



SLOVENSKI STANDARD
SIST EN ISO 2431:1997

01-december-1997

Barve in laki - Določanje iztočnega časa z uporabo iztočnih čaš (ISO 2431:1993, vključno s tehničnim popravkom 1:1994)

Paints and varnishes - Determination of flow time by use of flow cups (ISO 2431:1993, including Technical Corrigendum 1:1994)

Lacke und Anstrichstoffe - Bestimmung der Auslaufzeit mit Auslaufbechern (ISO 2431:1993, einschließlich Technische Korrektur 1:1994)

Peintures et vernis - Détermination du temps d'écoulement au moyen de coupes d'écoulement (ISO 2431:1993, Rectificatif Technique 1:1994 inclus)

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Ta slovenski standard je istoveten z: EN ISO 2431:1996

ICS:

87.040

Barve in laki

Paints and varnishes

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en

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EUROPEAN STANDARD

EN ISO 2431

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 1996

Supersedes EN 535:1991

ICS 87.040

Descriptors: paints, varnishes, tests, determination, flow time, viscosity, test equipment, calibration

English version

**Paints and varnishes - Determination of flow time
by use of flow cups (ISO 2431:1993, including
Technical Corrigendum 1:1994)**

Peintures et vernis - Détermination du temps
d'écoulement au moyen de coupes d'écoulement
(ISO 2431:1993, Rectificatif Technique 1:1994
inclus)

Lacke und Anstrichstoffe - Bestimmung der
Auslaufzeit mit Auslaufbechern (ISO 2431:1993,
einschließlich Technische Korrektur 1:1994)

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This European Standard was approved by CEN on 1995-11-12. 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.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

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

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

Foreword

The text of the International Standard from Technical Committee ISO/TC 35 "Paints and varnishes" of the International Organization for Standardization (ISO) has been taken over as a European Standard by the Technical Committee CEN/TC 139 "Paints and varnishes", the secretariat of which is held by DIN.

This European Standard replaces EN 535:1991.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 1996, and conflicting national standards shall be withdrawn at the latest by October 1996.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

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The text of the International Standard ISO 2431:1993, including Technical Corrigendum 1:1994 has been approved by CEN as a European Standard without any modification.

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NOTE: Normative references to International Standards are listed in annex ZA (normative).

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Annex ZA (normative)**Normative references to international publications
with their relevant European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

| Publication | Year | Title | EN | Year |
|-------------|------|---|-------------|------|
| ISO 1512 | 1991 | Paints and varnishes - Sampling of products in liquid or paste form | EN 21512 | 1994 |
| ISO 1513 | 1992 | Paints and varnishes - Examination and preparation of samples for testing | EN ISO 1513 | 1994 |

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INTERNATIONAL
STANDARD

ISO
2431

Fourth edition
1993-02-15

**Paints and varnishes — Determination of
flow time by use of flow cups**

iTeh STANDARD PREVIEW
*Peintures et vernis — Détermination du temps d'écoulement au moyen
de coupes d'écoulement*
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SIST EN ISO 2431:1997

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Reference number
ISO 2431:1993(E)

ISO 2431:1993(E)**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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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International Standard ISO 2431 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Sub-Committee SC 9, *General test methods for paints and varnishes*.

This fourth edition cancels and replaces the third edition (ISO 2431:1984), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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Introduction

The first edition of this International Standard, published in 1972, specified only one flow cup of orifice diameter 4 mm. The second edition specified three flow cups of orifice diameter 3 mm, 4 mm and 6 mm. The third edition corrected errors in figures 2 and 4 and the equations for those figures. This fourth edition specifies four flow cups of orifice diameter 3 mm, 4 mm, 5 mm and 6 mm.

As is well known, many countries over the years have developed their own standard flow cups and the difficulty in correlation between them has led to considerable confusion in comparing values. The standardization of an improved design of flow cup has been recommended after careful consideration, by an expert working group, of the role of flow cups for the measurement of flow time of paints, varnishes and related products.

It is recognized that the flow times are reproducible only for products of Newtonian or near-Newtonian flow properties. This effectively limits their practical use. Nevertheless, for checking purposes, these flow cups do serve a useful purpose. Furthermore, the measurement of flow time is often used to confirm the application consistency.

Paints often contain flow-arresting agents to confer increased viscosity. Such paints exhibit anomalous flow properties. Their viscosity during application can only be properly assessed using viscometers operating at high velocity gradients, such as that described in ISO 2884.

Resins and varnishes may exhibit Newtonian or near-Newtonian flow at much higher viscosities than most paints and, where this applies, flow cups can provide a useful means of controlling the consistency. To meet this requirement, this International Standard provides flow cups suitable for viscosities up to about $700 \text{ mm}^2/\text{s}$.

Recommendations for the use of flow cups for the adjustment of paint consistency are given in annex A.

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Paints and varnishes — Determination of flow time by use of flow cups

1 Scope

1.1 This International Standard is one of a series of standards dealing with the sampling and testing of paints, varnishes and related products.

1.2 This International Standard specifies a method for determining the flow time of paints, varnishes and related products that may be used to control consistency. A method for the adjustment of paints to the correct application consistency at the application temperature is described in annex A.

1.3 Four flow cups of similar dimensions, but having orifice diameters of 3 mm, 4 mm, 5 mm and 6 mm, are specified. The method for their calibration is given.

1.4 The method is limited to testing materials for which the breakpoint of the flow from the orifice of the flow cup can be determined with certainty. This point is difficult to determine and reproduce for materials with flow times in excess of 100 s due to slowing-down effects.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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 1512:1991, *Paints and varnishes — Sampling of products in liquid or paste form.*

ISO 1513:1992, *Paints and varnishes — Examination and preparation of samples for testing.*

ISO 2884:1974, *Paints and varnishes — Determination of viscosity at a high rate of shear.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 flow time: Time that elapses from the moment when the material under test starts to flow from the orifice of the filled cup to the moment when the flow stream of material first breaks close to the orifice.

3.2 Newtonian flow: Type of flow exhibited by a material in which the ratio of the shear stress to the velocity gradient does not vary either with time or with the velocity gradient. When variations in this ratio are small, the effect on viscosity of mechanical disturbance, such as stirring, is negligible and the material is said to have near-Newtonian flow.

3.3 anomalous flow: Type of flow exhibited by a material in which, at a constant temperature, the ratio of the shear stress to the velocity gradient varies either with time or with rate of shear. For example, with so-called thixotropic materials, stirring or other such mechanical disturbance immediately before test will reduce the flow time below that for an unstirred sample. With such materials, uncertain and variable values for flow time are obtained in all flow cups.