

# इंटरनेट

# मानक

## Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 9562 (1980): Specification for non-metal helmet for police force [CED 22: Fire Fighting]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE



*Indian Standard*  
SPECIFICATION FOR  
NON-METAL HELMET FOR POLICE FORCE

UDC 614.891.1 : 351.741



© Copyright 1980

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

GI 4

Price Rs 7.00

November 1980

# Indian Standard

## SPECIFICATION FOR NON-METAL HELMET FOR POLICE FORCE

### Composition of Fire Fighting Sectional Committee, BDC 22

<i>Chairman</i>	<i>Representing</i>
SHRI P. N. MEHROTRA	Ministry of Home Affairs
<i>Members</i>	
SHRI G. B. MENON ( <i>Alternate to</i> Shri P. N. Mehrotra )	
SHRI MAHESH C. AGARAWAL	Brijbasi Udyog, Mathura ( UP )
SHRI P. S. BANERJEE ( <i>Alternate</i> )	
ASSISTANT SECURITY OFFICER	Ministry of Railways
( FIRE ) NORTHERN RAILWAY	
SHRI S. R. BANSAL	Steel Authority of India ( Bokaro Steel Plant ), Bokaro Steel City
SHRI A. CHATTERJI	Tariff Advisory Committee, Bombay
SHRI F. B. SANJANA ( <i>Alternate</i> )	
SHRI S. C. CHATTERJEE	West Bengal Fire Services, Calcutta
SHRI D. K. BANERJEE ( <i>Alternate</i> )	
SHRI N. DEVASAHAYAM	Home Department ( Fire Services ), Govt of Tamil Nadu
SHRI V. JAYAPERUMAL ( <i>Alternate</i> )	
SHRI R. R. DHOBLEY	Bhabha Atomic Research Centre, Trombay, Bombay
DIRECTOR, FIRE SERVICES	Home ( Police ) Department, Government of Andhra Pradesh, Hyderabad
DEPUTY DIRECTOR, FIRE SERVICES ( <i>Alternate</i> )	
GENERAL SECRETARY	The Institution of Fire Engineers India, New Delhi
BRIG S. B. GHORPADE	Ministry of Defence ( DGI )
SHRI P. K. GHOSH ( <i>Alternate</i> )	
SHRI P. N. GHOSH	Ministry of Defence ( R & D )
SHRI A. K. SURI ( <i>Alternate</i> )	
SHRI G. N. GIDWANI	Directorate General of Supplies & Disposals, New Delhi
SHRI H. C. VERMA ( <i>Alternate</i> )	
SHRI GOPAL KRISHNAN	Central Building Research Institute, Roorkee
SHRI D. P. GUPTA	Directorate General of Technical Development, New Delhi
SHRI J. S. JAMSHEDJI	Steelage Industries Limited ( Minimax Division ), Calcutta
SHRI H. K. ERANI ( <i>Alternate</i> )	

( Continued on page 2 )

© Copyright 1980

INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* ( XIV of 1957 ) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

( Continued from page 1 )

