

4.1.3 Cleaning and disinfection

All parts of a mesh eye and face protector shall withstand cleaning and disinfection in accordance with the agents and procedures recommended by the manufacturer.

All the tests shall be carried out after subjecting the product to the cleaning and/or disinfection procedures recommended by the manufacturer.

4.1.4 Innocuousness of materials

Materials that come into contact with the wearer's skin shall not be known to be likely to cause irritation or any other adverse effect to health.

Testing shall be done in accordance with 5.7.

Those metal parts of mesh eye protectors and frames that come into direct and prolonged contact with the skin of the wearer shall have a nickel release of less than $0,5 \mu\text{g}/\text{cm}^2/\text{week}$ when tested according to EN 1811.

Coated items shall first be conditioned according to EN 12472.

4.1.5 Number of apertures in a mesh

The minimum number of apertures in the mesh shall be 15 per cm^2 .

Testing shall be done in accordance with 5.7.

4.2 Design and manufacture

4.2.1 General construction

Mesh eye and face protectors shall be free from projections, sharp edges or other defects which are likely to cause discomfort or injury to the wearer during use.

Testing shall be done in accordance with 5.7.

4.2.2 Headbands

Headbands used as the principal means of retention shall be at least 10 mm wide over any portion which may come into contact with the wearer's head, and shall be adjustable or self-adjusting.

Testing shall be done in accordance with 5.7.

4.2.3 Adjustability and/or replacement of components

Adjustable parts or components incorporated in mesh eye and face protectors shall be easily adjustable and where intended to shall be easily replaceable without the use of special tools.

Testing shall be done in accordance with 5.7.

4.2.4 Minimum area of coverage and field of vision of a mesh face screen

In the in-use position, the mesh face screen shall cover at least the facial region rectangle EFGH of the appropriate head form, defined in Figure 11 of EN 168:2001, when assessed in accordance with EN 168:2001, 10.2.

Field of vision requirements of EN 166:2001, 7.1.1 shall be met when the mesh face screen is tested according to EN 168:2001, Clause 18.

4.2.5 Minimum area of coverage and field of vision of a mesh eye protector

In the in-use position, the mesh eye protector shall cover at least the facial region rectangle ABCD of the appropriate head form, defined in Figure 11 of EN 168:2001, when assessed in accordance with EN 168:2001, 10.2.

Field of vision requirements shall be met when the mesh eye protector is tested according to EN 168:2001, Clause 18.

The minimum dimension of ocular area(s) shall be in accordance with 7.1.1 of EN 166:2001.

4.2.6 Comfort and retention in use

When subjected to the test procedure in 5.8, the mesh eye/face protector shall remain in its in-use position and shall not cause significant discomfort.

4.2.7 Contact with metal parts

When subjected to the test procedure in 5.8, metal parts of the mesh eye protector shall not come into direct contact with the head/face of the wearer.

4.3 Performance

4.3.1 Luminous transmittance

The luminous transmittance of the mesh ocular area shall be greater than 20,0 % when measured in accordance with 5.3.

4.3.2 Variations in luminous transmittance

The variations in luminous transmittance shall be in accordance with 7.1.2.2.3 of EN 166:2001.

4.3.3 Additional or alternative oculars

Additional or alternative oculars fitted to a mesh eye and face protector shall comply with 7.1 of EN 166:2001. The additional or alternative ocular shall meet or exceed the robustness or resistance to high speed particles requirements appropriate to the mesh eye protector to which it is fitted.

4.3.4 Robustness

The complete mesh eye and face protector shall be submitted to the impact of a steel ball striking the ocular area and the lateral protection at a specified speed. If the use of any cover and/or backing lens is recommended by the manufacturer the test shall be performed with a mesh face screen conforming to this recommendation.

Testing shall be done in accordance with 5.4.

The following defects shall not occur during testing:

a) Mesh fracture in the ocular area:

The mesh shall be considered to have fractured if the steel ball passes through the mesh or if at any point in the ocular area a gap or tear is produced which will allow a (300 ± 3) mm long and $(3,0 \pm 0,1)$ mm diameter steel rod with end faces which are flat and perpendicular to its longitudinal axis to pass through under its own weight in any orientation.

b) Ocular area deformation:

The mesh ocular area shall be considered to have been deformed when a mark appears on the white paper on the opposite side to that struck by the steel ball.

c) Failure of ocular housing, mesh face screen or frame:

An ocular housing or mesh face screen or frame shall be considered to have failed if it separates into two or more pieces, or if it is no longer capable of holding an ocular in position, or if an unbroken ocular detaches from the frame, or if the ball breaks through the housing, mesh face screen or frame.

4.4 Protection against high speed particles (optional)

The protector shall fulfil the requirements for protection against high speed particles in accordance with 7.2.2 of EN 166:2001. Defects noted at 4.3.4 a), b) and c) shall not occur.

A mesh face screen tested with an additional or alternative ocular shall be fitted with an ocular meeting the relevant high speed particle resistance requirements. If the use of any cover and/or backing lens is recommended by the manufacturer the test shall be performed with a mesh face screen conforming to this recommendation.

Testing shall be done in accordance with 5.5.

