

## 2.12 Application of panels as wall linings and partitions

### 2.12.1 Selection of panels for wall linings and partitions

The selection of wood-based panels for wall linings, partitions and ceilings depends on a number of factors of which the most important are

- moderate to high resistance to impact and abrasion, especially in certain types of public buildings
- good dimensional stability in the presence of seasonal changes in relative humidity of the air
- ability to reduce either sound absorption or sound transmission in particular applications. Attention is drawn to the acoustic requirements in Approved Document Part E (with corresponding regulations for Scotland and Northern Ireland): wood-based panels can be used or be complemented by other materials in order to satisfy these requirements.
- ability to receive a variety of finishes including paints and laminates
- satisfying the requirements for fire performance (spread of flame and rate of heat release)

The selection of panels for wall linings, partitions and ceilings based on satisfying the above requirements is given in Table 2.17. Their use as wall linings is illustrated in Figure 2.28.



**Figure 2.28 Illustrating the use of wood-based panels as wall linings**

**TABLE 2.17 PANEL GRADES\* FOR WALL LININGS AND PARTITIONS AND THE REACTION TO FIRE EUROCLASS FOR SPECIFIED THICKNESSES**

Selection

	SERVICE CLASS	PLYWOOD EN 636	PARTICLEBOARD EN 312	FLAXBOARD EN 15197	OSB EN 300	MDF EN 622-5	FIBREBOARD EN 622-3,4	CBPB EN 634
<b>Linings Partitions Ceilings</b>	1	636-1	P4	FB3	OSB/2	MDF	MBH	CBPB
	2	636-2	P5	FB4	OSB/3	MDF.H	MBH.H	CBPB

<b>Reaction to Fire Class* (pr EN 13501-1)</b>		See Annex 2d	See Annex 2a	See Annex 2g	See Annex 2b	See Annex 2e	See Annex 2f	See Annex 2c
--	--	--------------	--------------	--------------	--------------	--------------	--------------	--------------

\* The Euroclasses for these panels are available without testing based on Table 1 of the Decision of the Commission 2003/43/EC of 2003-01-17 (see OJEC L13 of 2003-01-18), as amended by the Decision 2003/593/EC of 2003-08-07 (see OJEC L201 of 2003-08-08) and corrected by the Corrigendum (see OJEC L331 of 2003-02-08), and further amended by the Decision 2007/348/EC of 2007-05-15 (see OJEC L131 of 2007/05-23) may be classified for reaction to fire performance without further testing (CWFT) in specific classes given therein. These Euroclasses are available in the Annexes of the Panel Guide. The important aspect to note is that there are particular fixing conditions that have to be adhered to in order to obtain the Euroclass without carrying out any further testing.

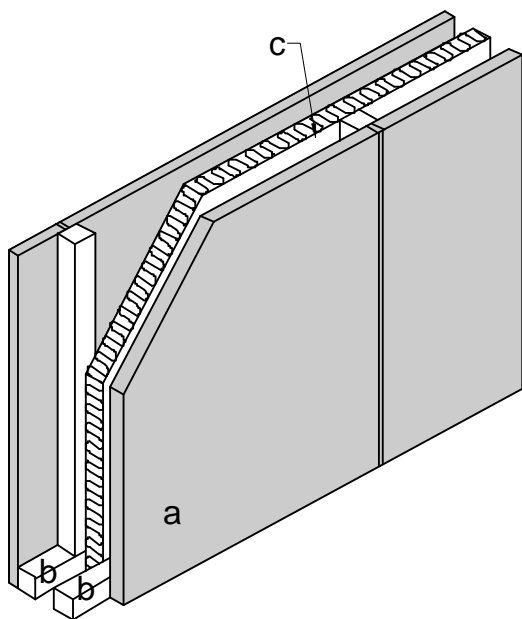
Most wood-based panels are suitable for use as internal decorative linings for walls and ceilings, both in new construction and in upgrading and refurbishment, subject to meeting the required surface spread of flame aspect of fire performance.

Because the appearance of boards used internally is usually of prime importance, a large number of proprietary profiled, film-faced or laminate-faced and pre-decorated boards are available.

Where internal linings also act as structural sheathing, strength and durability are of prime importance, with appearance and finish of lesser importance, particularly as internal sheathing may also be hidden by other linings.

### **Acoustic linings**

Some boards may be used to improve sound absorption within a room e.g. fibreboard ceiling tiles ('acoustic tiles') while other boards may be used to reduce sound transmission between rooms, e.g. the denser particleboard or cement bonded particleboard, used in conjunction with mineral fibre insulation and other recognised design features for sound resistant partition walls, as shown in Figure 2.29.



