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(पाँचवां पुनरीक्षण)

Selection, Installation and Maintenance of First-Aid Fire Extinguishers — Portable and Mobile — Code of Practice

(Fifth Revision)

ICS 13.220.10

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FOREWORD

This Indian Standard (Fifth 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 extinguishers are not expected to deal with large fires since they are essentially first-aid firefighting equipment. Nevertheless, they are very valuable in the early stages of a fire when used promptly and effectively. Provision of unsuitable types, incorrect operation, or improper maintenance of the extinguishers have, at times, led to failure in tackling the fire effectively in the early stages, thus involving greater loss of life and property. In addition to the value of their portability and mobility, the most important feature of these extinguishers is their immediate availability so that each extinguisher can be used by one/two persons. The usefulness of these extinguishers is limited, as it is entirely dependent upon the presence of persons having knowledge to operate them. Wheeled extinguishers are installed in high hazard areas for discharging extinguishing media at high flow rate for longer duration for hazard protection.

This standard has, therefore been formulated for giving guidance regarding proper selection, installation, and maintenance of portable first-aid fire extinguishers so that such extinguishers will function at all times as intended throughout their useful life. This standard does not cover the requirements applicable to fixed installation systems for extinguishing fire even though portions of such systems may be portable.

This standard gives provisions for the selection and installation of portable and wheeled fire extinguishers as per IS 15683 and IS 16018 and applicable only for ISI Marked fire extinguishers and equipment. Since a variety of shapes or methods of operation of fire extinguishers have at times led to confusion and failure to quench the fire, it is recommended that extinguishers installed in any one building or single occupancy shall be similar in shape and appearance and should have the similar methods of operation, as far as possible. For this purpose, IS 15683 and IS 16018 have been prepared having same method of operation. In order that fire extinguishers are effective, they should:

a) be portable/wheeled;

b) operate instantly;

c) have adequate throw;

d) have adequate quantity of extinguishant as per fire rating; and

e) specified shelf-life from the year of manufacture.

All these characteristics have been incorporated into portable/wheeled extinguishers, which are manufactured to deal with different types of fires. For effectiveness, they should conform to the relevant Indian Standards. The number and size of extinguishers for installation purposes shall be determined by the type, fire rating, and fire hazard classification of the protected risk.

The use of fire buckets, in lieu of fire extinguisher, is not recommended. However, users may provide fire buckets (*see* IS 2546) over and above the requirements given in this standard.

This standard was first published in 1962 and subsequently revised in 1970, 1979, 1992, and 2010. Since the early 1990s, additional types of fire extinguishers-both portable and wheeled/trolley-mounted-have been developed and put into use. It was, therefore, necessary to expand the scope of this standard to include provisions for all types of fire extinguishers and wheeled fire extinguishers for which Indian Standards have been formulated to date. In doing so, the opportunity was also taken to update the maintenance requirements based on current international practices. In the 2010 version, soda-acid and chemical-foam type extinguishers were phased out. The use of halons was restricted to essential applications, such as in aviation, defence, gas turbines, etc.

(*Continued on third cover*)

Indian Standard

SELECTION, INSTALLATION AND MAINTENANCE OF FIRST-AID FIRE EXTINGUISHERS — PORTABLE AND MOBILE — CODE OF PRACTICE

(Fifth Revision)

1 SCOPE

1.1 This standard gives requirement for the selection, installation, maintenance, and testing of portable and mobile (wheeled) fire extinguishers.

Fire extinguishers are a first line of defence against fires of limited size. They are needed even if the property is equipped with automatic sprinklers, standpipe and hose, or other fixed fire protection equipment/systems.

1.2 This standard is not alternative to permanently installed systems for fire extinguishment, even though portions of such systems may be portable (such as hose and nozzles attached to a fixed fire of extinguishing media).

1.3 The requirements mentioned in this standard are minimum in nature. The use of larger, higher-rated, or greater numbers of extinguishers will, in general, improve protection.

1.4 Extinguishers for use on board aircraft, watercraft, and vehicles are outside the scope of this standard.

2 REFERENCES

The standards listed 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 edition of these standards.

3 TERMINOLOGY

For the purposes of this standard, the definitions given below and those terms in IS 7673 shall apply:

3.1 Clean Agent — Electrically non-conductive gaseous, volatile, or vaporizing liquid fire extinguishant that does not leave a residue upon vaporization and are not toxic to level of concentration at which it extinguishes the fire some clean agents used are CO_2, HFC fluoro ketone, etc.

3.2 Competent Person — Person with the necessary training and experience and with access to the requisite tools, equipment, parts, and information (including the manufacturer's service manual) to be capable of carrying out the inspection, maintenance, and recharging procedures of this standard.

3.3 Foam Concentrate — Extinguishing media comprising the aqueous film-forming foam (AFFF) and film-forming fluroprotein (FFFP) foam types, and suitable for polar solvents (water-soluble flammable liquids) should confirm to IS 4989.

3.4 Fire Class

3.4.1 *Class A* — Fires involving solid combustible materials of organic nature such as wood, paper, rubber, plastics, etc, where the cooling effect of water is essential to extinguish the fire.

3.4.2 *Class B* — Fires involving flammable liquids or liquefiable solids or the like where a blanketing effect is essential to extinguish the fire.

3.4.3 *Class C* — Fires involving flammable gases under pressure including liquefied gases, where it is necessary to inhibit the burning gas at fast rate with an inert gas, powder, or vaporizing liquid for extinguishment.

3.4.4 *Class D* — Fires involving combustible metals such as magnesium, aluminium, zinc, sodium, potassium, etc, when the burning metals are reactive to water containing agents and in certain cases carbon dioxide, halogenated hydrocarbons, and ordinary dry powders. These fires require special media and techniques to extinguish.

3.4.5 *Class F* — Fires involving cooking media (vegetable or animal oils and fats) in cooking appliances and may be called kitchen fire.

3.5 Hazard Classes

3.5.1 *Class A Hazard* — Occupancies or fuel sources where Class A fires, involving materials such as wood, cloth, paper, rubber, and many plastics, may be expected to develop.

3.5.2 *Class B Hazard* — Fuel sources where Class B fires, involving materials such as oils, greases, and paints, may be expected to develop.

3.5.3 *Class C Hazard* — Fuel sources where Class C fires, involving materials such as natural and propane gas, may be expected to develop.

3.5.4 Class D Hazard — Fuel sources where Class D fires, involving materials such as magnesium, sodium, and potassium, may be expected to develop.

3.5.5 *Class F Hazard* — Fuel sources where Class F fires, involving materials in cooking appliances such as combustible cooking media (vegetable or animal oils and fats), may be expected to develop.

3.6 Hazard Types (*see* Annex B)

3.6.1 *Low* (*Light*) *Hazard* — Light hazard occupancies are locations where the total amount of Class A combustible materials, including furnishings, decorations, content, is of minor quantity. This can include some buildings or rooms occupied as offices, classrooms, churches, assembly halls, guest room areas of hotels/motels, and so forth. This classification anticipates that most content items are either non-combustible or so arranged that a fire is not likely to spread rapidly.

3.6.2 *Ordinary* (*Moderate*) *Hazard* — Ordinary hazard occupancies are locations where the total amount of Class A combustibles and Class B flammables are present in greater amounts that expected under light hazard occupancies. These occupancies could consist of dining areas, mercantile shop and storage, light manufacturing operations, research labs, auto showrooms, packing garages workshops, etc and warehouses containing ordinary hazard goods, for details (*see* IS 3594).

