# Engineered wood products

**Wood is a versatile material, available in a wide range of shapes, sizes and products. Over recent years, a family of engineered wood products has been developed and introduced which provides architects, designers and builders with timber solutions for situations where conventional timber would not always be viable. This Choose and Use sheet looks at some of the more common products now available in the UK.**

## Structural Engineered Products

Engineered wood products such as glulam (glue laminated timber), LVL (laminated veneer lumber), timber I-beams, and metal web beams are now commonplace. Other structural products include solid wood panels, parallel strand lumber and laminated strand lumber. All offer the aesthetic benefits of wood combined with greater strength. Other products include flooring systems, engineered floor boards and engineered sheet materials.

Engineered wood products (EWPs) offer many advantages, most of which are because they are made from wood sections which have had the weaker areas, such as knots, removed before being glued back together, resulting in a stiffer and stronger product. Other EWPs are manufactured using chips and flakes, thus optimising the use of the tree and cutting down waste to an absolute minimum.

Finally, in laminated timber sections for joinery, the timber grain is reversed across the section like a sandwich, resulting in a more stable product with a reduced tendency to warp or twist.

## The key benefits of EWPs

- Stronger and stiffer sections
- Consistent properties
- Available in long lengths and spans
- Manufactured at low moisture content so they can be installed in heated buildings with minimal shrinkage
- Improved stability

Laminated Veneer Lumbar

## Sustainable timber

Timber is the most sustainable building product available. It is naturally renewable - over 97% of softwood timber used in the UK comes from Europe, where the forest area is increasing by the equivalent of 90 football pitches every hour of the day and night.*

For reassurance for softwoods and hardwoods look for certification labels like FSC (Forest Stewardship Council) or PEFC (Programme for the Endorsement of Forest Certification).

FSC
FSC-ACC-008

Always ask your supplier about their responsible purchasing policies.

PEFC
PEFC/16-44-002

*IIED & ECCM, Using Wood to Mitigate Climate Change, 2004 and UNECE-FAO, State of the Europe's Forests, 2011.



Produced by TRADA Technology on behalf of the Timber Research and Development Association (www.trada.co.uk), and supported by Wood for Good and Swedish Wood

## Glulam

Glulam is made from layers of parallel solid timber laminates (normally spruce or pine) glued together under high pressure. The weather resistant glue can be specified either dark or light. Fire safety is similar to solid timber; slow to char, the uncharred section of the beam retains its strength. It is generally available in standard widths of 90mm - 240mm, and lengths of up to 12 metres. Other sizes may be available to order. Check with your local merchant.

Glulam beams

## Uses for glulam

Engineered wood products, such as glulam, often catch the eye of designers because of their use in specialist buildings. However, glulam can be used for most load-bearing structures where visual appearance is important.

It is available in a wide variety of forms, from straight beams to rounded columns, roof trusses to complex pyramid shapes, and from curved beams to large domes and arches.

Glulam columns, LVL transoms

## Laminated Veneer Lumber (LVL)

LVL is manufactured from rotary peeled veneers of solid timber glued together to form continuous panels, rather like plywood.

Laminated Veneer Lumber lamella roof

These panels have good bending resistance, tension and compression properties, and greater load-bearing capacity than solid timber.

LVL can be used for horizontal and vertical solutions, providing a dimensional precision which gives architects and specifiers greater design possibilities. The structure can become an elegant design feature in itself.

LVL is manufactured in up to 2.5m in width panels and can be cut into beams with breadths from 27mm to 90mm and depths from 200mm to 600mm and to a maximum length of 26m.

Two types of LVL are manufactured. One has the grain of the wood in all the veneers running parallel to each other, producing material for joists and beams.

The other type has some veneers placed with the grain at right angles to the other layers. This produces a product with more uniform stiffness, better suited to more specialised engineering uses like shear diaphragms.

## Uses for LVL

LVL is good for long spans, and is ideal for roof and floor joist and lintels/framework studs, both in new build and renovation, where strength is needed.

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## Timber I-beams or I-joists

The growing use of timber I-beams and metal-web beams or joists for roofs, floors, and in timber frame sections is testimony to the confidence architects, designers and builders have in these products.

I-beams

Proprietary products are approved for use in the UK through independent third party certification schemes e.g. Q-Mark, Agrément etc.