<i>Members</i>	<i>Representing</i>
JUNIOR MANAGER ( FIRE )	Heavy Engineering Corporation Ltd, Ranchi
SHRI S. N. KUNDU	Fire and Safety Appliances Co, Calcutta
SHRI S. PAUL ( Alternate )	
MANAGING DIRECTOR	Avon Services ( P & A ) Pvt Ltd, Bombay
TECHNICAL EXECUTIVE ( Alternate )	
SHRI L. S. D. MEHERVANJEE	Municipal Corporation of Greater Bombay ( Bombay Fire Brigade )
SHRI V. B. NIKAM ( Alternate )	
SHRI B. R. MEHTA	Central Industrial Security Force ( Ministry of Home Affairs ), New Delhi
SHRI P. C. RATHO	Steel Authority of India ( Rourkela Steel Plant ), Rourkela
SHRI C. D. SHARMA ( Alternate )	
SHRI R. K. SARIN	Directorate General of Civil Aviation, New Delhi
SHRI K. K. SAWHNEY	Air Foam Industries Pvt Ltd, New Delhi
SHRI R. MEHTA ( Alternate )	
SHRI P. L. SEBASTIN	Oil & Natural Gas Commission, Dehra Dun
SHRI V. V. KIMMATKAR ( Alternate )	
SHRI P. H. SETHNA	Kooverji Devshi & Co Pvt Ltd, Bombay
SHRI N. T. PANJWANI ( Alternate )	
SHRI J. V. SHAH	Newage Industries, Surendranagar ( Gujarat )
SHRI B. J. SHAH ( Alternate )	
SHRI CHANDRAKANT M. SHAH	Zenith Fire Services, Bombay
SHRI M. H. SHAH ( Alternate )	
SHRI D. K. SIKKAR	Synthetics & Chemicals Limited, Bareilly
SHRI R. S. SUNDARAM	Municipal Corporation of Delhi ( Delhi Fire Services ), Delhi
SHRI TARIT SUR	Sur Enamel & Stamping Works Pvt Ltd, Calcutta
SHRI S. SUR ( Alternate )	
SHRI B. V. WAGLE	Urban Development and Public Health Department, Government of Maharashtra, Bombay
SHRI V. H. MADKAIKAR ( Alternate )	
SHRI G. RAMAN, Director ( Civ Engg )	Director General, ISI ( Ex-officio Member )

*Secretary*

SHRI K. M. MATHUR  
Deputy Director ( Civ Engg ), ISI

**Helmets Subcommittee, BDC 22 : 5**

*Convener*

AIR CMDE P. DHARMARAJU  
P/6A, Hauz Khas, New Delhi

*Members*

SHRI M. K. DASGUPTA	National Physical Laboratory ( CSIR ), New Delhi
GENERAL SECRETARY	The Institution of Fire Engineers India, New Delhi
SHRI P. P. JAIN	The Mines Service Corporation, Asansol
SHRI A. P. AGARWALA ( Alternate )	

( Continued on page 14 )

# *Indian Standard*

## SPECIFICATION FOR NON-METAL HELMET FOR POLICE FORCE

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 31 July 1980, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

**0.2** Helmet is one of the most important items of personal protective equipment used by the industrial workers for protecting against head injuries which may be caused by falling objects, and by other hazards commonly met with in an industrial activity; by fire fighting personnel for protection against fire hazards and by scooter and motorcycle riders for protection against the hazards connected with driving on roads. Besides these, many other operations may require suitably designed helmets to be worn by the persons connected with such operations for their safety.

**0.2.1** Police in their normal course of duty do also need to use a helmet meeting to the needs of different situations encountered while on duty, namely, riot control operations against unarmed crowds, traffic duties and such other routine duties. This standard has been formulated to cater the requirements of police force.

**0.3** A policeman's helmet is expected to provide adequate protection to the policeman who during outburst of mob violence, may have to face brickbattling, lathi blows, empty soda water bottles, stones and other missiles and acid bulbs, and Molotov cocktails thrown on them.

**0.4** 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 should be the same as that of the specified value in this standard.

---

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

## 1. SCOPE

**1.1** This standard lays down the requirements regarding materials, construction, workmanship and finish, weight and performance requirements of helmets for the police force.

## 2. TERMINOLOGY

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

**2.1 Brim** — The rim surrounding the shell.

**2.2 Chin-Cup** — The device that fits around the point of wearer's lower jaw.

**2.3 Clearance** — Distance between the vertex of the head and vertical point above the vertex in the interior of the shell.

**2.4 Drawlace** — The cord used in the cradle to regulate the fitting of the helmet.

**2.5 Ear Flaps** — Additional part of the helmet to protect the ears.

**2.6 Inner Cushioning** — Material to improve wearing comfort.

**2.7 Neck Protector** — Additional part of the helmet to protect the neck.

**2.8 Protective Helmet** — Headwear primarily intended to protect against a blow to the wearer's head.

**2.9 Protective Padding** — Material provided to absorb impact energy which in addition provides thermal insulation.

**2.10 Retention System** — The complete assembly by means of which the helmet is maintained in position on the head which includes, head band, chin strap and cradle.

