



**PRODUCT MANUAL FOR  
PORTABLE FIRE EXTINGUISHERS –  
PERFORMANCE AND CONSTRUCTION  
ACCORDING TO IS 15683: 2018**

*This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.*

1.	<b>Product</b>	:	IS 15683 : 2018
	<b>Title</b>	:	PORTABLE FIRE EXTINGUISHERS – PERFORMANCE AND CONSTRUCTION
	<b>No. of Amendments</b>	:	NIL
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	Please refer <a href="#">ANNEX - A</a>
b)	<b>Grouping guidelines</b>	:	Please refer <a href="#">ANNEX – B</a>
c)	<b>Sample Size</b>	:	14 nos - for all tests except fire performance test 6 Nos - for fire performance test
3.	<b>List of Test Equipment</b>	:	Please refer <a href="#">ANNEX – C</a>
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer <a href="#">ANNEX – D</a>
5.	<b>Possible tests in a day</b> : Please refer <a href="#">ANNEX – E</a>		
6.	<b>Scope of the Licence :</b>		
	“Licence is granted to use Standard Mark as per IS 15683 : 2018 with the following scope:		
	Name of the product	PORTABLE FIRE EXTINGUISHERS – PERFORMANCE AND CONSTRUCTION	
	Extinguisher media		
	Nominal charge capacity		
	Fire rating		
	Operating temperature		

**ANNEX- A**

**DETAILS OF RAW MATERIAL**

1. Extinguishing media- (Clause 5.1 of IS 15683)
  - a) Carbon dioxide – IS 15222
  - b) Clean agent –certificate of manufacturer/supplier
  - c) Powder – IS 4308
  - d) Foam concentrate – IS 4989
2. Propellants – Clause 5.2 of IS 15683
3. Gas cartridge - IS 4947
4. Construction requirement :
  - a) High pressure cylinder – Clause 9.1 of IS 15683
    - i) for Steel body - IS 7285 (Part 1 and 2)
    - ii) for Aluminium body - IS 15660
  - b) Low pressure cylinder – Clause 9.2 of IS 15683
    - i) Welded low carbon steel cylinders – Clause 9.2.5 of IS 15683
    - ii) Stainless steel cylinders – Clause 9.2.6 of IS 15683
    - iii) Aluminium Cylinder – Clause 9.2.7 of IS 15683
    - iv) Composite cylinder – Clause 9.2.8 of IS 15683
  - c) Carrying handle – Clause 9.3 of IS 15683
  - d) Mounting – Clause 9.4 of IS 15683
  - e) Caps, valves and closures – Clause 9.5 of IS 15683
  - f) Safety devices – Clause 9.6 of IS 15683
  - g) Plastic components – Clause 9.7 of IS 15683
  - h) Hose assemblies – Clause 9.8 of IS 15683
  - i) Safety locking devices – Clause 9.10 of IS 15683
  - j) Pressure gauges and indicators for low pressure extinguishers – Clause 9.11 of IS 15683
  - k) Dip tubes and filters for water based extinguishers – Clause 9.12 of IS 15683
  - l) Horn for Carbon dioxide extinguishers - Clause 9.13 of IS 15683
  - m) Extinguishants - Clause 9.14 of IS 15683

**ANNEX - B**

**Grouping Guidelines**

1. Wheeled fire extinguishers covered under IS 15683 : 2018 are categorized as under:
  - a) Based on type of extinguishing media and capacity:
    - i) Water based extinguisher – 2, 3, 4, 6 and 9 litres
    - ii) Foam based extinguisher – 2, 3, 4, 6 and 9 litres
    - iii) Powder based extinguisher (ABC/BC/D Type) – 1, 2, 4, 6, 9 and 12 kg
    - iv) Carbon dioxide based extinguisher – 2, 3, 4 and 5 kg
    - v) Clean agent extinguisher – 2, 4 and 6 kg
    - vi) Water mist type extinguisher – 2, 3, 4, 6 and 9 litres
  - b) Based on Class of fire test : Class A/ Class B/ Class C/ Class D/ Class F  
(The fire rating shall be declared by the manufacturer)
2. Fire Extinguisher of each type of extinguishing media, nominal capacity and fire rating shall be tested to cover that particular variety in the scope of the licence.
3. The Firm shall declare the varieties of Fire Extinguishers they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.
4. During the operation of the Licence, BO shall ensure that all the varieties covered in the Licence are tested in rotation to the extent possible.

