

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 174

PLASTICS

DETERMINATION OF VISCOSITY NUMBER OF POLYVINYLCHLORIDE RESIN IN SOLUTION

1st EDITION

February 1961

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Printed in Switzerland

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BRIEF HISTORY

The ISO Recommendation R 174, *Determination of Viscosity Number of Polyvinyl-chloride Resin in Solution*, was drawn up by Technical Committee ISO/TC 61, *Plastics*, the Secretariat of which is held by the American Standards Association, Incorporated (ASA).

Work on this matter which the Technical Committee had begun since 1954, came to an end in 1956, with the adoption of a proposal as a Draft ISO Recommendation.

On 28 November 1958, the Draft ISO Recommendation (No. 189) was distributed to all the ISO Member Bodies and was approved, subject to some editorial amendments, by the following Member Bodies:

Australia	India	Spain
Austria	Israel	Sweden
Belgium	Italy	Switzerland
Bulgaria	Japan	Turkey
Burma	Netherlands	United Kingdom
Czechoslovakia	Poland	U.S.A.
Germany	Portugal	U.S.S.R.
Hungary	Romania	

One Member Body opposed the approval of the Draft : France.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in February 1961, to accept it as an ISO RECOMMENDATION.

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PLASTICS

DETERMINATION OF VISCOSITY NUMBER
OF POLYVINYLCHLORIDE RESIN IN SOLUTION

1. SCOPE

The purpose of this ISO Recommendation is to describe the determination of the viscosity number * of a solution in cyclohexanone of polyvinylchloride resin or of copolymer, in which the main repeating unit is that of vinylchloride. The methods applies only to those resins that give stable solutions and reproducible results under the conditions of test described herein. The times of flow of the solvent and a solution of resin at 0.005 g/ml are measured at 25 °C by conventional methods and the viscosity number is calculated from these measurements and from the known concentration of the solution. Density difference and kinetic energy corrections are small in this method and are not applied.

2. APPARATUS

The apparatus consists of the following:

- 2.1 *Automatic pipette* of 50 ml and 150 ml flat-bottomed flask with ground-glass stopper or 50 ml volumetric flask with ground-glass stopper.
- 2.2 *Funnel* : sintered glass filter funnel.
- 2.3 *Thermostatical bath*, maintained at 25 ± 0.05 °C.
- 2.4 *Viscometer*, suspended-level Ubbelohde type of which the essential dimensions are as shown in the Figure, page 6. Alternatively, any other viscometer which can be shown to give the same results.
- 2.5 *Balance*, to weigh to 0.0001 g.
- 2.6 *Stop-watch*, reading to 0.1 second.

* The term *viscosity number*, formerly "reduced viscosity", has been recommended for adoption by the International Union of Pure and Applied Chemistry (IUPAC).

Details are given in the *Journal of Polymer Science*, Vol. VIII (1952), No. 3, pages 269-270, where it is defined as follows:

$$\text{Viscosity number} = \frac{(\eta - \eta_0)}{\eta_0 C}$$

where η = absolute viscosity of solution,

η_0 = absolute viscosity of solvent, and

C = concentration in grammes, of solute per millilitre of solution.

It has since been argued that the term viscosity number is not wholly satisfactory, because the quantity which it describes is not without dimensions. The term is used in this method for lack of one more suitable, but it is intended to replace it when a more acceptable term is recommended by IUPAC.

ALL DIMENSIONS ARE IN MILLIMETRES

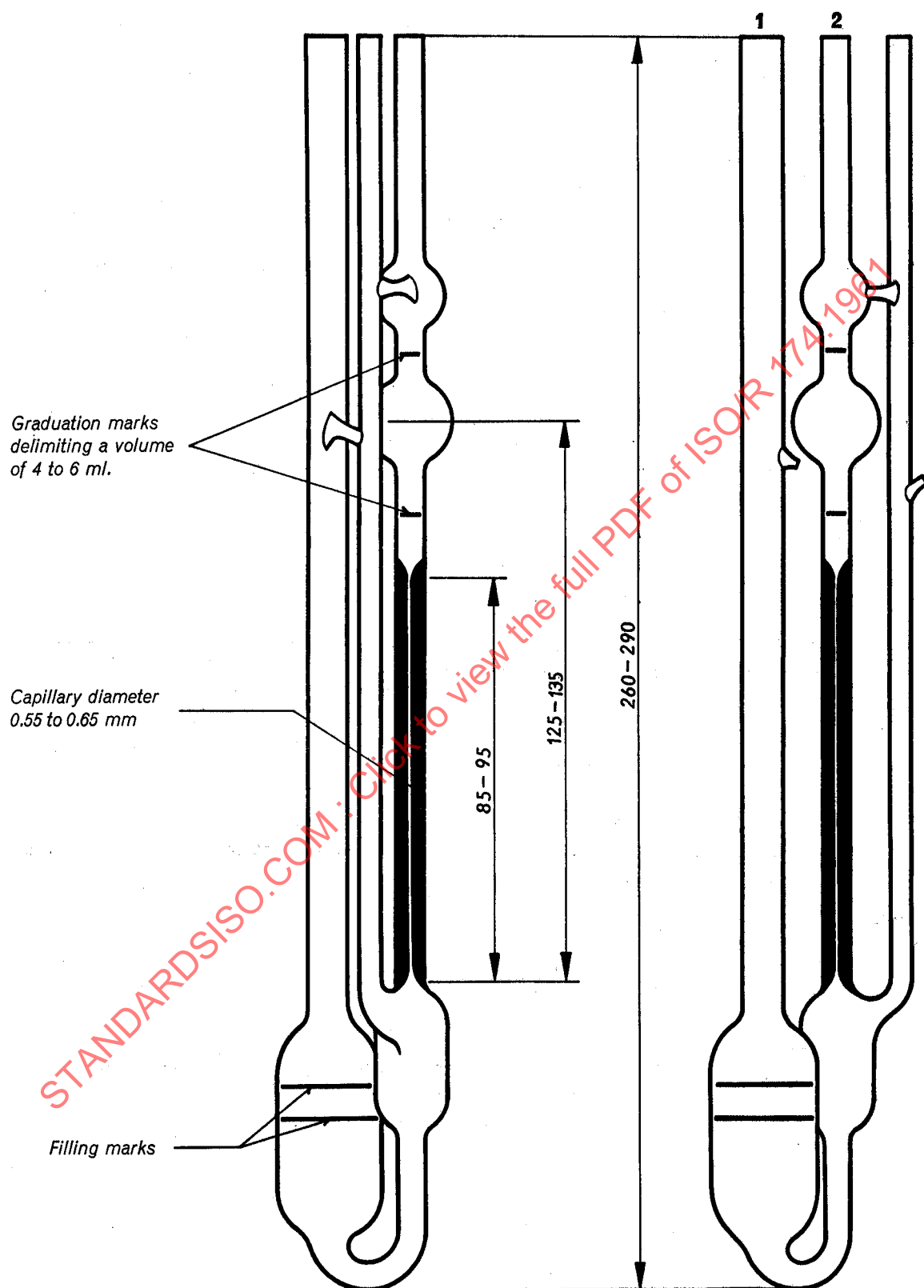


FIGURE — Ubbelohde Viscometer