INTERNATIONAL STANDARD

ISO 4262

Second edition
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Petroleum products — Determination of carbon residue — Ramsbottom method

Produits pétroliers — Détermination du résidu de carbone — Méthode Ramsbottom

Reference number
ISO 4262:1993(E)

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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 4262 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

This second edition cancels and replaces the first edition (ISO 4262:1978), which has been technically revised.

Annex A forms an integral part of this International Standard. Annex B is for information only.

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Petroleum products — Determination of carbon residue — Ramsbottom method

1 Scope

This International Standard specifies a method for determining the amount of carbon residue, in the range of 0,01 % (*m/m*) to 30,0 % (*m/m*), left after evaporation and pyrolysis of an oil, and is intended to provide some indication of relative coke-forming tendency. The method is generally applicable to relatively non-volatile petroleum products which partially decompose on distillation at atmospheric pressure.

NOTES

1 The term "carbon residue" is used throughout this International Standard to designate the carbonaceous residue formed during evaporation and pyrolysis of a petroleum product. The residue is not entirely composed of carbon, but is a coke which can be further changed by pyrolysis. The term "carbon residue" is retained in this method only in deference to its widespread use.

2 The carbon residue of distillate and residual fuel oils gives an approximate ranking of such fuels in terms of their propensity to form deposits in specific applications.

3 The presence of alkyl nitrates in distillate fuels, or ash-forming additives in either distillate or residual fuels, will give carbon residue results that are higher than the corresponding values of the fuel without additives. These values may not correlate with the propensity of a fuel to form deposits.

4 The carbon residue of base lubricating oils may give an indication of the propensity of the oil to lay down deposits in combustion chambers, and/or of the relative chemical constitution of oils of similar viscosity. Most finished lubricating oils contain ash-forming additives, and thus the carbon residue of finished lubricants cannot be used in this manner.

5 The carbon residue of a gas oil is a useful guide in the manufacture of gas.

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 683-13:1986, *Heat-treatable steels, alloy steels and free-cutting steels — Part 13: Wrought stainless steels.*

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

ISO 3171:1988, *Petroleum liquids — Automatic pipeline sampling.*

ISO 3405:1988, *Petroleum products — Determination of distillation characteristics.*

3 Principle

3.1 The test portion is weighed into a glass coking bulb having a capillary opening, and is placed in a metal furnace maintained at a temperature of approximately 550 °C. The test portion is thus quickly heated to the point at which all volatile matter is evaporated out of the bulb with or without decomposition, while the heavier residue remaining in the bulb undergoes cracking and coking reactions. In the later stages of the heating period, the coke or carbon residue is subject to further slow decomposition or slight oxidation due to the possibility of air being drawn into the bulb. After a specified heating period, the bulb is removed from the furnace, cooled in a dessicator, and again weighed. The residue remaining is calculated as a mass percentage of the test portion.

3.2 Provision is made for determining the proper operating characteristics of the furnace with a control bulb containing a thermocouple, which gives a specified time-temperature relationship.