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Ordinance for Technical Specifications pertaining to Foam Concentrates
(Ordinance of the Ministry of Home Affairs No. 26 of December 9, 1975)

Latest update: Ordinance of the Ministry of Internal Affairs and Communications No. 44 of March 31, 2008

In accordance with the provision of Article 21-2(2) of the Fire Service Act (Act No. 186 of 1948), the Ordinance for Technical Specifications pertaining to Foam Concentrates shall be specified as follows.

Chapter 1 General Provisions (Articles 1 to 4)

Chapter 2 Foam Concentrates (Articles 5 to 16)

Chapter 3 Foam Concentrates for Large-volume Foam Turret (Articles 17 to 22)

Chapter 4 Miscellaneous Provisions (Article 23)

Supplementary Provisions

Chapter 1 General Provisions

Purport

Article 1 This Ordinance covers the technical specifications applicable to foam concentrates (excluding foam concentrates for water-soluble liquids; the same shall apply hereinafter).

Definitions

Article 2 In this Ordinance, the meanings of the terms listed in the following items shall be as prescribed respectively in those items.

(i) Foam concentrate: The liquid agent composed of base, foam stabilizer, and other additives. To extinguish a fire, this liquid agent is mixed with water (including sea water; hereinafter the same shall apply in Item (vi)) at a given ratio of density and mechanically blended with air or inert gas to generate foam.

(ii) Protein foam concentrate: The foam concentrate that uses the hydrolyzed protein as a base.

(iii) Synthetic surface active agent foam concentrate: The foam concentrate that uses the synthetic surface active agent as a base (except for the foam concentrate defined in the next item).

(iv) Aqueous film forming foam concentrate: The foam concentrate that uses the synthetic surface active agent as a base and forms aqueous film on the oil surface.

(v) Foam concentrate for large-volume foam turret: The foam concentrate that is designed for the large-volume foam turret and prescribed in Article 14(5) of the Cabinet Ordinance for Prevention of Disasters in Petroleum Industrial Complexes and Other Petroleum Facilities (Cabinet Order No. 129 of 1976).

(vi) Foam solution: The aqueous solution composed of foam concentrate and water. 3% solution refers to the one whose density of foam concentrate is 3 volume percent while 6% solution refers the one having the density of 6 volume percent. With respect to the foam concentrate for large-volume foam turret, however, this foam solution refers to the aqueous solution whose density of foam concentrate is set to the

predetermined design volume percent.

(vii) Foam concentrate after property alteration test: The foam concentrate after such test sequence was implemented that the original foam concentrate is exposed to 65°C for 216 h, cooled to the room temperature, cooled to -18°C for 24 h, and heated to the room temperature.

(viii) Foam solution after property alteration test: The foam solution of the foam concentrate after the property alteration test.

Properties

Article 3 Foam concentrates shall meet the following property requirements.

(i) The material shall be uniform.

(ii) Effective measures shall be taken to prevent changes in properties.

(iii) Foam generated shall spread over the surface of petroleum or other flammable liquids and adhere to surfaces of wooden materials and other solids.

(iv) The material shall not have extreme toxicity or corrosiveness.

Service temperature range

Article 4 When foam concentrates are used in the temperature range from -5°C to 30°C (-10°C to 30°C for cold-resistant foam concentrates or -20°C to 30°C for extreme cold-resistant foam concentrates) (hereinafter referred to as “service temperature range”), they shall be capable of extinguish a fire effectively.

Chapter 2 Foam Concentrates

Specific gravity

Articles 5 When the foam concentrate at 20°C is measured with the specific gravity hydrometer conforming to JIS (refers to the Japanese Industrial Standards prescribed in Article 17(1) of the Industrial Standardization Law (Act No. 185 of 1949)) B 7525 in accordance with the method of measuring specific gravity of liquids specified in JIS Z 8804, the specific gravity of the foam concentrate (except for the foam concentrate used in the large-volume foam turret; hereinafter the same shall apply in this Article) shall stay within the range specified in the following table in accordance with the type classification of foam concentrate prescribed in that table.

