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AMENDMENT 1
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Eye and face protection for occupational use —

Part 1: General requirements

AMENDMENT 1

Protection des yeux et du visage à usage professionnel —
Partie 1: Exigences générales
AMENDEMENT 1

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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*, 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).

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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 hazards[1)]."

and the following footnote:

"[1)] In preparation."

Clause 2, 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

— 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 infra-red 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} 280 nm ≤ λ ≤ 315 nm %	$\tau_{SUVA\ 380}$ 315 nm ≤ λ ≤ 380 nm %	$\tau_{m380\text{-}400}$ 380 nm ≤ λ ≤ 400 nm %	$\tau_{v,D65}$ 380 nm ≤ λ ≤ 780 nm %	τ_{SIR} 780 nm ≤ λ ≤ 2 000 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."

6.3.3.4.2

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

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

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

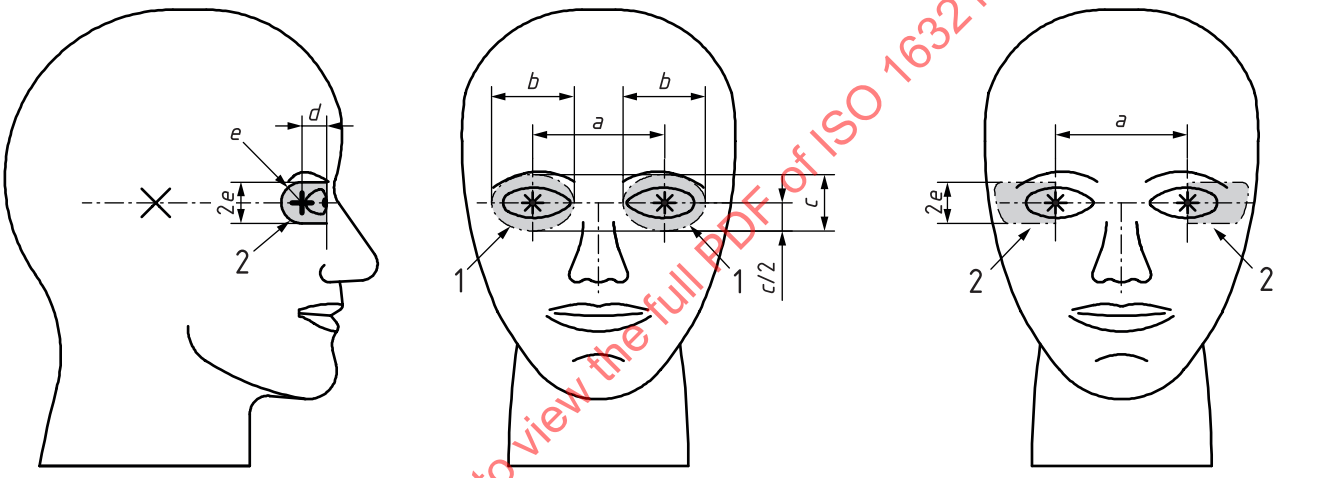
Replace the first paragraph with the following:

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:



a) Lateral area **b) Frontal area** **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

✳ corneal apices and pupil centres (centres of the ellipse)

+ lateral canthus

× resting point of the sides

a-e As defined in Table 11.

Figure 1 — Eye protection zone — Minimum area to be protected (basic impact)

7.1.1, Table 11

Replace by the following:

Table 11 — Dimensions of eye protection zone (basic impact level) for individual headforms based on interpupillary distance and corneal apex position
Tolerance on dimensions ±0,5 mm

Dimensions in millimetres

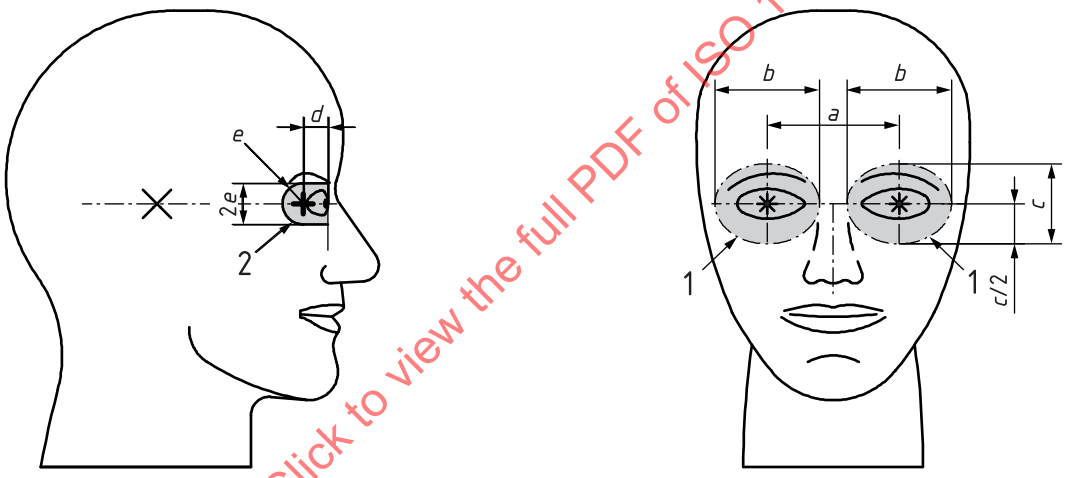
Dimensions see Figure 1	Headform						
	1-C12	1-S	1-M	1-L	2-S	2-M	2-L
a[a]	58	60	64	68	63	64	70
b	24	36	40	42	33	35	40
c	20	25	28	29	23	24	28
d	8	9	12	13	7	8	9
e	10 mm around lateral canthus location				10 mm around lateral canthus location		

