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IS 10204 (2001): Specification for portable fire extinguisher mechanical foam type [CED 22: Fire Fighting]



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भारतीय मानक

सुवाह्य अग्नि शामक, यांत्रिक झाग वाले — विशिष्टि
(पहला पुनरीक्षण)

Indian Standard

**SPECIFICATION FOR
PORTABLE FIRE EXTINGUISHER,
MECHANICAL FOAM TYPE**

(First Revision)

ICS 13.220.10

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

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.

Portable fire extinguisher, mechanical foam type, is one of the types of the first-aid fire fighting appliance. In these extinguisher foam is produced by expelling foam solution by stored air/gas cartridge and mechanical aeration at the foam making nozzle. This type of extinguisher is suitable for fighting fire in water non-miscible liquid, that is non-polar flammable liquids, that is Class B fires such as hydrocarbon fuels.

This standard was first published in 1982. In this revision, all the four amendments issued so far have been incorporated. The principal modifications made in this revision are in respect of (a) Providing additional materials for some of the components of fire extinguisher which are lighter and economical and all these are given in tabular form; (b) For anti-corrosive treatment, epoxy powder coating, Rubber/plastic lining incorporated; (c) Sampling clause modified; and (d) Updating the various clauses based on the use of this type of fire extinguisher in past 15 years. The details in regard to the maintenance of this appliance in efficient condition are given in IS 2190 : 1992 'Code of practice for selection, installation and maintenance of portable first-aid fire extinguishers (*second revision*)'.

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, 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
PORTABLE FIRE EXTINGUISHER,
MECHANICAL FOAM TYPE
(First Revision)

1 SCOPE

1.1 This standard lays down requirements regarding material, shape, construction, charge, anti-corrosive treatment and tests of fire extinguisher of mechanical foam type, having nominal capacity of 9 l.

2 REFERENCES

2.1 The Indian Standards listed in Annex A contain provisions which, through references in 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 liquid capacity of the extinguishers when filled with the charge, that is foam concentrate liquid and water up to the specified level shall be 9 ± 0.5 l.

4 PRINCIPLE

4.1 The extinguisher shall be operated by holding the extinguisher upright and piercing the seal of the gas container by applying pressure on the knob of the cartridge-piercing mechanism, or by pressing the squeeze grip whereby the compressed gas shall be released from the gas cartridge into the container and shall expel the foam-water solution by exerting a pressure on it.

5 MATERIAL

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

6 SHAPE

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

7 CONSTRUCTION**7.1 General**

The top end (dome) and the bottom end (dish) of

the body shall be dished outwards (convex) without reverse curvature to a radius not exceeding the maximum outside diameter of the body to which they are to be fixed or of which one or both forms a part in case of solid-drawn construction.

7.1.1 Non-ferrous metal parts shall be welded or soldered to the body.

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

7.1.3 The circumferential joint and the longitudinal joint, of the body should be welded construction as given in 7.2.1.

7.2 Body

The construction of the body shall be of welded type and thickness of the mild steel sheet shall be not less than 1.6 mm.

NOTE — The minimum thickness of sheet, takes into account the minimum thickness required based on bursting formulae, that is, not less than $d/115$ where d is the internal diameter of the body.

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

- a) Oxy-acetylene welding of fittings only 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 IS 1261.

- c) Metal arc welding shall conform to IS 9595.

7.3 Neck Ring

The neck ring shall have internal diameter not less than 57 mm (G 2¼) for bang on type and 63 mm (G 2½) for squeeze grip type, be firmly secured by welding. A parallel screw thread for the attachment of cap shall be not less than 16 mm in effective length and the threads shall be in accordance with IS 2463 (Part 1) with Class A tolerance.

7.4 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 2463 (Part 1). At least three 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 $6.5^{+0.0}_{-1.0}$ mm from the exposed face of the cap joint washer. A recess shall be made in the cap to retain the cap joint washer.

7.5 Cartridge Holder

Where the gas cartridge is fitted inside the extinguisher, 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 seal of the cartridge clean when the cartridge is fitted to this holder. Female left handed threads shall be provided in the holder and these shall correspond to those on the gas cartridge. Port holes shall also be provided in the cartridge holder.

7.6 Piercing Mechanism

A spring loaded piercing device shall be provided in the cap for piercing the seal of the gas cartridge when fitted to the cartridge holder. The puncturing end of the piercer shall be designed so as to ensure a clear opening in the cartridge seal when piercer is operated. A safety clip will be provided to prevent accidental operation of the piercing mechanism.

