CI/SfB Yi
Uniclass P51

Wood Information Sheet

WIS 2/3-67

Subject: Timber – General
Revised: May 2017

Specifying British-grown timbers

British-grown timbers are comparable with species that grow in northern Europe and North America, however, local growing conditions may influence some characteristics.

The purpose of this Wood Information Sheet (WIS) is to summarise the characteristics and the current and potential uses of timber grown in Britain.

This WIS is an overview of the subject with signposts to more detailed sources that are listed at the end.

Contents

Figure 1: British-grown Douglas fir roof components
Photo: BSW Timber Group

Key points

- British timber is wood harvested from trees grown in Britain – England, Wales, Scotland and Northern Ireland.
- All timber and timber products first placed onto the market in Britain are subject to the EU Timber Regulation, which requires timber to be sourced legally.
- Approximately 44% of British woodlands are certified against the UK Woodland Assurance Standard, which is endorsed by FSC and PEFC.
- Many people are unaware that the timber they are using is from a British forest, yet over 54% of the total sawn timber and over 74% of the total particleboard consumption in Britain is sourced from British-grown timber.
- British-grown timber, particularly softwood, tends to be characterised by faster growth rates than seen in the same species grown in more northerly zones of the northern hemisphere where colder climate results in slower growth.
- An ongoing study into plantation-grown softwoods has been conducted by Edinburgh Napier University in collaboration with Forest Research.
- In some cases this has an effect on durability as well as the timber structure, so it is important to specify not only the species but also the correct grade.
- British-grown timber can be considered interchangeable with its imported counterparts of the same species and grades.
- Most British-grown softwood is machine strength-graded to the C16 strength class because this is the most economically viable grade to produce.
- C16 strength class material is suitable for use in a wide range of building applications and sourcing higher strength class material that has been imported may not be necessary.
- Many future opportunities for British-grown timbers are expected to be found in construction.

British timber

British timber is wood harvested from trees grown in Britain – England, Wales, Scotland and Northern Ireland. Britain has a temperate northern European climate and the tree species grown are similar to those grown across northern Europe and also in North America, and in many cases are the same tree species. Using local materials, instead of imports, reduces the environmental impact that would have resulted from transportation of the material from another location.

Extent

In Britain, the total area of woodland is estimated to be 3.15 million hectares, equivalent to 13% of the total land area (at 31st March 2015) [1]. Of this area, the majority is held in the private sector with only 0.87 million hectares publicly owned by the Forestry Commission (England and Scotland), Natural Resources Wales or Forestry Service (Northern Ireland). Overall, the split between coniferous trees (which produce softwood timber) and broadleaved trees (which produce hardwood timber) is roughly equal being 1.62 million and 1.51 million hectares respectively. However, for publicly owned woodland, coniferous cover is nearly seven times that of the broadleaved species while broadleaved species are dominant in privately owned woodland.

There are differences in softwood/hardwood stocks between the countries in Britain and this is mostly influenced by the suitability of the soils and climate for the species stocked there. *Figure 2* below shows these differences. Not all of this woodland cover is available to provide timber for extraction. Some will be inaccessible, some in areas of scientific interest, and some will have non-timber benefits such as recreation.

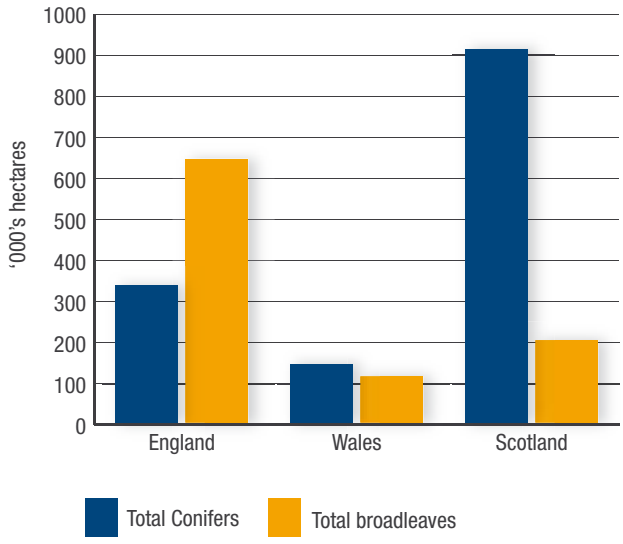

Figure 2: Coniferous vs. broadleaf cover for England, Wales and Scotland

Legal and sustainable harvesting

All timber and timber products (regardless of their certification status) first placed onto the market in the European Union (and thus Britain) are subject to the EU Timber Regulation (EUTR). This requires timber to be sourced legally in accordance with felling licences, local rules etc. For British-grown timber, this 'first placing onto the market' is most likely to mean the sale/transfer of felled logs following harvesting or the initial processing. The Forestry Commission and its associated bodies in Wales and Northern Ireland are responsible for awarding felling licences.

Figure 3: Logs harvested in Scootmore Forest, Moray
Photo: Norbord

The area of certified woodland in Britain, including Grown in Britain licensed woodland and also woodland with a UKFS management plan, is 44% of the total, although values in Wales, Scotland and Northern Ireland are much higher than in England. Woodlands are certified against the UK Woodland Assurance Standard (UKWAS), which is endorsed by both the Forest Stewardship Council® (FSC®)[a] and Programme for the Endorsement of Forest Certification (PEFC™)[b] and independently audited. Woodlands managed under the UKWAS are regarded as being sustainably managed and although it is acknowledged that non-certified woodlands may also be well managed, it is not easy to assess if this is the case.

a) FSC® A000503
b) PEFC/16-44-002

Annual felling

It is estimated that 10.6 million green tonnes (equivalent to 10.35 million m^3 of roundwood timber) were removed from Britain's woodlands in 2012 [2] following the slow upward trend of recent years. Of this, 95% is softwood timber and the vast majority was delivered to wood processors and other users. Just over 60% was sent to sawmills for further processing, with feedstock for panel board production and wood fuel the next major product types. Currently, nearly 75% of hardwood timber felled in Britain is used for woodfuel with around 14% being sent to sawmills for further

processing into products. *Figures 4 and 5* below show the uses by proportion for felled softwood and hardwood timber.

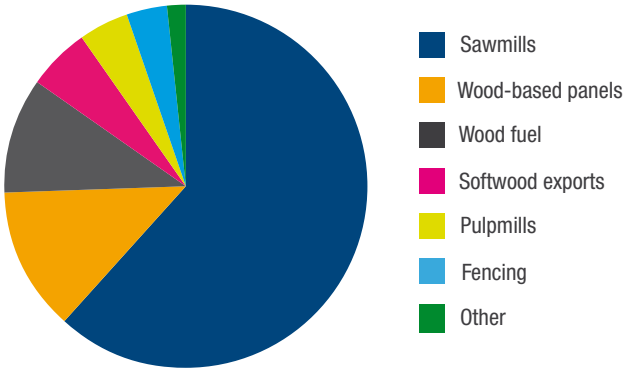

Figure 4: Volume of felled softwood timber usage

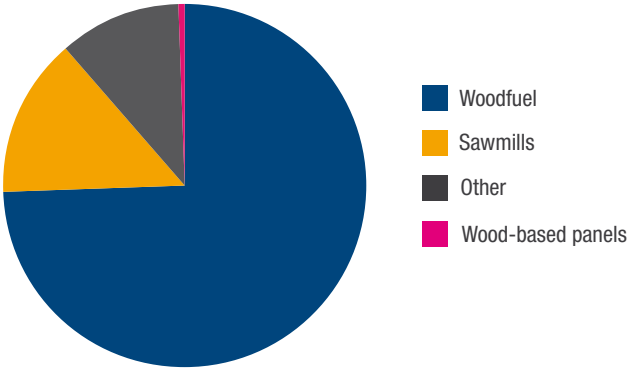

Figure 5: Volume of felled hardwood timber usage

When assessing total timber consumption in Britain for all products, excluding pulp and paper (where British-grown material accounts for just over 6% of the total used) and wood fuel, British-grown material provides around 43% by volume of the total [3].

