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Laminating, Scroll Saw Work and Pyrography

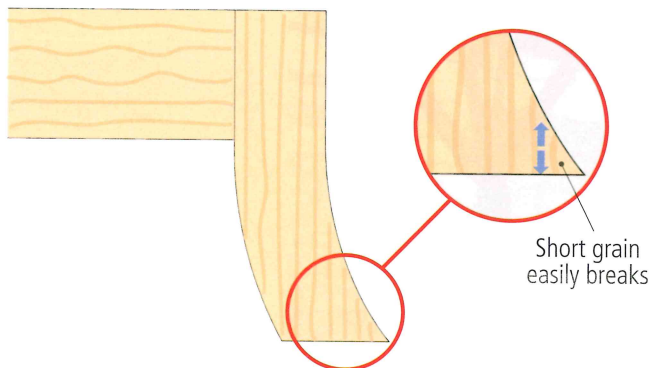
KEYWORDS

flexibility
former

fretwork
lamination

pyrography
short grain

Curved work can be difficult to form with wood, but it looks very attractive. It is possible to cut out a curve from a solid piece, for example see the backrest of the chair below. However, there is a lot of waste with this method and it leaves areas of **short grain** that break off the piece easily.



Short grain



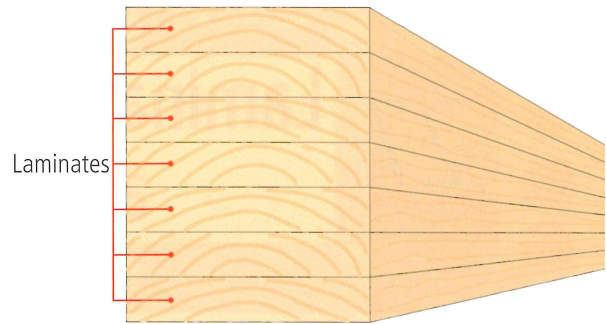
Chair with a curved back

Curved wooden pieces can be bent easily into shape by laminating pieces together or by steam bending. Laminating is the most practical method in school workshops.

LAMINATING

Lamination is the process of building up a section of wood by gluing a number of thinner pieces together. The laminated piece will be stronger than a solid piece of the same size. Also thinner pieces bend more easily, so they can be shaped into sweeping curves as they are being bonded. The laminates hold their shape when the glue sets. The laminates are bent around a curved formwork to form shaped pieces.

Laminating is also used in the construction industry to create solid beams of wood that span wide areas of a building and known as glu-lamination. These beams can also be curved to create interesting shapes.



Laminates



Glulam beams

Advantages of laminating

- A laminated piece is stronger than a solid of the same size
- It is very stable and won't warp
- Laminates bend more easily

Disadvantages of laminating

- Cutting and planing the laminates wastes wood
- A lot of glue is needed to bond all the surfaces
- It takes time for the glue to dry properly
- Moulds or formers are required

