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भारतीय मानक

अग्नि शामक, शुष्क पाउडर (कार्टिज वाले) — विशिष्टि

(चौथा पुनरीक्षण)

Indian Standard

PORTABLE FIRE EXTINGUISHERS, DRY POWDER (CARTRIDGE TYPE) — SPECIFICATION

(Fourth Revision)

(Incorporating Amendment Nos. 1, 2 & 3)

ICS 13.220.10

B U R E A U O F I N D I A N S T A N D A R D S
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Group 4

FOREWORD

This Indian Standard (Fourth 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.

Portable dry powder fire extinguishers (other than those used for metal fires) are used for dealing Class A, B, C fires. Use of these extinguishers have increased due to the banning of CTC type fire extinguishers and phasing out Halon extinguishers as these also act as a substitute for the same in certain risk. This standard has been prepared with a view to guide the industries for the manufacture and the users in obtaining the extinguisher capable of giving satisfactory performance. The details in regard to the maintenance are given in IS 2190 : 1992 'Code of practice for selection, installation and maintenance of portable first aid fire extinguishers (*third revision*)'. This standard was first published in 1962 and revised in 1972, 1976 and 1985. This fourth revision has been prepared so as to incorporate all the amendments issued so far. The provisions in respect of the fire extinguishers to be used for metal fires have been also covered in separate Indian Standards. The major changes in the present revision include:

a) Incorporation of Class A also,

b) Materials for some of the parts of the extinguisher, and

c) Size of filler opening added.

Composition of the Committee responsible for formulation of this standard is given in Annex D.

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 a 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 Government of India.

This edition 5.3 incorporates Amendment No. 1 (April 2001), Amendment No. 2 (March 2003) 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

PORTABLE FIRE EXTINGUISHERS, DRY POWDER (CARTRIDGE TYPE) — SPECIFICATION

(Fourth Revision)

1 SCOPE

1.1 This standard lays down the requirements regarding material, shape, construction, chemical charges, anti-corrosive treatment and tests for dry powder fire extinguishers.

2 REFERENCES

2.1 The Indian Standards listed in Annex A contain provision which, through reference in this 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 in Annex A.

3 PRINCIPLE

3.1 The method of expulsion of dry powder shall be by means of pressure produced from compressed or liquified gas from gas cartridge attached to the cap after piercing it uprightly or by pressing the squeeze grip.

4 CAPACITY

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

Nominal Capacity of Extinguisher	*Dry Powder Contents, (with tolerance of + 5 percent)*
kg	
5	5
10	10

5 MATERIALS

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

6 SHAPE

6.1 The shape of the body shall be cylindrical.

7 CONSTRUCTION

7.1 General

7.1.1 The cylinder shall be of welded construction having cold or hot drawn cylindrical portion with hemi-spherical elliproidal or torispherical ends welded to it or two halves (upper half shorter) cold or hot drawn having dome and bottom dish of hemi-spherical or ellipsoidal or torispherical and circumferentially welded together. A cylindrical skirt having minimum 25 mm height shall be welded to the bottom dish. The welding shall be done by an electric arc welding process and shall conform to IS 2825.

7.1.2 Where carrying handle and/or supporting fittings are fitted to the body, these shall be either welded or brazed. The carrying handle shall be made of mild steel or stainless steel rod not less than 6 mm in diameter or fabricated out of mild steel or stainless steel sheets of same thickness as the body and the clamp shall be of mild steel or stainless steel thickness of 3 mm, minimum.

7.2 Body

The material used in the construction of extinguisher bodies shall be weldable. The filler materials shall be compatible to the body steel to give good welds. A cylindrical ring shall be fitted/welded to the bottom dish. Minimum wall thickness of the body shall be calculated using the formula:

a) For carbon steel bodies,

$$t = \frac{D}{360} + 0.7$$

b) For austenitic stainless steel bodies,

$$t = \frac{D}{600} + 0.3$$

where

t = minimum thickness, in mm; and

D = external diameter of the body, in mm.