A condition of many felling licences is that the area is restocked. In the year 2012/2013, 13,100 hectares were replanted in Britain, with three quarters being coniferous trees mainly on the public forest estate, and 50% of this restocking taking place in Scotland. Although current restocking levels are less than that of recent years, the overall trend for the past 30 years has been gradually upwards. By comparison, new planting has been gradually falling over the past 30 years.

Although the majority of restocking is coniferous, the new planting – 10,800 ha in 2012/2013 – consists of just over 80% broadleaved species, with 50% of the total being planted in Scotland. Unlike the restocking levels, the majority of new planting is taking place on privately owned land. Reasons for planting new woodlands include incentives with grants, expectations that future markets for wood products look attractive as well as projected income from so called ecosystem services, particularly the valuable attribute of 'carbon storage'.

Species

Britain's forests and woodlands have a wide range of tree species suited to a temperate climate, many of which are commercially useful. Currently there is a mix of native and introduced species. Most introduced species are from the northern hemisphere but work is being carried out to examine species from the southern hemisphere's temperate areas to assess their suitability for commercial use in Britain.

Many of our tree species, in particular broadleaved species such as oak and beech, and a single coniferous species, Scots pine, are native to Britain. Those not originally native have been grown here for so long as to become a valued part of the landscape.

Figure 6 below shows the proportions by area of coniferous species in Britain. It is important to understand that these softwoods have been planted as a crop with the purpose of being harvested for their timber, albeit with a rotation period of several tens of years. Of the current resource 80% has been planted since 1951.

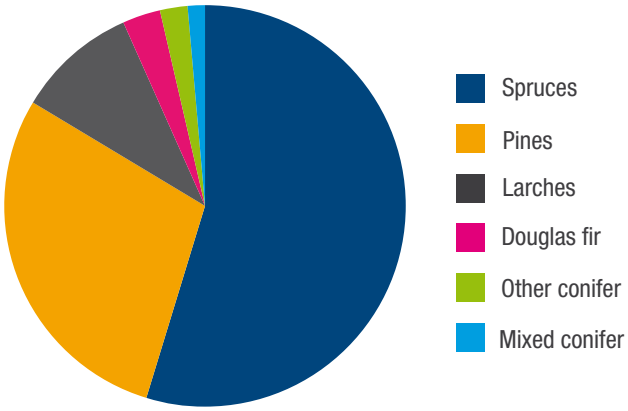

Figure 6: Proportion of British softwood species stocks by area ('Other' and 'Mixed' conifer includes a range of species such as western red cedar, western hemlock and yew)

Broadleaf species are much more varied and the numbers for 'Other' and 'Mixed' broadleaves are the largest proportion, amounting to almost 30% of the total for hardwood producing species. Oak is the most common hardwood comprising 23% of the total broadleaf cover, followed by birch (16%) and ash (13%). *Figure 7* shows the proportions by area of hardwood species in Britain.

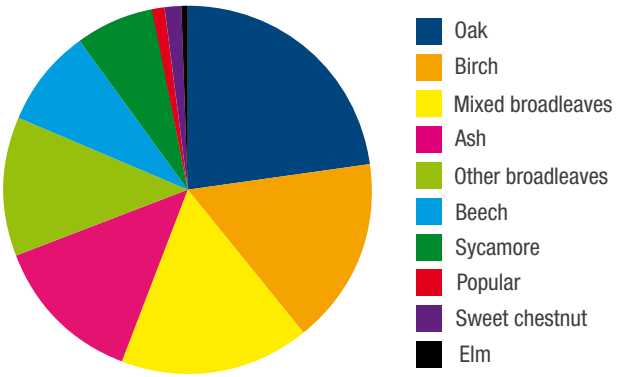

Figure 7: Proportion of British hardwood species stocks by area ('Other' and 'Mixed' broadleaved includes a huge range of species such as cherry, walnut and elm)

Species names

The naming of timbers is a complex area. Tree species are given a scientific (botanical) name which identifies them as an individual species. However, each species can have a number of common names. *BS EN 13556 Round and sawn timber. Nomenclature of timbers used in Europe* [4] lists the commonly used commercial timber species by scientific name and the common names used in Europe.

Thus, *Pinus sylvestris* will always be the same species whether grown in Britain or in Finland but its timber will be known by a number of names across Europe. In Britain we tend to refer to timber from British-grown *Pinus sylvestris* as Scots pine (the tree's common name) whereas elsewhere in Europe it is known as European redwood, Finnish redwood, Swedish redwood etc according to the country of origin.

European ash *(Fraxinus excelsior)* is known as English ash, French ash, Polish ash etc, even though it is the same species. It is often the case that timbers are given the prefix of their country, or sometimes region of origin to confer a special status on them – although the actual tree species that was the source of the timber is the same.

Tables 1 and 2 set out the most common British-grown species with common and botanical names.

Table 1: Principal hardwoods grown in Britain

Name	Botanical name(s)	Tree name	Native/introduced
European oak	*Quercus petrea*	Sessile oak	Native
	Quercus robur	Pedunculate oak	Native
European ash	*Fraxinus excelsior*	Ash	Native
European beech	*Fagus sylvatica*	Beech	Native
Birch	*Betula pendula*	Silver or white birch	Native
	Betula pubescens	Common or downy birch	Native
Sweet chestnut	*Castanea sativa*	Sweet chestnut	Introduced
Sycamore	*Acer pseudoplatanus*	Sycamore	Introduced
Poplar – black and balsam species and hybrids	*Populus nigra*	Black poplar	Native
	P. trichocarpa	Balsam poplar	Introduced
	P. x Canadensis & P. generosa	Hybrid black poplar	Hybrid introductions
Elm	*Ulmus procera*	English elm	Native
	Ulmus glabra	Wych elm	Native
Cherry	*Prunus avium*	Wild cherry, bird cherry	Native
Walnut	*Juglans regia*	Common walnut	Introduced
	Juglans nigra	Black walnut	Introduced

Table 2: Principal softwoods grown in Britain

Name	Botanical name(s)	Tree name	Native/introduced
Scots pine	*Pinus sylvestris*	Scots pine	Native
Corsican pine	*Pinus nigra ssp. laricio*	Corsican pine	Introduced
Lodgepole pine	*Pinus contorta*	Lodgepole pine	Introduced
Sitka spruce	*Picea sitchensis*	Sitka spruce	Introduced
Norway spruce	*Picea abies*	Norway spruce	Introduced
Larch	*Larix decidua*	European larch	Introduced
	Larix kaempferi	Japanese larch	Introduced
	Larix x eurolepsis		Hybrid introduction
Douglas fir	*Pseusdotsuga menziesii*	Douglas fir	Introduced
Western red cedar	*Thuja plicata*	Western red cedar	Introduced

A number of British-grown species produce structural timber and where these are graded as a single species they are known as the name given to them in *BS EN 13556*. However, as is common across the world, structural timbers can be graded and then traded as 'species combinations' (a visual or machine grade is assigned to timbers from more than one species but within the same genus and having the same comparable strength characteristics).

In Britain, the combination names and species included under each name are as set out in *Table 3* below. For ease of marking, a species code is assigned to either a single species (in which case codes are set out in *BS EN 13556*) or a species combination and codes for this are set out in *BS EN 14081-1 Timber structures. Strength graded structural timber with rectangular cross section. General requirements* [5]. These codes appear in grade stamps or accompanying documentation.

Table 3: Species commercial 'combination' names and included species and codes for British-grown structural softwood timbers

Species commercial name	Botanical species	Species code
British pine	*Pinus nigra (Corsican pine)*	WPNN
	Pinus sylvestris (Scots pine)	
British spruce	*Picea abies (Norway spruce)*	WPCS
	Picea sitchensis (Sitka spruce)	
Larch	*Larix deciduas* (European larch)	WLAD
	Larix x eurolepsis	
	Larix kaempferi (Japanese larch)	

Products and uses

Sawn timber

A variety of products are manufactured from British-grown timber. There has been a steady increase in sawn wood output from British sawmills year on year for the past five years. In 2012, 180 active sawmills consumed a total of 6.2 million green tonnes of roundwood softwoods and 0.1 million tonnes of hardwood yielding a total of 3.4 million m^3 of sawn timber. For softwood timber, this represents 40% by volume of all timber consumed in Britain and a wide range of sawn timber sizes, finishes and strength grades are produced.

