



UK Health
Security
Agency

Laser product information sheet: practical guide



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Overview

Lasers are found in a range of products: laser pointers, DIY equipment, night lights and toys. They may also be self-contained as in Blu-ray players or home-use hair removal or skin treatment devices. Lasers can be small, but some emit high power which may present a risk to the eyes and skin over considerable distances. Eyes are usually much more sensitive than skin and risks range from temporary visual impairment to permanent sight loss.

Depending on level of accessible emission, lasers are classified by BS EN 60825-1:2014+A11:2021 to indicate the potential risk and grouped into eight classes: the higher the number, the bigger the potential to cause harm. In practice, the risk also depends upon the conditions of use, exposure time and the environment.

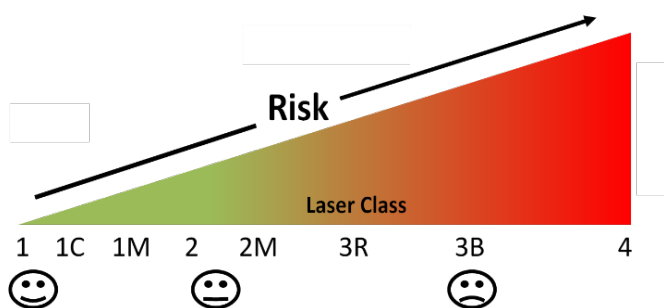


Figure 1. Laser classes with increasing risk.

UKHSA advice is that consumer products containing Class 1 or Class 2 lasers would be unlikely cause eye or skin injuries. Class 1M, Class 2M and Class 3R laser products may be acceptable for use by consumers where the manufacturer has assessed that the risk of eye injury is very low when used as intended by the manufacturer for a particular application. BS EN 50689:2021 “Safety of laser products — Particular Requirements for Consumer Laser Products” allows consumer laser products to be Class 1, Class 2, and a subgroup of Class 3R. However, consumer laser products that are child-appealing must not exceed Class 1.

Class 3B and Class 4 lasers are not suitable for general use by consumers.

Common Problems

Emission wavelength

The laser product emits additional wavelengths that are not specified on the label. This is often seen in laser products emitting a green beam where an infrared laser, invisible to the eye, is used to create the green light. In well-constructed products the invisible beam is completely contained within the device. The additional emissions from such products cannot be identified by visual inspection as the infrared radiation is invisible to the human eye. Nevertheless, the additional emission may be sufficiently powerful to present a risk of permanent sight loss.

Output power

The laser power is higher than specified on the product label and/or within the user information. Sometimes, Class 3B and Class 4 laser products are labelled as Class 2.

Laser power may be variable between batches of the same product due to poor quality control.

Practical tip

The battery used in a laser product is often a good indicator of maximum expected output power. **Laser products powered by coin / button style cell batteries are unlikely to be capable of causing harm.** The output power of laser products powered by high-capacity Li-ion batteries and some alkaline batteries may be sufficiently high to present the risk of eye or skin injury.



Figure 2. Common battery styles used in laser products.

Removable components

Laser products could incorporate optical components to produce multiple beams as shown in Figure 3. The optics can often be adjusted to change the pattern of the beam. If the optic is securely fixed and cannot be removed, it is likely the product will be eye-safe (dependent on the output of the laser). However, in some laser products the optic can be removed, resulting in a single output beam of much higher power, which may make the product unsafe.



Figure 3. Removable diffraction optics from the laser product.

Labelling and description of product

Frequently, laser products are labelled as compliant with the American Code of Federal Regulations, 21 CFR 1040.10 instead of BS EN 60825-1:2014+A11:2021.

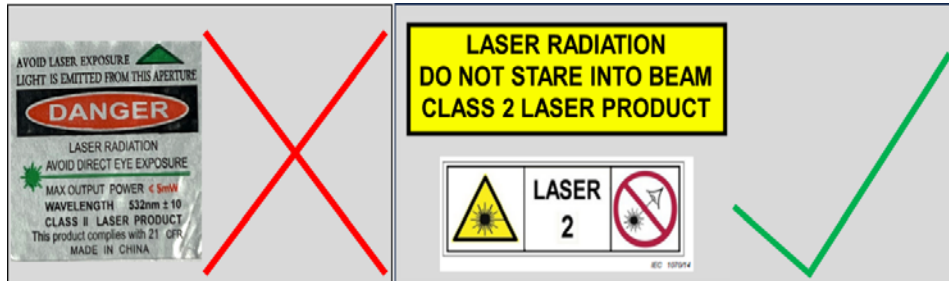


Figure 4. Incorrect label commonly found on laser products and example of correct labelling.

Consumer information

For laser products classified above Class 1, the manual should include information about the laser and appropriate safety advice or/and recommendations for safe use. This information may be absent or insufficient.

Intense Pulsed Light source (IPL)/ Laser hair removal

Light-based consumer products for hair removal or skin rejuvenation are common on the UK market. These devices should only operate when in direct contact with the skin. If the product emits light when not in direct skin contact, it could present risk to the eyes. Re-establishment of skin contact between each operation should also be required to prevent multiple exposures of the same area. These safety requirements apply to both types, IPL and laser devices.



Figure 5. Examples of Intense Pulse Light source (IPL).

About the UK Health Security Agency

UKHSA is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

[UKHSA](#) is an executive agency, sponsored by the [Department of Health and Social Care](#).

Further information could be found here: [Laser radiation: safety advice - GOV.UK](#)
(www.gov.uk)[Laser radiation: safety advice - GOV.UK](#).

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