3.6.3 *High Hazard* — High hazard occupancies are locations where the total amount of Class A combustibles and Class B flammables present, in storage, production, use, finished product, or combination thereof, is over and above those expected in occupancies classed as moderate hazard. These occupancies could consist of woodworking; vehicle repair; aircraft and boat servicing; cooking area; individual product display showrooms; product convention centre displays and storage and manufacturing processes such as painting; dipping, and coating, including flammable liquid handling. Also included is warehousing of or in-process storage.

3.7 High-Pressure Cylinder — Cylinder having a service pressure higher than 19 bar at 27 °C ± 5 °C.

3.8 Inspection — Brief examination to ensure that an extinguisher is available and will operate.

NOTE — This is intended to give reasonable assurance that the extinguisher is fully charged and operable. This is done by seeing that it is in its designated place, that it has not been actuated or tampered with, and that there is no obvious damage or condition to prevent its operation.

3.9 Low-Pressure Cylinder — Cylinder having a service pressure less than or equal to 19 bar at 27 °C ± 5 °C.

3.10 Maintenance — Thorough examination of the fire extinguisher.

NOTE — This is intended to give maximum assurance that an extinguisher will operate effectively and safely. It includes a thorough examination and any necessary repair or replacement. It will normally reveal if hydrostatic testing is required.

3.11 Non-Rechargeable Extinguisher/ Non-Refillable Extinguisher — Fire extinguisher that is not capable of (or intended for) undergoing complete maintenance or hydrostatic testing, nor of being restored to its full operating capability by means of the standard practices used by fire equipment service companies.

3.12 Powders — Fire extinguishing media in the powder form: Type ABC, BC, D that conform to IS 4308.

3.13 Portable Fire Extinguisher — Fire extinguisher that is designed to be carried and operated by hand and that, in working order, has a mass of not more than 17 kg. The pressure may be provided by the following:

a) A stored pressure (pressurization of the extinguishing medium container at the time of charging), or

b) A gas cartridge CO_2 (pressurization at the time of use through the release of gas from a separate cylinder into the medium container).

3.14 Rating — Comparative number associated with the classification assigned to an extinguisher and indicative of its capability in the extinguishment of a standard fire as given in IS 15683 and IS 16018.

3.15 Rechargeable Extinguisher/Refillable Extinguisher — Fire extinguisher that is capable of undergoing complete maintenance, including internal inspection of the container, replacement of parts and seals, and hydrostatic testing, and of being recharged with media and propellant and restored to its full operating capability by means of the standard practices used by fire equipment service companies.

NOTE — Rechargeable/refillable extinguishers are marked ‘recharge immediately after any use with the same rating as per BIS’ or with a similar equivalent marking.

3.16 Recharging — Replacement of the extinguishing medium with the same BIS rating marked on the extinguisher.

NOTE — This also includes the propellant for certain types of extinguishers.

3.17 Self-Expelling Medium Extinguisher — Extinguisher in which the extinguishant has sufficient vapour pressure at normal operating temperatures to expel itself.

3.18 Service Pressure — Equilibrium pressure developed in a normally charged and pressurized extinguisher conditioned at 27 °C ± 5 °C for at least 18 h stored pressure or pressure generated during actuation of gas cartridge.

3.19 Servicing — Process that includes maintenance, recharging or hydrostatic testing, or more than one of these.

3.20 Travel Distance — Distance a person must travel from any point to the closest appropriate extinguisher.

3.21 Test Pressure — Pressure at which the extinguisher or its components were tested at the time of manufacture or as BIS recommendation.

NOTE — The pressure at which the shell was tested is shown on the nameplate or the extinguisher body.

3.22 Water Type Extinguisher — The extinguisher which contains water based medium in the form of jet, spray, or mist as per IS 15683.

3.23 Wheeled Extinguisher — Mobile appliance on wheels having a total mass of more than 17 kg but not greater than 450 kg including its all accessories, which is designed to be transported to the fire and operated by one/two persons.

4 CLASSIFICATION, RATINGS AND PERFORMANCE OF EXTINGUISHERS

4.1 Extinguishers are classified for use on certain classes of fires and rated for relative extinguishing effectiveness by testing laboratories. This is based on the classification of fires and the fire-extinguishing potentials as determined by fire tests.

4.2 The classification and rating systems referenced in this standard are those specified in IS 15683 and IS 16018.

4.3 Extinguishers conformant with this standard shall also be in accordance with IS 15683 and IS 16018.

5 GENERAL REQUIREMENTS FOR INSTALLATIONS

5.1 Extinguishers shall be maintained in a fully charged and operable condition and shall be kept in their designated places at all times when not being used.

5.2 Extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire. Preferably, they shall be located along normal paths of travel, including exits from areas.

5.3 Cabinets housing extinguishers shall not be locked, with the exception that where extinguishers are subject to vandalism, locked cabinets may be used, provided they include means of emergency access.

5.4 Extinguishers shall not be obstructed or obscured from view, with the exception that in large rooms and in certain locations where visual obstruction cannot be completely avoided, labels/location marking sign or other suitable means shall be provided to indicate the location of the extinguishers. Signs or other means used to indicate fire extinguisher location shall be located in close proximity to the extinguisher and shall be visible from normal path of travel.

5.5 Extinguishers shall be installed on hangers or in brackets or mounted in cabinets. Fire extinguisher may be installed on a floor stand where wall mounting is not possible.

5.6 Extinguishers installed under conditions where they are subject to dislodgement or continuous vibration (like in fire tender) shall be installed in specifically designed brackets.

5.7 Extinguishers installed under conditions where they may be subject to physical damage shall be protected from impact.

5.8 Extinguishers having a gross mass of 17 kg or less (portable fire extinguishers) shall be installed so that the top of the extinguisher is not more than 1.5 m above the floor. The clearance between the bottom of extinguishers mounted on hangers or brackets and the floor shall not be less than 30 mm.

5.9 When mounted or placed in their intended location, the operating instructions shall face outwards or towards the most likely direction of access. Extinguisher periodic maintenance label/sticker, hydrostatic pressure testing (HPT) label/card/sheet shall not be positioned in such a way that obstruct the visibility of operating instruction.

5.10 Where extinguishers are installed in closed cabinets that are located outdoors, or are exposed to elevated temperatures, such cabinets shall be provided with ventilation openings and suitable drain point at bottom. All these opening shall be protected with mesh screen in order to prevent the ingress of insects/reptiles.

5.11 Extinguishers shall not be installed in areas where temperatures are outside the range marked on the extinguisher, or where they may be exposed to elevated temperatures from heating sources.

6 SELECTION OF EXTINGUISHERS

6.1 General

The selection of extinguishers for a given situation shall be determined by the character and extent of the fires anticipated, the construction and occupancy of the individual property, the hazard to be protected against, the ambient temperature conditions, as well as other factors, as appropriate. The number, rating, placement, and limitations of use of the required extinguishers shall meet the requirements of 7.

6.2 Clean Agent Fire Extinguishers

The use of clean agent fire extinguishers shall be limited to applications where a clean medium is necessary to extinguish fire efficiently without damaging the equipment or area being protected, or where the use of alternative media could cause a hazard to personnel in the area.

NOTE — In India the manufacture and use of clean agents is regulated by the Montreal Protocol and national regulations of Gazette Notification by Ozone Cell (Ministry of Environment Forest and Climate Change).

