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THE PEOPLE'S REPUBLIC OF CHINA

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MT/T 76-2011

Replacing MT 76-2002

Emulsifying oil, concentrate fluid and high-water content hydraulic fluid used for powered support

液压支架用乳化液、浓缩液

及其高含水液压液

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Table of Contents

Foreword.....	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Classification	6
5 Technical requirements	7
6 Test methods	8
7 Inspection rules	12
8 Marking, packaging, transportation and storage	14
Annex A (Normative) Requirements for test hard-water and test fluid preparation.....	15
Annex B (Normative) Special test apparatus	16

Foreword

Clauses 5.1, 5.2, 5.7, 5.14 and 5.15 of this Standard are voluntary; and the rest are compulsory.

This Standard is a revision of MT 76-2002, *Emulsifying oil concentrate and high-water content hydraulic fluid used for powered support and prop*. This Standard replaces MT 76-2002 from the data of implementation.

Compared with MT 76-2002, the major changes of this Standard are as follows:

- the standard name is changed, in which “and prop” is deleted and “concentrate” is changed into “concentrate liquid” (see the cover and text of 2002 edition and this edition);
- the product type specification is changed (see 4.2; 4.2 of 2002 edition);
- the relevant content of solid-state powder concentrate is deleted (see 5.2 of 2002 edition);
- the technical requirements for open cup flash point are modified (see 5.3; 5.1.3 of edition 2002);
- the technical requirements and test methods including odour, antifoaming performance and refractometer reading (see 5.2, 5.14, 5.15, 6.3, 6.15 and 6.16);
- the pH technical requirements are modified (see 5.8; 5.3.2 of 2002 edition);
- the “preparation of test water” is added (see 6.1);
- the test conditions and methods are modified (see 6.2, 6.4, 6.6, 6.9, 6.11 and 6.12; 6.1, 6.3, 6.4, 6.7, 6.9 and 6.10 of 2002 edition).

Annex A and Annex B of this Standard are normative.

This Standard was proposed by China Coal Industry Association.

This Standard shall be under the jurisdiction of the National Technical Committee on Special Equipment for Coal Industry and Coal Mines.

China Coal Research Institute Testing Sub-Institute is responsible for the drafting of this Standard; China Coal Research Institute Industrial Oils Business Division and Datong Yunyan Petrochemical Co., Ltd. participate in the drafting.

The main drafters of this Standard: Wang Ping, Jia Dajun, Han Yong, Liu Shanshan, Yu Chunlan, Wang Jiyong, Du Yong.

The previous editions of the standard replaced by this Standard are as follows:

Emulsifying oil, concentrate fluid and high-water content hydraulic fluid used for powered support

1 Scope

This Standard specifies: the emulsifying type (HFAE) and solution type (HFAS) high-water content hydraulic fluids; and the terms and definitions, product classification, technical requirements, test methods, inspection rules and marking, packaging, transportation and storage of emulsifying oils and concentrate fluids for the preparation of the hydraulic fluid.

This Standard applies to the high-water content hydraulic fluids for hydraulic supports, outside-pourable single hydraulic props, etc. and the emulsifying oils and concentrate fluids for the preparation of the hydraulic fluids.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to This Standard.

GB 265-1988, *Petroleum products - Determination of kinematic viscosity and calculation of dynamic viscosity*

GB/T 510-1983, *Petroleum products - Determination of solidification point*

GB/T 3142, *Lubricants - Determination of load carrying capacity (four balls method)*

GB/T 3536-2008, *Petroleum products - Determination of flash and fire points - Cleveland open cup method (ISO 2592:2000, MOD)*

GB/T 4756, *Method for manual sampling of petroleum liquids* (GB/T 4756-1998, ISO 3170:1988, NEQ)

GB/T 5231-2001, *Wrought copper and copper alloys - Chemical composition limits and forms of wrought products*

GB/T 7631.2, *Lubricants, industrial oils and related products (class L) - Classification - Part 2: family H (hydraulic systems)*

GB/T 11143-2008, *Standard test method for rust-preventing characteristics of*

Weigh accurately 2.922 g of sodium chloride (of analytical purity); dissolve in distilled water or deionized water; and use distilled water or deionized water to dilute to 1 L.

6.2 Appearance

At 10°C ~ 35°C, inject the emulsifying oil or concentrated fluid to be tested to the 100-ml scale of a 100-ml colorimetric tube of diameter 30 mm; use a stopper to seal; use a 5 W/220 V incandescent light bulb to irradiate the side of the colorimetric tube; and observe the filament through the test sample: if the filament can be seen clearly, it is transparent; if the filament is invisible or blurry, it is non-transparent. Reverse the colorimetric tube; the film formed on the wall of the colorimetric tube shall be uniform.

6.3 Odour

Through olfactory test, emulsifying oils or concentrated fluids shall have no pungent smell.