**2.10.1 Headband** — Part of retention system surrounding head, the plane of lower margin of headband shall correspond to reference line of the headform ( *see* IS : 7692-1975\* ).

**2.10.2 Anti-concussion Tapes** — Supporting strap which form the cradle along with the draw-lace, and in addition absorb impact energy.

**2.10.3 Cradle** — The adjustable assembly comprising of anti-concussion tape and draw-lace for affording adequate clearance for ventilation and to ensure proper fitment. This also absorbs impact energy.

---

\*Specification for wooden headforms for testing helmets.



**2.11 Shell** — The hard, smoothly finished material that provides the general outer form of helmet.

**2.12 Visor** — A transparent screen for the protection of eyes and face which shall allow a clear field of vision to the wearer.

**2.13 Wearing Height** — Vertical distance from the lower edge of the headband to the highest point of the head or headform.

### 3. MATERIALS

**3.1 Shell** — The shell of the helmet shall be made of non-metallic materials conforming to test requirements given in the standard.

**3.2 Protective Padding** — It shall be of expanded polystyrene or materials of similar properties.

**3.3 Retention System** — The material for the headband, chin strap, and cradle shall be sweat-resistant, non-irritant and shall not cause skin disease. The material for chin strap and cradle shall be of polyethylene or similar material.

### 4. SIZES

**4.1 Helmets** shall be of the sizes having circumference of inside headband as 530, 540, 550, 560, 570, 580, 590, 600, 610 and 620 mm. A tolerance of  $\pm 3$  mm for the size of the helmet shall be permitted.

NOTE — The size of the helmet shall be measured either with a fixed plug gauge or an expanding gauge which shall be made of metal.

### 5. CONSTRUCTIONAL REQUIREMENT

**5.1 General** — The construction of the helmet shall be essentially in the form of hard outer shell containing the necessary additional means of absorbing impact energy like protective padding and retention system.

**5.2 Shell** — The shell of the helmet shall have smoothly finished surface without any sharp edges and shall conform to shape given in Fig. 1. There shall be no metallic components passing through the shell. Protective padding material of not less than 8 mm thick shall cover the whole inner surface of the shell to within 15 to 25 mm of the plane of anchorage of retention system to the shell. No gaps, if there are any, in the protective padding material shall be of greater width than 5 mm and no part of the protective padding shall be readily detachable.

**5.2.1 Brim** — The brim shall be an integral part of the shell and shall be continuous around the dome. The width of the brim shall be as indicated in Fig. 1.

