

# COMPARING WOOD SPECIES



| UNIT | SPF-INTERIOR SPRUCE<br><small>(Picea glauca)</small> | SPF-LODGEPOLE PINE<br><small>(Pinus contorta)</small> | SPF-ALPINE FIR<br><small>(Abies lasiocarpa)</small> | WESTERN HEMLOCK<br><small>(Tsuga heterophylla)</small> | DOUGLAS FIR<br><small>(Pseudotsuga menziesi)</small> | YELLOW CEDAR<br><small>(Cupressus nootkatensis)</small> | WESTERN RED CEDAR<br><small>(Thuja plicata)</small> | DARK RED MERRANTI<br><small>(Shorea spp)</small> | EUROPEAN BEECH<br><small>(Fagus sylvatica)</small> | TEAK<br><small>(Tectona grandis)</small> | AMERICAN WHITE OAK<br><small>(Quercus alba)</small> | AMERICAN WHITE ASH<br><small>(Fraxinus americana)</small> |
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## WOOD PROPERTIES

|                     |       |           |           |           |           |           |           |           |           |           |           |                |           |
|---------------------|-------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------|-----------|
| DENSITY (AT 12% MC) | KG/M3 | 380       | 430       | 351       | 429       | 540       | 431       | 339       | 675       | 710       | 650       | 755            | 673       |
| MOR/ STRENGTH       | MPA   | 63        | 76        | 56        | 81        | 85        | 80        | 54        | 87.7      | 110       | 100.7     | 102.3          | 103.4     |
| MOE /STIFFNESS      | MPA   | 10000     | 10900     | 10200     | 12300     | 13440     | 11000     | 8200      | 12020     | 14310     | 10700     | 12150          | 11997     |
| HARDNESS            | N     | 1880      | 2190      | 1560      | 2740      | 3158      | 2510      | 1470      | 3570      | 6460      | 4400      | 5990           | 5871      |
| SEASONING           |       | GOOD      | GOOD      | GOOD      | GOOD      | GOOD      | GOOD      | GOOD      | DIFFICULT | DIFFICULT | GOOD      | DIFFICULT      | GOOD      |
| DURABILITY          |       | POOR      | POOR      | POOR      | POOR      | GOOD      | VERY GOOD | VERY GOOD | GOOD      | POOR      | VERY GOOD | GOOD           | POOR      |
| TREATABILITY        |       | MODERATE  | GOOD      | DIFFICULT | GOOD      | GOOD      | DIFFICULT | DIFFICULT | DIFFICULT | GOOD      | DIFFICULT | VERY DIFFICULT | GOOD      |
| PLANING             |       | VERY GOOD | EXCELLENT | VERY GOOD | VERY GOOD | VERY GOOD | EXCELLENT | VERY GOOD | VERY GOOD | VERY GOOD | GOOD      | GOOD           | GOOD      |
| TURNING             |       | GOOD      | GOOD      | GOOD      | VERY GOOD | EXCELLENT | VERY GOOD | GOOD      | VERY GOOD | EXCELLENT | VERY GOOD | GOOD           | EXCELLENT |
| MORTISING           |       | VERY GOOD | VERY GOOD | GOOD      | VERY GOOD | EXCELLENT | EXCELLENT | GOOD      | VERY GOOD | VERY GOOD | VERY GOOD | GOOD           | GOOD      |
| NAILING             |       | VERY GOOD | MODERATE  | MODERATE  | VERY GOOD | VERY GOOD | VERY GOOD | MODERATE  | MODERATE  | VERY GOOD | GOOD      | GOOD           | GOOD      |

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| SCREW HOLDING                          |   | GOOD      | MODERATE  | MODERATE  | GOOD      | VERY GOOD | GOOD      | MODERATE* | MODERATE  | VERY GOOD | VERY GOOD | GOOD      | GOOD      |
| STAINING                               |   | VERY GOOD | VERY GOOD | VERY GOOD | VERY GOOD | EXCELLENT | VERY GOOD | EXCELLENT | VERY GOOD | GOOD      | VERY GOOD | EXCELLENT | EXCELLENT |
| VOLUMETRIC SHRINKAGE (GREEN TO 12% MC) | % | 13.7      | 11.1      | 9.4       | 12.4      | 12.4      | 9.2       | 6.8       | 13.1      | 17.3      | 7         | 16.3      | 13.3      |
| T/R RATIO                              |   | 1.7       | 1.6       | 2.8       | 1.9       | 1.6       | 2.1       | 2.1       | 2.1       | 2         | 2.3       | 1.9       | 1.6       |
| SHRINKAGE- RADIAL                      | % | 4.7       | 4.3       | 2.6       | 4.2       | 4.8       | 2.8       | 2.4       | 3.8       | 5.7       | 2.5       | 5.6       | 4.9       |
| SHRINKAGE-TANGENTIAL                   | % | 8.2       | 6.7       | 7.4       | 7.8       | 7.6       | 6         | 5         | 7.9       | 11.6      | 5.8       | 10.5      | 7.8       |

\*SS wood screws allowing minimum 1" penetration or 1.25" penetration in structural application.

### References

- 1) Wood Handbook- Wood as an engineering material, 2010, centennial edition, Forest Products Laboratory, USA
- 2) <http://www.wood-database.com>
- 3) Sustainable American hardwoods: a guide to species [www.americanhardwood.org](http://www.americanhardwood.org)
- 4) Trada Technology, UK. [www.trada.co.uk/wood-species](http://www.trada.co.uk/wood-species)
- 5) Technology transfer factsheets, Forest Products Laboratory, USA  
[https://www.fpl.fs.fed.us/research/centers/woodanatomy/techsheets\\_display.php?geo\\_category\\_id=3&genus\\_commonname\\_criteria=c&sorting\\_rule=1a](https://www.fpl.fs.fed.us/research/centers/woodanatomy/techsheets_display.php?geo_category_id=3&genus_commonname_criteria=c&sorting_rule=1a)

### Scale From 1-10

|             |             |
|-------------|-------------|
| 10          | = Excellent |
| 8 & 9       | = Very Good |
| 7           | = Good      |
| 5 & 6       | = Moderate  |
| less than 5 | = Poor      |