Type of foam concentrate /// Specific gravity range

Protein foam concentrate /// 1.10 to 1.20

Synthetic surface active agent foam concentrate /// 0.90 to 1.20

Aqueous film forming foam concentrate /// 1.00 to 1.15

Viscosity

Article 6 When the foam concentrate is measured by using the test method of kinematic viscosity of petroleum products specified in JIS K 2283 within the service temperature range, the viscosity shall be not more than 200 cSt (400 cSt for the protein foam concentrate).

Pour point

Article 7 When the foam concentrate is measured by using the test method of pour point of petroleum products specified in JIS K 2269, the pour point shall be not more than -7.5°C (-12.5°C for cold-resistant foam concentrates or -22.5°C for extreme cold-resistant foam concentrates).

Hydrogen ion density

Article 8 When the foam concentrate at 20°C is measured by using the pH determination method specified in JIS Z 8802, the hydrogen ion density shall stay within the range specified in the following table in accordance with the type classification of foam concentrate prescribed in that table.

Type of foam concentrate /// Hydrogen ion density range

Protein foam concentrate /// 6.0 to 7.5

Synthetic surface active agent foam concentrate /// 6.5 to 8.5

Aqueous film forming foam concentrate /// 6.0 to 8.5

Amount of precipitation

Article 9 When the foam concentrate at 20°C is measured by using the aircraft lubricating oil test method specified in JIS K 2503 without the addition of precipitation naphtha, the amount of precipitation shall be not more than 0.1 volume percent.

(2) After the measurement prescribed in the preceding paragraph, the amount of precipitation in the foam solution of the supernatant shall be not more than 0.05 volume percent (0.2 volume percent for the synthetic surface active agent foam concentrate) and the cloudy or suspended products shall readily pass through the 80-mesh flat stainless steel wire gauze prescribed in JIS G 3555.

(3) When the foam concentrate is measured as prescribed in Paragraph (1) after the property alteration test, the amount of precipitation shall be not more than 0.2 volume percent.

Flash point

Article 10 When the foam concentrate is measured by using the Pensky-Martens closed cup method specified in JIS K 2265-3, the flash point shall be not less than 60°C .

Loss of mass due to corrosion of steel, etc.

Article 11 When steel, brass, and aluminum (hereinafter referred to as "steel, etc." in this Article) are immersed into the foam concentrate at 38°C for 21 days, the loss of mass of the steel, etc. shall be not more than 3 mg per 20 cm^2 in a day.

Foaming performance

Article 12 When the foam solution at 20°C (except for the foam solution of the foam concentrate for large-volume foam turret; hereinafter the same shall apply in this Article) is foamed with the standard foaming nozzle shown in Appended Figure 1 under the conditions, 0.69 MPa of hydraulic pressure and 10 L/min of discharge flow of, the foam expansion rate (refers to the ratio of volume of foam solution to that of foam generated; hereinafter the same shall apply in the next item) shall be not less than 6 (5 for the aqueous film forming foam concentrate) and the time spent to return the foam to the solution with the

volume equal to 25% of the pre-foaming solution volume shall be not less than 1 min. The same shall apply to the foam solution after property alteration test.

(2) When the foam solution at 20°C (limited to the solution pertaining to the synthetic surface active agent foam concentrate; hereinafter the same shall apply in this paragraph) is foamed with the standard foaming apparatus shown in Appended Figure 2 under the conditions, 0.1 MPa of hydraulic pressure, 6 L/min of discharge flow, and 13 m³/min of wind volume, the foam expansion rate shall be not less than 500 and the time spent to return the foam to the solution with the volume equal to 25% of the pre-foaming solution volume shall be not less than 3 min. The same shall apply to the foam solution after property alteration test.

Fire extinguishing performance

Article 13 When the Class B fire model containing 320 L of water and 200 L of gasoline (low expansion foam model), which is shown in Appended Figure 3, is ignited and the foam solution at 20°C is continuously foamed for 5 min (8 min for the synthetic surface active agent foam concentrate) in accordance with the procedure provided in Article 12(1) after the elapse of 1 min from the ignition, the foam concentrate shall meet the following fire extinguishing performance requirements. The same shall apply to the foam solution after property alteration test.