Table 1 Materials of Construction of Various Parts of Fire Extinguisher

(*Clause* 5.1)

Sl No.	Component	Material	Ref to Indian Standard
(1)	(2)	(3)	(4)
i)	Body	Mild steel sheet	Grade any of IS 513, IS 2062, IS 6240
ii)	Inner shell	i) Mild steel sheet	Grade any of IS 513, IS 3074 or IS 3601
		ii) Plastic	IS 7328
iii)	Neck Ting	i) Leaded tin bronze	Grade LTB 2 of IS 318
		ii) Brass forging	Grade FLB of IS 6912
		iii) Seamless mild steel tube	M. S. Tube having phosphorus and sulphur 0.05 percent maximum and other properties conforming to IS 1239 (Part 1).
iv)	Cap including cartridge holder	i) Leaded tin bronze	Grade LTB 2 of IS 318
		ii) Brass forging	Grade FLB of IS 6912
		iii) Plastic	*See* Annex B
		iv) Stainless steel	IS 6529
		v) Auminium die cast	IS 1804
	Plunger	i) Brass	Grade 2 of IS 291 or Type 1 of IS 319
v)	Cap washer	Rubber	Requirement in respect of hardness as applicable to Type 3 of IS 5382 and also acid/alkali resistant (*see* Note)
vi)	a) Plunger	i) Brass	Grade 2 of IS 291 or Type 1 of IS 391
		ii) Stainless steel	IS 6528
	b) Cartridge holder	i) Leaded tin bronze	Grade LTB 2 of IS 318
		ii) Brass	Grade 2 of IS 291 or Type 1 of IS 319
vii)	Piercer	Stainless steel	IS 6528
viii)	Spring	Carbon steel	Grade 1 of IS 4454 (Part 1)
ix)	Syphon tube	i) Mild steel	IS 3601
		ii) Brass	Alloy No. 2 of IS 407
		iii) Plastic	IS 7328
x)	Nozzle and discharge fitting	i) Aluminium alloy	Grade 4450 or 4225 of IS 617
		ii) Leaded tin bronze	Grade LTB 2 of IS 318
		iii) Brass	Grade 2 of IS 291 or Type 1 of IS 319
		iv) Plastic	*See* Annex B
xi)	Cartridge	Steel	IS 4947
xii)	Hose	Braided PVC/rubber	IS 14933
xiii)	Safety clip	i) Steel	Grade 1 of IS 2507
		ii) Plastic	IS 7328
xiv)	Squeeze grip handle	i) Mild steel	Any Grade of IS 513
		ii) Aluminium	Grade 4450 or 4225 of IS 617
		iii) Plastic	IS 7328

NOTE — When a piece of 2.5 cm 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 or damage.

7.3 Expansion Space

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

7.4 Neck Ring

The neck ring of 57 mm (G 2¼) for bang on type and of 63 mm (G 2½) for squeeze grip type shall be firmly secured by brazing or welding. A parallel screw thread for the attachment of cap shall be not less than 16 mm in effective length and the thread shall be in accordance with of IS 2643 with Class A tolerance.

7.5 Cap

The cap shall be screwed for fixing to the neck on the body for not less than 16 mm in effective length and the parallel threads shall be in accordance with IS 2643 (Part 1) to suit neck ring. At least 3 hole of not less than 2.5 mm diameter each shall be drilled through the threaded portion of the cap to form vents. The centres of the vent holes shall be 6.5 mm maximum from the exposed face of the cap joint washer.

