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Checklist
Hand-guided laser processing machines

How safely do you and your employees work with hand-guided laser processing machines?
Working with hand-guided laser processing machines poses a high risk of accidents. With the right safety measures, you can reduce this risk considerably.

The biggest risks when using lasers are:

- Improper handling of the laser
- Unsuitable protective equipment
- Inadequately secured laser controlled area

This checklist will help you to better manage these risks.

1. Complete the checklist.

A measure should be taken for any question you answer with "no". Note the measures on the last page. If a question does not apply to your company, simply cross it out.

2. Implement the measures.

General safety requirements

1 Is the laser correctly **classified** and **labelled** with a "laser class 4" laser warning sign and a laser information sign (Fig. 1), and does the type plate include all relevant laser information?

☐ yes ☐ no

2 Is there a **declaration of conformity** confirming that the laser processing machine complies with the Machinery Directive (from 2027, the Machine Ordinance will apply), among others?

☐ yes ☐ no

3 Are **operating instructions** available in an official Swiss language, and do these include all technical information (laser class, laser wavelength, continuous output, max. pulsed laser power, pulse duration), safety information, nominal ocular hazard distances (NOHD) and information on protective equipment?

☐ yes ☐ no

4 Has a **Laser Safety Officer** been appointed and trained?

Note: In Switzerland, there are no legal requirements on how the training should be structured.

☐ yes ☐ no

5 Is there a **written safety concept** for using lasers?

☐ yes ☐ no

6 Do **employees** with access to the laser controlled area receive regular **training** and is there **proof** of this?

☐ yes ☐ no

Technical safety requirements

7 Is there an **authorisation device**, e.g. a key control, for the equipment?

☐ yes ☐ no

8 Is there an **emergency stop**?

These must comply with standards IEC 60204-1 and ISO 13850.

☐ yes ☐ no

9 Are there **engineering controls** to prevent the laser beam being switched on accidentally? (Fig. 2)

It must not be possible to activate the laser simply by touching.

☐ yes ☐ no

10 Are there **engineering or structural controls** preventing the laser beam propagating from the process zone? (Fig. 3)

Example of laser cleaning: Non-contact distance measurement
Example of laser welding: Contact monitoring between laser gun and workpiece with ground terminal

It must not be possible to simply bypass this technical safety mechanism.

☐ yes ☐ no

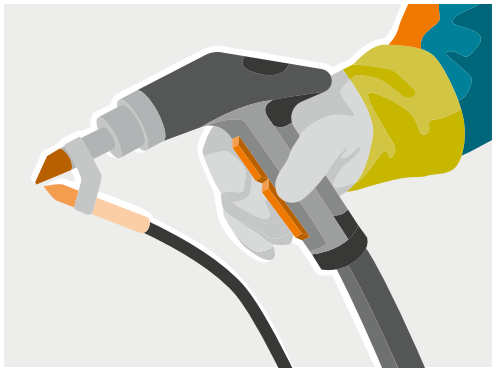
11 Is there **automatic detection of fibre breakage and fibre connectors**, and can information on this be found in the operating instructions or the technical documentation?

Detection must comply with at least Performance Level d (PL d) according to EN ISO 13849-1.

