

## 4.7 Decoration and finishing

### 4.7.1 General

All wood-based panels (except bitumen impregnated fibreboards) provide suitable substrates for paints, stains, varnishes and textured coatings.

Lining materials such as wallpaper, hessian and other fabrics can also be applied providing an appropriate adhesive is used, but they are not generally used on MDF or OSB.

Hardboards, mediumboards, MDF, particleboard, flaxboard, OSB and plywood can be veneered and laminated with high and low pressure laminates, paper and PVC foils, although not all of these can be applied to all types of fibreboard and particleboard. The most common combinations are shown in Table 4.9.

Some types of panel are available pre-decorated or with applied finishes.

**Table 4.9 Suitability of finishes**

	Water-based paint	Oil-based paint	Varnish	Stain	Wallpaper fabrics	Plastic laminates	Wood veneer	Foils
Softboard	✓	✓			✓			
Mediumboard	✓	✓			✓	✓	✓	✓
Hardboard	✓	✓			✓	✓	✓	✓
MDF	✓	✓	✓	✓	✓	✓	✓	✓
Particleboard	✓	✓	✓	✓	✓	✓	✓	✓
Flaxboard	✓	✓	✓	✓	✓	✓	✓	✓
OSB	✓	✓	✓	✓			✓	
Cement-bonded particleboard	✓	✓			✓	✓	✓	✓
Plywood	✓	✓	✓	✓	✓	✓	✓	✓

Key : ✓ = suitable

### 4.7.2 Conditioning

Timber and wood-based products expand on taking up moisture from the air and shrink on losing moisture. It is important that panels are installed and/or finished at a moisture content close to that which they will achieve in service. (See Section 4.2.4 of PanelGuide for further information).

### 4.7.3 Adhesives

When applying veneers, laminates, paper and PVC foils to fibreboards and particleboards it is essential to select adhesives appropriate to the materials, the scale of the operation and the facilities available to carry out the work. Materials suitable for large scale factory application are not necessarily suitable for use on site. Table 4.10 includes general guidance on suitable adhesives, and manufacturer's advice should be sought for further information.

The use of water-based adhesives for applying wallpaper and similar finishes may result in panel distortion and/or edge swelling unless panels and joints are sealed first.

**Table 4.10 Suitability of adhesives**

<b>Adhesive type</b>	<b>Wood veneer</b>	<b>Plastic laminate veneer</b>	<b>Paper foil laminate</b>	<b>PVC foil laminate</b>	<b>Wallpaper, hessian etc</b>
PVAC	✓	✓	✓		
UF	✓	✓	✓		
Neoprene		✓			
Copolymer EVA			✓	✓	
Epoxy				✓	
Polyurethane				✓	
PVAC based wallpaper adhesive					✓

Key : ✓ = suitable

Note: The alkalinity of cement-bonded particleboard precludes the use of some types of adhesive. The manufacturer's advice should be sought.

#### **4.7.4 Painting and sealing**

Virtually all paints have a tendency to draw away from a sharp edge or corner. It is therefore recommended that all corners and edges be rounded to a radius of at least 3mm, by machining or light sanding, to enhance paint retention. This is particularly important with panels exposed to exterior conditions.

Where appropriate types of wood-based panels are used as external cladding, infill panels, soffits etc. it is important that the finish applied is suitable for external use and provides the required protection to the panel. Paints and stains formulated for external use on natural timber can be used on wood-based panels. These should be applied in accordance with the manufacturer's instructions.

The edges of most panel types are more porous than the panel surfaces. As a result, absorption at the edges is greater than on the face and if panels are subject to a changing humid or exterior climate, care must be taken to ensure that the edges are adequately sealed.

For exterior conditions, it is particularly important that all surfaces are effectively sealed before the application of the primer and top coats. Refer to the panel manufacturer or sealant manufacturer's literature for recommendations.

Dry film thickness (build) is critical to performance of a paint coating. Simply applying enough paint to hide the colour of the substrate is not adequate and manufacturer's guidelines should be followed.

