

---

# INTERNATIONAL STANDARD 4608

---

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

---

## Plastics — PVC resins for general use — Determination of plasticizer absorption at room temperature

*Plastiques — Résines de polychlorure de vinyle à usages généraux — Détermination de la prise de plastifiant à froid*

**iTeh STANDARD PREVIEW**

First edition — 1977-10-01

**(standards.iteh.ai)**

[ISO 4608:1977](#)

<https://standards.iteh.ai/catalog/standards/sist/70690262-73ef-44f7-8198-bcf7165a372a/iso-4608-1977>

---

UDC 678.743.22 : 678.01 : 541.183.03

Ref. No. ISO 4608-1977 (E)

**Descriptors** : plastics, polyvinyl chloride, tests, determination, plasticizer absorption.

## 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 4608 was developed by Technical Committee ISO/TC 61, *Plastics*, and was circulated to the member bodies in December 1975.

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

Australia	Ireland	South Africa, Rep. of
Austria	Israel	Spain
Belgium	Italy	Sweden
Brazil	Japan	Switzerland
Canada	Mexico	Turkey
Finland	Netherlands	United Kingdom
France	New Zealand	U.S.A.
Germany	Peru	U.S.S.R.
Hungary	Poland	Yugoslavia
India	Portugal	
Iran	Romania	

No member body expressed disapproval of the document.

# Plastics – PVC resins for general use – Determination of plasticizer absorption at room temperature

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for determining plasticizer absorption at room temperature. It is applicable to general purpose resins (designated "G" in ISO 1060, *Plastics – Designation of polyvinyl chloride resins*).

The object of the test is to determine the quantity of plasticizer absorbed by a resin at room temperature to give a dry mixture.

The results give a general indication of the plasticizer absorption of the resins at room temperature. They indicate the usefulness of resins for the manufacture of plasticized dry blends, particularly when taken in conjunction with the results of plasticizer absorption tests under hot conditions.

## 2 PRINCIPLE

Addition of an excess of di-2-ethylhexyl phthalate (DOP) to a specific amount of resin. Centrifuging of the mixture under defined conditions and calculation of the amount of plasticizer retained by the resin.

## 3 REAGENT

### 3.1 Di-2-ethylhexyl phthalate (DOP).

## 4 APPARATUS

Usual laboratory apparatus, and the following :

4.1 Balance, accurate to 0,1 mg.

4.2 Burette, for example 50 ml, graduated in 0,1 ml.

4.3 Centrifuge, whose rotor turns in a horizontal plane and which has an acceleration under the test conditions of  $24\,500$  to  $29\,500\text{ m}\cdot\text{s}^{-2}$  measured at the level of the bottom of the tube, with, if necessary, a cooling system to prevent the temperature of the mixture from exceeding  $30\text{ }^{\circ}\text{C}$  at the end of centrifuging for 60 min.

NOTE – It is permissible to use higher acceleration to reduce the centrifuging time, for example  $34\,500\text{ m}\cdot\text{s}^{-2}$  and 30 min, provided that it has been verified that the results obtained are equivalent.

4.4 Centrifuge tubes, to fit the centrifuge used, consisting of a tube, usually of glass, with a conical bottom pierced by a hole of about 0,8 mm diameter. See the figure.

4.5 Plastic sheaths (polyamide, polyethylene, etc.) with a piece of polyvinyl chloride pipe at the bottom to support the centrifuge tube. See the figure.

