Designation: D6662 – 22

Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards[1]

This standard is issued under the fixed designation D6662; 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 specification covers polyolefin-based plastic lumber products for use as exterior residential decking boards.

1.2 Plastic lumber products are currently made predominantly with recycled polyolefin plastics (in particular high-density polyethylene) where the products are more or less non-homogenous in the cross-section. However, this specification is also potentially applicable to similar manufactured plastic products made from other plastic and plastic composite materials that have non-homogenous cross-sections.

1.3 This specification details a procedure to calculate recommended span lengths for spacing of support joists. This procedure was developed using experimental data from a typical unreinforced plastic lumber made predominantly from recycled high-density polyethylene. The methodology to develop span lengths for other types and compositions of plastic lumber is detailed in Appendix X1 of this standard.

1.4 The values are stated in inch-pound units, as these are currently the most common units used by the construction industry. Equivalent SI units are indicated in parentheses. However, the units stated for irradiance exposure in the weatherability section (6.3) are in SI units as these are the units commonly used for testing of this type.

1.5 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 The following documents of the issue in effect on the date of material purchase form a part of this specification to the extent referenced herein:

2.2 *ASTM Standards:*[2]

D883 Terminology Relating to Plastics

D2565 Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications

D2898 Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing

D2915 Practice for Sampling and Data-Analysis for Structural Wood and Wood-Based Products

D4329 Practice for Fluorescent Ultraviolet (UV) Lamp Apparatus Exposure of Plastics

D5033 Guide for Development of ASTM Standards Relating to Recycling and Use of Recycled Plastics (Withdrawn 2007)[3]

D6109 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products

D6112 Test Methods for Compressive and Flexural Creep and Creep-Rupture of Plastic Lumber and Shapes

D6341 Test Method for Determination of the Linear Coefficient of Thermal Expansion of Plastic Lumber and Plastic Lumber Shapes Between –30 and 140°F (–34.4 and 60°C)

E84 Test Method for Surface Burning Characteristics of Building Materials

E108 Test Methods for Fire Tests of Roof Coverings

G151 Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources

G154 Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

G155 Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials

3. Terminology

3.1 *Definitions:*

[1] This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.20 on Plastic Lumber.

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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.

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

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

3.1.1 *plastic lumber, n*—a manufactured product made primarily from plastic materials (filled or unfilled), typically used as a building material for purposes similar to those of traditional lumber, which is usually rectangular in cross-section. (Terminology D883)

3.1.1.1 *Discussion*—Plastic lumber is typically supplied in sizes similar to those of traditional lumber board, timber and dimension lumber; however the tolerances for plastic lumber and for traditional lumber are not necessarily the same. (Terminology D883)

3.1.2 *resin, n*—a solid or pseudo solid organic material often of high molecular weight, which exhibits a tendency to flow when subjected to stress, usually has a softening or melting range, and usually fractures conchoidally. (Terminology D883)

3.1.2.1 *Discussion*—In a broad sense, the term is used to designate any polymer that is a basic material for plastics. (1982)

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *bulge*—convex distortion (away from the center of the cross-section) of the face of the board from a straight line drawn from edge to edge across the width of the board.

3.2.2 *crook*—distortion of the board in which there is a deviation in a direction perpendicular to the edge from a straight line from end to end of the board.

3.2.3 *cup*—concave distortion (towards the center of the cross-section) of the face of the board from a straight line drawn from edge to edge across the width of the board.

3.2.4 *edge*—the side of a rectangular-shaped board corresponding to the thickness of the board.

3.2.5 *face*—the side of a rectangular-shaped board corresponding to the width of the board.

3.2.6 *thickness*—the lesser dimension of the cross-sectional profile of a rectangular-shaped board.

3.2.7 *width*—the greater dimension of the cross-sectional profile of a rectangular-shaped board.

3.3 Additional definition of terms applying to this specification appear in Terminology D883 and D5033.

4. Ordering Information

4.1 The information contained in this specification is intended to be helpful to producers, distributors, regulatory agencies and users. The information can also promote understanding between purchasers and sellers. The purchaser shall state whether this specification is to be used, select the preferred options permitted herein, and include the allowable design information in the invitation to bid and purchase order from the following:

4.1.1 Title, number and date of this specification,

4.1.2 Minimum allowable bending strength and allowable bending stiffness,

4.1.3 Percent recycled content (if requested),

4.1.4 Flame spread index,

4.1.5 Color,

4.1.6 Quantity in lineal feet,

4.1.7 Cut length,

4.1.8 Cross-sectional dimensions,

4.1.9 Packing requirements,

4.1.10 Palletization, if required,

4.1.11 Marking, if other than specified.

4.2 If specific mechanical property values are not required by the purchaser (for example, when purchasing materials for general retail sales distribution and not for a specific project), the manufacturer shall provide minimum allowable design information, as would be determined under this specification, to aid in the application of the decking board material by the end user.

5. Dimensions and Permissible Variations

It is permissible to produce decking boards either in sizes that are similar to the standard dimensions of the wood industry, or to proprietary dimensions designed by manufacturers. This specification does not limit the dimensional range of production. For reference, the standards of the wood industry are as follows:

5.1 *Thickness*—Unless otherwise specified in 4.1.8, boards shall be:

Nominal (in.)	Actual (in.)	Tolerance (in.)
1	¾	± 1/16
5/4	1	± 1/16
2	1-½	± 1/16

Tolerance on thickness of boards thicker than 2 inches (nominal) shall be ± 1/16 inch.

5.2 *Width of Boards*—Unless otherwise specified in paragraph 4.1.8, board widths shall be:

Nominal (in.)	Actual (in.)	Tolerance (in.)
3	2-½	± 1/16
4	3-½	± 1/16
6	5-½	± 1/16
8	7-¼	± 1/16
10	9-¼	± 1/16
12	11-¼	± 1/16

Tolerance on width of boards wider than 12 inches (nominal) shall be ± 1/16 inch.

5.3 *Length of Boards*—unless otherwise specified in 4.1.7, boards up to 20 feet shall have tolerances of +½ inch or -1/16 inch. Over 20 feet, the tolerances will be +½-inch or -1/16 inch per 20-ft of length or fraction thereof. Measurement of lengths to be made at 73 ± 2 °F and relative humidity of 50 ± 5 %.

5.4 *Flatness Tolerance*—Board shall be flat with maximum cup or bulge in the board face limited to the tolerances in Table 1. Linear interpolation of the values is acceptable for dimensions other than listed.

5.5 *Squareness*—Unless a specially shaped member is specified, the cross-section of all boards shall be visually rectangular (that is, the face and edge of the board are perpendicular to each other) and suited for the intended purpose.

TABLE 1 Cup or Bulge Tolerances Relative to Nominal Width of the Board Face

Face Width, in.	≤4 in.	6 in.	8 in.	10 in.	12 in.
Tolerance	1/32 in.	1/16 in.	1/8 in.	3/16 in.	1/4 in.