6.4 Open cup flash point

The flash point of emulsifying oils and concentrated fluids is tested as specified in GB/T 3536-2008, but the provision of 10.3 is not implemented. The bottom of thermometer bulb is 6 mm from the bottom of test cup. If forming or overflow occurs during the heating process, slow down the temperature-rise speed; and restore the normal temperature-rise speed after foam reduces. If a fluid overflows from test cup, then the test is invalid, and test shall be conducted once again. For some samples, they are heated until water is nearly evaporated dry; and when the sample in test cup is in the viscous semi-solid state or the upper part of thermometer bulb emerges above the fluid level and the steam on the surface of the sample does not flash, then the flash point of the sample is determined to be "none".

6.5 Kinetic viscosity

The kinetic viscosity of emulsifying oils or concentrated fluids are tested as specified in GB/T 265-1988, but the provision of 4.1 is not implemented.

6.6 Condensation point

The condensation point of emulsifying oils or concentrated liquids are tested as specified in GB/T 510-1983, but the provision of 4.2 is not implemented. For some samples, temperature rise occurs during the test, so the maximum temperature during the temperature reduction process before the temperature rise.

6.7 Freeze-thaw resistance

Inject emulsifying oils or concentrated fluids to the 100-ml scale of a 100-ml colorimetric tube of diameter 30 mm; use a stopper for sealing; place into a refrigeration equipment for 8 h at - 21°C ~ - 16°C; take it out and store for 16 h at 10°C ~ 35°C. This is deemed as a freeze-thaw process. After repeating 5 cycles, observe

concentration for oscillation stability test specified in Table A.2 in Annex A; inject into the treated 100-ml measuring cylinder with a stopper to the 50-ml scale; plug the cylinder closely with the stopper; use hand to hold the cylinder to oscillate for 1 min under the conditions of temperature 10°C ~ 35°C, amplitude 200 mm ~ 300 mm and frequency 100 times/min ~ 120 time/min; allow to stand; and observe the test liquid after foam disappears.

6.11 Anti-corrosion property

Emulsifying oils or concentrated liquids and artificial hard-water of corresponding hardness are prepared into a test solution in accordance with the specified working concentration. Test pieces are made of cast iron HT 300. At first, use abrasive cloth made of no. 120 aluminium oxide (brown aluminium oxide) to remove rust completely; then use no. 240 abrasive cloth to polish until smooth and bright. There shall be no visible machining marks. Use degreasing cotton and filter paper to wipe clean. If necessary, use solvent naphtha specified in SH 0004 for cleaning before drying. Drip the test fluid 5 drops on the surface of cast iron test pieces uniformly in the shape of plum blossom, with the diameter of each drop 6 mm ~ 7 mm. Use a watch glass of diameter 60 mm for coverage; store for 24 h at 10°C ~ 35°C; and observe the rusting conditions.

The material of cast iron test pieces is HT 300; and the diameter of test pieces is 50 mm.

6.12 Corrosion resistance

Use emulsifying oils or concentrated fluids and sodium chloride solution 0.05 mol/L to prepare the test fluid in accordance with the liquid concentration for corrosion resistance test specified in Table A.2 in Annex A; place in a high temperature resistant open-mouth beaker. Test pieces are made of steel bar and brass bar; conduct grinding and polishing as specified in Clause 8 of GB/T 11143-2008; place the test pieces ground and polished into the above-mentioned test liquid at the same time, making the threaded part of test pieces fully immersed in the test liquid. Do not use stirring devices. Store for 24 h at (70±2)°C before inspecting the rusting conditions of test pieces.

The material of brass bar shall meet the requirements for brass H62 specified in GB/T 5231-2001; the material of steel bar shall meet the requirements of 5.4 of GB/T 11143-2008; and the dimensions of test bar shall meet the requirements of Figure 3 of GB/T 11143-2008. The high temperature resistant open-mouth beaker shall meet the requirements of 5.2 of GB/T 11143-2008; the material of beaker cover shall meet the requirements of 5.3 of GB/T 11143-2008; and the dimensions shall meet the requirements of Figure B.2 of Annex B to this Standard.

6.13 Compatibility test for sealing materials

Use emulsifying oils or concentrated fluids and distilled water to prepare the test fluid in accordance with the specified working concentration. Test pieces are made of NBR;

L.

7.3.2 The sampling for exit-factory inspection shall be conducted for each batch; and the basic number of samples for type inspection shall not be less than 1 000 kg.

7.4 Judging criteria

7.4.1 If all the items of exit-factory inspection pass the inspection, then the exit-factory inspection is determined to be a pass; or else, the exit-factory inspection is determined to be a fail.

7.4.2 If all the items of type inspection pass the inspection, then the type inspection is determined to be a pass; or else, the exit-factory inspection is determined to be a fail.

8 Marking, packaging, transportation and storage

8.1 The marking of packaging containers shall include product name, type, standard number, date of manufacture or batch number, quality guarantee period, compliance certificate, manufacturer's name, address, contact phone and so on. When 200-l large packaging containers are used, the surface of containers shall be provided with a circle of painted mark of 200 mm width.

8.2 The packaging, transportation and storage of products shall be conducted as specified in SH 0164; and the temperature for storage shall not be lower than -5°C.

8.3 Products shall be used within the quality guarantee period. If products are beyond the shelf life, they shall be inspected in accordance with the exit-factory items, and can only be used after they pass the inspection.

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