

Wood-based sheet materials

Sheet materials are manufactured from solid timber and/or from recycled timber with the addition of an adhesive. The most commonly used sheet materials are plywood, oriented strand board (OSB) particleboard (chipboard) and fibreboard (MDF – medium density fibreboard). These materials are widely used in construction, with different grades for different uses. Using the right product for the job is essential. This information sheet describes the most commonly used sheet materials and some of their applications.

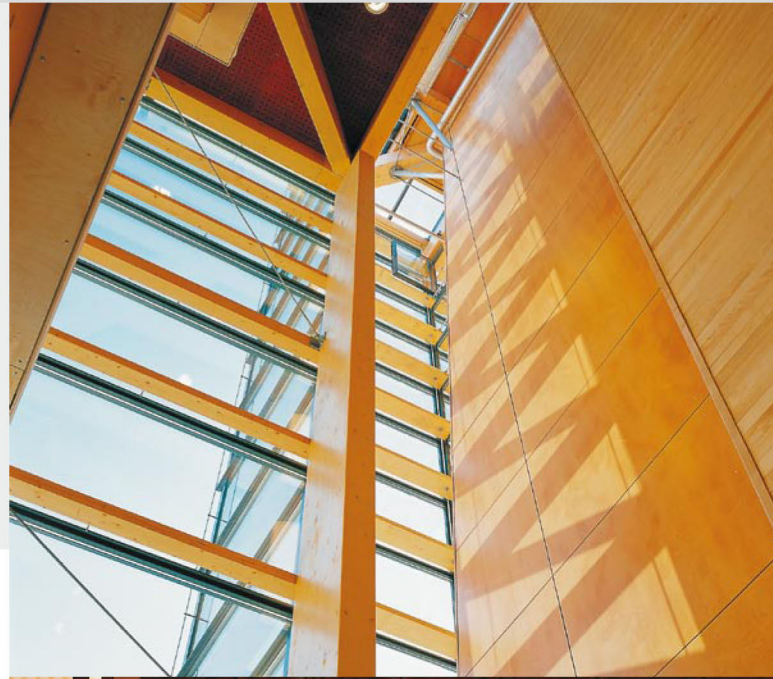
Making the right choice

To comply with Building Regulations it is essential you choose the right type of timber or timber product for a particular end use. Look also for certification markings (FSC or PEFC) to show that the timber is from legal and sustainable sources.

For structural applications you must use structural grades of sheet materials appropriate for their end use. In domestic situations the critical areas are usually in roofs, walls and floors, but structural sheet materials may be required in the construction of other structures as well.

When selecting sheet materials, you need to ensure the product is suitable for the job. You may need to take into account non-structural characteristics, like appearance, moisture resistance and fire resistance.

Building Regulations require all timber sheet materials specified for use in construction to be fit for their intended use, and suitable for the conditions in which they will be used. They must comply with the Construction Products Regulation (CPR). The most common way to achieve this is through compliance with BS EN 13986. The CE marks commonly seen on sheet materials are linked to this standard (see *Further information and advice* for more information).



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).

Always ask your supplier about their responsible purchasing policies.

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



This information sheet provides general advice only and is not specific to the requirements of a particular building project. It is the builder's responsibility to check compliance with Building Regulations and standards.

Types of wood-based sheet materials

The following descriptions are accompanied by a more comprehensive table of applications and conditions of use, as well as appropriate standards (see page 3).

Oriented strand board

OSB consists of resin-bonded sheets made up of small, thin strands of wood, compressed into layers to form a mat. It has good dimensional stability and no knots or voids in the structure. Different grades and thicknesses are available, which mean that this product is suitable for use in a wide range of structural and non-structural applications.

Particleboard

Particleboard, or chipboard, consists of chips compressed together with resin. It has smooth surfaces without knots or voids. Different grades and thicknesses are available, enabling the product to be used in a variety of structural and non-structural applications. Most chipboards incorporate some recycled chipped timber.



Plywood

Plywood is a versatile sheet material. Softwood plywood is usually made from European grown spruce, while European-grown birch is commonly used in the manufacture of hardwood plywood. Spruce is sometimes considered less decorative than birch and is used in construction where a visual appearance is not so important. Birch plywood can have a clearer, knot free appearance, depending on the grade selected. Both types of plywood have grades to suit decorative needs. Hardwood or hardwood-faced plywood is generally darker in colour than softwood plywood.



Plywood used in formwork

Appearance and strength are less of an issue here, although durability, glue bond performance and resistance to decay may have to be considered. Suitable sheets are available from Scandinavia, North America and the Far East.