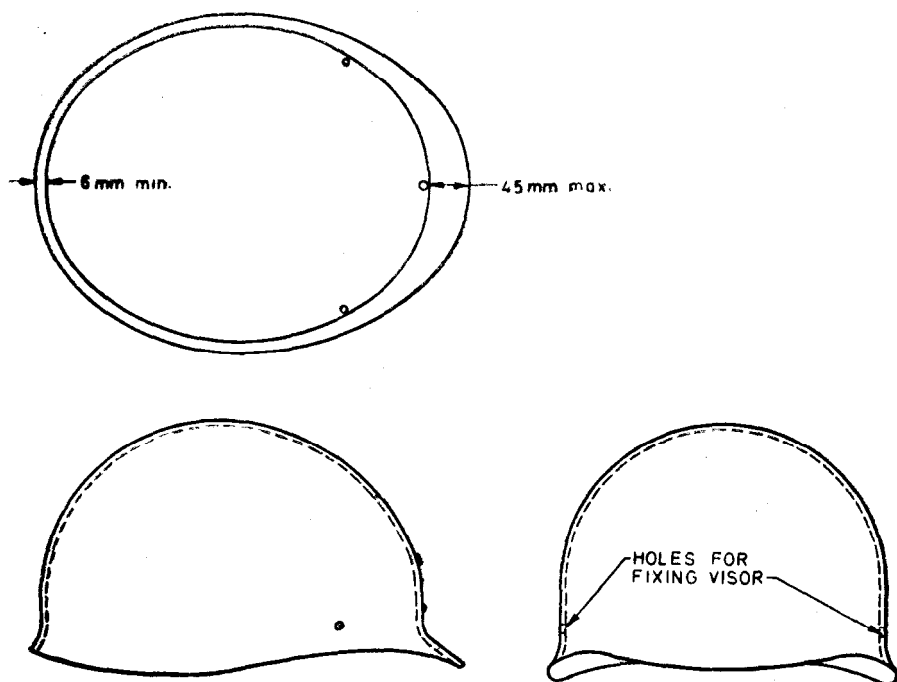


FIG. 1 A TYPICAL SHAPE OF SHELL OF POLICEMAN HELMET

### 5.3 Retention System

**5.3.1 Headband** — Headband shall not be less than 30 mm in width and shall be fixed along with the corrugated padding to the shell. The headband shall be well-cushioned from the shell by means of not less than 5 mm thick continuous corrugated sponge rubber fixed around the head.

**5.3.2 Chinstrap** — It shall be anchored to the shell. The chinstrap shall be at least 20 mm wide and shall be permanently fitted with a fastening device to adjust and maintain tension.

**5.3.3 Cradle** — The cradle shall be formed by anchoring anti-concussion tapes at eight points and shall be adjustable. The anti-concussion tapes shall be attached to the headband at equal spacing. The width of the

tapes shall not be less than 20 mm. The cradle shall ensure a clearance of at least 30 mm between the top of the wearer's head and the inside shell when measured as given in 5.3.3.1. No comfort padding shall be provided under the cradle.

**5.3.3.1** Mount the helmet on a headform (see IS: 7692-1975\*) corresponding to the size of the headband marked on the helmet in a position similar to that which it would occupy on man's head. Apply a load of 120 N to the top of the helmet. Measure the clearance by means of a rod, having diameter not more than 10 mm, inserted through the hole drilled in the vertical axis of the headform.

**5.3.4 Neck Protector** — The neck-curtain shall be 150 mm in depth from lower edge of the headband and shall extend from ear to ear positions. It shall be detachable with zip fastener.

**5.3.5 Visor** — The requirements in regard to visor shall be as specified 'Indian Standard on specification for visor for police and firemen's helmet' (under preparation). The fixing arrangements shall be as shown in Fig. 1. The holes shall be within the forward half of the helmet shell, just above the brim. The diameter of holes shall be not less than 5 mm.

## 6. WORKMANSHIP AND FINISH

**6.1** All external surfaces and edges shall be smooth and rounded and there shall be no metallic parts or other rigid projections on the inside of the helmet.

**6.2** The helmet shall be of specified colour which shall be inherent.

## 7. MASS

**7.1** Mass of the complete helmet excluding visor shall not exceed 950 g and if it exceeds, the mass to the nearest 30 g shall be marked.

## 8. SAMPLING AND CRITERIA FOR CONFORMITY

**8.1** The method of sampling and criteria for conformity shall be as specified in 'Indian Standard on methods of sampling of helmets' (under preparation).

## 9. PERFORMANCE REQUIREMENTS

**9.1 Shock Absorption Test** — Helmets shall be tested for shock absorption by the method described in Appendix A within one minute after subjecting them to conditions specified in (a) or (b) or (c) given below:

- a) A temperature of  $65 \pm 2^\circ\text{C}$  for 4 hours in an oven;

---

\*Specification for wooden headforms for testing helmets.

- b) A temperature of  $-10 \pm 2^{\circ}\text{C}$  for 4 hours in a refrigerator; and
- c) Water flowing over the whole outer surface of the shell for 4 hours at room temperature.