Some flame retardant treatments are very alkaline and treated panels may need a special primer before painting. The same is true for cement-bonded particleboard.

Once properly sealed and primed, most wood-based panel products can be top coated with an exterior coating suitable for wood products. The top coat should be applied to all surfaces and edges in accordance with the paint manufacturer's recommendations. Several thin coats of paint normally gives a better performance than a single thick coat, but each coat must be allowed to dry thoroughly before the application of the next.

Under exterior conditions, the following points are particularly important:

1. All uncoated edges or surfaces of prefabricated components must be fully coated prior to assembly or exposure to weathering
2. To aid with edge sealing, all edges must be rounded to a minimum 3mm radius
3. Solvent-based sealers are particularly recommended for initial coating of the panel. Water-based sealants may lead to raising of fibres, requiring resanding after drying, before subsequent coats
4. Some types of transparent stains are not recommended as they allow degradation by ultra-violet light. Exterior coatings should contain a suitable UV inhibitor
5. The design of components should eliminate potential areas of water collection
6. Both sides of the panel should be evenly coated. Otherwise, differential moisture changes on the two sides of the panel may lead to distortion
7. Mitre joints are not recommended due to the difficulty in coating sharp edges. Edge to face joints offer a similar aesthetic appearance with improved coating and edge protection
8. A coating maintenance programme in accordance with the coating manufacturer's recommendations should be adopted in order to ensure maximum life from the panels

#### **4.7.5 Ceramic tiling**

Ceramic tiling can successfully be applied to wood based panels in all manner of different situations, but care has to be taken in order to achieve adequate performance.

This is for two reasons:

Ceramic tiling provides a rigid coating and requires a rigid substrate to prevent cracking of the tiling. This is especially true for floors, because of the movement under load.

Wood-based panels are subject to changes in dimension as a result of changes in moisture content. This can lead to cracking of the tiling. Also different wood based panel products will behave differently with respect to the amount of moisture movement they exhibit.

As ceramic tiles tend to be used in areas subject to regular or accidental wetting, e.g. kitchen and bathrooms, special care should be taken to avoid problems and all use situations should be approached with caution.

The guidance in BS 5385: Part 3 and The Tile Association publication "Tiling to timber sheets and board, timber substrates and alternative products"<sup>3</sup> should be consulted for further detailed information on various end use situations from dry to prolonged contact with water.

#### **4.7.6 Finishing softboard**

##### **4.7.6.1 Surface coatings**

Softboard can be painted with conventional oil and water-based paints, applied by spray, brush or roller. Matt or satin finishes can be obtained. Panels should be brushed free of dust before decoration commences. No rubbing down of the surface should be required.

Natural and ivory faced panels should have a primer or sealer coat applied, a 50/50 mix of emulsion paint and water is suitable for this purpose. White primed softboards can be painted without using a sealer coat.

If further coating is applied an alkali resisting primer is required and the panel or paint manufacturer's advice should be sought.

If panel edges will be visible after completion it may be necessary to fill these with a wood or cellulose filler prior to the application of finish.

Textured coatings can also be applied. Care is needed in detailing panel joints which should be either scrimmed and filled or featured by leaving small gaps between adjacent panels. Coating manufacturer's recommendations regarding priming of panels should be closely followed. After joint treatment, the paint is applied and textured (stippled, combed etc). The edges are normally finished by using a small brush to produce a plain margin.

#### **4.7.6.2 Paper and fabric finishes**

Softboard can be faced with materials such as textured paper, fabric or hessian. This is best done after the panels are fixed into place. When selecting a softboard for wallpapering, the types which have a fine pulp overlay are preferable as these usually have a smoother surface than natural softboard. When using wallpaper, care is necessary to avoid movement at panel joints causing splitting or rucking in the applied finish; a robust textured paper material is usually preferable. When bonding on paper or fabric finishes, the panel will require 'sizing' to prevent excessive absorption of adhesive and to make it easier to remove the lining material at a later date.