Structural plywood

All plywood for structural loadbearing applications (ie walls, floors and roofs) must be strong enough for the loading. Always use plywoods that are listed in BS 5268-2:2002 – typically those from Canada, Finland, Sweden and the USA. They need to also comply with the Construction Products Regulation (CPR) by meeting the requirements of BS EN 13986, or by other means. The CE mark demonstrates CPR compliance and that those structural plywoods are fit for a particular purpose.

Marking	Notes
CE 1234 - CPD - 5678	CE Logo No of Notified Body - Directive Product/Certificate of Conformity No
Any Company PO Box ?? Any Town Country	Manufacturers name and address
02	Year CE mark affixed
EN 13986	Plywood standard for humid conditions
EN 636-2	Harmonised European Standard
E1	Formaldehyde Class
Plywood for use as structural flooring	Intended end use application

Marine plywood (certified to BS 1088)

Although intended for applications where increased resistance to decay is required, marine plywood is not suitable for general structural applications unless it has been tested and shown to meet the requirements of BS EN 13986.

Types of wood-based sheet materials			
Product	Conditions of use	Applications	Standards
OSB (oriented strand board)			
OSB/1	Use class 1 (under cover, not exposed to weather and wetting)	Non-structural interior fitments, including furniture	BS EN 300:2006
OSB/2	Use Class 1	Internal, structural applications, eg exhibition panels, internal walls, shelving, packing, cases	BS EN 300:2006
OSB/3	Use Classes 1 and 2 (under cover, not exposed to weather but where high environmental humidity can lead to occasional, but not prolonged, wetting)	Timber frame structural sheathing, flat and pitched roofs, wall sheathing, flooring, caravans	BS EN 300:2006
OSB/4	Use Classes 1 and 2	Heavy-duty structural applications in humid conditions	BS EN 300:2006
Particleboard (chipboard)			
Type P1	Use Class 1	Internal non-structural applications, eg general purpose joinery and furniture	BS EN 312:2010
Type P2	Use Class 1	Internal, non-structural furniture items, eg melamine-faced, veneered shelving, kitchen and bedroom units	BS EN 312:2010
Type P3	Use Class 1 and 2	Non-structural applications similar to those listed under P2 above. However, P3 suitable for use in humid conditions	BS EN 312:2010
Type P4	Use Class 1	Internal structural applications, eg flooring, loft planks, bathrooms, kitchens	BS EN 312:2010
Type P5	Use Classes 1 and 2	Structural applications similar to those listed under P4 above, however P5 suitable for humid conditions	BS EN 312:2010
Type P6	Use Class 1	Heavy-duty internal structural applications	BS EN 312:2010
Type P7	Use Classes 1 and 2	Heavy-duty structural applications in humid conditions	BS EN 312:2010
Plywood*			
EN 636 1G	Use Class 1	Internal non-structural applications	BS EN 636:2003
EN 636 1S	Use Class 1	Internal structural applications	BS EN 314-2:1993 Class 1 glue bond
EN 636 2G	Use Classes 1 and 2	Non-structural applications in humid conditions	BS EN 636:2003
EN 636 2S	Use Classes 1 and 2	Structural applications in humid conditions, eg timber frame wall sheathing, roofing, flooring	BS EN 314-2: 1993 Class 2 glue bond
EN 636 3G	Use Classes 1–3 (not under cover, not in contact with ground, exposed to weather continually or is protected from weather but subject to wetting)	External, non-structural applications. Additional treatment of the plywood may be required depending on the natural durability of the timber species	BS EN 636:2003 BS EN 314-2:1993 Class 3 glue bond
EN 636 3S	Use Classes 1–3	External, structural applications. Additional treatment of the plywood may be required depending on the natural durability of the timber species	DD CEN/TS 1099:2007
Standard MDF (medium density fibreboard)			
Type MDF	Use Class 1	Internal non-structural applications, eg general joinery, signage, door parts, fascias	BS EN 622-5:2009
Type MDF .H	Use Classes 1 and 2	Non-structural applications in humid conditions, eg kitchen and bathroom joinery	BS EN 622-5:2009
Type MDF .LA	Use Class 1	Internal, structural applications	BS EN 622-5:2009
Type MDF .HLS	Use Classes 1 and 2	Structural applications in humid conditions NB these panels are restricted to instantaneous or short periods of loading	BS EN 622-5:2009
Exterior MDF	Use Classes 1-3	External, non-structural applications, eg shopfronts, fascias, doors, cladding	See manufacturer's literature or www.wpif.org.uk
Flame-retardant MDF	Use Class 1	Internal, non-structural application where a Euro Class B and C (formerly Class 0 and Class 1) flame-retardant board is required	See manufacturer's literature or www.wpif.org.uk
Hardboard			
Type HB	Use Class 1	Internal, non-structural applications, eg panelling, boxing in pipework	BS EN 622-2:1997
Type HB.H	Use Classes 1 and 2	Non-structural applications similar to those listed above for Type HB. However, Type HB.H suitable for use in humid conditions	BS EN 622-2:1997
Type HB.E	Use Classes 1–3	Non-structural applications similar to those listed above for Type HB. However, Type HB.E suitable for use in external applications	BS EN 622-2:1997
Type HB.LA	Use Class 1	Internal, structural applications	BS EN 622-2:1997
Type HB HLA1	Use Class 2	Structural applications in humid conditions	BS EN 622-2:1997
Type HB HLA2	Use Class 2	Heavy-duty structural applications in humid conditions	BS EN 622-2:1997
Blackboard/Laminboard			
Should comply with requirements of BS EN 636:2003, as these products are included within the definition of plywood	Use Class 1	Generally used in applications requiring a product similar to plywood in appearance but at a lower cost. They are normally restricted to interior applications such as joinery, door blanks, furniture and shopfitting	Blockboard and laminboard are not commonly marketed as being in accordance with any particular standard. However, blockboard and laminboard are covered by the definition of plywood and should comply with the CPR if they are to be used in construction