**9.1.1** No single helmet shall, however, be subjected to more than one of these conditions and neither of the maximum values of transmitted force obtained shall exceed 20 kN ( 2000 kgf ) and shell shall remain intact, with no cracks extending as far as the edge and through the thickness of the shell.

**9.2 Penetration Resistance** — The helmet shall be subjected to the following tests for resistance against penetration within one minute after subjecting to the conditions specified in 9.1 which has given worst result in shock absorption.

- a) *Plate Test* — When tested in accordance with the method described in Appendix B, no integral part of the helmet shall fail or stretch permitting the helmet to be forced down over the headform. The shell shall not be dented or pierced through to touch the wooden headform or the cradle.
- b) *Plumb-Bob Test* — When tested by the method described in Appendix B, no integral part of the helmet shall fail or stretch permitting the helmet to be forced down over the headform. The static measurement of the depth of penetration or dent shall not exceed 10 mm.

**9.3 Strength of Retention System** — Helmet shall be tested for their retention system by the method given in Appendix C and it shall not fail under the maximum loading of 0.5 kN ( 50 kgf ) and the total extension as measured between the pre-load of 0.25 kN ( 25 kgf ) and the maximum load of 0.5 kN ( 50 kgf ), shall not exceed 10 mm.

**9.4 Rigidity Test** — Helmet when tested by the method prescribed in Appendix D the maximum deformation shall not exceed the initial deformation by more than 40 mm and the residual permanent deformation shall not exceed 15 mm.

**9.5 Water Absorption Test** — Helmets shall be tested for water absorption in accordance with the method specified in Appendix E. They shall not absorb water more than 5 percent of their mass.

**9.6 Flammability Resistance** — When tested by the method described in Appendix F, there shall be no flaming or visible evidence of flame penetration to the inside of the helmet.

**9.7 Firing Test** — When tested by the method described in Appendix G, none of the pellets shall penetrate the inner surface of the shell and there shall be no bulging of the inner surface of more than 5 mm.

## 10. MARKING

**10.1** Each helmet shall be clearly and indelibly marked with the following information:

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

**10.1.1** The helmet 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.

## APPENDIX A

( Clause 9.1 )

### SHOCK ABSORPTION TEST

#### A-1. APPARATUS

**A-1.1 Wooden Headform** — conforming to IS : 7692-1975\*.

**A-1.2 A Gauge and Recording Apparatus for Measuring Force** —

The gauge and the associated recording apparatus shall have proper time constant to be able to measure the impact loading up to 40 kN ( 4 000 kgf ) independent of the time of application of the force and a slow application of the load required for its calibration. The gauge shall have a minimum stiffness of 500 kN/mm ( 50 000 kgf/mm ). The headform shall be mounted on the gauge so that its vertical axis coincides with the vertical axis of the gauge.

**A-1.3 Accuracy** — The overall error of the whole set up including the load measuring and recording system shall be not more than 10 percent.

---

\*Specification for wooden headforms for testing of helmets.

**A-1.4** Concrete or similar monolithic block having a minimum height of 1 m, length 1 m and width 0.6 m, and mass 1 tonne, shall be used to support the gauge and headform the block shall be bedded on dry sand on a solid floor.

**A-1.5** A striker shall be in the form of a rectangular block of wood weighing  $4.5 \pm 0.1$  kg and having a horizontal striking face 180 mm square. The striker shall slide freely and without oscillation down two vertical guide wires so positioned that the centre of gravity of the striker lies on the vertical axis of the gauge and both lie in the plane of the guide wires.

## **A-2. METHOD**

**A-2.1** The helmet shall be placed on the headform. The striker shall be raised to a clear height of  $1.8 \text{ m} \pm 5 \text{ mm}$  above the point of contact with the helmet and allowed to fall freely. A photographic or other high speed record of the force transmitted during impact shall be made.

# **A P P E N D I X B**

*( Clause 9.2 )*

## **METHOD OF TESTING PENETRATION RESISTANCE**

### **B-1. PLATE TEST**

**B-1.1** Mount the helmet on wooden headform ( *see* IS : 7692-1975\* ) and then drop a steel plate 300 mm square and 6 mm in thickness with its plane vertical from a clear height of 3.0 m so that one side of the square strikes the top of the crown of the helmet. Examine the helmet for denting or piercing, failure of any integral parts, etc.