Dimensions in millimetres

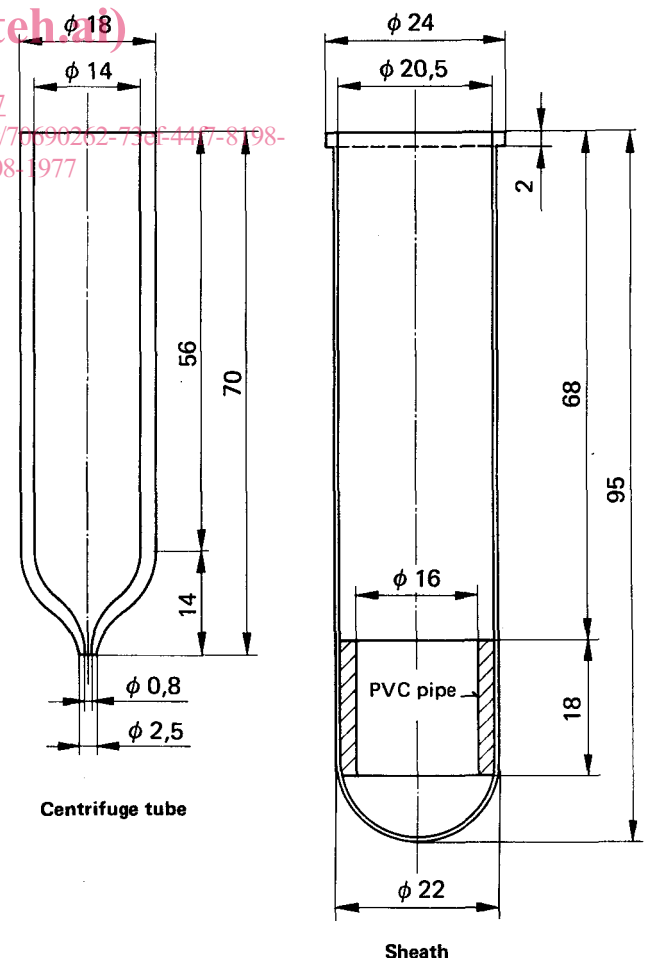


FIGURE – Example of centrifuge tube and sheath

**4.6 Cotton wool**, pharmaceutical quality, having a DOP absorption measured under the test conditions (see 5.1) of approximately 10 %.

NOTE — Glass wool may be used if it is shown to give equivalent results.

## 5 PROCEDURE

### 5.1 Measurement of DOP absorbed by the cotton wool

Under the conditions indicated in 5.2, carry out a test with a piece of cotton wool having a mass of  $100 \pm 2$  mg, but without resin.

Determine the amount of DOP absorbed by the cotton wool, in grams (mass  $m_0$ ).

### 5.2 Determination

Weigh a piece of cotton wool ( $100 \pm 2$  mg), place it in the centrifuge tube and pack it down slightly. Weigh the tube and cotton wool to the nearest  $\pm 0,1$  mg,  $m_1$  being the mass, in grams, of the prepared tube.

Weigh directly into the tube, to the nearest 1 mg, 2 g of the resin under test,  $m_2$  being the mass, in grams, of the prepared tube plus resin, to the nearest 0,1 mg.

From the burette, run into the tube 4 ml of DOP (3.1) and allow it to stand for about 10 min.

Then put the tube into its sheath and place the whole into one of the compartments of the centrifuge rotor (the other compartments being occupied by tubes containing other resins, all the tubes being balanced).

Set the centrifuge to give an acceleration of  $24\,500$  to  $29\,500 \text{ m}\cdot\text{s}^{-2}$  at the level of the bottom of the tube for 60 min. If necessary, the cooling device shall be switched on during centrifuging. Check that the temperature does not exceed  $30^\circ\text{C}$ .

Take the tube from its sheath, carefully wipe it to remove any DOP on the outside and weigh it to the nearest 0,1 mg,  $m_3$  being the mass, in grams, of the tube containing the resin and absorbed DOP.

## 6 EXPRESSION OF RESULT

### 6.1 Calculation

The room temperature plasticizer absorption, expressed as parts of DOP absorbed per 100 parts of resin (p.h.r.), is given by the formula

$$\frac{(m_3 - m_0) - m_2}{m_2 - m_1} \times 100$$

where

$m_0$  is the mass, in grams, of DOP absorbed by cotton wool (5.1);

$m_1$  is the mass, in grams, of the centrifuge tube with cotton wool (5.2);

$m_2$  is the mass, in grams, of the centrifuge tube with cotton wool and resin sample (5.2);

$m_3$  is the mass, in grams, of the centrifuge tube with resin and DOP absorbed after centrifuging (5.2).

### 6.2 Precision

Interlaboratory trials conducted on six resins in nine laboratories have shown the coefficients of variation to be as follows:

— **within laboratory**:  $\pm 0,5$  to  $\pm 3,5\%$  (with some instances of  $\pm 4$ ,  $\pm 5$  and even  $\pm 7\%$ );

— **between laboratory**: about twice those of within-laboratory results.

## 7 TEST REPORT

The test report shall include the following information:

- reference to this International Standard;
- full details necessary for the identification of the sample;
- centrifuging conditions (acceleration and time) if these differ from those defined in the method, and the temperature after centrifuging, if greater than  $30^\circ\text{C}$ ;
- the room temperature plasticizer absorption;
- date of the test.