SAFETY ALERT

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HAND-HELD LASER WELDERS

Hand-held laser welder devices are being imported into Australia in increasing numbers from a variety of sources. These devices transmit invisible laser light energy via fibre optic cables to a welding torch similar in design to a conventional GMAW or Mig welding torch. They are typically used for the welding of light-gauge sheet metals on a range of materials, some of which are highly reflective e.g. carbon and stainless steels, titanium and aluminium.

- Hand-held laser welding devices are Class 4 lasers, capable of inflicting severe burns and permanent blindness on unprotected personnel who may be directly or indirectly exposed to the laser radiation.
- Welders and personnel performing laser welding should wear clothing designed for welding that covers all exposed skin. Laser safety glasses designed for the wavelength of laser light in use must be worn at all times including under the welding helmet incorporating a laser resistant face shield.
- Hand-held laser welding should only be conducted in a fully enclosed absorptive booth designed for laser welding with safety interlocks on the door(s), or in areas that prevent direct and indirect beam exposure including by reflection.

ISSUE

The high energy (up to 8kW peak) laser light transmitted by these welding machines is often invisible, and is capable of inflicting severe burns and permanent blindness upon personnel who may be either directly or indirectly exposed without suitable protection. Accordingly, they are classified as a Class 4 laser product under AS/NZS IEC 60825.1 *Safety of laser products - Part 1: Equipment classification and requirements*.

SAFETY PRECAUTIONS

Hand-held laser systems are available with inbuilt safety features ranging from minimal, through to models with integrated systems designed to ensure that the laser can only be activated when intended. It is recommended that only hand-held laser systems which incorporate switching and other interlocking safety features designed to prevent inadvertent operation or operation when the welding torch is not in direct contact with the workpiece, be purchased and used. This includes:

- Lock out key operation
- Emergency stop (Estop)
- Door safety entry switch interlocks for the welding booth
- Work piece clamp to prevent operation when the torch is not in Contact with the workpiece
- No-plasma cut-out (when work piece clamp is connected to welding touch, unit will not emit a beam for any longer than 5 milliseconds i.e. machine cannot go into “star-wars” mode)
- Laser radiation hazard labels.

It is also recommended that hand-held laser welding only be conducted in a fully enclosed absorptive booth designed for laser welding, or in areas that prevent direct and indirect beam exposure including by reflection.

Protective clothing for welders using hand-held lasers should be suitable for welding and cover all exposed skin. Laser safety glasses designed for the wavelength of laser light in use must be worn at all times including under the welding helmet incorporating a laser resistant face shield.

REGULATIONS

Workplace health and safety regulations throughout Australia impose severe penalties upon any person controlling a business or undertaking that results in a person being exposed to direct or indirect laser radiation. The Regulations requires that:

1. Laser equipment intended for use on plant is designed, constructed and installed so as to prevent accidental irradiation of any person
2. Laser equipment on plant is protected so that any operator of the plant or other person is not exposed to direct radiation, radiation produced by reflection or diffusion or secondary radiation
3. Workers operating the laser equipment are trained in the proper operation of the equipment.

Welders operating hand-held laser welders must be suitably trained in the safety requirements and operation of the laser equipment.

WARNING

1. Direct exposure to laser radiation can cause severe skin burns and immediate and permanent loss of vision.
2. Exposure to reflected laser radiation is similarly hazardous and capable of causing permanent blindness and severe burns.

FURTHER INFORMATION

Refer to Weld Australia’s *Technical Guidance Note TGN-SW02 Laser safety* for further information. It can be download free of charge from https://weldaustralia.com.au.

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