

IS 10658 : 1999

Edition 2.3

(2003-09)

भारतीय मानक

शुष्क पाउडर वाले उच्च क्षमता के अग्नि शामक
(ट्राली स्थापित) की विशिष्टि
(पहला पुनरीक्षण)

Indian Standard

SPECIFICATION FOR HIGHER CAPACITY
DRY POWDER FIRE EXTINGUISHER
(TROLLEY MOUNTED)

(First Revision)

(Incorporating Amendment Nos. 1, 2 & 3)

ICS 13.220.10

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

Price Group 4

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

Dry powder fire extinguishers (trolley mounted) are larger version of the portable dry powder fire extinguishers and like the latter they may be used for dealing with class A, B and C fires which may be beyond the capacity of the portable fire extinguishers but which can still be controlled without the aid of fire engines/crash tenders. In principle, the operation of such fire extinguishers and portable fire extinguishers are similar; but because of larger capacity, bulk and mass of the former, these have to be mounted on a wheeled carriage trolley and the design of the fittings have to be modified to suit the mode of operation and their capacity. The details in regard to the maintenance are given in IS 2190 : 1992 'Selection installation and maintenance of first-aid fire extinguishers—Code of practice (*second revision*)'.

The extinguisher and component shall be designed taking into account the working pressure required to achieve satisfactory performance under minimum ambient temperature of 35°C and design pressure which shall be maximum pressure achieved at 60°C ambient temperature or maximum pressure likely to be developed in the system with stoppage of powder flow due to obstruction whichever is more.

This standard has been prepared with a view to guide the industries for the manufacturer and the users in obtaining the extinguisher capable of giving satisfactory performance. This standard was first published in 1983. The principal modifications made in this revision are in respect of (a) materials specified for different components given in tabular form and for some components additional materials have been specified, (b) new clauses for actuating mechanism, bore size of syphon tube, epoxy polyester powder coating, and (c) updating the various clauses based on the use of this type of extinguisher. The amendment issued has also been incorporated in the revised version.

The Composition of the technical committee responsible for the formulation of this standard is given at Annex C.

A scheme for labelling environment friendly products known as ECO Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO Mark would be administered by the Bureau of Indian Standards (BIS) under the *BIS Act*, 1986 as per the Resolution No. 71 dated 21 February 1991 and No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with ECO logo, it shall also carry the ISI Mark of BIS besides meeting additional optional environment friendly requirements. For this purpose, the Standard Mark of BIS would be single mark being a combination of the ISI Mark and the ECO logo. Requirements to be satisfied for a product to qualify for the BIS Standard Mark for ECO friendliness being included in the relevant published standards through an amendment. These requirements are optional; manufacturing units are free to opt for the ISI Mark alone also.

Amendment No. 1 is based on the Gazette Notification No. 160 dated 1 April 1999 for Fire Extinguishers as environment friendly products published in the Gazette of the Government of India.

This edition 2.3 incorporates Amendment No. 1 (March 2002), Amendment No. 2 (September 2002) and Amendment No. 3 (September 2003). Side bar indicates modification of the text as the result of incorporation of the amendments.

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 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SPECIFICATION FOR HIGHER CAPACITY DRY POWDER FIRE EXTINGUISHER (TROLLEY MOUNTED)

(*First Revision*)

1 SCOPE

1.1 This standard lays down the requirement regarding material, shape, construction, chemical charges, anti-corrosive treatment and tests for trolley mounted dry powder fire extinguishers of capacities 25 kg, 50 kg and 75 kg.

2 REFERENCES

2.1 The Indian Standards listed in Annex A contain provisions which, through references in the text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards given at Annex A.

3 CAPACITY

3.1 The total capacity of the dry powder extinguisher when filled for the various capacities shall be as under:

<i>Nominal Size,</i> kg	<i>Dry Powder Content,</i> kg, <i>Tolerance + 5 Percent</i>
25	25
50	50
75	75

4 PRINCIPLE

4.1 The method of expulsion of dry powder shall be by means of pressure produced from compressed or liquified gas from gas cylinder attached to the body and suitably mounted on trolley or gas cartridge attached to the cap.