This sawn timber is feedstock for an extensive range of products from fencing to packaging materials and pallets, joinery such as windows, doors, cladding and decking, and carcassing. There is a well-established and modern sawmilling industry in Britain with a particular concentration in northern England and Scotland as well as Wales and East Anglia, all close to the principal forest areas. The domestic wood-processing sector has seen significant and continued investment in recent decades and now produces millions of cubic metres of strength-graded material in modern factories. This material is supplied either as rough sawn or it is planed and the edges 'eased', which facilitates handling in production facilities such as timber frame fabrication.

Panel products

There is also a well-established and state-of-the-art wood panel industry in Britain. Domestic producers of particle boards – chipboard and oriented strand board (OSB) – provided 76% of all of these products used in Britain in 2014. For medium density fibre board (MDF) the value was 24% of the total volume consumed. These boards are suitable for a wide range of

applications including sheathing in timber frame construction, flooring and furniture.

Pulp and paper

Roundwood timber and sawmilling products are also feedstock for Britain's two integrated pulp and paper mills with a total of 536,000 green tonnes (435,000 green tonnes roundwood and 101,000 green tonnes sawmill by product) used in those mills in 2015. This is all softwood material and forms only a small part (6%) of the total feedstock requirements of the paper and pulp mills in Britain with the vast majority being recovered waste paper or imported pulp, although British-grown Sitka spruce is highly prized for paper making. The paper industries in Britain produced a total of 4 million tonnes of paper and paperboard in 2015 and levels have been at around this for the past few years.

Wood fuel

Currently 1.9 million green tonnes of roundwood is used as wood fuel with nearly a third of this coming from broadleaved trees accounting for 75% of the British-grown hardwood usage in Britain, sourced from logs that are not suitable for timber production. Some of this material is used for the production of wood pellets and briquettes which are made from both roundwood and sawmill by-products.

Engineered wood products

Britain does not currently have a well-developed manufacturing sector producing structural engineered wood products such as glulam, parallel strand lumber, laminated veneer lumber, laminated strand lumber and cross-laminated timber (CLT) utilising British-grown timber. However, relatively small-scale facilities exist for glulam production, and I-beams are made using British OSB. Brettstapel has been successfully produced using British-grown timber. Research and development at some of Britain's leading timber research establishments is being applied to these products that could utilise British-grown timber.

Non-structural products such as laminated joinery products are manufactured using British-grown timber.

However, there has been innovation, particularly in Wales, where recent funding has supported the development of products such as box and ladder beams using home-grown Sitka spruce. In addition, thermally modified timber is now being produced in Britain where research is being carried out on some of the temperate hardwoods grown in this country in an aim to improve their durability and dimensional stability.

Availability

Supply and demand

Many people are unaware that the timber they are using is from a British forest yet, as we have seen, over 54% of the total sawn timber and over 74% of the total particleboard consumption in Britain is sourced from British-grown timber.

As more projects use and publicise the use of British-grown timber, their acceptance will increase. For example, timber cladding and decking are popular products manufactured from British-grown sources. Other species, such as oak, sweet chestnut, Douglas fir and western red cedar, offer useful opportunities although specialist suppliers should be consulted to ensure selection of appropriate quality. Available stocks may not currently be large and so purchasing decisions may need to be taken earlier in projects requiring British-grown timber. However, these products are available and sources such as Sylva's myForest website (see www.sylva.org.uk/myforest), the Woodinfo website (see www.ukwoodinfo.com) and the TRADA Species database (see www.trada.co.uk/techinfo) offer suppliers of British-grown material.

The Grown in Britain WoodStock report [6] contains information on the availability of British hardwoods and that there are significant quantities available to replace a large percentage of imports.

Future possibilities

British-grown timber is now a regularly used product in a wide range of sectors including construction, which is where many of the future opportunities are expected to be found.

Research is being carried out at a number of British institutions to give a better understanding of a number of our commercial species. The forestry side of timber production looking at tree genetics and forestry practices to improve our timber stocks for the future are being examined. In addition, research is addressing how British-grown timber can be used in engineered timber products such as CLT, Brettstapel and stacked plank. Researchers are also examining floor truss systems using British-grown timber and closed panel wall timber frame solutions.

Research undertaken by the Forestry Commission in 2010 [7] examined the opportunities for adding value to British-grown timber (ranked on the basis of stakeholder selection, market, carbon value, profit and end-of-life options) and these were:

- cross-laminated timber panels
- glulam

- larch cladding
- ash solid wood flooring
- wood fuel pellets
- laminated strand lumber.

Although some of these are now being used, for example larch cladding, research is continuing on others to assess their suitability and performance when manufactured with British timber. Some of our less durable species may lend themselves to chemical or thermal modification techniques that improve their durability and dimensional stability, making them suitable for external use.

Quality

Timber is a natural product and its quality depends a number of factors including how and where the tree grows. Timber grown in Britain only differs from that grown elsewhere in the world by the growing conditions in Britain. Timber here, particularly softwood, tends to be characterised by faster growth rates than seen in the same species grown in more northerly zones of the northern hemisphere where colder climate results in slower growth. This has an effect on the structure of the timber from British-grown trees; timber grown in warmer climates has a higher proportion of early wood (spring and summer growth timber) to late wood (which is laid down during the autumn and winter months). In some cases this has an effect on durability as well as the timber structure and some species are less durable when grown in Britain.

Edinburgh Napier University has carried out research on wood properties and the uses of Sitka spruce in Britain [8]. An ongoing study has also been conducted by Edinburgh Napier University in collaboration with Forest Research. The summary of these findings can be found in the Forestry Commission Research Note 026 (FCRN026) [9].

Structural timbers

For visual strength grading, hardwoods follow *BS 5756 Visual strength grading of hardwood. Specification* [10] and softwoods follow *BS 4978 Visual strength grading of softwood. Specification* [11]. Machine grading of softwoods has been in use for many years.

Most of the softwood timbers graded for structural use in Britain are machine graded in state-of-the-art sawmills. Hardwoods are visually graded. All of the timber strength-graded using any of these methods is graded in compliance with the European Standards related to grading of timber – the *BS EN 14081* series of standards.

