WHITE OAK

Botanical name: *Quercus (w)* spp., family: FAGACEAE

Other important species: *Q. robur,* Syn.: *Q. pendunculata, Q. petrea, Q. alba*

Distribution: Europe, Mediterranean area including North Africa and Middle East, Temperate Asia, North America

Other important trade names: European oak (GB), European white oak (USA), Stieleiche, Sommereiche, Traubeneiche, Wintereiche, Spessarteiche (D)

Abbreviation as per DIN EN 13556: QCXE = *Q. petrea, Q. robur;* QCXA = *Q. alba* and other North American white oaks

Colour and structure of the wood:

Heartwood brown and light. Clear colour contrast between sapwood and heartwood, narrow. The sap is white to light grey, the heartwood is light to medium brown, sometimes with a greenish or yellowish tinge. The earlywood pore rings create striking raised “cathedral effect” formed by innermost growth rings on tangential surfaces and clear stripes on radial surfaces. The exceptionally wide wood rays are easily noticeable to the naked eye on cross-sections. On radial surfaces, they create very striking reflection, which affects the appearance of the wood.

Properties:

Weight fresh [kg/m³]		650 – 1000 – 1160
Bulk density air-dry (12-15% u) [g/cm³]		0.65 – 0.76
Compression strength $u_{12\text{-}15}$ [N/mm²]		42 – 64
Bending strength $u_{12\text{-}15}$ [N/mm²]		60 – 110
Modulus of elasticity (bending) $u_{12\text{-}15}$ [N/mm²]		10500 – 13000 – 14500
Toughness [kJ/m²]		50 – 75
Hardness (BRINELL) ⊥ to the grain $u_{12\text{-}15}$ [N/mm²]		20 – 34 – 42
Drying shrinkage (fresh up to $u_{12\text{-}15}$)	radial [%]	2.5 – 3.1
	tangential [%]	4.0 – 5.5
Differential shrinkage [%/%]	radial	0.15 – 0.22
	tangential	0.28 – 0.36
pH value (suspension)		4,2
pH value (surface)		3,6
Natural durability (DIN-EN 350-2)		category 2 (-3)

Workability:

The ability to work, strip and cut the wood using manual and machine tools is good to satisfactory, depending on the mass density. Due to easy cleavage, nailing and screwing requires pre-drilling. Bonding good to medium. The use of strong acidic and alkaline adhesives can lead to undesired colour reactions.

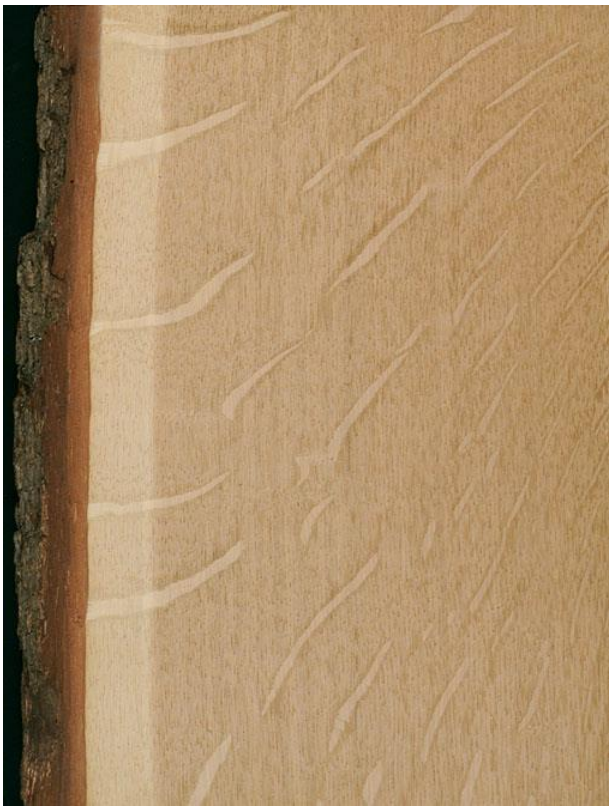
Drying:

Due to the tendency to crack and warp the wood must be dried very carefully. Too high drying temperatures can lead to cell collapse as well as irregular discolouring.

Use:

Outdoor or indoor use. Especially suitable for: Outdoor construction with no ground contact, frame structure (windows, house doors, conservatories) (laminated profiles); decorative veneer, floors (parquet, boards, etc.), stairs, wall and ceiling coverings (internal), furniture, other uses (wooden vats, barrels for maturing red wines and brandies).

Macroscopic cross-section of white oak
(10 times magnification lens)



Wood surface of white oak (radial section)

Surface treatment:

Treatment is possible without any problems. In contact with alkaline and compounds containing iron, surface discolouring may occur. Washable tannins also can lead to discolouring. When dried incorrectly yellow discolouring can be caused by fungal infestation. Treatability poor (sapwood moderate to poor; EN 350–2, 1994). Iron ions can corrode in wet woods through the high tannic acid content and cause strong reaction discolouring (iron tannin reaction).

Coating systems:

The coating systems selected here are variants which ensure utmost durability and lasting quality.

Other coating systems are basically possible; however, they must be coordinated with Teknos.

Details on processing can be found in the technical data sheets for each product.

Windows, doors, conservatories and folding shutters:

System coating	Translucent
Wood preservative	GORI 356 / TEKNOL AQUA 1410-01
Primer	AQUAPRIMER 2900-42
Intermediate	ANTISTAIN AQUA 2901-62
Topcoat	AQUATOP 2600-9X

System coating	Opaque
Wood preservative	GORI 356 / TEKNOL AQUA 1410-01
Primer	ANTISTAIN AQUA 2901-52
Intermediate	ANTISTAIN AQUA 2901-52
Topcoat	AQUATOP 2600-2X

System coating	Colourless
Wood preservative	GORI 356 / TEKNOL AQUA 1410-01
Intermediate	ANTISTAIN AQUA 2901-62
Topcoat	AQUATOP 2600-6X

Further information: Teknos A/S
Industrivej 19
DK-6580 Vamdrup
Tel: +45 76 93 94 00
www.teknos.com

Wood is a unique, beautiful and very versatile material

The features and properties of wood vary greatly and therefore individual attention is required in processing and surface finishing.

With this Teknos wood data sheet we would like to go into detail on the features and range of applications in the coating of important wood species.

The data sheet originated from a collaboration with the Johann Heinrich von Thünen-Institute in Hamburg.

The pH values of wood have been determined as important chemical variables for the first time.

The concentration dependence of extracts such as tannic acids or tannins to the pH value is important.

A good surface coating and targeted selection of system structures shall be safer based on these variables determined by Thünen-Institute and demonstrate wood-related problem solving.

All system structures named in the data sheet are selected according to utmost durability and quality and are considered to be relevant systems. However, a practical test is always necessary.

Due to different application possibilities and stresses of parts to be coated, variations are required.

To select individual systems easily, the Teknos technical department will be happy to assist you.