(i) The fire extinguishing time shall not exceed 5 min.

(ii) Even when the ignition device shown in Appended Figure 4 is placed near the foam after the elapse of 15 min (12 min for the synthetic surface active agent foam concentrate) from the completion of foaming, the model shall not be reignited.

(iii) A 15 × 15 cm² oil surface shall be exposed in the center of the colony of foam after the elapse of 15 min (12 min for the synthetic surface active agent foam concentrate) from the completion of foaming. When the oil is ignited and burned for 5 min, the burned area shall be not more than 900 cm².

(2) The synthetic surface active agent foam concentrate shall meet the fire extinguishing performance requirements prescribed in the preceding paragraph. In addition, when the foam solution at 20°C is foamed as prescribed in Article 12(2), it shall meet the following requirements. The same shall apply to the foam solution after property alteration test.

(i) When the Class B fire model containing 128 L of water and 80 L of gasoline (high expansion foam model), which is shown in Appended Figure 5, is ignited and the foam solution is continuously foamed for 2.5 min after the elapse of 30 s from the ignition, the fire extinguishing time shall not exceed 3 min.

(ii) When the Class A fire model (high expansion foam model), which is shown in Appended Figure 6, is ignited and the foam solution is continuously foamed for 5 min after the elapse of 1.5 min from the ignition, the afterflame shall not be observed and the model shall not be reignited within 10 min from the completion of foaming.

Diffusion factor

Article 14 When the foam solution (limited to the solution pertaining to the aqueous film forming foam concentrate; hereinafter the same shall apply in this Article) is measured with the cyclohexane conforming to JIS K 8464 in accordance with the test method of cutting fluid specified in JIS K 2241, the diffusion factor shall be not less than 3.5. The same shall apply to the foam solution after property alteration test.

Container

Article 15 The container of the foam concentrate shall be any of the vessels prescribed in the following items or the vessels having the corrosion resistance, impact resistance, and other physical properties equivalent to or higher than those.

- (i) Steel tight head drum conforming to JIS Z 1601
- (ii) Steel pail conforming to JIS Z 1620
- (iii) Polyethylene can conforming to JIS Z 1706

Indication

Article 16 The information specified in the following items shall be indicated on all foam concentrate containers at easily observable place in such the manner that the subject information may not be readily erased.

- (i) Type
- (ii) Model
- (iii) Volume of foam concentrate
- (iv) Service temperature range
- (v) Handling precautions
- (vi) Year of manufacture
- (vii) Manufacturing number
- (viii) Manufacturer's name or trademark
- (ix) Model code

Chapter 3 Foam Concentrates for Large-volume Foam Turrets

Specific gravity

Article 17 When the 20°C foam concentrate for large-volume foam turret is measured by using the method specified in Article 15 or by using the Harvard specific gravity bottle in accordance with the specific gravity bottle method specified in JIS K 0061, the specific gravity of the foam concentrate shall stay within the range specified in the table in that Article in accordance with the type classification of foam concentrate prescribed in that table.

Viscosity

Article 18 When the foam concentrate for large-volume foam turret is measured by using the method specified in Article 6 or by using the determination method of viscosity based on the single cylinder rotary viscometer specified in JIS K 8803 within the service temperature range, the viscosity shall not exceed the design value.

Foaming performance

Article 19 When the foam solution of the 20°C foam concentrate for large-volume foam turret (hereinafter simply referred to as "foam solution" in this and next Articles) is foamed under the conditions, 0.7 MPa of hydraulic pressure and 10 L/min of discharge rate, by means of the large-volume foam turret foaming nozzle, which is horizontally fixed to the position 1.075 m above the floor as shown in Appended Figure 7, and the foam is gathered with the foam container shown in Appended Figure 9 via the foam

collector shown in Appended Figure 8 and installed in the position where the foam may fall freely, the foam expansion rate (refers to the ratio of volume of foam solution to that of foam generated) shall be not less than 6 (5 for the aqueous film forming foam concentrate for large-volume foam turret) but less than 10 and the time spent to return the foam to the solution with the volume equal to 25% of the pre-foaming solution volume shall be not less than 2 min. The same shall apply to the foam solution after property alteration test.