7.6 Gas Cartridge and Cartridge Holder

A cartridge holder shall be provided and fitted inside the cap in such a way that the cartridge-seal-piercing mechanism passes through its centre and shall puncture the cartridge clean when the cartridge is fitted to this holder. The threads shall be provided in the holder and these shall correspond to the threads of gas cartridge (*see* IS 4947). Port holes shall also be provided in the cartridge holder. CO_2 cartridge 100 g capacity for 5 kg capacity and 200 g capacity for 10 kg capacity shall conform to IS 4947. The capacity of gas cartridge shall be 120 g for 5 kg and 180 to 200 g for 10 kg.

7.7 Plunger Rod and Piercing Mechanism

The plunger rod shall be of such a length that it has a minimum stroke of 7 mm. A spring loaded piercing device shall be provided in the plunger for piercing the seal of the gas cartridge when fitted to the cartridge holder. The puncturing end shall be designed so as to ensure a clear opening in the cartridge seal when piercer is operated. A safety clip shall be provided to prevent accidental operation of the piercing mechanism.

7.8 Cap Joint Washer

The cap joint washer shall be finished smooth and retained in a recess in the cap.

7.9 Hose

The extinguisher discharge outlet of 5 kg and 10 kg capacity shall be fitted with the hose of not less than 500 mm (or of suitable size) and 750 mm (or of suitable size) lengths, respectively.

7.10 Nozzle

The nozzle shall be squeeze grip type for 10 kg capacity and for 5 kg squeeze grip type if required. The nozzle shall be capable of discharging the dry powder as in **11.1**.

7.11 The syphon tube shall be fitted inside the body. In case of squeeze grip type, syphon tube shall be fitted in the cap.

7.12 Bottom Ring

Bottom ring/skirting of mild steel of minimum thickness 3 mm shall be provided.

8 DRY POWDER CHARGE

8.1 The dry powder used of BC or ABC Class shall conform to IS 4308 or IS 14609.

9 ANTI-CORROSIVE TREATMENT

9.1 All internal surfaces of the body shall be completely coated with lead-tin alloy (tin not less than 10 percent) applied by hot-dipping process to a thickness of not less than 0.012 mm. The thickness of the coating shall be measured as given in IS 3203. The external surfaces of the body and both surfaces of components, that is inner shell (if any), syphon tube (if of mild steel), spring etc, whichever applicable, shall also be subjected to this anti-corrosive treatments. There shall be no visible uncoated area both internally or externally.

9.1.1 Phosphating in accordance with the provisions of IS 3618 may be applied on the external surface of the body as an alternative to lead-tin alloy coating.

9.1.2 Epoxy polyster powder coating of 50 micron thickness may be applied on internal and external surfaces of the body as an alternative to lead-tin alloy coating.

10 PAINTING

10.1 Each extinguisher shall be painted fire red conforming to shade No. 536 of IS 5.

10.2 A picture showing a man operating the extinguisher in the correct manner shall be shown on the body of the extinguisher.

10.3 The extinguisher shall be marked with the letter 'A', 'B' and 'C', indicating their suitability for respective classes of fires as laid down in IS 2190 depending upon the powder conforming to IS 4308 or IS 14609 for class BC & class ABC respectively which is filled in the extinguisher. All the letters 'A', 'B' and 'C' shall be of 2.5 ± 0.5 cm size printed in white colour centrally contained in a square of 4 ± 0.5 cm size and a circle of 2 ± 0.5 cm radius respectively. The square and circle shall be coloured blue, conforming to shade No. 166 of IS 5.

10.4 The paint shall conform to IS 2932.

11 TEST REQUIREMENTS

11.1 The extinguisher shall be capable of discharging not less than 85 percent by mass of the actual rated capacity of dry powder, when the extinguisher is operated with its nozzle at an angle of 45° above horizontal line at a temperature of 27 ± 5°C in still weather conditions. The contents being expelled in the form of a continuous discharge which shall comply with the following requirements:

Capacity of Extinguisher	*Minimum Period for which Throw as Jet to be Maintained*	*Maximum Period to Discharge at least 85 percent of Rated Capacity*	*Range of Throw of Jet (as Measured from Nozzle End to Centre of Pattern of Discharge at the End of Test)*
kg	sec	sec	m
5	15	20	Not less than 4
10	23	30	Not less than 6

11.2 The extinguisher body and the cap assembly shall be tested to an internal hydraulic pressure of 3.0 MN/m^2 (30 kgf/cm^2) for a period of 2 min. During this test it shall not shown any sign of leakage.

