

# International Standard



# 4575

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

## Plastics — Polyvinyl chloride pastes — Determination of apparent viscosity using the Severs rheometer

*Plastiques — Pâtes de polychlorure de vinyle — Détermination de la viscosité apparente au rhéomètre Severs*

Second edition — 1985-08-15

UDC 678.743.22 — 404.9 : 532.13

Ref. No. ISO 4575-1985 (E)

**Descriptors :** plastics, polyvinyl chloride, pastes, tests, determination, viscosity, test equipment, rheometers.

Price based on 6 pages

## 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.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4575 was prepared by Technical Committee ISO/TC 61, *Plastics*.

ISO 4575 was first published in 1978. This second edition cancels and replaces the first edition, of which it constitutes a minor revision.

# Plastics — Polyvinyl chloride pastes — Determination of apparent viscosity using the Severs rheometer

## 1 Scope and field of application

This International Standard specifies a method for determining the apparent viscosity, at high shear, of polyvinyl chloride pastes prepared from PVC paste polymers and plasticizers, using the Severs rheometer.

It applies in particular to "standard pastes" prepared according to ISO 4612, *Plastics — PVC paste resins — Preparation of a paste*.

## 2 Principle

Placing of a sample of the paste in a Severs rheometer and setting of the jacket to a defined temperature.

Measurement of the flow rate of the paste through a calibrated die at different pressures.

Calculation of the shear rate and apparent viscosity for each flow rate corresponding to each of the pressures applied.

Optionally, preparation of a graph of apparent viscosity as a function of the corresponding shear rate.

## 3 Apparatus

**3.1 Severs rheometer**, of capacity 500 to 1 000 ml, of one of the two basic designs shown in figure 1, and consisting essentially of:

**3.1.1 Measuring vessel**, for example a stainless steel or bronze cylinder with polished internal surfaces to which can be fixed both a base having an orifice in which can be placed a die, and a cover which can be connected to the source of pressure or to the atmosphere. The whole must be airtight.

**3.1.2 Jacket**, connected to a system for temperature control which allows the contents of the body of the measuring vessel to be maintained at the temperature of  $23 \pm 0,5$  °C.

**3.1.3 Non-deformable die**, for example of stainless steel or PTFE, consisting of a cylindrical tube which can be fitted air-

tight to the bottom of the measuring vessel. The outer and internal surfaces of the tube are polished. The die is defined by the diameter and the height of the tube. Two dies, A and B, are specified in the application of this International Standard:

Dimension	Die A	Die B
Radius of tube, mm	$1,5 \pm 0,05$	$1,5 \pm 0,05$
Height, mm	$45 \pm 0,5$	$22,5 \pm 0,5$

**3.1.4 Piston**, if necessary, of rigid plastic material with a diameter slightly less than that of the measuring vessel to prevent the fluid, under pressure, from passing directly through the die in the case of pastes which cavitate. (Furthermore, its use simplifies the cleaning of the instrument.) A sketch of the piston is given in figure 2.

**3.1.5 Pressurizing device**, consisting of a cylinder of pressurized nitrogen, an expansion chamber with pressure gauges, and a number of valves. An example is shown in figure 3.

**3.2 Beakers**, of capacity about 50 ml.

**3.3 Timer**, accurate to 0,1 s.

**3.4 Balance**, accurate to  $\pm 0,5$  g.

**3.5 Thermometer**, to measure a temperature of  $23 \pm 0,5$  °C.

## 4 Conditioning

The paste may be tested immediately after its preparation or after conditioning at a temperature of 23 °C. The conditioning time shall be indicated in the test report.