

INTERNATIONAL STANDARD

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Petroleum-based lubricating oils — Ageing characteristics — Determination of change in Conradson carbon residue after oxidation

*Huile de graissage à base de pétrole — Caractéristiques de
vieillessement — Détermination de l'augmentation du résidu de carbone
Conradson après oxydation*



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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 6617 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*, Subcommittee SC 4, *Classifications and specifications*.

Annex A forms an integral part of this International Standard.

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Petroleum-based lubricating oils — Ageing characteristics — Determination of change in Conradson carbon residue after oxidation

WARNING — The use of this International Standard may involve hazardous materials, operations and equipment. 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 International Standard specifies a procedure for determination of the ageing characteristics of petroleum-based lubricating oils. It is applicable to those oils which have an evaporation loss of less than 15 % mass fraction, as determined by the procedure specified in 9.3 of this standard.

2 Normative references

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

ISO 3170:1988, *Petroleum liquids — Manual sampling*.

ISO 3585:1991, *Borosilicate glass 3.3 — Properties*.

ISO 6615:1993, *Petroleum products — Determination of carbon residue — Conradson method*.

3 Definition

For the purposes of this International Standard, the following definition applies.

3.1 ageing characteristics: Characteristics of a petroleum-based lubricating oil as determined by the increase in the Conradson carbon residue of the oil aged in accordance with this International Standard in comparison to that of the same non-aged oil.

4 Principle

The oil sample to be tested is aged for two 6-h periods at a temperature of 200 °C while air is passed through the oil. The value of the Conradson carbon residue of the aged sample is determined according to ISO 6615. The Conradson carbon residue of the non-aged oil, also determined according to ISO 6615, is subtracted from this value. The increase in the value of the carbon residue of the aged oil over that of the non-aged oil is reported as the result.

Under no circumstance may the procedure specified in ISO 6615 be modified, or any other procedure substituted for this procedure.

5 Apparatus

5.1 Testing apparatus, consisting of an ageing vessel and a holder with an air inlet tube and an air outlet tube (figure 1), all parts being manufactured from borosilicate glass in accordance with ISO 3585.

5.1.1 Ageing vessel, manufactured from 28 mm × 1,4 mm borosilicate glass pipe in accordance with ISO 3585, complete with a 29/32 conical ground glass joint.

5.1.2 Vessel for temperature measurement, constructed as specified for the ageing vessel (5.1.1), but without the ground glass joint.

5.1.3 Holder, with air inlet tube and air outlet tube.

The air inlet tube shall be manufactured from 7 mm × 1 mm borosilicate glass pipe in accordance with ISO 3585, and sealed into the holder as illustrated in figure 1. The air inlet tube shall be mounted in the centre of the holder and its lower end cut square. The length of the air inlet tube shall be such that, with the holder securely in place in the ageing vessel, its lower end is $1 \text{ mm} \pm 0,5 \text{ mm}$ above the bottom of the ageing vessel.

Each ageing vessel (5.1.1) and holder shall be manufactured as a matched set and appropriately marked to protect against mixing between sets.

5.2 Oven, capable of being maintained at a temperature of 105 °C to 110 °C.

5.3 Heating facility.

An oil-bath heating facility equipped with a stirrer and temperature-control device, complete with a cover and adequate insulation to minimize heat loss, shall be provided. The stirring and heating effect shall produce a uniform temperature of $200 \text{ °C} \pm 1 \text{ °C}$ in each sample. The quantity of oil in the bath should be such that at $200 \text{ °C} \pm 1 \text{ °C}$ it expands to within 13 mm of the cover. A calibrated thermometer (5.4) shall be placed in a separate ageing vessel (5.1.2) and filled with oil to a depth of 110 mm. The ageing vessel provided for the thermometer shall not be fitted with a ground glass joint or air inlet tube.

Dimensions in millimetres

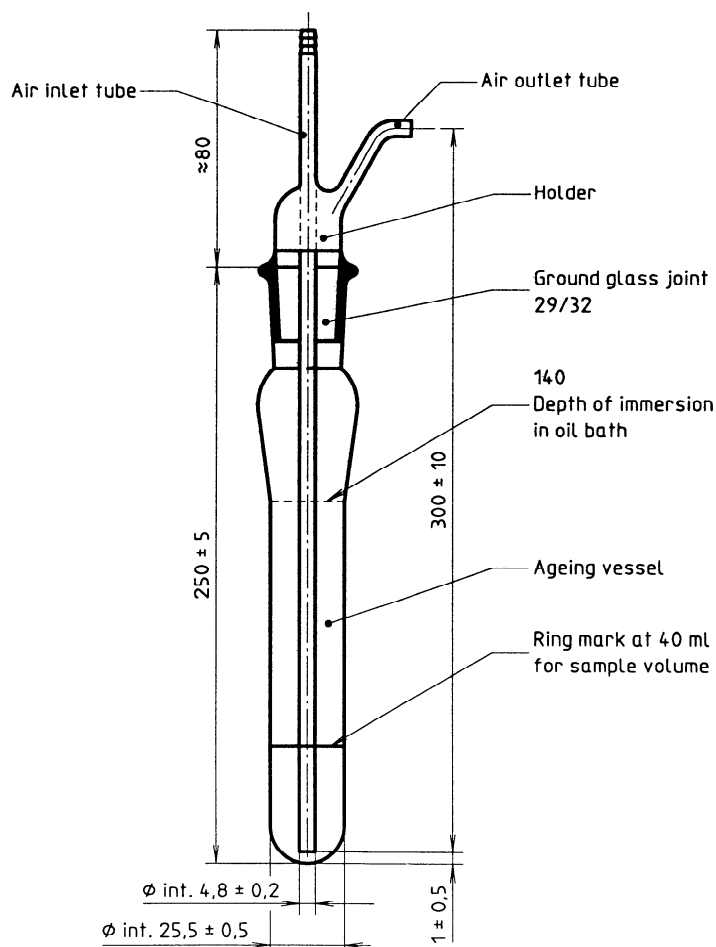


Figure 1 — Ageing vessel and holder