NOTE — The testing may be done either with cap or without cap and in that case the cap shall be tested separately.

11.3 In case of hydralic burst failure test, the mechanical failure shall not occur at a pressure of less than 4.5 MN/m^2 (45 kgf/cm^2).

NOTE — The testing shall be done through discharge fittings with the cap assembled.

11.4 Fire knock down properties shall be carried out on dry powder filled inside the extinguishers as per the procedure given in **3.7** of IS 4308 or **4.12** of IS 14609 depending upon the powder used in fire extinguisher.

12 OPTIONAL REQUIREMENTS FOR ECO MARK

12.1 General Requirements

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

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

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

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

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

12.1.6 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.

12.2 Specific Requirements

12.2.1 The fire extinguisher shall not contain any Ozone Depleting Substance (ODS) relevant to fire extinguishers industry as identified under the Montreal Protocol (Annex E).

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

12.2.3 Chemical used should not have global warming potential (Annex G).

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

12.2.5 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 — CO_2 extinguishers may be permitted till suitable substitutes are available.

13 MARKING

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

a) Manufacturer's name or trade-mark, serial No. and year of manufacture shall be embossed at the bottom ring.

b) Method of operation in prominent letter;

c) The words 'Dry Powder Extinguisher' class ABC or BC;

d) The capacity of the extinguisher in kg;

e) Capacity of gas cartridge;

f) A declaration to the effect that the body of the extinguisher has been tested to a pressure of 3.0 MN/m^2 (30 kgf/cm^2); and

h) Year of manufacture.

13.2 BIS Certification Marking

The product may also be marked with BIS Standard Mark.

13.2.1 The use of Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulation 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.

14 SAMPLING AND CRITERIA FOR CONFORMITY

14.1 The detail of sampling and criteria for conformity is given in Annex B.

ANNEX A

(*Clause* 2.1)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
5 : 1994	Colours for ready mixed paints and enamels (*third revision*)
265 : 1993	Hydrochloric acid (*fourth revision*)
291 : 1989	Naval brass rods and sections for machining purposes (*third revision*)
318 : 1981	Leaded tin bronze ingots and castings (*second revision*)
319 : 1989	Free cutting brass bars, rods and sections (*fourth revision*)
407 : 1981	Brass tubes for general purposes (*third revision*)
513 : 1994	Cold rolled low carbon steel sheets and strips (*fourth revision*)
617 : 1994	Aluminium and aluminium alloy ingots and castings for general engineering purposes (*third revision*)
819 : 1957	Code of practice for resistance spot welding for light assemblies in mild steel
1239 (Part 1) : 1990	Mild steel tubes, tubulars and other wrought steel fittings: Part 1 Mild steel tubes (*fifth revision*)
1261 : 1959	Code of practice for seam welding in mild steel
1323 : 1982	Code of practice for oxy-acetylene welding for structural work in mild steels (*second revision*)
2062 : 1992	Steel for general structural purposes (*fourth revision*)
2124 : 1974	Sodium bicarbonate (*first revision*)
2190 : 1992	Selection, installation and maintenance of first aid fire extinguishers —Code of practice (*second revision*)
2507 : 1975	Cold-rolled steel strips for springs (*first revision*)
2643 (Part 1) : 1975	Dimensions for pipe threads for fastening purposes: Part 1 Basic profile and dimensions (*first revision*)
2932 : 1993	Enamel, synthetic, exterior (a) undercoating, (b) finishing (*second revision*)
3203 : 1982	Methods of testing local thickness of electroplated coatings (*first revision*)
3601 : 1984	Steel tubes for mechanical and general engineering purposes (*first revision*)
3618 : 1966	Specification for phosphate treatment of iron and steel for protection against corrosion
4308 : 1982	Specification for dry powder for fire fighting (*first revision*)
4454 (Part 1) : 1981	Steel wires for cold formed springs: Part 1 Patented and cold drawn steel wires-unalloyed (*second revision*)
4947 : 1985	Specification for gas cartridges for use in fire extinguishers (*second revision*)
5382 : 1985	Rubber sealing rings for gas mains, water mains and sewers (*first revision*)
5762 : 1970	Methods for determination of melting range/temperature
6240 : 1989	Hot rolled steel plate (up to 6 mm) sheet and strip for the manufacture of low pressure liquifiable gas cylinder (*second revision*)
6528 : 1992	Stainless steel wire
6529 : 1972	Stainless steel blooms, billets and slabs forging
6912 : 1985	Copper and copper alloy forging stock and forgings (*first revision*)
7188 : 1974	Methods of test for cellulose acetate flakes
7328 : 1992	High density polyethylene materials for moulding and extrusion
8543 (Part 1/ Sec 2) : 1979	Methods of testing plastics: Part 1 Characterization polymer structure and size, Section 2 Determination of density of solid plastics
9595 : 1980	Recommendations for metal arc welding of carbon and carbon manganese steels
14609 : 1999	Dry chemical powder for fighting A, B and C class fires — Specification (*under print*)

