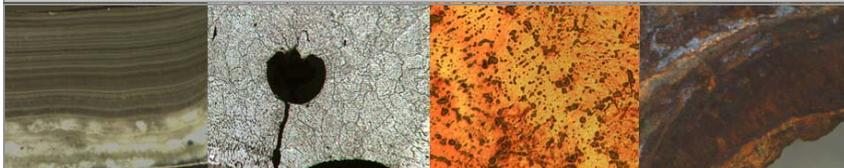


NU S & B L S



New Hampshire
MATERIALS
LABORATORY, INC.
Your Problem Solving Partner

THE EVOLUTION OF COMPOSITE LUMBER

JULY 2012 SUPPLEMENT ISSUE

Welcome to New Hampshire Materials Laboratory

The summer months are upon us. For many of us, this means enjoying backyard BBQs. This brings us to our Nuts & Bolts topic of plastic lumber. A composite material being used more and more for backyard decks due to its low maintenance.

Tim Kenney
Laboratory Director

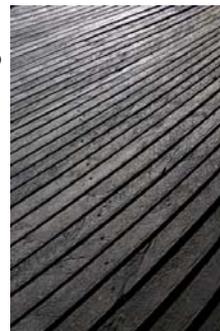
The Evolution of Composite Lumber

The emergence of the plastic lumber industry came from a need to find uses for plastic scrap and post-consumer plastic waste.

There are two types of plastic lumber products: 1) Composite or Wood lumber which is comprised of mix of recycled plastic, wood or fiberglass. 2) "Wood Like" products made solely from plastic.

Plastic Lumber Trade Association (PLTA) identifies four main technologies used to produce recycled plastic lumber ([for further information on recycled plastics refer back to our Nuts & Bolts: Polymers and Medical Devices September 2011](#)):

- Single-polymer made from recycled HDPE
- Mixes of recycled PE an/or other recycled plastics: Commingled plastics such as PE and PP; HDPE and LDPE
- Fiberglass reinforced PE: This is lumber that is reinforced with fiberglass rods.
- Wood/thermoplastic composites: blend of plastic resin with wood chips and/or sawdust.



Composite Lumber

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Due to its unique composition, plastic lumber cannot be tested using the same ASTM test methods and standards developed for virgin plastic. The PLTA has developed a new set of test methods and standards which focus on single-polymer products.

- ASTM D 6108-03: Compressive Properties of Plastic Lumber and Shapes.
- ASTM D 6109-03: Flexural Properties of Unreinforced and Reinforced Plastic Lumber.
- ASTM D 6111-03: Bulk Density and Specific Gravity of Plastic Lumber and Shapes by Displacement.
- ASTM D 6112-97: Compressive and Flexural Creep and Creepupture of Plastic Lumber and Shapes.
- ASTM D 6117-97: Mechanical Fasteners in Plastic Lumber and Shapes.
- ASTM D 6341-98: Linear Coefficient of Thermal Expansion of Plastic Lumber and Plastic Lumber Shapes [-34.3 and 60 C] -30 and 140 F.
- ASTM D 6435-99: Shear Properties of Plastic Lumber and Plastic Lumber Shapes.
- ASTM D 6662-01: Standard Specification for Polyolefin based Plastic Lumber Decking Boards.

Further ASTM standards are being developed for shear properties.

With a growing understanding of plastic lumber and wood composite performance and durability, it is no wonder we are seeing its use increase. Plastic lumber is low maintenance and does not require regular repainting or staining like typical lumber. Its resistance to weather, to insects such as termites, rot, and mildew makes it suitable for exterior use such as decking/railing systems, picnic tables, park benches, and more.

Eventually what started out as an environmentally friendly product may some day become an integral part of the construction industry.

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