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Eye and face protection for occupational use

Part 4: Protection against biological hazards



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- Association of Accredited Certification Bodies
- Australasian Fire and Emergency Service Authorities Council
- Australian Chamber of Commerce and Industry
- Australian Competition and Consumer Commission
- Australian Dispensing Opticians Association
- Australian Industry Group
- Australian Radiation Protection and Nuclear Safety Agency
- Better Regulation Division (Fair Trading, SafeWork NSW, TestSafe)
- Consumers Federation of Australia
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Part 4: Protection against biological hazards

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Preface

This Interim Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee SF-006, Eye and Face Protection.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this document as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this document is to provide specifications and guidelines relating to products that provide eye and face protection from biological hazards.

While this document has been prepared as an Australian Standard, it is related to the ISO 16321 series for eye and face protection. The ISO 16321 series currently includes Parts 1 to 3.

Attention is drawn to the fact that this document is an Interim Standard and should be regarded as a developmental Standard and liable to future alteration.

This document will have a currency of two years from its date of publication. At the conclusion of that period it will be superseded by another Standard, confirmed as an Interim Standard in its present form for a further one year period or withdrawn.

This document is being released as an Interim Standard to help meet the needs of the community and industry until an international version is released. An ISO version is currently being drafted by ISO TC 94/SC6 and SF-006 will consider its adoption once published.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

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Introduction

This document has been developed in the context of the COVID-19 pandemic, with significant learnings relating to infection control procedures having accelerated in 2020. An informative appendix is included in this document to provide information intended to guide end users and organizations about the appropriate personal protective equipment (PPE) specifically relating to eye or eye and face protection. The guidance is based on knowledge of best practice and may be used to help define and develop procedures and practice incorporating the use of products conforming to this document.

The requirements and principles apply independently of the method of manufacture.

NOTES

Australian Standard®

Eye and face protection for occupational use

Part 4: Protection against biological hazards

Section 1 Scope and general

1.1 Scope

This document specifies minimum requirements for protectors designed to provide protection for the eyes or the eyes and face from biological hazards, such as human or other animal bodily fluids and microorganisms, including viruses and other particulates, that may deposit onto the face or eyes.

This document specifies requirements for both single-use (disposable) and re-usable (disinfectable) products or components.

This document applies to all afocal (plano) and prescription lensed protectors and components.

Where eye and face protection is incorporated into or combined with other protective equipment, such as hoods, full face respirators, powered air purifying respirators (PAPR) hoods and headtops, the relevant requirements of this document apply to the components providing eye and face protection.

This document does not apply to —

- (a) protectors intended for protection from specific hazards, e.g. impact from high-speed particles, harmful artificial optical radiation, dusts, molten metals, heat, flame, hot solids, harmful gases, vapours (refer to AS/NZS 1337.1);
- (b) protectors specifically intended for sports (refer to the AS/NZS 18527 series);
- (c) protectors for lasers (refer to AS/NZS 1337.4 and AS/NZS 1337.5); or
- (d) protectors intended for respiratory protection against aerosols (refer to AS/NZS 1716).

NOTE See [Appendix A](#) for guidance relating to the specific selection, use and maintenance of protectors.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1337.0, *Personal protective equipment, Part 0: Eye and face protection — Vocabulary*

AS NZS 1338.2, *Filters for eye protectors, Part 2: Filters for protection against ultraviolet radiation*

AS/NZS 21987, *Ophthalmic optics – Mounted spectacle lenses (ISO 21987:2017, MOD)*

AS/NZS ISO 16034, *Ophthalmic optics—Specifications for single-vision ready-to-wear near-vision spectacles*

AS/NZS ISO 18526.1, *Eye and face protection — Test methods, Method 1: Geometrical optical properties*

AS/NZS ISO 18526.2, *Eye and face protection — Test methods, Method 2: Physical optical properties*

AS/NZS ISO 18526.3, *Eye and face protection — Test methods, Method 3: Physical and mechanical properties*

AS/NZS ISO 18526.4, *Eye and face protection — Test methods, Part 4: Headforms*

ISO 8980-4:2006, *Ophthalmic optics — Uncut finished spectacle lenses — Part 4: Specifications and test methods for anti-reflective coatings*

ISO/CIE 11664-1, *Colorimetry — Part 1: CIE standard colorimetric observers*

ISO/CIE 11664-2, *Colorimetry — Part 2: CIE standard illuminants*

1.3 Terms and definitions

For the purposes of this document, the terms and definitions given in AS 1337.0 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- (a) IEC Electropedia: available at <https://www.electropedia.org/>
- (b) ISO Online browsing platform: available at <https://www.iso.org/obp>

For the purposes of this document, “protector” is used as a synonym for spectacles, goggles, face shields and eye guards used for eye and/or face protection.