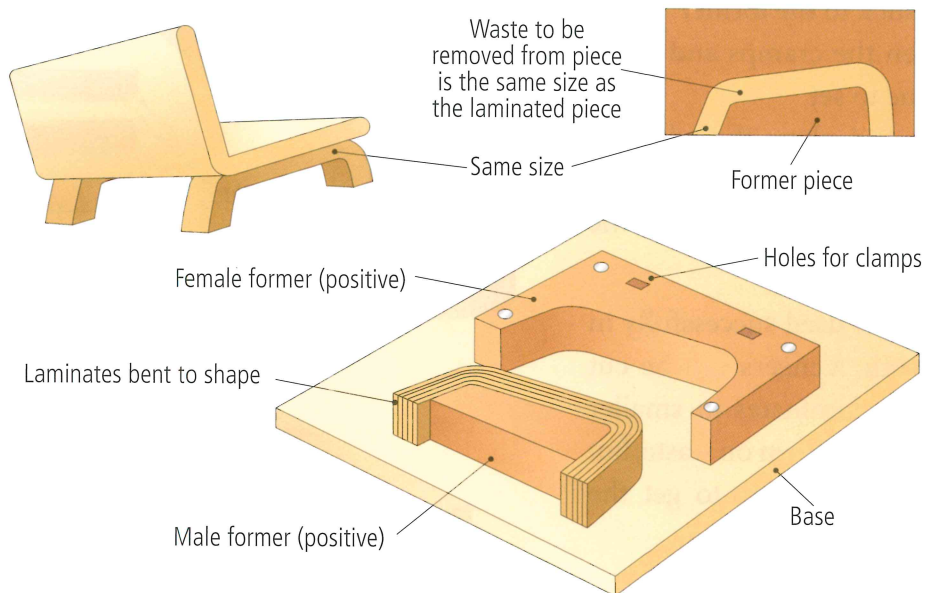
Laminating process

The laminates are shaped between solid pieces of wood called **formers**. The glued laminates are cramped between these formers while the glue sets. The shape on the former is made so that the laminates are bent slightly more than needed, because they will spring back slightly to their original shape when the cramps are removed.

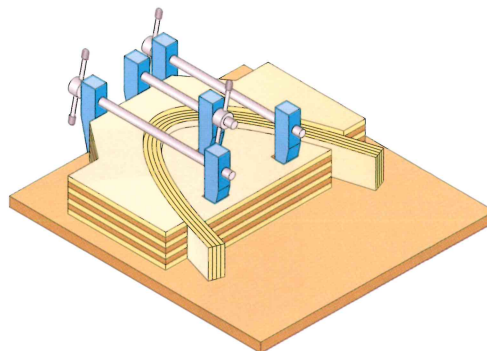
When designing a laminated piece you should always consider how the item will be cramped together.



Laminating in project work



Formers are used to hold the laminates in shape while the glue sets



Cramps are used to gradually pull the former closed

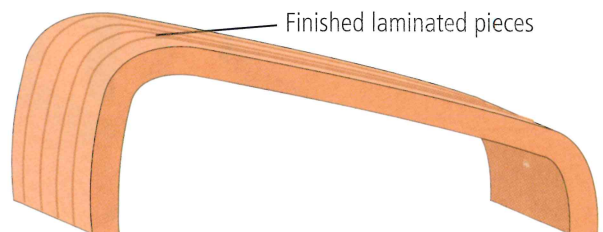
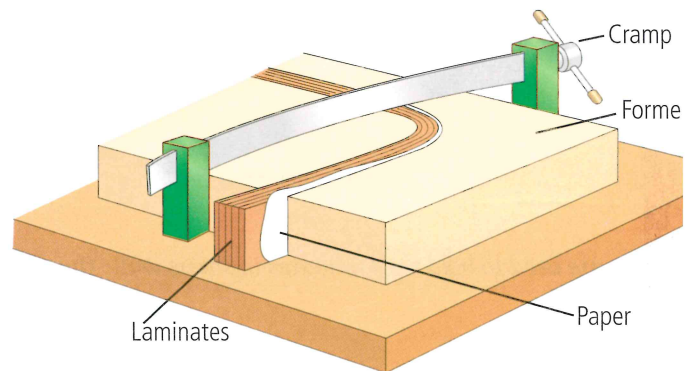
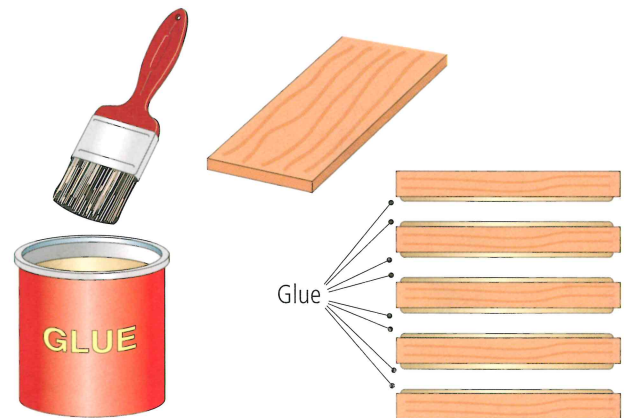
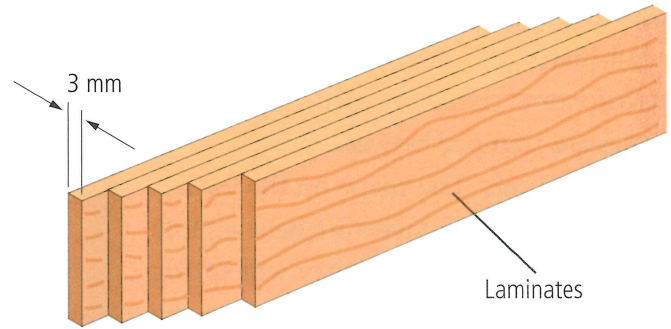
Using laminates

