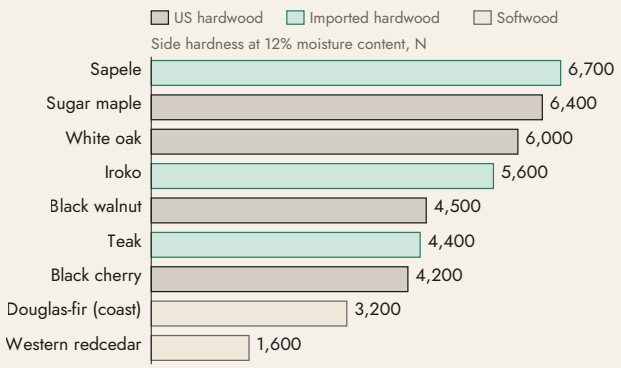
Timber *species* for joinery

Hardness, density, shrinkage and decay resistance for 18 joinery timbers, all from one source, the US Wood Handbook (2021), with what the numbers mean and what is missing.

AT A GLANCE

Timber	Side hardness, N (lbf)	Density at 12%, kg/m³	Shrinkage, tangential / radial, %	Heartwood decay resistance
White oak	6,000 (1,360)	760	10.5 / 5.6	Resistant
Black walnut	4,500 (1,010)	615	7.8 / 5.5	Resistant
Black cherry	4,200 (950)	560	7.1 / 3.7	Moderately resistant
Sugar maple	6,400 (1,450)	705	9.9 / 4.8	Slightly or non-resistant
White ash	5,900 (1,320)	670	7.8 / 4.9	Slightly or non-resistant
American beech	5,800 (1,300)	715	11.9 / 5.5	Slightly or non-resistant
Yellow-poplar	2,400 (540)	470	8.2 / 4.6	Slightly or non-resistant
Sapele	6,700 (1,510)	675 †	7.4 / 4.6	Moderately resistant
Iroko	5,600 (1,260)	660 †	3.8 / 2.8	Resistant
African mahogany	3,700 (830)	505 †	4.5 / 2.5	Moderately resistant
Teak	4,400 (1,000)	675 †	5.8 / 2.5	Very resistant (old growth)
Douglas-fir (coast)	3,200 (710)	540	7.6 / 4.8	Moderately resistant

US Forest Products Laboratory, Wood Handbook FPL-GTR-282 (2021): Tables 5-3 and 5-5 (hardness at 12% moisture content), 4-3 and 4-4 (shrinkage, green to oven-dry), 14-1 (decay). Density is ours from the handbook's specific gravity († calculated by its equations). Not European species; see the full table.



Side hardness at 12% moisture content in newtons for nine of the 18 timbers (US Forest Products Laboratory, Wood Handbook FPL-GTR-282, 2021, Tables 5-3a and 5-5a). Clear small specimens; values vary. Original chart by Make Bespoke Studio.

WHAT EACH NUMBER TELLS YOU

- Hardness is resistance to denting (a Janka-type side hardness). It says nothing about stability or durability.
- Density usually rises with hardness, and so does movement: the heavier timbers tend to shrink and swell more.

- Durability is the decay resistance of heartwood and matters only where timber is wet, above about 30% moisture content. Sapwood is not durable.
- Not in the table: European oak, ash, beech, sycamore, walnut and sweet chestnut. Ask the partner workshop for the data sheet and name the source.

SPECIFICATION WORDING

TIMBER SPECIES, CUT AND CLASS

Timber: [species by botanical name, e.g. Quercus robur or Q. petraea], heartwood [with / without] sapwood on exposed faces, cut [quarter sawn / plain sawn], appearance class [BS EN 942 class [J10]] against approved sample [ref]. Source and certification: [FSC / PEFC], chain of custody document at delivery.

HARDNESS AND DENSITY

Where hardness governs (tops, treads, handles): side hardness not less than [ ] N at 12% moisture content for [species], stating the test method and the source of the figure, confirmed by the partner workshop's data sheet for the batch supplied. No substitution of species without written approval against a sample.

DURABILITY

Wet or external areas: heartwood only of [species] with declared natural durability class [DC 1 or DC 2] to BS EN 350:2016, sapwood excluded, for use class [ ] to BS EN 335, with the supplier's declaration at delivery. Edge, end grain and fixing details as shown on the shop drawing.

MOISTURE AND FINISH

Timber supplied at [ ]% moisture content (tolerance [ ]%), measured and recorded on delivery and before fixing; finish [system] applied to the approved sample of the same species and cut. Steel wool and steel brushes not to be used on [oak / tannin-rich species].

TERMS USED

Janka hardness

Resistance to denting: the load needed to push an 11.28 mm steel ball to half its diameter into the wood. The Wood Handbook tabulates it as side hardness, in newtons or pounds-force. It is not a measure of stability or durability.

Natural durability

The resistance of a timber's heartwood to decay fungi. BS EN 350:2016 has five classes, DC 1 very durable to DC 5 not durable; sapwood is usually regarded as not durable.

Basic specific gravity

Oven-dry mass divided by the volume when green, relative to water. The Wood Handbook converts it to a density at any moisture content.

Heartwood and sapwood

Heartwood is the older, darker centre of the log, which carries the natural durability; sapwood is the younger outer wood, with low resistance to decay in essentially every species.

STANDARDS AND SOURCES

- USDA Forest Products Laboratory, Wood Handbook, FPL-GTR-282 (2021): Tables 4-3, 4-4, 5-3, 5-5, 14-1; chapters 2, 4, 14, 16. Read 5 Nov 2026.
- BS EN 350:2016 Durability of wood and wood-based products: named, not read; class names from the BWF.
- BS EN 335 (use classes) and BS EN 942:2007 (appearance classes): named, not read.
- British Woodworking Federation, Choose Wood: Durability: class names; heartwood and sapwood.

Full guide: https://makebespoke.com/trade/technical/timber-species-for-joinery. Make Bespoke Studio coordinates manufacture through its partner workshops. Figures are guidance only and your specification governs; some may be superseded, so contact the studio to verify.