shaping	Adjustability of power curve within a laser pulse			
Display and operation	Display with membrane keyboard Laser parameters can also be set using a multifunctional footswitch		Additionally through WINLaserNC software	
OBSERVATION LENS				
	Leica trinocular microscope attachment with eyepieces for use with eyeglasses, 10x, Optional 16x		Leica Ergotabus with eyepieces for use with eyeglasses	
WORKING CHAMBER				
WxDxH in mm	800 x 850 x 550	800 x 850 x 550	1080 x 850 x 450	1080 x 850 x 450
Mounting plate (WxD) in mm	600 x 600	600 x 600	600 x 475	600 x 475
workpiece weight	350 kg max., central	350 kg max., central	400 kg max., central	400 kg max., central
Workpiece movement	Motorized through joystick	Motorized through joystick	Motorized through joystick	Motorized through joystick
Movement range (X, Y, Z)	180 mm x 180 mm x 380 mm	180 mm x 180 mm x 380 mm	490 mm x 400 mm x 350 mm	490 mm x 400 mm x 350 mm
EXTERNAL DIMENSIONS				
WxDxH in mm	920 x 1220 x 1570	920 x 1220 x 1570	1190 x 1400 x 1500	1190 x 1400 x 1500
Weight	500 kg	500 kg	870 kg	870 kg
ELECTRICAL CONNECTION				
Electrical connection	3 x 400 V / 50-60 Hz / 3 x 16 A	3 x 400 V / 50-60 Hz / 3 x 16 A	3 x 400 V / 50-60 Hz / 3 x 16 A	3 x 400 V / 50-60 Hz / 3 x 16 A
Extreme cooling			Optional	Optional
Extraction	Integrated	Integrated	Integrated	Integrated
OPTIONS				
	Coaxial illumination Rotary axis module Micro welding function Ergo wedge TV system for demonstrating and observing the welding process		Turn and tilt objective Rotary axis module Micro welding function Ergo wedge TV system for demonstrating and observing the welding process	



ALV

The compact ALV laser welding device with laser-proof working chamber is available with various laser outputs, sources and controls. The ALV is used in micro and deposition welding in tool and mold manufacturing, in sensor production and medical technology. The laser welding device offers a large vertical movement range and doors that open wide, so that even larger workpieces can be processed. In just a few steps, this closed system can be converted to function as an open laser system for processing larger or longer components.

ALV

IT'S YOUR CHOICE

The ALV has three linear movement axes, and the vertical Z axis lifts up to 50 kg. A rotary axis for processing cylindrical parts is also available. The optional WINLaserNC software additionally allows automatic welding. The system is operated through an intuitive touchscreen.

The ALV is available with a wide range of Nd:YAG or fiber laser sources. This provides laser power of 100 to 450 watts.



ALV open

TECHNICAL DATA	ALV 100	ALV 100 WINLaserNC	ALV 150	ALV 150 WINLaserNC	ALV 150 F	ALV 300 F
LASER						
Laser type / wave length	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Fiber laser, 1070 nm	Fiber laser, 1070 nm
Average power	100 W	100 W	150 W	150 W	150 W	300 W
CW power					150 W	300 W
Peak pulse power	9 kW	9 kW	9 kW	9 kW	1.5 kW	3 kW
Pulse energy	75 J	75 J	75 J	75 J	15 J	30 J
Pulse duration	0.5 – 20 ms				0.2 – 50 ms or CW	
Pulse frequency	Single pulse - 50 Hz		Single pulse - 100 Hz		Single pulse - 100 Hz	
Operating modes	Pulsed				Pulsed / CW	
Welding spot Ø	0.2 – 2.0 mm With micro welding function (optional) < 100 µm				0.2 – 2.0 mm	
Focusing objective	150 mm, further according to lens data sheet					
Pulse shaping	Adjustability of power curve within a laser pulse (6 pulse types)					
Display and operation	Touchscreen. Laser parameters can also be set using a multifunctional footswitch (optional)					
OBSERVATION LENS	Leica microscope attachment with eyepieces for glasses wearers, 10x; Optional 16x					
WORKING CHAMBER						
WxDxH in mm	580 x 420 x 490					
Mounting plate (WxD) in mm	360 x 355					
workpiece weight	max. 50 kg, central load					
Workpiece movement	Motorized through joystick					
Movement range (X, Y, Z)	100 x 85 x 250 mm					
Movement speed	0 – 25 mm/s					
Extraction	Integrated					
EXTERNAL DIMENSIONS						
WxDxH in mm	650 x 1090 x 1400					
Weight	approx. 260 kg					
EXTERNAL CONNECTIONS						
Electrical connection	200-240 V / 50-60 Hz / 16 A		3 X 400 V / 50-60 Hz / 3 X 16 A		200-240 V / 50-60 Hz / 16 A	
	Rotary axis module with chuck, tiltable, for horizontal to vertical rotation				Rotary axis module with chuck, tiltable, for horizontal to vertical rotation	
	Micro welding function				TV system for demonstrating and observing the welding process	
	TV system for demonstrating and observing the welding process				Ergo wedge	
	Ergo wedge				Multifunctional footswitch	
	Multifunctional footswitch				turn and tilt objective	
OPTIONS						

