

Measurement

The NHLA lumber grading rules adopted by the US hardwood industry are based on an imperial measurement system using inches and feet. In contrast most export markets are more familiar with a metric standard. Additionally, the grade rules were developed with random width and length lumber in mind. Any selection for particular specifications should be discussed prior to ordering.

Board foot

A board foot (BF) is the unit of measurement for hardwood lumber.

A board foot is 1 foot long x 1 foot wide x 1 inch thick. (1 foot = 0.305 metres, 1 inch = 25.4mm)

The formula for determining board feet in a board is:

(Width in inches x length in feet x thickness in inches) divided by 12

The percentages of clear wood required for each grade are based on this 12 unit of measure.

Surface measure

Surface measure (SM) is the surface area of a board in square feet. To determine surface measure, multiply the width of the board in inches by the length of the board in feet and divide the sum by 12 rounding up or down to the nearest whole number. The percentage of clear wood required for each grade is based on the surface measure, not the board feet, and because of this all boards, no matter what the thickness, are graded in the same way.

Some examples for surface measure calculations are as follows:

$$6\frac{1}{2}'' \times 8 \div 12 = 4\frac{1}{3} = 4 \text{ SM}$$

$$8' \times 12 \div 12 = 8 \text{ SM}$$

$$10' \times 13 \div 12 = 10\frac{1}{2} = 11' \text{ SM}$$



Example of SM and BF:

The board above is a 2' thick, 6 1/4" wide, and 8 long.

$6\frac{1}{4}'' \times 8 \div 12 = 4\frac{1}{3}$, thus the SM is 4. Multiply the SM by the thickness 2' and the BF is 8.

When preparing a bundle tally for export, the boards are recorded by their width and length. Random widths above or below the half inch are rounded to the nearest whole inch. Board widths falling exactly on the half inch are alternatively rounded up or down. Lengths that fall between whole foot increments are always rounded down to the nearest whole foot. For example a board 5 1/4" width and 8 1/2' long is tallied 5' and 8.

Standard thickness for rough sawn lumber

Standard thickness for rough sawn lumber is expressed in quarters of an inch. For example 1" = 4/4. The majority of US hardwood lumber production is sawn between 1" and 2", although other thicknesses are available in more limited volumes. The standard thicknesses and their exact metric equivalent are shown below.

3/4	(3/4" = 19.0mm)	8/4	(2" = 50.8mm)
4/4	(1" = 25.4mm)	10/4	(2 1/2" = 63.5mm)
5/4	(1 1/4" = 31.8mm)	12/4	(3" = 76.2mm)
6/4	(1 1/2" = 38.1mm)	16/4	(4" = 101.6mm)

Standard thickness for surfaced (planed) lumber

When rough sawn lumber is surfaced (planed) to a finished thickness, defects such as checks, stain, and warp are not considered when establishing the grade of a board, **if they can be removed in the surfacing (planing) process**. The finished thickness for lumber of 1 1/2" and less can be determined by subtracting 3/64" from the nominal thickness. For lumber 1 3/4" and thicker, subtract 1/4".

Measurement of kiln dried lumber

Net tally: The actual board feet of kiln dried lumber measured after kiln drying.

Gross or green tally: The actual board feet measured before kiln drying. When kiln dried lumber is sold on this basis, the buyer can expect to receive approximately 7% less board feet because of shrinkage in the kiln drying process.

Estimating board feet in a bundle of lumber

To determine the board feet of one board, the procedure is to multiply the surface measure by the thickness. A bundle of lumber can be estimated in much the same manner. First, calculate the surface measure of one layer of boards. Do this by multiplying the width of the bundle, minus gaps, by the length of the bundle and divide the sum by 12. If there are several lengths in the bundle, use an average length. Once one layer is estimated, multiply this sum by the total number of layers.

Example:

Average width of unit 40'
(lumber only, after allowing for gaps between boards)

Length of unit 10

$$\begin{aligned}
 40' \times 10 &= 400 \div 12 &&= 33.33 \\
 \text{Thickness of lumber } 8/4 &&&\times 2 \\
 &&&= 66.66 \\
 \text{Number of layers} &&&\times 10 \\
 &&&= 666.67 \\
 &&&\text{-----}
 \end{aligned}$$

Estimated board feet of the bundle 667 BF



Conversion factors

1": 25.4 millimetres (mm)
1m: 3.281 feet
1,000BF: (1MBF) 2.36 cubic metres (m³)

1m³: 424 board feet (BF)
1m³: 35.315 cubic feet (cu. ft)