भारतीय मानक

सुवाह्य अग्नि-शामक पानी टाइप (गैस कारतूस)—विशिष्टि

(चौथा पुनरीक्षण)

Indian Standard

PORTABLE FIRE EXTINGUISHER, WATER TYPE (GAS CARTRIDGE)—SPECIFICATION

(Fourth Revision)

ICS 33.220.10

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

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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 fire extinguisher, water type (gas cartridge) is one of the types of the fire extinguishers used as first-aid fire fighting appliance. This type of extinguisher is suitable for fighting fires in Class A fires, that is, in wood, textiles, paper, etc. The details in regard to maintenance of this appliance in efficient condition are given in IS 2190 'Code of practice for selection, installation and maintenance of portable first-aid fire extinguishers (*third revision*)'.

This standard was first published in 1961 and subsequently revised in 1972, 1976 and 1989. In this revision, the principal modifications made are in respect of providing cap having squeeze grip type CO_2 gas cartridge puncture mechanism and also on-off control discharge. Squeeze grip type cap has following advantages over the conventional cap:

a) It is safe in operation as the operation need not hit the knob with force by hand.
b) The discharge can be halted and restarted at the will of the operator.
c) It has built in operation lever and carrying handle.

Other modifications made are as follows:

a) Stainless steel body is included to provide resistance from corrosion and good aesthetic appearance.
b) Internal plastic lining of the extinguisher to avoid corrosion in usage.
c) Type test for leaded tin alloy coating and stainless steel bodies have been incorporated.
d) Epoxy powder coating for external surface is included to improve the scratch hardness, life and aesthetics.
e) Provision of thickness of body in accordance with bursting formulae.

In addition to above various provisions have been updated which are based on experience gained in the use of this appliance in the past.

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 are optional; manufacturing units are free to opt for the IS Mark alone also .

This clause 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.

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 EXTINGUISHER, WATER TYPE (GAS CARTRIDGE)—SPECIFICATION

(Fourth Revision)

1 SCOPE

This standard lays down the requirements regarding principle, capacity, material, shape, design, construction, anti-corrosive treatment and tests of portable water type fire extinguisher.

2 REFERENCES

The standards given in Annex A contain provisions 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 D.

3 PRINCIPLE AND DESIGN

3.1 The extinguisher shall be upright type, thus operated by holding the extinguisher upright and piercing the gas cartridge by applying pressure on plunger or by pressing the squeeze grip thereby discharging the contents.

3.2 During the operation, the jet, where possible, should be able to strike the burning surface and engulf fire.

4 CAPACITY

The liquid capacity of the extinguisher when filled to the specified level indicated in exterior of the body shall be 9.0 ± 0.5 litre.

5 MATERIAL

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

6 SHAPE

The shape of the body shall be cylindrical with an outside diameter of 175 ± 5 mm.

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 ellipsoidal 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.

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.

7.3 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 IS 2643 with Class A tolerance.

7.4 Syphon Tube and Strainer

The syphon tube with strainer at free end shall be fitted inside the body. In case of squeeze grip type, syphon tube shall be fitted in the cap.

Table 1 Material of Construction of Various Parts of Fire Extinguisher

(*Clause* 5)

