

The Guide to



Structural Timber

All about Structural Timber

A wide range of timber materials is required on almost all construction projects. Even the masonry properties contain wooden elements like joists or studs. In this article we will deal with different types of timber and provide guidance on its selection.

Selection by the type of timber

First of all there is a distinction between hardwoods and softwoods. Hardwoods are more expensive as they are obtained from deciduous trees which take longer to grow and are considered stronger and higher quality than

softwoods harvested from coniferous trees. Softwood is also commonly used in construction for instance in carpentry. Some of hardwoods and softwoods are used either in first fix carpentry – construction or second fix carpentry - decorative or in both.

HARDWOOD	DESCRIPTION	USAGE
Oak	Strong construction material, used both as a structural and decorative element	Decorative beams, flooring, kitchens, skirting, architrave
Beech	A straight-grained hardwood	Worktops, floors, decorative features
Teak	Used in second fix to provide high quality finish	Staircase, garden features
Idigbo	Easy to work with, good value for money	Windows, staircase
Mahogany	Used in furniture industry	Furniture
Maple	Decorative hardwood	Decorative flooring
American black walnut	Used in interior joinery	Kitchens, veneers

source: DIY: Know-How and Show-How (J.Cassell and P.Parham 2006)

SOFTWOOD	DESCRIPTION	USAGE
Pine	Most commonly used	First and second fix
Cedar of Lebanon	Used in internal joinery	First and second fix
Western red cedar	Mainly used in exteriors	Boarding, shingles, decking
Douglas fir	Commonly used in plywoods	Construction, decking
Hemlock	Light wood	Doors and windows

source: DIY: Know-How and Show-How (J.Cassell and P.Parham 2006)

Selection by the timber features

Seasoned features or treated features are not exclusive. The wood can be both treated and seasoned if required.

Seasoned wood - it contains high levels of moisture and needs to dry out before usage. This is called seasoning. Wood can distort during the drying process and often it contains moisture long after seasoning. The distorting can be avoided when wood is stored horizontally, above ground level and when it is supported along length.

Seasoned kiln-dried timber- artificially dried wood with the accelerated seasoning. It is expensive but less prone to distort.

Treated wood is stronger than non treated wood but less resilient than pressure-treated wood. The degree to which wood has been treated has impact on its lifespan.

Pressure-treated wood is usually impregnated with preservative and it is with green or brown tinge. Such timber can be in contact with surfaces like soil and is more resistant to damp or insects.

Second fix carpentry (for instance skirting or doors) does not require treated timber, while first

fix carpentry (for instance rafters or stud wall) needs treated wood.

Reclaimed timber is old and in most cases has been very well seasoned. There are for instance reclaimed floorboards on sale.

Selection of rough-sawn wood or planed wood

Wood is measured when it is rough-sawn and is priced based on its dimensions. However the actual nominal dimensions might be different due to shrinkage during the drying process, while in the case of planed wood nominal dimensions will be smaller as it has been plane on all sides. Merchants more often sell wood in the exact dimensions (standard sizes) but it is worth to check before ordering.

Rough-sawn wood has rough surface so it is used where it will not be visible, for instance in stud walls. Its dimensions are quite adequate as it is measured when rough-sawn.

Planed wood is used where it will be visible, for instance skirting. It has been planed after being measured so its dimensions might not be as stated.

Selection by timber grades

Timber is graded in strength classes and grades denote a group of species and strength grade combinations. Additional features that add to a particular grade are strength, stiffness, density, number of knots, slope of grain, species, origin etc. Strength classes varies from C14 to C50 for softwood and D18 to D70 for hardwoods. The higher the grade, the stronger the timber. The most common timber grades are C16 and C24. C16 is stronger than C24 timber.

Graded timber is in most cases kiln dried but it can also be wet graded (which is moisture content at ambient levels and not kiln dried). **Regularised** means that the product has a machined finish what gives a regular consistent section size.

After assessment each piece of wood is stamped with the appropriate mark, which contains timber condition (e.g. dry graded), strength class (e.g. C16), reference, species group and certification body.

Timber marked as dry is graded at a maximum moisture content of 20% and should be



shutterstock.com



shutterstock.com

transported, stored and installed in the way so this moisture content will not be exceeded.

Span tables show timber sizes and strengths and allow to choose the size of timber necessary to give adequate support to flooring, ceiling or roofing.

Tips on buying wood

- Defect free wood costs more but its lifespan is longer. When buying wood check it for splits, knots or uneven grain. Splits mean that wood might have dried too rapidly or was not properly stored. Softwoods can be damaged easily at the storage. A warped timber might be difficult to saw and it might have been twisted. Knots are especially not welcome in second fix carpentry as they might be visible through paint or might start bleeding. It is best to treat them with knotting solution.

- Find out whether wood has been treated or seasoned or both
- Find out how wood has been stored
- Check if its damped
- Find out if merchant sells it in nominal or standard sizes to estimate the appropriate quantity

Timber accessories

The most appropriate fixings for wood boards are screws, brackets, hangers or nails and pins.

Screws types vary to suit different applications. For instance traditional wood screws (KDH silver) are tapered shank and fits tight. There are also untapered wood screws (KDH gold) which are less likely to split wood. Dry-wall black-phosphate-coated (KSGD) are used to fix plasterboard to studwork. MDF screws are sharp pointed and twin-thread while for chipboard the wax-coated screws are recom-

mended. Dowel screws are threaded at both ends to join two pieces of wood.

Nails are the most basic and essential fixings. They are available in various sizes and are for general use. Most are made of steel and iron, some are galvanized. Typically they are sold by weight.

Pins are very thin and with small heads what makes them less likely to split wood.

Timber brackets and hangers are used for timber fixing applications. There is a wide selection available. To mention the most common there are angle brackets and ties which are used for both heavy and light duty fixing. Also there are timber to masonry or timber to timber joists hangers. Restraint straps connect timber floor and roof system to masonry and provide required restraint. Post bases are used for heavy duty applications, for instance to fix timber posts into concrete. Racking solutions provide resistance to timber frame structures.