TECHLINE
Properties and Use of Wood, Composites, and Fiber Products

Hardwoods for Structural Lumber

Structural lumber produced from hardwood species may be economically competitive as lower quality hardwoods become more abundant and research resolves technical problems.

For many years, the primary source of lumber for residential, commercial, and industrial construction has been softwood species. Hardwoods have commonly been used for higher valued products such as furniture and cabinetry. In today's forests, lower quality hardwoods not well suited for these demanding uses are abundant. This timber resource appears suited for structural application and may be economically competitive with softwoods in the structural lumber market.

Research has resolved many of the technical problems associated with the manufacture of dimension lumber from hardwoods, notably excessive warp and twist. Structural grading rules and allowable design stresses approved by the American Lumber Standards Committee (ALSC) are available for visually graded structural lumber for three lower density hardwood species (cottonwood, aspen, and yellow-poplar) and several higher density hardwood species or species groups (red maple, mixed maple, beech–birch–hickory, mixed oak, red oak, northern red oak, and white oak). Machine stress rated (MSR) lumber has been produced with these hardwood species and used to construct lumber bridges.

Despite the removal of many technical barriers, structurally graded hardwoods are not generally available in the market. Potential producers still face uncertainties of competition with softwood lumber, pricing of hardwood lumber, and expected profit margin. These economic questions are further complicated by consumer tendency to stay with familiar products.

Despite this, the outlook for hardwood structural lumber has never been more favorable. Increasing demand, both domestic and international, for dimension lumber and reductions in timber harvest from Federal land in the West have increased interest in using local species, including hardwoods.

Structural lumber can be produced using hardwood species in mills that have traditionally used softwood species. It can also be produced in traditional hardwood mills interested in diversifying their product mix. Although not generally available, mechanically graded hardwood structural lumber can be produced using the same procedures as for softwood species. Mill owners must examine all variables of economic feasibility, such as log and stumpage prices, yields and product values, processing costs, and any needed capital investments.

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