

May 2011

LUXURIOUS WOOD

The warmth and beauty of wood is a look that only nature can create. From this natural beauty, Landscape Forms fashions tastefully designed, high quality public space furniture, engineered to wear beautifully in the public eye.

HARDWOODS

There are many species of hardwoods available in the world in quantities and at prices that make them a practical choice for furniture. We use hardwood species that are difficult to carve into – a good choice for furniture placed in unsupervised public areas. Landscape Forms currently uses seven hardwoods: red oak, hard maple, jarrah, ipe, black locust, purpleheart and teak.

SOFTWOODS

The advantage of softwoods is their stability. As softwoods weather through wet and dry cycles, they expand and shrink only a small amount. As a result, softwood is less likely to warp, check, cup or split. Landscape Forms uses redwood and Alaskan yellow cedar. They are two of the higher rated softwoods.

FOREST MANAGEMENT

Forests are a renewable natural resource. Through ongoing programs of management and reforestation, we will always have an ample supply of hardwoods for useful products. According to the Forest Statistics of the United States, "The U.S. grows far more hardwoods than

are harvested each year. Overall, the net volume of growing stock timber in the U.S. is increasing." Our red oak and maple are harvested from well managed U.S. Forests. Black locust rapidly propagates itself in its native Appalachia.

The Western Australian forests which produce jarrah are managed by the Australian government's Forest Products Commission which is ISO 14001 certified and has received the Timber Industry's Excellence in Forest Management Award. All Western Australian jarrah is now from regrowth forests, with no harvesting of old growth forests allowed.

The redwood forests lie along the West Coast. Abundant groves of very large, old redwood trees have been preserved. The commercial redwood forests are privately owned lands where tree farmers have planted and grown trees specifically to be harvested. These farms are inspected and approved by the State Department of Forestry.

Landscape Forms is certified for chain of custody by SmartWood. Wood products certified by SmartWood are recognized as coming from well managed forests adhering to strict environmental and socioeconomic standards in accordance with the principles and criteria of the Forest Stewardship Council (FSC). This certification is your assurance that Landscape Forms utilizes wood from well managed forests. FSC Chain of Custody certified Ipe, maple, red oak, black locust, purpleheart and Alaskan yellow cedar are

available upon request for specific products as noted on our website. Landscape Forms FSC Chain of Custody registration code is SW-COC-001261. Our teak is from plantations in Java which are well managed by the government agency responsible for managing Indonesia's extensive forests and plantations. This agency strictly regulates the number and size of trees that can be felled, and the number of trees replanted to maintain productivity of the teak forests for future generations.

MAINTENANCE

Wood products in interior applications may be dusted or cleaned with a quality furniture polish. Woods for exterior use require no finish or routine maintenance. Over a period of time these exterior woods will weather to a warm, pewter gray and the texture of the wood will become more pronounced. This is a natural process that does not affect the structural integrity of the product. Staining, painting or varnishing are not recommended for exterior woods because this natural weathering process would make periodic refinishing a necessity.

WOODS AND FINISHES

Below is a quick overview of the woods and finish used at Landscape Forms. Our LF-80 finish has been specially formulated to protect our interior wood products without masking the beauty of the grain.

MECHANICAL PROPERTIES

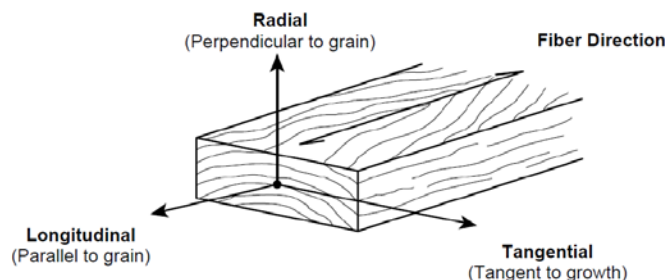
Category	Ipe	Jarrah	Maple	Northern Red Oak	Redwood (Young-growth)	Teak	Alaskan Yellow Cedar	Black Locust	Purpleheart
Drying Method & Moisture Content	Air Dry	Kiln Dry 8% - 12%	Kiln Dry 6% - 8%	Kiln Dry 6% - 8%	Kiln Dry 12% - 15%	Kiln Dry 12%	Kiln Dry 15% or less	Kiln Dry 6% - 8%	Kiln Dry 12%
Density Lbs/Ft3	64	54	39	47	26	40	29	43	61
Specific Gravity	0.92	0.67	0.63	0.63	0.35	0.55	0.48	0.69	0.79
Static Bending:									
Modulus of Rupture (psi)	22,600	16,200	15,800	14,300	7,900	13,710	11,354	19,400	19,200
Modulus of Elasticity (Million psi)	2.92	1.88	1.83	1.82	1.1	1.55	1.30	2.05	2.27
Work to Maximum Load [Ability to Absorb Shock] (in-lb per in3)	27.6		16.5	14.5	5.2	12.0	13.0	18.4	17.6
Impact Bending:									
Height of 50lb. hammer drop (inches) causing complete failure			39	44	15	—	29	57	44
Compression Parallel to Grain:									
Maximum crushing strength (psi)	13,010	8,870	7,830	6,760	5,220	7,605	7,520	10,800	10,320
Compression Perpendicular to Grain:									
Fiber stress at proportional limit			1,470	1,010	520	—	910	1,830	—
Shear Parallel to Grain:									
Maximum shearing strength (psi)	2,060	2,130	2,330	1,780	1,110	1,890	880	2,480	2,220
Tension Perpendicular to Grain:									
Maximum tensile strength (psi)				800	250	487	370	640	529
Load perpendicular to grain (lbs.). Represents the resistance of the wood to wear and to marring:	3,680	1,910	1,450	1,290	420	430	500	1,700	1,860

