

Methods of test for petroleum and its products —

**Part 135: Determination of
rust-preventing characteristics of
steam-turbine oil in the presence of
water
(Identical with IP 135:2005)**

ICS 75.100

National foreword

This British Standard reproduces verbatim IP 135:2005 and implements it as the UK national standard. It supersedes BS 2000-135:1993 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PT/13, Petroleum testing and terminology, which has the responsibility to:

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Cross-references

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Summary of pages

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Determination of rust-preventing characteristics of steam-turbine oil in the presence of water

This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This standard specifies a method for evaluating the ability of inhibited mineral oils, particularly steam-turbine oils, to aid in preventing the rusting of ferrous parts should water become mixed with the oil. This method can also be used for testing other oils, such as hydraulic oils and circulating oils and provision is also made in the method for testing heavier-than-water fluids.

NOTE 1 - Until 2003, it was customary to run the test for 24 h. A round robin using different test times showed that no statistically significant differences in rating were found, for any sample, between the 4 h and 24 h results. The results of the round robin with modified test duration are held at the Energy Institute.

NOTE 2 - The test duration may, with the agreement of the contracting parties, be for a shorter or longer period.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

BS 970-1, *General inspection and testing procedures and specific requirements for carbon, carbon manganese, alloy and stainless steels*

2 Principle

300 ml of the oil being tested is placed in a beaker, immersed in an oil bath, fitted with a stirrer and heated to 60°C. A prepared steel specimen is placed in the oil and the oil stirred for 30 min. After

30 min 30 ml of either distilled or synthetic sea water is added and the mixture is maintained at 60°C and stirred for the duration of the test. At the end of the test period the steel specimen is removed and examined without magnification for evidence of rusting. The test procedure is carried out in duplicate.

3 Apparatus

3.1 Oil bath, thermostatically controlled capable of maintaining a temperature in the oil being tested of 60°C ± 1°C, with a cover with holes to accommodate the beakers.

3.2 Beaker glass, tall-form approximately 27 mm in height measured from the inside bottom centre and approximately 70 mm inside diameter measured at the middle with a nominal capacity of 400 ml, see figure 1.

3.3 Beaker cover, glass or methyl methacrylate resin kept in position by suitable means such as a rim or groove with three holes. One for a stirrer, 11,7 mm to 12,2 mm in diameter, with its centre 6,1 mm to 6,6 mm from the centre of the cover. One, on the opposite side of the centre of the cover, for the test specimen assembly, 17,6 mm to 18,1 mm in diameter, with its centre 15,6 mm to 16,1 mm from the centre of the cover. One 11,7 mm to 12,2 mm in diameter, for a thermometer, with its centre 21,9 mm to 22,5 mm from the centre of the cover, and on a diameter of the cover at right angles to the diameter through the other two holes.

NOTE 3 - An inverted, modified Petri dish makes a suitable cover, as the sides of the dish aid in keeping it in position.

NOTE 4 - Figure 2 shows a methyl methacrylate resin cover for the beaker which has been found to be suitable. An optional feature is shown consisting of a slot, 1,6 mm by 27 mm, which is centred on a diameter of the stirrer hole at right angles to the cover diameter through the specimen hole and stirrer hole. This feature allows