



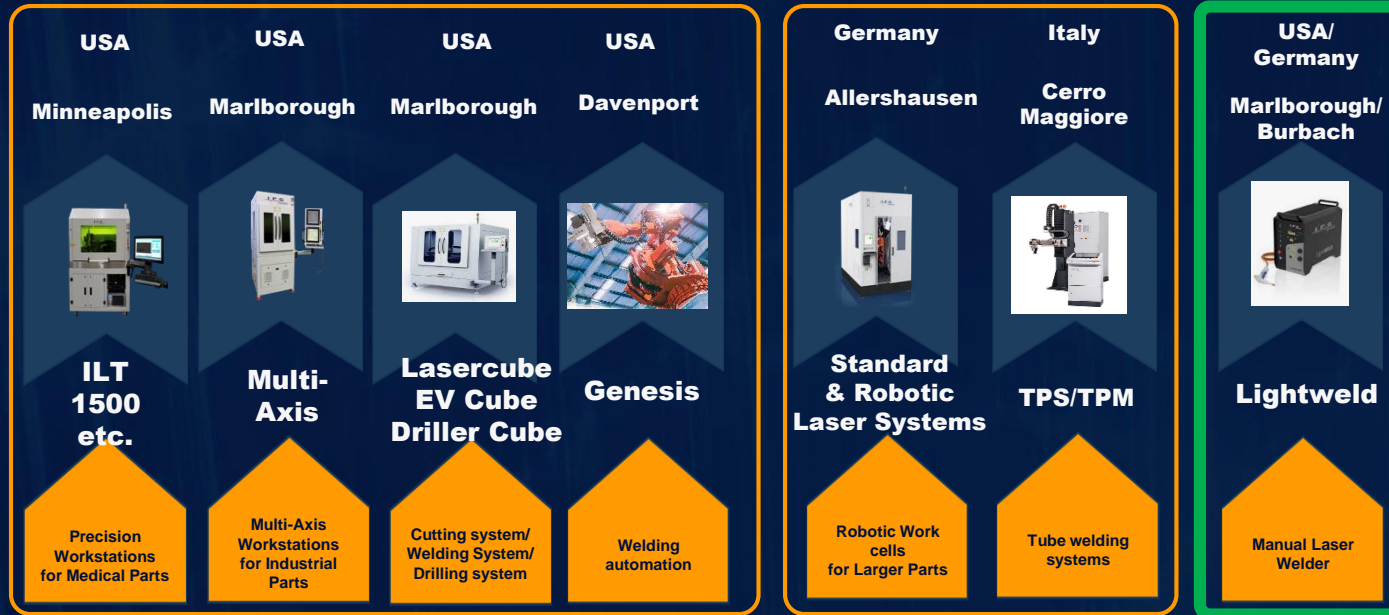
Hand-held Laser welding with LightWELD 1500&XC®

Marketing & Sales Systems



MS-S

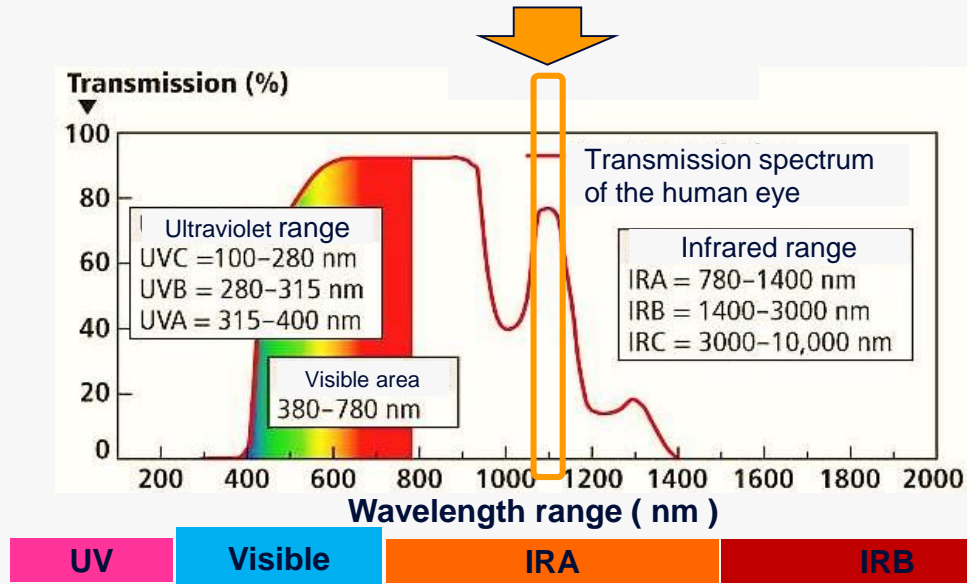
Marketing & Sales - Systems product lines