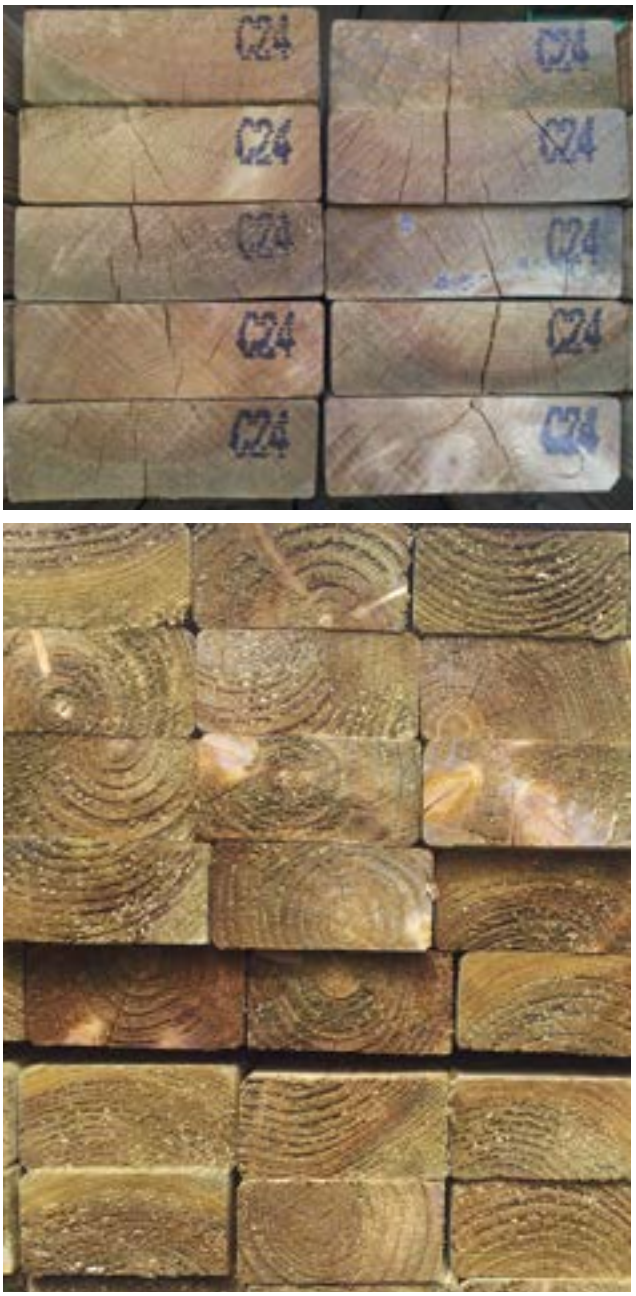

Figure 8: British-grown C16 and C24 softwoods
Photos: Willmott Dixon Group

Most British-grown softwood tested is machine strength-graded to the C16 strength class, but this is because it is largely made up of spruce. Some domestic timber will meet higher strength grades/strength classes, such as British pine and larch. Currently, only British-grown pines and British-grown spruces are machine strength-graded, although machine strength grading settings have been produced for Japanese, European and hybrid larch grown in Britain.

Table 4 below sets out the species that are visually graded in Britain and the grades and the strength classes that are assigned to these using *BS EN 1912 Structural Timber. Strength classes. Assignment of visual grades and species* [12].

Table 4: Strength classes of commonly used British timbers

	Name	Visually graded		Machine graded
		Grade(s)[a]	Strength class[b]	
Softwoods	British spruce	GS	C14	C16 or C24
		SS	C18	
	British pine	GS	C14	C16 or C24
		SS	C22	
	Larch	GS	C16	C16 or C24
		SS	C24	
	Douglas fir[c]	GS	C14	Not machine graded
		SS	C18	
Hardwoods	Oak	TH1	D30	Not machine graded
		TH2	D24	
		THA	D40	
		THB	D30	
	Sweet chestnut	TH1	D24	Not machine graded

[a] Softwoods graded to *BS EN 4978* and hardwoods to *BS EN 5756*
[b] As set out in *BS EN 1912* or *PD 6693* [13]
[c] Where cross-sectional area exceeds 20,000mm² and both cross-sectional dimensions exceed 100mm, British-grown Douglas fir of SS grade may be allocated to strength class C24

The latest versions of *BS EN 1912* or *PD 6693* should always be referred to when assigning a strength class.

Manufacturers of grading machines work, using the Standards, to establish machine settings for various combinations of species and timber provenance to produce timber graded to a particular strength class. When an individual machine is installed at a sawmill, the settings are checked as part of commissioning so that the output of the sawmill can be CE marked.

In the past, it was thought that British-grown C16 material was somehow inferior to equivalent grade softwood sourced from overseas. However, it is machine strength-graded and assessed in the same manner and to the same Standards as that graded elsewhere in Europe and can therefore be regarded as equivalent material. In many cases, particularly with the advent of thicker wall sections to meet modern building performance requirements, C16 strength class material is suitable for use in a wide range of building applications and sourcing higher strength class material that has been imported may not be necessary. Indeed the

attraction of a wall section manufactured from strength-graded British-grown solid timber with OSB sheathing is increasing.

It might not always be necessary to specify C24 timber (material that will probably be imported). For example, a slightly deeper floor joist might be economical in C16 timber.

Non-structural timber

Timbers not required for structural purposes are often graded for appearance quality (indeed in some cases an appearance grade is also applied to structural timbers where these will be visible in the building) and again, there is a misconception that British timber is of lower quality when considering appearance. Timber is a natural product and its appearance is naturally variable, which is why Standards and appearance grades are produced to set limits on the characteristics in timber that may or may not be desirable.

For joinery purposes, *BS EN 942 Timber in joinery. General requirements* [14] sets out criteria for seven appearance grades. Other 'suppliers' grades' may also be available. As there is a wide range of appearance grades, care should be taken to understand them and which natural characteristics each allows, such as the size of knots. When designing with and specifying any timber for applications where appearance is important, it is good practice to set limits for natural characteristics in the specification by using standards such as *BS EN 942* or to use a sample board. Early discussion with specialist timber suppliers on this subject is recommended. Although British timber can sometimes be quite knotty, in some cases this knottiness is seen as a positive attribute bringing 'character' to the product.

Engineered wood products

As with all engineered wood products on sale across Europe, which are to be incorporated into buildings or civil engineering structures, British-manufactured products are required to be CE marked and meet the requirements of the Construction Products Regulation as described in TRADA's *WIS 2/3-56: CE marking: implications for timber products* [15]. Therefore, any products or building systems manufactured in Britain and with British-grown timber may be assumed to be of equal quality to equivalent imported materials. They will have been manufactured and assessed using either the same or equivalent standards as those used across Europe for the similar products.

Design and interchangeability

Design of any timber element or building requires care and the principles of designing for durability are the same regardless of where timber is sourced. TRADA's *WIS 4-28: Durability by design* [16] gives guidance on this issue.

Softwoods

British-grown timber, in particular British softwood, is usually interchangeable with its imported counterparts of the same species and grades. It has the advantages of having been produced locally and transported, in some cases, over shorter distances and its production having contributed to Britain's economy, particularly in some regions where other industry is not present due to its remote location.

Attention should be paid to the natural durability rating of species as in some cases British-grown timber may have different durability ratings to imported species. For example, British-grown western red cedar is considered to be moderately durable whereas North American material is rated as durable. Douglas fir grown in Europe (including in Britain) is considered to be slightly durable rather than the moderately durable rating for North American Douglas fir. See *BS EN 350 Durability of wood and wood-based products. Testing and classification of the durability to biological agents of wood and wood-based materials* [17].

Hardwoods

As with softwood timbers, British-grown hardwood timber is usually interchangeable with its imported counterparts of the same species and grades. However, with the advent of the EU Timber Regulation (EUTR) some of Britain's hardwoods may have a role to play in substituting imported tropical hardwoods where the source may be risky. Although only a small proportion of British hardwood is currently used for construction, it is used for production of furniture and is suited for use in a wide range of other applications.

Table 5 (overleaf) sets out some common imported species used for joinery and some British hardwoods that could be considered for substitution. Particular attention must be paid to ensure fitness for purpose and complete interchangeability in terms of properties. These timbers were assessed for similar strength, moisture movement, density and durability. However, their appearance and other characteristics may be quite different. Samples and specialist guidance should be sought.

Data sheets

This WIS has accompanying data sheets for the species set out below, with a single data sheet covering the 'minor species'. These sheets contain data drawn from:

- Handbook of hardwoods including 1997 supplement, ISBN 1860814107, BRE, 2000
- Handbook of softwoods, BRE, 1977
- Lavers, G. M., The Strength properties of timber, BRE, 2002
- TRADA Species database, available at www.trada.co.uk/techinfo
- TRADA's Timbers of the world (the red booklets), various, available from www.trada.co.uk/bookshop.

Values given within the tables on data sheets are indicative mean values taken from tests on small, clear specimens.

In the data sheets, CITES is the Convention on International Trade in Endangered Species and IUCN is the International Union for Conservation of Nature.

Hardwoods	Hardwoods (minor species)	Softwoods	Softwoods (minor species)
Oak	Birch	Scots pine	Firs
Sweet chestnut	Cherry	Corsican pine	Western hemlock
Ash	Walnut	Sitka spruce	Yew
Beech	Elm	Norway spruce	
Sycamore	Poplar	Larch	
		Douglas fir	
		Western red cedar	

British-grown timbers are available from merchants. Large volumes may affect the lead time.