Fire extinguishing performance

Article 20 When the Class B fire model containing 200 L of n-heptane (model for large-volume foam turret), which is shown in Appended Figure 10, is ignited and the foam solution at 20°C is continuously foamed near the center of the burned surface for 3 min in accordance with the procedure provided in Article 19 after the elapse of 1 min from the ignition, the foam concentrate for large-volume foam turret shall meet the following fire extinguishing performance requirements. The same shall apply to the foam solution after property alteration test.

(i) The fire extinguishing time shall not exceed 4 min.

(ii) When the fire resistance test pot, which contains 1 L of n-heptane and is shown in Appended Figure 11, is placed in the center of the colony of foam in such the manner that the upper edge of the pot is flush with the surface of the colony and ignited after the elapse of 15 min from the completion of foaming, the model shall not be reignited.

(iii) Even when flame of the ignition device shown in Appended Figure 4 is placed near the surface of the colony of foam after the elapse of 20 min from the completion of foaming, the model shall not be reignited.

Indication

Article 21 The information specified in the following items shall be indicated on all foam concentrate containers for large-volume foam turrets at easily observable place in such the manner that the subject information may not be readily erased.

(i) Type

(ii) Model

(iii) Volume of foam concentrate for large-volume foam turret

(iv) Service temperature range

(v) Handling precautions

(vi) Year of manufacture

(vii) Manufacturing number

(viii) Manufacturer's name or trademark

(ix) Model code

(x) Description of foam concentrate for large-volume foam turret

Application mutatis mutandis

Article 22 Provisions in Articles 7 to 11, 14, and 15 shall apply mutatis mutandis to foam concentrates for large-volume foam turrets.

Chapter 4 Miscellaneous Provisions

Exemption from standards

Article 23 When the Minister of Internal Affairs and Communications recognizes that foam concentrates newly created as a result of technology development activities have the performance equivalent to or higher than those conforming to the provisions prescribed in this Ordinance, judging from their composition and performance, the technical standards specified by the Minister of Internal Affairs and Communications shall apply to these new developments notwithstanding the provisions of this Ordinance.

Supplementary Provisions

This Ordinance shall come into effect as of January 1, 1976.

Supplementary Provisions (Ordinance of the Ministry of Home Affairs No. 1 of December 22, 1975)

This Ordinance shall come into effect as of January 1, 1976.

Supplementary Provisions (Ordinance of the Ministry of Home Affairs No. 7 of March 18, 1987)

This Ordinance shall come into effect as of the day of promulgation.

Supplementary Provisions (Ordinance of the Ministry of Home Affairs No. 37 of September 28, 1998)-Excerpt

Effective date

Article 1 This Ordinance shall come into effect as of October 1, 1999.

Transitional measures

Article 2 For tests pertaining to fire extinguishers, fire extinguishing agents, automatic closed sprinkler heads, fire hoses, deluge valves, foam concentrates, detectors and manual call points, water flow detecting devices, plug-in couplings, and screw couplings whose application for test has been already made to have the target equipment tested by the Japan Fire Equipment Inspection Institute at the time of enforcement of this Ordinance, the provisions then in force shall remain applicable.

(2) For fire extinguishers that have already got model approvals and fire extinguishers that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in the preceding paragraph at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance for Technical Specifications pertaining to Fire Extinguishers amended according to the provisions of Article 1.

(3) For fire extinguishing agents that have already got model approvals and fire extinguishing agents that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in Paragraph (1) at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance for Technical Specifications pertaining to Fire Extinguishing Agents amended according to the provisions of Article 2.

(4) For automatic closed sprinkler heads that have already got model approvals and automatic closed sprinkler heads that have got model approvals based on the results from the tests identified by the

prescription “provisions then in force shall remain applicable” as described in Paragraph (1) at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance for Technical Specifications pertaining to Automatic Closed Sprinkler Heads amended according to the provisions of Article 3.

