



Designation: D6117 – 24

Standard Test Methods for Mechanical Fasteners in Plastic Lumber and Shapes¹

This standard is issued under the fixed designation D6117; 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.

INTRODUCTION

The use of plastic lumber and shapes often involves the use of mechanical fasteners, such as nails, screws, bolts, lag screws, and connectors. Data on the strength and performance of such fasteners are frequently needed for design and for comparative purposes. Presented herewith are methods of conducting tests for nail, staple and screw withdrawal resistance and lateral load transmission by nail, staple, screw, and bolt. The use of standard methods for these tests is recommended as a means of obtaining comparable data and of eliminating variables in test results because of variation in testing methods.

1. Scope*

1.1 These test methods cover the evaluation of fastener use with “as manufactured” plastic lumber and shapes through the use of two different testing procedures.

1.2 The test methods appear in the following order:

	Sections
Test Method A—Nail, Staple, or Screw Withdrawal Test	4 to 13
Test Method B—Nail, Staple, or Screw Lateral Resistance Test	14 to 22

1.3 Plastic lumber and plastic shapes are currently made predominately from recycled plastics. However, these test methods would also be applicable to similar manufactured plastic products made from virgin resins where the product is non-homogeneous in the cross-section.

1.4 The values stated in inch-pound units are to be regarded as standard. The SI units given in parentheses are for information only.

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 known ISO equivalent to this 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 Recom-*

mendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 ASTM Standards:²

D883 Terminology Relating to Plastics

D1761 Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials

D6111 Test Method for Bulk Density And Specific Gravity of Plastic Lumber and Shapes by Displacement

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)

E4 Practices for Force Calibration and Verification of Testing Machines

2.2 ANSI Standards:³

B18.6.1 American National Standard for Slotted and Recessed Head Wood Screws

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms relating to plastics used in this test method, refer to Terminology D883.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *plastic shape, n*—a manufactured product made primarily from plastic materials (filled or unfilled), which is not necessarily rectangular in cross section.

¹ These test methods are under the jurisdiction of ASTM Committee D20 on Plastics and are the direct responsibility of Subcommittee D20.20 on Plastic Lumber.

Current edition approved Dec. 1, 2024. Published December 2024. Originally approved in 1997. Last previous edition approved in 2023 as D6117 – 23. DOI: 10.1520/D6117-24.

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

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

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