Table 5: Potential British-grown alternatives for imported hardwoods

Species		Source	British alternative(s)
Common name	**Botanical name**		
Sapele	*Entandrophragma cylindricum*	West Africa	Oak, sweet chestnut
Utile	*Entandrophragma utile*	Tropical Africa	Sweet chestnut
Maple, rock	*Acer saccharum, Acer nigrum*	Eastern USA and Canada	Sycamore, sweet chestnut
Maple, soft	*Acer saccharinum, Acer rubrum*	Eastern USA and Canada	Sweet chestnut
Tulipwood/ American yellow poplar	*Liriodendron tulipifera*	Eastern USA and Canada	Ash (although slightly heavier)
Dark red meranti	*Shorea spp, Shorea pauciflora, Shorea acuminata, Shorea platycarpa, Shorea platyclados, Shorea curtisii*	Malaysia	Ash, sycamore Birch, beech although care will be required with these are they are large movement species
Light red meranti	*Shorea spp, Shorea acuminata, Shorea leprosula, Shorea parvifolia, Shorea macroptera, Shorea ovalis, Shorea dasyphylla, Shorea lepidota, Shorea palembanica, Shorea teysmanniana, Shorea platycarpa, Shorea albida, Shorea quadrinervis, Shorea smithiana*	Malaysia	Ash, sycamore
Ash, American	*Fraxinus spp, Fraxinus nigra, Fraxinus pennsylvanica, Fraxinus americana*	Eastern USA and Canada	European ash
Iroko	*Chlorophora excelsa, Chlorophora regia*	West Africa	European oak, sweet chestnut (although slightly larger movement)
Oak, American white	*Quercus spp, Quercus alba, Quercus prinus, Quercus montana, Quercus lyrata, Quercus michauxii*	Eastern USA and Canada	European oak

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- Confederation of Forest Industries
- Timber Trades Federation
- UK Forest Products Association
- UK Contractors Group – Grown in Britain Construction Task

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About TRADA

The Timber Research and Development Association (TRADA) is an internationally recognised centre of excellence on the specification and use of timber and wood products.

TRADA is a company limited by guarantee and not-for-profit membership-based organisation. TRADA's origins go back over 80 years and its name is synonymous with independence and authority. Its position in the industry is unique with a diverse membership encompassing companies and individuals from around the world and across the entire wood supply chain, from producers, merchants and manufacturers, to architects, engineers and end users.

Our aim

To provide members with the highest quality information on timber and wood products to enable them to maximise the benefits that timber can provide.

What we do

We seek to achieve this aim through active and on-going programmes of information and research. Information is provided through our website, an extensive collection of printed materials and our training courses.

Research is largely driven by the desire to update and improve our information so that it continues to meet our members' needs in the future.

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Exova BM TRADA provides independent certification, testing, inspection, training, technical services and information to the timber, building, fire and furniture industries. It is also the appointed service provider for TRADA's research, information and membership administration.

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Species Data Sheet

Oak—hardwood

British grown

Quercus robur
Quercus petraea

Distribution

European oak timber is sourced from *Q.robur* and *Q.petraea* which are both native to the British Isles except for the far north and also across much of Europe extending into Asia and north Africa.

Environmental

Neither species is listed in CITES. *Q.robur* is listed as a 'least concern' species in the IUCN Red List and *Q.petraea* is not listed at all. Available from well managed sources and with certification.

Description

Both species produce wood of similar appearance with the sapwood being lighter in colour than the heartwood which is yellowish brown. The texture is medium to coarse and quarter sawn surfaces show a distinct silver-grain figure due to the broad rays. British-grown oak can be variable due to differing growth conditions but is often tougher and harder than that grown in central Europe.

Properties

Durability:	Durable to slightly durable*
Ease of treatment:	Extremely difficult (sapwood is easy)
Movement:	Medium
Density (at 15% moisture content):	720 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	97 N/mm^2
Modulus of elasticity:	10100 N/mm^2
Compression parallel to grain:	51 N/mm^2

Data shown in this table is for small clear specimens *Q spp*. European oak. For structural, strength-graded material use the characteristic data values for strength class in BS EN 338. Structural timber strength classes should be referred to and used in calculations.

Assigned strength class:

D30 for timber visually strength graded as TH1 to BS EN 5756

D24 for timber visually strength graded as TH2 to BS EN 5756

D40 for timber visually strength graded as THA to BS EN 5756 (minimum 20,000mm^2 and no dimension less than 100mm)

D30 for timber visually strength graded as THB to BS EN 5756 (minimum 20,000mm^2 and no dimension less than 100mm)

Working qualities:

	Poor	Fair	Good	Excellent
Sawing		✓	✓	
Machining		✓	✓	
Nailing/screwing	✓			
Gluing			✓	
Drilling		✓	✓	
Finishing			✓	
Fixing	Requires pre-drilling for nailing and screwing			

Special considerations

Contains tannin and is slightly acidic. Care is required to avoid iron staining and corrosion of fixings and adjacent metals in damp conditions. Also, tannin staining of adjacent masonry is a risk.

Oak can also be 'limed' (to lighten its colour) or 'fumed' (to darken it in colour).

Uses

Heavy structural use, cladding, joinery – exterior, joinery – interior, furniture, flooring, sleepers, decking.

*The most recent version of BS EN 350:2016 has changed the durability of European oak from 'durable' (prior to 2016) to 'durable to slightly durable'. The 2016 standard states that this species exhibits a wide range of durability to fungi when tested in in-ground conditions.

Accompanies Wood Information Sheet 2/3-67

Species Data Sheet

Sweet chestnut – hardwood

British grown

Castanea sativa

Distribution

This timber was introduced into Britain in Roman times and is widespread particularly in southern counties on lighter soils where it is an important coppice species.

Environmental

Not listed in CITES. Available from well managed sources.

Description

The sapwood is narrow and distinct from the heartwood which is yellow brown, closely resembling oak, and is medium in texture. The timber is straight grained although older trees can yield spiral grained timber. Sweet chestnut lacks the broad rays of oak and so does not show the silver figure seen in that timber.

Properties

Durability:	Durable
Ease of treatment:	Extremely resistant (sapwood is moderately easy)
Movement:	Small movement species
Density (at 15% moisture content):	560 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	79 N/mm^2
Modulus of elasticity:	8200 N/mm^2
Compression parallel to grain:	44 N/mm^2

Data shown in this table is for small clear specimens of *C.sativa*. For structural, strength-graded material use the characteristic data values for strength class in BS EN 338. Structural timber strength classes should be referred to and used in calculations.

Assigned strength class:
D24 for timber graded as TH1 in BS EN 5756.

Working qualities:

	Poor	Fair	Good	Excellent
Sawing			✓	
Machining			✓	
Nailing/screwing		✓		
Gluing			✓	
Drilling			✓	
Finishing			✓	
Fixing	Pre-drilling required for fixings and corrosion resistant fixings needed.			

Special considerations

Contains tannin and is slightly acidic. Care is required to avoid iron staining and corrosion of fixings and adjacent metals. Also, tannin staining of adjacent masonry is a risk. Sweet chestnut splits easily.

Uses

Interior and exterior joinery and panelling, cladding, shingles, stakes, furniture, cooperage, heavy carpentry – including glulam.

Species Data Sheet

Ash—hardwood

British grown

Fraxinus excelsior

Distribution

Ash is native to the British Isles and much of western Europe and Asia, and also across northern Africa.

Environmental

Not listed in CITES or the IUCN Red List. Available from well managed sources and with certification.

Description

There is usually no distinction in colour between the sapwood and heartwood of ash with freshly cut timber being whitish to pale brown, sometimes with a pinkish cast. The wood turns to a slightly brownish white after drying. Some logs contain an irregular dark brown or black heartwood and these are often enhanced in value because of the decorative nature of this wood. The wood is typically straight grained and is the toughest British-grown timber. It is flexible, making it one of the world's most valuable timbers for sports goods and striking tool handles. The texture is rather coarse and the contrast between porous early wood and denser latewood can produce a decorative figure.

Properties

Durability:	Not durable
Ease of treatment:	Moderately easy (sapwood is moderately easy)
Movement:	Medium
Density (at 15% moisture content):	710 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	116 N/mm^2
Modulus of elasticity:	11900 N/mm^2
Compression parallel to grain:	53 N/mm^2

Data shown is for small clear specimens.

Assigned strength class:
None assigned, contact TRADA helpline for further advice.

