

## DOUGLAS FIR

<b>Botanical name:</b>	<i>Pseudotsuga menziesii</i> (Syn.: <i>Pseudotsuga taxifolia</i> ), family PINACEAE
<b>Distribution:</b>	North America (west coast); cultivated in Europe, Chile and New Zealand
<b>Other important trade names:</b>	Douglasie, Douglas Tanne (D); Douglas fir, Oregon fir, Oregon pine
<b>Abbreviation as per DIN EN 13556:</b>	PSMN

### Colour and structure of the wood:

Heartwood brown to red to yellow. Clear colour contrast between sapwood and heartwood, narrow. Sapwood is white to yellowish grey, heartwood light yellowish brown to reddish brown. The growth zones boundary is clearly marked by the dark latewood and the light earlywood. With older trees, the year rings are characteristically narrow. The wood produced in Europe stems from relatively young trees and thus shows a mostly large proportion in rough aged wood. The smell of the wood is distinctive (the volatile resins give particularly fresh wood a sharp aromatic smell, making it possible to distinguish between the very similar wood of the larch).

### Properties:

Weight fresh [kg/m <sup>3</sup> ]		640 – 800
Bulk density air-dry (12-15 % u) [g/cm <sup>3</sup> ]		0.51 – 0.58
Compression strength $u_{12-15}$ [N/mm <sup>2</sup> ]		42 – 68
Bending strength $u_{12-15}$ [N/mm <sup>2</sup> ]		70 – 100
Modulus of elasticity (bending) $u_{12-15}$ [N/mm <sup>2</sup> ]		11000 – 13200
Toughness [kJ/m <sup>2</sup> ]		38 – 60
Hardness (BRINELL) $\perp$ to the grain $u_{12-15}$ [N/mm <sup>2</sup> ]		17 – 20 – 30
Drying shrinkage (fresh up to $u_{12-15}$ )	radial [%]	2.5
	tangential [%]	4.0
Differential shrinkage [%/%]	radial	0.15 – 0.19
	tangential	0.24 – 0.31
pH value (suspension)		3.7
pH value (surface)		4.7
Durability class (EN 350:2016)	North America	DC 3
	Cultivated in Europe	DC 3 – 4

### Additional information:

Splinter wounds can cause painful inflammations. The resin contains terpenes, one of which is a known allergen.

**Workability:**

The workability of the wood depends on the year ring width. Narrow ring wood can be worked very easily. Splits can occur with wide ring wood when stemming or nailing. Bonding good to medium.

**Drying:**

No difficulties occur with kiln drying; however, this should be done carefully to avoid the outflow of resins. With greater strengths, a fine formation of cracks can appear on the surface.

**Use:**

Outdoor or indoor use, supporting or non-supporting. Especially suitable for: Outdoor use with no ground contact, horticulture and landscaping, children's play area and equipment, exterior cladding (facades), rotary cut veneer (for plywood) (in the USA as weather proof bonded building plywood), frame structure (windows, house doors, conservatories), floors (parquet, boards, etc.), and stairs.



Macroscopic cross-section of Douglas Fir  
(10 times magnification lens)



Wood surface of Douglas Fir (radial section)  
best growth quality of natural habitat USA

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### Surface treatment:

In individual cases woods with a high proportion of resins can cause problems. In case of restrained touches of heartwood discolouring may occur therefore the use of knot sealer and/or antistain products as primer and intermediate coat is advisable. Discolouring occurs in contact with iron ions (iron/tannin reaction).

### Coating systems:

The coating systems illustrated here are examples developed to ensure utmost durability and lasting quality.

Alternative systems are also available; however, these must be confirmed by Teknos. Please contact your local Teknos representative for further details.

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

### Windows, doors, conservatories, and folding shutters:

System coating	Translucent
Wood preservative*	TEKNOL AQUA 1412-01 / TEKNOL AQUA 1410-01 / TEKNOL AQUA 1415-01
Primer	AQUAPRIMER 2900-X2
Intermediate	AQUAFILLER 6500-01
Topcoat	AQUATOP 2600 translucent topcoat

System coating	Opaque
Wood preservative*	TEKNOL AQUA 1412-01 / TEKNOL AQUA 1410-01 / TEKNOL AQUA 1415-01
Primer	ANTISTAIN AQUA 5200-01
Intermediate	ANTISTAIN AQUA 5200-01
Topcoat	AQUATOP 2600-2X

System coating	Colourless
Wood preservative*	TEKNOL AQUA 1412-01 / TEKNOL AQUA 1410-01 / TEKNOL AQUA 1415-01
Intermediate	AQUAFILLER 6500-01
Topcoat	AQUATOP 2600-6X

\*The use of biocidal products within EU is only allowed if the product has been authorized according to BPR for the country in question. Use biocides safely. Always read the label and product information before use.

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## **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.

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