Laser safety of Hand-held Laser system



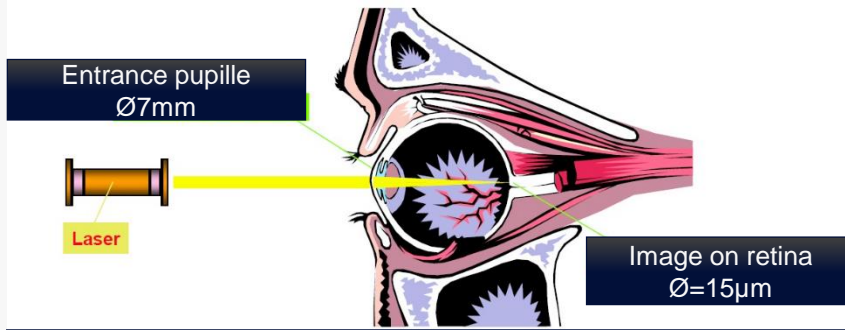
Laser safety



Light radiation 700 to 1400 nm is dangerous for the human eye!

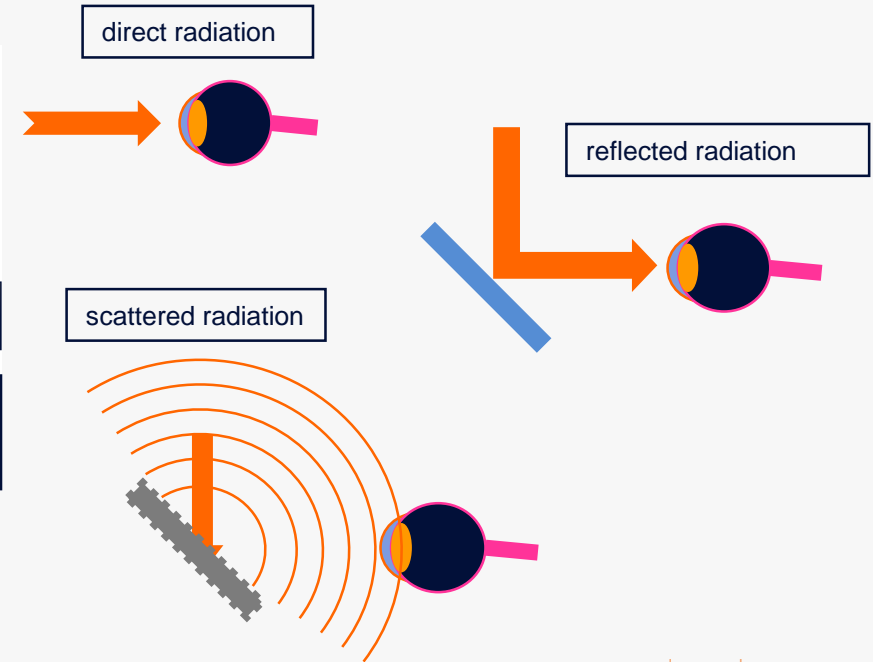