VL 50 | ALS 100

MANUAL WELDING LASER

These compact laser welding devices are suitable for demanding manual work and for tasks in small-series industrial production. Ideal for gold and silver, but also for ordinary steels.

The VL 50 bench laser welding device and the ALS 100 upright device offer 50 or 100 watts for high-performance beam behavior. They stand out for their consistent, powerful yet smooth welding behavior. The spacious working chamber offers a very well-lighted work area. The ALS 100 is loaded through two side doors, and the VL 50 through the front flap.

Even the finest joints can be created with the optional micro welding option, and monitored through the stereo microscope.

Thanks to the ergonomically designed housing, the well arranged operating elements, keyboard, display and joystick, this manual welding laser lets you concentrate on your work – even for hours.



VL 50

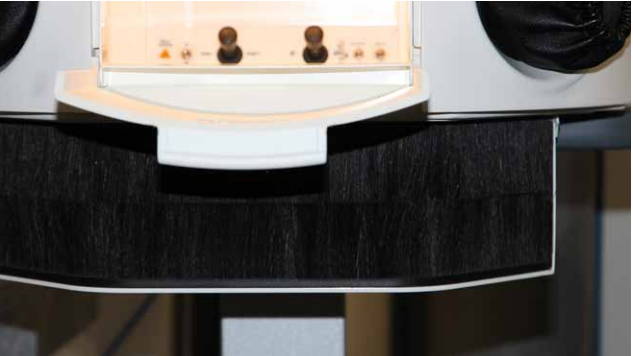
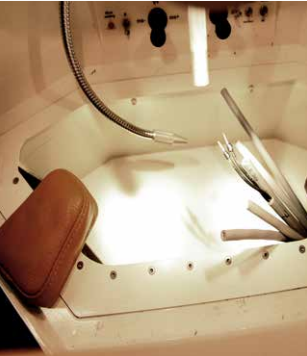


ALS 100

TECHNICAL DATA	VL 50	ALS 100	ALS 100 S
LASER			
Laser type / wave length	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm	Nd:YAG, 1064 nm
Average power	60 W	100 W	100 W
Peak pulse power	7.5 kW	8 kW	10 kW
Pulse energy	50 J	60 J	95 J
Pulse duration	0.5 – 20 ms		
Pulse frequency	Single pulse - 25 Hz		
Operating mode	pulsed		
Welding spot Ø	0.2 – 2.0 mm, continuously adjustable		
Focusing objective	120 mm		
Pulse shaping	3 preset pulse shapes		
Display and operation	Display with membrane keyboard Touchscreen optional (VL 50)		
OBSERVATION LENS			
	SMK (Leica binocular microscope attachment optional)	Leica microscope attachment with eyepieces for glasses wearers, 10x Optional 16x	
WORKING CHAMBER			
WxDxH in mm	475 x 232 x 192	488 x 308 x 209	488 x 308 x 209
Max. workpiece height in mm	88 (200 with recessed working chamber)	105 (165 with recessed working chamber)	105 (165 with recessed working chamber)
Extraction	integrated (H14)	integrated (H14)	integrated (H14)
EXTERNAL DIMENSIONS			
WxDxH in mm	510 x 645 x 430 mm	570 x 800 x 1260 mm	570 x 800 x 1260 mm
Weight	50 kg	100 kg	100 kg
EXTERNAL CONNECTIONS			
Electrical connection	200 - 240 V / 50-60 Hz / 10 A	200 - 240 V / 50-60 Hz / 16 A	200 - 240 V / 50-60 Hz / 16 A
OPTIONS			
	Micro welding function TV system for demonstrating and observing the welding process Ergo wedge Halogen dimmer LED ring light	50 Hz technology	50 Hz technology