wood

technical information

May 2011

	<i>Appearance</i>	<i>Attributes</i>	<i>Region</i>	<i>Availability/Price</i>	<i>LF Grade</i>	<i>LF Use/Finish</i>
Red Oak	Slightly coarse grain with large, rounded pores.	Very strong, hard, stiff, heavy, durable. Finishes easily.	Northeast U.S.	Readily available, average price range.	FAS northern red oak.	For interior use only – LF-80, our clear catalyzed acrylic lacquer.
Hard Maple	Uniform in texture, straight-grained.	Heavy, hard, strong, close-grained, tough, stiff. Finishes well.	Lake States, Appalachians, Northwest U.S., Canada	Readily available, average price range.	Choice U.S. hardwood.	For interior use only – LF-80, our clear catalyzed acrylic lacquer.
Jarrah	Reddish-brown. Slowly weathers to a soft pewter gray outside. Even texture, fairly coarse, interlocked or wavy grain.	Very hard, highly resistant to indentation. Immune from dry rot, fungoid growth. Equally strong in wet or dry conditions. Very resistant to acids, termites, insect attack. Finishes well.	Western Australia	Readily available, moderate to high price range.	Select and better Australian hardwood.	Exterior wood products require no finish. Will weather to a soft pewter. For interior use only – LF-80, our clear catalyzed acrylic lacquer.
Redwood	Warm, reddish tone. Distinctly beautiful texture and grain patterns. Slowly weathers to a soft pewter gray outside.	Less likely to warp, check, cup or split. Resistant to decay, fire, insects, termites. Easy to work with. Holds finishes well.	U.S. West Coast	Readily available, average price range.	Clear all heart solid stock.	Exterior wood products require no finish. Will weather to a soft pewter.
Ipe	Light brown. Slowly weathers to a soft pewter gray outside. Fine to medium texture, straight grain.	Very strong, hard. Extremely dimensionally stable. Highly resistant to decay and insect infestation. Requires no finish. Weathers well.	South America	Readily available, average price range.	Select and better South American hardwood.	Exterior wood products require no finish. Will weather to a soft pewter.
Teak	Rich, golden brown luster with an oily feel when freshly cut. Has varying grain patterns.	Highly resistant to moisture and humidity. Resistant to splitting and cracking associated with weathering. Rich in natural oils and organics makes teak highly resistant to decay.	Burma, Thailand, Laos, India, Vietnam, Cambodia and Indonesia	Teak is a precious world resource that is tightly managed. Quality teak is a moderately expensive tropical wood traded as a world commodity.	A & B grade furniture teak.	Exterior wood products require no finish. Teak will weather to a soft, silvery-gray color upon exposure to air and light.
Alaskan Yellow Cedar	Distinctive and uniform pale yellow. Occasional knots are part of the character of the wood.	Prized by boat builders and for structural GluLam beams, it has exceptional resistance to weather and insects as well as easy workability.	Pacific coast region of North America	Readily available from managed plantations. Average to premium price range.	Lamination grade is specified for GluLam construction.	Exterior wood products require no finish. Will weather to a soft pewter.
Black Locust	Tan with brown and yellowish hues. Medium grain texture with random patterns.	Outstanding durability and resistance to decay. High strength.	Black Locust propagates itself in many regions of the United States. The best specimens are from Appalachia.	Readily available. Moderate price. Black Locust is considered an invasive species that rapidly self-propagates.	Premium Grade – (Plus)	Exterior wood products require no finish. Weathers in stages from golden-brown, soft pewter and finally to a somewhat darker pewter.
Purpleheart	Dark purple-brown. Typically straight grain patterns.	Very durable and resistant to decay.	Central and Latin America, and S.E. Asia.	Supplies are ample, but the wood can be fairly expensive. Exported in generally low but regular rate.	Clear grade	Exterior wood products require no finish. Will weather to a medium pewter.



The Three Principle Axis of Wood with respect to grain direction and growth rings