

Unofficial Translation

In the event of any doubt or misunderstanding arising from this translation, the standard in Thai will be held to be authoritative.

THAI INDUSTRIAL STANDARD FOR PORTABLE FIRE EXTINGUISHERS: FOAM TIS 882-2532 (1989)

1. Scope

- 1.1 This standard specifies types, sizes, components and construction, requirements, marking and labelling, sampling and criteria for conformity and testing for portable fire extinguishers of the foam type.

2. Definitions

For the purpose of this standard, the following definitions apply:

- 2.1 PORTABLE FIRE EXTINGUISHER: FOAM hereinafter referred to as "EXTINGUISHER": A portable first aid fire fighting appliance capable of expelling fire fighting foam for extinguishing class B fire.
- 2.2 GAS CONTAINER TYPE EXTINGUISHER: An extinguisher in which the foam is expelled by means of a compressed gas released from a gas container attached to or fitted into the extinguisher.
- 2.3 STORED PRESSURE TYPE EXTINGUISHER: An extinguisher in which the foam is expelled by means of an inert gas or air stored with the foam under pressure.
- 2.4 CHEMICAL REACTION TYPE EXTINGUISHER: An extinguisher in which when the contained solutions are mixed, gas and foam are produced and expelled.
- 2.5 WORKING PRESSURE:
 - 2.5.1 For gas container type – the maximum pressure developed in a correctly charged extinguisher when the extinguisher is ready for use;
 - 2.5.2 For stored pressure type – the pressure developed in a correctly charged extinguisher when filled with inert gas;
 - 2.5.3 For chemical reaction type – the maximum pressure developed in a correctly charged extinguisher when the contained solutions are mixed and the extinguisher is ready for use.
- 2.6 CLASS B FIRES: Fires in flammable and combustible gases, liquids and greases.

3. Types

- 3.1 Extinguishers are classified into 3 types:
 - 3.1.1 Gas container type
 - 3.1.2 Stored pressure type
 - 3.1.3 Chemical reaction type

4. Sizes

- 4.1 The sizes of extinguishers are specified in accordance with the liquid capacity of the extinguisher, when the extinguisher is filled to the marked liquid level, which shall be not less than 9 dm³ and not more than 11.5 dm³.

5. Components and construction

- 5.1 Body
The body of the extinguisher shall be made of suitable materials and so designed as to withstand the pressure of clause 6.4.
- 5.2 Fittings and devices
Fittings and devices shall be made of corrosion-resistant material of adequate strength.
- 5.3 Neck ring and cap
- 5.3.1 The neck ring shall be made of a suitable material having a tensile strength of not less than 185 Mpa, and shall be firmly secured to the body by welding. The internal diameter of the neck ring shall be not less than 25 mm.
- 5.3.2 Cap
The cap shall be made of a suitable material having a tensile strength of not less than 185 Mpa, with the form and shape convenient for use. It shall be provided with vents to permit the release of pressure remaining in the body before the complete removal of the cap. If the vents are provided at the screws of the cap, the remaining pressure shall be released when not more than half of the screws are untightened.
- 5.3.3 The thread of neck ring and cap shall be parallel screw thread and shall engage tightly.
- 5.3.4 Cap washer shall be made of suitable leather, rubber or plastics.
- 5.4 Operating head of stored pressure type extinguisher
- 5.4.1 The operating head shall be made of suitable material having tensile strength of not less than 185 Mpa.
- 5.4.2 The operating head shall be secured to the neck ring by a screw thread and shall be of adequate strength, the closure being such that there is no loss of pressure when the fully charged extinguisher is not in use.
The operating head may have the actuating mechanism and the discharge nozzle affixed to it.
- 5.4.3 The operating head shall be provided with vents to permit the release of pressure remaining in the body during removal of the operating head. If the vents are provided at the screws of the cap, they shall be such that the remaining pressure is released when not more than half of the screws are untightened.
- 5.5 Actuating mechanism
The actuating mechanism shall be of corrosion-resistant material of adequate strength. Where a piercer is employed, it shall be of sufficient length to ensure that when driven to its maximum stroke it will effectively pierce the sealing device and allow the contents to be discharged. The piercer shall be designed to prevent jamming and incorporates a safety device to prevent accidental operation.

5.6 Discharge fittings

5.6.1 Siphon tube

The siphon tube shall be of sufficient length to ensure the discharge of 95 percent of the contents when the extinguisher is operated. The tube shall be as straight as practicable and located so as not to make difficult the cleaning of the interior of the body.

5.6.2 Strainer

The strainer shall be provided at the intake end of the siphon tube or at the discharge nozzle connector.

