Apply Sheet Laminates by Hand

Learner’s Guide
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Apply Sheet Laminates by Hand
Section 1 – Introduction

This topic of the furnishing training package explores the essential activities required to apply sheet laminates by hand, including the preparation, layout, application and finalisation processes. This will cover:

- types, characteristics, uses and limitations of laminates
- the interpretation of kitchen and bathroom plans
- the preparation of drawings/set-outs
- the identification of hand tools and/or power tools, materials, equipment, processes and procedures
- workflow in relation to furniture production.

As part of the assessment requirements for this training package, you must be able to:

- interpret work orders and locate and apply relevant information
- apply safe handling procedures for equipment, products and materials, including use of personal protective equipment
- follow work instructions, operating procedures and inspection practices to:
  - minimise the risk of injury to self or others
  - prevent damage to goods, tools, equipment or products
  - maintain required production output and product quality
- apply and finish laminates to at least three different surfaces, including at least two requiring laminate edging
- work effectively with others
- modify activities to cater for variations in workplace context and environment.
Required resource materials

As you work through this topic you will be required to obtain information to fill in the blanks throughout this learner’s guide. While some of this information can be provided by reflecting on your experiences in the workplace and through discussion with your lecturer/trainer, other information can be obtained only from the relevant presentation delivered by your lecturer/trainer or through your own further research. You may find the following resources useful.

Suggested text resources


Suggested web-based resources

www.formica.com.au
www.laminex.com.au
www.wilsonart.com
www.surfacesquared.com.au

Suggested audiovisual resources

*Postforming laminated plastic* 1983, video recording, Leederville Technical College, Leederville, WA.
Section 2 – Sheet laminate

Discussion

Discuss in class with your lecturer/trainer the reasons why sheet laminate has become an indispensable material in the manufacture of kitchens and furniture. Explore the range of products that are manufactured with laminate finishes and why laminate has been chosen over another material.

Sheet laminate is used extensively in the furniture-making industry today as both a ________________ and as a ________________, as this material is extremely ________________ and is available in an infinite ________________ and designs.

Laminate is used broadly in kitchen manufacture on benchtops for its protective qualities and because it can be easily incorporated into almost any décor. It is used to cover the bottom face of overhead cabinets as it is low maintenance and easy to clean. These advantages have also led to it being used for the faces of doors, drawers and other vertical surfaces such as cabinet ends and feature backs (island cabinets), as well as for the fact that it can be colour-coordinated to suit the setting. Essentially, though, laminate is nothing more than paper and resin.
Activity 2.1

After viewing a presentation or discussing with your lecturer/trainer, complete the following information describing the structure and range of sheet laminates.

Laminate defined

Laminate may be defined as an assembly of ____________________________
____________________________ bonded with ____________________________
by the combined action of ____________________________. Basically decorative, laminate is composed of two distinct layers, ____________________________
____________________________.

The core is usually composed of ____________________________
____________________________.

The surface assembly is composed of ____________________________
____________________________.

The alpha pulp sheet, generally referred to as a barrier or print sheet, is
____________________________.

To protect the printed patterns, an overlay sheet is placed over the barrier sheet. Both the print and overlay sheets are ____________________________
____________________________.
Sheet laminate thicknesses/finishes

In Australia, 0.8 mm sheet laminate is used for commercial and general domestic situations such as ________________________________.

Sheet laminates are also available in thicknesses of up to 10 mm for wall coverings in wet areas such as ________________________________. This alleviates the need for grout in these areas.

Sheet laminates are available in a range of solid colours, wood grains and stone-like finishes, as well as metallic finishes such as brass, stainless steel, aluminium and copper for architectural and other special-purpose uses.

Substrates for sheet laminates

Sheet laminate used in the furniture industry is fairly thin. It is therefore quite flimsy as a material and needs to be handled carefully in order to prevent damage. So, how is it that laminated surfaces have reasonable strength to perform the tasks to which they have been put? Quite simply, they are adhered to stronger or thicker materials. These materials are referred to as ‘substrates’.