7.7 Cap Joint Washer

The Cap joint washer, either rubber shall be finished smooth and retained in a recess in the cap.

7.7.1 Snifter Valve (Breather Device)

A snifter valve shall be fitted to extinguishers or cap. The design of the snifter valve shall be such that when the variation in atmospheric temperature is within $\pm 10^{\circ}\text{C}$, there shall not be any spouting of liquid through the nozzle.

7.8 Discharge Fitting

7.8.1 Hose

The discharge hose shall have a bore of not less than

8 mm and a length of not less than 600 mm.

7.8.2 Nozzle

The design of the area of orifice shall be such that when extinguisher is set into the operation under normal temperature conditions of $27 \pm 5^{\circ}\text{C}$, the foam solution shall be expelled in the form of a jet which will maintain a throw of not less than 6 m for the minimum period of 25 s. The maximum period for discharge of minimum 90 percent of the liquid content shall be 90 s. The test shall be carried out so that the stream is discharged in horizontal direction in still air condition. The film of foam expelled shall cover an area of 1 m² at the depth of 5 cm.

7.8.2.1 In case of squeeze grip type, squeeze lever and wait for 10 s to build pressure in the cylinder, squeeze lever again for the complete discharge of extinguishant.

7.8.3 Syphon Tube

A syphon tube shall be fitted to the inner end of the union or body to which the discharge hose nozzle is attached.

7.9 Gas Cartridge

Gas cartridge shall conform to IS 4947. The CO₂ gas cartridge shall be of minimum 60 g.

7.10 Liquid Level Indicator

The specified level of charge in the body shall be indicated on the exterior of the body and shall also be permanently indicated in the interior or means shall be provided to demonstrate that the level is correct.

8 CHARGE

8.1 The charge shall consist of foam concentrate conforming to IS 4989 (Part 2) and quantity not less than 540 ml if foam concentration is 6 percent and 270 ml, if foam concentrate is 3 percent and balance quantity of water.

9 ANTI-CORROSIVE TREATMENT

9.1 All internal surface of the body shall be completely coated with plastic or rubber lining by centrifuge and curing by heat process to a minimum thickness of 0.5 mm. This internal lining shall be subjected to the following test:

- a) *Type Test for Adhesion of Lining* – Subject the unfilled extinguisher to a pressure of 15 kg/cm² and store for 120^{+4}_0 h at $27 \pm 5^{\circ}\text{C}$. 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.

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

Sl No.	Component	Material	Requirements, Relevant to IS
i)	Body	a) Stainless steel b) Mild steel sheet	IS 6911 Any Grade of IS 513
ii)	Neck ring	a) Stainless steel b) Leaded tin bronze c) Mild steel pipe d) Brass forging	IS 6913 Grade LTB 2 of IS 318 Seamless mild steel tubes having sulphur and phosphorous 0.05% Max Grade FLB of IS 6912
iii)	Cap	a) Leaded-tin-bronze b) Stainless steel c) Brass forging d) Pressure diecast aluminium	Grade LTB 2 of IS 318 IS 3444 Grade FLB of IS 6912 IS 11804
iv)	Cap washer	Rubber	Conforming to the requirements of hardness as applicable to Type 3 of IS 5382 and also acid and alkali resistant (<i>see Note</i>)
v)	Spring	Spring steel	Grade 1 of IS 4454 (Part 1)
vi)	Siphon tube	a) Brass b) HDPE c) Mild steel d) Stainless steel	Alloy No. 2 of IS 407 IS 4984 IS 3601 IS 6913
vii)	Discharge fittings	a) Leaded-tin-bronze b) Brass c) Plastic (for nozzle)	Grade LTB 2 of IS 318 Grade 2 of IS 291 or Type 1 of IS 319 Annex B
viii)	Foam making branch pipe	a) Aluminium alloy b) Leaded-tin-bronze c) Plastic	Grade 4450 or 4425 of IS 617 Grade LTB 2 of IS 318 IS 7328
ix)	Gas cartridge	—	IS 4947
x)	Hose	Braded rubber plastic	Having bursting pressure of not less than 50 kg/cm ²
xi)	Piercer	Stainless steel	IS 6528
xii)	Check nut (Swivel type nut)	a) Brass b) Stainless steel c) Leaded-tin-bronze	IS 6912 IS 6529 Grade LBT 2 of IS 318
xiii)	Sniffer valve	a) Brass b) Stainless steel c) Leaded-tin-bronze d) Plastic	Type 1 of IS 319 IS 6913 Grade LBT 2 of IS 318 IS 7328

NOTE — When a piece of 2.5 cm cut from any portion is dipped in 20 percent sulphuric acid 15 percent sodium hydroxide solution for 10 min, there shall be no sign of corrosion or damage.