6.3 Selection by Hazard Class

6.3.1 Extinguishers shall be selected for the specific class(es) of hazards to be protected against.

6.3.2 Extinguishers for protection against Class A hazards shall be selected from extinguishers with the appropriate Class A rating.

6.3.3 Extinguishers for protection against Class B hazards shall be selected from extinguishers with the appropriate Class B rating.

6.3.4 Extinguishers for protection against Class C hazard shall be same as for Class B.

6.3.5 Extinguishers and extinguishing media for protection against Class D hazards shall be of types suitable for use on the specific combustible-metal hazards, and marked on the extinguishers for Class D.

6.3.6 Extinguishers for protection against Class F hazards shall be selected from extinguishers with the appropriate Class F rating as marked.

6.3.7 Extinguishers for protection against hazards which involve energized electrical equipment shall be of the carbon dioxide, powder, clean agent, or water-mist types which have been tested and found suitable for this application. Carbon dioxide extinguishers equipped with metal horns are not considered safe for use on fires involving energized electrical equipment.

While powder extinguishers can be effective in extinguishing fires in delicate electronic equipment, the residue from their media could seriously damage the equipment they are intended to protect.

6.4 Selection for Pressurized Flammable Liquid and Gas Fires

6.4.1 Extinguishers containing media other than powder are relatively ineffective on pressurized flammable liquids and pressurized gas fires. The selection of extinguishers for this type of hazard shall be made on the basis of recommendations by qualified fire professional or authority having jurisdiction or manufacturer. The system used to rate the effectiveness of extinguishers on Class B fires (flammable liquids in depth) is not applicable to these types of hazards. It has been determined that special nozzle design and rates of media application are required to cope with such hazards. Also, the first requirement to handle such hazards to stop supply of gas/liquid if feasible.

NOTE — It is undesirable to attempt to extinguish this type of fire unless there is reasonable assurance that the source of fuel can be promptly shut off.

6.4.2 Extinguishers for three-dimensional Class B hazards involving Class B materials in motion, such as pouring, running, or dripping flammable liquids, shall be selected on the basis of recommendations by qualified fire professional or authority having jurisdiction or manufacturer. The system used to rate extinguishers on Class B fires (flammable liquids in depth) is not directly applicable to this type of hazard.

NOTE — The installation of fixed systems for such hazards should be considered when applicable.

6.4.3 Aqueous film forming foam (AFFF) and film-forming fluoroprotein (FFFP) foam types of fire extinguishers shall not be selected for the protection of water-soluble flammable or combustible liquids, unless specifically referenced on the fire extinguisher's nameplate. Special multipurpose or alcohol resistant foams shall be used for this purpose (*see* IS 4989).

6.4.4 Wheeled extinguishers shall be considered for hazard protection in high hazard areas or where:

a) high media flow rates,

b) increased media stream range, or

c) increased media capacity is required.

7 DISTRIBUTION OF EXTINGUISHERS

7.1 General Requirements

7.1.1 The minimum number of extinguishers needed to protect a hazard shall be determined as outlined in this clause.

Additional extinguishers may be installed to provide more suitable protection for special hazards.

Consideration shall be given to the protection of high storage items and other hazards requiring extinguishers with a suitable vertical range. Extinguishers having ratings less than those specified in Table 1 and Table 2 may be installed, provided they are not used to fulfil the minimum protective requirements of this clause.

7.1.2 Extinguishers shall be provided for the protection of both the building structure, if combustible, and the hazards contained therein.

7.1.3 Required building protection shall be provided by extinguishers suitable for Class A fires.

7.1.4 Protection of building contents shall be provided by extinguishers suitable for such Class A, Class B, Class C, Class D, or Class F fire hazards as may be present.

7.1.5 Extinguishers provided for building protection may also be considered for the protection of occupancies having a Class A fire potential.

7.1.6 Buildings having Class B and/or Class C hazards shall have a standard complement of Class A extinguishers for building protection, plus additional Class B and/or Class C extinguishers. Where extinguishers have more than one letter classification, they may be considered to satisfy the requirements of each letter class.

7.1.7 Occupancies shall be classified generally as light (low) hazard, moderate hazard, or high hazard occupancies (*see* **3.6**). Limited areas with greater or lesser hazards shall be protected as required. Consideration shall also be given to the number of occupants, their ages, and their ability to evacuate in the case of fire.

7.1.8 On each floor level, the area protected, and the travel distances are based on extinguishers installed in accordance with Table 1 and Table 2.

7.2 Fire Extinguisher Ratings and Placement for Class A Hazards

7.2.1 Fire extinguishers for the different types of hazards shall be provided on the basis of Table 1.

7.2.2 At least two extinguishers in accordance with Table 1 shall be provided per floor level, with the exception that for floor levels having an area of less than 100 m^2, one extinguisher may be provided.

7.2.3 The protection requirements may be fulfilled with extinguishers of higher ratings, provided the travel distance to such larger extinguishers and the maximum floor area per unit does not exceed the distance and floor area for given hazards specified in Table 1.

Table 1 Placement Requirement for Class A Fire Extinguisher

(*Clauses* 7.1.1, 7.1.8, 7.2.1, 7.2.2 *and* 7.2.3)

Sl No.	Type of Hazard	Minimum Extinguisher Rating	Maximum Travel Distance to Extinguisher m	Maximum Area per Extinguisher m^2
(1)	(2)	(3)	(4)	(5)
i)	Light	2A	20	300
ii)	Moderate	3A[a]	20	150
iii)	High	4A[a]	15	100

[a] Two 2A rated water-type extinguishers, provided they are installed adjacent to each other, may be used to fulfil the requirements of one 3A or 4A rated extinguisher.

7.3 Extinguisher Rating and Placement for Class B Hazards Other than Hazards in Flammable Liquids of Appreciable Depth (In Excess of 6 mm) and for Class C Hazards

7.3.1 Extinguishers for the listed types of hazards shall be provided on the basis of Table 2, with the exception that extinguishers of lesser rating, for small specific hazards within the general hazard area, may be used, but shall not be considered as fulfilling any part of the requirements of Table 2.

For pressurized flammable liquid and gas fires, (*see* **6.4**).

For fires involving water-soluble flammable liquids, (*see* **6.4.3**).

7.3.2 Two or more extinguishers of lower rating shall not be used to fulfil the protection requirements of Table 2 with the exception that up to three AFFF-type extinguishers, provided the sum of their ratings equals or exceeds the minimum required rating, may be used to fulfil the requirements of a single extinguisher of the required rating.

7.3.3 The protection requirements may be fulfilled with extinguishers of higher ratings, provided the travel distance to such larger extinguishers does not exceed the distance specified in Table 2.

7.3.4 At least two extinguishers as specified in Table 2 shall be provided per floor level, with the exception that for floor levels having an area of less than 100 m^2, one extinguisher may be provided.

7.4 Extinguisher Size and Placement for Class B Hazards in Flammable Liquids of Appreciable Depth (in Excess of 6 mm)

7.4.1 For flammable liquid hazards of appreciable depth, such as in dip or quench tanks, additional Class B extinguishers shall be provided on the basis of at least 144 numerical units of Class B extinguishing potential per square meter of the estimated maximum fire area, with the exception that AFFF type extinguishers may be provided on the basis of 89B of protection per square meter of hazard.

7.4.2 Two or more extinguishers of lower ratings shall not be used in lieu of the extinguisher required for the largest tank, with the exception that up to three AFFF-type or FFFP-type extinguishers may be used to fulfil the requirements of a single extinguisher of the required rating, provided the sum of their ratings equals or exceeds the minimum required rating.

