BS 2000 :
Part 137 : 1993

Methods of test for

Petroleum and its products

Part 137. Determination of oil content of water mix metalworking oil dilutions

(Identical with IP 137/82(87))

Confirmed
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BSi
British Standards

Foreword

This British Standard, having been prepared under the direction of the Petroleum Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 28 February 1993.

This British Standard supersedes BS 2000 : Part 137 : 1990, which is withdrawn.

BS 2000 comprises a series of test methods for petroleum and its products that are published by the Institute of Petroleum (IP) and have been accorded the status of a British Standard. Each method should be read in conjunction with the preliminary pages of 'IP Standard methods for analysis and testing of petroleum and related products' which gives details of the BSI/IP agreement for publication of the series, provides general information on safety precautions, sampling and other matters, and lists the methods published as Parts of BS 2000.

The numbering of the Parts of BS 2000 follows that of the corresponding methods published in 'IP Standard methods for analysis and testing of petroleum and related products'. Under the terms of the agreement between BSI and the Institute of Petroleum, the revised version of BS 2000 : Part 137 will be published by the IP (in 'Standard methods for analysis and testing of petroleum and related products' and as a separate publication). BS 2000 : Part 137 : 1993 is thus identical with IP 137/82, which was reapproved in 1987. Square brackets marked in the margin of this IP Standard indicate text that differs from the previous edition.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Committee reference PTC/13

IP 137/82 (1987) BS 2000: Part 137: 1993

Determination of oil content of water mix metalworking oil dilutions

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.

SCOPE

1. This method determines the oil content of unused and used water mix metal working oil dilutions.

NOTE 1: In order to relate the results of this test to the actual content of water mix metal working oil in the dilution, a similar test should be made on a dispersion of the given water mix metal working oil which has been accurately diluted to a comparable extent.

DEFINITIONS

2. The *Oil Content* is defined as the amount of material which separates under the conditions of this test as an oily layer insoluble in the aqueous phase. In addition to the mineral oil originally present in the water mix metal working oil, the separated material may also include portions of those emulsifiers which are decomposed by the acid treatment.

OUTLINE OF METHOD

3. A known volume of the water mix metal working oil dilution is treated with hydrochloric acid in a graduated flask and the volume of liberated oil is measured.

APPARATUS

4. (*a*) *Separating Funnel* – of 500 ml capacity or less according to the amount of sample available.

(*b*) *Flask* – of 150 ml capacity and with a 10 ml graduated neck, conforming to BS 676.

MATERIALS

5. *Hydrochloric Acid* – approx 2 M aqueous solution.

PREPARATION OF SAMPLE

6. (*a*) Shake the sample gently but sufficiently to make it uniform. Pour 500 ml of the sample, or the whole of the sample if less than 500 ml, into a separating funnel of an appropriate size, and allow it to stand overnight.

(*b*) After allowing the sample to stand overnight, run off all of the dilution including any creamy layer, into a suitable beaker, leaving only free oil in the funnel. Stir the dilution to make it uniform and test it without further delay.

PROCEDURE

7. (*a*) Measure 100 ml of the uniform dilution from a 100 ml measuring cylinder into the graduated flask and add 40 ml of the hydrochloric acid. When the dilution is known to have an oil content of more than 10%, or when a volume of oil of more than 10 ml is found to separate as a result of the procedures described in Sections 7(*b*) and (*c*), measure a smaller quantity of the dilution such as to give a convenient volume of separated oil; add sufficient hydrochloric acid to give a total volume of approx 140 ml.

(*b*) Swirl the flask until its contents are thoroughly mixed and heat it in a boiling water-bath for 1 h. Remove the flask from the bath and fill it to the top graduation with the hydrochloric acid. Allow the flask to stand for 1 h, swirling it from time to time to detach any oil adhering to the sides.

(*c*) Adjust the oil level if necessary by further addition of the hydrochloric acid. Determine the difference in the scale readings corresponding with the top edge of the meniscus at the upper and lower levels of the separated oil and record the volume to the nearest 0.05 ml.

CALCULATION AND REPORTING

8. Calculate the result as a percentage by volume and report it to the nearest 0.1% as the Oil Content, IP 137.

PRECISION

9. (*a*) For unused water mix metal working oil dilutions duplicate results should not differ by more than the following amounts:

Repeatability	Reproducibility
0.1%	0.2%

(*b*) With used water mix metal working oil dilutions difficulty may be experienced in reading the volume of separated oil, depending on the condition of the used dilution. For this reason no acceptable limits can be given.