

TIMBER POCKET

Wood campus

Joinery | Strength & Span tables | Decking Cladding | Engineered wood | Treated wood Sheet material | Flooring | Fire doors | Windows

Sustainable wood

The vast majority of the wood we use in the UK comes from Europe.¹

Europe's forests are growing by 0.8 million hectares a year. In the last 20 years they've grown by 16 million hectares - an area roughly twice the size of Ireland.²

Using products from sustainably managed forests reduces carbon dioxide in the atmosphere in three ways:

- It locks carbon dioxide away in the wood product
- It saves the carbon dioxide that would have been produced by an alternative material (the substitution effect)
- And it means more trees are planted increasing the 'carbon sink effect' of the forests. Between 2005 and 2010 about 870 million tonnes of CO₂ a year were removed from the atmosphere by the photosynthesis and tree growth of Europe's forests.²

There are two main certification schemes in the UK:

- FSC® (Forest Stewardship Council®)
- PEFC (Programme for the Endorsement of Forest Certification).

¹ 97% of softwood and c.60% of hardwood consumed in Europe is sourced from European forests (IIED, Using Wood to Mitigate Climate Change, 2004)

² MCPFE/UNECE-FAO State of Europe's Forests 2011



TIMBER POCKET GUIDE

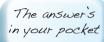
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More information on most of the topics in this guide, including 90-second know-how videos and Choose and Use factsheets can be found, free, at www.woodcampus.co.uk

Wood campus

The timber industry's information and learning portal www.woodcampus.co.uk

What's the smart way to get tips on timber?







For instant top tips on the jobs you do with wood, download your FREE Wood Campus app. Now available on Android as well as iPhone.

For Android go to the Google Play Store https://play.google.com/store For iPhone go to the iStore, or www.woodcampus.co.uk/smartphone

${f EUTR}$ (European Union Timber Regulation)

From 3rd March 2013 it became unlawful to place illegally harvested timber and timber products on the EU market.

Whether you are a Trader (buying or selling timber or timber products in the EU) or an Operator (buying timber or timber products directly from a supplier outside the EU or producing timber or timber products in the EU) you have to be able to identify:

- Who you bought the timber or timber products from
- And, where applicable, who you have sold the timber or timber products to.

This information must be kept for at least five years and be provided for checks if requested.

If you are an Operator you will also have to conduct due diligence.

A due diligence system involves providing information on your supply of timber products, including description of species, volume, country of harvest and where applicable concession of harvest, name and address of your supplier and most importantly evidence of compliance with applicable legislation.

The system also requires risk assessment of your supply and, where high risk is identified, mitigation to eliminate any potentially illegal timber.

Criteria which can be used to assess this risk include:

- Assurance of compliance with applicable legislation, including certification schemes and third party verification
- Prevalence of illegal harvesting of specific tree species
- Prevalence of illegal logging in the country of harvest
- UN or EU sanctions on timber imports or exports
- · Complexity of the supply chain.

Operators can either set up their own due diligence systems, or make use of one provided by a Monitoring Organisation.

For more information visit: www.cpet.org.uk

CE Marking

CE

Certain timber and timber-based construction products, such as windows or external doorsets, wood flooring, garage doors, shutters, gates, cladding and paneling must now be CE marked. As well as labeling their products with the CE mark, manufacturers have to declare information about their products in a standardized format, using a Declaration of Performance (DoP). This makes it easier to ensure the product you are buying is fit for purpose.

By placing the CE mark and relevant information on a product, the manufacturer takes responsibility for the performance of the product for a specific end use as laid down within the relevant harmonised European technical specification.

What can I learn about a product's performance?

The Declaration of Performance (DoP) outlines how the product performs in relation to 'essential characteristics' (technical information to demonstrate the product's fitness for purpose). All of these characteristics must be listed on the document, but they only have to have a value against them if they are either a regulated characteristic in the UK, or the Product Standard requires a threshold level of performance to be met. For windows, this means thermal transmittance (U-value), a declaration of dangerous substances and the load-bearing capacity of safety devices must be declared. Manufacturers will list any evidence they have against the other, nonessential, characteristics.

Where can I find the DoP?

Some manufacturers will have them on their website, others may send you them by email or post.

Why do some timber products not need CE Marking?