Sl No.	Component	Materials	Relevant Indian Standards
(1)	(2)	(3)	(4)
i)	Body	i) Mild steel sheet	Minimum Grade D of IS 513
		ii) Stainless steel sheet	IS 5522
ii)	Syphon tube	i) Brass tube	Alloy No. 2 of IS 407
		ii) Stainless steel tube	IS 6913
		iii) Plastic pipe	IS 4985
iii)	Neck ring	i) Lead tin bronze	Grade LTB 2 of IS 318
		ii) Seamless mild steel	Seamless mild steel tubes having sulphur and phosphorus not exceeding 0.05 percent
		iii) Stainless steel	IS 6913
iv)	Cap	i) Aluminium die-cast	IS 11804
		ii) Brass	Grade FLB of IS 6912
		iii) Leaded tin-bronze	Grade LTB 2 of IS 318
v)	Cap body	i) Leaded tin-bronze	Grade LTB 2 of IS 318
		ii) Stainless steel	Grade 1 of IS 3444
		iii) Aluminium die-cast	IS 617
vi)	Check nut	i) Leaded tin bronze	Grade LTB 2 of IS 318
		ii) Brass	Type 1 of IS 319
		iii) Stainless steel	IS 6529
vii)	Cap washer ('O' ring)	Rubber	IS 937 conforming to requirement of hardness as applicable to Type 3 of IS 5382 and also acid and alkali resistant test (*see* Note)
viii)	Cartridge holder, knob, discharge fittings and plunger	i) Brass	Type 1 of IS 319
		ii) Lead tin bronze	Grade LTB 2 of IS 318
		iii) Stainless steel	IS 6528
ix)	Piercer	Stainless steel	IS 6528
x)	Plunger	i) Stainless steel	IS 6528
		ii) Brass	Type 1 of IS 319
xi)	Squeeze grip handle	i) Mild steel	IS 513
		ii) Aluminium	IS 737
		iii) Plastic	IS 7328
xii)	Spring	Spring steel wire	Grade 1 of IS 4454 (Part 1)
xiii)	Safety clip	Steel	Grade 1 of IS 2507
xiv)	Snifter valve	i) Brass	Type 1 of IS 319
		ii) Stainless steel	Grade 04Cr 18 Ni10 of IS 6603
xv)	Nozzle and discharge fittings	i) Brass	Type 1 of IS 319
		ii) Lead tin bronze	Grade LTB 2 of IS 318
		iii) Plastic	IS 7328
		iv) Aluminium	IS 617
xvi)	Strainer	i) Bass sheet	Grade CuZn37 of IS 410
		ii) Plastic	IS 7328
		iii) Stainless steel sheet	IS 5522
xvii)	Hose	Braided rubber/plastic	Shall have a minimum bursting pressure of 4 MN/m^2 (40 kgf/cm^2)
xviii)	Gas cartridge	–	IS 4947

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 damage.

7.5 Cap

7.5.1 For fixing the cap to the neck the cap shall be screwed on the body up to a minimum of 16 mm effective length. The size of parallel thread shall suit the neck ring (*see* **7.3**). At least 3 holes of not less than 2.5 mm diameter shall be drilled through the threaded portion of the cap to form vents. The centres of the vent holes shall be 6.5 mm, *Max* apart from the exposed face of the cap joint washer.

7.5.2 For squeeze grip type, a cap having squeeze grip type CO_2 gas cartridge puncture mechanism and also on/off control discharge shall be provided. A swivel coupler nut shall be provided to screw up the cap on the neck ring.

7.6 Nozzle

The design of the nozzle and the area of the orifice shall be such that it satisfies the performance requirements given in **10.3**. The nozzle may be fixed either to the body or to a hose or to cap.

7.6.1 The hose (if provided) shall be of not less than 8 mm bore and length not less than 600 mm.

7.7 Expansion Space

An air space shall be provided in the body above the specified liquid level which shall be of sufficient volume to ensure that when the discharge nozzle is temporarily closed and the extinguisher put into operation at a temperature of 27 ± 5 °C , the internal pressure exerted shall not exceed 1.5 MN/m².

7.8 Snifter Valve (Breather Device)

A snifter valve shall be fitted to extinguisher. The design of the snifter valve shall be such that in the variation of atmospheric temperature within ± 10 °C, there shall not be any spouting of liquid through the nozzle.

7.9 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). Pot holes shall also be provided in the cartridge holder. The maximum size of gas cartridge shall be 60 g.

7.10 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 load 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 pierce is operated. A safety clip shall be provided to prevent accidental operation of the piercing mechanism.

8 ANTI-CORROSIVE TREATMENT

8.1 All internal surfaces of the mild steel body shall be completely coated with plastic or rubber lining of a minimum thickness of 0.5 mm. The internal lining shall be subjected to the following test.

