BS EN ISO 16321-1:2022+A1:2025

BSI Standards Publication

Eye and face protection for occupational use

Part 1: General requirements

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Full document details: BS EN ISO 16321-1:2022+A1:2025

National foreword

This British Standard is the UK implementation of EN ISO 16321-1:2022+A1:2025. It is identical to ISO 16321-1:2021, incoporating amendment 1:2024. It supersedes BS EN ISO 16321-1:2022, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO text carry the number of the ISO amendment. For example, text altered by ISO amendment 1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee PH/2/2, Industrial eye protectors.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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For the Great Britain market (England, Scotland and Wales), if UK Government has designated this publication for conformity with UKCA marking (or similar) legislation, it may contain an additional National Annex. Where such a National Annex exists, it shows the correlation between this publication and the relevant UK legislation. If there is no National Annex of this kind, the relevant Annex ZA or ZZ in the body of the European text will indicate the relationship to UK regulation applicable in Great Britain. References to EU legislation may need to be read in accordance with the UK designation and the applicable UK law. Further information on designated standards can be found at www.bsigroup.com/standardsandregulation.

For the Northern Ireland market, UK law will continue to implement relevant EU law subject to periodic confirmation. Therefore Annex ZA/ZZ in the European text, and references to EU legislation, are still valid for this market.

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UK Government is responsible for legislation. For information on legislation and policies relating to that legislation, consult the relevant pages of www.gov.uk.

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

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2022.

Amendments/corrigenda issued since publication

Date	Text affected
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English Version

Eye and face protection for occupational use - Part 1: General requirements - Amendment 1 (ISO 16321-1:2021/Amd 1:2024)

Protection des yeux et du visage à usage professionnel - Partie 1: Exigences générales - Amendement 1 (ISO 16321-1:2021/Amd 1:2024)

Augen- und Gesichtsschutz für berufliche Anwendungen - Teil 1: Allgemeine Anforderungen - Änderung 1 (ISO 16321-1:2021/Amd 1:2024)

This amendment A1 modifies the European Standard EN ISO 16321-1:2022; it was approved by CEN on 17 July 2024.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European foreword

This document (EN ISO 16321-1:2022) has been prepared by Technical Committee ISO/TC 94 "Personal safety -- Personal protective equipment" in collaboration with Technical Committee CEN/TC 85 “Eye protective equipment” the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2022, and conflicting national standards shall be withdrawn at the latest by April 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 166:2001, EN 169:2002, EN 170:2002, EN 171:2002, EN 172:1994, EN 379:2003+A1:2009.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Regulation 2016/425.

For the relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

The following referenced documents are indispensable for the application of this document. For undated references, the latest edition of the referenced document (including any amendments) applies. For dated references, only the edition cited applies. However, for any use of this document ‘within the meaning of Annex ZA, the user should always check that any referenced document has not been superseded and that its relevant contents can still be considered the generally acknowledged state-of-art.

When an IEC or ISO standard is referred to in the ISO standard text, this shall be understood as a normative reference to the corresponding EN standard, if available, and otherwise to the dated version of the ISO or IEC standard, as listed below.

NOTE The way in which these referenced documents are cited in normative requirements determines the extent (in whole or in part) to which they apply.

Undated normative references in the ISO standard	**Clause(s) of the ISO standard**	**Equivalent dated standard**	
		EN	ISO or IEC
ISO 4007	Clause 2 & 3	EN ISO 4007:2018	ISO 4007:2018
ISO 11664-1	Clause 2 & 4.3.1.1	EN ISO 11664-1:2011	ISO 11664-1:2007
ISO 11664-2	Clause 2 & 4.3.1.1	EN ISO 11664-2:2011	ISO 11664-2:2007
ISO 16321-1	Clause 1, 2, & 4.1	EN ISO 16321-1:2020	ISO 16321-1:2020
ISO 18526-1	Clause 2	EN ISO 18526-1:2020	ISO 18526-1:2020
ISO 18526-2	Clause 2	EN ISO 18526-2:2020	ISO 18526-22020

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ISO 18526-3	Clause 2	EN ISO 18526-3 :2020	ISO 18526-3:2020
ISO 18526-4	Clause 2, 6.3 & 7	EN ISO 18526-4 :2020	EN ISO 18526-4 :2020

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 16321-1:2021 has been approved by CEN as EN ISO 16321-1:2022 without any modification.

