

Oak

The Tree

The prominent oak that reaches impressive diameters and grows over 1000 years old must be one of the most well-known trees in the UK. Oak leaves are dark green and lobed, their fruits are round or elongated acorns that sit in small wooden cups. Oak bark has historically been used for tanning leather and acorns as fodder for pigs, and still make an important food source for many forest species. According to the Woodland Trust, oaks support more wildlife than any other native tree.

Typical diameters 1-1.5 m, also up to

Height up to 40 m

Age up to 2000 years

16% of UK broadleaved forest

Typical yield class 6

Sessile oak *Quercus petraea*

Pedunculate oak (also English oak) *Q. robur*



Oak

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The Timber

Oak has a long history of being used in construction of buildings, ships and marine structures and is still the most widely-used hardwood in the UK (though mostly imported from Europe and America¹). Wood of the two abovementioned oak species cannot be distinguished, even microscopically, and is traded together as European oak, which is used in structures, furniture, flooring and whisky barrels. Because of the longstanding tradition of being used in structures, UK oak can be graded to the strength classes D24, D30 and (for large cross sections) D40. Oak from Germany can be graded to D30.

¹ American oak usually means two different species, *Quercus rubra* and *Q. alba*. Most oak species have relatively similar properties and are used in the same applications.



Oak endgrain

Oak tangential section

Sapwood pale, heartwood light to medium brown, usually clearly demarcated
 Rays well visible
 Aggregate rays common, several centimetres long and up to 1cm wide
 Rough texture
Growth rings visible
 Ring-porous with large, exclusively solitary earlywood pores
 Latewood pores in radial multiples
 Tylosis common
 Two sizes of rays
 Parenchyma apotracheal, diffuse-in-aggregates

What do we know about home-grown oak?

| | |
|---------------------|---|
| Strength | Moderately high; comparable to sycamore |
| Stiffness | |
| Density (at 12% mc) | 610 kg/m ³ |
| Hardness | Moderate compared to other hardwoods; lower than beech and ash |
| Machinability | Generally good Planing can be difficult due to the rough texture Can react with metal fasteners Dries slowly |
| Durability | Durable – slightly durable |

Why is this information so vague?

Little is known about the properties of home-grown hardwoods. Some research was carried out by Lavers, starting in the 1950s and carrying on until 2002, but a limited number of trees was used in this research. Also, the testing was done on small clear specimens, and data for full-sized specimens with defects is rarely available. Nonetheless, we can use this data to compare between species, between timbers from the UK and Europe (or other countries) and between new data and historic results.

References & Further Reading

[The Wood Database](#)

[European Atlas of Forest Tree Species, Oak](#)

[Woodland Trust, Sessile oak](#) / [Woodland Trust, English oak](#) (but be wary of the first sentence under "Uses")

[Cotton, Scottish Furniture Woods](#)

Lavers, 2002, The Strength Properties of Timber