If without a siphon tube, the area of each hole in the strainer shall be less than the area of the discharge nozzle outlet. The aggregate area of the holes in the strainer shall be not less than twice that of the siphon tube area or discharge nozzle connector.

5.6.3 Discharge hose and fittings

Where a discharge hose is provided, the hose and its fittings shall be of durable materials of adequate strength to withstand a pressure of clause 6.3. The hose shall be of a length adequate for use, such that the nozzle hanging down terminates at a point not less than 10 mm above the base of the extinguisher.

5.7 Pressure indicating device

The stored pressure type extinguisher shall be fitted with a device which will indicate whether or not the pressure in the extinguisher is appropriate for use.

5.8 Handle, supporting fitting and support fixture

These shall be of adequate strength, and shall be designed for convenience in use.

5.9 Joints

The longitudinal and circumferential joints shall be made by one of the following methods –

5.9.1 Riveted construction

Lap joints shall overlap not less than 15 mm. Flanges of top and bottom ends shall be not less than 15 mm wide.

Rivets in joints shall be spaced at not less than 20 mm and not more than 25 mm pitch. Rivet holes shall be cleanly punched or drilled to the correct size. Rivets shall be of carbon steel for steel bodies and of annealed copper for copper bodies; in either case the rivets shall be not less than 3 mm diameter.

5.9.2 Welded construction

Welded joints shall be made by the method specified in TIS 332, "Dry chemical portable fire extinguishers".

5.9.3 Swaged construction

Swaged construction may be applied only to the joint between the body and the bottom end. An internal swage not less than 6 mm deep shall be formed in the body not less than 25 mm from the end of the body to retain the bottom end in position when pressure is applied. The joints shall finally be welded.

5.10 Liquid level indicator

The liquid level to which the extinguisher should be filled shall be clearly indicated inside the extinguisher by any appropriate methods, such as by stamping on the container.

Where a siphon tube forms part of the body assembly, the liquid level may be clearly indicated by a permanent projection on the siphon tube.

5.11 Protective finishes

- 5.11.1 Unless made of a corrosion-resistant metal or of austenitic stainless steel and having passed the intercrystalline corrosion test in accordance with TIS 332, the body of the extinguisher shall have all internal surfaces protected against corrosion, which may be by means of metallic or organic lining. Metallic lining shall satisfy the requirement of the test of clause 9.1.1 and organic lining the test of clause 9.1.2.
- 5.11.2 The external surfaces of the extinguisher body shall be suitably paint coated in compliance with clause 7.3.
- 5.11.3 Other components of the extinguisher body shall be suitably coated to resist corrosion and not contribute towards corrosion of the body.

5.12 Compressed gas container

The compressed gas container shall comply with TIS 332.

6. Requirements

6.1 General characteristics

The extinguisher shall be designed to be operated in the normal upright position, i.e. with the operating head at the top. It shall incorporate a safety device to prevent accidental operation, and means to indicate that the extinguisher is fully charged. Compliance is checked by visual inspection.

6.2 Charge

6.2.1 Gas container type extinguisher

The charge shall consist of a mixture of foam liquid and water which may be mixed before or while in use.

6.2.2 Stored pressure type extinguisher

The charge shall consist of a mixture of foam liquid and water.

6.2.3 Chemical reaction type extinguisher

The charge shall consist of 2 or more mixtures which are mixed when the extinguisher is put to use.

Compliance is checked by visual inspection.

6.3 Performance

6.3.1 Gas container type extinguisher

6.3.1.1 Discharge time

When tested as in clause 9.2, the extinguisher shall discharge not less than 95 percent of its contents. The jet shall be maintained at an effective range of not less than 6 m for a period of 30 s and the required discharge shall take place in not more than 90 s. The foam-producing material shall –

- (1) not be liable to stratification;
- (2) be stable;
- (3) produce a foam consisting of a mass of minute bubbles which will not be easily broken down by intense heat; and
- (4) produce a volume of foam at least 8 times the capacity of the extinguisher.

6.3.1.2 The extinguisher shall be capable of controlling class B fires according to the rating indicated on the label.

Compliance is checked in accordance with TIS 332.

- 6.3.2 Stored pressure type extinguisher and chemical reaction type extinguisher
- 6.3.2.1 Discharge time
- When tested as in clause 9.2, the extinguisher shall discharge not less than 95 percent of its contents. The jet shall be maintained at an effective range of not less than 4.5 m for a period of 30 s and the required discharge shall take place in not more than 90 s. The foam-producing material shall -
- (1) not be liable to stratification;
 - (2) be stable;
 - (3) produce a foam consisting of a mass of minute bubbles which will not be easily broken down by intense heat; and
 - (4) produce a volume of foam at least 3 times the capacity of the extinguisher.
- 6.3.2.2 Where the extinguisher is designed for intermittent discharge, it shall be capable of operating satisfactorily with an interrupted discharge cycle of 3 s open and 10 s shut, and not more than 3 s shall elapse between the opening of control valve and the recommencement of the discharge, The discharge times shall comply with clause 6.3.2.1.
- 6.3.2.3 The extinguisher shall be capable of controlling class B fires according to its rating indicated on the label.
- Compliance is checked in accordance with TIS 332.

