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Plastics - Determination of the viscosity of polymers in dilute solution using capillary viscometers - Part 1: General principles (ISO 1628-1:2021)

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Plastics - Determination of the viscosity of polymers in dilute solution using capillary viscometers - Part 1: General principles (ISO 1628-1:2021)

Plastiques - Détermination de la viscosité des polymères en solution diluée à l'aide de viscosimètres à capillaires - Partie 1: Principes généraux (ISO 1628-1:2021)

Kunststoffe - Bestimmung der Viskosität von Polymeren in verdünnter Lösung durch ein Kapillarviskosimeter - Teil 1: Allgemeine Grundlagen (ISO 1628-1:2021)

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European foreword

This document (EN ISO 1628-1:2021) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics" the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.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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The text of ISO 1628-1:2021 has been approved by CEN as EN ISO 1628-1:2021 without any modification.

**Plastics — Determination of the
viscosity of polymers in dilute solution
using capillary viscometers —**

**Part 1:
General principles**

*Plastiques — Détermination de la viscosité des polymères en solution
diluée à l'aide de viscosimètres à capillaires —*

Partie 1: Principes généraux



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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 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 1628-1:2009), which has been technically revised. It also incorporates the Amendment 1 ISO 1628-1:2009/Amd 1:2012.

The main changes compared to the previous edition are as follows:

- ISO 3205 (withdrawn) has been deleted from [Clause 2](#);
- the figure keys have been revised;
- nominal viscometer constant has been added to [Table 1](#);

A list of all parts in the ISO 1628 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.

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

Part 1: General principles

1 Scope

This document defines the general conditions for the determination of the reduced viscosity, intrinsic viscosity and *K*-value of organic polymers in dilute solution. It defines the standard parameters that are applied to viscosity measurement.

This document is used to develop standards for measuring the viscosities in solution of individual types of polymer. It is also used to measure and report the viscosities of polymers in solution for which no separate standards exist.

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 3105, *Glass capillary kinematic viscometers — Specifications and operating instructions*

ISO 80000-1, *Quantities and units — Part 1: General*

ISO 80000-4, *Quantities and units — Part 4: Mechanics*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 80000-1, ISO 80000-4 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 Terms related to any liquid

3.1.1

viscosity

property of a fluid sheared between two parallel plates, one of which moves relative to the other in uniform rectilinear motion in its own plane, defined by the Newton formula

$$\tau = \eta \dot{\gamma}$$

where