Potential risk of Laser radiation

- Risk for human eye

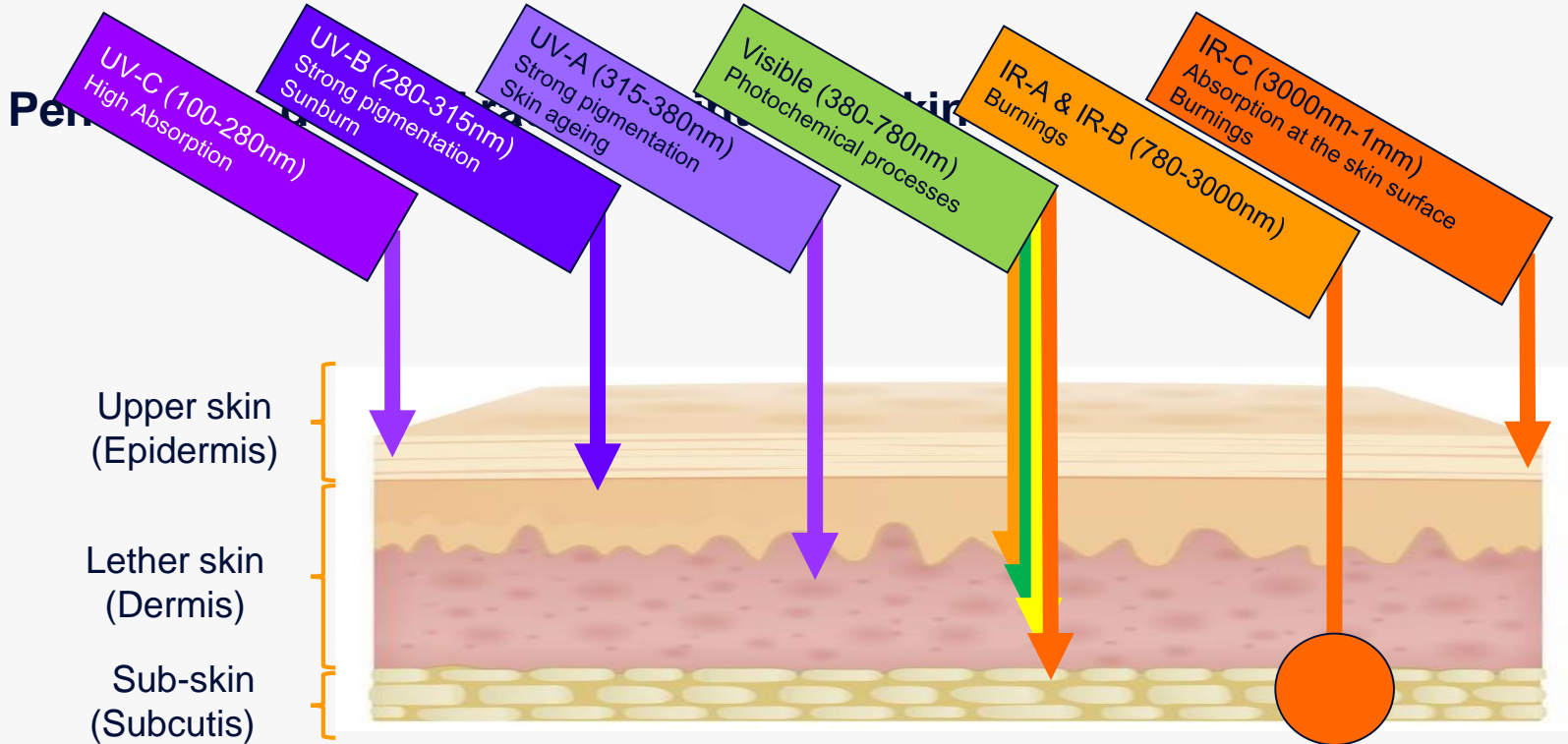


Example: Energy density of 1mW/cm² (50% of the limit of a class 2 laser) at the entrance pupil is compressed to 200W/cm² on the retina!