CE Marking only applies to construction products covered by a harmonized European Standard or conforming to a European Technical Assessment: most of these are safety-critical products, such as Structural Plywood and Structural Timber. Examples of important wood products which do not currently need CE marking include general Sawn or Machined goods (unless they are Structural or Flooring). Equally, Treated Fencing does not require CE marking but Treated Structural Timber does. Deck boarding is also on the whole exempt but may count as Structural if it is used as a balcony or raised up on columns. Decking substructure and joists are strength-graded and therefore CE marked.

CE Marking for certain timber and timber-based construction products is now a legal requirement.

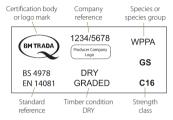
CE Marking Available	No CE Marking Available
EN 14081-1 Strength Graded Timber (Untreated or Treated)	Ungraded Sawn or PAR Timber
EN 14342 Wood Floorings	Mouldings, Skirtings, Architraves etc
EN 14915 Solid Wood Claddings / Paneling	
EN 13986 All Wood-Based Panels used in Construction	Any Panels specifically for furniture, formwork/hoarding, doors
EN 14250 Trussed Rafters	Tile Battens
Metal Web Beams & I-Joists (See note below)*	Decking
EN 14080 Glulam	
EN 14374 Structural LVL	
EN 15497 Structural Finger-Jointed Timber	
EN 16351 Cross-Laminated Timber (CLT)	
EN 14351-1 Non-Fire Windows and Doors	
EN 14041 Laminate Flooring	
EN 14592 Dowel Type Fasteners for Structural Timber use (metals screws, nuts, bolts etc)	
EN 14545 Timber Connectors	
EN 14732 Prefabricated Timber Frame Panels DELAYED TO 2014	



For more information and guidance, visit the Timber Trade Federation website at: www.ttf.co.uk

Strengths & Spans

Timber used in structural applications must be graded and clearly marked to show it complies with the correct standards and strength laid down by building codes and regulations.



Strength stamps and grades

Strength grading is a way of assessing the strength of a piece of timber, which depends on its species and grade.

A low grade timber from a strong species may be as strong as a high grade timber from a weaker species.

To make specifying easier, species and grades are grouped into strength classes of similar strength.

The most common strength classes for softwood are C16 and C24, although they range from C14 to C50. The most common hardwood strength class is D30, although they go up to D70. The higher the number, the stronger the timber.

Span tables

Use span tables to work out the size of joist of a particular strength class you need for a given span and load. They also tell you the maximum spacing between each section or timber member.

The table below is for illustration only. It relates to softwoods used for domestic floor joists in dwellings up to three storeys and is based on pan-European standards. It is important that you consult the complete set of span tables in the booklet shown opposite for the full information (e.g. loading) you will need for each particular job:

At 400mm centres

Size of joist (mm)	C16 clear max span (m)	C24 clear max span (m)
47 x 95	1.77	2.05*
47 x 145	2.89*	3.22*
72 x 145	3.33*	3.70*
72 x 220	5.00*	5.55*

*Two additional joists required

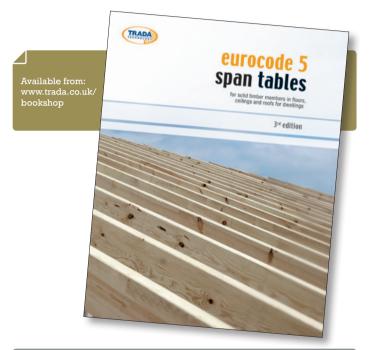
Eurocode 5 span tables

This publication has now been revised and updated to comply with Eurocode 5.

It contains section sizes and spans for solid timber members in floors, ceilings and roofs

(excluding trussed rafter roofs) for dwellings.

The tables cover softwood species and grade combinations which satisfy strength classes C16 and C24.



i T

The Timber Research and Development
Association's membership technical helpline
provides answers to any question on wood.
Join at www.trada.co.uk



Engineered wood

Engineered wood products are made of wood sections that have had weaker areas, such as knots, removed before being glued back together.

Benefits

- · Strength and stability
- Consistency
- · Available in long lengths and spans
- Can be installed in heated buildings without shrinkage

Glulam



Parallel layers of solid timber (normally spruce, pine or larch) glued together under high pressure.