ALS 100 open



VL 50 | ALS 100

SPECIAL SOLUTIONS

For processing larger workpieces, the ALS 100 can be ordered as an open variant that allows welding without doors or a working chamber bottom. In this case, additional laser safety measures are needed. An electrically adjustable lifting table with manual X and Y axes is available as an option.

The VL 50 and ALS 100 are also available with bristle grips. Sensor manufacturing especially involves processing of tubes and cables. They can be fed laser-proof through the bristles into the working chamber and welded there. Special lenses allow micro welding even in the tiniest tubes.

LASER HARDENING

AL-ROCK

MOBILE LASER HARDENING SYSTEM

The AL-ROCK is the first mobile robot for targeted hardening of metal surfaces – whether at the customer's site or at changing locations in the hall. With the self-driving caterpillar track, you can move the laser right to the workpiece. There is no need to remove the components to be hardened, and reworking cost is significantly reduced. All that is needed is the laser beam's free access to the processing location.

The laser beam precisely follows the workpiece contour in free 3D movements. This allows weld edges, grain structures, nubs or individual points to be hardened easily.

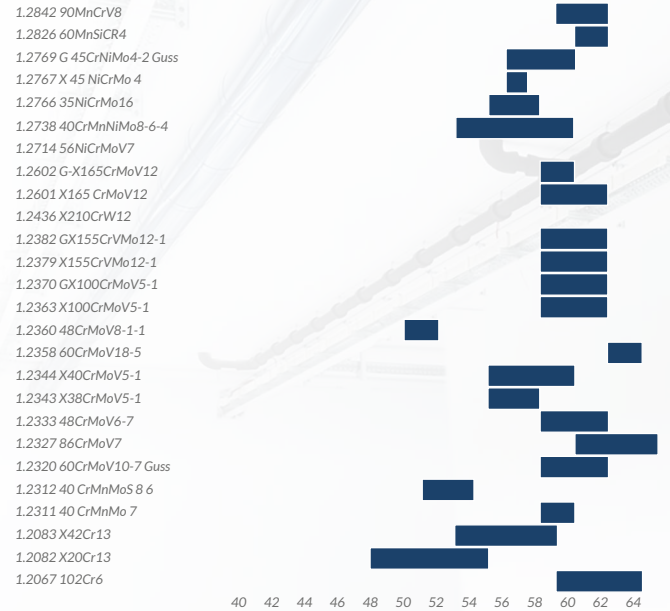
Temperature-dependent control of the laser power brings the heat precisely to the desired location to achieve the maximum hardness needed there.

The component's surrounding areas receive little or no heat load.

For quality control, the hardening process is documented, ensuring process reliability and reproducibility.

With the AL-ROCK, you can also perform laser deposition welding with powder or wire (with add-on modules).