Complete the following information regarding substrates.

• Added strength is obtained by bonding the thin sheet to a firm base, such as ________________________________.

• ________________________________ may also be used as a substrate, but when using ________________________________, it should be ________________________________.

• ________________________________ do not make an ideal base because they are subject to movement.
Tools

Discussion

As laminating is a labour-intensive process and the materials are relatively expensive, not all apprentices are given the opportunity to be involved in laminating until they have gained further skills and knowledge. Before continuing with this exercise, discuss in your groups the ways in which laminate is marked out, cut, applied and finished at your workplace. Then pencil into the appropriate columns in the table below as many tools as you can think of that are used in the laminating process.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Marking</th>
<th>Cutting</th>
<th>Fitting</th>
</tr>
</thead>
<tbody>
<tr>
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Many tools used when working with laminate are the very same tools used in other situations in furniture making. Some of the tools, however, are used specifically for laminating. After viewing a presentation or discussing with your lecturer/trainer, complete the table detailing the remaining tools.

<table>
<thead>
<tr>
<th>Apply</th>
<th>Trim</th>
<th>Clean-up</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
Section 3 – Adhesives

Various adhesives can be used to stick the laminate to a substrate. It is important to take into consideration the following when selecting an adhesive.

- How much heat the surface will be exposed to; for example, the laminated surface may be exposed to direct sunlight, or be close to gas cooker-tops or gas heating points. Although advancements in adhesive technology are occurring all the time, some contact adhesives will soften and release their grip when exposed to these heat sources.

- How much dampness the substrate will be exposed to – moisture absorbed into the substrate can adversely affect the grip of the adhesive, as well as cause the substrate itself to deteriorate.

- What processes need to be undertaken; for example, postforming calls for a special-purpose contact cement or even a special-purpose PVA glue for the section of the laminate that is to be formed around the curve.

Activity 3.1

After viewing a presentation or discussing with your lecturer/trainer, complete the following information on the most common adhesives used for laminating today.

- **Contact adhesive** (also known as ____________________________): made from rubber, solvents, fillers and phenol. Depending on the type, it may be spread with a serrated edge trowel, stiff brush, roller or spray gun.

- **Synthetic resin adhesive**: thermosetting glue that forms a rigid glue line (setting like glass and then not moving). Rigid glues, such as ____________________________ ____________________________, have maximum bonding effectiveness and heat resistance. These glues are suitable for flat surfaces that will fit into a press. Synthetic resin adhesives are two-part adhesives; for example, a resin and a hardener are measured then mixed thoroughly and set by chemical reaction.

- **Polyvinyl acetate (PVA) glue**: PVA glue is applied by brush, roller or scraper. A cross-link PVA is generally used for ____________________________.
Section 4 – Edge treatments

There are many types of edge treatment that are suitable for laminated surfaces. Most edges are simply covered either with a laminate, plastic or melamine strip. The greatest range of edge treatment is reserved for benchtops, because this small detail can add significantly to the appearance of the final product.

- For a conventional edge, the best practice is to apply the edge treatment before applying the top surface whenever possible.

- A laminated top has a more pleasing appearance if the edge is built up.
• When applying a metal or plastic edge, the top surface will have to be laminated first.

Fig 4.3 ‘T’ edge

• For a solid timber effect, apply a solid timber edge to the panel or top. A shaped profile can then be applied by routing the edge using a profile bit and router.

Fig 4.4 Solid timber edge – 1

Fig 4.5 Solid timber edge – 2

Fig 4.6 Solid timber edge – 3
• Postformed edge – this treatment method is produced by heating and bending the laminate and requires special postforming equipment.

Fig 4.7 Postformed edge

Safety issues

Contact adhesives are both flammable and toxic, so only use these in a well-ventilated area free from naked flames. Formaldehyde adhesives can be harmful. When working in non-ventilated areas with chemical substances (e.g., adhesives and solvents), always wear a breathing mask with charcoal filters.

