

BRITISH STANDARD

Eyewear for protection against intense light sources used on humans and animals for cosmetic and medical applications

Part 2: Guidance on use

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Summary of pages

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Foreword

Publishing information

This part of BS 8497 is published by BSI and came into effect on 31 March 2008. It was prepared by Technical Committee PH/2/3, *Eye protection against lasers*. A list of organizations represented on this committee can be obtained on request to its secretary.

Information about this document

This is a new standard, which has been written to fill a need for the standardization of protective eyewear for users of intense light source (ILS) equipment.

Use of this document

As a guide, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Introduction

Protective eyewear for intense light source (ILS) equipment protects against excessive exposure to optical radiation during normal operation of the equipment and foreseeable accidental exposure due to equipment malfunctioning or human error. This includes accidental and cumulative exposure, and discomfort associated with viewing bright reflections.

1 Scope

This British Standard gives guidance and information to users, manufacturers and suppliers of ILS devices and safety advisors on the selection and safe use of eye protectors for humans and animals for cosmetic and medical applications used against excessive exposure to optical radiation in the spectral range 180 nm to 3 000 nm, with the exception of laser radiation.

This standard is not applicable to eye protectors for use with tanning equipment, ophthalmic instruments or other medical/cosmetic devices, the safety issues of which are addressed through other European and British standards.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 8497-1:2008, *Eyewear for protection against intense light sources used on humans and animals for cosmetic and medical applications – Part 1: Specification for products*

3 Terms and definitions

For the purpose of this British Standard, the terms and definitions given in BS 8497-1 and the following apply.

3.1 attenuation

decrease in the radiant flux as it passes through an absorbing or scattering medium

3.2 exposure limit values (ELVs)

level of exposure to the eye or skin that is not expected to result in adverse biological effects

3.3 intense pulsed light source (IPLS)

ILS that delivers its energy in the form of a single pulse or a train of pulses where each pulse is assumed to have a duration less than 0.25 s for wavelengths in the range 400 nm to 700 nm and 10 s for all other wavelengths

3.4 ocular hazard distance (OHD)

distance at which the beam irradiance, radiance or radiant exposure equals the appropriate ocular ELVs

3.5 pulse duration

time increment measured between the half peak (50%) of power points at the leading and trailing edges of a pulse

3.6 pulse separation

time between the end of one pulse and the onset of the following pulse, measured at the 50% trailing and leading edges

4 Optical radiation hazards

4.1 Risk assessment

4.1.1 The eye is at risk of injury from optical radiation in excess of the exposure limit values (ELVs) (see Annex A). A comparison of the predicted or measured radiation exposure with the applicable ELVs allows an assessment of a personal workplace exposure to optical radiation.

4.1.2 The risk assessment should include the following.

- a) Determine the ELVs for exposure duration, type of hazard and emitting device configuration.
- b) Calculate the spectrally weighted radiance using the data provided by the manufacturer of the ILS equipment. If this information is not available, measure the actual spectral irradiance or spectral radiance.
- c) Compare the measured values with the ELVs.

4.1.3 If other measures are inadequate to control the risk of eye exposure in excess of any applicable ELVs, eye protection specifically designed for the wavelengths and output should be worn.

NOTE Personnel who might be at risk include the patient/client, ILS equipment operator, assisting staff and others.