Working qualities:

	Poor	Fair	Good	Excellent
Sawing		✓	✓	
Machining			✓	
Nailing/screwing	✓	✓		
Gluing		✓	✓	
Drilling		✓	✓	
Finishing			✓	
Fixing	Pre-boring advisable except for less dense material			

Special considerations

Ash has excellent steam bending properties except where irregular grain or knots are present.

Uses

Sports goods, furniture, interior joinery, flooring, veneers, tool handles.

Potentially suitable for wood-modification techniques.

Accompanies Wood Information Sheet 2/3-67

Species Data Sheet

Beech—hardwood

British grown

Fagus sylvatica

Distribution

Beech is a native species and is widely distributed across Britain and Europe.

Environmental

Not listed in CITES or the IUCN Red List. Available from well managed sources and with certification.

Description

Usually there is no demarcation between the colour of the sapwood and heartwood of beech with the timber being very pale brown when freshly cut, turning reddish brown on exposure. Beech can be steamed, changing the colour to pink or light red. The grain is usually straight with a fine, even texture with rays distinctly visible especially on longitudinal surfaces. British-grown beech tends to be heavier than that grown in central Europe.

Properties

Durability:	Not durable
Ease of treatment:	Easy (sapwood is easy)
Movement:	Large
Density (at 15% moisture content):	720 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	118 N/mm^2
Modulus of elasticity:	12600 N/mm^2
Compression parallel to grain:	56 N/mm^2

Data shown is for small clear specimens.

Assigned strength class:
None assigned, contact TRADA helpline for further advice.

Working qualities:

	Poor	Fair	Good	Excellent
Sawing		✓		
Machining			✓	
Nailing/screwing	✓			
Gluing			✓	
Drilling		✓		
Finishing		✓		
Fixing	Requires pre-drilling for nailing and scewing			

Special considerations

The steam bending properties of British-grown beech are extremely good and even pieces with knots or irregular grain can be bent successfully.

Uses

Joinery – interior, furniture, flooring, wood ware, plywood, veneers. Potentially suitable for wood modification techniques.

Species Data Sheet

Sycamore—hardwood

British grown

Acer pseudoplanatus

Distribution

Sycamore has a native range in central Europe and western Asia and is an introduced species that is now considered naturalised, growing reasonably readily across Britain.

Environmental

Not listed in CITES or the IUCN Red List. Available from well managed sources and with certification.

Description

There is usually no distinction in colour between the sapwood and heartwood of sycamore. The timber is white or yellowish-white when freshly cut, with a natural lustre, especially on quarter-sawn surfaces. It darkens to a light brown colour on drying. Sycamore is generally straight grained, with a fine texture, and wavy or curly grained material is sometimes found.

Properties

Durability:	Not durable
Ease of treatment:	Easy (sapwood is easy)
Movement:	Medium
Density (at 15% moisture content):	630 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	99 N/mm^2
Modulus of elasticity:	9400 N/mm^2
Compression parallel to grain:	48 N/mm^2

Data shown is for small clear specimens.

Assigned strength class:
None assigned, contact TRADA helpline for further advice.

Working qualities:

	Poor	Fair	Good	Excellent
Sawing		✓		
Machining		✓	✓	
Nailing/screwing			✓	
Gluing			✓	
Drilling			✓	
Finishing				✓
Fixing	Timber is easily fixed			

Special considerations

Sycamore is a timber that bends very well, providing wavy/curly grain or knots are not present.

Uses

Cabinet work, interior joinery, flooring, veneers, wood ware, turned goods, musical instruments (particularly backs and cases of stringed instruments).

Potentially suitable for wood modification techniques.

Species Data Sheet

Scots pine—softwood

British grown

Pinus sylvestris

Distribution

Native to northern Scotland and widely distributed in Europe as far south as Spain and in northern Asia. It is the only true indigenous pine species in Britain.

Environmental

Not listed in CITES and is listed as a 'least concern' species in the IUCN Red List. Available from well managed sources and with certification.

Description

The sapwood is creamy white to yellowish in colour and is usually distinct from the heartwood. Sapwood of British-grown timber tends to be wider than in species imported from more northerly climes. The heartwood is pale yellowish brown to reddish brown and can be resinous. The timber has a coarse texture and the annual growth rings are clearly marked by the denser late wood.

For its weight Scots pine is a strong, moderately hard timber, with British-grown timber being some 20% harder on the side grain than that grown elsewhere and also tougher. In all aspects, however, there is practically no difference in comparable grades.

Properties

Durability:	Slightly durable
Ease of treatment:	Extremely difficult (sapwood is easy)
Movement:	Medium
Density (at 15% moisture content):	510 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	89 N/mm^2
Modulus of elasticity:	10000 N/mm^2
Compression parallel to grain:	47 N/mm^2

Data shown in this table is for small clear specimens *P.sylvestris*. For structural, strength-graded material use the characteristic data values for strength class in BS EN 338. Structural timber strength classes should be referred to and used in calculations.

The structural species mix 'British pine' comprises Scots pine P.sylvestris and Corsican pine P nigra var laricio grown in Britain.

Assigned strength classes:

C14 for timber visually strength graded as GS to BS EN 4978

C22 for timber visually strength graded as SS to BS EN 4978

Machine settings are available to strength grade British pine to strength classes C24 and C16

Working qualities:

	Poor	Fair	Good	Excellent
Sawing			✓	
Machining			✓	
Nailing/screwing			✓	
Gluing			✓	
Drilling			✓	
Finishing			✓	
Fixing	Care is needed when nailing and screwing to avoid splitting of the timber			

Special considerations

The quality of the timber is affected by the conditions of growth, climate, soil, elevation etc, more than most timbers because of its wide and varying distribution, and these factors affect the texture, density, size and number of knots.

Uses

Cladding, flooring, joinery – exterior, structural use, decking, mouldings, plywood joinery – interior.

Accompanies Wood Information Sheet 2/3-67

Species Data Sheet

Corsican pine—softwood

British grown

Pinus nigra var laricio

Distribution

Widely distributed throughout the Mediterranean and southern Europe extending into southern Russia. It was introduced into Britain in 1759 in the belief it was a maritime version of Scots pine.

Environmental

Not listed in CITES and is available from well managed sources and with certification.

Description

The heartwood is light yellowish brown clearly demarcated from the yellowish white sapwood. It is similar in appearance to Scots pine but the sapwood is wider and much wider in British-grown material. The texture is fairly coarse and Corsican pine often contains a greater number of knots than Scots pine.

Properties

Durability:	Slightly durable
Ease of treatment:	Extremely difficult (sapwood is easy but can be variable)
Movement:	Small
Density (at 15% moisture content):	510 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	81 N/mm^2
Modulus of elasticity:	9200 N/mm^2
Compression parallel to grain:	44 N/mm^2

Data shown in this table is for small clear specimens of *P nigra var laricio*. For structural, strength-graded material use the characteristic data values for strength class in BS EN 338. Structural timber strength classes should be referred to and used in calculations.

The structural species mix 'British pine' comprises Scots pine *P.sylvestris* and Corsican pine *P nigra var laricio.*

Assigned strength classes:

C14 for timber visually strength graded as GS to BS EN 4978

C22 for timber visually strength graded as SS to BS EN 4978

Machine settings are available to strength grade British pine to strength classes C24 and C16

Working qualities:

	Poor	Fair	Good	Excellent
Sawing			✓	
Machining			✓	
Nailing/screwing			✓	
Gluing			✓	
Drilling			✓	
Finishing			✓	
Fixing	Care is needed when nailing and screwing to avoid splitting of the timber			

Special considerations

None.

Uses

Joinery – exterior, structural use, joinery – interior.

Accompanies Wood Information Sheet 2/3-67

Species Data Sheet

Sitka spruce—softwood

British grown

Picea sitchensis

Distribution

The natural distribution of Sitka spruce is Canada and the USA but the tree has been extensively planted in Britain.

Environmental

Not listed in CITES and listed in IUCN Red List as a species of 'least concern'. Available from well managed sources and with certification.