It is also necessary to always wear gloves and safety glasses when you use solvents to clean laminate (to protect from splashes); and when trimming laminate with a router or laminate trimmer, you should always wear hearing and eye protection. It is worth noting that the noise level of an extraction system in a contact cement spray-booth exceeds 85 dB in most cases, so wear hearing protection when working in a spray booth.

Another safety point to remember is that off-cuts of laminate can be extremely dangerous.

• If off-cuts are left on the floor, workers may tread on them and slip, which could result in injuries ranging from strains to the groin or back through to concussion from falls.

• The edges are very sharp and capable of cutting hands and other parts of the body.

Quality control

Sheet laminate and the materials used for the substrate are fairly expensive. The process of cutting and applying the sheet to a substrate is also fairly labour-intensive. This expense means that special care needs to be taken at every point in the manufacture of laminated products.
Activity 4.1

After viewing a presentation or discussing with your lecturer/trainer, complete the following seven essential checks that need to be conducted in order to prevent expensive mistakes/repairs.

1. ____________________________________________________________
   ____________________________________________________________

2. ____________________________________________________________
   ____________________________________________________________

3. ____________________________________________________________
   ____________________________________________________________

4. ____________________________________________________________
   ____________________________________________________________

5. ____________________________________________________________
   ____________________________________________________________

6. ____________________________________________________________
   ____________________________________________________________

7. ____________________________________________________________
   ____________________________________________________________
Section 5 – Laminating a benchtop and edge

Discussion

How do you laminate a benchtop and edge at your workplace?

The below procedure is a general guide to laminating a benchtop and edge.

1. Mark out and cut the benchtop substrate to the correct size and shape, including any build-ups for edges.

2. If sinks, basins and hotplates are required, do the cut-outs for these at this point. This can prevent the possible chips and scratches that can occur if the laminate is applied first.

3. Glue and attach any build-ups.

4. Mark out the sheet laminate to the correct size and shape, including edge strips.

5. Cut the laminate to the required size using a laminate scoring knife or a panel saw. For any internal cut-outs, you must drill a hole in each corner to prevent the sheet from cracking during the cutting.

6. Apply the laminate edges: coat both surfaces (the laminate edge and the edge of the substrate) with a contact adhesive. If the substrate is a porous material (for instance, particleboard), apply a second coat of adhesive once the first coat has dried. Wait until the edges are touch-dry and then apply the laminate.

7. Trim the edges until they are flush, using a router, before sanding and filing the corners where necessary.

Fig 5.1 Router
8. Before applying any adhesive to the benchtop laminate and substrate, make sure both surfaces are clean.

9. Spray both the laminate and substrate with an even coating of contact adhesive.

10. Allow sufficient time for the adhesive to dry.

11. Place spacers, such as lengths of dowel, over the surface to allow you to position the laminate.

12. Remove the spacers with care to ensure the laminate can be accurately located.

13. Press the surfaces firmly together with a roller (hand or machine).

Fig 5.2 Hand roller

Fig 5.3 Roller and bench
14. Trim off any waste laminate from around the benchtop, including any sink, basin or hotplate cut-outs.

![Fig 5.4 Router to trim waste](image)

15. File all the edges smooth.

![Fig 5.5 Filing](image)

16. Use a solvent to clean all the laminate surfaces.
Discussion

What cleaning agents or solvents do you use at your workplace? Suitable solvents include:

- thinner
- mineral turps
- acetone
- methylated spirit.

Activity 5.1

Joining laminate

Sheet laminates can be joined to create an almost seamless joint in the face of the sheets. This is done only for the convenience of transportation before fitting large tops on site, or where sheet size limitations do not permit cutting a single piece large enough for the job. When the laminate needs to be joined across the face of the job, there are two possible ways to achieve a satisfactory outcome. These are:

1. _____________________________________________
   _____________________________________________
   _____________________________________________
   _____________________________________________

2. _____________________________________________
   _____________________________________________
   _____________________________________________
   _____________________________________________
Section 6 – Postforming laminated plastics

Postforming is the process of bending sheet laminate around a contoured edge, usually for benchtops but it can be applied to doors and drawer faces too. Postforming creates both a pleasant-looking and hygienic edge for laminated surfaces.

