Designation: ~~D3917 – 15~~ D3917 – 15$^{\varepsilon 1}$

Standard Specification for Dimensional Tolerance of Thermosetting Glass-Reinforced Plastic Pultruded Shapes[1]

This standard is issued under the fixed designation D3917; 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.

ε[1] NOTE—Editorial corrections were made in July 2015.

1. Scope*

1.1 This specification defines production tolerances applicable to standard rods, bars, shapes, and flat sheet pultruded from thermosetting glass-reinforced plastics.

1.2 These dimensional tolerances apply to all shapes specified as "standard" by the pultrusion industry.

1.3 Custom shapes and products designed for special applications may carry specific tolerances that vary from the standard.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 The following safety hazards caveat pertains only to the test methods portion, Section 4, 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 known ISO equivalent to this standard.

2. Terminology

2.1 *Definitions:*

2.1.1 *camber*—the deviation of the edge or surface from a reference straight line with the weight of the pultrusion not minimizing the measurement.

2.1.2 *flat sheet*—a rectangular solid pultruded profile with a width of 12 in. up to and including 78 inches.

2.1.3 *mean wall thickness*—the average of two or more wall thickness measurements taken at multiple locations.

2.1.4 *straightness*—the upward deviation of a pultruded shape when resting on a flat surface measured in a manner that the weight of the pultruded part minimizes the deviation.

3. Dimensional Criteria

3.1 Cross-sectional dimensions for standard rods, bars, and shapes shall be prescribed in Table 1.

3.2 Length tolerances for standard rods, bars, and shapes shall be as prescribed in Table 2.

3.3 Straightness tolerances shall be as prescribed in Table 3 (also see 4.2).

3.4 Twist tolerances for bars and shapes shall be as prescribed in Table 4 (also see 4.3).

3.5 Flatness (flat surface) tolerances for bars, solid shapes, semihollow shapes, and flat sheet shall be as prescribed in Table 5.

3.6 Flatness (flat surface) tolerances of hollow shapes shall be as prescribed in Table 6.

3.7 Angularity tolerances for bars and shapes shall be as prescribed in Table 7 (also see 4.4).

3.8 Camber tolerances for shapes can be as prescribed in Table 8, if required by the customer. Camber is not specified for standard shapes but will be a special customer requirement.

---

[1] This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.18 on Reinforced Thermosetting Plastics.

Current edition approved April 1, 2015. Published April 2015. Originally approved in 1980. Last previous edition approved in 2012 as D3917 - 12. DOI: ~~10.1520/D3917-15.~~10.1520/D3917-15E01.

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

3.9 The selection, type, and amount of reinforcements, as well as resin system used, directly affect dimensions. Tolerances shall be agreed upon between the supplier and the user.

3.10 Squareness of end cut for bars, solid shapes, semihollow shapes, and flat sheet shall be as prescribed in Table 9.

4. Test Methods

4.1 Obtain the specified tolerances with conventional measuring equipment. Measuring procedures, gages, and fixtures shall be agreed upon between the supplier and the user.

4.2 Measure departure from straightness by placing the section on a level table so that the arc or departure from straightness is vertical. Measure the vertical depth of the arc with a feeler gauge, a straightedge, or both.

4.3 Measure twist by placing the pultruded section on a flat surface and using an inclinometer. An inclinometer is a commercially available device used to measure the angle of inclination.

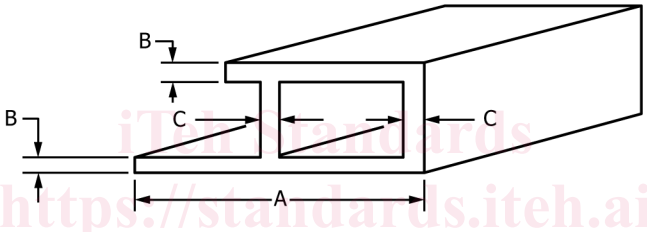
4.4 Measure angles with protractors or gauges.

5. Keywords

5.1 dimensional tolerance; pultruded shapes; thermosetting plastic

TABLE 1 Cross-Sectional Dimensions—Standard Rods, Bars, and Shapes

NOTE 1—The minimum tolerances are applicable for thicknesses less than 0.05 in. (1.27 mm).



Solid Dimensions, ±in. (mm)				
A Die Struck Dimension[A, B]	B Wall Thickness[B] (Open Shape)	B Thickness (Flat Sheets)		C Wall Thickness[B] (Closed Shape)
		Thickness 0.125 (3.175) and under	Thickness over 0.125 (3.175)	
~~±4 %~~ ~~(0.094 in. max)~~	~~±10 %~~ ~~±0.010 (0.25) min~~	~~±15 %~~ ~~±0.010 (0.25) min~~	~~±10 %~~ ~~±0.050 (1.27) max~~	~~±20 %~~ ~~±0.010 (0.25) max~~
±4 % 0.094 (2.39) max	±10 % ±0.010 (0.25) min	±15 % ±0.010 (0.25) min	±10 % ±0.050 (1.27) max	±20 % ±0.010 (0.25) min

[A]The outside dimension of a part.
[B]Standard pultruded section with dimension up to 36-in. (914-mm) diameter.

TABLE 2 Length—Standard Rods, Bars, Shapes, and Flat Sheet

	Allowable Deviation from Specified Length, +, – in. (+, – mm), except as noted		
	Length up to 8 ft (~~3.65~~2.44 m) inclusive	Length over 8 to 24 ft (~~3.65~~2.44 to ~~9.147~~.32 m) inclusive	Length over 24 ft (~~9.14~~7.32 m)
All Rods, Bars, and Shapes	+0.25, –0 (+6.35, –0)	+0.5, –0 (+12.7, –0)	+3, –0 (+76.2, –0)

TABLE 3 Straightness—Standard Bars, Rods, Shapes, and Flat Sheet

Product	Specified Diameter (Rods) Specified Width (Bars) Max Dimension (Shapes)	Specified Thickness (Rectangles) Minimum Thickness (Shapes)	Allowable Deviation (*D*) from Straight, in. (mm)
	in. (mm)	in. (mm)	In Total Length of Piece
~~Rods and square, hexagonal, and octagonal bars~~	~~all~~	~~...~~	~~0.030 (2.50) × length, ft (m)~~
Rods and square, hexagonal, and octagonal bars	all	...	0.030 (2.5) × length, ft (m)

TABLE 3 *Continued*

Product	Specified Diameter (Rods) Specified Width (Bars) Max Dimension (Shapes)	Specified Thickness (Rectangles) Minimum Thickness (Shapes)	Allowable Deviation (*D*) from Straight, in. (mm)
	in. (mm)	in. (mm)	In Total Length of Piece
Rectangular bars	Up to 1.499 (38.07), incl	Up to 0.094 (2.4), incl	0.050 (4.17) × measured length, ft (m)
		0.095 (2.4) and over	0.040 (3.33) × measured length, ft (m)
	1.500 (38.10) and over	all	0.040 (3.33) × measured length, ft (m)
Shapes–Open	all	all	0.050 (4.17) × measured length, ft (m)
Shapes–Closed	all	all	0.030 (2.5) × measured length, ft (m)[A]
Flat Sheet	all	all	0.030 (2.5) × measured length, ft (m)[A]

[A]Measured when weight of pultrusion minimizes the deviation by contact with flat surface.