**ANNEX C****List of Test Equipment***Major test equipment required to test as per the Indian Standard*

<b>S. No.</b>	<b>Tests used in with Clause Reference</b>	<b>Test Equipment</b>
1	Fill density (Clause 5.3.1), Filling tolerance(Clause 5.3.2), Capacities (Clause 5.3.3)	- Weighing balance - Measuring jar
2	Operating temperature (Clause 7.1)	- Temperature incubator - Hot air oven - Deep freezer
3	Minimum Effective Discharge Time (Clause 7.2)  Retention of charge following partial discharge (Clause 7.4.1)	- Performance Chamber - Stop Watch - Measuring Tape - Air conditioner - Hot air oven - Pressure gauge - Weighing balance
4	Resistance to Temperature Changes (Clause 7.3)	- Performance chamber - Stop watch - Hot air oven - Weighing balance - Conditioning chamber
5	Leakage test (Clause 7.4.2)	- Water tank - Glass funnel
6	Mechanical resistance (Clause 7.5) a) Impact resistance test (Clause 7.5.1)	- Conditioning chamber - Stop watch - Steel cylinder hammer - Rigid flat surface
	b) Vibration resistance test (Clause 7.5.2)	- Vibration testing setup as per clause 7.5.2.5.2 of IS 15658 - Performance Chamber - Stop Watch - Measuring Tape - Air conditioner - Hot air oven - Pressure gauge - Weighing balance

7	Resistance to corrosion (Clause 7.6)	
	a) External corrosion test (Clause 7.6.1)	<ul style="list-style-type: none"> <li>- Salt spray apparatus as per IS 11864</li> <li>- Sodium chloride and</li> <li>- Distilled water</li> </ul>
	b) Internal corrosion test for water and foam type extinguisher (Clause 7.6.2)	<ul style="list-style-type: none"> <li>- Hot air oven</li> <li>- Air conditioner</li> <li>- Closed glass container</li> </ul>
8	Tapping test (Powder Extinguisher only) (Clause 7.7)	<ul style="list-style-type: none"> <li>- Compaction machine with rod and guided by castors as per Figure 1 of IS 15658</li> <li>- Steel supporting plate</li> <li>- Tapping machine as per IS 15658 with rigid steel plate</li> </ul>
9	Intermittent discharge test (Clause 7.8)	<ul style="list-style-type: none"> <li>- Conditioning chamber</li> <li>- Stop watch</li> </ul>
10	Performance requirements for test fires (Clause 8)	<ul style="list-style-type: none"> <li>- As per clause 8.1 to 8.7 of IS 15658</li> </ul>
11	Electrical conductivity of extinguisher discharge (clause 8.8)	<ul style="list-style-type: none"> <li>- Metal plate(1 m X 1 m)</li> <li>- Transformer(36 kV)</li> <li>- Voltmeter</li> <li>- Ammeter</li> <li>- Measuring Tape</li> <li>- Wire</li> </ul>
12	Construction requirements- Burst test (Clause 9.1.2)	<ul style="list-style-type: none"> <li>- Conditioning chamber</li> <li>- Pressure gauge</li> <li>- Burst test apparatus with pressure gauge and pressuring arrangement</li> </ul>
13	Construction requirements – Crushing test (Clause 9.1.3)	<ul style="list-style-type: none"> <li>- Crushing test apparatus</li> </ul>
14	Pressure cycling test (Clause 9.2.4)	<ul style="list-style-type: none"> <li>- Pressure cycle testing arrangement with counter and pressuring unit</li> <li>- Stopwatch</li> </ul>
15	Minimum wall thickness (clause 9.2.5.3, 9.2.6, 9.2.7)	<ul style="list-style-type: none"> <li>- Micrometer</li> <li>- Vernier caliper</li> </ul>
16	Accelerated stress rupture test (clause 9.2.8.4)	<ul style="list-style-type: none"> <li>- Hydrostatic pressure test apparatus with pressuring unit and hour meter</li> <li>- Conditioning cabinet</li> <li>- Burst test apparatus with pressure gauge and pressuring arrangement</li> </ul>
17	Carrying handle (Clause 9.3)	<ul style="list-style-type: none"> <li>- Weighing balance</li> <li>- Vernier caliper</li> </ul>