- Prepare thin laminates (1 mm to 4 mm) so that together they equal the thickness required
- Soften laminates using hot water so they bend more easily
- Apply glue to each surface to be bonded but not the two outside faces
- Position the pieces in the former with paper around the outside, so that the laminates don't stick to the former
- Tighten the cramps and allow the glue to set
- Clean and plane the edges of the piece when it is set
- Remove any paper and sand the piece smooth

Laminating is used successfully in project work. Veneers can be cut and used as laminates in smaller items. This cuts down on waste, but it takes many veneers to get the thickness as they are so thin.

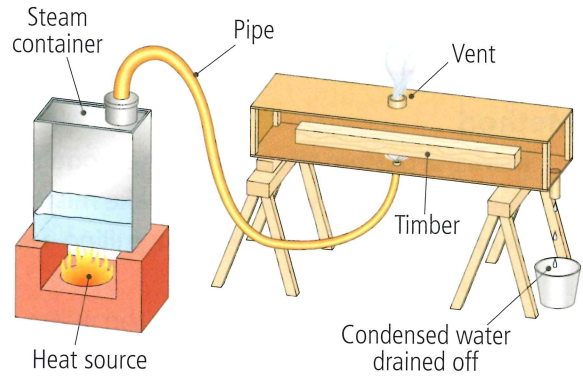
Steam bending

Solid wood can be bent by first softening it using heat. Steam is used to heat the wood through. When the fibres are softened, the wood is slowly bent in a former. The process of heating and bending may need to be repeated a number of times before the piece is fully shaped.



Thin laminates break less easily

A special steaming box is used to help contain the heated steam. The piece should be left in the box for 45 minutes for every 25 mm of thickness. When the wood is hot, it is removed and bent around the former. The piece must be left to cool and dry out before the cramps can be removed. This can take a week or so.



Steaming box

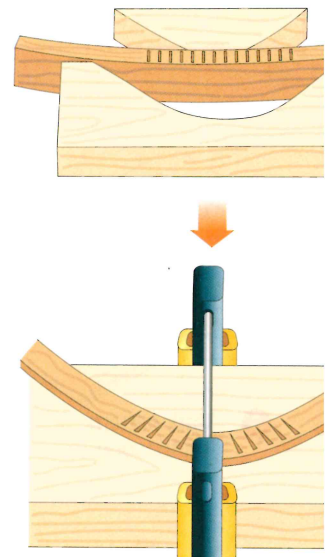
Woods for bending

All woods have some bending properties, but some are more suitable than others, because of their durability and flexibility (bend easily):

■ Ash ■ Elm ■ Beech ■ Oak

Saw kerfing

Saw kerfing is a method of bending a piece of solid wood leaving the front face of the piece intact. A piece of wood will bend if it is thin enough, so cutting grooves in a thicker piece allows some bending to take place.



Saw kerfing

FRETWORK

Scrollwork or fretwork is a method of cutting detailed shapes. A hand-held fretsaw used to be popular for doing this type of work, but it has been replaced by the modern scroll saw.

Pictures can be made using woods cut with the scroll saw. The wood used is usually thin, to make cutting easy, but many different woods and manufactured boards are used.