#### **4.7.7 Finishing mediumboard and hardboard**

##### **4.7.7.1 Surface coatings**

Mediumboard and hardboard can be painted with conventional oil and water-based paints, applied by spray, brush or roller. Matt, satin or gloss finishes can be obtained. Little preparation of the surface should be required, dust and grease should be removed from the panel, if necessary using white spirit.

Panels should have a primer or sealer coat applied, this can be a proprietary hardboard sealer or a coat of emulsion paint. Some types of oil tempered hardboard (which contain natural or added oils require priming with an aluminium primer or multi purpose primer).

If panel edges will be visible after completion it may be necessary to seal these with hardboard sealer or with a wood or cellulose filler prior to the application of the finish

Textured coatings can be applied but care is needed in detailing panel joints which should be either scrimmed and filled or featured by leaving small gaps between adjacent panels. (See Section 4.5.3 of PanelGuide for further information). Coating manufacturer's recommendations regarding preparing and priming of panels should be closely followed. After joint treatment, the paint is applied and textured (stippled, combed etc). The edges are normally finished using a small brush to give a plain margin.

##### **4.7.7.2 Paper and fabric finishes**

Hardboard and mediumboard can be faced with materials such as fabric or hessian. This is best done after the panels are conditioned and fixed into place. When using wallpaper, care is necessary to avoid movement at panel joints causing splitting or rucking in the applied finish, robust textured papers and materials are usually preferable. When bonding on paper or fabric finishes, Type MBL mediumboard should be 'sized' before application. For all types of hardboard or mediumboard it is advisable to seal the panel surface first with an acrylic primer or hardboard sealer so that subsequent removal will be easier.

##### **4.7.7.3 Laminates, foils and veneers**

Plastics, laminates, foils and veneers can be bonded to hardboard without pre-treatment. Care is necessary to ensure that all materials have similar moisture contents and balancing laminates or veneers will generally be required to avoid panel deformation.

## **4.7.8 Finishing MDF**

### **4.7.8.1 Opaque surface coatings**

MDF can be finished with a wide range of opaque coatings. The surfaces to be finished should be free of dust or sanding marks. The faces of MDF are pre-sanded with 120 grit abrasive which provides a smooth surface suitable for most opaque finishes without further sanding. The use of 200 or 320 grit papers may be found advisable when using high gloss finishes or when a minimum coating thickness is required.

Opaque paints are the easiest finishes to apply as their high solids content allows a high build. A base coat and a finish coat are usually all that is required. Pigmented systems can provide single colour finishes; more specialised techniques and lacquers can enable metallic marbled and other finishes to be obtained. The selection of the finishing system will be dependent upon the scale of production, application equipment, drying facilities and the expected performance of the finish in use.

Good results can be obtained using conventional oil or water-based paints, better results can be achieved in a shorter time using lacquers based on nitrocellulose, acid catalysed resins, polyurethane or polyester resins applied by hand spray.

High gloss finishes can be obtained using a high build coating based on polyester resins, possibly with a clear lacquer top coat to protect the surface and enhance the gloss effect.

Panel edges may require sealing with shellac, polyurethane, diluted PVAC, or specially formulated high solid sealers to compensate for their greater absorption.

### **4.7.8.2 Satin or lacquer finishes**

Clear lacquers and varnishes can be used on MDF. Application and preparation is similar to that for pigmented finishes. When coloured translucent finishes are required, decorative stain finishes can be used. Solvent borne stains will wet the surface effectively and ensure an even colour; water borne stains can also be used but the waxes sometimes added to the hardboard and MDF to reduce water absorption may result in uneven absorption of stain and consequent colour variation. Stained surfaces can be protected by one or two coats of clear lacquer with a light denibbing between coats using 320 grit paper.

As the edges of MDF are more absorbent than surfaces, stain finishes applied to edges may result in darker colours compared to surfaces. Edges can be sealed before staining, using shellac, polyurethane, diluted PVAC or specially formulated high solid sealers to reduce this effect.

### **4.7.8.3 Laminates, foils and veneers**

MDF can be surfaced with plastics laminates, paper and PVC foils and veneers. Wood veneers and foils can also be applied to shallow profile surfaces. Balancing laminates or veneers will generally be required to avoid panel deformation. The inherent smooth surface of MDF also allows heat transfer foils to be applied to both the face and profiled edges of the panel.