18	Mounting (Clause 9.4)	<ul style="list-style-type: none"> <li>- Mounting wooden board with bracket</li> <li>- Weighing balance</li> <li>- Stop watch</li> </ul>
19	Cap, valves and closures - Burst Test (Clause 9.5)	<ul style="list-style-type: none"> <li>- Burst test apparatus with pressure gauge and pressuring arrangement</li> <li>- Stop watch</li> </ul>
20	Requirement for plastic components (Clause 9.7)	<ul style="list-style-type: none"> <li>- Conditioning cabinet for maintain temperature of 100 °C and 27 ± 5 °C</li> <li>- Cylinder pressuring unit with water and nitrogen</li> <li>- Stop watch</li> <li>- oven</li> <li>- Steel cylinder hammer</li> <li>- Rigid flat surface</li> </ul>
21	Hose assembly (Clause 9.8)	<ul style="list-style-type: none"> <li>- Steel tape or scale</li> <li>- Conditioning cabinet</li> <li>- Pressuring unit with pressure gauge</li> <li>- Stop watch</li> </ul>
22	Method of operation (Clause 9.9)	<ul style="list-style-type: none"> <li>- Dynamometer</li> <li>- Cylindrical steel weight with flat face 75 mm dia and weight of 4 kg</li> </ul>
23	Safety locking devices (Clause 9.10)	<ul style="list-style-type: none"> <li>- Safety Locking Device</li> </ul>
24	Pressure gauges for low-pressure extinguishers (Clause 9.11)	<ul style="list-style-type: none"> <li>- Dead gauge testes with hydraulic pressure pump</li> <li>- Pressure impulse tester</li> <li>- Inverted water column/flow meter</li> <li>- Air/Nitrogen</li> <li>- Bourdon tube</li> <li>- 0.3 m of water tank</li> <li>- Leak detector apparatus</li> </ul>
25	Dip tube and filter (Clause 9.12)	<ul style="list-style-type: none"> <li>- Conditioning cabinet for maintain temperature of 100 °C and 27 ± 5 °C</li> <li>- Cylinder pressuring unit with water and nitrogen</li> <li>- Stop watch</li> <li>- oven</li> <li>- Steel cylinder hammer</li> <li>- Rigid flat surface</li> <li>- Vernier caliper / internal diameter gauge</li> </ul>
26	Horn test for carbon di-oxide extinguisher (Clause 9.13)	<ul style="list-style-type: none"> <li>- Crushing test arrangement</li> <li>- Conditioning chamber</li> <li>- Static load of 25 kg as per clause 9.13 (d)</li> </ul>

27	Requirement for extinguishers filled in the extinguisher (Clause 9.14) – a) Determination of mono ammonium phosphate, sodium bicarbonate/potassium bicarbonate as per IS 4308	<ul style="list-style-type: none"> <li>- Analytical balance</li> <li>- Aluminium dishes</li> <li>- Glass desiccator</li> <li>- Oven</li> <li>- Sodium bicarbonate /Potassium bicarbonate</li> <li>- Centrifuge tubes</li> <li>- Centrifuge machine</li> <li>- Steam bath</li> <li>- pH meter</li> <li>- Burette</li> <li>- Absolute /denatured ethanol</li> <li>- Ethanol</li> <li>- Sodium hydroxide</li> <li>- Melting point determination apparatus</li> </ul>
	b) Surface tension as per IS 4989	<ul style="list-style-type: none"> <li>- Du-Nouy precision tensiometer</li> <li>- Platinum ring</li> <li>- Glass container</li> </ul>

*The above list is indicative only and may not be treated as exhaustive.*

**ANNEX D**

**Scheme of Inspection and Testing**

**1. LABORATORY** - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

**1.1** The manufacturer shall prepare a calibration plan for the test equipments.

**2. TEST RECORDS** – The manufacturer shall maintain test records for the tests carried out to establish conformity.

**3. LABELLING AND MARKING** – As per the requirements of IS 15683: 2018

**4. CONTROL UNIT** – **100 Fire extinguishers or part thereof of same type/classification and capacity manufactured continuously or on consecutive days from same consignment of material under similar condition of manufacturing** shall constitute a control unit.