The process is carried out under factory conditions with the aid of specialised equipment. The simultaneous application of both heat and pressure is necessary for the bend to be made successfully.

Additionally, postforming-grade sheet laminate is thinner in gauge than regular laminates. Sheet laminates that are to be postformed are purpose-made to be more flexible, making the sheet less likely to fracture during the bending process.

This flexibility is instilled in the sheet by not fully curing it during the production cycle. Less curing equals less brittleness.

Advantages of postforming sheet laminate

After viewing a presentation or discussing with your lecturer/trainer, list the advantages of postforming-grade sheet laminate.

• 
• 
•

Forming process

Most present-day methods of postforming involve gluing the sheet laminate to the flat area of the top (that has edges that have already been shaped) first, and then forming and gluing simultaneously over these shaped edges. Of course, all the flat ends of tops must be laminated and cleaned up before any postforming takes place.

Note The process for laminating the leading edge of a benchtop and for creating a waterproof splashback is very different, and is explained on the following pages.
Postforming a leading edge

1. The ram secures the benchtop in the machine while heat is applied by the pressure bar to warm the laminate in readiness for bending.

2. The pressure bar slowly progresses, applying both heat and pressure to the bending laminate.

3. The bending continues – usually non-stop.
4. The process may take up to two minutes to complete.

Fig 6.4

5. Once it’s in place, the laminate is left under heat and pressure for approximately 20 seconds to ensure the bond.

Fig 6.5

6. Typical uses for these tops include:
   - kitchen benchtops
   - commercial counters
   - medical/pathology benchtops.

Fig 6.6
Postforming a splashback

1. Apply the sheet laminate to the substrate and bend the leading edge if required.

![Figure 6.7](image1)

2. Place the prepared benchtop into the bender.

![Figure 6.8](image2)

3. The laminate will gradually soften to allow gravity to create the bend.

![Figure 6.9](image3)
4. Glue and nail a support block in place.

Fig 6.10

cove to suit the radius of the bend

5. Remove the benchtop from the bender and clean up all overhanging edges.

Fig 6.11

Postformed splashbacks are typically used for bathroom cabinets.
Notes
Section 7 – Reading plans

Activity 7.1

Quantity exercise

To answer the following questions, refer to the plans on the back page.

1. From the plan supplied, calculate the amount of 18MDF-HMR board required for the kitchen top. The tops are to have 70 mm-wide × 18 mm-thick build-ups all round. MDF sheets are 2400 mm × 1200 mm × 18 mm. (Label all components and give dimensions.)

2. Show how the benchtop laminate and edges would be cut from a sheet measuring 3600 mm × 1350 mm.

3. Calculate the sheet laminate size required for the vanity top, ends and doors.

4. Show by sketch how the top, ends and doors will be cut from the sheet of laminate (cut plan). (Label all components and give dimensions.)

Part A How many sheets are required for the job? ____________

Sheet size 2400 mm × 1200 mm

Sheet size 2400 mm × 1200 mm

Sheet size 2400 mm × 1200 mm
**Part B**  Show your cut pattern for the benchtop laminate including all edge strips.

**Part C**  The sheet size required for the vanity unit is ________ × ________.

**Part D**  Show your cut pattern inside the most appropriate sheet size.

- Sheet size 1800 mm × 900 mm
- Sheet size 1200 mm × 900 mm
- Sheet size 2400 mm × 1200 mm
Sheet size 3600 mm × 1200 mm
DESCRIPTION
This learner’s guide has been developed to assist in the delivery of Certificate I, II and III in furniture-making and cabinet-making qualifications within the furnishing training package. It contains information and activities that cover the types, characteristics and uses of laminates, the interpretation of drawing plans, the preparation of drawings and workflow in the workplace.

EDITION
Second edition

CATEGORY
Building and Construction

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BC2013 Join Solid Timber
BC2014 In the Workshop
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