8.2 Test for Plastic Lining

a) *Test for Adhesion of Plastic Lining (Type Test)*

Subject the unfilled extinguisher to a pressure 15 kgf/cm² and store for 120 ± 4 h at 28 ± 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.

b) Test for Continuity of Plastic Lining

Fill the extinguisher body to within 10 mm of the top of the lining with a 1 percent (*m/m*) solution of sodium chloride in water containing sufficient hydrocarbon surfactant to reduce the surface tension of the solution to less than 40 MN/m. Check the lining for continuity by the application of a 500 ± 50 M insulation resistance test across the lining through connections made to the metal body and to an electrode introduced into the solution in the extinguisher body.

8.3 Phosphating in accordance with the provisions of IS 3618 may be applied on the external surface of the body as an alternative.

8.4 Epoxy polyester powder coating of 50 micron thickness may also be applied on internal and external surfaces of the mild steel body.

9 PAINTING

9.1 Each extinguisher body except stainless steel body shall be painted 'Fire Red.' or Post Office red as per shade 536 or 537 of IS 5, either by epoxy powder coating or synthetic enamel paint. Stainless steel body shall be buffed.

9.2 A large size picture showing a man operating the extinguisher in the correct manner shall be shown on the body of the extinguisher (*see* **3.2**).

9.3 The extinguisher shall be marked with the letter 'A' indicating the suitability of the unit for Class A fires as laid down in IS 2190. The letter 'A' shall be 2.5 ± 0.5 cm in height, painted in black colour centrally inside an equilateral triangle of side 5.0 ± 0.5 cm. The triangle shall be coloured golden yellow.

9.4 The paint shall conform to IS 2932 .

10 TEST REQUIREMENT

10.1 The extinguisher body and the cap assembly

shall be tested to an internal hydraulic pressure of 3.0 MN/cm² (30 kgf/cm²) for a period of 2 min. During the test it shall not show any sign of leakage.

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

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

NOTE — The test shall be done through discharge fittings with the cap assembly.

10.3 When the extinguisher is set in operation under normal temperature conditions of 27± 5°C with a stream starting in horizontal direction in wind-free condition, the water shall be expelled in the form of jet which shall maintain an effective throw of not less than 6 m for the minimum period of 60 s provided that at least 95 percent of water is discharged from the extinguisher within the maximum period of 120 s.

10.4 The fire extinguisher after subjecting to the tests laid down in **10.1** and **10.3** shall be thoroughly cleaned with water, water shall then be completely drained off and the extinguisher retained in this condition for 24 h. At the end of this period, the interior shall be free from any trace of rust.

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, 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.

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

11.1.4 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.

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 (*see* Annex B).

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

11.2.3 Chemical used should not have global warming potential (*see* Annex D)

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 — CO_2 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 in addition to that given in **9.2** and **9.3**:

a) Manufacturer's name or trade-mark, if any;

b) Method of operation in prominent letters;

c) The words 'Water type (Gas cartridge)' in prominent letters;

d) The size of gas cartridge used;

e) Liquid level to which the extinguisher is to be charged;

f) The words 'Tested to a hydraulic pressure 3 MN/m² (30 kgf/cm²)'; and

g) Year of manufacture.

12.2 BIS Certification Marking

The extinguisher may also be marked with the Standard Mark.