ACHIEVABLE HARDNESS – IN HRC, E.G. TOOL STEEL



TECHNICAL DATA

AL-ROCK

LASER	
Laser type / wave length	Diode laser, 900 – 1070 nm
Pilot laser	Red 630 – 680 nm (≤ 5 mW) green 532 nm (5mW)
Power	3,000 W (CW)
Focal distance	f = 250 mm
Shielding gas feed	Included
Laser cooling system	External water-air cooling system
Display and operation	Display 1 on mobile component Display 2 at the station with 8 mm cable for free position selection
WORK AREA	
Movement speed (X, Y, Z)	Focal spot 0 – 10 mm/s over component surface
Movement range (X, Y, Z)	3000 x 1000 x 1900 mm as spherical half space
Lowest working point	0 mm
Highest working point	1900 mm
Radius of 3D work area	approx. 2 m (from the booth)
HARDENING	
Gauges	Variable, from 5–30 mm (depending upon the material)
Case hardening depth (CHD)	max. 2 mm (depending upon the material)
Control	Camera-guided continuous laser output control LompocPro with E-MAqS camera
Repeat accuracy	+/- 0.08 mm max.
Smallest programmable path dimension	0.01 mm
EXTERNAL DIMENSIONS	
Mobile component WxDxH in mm	1200 x 1500 x 1800
Weight	approx. 1,400 kg
Station, incl. cooling system WxDxH in mm	1100 x 1900 x 1800
Weight	approx. 700 kg
EXTERNAL CONNECTIONS	
Electrical connection	32A 400V 3P+PE 6h 50Hz
OPTIONS	
	Mobile laser protection walls rotation/tilt axis Mirror system and beam splitter smoke extraction Mobile workbench DCAM external programming system



AL-ROCK

LASER HARDENING
LASER CLADDING
LASER DEPOSITION WELDING WITH WIRE

AC 300 F | AC 450 F

LASER CUTTING

From basic geometric forms to complex, ornate jewelry items made of precious metal, with the flexible cutting system AC 300 F you can cut sheets up to 3 mm in thickness automatically, quickly and accurately.

The CAD-generated cutting paths are converted within minutes and can be cut directly – ideal also for prototypes and small series.

With a small footprint of 1.340 × 1.180 mm, the compact system offers a spacious work area of 500 × 500 mm, where plates of arbitrary lengths and widths of up to 500 mm can be processed.

The fully automatic cutting process takes place in the closed, laser-proof working chamber and can be observed through a large protection window. The system is operated via the intuitive touch screen.

The nesting function shines especially in mass production. This function provides optimized use of materials, preventing unnecessary waste of material. Precious metal residues are collected and can be reused later.

Depending on your needs, fiber laser sources with 300 W or 450 W of laser power are available.

AC 300 F

TECHNICAL DATA	AC 300 F	AC 450 F
LASER		
Lasertype / Wavelength	Fiber laser, 1070 nm (invisible, near-IR)	
Pilot laser	630 - 680 nm (≤ 1 mW)	
Laser protection class	1	
Average power	300 W	450 W
Peak pulse power	CW - 3 kW	CW - 4,5 kW
Pulsenergie	30 J	45 J
Pulse duration	0,2 ms - CW	
Laser cooling	Pressure cooling	
CUTTING		
Focal spot Ø / Cutting width	min. 60 µm	
Focal distance	f=86 mm	
Work area	500 x 500 mm	
Maximum sheet size (B x T x H)	500 x arbitrary ² x 3 mm	
Cutting speed	max. 3 m/min	
MOVEMENT SYSTEM		
Precision: ³	(at 1 m measurement length)	
Smallest programmable increment	0,001 mm	
Positional deviation (P ₂)	0,05 mm max.	
Average positioning scatter (P ₁)	0,03 mm max.	
EXTERNAL DIMENSIONS		
W x D x H in mm	1343 x 1180 x 1341 (or 1960) mm	
Footprint	1343 x 1180 mm	
Weight	Approx. 913 kg	
ELECTRICAL CONNECTION		
3-phase	3 x 400 V, 50 - 60 Hz, 3 x 10 A, 3 kW + Neutral conductor and grounding conductor	
MISCELLANEOUS		
Cutting gas supply	Included	
Smoke exhaust	Can be connected	
Software CAD/CAM-Module	PEPS by Camtec / cncCUT by IBE	
OPTIONS		
	Rotary axis insert	

¹ CW = continuous wave
² A lead-through on the rear side of the system enable processing of sheets of any length
³ According to VDI / DGQ 3441 - Depending on material, pretreatment, material thickness and sheet size.