Standard widths: 90 - 240mm; lengths up to 12 metres.

Laminated Veneer Lumber (LVL)

Made from rotary peeled veneers glued together to form continuous panels.

Good bending resistance, tension and compression properties; greater load bearing capacity than solid timber.

I-Beams or I-Joists

I-Beams consist of flanges, typically solid timber or LVL, connected by a panel product web, usually OSB.

Cross Laminated Timber (CLT)

Cross-laminated sections of kiln-dried spruce in large solid panels, for walls, roofs, floors etc.

51-300mm thick, 4.8 metres wide and 15 metre lengths.



Other engineered products

Other engineered products available include trusses, cassette floors and spandrel panels.

Joinery timber

Softwood and hardwood

The most popular softwoods are Redwood (pine) and Whitewood (spruce), typically from Sweden and other Nordic countries. They make up over 80% of UK usage and certified supplies are widely available.

The supply of certified timber from some species of tropical hardwoods is limited.

Most softwoods need to be pressure-treated with preservative to be durable outdoors.



However, some, such as larch, western red cedar and Douglas fir, can be used outdoors with no preservative treatment (so long as the sapwood is excluded).

Prepared softwood timber

PAR/PSE, linings, casings and many other moulded softwood sections are available in a range of grades.















For more information, visit the Glued Laminated Timber Association at www.glulam.co.uk or the Trussed Rafter Association at www.tra.org.uk

Joinery timber

Softwood



Redwood (pine) from Sweden and other Nordic countries has yellowish-white sapwood and reddish heartwood. It is one of the most widely used species for all types of interior and exterior joinery.

Whitewood (spruce) from Sweden and other Nordic countries is creamy-white to yellowish and widely used in construction and for interior and exterior joinery.



Southern Yellow Pine from N. America is dense, stable and reddish-brown, with a distinctive grain. It is used for windowboards, stair stringers and decking.



Hemlock from N. America is clear and pale pinkish-brown with a fine texture. It is used in mouldings, stairparts, kitchens, bedrooms and shopfitting.



Douglas Fir from N. America is clear, strawcoloured and relatively stable. It can be used internally and externally without preservative treatment



Western Red Cedar from N. America is highly durable and can be used internally and externally without preservative treatment. It is widely used for cladding.

Hardwood



American Ash is a light-coloured temperate hardwood suitable for internal use only.



Beech is a non-durable temperate hardwood. It is a creamy white, going reddish-brown after steaming. Traditionally used for furniture.



European Oak is a yellowish brown temperate hardwood with a medium to coarse texture. Durable, it has medium movement and is susceptible to iron staining. Used for cladding, flooring and decking.



American White Oak is a tight-grained temperate hardwood from a pale straw-colour to pale red. Although durable, it can swell if used externally.



American Tulipwood is a yellowish brown temperate hardwood with a fine texture. It is slightly durable and used for furniture and interior joinery.



Sapele is a tropical hardwood from West Africa. Pink to pale red in colour, it can be used internally and externally.



Dark Red Meranti from Malaysia is a redcoloured tropical hardwood, suitable for internal and external joinery.



Iroko from West Africa is a light-brown tropical hardwood. As it is highly durable, it is suitable for external as well as internal use and sometimes used as a teak substitute.



Download TRADA's Wood Species app from http://www.trada.co.uk/techinfo/tsg/

Decking

Planning and building regs

You'll need planning permission if the deck is:

- · Over 300mm high
- · Visible within 20 metres of a road
- · More than 50% of the garden
- In a conservation area or attached to a listed building.



Building Regs say decks up to 600mm high must have 900mm balustrades; decks over 600mm must have 1100mm balustrades. Keep spaces between rails, balusters and deck to 100mm or less.

Materials

Use stainless steel, hot dipped galvanised or high quality carbon coated steel fixings.

Use stress-graded timber; minimum C16 for decks under 600mm high; C24 for raised, heavy duty or commercial; D30 for hardwood. Use timber that's preservative treated to the correct Use Class. Brush end grain preserver on all cut ends and notches.

Construction



Slope the deck surface away from the house; lay grooved boards in the direction of the fall.

Leave a 5-8mm gap between boards for drainage, and at least 10mm if attaching a deck to a property.



