

Which species of wood should I choose?

Consider these points:

1. The end use – for example, is the wood to be used as a structural material and then covered with something else, i.e. studding covered by plasterboard, or will it be exposed?
2. What strength is required? Does the timber need to have a high bending strength, such as a joist, or a high tensile strength where the timber is stretched in the application?
3. Is the wood to be used purely for a decorative effect? Is this to be a dark or light colour?
4. Is the wood to be machined? Some species are more easily machined than others.
5. Is the wood from a certified legal and sustainably-managed forest source (i.e. FSC or PEFC) or is it from a source that is making progress towards certification (i.e. Verified Progress)?
6. Cost. It may look nice, but is it worth the additional cost, if another less expensive and more commercially available timber can do the same job?
7. Durability and treatability: is it necessary to use preservatives?



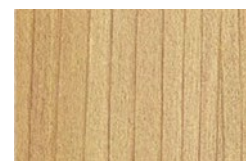
European redwood (pine)



European whitewood (spruce)



Douglas fir



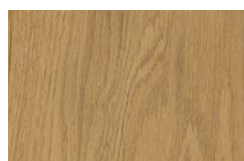
Western red cedar

Softwoods – main characteristics

Species/Origin	Colour	Density kg/m ²	Texture	Moisture movement	Working qualities	Durability ¹	Treatability ² (heartwood)	Uses
Redwood, European <i>Scandinavia/ Europe</i>	Creamy white	510	Medium	Medium	Medium	Slightly to moderately durable	Difficult to extremely difficult	Flooring, external and interior joinery, furniture, structural
Whitewood, European <i>Scandinavia/ Europe</i>	White to pale yellowish brown	470	Medium	Medium	Good	Slightly durable	Difficult to extremely difficult	Flooring and interior joinery, furniture, structural
Scots pine <i>UK</i>	Creamy white	510	Coarse	Medium	Medium	Slightly to moderately durable	Difficult to extremely difficult	External and interior joinery, structural
Douglas fir <i>N America, UK and Europe</i>	Reddish brown to light brown	530	Medium	Small	Good	Moderately durable	Extremely difficult	Interior and exterior joinery, cladding
Larch, European <i>Europe</i>	Pale reddish brown	550	Fine	Small	Medium	Slightly to moderately durable	Extremely difficult	Cladding, trim
Western red cedar <i>N America</i>	Reddish brown	390	Coarse	Small	Good	Moderately durable	Difficult to extremely difficult	Cladding
Spruce, Sitka <i>N America and UK</i>	Reddish brown	450	Coarse	Small	Good	Not durable to slightly durable	Difficult	Interior joinery, packaging, pallets, structural



Beech



European oak



Iroko



Sapele

Temperate hardwoods – main characteristics

Species/Origin	Colour	Density kg/m ²	Texture	Moisture movement	Working qualities	Durability ¹	Treatability ² (heartwood)	Uses
Beech, European <i>Europe, UK</i>	White/cream (reddish brown after steaming)	720	Fine	Large	Good	Not durable	Easy (red heart extremely difficult)	Furniture, interior joinery, flooring, plywood
Birch, European <i>Europe, Scandinavia</i>	Light brown	670	Fine	Large	Good	Not durable	Easy to moderately easy	Cabinet making, furniture, plywood.
Cherry, European <i>Europe, UK, Scandinavia, Asia, N. Africa</i>	Pinkish brown	510	Fine	Medium	Good	Moderately durable	No information	Cabinet making, furniture
Chestnut, Sweet <i>Europe, UK, Asia Minor, Australia, N. Africa</i>	Yellow to brown	530	Medium	Large	Good	Durable	Extremely difficult	Interior and exterior joinery, fencing, trim, structural
Oak, European <i>Europe, Asia Minor, N. Africa</i>	Yellowish brown	550	Medium to coarse	Medium	Medium to difficult	Durable	Extremely difficult	Furniture, interior and exterior joinery, flooring, heavy structural.

Tropical hardwoods – main characteristics

Species/Origin	Colour	Density kg/m ²	Texture	Moisture movement	Working qualities	Durability ²	Treatability ³ (heartwood)	Uses
Teak <i>Burma, Indonesia, Thailand and plantations elsewhere</i>	Golden brown some with dark markings	660	Medium	Small	Medium	Very durable	Extremely difficult	Interior and exterior joinery, sports goods, furniture
Iroko <i>W. Africa</i>	Yellow brown	660	Medium	Small	Medium to difficult	Durable to very durable	Extremely difficult	Interior and exterior joinery, bridge construction
Sapele <i>W. Africa</i>	Reddish brown	640	Medium	Medium	Medium	Moderately durable	Difficult	Interior and exterior joinery, furniture, flooring, veneer
Utile <i>W. Africa</i>	Reddish brown	660	Medium	Medium	Medium	Moderately durable to durable	Extremely difficult	Interior and exterior joinery, furniture, cabinet work

¹ Moisture movement

For structural purposes movement is not usually significant, but if you require stability in varying humidities (e.g. decorative flooring), use a species with small movement. These classifications are not directly related to the shrinkage of green timber.

² Durability

Refers to resistance to fungal decay of the heartwood only. Sapwood in most species is generally not durable and should not be used in exposed conditions without preservative treatment. Classes referred to in BS EN 350-1 are:
Class 1 – ‘very durable’
Class 2 – ‘durable’
Class 3 – ‘moderately durable’
Class 4 – ‘slightly durable’
Class 5 – ‘not durable’

³ Treatability

Refers to how easily timbers can be penetrated with vacuum pressure preservative treatments. The four levels of treatability in BS EN 350-2 are ‘easy’, ‘moderately easy’, ‘difficult’, ‘extremely difficult’.

Modified timber

A number of brands of timber are now available that have been modified chemically, such as Accoya™, or by heat treatment, such as Thermowood.

Generally, these products provide the sustainability of softwoods with the stability and durability normally associated with hardwoods.

The different modification processes affect the performance of the timbers in different ways. Consult the manufacturer for specific details.



Tannin stain

Tannin is natural in softwoods and hardwoods. For example, oak and Western red cedar will exude tannin as they dry, which may give the appearance of a black deposit. As a result, water running off these surfaces can leave staining, particularly around metal fixings.

Further information and advice

Sourcing sustainable timber

- See Timber Trade Topic 1 *Sourcing Sustainable Timber*
- See Wood Campus CPD module *Procuring Sustainable Timber*

Available species

Consult your local timber merchant or Timber Trade Federation member www.ttf.org.uk

Swedish grown species

www.swedishwood.com

UK grown species

www.forestry.gov.uk

American species

www.americansoftwoods.com

www.americanhardwood.org

Technical information

www.trada.co.uk

Sustainable timber

Timber is the most sustainable mainstream building product. It is naturally renewable. Over 90% of timber used in UK construction comes from Europe, where more trees are grown than harvested (source: TTF Statistical Review 2016).

Softwood and temperate hardwood forests in Scandinavia, Europe, Canada and North America are stable or growing. Growing forests act as carbon sinks; wood products act as carbon stores.

Ask for PEFC or FSC Chain of Custody certification.

See Wood Campus RIBA CPD module *Procuring Sustainable Timber* for more on timber certification and sustainability and government requirements.



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This Topic sheet provides general advice only and is not specific to the requirements of a particular building project. It is the builder's responsibility to check compliance with building regulations and standards. Care has been taken to ensure the information is accurate and up-to-date. However, neither Wood Campus, nor any of its collaborators, can be held responsible for any mistakes or omissions.