### **B-2. PLUMB-BOB TEST**

**B-2.1** Mount the helmet on the headform and drop freely a cylindrical steel striker weighing 2 kg, 32 mm in diameter and having at its lower end a conical point with an included angle of  $36^\circ$  and a maximum tip radius of 0.5 mm, from a clear height of 1 metre to strike the top of the crown of helmet. Examine the helmet for piercing, denting or failure of any integral parts.

---

\*Specification for wooden headform for testing of helmets.

**APPENDIX C***( Clause 9.3 )***TEST FOR STRENGTH OF RETENTION SYSTEM****C-1. PROCEDURE**

**C-1.1** The helmet is placed on the appropriate headform with the chin strap fastened over a device approximating to the shape of the bony structure of the lower jaw. This shall consist of two metal rollers each  $12.5 \pm 0.5$  mm in diameter and at  $76 \pm 0.5$  mm centres apart. The helmet shall be supported on the headform so that the points of attachment of the chin strap to the shell will be subjected to the same test as the strap itself.

**C-1.2** After applying a preload of 0.25 kN ( 25 kgf ) for not less than 30 seconds an additional load of 0.25 kN ( 25 kgf ) shall be applied to the device retained by the chin strap at a uniform rate of 1 kN ( 100 kgf ) per minute. After 2 minutes at the maximum load the elongation of the retention system is determined by measuring the vertical distance between reference point on the device and on top of the helmet shell, and comparing this distance with that obtained under preload at 30 seconds.

**APPENDIX D***( Clause 9.4 )***REGIDITY TEST****D-1. APPARATUS**

**D-1.1 Press with Two Parallel Metal Plates** — They are arranged so that the distance between them could be determined within  $\pm 1$  mm.

**D-2. PROCEDURE**

**D-2.1** One helmet shall be tested along its longitudinal axis and the other along its transverse axis. In both cases the helmets shall be positioned between the two parallel plates by means of which the initial load of 30 N ( 3 kgf ) shall be applied to the helmet shell. After 2 minutes, the distance between the plates shall be measured. The load shall then be increased to 630 N ( 63 kgf ) by increment of 100 N ( 10 kgf ) every 2 minutes and maintained at that level for 2 minutes, after which the distance between the plates shall be measured again. The load applied to the plates shall then be reduced to 30 N ( 3 kgf ) and maintained at this level for 5 minutes. The distance between the plates shall be

measured again. The difference in distance between the plates when the load was increased from 30 to 630 N ( 3 to 63 kgf ) and the difference in distance between the plates when the initial load of 30 N ( 3 kgf ) was applied and the final load of 30 N ( 3 kgf ) was applied shall be reported for both the longitudinal and transverse direction.

## **A P P E N D I X E**

( *Clause 9.5* )

### **WATER ABSORPTION TEST**

#### **E-1. SAMPLES**

**E-1.1** The samples which have been used for shock absorption in condition 9.1(a) shall be used for carrying out this test.

#### **E-2. PROCEDURE**

**E-2.1** Cut three pieces, 25 × 50 cm from the shell. Coat the cut edges of each with wax or sealing compound, weigh the specimens and then immerse them for 24 hours in water at a temperature of  $27 \pm 2^{\circ}\text{C}$ . Remove them from the water, dry the surfaces by wiping them, and weigh the pieces again. Report the average gain in mass as a percentage.

## **A P P E N D I X F**

( *Clause 9.6* )

### **METHOD FOR TESTING FLAMMABILITY RESISTANCE**

#### **F-1. PROCEDURE**

**F-1.1** The helmet shall be supported, crown uppermost, on a headform ( *see* IS : 7692-1975\* ). A barthel burner conforming to the requirements given in **F-2**, is to be brought into contact with the outer surface of the helmet with the flame at right angles at a point of 12 cm below the crown, measured externally, whilst it is rotated steadily through one complete revolution at a speed of 2 rev/min.