The scroll saw is used to make pieces that enhance projects



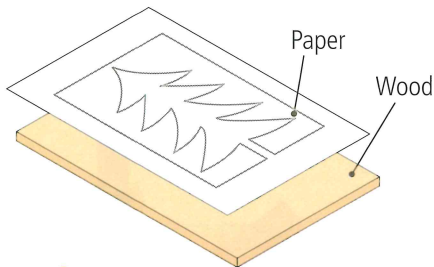
Always keep hands clear of the blade when using the scroll saw



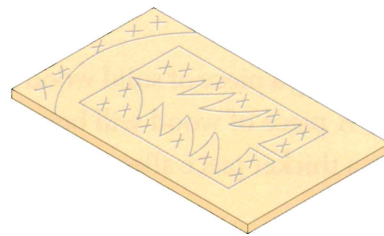
Cutting a fretwork pattern

Method

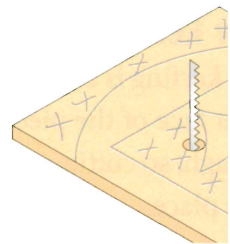
- 1 Mark the pattern shape on to the wood using carbon paper.
- 2 Mark waste so that you don't make mistakes.
- 3 Remove internal pieces by first drilling a small hole and threading the blade through the hole.
- 4 Cut along the lines carefully on the waste side.
- 5 Remove the waste on the outside piece accurately.
- 6 Smooth edges using spokeshaves, a file or a rasp.
- 7 Finish by sanding all edges smooth.



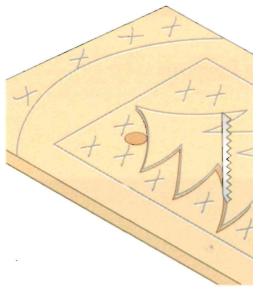
1 Mark pattern on to wood



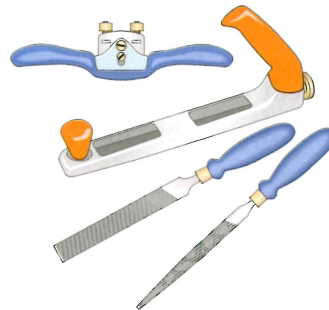
2 Mark waste



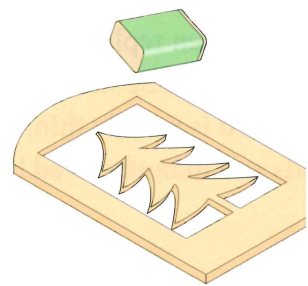
3 Drill hole and thread blade through



4 Cut along lines and remove waste



5 Select tool for smoothing



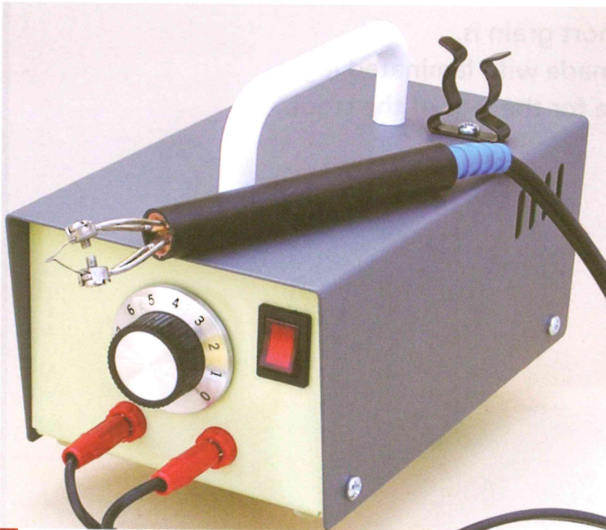
6 Sand edges smooth

The process of making a scroll saw pattern

PYROGRAPHY

Pyrography is the art of burning images on to wood. There is an electrically heated tool especially for this purpose. The tool is similar to a pen and has an electrically heated wire, which scorches the wood or other material. The wire point is easily replaced when worn or damaged.