7.4.3 When the size of a Class B hazard of appreciable depth is such that it cannot be protected by portable extinguishers, the use of a wheeled extinguisher may be considered when it can be demonstrated that it is capable of protecting against the hazard. Where so used, Class B portable extinguishers shall also be provided, as covered in **7.3.1**, to protect areas in the vicinity of such a hazard.

7.4.4 Travel distances to extinguishers shall not exceed 15 m.

7.4.5 Scattered or widely separated hazards shall be individually protected. An extinguisher in the proximity of a hazard shall be carefully located to be accessible in the presence of a fire without undue danger to the operator.

7.5 Extinguisher Size and Placement for Electrical Hazards

7.5.1 Electrical hazards include hazards either directly involving or surrounding electrical equipment.

7.5.2 As these hazards are themselves either Class A or Class B hazards, the extinguishers shall be sized and located on the basis of the anticipated Class A or Class B hazard.

7.5.3 Where energized electrical equipment could be encountered, the extinguishers shall have been proved to be suitable for use on energized electrical equipment and so marked. Electrical equipment should be de-energized as soon as possible to prevent re-ignition.

7.6 Extinguisher Size and Placement for Class D Hazards

7.6.1 Class D extinguishers shall be provided for hazards involving combustible metals.

7.6.2 The travel distances to extinguishers for Class D hazards shall not exceed 20 m.

7.6.3 The size and number of extinguishers shall be determined on the basis of the specific combustible metal, its physical particle size, and the area to be covered.

7.7 Extinguisher Size and Placement for Class F Hazards

7.7.1 Class F extinguishers shall be provided for hazards involving combustible cooking media (vegetable or animal oils and fats) in cooking appliances.

7.7.2 The travel distances to extinguishers for Class F hazards shall not exceed 10 m.

7.7.3 The size and number of extinguishers shall be determined on the basis of the total cooking area to be covered, in accordance with Table 3.

8 PORTABLE AND WHEELED FIRE EXTINGUISHERS — INSPECTION AND MAINTENANCE

8.1 General

Portable fire extinguishers are a first line of defence against fires of limited size. They are needed even if the property is equipped with automatic sprinklers, standpipe and hose, or other fixed protection equipment.

The provisions are not applicable to permanently installed systems for fire extinguishment, even though portions of such systems may be portable (such as hose and nozzles attached to a fixed supply of extinguishing media).

8.2 Inspection, Maintenance, and Recharging

The following suggests the requirements relating to inspection, maintenance, and recharging.

8.2.1 The owner or owner's designated agent or occupant of a property in which extinguishers are located shall be responsible for inspection, maintenance and recharging with the same rating marked on the extinguisher.

8.2.2 The procedure for inspection and maintenance of extinguishers varies considerably. Minimal knowledge is necessary to perform a quarterly inspection procedure as outlined in **8.3.1**. Only competent persons shall service extinguishers, as outlined in **8.3** and **8.4** (*see* Annex C).

8.2.3 Maintenance and recharging shall be performed in accordance with the appropriate manual(s), using the proper types of tools, recharge materials, lubricants, and the manufacturers recommended and identified replacement parts.

8.2.4 Extinguishers out of service for maintenance or recharge shall be replaced at once by spare extinguishers of the same type and at least equal classification and rating.

Table 2 Placement Requirement for Class B, Class C Fire Extinguisher

(*Clauses* 7.1.1, 7.1.8, 7.3.1, 7.3.2, 7.3.3 *and* 7.3.4)

Sl No.	Type of Hazard	Minimum Extinguisher Rating	Maximum Travel Distance to Extinguisher, m	Maximum Area per Extinguisher, m^2
(1)	(2)	(3)	(4)	(5)
i)	Light	55B	15	300
ii)	Moderate	144B	15	150
iii)	High	233B	15	100

Table 3 Extinguisher Rating for Fat Fires

(*Clause* 7.7.3)

Sl No.	Minimum Extinguisher Rating	Maximum Cooking Area per Extinguisher, m^2
(1)	(2)	(3)
i)	5F	0.03
ii)	15F	0.05
iii)	25F	0.08
iv)	75F	0.25

8.3 Inspection

8.3.1 Extinguishers shall be checked when initially placed in service and thereafter should be checked at approximately 90 day intervals. Extinguishers shall be checked at more frequent intervals when circumstances require.

8.3.2 Periodic checks shall be made to ensure that:

a) The extinguisher is located in the designated place;

b) The extinguisher is unobstructed and visible, with its operating instructions facing outwards;

c) Operating instructions are legible;

d) Seals and tamper indicators are not broken or missing;

e) The extinguisher is full (by weighing or hefting);

f) The extinguisher is not obviously damaged, corroded or leaking and does not have a clogged nozzle;

g) Where provided, the pressure gauge reading, or indicator is in the operable range or position;

h) Verify that the hanger, bracket, or cabinet is secure, undamaged, and properly mounted;

j) Ensure that inspection tag, extinguisher location/identification number, hydrostatic pressure testing (HPT) tag shall be intact;

k) Verify that the hose retention band is secure and properly adjusted; and

m) Clean all exterior surface of the extinguisher with dry cloth and install back at its designated place.

8.3.3 When a check of any extinguisher reveals a deficiency in the conditions given 8.3.2(a) and (b), immediate corrective action shall be taken.

8.3.4 When a check of any rechargeable extinguisher reveals a deficiency in any of the conditions 8.3.2(c), (d), (e), (f) or (g), it shall be subjected to appropriate maintenance procedures.

8.3.5 When a check of any non-rechargeable powder extinguisher reveals a deficiency in any of the conditions 8.3.2(e), (f) or (g), it shall be removed from service.

8.3.6 When a check of any non-rechargeable clean agent extinguisher reveals a deficiency in any of the conditions 8.3.2(e), (f) or (g), it shall be removed from service and the medium shall be recovered or destroyed.

8.4 Maintenance

8.4.1 *General*

All extinguishers, except as given in Annex D, shall be subjected to maintenance as follows:

a) Once a year but not less than six months apart;

b) At the time of hydrostatic testing; and

c) When specifically indicated by an inspection.

Maintenance procedures shall be performed in accordance with 8.4.2.

8.4.2 *All Extinguishers*

8.4.2.1 At each maintenance, all extinguishers shall be subjected to the following:

a) A check of the seal and safety device to determine whether the extinguisher may have been used;

b) Subsequent to maintenance, replacement of the safety device if any (once in five years) and fitting of a new seal; and

c) Attachment of a label to the extinguisher or marking of a label attached to the extinguisher indicating that the required maintenance has been performed.

8.4.2.2 For the balance of the procedures to be carried out when maintaining portable fire extinguishers, the extinguisher types shall be categorised as follows:

a) *Category* 1 — Stored-pressure-type extinguishers with water, water with additives, or foam as the extinguishing media;

b) *Category* 2 — Stored-pressure-type extinguishers with powder or clean agent as the extinguishing media;

c) *Category* 3 — Gas-cartridge-type extinguishers with water, water with additives, or foam as the extinguishing media;

d) *Category* 4 — Gas-cartridge-type extinguishers with powder as the extinguishing media; and

e) *Category* 5 — Carbon dioxide extinguishers.

8.4.2.3 In addition to the requirements of 8.3.2(a), (b) and (c), extinguishers shall be maintained in accordance with Table 4.