For posts embedded in the ground or concrete you MUST use Use Class 4 treated timber; for out of ground timber, use Use Class 3.

Butt boards over a double joist, with two fixings at least 15mm from board ends; every time a board crosses a joist use two fixing points. Pre-drilling fixing points helps avoid splitting boards.

The Timber Decking & Cladding Association is an independent advisory body providing guidance on materials, specifications and installation practices.

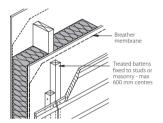
For more information, visit the Timber Decking Association at www.tda.org.uk

Cladding

Materials

Use preservative treated pine, or more naturally durable larch and western red cedar; or hardwoods like oak and sweet chestnut.

Pre-finished pine boards and heat-treated or modified wood products, such as Thermowood®, Plato® WOOD and Accoya® are increasingly popular.



Use Class 3 treated battens; leave a ventilated cavity of at least 19mm between wall and cladding; most structures need a weather-proof breather membrane.

Fix insect mesh to all ventilation gaps.

Arrange shiplap or feather-edged boards with a minimum 15mm overlap; allow a 2mm expansion gap between up-stand and rebate.

Tongued and grooved boards should be no wider than 120mm, with 2mm clearance above the tongues for expansion; install tongue upwards; open joint boards should have an 8-15mm gap at the 'water face'.

Fixing

Generally, for softwoods, use annular ring shank nails; nails should be at least twice as long as the thickness of the board to be fixed; use stainless steel nails for species with high tannin contents to avoid staining.

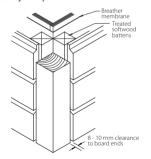
Boards over 100mm wide should have double fixings; meet horizontal butt joints on double batten supports.

For vertical cladding support, use counter battens with sloping top edge for drainage.

Using hardwood? Screw and 'over drill' to allow for movement.

Fitting green wood? Drill oversize holes and use washers with the screws.

Don't mitre corners - natural movement will let the joint open.



Diagrams courtesy of TRADA

[i]

For more information, visit the Timber Decking and Cladding Association at www.timbercladding.org

Windows

Materials

Most windows are made with preservative treated softwood, often engineered to remove knots.

Check the wood is certified legal and sustainable.

Fully-factory finished windows will have all surfaces, including joints and end-grain correctly coated.

Don't use putty with double-glazing units use tape.

Style



Replacing windows in a period property? Authentic materials and traditional designs are important to a property's value. Wood windows can combine energy-efficiency with traditional profiles and designs. Don't use plastic.

All sorts of wood windows are available: side-hung, 'easy-clean', or fully-reversible casements; tilt and turn; or vertical sliding sash (with cords & pulleys, or spiral balance).



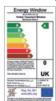
Performance

Double or triple-glazed wood windows save energy, carbon dioxide emissions and money.

Windows should comply with BS 6375 Parts 1 & 2 to ensure good performance, air and water tightness.

Except in listed properties, building regs require replacement windows to have a total window (not centre pane) U-value of 1.6W/ m2K or below (BFRC Window Energy Rating C).

For new build, building regs require a Total Envelope Rating; look for a U-value of 1.8W/ m²K or below (again, a C rating).



Wood windows are available with A and C ratings. An A rating is equivalent to a U-value of around 1.4W/m2K: wood windows can achieve U-values of as low as 0.7W/ m2K using triple-glazing.

Security



Lockable handles are available: for extra security, look for the Secured by Design lahel



Fixina & finishina

If you damage the window during installation, touch it up immediately.

Set windows as far back from the wall face as possible; avoid deep timber cills; use angled concrete, tile or stone.



Use an insulated cavity closer system to create accurate window apertures; use ties that fix to the window jamb and then screw into the brickwork

Factory-finished wood windows are available in a full range of paint colours and wood stains.

For unfinished windows, use a proprietary primer, undercoat and topcoat.

Maintenance

Wash frames and lubricate hardware annually. Recoat factory-finished windows initially after 10 years (depending on exposure), then at roughly 7-yearly intervals; little preparation will be required. Hand-painted windows will require more preparation and more regular decoration

Durability

Wood windows should last at least 30 years. Factory-finished windows made to Wood Window Alliance standards have a 60-year minimum estimated service life.