12.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*,1986 and the Rules and Regulations made thereunder. Details of conditions under which a licence for the use of the 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 is given in Annex E.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
5 : 1994	Colours for ready mixed paints and enamels (*fourth revision*)
318 : 1981	Specification for leaded tin bronze ingots and castings (*second revision*)
319 : 1989	Free cutting leaded brass bars, rods and sections — Specification (*fourth revision*)
407 : 1981	Specification for brass tubes for general purposes (*third revision*)
410 : 1977	Cold rolled brass sheet, strip and foil (*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*)
737 : 1986	Wrought aluminium and aluminium alloy sheet and strip for general engineering purposes (*third revision*)
937 : 1981	Specification for washers for water fittings for fire fighting purposes (*second revision*)
2190 : 1992	Selection, installation and maintenance of first-aid fire extinguishers — Code of practice (*third revision*)
2507 : 1975	Cold rolled steel strip for springs (*first revision*)
2643 : 1999	Pipe threads where pressure-tight joints are not made on the threads — Dimensions, tolerance and designation (*second revision*)
2825 : 1969	Code of unfired pressure vessels
2932 : 1993	Enamel, synthetic, exterior (a) undercoating, (b) finishing — Specification (*second revision*)
3444 : 1999	Corrision resistant high alloy steel and nickel base casting for general applications — Specification (*third revision*)
3618 : 1966	Specification for phosphate treatment of iron and steel for protection against corrosion
4454	Specification for steel wires for mechanical springs:
(Part 1) : 2001	Patented and cold drawn steel wires — Unalloyd (*third revision*)
4947 : 1985	Specification for gas cartridge for use in fire extinguisher (*second revision*)
4985 : 2000	Unplasticized PVC pipes for potable water supplies — Specification (*third revision*)
5382 : 1985	Specification for rubber sealing rings for gas mains, water mains and sewers (*first revision*)
5522 : 1992	Stainless steel sheets and strips for utensils (*second revision*)
6528 : 1995	Stainless steel wire (*first revision*)
6529 : 1996	Steelness steel blooms, billets and slabs for forging (*first revision*)
6603 : 1972	Stainless steel bars and flats — Specification (*first revision*)
6912 : 1985	Copper and copper alloy forging stock and forgings (*first revision*)
6913 : 1973	Stainless steel tubes for the food and beverage industry
7328 : 1992	High density polyethylene materials for moulding and extrusion — Specification (*first revision*)
11804 : 1986	Code of practice for manufacture of aluminium alloy pressure die castings

Trade Name	*ODP*
(1)	(2)
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
$C_2H_3C_{13}$	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 E

(*Clause* 13)

SAMPLING AND CRITERIA FOR CONFORMITY

E-0 GENERAL

E-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.

E-1 SAMPLING

E-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.

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

E-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 **E-1.2.2** and **E-1.2.3**.

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

E-1.2.3 They shall be examined visually as far as possible in respect of requirements specified in **3** to **9** except **7.7** and then in respect of hydraulic pressure test (*see* **10.1**) and corrosion test (*see* **10.4**).

Table 2 Sample Size for Lots Produced Under Quality Control System

(*Clause* E -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

E-1.2.4 All the samples tested shall pass these tests for the lot to be declared to conform to these requirements.

E-1.2.5 For expansion test as per **7.7**, one sample shall be tested from each lot.

E-1.2.6 In respect of performance test (*see* **10.3**) and expansion space (*see* **7.9**) , one sample shall be tested for these properties and the sample shall pass these tests for the lot to be declared to conform to this requirement.

E-1.2.7 In respect of bursting pressure (*see* **10.2**), type test shall be done and this could conform to the requirements laid down in the specification.

E-1.2.8 In the absence of a certificate from manufacturer about the conformity of various components (*see* **5.1**) to this specification from a sample fire extinguisher, one item each shall be taken separately and examined individually with respect to the relevant requirement of this specification. These shall constitute the type tests.