(5) For fire hoses that have already got model approvals and fire hoses that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in Paragraph (1) at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance for Technical Specifications pertaining to Fire Hoses amended according to the provisions of Article 4.

(6) For deluge valves that have already got model approvals and deluge valves that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in Paragraph (1) at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance for Technical Specifications pertaining to Deluge Valves amended according to the provisions of Article 5.

(7) For foam concentrates that have already got model approvals and foam concentrates that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in Paragraph (1) at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance for Technical Specifications pertaining to Foam Concentrates amended according to the provisions of Article 6.

(8) For detectors and manual call points that have already got model approvals and detectors and manual call points that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in Paragraph (1) at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance for Technical Specifications pertaining to Detectors and Manual Call Points of Fire Detection and Fire Alarm Systems amended according to the provisions of Article 7.

(9) For water flow detecting devices that have already got model approvals and water flow detecting devices that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in Paragraph (1) at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance for Technical Specifications pertaining to Water Flow Detecting Devices amended according to the provisions of Article 8.

(10) For plug-in couplings that have already got model approvals and plug-in couplings that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in Paragraph (1) at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance for Technical Specifications pertaining to Plug-in Couplings used for Fire Hoses amended according to the provisions of Article 11.

(11) For screw couplings that have already got model approvals and screw couplings that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in Paragraph (1) at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the Ordinance

for Technical Specifications pertaining to Screw Couplings used for Fire Hoses or Fire Suction Hoses amended according to the provisions of Article 12.

(12) For power driven fire pumps that were notified to the Minister of Home Affairs in accordance with the provision of Article 21-16-4(1) of the Fire Service Act (Act No. 186 of 1948) before the enforcement of this Ordinance, they shall be deemed as those that conform to the standards prescribed in the Ordinance for Technical Specifications pertaining to Power Driven Fire Pumps amended per provisions of Article 9.

(13) For fire suction hoses that were notified to the Minister of Home Affairs in accordance with the provision of Article 21-16-4(1) of the Fire Service Act before the enforcement of this Ordinance, they shall be deemed as those that conform to the standards prescribed in the Ordinance for Technical Specifications pertaining to Fire Suction Hoses amended according to the provisions of Article 10.

Supplementary Provisions (Ordinance of the Ministry of Home Affairs No. 44 of September 14, 2000)

This Ordinance shall come into effect as of the effective date (January 6, 2001) of the Act for Partial Revision of Cabinet Law (Act No. 88 of 1999).

Supplementary Provisions (Ordinance of the Ministry of Internal Affairs and Communications No. 151 of November 10, 2005)

This Ordinance shall come into effect as of the day of promulgation.

Supplementary Provisions (Ordinance of the Ministry of Internal Affairs and Communications No.44 of March 31, 2008)

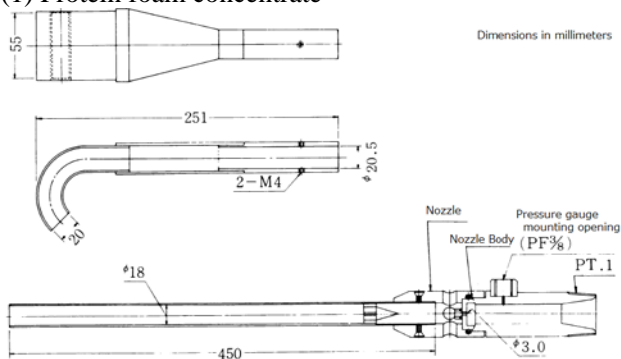
(1) This Ordinance shall come into effect as of the day of promulgation.

(2) For tests pertaining to foam concentrates whose application for test has been already made to have the target equipment tested by the Japan Fire Equipment Inspection Institute at the time of enforcement of this Ordinance, the provisions then in force shall remain applicable.