5 MATERIALS

5.1 The material for construction of various parts of the extinguisher shall be as given in Table 1.

6 CONSTRUCTION**6.1 Body**

The construction of the body shall be welded conforming to the requirements given in IS 9595. The shape of the body shall be

cylindrical having diameter not more than 75 cm. The domed ends of the body shall be without reverse of curvature and shall be dished outwards to a radius not exceeding the internal diameter of the body to which these are fixed. The minimum thickness of the body shall be calculated as under with an extra allowance of 0.5 mm for corrosion:

$$t = \frac{p \times D_o}{200 f \cdot j + p}$$

where

P = design pressure in kgf/cm².

D_o = outside diameter in mm,

f = allowable stress value in kgf/mm², and

j = weld joint factor = 0.70 for no radiography with double welded butt joints, 0.65 for no radiography with single welded butt joint with backing strip; 0.85 for spot radiography with double welded butt joints and 0.80 for spot radiography with single welded butt joints with backing strip.

6.2 Neck Ring

The neck ring shall provide a clear opening of not less than 75 mm. It shall have parallel screw threads for effective length of not less than 22 mm. The neck ring shall be firmly secured to the body by brazing or welding.

6.3 Cap

The cap shall be threaded for fixing to the neck ring in the body for not less than 22 mm effective length. The parallel threads shall be in accordance with IS 2643 (Part 1). At least 3 holes of not less than 3 mm diameter each shall be drilled through the threads of the cap to form vents for release of any pressure remaining in the body during withdrawal of the cap. The centres of the vent holes shall be 6.5 mm maximum from the face of the cap joint washer. The extinguisher shall be fitted with safety valve which shall release at a pressure of 2.5 MN/m² (not more than 20 kgf/cm²) as per requirement of IS 5903.

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6.4 Cap Joint Washer

The cap joint washer shall be provided in the recess in the cap as shown in Fig. 1.

6.5 Expansion Space

A space shall be provided above dry powder level in the body of the extinguisher. It shall be of sufficient volume to ensure that when discharge nozzle is temporarily closed and the extinguisher is operated at a temperature of $27 \pm 5^\circ\text{C}$, the internal pressure shall not exceed 1.5 MN/m^2 (15 kgf/cm^2) and the body shall not show any sign of leakage.

NOTE — For testing this requirement the adapter with pressure gauge be fitted in place of cap.

6.6 Discharge Hose

Discharge hose shall be of braided rubber or PVC of nominal bore 19 mm diameter fitted with not less than 3 m in case of 25 kg and 5 m in case of 50 kg and 75 kg length of hose. The hose shall have bursting pressure of not less than 50 kgf/cm^2 .

6.7 Cylinder

The CO_2 gas cylinder shall conform to IS 7285 and shall be of capacity 1.5 litres for 25 kg size and 3 litres for 50 and 75 kg size and shall be filled with carbon dioxide (see IS 307) having maximum filling ratio of 0.667 which is the ratio of mass of carbon dioxide charged in the container to the mass of water required to fill the container at 27°C .

6.8 Copper Tubing or High Pressure Hose — Copper tubing shall conform to bursting pressure of 275 kgf/cm^2 or wire braided high pressure hose as per IS 14933 : 2001.

6.9 Nozzle and Other Discharge Fittings

The nozzle shall be trigger controlled and shall be capable of discharging dry powder as in 9.1, and shall be so designed as to eximinate moisture penetration.