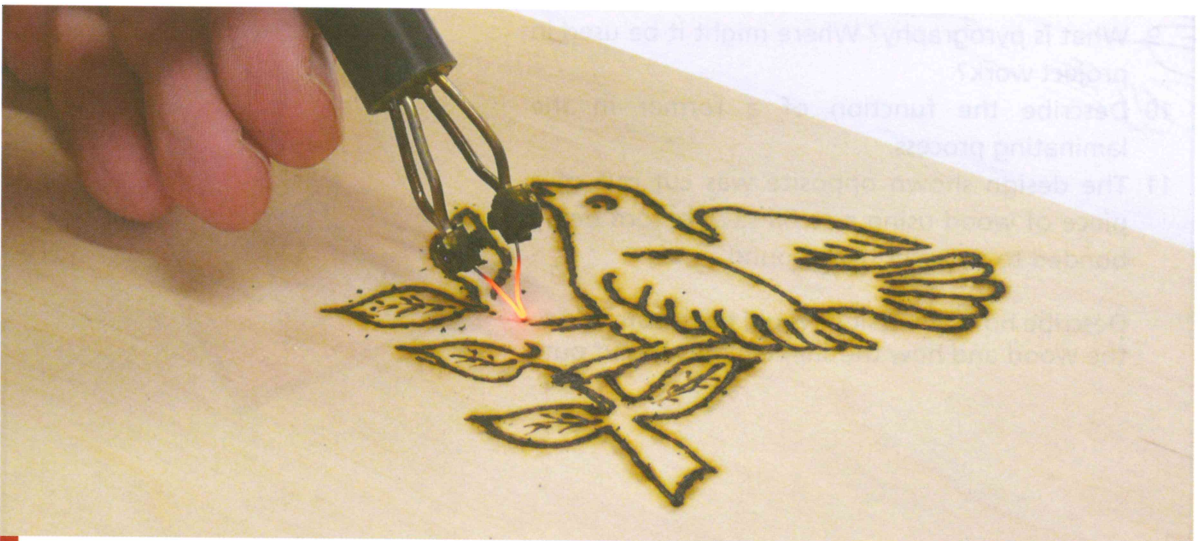
This type of wood decoration works best with light-coloured woods such as beech, sycamore and lime. It also works well on leather. Sand all surfaces smooth before making the image, as any sanding later will remove the burnt effect.



Pyrography tool

Caution

The wire is very hot and would cause burns if touched. Switch off and unplug when not in use.



Using a pyrography tool



Exercises

- 1 Describe how a laminate is made.
- 2 Name two hardwoods that are suitable for bending projects.
- 3 Give two reasons why you might use a laminated piece as part of a project.
- 4 What is a former used for?
- 5 Why is paper put between the laminates being glued and the formers during the cramping process?
- 6 Using words and sketches, explain what short grain is.
- 7 The stool shown in the diagram below is made with laminated legs. Suggest two woods that would be suitable for the legs of the stool.



- 8 Using notes and sketches, describe a suitable method for forming the leg of the stool in the diagram above.
- 9 What is pyrography? Where might it be used in project work?
- 10 Describe the function of a former in the laminating process.
- 11 The design shown opposite was cut out of a piece of wood using a scroll saw, before being bonded to a darker background.

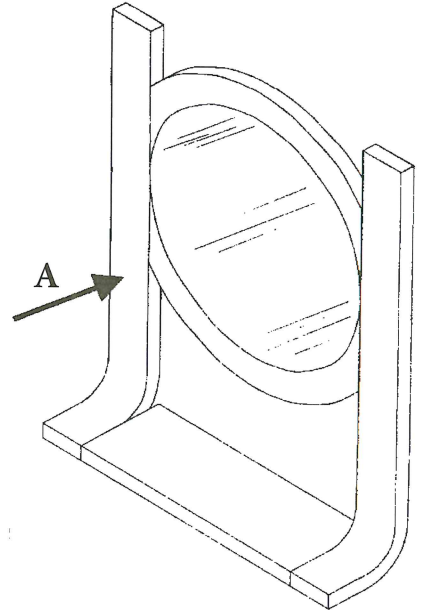
Describe how the design would be transferred to the wood and how the shape might be cut out.



Exam Questions

- 1 The diagram shows a mirror with laminated beech sides.
- With the aid of neat freehand sketches, describe how the laminated side A would be formed.
 - Suggest a suitable finish for the frame. With the aid of notes and freehand sketches, describe how you would prepare the surface and apply your chosen finish.

(JC, HL, 2002)



Web Links

www.tai-workshop.com/english

www.craftideas.info/html/scrollsaw.html

www.scrollsaw.com