
Executive Summary

This Healthy Building Network report compares and evaluates different plastic lumber types from an environmental and public health perspective, and offers advice on how to choose a plastic lumber product based upon its health hazards and recycling impacts. We rate the environmental preferability of 55 plastic lumber products manufactured by 44 companies based on three criteria:

- 1) Materials used
- 2) Recycled content
- 3) Potential recyclability

No determination is made as to whether plastic lumber is on the whole either more or less preferable to other materials with which it competes such as naturally rot-resistant wood, pressure-treated wood, steel, aluminum, or concrete. Rather, this information is intended to inform those who are interested in understanding the range of environmental and public health impacts associated with different plastic lumber products.

Materials Used

Most plastic lumber products on the market are made from polyethylene (commonly available in high and low densities, HDPE and LDPE). Some manufacturers are also using polystyrene (PS) and polyvinyl chloride (PVC). Still others rely on a commingled mix of different types of plastics (largely collected from municipal recycling programs). All plastic types (also called plastic resins) currently used for lumber share a common origin in fossil fuels and thus a common set of initial environmental and public health impacts. Plastics differ, however, according to their manufacturing procedures and the additional materials used in formulating various products. These differences distinguish some plastics as possessing greater chemical hazards than others throughout their lifecycle of production, use, and disposal. While no plastic is environmentally benign, our analysis concludes that the polyethylenes possess lesser chemical hazards and associated environmental health impacts, making them environmentally preferable to those that have greater hazards and impacts such as PS and PVC.

To improve performance qualities such as rigidity or strength, some plastic lumber producers reinforce the primary plastic resin with other materials. Fiberglass is one material often used to increase the load-bearing capacity of plastic lumber. As fiberglass production and use raise significant health concerns, we rate fiberglass-reinforced lumber products lower than fiberglass-free products. At least one company combines polystyrene with HDPE for added strength. Because polystyrene's lifecycle of production, use and disposal is associated with greater chemical hazards, we give a lower rating to products containing this resin.

Recycled Content

Recycled content varies widely among plastic lumber products. One half of the products we review contain post-consumer plastic content. We give the most credit to products that have a minimum 50% post-consumer content. We give a lower rating to products that have less than 50% minimum post-consumer content.

Recyclability

In general, products that can be recycled after their intended use are environmentally preferable over those that cannot. Recycling contributes to an overall reduction in resource consumption and pollution over time. More than a dozen companies offer lumber made from a single resin, polyethylene, one of the most recyclable and recycled plastics, while other plastic lumber products also contain other plastics, fiberglass, and/or wood fiber or wood flour. Based upon the record of plastics recycling to date, these composite products will be more difficult to recycle effectively than single resins. Therefore, we favor single-polyethylene-resin products as more environmentally preferable over plastic composites or lumber made from commingled plastics.

Findings

- ✳ **Most Environmentally Preferable:** More than one-third of the products (15 of 55) we survey earn this designation. They use only high- or low-density polyethylene and contain high volumes (50% and greater) of post-consumer recycled content.
- ✳ **Environmentally Preferable:** Only three products we survey combine high percentages of post-consumer recycled content with other plastics or wood fibers. This designation acknowledges the high post-consumer content but downgrades the blending of different materials.
- ✳ **Less Environmentally Preferable:** One third of the products we survey (18 of 55) earn this designation. These include mixtures of plastics and wood having low (less than 50%) post-consumer recycled content, and the HDPE-only products with low, zero, or unknown post-consumer recycled content.
- ✳ **Not Environmentally Preferable Except for Structural Applications:** Four of the products we survey are unique for their use in demanding structural applications such as bridge supports or railroad ties. These products contain fiberglass or polystyrene, materials associated with greater health hazards during their lifecycle. Their use may be justified for these applications; otherwise avoid.
- ✳ **Not Environmentally Preferable:** More than one quarter of the products we survey (15 of 55) earn this designation. These include PVC and polystyrene products that contain no post-consumer recycled plastic content. None of the products in this category contain more than 30% post-consumer plastic content.

