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Foreword

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This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Personal protective equipment*, Subcommittee SC 6, *Eye and face protection*.

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

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Eye and face protection for occupational use

Part 1: General requirements

AMENDMENT 1:

Scope

Add at the end of the second paragraph:

"ISO 16321-4 provides requirements and guidance on protectors against biological hazards¹⁾."

and the following footnote:

¹⁾ In preparation."

Clause 2 — ~~normative~~ Normative references

Change the date of ISO 12312-1 to 2022.

5.1

Replace the two existing paragraphs with:

"Excluding face shields and eye shields mounted on another item of PPE that restricts the superior field of view, e.g., a protective helmet, bumpcap, headgear or hood, protectors, when in the as-worn position and measured at the corneal apices of the headform in accordance with ISO 18526-3:2020, 6.2, shall have a minimum unobstructed field of view in front of each eye of 30° temporally and nasally in the horizontal meridian, and 30° superiorly and inferiorly in the vertical meridian.

Face shields and eye shields mounted on another item of PPE that restricts the superior field of view, when in the as-worn position and measured at the corneal apices of the headform in accordance with ISO 18526-3:2020, 6.2, shall have a minimum unobstructed field of view in front of each eye of 30° temporally and nasally in the horizontal meridian, and

— a minimum vertical field of view in the superior direction of not less than 7°, and

¹⁾ In preparation

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- a minimum field of view in the inferior direction of 30°, and
- a minimum field of view in the vertical direction (superior and inferior combined) of 60°.

Protectors used for driving shall have a minimum unobstructed field of view in front of each eye of 60° temporally and 30° nasally in the horizontal meridian and 30° superiorly and inferiorly in the vertical meridian, when measured at the corneal apices of the headform in accordance with ISO 18526-3:2020, 6.2."

6.3.3.2, Table 8

Amend the headers in columns 3 and 4, row 4 (change of < to ≤):

Table 8 — Transmittance requirements for sunglare filters for occupational use, code letter G

Scale number	Wavelength range from 280 nm to 400 nm			Visible spectral range	Optional infrared spectral range
	Maximum solar UV-B transmittance	Maximum solar UV-A transmittance	Maximum mean 380 nm to 400 nm transmittance	Luminous transmittance	Maximum solar IR transmittance
	τ_{SUVB}	$\tau_{SUVA\ 380}$	$\tau_{m380-400}$	$\tau_{v,D65}$	τ_{SIR}
	$280\text{ nm} \leq \lambda \leq 315\text{ nm}$	$315\text{ nm} \leq \lambda \leq 380\text{ nm}$	$380\text{ nm} \leq \lambda \leq 400\text{ nm}$	$380\text{ nm} \leq \lambda \leq 780\text{ nm}$	$780\text{ nm} \leq \lambda \leq 2\ 000\text{ nm}$
	(%)%	(%)%	(%)%	(%)%	(%)%

6.3.3.3

Replace the existing text with:

"Sunglare filters that meet the mandatory transmittance requirements given in Table 8 shall be marked by code letter G. Sunglare filters of shade numbers 0, 1, 2 or 3 shall comply with the requirements of 6.1, detection of signal lights, and shall be marked with G0, G1, G2 or G3. Sunglare filters of scale number G0, G1, G2 or G3 are suitable for road use and driving.

Sunglare filters of scale number G4 comply with the requirements of 6.1 but are not suitable for road use and driving.

Photochromic filters shall be identified and labelled with their shade numbers corresponding to their faded state $\tau_{v,0}$ and darkened state $\tau_{v,1}$, e.g. G0-2.

Sunglare filters that are claimed to meet the optional infrared transmittance requirements shall be marked with the code letter GR-"

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6.3.3.4.2

~~Paragraph 2~~—~~In the second paragraph~~, delete code letter L and write as follows:

"When tested in accordance with ISO 18526-2:2020, 15.2, the polarizing efficiency, *P*, shall be ≥78 % for filter categories G2, G3, G4 and ≥60 % for filter category G1.

