Binders for paints and varnishes - Determination of hydroxyl value - Part 3: Rapid test (ISO 4629-3:2018)

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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 4629-3:2020 sisaldab Euroopa standardi EN ISO 4629-3:2020 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 4629-3:2020 consists of the English text of the European standard EN ISO 4629-3:2020.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 02.09.2020.	Date of Availability of the European standard is 02.09.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Binders for paints and varnishes - Determination of hydroxyl value - Part 3: Rapid test (ISO 4629-3:2018)

Liants pour peintures et vernis - Détermination de l'indice d'hydroxyle - Partie 3: Méthode rapide (ISO 4629-3:2018)

Bindemittel für Beschichtungsstoffe - Bestimmung der Hydroxylzahl - Teil 3: Schnellverfahren (ISO 4629-3:2018)

This European Standard was approved by CEN on 19 July 2020.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

The text of ISO 4629-3:2018 has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 4629-3:2020 by Technical Committee CEN/TC 139 "Paints and varnishes" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by March 2021, and conflicting national standards shall be withdrawn at the latest by March 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 4629-3:2018 has been approved by CEN as EN ISO 4629-3:2020 without any modification.

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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 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*.

A list of all parts in the ISO 4629 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The most frequently described method for determining the hydroxyl number is conversion with acetic anhydride in pyridine with subsequent titration of the released acetic acid.

$$H_3C\text{-}CO\text{-}O\text{-}CO\text{-}CH_3 + R\text{-}OH \rightarrow R\text{-}O\text{-}CO\text{-}CH_3 + CH_3COOH$$

However, this method suffers from the following disadvantages:

— the sample is boiled under reflux for 1 h;

— the method cannot be automated;

— small hydroxyl numbers cannot be determined exactly;

— unpleasant and toxic pyridine is used.

For these reasons, a far simpler method was selected for automation. The (primary and secondary) hydroxyl groups are converted to acidic carbamate groups using toluene-4-sulfonyl-isocyanate.

$$H_3C\text{-}(C_6H_4)\text{-}SO_2\text{-}NCO + R\text{-}OH \rightarrow H_3C\text{-}(C_6H_4)\text{-}SO_2\text{-}NH\text{-}COOR$$

The carbamate can then be titrated with the strong base tetrabutylammonium hydroxide (TBAOH) under non-aqueous conditions, i.e. in an organic solvent.

Binders for paints and varnishes — Determination of hydroxyl value —

Part 3: Rapid test

1 Scope

This document specifies a titrimetric method for determining the hydroxyl groups in resins and binders for paints and varnishes.

This method is primarily suitable for neutral media. Acidic products provide higher values; neutral products provide, through neutralization of the acidic carbamates, lower values. For these products, preliminary tests are performed to ensure the applicability of the method.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4618, *Paints and varnishes — Terms and definitions*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
hydroxyl value
number of milligrams of potassium hydroxide (KOH) corresponding to hydroxyl groups that have been acetylated under specified test conditions in 1 g of the product tested

[SOURCE: ISO 4629-1:2016, 3.1]

4 Principle

The primary and secondary hydroxyl groups of the sample are converted to acidic carbamate groups using toluene-4-sulfonyl-isocyanate. The carbamate can then be titrated with the strong base tetrabutylammonium hydroxide (TBAOH) under non-aqueous conditions, i.e. in an organic solvent.