European foreword to Amendment 1

This document (EN ISO 16321-1:2022/A1:2025) has been prepared by Technical Committee ISO/TC 94 "Personal safety -- Personal protective equipment" in collaboration with Technical Committee CEN/TC 85 “Eye protective equipment” the secretariat of which is held by AFNOR.

This Amendment to the European Standard EN ISO 16321-1:2022 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2025, and conflicting national standards shall be withdrawn at the latest by March 2028.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 16321-1:2021/Amd 1:2024 has been approved by CEN as EN ISO 16321-1:2022/A1:2025 without any modification.

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Annex ZA
(informative)

Relationship between this European Standard and the essential requirements of Regulation 2016/425 aimed to be covered

This European Standard has been prepared under a Commission's standardization request (mandate M/571) to provide one voluntary means of conforming to essential requirements of Regulation 2016/425 C(2020) 7924 final.

Once this standard is cited in the Official Journal of the European Union under that Regulation 2016/425, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Regulation 2016/425 and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Annex II of Regulation 2016/425

Essential Requirements of Regulation 2016/425	Clause(s)/subclause(s) of this EN	Remarks/Notes
1.1.1 Ergonomics	4.3; 7.2	
1.1.2 Level and classes of protection	6.2; 6.3.1; 6.3.2; 6.3.3; 6.3.4; 6.6; 7.1;7.4; 7.10; 7.11; 7.14; 7.15; 7.16; 7.17; 7.18; 7.19; 7.20; 7.21	
1.2.1 Absence of risks and other 'inherent' nuisance factors	5.2, 6.1	
1.2.1.1 Suitable constituent materials	4.2	
1.2.1.2 Satisfactory surface condition of all PPE parts in contact with the user.	4.3	
1.2.1.3 Maximum permissible user impediment	5.1; 5.2; 5.3; 5.5; 6.1; 6.5; 6.7; 7.3	
1.3.1 Adaptation of PPE to user morphology	4.3; 4.5; 5.1; 7.2	
1.3.2 Lightness and design strength	4.1; 7.4; 7.5; 7.6; 7.7; 7.8, 7.12	
1.4 Manufacturer's instructions	9	

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and information		
2.2 PPE "enclosing" the parts of the body to be protected	7.9; 7.13	
2.3 PPE for the face, eyes and respiratory system	4.3; 5; 6.1; 6.5; 6.7; 7.9; 7.13	
2.9 PPE incorporating components which can be adjusted or removed by the user	4.3	
2.12 PPE bearing one or more identification markings or indicators directly or indirectly relating to health and safety	8	
2.14 "Multi risk" PPE	6; 7	This standard describes multiple types of risks. The EHSR is covered by the appropriate combination of requirements, associated with the risks corresponding to the intended use of the eye/face protector
3.1.1 Impact caused by falling or ejected objects and collision of parts of the body with obstacle	7.1; 7.4; 7.9; 7.10; 7.11	This standard does not cover requirements concerning prevention of injuries caused by collision of the face with obstacles.
3.6.1 PPE constituent materials and other components	6.3.2; 6.6; 7.5; 7.14; 7.19; 7.4; 7.10.2; 7.11.2	
3.6.2 Complete PPE ready for use	6.3.2; 7.19	
3.9.1Non-ionising radiation	6; 7.1; 8; 9	
3.10.2 Protection against cutaneous and ocular contact	7.15; 7.16; 7.17; 7.18; 7.20	

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Table ZA.2 — Applicable Standards to confer presumption of conformity as described in this Annex ZA

