

## Recycled Plastic and Composite Lumber

Plastic and wood composite lumber are quickly becoming a common replacement for redwood, cedar, and treated lumber in such applications as decking, door and window frames, and exterior moldings. Treated lumber, frequently used for decking, used to be treated with toxic copper chromated arsenic (CCA), which must be disposed of as hazardous waste. While the newer alternate treatments do not contain arsenic, they can leach copper, which is toxic to aquatic life. Redwood and cedar decking use virgin trees, maintaining our dependence on scarce wood resources. Plastic and wood composite lumber are worked similarly to real wood and do not require treatment, yet they hold up well to water, sun, insects, and salt air, typical enemies of wood.



Both recycled plastic lumber and recycled wood/ plastic composite lumber are molded or continuously extruded into standard lumber forms. 100% plastic lumber is usually made with 100% recovered plastics such as HDPE, LDPE, PET, or a mixture of various recovered plastics. Check the fine print, though, as today a number of manufacturers produce 100% virgin plastic or PVC lumber. The HDPE raw material comes from post-consumer waste (primarily milk and laundry bottles and plastic bags), LDPE from plastic bags and shrink wrap packaging, and PET from post-consumer soda bottles. Wood/ plastic composite lumber is made from a 50/50 mix of plastic resins (typically trash bags) and reclaimed wood such as sawdust from furniture manufacturing plants. Manufacturers claim that recycled wood/ composite plastic lumber is more rigid than 100% recycled plastic lumber because the wood fibers act as reinforcement. The plastic encapsulates and binds the wood to resist moisture penetration and degradation from fungal rot, bringing together some of the best properties of both wood and plastic.

Plastic lumber is commonly available in three grades: hollow, solid, and structural solid. Hollow grade plastic lumber is used for light-load applications such as low-load deck surfaces, fence signage, and shutters. Regular solid grade plastic lumber is used for medium-to-light load



applications, such as deck surfaces and planters. Structural grade plastic lumber has a 20% fill of fiberglass to provide superior strength and reduce expansion and contraction issues.

### **PRODUCT COMPARISONS**

<b>Plastic &amp; Wood Composite Lumber</b>	<b>Redwood, Cedar, &amp; Treated Lumber</b>
Does not require staining or sealing	Requires annual staining or sealing
Indefinite life span	Shorter life span
Made of 90-100% recycled materials	Made of virgin lumber
Does not rot, splinter, or crack	Will rot, splinter, and crack

### **LEED CREDITS**

Using this material potentially contributes to obtaining these credits in the US Green Building Council's LEED certification program:

#### **Materials & Resources**

MR Credit 4.1 Recycled Content

MR Credit 4.2 Recycled Content

LEED stands for Leadership in Energy and Environmental Design. To find out more about it, visit [www.leedbuilding.org](http://www.leedbuilding.org)

### **ENVIRONMENTAL ATTRIBUTES**

#### **Energy Performance**

Using recycled plastic and wood composite lumber saves energy in the manufacturing process, using less energy than the creation of virgin plastic.

#### **Resource Impacts**

Plastic and wood composite lumber has minimal impact on the environment since it eliminates use of our scarce wood resources and keeps material out of the waste stream and incinerators. It has an indefinite lifespan and theoretically can be recycled at the end of its useful life. An estimated 12% of the U.S. solid waste stream is plastic, and 19% of that is high-density polyethylene (HDPE). More than 750 recycled milk jugs and detergent bottles are used to make a single four foot long plastic bench, thus providing an end use for materials already in the waste stream. *Be aware that not all plastic lumber is made from recycled materials, so it is important to request recycled-content products.*

By eliminating the need to paint, stain, or seal a deck, plastic lumber also eliminates those products' environmental impacts, which can be significant.

