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IS 9995 (1981): Specification for visor for non-metal police and firemen's helmets [CED 22: Fire Fighting]



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Indian Standard
SPECIFICATION FOR
VISOR FOR NON-METAL POLICE AND
FIREMEN'S HELMETS

UDC 614.891.1 : 614.893.63 : 351.74



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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Rs 5.00 Gr 3

January 1982

Indian Standard

SPECIFICATION FOR VISOR FOR NON-METAL POLICE AND FIREMEN'S HELMETS

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Indian Standard
SPECIFICATION FOR
VISOR FOR NON-METAL POLICE AND
FIREMEN'S HELMETS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 September 1981, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Indian Standards covering helmets for police and firemen have already been formulated. For such helmets, a visor also forms an essential part as it gives protection to the face and head of the police personnel and the firemen in discharging their duties. This standard has, therefore, been formulated to cover the requirements of visors to be used in conjunction with the helmets.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirements regarding material, construction, weight and performance of the visor for protection of face without impairing the field of vision.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Visor — The complete assembly of visor screen with suitable provision for attachment with the helmet.

2.2 Visor Screen — The curved transparent polycarbonate material intended for providing protection to the eyes and face.

*Rules for rounding off numerical values (*revised*).

3. MATERIAL

3.1 Visor Screen — It shall be made optically clear and transparent polycarbonate sheet of 3.0 ± 0.2 mm thickness. The polycarbonate sheet shall meet the requirements given in Appendix A.

4. CONSTRUCTION

4.1 The visor shall be of adjustable type as shown in Fig. 1, and shall have provision for bolting to the shell of the helmet as indicated in this figure.

5. WORKMANSHIP AND FINISH

5.1 The visor screen shall be optically clear, free from surface imperfections, scratches, bubbles and irregularities causing visual irregularities. All edges shall be finished smooth and shall be free from burrs, protrusions and irregularities.

6. MASS

6.1 The mass of the complete visor shall not exceed 350 g. If the mass exceeds 350 g, this mass determined to the nearest 10 g shall be shown on the label attached to the visor.

7. INSTRUCTIONS

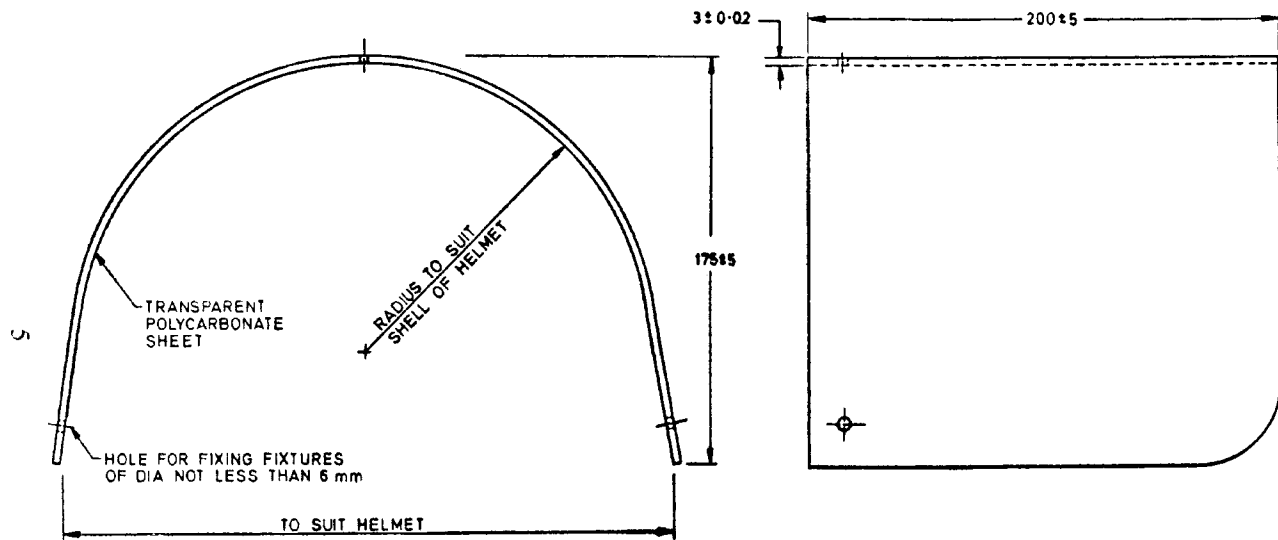
7.1 Each visor shall be supplied with a printed card fixed with a tag having the following information:

- a) To maintain a good field of vision, formation of scratches and accumulation of dirt on the visor screen shall be avoided.
- b) No organic solvents or materials containing organic solvents such as metal polish, waxes and other polishes shall be used to clean the visor screen.
- c) A soft cloth shall be used to wipe the visor for removing dust, dirt, etc.

8. MARKING

8.1 Each visor shall be marked with the following information:

- a) Manufacturer's name or trade-mark, and
- b) Year of manufacture.



All dimensions in millimetres.

FIG. 1 VISOR FOR NON-METALLIC POLICE AND FIREMEN'S HELMET

8.1.1 The visor may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

A P P E N D I X A

(Clause 3.1)

REQUIREMENTS OF THE POLYCARBONATE SHEET

A-1. PHYSICAL REQUIREMENTS

A-1.1 Relative Density — The relative density of the material as determined by the method given in IS : 2530-1963* shall be not less than 1.2.

A-1.2 Tensile Strength — The tensile strength of the material when tested according to IS : 2530-1963*, shall be not less than 600 kgf/cm².

A-1.3 Elongation — The elongation, when tested according to IS : 2530-1963*, shall be not more than 7 percent.