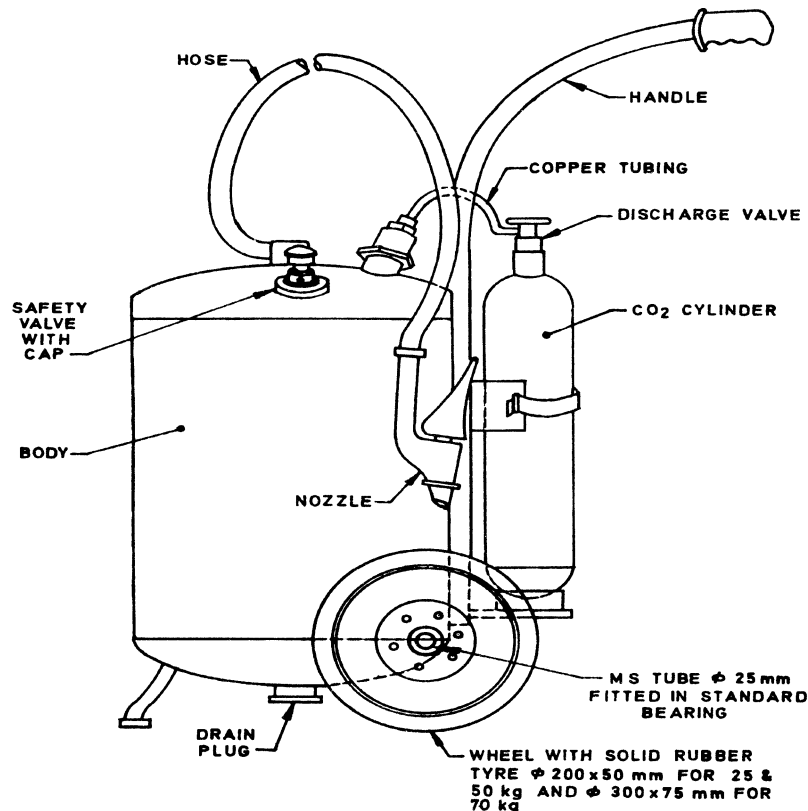
6.10 Actuation Mechanism

The CO_2 cylinder shall have wheel valve as shown in Fig. 1 to operate and discharge gas.

Table 1 Materials for Construction of Various Parts of Fire Extinguisher
(Clause 5.1)

Sl No.	Component	Material	Relevant Indian Standard
(1)	(2)	(3)	(4)
i)	Body	Mild steel sheets	IS 1079 or IS 2002 or IS 2041 or IS 2062
ii)	Neck ring	i) Leaded tin bronze ii) Seamless mild steel tube iii) Copper	Grade LTB2 of IS 318 IS 1239 (Part 1) IS 6912
iii)	Nozzle	i) Brass ii) Leaded tin bronze iii) Plastic iv) Aluminium alloy	Grade 2 of IS 291 or Type I of IS 319 Grade LTB2 of IS 318 IS 7328 Grade 4450 of IS 617
iv)	Cap	i) Leaded tin bronze ii) Brass	Grade LTB2 of IS 318 Type I of IS 319
v)	Drain plug	i) Leaded tin bronze ii) Brass	Grade LTB2 of IS 318 Type I of IS 319
vi)	Washer	Rubber	Conforming to requirement of hardness as applicable to Type 3 of IS 5382 and also acid and alkali resistant (see Note)
vii)	Discharge valve	—	IS 3224
viii)	Syphon tube	Mild steel tube	IS 1239 (Part 1) IS 3601

NOTE — When a piece of 25 mm cut from any portion is dipped in 20 percent sulphuric acid/5 percent sodium hydroxide solution for 30 min, there shall be no sign of corrosion/damage.



NOTES

- 1 For 25 kg capacity gas cartridge outside or inside may be used.
- 2 For 25 kg capacity drain plug is not necessary.

FIG. 1 TYPICAL DETAILS OF DRY POWDER FIRE EXTINGUISHER (TROLLEY MOUNTED)

6.11 Drain Plug

The drain plug of not less than 25 mm diameter shall be provided on the body except in case of 25 kg capacity and the washer shall be provided to make the joint water tight.

