INTERNATIONAL STANDARD 3013

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Aviation fuels — Determination of freezing point

Carburants aviation — Détermination du point de disparition des cristaux

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

International Standard ISO 3013 was drawn up by Technical Committee ISO/TC 28, *Petroleum products,* and circulated to the Member Bodies in March 1973.

It has been approved by the Member Bodies of the following countries :

Australia	India	South Africa, Rep. of
Belgium	Iran	Spain
Brazil	Israel	Sweden
Bulgaria	Mexico	Thailand
Canada	Netherlands	Turkey
Chile	New Zealand	United Kingdom
Czechoslovakia	Norway	U.S.A.
France	Poland	U.S.S.R.
Germany	Portugal	
Hungary	Romania	

No Member Body expressed disapproval of the document.

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Aviation fuels — Determination of freezing point

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a procedure for the detection of separated solids in aviation reciprocating engine and turbine engine fuels at any temperature likely to be encountered during flight or on the ground.

2 DEFINITIONS

2.1 freezing point : That temperature at which crystals of hydrocarbons formed on cooling disappear when the temperature of the fuel is allowed to rise.

2.2 crystallization point : That temperature at which crystals of hydrocarbons first appear upon cooling the fuel.

3 APPARATUS (see figure 1)

3.1 Jacketed sample tube : a doublewalled, unsilvered vessel, similar to a Dewar flask, the space between the inner sample tube and the outer glass jacket being filled at atmospheric pressure with dry nitrogen or air. The mouth of the tube shall be closed with a cork stopper supporting the thermometer and packing gland through which the stirrer passes.

3.2 Gland, consisting of a brass tube of the design shown in figure 2. This tube must fit tightly into the cork stopper, the space between the brass tube and the stirring rod being filled with absorbent cotton. A packing gland is necessary to prevent condensation of moisture in the sample tube from the surrounding air at the low test temperatures used. (See also 3.3 for an alternative design.)

3.3 Collars, moistureproof, as shown in figures 3 and 4. These may be used instead of the gland (3.2) to prevent condensation of moisture.

3.4 Stirrer, made of 1,6 mm brass rod bent into a smooth three-loop spiral at the bottom.

3.5 Vacuum flask, unsilvered, having the minimum dimensions shown in figure 1. The capacity shall be sufficient to hold an adequate volume of cooling liquid and permit the necessary depth of immersion of the jacketed sample tube.

3.6 Thermometer, total immersion type, conforming to the following specification :

Range	− 80 to + 20 °C
Immersion	total
Graduation at each	0,5 °C
Longer lines at each	1 °C and 5 °C
Figured at each	5 °C
Scale error not to exceed	1 °C
Expansion chamber permitting heating to	45 °C
Overall length	300 ± 10 mm
Stem diameter	5,5 to 8,0 mm
Bulb length	8 to 16 mm
Bulb diameter	not greater than stem
Bulb shape	cylindrical
Length of graduated portion	170 to 210 mm
Distance from bottom of bulb to 0 °C line	220 mm max.
Top finish	plain or ring

NOTES

1 Toluene or other suitable liquid coloured red with a permanent dye shall be used as the actuating liquid. The filling above the liquid shall be gas under pressure.

2 The accuracy of this thermometer must be checked in accordance with ISO/R 386, *Principles of construction and adjustment of liquid-in-glass laboratory thermometers,* at temperatures of 0, − 40, − 60, and − 75 °C. Corrections shall be applied to test readings.