ANNEX B

(*Table* 1)

REQUIREMENTS FOR PLASTIC

B-1 PHYSICAL TESTS

B-1.1 From a sample, requirements of following properties shall be checked:

Property	*Method of Test*	*Requirements*
Specific gravity	IS 8543 (Part 1/Sec 2)	1.25 ± 0.02
Melting point	IS 5762	215°C-225°C
Ash content	IS 7188	15 ± 2%

B-2 BURST PRESSURE TEST

B-2.0 If the sample passes the requirements mentioned in **B-1**, the following burst pressure test shall be done on the second sample.

B-2.1 The sample shall be subject to internal hydraulic pressure of 50 kgf/cm^2 after blocking plunger hole, if any. The pressure shall be built up gradually over a period of 30 s and maintained for 1 min. There shall be no mechanical failure of cap and cap threads.

B-3 AGEING TEST

B-3.0 If the sample passes the requirements mentioned in **B-2** the following tests shall be done on the third sample in order as indicated below, and the sample shall pass all the tests.

B-3.1 Acid Resistance Test

The sample shall be submerged in 10 percent dilute hydrochloric acid (*see* IS 265) for 72 h at the temperature of 27 ± 5°C. It shall be then removed, rinsed with potable water and dried. The sample shall not show any sign of discolouration, distortion or deterioration of any kind.

B-3.2 Alkali Resistance Test

The sample then shall be submerged in 10 percent sodium bicarbonate solution (*see* IS 2124) for 72 h at a temperature of 27 ± 5°C. and then shall be removed, rinsed with potable water and dried. The sample shall not show any sign of discolouration, distortion or deterioration of any kind.

B-3.3 The sample then shall be screwed and unscrewed into neck ring of the fire extinguisher for 100 times. The samples shall not show any sign of damage or distortion of threads. The sample shall then be first tested for internal hydraulic pressure of 45 kgf/cm^2 after blocking plunger holes if any. The pressure shall be built up over a period of 30 s and maintained for 1 min. There shall not be any sign of leakage. It shall be then kept suspended in an oven maintaining the temperature of 60 ± 1°C for 72 h and after removing when it attains temperature of 27 ± 5°C it shall be kept in refrigerator at a temperature of 5 ± 1°C for 72 h. After this period the sample shall be removed and when it attains the temperature 27 ± 5°C and at this stage it does not show any sign of discolouration, distortion or deterioration of any kind, shall be subject to internal hydraulic pressure test as mentioned above and there shall not be any sign of leakage. This cycle of test shall be further repeated 2 times with gap of 24 h and the sample shall be observed and shall not show any sign of discolouration, distortion and deterioration besides passing the hydraulic pressure test.