NOTE 1 Filters of category G0 do not have any useful polarizing effect."

6.3.3.4.3

~~Paragraph 2~~—~~In the second paragraph~~, delete code letter L and write as follows:

~~...~~" Table 8 and the detection of signal lights requirements from 6.1 (for filter number G0 to G3)~~...~~"

6.6

~~3~~~~In the third~~ paragraph—, delete code letter GL4 and write as follows:

"Sunglare filters with the scale number G4 shall provide temporal shielding in accordance with ISO 12312-1:2022, 11.2."

7.1.1

Replace the first paragraph with the following:

Figures 1 to 4 and Tables 11 to 14 describe the minimum areas on the headform to be protected. These areas include both frontal and lateral protection zones. The areas indicated in Figures 1 to 4 are illustrative only, and are not to scale, especially as the relative dimensions vary with the headform under consideration. Refer to the data in the tables for the required dimensions.

NOTE:—The lateral protection has been clarified to align with that in many regional and national standards, eg, EN 166.

The dimensions of the headforms are defined in ISO 18526-4.

Replace Figures 1, 2, 3 and 4 with the following Figures:

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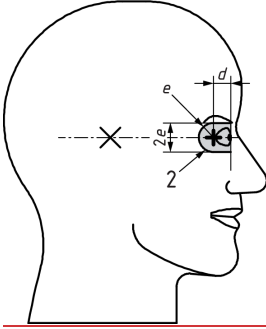
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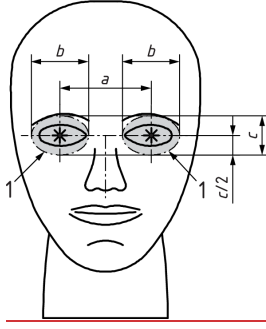
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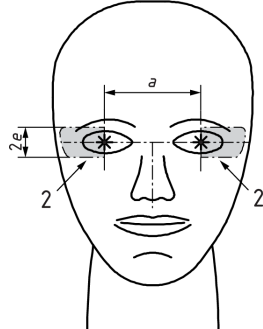
(a) Lateral area

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(b) Frontal area

16321_1_ed1amd1fig1c.EPS



(c) Lateral area as seen from the front

Replace the key with the following:

- Key**
- 1 frontal eye protection zone
 - 2 lateral eye protection zone

1632
1-
1-ed1
amd1 corneal apices and pupil centres (centres of the ellipse)
fig1-k
ey1-E
PS *

1632
1-
1-ed1
amd1 lateral canthus
fig1-k
ey2-E
PS +

1632
1-
1-ed1
amd1 resting point of the sides
fig1-k
ey3-E
PS X

^{a-e} As defined in Table 11.

Figure 1 — Eye protection zone — Minimum area to be protected (basic impact) — (a) lateral area, (b) frontal area and (c) lateral area as seen from the front

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1_ed1
amd1 corneal apices and pupil centres (centres of the ellipse)
fig1_k
ey1_E
PS*

1632
1-
1_ed1
amd1 lateral canthus
fig1_k
ey2_E
PS+

1632
1-
1_ed1
amd1 resting point of the sides
fig1_k
ey3_E
PSX

^{a-e} As defined in Table 12.

Figure 2 — EyeOrbital protection zone (OPZ) — Minimum area to be protected [impact level C (45 m/s)]
(a) lateral area, (b) frontal area

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7.1.1, Table 12

Replace by the following:

Table 12 — Dimensions of orbital protection zone (impact level C) for individual headforms based on interpupillary distance and corneal apex position
Tolerance on dimensions ±0,5 mm

Dimensions in millimetres

Dimensions see Figure 2	Headform						
	1-C12	1-S	1-M	1-L	2-S	2-M	2-L
<i>a</i> ^a	58	60	64	68	63	64	70
<i>b</i> ^a	32	36	40	42	33	35	40
<i>c</i> ^a	26	30	33	35	27	29	33
<i>d</i> ^a	8	9	12	13	7	8	9

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