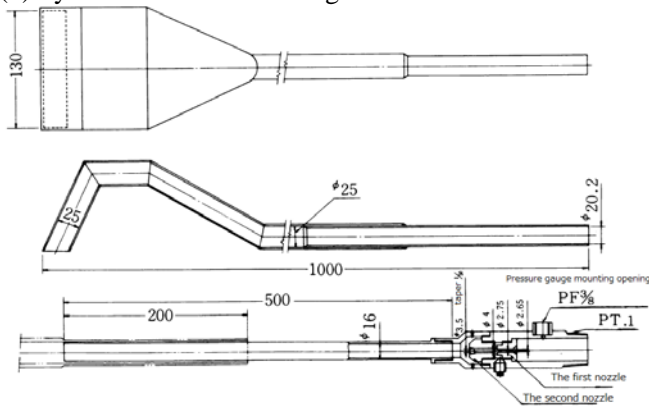
(3) For foam concentrates that have already got model approvals and foam concentrates that have got model approvals based on the results from the tests identified by the prescription “provisions then in force shall remain applicable” as described in the preceding paragraph at the time of enforcement of this Ordinance, their model approvals shall be deemed as those provided in accordance with the standards prescribed in the amended Ordinance for Technical Specifications pertaining to Foam Concentrates.

Appended Figure 1 Standard foaming nozzle (relative to Article 12)

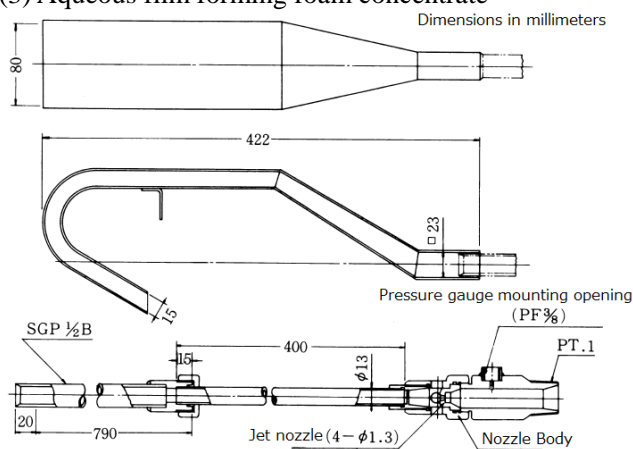
(1) Protein foam concentrate



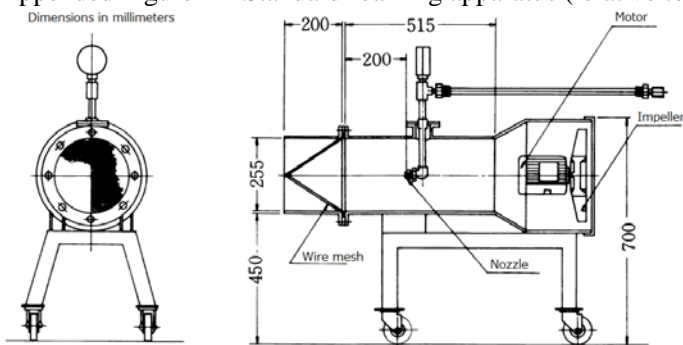
(2) Synthetic surface active agent foam concentrate



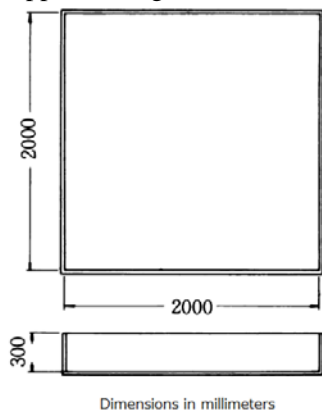
(3) Aqueous film forming foam concentrate



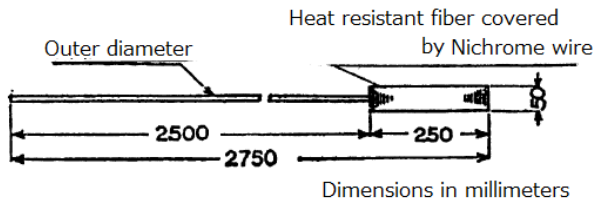
Appended Figure 2 Standard foaming apparatus (relative to Article 12)