B-3.4 UV Exposure Test

The sample then shall be exposed at 27 ± 5°C to XERON ARC.U.V. radiations for 100 min followed by exposure at a R.H. 60 ± 5 percent and temperature 62 ± 5°C for 20 min. The cycle shall be repeated 60 times and the sample shall then be subjected to internal hydraulic pressure mentioned in **B-3.3** and shall pass the requirement.

ANNEX C

(*Clause* 13.1)

SAMPLING AND CRITERIA FOR CONFORMITY

C-0 GENERAL

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

C-1 SAMPLING

C-1.1 Lot

All portable 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.

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

C-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 **C-1.2.2** and **C-1.2.3**.

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

C-1.2.3 They shall be examined visually as far as possible in respect of requirements specified in **4, 7, 10** and **12** and then in respect of hydraulic pressure test (*see* **11.1**) and corrosion test (*see* **9**).

C-1.2.4 In respect of performance test (*see* **11.1**), expansion space (*see* **7.3**) one sample shall be tested for these property and the sample shall pass this test for the lot to be declared to conform to this requirements.

Table 2 For Lots Produced Under Quality Control System

(*Clause* C-1.2.2)

No. of Items in the Lot	Sample Size
(1)	(2)
Up to 50	13
51 to 90	20
91 to 150	32
151 to 280	50
281 to 500	80
501 to 1200	125
1 201 and above	200

C-1.2.5 In respect of bursting pressure (*see* **11.3**) type test shall be done and these should conform to the requirements laid down in the specification.

C-1.2.6 In the absence of a certificate from a manufacturer about conformity of specification for the various components (*see* **5.1**) and the charge (*see* **8.1**) of the quality specified in this specification, from a sample fire extinguisher, on item each shall be taken separately and examined individually in respect of the relevant requirements laid down in this specification. The lot shall be considered satisfactory if all the items satisfy the relevant requirements of this specification.

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Fire Fighting Sectional Committee, CED 22

