Designation: D2581 – 09

Standard Classification System for Polybutylene (PB) Plastics Molding and Extrusion Materials[1]

This standard is issued under the fixed designation D2581; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This classification system covers polybutylene plastics materials suitable for molding and extrusion.

1.2 This classification system is applicable to all butene homopolymers and to copolymers of butene with a maximum content of other 1-olefinic monomers of less than 50 % and with a content of non-olefinic monomers with functional groups up to a maximum of 1 %.

1.3 This classification system allows for the use of those polybutylene plastic materials that are to be recycled, reconstituted, and reground, provided the following conditions are met:

1.3.1 The requirements as stated in this classification system and other guideline pertaining to these materials are met, and

1.3.2 The material has not been modified in any way to alter its conformance to water contact regulations or other similar requirements.

1.4 The proportions of recycled, reconstituted, and regrind material used, as well as the nature and the amount of any contaminant, cannot be practically covered in this classification system. It is the responsibility of the supplier and buyer of recycled, reconstituted, and regrind materials to ensure compliance.

1.5 The properties included in this classification system are those required to characterize and classify the specific product. Other properties are necessary to identify particular characteristics important to specialized applications. These are specified by using suffixes as given in Section 5. Properties shall be selected in such a manner that consistency of different lots or shipments is assured. The tests involved in this classification system are intended to provide information for identifying materials in accordance with types and categories. It is not the function of this classification system to provide specific engineering data for design purposes.

1.6 This classification system and subsequent line callout (specification) are intended to provide a means of calling out plastic materials used in the fabrication of end items or parts. It is not intended for the selection of materials. Material selection is to be made by those having expertise in the plastic field after careful consideration of the design and the performance required of the part, the environment to which it will be exposed, the fabrication process to be employed, the costs involved, and the inherent properties of the material other than those covered by this standard.

1.7 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

NOTE 1—This standard, ISO 8986-1, and ISO 8986-2 address the same subject matter, but differ in technical content.

1.8 The following precautionary caveat pertains only to the test methods portion, Section 11, of this classification system: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C177 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

D149 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies

D150 Test Methods for AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulation

D257 Test Methods for DC Resistance or Conductance of Insulating Materials

D495 Test Method for High-Voltage, Low-Current, Dry Arc Resistance of Solid Electrical Insulation

D543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents

D570 Test Method for Water Absorption of Plastics

[1] This classification system is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

***A Summary of Changes section appears at the end of this standard**

D618 Practice for Conditioning Plastics for Testing
D635 Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
D638 Test Method for Tensile Properties of Plastics
D648 Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
D696 Test Method for Coefficient of Linear Thermal Expansion of Plastics Between −30°C and 30°C with a Vitreous Silica Dilatometer
D732 Test Method for Shear Strength of Plastics by Punch Tool
D746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
D883 Terminology Relating to Plastics
D1238 Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
D1505 Test Method for Density of Plastics by the Density-Gradient Technique
D1525 Test Method for Vicat Softening Temperature of Plastics
D1600 Terminology for Abbreviated Terms Relating to Plastics
D1603 Test Method for Carbon Black Content in Olefin Plastics
D2240 Test Method for Rubber Property—Durometer Hardness
D2863 Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)
D2990 Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics
D3418 Test Method for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry
D3801 Test Method for Measuring the Comparative Burning Characteristics of Solid Plastics in a Vertical Position
D3892 Practice for Packaging/Packing of Plastics
D3895 Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
D4000 Classification System for Specifying Plastic Materials
D4703 Practice for Compression Molding Thermoplastic Materials into Test Specimens, Plaques, or Sheets
D5033 Guide for Development of ASTM Standards Relating to Recycling and Use of Recycled Plastics (Withdrawn 2007)[3]
D5279 Test Method for Plastics: Dynamic Mechanical Properties: In Torsion
D5630 Test Method for Ash Content in Plastics
D6110 Test Method for Determining the Charpy Impact Resistance of Notched Specimens of Plastics
D7209 Guide for Waste Reduction, Resource Recovery, and Use of Recycled Polymeric Materials and Products (Withdrawn 2015)[3]
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
E105 Practice for Probability Sampling of Materials
E831 Test Method for Linear Thermal Expansion of Solid Materials by Thermomechanical Analysis
F699 Practice for Accelerated Conditioning of Polybutylene Pipe and Tubing for Subsequent Quality Control Testing (Withdrawn 2005)[3]

2.2 *ISO Standards:*
ISO 62 Test Method for Linear Thermal Expansion of Solid Materials by Thermomechanical Analysis
ISO 75-1 Plastics—Determination of Temperature of Deflection under Load—Part 1: General Test Method
ISO 75-2 Plastics—Determination of Temperature of Deflection under Load—Part 2: Plastics and Ebonite
ISO 178 Plastics—Determination of Flexural Properties
ISO 179 Plastics—Determination of Charpy Impact Properties—Part 2: Instrumented Impact Test
ISO 293 Plastics Compression Moulding of Test Specimens of Thermoplastic Materials
ISO 527-1 Plastics—Determination of tensile properties—Part 1: General Principles
ISO 527-2 Plastics—Determination of Tensile Properties—Part 2: Test Conditions for Moulding and Extrusion Plastics
ISO 604 Plastics—Determination of Compressive Properties
ISO 868 Plastics and Ebonite—Determination of Indentation Hardness by Means of a Durometer (Shore Hardness)
ISO 899-1 Plastics—Determination of Creep Behaviour—Part 1: Tensile Creep
ISO 899-2 Plastics—Determination of Creep Behaviour—Part 2: Flexural Creep by Three-Point Loading
ISO 1133 Plastics—Determination of The Melt Mass-Flow Rate (MFR) and The Melt Volume-Flow Rate (MVR) of Thermoplastics
ISO 1183-1 Plastics Methods for Determining the Density of Non-Cellular Plastics Part 1: Immersion Method, Liquid Pyknometer Method and Titration Method
ISO 1183-2 Plastics Methods for Determining the Density of Non-Cellular Plastics Part 2: Density Gradient Column Method
ISO 1628-3 Plastics—Determination of the Viscosity of Polymers in Dilute Solution Using Capillary Viscometers—Part 3: Polyethylenes and Polypropylenes-Second Edition
ISO 3451-1 Plastics—Determination of Ash—Part 1: General Methods
ISO 4589-2 Plastics—Determination of Ash—Part 1: General Methods
ISO 8256 Plastics—Determination of Tensile-Impact Strength
ISO 8986-1 Plastics—Polybutene (Pb) Moulding and Extrusion Materials—Part 1: Designation System and Basis for Specifications

[3] The last approved version of this historical standard is referenced on www.astm.org.