- Possibilities of damage



Personal protective equipment



Personal protective equipment

Laser
specific



suitable laser
safety glasses.
m in D LB3 | LB4

+



IPG LightWELD helmet

Normal
welding
PPE

Heat-resistant and flame-
retardant work clothing for
welding work.



Respirators



Security monitoring



In front:
Emergency stop
button and key
switch

2 channel
door security
release



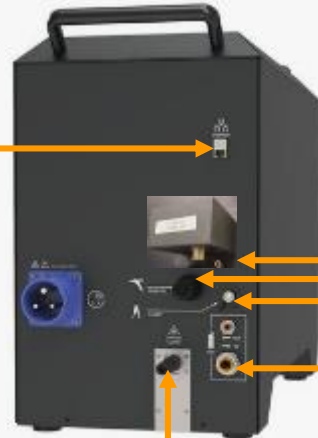
Closed when
in contact
with
component

Plasma and temperature sensor



Component
clamp

Factory systems
are locked and
must be unlocked

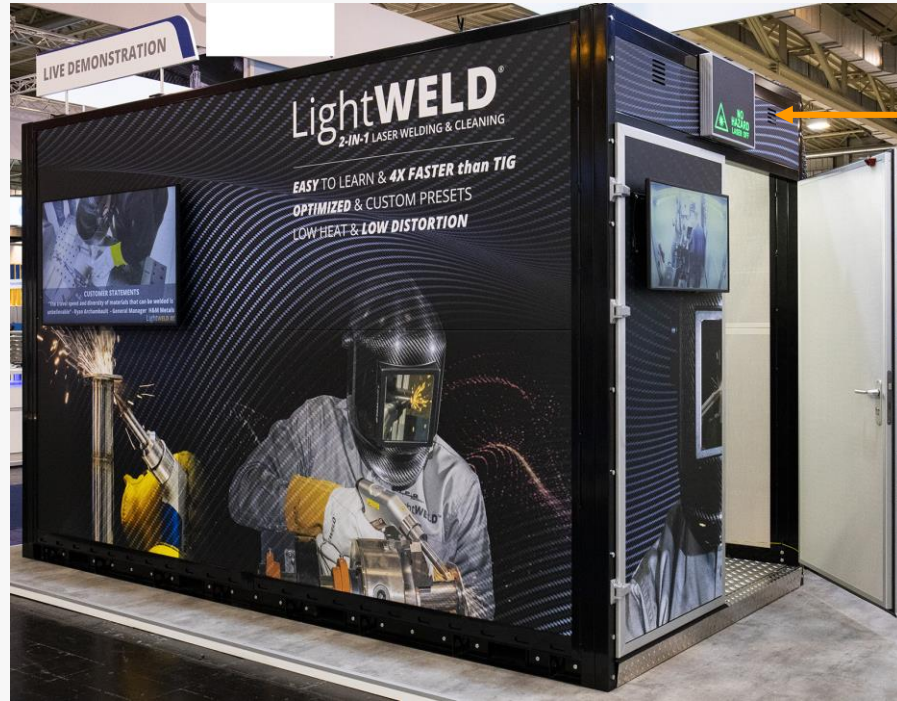


Fiber breakage
monitoring



Security monitoring

2 channel door security release



Emission „on“ sign controlled by Lightweld interface signal

LightWELD device and application



Product variances

LightWELD 1500



- ❑ 1500 W High-brightness beam for thick, thin and reflective metal welding
- ❑ Welding head and 4 nozzles for different joint types
- ❑ CW, Pulsed and Wobble Operating Modes
- ❑ Pre-set welding modes for fast parameter setting
- ❑ Air Cooled – Compact, Single Unit

LightWELD 1500 XC

All the functionality of the LightWELD 1500, **PLUS**



- ❑ High frequency pulsed laser mode 2500 W pk power
- ❑ Wide (15 mm) scan field for high-speed coverage
- ❑ Weld head nozzle cleaning attachment with 3 tips
- ❑ Pre-set cleaning mode software

LightWELD structure and components

Front

LED status display

Display of the most important status signals.