Chairman	*Representing*
SHRI OM PRAKASH (FIRE ADVISER)	Ministry of Home Affairs, New Delhi
Members	
SHRI D. K. SHAMI	Ministry of Home Affairs
DR NAVINCHANDRA JAIN	Government of Maharashtra, Mumbai
SHRI P. N. SETHNA SHRI N. T. PANJWANI (*Alternate*)	Kooverji Devshi & Co (P) Ltd, Mumbai
SHRI SHIV NATH SHRI P. GANESHAN (*Alternate*)	Steelage Industries Ltd, Chennai/Delhi
SHRI P. K. CHATTERJEE SHRI H. S. KAPARWAN (*Alternate*)	Ministry of Defence, Delhi
SHRI K. P. SHARMA ASSTT SECURITY COMMISSIONER (FIRE) (*Alternate*)	Railway Board, Delhi
SHRI M. GANGARAJU SHRI V. K. VERMA (*Alternate*)	Directorate General of Supplies and Disposals, Pune
SHRI S. K. DHERI SHRI R. C. SHARMA (*Alternate*)	Delhi Fire Service, Delhi
SHRI V. L. N. RAO LT COL S. K. MARKENDEY (*Alternate*)	Controllerate of Quality Assurance, Pune
SHRI P. A. DUBEY	Design & Consultancy, CME Campus, Pune
SHRI NARINDER KUMAR	Engineer-in-Chief's Branch, New Delhi
FIRE ADVISER SHRI S. C. RAY (*Alternate*)	Defence Research & Development Organization, Delhi
SHRI J. N. VAKIL SHRI K. RAVI (*Alternate*)	Tariff Advisory Committee, Ahmedabad
DIRECTOR DEPUTY DIRECTOR (*Alternate*)	Home Department (Fire Service), Chennai
DR T. P. SHARMA DR A. K. GUPTA (*Alternate*)	Central Building Research Institute (CSIR), Roorkee
SHRI B. PATHAK	West Bengal Fire Service, Calcutta
MANAGING DIRECTOR TECHNICAL EXECUTIVE (*Alternate*)	Avon Services Pvt Ltd, Mumbai
SHRI P. S. BHANDARI SHRI D. R. YADAV (*Alternate*)	Central Industrial Security Force, New Delhi
PRESIDENT GENERAL SECRETARY (*Alternate*)	The Institution of Fire Engineers (India), Delhi
SHRI S. N. KUNDU	Fire & Safety Appliances Co, Calcutta
SHRI P. KHANNA	Jaya Shri Textiles, Delhi
DIRECTOR OF EQUIPMENT SENIOR FIRE OFFICER (*Alternate*)	National Airport Authority, New Delhi
SHRI C. P. GOSAIN	Central Public Works Department, New Delhi
SHRI P. N. GHOSH	In personal capacity (*J-1916 Chittaranjan Park, New Delhi*)
SHRI B. J. SHAH SHRI A. M. SHAH (*Alternate*)	Newage Industries, Gujarat
SHRI V. V. RAO SHRI V. G. SAWANT (*Alternate*)	Bombay Fire Brigade, Mumbai
SHRI T. YOGESWARA SHRI JOHN TAKEY (*Alternate*)	Steel Authority of India Ltd, Rourkela
SHRI SURESH BABU SHRI D. N. SINGH (*Alternate*)	Steel Authority of India Ltd, Dhanbad
SHRI R. P. SAXENA SHRI NEERAJ SHARMA (*Alternate*)	Oil & Natural Gas Commission, Dehra Dun
SHRI SWARANJIT SEN DEPUTY DIRECTOR (*Alternate*)	Home (Police Department) Government of Andhra Pradesh, Hyderabad
SHRI TARIT SUR SHRI D. NEOGI (*Alternate*)	Surex Prodution & Sales Pvt Ltd, Calcutta
SHRI HARISH SALOT	Vijay Fire Protection System Pvt Ltd, Mumbai

(*Continued on page* 9)

(*Continued from page* 8)

Members	*Representing*
SHRI RAMESH R. DHOBLEY	Bhabha Atomic Research Centre, Mumbai
SHRI S. M. DESAI	Eureka Firetech Pvt Ltd, Mumbai
SHRI G. B. MENON	In personal capacity (*House No.33/238 A-5 Puzhakkara Padam Vennala Cochin*)
SHRI ASHOK SHARMA SHRI A. K. NANDI (*Alternate*)	Mather & Platt (India) Ltd, Mumbai
MANAGING DIRECTOR	Loss Prevention Association of India, Mumbai
SHRI P. N. PANCHAL	In personal capacity (*Flat No.46, Block E-1, Pocket II, Sector 15, Rohini, Delhi*)
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Member Secretary
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Joint Director (Civ Engg), BIS

ANNEX E

(*Clause* 12.2.1)

LIST OF OZONE DEPLETING SUBSTANCES (ODS) CONTROLLED BY MONTREAL PROTOCOL

Trade Name	*ODP*
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
CCI_4	1.1
$C_2 H_3 C_{13}$	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 F

(*Clause* 12.2.2)

LIST OF ATMOSPHERIC LIFE TIME OF GAS-BASED AGENTS

Trade Name	*Designation*	*Atmospheric Life Time (Year)*
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	IGG 541	—
Argonite	IG 55	—
Argon	IG 01	—

ANNEX G

(*Clause* 12.2.3)

LIST OF SUBSTANCES HAVING GLOBAL WARMING POTENTIAL (GWP)

Trade Name	*GWP (100 year)* V_s Co_2
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