#### **F-2. BURNER WITH ACCESSORIES**

**F-2.1** The test shall be carried out with barthel burner conforming to **A-1** of IS : 4355-1967†.

\*Specification for wooden headform for testing of helmets.

†Specification for fire-resistant brattice cloth.



**F-2.2** The following accessories shall be used with the burner:

- a) Reservoir,
- b) Connecting tube of polyethylene or soft rubber,
- c) Absolute alcohol ( ethanol ),
- d) Bare copper wire 0.71 mm diameter having a free length of not less than 100 mm, and
- e) Stand to help the reservoir.

**F-2.3** The absolute alcohol shall be filled in the reservoir and the tube, air bubbles entrapped in the tube shall be removed by pressing the tube several times. Cotton waste soaked in spirit shall be kept in the cup on the burner and lighted. After a few minutes when the burner is sufficiently heated the regulator of burner shall be turned to allow the spirit to flow in the form of vapour.

**F-2.4** Burner shall be operated with the valve so as to get a flame height of 150 mm. Level of the fuel shall be  $760 \pm 75$  mm above the base of the burner. Satisfactory operation of burner shall be checked by inserting in the flame the bare copper wire in position normally occupied by lower edge of the test piece, that is, 50 mm above the burner and reaching farther edge of the flame. The wire should not take more than 6 seconds to melt.

## APPENDIX G

( Clause 9.7 )

### METHOD OF FIRING TEST

#### G-1. PROCEDURE

**G-1.1** Each helmet shall be mounted on a headform ( *see* IS : 7692-1975\* except that it shall be without plates ), tightly fastened to securely hold the helmet. Headform shall be firmly secured to the base support or planted securely in a firm ground.

**G-1.1.1** The helmet shell shall be struck by one round of 12 bore, 4 buck cartridge of AF Kirkee fired from a distance of 10 metres front side being the target while aiming horizontally. The gun shall be a standard 12 bore and its barrel shall not have any choke. One sample shall be tested in front and back and another sample for sides.

---

\*Specification for wooden headform for testing of helmets.

( Continued from page 2 )

<i>Members</i>	<i>Representing</i>
JOINT DIRECTOR OF MINES SAFETY	Directorate General of Mines Safety,
SHRI R. B. KHURANA	Gadgets India, Faridabad
SHRI M. B. KHURANA ( Alternate )	
SHRI T. S. KUMAR	Central Mining Research Station ( CSIR ), Dhanbad
SHRI U. S. NIGAM ( Alternate )	
SHRI P. N. MEHROTRA	Ministry of Home Affairs
SHRI G. B. MENON ( Alternate )	
SHRI S. RAJU	The Automotive Research Association of India, Pune
SHRI R. RAMAKRISHNAN	Concord Arai Pvt Ltd, Madras
SHRI B. RAJAGOPAL ( Alternate )	
SHRI M. B. SINGH	Ministry of Defence ( R & D )
SHRI K. RAMACHANDRAN ( Alternate )	
SHRI D. K. SARKAR	Synthetics & Chemicals Limited, Bareilly



# AMENDMENT NO. 1 MARCH 1983

TO

## IS : 9562-1980 SPECIFICATION FOR NON-METAL HELMET FOR POLICE FORCE

### Alterations

( *Page 7, clause 5.3.5, first sentence* ) — Substitute the following for the existing sentence:

‘ The requirements in regard to visor shall be as specified in IS : 9995-1981 Specification for visor for non-metal police and firemen’s helmets ’.

( *Page 7, clause 7.1, line 1* ) — Substitute ‘ may ’ *for* ‘ shall ’.

( *Page 7, clause 8.1* ) — Substitute the following clause for the existing:

‘ **8.1** The method of sampling and criteria for conformity shall be as specified in IS : 9695-1980 Methods for sampling of helmets. ’

( *Page 8, clause 9.3, line 5* ) — Substitute ‘ 25 mm ’ *for* ‘ 10 mm ’.