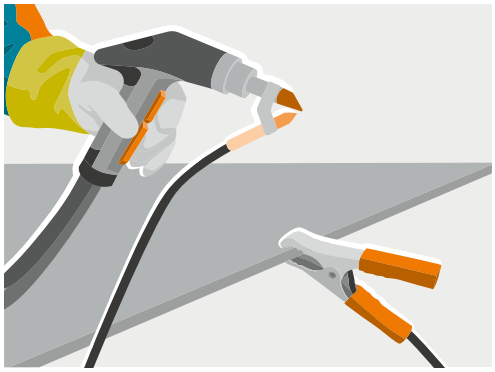
☐ yes ☐ no



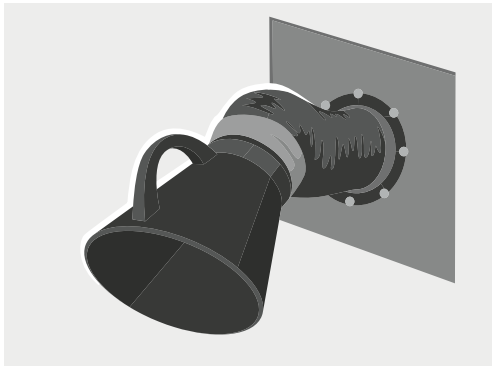
1 Classification, "laser class 4" laser warning sign and laser information signs according to standard SN EN 60825-1



2 Laser welding gun with two-button activation



3 Laser welding gun with two-button activation and ground terminal



4 Harmful substance extraction

12 Is there sufficient, functioning **extraction of harmful substances?** (Fig. 4)

Find out more in the leaflet "Schweissen und Schneiden" [welding and cutting, not available in English]: www.suva.ch/44053.d

☐ yes ☐ no

Laser controlled area

13 Is there a **clearly defined and demarcated** laser controlled area? (Fig. 5)

☐ yes ☐ no

14 When operating the laser, is there a **warning device** (visible or audible) within and outside of the laser controlled area? (Fig. 6)

☐ yes ☐ no

15 Is there an **interface for an external safety mechanism** that prevents the emission of laser radiation, e.g. when opening the door to the laser controlled area? (Fig. 7)

The entire system (laser and laser controlled area) must comply with at least PL d according to EN ISO 13849-1. It must not be possible to simply bypass the safety switch.

☐ yes ☐ no

16 Is **access** to the laser controlled area clearly marked?

☐ yes ☐ no

17 Do only trained individuals have **access** to the laser controlled area, and is this indicated with a prohibition sign outside of the laser controlled area? (Fig. 8)

☐ yes ☐ no

18 Are the **laser guards, safety windows and safety curtains designed** such that no harmful laser radiation can escape from the laser controlled area?

☐ yes ☐ no

19 Are the **laser guards or safety curtains certified?**

Laser guards must comply with standard EN 60825-4 and laser safety curtains with EN 12254 and can also be self-certified according to the requirements of the standards if necessary.

☐ yes ☐ no

20 Have all **reflecting and unnecessary items** been removed from the laser controlled area?

☐ yes ☐ no

21 Have all **flammable liquids and items** been removed from the laser controlled area?

☐ yes ☐ no

22 Is a **fire extinguisher easily accessible** close to the workstation?

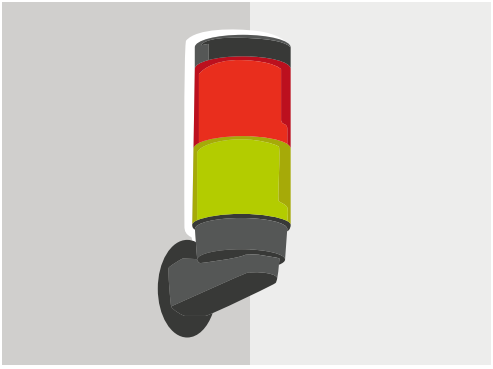
☐ yes ☐ no

23 Have potential **trip hazards** been removed from the laser controlled area?

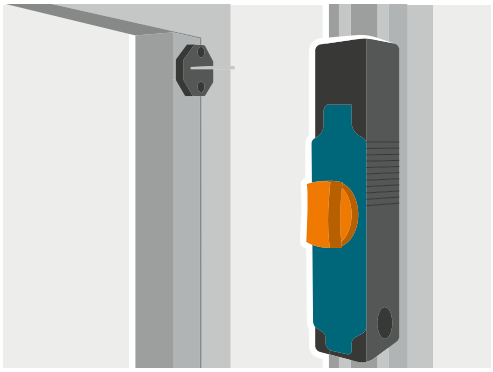
☐ yes ☐ no



5 Defined and demarcated laser controlled area



6 Warning light



7 Monitoring switch, which is connected to the safety mechanism



8 Prohibition sign outside of the laser controlled area

24 Has it been ensured that **during laser processing**, only individuals with the required **protective equipment** are in the laser controlled area?