SENSOR-WORKSTATION AL-SWS

ONE LASER SYSTEM – SEVERAL APPLICATIONS

With the AL-SWS multifunctional laser system, you can effortlessly weld and cut work pieces with a diameter of up to 12 mm; for example, sensors, sheathed or unsheathed cables, sheathed or unsheathed thermocouples or resistance thermometers. The system AL-SWS can be equipped with the laser sources AL 50, AL 100 and AL 200.

The variable inserts for the special tasks of sensor manufacturing can be replaced very easily. This allows you to quickly switch between the different welding and cutting applications.



Detailed information about the inserts you will find on the next two pages

TECHNICAL DATA	
EXTERNAL DIMENSIONS	
Workbench (LxWxH)	132 cm x 50 cm x 127 cm
Required space (LxWxH)	132cm x 150 cm x 150 cm
Weight	Approx. 320 kg
ELECTRICAL CONNECTIONS	
3-phase	3 X 400 V, 50-60 HZ, 3 X 16 A N/PE
LASER	
Laser crystal	Nd:YAG, flash lamp-pumped
Wave length	1064 nm (invisible, near infrared)
Laser protection class	4 (1 in case of insert with a working chamber)
Average power	50 W - 200 W
Pulse Energy	50 - 90 Joule
Peak pulse power	5 - 9 kW
Pulse duration	0,5 ms - 20 ms
Pulse frequency	Single pulse -50 Hz or -100 Hz
WELDING / CUTTING	
Focal spot Ø	0,2 - 2,0 mm - With Micro Welding : 50 µm - 2,0 mm
Observation objective	Stereo Microscope attachment
Focal distance	Eyeiece 10x, 16x, 25x / Visual field Ø 3-16mm
Shielding Gas input	Included
MOVEMENT SYSTEM	
Machine axes	4 (2x software-controlled, 2x manual)
Range of movement	Y: approx. 40 mm, Z: approx. 120 mm

CHANGEABLE INSERTS

THE MULTIFUNCTIONAL LASER WORKSTATION



INSERT A - CONTACT WELDING

During the welding process, the two parts to be welded are held manually under the laser beam, for example, for welding (sheathed) cables or thermocouples.

The insert consists of:

- Recess for feeding through longer work pieces from below, e.g. cables with insulated sheath
- Exhaustion tube
- Two grips for quickly changing the insert



INSERT B - CIRCULAR WELDING

The integrated rotary axis rotates the work pieces during the welding: for example, for welding the sheath of resistance thermometers, sensors, or thermocouples.

The insert consists of:

- Rotary axis, pivotable and slidable, with three-jaw chuck \varnothing 63 mm, opening for work piece: up to \varnothing 8 mm
- Quick positioning / fine adjustment
- Buttons for starting/stopping the welding process
- Pneumatic collet chuck, exhaustion tube
- Recess for feeding through longer work pieces from below, e.g. cables with insulated sheath
- Niches for stowing smaller tools
- Two grips for quickly changing the insert

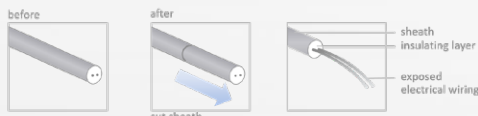


INSERT C - MICRO WELDING

With this insert you can weld even inside the finest thermocouples.

The insert consists of:

- A micromanipulator for precise positioning
- Exhaustion tube
- Two grips for quickly changing the insert

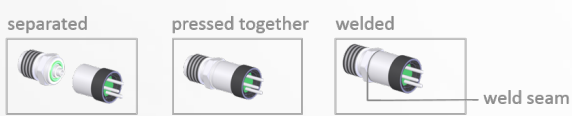


INSERT D - CUTTING

This insert is used to cut rotationnaly symmetrical work pieces. The work piece is rotated and cut down to a specified depth around its entire circumference. For example, you can use this insert to cut the covers of resistance thermometers. This insert is also ideal for removing the sheath of sheathed cables:

The insert consists of:

- Closed working chamber with collet chuck, rotating axis and exhaustion tube
- Reference mark (optional) for processing multiple work pieces of the same length (up to 2 m length)
- Buttons for opening and closing the collet chuck and reference mark
- Laser cutting head
- Two grips for quickly changing the insert



INSERT E - SHEATH WELDING UNDER MECHANICAL PRESSURE

Use this insert to weld two parts of a sensor housing together. Both parts are mechanically pressed against each other, to press the internal sealing rings:

The insert consists of:

- Closed working chamber
- Collet chuck, tailstock
- Exhaustion tube



INSERT F - CIRCULAR WELDING WITH HORIZONTAL GUIDE

This insert is designed specifically for end and face weldings on long work pieces.

The insert consists of:

- Same components as insert A, but with three-jaw chuck \varnothing 100 mm, opening for work piece: up to \varnothing 15 mm
- Slidable horizontal guiding rails
- Turn and tilt objective (optional)

OPTIONS

MICRO WELDING FUNCTION

The optional micro welding function delivers welding point diameters of less than 0.1 mm for high-precision micro welds.

WINLaserNC SOFTWARE

Our patented semi-automatic User Coordinate Controller offers unique ease of use, making 3D motion sequences easy. However the areas to be joined are positioned in space, the movement system allows fast, easy setup, so that you can concentrate on the welding task.

LAfet®-SM PROGRAMMABLE LASER WIRE FEED SYSTEM

Process safety, the highest reproducibility of laser welding, and optimal welding time, are impressive properties that show the advantages of the LAfet®. Welding wire diameters of 0.3 to 0.5 mm are fed with the utmost precision by the LAfet®.

LAfet®-SM Manual LASER WIRE FEED SYSTEM

Manually guided, easy-to-use wire feed through a grip. As soon as the tip of the laser wire touches the workpiece, the wire feed starts continuously and with the highest precision. If contact is interrupted, the feed stops immediately. For wire thickness of 0.3 mm to 0.6 mm.

TURN AND TILT OBJECTIVE

Our turn and tilt objective significantly eases work in difficult workpiece positions. In the objective's full 360° rotational range, the beam can be directed continuously up to 40° from vertical. This gets you to hard-to-reach locations while maintaining an ergonomically correct work posture.

LASER SAFETY

SAFETY IS ONE OF OUR TOP PRIORITIES

Our laser systems offer you not only optimal results for your welding, cutting and hardening tasks, but also ensure safe work. As the manufacturer of the world's first laser system with TÜV certification for meeting the high safety requirements for Performance Level d, we offer a wide range of safety accessories, ideally suited to our devices.



TÜV SAFETY

ALPHA LASER is the world's first manufacturer of laser systems with TÜV certification for safety level 'Performance Level d'. The TÜV seal confirms the laser system's functional safety according to European standard DIN EN ISO 13849. This means that the laser system remains safe even during a technical malfunction.

OUR SERVICES

GREAT SERVICE FROM THE GET-GO

APPLICATIONS TECHNOLOGY

Whether for welding samples, analyzing processes or determining welding suitability or parameters:

ALPHA LASER applications technicians back you in all your welding tasks.

We concentrate on your application and determine the process and necessary laser parameters with you. For this, we can draw on a broad product array and a wide range of laser performance classes. Our new show room has plenty of space and a calm atmosphere for working out solutions together.

TRAINING

Our trainers come from the field and know how to orient beginners quickly in laser welding. However, they are also competent advisors for experienced welders. Training is held on your device and adapted to your needs.

We offer you training in operation, maintenance, software and applications.