Green Deal

All Wood Window Alliance manufacturer members are Annex D compliant.

Typical warranties available¹

- · Up to 30 years on the frame
- · 8-10 years on paint finishes
- · 6 years on stains
- · 10 years on glazing units, seals and hardware

¹ Subject to correct fixing and maintenance

All Wood Window Alliance members meet strict performance, quality and sustainability standards.

The Wood Window Alliance





For more information, visit www.woodwindowalliance.com

Flooring

Materials

Pine is sustainable and good value, whether natural or pre-finished.

Hardwoods, like oak, maple or cherry are highly decorative and resist furniture marks better than softwood

Engineered boards can offer the beauty of a real wood surface bonded to a stable base.

Underfloor heating

Changes in temperature and humidity will cause movement in a wood floor; this is true of hot underfloor pipes, which should be well lagged, as well as underfloor heating.

Consider engineered boards for underfloor heating; if using a solid wood floor, consult the manufacturer

Finishing

Natural finishes like oils and waxes will need several coats; polyurethane finishes will be harder-wearing, but will need to be stripped off completely when re-finishing.

> For decorative floors, use tongue and groove boards that have been kiln-dried to 8-10%. For structural floors, use normal trade stock.



Fittina

Open packs and store boards in the room where they will be fitted for at least 24 hrs (48 hrs for hardwoods) to allow acclimatisation. reducing shrinkage and cupping.

Fit directly to joists, or 'float' over the existing floor. Use an 8mm spacer block against all walls to allow natural movement (cover gap with a skirting board).



Consider using a proprietary underlay to reduce noise.

Use a hammering block, a punch to 'secret nail' through the tongues without damaging the boards and a special tool to fit the final board.





Fire doors

When is a fire door needed?

DOMESTIC

- · Between an integral garage and the house (must be self-closing)
- · When installing a loft conversion; or if the house has more than two storevs
- Flats must have a fire door to common parts.

NON-DOMESTIC

Exit routes must be protected by fire doors.

What is a fire door?

It's been tested to withstand fire for a specific time (an FD30 door is rated for 30 minutes: FD60 for 60 minutes etc.).



It has an intumescent seal that expands in a fire to fill the gap between door and frame: it has either a 'plug', or a label on the top edge giving information.

It has fitting/maintenance instructions. It is tested as a complete assembly, so it is important to use the right

components, including a certified frame, and to follow instructions

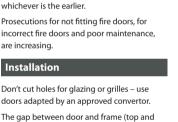












sides) should be 3mm (±1mm); the gap at the bottom, no more than 10mm. Don't use rising butt hinges: hinges should

be CF marked and certificated for use with a fire door

If you don't fit fire doors correctly, you'll invalidate the certificate.



Download building regs. from

19

The best solution?

Use a fire doorset, sold complete with frame and all components.



Responsibility

For non-domestic properties, building regs

require the builder to give the owner or

manager fire safety information not later

than the date of completion or occupation.

www.theplanningportal.gov.uk For more information visit www.bwfcertifire.org.uk or www.trada.co.uk

Sheet materials

Building regs & structural grades

Doing structural work? You must use the right quality of plywood for the task (see chart).



The easiest way to achieve this is through compliance with BSEN 13986.

The CE mark on sheet materials is linked to this standard.

Structural plywood

All plywood for load bearing applications (e.g. walls, floors, roofs) must be strong enough for the loading; use plywood listed in Eurocode 5 or BS 5268-2:2002, typically from Canada, Finland, Sweden and the USA.



Materials

Plywood: see chart opposite for information on grades and typical uses of softwood and hardwood ply.

Softwood plywood, (usually spruce) is mainly for construction. Hard-wood plywood (usually birch) can have a clearer finish.



OSB (Oriented Strand Board): a low cost, dimensionally stable resin-bonded sheet made of small strands of wood. Suitable for structural floors, roofs, hoardings etc.

Chipboard: wood chips pressed together with resin; smooth surfaces; available in structural and non-structural applications.