**4.1** Operating instructions as per Clause 10.2.2 and manual as per Clause 11 of IS 15683 : 2018 shall be provided with each extinguisher.

**5. LEVELS OF CONTROL** - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

**5.1** All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

**6. REJECTIONS** – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.



**TABLE 1**

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods Clause Reference			No. of Sample	Frequency	Remarks
5	<b>Extinguishing media, Propellants and filling requirements</b>						
5.1.2	Carbon dioxide	5.1.2	IS 15683 IS 15222	S	1	Each consignment	Further testing is not required if consignment received with test certificate. However one sample may be tested once in six month as verification sample
5.1.3	Clean agent	5.1.3	IS 15683	-	-	-	Manufacturers/suppliers test certificate shall be available.
5.1.4	Powders	5.1.4	IS 15683 IS 4308	S	1	Each consignment	Further testing is not required if consignment received with test certificate.
5.1.5	Foam concentrate	5.1.5	IS 15683 IS 4989	S	1	Each type in a consignment received	Further testing is not required if consignment received with test certificate.
5.2	Propellants	5.2	IS 15683	-	Each extinguisher	-	-
5.3.1	Fill density	5.3.1	IS 15683	R	1	Each control unit	-
5.3.2	Filling tolerance	5.3.2	IS 15683	R	1	Each control unit	-
5.3.3	Capacities	5.3.3	IS 15683	R	1	Each control unit	-

6.1	Test pressure	6.1	IS 15683	R	1	Each control unit	-
6.2	Minimum burst pressure	6.2	IS 15683	R	1	Each control unit	-
7.1	Operating temperature range	7.1	IS 15683	-	-	-	Shall be declared by the manufacturer
7.2	Minimum effective discharge time and Bulk range of discharge	7.2.1 7.2.2 7.2.3	IS 15683	R	1	Each control unit	-
7.3	Resistance to temperature changes	7.3.1 7.3.2	IS 15683	S	2	Once in three month	-
7.4	<b>Retention of charge</b>						
7.4.1	Retention of charge following partial discharge (Discharge valve test)	7.4.1.1 7.4.1.3	IS 15683	R	1	Each control unit	-
7.4.2	Leakage test	7.4.2	IS 15683	R	1	Once in three month	-
7.5	<b>Mechanical resistance</b>						
7.5.1	Impact resistance test	7.5.1	IS 15683	S	1	Once in three month	-
7.5.2	Vibration resistance test	7.5.2	IS 15683	S	1	Once in three month	-
7.6	<b>Resistance to corrosion</b>						
7.6.1	External corrosion test for all types of extinguishers	7.6.1	IS 15683	S	1	Once in three months	All types of extinguishing media shall be covered over a period of one year.
7.6.2	Internal corrosion test for extinguishers using water based medium and clean agent	7.6.2	IS 15683	S	1	Once in three months	

7.7	Tapping test (Powder extinguishers only)	7.7.1 7.7.2 7.7.3	IS 15683	S	1	Once in three months	All sizes and types shall be covered over a period of two years.
7.8	Intermittent discharge test	7.8.1 7.8.2	IS 15683	S	1	Once in three months	
8	Performance requirements for test fires	8.1 to 8.7	IS 15683	S	1	Once in a year	All sizes, type and extinguishing media shall be covered in a year. For each class the manufacturer shall declare the fire rating. Testing may be done preferably in presence of BIS officer.
8.8	Electrical conductivity of extinguisher discharge	8.8	IS 15683	S	1	Once in six month	-
9	<b>Construction requirements</b>						
9.1	High pressure extinguishers	9.1	IS 15683	-	Each extinguisher	-	-
9.2	Low pressure extinguishers	9.2.1.1 to 9.2.1.7	IS 15683	-	Each extinguisher	-	-
9.2.1.8	Determination of maximum service pressure	9.2.1.8	IS 15683	S	One sample from each type and size	Once in three month	-
9.2.2	Burst test	9.2.2	IS 1568.3	R	1	Each control unit	-
9.2.3	Crushing test	9.2.3	IS 15683	S	One sample from each type and size	Once in three month	-
9.2.4	Pressure cycling test	9.2.4	IS 15683	S	One sample from each type	Once in three month	-

