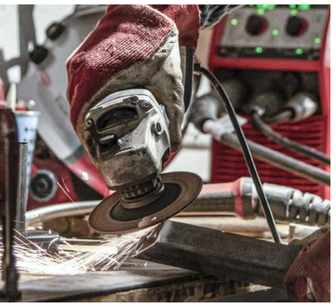
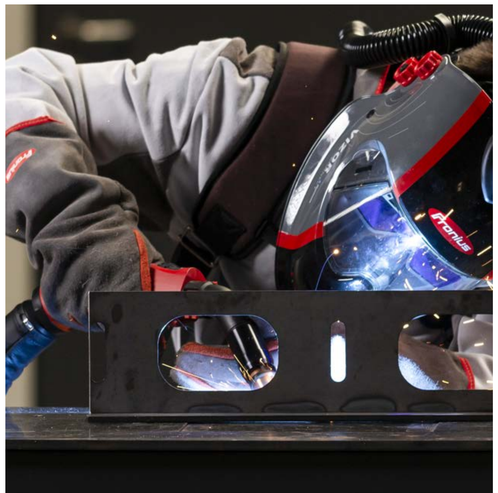
# Dangers When Welding

Welding is a multi-faceted activity that is experienced with all the senses. But without adequate protection, there are certain dangers. What's needed are efficient measures to ensure safe welding and protect the health of welders.

## Potential Sources of Danger During Welding:

- Dangers due to radiation
- Dangers due to electrical current
- Dangers due to heat
- Dangers due to gases and vapors
- Dangers due to noise





## Dangers Due to Radiation

**Actions**

- Use a protective shield or welding helmet with side protection and protective glass that is appropriate for the power being used
- Protect skin from radiation using suitable safety measures such as UV-resistant and temperature-resistant work apparel, welding gloves and a head covering (personal protective equipment)
- Shield the environment from UV, infrared, and visible radiation

## Dangers Due to Heat

**Actions**

- Flame-retardant clothing: use suitable, certified protective welding apparel
- Do not touch hot metals with bare hands
- Use a visor with a fresh-air supply
- Cover preheated components with temperature-resistant mats

## Dangers Due to Gases and Vapors

**Actions**

- Helmet with fresh-air supply or PAPR system
- Use extraction systems that extract directly where the gases/vapors are generated, e.g. fume extraction torches and mobile extraction units with adjustable extraction arm
- Mechanically remove coatings such as varnish or primer before welding

## Dangers Due to Electrical Current

**Actions**

- Check for defective insulation of mains leads, welding torches, and grounding cables; replace if necessary
- Mains supply via residual current circuit breaker only
- Change wet clothing or gloves
- Use welding systems that have undergone a safety inspection according to the standard EN 60974-4
- Only use welding systems with the 's' marking in environments with an elevated level of electrical hazard

## Dangers Due to Noise

**Actions**

- According to EU regulations, hearing protection is recommended at sound pressure levels of 85 dB or above
- Use soundproofed grinding cabins
- Use noise barriers in the workplace
- Integrate fireproof sound absorbers in floors and ceilings
- Be aware of the working environment and adapt the sound protection if necessary

# Important Standards for Welding Protection

### UV and Glare Protection

In Europe, there are very strict rules governing the use of processing materials and the functionality of automatic welding helmets. These helmets must satisfy the requirements of the standards EN 165, EN 166, EN 167, EN 168, and EN 169, as well as EN 175 and EN 379.

### Hand Protection

Protective gloves for welders must satisfy the standard EN 12477 and must be tested according to the following criteria:

- Abrasion resistance (EN 388)
- Cut resistance (EN 388)
- Tear resistance (EN 388)
- Puncture resistance (EN 388)
- Convective heat (EN 407)
- Resistance to small spatters of molten metal (EN 407)
- Flammability (EN 407)
- Contact heat resistance (EN 407)
- Finger strength (EN 420)

### Risk Categories for Personal Protective Equipment (PPE)

**Category I** – minimal risks – low protection requirements, for example for gardening or household work.

**Category II** – moderate risks – protection against mechanical hazards, such as working with sharp edges or welding.

**Category III** – high risks – protection against irreversible damage and deadly hazards, for example when handling chemicals or fighting fires.

### Protective Clothing (EN 11611)

Protective welding apparel according to EN 11611 must always be worn when there is a danger of injury due to sparks, metal spatters or shooting flames. Certification according to the standard must be clearly indicated on the washing label as well as in the instructions for use. The key requirements that protective welding apparel must satisfy include indication of the manufacturer's name, product name, flame symbol, reference to EN 11611, and CE marking.

### Foot Protection

When it comes to foot protection, the applicable EN standard makes a distinction between safety shoes and work shoes. EN ISO 20345, S3 rating: safety shoes with protective toe caps that withstand a test energy of 200 joules. EN ISO 20347 2011: work shoes without protective toe caps and S3 penetration protection, antistatic, tested slip resistance SRC.