## **4.7.9 Finishing particleboards and flaxboards**

### **4.7.9.1 Opaque surface coatings**

Particleboard can be painted with conventional oil and water-based paints applied by spray, brush or roller. Matt, satin or gloss finishes can be obtained, textured coatings may also be applied. In order to achieve a high quality paint finish, panels may require filling prior to painting since, although the surface appears to be smooth, it can contain small holes and interstices which become noticeable when paint is applied. Before applying a filler the panel should first be primed. A normal plaster based filler is then applied and rubbed down to give the desired surface.

Panels with especially fine surfaces are available and these provide an excellent surface for painting and grain printing without additional filling.

Panels should have a primer or sealer coat applied, conventional wood priming paints are suitable. Water-based primers may cause the surface of the panels to swell slightly giving a textured surface which will not accept gloss finishes satisfactorily.

Flame retardant panels are available to meet Class 1 and Class '0' requirements. If further coating is applied to these, the panel or paint manufacturer's advice should be sought.

If panel edges will be visible after completion it may be necessary to fill these with a wood or cellulose filler, sand with 180 grit paper and prime prior to the application of finish.

#### **4.7.9.2 Clear seals and varnishes**

The surface pattern and colour of particleboards is naturally decorative and the application of a clear sealer or varnish can accentuate this.

For floors, a translucent or transparent flooring grade sealer will provide an excellent hard wearing and decorative surface. Panels are available with a peel off paper surface to protect them from staining and dirt prior to application of the finish.

#### **4.7.9.3 Paper and fabric finishes**

Particleboard can be faced with materials such as wallpaper, fabric or hessian. This is best done after the panels are fixed into place and joints between panels should be featured to avoid the potential for splitting or rucking of the finish as a result of slight movement of the panel due to changes in moisture content. It is advisable to seal the panel surface with an acrylic primer or sealer before applying the finish so that subsequent removal will be easier.

#### **4.7.9.4 Laminates, foils and veneers**

Plastics laminates, foils and veneers can be bonded to particleboard without pre-treatment. Care is necessary to ensure that all materials have similar moisture contents and balancing laminates or veneers will generally be required to avoid panel deformation.

#### **4.7.9.5 Finishing flaxboard**

Flaxboard can be veneered or faced with laminates in the same way as wood particleboard. It can also be painted and have vinyl or paper overlay applied, but it is not generally used in applications where these types of direct finishing are required.

### **4.7.10 Finishing OSB**

#### **4.7.10.1 Opaque surface coatings**

Oriented strand board can be painted with conventional oil and water-based paints applied by spray, brush or roller; textured coatings may also be applied. As water-based finishes cause slight increase of the surface texture and may, when the coating is applied to one face only, result in bowing due to moisture uptake, their use should generally be limited in situations where final appearance is not of paramount importance. Oil-based coatings are recommended where appearance is critical.

Where a high quality finish is required, factory sanded panels should be used. When using unsanded panels it is necessary to rough sand the surface to remove any loose wafers and resin deposits before applying a surface coating.

Boards should have a primer or sealer coat applied, conventional wood priming paints are suitable. Water-based primers may cause the surface of the panels to swell slightly giving a textured surface which will not accept gloss finishes satisfactorily.

Panels can be impregnated or surface treated with intumescent paint or varnish to upgrade surface spread of flame performance. If a further coating is applied, the manufacturers' advice should be sought.

If panel edges will be visible after installation, it may be necessary to fill these with a wood or cellulose filler, sanding and priming before application of the finish.

#### **4.7.10.2 Clear seals and varnishes**

The surface pattern and colour of OSB is naturally decorative and the application of a clear sealer or varnish can accentuate this. If required they can also be coated with spirit-based decorative stain finishes. Factory sanded panels should be used and oil-based sealers and varnishes are preferred as these will not raise the surface texture.

For floors, a translucent or transparent flooring grade sealer will provide an excellent hard wearing and decorative surface.

