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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 21461.1-2023

Replacing GB/T 21461.1-2008

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

塑料 超高分子量聚乙烯 (PE-UHMW) 模塑和挤出材料 第1部分：命名系统和分
类基础

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document is Part 1 of GB/T 21461 "Plastic ultra-high molecular weight polyethylene (PE-UHMW) molding and extrusion materials":

GB/T 21461 has published the following parts:

---Part 1: Nomenclature system and classification basis;

---Part 2: Sample preparation and performance determination:

This document replaces GB/T 21461.1-2008 "Plastic ultra-high molecular weight polyethylene (PE-UHMW) molding and extrusion materials No: 1 Part: Naming System and Classification Basis", compared with GB/T 21461.1-2008, in addition to structural adjustments and editorial changes, the main technical changes transformed as follows:

a) Part of the content of the scope has been changed, and the characteristic property "viscosity" has been changed to "viscosity number (specific concentrated viscosity)"; special purpose materials can be Description of additional requirements for character group 5 was changed to the clauses related to character group 5 (see Chapter 1 and 4:6, 2008 edition of 1:5 and 3:6);

b) Added description group and national standard number part (see 4.1);

c) Changed the order of character groups in named feature item groups (see Chapter 4, Chapter 3 of the:2008 edition);

d) The meaning of the letter "E" in position 1 of character group 3 has been changed from "extrusion" to "extruded pipes, profiles and sheets/plates";

The meaning of the mother "Y" is changed from "spinning" to "fiber, spinning" (see Table 2, Table 1 of the:2008 version);

e) Changed the range of viscosity number (see Table 3, Table 2 of the:2008 version);

- f) The range of tensile stress has been changed (see Table 4, Table 3 of the:2008 edition);
- g) Changed the range of double-notch impact strength of simply supported beams (see Table 5, Table 4 of the:2008 edition);
- h) Added naming examples for ultra-high molecular weight polyethylene thermoplastics used for extruded pipes (see 5.1:2) and ultra-high molecular weight polyethylene thermoplastics used for spinning:

Examples of nomenclature for high molecular weight polyethylene thermoplastics (see 5.1:3):

This document is modified to adopt ISO 21304-1:2019 "Plastic ultra-high molecular weight polyethylene (PE-UHMW) molding and extrusion materials" Part 1: Nomenclature systems and basics of classification:

The technical differences between this document and ISO 21304-1:2019 and their reasons are as follows:

- a) Part of the content of the scope has been changed, and the characteristic performance "viscosity number" has been changed to "viscosity number (specific concentrated viscosity)"; special-purpose materials can be the description of additional requirements given in character group 5 has been changed to the clauses related to character group 5 to make the content of the standard clearer and facilitate this document:

Application of documentation (see Chapter 1 and 4:6);

- b) Replace ISO 1043-1 (see 4.1) with normatively quoted GB/T 1844.1 to adapt to my country's technical conditions and increase operability work nature;
- c) Replace ISO 1628-3 (see 4.5:2) with normatively quoted GB/T 1632.3 to adapt to my country's technical conditions and increase operability work nature;
- d) Replace ISO 21304-2 (see 4.5:3 and 4.5:4) with normatively cited GB/T 21461.2-2023 to adapt to my country's technology technical conditions to increase operability;
- e) Replace ISO 5834-1 (see 5.2) with normatively cited GB/T 19701.1 to adapt to my country's technical conditions and increase operability Doing things:

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

The previous version of GB/T 21461.1 (this document) and the previous version of GB/T 21461.2 released at the same time as this document are adopted equally:

ISO 11542-1:2001 and ISO 11542-2:1998: In:2016, my country took the lead in revising ISO 11542-1:2001 and ISO 11542-2:

In:1998, the ISO/TC61/SC9 Thermoplastics Branch revised the material naming system rules and released a new material naming system:

Name format template: In order to facilitate the readers and users of the standard to become familiar with it and use it during the transition period, ISO stipulates that the standard Part 1 of the new template should be adopted:

