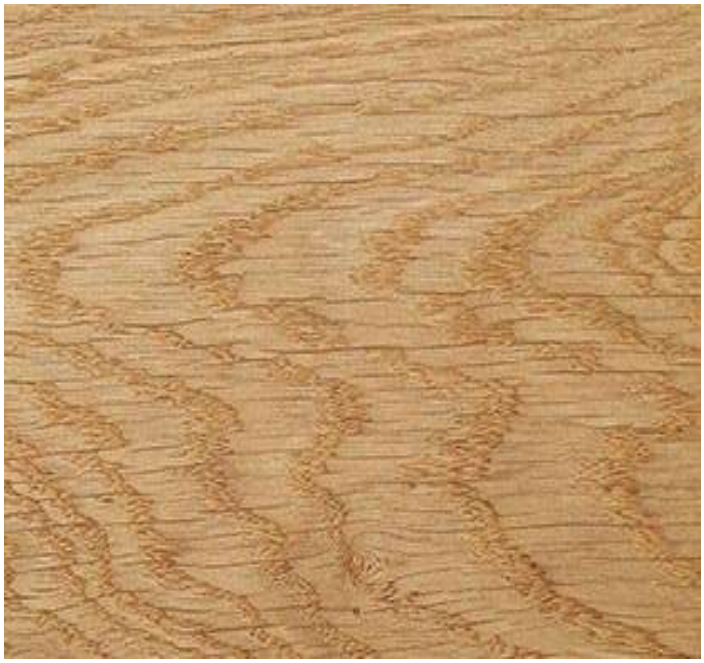
European Oak Details



Common Name(s):	European Oak, English Oak, French Oak
Scientific Name:	*Quercus robur, Quercus petraea*
Distribution:	Europe and parts of western Asia
Tree Size:	80-100 ft (24-30 m) tall, 3-6 ft (1-1.8 m) trunk diameter
Average Dried Weight:	47 lbs/ft^3 (755 kg/m^3)
Specific Gravity: (Basic, 12% MC)	0.60, 0.75 (Basic, 12% MC)
Janka Hardness:	1,120 lbf (4,980 N)
Modulus of Rupture:	14,800 lbf/in^2 (102 MPa)
Elastic Modulus:	1,740,000 lbf/in^2 (12.00 GPa)
Crushing Strength:	7,440 lbf/in^2 (51.3 MPa)
Shrinkage:	Radial: 4.0%, Tangential: 8.6%, Volumetric: 12.6%, T/R Ratio: 2.2

Colour/Appearance: Heartwood is light to medium brown, often with an olive cast. Colour tends to darken with age. Prominent medullary rays produce a distinctive fleck pattern on quartersawn surfaces.

Grain/Texture: Grain is usually straight, though can be irregular. Coarse, uneven texture with good natural luster.

Rot Resistance: Heartwood is rated as durable to very durable with good resistance to decay. Excellent resistance to moisture penetration due to tyloses, making it suitable for exterior and boatbuilding applications. Moderate insect resistance.

Workability: Generally easy to work with hand and machine tools, though its density can cause moderate tool wear. Reacts with iron fasteners, causing staining and potential corrosion—stainless steel or coated fixings are recommended. Glues, stains, and finishes well.

Pricing/Availability: Widely available across Europe. Moderately expensive, with higher prices for wide boards, quartersawn stock, and character grades.

Sustainability: Not listed in CITES Appendices. Both species are listed as Least Concern on the IUCN Red List. Widely sourced from sustainably managed European forests.

Comments: A historically important timber used in construction, furniture, flooring, and cooperage (barrel making). European oak is generally more porous and less dense than Quercus alba, though both share similar durability characteristics. Its high tannin content contributes to its durability but can also cause staining when in contact with metals or alkaline materials.

Timber Quality Advice – Redwood

Redwood is a popular choice for construction and external furnishings, but it is important to reiterate that **all solid timbers are organic materials** and therefore constantly change relative to their environment.