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Amendments Issued Since Publication

Amend No.	Date of Issue
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Amd. No. 2	March 2003
Amd. No. 3	September 2003

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AMENDMENT NO. 4 APRIL 2005
TO
IS 2171 : 1999 PORTABLE FIRE EXTINGUISHER, DRY POWDER (CARTRIDGE TYPE) — SPECIFICATION

(Fourth Revision)

[*Page* 1, *clause* **7.1.1** (*see also Amendment No.* 3)] — Delete last sentence 'The welding ----- IS 2825' and add the following:

'The welded construction shall be one of the types given below, and shall conform to the relevant Indian Standard:

a) Oxy-acetylene welding shall conform to the requirements specified in IS 1323.

b) Resistance welding:

   1) Spot welding (for attachment of fittings only) shall conform to IS 819.

   2) Stitch welding shall conform to the requirements specified in IS 819.

   3) Seam welding shall conform to the requirements specified in IS1261.

c) Metal arc welding shall conform to IS 9595.

d) Electric arc welding shall conform to IS 2825.

[*Page* 1, *clause* **7.1.2**, *last line* (*see also Amendment No.* 3)] — Substitute '2 mm' *for* '3 mm'.

(*Page* 1, *clause* **7.1.2**) — Add new subclause **7.1.3** as follows:

'The thickness of the shell shall be calculated in accordance with **7.2** but it shall not be less than 1.4 mm.'

[*Page* 1, *clause* **7.2** (*see also Amendment No.* 3)] — In formula, substitute '300' *for* '360'.

(*Page* 2, *Table* 1, *Sl No.* (iii)] — Add the following:

(3)	(4)
iv) Stainless Steel	IS 6913

[*Page* 2, *Table* 1, *Sl No.* (i)] — Add the following:

(3)	(4)
Stainless Steel sheet	IS 6911

[*Page* 2, *Table* 1, *Sl No.* (xii), *col* 4 (*see also Amendment No.* 3)] — Substitute 'Having burst pressure of not less than 50 kgf/cm^2' *for* 'IS 14933'.

[*Page* 2, *clause* **7.4** (*see also Amendment No.* 3)] — Substitute the first sentence with the following:

'The neck ring of 63 mm (G 2½) or 75 mm (G 3) shall be firmly secured by brazing or welding.'

(*Page* 3, *clause* **7.9** (*see also Amendment No.* 3)] — In line 3, delete '(or of suitable size)'.

(*Page* 3, *clause* **7.12** (*see also Amendment No.* 2)] — Substitute '1.6 mm' *for* '3 mm'.

(*Page* 3, *clause* **9**) — Substitute the following for the existing:

'**9.1** All internal and external surfaces of the body shall be completely epoxy powder coated to minimum 0.050 mm thickness. The thickness of the coating shall be measured as given in IS 3203. The internal surface of the body shall be plastic/rubber coated and lining shall be of a minimum thickness of 0.5 mm as an alternative to powder coating.

9.1.1 *Test for Adhesion of Plastic Lining* (*Type Test*) — Subject the unfilled extinguisher to a pressure 15 kgf/cm^2 and store for $120 + {}^{4}_{-0}$ h at 27 ± 5°C.

Release the pressure and examine the extinguisher internally for cracking, separation from the wall of the body or lifting of the lining, and bubbles between the lining and the body.'

(*Page* 3, *clause* **9.1.1**) — Renumber '**9.1.1**' as '**9.2**' and delete 'to lead-tin alloy coating.'

(*Page* 3, *clause* **9.1.2**) — Delete.

(*Page* 3, *clause* **10.1**) — Insert 'Post Office red' after 'Fire red' and 'No. 538' after 'No. 536 '.

(*Page* 4, *clause* **11.4** (*see also Amendment No.* 2)] — Delete.

(CED 22)

Reprography Unit, BIS, New Delhi, India