- b) *Test for Continuity of Plastic Lining* – Fill the extinguisher body to 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 N/mm. Check the lining for continuity by the application of 500 ± 50 M Ω 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.

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

9.1.2 Both the surfaces of components that is syphon tube etc, should be either lead-tin alloy coated or plastic or rubber lined.

10 PAINTING

10.1 Each extinguisher shall be painted 'FIRE RED', conforming to shade No. 537 of IS 5. The paint shall conform to IS 2932 or epoxy powder coating conforming to IS 13871.

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

10.3 The extinguisher shall be marked with letter 'B' indicating the suitability for Class 'B' fire as laid down in IS 2190. The letter 'B' shall be of 2.5 cm size printed in black colour centrally contained in a square of 4 cm size. The square shall be coloured cream (lemon yellow) conforming to shade No. 355 of IS 5. The paint shall conform to IS 2932.

11 TEST REQUIREMENT

11.1 Discharge Performance Test

The design of foam making nozzle, capacity of gas cartridge and the design of extinguisher shall be such that when extinguisher is set into operation under normal ambient temperature conditions of $27 \pm 5^\circ\text{C}$ and still air conditions. Keeping the foam making branch pipe horizontal the expanded foam shall be expelled out in the form of a jet which will maintain a throw, that is, projection range of not less than 6 m for the minimum period of 25 s. The maximum period for discharge of minimum 90 percent of the liquid content shall be 60 s. The entire quantity of the foam shall be made to fall and collect in a leak proof mild steel tray having an area of 1 m². The foam layer so collected in the tray shall have a thickness of not less than 50 mm or alternately the expansion ratio then measured as per the test method given in IS 4989 (Part 2) shall be minimum 6.

11.2 Fire Test (Type Test)

Extinguisher should be capable of extinguishing 2.32 m² size fire with 25 l high speed diesel, within its discharge time of 60 s.

11.3 Hydraulic Pressure Test

The extinguisher shall be capable of withstanding an internal hydraulic pressure of 3 MN/m² (30 kgf/cm²) for a period of 2 min without leakage or visible distortion. This test shall be carried out before the extinguisher is painted.

11.4 Burst Pressure Test

The extinguisher fitted with cap and hose without nozzle shall be subjected to a hydraulic pressure of 4.5 MN/m² (45 kgf/cm²). This pressure shall be maintained for 30 s. Mechanical failure shall not occur.

11.5 Fire extinguisher after subjected to the performance tests laid down in 7.8.2, 11.4 shall be thoroughly cleaned with water free from chemical solutions, 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 all traces of rust.

12 WORKMANSHIP

12.1 All the components of the extinguisher shall have a smooth finish and shall be free from burrs, sharp edges and other visual defects that may cause injury to users.

13 MARKING

13.1 Each extinguisher constructed and tested in conformity with this standard shall be clearly and permanently marked with the following information :

- a) Method of operation in prominent letters;
- b) The word 'MECHANICAL FOAM' in prominent letters;
- c) The nominal charge of the liquid in litres;
- d) Capacity of the CO₂ gas cartridge to be used;
- e) Manufacturer's name or trade-mark, if any;
- f) The liquid level to which the extinguisher is to be charged;
- g) The words 'after discharge the extinguisher must be washed out carefully with fresh water using at least two changes' in prominent letters;
- h) A declaration to the effect that the extinguisher has been tested to a pressure of 2.5 MN/m² (25 kgf/cm²); and
- j) Year of manufacture.

13.2 BIS Certification Marking

The extinguisher may also be marked with BIS Standard Mark.

13.2.1 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.