Column 1 Reference in Clause 2	Column 2 International Standard Edition	Column 3 Title	Column 4 Corresponding European Standard Edition
ISO 4007	ISO 4007:2018	Personal protective equipment - Eye and face	EN ISO 4007:2018
ISO/CIE 11664-1	ISO/CIE 11664-1:2019	Colorimetry – Part 1: CIE standard colorimetric observers	EN ISO/CIE 11664-1:2019
ISO/CIE 11664-2	ISO/CIE 11664-2:2022	Colorimetry – Part 2: CIE standard illuminants	EN ISO/CIE 11664-2:2022
ISO 12312-1	ISO 12312-1:2022	Eye and face protection – Sunglasses and related eyewear - Part 1: Sunglasses for general use	EN ISO 12312-1:2022
ISO 16034	ISO 16034:2002	Ophthalmic optics — Specifications for single-vision ready-to-wear near-vision spectacles	X
ISO 16321-2	ISO 16321-2:2021	Eye and face protection for occupational use — Part 2: Additional requirements for protectors used during welding and related techniques	EN ISO 16321-2:2021
ISO 16321-3	ISO 16321-3:2021	Eye and face protection for occupational use — Part 3: Additional requirements for mesh protectors	EN ISO 16321-3:2022
ISO 18526-1	ISO 18526-1:2020	Eye and face protection — Test methods — Part 1: Geometrical optical properties	EN ISO 18526-1:2020
ISO 18526-2	ISO 18526-2:2020	Eye and face protection — Test methods — Part 2: Physical optical properties	EN ISO 18526-2:2020
ISO 18526-3	ISO 18526-3:2020	Eye and face protection — Test methods — Part 3: Physical and mechanical properties	EN ISO 18526-3:2020
ISO 18526-4	ISO 18526-4:2020	Eye and face protection — Test methods — Part 4: Headforms	EN ISO 18526-4:2020

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ISO 21987	ISO 21987:2017	Ophthalmic optics — Mounted spectacle lenses	EN ISO 21987:2017
ISO 80079-36	ISO 80079-36:2016	Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements	EN ISO 80079-36:2016

The documents listed in the Column 1 of Table ZA.2, in whole or in part, are normatively referenced in this document, i.e. are indispensable for its application. The achievement of the presumption of conformity is subject to the application of the edition of Standards as listed in Column 4 or, if no European Standard Edition exists, the International Standard Edition given in Column 2 of Table ZA.2.

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by ISO/TC 94, *Personal safety — Personal protective equipment*, Subcommittee SC 6, *Eye and face protection*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 85, *Eye protective equipment*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This document cancels and replaces ISO 4849:1981, ISO 4851:1979, ISO 4852:1978 and ISO 4856:1982.

A list of all parts in the ISO 16321 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The family of documents comprised of the ISO 16321 series, the ISO 18526 series and the ISO 18527 series was developed in response to the worldwide stakeholders' demand for minimum requirements and test methods for eye and face protectors traded internationally. ISO 4007 gives the terms and definitions for all the various product types. The test methods are given in the ISO 18526 series, while the requirements for occupational eye and face protectors are given in the ISO 16321 series. Eye protectors for specific sports are mostly dealt with by the ISO 18527 series. A guidance document, ISO 19734, for the selection, use and maintenance of eye and face protectors is under preparation.

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Eye and face protection for occupational use —

Part 1: General requirements

1 Scope

This document specifies general requirements for eye and face protectors. These protectors are intended to provide protection for the eyes and faces of persons against one or more common occupational hazards such as impacts from flying particles and fragments, optical radiation, dusts, splashing liquids, molten metals, heat, flame, hot solids, harmful gases, vapours and aerosols.

Additional requirements for eye and face protectors used during welding and related techniques and for mesh protectors are given in ISO 16321-2 and ISO 16321-3, respectively. 〚A1〛 ISO 16321-4 provides requirements and guidance on protectors against biological hazards[1)]. 〚/A1〛

This document applies to:

— all plano as well as corrective and prescription lensed protectors and components;

— those eye and face protectors used for occupational-type tasks that are performed similarly to an occupation, e.g. "do-it-yourself";

— those eye and face protectors used in educational establishments.

This document does not apply to:

— protectors specifically intended for protection against only solar radiation and used in non-occupational environments for which the ISO 12312 series applies;

— protectors for medically prescribed applications (not occupational), e.g. eye protection for severe dry eye, tints prescribed for medical conditions;

— patient eye protectors during diagnosis or treatment (e.g. ISO/TR 22463);

— protectors for use during medical or e.g. aesthetic applications, e.g. intense light sources (ILS) for which the ISO 12609 series applies;

— protectors specifically intended for sports for which the ISO 18527 series applies;

— laser protectors;

— face protectors intended for live-working to protect against short-circuit electric arcs for which IEC 62819 applies;

— protectors intended to protect against ionizing radiation, e.g. X-rays, for which IEC 61331-3 applies.