8.4.2.4 Powder extinguishers of cartridge type shall be opened for performing maintenance procedure.

a) Powder extinguishers shall be opened only in the driest available conditions and for the minimum time necessary for examination, to minimize the effect of atmospheric moisture on the powder (powder may absorb deleterious amounts of moisture if exposed to air of high relative humidity, or if the powder is colder than the ambient air);

b) Mixing or cross-contamination of different types of powder shall not be permitted; and

c) Some types of powder are capable of reacting with other types to produce water and carbon dioxide. This reaction often does not become apparent until after a delay of weeks during which no apparent reaction occurs. The water causes caking, and, in a closed container, the carbon dioxide causes a pressure rise that can be dangerous. Only extinguishers containing the same powder should be opened and examined at any one time.

NOTE — Before any powder extinguisher is opened, it shall be ascertained that, during inspection and maintenance, the precautions given in 8.4.2.4(a), (b), and (c) can and will be observed.

Table 4 Maintenance Procedures for Each Categorized Extinguisher Type

(*Clause* 8.4.2.3)

Sl No.	Maintenance Procedure	Category				
		1	2	3	4	5
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Examine and verify that the pressure-indicating device (if fitted) is reading the internal pressure correctly or, where a device is not fitted, that the internal pressure is correct as per design.	x	x	–	–	–
ii)	Examine the extinguisher body externally for corrosion or damage. If the extinguisher is slightly corroded, or has sustained minor damage, it shall be discarded subject to hydrostatic test fail result. If heavily corroded or severely damaged, it shall be discarded.	x	x	x	x	x
iii)	Weigh the extinguisher (with or without the operating mechanism, according to the manufacturer's instructions) or use suitable alternative means to check that it contains the correct mass of medium. Check the mass against the mass recorded when it was first put into service.	x	x	x	x	x
iv)	Examine the nozzle and hose (if provided) and clean if necessary. Replace if worn or otherwise not in good condition.	x	x	x	x	x
v)	Where extinguishers are designed to have the operating mechanism removed, check the operating mechanism and discharge control (where fitted) for free movement. Clean, rectify or replace if necessary. Protect the moving parts and threads against corrosion with a lubricant as recommended by the manufacturer.	–	–	x	x	–
vi)	Open the extinguisher or otherwise remove the head assembly. Remove the gas cartridge.	–	–	x	x	–
vii)	(Water with additive, or foam extinguishers only.) Pour the liquid into a clean container. If evidence of deterioration is apparent (refer to manufacturer's instructions regarding specific products), discard the liquid and refill with the manufacturer's specified liquid. Where the foam concentrate or additive is in a separate container, check this for leakage. Discard leaking containers and replace with a new container and charge.	–	–	x	–	–

Table 4 (*Concluded*)

Sl No.	Maintenance Procedure	Category				
		1	2	3	4	5
(1)	(2)	(3)	(4)	(5)	(6)	(7)
viii)	Clean the inside and outside of the extinguisher and examine the body externally and internally for corrosion or damage. If the extinguisher is slightly corroded, or has sustained minor damage, it shall be discarded or subjected to hydrostatic testing. If heavily corroded or severely damaged, it shall be discarded.	–	–	x	x	–
ix)	Examine the gas cartridge externally for corrosion or damage. If the gas cartridge is damaged or corroded, replace the cartridge as recommended by the manufacturer. Weigh the gas cartridge and check the mass against that marked on the cartridge. A gas cartridge which has a content less than the 10 percent of total gross weight, or which is found to be leaking, shall be withdrawn from service, or replaced by a cartridge as recommended by the manufacturer.	–	–	x	x	–
x)	Clean if necessary and pass air through the vent holes (or other venting device) in the cap.	–	–	x	x	–
xi)	Examine the branch pipe (where used) nozzle, strainer and (where fitted) the internal discharge tube and breather valve, and clean if necessary.	–	–	x	–	–
xii)	Clean and examine the nozzle, hose, and internal discharge tube for blockage by passing air through them; rectify or replace if necessary.	–	–	–	x	–
xiii)	Examine all washers, diaphragms, and hose, and replace if damaged or defective. If the hose is fitted at the bottom end of the extinguisher and a diaphragm is used, it shall be replaced.	–	–	x	x	–
xiv)	Examine the powder in the extinguisher to check that there are no visual signs of caking, lumps, or foreign bodies. Agitate the powder by inverting and shaking the extinguisher, taking care to avoid spillage. If there is any evidence of caking, lumps, or foreign bodies, if it is not free flowing, or if there is any doubt, discard all the powder, and recharge the extinguisher with the original manufacturer's powder.	–	–	–	x	–
xv)	Return the original charge to the extinguisher, topping up any loss with water, or replacing with fresh water as necessary. For water with additives, or foam, recharge the extinguisher in accordance with the manufacturer's instructions.	–	–	x	–	–
xvi)	Re-assemble the extinguisher in accordance with the manufacturer's instructions.	–	–	x	x	–
xvii)	Examine the horn, hose, and valve assembly, and clean and replace if not in good condition.	–	–	–	–	x
xviii)	Check the zero error by removing the pressure gauge (make sure the pressure gauge has self-locking NRV coupling). The gauge should read “zero” when removed. Change the gauge if not showing zero reading	x	x	–	–	–
xix)	Discard the DCP powder from extinguisher if it exceeds manufacturer recommended shelf-life period.	–	x	–	x	_

8.4.2.5 In addition to the annual maintenance specified in 8.4.1 to 8.4.2.4, the maintenance procedures in accordance with Table 5 shall be performed at intervals not exceeding five years, with the following exceptions:

a) Non-rechargeable fire extinguishers, other than clean agent types, shall be discharged and discarded not later than five years from their date of manufacture; and

b) Non-rechargeable fire extinguishers of the clean agent type shall be removed from service and returned to a recycling centre for recovery of the clean agent not later than five years from their date of manufacture.

Clean agent extinguishers shall not be discharged to the atmosphere but shall be emptied at intervals not exceeding five years by a method that permits recovery of the clean agent. Following emptying, the additional maintenance in accordance with Table 5 shall be performed. When emptied, measures should be taken to minimize any emissions of clean agents into the atmosphere.

9 RECHARGING

9.1 All rechargeable-type extinguishers shall be recharged after any use or when indicated by an inspection or maintenance deficiency.

9.2 When performing the recharging, the recommendations of the manufacturer shall be followed.

9.3 The amount of recharge medium shall be verified by weighing/measuring. The recharged gross mass/volume shall be the same as the gross mass/volume that is, marked on the manufacturer's label.

9.4 After recharging, a leak test shall be performed on stored pressure and self-expelling media extinguishers and cartridges.

9.5 Aqueous film-forming foam (AFFF), film-forming fluoroprotein (FFFP) foam shall be recharged with fresh media in accordance with the instructions on the extinguisher.

9.6 Only the medium specified on the nameplate shall be used.

Table 5 Additional Maintenance Procedures for Extinguishers in Categories 1, 2 and 5 to be Performed at Intervals of Not More Than Five Years

(*Clause* 8.4.2.5)

Sl No.	Maintenance Procedure	Category		
		1	2	5
(1)	(2)	(3)	(4)	(5)
i)	Discharge the extinguisher completely. After discharge, the zero-pressure gauge (where provided) shall indicate zero pressure, and an indicator (where provided) shall show a discharged position.	x	x	x
ii)	Open the extinguisher, clean the inside and examine the body internally for corrosion or damage. If the extinguisher is slightly corroded, or has sustained minor damage, it shall be discarded or subjected to hydrostatic testing. If heavily corroded or severely damaged, it shall be discarded.	x	x	x
iii)	Examine, as appropriate, the nozzle, strainer and hose, vent holes (or other venting device) in the cap or valve assembly, and the internal discharge tube. Clean, if necessary.	x	x	x
iv)	Examine all sealing washers and hose (if fitted) and replace if defective.	x	x	x
v)	Check the operating mechanism for free movement and clean, rectify or replace as necessary.	x	x	x
vi)	Re-assemble the extinguisher and recharge.	x	x	x
vii)	Check the rupture disc/safety device for its intactness. Check operating lever/valve for its smooth operation and replace if required	x	x	x

9.7 One type of powder shall not be mixed with, or allowed to be contaminated by, another powder type such as BC, ABC and D powders shall not be mixed.

