



Designation: D 6263 – 98

Standard Specification for Extruded Rods and Bars Made From Rigid Poly(Vinyl Chloride) (PVC) and Chlorinated Poly(Vinyl Chloride) (CPVC)¹

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INTRODUCTION

This specification is intended to be a means of calling out mechanical grade plastic product used in the fabrication of end items or parts.

1. Scope

1.1 This specification covers requirements and test methods for the material, dimensions, and workmanship, and the properties of extruded shapes of rods and bars made from poly(vinyl chloride) (PVC), and chlorinated poly(vinyl chloride) (CPVC).

1.2 The properties included in this specification are those required for the compositions covered. Requirements necessary to identify particular characteristics important to specialized applications may be described by using the classification system given in Section 4.

1.3 This specification allows for the use of regrind and recycled plastics as defined in Guide D 5033 providing: products produced from regrind or recycled PVC material can be shown to meet the requirements of this standard with regard to material classification, physical performance, dimensions and workmanship; and the regrind or recycled plastics used have not been subjected to severe environments in post consumer applications (such as chemical service) which could adversely affect the end products performance when subjected to machining or critical applications or both.

1.4 The values are stated in inch-pound units and are regarded as the standard in all property and dimensional tables. For reference purposes, SI units are also included in Table 1 only.

1.5 The following safety hazards caveat pertains only to the test method portions section of this specification: *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.*

¹ This specification is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.20 on Plastic Products (Section D20.20.02).

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NOTE 1—There is no similar or equivalent ISO standard.

2. Referenced Documents

2.1 ASTM Standards:

D 256 Test Method for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics²

D 618 Practice for Conditioning Plastics and Electrical Insulating Materials²

D 638 Test Method for Tensile Properties of Plastics²

D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Materials²

D 883 Terminology Relating to Plastics²

D 1784 Specification for Rigid Poly(Vinyl Chloride) (PVC), and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds³

D 3892 Practice for Packaging/Packing of Plastics³

D 4000 Classification System for Specifying Plastics Materials³

D 5033 Guide for the Development of Standards Relating to the Proper Use of Recycled Plastics

2.2 ANSI Standard:

Z1.4-1993 Sampling Procedures and Tables for Inspection by Attributes⁴

2.3 NSF Standard:

NSF Standard 61⁵

3. Terminology

3.1 Definitions:

3.1.1 For definitions of other technical terms pertaining to plastics used in this specification, see Terminology D 883 or Guide D 5033.

² Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 08.02.

⁴ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁵ Available from NSF International, P.O. Box 130140, Ann Arbor, MI 48113-0140.

3.1.2 *regrind plastic, n*—a product or scrap such as sprues and runners and edge trim that have been reclaimed by shredding and granulating for use in-house.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *rod, n*—an extruded solid cylindrical shape with a minimum diameter of $\frac{1}{8}$ in. (3.2 mm).

3.2.2 *tubular bar, n*—an extruded annular shape with minimum inside diameter of $\frac{3}{8}$ in. (9.5 mm) and minimum wall thickness of $\frac{1}{16}$ in. (1.6 mm).

4. Classification and Material

4.1 Product shape and size as defined in the applicable purchase order.

4.2 This specification covers extruded product as listed in Tables S-PVC-I and S-PVC-II. Products included in the designations reference Specification D 1784 callouts where applicable.

4.2.1 The type of poly(vinyl chloride), and chlorinated poly(vinyl chloride) shape product may be categorized by type, grade, and class depending on resin composition as defined in Table S-PVC-II.

4.3 The type, class and grade is further differentiated based on dimensional stability (elevated temperature excursion test). See Table S-PVC-II and dimensional requirements, Table A.

4.4 *Property Tables:*

4.4.1 Tables S-PVC-I and S-PVC-II may be used to describe extruded products.

4.4.2 Table 1 may also be used to describe extruded products not included in Table S-PVC-I or S-PVC-II via a cell callout that includes the applicable material type and specific properties (Designations 1 through 7).