4.1.4 See Annex B for a retinal thermal hazard assessment and Annex C for a worked example calculation.

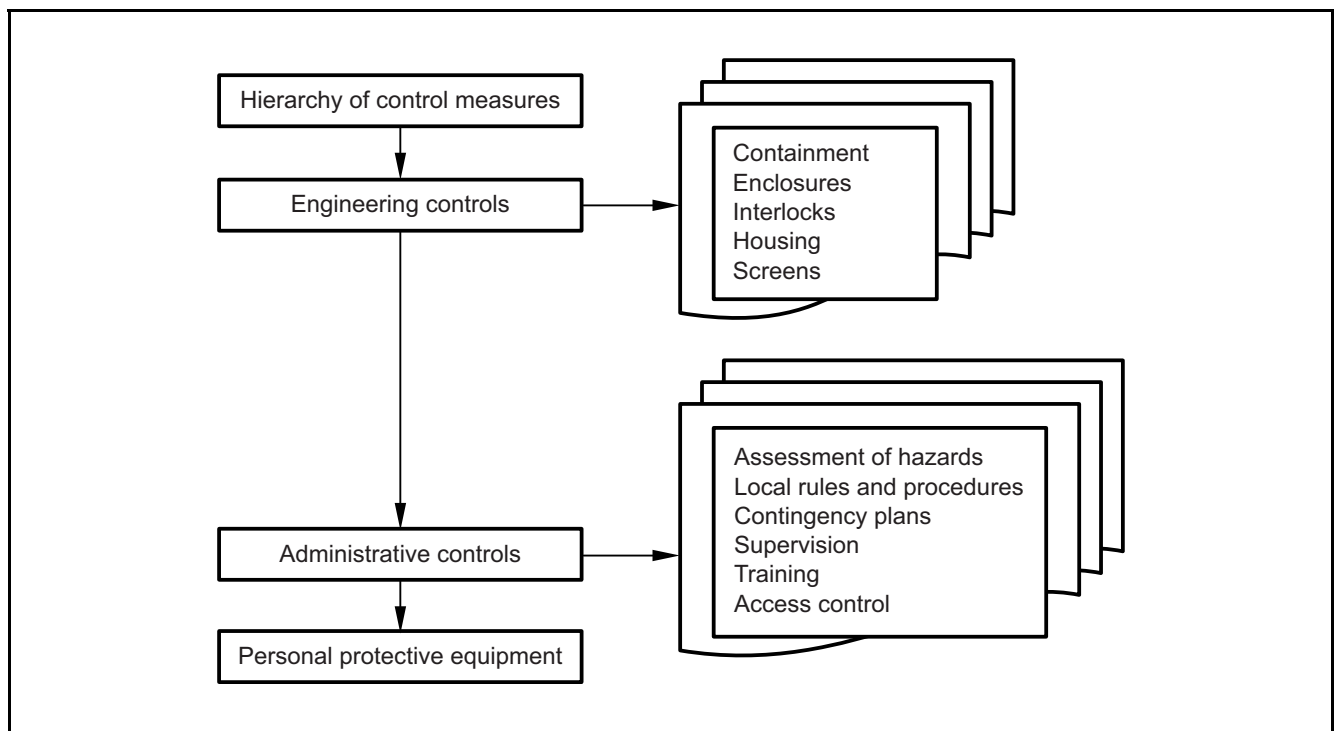
4.2 Control measures

4.2.1 Any person who is present within the hazard distance should be protected against eye or skin exposure to optical radiation above any applicable ELVs.

4.2.2 The extent of the skin and ocular hazard distance might vary according to the type of ILS equipment used and the optical properties of the applicators.

4.2.3 Exposure to optical radiation should be reduced, as far as reasonably practicable, by means of physical safeguards, such as engineering controls. Personal protection should only be used when engineering and administrative controls are impracticable or incomplete, in accordance with Figure 1.

Figure 1 Hierarchy of control measures



5 Eye protection

5.1 Protective eyewear

5.1.1 Reduction of unintended exposure should be included in the design specifications of the ILS equipment. Exposure to optical radiation should be reduced, as far as reasonably practicable, by means of physical safeguards, such as engineering controls.

5.1.2 When the treatment region is close to the eye, the patient's or client's protective eyewear should be selected carefully, as there will be a significant risk of exposure in excess of the ELVs. Consideration should also be given to the good fit of safety eyewear to prevent penetration of optical radiation from around the frame.

5.1.3 Different types of eye protection might be required for patients/clients, ILS equipment operators and supporting personnel.

5.1.4 An unambiguous and robust method of marking the ILS protective eyewear should be employed to ensure that there is a clear link to the particular ILS equipment device for which it has been specified.

5.1.5 A checklist to help select protective eyewear for the patient/client is given in Annex D.

5.1.6 A checklist to help select protective eyewear for the operator is given in Annex E.