

## Species of Wood -- Table of Relative Wood Densities

The following lists the density of some woods. The Drivability of RAPTOR® fasteners depends on the density and hardness of the substrate and the shape of the fastener (length/diameter). Shorter thicker nails will drive into harder substrates easier than long, thin nails. RAPTOR® staples will drive into harder substrates if pneumatic tools are used rather than manual tools.

While some customers are using shorter staples and brads in oak and maple (Group I), longer nails are limited to soft wood applications (Group III & IV). Woods with very dense latewood growth rings do not give good performance with RAPTOR® products.

|                   | Species Of Wood              | Relative Density*<br>(Specific Gravity) |
|-------------------|------------------------------|---|
| <b>Group I</b>    | Ash, Commercial White        | 0.62                                    |
|                   | Beech                        | 0.68                                    |
|                   | Birch, Sweet & Yellow        | 0.66                                    |
|                   | Hickory & Pecan              | 0.75                                    |
|                   | Maple, Black & Sugar         | 0.66                                    |
|                   | Oak, Red & White             | 0.67                                    |
| <b>Group II</b>   | Douglas Fir-Larch            | 0.51                                    |
|                   | Southern Pine                | 0.55                                    |
|                   | Sweetgum & Tupelo            | 0.54                                    |
|                   | Virginia Pine-Pond Pine      | 0.54                                    |
| <b>Group III</b>  | California Redwood0.         | 0.42                                    |
|                   | Douglas Fir, South0.         | 0.48                                    |
|                   | Eastern Hemlock0.            | 0.43                                    |
|                   | Eastern Hemlock-Tamarack0.   | 0.45                                    |
|                   | Eastern Softwoods0.          | 0.42                                    |
|                   | Eastern Spruce0.             | 0.43                                    |
|                   | Hem-Fir0.                    | 0.42                                    |
|                   | Lodgepole Pine0.             | 0.44                                    |
|                   | Mountain Hemlock0.           | 0.47                                    |
|                   | Mountain Hemlock-Hem Fir0.   | 0.44                                    |
|                   | Northern Aspen0.             | 0.42                                    |
|                   | Northern Pine0.              | 0.46                                    |
|                   | Ponderosa Pine0.             | 0.49                                    |
|                   | Ponderosa Pine, Sugar Pine0. | 0.42                                    |
|                   | Red-Pine0.                   | 0.42                                    |
|                   | Sitka Spruce0.               | 0.43                                    |
|                   | Southern Cypress0.           | 0.48                                    |
|                   | Spruce-Pine-Fir0.            | 0.42                                    |
| Western Hemlock0. | 0.48                         |   |
| Yellow Poplar0.   | 0.46                         |   |

|                 | Species Of Wood                | Relative Density*<br>(Specific Gravity) |
|-----------------|--------------------------------|---|
| <b>Group IV</b> | Aspen                          | 0.40                                    |
|                 | Balsam Fir                     | 0.38                                    |
|                 | Black Cottonwood               | 0.33                                    |
|                 | California Redwood, Open Grain | 0.37                                    |
|                 | Coast Sitka Spruce             | 0.39                                    |
|                 | Coast Species                  | 0.39                                    |
|                 | Cottonwood, Eastern            | 0.41                                    |
|                 | Eastern White Pine             | 0.38                                    |
|                 | Eastern Woods                  | 0.38                                    |
|                 | Engelmann Spruce-Alpine Fir    | 0.36                                    |
|                 | Idaho White Pine               | 0.40                                    |
|                 | Northern Species               | 0.35                                    |
|                 | Northern White Cedar           | 0.31                                    |
|                 | West Coast Woods               | 0.35                                    |
|                 | Western Cedars                 | 0.35                                    |
|                 | Western White Pine             | 0.40                                    |
|                 | White Woods (Western)          | 0.35                                    |

**\* Relative Density (Specific Gravity relative to Moisture Content)**

Technically, specific gravity is a measure of the ratio of a wood's density as compared to water.

(i.e. If a wood were of the same density as water, its specific gravity would be 1.00.)

As with any density measurement for wood, it is greatly dependent upon the wood's moisture content:

i.e. the more moisture the wood contains, the denser it will be. The "average dried weight" moisture content of wood is generally assumed to be 12% — unless otherwise noted.

- Ref. 1: *The Wood Database | Specific Gravity*
- Ref. 2: *CECALC | Wood Species Specific Gravity*
- Ref. 3: *Engineering Toolbox | Density of Wood and Moisture Content*