9.8 Extinguishers shall not be converted from one type to another, nor shall any extinguisher be converted to use a different type of extinguishing medium.

9.9 The remaining powder in a discharged extinguisher shall not be re-used.

9.10 Extinguishers removed for 5 years maintenance or hydrostatic testing shall be emptied. The powder shall not be re-used unless a closed recovery system is used and the media separately stored in a sealed container to prevent contamination. Prior to re-use, the powder shall be thoroughly checked. Where doubt exists with respect to type, contamination, or condition of the powder, it shall be discarded.

9.11 For all non-water types of extinguishers, any moisture present in the emptied extinguisher shall be removed before recharging.

9.12 Clean agent-type extinguishers shall only be charged with the proper type and mass of medium as specified on the nameplate.

9.13 The removal of media from clean agent extinguishers shall only be done using a closed recovery system for clean agents. The extinguisher cylinder shall be examined internally for contamination and/or corrosion. The media retained in the system recovery cylinder shall be re-used only if no evidence of internal contamination is observed in the extinguisher cylinder. Clean agent removed from extinguishers that exhibit evidence of internal contamination or corrosion shall be processed in accordance with the extinguisher manufacturer's instructions.

9.14 Carbon dioxide shall meet the requirements of IS 15222 and should be recharged by approved CO_2 filling agency.

9.15 When recharging water-type extinguishers, overfilling will result in improper discharge. The correct amount of liquid medium shall be determined by using one of the following:

a) exact measurement by mass;

b) exact measurement by volume;

c) use of an anti-overfill tube when provided; and

d) use of a fill mark, if provided.

9.16 Gauges used to set the regulated source of pressure shall be calibrated at least annually.

9.17 A rechargeable stored-pressure-type extinguisher shall be pressurized only to the charging pressure specified on the extinguisher nameplate. The manufacturer's pressurizing adaptor shall be connected to the valve assembly before pressurizing the extinguisher. A regulated source of pressure, set to no higher than 0.2 MPa above the operating (service) pressure, shall be used to pressurize fire extinguishers.

NOTES

1 An unregulated source of pressure, such as a nitrogen cylinder without a pressure regulator, shall never be used, because the extinguisher could be over pressurized and possibly rupture.

2 Never leave an extinguisher connected to the regulator of a high-pressure source for an extended period of time. A defective regulator could cause the shell to rupture due to excess pressure.

9.18 Only standard industrial-grade dry nitrogen or other inert gas shall be used to pressurize stored pressure powder and clean agent fire extinguishers. Compressed air through moisture traps shall not be used for pressurizing, even if this is stated in the instructions on older extinguishers.

9.19 Carbon dioxide, in external cylinder, shall be used for higher capacity fire extinguishers to pressurise during its operation. Where carbon dioxide is used, it shall meet the requirements of IS 15222.

9.20 *See* Annex E for detailed refilling/recharging schedule of fire extinguishers.

10 RECORDS

10.1 The maintenance company shall keep records of all extinguishers serviced by their personnel, including the type of service performed.

10.2 The date the service was performed and the identification of the organization and person performing the service shall be recorded.

10.3 Each extinguisher shall have a tag or label securely attached that indicates the month and year the service (maintenance, recharging and hydrostatic tests) was performed, and this shall identify the person performing the service.

10.4 Labels recording service shall not be placed on the front of the extinguisher.

10.5 Each extinguisher shall have unique identification number in maintenance record.

10.6 Pressure gauge (PSV) of fire extinguisher shall be either replaced or calibrated at its hydrostatic pressure testing (HPT) schedule.

10.7 Rupture disc shall be replaced after every hydrostatic pressure testing or at every 5 years interval, whichever is lower.

10.8 For category 5 (CO_2 extinguisher) hydrostatic pressure testing (HPT) is mandatory prior to refilling as per gas cylinder rules.

11 HYDROSTATIC PROOF-PRESSURE TESTS

11.1 General

11.1.1 Hydrostatic tests shall be performed by persons trained in pressure-testing procedures and safeguards, and having available suitable testing equipment, facilities, and appropriate service manual(s).

11.1.2 If, at any time, an extinguisher shows evidence of corrosion or mechanical damage, and is not discarded, it shall be hydrostatically tested, subject to the provisions of **11.1.3**. The exceptions to these requirements are the following.

a) Non-rechargeable fire extinguishers, other than clean agent types, shall be discharged and discarded; and

b) Non-rechargeable clean agent extinguishers shall be returned to a recycling centre for recovery of the clean agent.

11.1.3 When an extinguisher cylinder or shell fulfils one or more of the conditions listed in (a) to (k) below, it shall not be hydrostatically tested, but shall be destroyed by the owner or at his or her direction:

a) Where repairs by soldering, welding, brazing, or use of patching compounds exist;

b) Where the cylinder threads are worn, corroded, broken, cracked, or nicked;

c) Where corrosion has caused pitting, including pitting under a removable nameplate or name band assembly;

d) Where the fire extinguisher has been exposed to excessive heat, flame, or fire;

e) Where a calcium chloride-type extinguishing agent has been used in a stainless-steel fire extinguisher;

f) Where the shell is of copper or brass construction joined by soft solder or rivets;

g) Where the depth of a dent exceeds 1/10 of the greatest dimension of the dent if not in a weld or exceeds 6 mm if the dent includes a weld;

h) Where any local or general corrosion, cuts, gouges, or dings have removed more than 10 percent of the minimum cylinder wall thickness;

j) Where a fire extinguisher has been used for any purpose other than that of a fire extinguisher; and

k) When the extinguisher is considered obsolete (*see* Annex D).

11.2 Frequency

11.2.1 Hydrostatic pressure testing (HPT) of fire extinguishers shall be carried as mentioned in Annex F.

NOTE — For non-rechargeable extinguishers, (*see* **11.1.2**).

11.2.2 High-pressure cartridges or nitrogen or CO_2 cylinders used for expellant gas storage for wheeled extinguishers shall be hydrostatically tested at intervals not exceeding 5 years. The exceptions being cartridges not exceeding 50 mm outside diameter and having a maximum capacity of 300 g are exempt from periodic hydrostatic retest.

11.2.3 The hydrostatic test interval for hose assemblies equipped with a shut-off nozzle at the end of the hose shall be the same as that specified for the extinguisher on which the hose is installed.

11.2.4 *See* Annex F for detailed schedule for hydrostatic pressure testing (HPT) of fire extinguishers.

11.3 Test Pressures

11.3.1 All extinguishers, cartridges, nitrogen or CO_2 cylinders used with wheeled extinguishers shall be tested at the factory test pressure.

11.3.2 Carbon dioxide hose assemblies shall be tested at 1.5 times of maximum service pressure at 27 °C ± 5 °C or 1.25 times of maximum service pressure at 55 °C ± 2 °C.

