Understanding wood grading

When we purchase wood, we are often faced with terms such as "FAS", "FAS 1", "Number 1 Common", "Number 2 Common", etc. What do these terms mean? How will your choice impact your project?

Wood grouping (construction):

Wood used in construction is basically broken up into two groups, "Structural" and " Non-Structural".

"Structural wood" is wood used in construction for load bearing applications. "Load Bearing" refers to any piece which is used to support weight and cannot safely be removed once installed. Examples are: foundations, columns, beams, and load-bearing walls.

"Non-structural" wood is non load bearing wood used for elements that are essential for a building's functioning but do not contribute to its load-bearing capacity or structural integrity, such as ceilings, partitions, doors, windows, flooring, trim, and other finishing materials.

Construction Grading:

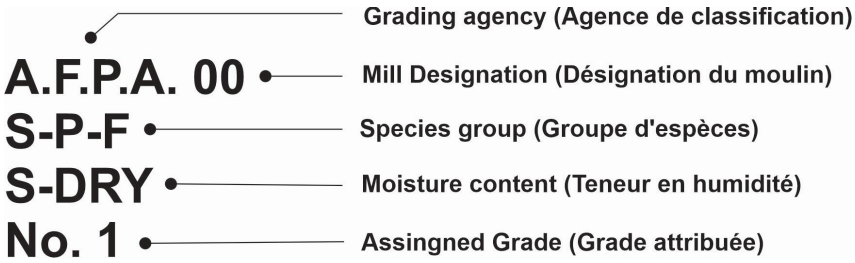
Construction grade lumber is dimensional wood (wood that's been milled and cut to standard, pre-defined sizes) that is milled and sold based on its strength rather than its other qualities. It is almost always made from softwoods: spruce, pine or fir ("SPF").

Canadian dimension lumber is manufactured in accordance with CSA O141 *Canadian Standard Lumber* and must conform to the requirements of the Canadian and US lumber grading rules. Each piece of dimension lumber is inspected to determine its grade, and a stamp is applied indicating the assigned grade, the mill identification number, a green (S-Grn) or dry (S-Dry) moisture content at time of surfacing, the species or species group, the grading authority having jurisdiction over the mill of origin, and the grading rule used, where applicable.

The lumber grader is an integral part of the lumber manufacturing process. Using established correlations between appearance and strength, lumber graders are trained to assign a strength grade to dimensional lumber based on the presence or absence of certain natural characteristics. Examples of such characteristics include; the presence of wane (bark remnant on the outer edge), size and location of knots, the slope of the grain relative to the long axis and the size of shakes, splits and checks. Other characteristics are limited by the grading rules for appearance reasons only. Some of these include sap and heart stain, torn grain and planer skips.

Grades like #1, #2, and #3 are common for structural framing, with smaller numbers indicating higher strength and fewer defects.

Grade Stamp:



Grade size definitions (construction):

2x4: Actual size is: 1 1/2" x 3 1/2".
2x6: Actual size is: 1 1/2" x 5 1/2".
2x8: Actual size is: 1 1/2" x 7 1/4".
2x10: Actual size is: 1 1/2" x 9 1/4".
2x12: Actual size is: 1 1/2" x 11 1/4".
4x4: Actual size is: 3 1/2" x 3 1/2".
4x6: Actual size is: 3 1/2" x 5 1/2".
6x6: Actual size is: 5 1/2" x 5 1/2".
8x8: Actual size is: 7 1/4" x 7 ¼

Standard Grades of Hardwood Lumber

Grade Name	Grade	Min. Board Length	Min. Board Width	Min. Cutting Size Required Width	Min. Area of Cuttings Clear
First & Seconds	FAS	8'	6"	4"x5' - 3"x7'	83-1/3%

This is the highest grade, representing the finest quality lumber with minimal defects, ideal for high-quality furniture and cabinetry.

FAS 1-Face	F1F	8'	6"	4"x5' - 3"x7'	83-1/3%

This grade requires the best face to meet FAS standards, while the other side meets #1 Common standards.

Select	SEL	6'	4"	4"x5' - 3"x7'	83-1/3%

Slightly lower than FAS, Select grade lumber offers excellent quality with a few more imperfections, still suitable for fine woodworking.

No. 1 Common	1C	4'	3"	4"x2' - 3"x3'	66-2/3%

This grade contains more character than Select, but each board must be two-thirds or more usable, making it more economical for small projects or when a variety of sizes are to be cut.

No. 2A Common	2AC	4'	3"	3"x2'	50%

This is the lowest grade, often used for framing or where a lower quality appearance is acceptable.

No. 2B Common	2BC	4'	3"	3"x2'	50%

This grade is often referred to as the Economy grade because of its price and suitability for a wide range of furniture parts and is also the grade of choice for the hardwood flooring industry.

No. 3A Common	3AC	4'	3"	3"x2'	33-1/3%

Is the same as #2A Common, except that stain and other sound defects are admitted in the clear cuttings, making it an excellent grade for painting.

Prime: Prime grade lumber provides the same structural properties as #1 grade lumber, but has fewer knots and better appearance. #2 Prime grade has the strength of #2 grade lumber, but will look better, with fewer knots.

Wood grouping (woodworking):

"*Timber*" is the reference term used in woodworking when the wood still raw wood from trees before processing into lumber.

"*Lumber*" is the reference term used in woodworking when the wood has been processed into boards and planks

Factors Affecting Lumber Grades:

***Defects*:** Knots, splits, wane, bark inclusion, checks, and other defects can lower the grade of lumber. If any of these elements are present, they interrupt the face and reduce the size of the cutting that can be obtained.

Knot Split Wane Bark inclusion Checks

***Grain Slope*:** The angle of the grain relative to the length of the piece affects strength. The slope of grain is typically expressed as a ratio, with the first number representing the rise (or deviation) and the second number representing the run (or distance over which the deviation occurs). For example, a slope of grain of "1 in 12" means that for every 12 inches along the length of the piece, the grain deviates by 1 inch from a line parallel to the edge.


***Species*:** Different wood species possess varying strengths and qualities due to factors like density, grain structure, and cell wall thickness, influencing their hardness, elasticity, and suitability for different applications.

***Size*:** The length, width, and thickness of the lumber piece can also influence its grade, with larger, more consistent dimensions often resulting in higher grades

Acceptable Factors Affecting Lumber Grades:

The following elements are considered acceptable and will not affect the cutting sizes. These elements do not affect the structural integrity of the lumber and in many cases can be seen as appealing character depending on the industry and final use.

- Sapwood to Heartwood Transitions

- Mineral Streaks

- Sticker stains

- Gum Streaks

Use the grade as your guide, but have a clear understanding of what you need to use your lumber for and what "defects" will be accepted.