MDF (Medium Density Fibreboard): engineered stiff, stable, smooth sheets. Good for joinery and decoration. Available in Light, Standard and Moisture Resistant grades.

i For more information, visit the Wood Panel Industries Federation at www.wpif.org.uk

Products	Description	Typical uses	Thickness		
Softwood Plywood					
WISA Spruce (Finland)	Face veneer grade III/IIII. Structural panel (BS EN 636: 2003; BS 5268-2:2002).	Load-bearing applications such as roofing, flooring and wall-sheathing. Also joinery, furniture, soffits and packaging.	9-24mm		
Elliotis Pine (Brazil)	Face veneer grade C+/C Structural (CE2+).	Can be used in certain structural applications provided the necessary documentation from mill to distributor is available.	9-25mm		
Coniferous Plywood, Elliotis type (Brazil)	Face veneer grade C+/C. Economy non-structural range.	Site hoardings, window shuttering, wall sheathing, pallets, crates, WHERE STRUCTURAL PERFORMANCE IS NOT A KEY FACTOR.	12-18mm		
Hardwood Ply	wood				
WISA TWIN (Finland)	Face veneer grade BB/WG. Structural grade EN636-2 S, birch faces with spruce core.	Construction, furniture or joinery. Ideal for stains, paints or lamination. Can be used for roofing, when not subject to wetting. Needs to be primed and sealed.	4-24mm		
Hardwood- faced Plywood (Malaysia/ Brazil)	Face veneer grade BB/CC. Tropical hardwood-faced structural grade plywood (EN636-2 S).	Smooth-faced plywood for any construction environment. Soffit and fascia boards, flooring, roofing. Certified for walls, floors and roofs in thicknesses of 9mm or more.	3.6-25mm		
Hardwood- faced Plywood (Malaysia)	Face veneer grade BB/CC. Melamine-bonding (EN314-2, class 2 Ext). Advisable for internal use only.	As it has restricted exterior and occasional wetting applications, this plywood is best considered for internal use only. Ideal for shop-fitting. Dependent on use, needs to be primed and sealed prior to application.	5.5-18mm		
Marine Plywood (Far East)	Face veneer grade BB/CC. For more demanding high- moisture environments. Compliant with BS1088.	Bathrooms. Needs to be primed and sealed prior to application.	6-25mm		
Concrete formwork WISA Form MDO (Finland)	Medium Density Overlay coating.	Concrete formwork. Can be re-used approximately 10-15 times. Mainly for horizontal castings - special attention needs to be paid to support for vertical castings.	18mm		

Treated wood

Hardwoods, such as oak, and some softwoods, such as western red cedar and larch, are naturally durable for outdoor use.

Most softwoods must be treated with preservative to last outdoor.

Use wood that has been pressure treated by an industrial process.

British Standards require wood treatments to be specific to a component's use.

BS EN 335 pt 1 defines the Use Classes:

- 1. Internal, dry (e.g. upper floor joists)
- 2. Internal, risk of wetting (e.g. tile battens)
- 3.a Outdoors, coated, above ground (e.g. window frames)
- 3.b Outdoors, uncoated, above ground (e.g. fence panels and balustrades)
- 4. Permanent ground or freshwater contact (e.g. fence and deck posts)



The WPA is the technical and advisory body for wood protection technology in the UK



Correct treatment for Use Class 4 will provide a minimum 15-year life.

Brush-apply exposed areas with preservative where treated timber has been cut or notched.





For more information, visit www.wood-protection.org

Useful contacts

Wood Campus	woodcampus.co.uk
American Hardwood Export Council	americanhardwood.org
American Softwoods	americans of two ods.com
British Woodworking Federation	bwf.org.uk
Confederation of Forest Industries	confor.org.uk
North West Timber Trade Association	nwtta.org
Swedish Wood	swedishwood.com
Timber Decking Association	tda.org.uk
Timber Decking & Cladding Association	timbercladding.org
Timber Trade Federation	ttf.co.uk
TRADA	trada.co.uk
Wood for Good	woodforgood.com
Wood Protection Association	wood-protection.org
Wood Window Alliance	woodwindowalliance.com

Wood campus

The timber industry's FREE online Wood Campus gives you everything you need to know about wood in one place:

- · '90-second Know-How' product briefings
- Want more detail? We've got 15-minute information videos
- · Downloadable TRADA Choose & Use leaflets
- · Videos, CPD sessions, and much, much more...

www.woodcampus.co.uk

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