[a] Dimension *a* is the same as dimension *D* in ISO 18526-4:2020, Table 2 and Table 3.

NOTE There are no dimensions available for headform 2-C12.

7.1.1, Figure 2

Replace by the following:



a) Lateral area **b) Frontal area**

Key

1 frontal orbital protection zone
2 lateral orbital protection zone
✳ corneal apices and pupil centres (centres of the ellipse)
+ lateral canthus
× resting point of the sides
a-e As defined in Table 12.

Figure 2 — Orbital protection zone (OPZ) — Minimum area to be protected [impact level C (45 m/s)]

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

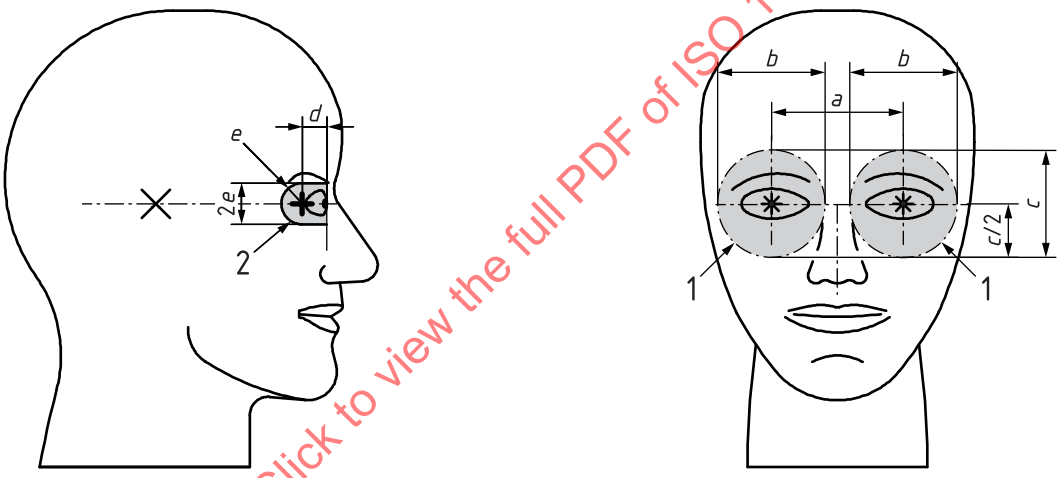
Dimensions see Figure 2	Headform						
	1-C12	1-S	1-M	1-L	2-S	2-M	2-L
a[a]	58	60	64	68	63	64	70
b	32	36	40	42	33	35	40
c	26	30	33	35	27	29	33
d	8	9	12	13	7	8	9
e	10 mm around lateral canthus location				10 mm around lateral canthus location		

[a] Dimension *a* is the same as dimension *D* in ISO 18526-4:2020, Table 2 and Table 3.

NOTE There are no dimensions available for headform 2-C12.

Figure 3

Replace by the following:



a) **b)**

Replace the Key with the following:

Key

1 frontal extended orbital protection zone
2 lateral extended orbital protection zone
✳ corneal apices (centres of the circles)
+ lateral canthus
× resting point of the sides
a-e As defined in Table 13.

Figure 3 — Extended orbital protection zone (EOPZ) — Minimum area to be protected [(impact level D (80 m/s)]

7.1.1, Table 13

Replace by the following:

Table 13 — Dimensions of extended orbital protection zone (impact level D) for individual headforms based on interpupillary distance and corneal apex position