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. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4007, *Personal protective equipment — Eye and face protection — Vocabulary*

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

〚A1〛 1) In preparation. 〚/A1〛

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

〚A1〛 ISO 12312-1:2022 〚A1〛, *Eye and face protection — Sunglasses and related eyewear — Part 1: Sunglasses for general use*

ISO 16034:2002, *Ophthalmic optics — Specifications for single-vision ready-to-wear near- vision spectacles*

ISO 16321-2:2021, *Eye and face protection for occupational use — Part 2: Additional requirements for protectors used during welding and related techniques*

ISO 16321-3:2021, *Eye and face protection for occupational use — Part 3: Additional requirements for mesh protectors*

ISO 18526-1:2020, *Eye and face protection — Test methods — Part 1: Geometrical optical properties*

ISO 18526-2:2020, *Eye and face protection — Test methods — Part 2: Physical optical properties*

ISO 18526-3:2020, *Eye and face protection — Test methods — Part 3: Physical and mechanical properties*

ISO 18526-4, *Eye and face protection — Test methods — Part 4: Headforms*

ISO 21987:2017, *Ophthalmic optics — Mounted spectacle lenses*

ISO 80079-36:2016, *Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4007 apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 General requirements for protectors

4.1 Ambient temperatures

Protectors[1)] described in this document are intended for use at normal ambient temperatures (23 ± 5) °C. In order to ensure that critical aspects of protection are not compromised due to temperatures towards the extremes of the normal range of occupational environments from (−5 ± 2) °C to (+55 ± 2) °C, physical and mechanical requirements at extremes of temperature are included (sometimes optionally) in this document. These physical and mechanical requirements can also be provided by manufacturers for validation of claims for protection at temperatures below (−5 ± 2) °C and/or above (+55 ± 2) °C.

4.2 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. The risks posed by substances leaking or evaporating from the protector that can come into prolonged contact with the wearer, shall be reduced by the manufacturer to within the limits of any applicable regulatory requirement.

ς) For the purposes of this document, "protector" is used as a general term for eye and/or face protectors such as, but not limited to, spectacles, goggles, face shields and eye shields.

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Special attention shall be given to substances that are allergenic, carcinogenic, mutagenic or toxic to reproduction.

NOTE 1 Excessive pressure due to a poor fit on the head, chemical irritation and allergy are known to produce reactions. Rare or idiosyncratic reactions to any material are known to occur and the individual wearer is well advised to avoid those types of frame materials.

Substances recommended for cleaning, maintenance or disinfection shall be known to be unlikely to have any adverse effect upon the wearer, when applied in accordance with the instructions given in the information to be supplied by the manufacturer.

Manufacturers/suppliers shall perform an appropriate risk analysis on potentially harmful substances contained in the protector that, when the protector is used under the conditions and for the purposes intended, the health (and safety) of the wearer shall not be compromised.

The following are examples of documents that represent the appropriate information:

a) specification of the material(s);

b) safety data sheets relating to the materials;

c) information relating to the suitability of the materials for use with food, in medical devices, or other relevant applications;

d) information relating to toxicological, allergenic, carcinogenic, toxic to reproduction, or mutagenic investigations on the materials.

NOTE 2 Specific national regulations with regard to restriction of certain chemical substances need to be observed, for example release of nickel.

4.3 Construction and adjustment

Areas of the protector that may, during intended use, come into contact with the wearer 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 instructions given in the information to be supplied by the manufacturer) shall facilitate adjustment, removal and attachment without the use of tools.

Any adjustment system incorporated in the protector shall maintain the intended fit for the foreseeable conditions of use.

The test shall be carried out by physical inspection in accordance with ISO 18526-3:2020, 6.1.

4.4 Cleaning and/or disinfection

The protectors shall be cleaned only once in accordance with the cleaning and/or disinfection procedures in the information to be supplied by the manufacturer before being subjected to testing.

4.5 Headform(s)

Unless the manufacturer specifies the headform(s) in accordance with ISO 18526-4 that is/are compatible with the protector, the test methods where (a) headform(s) is/are required shall use the headform 1-M in accordance with ISO 18526-4 as the default.

4.6 Mandatory and optional requirements

In this document both optional and mandatory requirements are described. Depending on the intended use and/or the manufacturer's claimed specification, some requirements marked as optional become mandatory.

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