14 SAMPLING AND CRITERIA FOR CONFORMITY

14.1 The details of sampling and criteria for conformity is given in Annex C.

ANNEX A

(Clause 2.1)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
5 : 1994	Colours for ready mixed paints and enamels (<i>fourth revision</i>)	2124 : 1974	Sodium bi-carbonate (<i>first revision</i>)
265 : 1993	Hydrochloric acid (<i>fourth revision</i>)	2190 : 1992	Code of practice of selection, installation and maintenance of portable first-aid fire extinguishers (<i>second revision</i>)
291 : 1989	Naval brass rods and sections for machining purposes — Specification (<i>third revision</i>)	2643 (Part 1) : 1975	Dimensions for pipe threads fastening purposes : Part 1 Basic profile and dimensions (<i>first revision</i>)
318 : 1981	Leaded tin bronze ingots and castings (<i>second revision</i>)	2932 : 1993	Enamel, synthetic, exterior (a) Undercoating, (b) Finishing (<i>second revision</i>)
319 : 1989	Free cutting brass bars, rods and sections (<i>fourth revision</i>)	3203 : 1982	Methods of testing local thickness of electroplated coatings (<i>first revision</i>)
407 : 1981	Brass tubes for general purposes (<i>third revision</i>)	3444 : 1987	Corrosion resistant alloy steel and nickel base casting for general applications (<i>second revision</i>)
513 : 1994	Cold rolled low carbon steel sheets and strips (<i>fourth revision</i>)	3601 : 1984	Steel tubes for mechanical and general engineering purposes (<i>first revision</i>)
538 : 1968	Phenol (carbolic acid) (<i>first 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>)	4454 (Part 1) : 1981	Steel wires for cold formed springs : Part 1 Patented and cold drawn steel wires — Unalloyed (<i>first revision</i>)
819 : 1957	Code of practice for resistance spot welding for light assemblies in mild steel	4947 : 1985	Gas cartridges for use in fire extinguishers — Specification (<i>second revision</i>)
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 steel (<i>second revision</i>)		

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
4984 : 1995	High density polyethylene pipes for water supply (<i>fourth revision</i>)	7180 : 1973	Disposable artificial insemination gloves
4989 (Part 2) : 1984	Specification for foam concentrate for producing mechanical foam for fire fighting : Part 2 Aqueous film forming foam (AFFF)	7285 : 1988	Seamless steel cylinders for permanent and high pressure liquefiable gases (<i>second revision</i>)
5382 : 1985	Rubber sealing rings for gas mains, water mains and sewers (<i>first revision</i>)	7328 : 1992	High density polyethylene materials for moulding and extrusion (<i>first revision</i>)
5762 : 1970	Methods for determination of melting range/ temperature	8543 (Part 1/Sec 2) : 1979	Methods of testing plastics : Part 1 Characterization of polymer structure and size, Section 2 Determination of density of solid plastics
6528 : 1995	Stainless steel wire (<i>first revision</i>)	9595 : 1996	Metal-arc welding of carbon and carbon manganese steels — Recommendations (<i>first revision</i>)
6529 : 1996	Stainless steel blooms, billets and slabs for forging (<i>first revision</i>)	11804 : 1986	Code of practice for manufacture of aluminium alloy pressure die castings
6603 : 1972	Stainless steel bars and flats	13871 : 1993	Powder coatings
6911 : 1992	Stainless steel plate, sheet and strip (<i>first revision</i>)		
6912 : 1985	Copper and copper alloy forging stock and forgings (<i>first revision</i>)		
6913 : 1973	Stainless steel tubes for the food and beverage industry		

ANNEX B

[Table 1, *Sl No.* (vii)]

REQUIREMENTS FOR PLASTIC

B-1 PHYSICAL TESTS

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

<i>Sl No.</i>	<i>Property</i>	<i>Method of Test</i>	<i>Requirement</i>
1.	Specific gravity	IS 8543 (Part 1/Sec 2)	1.25 ± 0.02
2.	Melting point	IS 5762	215°C - 225°C
3.	Ash content	IS 7180	15 ± 1 percent

B-2 BURST PRESSURE TEST

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

B-2.1 The sample of cap shall be subjected to internal hydraulic pressure of 50 kgf/cm² 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 requirement mentioned in B-1, the following tests shall be done on the third sample in the 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 shall be submerged in 10 percent sodium bicarbonate solution (*see* IS 2124) for 72 h at the 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 samples shall then be first tested for internal hydraulic pressure of 45 kgf/cm² 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 of 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 or deterioration besides passing the hydraulic pressure test.

B-3.4 UV Exposure Test

The sample then shall be exposed at 27 ± 3°C to XERON ARC U.V. radiations for 100 min followed by exposure at a R.H. of 60 ± 5 percent and temperature 62 ± 5°C for 20 min. The cycle shall be repeated 60 times and the cap shall then be subjected to internal hydraulic pressure mentioned in B-3.3 and shall pass the requirement.

ANNEX C

(Clause 14.1)

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 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.

