

**Plastid. Polümeeride viskoossuse  
määramine lahjendatud lahuses, kasutades  
kapillaarviskosimeetrit. Osa 2:  
Polü(vinüülkloriid)vaigud**

Plastics - Determination of the viscosity of polymers  
in dilute solution using capillary viscometers - Part 2:  
Poly(vinyl chloride) resins

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 1628-2:2000 sisaldab Euroopa standardi EN ISO 1628-2:1998 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 20.03.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 1628-2:2000 consists of the English text of the European standard EN ISO 1628-2:1998.</p> <p>This document is endorsed on 20.03.2000 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>Rahvusvahelise standardi ISO 1628 käesolev osa määrab kindlaks tingimused PVC-vaikude taandatud viskoossuse (tuntud ka kui viskoossusindeks) ja K-arvu määramiseks. See meetod kehtib pulbrikujuliste vaikude kohta, mis koosnevad vinüülkloriidi monomeeride homopolümeeridest või kopolümeeridest, terpolümeeridest jne., mis on saadud vinüülkloriidi polümerisatsioonil koos ühe või mitme teise aine monomeeriga, kuid kus vinüülkloriid on põhikomponendiks.</p>	<p><b>Scope:</b></p>
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**ICS 83.080.20**

**Võtmesõnad:** lahustuv aine, määramine, plastid, polüvinüülkloriid, testimine, vaigud, viskoossuse mõõtmine, viskoossusindeks

English version

Plastics

Determination of the viscosity of polymers in dilute  
solution using capillary viscometers

Part 2: Poly(vinyl chloride) resins  
(ISO 1628-2 : 1998)

Plastiques – Détermination de la viscosité des polymères en solution diluée à l'aide de viscosimètres à capillaires – Partie 2: Résines de poly(chlorure de vinyle) (ISO 1628-2 : 1998)

Kunststoffe – Bestimmung der Viskosität von Polymeren in verdünnter Lösung unter Verwendung von Kapillärviskosimetern – Teil 2: Vinylchlorid-Polymere (ISO 1628-2 : 1998)

This European Standard was approved by CEN on 1998-12-13.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

**Central Secretariat: rue de Stassart 36, B-1050 Brussels**

## Foreword

International Standard

ISO 1628-2 : 1998 Plastics – Determination of the viscosity of polymers in dilute solution using capillary viscometers – Part 2: Poly(vinyl chloride) resins,

which was prepared by ISO/TC 61 'Plastics' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 249 'Plastics', the Secretariat of which is held by IBN, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by June 1999 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 1628-2 : 1998 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

## 1 Scope

This part of ISO 1628 specifies conditions for the determination of the reduced viscosity (also known as viscosity number) and  $K$ -value of PVC resins. It is applicable to resins in powder form which consist of homopolymers of the monomer vinyl chloride and copolymers, terpolymers, etc., of vinyl chloride with one or more other monomers, but where vinyl chloride is the main constituent. The resins may contain small amounts of unpolymerized substances (e.g. emulsifying or suspending agents, catalyst residues, etc.) and other substances added during the course of the polymerization. This part of ISO 1628 is not applicable, however, to resins having a volatile-matter content in excess of  $0,5 \% \pm 0,1 \%$ , when determined in accordance with ISO 1269. In addition to this, it is not applicable to resins which are not entirely soluble in cyclohexanone.

The reduced viscosity and  $K$ -value of a particular resin are related to its molecular mass, but the relationship varies depending on the concentration and type(s) of other monomer(s) present. Hence homopolymers and copolymers having the same reduced viscosity or  $K$ -value may not have the same molecular mass.

The values determined for reduced viscosity and  $K$ -value, for a particular sample of PVC resin, are influenced differently by the concentration of the solution chosen for the determination. Hence the use of the procedures described in this part of ISO 1628 will only give values for reduced viscosity and  $K$ -value that are comparable when the concentrations of the solutions used are identical.

Limiting viscosity number is not used for PVC resins.

The experimental procedures described in this part of ISO 1628 can also be used to characterize the polymeric fraction obtained during the chemical analysis of a PVC composition. However, the values calculated for the reduced viscosity and  $K$ -value in these circumstances may not indicate the actual values for the resin used to produce the composition because of the impure nature of the recovered polymer fraction.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 1628. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 1628 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1042:1998, *Laboratory glassware — One-mark volumetric flasks.*

ISO 1269:1980, *Plastics — Homopolymer and copolymer resins of vinyl chloride — Determination of volatile matter (including water)*.

ISO 1628-1:1998, *Plastics — Determination of the viscosity of polymers in dilute solution using capillary viscometers — Part 1: General principles*.

ISO 3105:1994, *Glass capillary kinematic viscometers — Specifications and operating instructions*.

### 3 Definitions

The terms used in this part of ISO 1628 are defined in ISO 1628-1:1998, clause 3, and, in particular, definitions 3.3.3 (reduced viscosity) and 3.3.6 (*K*-value).

### 4 Principle

A test portion is dissolved in a solvent. The reduced viscosity and the *K*-value are calculated from the efflux times for the solvent and the solution in a capillary tube viscometer.

### 5 Materials

**5.1 Cyclohexanone**, having a viscosity/density ratio (kinematic viscosity) between  $2,06 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$  and  $2,33 \times 10^{-6} \text{ m}^2 \text{ s}^{-1}$  ( $2,06 \text{ mm}^2 \text{ s}^{-1}$  and  $2,33 \text{ mm}^2 \text{ s}^{-1}$ ) at 25 °C. The specified boiling point shall be 155 °C. Store the solvent in the dark in a dark-coloured bottle fitted with a ground-glass stopper. Check the kinematic viscosity before use.

### 6 Apparatus

The apparatus required to carry out viscosity measurements on polymers in dilute solution is described in ISO 1628-1:1998, clause 5. In addition, the following particular items are required for the procedures described in this part of ISO 1628:

**6.1 Viscometer:** From the viscometers described in subclause 5.1 of ISO 1628-1:1998, model 1C, with a capillary diameter of  $0,77 \text{ mm} \pm 2 \%$ , from table B.4 of ISO 3105:1994, shall be used as the reference viscometer.

Other viscometers described in ISO 1628-1 may be used provided the correlation between the chosen viscometer and the reference viscometer has been established over the range of reduced viscosities and *K*-values to be measured, and the results are corrected accordingly.

**6.2 Graduated flask** (one-mark volumetric flask), class A, as specified in ISO 1042, with a volume of 50 ml.

**NOTE** The use of a flask calibrated at a temperature of 20 °C — as specified in ISO 1042 — causes a systematic error which can, however, be neglected.

**6.3 Filter funnel**, with fritted-glass filter disc of medium porosity (pore size 40 µm to 50 µm), or **glass funnel with paper filter**.

**6.4 Mechanical agitator**, equipped with a heating device to keep the flask (6.2) and its contents at a temperature between 80 °C and 85 °C.

As an alternative, a rotary agitator or shaker may be placed in an oven at a temperature between 80 °C and 85 °C.

**6.5 Analytical balance**, accurate to 0,1 mg.