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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Petroleum products and lubricants — Petroleum oils and other fluids — Determination of rust-preventing characteristics in the presence of water

*Produits pétroliers et lubrifiants — Huiles de pétrole et autres fluides — Détermination des
caractéristiques anti-rouille en présence d'eau*

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7120 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Petroleum products and lubricants — Petroleum oils and other fluids — Determination of rust-preventing characteristics in the presence of water

1 Scope and field of application

1.1 This International Standard specifies a method for evaluating petroleum oils and other fluids to indicate their effectiveness in preventing the rusting of ferrous parts should water become mixed with the oil/fluid. The method is for application to inhibited mineral oils including steam turbine oils, circulating oils and hydraulic oils and non-hydrocarbon fluids including fluids denser than water.

1.2 In many cases, such as in the gears of a steam turbine, water can become mixed with the lubricant, and rusting of ferrous parts may occur. This test indicates the effectiveness of inhibited mineral oils aid in preventing this type of rusting.

2 References

ISO 3170, *Petroleum products — Liquid hydrocarbons — Manual sampling*.

ISO 3171, *Petroleum products — Liquid hydrocarbons — Automatic pipeline sampling*.

ISO 3448, *Industrial liquid lubricants — ISO viscosity classification*.

3 Principle

A mixture of 300 ml of the oil or fluid under test is stirred with 30 ml of distilled water or synthetic sea water, as required, at a temperature of 60 °C with a cylindrical steel specimen completely immersed therein. It is customary to run the test for 24 h; however, the test period may, at the discretion of the interested parties, be for a shorter or longer period. The specimen is then observed for signs of rusting and degree of rusting.

4 Reagents and materials

Unless otherwise stated, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

4.1 Cleaning and polishing fluid, *iso*-octane.

NOTE — For non-reference testing, petroleum spirit of satisfactory volatility may be used.

CAUTION — *iso*-octane is flammable. Do not use in an area near sparks or an open flame. Provide adequate ventilation.

4.2 Chromic acid cleaning solution or other equally effective glassware cleaning fluid.

CAUTION — Chromic acid is a highly corrosive and toxic substance. For environmental and/or toxicological reasons, its use is forbidden in many laboratories. In this case, use an alternative cleaning fluid which has been shown to produce chemically clean glassware.

Prepare chromic acid cleaning solution by dissolving 400 g of sodium dichromate ($\text{Na}_2\text{Cr}_2\text{O}_7$) in 100 ml of hot water. Allow the solution to cool and store in a glass-stoppered bottle. Place 35 ml of this saturated sodium dichromate solution in a 500 ml beaker. In a fume hood, while stirring, carefully add 1 litre of sulfuric acid (H_2SO_4). Stir for 5 min. Store in a glass-stoppered bottle.

4.3 Distilled water.

4.4 **Synthetic sea water**, for testing in accordance with procedure B, and conforming to the requirements given in 9.1 and 9.2.

4.5 Steel test specimen, as described in 7.1.

5 Apparatus

5.1 **Oil bath**, thermostatically controlled and capable of maintaining the test sample at a temperature of 60 ± 1 °C. An oil of viscosity grade ISO VG 32 is suitable for the bath. The bath shall have a cover with holes to accommodate the test beakers.

5.2 **Thermometer**, for checking the temperature of the test fluid with scale divisions of 0,5 °C with a specified immersion specification to allow measurement of the temperature in the test vessel at 60 °C with a precision at least equal to that of thermometer STL/0,5/ -35/ +115 of ISO 653.

NOTE — Thermometer conforming to ASTM 9C/IP 15C or ASTM 34C/IP 21C.