C-1 SAMPLING

C-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.

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

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 to 7, 10 and 12 and then in respect of hydraulic pressure test (see 11.3) and corrosion test (see 9).

Table 2 For Lots Produced under Quality Control System
(Clause C-1.2.2)

No. of Items in the Lot (1)	Sample Size (2)
Up to 25	3
26 to 50	5
51 to 100	8
101 to 200	13 percent

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

C-1.2.4 In respect of performance test (see 11.3), 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 requirements.

C-1.2.5 In respect of bursting pressure (see 11.4) one type test shall be done and these should conform to the requirements laid down in the standard.

C-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 8) from a sample fire extinguisher, such items shall be taken separately and examined individually in respect of the relevant requirements laid down in the standard. The lot shall be considered satisfactory if all the items satisfy the relevant requirements of this standard.

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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AMENDMENT NO. 1 AUGUST 2002
TO
IS 10204 : 2001 SPECIFICATION FOR PORTABLE
FIRE EXTINGUISHER, MECHANICAL FOAM TYPE
(First Revision)

(*Second cover page, Foreword*) — Insert the following before last para:

‘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.

The amendment 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.’

(*Page 4, clause 11.5*) — Insert the following new clauses after 11.5 and renumber the subsequent clauses:

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

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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 along with 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 (*see Annex D*).

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

12.2.3 Chemical used should not have global warming potential (*see Annex F*).

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

ANNEX D
(*Clause 12.2.1*)

**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 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-11 which has been assigned arbitrary value of 1.0.

ANNEX E

(Clause 12.2.2)

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 12.2.3)

LIST OF SUBSTANCES HAVING GLOBAL WARMING POTENTIAL (GWP)

<i>Trade Name</i>	<i>GWP (100 year) δs CO₂</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

(CED 22)

**AMENDMENT NO. 2 DECEMBER 2003
TO**

**IS 10204 : 2001 SPECIFICATION FOR PORTABLE
FIRE EXTINGUISHER, MECHANICAL FOAM TYPE**

(First Revision)

(Page 1, clause 7) — Substitute the following for the existing clause:

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 for holding the foam making nozzle shall be of mild steel sheet/plastic having thickness not less than that of the body.

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

$$t = \frac{D}{300} + 0.7$$

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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.

(Page 2, clause 7.7) — Substitute the following for the existing:

‘7.7 The cap joint washer shall be made of rubber and shall be finished smooth and retained in the recess made in the cap.’

(Page 2, clause 7.7.1) — Substitute the following for the existing:

7.7.1 Snifter Valve (Breather Device)

A snifter valve shall be fitted on the siphon tube or cap of the extinguisher. The design of the snifter valve shall be such that when the variation in atmospheric temperature is within $\pm 10^{\circ}\text{C}$, there shall not be any spouting of liquid through the foam making nozzle.’

(Page 2, clause 7.8.2, Title) — Substitute the following for the existing:

‘7.8.2 Foam Making Nozzle’

(Page 2, clause 7.8.2, line 7) — Substitute ‘60 s’ for ‘90 s’.

(Page 2, clause 7.8.2, sentences 3 and 4) — Substitute ‘The design of the nozzle and its orifice shall be such that it meets the performance requirement given in 11.1’ for ‘The test shall be carried out so that the stream is discharged in horizontal direction in still air condition. The film of foam expelled shall cover an area of 1 m^2 at the depth of 5 cm.’

(Page 2, clause 7.8.2.1) — Substitute the following for the existing clause:

‘7.8.2.1 In case of squeeze grip type, squeeze operation lever and carrying handle together. Immediately raise/lift the operation lever and wait for 10 s to allow the pressure to build up in the body of extinguisher. Holding the foam making nozzle squeeze operation lever again and keep it continuously pressed to completely discharge the foam water solution as jet of foam.’

(Page 2, clause 8.1, line 2) — Substitute 'conforming' for 'confirming'.

[Page 2, clause 9.1(b), lines 6 and 8] — Substitute 'M.N/m' for 'N/mm' and 'V' for 'M W'.

[Page 3, Table 1, Sl No. (vii), Material] — Delete ' c) Plastic (for nozzle) '.

[Page 3, Table 1, Sl No. (viii), Component] — Substitute 'Foam making nozzle' for 'Foam making branch pipe'.

[Page 3, Table 1, Sl No. (x), Material] — Substitute ' Braided rubber or ' for 'Bbraded rubber plastic'.