**Figure 2.29 Internal partition wall with improved acoustic performance**

- a: particleboard or cement bonded particleboard linings fixed to framing with board joints staggered**
- b: separate wall framing to each face**
- c: sound absorbent mineral fibre quilt hung in cavity**

### **Reaction to fire**

Where timber-based products are exposed internally, fire performance,, must be considered. With the introduction of CE marking in many European countries (sections 2.1 and 2.2.3) on 1<sup>st</sup> April 2004 and the requirement for all wood-based panels to comply with the requirements of the European Harmonised Standard BS EN 13986 fire performance must now relate to the series of European reaction to fire classes known as the Euroclasses (section 2.2.3.2).

When using wood-based panels in construction the reaction to fire performance shall either be determined by test and classified according to BS EN 13501-1 or the classes shall be taken from Table 8 in the Harmonised Standard BS EN 13986 or from Commission Decision 2003/43/EC most recently amended by Decision 2007/348/EC: These classes are reproduced in the Annexes 2a to 2g of this document.

## 2.12.2 Design factors in linings and partitions

### 2.12.2.1 Sizes and thicknesses of boards

Typical board sizes are 2400 x 1200mm and 2400 x 600mm, with other sizes available to order. Sizes up to 3660mm high are available to allow fabrication of wall panels for increased storey heights. The usual board width is 1200mm to suit framing centres of 400 and 600mm.

Thickness will depend on the location and purpose of the lining or partition and on the stiffness and impact resistance required.

### 2.12.2.2 Framing and support centres

**Non-structural linings and partitions:** Conventional framed support is suitable for all boards. Framing should provide support for all board edges, unless tongued and grooved boards are used.

Intermediate vertical supports should be at the centres shown below depending on board thickness. For boards of thicknesses <10mm, horizontal supports should be at the same centres as the vertical supports; for boards >10mm, horizontal supports should be at centres no greater than 1200mm.

In order to achieve smooth flat surfaces maximum stud and batten centres (mm) for boards of given type and thickness should be as given in Table 2.18.

**Table 2.18 Maximum stud and batten centres (mm) for linings and partitions**

Panel types	Board thickness (mm)						
	3.2	4.8	6.4	9/10	12/13	18/19	>20
Softboard				300	400	600	
Mediumboard			400	450	600	600	600
Hardboard	400	500	600				
MDF			450	450	600	600	600
Cement bonded particleboard			450	450	600	600	600
Particleboard				450	600	600	600
Flaxboard					600	600	600
OSB				450	600	600	600
Plywood				450	600	600	600

**Structural sheathing:** Where internal linings also act as structural sheathing the recommendations included in Section 2.7 should be followed.

### 2.12.2.3 Secret fixing

Boards may also be secret-fixed using interlocking framing battens, as shown in Figure 2.30. Boards so fixed should also have framing battens fixed at the above centres to provide adequate stiffness.

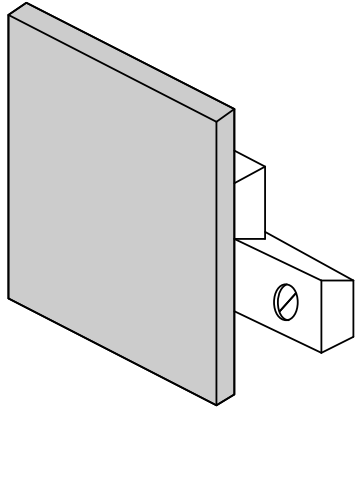
### 2.12.2.4 Jointing

To eliminate visually unacceptable gaps at board joints due to panel shrinkage it is recommended that provision is made to mask such gaps by using featured joints or cover strips.

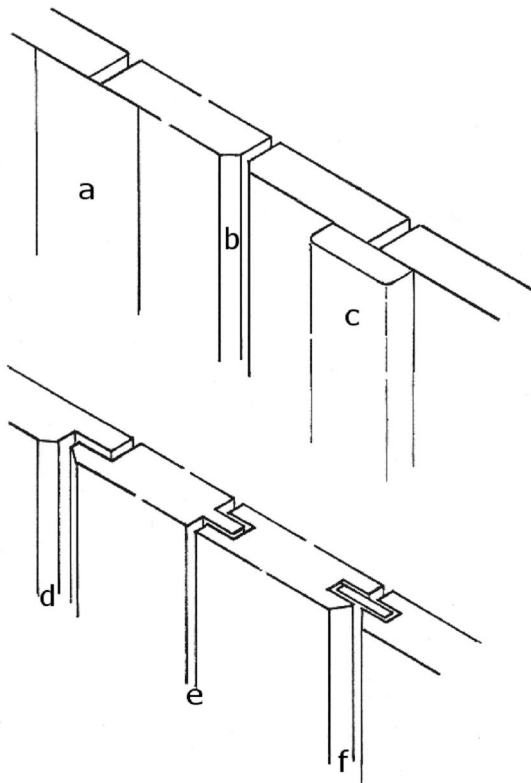
### 2.12.2.5 Joints

Joints can be featured using gaps or profiled edges, cover battens or metal profiles. Examples are shown in Figure 2.31.