Tolerance on dimensions ±0,5 mm

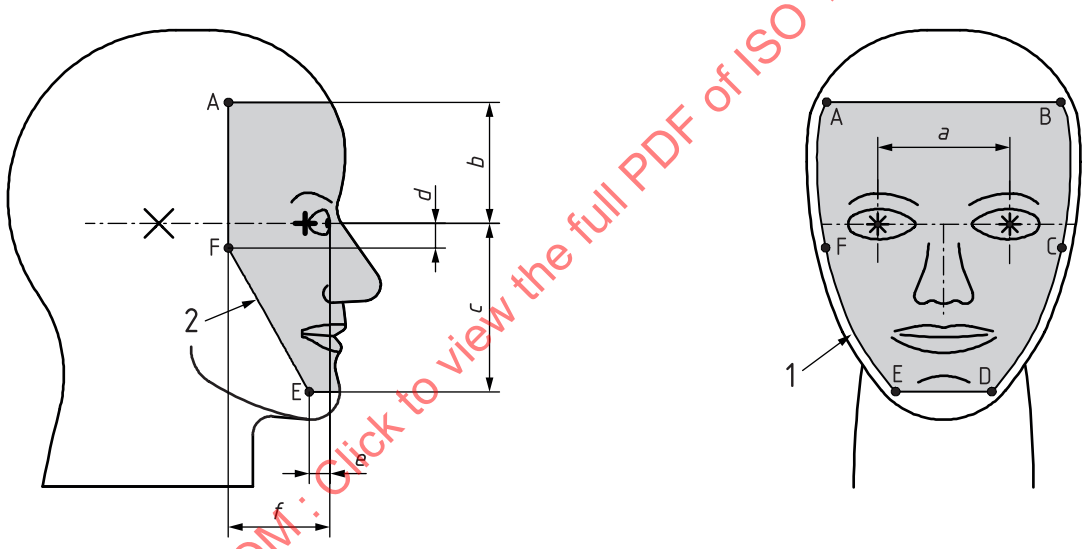
Dimensions in millimetres

Dimensions see Figure 2	Headform						
	1-C12	1-S	1-M	1-L	2-S	2-M	2-L
a[a]	58	60	64	68	63	64	70
b and *c*	41	47	52	55	43	45	51
d	8	9	12	13	7	8	9
e	10 mm around lateral canthus location				10 mm around lateral canthus location		

[a] Dimension *a* is the same as dimension *D* in ISO 18526-4:2020, Table 2 and Table 3.

NOTE There are no dimensions available for headform 2-C12.

Replace Figure 4 and its key with the following:



Key

ABCDEFA	face protection zone
1	frontal protection zone
2	lateral protection zone
✳	corneal apices and pupil centres
┼	lateral canthus
✕	resting point of the sides
a-f	As defined in Table 14.

7.1.2

Replace the current text by the following:

7.1.2.1 Frontal protection

"For the basic impact level, the protector (combined lens and/or frame) shall cover the minimum area to be protected as defined in Figure 1 b) and Table 11 on the headform(s) in accordance with ISO 18526-4 and specified by the manufacturer. The area is bounded by an ellipse of major and minor axes *b* and *c* respectively, centred on the corneal apex of each eye of the headform (marked * in the figures) and projected horizontally on to the headform from the front.

If an impact level C or D is claimed, depending on the impact velocity in accordance with 7.10, the minimum area to be protected for protectors shall protect, by means of the lens and/or frame, the orbital or extended orbital protection zone (shown in Figures 2 b) or 3 b) and Tables 12 and 13 respectively).

NOTE 1 In the case of Impact level D, the dimensions, *b* and *c*, are numerically equal, so that the projected area is a circle.

NOTE 2 These dimensions define the areas to be protected on the headforms and not the dimensions and shape of the protector.

The protection from frontal impact shall be assessed in accordance with ISO 18526-3:2020, 6.3. The eye protector shall prevent any portion of the end of the rod from touching the specified area to be protected on the headform.

7.1.2.2 Lateral protection

Basic impact level. Protectors for this level of protection that provide frontal but not lateral protection shall be accompanied by the warning "For protection against frontal impact only".

All other protectors. The protector (combined lens and/or frame) shall cover the minimum area to be protected for the Basic impact level and high speed particle impact levels C and D defined in Figures 1 a), 2 a) and 3 a) and Tables 11 to 13 on the headform(s) in accordance with ISO 18526-4 and specified by the manufacturer. The area is bounded:

a) to the posterior of the headform by a semicircle of radius, *e*, centred on the lateral canthus of each eye of the headform, situated a distance, *d*, posterior to the corneal apex labelled **+**;

b) above and below by lines a distance, *e*, from the lateral canthus; and

c) to the front, by a vertical line passing through the corneal apex projected laterally on to the headform.

The lateral protection shall be projected horizontally onto the headform from the side in a direction parallel to the line joining the corneal apices. For Basic impact, and levels C and D (Figures 1 to 3, Tables 11 to 13), this projection stops on the headform at a vertical plane in the frontal direction through the corneal apex – see Figure 1 c).

For basic impact level, the lateral protection shall be provided by a wrap-around design of the protector or permanently attached side shields.

NOTE 1 The dimensions and location of the area to be protected from lateral impact are the same for Basic Impact, Impact level C and Impact level D.

NOTE 2 These dimensions define the areas to be protected on the headforms and not the dimensions and shape of the protector.

The protection from lateral impact shall be assessed in accordance with ISO 18526-3:2020, 6.4 except that the direction of probing shall extend from the lateral direction around to the frontal direction defined in 7.1.2.1. The orientation of the probe shall remain horizontal. The eye protector shall prevent any portion of the end of the rod from touching the specified area to be protected on the headform.

Impact levels C and D. If an impact level C or D is claimed, depending on the impact velocity in accordance with 7.10, 7.1.4 shall apply."

7.10.1