Surface Features

When specifying Red Wood timber for your project you should expect the following natural features in the face and end grain of the pieces.

These features should not be considered defects and the extent of many surface features in the timber will change seasonally, sometimes closing up entirely due to natural expansion or shrinkage:

Knots

Knots appear as dark and often gnarled blemishes on the surface of the timber.
They generally occur where branches leave the trunk of the tree, or where a tree had become damaged throughout its life.

Splits

Splits are a separation of the wood from one face to the opposite.
They can occur as a result of mechanical damage while processing but most commonly occur during the drying process.
Red Wood beams will have small or partial splits visible on the surface and end gain but unless they run the entire length of the piece, pose minimal structural concerns for application in non-load bearing exterior furnishings.

Shake

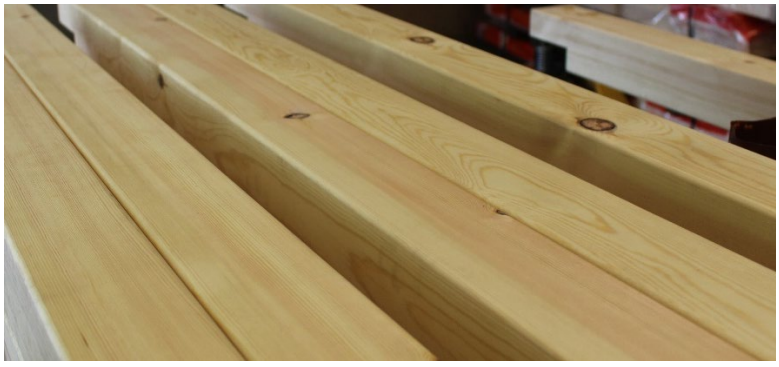
Shakes are lengthwise separations of wood along the grain usually occurring between or through the rings of annual growth. Shakes are commonly most noticeable on the end grain of a piece.

Sapping

Sap is **a natural exudate from all trees**. Under hot temperature conditions, the sap can ooze out of the wood surface. To stop this, you need to seal the wood surface. This is done by cleaning the wood of sap, sanding it, and then applying the sealer.

Colour

Subtle variations in colour are to be expected give the nature of the species. Storage and treatment also play a large role in the colour of red wood. See **Delivery & Storage** for more information.



Dimensional Tolerance & Movement

The sawmills and suppliers of our timber products will generally work to a rough-sawn dimensional tolerance of +6/-0mm. They will then ensure pieces are planed flat and to final size with all faces and ends square, with tolerances as close as +0.4/-0.4mm.

Red Wood will also be subject to seasonal movement and other environmental factors, and dimensions are likely to change slightly from sawmill to our assembly plant to delivery on site.

As a general rule, a board/beam of 300mm can shrink/expand across its width as much as 6mm. This will dictate minimum distance adjacent timbers are spaced on a product as any contact between expanding pieces could have a severe effect on the integrity of the support or fixings. Longer Red Wood pieces will also expand and contract at different rates along their length resulting in lines originally cut perfectly straight becoming wavey over time. It is important to allow the timber to move without restriction to avoid failure.

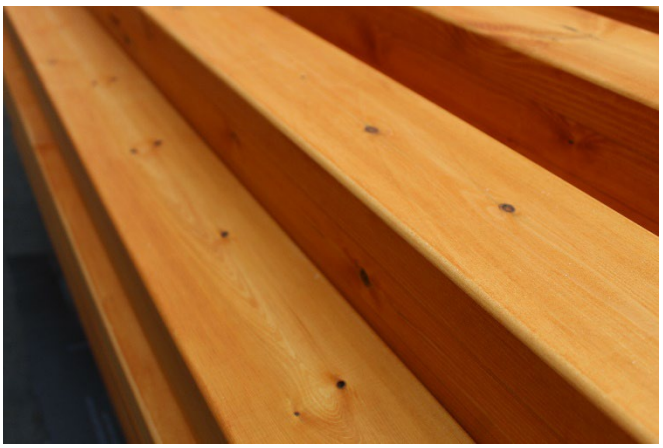
We can advise on any design changes/limitations to be set to minimise these issues.