Description

There is little difference in colour between sapwood and heartwood, the wood generally being a creamy white, but the heartwood usually has a pinkish tinge. It usually has a very straight grain, but occasionally this may be spiral. The texture is medium but dependent on the rate of growth, which for British-grown material can be faster than for timber from more northerly parts of Europe. The wood is non-resinous without odour and therefore non-tainting, light in weight and showing a silvery lustre on planed surfaces.

Properties

Durability:	Not durable
Ease of treatment:	Difficult (sapwood is moderately easy to difficult)
Movement:	Small
Density (at 15% moisture content):	450 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	67 N/mm^2
Modulus of elasticity:	8100 N/mm^2
Compression parallel to grain:	36 N/mm^2

Data shown in this table is for small clear specimens of *P.sitchensis*. For structural, strength-graded material use the characteristic data values for strength class in BS EN 338. Structural timber strength classes should be referred to and used in calculations.

The structural species 'British spruce' comprises Norway spruce *Picea abies* and Sitka spruce *Picea sitchensis*, grown in the UK and Ireland.

Assigned strength classes:

C14 for timber visually strength graded as GS to BS EN 4978

C18 for timber visually strength graded as SS to BS EN 4978

Machine settings are available to strength grade British spruce to strength classes C24 and C16

Working qualities:

	Poor	Fair	Good	Excellent
Sawing		✓		
Machining		✓		
Nailing/screwing		✓	✓	
Gluing		✓		
Drilling		✓		
Finishing		✓		
Fixing				

Special considerations

None

Uses

Structural use, joinery – interior, joinery – exterior, cladding, decking.

Species Data Sheet

Norway spruce – softwood

British grown

Picea abies

Distribution

Widely distributed throughout Europe with the exception of Denmark and the Netherlands. Although classed as an introduced species to Britain, there is no true record of its modern introduction, but it is known to be prior to 1548.

Environmental

Not listed in CITES and listed in IUCN Red List as a species of 'least concern'. Available from well managed sources and with certification.

Description

There is no difference by colour between sapwood and heartwood, the colour varying from almost white to pale yellowish-brown. The growth rings as seen on plain-sawn surfaces are less prominent than those of Scots pine (European redwood), and the wood is more lustrous. It has a straight grain and a rather fine texture. British-grown timber and material from parts of south-east Europe usually have a slightly lower density than timber sourced from more northerly zones due to the faster growth resulting from the relatively lower elevations and climatic conditions of these areas.

Properties

Durability:	Slightly durable
Ease of treatment:	Extremely difficult (sapwood is difficult)
Movement:	Medium
Density (at 15% moisture content):	470 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	72 N/mm^2
Modulus of elasticity:	10200 N/mm^2
Compression parallel to grain:	36 N/mm^2

Data shown in this table is for small clear specimens of *P. abies*. For structural, strength-graded material use the characteristic data values for strength class in BS EN 338. Structural timber strength classes should be referred to and used in calculations.

The structural species 'British spruce' comprises Norway spruce *Picea abies* and Sitka spruce *Picea sitchensis*, grown in the UK and Ireland.

Assigned strength classes:

C14 for timber visually strength graded as GS to BS EN 4978

C18 for timber visually strength graded as SS to BS EN 4978

Machine settings are available to strength grade British spruce to strength classes C24 and C16

Working qualities:

	Poor	Fair	Good	Excellent
Sawing			✓	
Machining		✓		
Nailing/screwing		✓	✓	
Gluing			✓	
Drilling			✓	
Finishing			✓	
Fixing				

Special considerations

None.

Uses

Joinery – exterior, joinery – interior, flooring, structural use, cladding.

Species Data Sheet

Larch – softwood

British grown

European larch – Larix decidua
Japanese larch – Larix kaempferi

Distribution

The natural habitat of European larch is the mountainous areas ascending to great elevations, generally from the Bavarian to Swiss Alps, through western Poland and the Moravian Heights to the Carpathians. It has also been extensively planted elsewhere in Europe including Britain where it was introduced early. Japanese larch occurs naturally in Japan, but has been extensively planted in Europe and Britain.

Environmental

Neither species is listed in CITES and both are listed as 'least concern' species in the IUCN Red List. Available from well managed sources and with certification.

Description

Both species are very similar in colour and texture. The heartwood is pale reddish-brown to brick-red in colour, sharply defined from the narrow, lighter-coloured sapwood. It is a very resinous wood, with clearly marked annual rings, a straight grain, and a fine, uniform texture.

L decidua is rather heavier than *L.kaempferi.*

Properties

Durability:	Both listed as Slighty durable to Moderately durable	
Ease of treatment:	Extremely difficult (sapwood is moderately easy)	
Movement:	Small	
Density (at 15% moisture content):	*L. decidua* = 550 kg/m^3 *L.kaempferi* = 530 kg/m^3	
Strength (at 12% moisture content):		
	L. decidua	*L. kaempferi*
Bending strength:	92 N/mm^2	83 N/mm^2
Modulus of elasticity:	9900 N/mm^2	8300 N/mm^2
Compression parallel to grain:	46 N/mm^2	43 N/mm^2

Data shown in this table is for small clear specimens *L decidua* and *L kaempferi*. For structural, strength-graded material use the characteristic data values for strength class in BS EN 338. Structural timber strength classes should be referred to and used in calculations.

The structural species mix 'Larch' comprises *L. decidua*, *L. kaempferi*, and *L. x eurolepsis.*

Assigned strength classes:
C16 for timber visually strength graded as GS to BS EN 4978

C24 for timber visually strength graded as SS to BS EN 4978

Work is undergoing to develop machine strength grading settings for Japanese larch grown in Britain (the highest volume larch species grown and harvested in Britain) and it is expected that these will be introduced in 2014.

Working qualities:

	Poor	Fair	Good	Excellent
Sawing		✓		
Machining		✓		
Nailing/screwing	✓	✓		
Gluing		✓		
Drilling		✓		
Finishing		✓	✓	
Fixing	Care is needed when nailing and screwing to avoid splitting of the timber			

Special considerations

Japanese larch has a tendency for the soft early wood zones to crumble and tear on machining so care must be taken.

More recently, Japanese larch has been found to be seriously affected by the introduced pathogen, *Phytophthora ramorum,* which may affect future use. This has resulted in large quantities of early felled wood being made available on to the market.

Uses

Cladding, flooring, joinery – exterior, structural use, decking, mouldings.

Species Data Sheet

Douglas fir—softwood

British grown

Pseudotsuga menziesii

Distribution

Although native to North America the tree has been extensively planted in Europe and Britain.

Environmental

Not listed in CITES and listed in IUCN Red List as a species of 'least concern'. Available from well managed sources and with certification.

Description

The heartwood is light reddish-brown in colour, usually quite distinct from the lighter coloured sapwood. The abrupt change and contrast in colour, between early-wood and late-wood bands, produce a prominent growth ring figure which is a feature of plain-sawn surfaces and of rotary-cut veneer. The wood from trees grown in Britain appears to have less resin than the North American wood, and to some extent is of more rapid growth.

Properties

Durability:	Slightly durable
Ease of treatment:	Extremely difficult (sapwood is moderately easy to difficult)
Movement:	Small
Density (at 15% moisture content):	530 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	91 N/mm^2
Modulus of elasticity:	10500 N/mm^2
Compression parallel to grain:	48 N/mm^2

Data shown in this table is for small clear specimens of *P menziesii*. For structural, strength-graded material use the characteristic data values for strength class in BS EN 338. Structural timber strength classes should be referred to and used in calculations.

Assigned strength classes:

C14 for timber visually strength graded as GS to BS EN 4978

C18 for timber visually strength graded as SS to BS EN 4978

Where cross sectional area exceeds 20,000mm^2 and both cross sectional dimensions exceed 100mm, British-grown Douglas fir of SS grade may be allocated to strength class C24.

Working qualities:

	Poor	Fair	Good	Excellent
Sawing		✓		
Machining		✓		
Nailing/screwing		✓		
Gluing		✓	✓	
Drilling		✓	✓	
Finishing		✓		
Fixing	Timber can split on nailing so pre-drilling may be necessary			

Special considerations

The abrupt transition from early wood to late wood provides an attractive feature of this wood but can also cause issues with processing.