There is a risk of cracking at flush joints due to unavoidable slight movement of board substrates caused by changes in temperature and humidity.



**Figure 2.30 Secret fixing using interlocking battens**  
Upper batten fixed to back of board and lower batten screwed to wall

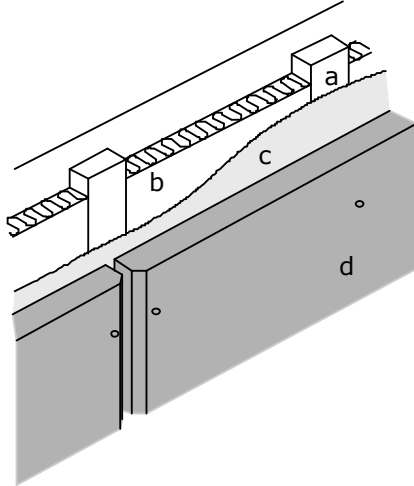


**Figure 2.31 Typical lining board joints**

- a: butt joint with scrim tape for plaster skim coat
- b: butted 'V' joint for face fixing
- c: butt joint with timber or metal cover trim
- d: rebated 'V' joint for face fixing
- e: secret fixing tongued and grooved joint
- f: grooved joint with hardwood tongue

### 2.12.3 Other considerations

Where wood-based boards are applied to upgrade a solid masonry wall or to provide an internally insulated lining, condensation risk should be considered. A vapour control layer should be included on the warm side of the insulation (see Figure 2.32). Further information is provided in BS 5250 which now refers to BS EN ISO 13788 as the method of calculation.



**Figure 2.32 Internal lining with thermal insulation**

**a: battens and counterbattens fixed to wall**

**b: insulation**

**c: vapour control layer – typically 500 gauge polyethylene sheet with lapped joints**

**d: lining board**

### 2.12.4 Sitework

#### 2.12.4.1 Conditioning

It is important that boards are installed at a moisture content close to that which they will achieve in service. Advice on the conditioning of boards is to be found in Section 4.2

#### 2.12.4.2 Fixing of panels

Boards should be fixed using corrosion resistant nails, staples or screws. Corrosion resistant materials include galvanised or sheradised steel, austenitic stainless steel, phosphor bronze and silicon bronze.

Minimum nail length should be 50mm or 2.5 times the board thickness, whichever is greater.

Staples should have as wide a crown as possible – 11mm minimum, be not less than 15 gauge and not less than 50mm in length.

The frequency and pattern of nailing around the periphery and on intermediate framing should be as shown in Table 2.19. Where manufacturer's instructions are supplied with the boards their recommendations should be followed. To avoid tear out at board edges, fixings should not be inserted closer to the edges than the minimum distances given.

With the thinner and more flexible boards, to avoid buckling, nailing should commence at the top centre and continue outwards and downwards.

**Table 2.19 Spacings of linings and partitions**

Panel type	Maximum spacings (mm)		
	Perimeter framing	Intermediate framing	Min edge distance (mm)
Softboard	75	150	12
Mediumboard	150	300	8
MDF	150	300	8
Hardboard	150	300	8
Particleboards	150	300	8
Flaxboard	150	300	8
Cement bonded particleboard	see note below	see note below	see note below
OSB	150	300	8
Plywood	150	300	8

Note: For cement bonded particleboard recommended nail spacings and edge distances vary with thickness and from manufacturer to manufacturer – examples of nail spacing range from 200 to 400mm on perimeter framing and from 300 to 610mm on intermediate framing; nail edge distance varies from 15mm for boards less than 12mm and 20mm for thicker boards up to 25mm irrespective of thickness. Boards may need to be pre-drilled or fixed with self-drilling screws to avoid splitting. For fixing cement bonded particleboard it is therefore essential to obtain and follow the manufacturer's recommendations.

#### **2.12.4.3 Finishes**

Boards can be pre-decorated or site-finished with a wide variety of finishes including paints, stains, laminates, wallpaper and other coverings, and tiling. These are described in more detail in Section 4.7.