[Page 3, Table 1, Sl No. (xiii), Component] — Substitute 'sniffer' for 'sniffer'.

(Page 3, Table 1, Note) — Substitute the following for the existing:

'NOTE — When two pieces each of 2.5 cm approximately cut from any portion of the rubber washer are kept dipped separately in 20 percent sulphuric acid and 15 percent sodium hydroxide for 10 minutes, there should be no sign of erosion or corrosion or damage.'

(Page 4, clause 10.3) — Substitute the following for the existing clause:

'10.3 The extinguisher shall be marked with the letter 'A' and 'B' indicating the suitability for class 'A' as well as class 'B' fires as laid down in IS 2190. The alphabet 'A', shall be of 25 mm size printed in black colour centrally contained in an equilateral triangle of 50 mm side. The triangle shall be coloured golden yellow conforming to shade 356 of IS 5. The alphabet 'B' shall be of 25 mm size printed in black colour centrally contained in a square of 40 mm size. The square shall be coloured cream (lemon yellow) conforming to shade No. 355 of IS 5. The paint shall conform to IS 2932.'

(Page 4, clause 11.1, line 15) — Substitute 'ratio when' for 'ratio then'.

(Page 4, clause 11.2) — Substitute the following for the existing clause:

11.2 Fire Test (Type Test)

A square tray having area 2.32 m^2 (that is, each side 152.3 cm) made out of 6 mm thick mild steel sheet shall be taken. The tray shall be all welded and of water leak proof joint construction. The height of the sides shall be 200 mm. All the upper edges of the tray shall be reinforced from outside with 5 mm thick angle iron welded continuously around the perimeter. The angle iron shall form a turned out edge flush with the top edge of the tray. The lower leg of the angle

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may be welded. The tray shall be kept on flat ground. Water shall be poured to form 20 mm thick layer. The extinguisher shall be charged and kept ready at a distance of approximately 8 m from the nearest edge of the tray.

25 litres of high speed diesel shall be poured into the tray and lit with the help of a burning torch. A preburn period of 30 s shall be allowed. The operator shall hold the foam making branch and hit the knob of the cap with hand or some hard object or operate the extinguisher as per 7.8.2.1. The operator shall apply the jet of foam on the opposite free board/wall of the tray taking care not to splash the fuel out of tray by hitting the surface of fuel by foam jet. The operator shall apply the foam as gently as possible and making effort that entire quantity of foam falls into the tray. Initially the operator shall be at a distance of about 6 m and may gradually advance towards the tray as fire comes under control and the throw diminishes.

The extinguisher shall be declared to meet the requirement of fire test if fire is extinguished within its discharge time of 60 s.

The test shall be performed in still air condition in open field.

(Page 4, clause 11.3, line 1) — Insert 'fitted with cap and hose but without foam making nozzle' after 'extinguisher'.

(Page 4, clause 11.4, line 2) — Insert 'foam making' before 'nozzle'.

[Page 4, clause 13.1(h)] — Substitute '3.0' for '2.5' and '30' for '25'.

(Page 6, Annex B) — Delete.

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AMENDMENT NO. 3 MARCH 2005
TO
IS 10204 : 2001 SPECIFICATION FOR
PORTABLE FIRE EXTINGUISHER, MECHANICAL
FOAM TYPE

(First Revision)

(Page 2, clause 7.3, line 6) — Substitute 'IS 2643 (Part 1)' for 'IS 2463 (Part 1)'.

(Page 2, clause 7.4, line 4) — Substitute 'IS 2643 (Part 1)' for 'IS 2463 (Part 1)'.

(Page 2, clause 9.1) — Substitute the following for the existing clause:

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 $27 \pm 5^\circ\text{C}$.

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 4, clause 9.1.1) — Renumber as **9.2**

(Page 4, clause 9.1.2) — Renumber as **9.3** and delete 'either lead-tin alloy coated or'.

(Page 4, clause 10.1) — Insert 'or P.O. Red' after 'FIRE RED' and substitute '536 or 538' for '537'

(Page 4, clause 11.5, line 2) — Substitute '**11.1**' for '**11.4**'

(CED 22)

AMENDMENT NO. 4 SEPTEMBER 2006
TO
IS 10204 : 2001 SPECIFICATION FOR PORTABLE
FIRE EXTINGUISHERS, MECHANICAL
FOAM TYPE

(First Revision)

[Page 4, clause 12 (see also Amendment No. 1)] – Substitute
'ADDITIONAL' for 'OPTIONAL'.

(CED 22)