A-1.4 Compressive Strength — The flexural strength, when tested according to IS : 5210 - 1969†, shall be not less than 1 000 kgf/cm².

A-1.5 Impact Strength — The impact strength, when tested according to Appendix A of IS : 2267-1972‡, shall be between 65-100 kg cm/cm.

A-1.6 Deflection Temperature — The temperature of deflection under load, when tested according to IS : 867-1963§, shall be not less than 135°C.

*Methods of test for polyethylene moulding materials and polyethylene compounds.

†Specification for high impact polystyrene sheet.

‡Specification for polystyrene moulding materials (*first revision*).

§Methods of test for phenolic moulding materials (*revised*).

A-1.7 Water Absorption — Water absorption, when tested according to IS : 867-1963*, shall be not more than 0.18 percent by mass.

A-1.8 Rockwell Hardness — The rockwell hardness, when tested as per IS : 2530-1963†, shall be between 115-125.

A-1.9 Flammability — When tested as per method given in Appendix H of IS : 2745 : 1969‡, it shall be self-extinguishing.

A-2. OPTICAL REQUIREMENTS

A-2.1 Distortion — There shall not be any visually detectable (with unaided eye) distortion of objects seen through the visor.

A-2.2 Spherical and Cylindrical Error — Spherical and cylindrical errors, when tested as given in Appendix B, shall not be more than 0.5 diopter.

A-2.3 Prismatic Error — The maximum prismatic error, when tested as per method given in Appendix B, shall be 0.5 diopter and the maximum difference between prismatic power of the left and rightside vision areas of the helmet shall be 0.5 diopter.

A-2.4 Diffuse Transmittance — When tested as per method given in Appendix G of IS : 7569-1975§, the diffuse transmittance shall not be more than 5 percent.

A-2.5 Light Transmission — When tested as per method given in Appendix G of IS : 7569-1975§, the minimum light transmission shall be 80 percent.

A P P E N D I X B

(Clause A-2.2)

METHOD OF TEST FOR SPHERICAL AND CYLINDRICAL ERROR

B-1. APPARATUS

B-1.1 Telescope — Having a magnification between 7.5 and 20 (recommended magnification 15) with an aperture of 15 to 20 mm and an adjustable

*Methods of test for phenolic moulding materials (*revised*).

†Methods of test for polyethylene moulding materials and polyethylene compounds.

‡Specification for firemen's helmets (*first revision*).

§Specification for cast acrylic sheets for use in luminaires.

eye-piece fitted with a graticule, for example, a theodolite which is adjustable both vertically and laterally.

NOTE — If the telescope shows a doubling of the image or other aberrations, the eye-piece to be tested shall be examined with a 5 mm aperture in the instrument to locate and qualify the area or areas of observation in the total area of 20 mm diameter. A focometer may be used for this purpose.

B-1.2 Adjustable Light Source with Condenser

B-1.2.1 Target — Consisting of a black plate with the cut-out pattern shown in Fig. 1 of IS : 7524 (Part II)-1979*. The bars are 2 mm wide. The bigger annulus depicted inside the bars has a diameter of 46 mm with an annular aperture of 0.6 mm and the smaller annulus has a diameter of 23 mm. The diameter of the central aperture is 0.6 mm. This target is mounted on a glass plate.

B-1.2.2 Standard Lenses — With refractive powers of $\pm 0.06 \text{ m}^{-1}$, $\pm 0.12 \text{ m}^{-1}$ and $\pm 0.25 \text{ m}^{-1}$ (tolerance $\pm 0.01 \text{ m}^{-1}$).

B-2. PROCEDURE

B-2.1 Calibration and Test — Place the telescope and the optical system of the target so that they are on the same axis. Trans-illuminate the target [Fig. 1 of IS : 7524 (Part II) - 1979*] by means of a parallel beam of a light of adjustable intensity. Adjust the distance between the telescope and the target at $4.6 \pm 0.1 \text{ m}$. Focus the reticule and the target aligning the telescope so that a clear image of the pattern is obtained. Regard this setting as the zero point of the diopter scale of the telescope.

NOTE — The focusing adjustment of the telescope shall be calibrated so that a power of 0.01 m^{-1} can be measured.

B-2.2 Insert the standard lenses, one at a time, in the order of ascending refractive powers, normal to the axis of the telescope, in the path of the rays and adjust the telescope to get a clear image of the target each time. Mark these positions on the diopter scale of the telescope for the respective refractive powers.

B-2.3 Next insert the visor in place of the standard lenses as in B-2.2. Adjust the telescope to get a clear image and note their refractive powers from the diopter scale of the telescope.

B-2.4 Record astigmatism of the visor as the maximum difference between the values of refractive powers obtained in resolving the horizontal and

*Methods of test for eye protectors: Part II Optical test (*first revision*).

vertical bars [see Fig. 1 of IS : 7524 (Part II)-1979*] of the target during rotation of the test lens around its axis.

B-2.5 For determining the prismatic power, place the visor normal to the axis of the telescope in the path of the rays and adjust the telescope to get a clear image. If on doing so, the point of intersection of the lines of the reticule falls outside the image of the bigger annulus the prismatic power of the test lens shall be taken as having exceeded 0.5 diopter.

*Methods of test for eye protector: Part II Optical test (*first revision*).

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AMENDMENT NO. 1 JANUARY 1989
TO
IS : 9995 - 1981 SPECIFICATION FOR VISOR
FOR NON-METAL POLICE AND FIREMEN'S
HELMETS

(*Page 5, Fig. 1*) — Delete indication of central hole.

(BDC 22)

Printed at Swatantra Bharat Press, Delhi, India