6.12 The dry powder used in the extinguisher shall conform to IS 4308 or IS 14609.

6.13 The bore of syphon tube shall not be less than 19 mm.

6.14 Provision shall be made for an internal pressure test on the body. For this purpose, the union to which the discharge hose is connected shall be screwed with threads which shall be in accordance with G 1/2 or G 3/4 of IS 2643 (Part 1) so that a test pipe may be connected at this point.

7 ANTI-CORROSIVE TREATMENT

7.1 All internal and external surfaces of the body and internal parts shall be completely coated with zinc or lead-tin alloy (tin 10 percent minimum) applied by hot-dipping or electrolytic process to a thickness of not less than 0.025 mm. The thickness of the coating shall be measured as given in IS 3203. There shall be no visible uncoated area both internally and externally.

7.2 Phosphating (see IS 3618) may be applied on the external surface of the body as an alternative to zinc or lead-tin alloy coating.

7.3 Epoxy polyester powder coating of 50 micron thickness may be applied on both surfaces of the body as an alternative to lead-tin alloy coating.

8 PAINTING

8.1 Each extinguisher shall be painted fire red conforming to shade No. 536 of IS 5. All components of trolley and other items other than the fire extinguisher shall be painted with the primer and finishing paints of two coats each. The paint shall conform to IS 2932.

9 TEST REQUIREMENTS**9.1 Performance Test**

The extinguisher shall be capable of discharging minimum of 85 percent by mass of the actual rated capacity of dry powder when the extinguisher is operated at a temperature of $27 \pm 5^\circ\text{C}$ prior to performance test, sample shall be conditioned for 2 h and test shall be carried out in still weather condition where air flow is 3 km/h maximum. The contents shall be expelled in the form of a continuous discharge which shall comply with the following requirements:

Capacity of Extinguisher	Duration s	Range of Jet Throw (Minimum Throw)
kg		m
25	25 to 30	6
50	40 to 50	8
75	50 to 60	10

9.2 Hydraulic Test

The extinguisher shall be tested to an internal hydraulic pressure of 3.0 MN/m² (30 kgf/cm²). The test pressure shall be held for a minimum period of two and a half minutes. During the test, it shall not show any sign of leakage.

9.3 Bursting Test

In case of hydraulic burst test, failure shall not occur at a pressure of less than 4.5 MN/m² (45 kgf/cm²).

10 WHEELED CARRIAGE

The fire extinguisher shall be provided with wheeled carriage according to details given in Fig. 1. The fitting shall ensure that the lowest part of the body remains not less than 10 cm for 25 kg and 20 cm for 50 kg and 75 kg above the ground when it is in the vertical position.

11 OPTIONAL REQUIREMENTS FOR ECO MARK

11.1 General Requirements

11.1.1 Any fire extinguisher having BIS Standard Mark qualifies for consideration of ECO Mark.

11.1.2 The products manufacturer must produce the consent clearance as per provision of the *Water (Prevention & Control of Pollution) Act, 1974*, *Water (Prevention & Control of Pollution) Cess Act, 1977* and *Air (Prevention & Control of Pollution) Act, 1981* respectively, along with authorization if required under *Environment (Protection) Act, 1986*, and the Rules made thereunder to the Bureau of Indian Standards while applying for ECO Mark.

11.1.3 The products may display in brief the criteria based on which the product has been awarded ECO Mark.

11.1.4 The product may carry along with instructions for proper use so as to maximize product performance with statutory warning, if any, minimize waste and method of safe disposal.

11.1.5 The material used for product packaging (excluding refills) shall be recyclable, reusable or biodegradable.

11.1.6 The product must display a list of critical ingredients in descending order of quantity present in percent by weight. The list of such critical ingredients shall be identified by the Bureau of Indian Standards.

11.2 Specific Requirements

11.2.1 The fire extinguisher shall not contain any Ozone Depleting Substance (ODS) relevant

to fire extinguishers industry as identified under the Montreal Protocol (Annex D).