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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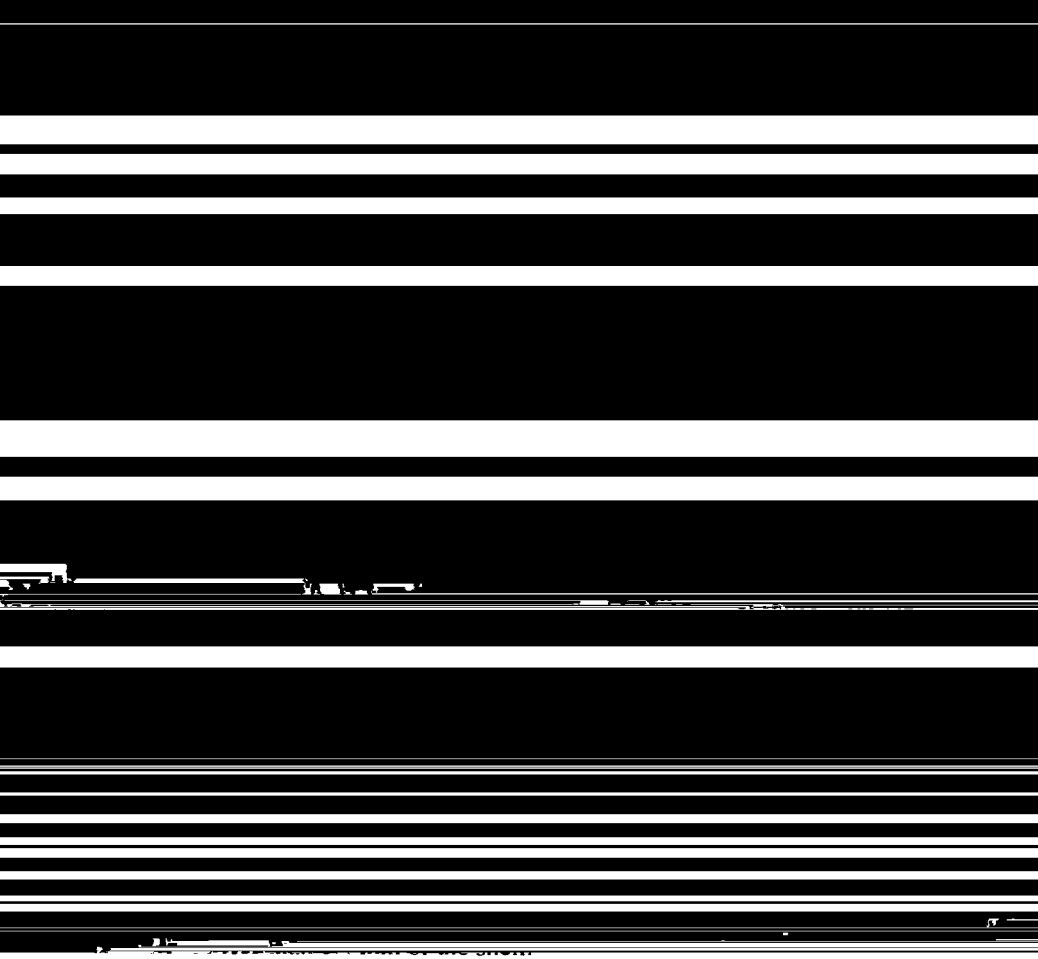

[*Page* 1, *clause* **7.2**(a)] — In formula, substitute '300' *for* '360'.

[*Page* 2, *Table* 1, *Sl No.* (i), *col* 4] — Substitute 'IS 6911' *for* 'IS 5522'.

(*Page* 3, *clauses* **8.1** *and* **8.2**) — Substitute the following for the existing:

'**8.1** 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.

8.1.1 *Test for Adhesion of Plastic Lining (Type Test)* — Subject the unfilled extinguisher to a pressure 15 kgf/cm^2 and store for $120 + \begin{smallmatrix}4\\-0\end{smallmatrix}$ h at $27 \pm 5^{\circ}$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) — Renumber the subclause **8.3** as **8.2**.

(*Page* 3, *clause* **8.4**) — Delete.

(*Page* 3, *clause* **9.1**, *line* 3) — Substitute '538' *for* '537'.

(*Page* 4, *clause* **12.1**, *line* 2) — Insert 'by embossing or other suitable method' between 'marked' and 'with'.

[*Page* 4, *clause* **12.1**] — Insert the new item between 'a)' and 'c)':

'b) Serial Number' and renumber the subsequent Sl Nos.

(CED 22)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 MAY 2006
TO
IS 940 : 2003 PORTABLE FIRE EXTINGUISHERS, WATER TYPE (GAS CARTRIDGE) — SPECIFICATION

[*Page* 4, *clause* **12.1**(a)] — Substitute the following for the existing:

(c) Manufacturer's name or trade mark, serial number and year of manufacture shall be embossed at the body or bottom ring.

[*Page* 4, *clause* **12.1**(g)] — Delete

(CED 22)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 3 SEPTEMBER 2006
TO
IS 940 : 2003 PORTABLE FIRE EXTINGUISHERS, WATER TYPE (GAS CARTRIDGE) — SPECIFICATION

(Fourth Revision)

(*Page* 4, *clause* **11**, *Title*) — Substitute 'ADDITIONAL' *for* 'OPTIONAL'.

(CED 22)

Reprography Unit, BIS, New Delhi, India