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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**General technical condition of high-ratio-foam fire extinguish
agent for coal mine
(English Translation)**

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Appendix A (standard appendix) Foam test device Figure 8

General technical requirements for high-expansion foam fire extinguishing agents for coal mines

1 Scope

This standard specifies the classification, technical requirements, test methods, inspection rules, signs, packaging, transportation, and Storage, etc.

This standard applies to high-expansion foam fire extinguishing agents for coal mines (hereinafter referred to as fire extinguishing agents).

2 Definition

This standard uses the following definition.

2.1 Keroseneinertgas A kerosene fuel mixed with air in a special combustion chamber is mixed with nitrogen, carbon dioxide and water vapor to produce a mixed wet Inert gas.

2.2 foam to solution volume ratio the volume of the foam and the high-expanding foam fire extinguishing agent solution used to generate the foam (that is, the solution prepared by adding liquid high-expanding foam fire extinguishing agent to water, Hereinafter referred to as the solution) volume ratio.

2.3 Stability of foam

Under the specified conditions, a certain volume of foam bursts in half the time.

2.4 extractive ratio

The rate of solution detachment from the foam is expressed by the ratio of the volume of the solution precipitated from the foam to the volume of the foam within a certain period of time.

2.5 Use of agent to solution ratio Mass ratio of fire extinguishing agent in the prepared solution.

3 categories

Divided by the medium used to form the foam and its temperature

--- Ordinary type. Use air medium to foam, medium temperature is $-5^{\circ}\text{C} \sim 40^{\circ}\text{C}$;

--- High temperature resistant type. Use fuel inert gas to foam, the temperature of the medium is $15^{\circ}\text{C} \sim 85^{\circ}\text{C}$.

4 Technical requirements

4.1 General requirements

4.1.1 The use temperature range of fire extinguishing agent is $-5^{\circ}\text{C} \sim 40^{\circ}\text{C}$ for general type and $15^{\circ}\text{C} \sim 85^{\circ}\text{C}$ for high temperature resistance type.

4.1.2 The fire extinguishing agent shall be a homogeneous liquid.

4.1.3 The fire extinguishing agent should not be significantly irritating to the human body after being diluted with water, and should not have obvious toxicity to living beings, and the surfactants therein are easily reduced by living beings Solution, no pollution to the environment.

4.2 Performance requirements the performance of the extinguishing agent should meet the requirements in Table 1.

Table 1

Project technical indicators

1 Density (20°C), g/cm^3 0.90 ~ 1.20

2 Viscosity (20°C), $\text{MPa} \cdot \text{s}$ 25 3 pH value (20°C) 6 ~ 8

4 Foam multiple, 500 times

5 Foam stability, min 90

6 Foam leaching rate (≥ 15 min), % 15

7 Water-resistant hardness, degree of virtue 30

8 Use concentration of fire extinguishing agent, % 3 ~ 6

9 Fire performance

Time for extinguishing Class A fire, min 5 Time for extinguishing a Class B fire, min 3

10 Storage period (inspected by aging test) 2 years

5 Test method

5.1 Homogeneous inspection

5.1.1 Instrument

--- graduated cylinder. 250mL or 100mL;

--- Glass rod. 250 ~ 500mm.

5.1.2 Test procedure

5.1.2.1 Pour the fire extinguishing agent into a measuring cylinder, place it still, and inspect it visually.

5.1.2.2 Stir the fire extinguishing agent in the graduated cylinder with a glass rod and leave it still. Visually inspect the fire extinguishing agent after it has stabilized.

5.1.3 Conclusion

Both results were independent.

5.2 Toxicity check

According to the ingredients contained in the fire extinguishing agent, perform the method specified in the product standard.

5.3 Density determination

5.3.1 Instrument

--- Precision density meter. range is 0.900 ~ 1.200g/cm³;

--- thermometer; range is 0 ~ 50 °C, division value is 0.5 °C;

--- graduated cylinder. 250mL or 100mL;

--- Constant temperature water bath. constant temperature range is 0 ~ 100 °C, temperature control accuracy is ± 1 °C.

5.3.2 Test procedure

5.3.2.1 Control the temperature of the thermostatic water bath at 20 ± 1 °C.

5.3.2.2 Slowly pour the uniformly mixed fire extinguishing agent into a dry and clean measuring cylinder.

Scrape it off with filter paper. Then put it vertically into the constant temperature water bath, the liquid level of the fire extinguishing agent should be lower than the water bath liquid level.

5.3.2.3 When the temperature is constant to $20 \text{ °C} \pm 1 \text{ °C}$, slowly put the upper end of the hand-held clean density meter into the fire extinguishing agent, and take a reading when the density meter is stable.

5.3.3 Results

Take the average of the two test results as the measurement result, the difference between the two test results should not be greater than 0.002g/cm³.

5.4 Viscosity determination

5.4.1 Instrument

Rotary Viscometer. Turntable range is 0 ~ 100, accuracy is $\pm 5\%$;

Freezing point thermometer. The range is -30 °C ~ 60 °C, and the division value is 1 °C;

High beaker. 250mL;

Graduated cylinder. 25mL, 250mL each;

Semiconductor cold trap. temperature control accuracy is ± 1 °C;

50% ethanol in water.

5.4.2 Test procedure

5.4.2.1 Slowly inject the uniformly mixed 20mL fire extinguishing agent into the sleeve of the rotary viscometer, install the adapter of the rotary viscometer and the sleeve it was installed in a rotary viscometer, and the sleeve was immersed in a 50% ethanol aqueous solution of a semiconductor cold trap.

5.4.2.2 Set the temperature of the semiconductor cold trap to -5 °C, select an appropriate speed, and wait for the fire extinguishing agent to reach -5 °C for 30 minutes before proceeding.

Line determination. The value indicated by the pointer during measurement should be