Emergency stop button

Switches off the entire power supply to the laser power supply.

Key switch

Switches off the power supply to the control unit.

IP54 cabinet



Laser power display

The current set laser power is displayed here in watts. (150-1500W CW)
Turn the knob → adjust the power.

Program display

The currently set program is displayed here.
Press and hold a button → change the program mode. Press briefly □ change the program number.
Hold down both buttons for 3 seconds → save program changes. Hold down both buttons for 10 seconds → undo changes.

Wobble frequency display

The current wobble frequency is displayed here. (0-300Hz)
Turn the knob → adjust the frequency.

Wobble length display

The current wobble width is displayed here. (0-5mm)
Turn the knob to adjust the wobble width (0.1mm increments).

LightWELD is simply to apply



Part preparation (up to 4 mm one-sided)

- Parts gap-free position

System setup

- Predefined Material/Thickness Process Modes
- Immediately ready for use

Welding process

- Pull your head along the seam in a smooth motion

Save

- Create a new saved mode for quick recall

LightWELD application area

	Traditional Welding Methods	LightWELD Laser Welding
Speed	Average	Up to 4X Faster than TIG
Quality	Depends on user experience	Consistent high-quality results
Learning Curve	Steep	Quick and easy
Material Flexibility	Limited with consumables changes	Wide range with no set up
Distortion & Deformation	High	Very low
Heat Affected Zone	Large	Small
Wobble Welding	NO	Yes- up to 5 mm additional weld width

beneficial for thin-to-thick joints



TIG welding:

- High heat input – part distortion
- Extensive finishing required
- Difficult on thin metals
- Limited on dissimilar thickness

MIG welding:

- Consumable wire
- Cleaning & beveling
- Work angles challenging



LightWELD:

- Dramatically faster
- Easier to learn
- Higher-quality results
 - Less distortion
 - Easier finishing

LightWELD performance data

- ❑ Laser power of 150 W -1500 W continuous power (CW mode)
- ❑ Pulse operation up to 2500 W (HPP mode at 20% duty cycle)
- ❑ Wobble frequency from 0 Hz – 300 Hz
- ❑ XC models with cleaning function → max. 60 Hz.
- ❑ Seam width from 0mm - 5.0mm
- ❑ XC models in the cleaning function, up to 15mm processing width
- ❑ 10 IPG programs with subprograms
- ❑ Customer can create an additional 20 individual programs
- ❑ 100% duty cycle with over 40% efficiency thanks to air-cooled laser (IPG standard)
- ❑ Suitable for mild steel, stainless steel and aluminium, up to 4mm material thickness

LightWELD XC full welding cycle

Switch nozzles and process mode for wire welding



LightWELD add-ons and future outlook



Wire feeder WF-100

available
from
Dec. 2023



WF-100 for Lightweld:

- 4 rollers drive
- rollers for Ø0.8 – 1.6mm wire available
- Wire feed speed 0.2 – 5m/min.
- direct connection to Lightweld
- electronics IP54 protected
- wire retract function



LightWELD 1500 XR

available
from
Dec. 2023

Single-mode handheld laser:

- ❑ More focusable, smaller beam diameter
- ❑ Different Optical Configuration
- ❑ Spot size on Part: 60 μm
- ❑ Spot size supports copper applications
- ❑ For Reference

Typical Spot Size on Part: 150 μm

Single Mode > 6 x Energy Density



Connectivity to Cobots

Coming soon



Summary

- ❑ **LightWELD is a maintenance-free system**
- ❑ **quickly learn welding without any prior knowledge**
- ❑ **optionally working with additional wire possible**
- ❑ **predefined programs for even easier work**
- ❑ **Laser for different sheet thicknesses and welding depths**
- ❑ **cleaning function for even better welding results**
- ❑ **modern tool as a supplement to arc welding**
- ❑ **constant development of the product portfolio/applications**
- ❑ **.....arrange your demonstration appointment.....**



**Thank you for your
attention!**