NOTE Eye-protectors offering protection against high-speed particles should provide lateral protection (see 7.2.8 of EN 166: 2001).

5 Test methods

5.1 Resistance to corrosion of metal parts

Testing shall be done in accordance with Clause 8 of EN 168:2001.

5.2 Resistance to ignition

Testing shall be done in accordance with Clause 7 of EN 168:2001.

5.3 Luminous transmittance

Testing shall be done in accordance with Clause 6 of EN 167:2001.

5.4 Robustness

Testing shall be done in accordance with 3.2 of EN 168:2001.

5.5 Protection against high speed particles (optional)

Testing shall be done in accordance with Clause 9 of EN 168:2001.

5.6 Allocation of test requirements and examination test schedule for mesh eye and face protectors

The allocation of test requirements and examination test schedule for mesh eye and face protectors shall be as given in Table 1.

5.7 Visual inspection

The visual inspection may entail a certain amount of dismantling in accordance with the manufacturer's instructions for maintenance. The visual inspection shall include the assessment of the device marking (if applicable) and information supplied by the manufacturer (if applicable) and any safety data sheets (if applicable) or declarations relevant to the materials used in its construction.

5.8 Test for comfort and security of fit

One device shall be adjusted appropriately and donned by two different test subjects. With the mesh eye/face protector in the in-use position, the following actions shall be undertaken, starting from a standing position.

- turn head fully left and right;
- tilt head fully back and forward;
- standing jump on the spot five times;
- bend forward at the hips to touch the toes, keeping the neck in line with the back. While bent over, turn the head from side to side;
- observe for direct contact between the wearer's head/face and any exposed metal components of the eye protector.

Note any significant discomfort or insecurity of the fit of the mesh eye/face protector.

Table 1 — Allocation of test requirements and examination test schedule for mesh eye and face protectors

Test order	Requirement	Test specimen Number											Allocation of test requirements	
		1	2	3	4	5	6	7	8	9	10	11	Mesh spectacles, goggles and face screens	Mesh eye protectors against high speed particles
1	Marking (see Clause 7)	X											Yes	Yes
2	Information supplied by the manufacturer (see Clause 8)	X											Yes	Yes
3	Cleaning and disinfection (see 4.1.3)	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes
4	Number of apertures (see 4.1.5)	X											Yes	Yes
5	Design and manufacture (see 4.2)	X											Yes	Yes
6	Luminous transmittance (see 4.3.1)		X										Yes	Yes
7	Variations in luminous transmittance (see 4.3.2)			X									Yes	Yes
8	Robustness (see 4.3.4)				X	X	X	X					Yes	Yes
9	Protection against high speed particles (see 4.4)								X	X	X	X	No	Yes
10	Resistance to corrosion (see 4.1.1)		X										Yes	Yes
11	Resistance to ignition (see 4.1.2)			X									Yes	Yes
12	Comfort and retention in use (see 4.2.6)	X											Yes	Yes
13	Innocuousness of materials (see 4.1.4)	X											Yes	Yes
X Testing to be carried out on indicated specimen.														
Empty field No testing specified.														
NOTE 1 If testing requires the oculars to be mounted, then appropriate frames should be used.														
NOTE 2 For testing, frames supplied without oculars fitted should, where necessary, be fitted with appropriate oculars.														
NOTE 3 The sequence of tests 1 to 5 and 12 to 13 is not important and may be changed by the testing laboratory.														
NOTE 4 Specimen on which the high speed particle test is to be conducted need not be subjected to the robustness test.														
NOTE 5 Test evaluation should allow no defectives, and no account should be taken of measurement uncertainties.														

6 Designation of the field of use of mesh eye and face protectors

The symbols given in Table 2 shall be used for the designation of the field of use of mesh eye and face protectors.

Table 2 — Symbols of the field of use of mesh eye and face protectors

Symbol	Field of use	Mechanical strength	Requirements in accordance with clause
S	basic use	robustness	4.3.4
F	high speed particles ^a	low energy impact	4.4
B		medium energy impact	4.4
A		high energy impact	4.4

^a If the symbols F, B and A are not common to both the mesh, the additional or alternative ocular and the frame then it is the lower level which shall be assigned to the complete mesh eye and face protector.

EXAMPLE Designation of a mesh face screen for high speed particles and high energy impact (A):

Mesh face screen EN 1731:2005-A

7 Marking

In order to be able to identify and use a mesh eye and face protector as intended, it shall be permanently marked to indicate its possible field of use.

The marking shall be visible when the complete mesh eye and face protector is assembled and shall not encroach into the minimum visible aperture (ocular area) defined in 4.2.5 of this standard.

The number of this standard shall be applied to frames, housings and mesh oculars where separable. It shall not be applied to additional or alternative protective oculars.

The frame and ocular shall be marked separately. If the ocular and frame form a single unit, the complete marking shall be applied to the frame.

For examples of typical marking refer to 9.2 of EN 166:2001.

The marking of mesh eye and face protectors shall contain the following information:

- identification of the manufacturer;
- number of this standard;
- symbol of mechanical strength according to Table 2 of this standard.

Marking of mesh visors or additional or alternative oculars shall be in accordance with 9.2 of EN 166:2001.