1.3.1

aerosol

aerosolized

<biological>colloidal suspension of liquid or solid particles dispersed in a gas (usually air), smoke or fog

[SOURCE: ISO 15190:2020, 3.2, modified]

1.3.2

airborne

biological material that is in the air (suspended or travelling)

Note 1 to entry: The biological material can include splashes, spurts, sprays, aerosols and droplets.

1.3.3

airborne transmission

spread of an infectious agent caused by the dissemination of droplet nuclei (aerosols) that remain infectious when suspended in air over distances and time

1.3.4

biological hazard

biological substance(s) that pose(s) a threat to the health of living organisms, primarily that of humans

Note 1 to entry: Hazards can include medical waste or samples of a microorganism, virus, or toxin (from a biological source) that can affect human health.

1.3.5

cleaning

process to remove any type of contamination

Note 1 to entry: The contamination can be visible or not visible.

1.3.6

disinfection

process to reduce the number of microorganisms ([1.3.8](#)), but not usually of bacterial spores, without necessarily killing or removing all organisms, to a level previously specified as being appropriate for a defined purpose

1.3.7

droplet

very small drop of liquid

Note 1 to entry: Relevant examples include particles of moisture discharged from the mouth during coughing, sneezing, speaking or released by agitation or spillage of a liquid source.

Note 2 to entry: Some droplets can transmit pathogens and cause infection by dispersion into the air.

Note 3 to entry: Particles intermediate in size between drops and aerosol can contain infectious microorganisms. A risk assessment should be made of the potential biological hazards and the possible droplet/aerosol exposure scale and type.

Note 4 to entry: Size influences the amount of time particles will remain in the air, and particle size may change while suspended in air due to evaporation.

1.3.8

microorganisms

microscopic organisms including protozoa and other parasites, fungi, archaea, bacteria, unicellular algae, viruses and viroids

1.3.9

level I protector

protector providing protection to the eyes

Note 1 to entry: Examples of Level I protectors are spectacle type or goggle eye protectors.

1.3.10

level II protector

protector providing protection to the eyes, nose and mouth

Note 1 to entry: An example of a Level II protector is an eye protector together with a face mask.

1.3.11

level II+ protector

protector providing protection to the eyes, an extended area around the nose and the mouth

Note 1 to entry: Examples of Level II+ protectors are faceshields and full face masks.

1.3.12

infectious microorganism

microorganism capable of invading a susceptible host and multiplying in it

Note 1 to entry: Infectious microorganisms can, but may not, cause a disease.

1.3.13

pathogen

infectious organism, usually microscopic, capable of causing disease in a host

1.3.14

re-usable

product intended to be cleaned and disinfected for multiple use

1.3.15

shall

indicates that a statement is mandatory

1.3.16

should

indicates a recommendation

1.3.17

single use

use by a single person within a specified time frame or exposure situation

1.3.18

splash

liquid scattered through the air or onto a surface

1.3.19**spray**

very small drops of liquid carried in the air

1.3.20**spurt**

sudden fast stream of liquid

EXAMPLE Cough of mucus, leak from laboratory process, spurt from blood vessel in surgical/paramedical settings.

1.3.21**sterile**

free from viable microorganisms

Note 1 to entry: In practice, no such statement regarding the absence of microorganisms can be proven.

1.3.22**sterilization**

validated process used to render product free from viable microorganisms

Note 1 to entry: The number of microorganisms that survive a sterilization process can be expressed in terms of probability. While the probability may be reduced to a very low number, it can never be reduced to zero.

[SOURCE: ISO 11139:2018, 3.277]

1.3.23**UV-C**

optical radiation source of wavelengths between 100 nm and 280 nm

Section 2 General requirements for protectors

2.1 Ambient temperature

The protectors described in this document are intended for use at normal ambient temperatures (23 ± 5) °C.

2.2 Physiological compatibility

Protectors shall be designed and manufactured in such a way that, when used under the conditions and for the purposes intended, they will not compromise the health or safety of the wearer. Risks to the wearer from prolonged contact with component materials shall be reduced. Materials of construction that are prone to absorption of moisture shall be readily replaceable.

