

SILMADE JA NÄO KAITSEVAHENDID TÖÖKESKKONNAS  
KASUTAMISEKS. OSA 2: LISANÕUDED KAITSETELE,  
MIDA KASUTATAKSE KEEVITAMISEL JA SELLEGA  
SEONDUVATEL TÖÖDEL

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

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 16321-2:2021 sisaldab Euroopa standardi EN ISO 16321-2:2021 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 16321-2:2021 consists of the English text of the European standard EN ISO 16321-2:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 29.09.2021.	Date of Availability of the European standard is 29.09.2021.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 13.340.20

**Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele**

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis- ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autoriõiguse kaitse kohta, võtke palun ühendust Eesti Standardimis- ja Akrediteerimiskeskusega: Koduleht [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

**The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation**

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about standards copyright protection, please contact the Estonian Centre for Standardisation and Accreditation: Homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

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

Protection des yeux et du visage à usage professionnel  
- Partie 2: Exigences complémentaires relatives aux  
protecteurs utilisés pour le soudage et les techniques  
connexes (ISO 16321-2:2021)

Augen- und Gesichtsschutz für berufliche  
Anwendungen - Teil 2: Zusätzliche Anforderungen an  
Schutzgeräte, die während des Schweißens und  
verwandten Verfahren verwendet werden (ISO 16321-  
2:2021)

This European Standard was approved by CEN on 7 November 2020.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a 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 European Standard 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.

CEN members are the national standards bodies of 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 United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

## European foreword

This document (EN ISO 16321-2:2021) 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 March 2022, and conflicting national standards shall be withdrawn at the latest by September 2024.

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 given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / 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 websites.

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 18526-2:2020
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 16321-2:2021 has been approved by CEN as EN ISO 16321-2:2021 without any modification.

## 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 [Full reference to the request "M/571"/"C(2015) xxxx final"] to provide one voluntary means of conforming to requirements of Regulation 2016/425.

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)/sub-clause(s) of this EN	Remarks/Notes
		Most Essential Requirements of Regulation 2016/425 are wholly or partially covered by reference to EN ISO 16321-1:2020 as described in Clause 4.1 of this standard.
1.1.1 Ergonomics	4.1; 4.2; 4.3	By reference to EN ISO 16321-1:2020
1.1.2 Level and classes of protection	4; 5	By reference to EN ISO 16321-1: 2020
1.2.1 Absence of risks and other 'inherent' nuisance factors	4.1	By reference to EN ISO 16321-1: 2020
1.2.1.1 Suitable constituent materials	4.1	By reference to EN ISO 16321-1: 2020
1.2.1.2 Satisfactory surface condition of all PPE parts in contact with the user	4.1	By reference to EN ISO 16321-1: 2020
1.2.1.3 Maximum permissible user impediment	4.3; 4.4	By reference to EN ISO 16321-1: 2020
1.3.1 Adaptation of PPE to user morphology	4.1	By reference to EN ISO 16321-1: 2020
1.3.2 Lightness and design strength	5.2	By reference to EN ISO 16321-1: 2020
1.4 Manufacturer's instructions and information	7	
2.1 PPE incorporating adjustment	4.1	By reference to EN ISO 16321-1: 2020

Essential Requirements of Regulation 2016/425	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
systems		
2.3 PPE for the face, eyes and respiratory system	4.2; 4.3.2; 4.4.3; 4.4.4; 4.4.5; 5.2.2	By reference to EN ISO 16321-1: 2020
2.9 PPE incorporating components which can be adjusted or removed by the use	4.1	By reference to EN ISO 16321-1: 2020
2.12 PPE bearing one or more identification markings or indicators directly or indirectly relating to health and safety	6	
3.1.1 Impact caused by falling or ejected objects and collision of parts of the body with obstacle	4.1	By reference to EN ISO 16321-1: 2020
3.6.1 PPE constituent materials and other components	4.3.1; 5.2.5	By reference to EN ISO 16321-1: 2020
3.6.2 Complete PPE ready for use	4.3.1; 5.2.5; 7	By reference to EN ISO 16321-1: 2020
3.9.1 Non-ionising radiation	4.3.1; 4.4; 5.1	

**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.

# Contents

Page

<b>Foreword</b>	<b>iv</b>
<b>Introduction</b>	<b>v</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>1</b>
<b>4 Requirements</b>	<b>1</b>
4.1 General	1
4.2 Field of view	2
4.3 Requirements for welding filters	2
4.3.1 Transmittance requirements and scale numbers	2
4.3.2 Narrow angle scatter (reduced luminance coefficient)	4
4.3.3 Minimum robustness for unmounted welding filters (Static Load Test)	4
4.3.4 Resistance to UV radiation	5
4.4 Automatic welding filters	5
4.4.1 General	5
4.4.2 Transmittance requirements	6
4.4.3 Luminous transmittance variation over time for automatic welding filters	7
4.4.4 Variation in luminous transmittance for automatic welding filters	7
4.4.5 Switching time and holding time of automatic welding filters	8
4.4.6 Manual control of dark shade number	9
4.4.7 Resistance to thermal exposure of automatic welding filters	9
4.4.8 Optical sensitivity of welding arc detection by automatic welding filters (Optional requirement)	10
4.4.9 Resistance to surface damage due to fine flying particles (Optional requirement)	10
<b>5 Requirements for welding helmets, welding hand shields, welding frames and welding mountings</b>	<b>10</b>
5.1 Optical requirements	10
5.1.1 Non-filter area transmittance	10
5.1.2 Luminous reflectance of welding helmets and welding hand shields	10
5.2 Physical and mechanical requirements	11
5.2.1 Area to be protected for welding helmets	11
5.2.2 Light tightness of welding protectors	11
5.2.3 Drop robustness for welding protectors	11
5.2.4 Electrical insulation of welding helmets and welding hand shields	11
5.2.5 Resistance to penetration by hot solids of welding helmets and welding hand shields	11
5.2.6 Dimensions and mass of welding hand shields	11
<b>6 Marking of welding protectors</b>	<b>12</b>
6.1 General	12
6.2 Mandatory markings on welding filters	12
6.3 Mandatory markings on welding protectors except for welding filters	12
6.4 Optional markings on welding filters	13
6.5 Optional markings on welding protectors except for welding filters	13
6.6 Examples of markings	13
<b>7 Information to be supplied by the manufacturer</b>	<b>14</b>
<b>Bibliography</b>	<b>15</b>



## 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](http://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](http://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 on 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 the following URL: [www.iso.org/iso/foreword.html](http://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 first edition of ISO 16321-2 cancels and replaces ISO 4850:1979.

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](http://www.iso.org/members.html).