11.2.2 Gas based extinguishing media once discharged in the atmosphere should not have atmospheric life time of more than a year (Annex E).

11.2.3 Chemical used should not have global warming potential (Annex F).

11.2.4 The metallic body and other metal parts of the fire extinguishers shall be free of lead or lead alloys.

11.2.5 The coating used for the metallic part shall not be formulated with mercury and mercury compounds or be tinted with pigments of lead, cadmium, chromium VI and their oxides. Excluded are natural impurities entailed by the production process up to the amount 0.1 percent by weight which are contained in the raw material.

NOTE — CO₂ extinguishers may be permitted till suitable substitutes are available.

12 MARKING

12.1 Each extinguisher shall be clearly and permanently marked with the following information:

- Manufacturer's name or trade-mark, serial number and year of manufacture shall be embossed at the bottom ring.
- Method of operation in prominent letter;
- Words 'Dry Powder Extinguisher';
- Capacity of the extinguisher in kg;
- Words 'Recharge After Use';
- A declaration to the effect that the body of the extinguisher has been tested to a pressure of 3.0 MN/m² (30 kgf/cm²);
- Letters indicating the various classes of fires for which the extinguisher is suitable;
- Year of manufacture;
- Working and design pressure;
- Capacity of gas cartridge; and
- Capacity of gas cylinder with filling ratio.

12.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

12.2.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

13 SAMPLING AND CRITERIA FOR CONFORMITY

The details of sampling and criteria for conformity are given in Annex B.

ANNEX A

(Clause 2.1)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
5 :1994	Colours for ready mixed paints and enamels (<i>fourth revision</i>)	2932 : 1993	Enamel, synthetic, exterior (a) undercoating, (b) finishing (<i>second revision</i>)
291 : 1989	Naval brass rods and sections for machining purposes (<i>third revision</i>)	3203 : 1982	Methods of testing local thickness of electroplated coatings (<i>first revision</i>)
307 : 1966	Carbon dioxide (<i>second revision</i>)	3224 : 1979	Valve fitting for compressed gas cylinders excluding liquefied petroleum gas (LPG) cylinders (<i>second revision</i>)
318 : 1981	Leaded tin bronze ingots and castings (<i>second revision</i>)	3601 : 1984	Steel tubes for mechanical and general engineering purposes (<i>first revision</i>)
319 : 1989	Free cutting brass bars, rods and sections (<i>fourth revision</i>)	3618 : 1966	Phosphate treatment of iron and steel for protection against corrosion
617 : 1994	Aluminium and aluminium alloy ingots and castings for general engineering purposes (<i>third revision</i>)	4308 : 1982	Specification for dry powder for fire fighting (<i>first revision</i>)
1079 : 1994	Hot rolled carbon steel sheets and strips (<i>fifth revision</i>)	5382 : 1985	Rubber sealing rings for gas mains, water mains and sewers (<i>first revision</i>)
1239 (Part 1) : 1990	Mild steel tubes, tubulars and other wrought steel fittings: Part 1 Mild steel tubes (<i>fifth revision</i>)	5903 : 1970	Recommendations for safety devices for gas cylinders
2041 : 1995	Steel plates for pressure vessels used at moderate and low temperature (<i>second revision</i>)	6912 : 1985	Copper and copper alloy forging stock and forgings (<i>first revision</i>)
2062 : 1992	Steel for general structural purposes (<i>fourth revision</i>)	7285 : 1988	Seamless steel cylinders for permanent and high pressure liquefiable gases (<i>second revision</i>)
2190 : 1992	Selection, installation and maintenance of first-aid fire extinguishers – Code of practice (<i>second revision</i>)	7328 : 1992	High density polyethylene materials for moulding and extrusion (<i>first revision</i>)
2643 (Part 1) : 1975	Dimensions for pipe threads for fastening purposes: Part 1 Basic profile and dimensions (<i>first revision</i>)	9595 : 1996	Metal-arc welding of carbon and carbon manganese steels-Recommendations (<i>first revision</i>)
		14609 : 1999	Dry chemical powder for fire fighting A, B, C class fires – Specification

ANNEX B

(Clause 12)

SAMPLING AND CRITERIA FOR CONFORMITY

B-0 GENERAL

B-0.1 The risk involved in failure of a fire extinguisher to work when needed is extremely large. Fire extinguishers, therefore, ought to have a high degree of reliability of performance during the entire period of its service. It can be achieved only through adequate design and control at all stages of manufacture and assembly.

