



Ecological Concepts, Inc



Eco-Tech

DURA MAX

STRUCTURAL LUMBER

DESCRIPTION

Dura Max Structural Lumber is a high-performance construction material consisting of a formula of recycled plastic, fiberglass, and selective additives. The plastic raw material utilized in **Dura Max** Structural Lumber is derived from post-consumer bottle waste such as milk and detergent bottles. This material is compounded into a consistent, reinforced plastic timber product using reactive stabilizers, creating a strong and stable plastic/fiber matrix. **Dura Max** Structural Lumber is a cost-effective and high-performance timber replacement product for marine construction and commercial applications. It has exceptional resistance to marine borers, salt spray, termites, corrosive substance, oil and fuels, fungi, and other environmental stresses. It does not absorb moisture; therefore it will not rot, splinter or crack.

Dura Max Structural Lumber products are manufactured in many dimensional lumber and timber sizes, particularly in large cross sections. Deck and dock planks, sheet piling, wale timbers, camels, fenders, and piles are all available from **ECO-TECH**.

The product comes in almost any transportable length and is standard in Gray. It can be special ordered in colors to complement your color choice. **Dura Max** Structural Lumber has excellent weathering resistance; however, as with many other polyolefin's, the material will fade over the service life of the product. The product requires no waterproofing, painting, staining, or similar maintenance when used in many exterior applications.

BASIC USES

Dura Max Structural Lumber are used in a variety of commercial and marine applications and are often the product of choice for exterior applications where resistance to salt and fresh water, marine borers, and other environmentally harsh conditions is required. Due to the unique composition of *Dura Max* Structural Lumber, the product can be used for a number of structural members in commercial and shoreline timberwork. It is well suited for:

- Dock and deck planks
- Sheet piling
- Pilings
- Channel markers
- Wale timbers
- Camels
- Fenders
- Post, beam, and joist

Mechanical Properties @ 21°c	Test Method	Average Value
Density, kg / m ³	ASTM D6111	748-831
Modulus of rupture (ultimate)	ASTM D198	20 Mpa
	ASTM D6109	20 Mpa
Modulus of Elasticity	ASTM D189	2896 Mpa
(Chord modulus method)	ASTM D6109	2241 Mpa
Compression parallel to grain (ultimate)	ASTM D198	12 Mpa
Compression perpendicular to grain	ASTM D143	5 Mpa
Shear parallel to grain	ASTM D143	8.7Mpa
Tension parallel to grain (ultimate)	ASTM D198	66.53
Screw withdrawal (N per 1mm of depth)	ASTM D1761	20Mpa
Coefficient thermal expansion mm/mm/°c	ASTM D6341	0.0000612
Coefficient of friction	Tribometer (dry)	0.61
Flame Spread	ASTM E84	“Class C”

LIMITATIONS

This type of plastic lumber products has a significantly higher modulus of elasticity (MOE) than conventional forms of plastic lumber. However, the MOE of *Dura Max* Structural lumber is lower than wood timber in good conditions; therefore, it is important to evaluate the suitability of this product for specific uses. It is recommended that an engineering study be performed prior to use of *Dura Max* Structural Lumber products for structural applications. Building code regulations vary by region, so all users should consult local building and safety codes prior to installation for specific requirements.

INSTALLATION

Dura Max Structural Lumber can be fabricated and installed with the same tools used to work wood lumber. The product will cut and drill very clean as there is no grain to split or chip, or knots to bind tools and bend fasteners. It is reinforced with glass fibers and precautions should be taken when fabricating the product. Maintain adequate ventilation when generating fabrication dust and personal respiratory protection such as dust masks should be employed during fabrication, as well as safety glasses or goggles. Pilings and sheet piling products can be driven with pile-driving equipment such as vibratory hammers, land-based or barge-mounted drop hammers, or water jet. For sheet piling installations, backfill soils should always be analyzed to determine that the proper amount of force would be exerted on the sheet piling system. For shoreline timberwork applications, **Dura Max** Structural Lumber is used with conventional hardware such as stainless or galvanized bolts, tie rods, nuts, washers, and anchor systems. When using **Dura Max** Structural Lumber for decking, joist spacing should be in accordance with the span tables. Multiple-span data at 49°C or less are presented here:

Structural Allowable Live Load (kpa), Multiple Span, at 49°C or less			
	305 mm	406 mm	610 mm
Deflection Limit	Span	Span	Span
Structural Decking Board † = 33mm			
L / 360	105	44	13
L / 240	144°	67	20
L / 180	144°	77	26

* Load limited by allowable stress of 6.9 Mpa

Note: Table provides limiting uniform load present on three spans in (kpa) based on noted deflection criteria.

Recommended standard is to limit live load deflection for floors to L / 360 and to limit total deflection (dead + live load) to L / 240. Designers may choose less restriction or more restrictive or more restrictive criteria for a given application. Except for very unusual and heavy loading, deflection criteria will control allowable plank span.

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Multiple span data assumes uniform load is present on three spans (deflection = $.0069wL^4/EI$.) This formulation is consistent with and slightly more conservative than plank span data promulgated by the Western Woods Product Association and others. Multiple span values are applicable to planks continuous over at least two spans.

WARRANTY

Each user of **Dura Max** Structural Lumber products is solely responsible for determining the suitability, safety, and effectiveness of any application or use of the product. **Dura Max** Structural Lumber products come with a limited 25 year warranty. The product is warranted against termites, decay, mold or facial fractures. Contact **ECO-TECH** for specific limited warranty coverage.

MAINTENANCE

Dura Max Structural Lumber products are unaffected by most corrosive substances and will not absorb moisture. To maintain the original finish, clean the lumber with soap and water. No sealing or painting is required; as a general rule, paint will not adhere well to these products. Graffiti can be cleaned from the plastic lumber with the use of a conventional all-purpose cleaner or petroleum-based cleaner. If the skin or surface layer of plastic lumber becomes marred or blemished, it is possible to sand off the top skin. The surface can also be buffed to eliminate abrasions.

ADDITIONAL INFORMATION

Dura Max Structural Lumber has a melt temperature of approximately 132°C and a flash-point of approximately 327°C. It has a higher flashpoint than wood, and it must be exposed to a severe combustion source for a longer period than wood to ignite the product. But like wood, when exposed to a combustion source for a long enough period, it will burn. Should a flame occur, extinguishing media should be dry chemical, foam, carbon dioxide, or water spray; water should be applied from a fogging nozzle.

Dura Max Structural Lumber products have been tested under repeated hydrothermal conditions (freezing, thawing, and wet conditions) as established by the ASTM and are proven to maintain their mechanical properties. **Dura Max** Structural Lumber has been submitted to and is under evaluation by International Code Council (ICC).