11.3.3 For all types of hoses except CO_2 type fire extinguishers, 2 times maximum service pressure at 27 °C ± 5 °C or 1.5 times of maximum service pressure at 55 °C ± 2 °C.

11.3.4 For life of fire extinguishers, refer Annex G.

11.4 When a fire extinguisher cylinder, shell, or cartridge fails a hydrostatic pressure test, it shall be condemned or destroyed by the owner or the owner's designated agent (*see also* **13**).

12 MAINTENANCE OF RECORDS

The records of maintenance, inspection and testing of all fire extinguishers including its operational history shall be maintained in a register as per the formant given in Annex H.

13 REJECTED EXTINGUISHERS

The rejected fire extinguishers should be cut centrally across the body and made unusable before disposal so as to prohibit their subsequent use. The date of rejection and the mode disposal should be recorded in the register of fire extinguisher (*see* Annex H).

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 3594 : 1991	Code of practice for fire safety of industrial buildings: General storage and warehousing including cold storage (*first revision*)
IS 4308 : 2019	Dry chemical powders for fire fighting — BC, ABC and D types — Specification (*third revision*)
IS 4989 : 2018	Foam concentrate for producing mechanical foam for fire fighting — Specification (*fourth revision*)
IS 7673 : 2004	Fire fighting equipment — Glossary of terms (*first revision*)
IS 14951 : 2001	Fire extinguisher — 135 litres capacity mechanical foam type — Specification
IS 15222 : 2002	Carbon dioxide as fire extinguishing media for fire protection — Specification
IS 15683 : 2018	Portable fire extinguisher — Performance and construction — Specification (*first revision*)
IS 16018 : 2012	Wheeled fire extinguishers — Performance and construction — Specification

ANNEX B

(*Foreword* and clause 3.6)

HAZARD TYPES

B-1 Table 6 is an example of specific criteria for selection of the hazard type (*see also* **3.6**) for details.

Table 6 Example of Specific Criteria for Selection of the Hazard Type

(*Clause* B-1)

Sl No.	Parameter	Type of Hazard		
		Low	Moderate	High
(1)	(2)	(3)	(4)	(5)
i)	Height of building (m)	Up to 15	Not applicable	In excess of 15
ii)	Number of occupants	Less than 15	Between 15 and 250	In excess of 250
iii)	Building surface area (m^2)	Less than 300	Between 300 and 3 000	In excess of 3 000
iv)	Flammable gases (litres)	Less than 500	Between 500 and 3 000	In excess of 3 000
v)	Flammable liquids (litres)	Less than 250	Between 250 and 1 000	In excess of 1 000
vi)	Combustible liquids (litres)	Less than 500	Between 1 000 and 2 000	In excess of 2 000

ANNEX C

(*Foreword* and clause 8.2.2)

COMPETENT PERSONS

C-1 GENERAL

This annex gives an approach to determining and assuring the competency of persons engaged in the servicing of fire extinguishers. Alternative methods may be considered in achieving a satisfactory level of competence.

C-2 TRAINING AND EXPERIENCE OF A COMPETENT PERSON

C-2.1 The competent person shall be trained with at least 3 months 'on the job' or practical experience and by participation in a training course. The recommended length of the course should be at least 32 h. The competent person shall successfully pass an examination at the end of the training course. The examination shall be supervised by an independent body recognized by national authorities.

C-2.2 The training course shall be run by a manufacturer or other qualified and recognized body.

C-2.3 The competent person shall attend a refresher course (4 h duration) at least every 5 years.

ANNEX D

(*Foreword*, *clauses* 8.4.1 *and* 11.1.3)

OBSOLETE EXTINGUISHERS

D-1 The following types of extinguishers are considered obsolete and shall be removed from service:

a) Soda acid types;

b) Chemical foam types;

c) Chlorobromomethane or carbon tetrachloride types;

d) Non-rechargeable types more than 5 years old;

e) Inverting types; and

f) Copper or brass shell types (excluding pump tanks) jointed by softer solder or rivets; steel shell types joined by rivets.

ANNEX E

(*Clause* 9.20)

REFILLING SCHEDULE FOR FIRE EXTINGUISHRS AND SCHEDULE FOR OPERATIONAL TEST ON FIRE EXTINGUISHERS

E-1 EXTINGUISHERS TO BE REFILLED/ OPERATED FOR PERFORMANCE TEST IN ANNUALLY CYCLIC MANNER

E-1.1 Once in Three Years

a) Portable fire extinguisher, water type 9 litres (gas cartridge);

b) Portable fire extinguisher, mechanical foam type 9 litres (cartridge type);

c) Wheeled fire extinguisher, water type 50 litres (gas cartridge);

d) Wheeled fire extinguisher, mechanical confirming to IS 16018;

e) Portable fire extinguisher, dry powder ABC/BC should be cartridge type;

f) Portable fire extinguisher, water type stored pressure;

g) Portable fire extinguisher, foam type stored pressure; and

h) 135 litres capacity mechanical foam type (IS 14951).

E-1.2 Once in Five Years

a) Fire extinguisher, carbon dioxide type (portable and wheeled);

b) Portable and wheeled dry powder fire extinguisher (stored pressure); and

c) Clean agent fire extinguishers stored pressure type.

NOTES

1 In corrosive environments\industries\warehouses, it is desirable to have the discharge test carried out at half the frequency mentioned.

2 As per the restriction on release of halon in atmosphere, it need not be necessary to refill/operate halon 1211 type portable fire extinguisher within any stipulated period. However, as regards the pressure of injections gas that is dry N_2 should be checked up for the adequate pressure on the pressure gauge/indicating gauge and the contents by weighing the fire extinguisher.

3 During maintenance/inspection if loss of gas observed then the fire extinguisher needs to be replaced/ recharged immediately. If the chemical content is observed unsatisfactory during maintenance/inspection the same needs to be replaced immediately.

4 10 percent of stored pressure type DCP fire extinguisher from HPT lot shall be subjected to performance test.

ANNEX F

(*Clauses* 11.2.1 *and* 11.2.4)

SCHEDULE FOR HYDROSTATIC TESTING OF FIRE EXTINGUISHERS

F-1 Every extinguisher installed in premises shall be hydrostatically pressure tested as per the schedule given below. There shall not be any leakage or visible distortion. Extinguishers which fail in this requirement shall be replaced.

F-2 The carbon dioxide type and clean agent type fire extinguishers shall be pressure tested every time when the cylinders are sent for recharging (after periodic discharge test or otherwise) to the pressure specified in the relevant Indian Standard specifications.

Sl No.	*Type of Fire Extinguishers*	*Test Interval*	*Minimum Test Pressure*	*Time for which Pressure is Maintained*
		Year	kg/cm^2	s
(1)	(2)	(3)	(4)	(5)
i)	Water type	3	35	150

Table (*Concluded*)

Sl No.	*Type of Fire Extinguishers*	*Test Interval*	*Minimum Test Pressure*	*Time for which Pressure is Maintained*
		Year	kg/cm^2	s
(1)	(2)	(3)	(4)	(5)
ii)	Foam type	3	35	150
iii)	Dry powder type	5	35	150
iv)	Carbon dioxide type	5	225	30
v)	Clean agent	5	35	150

ANNEX G

(*Foreword* and clause 11.3.4)

LIFE OF FIRE EXTINGUISHERS

G-1 The life of fire extinguishers shall be as given below:

Sl No.	*Type of Extinguisher*	*Lifetime*
(1)	(2)	(3)
i)	Water based	10 years
ii)	Foam based	10 years
iii)	Powder based	10 years
iv)	Carbon dioxide	15 years
v)	Clean agent	10 years

NOTES

1 Life of fire extinguishers will be considered from date of manufacture.

2 In case of failure in hydrostatic pressure testing, the extinguisher shall be discarded immediately and replaced by similar type and fire rating.

