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International Standard



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Aromatic hydrocarbons — Benzene, xylene and toluene — Determination of density at 20 °C

Hydrocarbures aromatiques — Benzène, xylène et toluène — Détermination de la masse volumique à 20 °C

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ISO 5281-1980 (E)

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 5281 was developed by Technical Committee ISO/TC 78, *Aromatic hydrocarbons*, and was circulated to the member bodies in October 1977.

It has been approved by the member bodies of the following countries :

Australia	Germany, F.R.	Portugal
Austria	Hungary	Romania
Brazil	India	South Africa, Rep. of
Bulgaria	Korea, Rep. of	Turkey
Chile	Mexico	United Kingdom
Czechoslovakia	Netherlands	USSR
Egypt. Arab Rep. of	Philippines	Yugoslavia
France	Poland	

No member body expressed disapproval of the document.

Aromatic hydrocarbons — Benzene, xylene and toluene — Determination of density at 20 °C

WARNING — Aromatic hydrocarbons are generally toxic by inhalation, ingestion or skin absorption. Volatile aromatic hydrocarbons are also highly flammable.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies pycnometer and hydrometer methods for the determination of the density at 20 °C of benzene, xylene and toluene.

2 REFERENCES

ISO 387, *Hydrometers — Principles of construction and adjustment.*

ISO 649, *Laboratory glassware — Density hydrometers for general purposes.*¹⁾

ISO 1995, *Aromatic hydrocarbons — Sampling.*²⁾

ISO 3507, *Pyknometers.*

3 DEFINITION

For the purpose of this International Standard, the following definition applies :

density : The ratio of mass to volume at a given temperature called the reference temperature.

For the purposes of standard tests, density is expressed in grams per millilitre. For all products the reference temperature is 20 °C.

This definition is concerned with mass, not with weight, in air, but the conversion tables given in the pycnometer method make allowance for the weighing in air. The scales of density hydrometers complying with ISO 649 are graduated in terms of mass per unit volume.

4 PRINCIPLES

4.1 Pycnometer method

Weighing of a pycnometer empty, then filled with water and, finally, filled with the aromatic hydrocarbon under test, at known temperatures. Calculation of the density from the values obtained, applying certain corrections given in tables.

4.2 Hydrometer method

Immersion of a hydrometer in the aromatic hydrocarbon under test, and recording of the hydrometer scale reading and the temperature. Calculation of the density from the values obtained, after applying a correction, obtained from the calibration certificate.

5 SAMPLING

Take a representative sample of not less than 1 000 ml from the bulk of the material.

Recommended methods of sampling are given in ISO 1995.

6 PYKNOMETER METHOD

6.1 Apparatus

6.1.1 Pycnometer, Lipkin, of borosilicate glass, 10 ml capacity, complying with the requirements of ISO 3507, type 1.

6.1.2 Water bath, glass-sided, of depth greater than 300 mm, thermostatically controlled to within 0,1 °C at any convenient temperature between 10 and 30 °C.

6.1.3 Thermometers, complying with the requirements given in the annex.

6.2 Procedure

6.2.1 Cleaning

Before calibrating the pycnometer (6.1.1), or when any liquid fails to drain cleanly from the walls or capillary of the pycnometer, clean it as follows.

Fill the pycnometer with chromic acid solution, or alternatively with a suitable distilled detergent. Allow to stand overnight empty and rinse well with distilled water followed by anhydrous acetone. Dry the pycnometer by passing a slow stream of dry filtered air through it. Between determinations, rinse the pycnometer with toluene followed by anhydrous acetone and dry it as before.

1) At present at the stage of draft. (Revision of ISO/R 649.)

2) At present at the stage of draft.