New standard numbers are given when the standard is revised: Part 2 standards also appear with new standard numbers when they are revised: Therefore, the ISO standard is revised to ISO 21304-1:2019 and ISO 21304-2:2021 replace ISO 11542-1:2001 and ISO 11542-2:1998 respectively:

GB/T 21461 is intended to consist of two parts:

---Part 1: Nomenclature system and classification basics: The purpose is to establish a standard model suitable for ultra-high molecular weight polyethylene materials:

Nomenclature and classification principles of materials:

---Part 2: Sample preparation and performance determination: The purpose is to establish a sample preparation method suitable for ultra-high molecular weight polyethylene materials:

Methods and performance measurement items, methods and conditions:

This document is modified to adopt ISO 21304-1:2019, based on the characteristics of ultra-high molecular weight polyethylene (PE-UHMW) molding and extrusion materials:

points, with specified characteristic property values as well as recommended uses and/or processing methods, important properties, additives, colorants, fillers and reinforcing materials et al.; specify a nomenclature classification method for different types of ultra-high molecular weight polyethylene molding and extrusion materials:

This document supplements the binning ranges for three characteristic properties of ultra-high molecular weight polyethylene (PE-UHMW) molded and extruded materials:

Improve, especially combined with the application characteristics of PE-UHMW materials in new fields, the viscosity number that characterizes the molecular weight of PE-UHMW materials:

The (reduced viscosity) binning range has been appropriately extended to the low molecular weight end: Therefore, this document and the previous version of this document are adopted for PE-UHMW Material nomenclature may vary: GB/T 21461.2 released at the same time as this document adopts a triple cut-off under the condition of 230°C/21.6kg:

It is a test item to measure the melt volume flow rate (MVR) of PE-UHMW materials using an area die (inner diameter 3:628mm), which can quickly measure part Flowability of lower molecular weight PE-UHMW materials for specific applications:

Due to the ISO standard revision rules and the rapid development of PE-UHMW materials

in my country, some aspects of the standard adoption standards will be revised during the revision process of this document:

Technical modifications have been made to the sub-clauses and contents, and comparative instructions have been given in appropriate ways:

Plastic ultra-high molecular weight polyethylene (PE-UHMW) Molding and Extrusion
Materials Part 1: Nomenclature System and classification basis

1 Scope

This document specifies a nomenclature system for ultra-high molecular weight polyethylene (PE-UHMW) thermoplastic materials that may serve as a classification Base:

The ultra-high molecular weight polyethylene (PE-UHMW) in this document refers to the melt mass at a temperature of 190°C and a load of 21:6kg:

Polyethylene materials with a flow rate (MFR) less than 0:1g/10min:

Note: GB/T 21461.2 has added the measurement of melt volume flow rate using a triple cross-sectional area die (inner diameter 3:628mm) under the conditions of 230°C/21:6kg:

(MVR) additional performance test items, which are valuable for characterizing the performance of certain PE-UHMW materials (such as pipe materials):

Different types of ultra-high molecular weight polyethylene thermoplastic materials are specified below with characteristic property values and recommended uses and/or processing A classification system based on methods, important properties, additives, colorants, fillers and reinforcing materials:

- a) Viscosity number (reduced viscosity);
- b) Definite tensile stress;
- c) Double-notch impact strength of simply supported beams:

This document applies to all PE-UHMW homopolymers and other 1-olefin monomers with a mass fraction of less than 50% and non-olefins with functional groups:

Copolymers with a mass fraction of hydrocarbon monomers not exceeding 3%:

This document applies to ultra-high molecular weight polymers that are conventionally in the form of powder, granules or granules, unmodified or modified by colorants, additives, fillers, etc:

Ethylene (PE-UHMW) thermoplastic:

This document does not imply that materials named identically will necessarily have the same properties: This document is not intended to illustrate the specific uses of the material and (or) Engineering data, performance data or processing condition data required for the