

Softwood Lumber Grading

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Softwood lumber in the United States is most commonly graded according to the guidelines of the American Softwood Lumber Standard PS 20-70, established by the U. S. Department of Commerce. Canadian softwood lumber imported into the U. S. is graded by inspection agencies in Canada that also adhere to the American Softwood Lumber Standard.

For purposes of grading, softwood lumber may be categorized into two categories of intended use: construction or remanufacture. Construction lumber is lumber that will function as graded and sized after primary processing - sawing , surfacing, etc. It is commonly available in retail lumber yards and serves as the primary softwood resource for many woodworkers. Lumber for remanufacture can be expected to undergo secondary manufacturing to create a product that may differ markedly from the original graded piece. Industrial operations are the typical users of this type of lumber. Some examples include stock for pencils, ladders, poles, boxes, and moulding. Most softwood lumber is sold as construction lumber and that will be the emphasis of the following discussion.

Construction Lumber

Lumber intended for general construction purposes may be subdivided into **stress-graded**, **nonstress-graded**, and **appearance** lumber. For stress-graded and nonstress-graded lumber, the structural integrity of the wood is the primary requirement in the grading process. With appearance lumber, the appearance or visual quality of the piece is most important and structural integrity is of secondary importance. The term "yard lumber" is often applied to the nonstress-graded and appearance lumber that is sold by retail lumberyards. This is the type of lumber that many woodworkers utilize. With such lumber, grading is done on the better side of a piece after drying and surfacing, and grades are designated by specifying the allowable size and number of defects (e.g., knotholes). This contrasts with hardwoods where most grades are determined from the poorer side of each piece on the basis of a specified number of clear cuttings. Another distinction is that hardwoods are typically graded prior to drying and surfacing.

Nonstress-Graded Lumber (Common)

With nonstress-graded lumber, pieces are graded primarily for serviceability but appearance is also considered, especially in the higher grades. Imperfections such as knots and knotholes are allowed to become larger and more frequent as the grade drops. The primary product is boards that are less than 2 inches in nominal thickness and 2 inches or more in nominal width. The standard 3/4" thick board found in retail lumber yards is an example familiar to most woodworkers. Common nominal widths are 2-, 3-, 4-, 6-, 8-, 10-, and 12-inches. Lengths are usually from 6- to 18-feet in increments of 2 feet. Boards may be sold square-edged, tongue-and-grooved, or shiplapped. Three to five different Common grades may be applied to boards in this group depending upon the species and the lumber manufacturing association involved. In descending order of quality, the grades are No. 1 (Construction), No. 2

(Standard), No. 3 (Utility), No. 4 and No. 5. The first three grades are most commonly available in retail lumber yards.

Common Lumber Grades

No. 1 (Construction)

Moderate-sized tight knots. Paints well. Used for siding, cornice, shelving, paneling, some furniture.

No. 2 (Standard)

Knots larger and more numerous. Paints fair. Similar uses as No. 1.

No. 3 (Utility)

Splits and knotholes present. Does not take paint well. Used for crates, sheathing, subflooring, small furniture parts.

No. 4 (Economy)

Numerous splits and knotholes. Large waste areas. Does not take paint well. Used for sheathing, subflooring, concrete form work.

No. 5 (Economy)

Larger waste areas and coarser defects. Unpaintable. Applications are similar to No. 5.

Appearance Lumber (Finish, Selects)

Appearance lumber (graded as Finish or Selects) is often nonstress-graded but a separate category exists due to the greater importance placed on appearance. Boards in this category will be of most use to the woodworker interested in making quality softwood furniture with a natural finish. In addition to boards, this group includes most softwood lumber that has been custom milled to a pattern or otherwise surfaced on all four sides (S4S). Examples are trim, siding, shingles, flooring, casing, base, stepping, and paneling. The highest grade of appearance lumber is Finish, which is subdivided into grades composed of letters or combinations of letters (B&BTR, C, D) or names such as Superior or Prime, depending on the grading agency. The next level down is Selects which has grade designations composed of numbers, letters, and names of combinations of them (B&BTR, C Select, D Select).

To further complicate matters, some differences in grade designations exist for different wood species and products. Cedar and redwood, for example, have different grade designations than other softwoods due to the marked difference in color between heartwood and sapwood in these two woods. Typical redwood board grades are Clear All Heart, Clear, and Select. Other woods, such as western white or Idaho white pine (IWP) are graded as Supreme-IWP, Choice-IWP, and Quality-IWP. Some appearance lumber may also carry annotations such as FG (flat grain), VG (vertical grain), or MG (mixed grain).

In spite of all of these complexities, many woodworkers will encounter four grades of Select boards in shopping for project lumber. These are denoted A, B, C, and D with A being the highest grade, and D the lowest. In practice, grades A and B are

combined into one grade known as B and better (B&BTR). The accompanying table briefly summarizes each of the standard grades of Select appearance lumber.

Select Appearance Lumber Grades

A Select

No knots, splits, or other visible defects. Used for fine furniture, exposed cabinetry, trim, flooring

B Select

A few, small defects but nearly perfect. Used for fine furniture, exposed cabinetry, trim, flooring.

C Select

Small tight knots. May be nearly perfect on one side. Used for most furniture, shelving, some trim and flooring.

D Select

More numerous "pin" knots and other small blemishes. May be used for some furniture, shelving, some trim and flooring.

Stress-Graded (Dimension) Lumber

This category includes most softwood lumber that is nominally 2 to 4 inches thick, referred to as "dimension" lumber. Examples include posts, beams, decking, studs, rafters, joists, timbers, and other structural lumber where working stresses will exist. Important qualities for stress-graded wood are strength, stiffness, and uniformity of size. Stress ratings may be determined either visually or mechanically to derive working values for properties such as bending stress and modulus of elasticity (E). A single set of grade names and descriptions are used throughout the United States although the allowable properties vary with wood species. Dimension stock is carried in nominal 2-, 4-, 6-, 8-, 10-, and 12-inch widths and 8- to 18-foot lengths in multiples of 2 feet.

Grades for Dimension Lumber

2" x 4" and Wider	2" x 4"	Posts, Timbers, Beams, etc.
Select Structural	Standard and Better (STD&BTR)	Select Structural
No. 1	Utility and Better (UTIL&BTR)	No. 1 Structural (Douglas Fir)
No. 2	STUD (10' max)	No. 1 SR (southern pine)
No. 3		No. 2 SR (southern pine)
No. 2&BTR		
No. 3&BTR		