

STERLING CRANE MATS™

STRONGER, SAFER, & LONGER LASTING THAN MATS BUILT WITH GUM TIMBERS.

At Sterling Lumber, we stockpile only quality Oak hardwood timber for our mats. Our consistent selection of high-grade Oak maximizes the strength, performance and overall longevity of our mats. Although they may look similar, a number of competitive mat manufacturers use various species of gum in their mats. Species such as: Sweetgum; Black Tupelo; and Black Gum are no match for Sterling's use of Mixed Oak timbers.

Mixed Oak Beats Gum Where it Counts... In Overall Strength and Durability!

In relatively every physical property related to wood strength, Mixed Oak timbers outperform Gum. Mechanical properties most commonly measured and represented as "strength properties" for lumber include modulus of rupture in bending, maximum stress in compression parallel to grain, compressive stress perpendicular to grain, and shear strength parallel to grain.

Modulus of Rupture (Fig. A) reflects the maximum load carrying capacity of lumber (the modulus is the point at which the wood will damage due to load or stress). The wood species' modulus of rupture is an accepted criterion of strength, although it is not a true stress rating because the formula by which it is computed is valid only to its elastic limit.

Compressive Strength (Fig. B) The wood's maximum stress or force that can be sustained before damage is measured parallel to grain.

Shear Strength (Fig. C) is the wood's ability to resist internal shearing along the grain under load. The values presented are average strength in radial and tangential shear planes (parallel to grain).

Resistance to Decay

Unlike mold and stain fungi, wood-destroying (decay) fungi seriously reduce strength by metabolizing the cellulose fraction of wood that gives wood its strength. Early stages of decay are virtually impossible to detect. When weight loss reaches 5% to 10%, mechanical properties are reduced by 20%-80%. Decay has the greatest effect on toughness, impact bending, and work to maximum load in bending.¹

Multiple Oak species are listed as resistant or very resistant to decay. (The USDA Forest Products Laboratory "Wood Handbook.")¹

Sweetgum / Black Tupelo / Black Gum are not durable with contact to the soil. (University of North Carolina, "on exposure, is not durable.")²

Mixed Oak Lumber is Tougher and has Higher Resistance to Impact

Measurements that are made to evaluate toughness and resistance to impact and load are: work to maximum load in bending, impact bending strength, tensile strength perpendicular to grain, side hardness, radial and tangential toughness and modulus of elasticity.

Work to Maximum Load (Fig. D)

is wood's ability to absorb shock (with some permanent deformation). Work to maximum load is a measure of the combined strength and toughness of wood under the stress of bending.

Impact Bending (Fig. E)

measures the wood's ability to absorb shocks or be crushed from speed, acceleration and force (weight). Drop Test - The test for impact bending is to drop a 50-pound hammer on a wood beam from successively increased heights until rupture occurs or the beam deforms 152 mm (6 in.) or more. The height of the maximum drop, or the drop that causes failure, is the comparative value.

Tensile Strength (Fig. F) Perpendicular to Grain

Resistance of wood to forces acting across the grain tends to split a member. (Values presented are the average of radial and tangential measurements.) Failure is the comparative value.

Side Hardness (Fig. G) Resistance to Indentation

The standard test - Measure the force required to embed a 11.28 mm (0.444 in.) steel ball to one-half its diameter in the wood sample.