Make sure the product you choose is approved for your intended use.

Timber I-beams and metal-web joists have proved to be a cost-effective solution for floor and roof construction because of their light weight, long lengths, (allowing large spans) and dimensional stability.

Timber I-joists consist of timber flanges, typically solid timber or LVL, and a panel product web, usually OSB (oriented strand board). Metal-web timber joists combine timber flanges with metal strutting webs.

I-joists

## Solid Wood Panels (SWP)

These cross laminated sections of kiln-dried spruce are produced as large solid panels to form walls, roofs, floors and even lift shafts and stairs. The system provides a very high quality and durable building envelope that can be easily clad with other materials such as timber, brick, render, or composite panels. By using solid wood as the construction and insulating material, buildings using SWP have a very low carbon footprint.

Standard panel dimensions range from 51mm up to 300mm in thickness, while larger panels as thick as 500mm can also be produced.

Solid wood panels

Panel length and width dimensions are mostly limited by what can be transported to site and can be up to 4.8 metres wide and 15 metres long.

Wall, floor and roof elements can be pre-cut in the factory to any dimension and shape, including openings for doors, windows, stairs etc.

SWP structures can offer good thermal, acoustic and fire performance to meet Building Regulation requirements.

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# Other engineered wood products

## Flooring

Engineered wood flooring is growing in popularity because it provides a durable and stable decorative floor that is less prone to moisture movement than traditional solid timber flooring. It consists of a solid timber walking surface bonded to an engineered timber substrate for strength and stability.

**Engineered wood flooring**

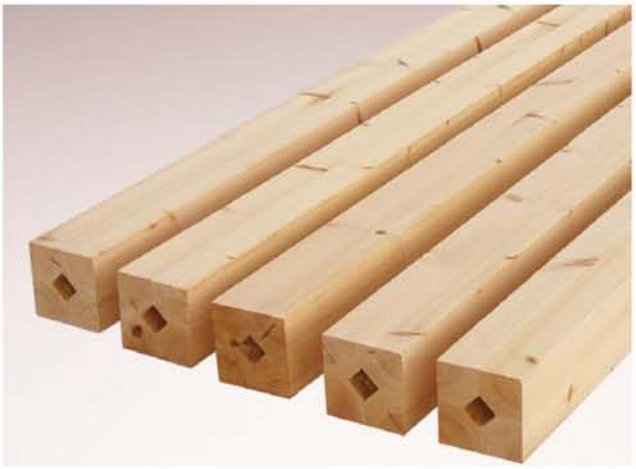
Engineered wood flooring is available with a variety of surface veneers, providing the appearance and feel of solid timber floors.

## Board materials

Board materials, such as oriented strand board (OSB), medium density fibreboard (MDF), and plywood etc. are available for a wide range of structural, decorative and utility uses. Details of these materials are shown in Choose and Use: Wood based sheet materials.

## Joinery materials

Timber is increasingly being engineered to provide stable, products for joinery. Ask for further information from your merchant or go to www.trada.co.uk/techinfo.



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## Further information and advice

You MUST ensure that structural calculations and span tables have been considered when using these products for structural applications.

EWPs are manufactured to a low timber moisture content, and moisture-related movement, such as shrinkage, twisting and warping is virtually eliminated when installed in dry, heated buildings. But, like all timber based products, they are liable to swell if subject to prolonged wetting or high humidity.

Further advice on engineered wood products can be obtained from your supplier or merchant. Ask for manufacturers' sales or technical literature.

Check on manufacturers' websites for further technical information.

Visit **www.trada.co.uk** for additional advice if needed.

Information on glulam and glulam applications can also be obtained from the Glulam Association www.glulam.co.uk

Other *Choose and Use* factsheets are available in the series, including Treated timber, Wood-based sheet materials, Timber species and Storing timber and wood-based products on building sites.

**Choose and Use** is a series of information sheets for builders produced by TRADA, The Timber Research and Development Association.

They offer up-to-date advice on how to select the right timber and timber products for different applications.

You can often save time and money by choosing the correct timber material or timber products as well as ensuring you comply with current Building Regulations and Building Codes. For more information about specific products visit **www.trada.co.uk** or contact your local supplier.



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