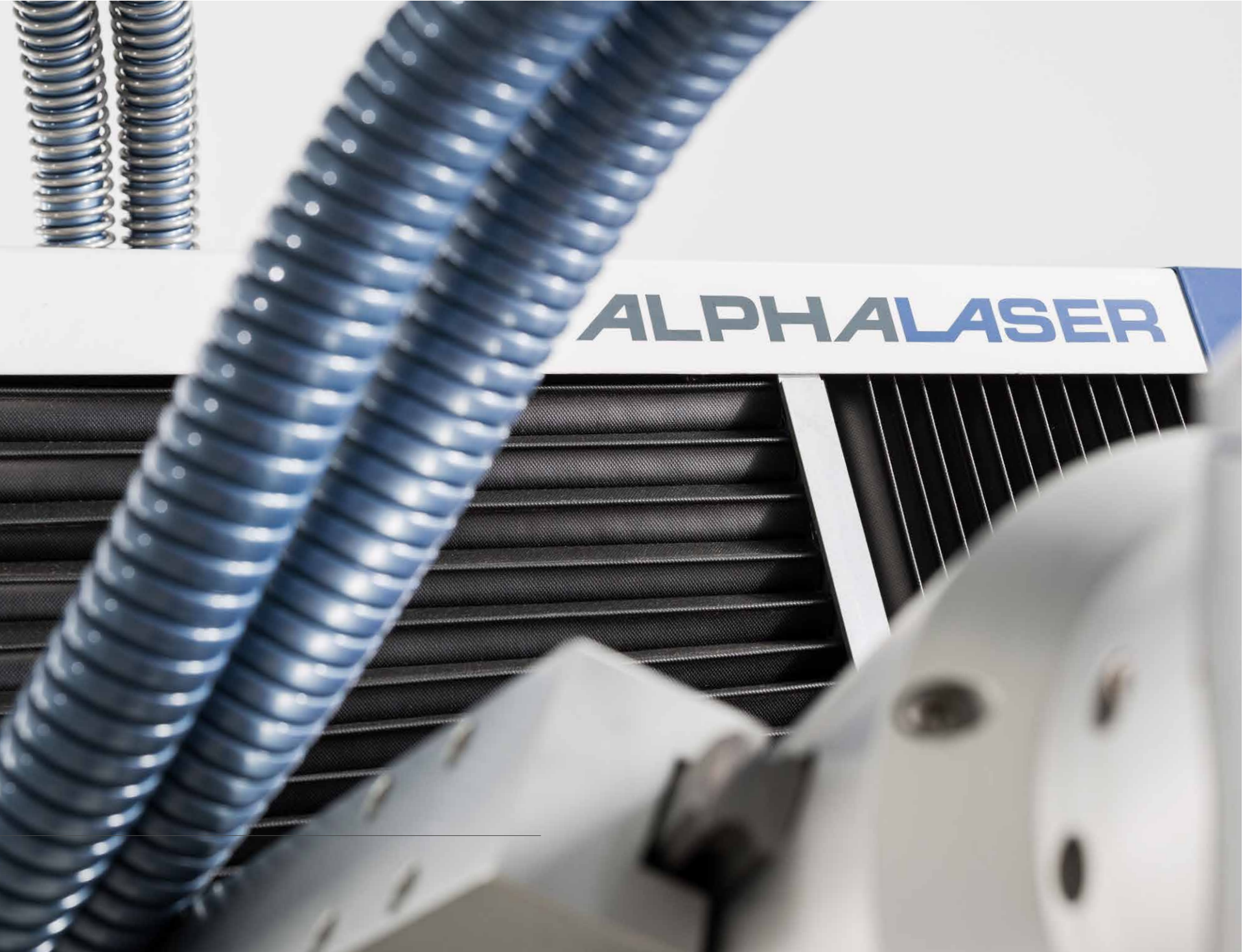
COMMISSIONING

Trained employees set up your machine and show you how to use it.

REPLACEMENT PARTS

Reinforced by qualified partners worldwide, our service team is there for you with assistance and advice. Competent advice on replacement parts and fast, reliable delivery ensure that you can keep your work going. We guarantee that your ALPHA LASER system's replacement parts will stay available for many years.

*Did you know that our first lasers are still operating -
and that replacement parts are still available for them?*



ALPHA LASER IMPRESSIONS



All photographs were taken in our new corporate building.
The hall in which the laser systems were photographed is our production facility.
Today, the hall is equipped and divided into different sections.

LOCATIONS

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worldwide sales and service network*



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