

INTERNATIONAL STANDARD



3105

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

2^e édition
en 95

Glass capillary kinematic viscometers — Specification and operating instructions

Viscosimètres à capillaire, en verre, pour viscosité cinématique — Spécifications et modes d'emploi

First edition — 1976-08-01

UDC 532.13

Ref. No. ISO 3105-1976 (E)

Descriptors : laboratory equipment, laboratory glassware, viscometers, capillary viscometers, specifications, dimensions, calibrating, instructions.

Price based on 28 pages

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 3105 was drawn up by Technical Committee ISO/TC 28, *Petroleum products*, and circulated to the Member Bodies in October 1973.

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

Austria	India	South Africa, Rep. of
Belgium	Ireland	Spain
Bulgaria	Israel	Sweden
Canada	Mexico	Thailand
Czechoslovakia	Netherlands	Turkey
Egypt, Arab Rep. of	New Zealand	United Kingdom
France	Norway	U.S.A.
Germany	Poland	U.S.S.R.
Hungary	Romania	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Australia

Glass capillary kinematic viscometers — Specification and operating instructions

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard gives specifications and operating instructions for glass capillary kinematic viscometers of all the types described in detail in annexes A, B, and C as follows :

- modified Ostwald viscometers, annex A
- suspended-level viscometers, annex B
- reverse-flow viscometers, annex C

1.2 The calibration of the viscometers is described in clause 5.

1.3 This International Standard covers some widely used viscometers suitable for use in accordance with ISO 3104, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*. Other viscometers of the glass capillary type which are capable of measuring kinematic viscosity within the limits of precision given in ISO 3104 may be used.

2 NOMENCLATURE FOR FIGURES

The more frequently used letters on the figures in the annexes are as follows :

A	lower reservoir
B	suspended level bulb
C and J	timing bulbs
D	upper reservoir
E, F, and I	timing marks
G and H	filling marks
K	overflow tube
L	mounting tube
M	lower vent tube
N	upper vent tube
P	connecting tube
R	working capillary

3 MATERIALS AND MANUFACTURE

3.1 Fully annealed, low-expansion borosilicate glass shall be used for the construction of all viscometers. The size number, serial number, and manufacturer's designation shall be permanently marked on each viscometer. All timing marks shall be etched and filled with an opaque colour, or otherwise made a permanent part of the viscometer.

3.2 With the exception of the FitzSimons and Atlantic viscometers, all viscometers are designed to fit through a 51 mm hole in the lid of a constant-temperature bath having a liquid depth of at least 280 mm; and it is assumed that the surface of the liquid will be not more than 45 mm from the top of the bath lid. For certain constant-temperature baths, especially at low or high temperatures, it may be necessary to construct the viscometers with the uppermost tubes longer than shown to ensure adequate immersion in the constant-temperature bath. Viscometers so modified can be used to measure kinematic viscosity within the precision of the test method. The lengths of tubes and bulbs on the figures should be held within $\pm 10\%$ or ± 10 mm, whichever is less, such that the calibration constant of the viscometer does not vary more than 15 % from the nominal value.

4 VISCOMETER HOLDER AND ALIGNMENT

4.1 All viscometers shall be mounted in a constant-temperature bath with tube L held within 1° of the vertical as observed with a plumb bob or other equally accurate inspection means. A number of commercially available holders are so designed that the tube L is held perpendicular to the lid of a constant-temperature bath; nevertheless, the viscometer should be tested with a plumb line in order to ensure that the tube L is in a vertical position.

4.2 Round metal tops, designed to fit above a 51 mm hole in the lid of the bath, are frequently cemented on to the Zeitfuchs, Zeitfuchs cross-arm, and Lantz-Zeitfuchs