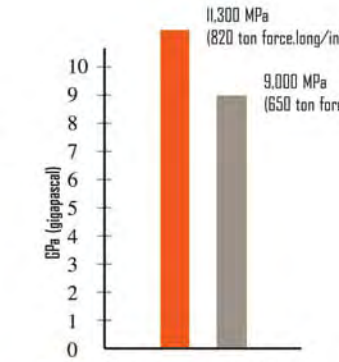
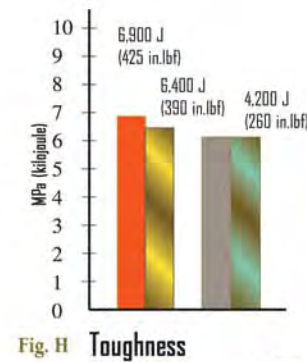
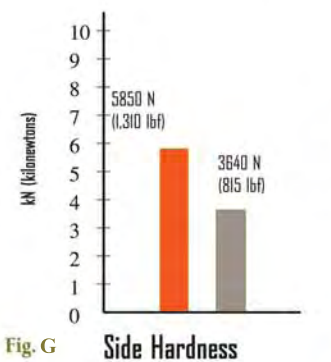
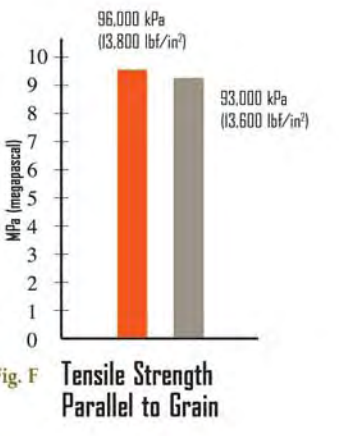
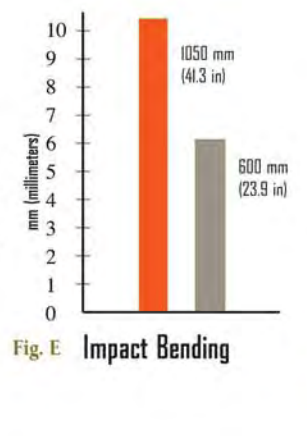
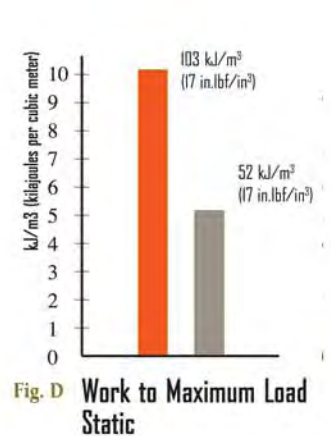
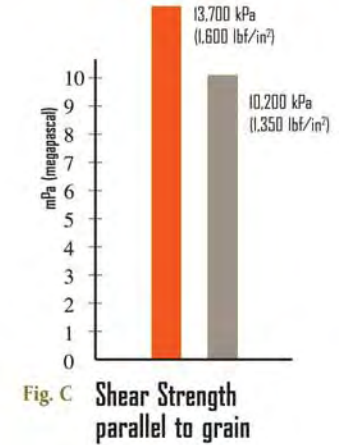
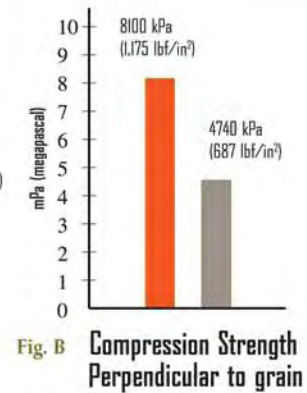
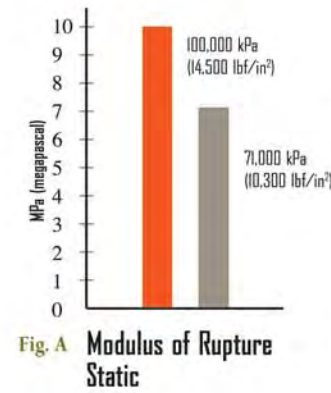
Radial and Tangential Toughness (Fig. H)

This is the energy or force required to cause rapid complete failure (snap or crack in pieces, enough damage to require replacement).

Modulus of Elasticity (Fig. I)

Elasticity implies that deformations produced by low stress are completely recoverable after loads are removed. When loaded to higher stress levels, deformation or failure occurs. In wood, this is tested by bending rather than an axial load.

MIXED OAK VS. GUM PHYSICAL PROPERTIES



Note: Bar graphs above represent the data reported in Mechanical Properties of Wood⁴ averaged for the species. Gum lumber data includes Sweetgum, Tupelo Black, Water Black and Black Gum. Mixed Oak includes: Red Oak (Black, Cherrybark, Laurel, Northern Red, Pin, Scarlet, Southern Red, Water and Willow) and White Oak (Bur, Chestnut, Overcup, Post, Swamp Chestnut, Swamp White and White).

References

- USDA Forest Products Laboratory. 1999, Wood Handbook—Wood as an Engineering Material. Gen. Tech. Rep. FPL-GTR-113. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 463 p.
- U of North Carolina, found on Wikipedia.
- Property values based on ASTM Standard D2555-88. Information on additional properties can be obtained from Department of Forestry, Canada, Publication No. 1104.
- Data From Tables in Chapter 4, Mechanical Properties of Wood, David W. Green, Jerrold E. Winandy, and David E. Kretschman.