6.4 Pressure resistance

When hydrostatically tested in accordance with TIS 332,

- 6.4.1 The extinguisher body shall withstand without failure an internal pressure of not less than twice the working pressure or 2.5 MPa.
- The manufacturer shall be responsible for carrying out this test before painting is applied to the extinguisher body.
- 6.4.2 The discharge hose, the discharge nozzle and all fittings shall withstand the pressure of clause 6.4.1.
- Note: Safety devices need not be tested. Fittings may be tested separately.
- 6.4.3 Bursting resistance
- The extinguisher body shall withstand without rupture or breakage a pressure equal to the working pressure which shall not be less than 5 MPa.

6.5 Leakage (only for gas container type extinguisher and stored pressure type extinguisher)

The extinguisher shall be free from leakage when tested in accordance with TIS 332.

7. Marking and labelling

- 7.1 Every extinguisher shall bear at least number, letter or mark indicating legibly and clearly the following information:
- (1) The word "FOAM"
 - (2) Type designation
 - (3) Size in dm³
 - (4) Working pressure and test pressure in Pa
 - (5) Symbol of class of fires applicable to the extinguisher as follows,

B

Flammable liquid

Note: Symbol  red background

- (6) Statement "NOT FOR ELECTRICAL FIRES".
 - (7) Performance rating of the extinguisher (according to TIS 332, Annex H)
 - (8) Instructions or picture illustrating use for operation
 - (9) Name of manufacturer or factory registered trade-mark or distributor
 - (10) Weight of extinguisher body with operating head prior to filling, in kg
 - (11) The words "RECHARGE AFTER USE"
 - (12) Year of manufacture of the body
- 7.2 Marking as specified in clause 7.1 shall be made by stamping on the extinguisher, or on a metal plate welded thereto or shall be displayed on the extinguisher by means of painting or approved durable label.
The marking required under clause 7.1 (1), (6), (8) and (11) shall be in numbers and letters not less than 5 mm high and of such a contrast with the background as to be readily and distinctly visible. The year of manufacture required under clause 7.1 (12) shall be stamped on the extinguisher body only.
- 7.3 The body of the extinguisher shall be red.
- 7.4 A manual for use shall be provided in accordance with TIS 405, "General principles of manual for use and maintenance of portable fire extinguisher".
- 7.5 In case foreign language is used, the meaning shall correspond to that in Thai specified above.
In such case, the marking as of clause 7.1 (1), (6), (8) and (11) in Thai shall also be attached.
- 7.6 Any person who manufactures products conforming to this standard may use the Standards Mark in connection with his products only after having received a licence from the Industrial Product Standards Council.

8. Sampling and criteria for conformity

- 8.1 Lot: Not more than 3000 extinguishers of the same type and size which are manufactured or delivered or purchased at the same time.
- 8.2 Sampling and criteria for conformity shall comply with the sampling plan specified below or other technically equivalent plan.
- 8.2.1 Sampling
Samples shall be taken at random from the same lot in quantities as given in Table 1.

Table 1
Sampling plan
(clause 8.2.1)

| Lot size units | Sample size units |
|-------------------|----------------------|
| up to 90 | 3 |
| 91 to 500 | 13 |
| 501 to 1200 | 20 |
| 1201 to 3000 | 32 |

8.2.2 Criteria for conformity

Provided that all samples satisfy all the requirements of clause 5, 6 and 7, that lot shall be deemed as conforming to this standard.

9. Testing

9.1 Protective finishes

9.1.1 Internal metallic lining

The extinguishers shall be stored in the positions ready for operation for a period of 3 months. They shall then be discharged and inspected on the internal surface. There shall be no signs of corrosion of the parent metal.

9.1.2 Organic lining

Resistance test shall be conducted checking the lining for continuity by a 500 V megohmmeter connected between the metal body and an electrode immersed in water in the extinguisher body. The test shall give a reading of infinity for the test requirement to be considered met.

Note: It may be necessary to add salt to the water to ensure its conductivity.

9.2 Discharge time

The test shall be conducted in an open space under condition of essentially still air at 27 ± 2 °C.

The extinguisher shall be operated and the time required for complete discharge shall be noted.