Plastic Lumber Product Ratings

Most Environmentally Preferable

Ameriwood (American Plastic Lumber)
 Bear Board (Engineered Plastic Systems)
 BreezeWood (Aeolian Enterprises)
 Eco-Tech (Eco-Tech)
 Eco-Tuff (Eco-Tech)
 Enviro-Curb (Enviro-Curb Manufacturing)
 Everlast (Everlast Plastic Lumber)
 HDPE lumber (U.S. Plastic Lumber)
 Leisure Deck (The Plastic Lumber Company)
 MAXITUF (Resco Plastics)
 Millennium Lumber (BJM Industries)
 Orcaboard (Durable Plastic Design)
 Perma-Deck Advantage+ (Cascades)
 PlasTEAK (PlasTEAK)
 Select (Bedford Technology)

Environmentally Preferable

Perma-Deck Elegance (Cascades)
 Plasboard (Northern Plastic Lumber)
 Rhino Deck (Master Mark Plastics)

Less Environmentally Preferable

Dream Composite Deck (Thermal Industries)
 ChoiceDek (A.E.R.T., Inc.)
 CorrectDeck (Correct Building Products)
 CrossTimbers (Elk Composite Building Products)
 Evergrain (Epoch Composite Products)
 Evolve & Perma-Poly (Renew Plastics Division)
 fiberon (Fiber Composites)
 Four Seasons (Delmarva Industries)
 Geodeck (Kadant Composites)
 Latitudes Decking (Universal Forest Products)
 Monarch (Green Tree Composites)
 Oasis Composite (Alcoa Home Exteriors)
 Polywood nonstructural (Polywood)
 TimberTech (TimberTech)
 Trex Origins (Trex)
 Veranda (Universal Forest Products)
 WeatherBest Select (Louisiana-Pacific)
 WindRiver Fence (Aeolian Enterprises)

Not Environmentally Preferable Except for Structural Applications

Ameriwood-Plus (American Plastic Lumber)
 FiberForce (Bedford Technology)
 Polywood (Polywood)
 Trimax (U.S. Plastic Lumber)

Not Environmentally Preferable – Avoid

Boardwalk (CertainTeed)
 Country Estate (Nebraska Plastics)
 Deck Lok (Royal Crown)
 Deck/Dock (Wastech Fencing)
 Dream Deck (Thermal Industries)
 eon (CPI Plastic Group)
 EverNew, Bufftech (CertainTeed)
 Forever-Wood (Forever Wood)
 Oasis PVC Deck (Alcoa Home Exteriors)
 Procell (Procell Decking Systems)
 Sheerline (L.B. Plastics)
 Synboard (Synboard America)
 VEKAdeck (VEKA)
 vinyl decking (Poly Vinyl Creations)
 Xpotential (XPotential Products)

Source: Healthy Building Network, 2005.
 Note: Full chart is on page 8.

Recommendations

The Healthy Building Network endorses the following guidelines for plastic lumber purchases. These guidelines are based on environmental, public health, and recycling considerations.

✱ **Favor products:**

- o **with high recycled content**, specifically high post-consumer recycled content.
- o **made from high-density and low-density polyethylene (HDPE and LDPE)**, recyclable resins associated with fewer chemical hazards and impacts than other petroleum-based polymers.
- o **by producers sourcing resins from local municipal recycling programs**, therefore cutting transportation costs and supporting the local economy.

✱ **Limit use of:**

- o **wood-plastic composites** because of concerns about mixing biological and synthetic materials, including limited end-of-life recyclability.
- o **fiberglass-reinforced or polystyrene-blended “structural” plastic lumber to demanding structural applications** such as railroad ties and bridge supports, as a less toxic alternative to chemically treated wood.
- o **products with multiple commingled recycled consumer plastics** as they will have more contaminants and inconsistent properties. They also support token markets for plastics that otherwise are largely unrecyclable, and many of which are highly toxic. This perpetuates the use of plastics that should be phased out.

✱ **Avoid products made with:**

- o **PVC and polystyrene** because these are associated with more chemical hazards and impacts throughout their lifecycle than other plastics.
- o **fiberglass for nonstructural applications** that do not require reinforced plastic lumber (such as decking boards, benches, and tables).
- o **predominantly non-recycled plastics**. Alternatives with high recycled content are readily available.