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HDPE Decking

Technical Data

DESCRIPTION

APL's HDPE products are made of high-density polyethylene (HDPE), UV-inhibited pigment systems, foaming compounds and selected process additives.

The HDPE raw material is derived from post-consumer bottle waste, such as milk and detergent bottles. This material is cleaned in APL Building Product's decontamination process to a high purity level, which removes contaminants such as food residue, paper, and adhesives. It is then compounded into a rigid board stock material, with the resulting finished product containing over 90% recycled plastic by weight.

Because HDPE products are made with a single, purified polymer, they are manufactured to exacting, reproducible specifications. They have exceptional resistance to corrosive substances, oils and fuels, insects, fungi, salt spray, and other environmental stresses. They do not absorb moisture; therefore, they will not rot, splinter, or crack.

HDPE products are manufactured in many dimensional lumber sizes, shapes, and colors. Planks, posts, rails, balusters, tongue and groove, groove and groove, and many specialty profiles are available. The products come in many wood tones and popular colors, including Sand, Weathered Wood, Light Gray, Cedar, Redwood, and White.

HDPE products have excellent weathering resistance; however, as with other polyolefins, it is possible that the material will fade slightly over the service life of the product. These products require no waterproofing, painting, staining, or similar maintenance when used in many exterior applications.

BASIC USES

HDPE products are used in many conventional wood lumber applications and are often the products of choice for exterior applications where weathering resistance and low maintenance are required.

Used in both residential and municipal applications, HDPE products are well suited for decking, porch flooring, docks, piers, furnishings, fencing, and lawn and garden items. HDPE products are cost-effective alternatives for ground contact and animal contact, wet, and environmentally harsh conditions.

Mechanical Properties @ 70°F	Test Method	Average Value...
Modulus of elasticity (@ 1% strain)	ASTM D6109	114,000 psi
Ultimate flexural stress (@ 3% strain)	ASTM D6109	2300 psi

LIMITATIONS

This type of product has less rigidity (modulus of elasticity) and greater elongation than wood lumber. Therefore, it is not recommended for use as a true structural member. Examples of applications that are inappropriate would be load-bearing walls, deck framing, and floor joists. It is recommended that an engineering study be performed prior to use of HDPE products if the application involves structural requirements. For commercial applications where the system design calls for concentrated loads, APL's Structural Lumber should be considered.

When utilizing HDPE products for decking or flooring, careful attention must be paid to joist spacing; joist spans will depend upon which HDPE deck board is installed. Multiple-span data at 120°F or less are presented here:

Deflection Limit	Allowable Live Load (psf), Multiple Spans, at 120°F or less			
	12" Span	16" Span	19.2" Span	24" Span
1 X Decking Board (t = 0.75)				
1/360	85	-	-	-
1/240	128	54	-	-
1/180	171	72	-	-
5/4 G & G/C Deck Board (t = 1.25)				
1/360	235	99	57	-
1/240	353	149	86	-
1/180	470	198	115	-
2 X Decking Board (t = 1.50)				
1/360	749	318	183	94
1/240	1124	474	274	140
1/180	1498	632	368	187

Note: Table provides limiting uniform load in pounds per square foot (psf) based on noted deflection criteria. Recommended standard is to limit live load deflection for floors to 1/360 and to limit total deflection (dead + live load) to 1/240. Designers may choose less restrictive or more restrictive criteria for a given application. Except for very unusual and heavy loading, deflection criteria will control allowable plank span. Deflection determination is based on the secant modulus of elasticity measured at 1% strain at 70°F in accordance with published data. Multiple span data assume uniform load is present on three spans (deflection = .0089wL⁴/EI). This formulation is consistent with and slightly more conservative than the plank span data promulgated by the Western Woods Product Association and others. Multiple span values are applicable to plank continuous over at least two spans.

INSTALLATION

HDPE products can be fabricated and installed with the same tools used to work wood lumber. The product will cut and drill very cleanly, as there is no grain to split or chip. It is not necessary to pre-drill the plastic lumber when fastening. Stainless steel or coated decking nails and screws are recommended for use with HDPE products. Screws are recommended for use with HDPE products. Screws offer the best form of attachment; however, nails and staples may also be utilized in some applications. See recommended fastener configurations and minimum screw