					and size		
9.2.5	Welded low carbon steel cylinder	9.2.5	IS 15683	S	1	Each consignment received	-
9.2.6	Stainless steel cylinder	9.2.6	IS 15683	S	1	Each consignment received	-
9.2.7	Aluminium cylinder	9.2.7	IS 15683	S	1	Each consignment received	-
9.2.8	Composite cylinder	9.2.8	IS 15683	S	1	Each consignment received	-
9.3	Carrying handle	9.3.1 to 9.3.3	IS 15683	R	Each extinguisher	-	-
9.4	<b>Mounting</b>						
9.4.1	Wall mounting	9.4.1	IS 15683	-	Each extinguisher	-	-
9.4.2	Mounting hook strength	9.4.2	IS 15683	R	2	Each control unit	-
9.4.3 to 9.4.6	Mounting bracket strength	9.4.3 to 9.4.6	IS 15683	R	2	Each control unit	-
9.5	Caps, valves and closures	9.5.1 to 9.5.4 & 9.5.6	IS 15683	-	Each component	-	-
9.5.5	Burst test of caps, valve and closures	9.5.5	IS 15683	R	2	Each lot of same size.	
9.6	Safety device	9.6.1 9.6.2	IS 15683	-	Each extinguisher	-	-

9.7	<b>Requirement for plastic components</b>						
9.7.1	Air-oven ageing	9.7.1	IS 15683	S	2	Once in six month	-
9.7.2	Impact resistance	9.7.2	IS 15683	S	4	Once in three month	-
9.7.3	Test for exposure to extinguisher medium	9.7.3	IS 15683	S	1	Once in a year	Additional sample shall be tested whenever there is change insource of supply or mix design
9.8	Hose assemblies	9.8.1 to 9.8.2	IS 15683	R	2	Each consignment	Further testing is not required, if accompanied with test certificate or ISI marked.
9.9	Method of operation	9.9.1 9.9.2	IS 15683	R	1	Each control unit	-
9.10	Safety – locking device	9.10.1 to 9.10.6	IS 15683	R	2	Each control unit	-
9.11	<b>Requirements for pressure gauges and indicators for low pressure extinguishers</b>						
9.11.1	General	9.11.1	IS 15683	-	Each component	-	-
9.11.2	Calibration test– Gauges and Indicators	9.11.2	IS 15683	S	Each pressure gauge	-	-
9.11.3	Burst strength test – Gauges and Indicators	9.11.3	IS 15683	R	1	Each 100 or part thereof from same source for each size	
9.11.4	Water resistance test– Gauges and Indicators	9.11.3	IS 15683	R	1	Each 100 or part thereof from same source for each size	
9.12	Dip tubes and filters – Water based Extinguishers	9.12.1 9.12.2	IS 15683	-	Each extinguisher	-	-
9.13	Horn test for carbon dioxide extinguisher	9.13	IS 15683	R	1	Once in three month	-

9.14	Requirements for extinguishants filled in the extinguisher	9.14.1 to 9.14.3	IS 15683	S	1	Each consignment received	No further testing is required if accompanied with test certificate or ISI marked.
10.1	Colour	10.1	IS 15683	-	Each extinguisher	-	-

Note-1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval of BO Head.

**ANNEX- E**

**POSSIBLE TESTS IN A DAY**

- a) Fill density (Clause 5.3.1)
- b) Effective discharge time (Clause 7.2)
- c) Carrying handle (Clause 9.3)
- d) Mounting (Clause 9.4)
- e) Caps, valve and closures (Clause 9.5)
- f) Hose assembly (Clause 9.8)
- g) Method of operation (Clause 9.9)
- h) Colour (Clause 10.1)
- i) Marking (Clause 10.2)