ANNEX H

(*Clauses* 12 *and* 13)

REGISTER OF FIRE EXTINGUISHER

H-1 Record of fire extinguishers installed in a premise, its inspection, maintenance, and operational history shall be maintained as per the format given below:

Sl No.	*Type*	*Capacity*	*Year of Manufacture*	*Make*	*Location*	*Quarterly Inspection Dates*	*Annual Inspection Dates*	*Pressure Tested on*	*Date of Discharge*	*Refilled on*	*Due for Refilling*	*Remarks*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	-	-	-	-	-	-	-	-	-	-	-	-
ii)	-	-	-	-	-	-	-	-	-	-	-	-
iii)	-	-	-	-	-	-	-	-	-	-	-	-
iv)	-	-	-	-	-	-	-	-	-	-	-	-
v)	-	-	-	-	-	-	-	-	-	-	-	-
vi)	-	-	-	-	-	-	-	-	-	-	-	-

NOTES

1 In remarks column fill details of date of operation as per annual maintenance date, date of rejection and disposal with details of observations and date of calibration of safety valves and pressure gauges in case of high-capacity extinguishers.

2 Each extinguisher should be allotted one full page and the particulars of a permanent nature like Sl No., type, capacity, year of manufacture, make and location can be transferred to the top portion of the register.

3 The maintenance of the fire extinguishers shall be done by the manufacturer or their authorized agent or qualified fire professionals.

ANNEX J

(*Foreword*)

COMMITTEE COMPOSITION

Fire Fighting Sectional Committee, CED 22

Organization	*Representative(s)*
In Personal Capacity (*House No. 1933, Sector-4, Urban Estate, Gurugram*)	DR K. C. WADHWA **(*Chairperson*)**
Advance Firetec and Research Lab Private Limited, New Delhi	SHRI SUBIR K. NANDI
Agni Controls, Chennai	SHRI BALACHANDRAN SHRI ARUN KUMAR (*Alternate*)
Airports Authority of India, New Delhi	SHRI ARVIND KUMAR SHRI P. K. DESHMUKH (*Alternate*)
Bennett Coleman and Company Limited, New Delhi	SHRI PURUSHOTAM SINGH
Central Industrial Security Force, New Delhi	SHRI SUDHIR KUMAR
Central Public Works Department, New Delhi	SHRI CHAITANYA KUMAR VERMA SHRI PREM MOHAN (*Alternate*)
Centre for Fire and Explosive Environment Safety, Defence Institute of Fire Research, Delhi	SHRI PANKAJ CHAWLA
CSIR - Central Building Research Institute, Roorkee	DR HARPAL SINGH SHRI SHORAB JAIN (*Alternate*)
Directorate General of Quality Assurance, New Delhi	CONTROLLER JT CONTROLLER (*Alternate*)
Engineers India Limited, New Delhi	SHRI AMITABH KISHORE SHRI GYASUDDIN (*Alternate* I) AKASH DEEP PATEL (*Alternate* II)
Fire and Emergency Services, Kolkata	SHRI ABHIJIT PANDEY SHRI KAMAL NANDY (*Alternate*)
Fire and Security Association of India, Chennai	SHRI ANAS RIZVI
F. M. Engineering International India Branch, Bengaluru	SHRI SRIKANTH YAJJALA SHRI YASSAR NABEEL MOHAMED (*Alternate*)
Gunnebo India Private Limited, Thane	SHRI JOHNSON MATHEW SHRI SAMIR MISRI (*Alternate* I) SHRI YOGESH JADHAV (*Alternate* II)
H. D. Fire Protect Private Limited, Thane	SHRI HARISH N. DHARAMSHI SHRI K. T. CHAUDHARI (*Alternate* I) SHRI ANIK N. DHARAMSHI (*Alternate* II)
Indian Oil Corporation Limited, New Delhi	SHRI SAMIR V. SATHE
Institute of Fire Engineers India, New Delhi	PRESIDENT SHRI U. S. CHHILLAR (*Alternate* I) SHRI PRADEEP KUMAR (*Alternate* II)

Organization	*Representative(s)*
Johnson Controls, Bengaluru	SHRI SANTHOSH MUZUMDAR SHRI NITIN RASTOGI (*Alternate*)
K. V. Fire Chemicals India Private Limited, Navi Mumbai	SHRI RAJESH SABADRA SHRI UDAY K. SHROFF (*Alternate*)
Maharashtra Fire Services, Mumbai	SHRI SANTOSH S. WARICK SHRI KIRAN HATYAL (*Alternate*)
Ministry of Home Affairs, New Delhi	SHRI MORESHWAR KUDKILWAR
National Association of Fire Officers, Mumbai	SHRI M. V. DESHMUKH PRESIDENT (*Alternate*)
Nohmi Bosai India Private Limited, Gurugram	SHRI ISWAR IYER SHRI NEERAJ SEHGAL (*Alternate*)
Oil Industry Safety Directorate, Noida	SHRI MURARI MOHAN PRASAD SHRI N. K. PANDEY (*Alternate*)
Proion Consultants, New Delhi	SHRI SANDEEP GOEL
Reliance India Limited, Mumbai	SHRI UMESH KHANDALKAR SHRI MUKESH CHANDRA KUMAR (*Alternate*)
RESQ Technologies, Aabad	SHRI ROHIT V. SHAH
Safex Fire Services Limited, Mumbai	SHRI JITENDRA SHAH SHRI SANDIP SHAH (*Alternate*)
Shah Bhogilal Jethalal & Bros., Ahmedabad	SHRI MUKESH M. SHAH
State Bank of India, Mumbai	SHRI MAYANK YADAV
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In Personal Capacity (*Gheekanta Road, Near Madhuram Cinema, Ahmedabad*)	SHRI ABHAY D. PURANDARE

(*Continued from second cover*)

Halon-based extinguishers have been limited to essential use until technically suitable replacements become available, in accordance with the Montreal Protocol. In this revision, the following major changes have been made:

a) Requirement of monthly inspection has been removed but the quarterly and yearly inspection has been made more robust;

b) An informatory annex on example of specific criteria for selection of the hazard type has been included at Annex B;

c) Annex on competency of persons engaged in the servicing of fire extinguishers has been included at Annex C;

d) Informatory annex on extinguishers considered obsolete and their removal from service has been included at Annex D; and

e) Life of fire extinguishers has been included at Annex G.

For the formulation of this standard significant assistance was taken from the following standards:

ISO/TS 11602-1 'Fire protection — Portable and wheeled fire extinguishers — Part 1: Selection and installation'

ISO/TS 11602-2 'Fire protection — Portable and wheeled fire extinguishers — Part 2: Inspection and maintenance'

This standard contributes to the United Nations Sustainable Development Goal 9, SDG 9: 'Industry, innovation, and infrastructure'. The standard addresses requirements for the selection, installation, maintenance, and testing of fire extinguishers, which are important for ensuring safety in industrial and infrastructural environment.

The composition of the Committee responsible for the formulation of this standard is given in Annex J.

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 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of specified value in this standard.

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Amendments Issued Since Publication

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