☐ yes
☐ no

Personal protective equipment (PPE)

25 **Laser welding:** Are appropriate, certified **laser safety helmets or face visors** with appropriate laser safety filters available? (Fig. 10)

See "Important information on 25 and 26"

☐ yes
☐ no

26 **Laser cleaning:** Are appropriate, certified **laser safety helmets or laser safety goggles** available, along with proof that these provide adequate protection?

See "Important information on 25 and 26"

Depending on the laser power and reflections during laser cleaning, laser safety goggles may be sufficient rather than laser safety helmets. This must be justified in the manufacturer's operating instructions.

☐ yes
☐ no

27 Is at least the following **information** from the manufacturer available for all laser safety helmets and laser safety goggles?

- Name, address and contact details of the manufacturer
- Model name
- CE label
- Identification number of the notified body that conducted the EU type-examination
- Protection level
- Wave length for which these are suitable

☐ yes
☐ no

28 Are there clear signs **before entering** the laser controlled area stating that a laser safety helmet or laser safety goggles must be worn?

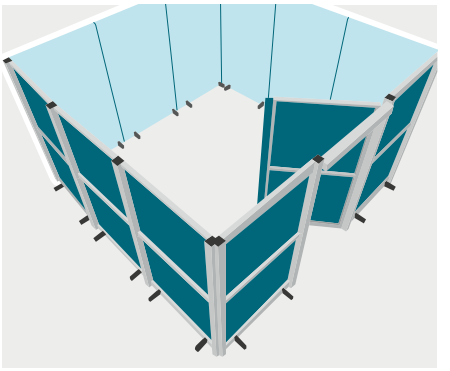
☐ yes
☐ no

29 Are appropriate **gloves** providing adequate protection available?

☐ yes
☐ no

30 Does everyone in the laser controlled area wear long-sleeved, closed **protective equipment** to protect their skin from laser radiation?

☐ yes
☐ no



9 Laser controlled area with mobile laser guards



10 Appropriate, certified laser safety helmet

Important information on 25 and 26

There is no general laser protection level for helmets or goggles that is equally suitable for all lasers. The manufacturer must specify which laser safety googles are/which laser safety helmet is required for which laser.

Mobile operation

31 Are **all points** in this checklist also **complied with** during mobile operation, particularly in the laser controlled area? (Fig. 9)

☐ yes
☐ no

The same control measures apply during both mobile and stationary operation. Deviations must be justified with a hazard identification, a risk analysis and a safety concept. The objective is for the laser radiation not to be able to harm anyone – whether operators or third parties.

Possible implementation:

- Shielding: Laser guards or safety curtains must effectively shield the laser controlled area and it must not be possible to open these using simple means.
- Access control: Doors and access must be linked to the safety circuit so that the laser switches off when a door opens. Ideally, the laser controlled area should be designed such that there is only one access point.
- Signage: The laser controlled area must be clearly indicated, including warning notices.
- Warning signals: Audible or visible signals must warn of laser radiation outside of the laser controlled area.

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32 Has the Laser Safety Officer drawn up a **hazard identification**, a **risk analysis** and a **safety concept** for mobile operation of handheld lasers?

☐ yes
☐ no

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33 Is the **safety concept** effective, and is it correctly implemented?

☐ yes
☐ no

It is possible that there are other dangers related to the topic of this checklist at your company.

If this is the case, take the necessary additional measures. Note these on the last page.

Planning of measures

Hand-guided class 4 laser processing machines

Checklist completed by:

Date: Signature:

Make: Type: Year of manufacture:

No.	Measure to be taken	Deadline	Person responsible	Completed		Comments	Checked	
				Date	Initials		Date	Initials

Repeat inspection on: (recommendation: every 6 months)

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