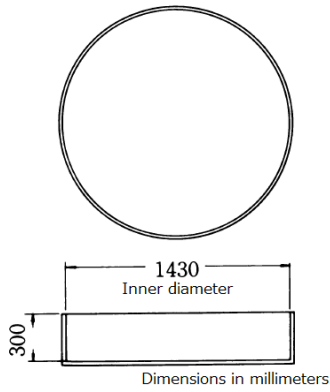
Appended Figure 3 Class B fire model (low expansion foam model) (relative to Article 13)



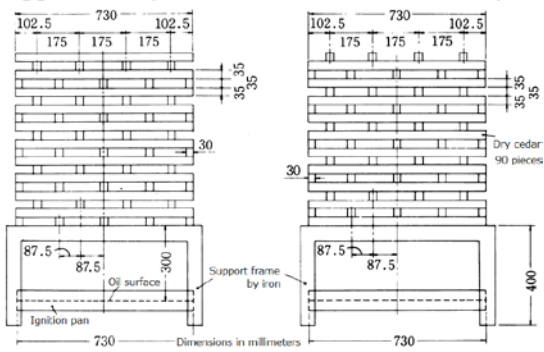
Appended Figure 4 Ignition device (relative to Articles 13 and 20)



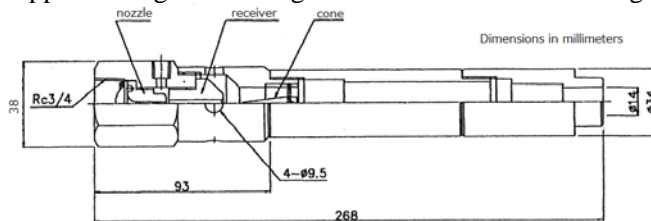
Appended Figure 5 Class B fire model (high expansion foam model) (relative to Article 13)



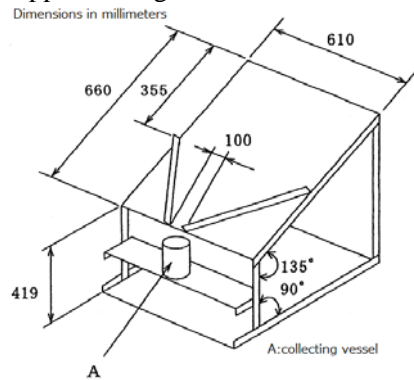
Appended Figure 6 Class A fire model (high expansion foam model) (relative to Article 13)



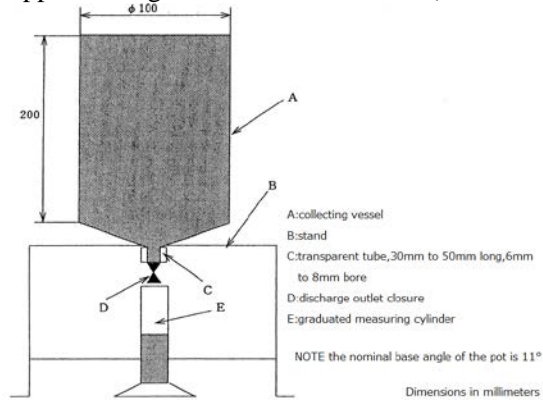
Appended Figure 7 Large-volume foam turret foaming nozzle (relative to Article 19)



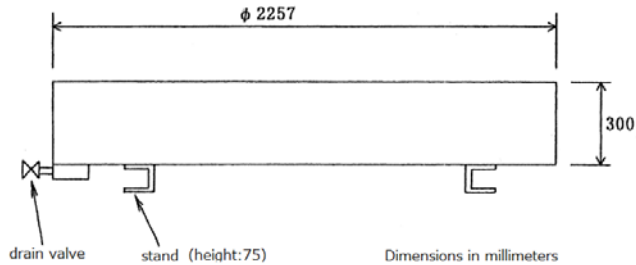
Appended Figure 8 Foam collector (relative to Article 19)



Appended Figure 9 Foam container (relative to Article 19)



Appended Figure 10 Class B fire model (model for large-volume foam turret) (relative to Article 20)



Appended Figure 11 Fire resistance test pot (relative to Article 20)