B-1 SAMPLING**B-1.1 Lot**

All fire extinguishers of the same type, shape, design and capacity, produced by the same manufacturer from similar materials under almost identical conditions of manufacture shall be grouped together to constitute a lot.

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B-1.2 Each lot shall be considered individually for the purpose of evaluation of quality in accordance with this specification.

B-1.2.1 The number of samples for testing to be taken at random from a lot and the criteria for conformity shall be as given in **B-1.2.2** and **B-1.2.3**.

B-1.2.2 From each lot a number of samples as indicated in col 2 of Table 2 shall be selected at random.

B-1.2.3 They shall be examined visually, as far as possible, in respect of requirements specified in 3, 5 to 8, 11 and then in respect of hydraulic pressure test (see 9).

B-1.2.3.1 All the samples tested shall pass these tests for the lot to be declared to conform to these requirements.

B-1.2.4 In respect of performance test (see 9.1), one sample shall be tested for this property and the sample shall pass this test for the lot to be declared to conform to this requirement.

B-1.2.5 In respect of bursting pressure (see 9.3), one type test shall be done and these

should conform to the requirements laid down in the specification.

B-1.2.6 In the absence of a certificate from a manufacturer about conformity of specifications for the various components (see 5) and the charge (see 6.12) from a sample fire extinguisher, such items shall be taken separately and examined individually in respect of the relevant requirements laid down in the specification. The lot shall be considered satisfactory if all the items satisfy the relevant requirements of this specification.

Table 2 For Lots Produced Under Quality Control System
(Clause B-1.2.2)

Sl No.	No. of Items in the Lot	Sample Size
(1)	(2)	(3)
i)	Up to 25	3
ii)	26 to 50	5
iii)	51 to 100	8
iv)	101 to 200	8 percent

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Fire fighting Sectional Committee, CED 22

Chairman

SHRI OM PRAKASH (FIRE ADVISER)

Members

SHRI D. K. SHAMI

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SHRI P. N. SETHNA

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SHRI K. RAVI (*Alternate*)

DIRECTOR

DEPUTY DIRECTOR (*Alternate*)