### Addendum

( *Page 3, clause 0.3* ) — Add the following new clause after **0.3**:

‘ **0.3.1** The fire test included in this standard is based on data furnished by ‘ Bureau of Police Research and Development, Ministry of Home Affairs ’.

( BDC 22 )



AMENDMENT NO. 2 DECEMBER 1983

TO

IS:9562-1980 SPECIFICATION FOR NON-METAL  
HELMET FOR POLICE FORCE

Alteration

(Page 13, clause G-1.1.1, lines 1 and 2) -  
Substitute 'size 4' for '4 buck'.

(BDC 22)

---

Reprography Unit, ISI, New Delhi, India



AMENDMENT NO. 3 NOVEMBER 1984

TO

IS:9562-1980 SPECIFICATION FOR NON-METAL  
HELMET FOR POLICE FORCE

*(Page 4, clauses 2.4 and 2.5) - Delete.*

*(Page 4, clause 2.10.2, line 2) - Delete the words 'along with the draw-lace, and in addition absorb impact energy'.*

*(Page 4, clause 2.10.3) - Substitute the following for the existing clause:*

*'2.10.3 Cradle - The fixed or adjustable assembly comprising anti-concussion tapes for affording adequate clearance for ventilation and to ensure proper fitment. This also absorbs impact energy.'*

*(Page 6, clause 5.3.3, first and second sentences) - Substitute the following for the existing sentences:*

*'The headband shall be fitted with anti-concussion tapes secured at at least four anchoring points and forming a cradle.'*

(BDC 22)

---

Reprography Unit, ISI, New Delhi, India

**AMENDMENT NO. 4 JANUARY 1989**  
**TO**  
**IS : 9562 - 1980 SPECIFICATION FOR NON-METAL**  
**HELMET FOR POLICE FORCE**

( *Page 3, clause 0.2* ) — Insert the following at the end :  
'For the lighter requirements, other than given in **0.3**, the requirements in respect of neck protector visor and fire test may be treated as optional.'

( *Page 6, Fig. 1* ) — Delete indication of central hole.

( *Page 7, clause 5.3.4* ) — Insert the words 'where required' after the word 'Protector'.

( *Page 7, clause 5.3.5* ) — Insert the words 'where required' after the word 'Visor'.

( *Page 8, clause 9.7, line 1* ) — Insert the words 'where required' after the word 'Test'.

( *Page 9, clause 10.1* ) — Insert the following items :

- 'd) With or without neck protector
- e) With or without visor
- f) With or without fire test.'

( BDC 22 )

**AMENDMENT NO. 5 DECEMBER 2000**  
**TO**  
**IS 9562 : 1980 SPECIFICATION FOR NON-METAL**  
**HELMET FOR POLICE FORCE**

(Page 12, *APPENDIX F*) — Substitute the following for the existing:

**APPENDIX F**  
( *Clause 9.6* )

**METHOD OF TESTING FLAMMABILITY RESISTANCE**

**F-1 SAMPLES**

**F-1.1** The samples for testing shall be selected as given in 8.1.

**F-2 BURNER**

**F-2.1** Burner shall be operated with the valve so as to get a flame height of 150 mm. Satisfactory operation of burner shall be checked by inserting in the flame, the bare copper wire of 0.71 mm diameter having a free length of not less than 100 mm in position normally occupied by low edge of the test piece, that is, 50 mm above the burner and reaching farther edge of the flame. The wire should not take more than 6 seconds to melt.

**F-3 PROCEDURE**

**F-3.1** The helmet shall be supported, crown uppermost, on a head form (*see IS 7692*).

A burner conforming to the requirements given in **F-2** is to be brought into contact with outer surface of the helmet with the flame at right angles at a point of 12 cm below the crown, measured externally, whilst it is rotated steadily through one complete revolution at a speed of 2 rev/min.

( CED 22 )