Surface Treatments and Protection

As standard we treat our soft wood timber with a Teak Wood Stain. This waterproof coating is long lasting and protected by film protection that will resist algal and fungal growth.

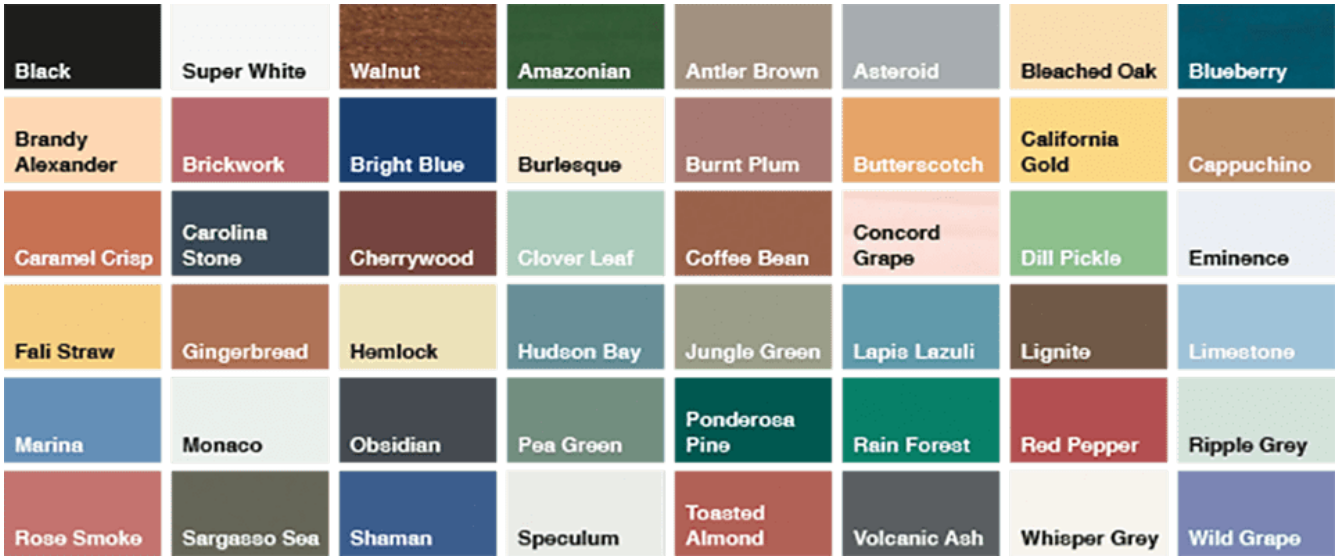
Please note that the Teak Wood Stain coating will wear off over time – so reapplication will be required.

Untreated



Teak Wood Stain

Alternative wood stains are available in a range of colours ***at additional cost**



Delivery & Storage

We often deliver timber products to site strapped and wrapped for secure shipping and we are aware that products are commonly stored on site for weeks or months before installation:

If products are left tightly bound/strapped any natural movement may be restricted, leading to severe, uneven dimensional changes and even failure of the timber or fixings. **All strapping must be removed or loosened immediately following delivery to site.**

If products are left wrapped in shipping materials they may be subject to much higher temperature and humidity than the surrounding environment, which will lead to moisture being drawn out from the wood at a high rate, potentially causing severe dimensional changes. As this moisture will have nowhere to go the products will accumulate a large amount of condensate, which can stain the timber and even damage steelwork; the timber may also begin to rot if left in this state for too long. **All wrapping must be removed immediately following delivery to site.**

Consider assigning an outdoor, but covered area to store furniture products before final installation.

The workshop team at Bailey Street Furniture Group will assess every piece of timber to be used in your furniture product and will reject those that have excessive splitting, warping or potentially dangerous surface features.

Faces will be sanded to minimum 80 grit and all sharp corners softened unless instructed otherwise.