Representing

Ministry of Home Affairs, New Delhi

Ministry of Home Affairs, New Delhi

Government of Maharashtra, Mumbai

Kooverji Devshi & Co (P) Ltd, Mumbai

Steelage Industries Ltd, Chennai/Delhi

Ministry of Defence, Delhi

Railway Board, Delhi

Directorate General of Supplies & Disposals, Pune

Delhi Fire Service, Delhi

Controllerate of Quality Assurance, Pune

Design and Consultancy, CME Campus, Pune

Engineer-in-Chief's Branch, New Delhi

Defence Research and Development Organization, Delhi

Tariff Advisory Committee, Ahmadabad

Home Department (Fire Service), Chennai

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<i>Members</i>	<i>Representing</i>
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PRESIDENT GENERAL SECRETARY (<i>Alternate</i>)	The Institution of Fire Engineers (India), Delhi
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SHRI SURESH BABU SHRI D. N. SINGH (<i>Alternate</i>)	Steel Authority of India Ltd, Dhanbad
SHRI R. P. SAXENA SHRI NEERAJ SHARMA (<i>Alternate</i>)	Oil and Natural Gas Commission, Dehradun
SHRI SWARANJIT SEN DEPUTY DIRECTOR (<i>Alternate</i>)	Home (Police Department) Government of Andhra Pradesh, Hyderabad
SHRI TARIT SUR SHRI D. NEOGI (<i>Alternate</i>)	Surex Production and Sales Pvt Ltd, Calcutta
SHRI HARISH SALOT	Vijay Fire Protection Systems Pvt Ltd, Mumbai
SHRI RAMESH R. DHOBLEV	Bhabha Atomic Research Centre, Mumbai
SHRI S. M. DESAI	Eureka Firetech Pvt Ltd, Mumbai
SHRI G. B. MENON	In personal capacity (<i>16 Amiket Society, Manjal Pur, G.I.D.C Road, Vadodara</i>)
SHRI ASHOK SHARMA SHRI A. K. NANDI (<i>Alternate</i>)	Mather and Platt (India) Ltd, Mumbai
MANAGING DIRECTOR	Loss, Prevention Association of India, Mumbai
SHRI P. N. PANCHAL	In personal capacity (<i>Flat No. 46 Block E-1, Pocket II, Sector 15, Rohini, Delhi</i>)
SHRI VINOD KUMAR Director (Civ Engg)	Director General, BIS (<i>Ex-officio Member</i>)

Member-Secretary

SHRI SANJEEV CHATURVEDI
Joint Director (Civ Engg), BIS

ANNEX D*(Clause 11.2.1)***LIST OF OZONE DEPLETING SUBSTANCES (ODS) CONTROLLED
BY MONTREAL PROTOCOL**

<i>Trade Name</i>	<i>ODP</i>
Halon 1211	3.0
Halon 1301	10.0
Halon 2402	6.0
CFC-11	1.0
CFC-12	1.0
CFC-113	0.8
CFC-114	1.0
CFC-115	0.6
CCl ₄	1.1
C ₂ H ₃ Cl ₃	0.1
CFC-13	1.0
CFC-111	1.0
CFC-112	1.0
CFC-211	1.0
CFC-212	1.0
CFC-213	1.0
CFC-214	1.0
CFC-215	1.0
CFC-216	1.0
CFC-217	1.0
Methyl Bromide	0.6

NOTE — ODP values are relative to CFC-II which has been assigned arbitrary value of 1.0.

ANNEX E*(Clause 11.2.2)***LIST OF ATMOSPHERIC LIFE TIME OF GAS-BASED AGENTS**

<i>Trade Name</i>	<i>Designation</i>	<i>Atmospheric Life Time (Year)</i>
Halon-13001	(CF 31)	<1 day
NAFS III	HCFC (Blend A)	12
FE 25	HCFC-125	36
FE 241	FCFC-124	6
FE 36	HFC-227 fa	250
FE 13	HFC-23	250
FM 200	HFC-227 EA	41
CEA 410	FC-3-1-10	2 600
Halon 1301	Halon 1301	65
Inergen	IG 541	—
Argonite	IG 55	—
Argon	IG 01	—

ANNEX F*(Clause 13.2.3)***LIST OF SUBSTANCES HAVING GLOBAL WARMING POTENTIAL (GWP)**

<i>Trade Name</i>	<i>GWP (100 year)</i> <i>V_sCO₂</i>
Halon 1301	5 600
Inergen	—
Argonite	—
Argon	—
CEA 410	5 500
FM 200	3 300
FE 13	12 100
FE 36	8 000
FE 241	480
FE 25	3 200
NAFS III	1 450
CF 31	<5

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

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Amd. No. 2	September 2002
Amd. No. 3	September 2003

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Telephone

{ 323 76 17
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Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Kankurgachi
KOLKATA 700054

{ 337 84 99, 337 85 61
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Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022

{ 60 38 43
{ 60 20 25

Southern : C. I. T. Campus, IV Cross Road, CHENNAI 600113

{ 235 02 16, 235 04 42
{ 235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
MUMBAI 400093

{ 832 92 95, 832 78 58
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