#### **Health Considerations**

Plastic and wood composite lumber has minimal to no impact on personal health, not containing the preservatives or chemical additives found in treated lumber. Since it does not require staining or sealing, the health hazards of applying annual treatments for redwood, cedar, or treated decks are eliminated.



## ***FUNCTIONAL CONSIDERATIONS***

### **Cost**

Prices of solid wood products fluctuate widely from day to day. Historically, alternative wood products have been a little more expensive than cedar, redwood, or treated lumber. Recently, however, the cost of virgin wood products has risen considerably, and the cost of plastic and composite lumber continues to become more competitive as demand for them increases.

The cost of a single annual refinishing (cleaning and resealing) of a wood deck usually equals the added cost of purchasing plastic lumber over lower-cost treated lumber.

### **Installation**

Plastic and wood composite decking materials are available in a wide range of colors and textures to complement any home's exterior. It can be installed using common carpentry tools and will cut, drill, and rout cleanly since there is no grain to split or chip. Generally, both screws and nails with a galvanized coating are acceptable fasteners, although screws are generally preferred.

Plastic and wood composite lumber should not be used as a structural component such as a support post, joist, or stringer unless it has been engineered for a specific application. The 100% plastic lumber does have a high coefficient of expansion and must be considered in the design.

For most residential applications, plastic lumber will require joist spacing similar to traditional lumber. When using 5/4" x 6" or 2" x 6" decking boards, the joist spacing should be 16" on center. However, some manufacturers have products that allow for longer spans. Carefully follow the recommendations of each manufacturer before purchasing and installing any product.

### **Maintenance**

Many manufacturers recommend periodically sweeping and hosing the deck and occasionally cleaning the deck with conventional deck washes or detergents. If need be, the deck can be sanded down to remove scratches. Most recycled plastic and wood composite lumber is ultraviolet light (UV) stabilized to resist sunlight damage, though colors generally fade slightly during an initial weathering phase. Most manufacturers offer a limited lifetime guarantee and will replace any pieces that crack, warp, or break.

### **Other Data / Comments**

For some people, the darker colors of plastic and wood composite lumber, as well as natural wood, can become uncomfortably hot in direct sun. Generally, the darker and denser the material, the more heat it will retain. If possible, test the different surfaces when the sun is overhead before choosing a color.

## ***RESOURCES***

### **Manufacturers**

Recycled plastic or composite lumber is available at most lumberyards and home improvement stores. For up-to-date product and retailer information, visit the manufacturers' websites or search the Green Materials Database, [www.builditgreen.org/guide](http://www.builditgreen.org/guide).



**AERT Inc./ Weyerhaeuser**

(ChoiceDek)  
(877) 235-6873  
[www.choicedek.com](http://www.choicedek.com)

**EPOCH Composite Products**

(Evergrain Decking)  
(800) 405-0546  
[www.epochwood.com](http://www.epochwood.com)

**Fiber Composites, LLC**

(Fiberon)  
(704) 463-7120  
[www.fibercomposites.com](http://www.fibercomposites.com)

**Kadant Composites**

(GeoDeck)  
(781) 275-3600  
[www.geodeck.com](http://www.geodeck.com)

**Master Mark Plastics**

(Rhino Deck)  
(800) 535- 4838  
[www.mastermark.com](http://www.mastermark.com)

**Nexwood Industries Ltd.**

(888) 763-9966  
[www.nexwood.com](http://www.nexwood.com)

**Resco Plastics, Inc.**

(MAXiTUF Plastic Lumber)  
(541) 269-5485  
[www.rescoplastics.com](http://www.rescoplastics.com)

**TimberTech**

(800) 307-7780  
[www.timbertech.com](http://www.timbertech.com)

**Trex Company, Inc.**

(800) 289-8739  
[www.trex.com](http://www.trex.com)

**US Plastic Lumber**

(Carefree Xteriors, Trimax Structural Lumber)  
(877) 289-8775  
[www.usplasticlumber.com](http://www.usplasticlumber.com)

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