4.4.3 To facilitate the incorporation of future or special materials not covered by Tables S-PVC-I and S-PVC-II, the “as specified” category (00) for type, class and grade is shown in the applicable table with the basic properties to be obtained from Table 1 as they apply.

4.5 *Callout Designation*—A one-line system shall be used to specify poly(vinyl chloride), or chlorinated poly(vinyl chloride) materials covered by this specification. The system uses pre-defined cells to refer to specific aspects of this specification as illustrated below:

4.5.1 *Examples:*

4.5.1.1 *Example 1*—Product made from general purpose poly(vinyl chloride):

CELL CALLOUT: S-PVC0111
S-PVC01 = Product made from PVC in accordance with Table S-PVC-I and Table S-PVC-II
1 = Unfilled class
1 = General purpose grade product

4.5.1.2 *Example 2*—Product made from general purpose chlorinated poly(vinyl chloride):

CELL CALLOUT: S-CPVC0211
S-PVC02 = Product made from CPVC in accordance with Tables S-PVC-I and S-PVC-II
1 = Unfilled class
1 = General purpose grade product

4.5.2 These two examples illustrate how a one-line, alphanumeric sequence can identify the product composition, commercial parameters and physical characteristics of extruded product. A space must be used as a separator between the

specification number and the type designation. No separators are needed between type, class, and grade. When special notes are to be included, such information should be preceded by a comma. Special tolerances must be noted at time of order and are inserted after the grade in parenthesis and preceded by a comma.

NOTE 2—The material used in the manufacture of PVC and CPVC shapes intended for contact with or the transport of potable water, or both, must be evaluated and certified as safe for this purpose by a testing agency acceptable to the local health authority. The evaluation shall be in accordance with the requirements for chemical extraction, taste, and odor, that are no less restrictive than those included in the National Sanitation Foundation (NSF) Standard 61.

5. Ordering Information

5.1 All shapes covered by this specification shall be ordered using the proper callout designation (see 4.5).

6. Physical Property Requirements

6.1 The physical property values listed within this specification’s tables are to be considered minimum specification values. Any requirement for specific test data for a given production lot shall be specified at the time of order. Physical properties for products not yet included in Table S-PVC-I or S-PVC-II may be specified by using Table 1 for extruded products.

7. Dimensional Requirements

7.1 The type, class, and grade is differentiated based on dimensional stability (elevated temperature excursion test) as indicated in Table S-PVC-II.

7.2 Products shall be produced within the commercial tolerances and with the lowest stress levels for machined parts as delineated in Table A.

7.3 Tubular bar dimensions shall be supplied in the unfinished condition, unless otherwise specified at time of order, sufficient to finish to the nominal dimensions ordered.

7.4 The maximum allowable camber at final inspection at the factory shall be within the limits referenced in Table A.

8. Workmanship, Finish and Appearance

8.1 *Appearance*—The resin material color for poly(vinyl chloride) shall be dark gray. The resin material color for chlorinated poly(vinyl chloride) shall be light gray. All shapes shall be uniform in color throughout the thickness. Specific colors and color matching only as agreed to by order.

8.1.1 Physical properties may be affected by other colors. Regardless of color, minimum properties of 4.4 must be met.

8.2 *Finish*—All products shall be free of blisters, wrinkles, cracks, gouges and defects that restrict commercial use of the product. Special surface finish shall be supplied only when specified in the purchase order or contract.

8.3 *Defects*—All products shall be free of visual voids, dirt, foreign material and embedded particles exceeding 0.040 in. (1 mm) maximum diameter as defined in 8.3.1

8.3.1 The criteria for determining the cleanliness shall be external visual inspection. A maximum number of two defects per one foot length of rod and tubular bar are allowed. Clusters of defects less than 0.040 in. (1 mm) diameter are to be counted as a single defect.