
International Standard



7387/1

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

Adhesives with solvents for assembly of u PVC pipe elements — Characterization — Part 1 : Basic test methods

Adhésifs à solvant pour assemblages d'éléments de canalisation en u PVC — Identification — Partie 1 : Méthodes d'essai de base

First edition — 1983-09-15

UDC 665.939.5 : 621.643.29 : 620.1

Ref. No. ISO 7387/1-1983 (E)

Descriptors : piping, plastic tubes, unplasticized polyvinyl chloride, adhesive, tests, determination, viscosity, dynamic viscosity, dry matter.



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (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 authorized 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 7387/1 was developed by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, and was circulated to the member bodies in May 1981.

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

Australia	Greece	Romania
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The member body of the following country expressed disapproval of the document on technical grounds :

United Kingdom

Adhesives with solvents for assembly of u PVC pipe elements — Characterization —

Part 1 : Basic test methods

0 Introduction

ISO 7387 is a collection of test methods relating to the characterization of adhesives with solvents for the assembly of u PVC pipes and fittings.

These methods have been divided into groups, each of which is issued as a part of ISO 7387.

Part 1 consists of the basic methods which are essential in deciding the uniformity of an adhesive in relation to itself.

Part 2 consists of methods which can, if necessary, be used to supplement the previous ones for the same purpose.

Part 3 gives methods for separating the constituent parts of the adhesives, for the purpose of closer characterization.

Methods of testing suitability for use are planned to supplement the test methods for characterization.

The various test methods are given in the following parts of ISO 7387.

Part 1 : Basic test methods

- Dynamic viscosity according to the shear rate
- Brookfield viscosity
- Conventional dry matter content
- Ash content

Part 2 : Secondary test methods

- Bulk density
- Flash point

Part 3 : Other test methods

- Determination of the total quantity of resin and powder substances
- Extraction and determination of the total quantity of solvents

1 Scope and field of application

This part of ISO 7387 specifies the basic test methods for adhesives with solvents for the assembly of u PVC pipe elements for characterization purposes.

It is divided into three sections :

Section one : viscosity;

Section two : conventional dry matter content;

Section three : ash content. (Applicable only to adhesives which do not contain a filler unstable at the test temperature.)

Section one : Viscosity

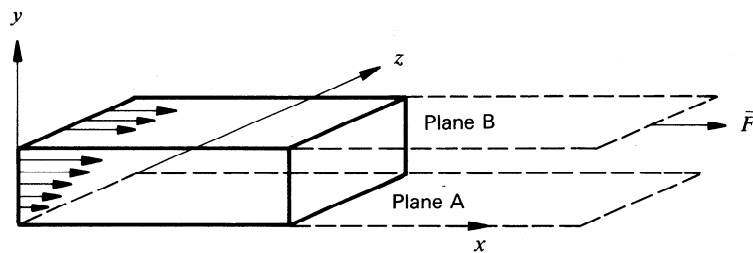
2 General

Two test methods are specified for the determination of this characteristic. The first allows the measurement of dynamic viscosity according to the shear rate; this is the reference method. The second is the Brookfield method which can be reserved, for example, for manufacturing inspection.

3 Dynamic viscosity according to shear rate

3.1 Definitions

For the purpose of this International Standard, the viscosity of a solution is defined as follows :



Consider a volume of liquid lying within two parallel planes, A and B.

Plane A is stationary, plane B is moved at a uniform velocity v by a force F .

Assuming laminar flow, when rate velocity v is low, it can be assumed that the laminar elements of liquid slide in relation to each other at a uniform shear rate defined by the formula :

$$\dot{\gamma} = \frac{dv}{dy}$$

In the case of laminar flow, $\dot{\gamma}$ is in direct proportion to the force applied per surface unit, A :

$$\dot{\gamma} = \frac{1}{\eta} \times \frac{F}{A}$$

where

η is the reciprocal of the coefficient of proportionality, that is the dynamic viscosity of the liquid under consideration; in pascals seconds (Pa.s)*;

$$\frac{F}{A} = \tau \text{ is the shear stress, in pascals (Pa);}$$

$\dot{\gamma}$ is the shear rate, in seconds to the power minus one (s^{-1}).

Liquids for which, at a given temperature, τ is independent of $\dot{\gamma}$ are called Newtonian. In other cases, the liquid is said to be non-Newtonian.

A liquid can therefore only be characterized by its viscosity coefficient if it is Newtonian. If this is not so, the value of $\dot{\gamma}$ or τ for which η is indicated shall be stated.

3.2 Principle

Measuring, at a determined temperature, the value of torque required to overcome the resistance of adhesive to the movement of an immersed rotor turning at a determined and constant rate.

Plotting of the shear stress curve as a function of the shear rate ($\tau = \eta \dot{\gamma}$).

3.3 Apparatus

Viscometer, with a cylindrical moving body, turning in a vessel which is also cylindrical. The vessel and the cylinder are strictly coaxial.

This viscometer shall be equipped with the following :

- manual switch allowing selection of known shear rates;
- measuring equipment allowing a value p proportional to the viscosity and to the shear stress τ to be indicated.
- thermostatically controlled environment, enabling the revolving moving body and the vessel to be kept at a constant temperature.

3.4 Preparation of the test sample

Mix the adhesive to make it homogeneous and take a sample of sufficient volume to enable two measurements to be carried out.

* 1 Pa.s = 1 N.s/m² = 10³ cP (centipoise).