Uses

Heavy construction, flooring, interior joinery.

Species Data Sheet

Western red cedar—softwood

British grown

Thuja plicata

Distribution

Although native to North America, western red cedar grows well in Britain and has been planted to a limited extent.

Environmental

Not listed in CITES and listed in IUCN Red List as a species of 'least concern'. Available from well managed sources and with certification..

Description

The sapwood is narrow and white in colour, and the heartwood is reddish-brown when freshly felled. The heartwood often displays a marked variation in colour that, from the centre of the log, may be a dark chocolate-brown changing to salmon pink nearer the sapwood, or the wood may be variegated with alternate dark and light zones. After drying, the wood assumes a uniform reddish-brown tone, but after long exposure to weather the colour is lost and the wood becomes silver-grey. This weathered appearance is sometimes purposely sought by architects, but a further property of the wood is its ability to take and hold stain of the finest tint without discolouration. The wood is non-resinous, straight grained, somewhat coarse textured and exhibits a fairly prominent growth ring figure. It is soft, rather brittle, aromatic, especially when wet and light in weight.

Properties

Durability:	Moderately durable
Ease of treatment:	Extremely difficult (sapwood is difficult)
Movement:	Small
Density (at 15% moisture content):	390 kg/m^3
Strength (at 12% moisture content):	
Bending strength:	65 N/mm^2
Modulus of elasticity:	7000 N/mm^2
Compression parallel to grain:	35 N/mm^2

Data shown in this table is for small clear specimens of *Thuja plicata.* For structural, strength-graded material use the characteristic data values for strength class in BS EN 338. Structural timber strength classes should be referred to and used in calculations.

Assigned strength class:
None assigned, contact TRADA helpline for further advice.

Working qualities:

	Poor	Fair	Good	Excellent
Sawing			✓	
Machining		✓		
Nailing/screwing			✓	
Gluing			✓	
Drilling			✓	
Finishing			✓	
Fixing				

Special considerations

Timber grown in Britain contains frequent small knots which can cause tearing in planing and moulding. Furthermore, the wide bands of soft springwood can be difficult to work with hand tools.

Fine dust may be irritant.

Contains tannin and is slightly acidic. Care is required to avoid iron staining and corrosion of fixings and adjacent metals in damp conditions. Also, tannin staining of adjacent masonry is a risk.

Uses

Cladding.

Accompanies Wood Information Sheet 2/3-67

Other species

British grown

Britain's forests and woodlands include a wide range of species, some of which are useful for a variety of applications. Although not always widely commercially available, the better known of these include both hardwood and softwood species.

Hardwoods

Name	General description	Uses
Birch Silver or white birch *Betula pendula* Common or downy birch *B.pubescens*	These birch species are native to Britain and grow widely across Europe up to the far north. There is no distinction between the sapwood and heartwood and the timber is whitish to light brown, straight grained without noticeable rays. Birch is a not durable species and has a density of 670 kg/m^3. The working qualities are good – works fairly easily but is inclined to be woolly. It can be planed and moulded to a good clean surface, and can be glued, stained and polished satisfactorily, and is a good turnery wood.	Furniture and floors
Cherry *Prunus avium*	Cherry is a native species. The heartwood is pale pinkish-brown, fairly well defined from the lighter coloured sapwood. The wood has a fairly fine, even texture, and a generally straight grain. Cherry is rated as moderately durable and weighs about 630 kg/m^3 when dried. The working qualities are good, but this is dependent on the type of grain present; cross-grained material tends to tear, but straight-grained material finishes well. It is a good turnery wood, and takes stain and an excellent polish.	Furniture, flooring, cabinet making, interior joinery, panelling
European walnut *Juglans regia*	European walnut has a natural range across Europe and was introduced into Britain in the 15th Century. The timber varies very considerably in colour; the sapwood is a pale straw colour, clearly defined from the heartwood which is greyish or greyish-brown, with an occasional darker-coloured streaky figure, the decorative appeal often being accentuated by natural wavy grain. Burrs, crotches and stumps provide valuable material for highly decorative veneer. A good walnut tree should always be grubbed out and never sawn down above soil level, stumps often producing beautifully mottled wood. The texture of walnut is rather coarse, the grain usually wavy. While it is not possible to apply hard and fast rules to the type of walnut produced in a given country, English walnut lies between French and Italian in decorative appeal, but is often superior to both. Walnut weighs about 670 kg/m^3 when dried and is moderately durable. It works easily and well with both hand and machine tools. It is suitable for hand carving and for turnery, finishing cleanly from the tool. It can be glued satisfactorily and takes an excellent polish.	Furniture, wood ware, joinery sliced veneer, turnery, highly prized for gun stocks
Elm Wych elm *Ulmus glabra* English elm *U.procera*	These are native species and are grown widely across Europe. Although much of the elm has been wiped out in England by Dutch elm disease, reasonable supplies of Wych elm *U. glabra* and some other elm species are still available from Northern parts of Britain. The heartwood is a dull brown colour, clearly defined when green from the lighter-coloured sapwood. The irregular growth rings, together with the cross-grained character of the wood, gives it an attractive appearance, but the large early-wood pores produce a rather coarse texture. English elm is rated as slightly durable and weighs about 560 kg/m^3 when dried. Elm is a fairly difficult timber to work but can be finished to a fine surface with care. It glues easily and can be stained, polished or waxed. It takes nails without splitting and can produce a good decorative veneer.	Furniture, joinery and flooring
Poplar *Populus* spp.	There is little distinction in colour between sapwood and heartwood with the wood being white to greyish or occasionally light brown. There is no visible figure or rays and the grain is typically straight. The timber is not durable and weighs 450 kg/m^3 when dried. Its soft nature can lead to problems on machining but with care a good finish is obtainable with all species. It can be glued satisfactorily and take paint, polish and varnish quite well. But while it can be stained the wood accepts the stain with patchy results.	Interior joinery and flooring, boxes, furniture

Softwoods

Name	General description	Uses
Firs Grand fir *Abies.grandis* Noble Fir *A procera*	A native of north America and planted to some extent in Britain. The timber closely resembles spruce although is less lustrous and coarser in texture, nearly white to light brown in colour with straight grain. It works easily, can be glued and painted and takes nails. It is 450 kg/m^3 when dried and rated as not durable. A native of north America, it yields a pale buff coloured timber with darker summerwood bands. It is fairly coarse in texture and weighs 420 kg/m^3 and is rated as not durable. It has similar working qualities to grand fir.	Interior joinery, boxes and crates, pulp
Western hemlock *Tsuga heterophylla*	A native of north America it has been planted in Britain. The timber of western hemlock is pale brown in colour and somewhat lustrous, with a straight grain and fairly even texture, non-resinous and non-tainting when dried. It has a faint sour odour when freshly sawn. The darker-coloured late-wood bands have a reddish or purple cast and produce a well-marked growth-ring figure on plain-sawn surfaces, with an occasional short, purplish-coloured line here and there on the wood. The growth-rings are less prominent than those of Douglas fir. The timber weighs about 500 kg/m^3 when dried and is rated as slightly durable. Western hemlock works readily and a good finish is obtained. It can be glued, stained, painted and varnished, and takes a good polish. It can be screwed and nailed but, although it is less inclined to split in nailing than Douglas fir, it should be pre-bored if nailing takes place close to the ends of dry boards.	Mouldings, interior joinery
Yew *Taxus baccata*	The sapwood is very narrow and white in colour, sharply demarcated from the heartwood which varies in colour from orange-brown to dark purplish-brown, the lighter-coloured wood often containing darker streaks. The growth characteristics of yew leads to a low availability of large planks but can also often produce a valuable, decorative appearance in the wood. It is a hard, relatively heavy softwood weighing about 670 kg/m^3 when dried and is rated as durable. A moderately difficult to difficult timber to machine but can be finished to a good surface. The wood is inclined to be oily, which sometimes interferes with good gluing, and care is therefore needed. It takes stains satisfactorily and a high polish. It is a good turnery wood. Yew is also one of the best softwoods for bending.	Joinery, furniture decorative work