Panels are available with a peel off paper surface to protect them from staining and dirt prior to the application of the finish.

#### **4.7.10.3 Laminates and foils**

Plastic laminates and foils can be bonded to factory sanded OSB without pre-treatment. Care is necessary to ensure that all materials have similar moisture contents and balancing laminates will generally be required to avoid panel deformation.

### **4.7.11 Finishing cement bonded particleboard**

#### **4.7.11.1 General**

Due to alkalinity of the panels an alkali resistant finish is recommended. The advice of the panel or finish manufacturer should be sought.

Provided that a special primer is used, cement bonded particleboard can be painted with conventional oil and water-based paints applied by spray, brush or roller, cement-based paints and textured coatings may also be used.

Before applying any finish, dust should be removed from the panel surface using a damp cloth and any holes or surface damage filled with a proprietary filler.

#### **4.7.11.2 Laminates, foils and veneers**

Plastic laminates and veneers can be bonded to cement bonded particleboard. Factory calibrated panels must be used and balancing laminates or veneers are required to avoid panel deformation.

Due to the panel's alkalinity, the manufacturer's advice should be sought with regard to suitable adhesives.

#### **4.7.11.3 Tiling**

Before the application of ceramic tiles to cement bonded particleboard, the rear face of the panel should be sealed using an approved sealer. The tiling adhesive used must be an elastic emulsion adhesive. Reference should be made to the panel manufacturer for specific recommendations. Further guidance can also be found in The Tile Association guidance.<sup>3</sup>

## **4.7.12 Finishing plywood**

### **4.7.12 1 General**

As one of the few wood-based panels that is suitable for permanent use in exterior conditions, the requirements for finishing plywood are more complicated than for most of the other panel types. In interior conditions, most wood finishes are suitable for use on plywood, but the quality of the finish will be a function of the wood species and the quality of the surface veneer. A European guidance standard, ENV 635 " Plywood. Classification by surface appearance. Part 4: Parameters of ability for finishing, Guideline." gives guidance on the finishing of plywood in relation to the quality of the surface veneers.

Under exterior conditions, plywood will weather to a dull grey colour in the same way as unprotected solid timber. Further weathering can lead to a loss of fibre and checking and splitting of the surface. The application of a suitable finish before weathering occurs can protect the material and enhance its appearance. When used externally, all four edges of plywood should be effectively sealed with a suitable sealing compound

### **4.7.12.2 Opaque surface coatings**

Plywood can be painted with most types of wood paints but some of these may not be able to tolerate the surface movements of plywood. Some water-based acrylic paints show high levels of extensibility and can tolerate these movements. However, dark colours of such paints should not be used in areas sheltered from rainfall as salt efflorescence can appear on the surface. Plywoods with a medium density paper overlay are specially designed to be painted.

Low-build exterior wood stains possess certain advantages over film-forming finishes by being more able to cope with the behaviour of exposed plywood. Exterior wood stains will not prevent surface checking but are less likely to flake off than paint. Redecoration with a stain will protect the checked surface and should maintain an acceptable appearance.

### **4.7.12.3 Clear seals and varnishes**

The surface appearance of plywood can present an attractive finish and under interior conditions a clear sealer or varnish can accentuate this. For floors, a translucent or transparent flooring grade sealer will provide an excellent hard wearing and decorative surface. Under exterior conditions however, most of these unpigmented products do not offer protection from ultraviolet light and are not normally recommended.

### **4.7.12.4 Paper overlays**

Plywood is available with a range of paper overlays, to protect the panel and enhance its durability, to give a decorative finish or to facilitate painting. In interior conditions, plywood can be decorated with the normal range of paper and fabric wallpapers.

### **4.7.12.5 Laminates, foils and veneers.**

As with other wood-based panels, plywood can be finished with decorative laminates, foils or decorative veneers. In order to avoid distortion in service, care must be taken to ensure that the panel construction remains balanced.

<sup>3</sup> "Tiling to timber sheets and board, timber substrates and alternative products" The Tile Association