



Designation: D 6098 – 97

Standard Specification for Extruded and Compression Molded Shapes Made from Polycarbonate (PC)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 and compression molded plate, rod, and tubular bar manufactured from polycarbonate.

1.2 This specification is not intended to cover materials used in glazing and signage as defined in 3.2.1 and 3.2.6. It is intended to be a means of calling out mechanical grade plastic products used for fabrication of end items or parts as defined in 3.2.2.

1.3 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.

1.4 This specification allows for the use of recycled plastics as defined in Guide D 5033.²

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

1.6 The following precautionary caveat pertains only to the test method portions, Section 12, 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.*

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

2. Referenced Documents

2.1 ASTM Standards:

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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² As defined in Guide D 5033.

D 256 Test Methods for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics³

D 618 Practice for Conditioning Plastics for Testing³

D 638 Test Method for Tensile Properties of Plastics³

D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Materials³

D 883 Terminology Relating to Plastics³

D 3892 Practice for Packaging/Packing of Plastics⁴

D 3935 Specification for Polycarbonate (PC) Unfilled and Reinforced Material⁴

D 4000 Classification System for Specifying Plastic Materials⁴

D 5033 Guide for the Development of Standards Relating to the Proper Use of Recycled Plastics⁵

2.2 ANSI Standard:

Z1.4-1993 Sampling Procedures and Tables for Inspection by Attributes⁶

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.

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 *glazing product, n*—a finished product which is glazed or set in frame or sash and not held by mechanical fasteners which pass through the product.

3.2.2 *mechanical grade plastic product, n*—extruded or compression molded shapes made from polycarbonate used for fabrication of end items or parts.

³ Annual Book of ASTM Standards, Vol 08.01.

⁴ Annual Book of ASTM Standards, Vol 08.02.

⁵ Annual Book of ASTM Standards, Vol 08.03.

⁶ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.



3.2.3 *plate, n*—flat stock greater than ¼ in.

3.2.4 *recycled-plastic shape, n*—a product made from up to 100 % recycled plastic.

3.2.5 *rod, n*—an extruded solid cylindrical shape with a minimum diameter of ⅛in.

3.2.6 *signage product, n*—a fabricated sign or outdoor/indoor structure, consisting of any letter, figure, character, mark, point, plane, marquee sign, design, poster, pictorial, picture, stripe, line, trademark, reading matter or illuminating device, which is constructed, attached, erected, fastened, or manufactured in any manner so that the same shall be used for the attraction of the public to any place, subject, person, firm, corporation, public performance, article, machine or merchandise, and displayed in any manner for recognized advertising purposes.

3.2.7 *tubular bar, n*—an extruded annular shape with minimum inside diameter of ⅜in. and minimum wall thickness of ⅛in.

4. Classification and Material

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

4.2 This specification covers product extruded and compression molded as listed in Table S-PC. Products included in the designations reference Specification D 3935 callouts where applicable.

4.2.1 The type of polycarbonate shape product may be categorized by type, grade and class depending on resin and filler compositions as defined in Table S-PC.

4.2.2 Each type of polycarbonate shape may be categorized into one of several grades as follows:

4.2.2.1 *Grade 1—General Purpose*—Extruded or compression molded product made using only 100 % virgin polycarbonate resin.

4.2.2.2 *Grade 2—Recycled*—Extruded or compression molded product made using any amount up to 100 % recycled polycarbonate plastics.

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

4.4 Property Tables:

4.4.1 Table S-PC may be used to describe both extruded or compression molded products.

4.4.2 Table 1 may also be used to describe extruded or compression molded products not included in Table S-PC via a cell callout that includes the applicable Table S-PC polycarbonate type and specific properties (Designations 1–7).

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

4.4.4 *Reinforcements and Additive Materials*—A symbol (single-letter) will be used for the major reinforcement or combination, or both, along with two numbers that indicate the percentage of addition by mass with the tolerances as tabulated below. This must be included in all Table 1 callouts.

Symbol	Material	Tolerance (Based on the Total Mass)
C	Carbon and graphite fiber reinforced	±2 %
G	Glass-reinforced	
	<15 % glass content	±2 %
	>15 % glass content	±3 %
L	Lubricants (for example, PTFE, graphite, and silicone)	by agreement between the supplier and the user
M	Mineral	±2 %
R	Combinations of reinforcements or fillers, or both	±3 % for the total reinforcement

4.5 *Callout Designation*—A one-line system shall be used to specify polycarbonate 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 polycarbonate:

CELL CALLOUT: S-PC0111

S-PC01 = Product made from PC in accordance with Table S-PC
1 = Unfilled class
1 = General purpose grade product

4.5.1.2 *Example 2*—Product made from 20 % glass reinforced general purpose polycarbonate:

CELL CALLOUT: S-PC0100G20I3454430

S-PC0100 = Product made from PC in accordance with Table S-PC
G20 = 20 % glass
1 = Table 1 properties
3 = Tensile strength (10,000 psi)
4 = Elongation at break (10 %)
5 = Tensile Modulus (500,000 psi)
4 = Dimensional stability (0.4 %)
4 = Flexural Modulus (550,000 psi)
3 = Izod Impact (1.0 ft-lb/in. of notch)
0 = Unspecified

4.5.2 These two examples illustrate how a one-line, alpha-numeric sequence can identify the product composition, commercial parameters and physical characteristics of extruded or compression molded 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 the time of order and are inserted after the grade in parenthesis and preceded by a comma.

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 should be specified at the time of order. Physical properties for products not yet included in Table S-PC may be specified using Table 1 for extruded or compression molded products.

7. Dimensional Requirements

7.1 The type, class and grade is differentiated based on dimensional stability (elevated temperature excursion test), as