Plastics - Ultra-high-molecular-weight polyethylene (PE-UHMW) moulding and extrusion materials - Part 1: Designation system and basis for specifications (ISO 21304-1:2019)

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 21304-1:2019 sisaldab Euroopa standardi EN ISO 21304-1:2019 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 21304-1:2019 consists of the English text of the European standard EN ISO 21304-1:2019.
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 17.04.2019.	Date of Availability of the European standard is 17.04.2019.
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.

ICS 83.080.20

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 21304-1

April 2019

ICS 83.080.20

Supersedes EN ISO 11542-1:2001

English Version

Plastics - Ultra-high-molecular-weight polyethylene (PE-UHMW) moulding and extrusion materials - Part 1: Designation system and basis for specifications (ISO 21304-1:2019)

Plastiques - Matériaux à base de polyéthylène à très haute masse moléculaire (PE-UHMW) pour moulage et extrusion - Partie 1: Système de désignation et base de spécifications (ISO 21304-1:2019)

Kunststoffe - Ultrahochmolekulare Polyethylen (PE-UHMW)-Werkstoffe - Teil 1: Bezeichnungssystem und Basis für Spezifikationen (ISO 21304-1:2019)

This European Standard was approved by CEN on 16 March 2019.

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

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Ref. No. EN ISO 21304-1:2019 E

European foreword

This document (EN ISO 21304-1:2019) 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 October 2019, and conflicting national standards shall be withdrawn at the latest by October 2019.

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.

This document supersedes EN ISO 11542-1:2001.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 21304-1:2019 has been approved by CEN as EN ISO 21304-1:2019 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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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 9, *Thermoplastic materials*.

This first edition of ISO 21304-1 cancels and replaces ISO 11542-1:2001, which has been technically revised to introduce a new designation system.

The revised designation system is published under a new ISO number, as many existing documents refer to ISO 11542-1. If the existing ISO 11542-1 would be replaced by the new designation system, these documents would refer to the incorrect designation system.

The new designation system according to ISO 21304-1 is intended to replace gradually any designation system according to ISO 11542-1.

During this period, ISO 11542-2 will effectively be Part 2 of this document.

A list of all parts in the ISO 21304 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 — Ultra-high-molecular-weight polyethylene (PE-UHMW) moulding and extrusion materials —

Part 1: Designation system and basis for specifications

1 Scope

This document establishes a system of designation for thermoplastic PE-UHMW materials, which can be used as the basis for specifications.

For the purposes of this document, PE-UHMW materials are polyethylene materials having a melt mass-flow rate (MFR) of less than 0,1 g/10 min, measured at 190 °C and 21,6 kg load.

NOTE It has been confirmed that the melt volume-flow rate (MVR) is useful for characterizing some PE-UHMW materials (e.g. pipe materials) under the test condition of 230 °C/21,6 kg and bore diameter of die with 3,628 mm (see ISO 21304-2).

The types of PE-UHMW are differentiated from each other by a classification system based on appropriate levels of the designatory properties:

a) viscosity number;

b) elongational stress;

c) Charpy double-notched impact strength;

and on information about the intended application and/or method of processing, important properties, additives, colorants, fillers and reinforcing materials.

This designation system is applicable to all PE-UHMW homopolymers and to ultra-high-molecular-weight copolymers of ethylene having a content of other 1-olefinic monomers of less than 50 % by mass and a content of non-olefinic monomers with functional groups up to a maximum of 3 % by mass. It applies to materials ready for normal use in the form of powder, granules or pellets, unmodified or modified by colorants, fillers and other additives.

It is not intended to imply that materials having the same designation give necessarily the same performance. This document does not provide engineering data, performance data or data on processing conditions which can be required to specify a material. If such additional properties are required, they are intended to be determined in accordance with the test methods specified in ISO 21304-2, if suitable.

In order to specify a thermoplastic PE-UHMW material to meet particular specifications, the requirements are to be given in data block 5 (see 4.1).

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 1043-1, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics*

ISO 1628-3, *Plastics — Determination of viscosity number and limiting viscosity number — Part 3: Polyethylenes and polypropylenes*

ISO 5834-1, *Implants for surgery — Ultra-high molecular weight polyethylene — Part 1: Powder form*

ISO 21304-2[1)], *Plastics — Ultra-high-molecular-weight polyethylene (PE-UHMW) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties*

3 Terms and definitions

No terms and definitions are listed in this document.

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/

4 Designation system

4.1 General

The designation system for thermoplastics is based on the following standardized pattern:

Designation						
Description block (optional)	Identity block					
	International Standard number block	Individual-item block				
		Data block 1	Data block 2	Data block 3	Data block 4	Data block 5

The designation consists of an optional description block, reading “Thermoplastics”, and an identity block comprising the International Standard number and an individual-item block. For unambiguous coding, the individual-item block is subdivided into five data blocks comprising the following information:

— Data block 1: Identification of the plastic by its symbol PE-UHMW, it shall be in accordance with ISO 1043-1 (see 4.2).

— Data block 2: Fillers or reinforcing materials and their nominal content (see 4.3).

— Data block 3: Position 1: Intended application or method of processing (see 4.4).

Positions 2 to 8: Important properties, additives and supplementary information (see 4.4).

— Data block 4: Designatory properties (see 4.5).

— Data block 5: For the purpose of specifications, a fifth data block contains appropriate information (see 4.6).

The first character of the individual item block shall be a hyphen. The five data blocks shall be separated from each other by commas. If a data block is not used, this shall be indicated by doubling the separation sign, i.e. by two commas (,,).

4.2 Data block 1

In this data block, after the hyphen, PE-UHMW plastics are identified by the symbol “PE-UHMW”, in accordance with ISO 1043-1.

1) Under preparation. Stage at the time of publication: ISO/FDIS 21304-2:2019.