* Various grades of light MDF and ultra-light MDF are available. See BS EN 622-5:2009 or consult with manufacturers or visit www.wpif.org.uk

Medium density fibreboard

MDF is an engineered, stiff, flat sheet made from wood fibres and bonded together with resin. It has no knots or surface grain and can be machined, drilled, cut and filled easily without damaging the surface. It is also available in finished products such as skirting boards, architraves and other mouldings. Fire rated and external grades are available. MDF is sometimes colour coded by dyes in the board layers to indicate its use:

- green for moisture resistant
- grey for exterior use
- red for sheets with flame-retardant chemicals.

If used in construction, MDF must comply with Construction Products Regulation (CPR).

Hardboard

Made from wood fibre extracted from chips or pulped wood waste. Non-structural product for internal use such as flooring, underlay and shopfitting, although enhanced performance hardboards can be used where higher strength is needed. Enhanced boards find applications as components within structural members eg, I-beams, exterior soffits and signage.

Blockboard and laminboard

Made up of a core of softwood strips up to 25mm wide, placed edge to edge, sometimes sandwiched between softwood or hardwood veneers and glued together under high pressure. Mainly used for non-structural internal applications.

Storing

Store sheet materials flat, on bearers or in 'A' frames. As wood is sensitive to changes in moisture, try to acclimatise any wood-based sheets to the temperature and humidity in the room where it will be installed, prior to installation.

Fixings

Secure by screws, nails and glues, using the many different specialist products developed for these products. Metal fixings such as screws and nails should have an overall length of about 2.5 times the sheet thickness. Where engineering design requires a certain fastener type and spacing, this must be adhered to.

Further information and advice

BS EN 13986:2004 Wood-based panels for use in construction. Characteristics, evaluation of conformity and marking, BSI

BS EN 622-5:2009 Fibreboards. Specifications. Requirements for dry process boards (MDF), BSI

BS 5268-2:2002+A1:2007 Structural use of timber. Code of practice for permissible stress design, materials and workmanship, BSI

BS 1088-1:2003 Marine plywood. Requirements, BSI

BS EN 300:2006 Oriented strand boards (OSB). Definitions, classification and specifications, BSI

BS EN 312:2010 Particleboards. Specifications, BSI

BS EN 636:2003 Plywood. Specifications, BSI

BS EN 314-2:1993 Plywood. Bonding quality. Requirements, BSI

DD CEN/TS 1099:2007 Plywood. Biological durability. Guidance for the assessment of plywood for use in different use classes, BSI

For further information on all the sheet materials, specifications, sizes and thicknesses fixing locations, support details and spans, especially in structural applications, ALWAYS refer to the manufacturer's own literature or website or enquire through your local merchant.

Visit www.trada.co.uk, www.woodforgood.com or the Wood Panels Industries Federation (www.wpif.org.uk/panelguide.asp) for additional advice.

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.

Company Details Here

Address Here

Address Here

Address Here

Postcode

Contact numbers

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