NOTE 1 Refer to regulations on limits of risk for component materials used in the protector.

Substances recommended for cleaning, maintenance or disinfection, when applied in accordance with the manufacturer's instructions, shall have minimal adverse effect upon the wearer.

NOTE 2 Excessive pressure due to a poor fit on the face, chemical irritation or allergy are known to produce reactions. Rare or idiosyncratic reactions can occur to any material and indicate the need for the individual to avoid protectors made from that particular material.

2.3 Construction and adjustment

Protectors shall be free from projections, sharp edges or other features likely to cause discomfort or injury during use.

Any part of the protector that can be adjusted or removed by the wearer for the purpose of replacement (in accordance with the manufacturer's instructions) shall be designed and manufactured to facilitate adjustment, removal and attachment without the use of tools.

The test shall be carried out by the physical inspection specified in AS/NZS ISO 18526.3.

2.4 Cleaning

Manufacturers' cleaning procedures should be followed.

Cleaning procedures shall not impair the performance of protectors. All the tests shall be carried out after subjecting the protector to the cleaning procedures once in accordance with the information supplied by the manufacturer.

2.5 Product disinfection for re-usable protectors

2.5.1 Principle

This clause applies to protectors intended to be disinfected and re-used.

Protectors shall be subjected to the disinfection procedure specified by the manufacturer. In the absence of a disinfection method, eye protectors shall be exposed to at least one of the following chemicals:

- (a) Ethanol (nominally 70 %).
- (b) Benzalkonium chloride (nominally 0.5 %).
- (c) Didecyl dimethyl ammonium chloride (nominally 0.5 %).
- (d) Polyhexamethylene biguanide (PHMB) (nominally 0.10 %).

Protectors intended for re-use shall be marked with the appropriate marking in accordance with [Section 8](#).

NOTE 1 Refer to local guidelines and standards for information on the re-use of protectors. Where the manufacturer claims that a product is able to be disinfected, reasonable and statistically sound testing giving better than 95 % confidence of success should be provided.

NOTE 2 Certain disinfection methods can cause deterioration of the protector. This can take the form of impaired optical performance (e.g. development of opacity of the lens) and reduced mechanical strength of the frame or lens holder (increased brittleness). If the disinfection method specified is known to cause deterioration of the product, the number of disinfection cycles that the product is capable of withstanding without deterioration of its intended performance should be specified.

2.5.2 UV-C disinfection

Products intended to be disinfected with the use of a UV-C radiation source shall conform to the requirements of [Clause 2.5.4](#) after UV-C disinfection. UV-C disinfection shall be in accordance with the manufacturer's instructions.

2.5.3 Disinfection by other means

If a manufacturer specifies another method of disinfection, the method shall conform to the appropriate standard. When disinfected according to this method, the product shall conform to the requirements of [Clause 2.5.1](#).

NOTE Refer to the relevant regulatory requirements (TGA classifications) for methods of disinfection.

2.5.4 Testing

A minimum of two protectors shall be tested in accordance with the method provided by the manufacturer. At least one protector shall be tested in accordance with the below list Items (a), (b) and (c) and one protector for list Item (d).

After exposure in accordance with AS/NZS ISO 18526.3:2021 Clause 6.17, followed by thorough rinsing in clean water and drying, the protectors shall continue to fulfil the following requirements:

- (a) There shall be no visible distortion of the protector when assessed in accordance with AS/NZS ISO 18526.3:2021 Clause 6.6.
- (b) Wide-angle scatter in accordance with AS/NZS ISO 18526.2:2021 Clause 14.1.
- (c) Transmittance characteristics shall continue to conform to the requirements specified in [Clause 4](#), including optional claims (if specified).
- (d) Continued operation of any incorporated mechanisms shall be assessed. The security of fastenings and retention shall be assessed when tested in accordance with AS/NZS ISO 18526.3:2021 Clause 6.5.

Products intended to be re-usable shall not include components likely to absorb chemicals or other irritants, e.g. open cell foam, unless these components can be easily replaced. Products intended to be reusable shall be marked with the appropriate marking in accordance with [Section 8](#).

2.6 Headforms

The test methods where headforms are required shall use 1-M in accordance with AS/NZS ISO 18526.4 unless the manufacturer specifies other headform(s) conforming to AS/NZS ISO 18526.4 to be compatible with the protector.