Designation: D7258 – 14

# Standard Specification for Polymeric Piles[1]

This standard is issued under the fixed designation D7258; 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 addresses the use of round and rectangular cross-section polymeric piles in axial and lateral load-bearing applications, including but not limited to marine, waterfront, and corrosive environments.

1.2 This specification is only applicable to individual polymeric pile products. Sheet pile and other mechanically connected polymeric pile products using inter-locking systems, are not part of this specification.

1.3 The piling products considered herein are characterized by the use of polymers, whereby *(1)* the pile strength or stiffness requires the inclusion of the polymer, or *(2)* a minimum of fifty percent (50 %) of the weight or volume is derived from the polymer. The type classifications of polymeric piles described in Section 4 show how they can be reinforced by composite design for increased stiffness or strength.

1.4 This specification covers polymeric piles fabricated from materials that are virgin, recycled, or both, as long as the finished product meets all of the criteria specified herein. Diverse types and combinations of inorganic filler systems are permitted in the manufacturing of polymeric piling products. Inorganic fillers include such materials as talc, mica, silica, wollastonite, calcium carbonate, etc. Pilings are often placed in service where they will be subjected to continuous damp or wet exposure conditions. Due to concerns of water sensitivity and possible affects on mechanical properties in such service conditions, organic fillers, including lignocellulosic materials such as those made or derived from wood, wood flour, flax shive, rice hulls, wheat straw, and combinations thereof, are not permitted in the manufacturing of polymeric piling products.

1.5 The values are stated in inch-pound units as these are currently the most common units used by the construction industry.

1.6 Polymeric piles under this specification are designed using design stresses determined in accordance with Test Methods D6108, D6109, and D6112 and procedures contained within this specification unless otherwise specified.

1.7 Although in some instances it will be an important component of the pile design, frictional properties are currently beyond the scope of this document.

1.8 Criteria for design are included as part of this specification for polymeric piles. Certain Types and sizes of polymeric piles will be better suited for some applications than others. Polymeric piles designed and manufactured under the different Type classifications as defined within this specification will, as a whole, exhibit a wide-range of mechanical properties. For example, a 10-in. diameter Type II, chopped glass fiber reinforced high-density polyethylene (HDPE) pile will likely have an apparent stiffness much different than a 10-in. diameter Type V, glass fiber reinforced composite tube filled with concrete. Similarly, the ultimate moment capacity of these two example piles will also likely be significantly different from each other. Use of a licensed Professional Engineer is, therefore, highly recommended for designing and selecting polymeric piles in accordance with this specification.

1.9 *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 specification.

## 2. Referenced Documents

2.1 *ASTM Standards:*[2]

D883 Terminology Relating to Plastics

D1141 Practice for the Preparation of Substitute Ocean Water

D2344/D2344M Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates

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

D5033 Guide for Development of ASTM Standards Relating

[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.

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

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