Processes – Construction techniques Using Manufactured Boards

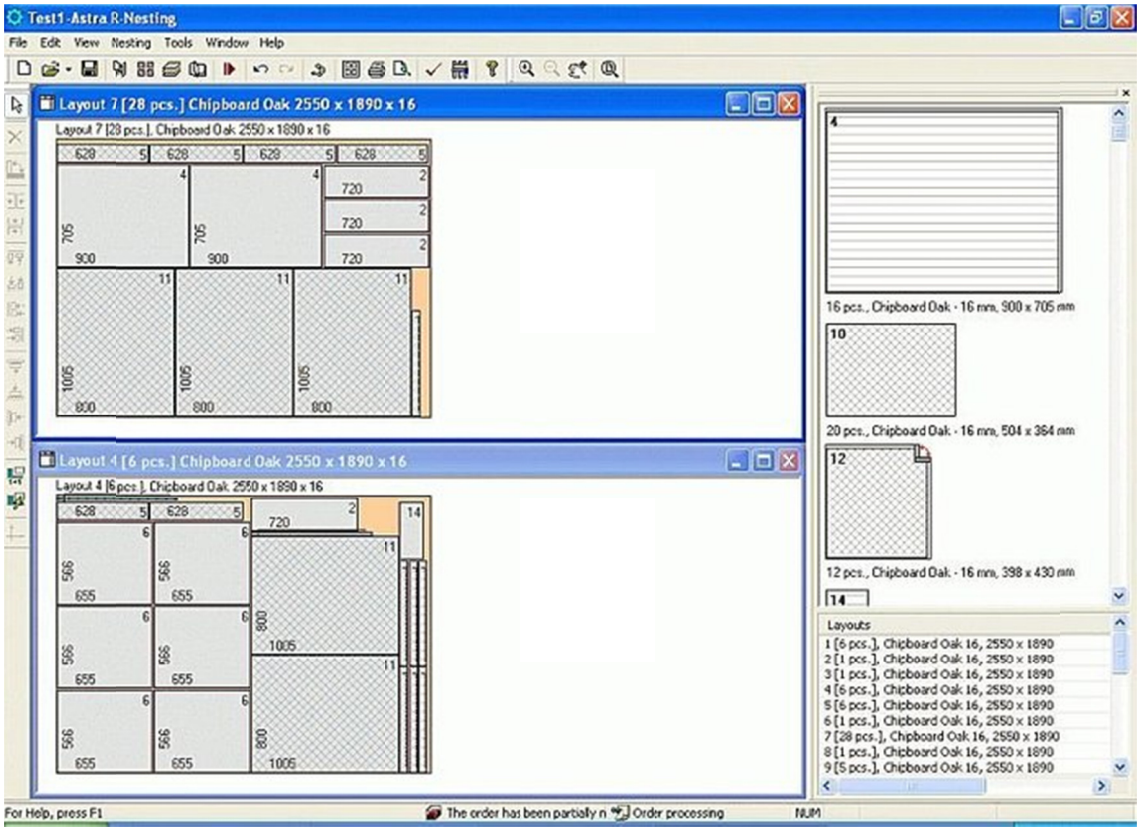
Economical Sheet Layout

There are a number of different ways to fit components onto a sheet of manufactured board such as plywood or particleboard. Whenever components are made to fit onto a sheet the two main considerations are grain direction and waste minimisation. These two aspects need to be considered together. It is no use making all of your components fit onto one sheet if the grain is running in different directions on each part.

Method 1 – involves drawing a sheet of particleboard/plywood to scale on a piece of paper. A 2400 x 1200 sheet can be drawn on paper at a scale of 1:10. Each component can then be drawn on using the same scale.

Method 2 – is the same process as above but is drawn using CAD software.

Method 3 – involves using software specifically designed for the task of 'nesting'. This software can take your cutting list and fit the pieces to a sheet for you. It can also send the sheet layout to a CNC router to cut all of the pieces, drill the holes and route all housing and rebate joints.

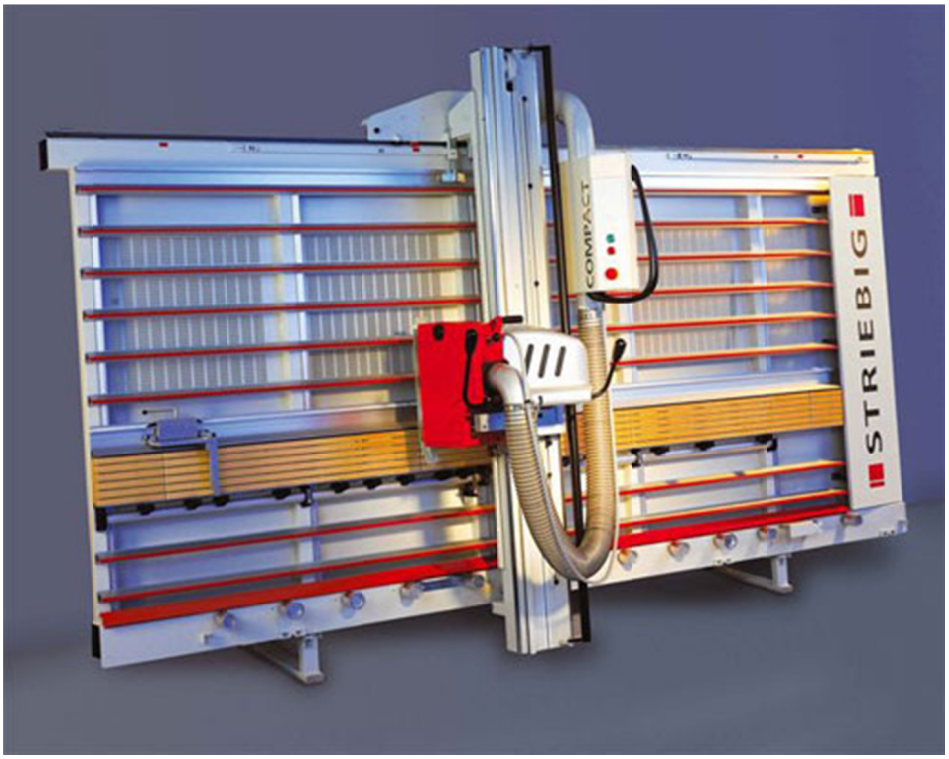


Cutting Sheet Material

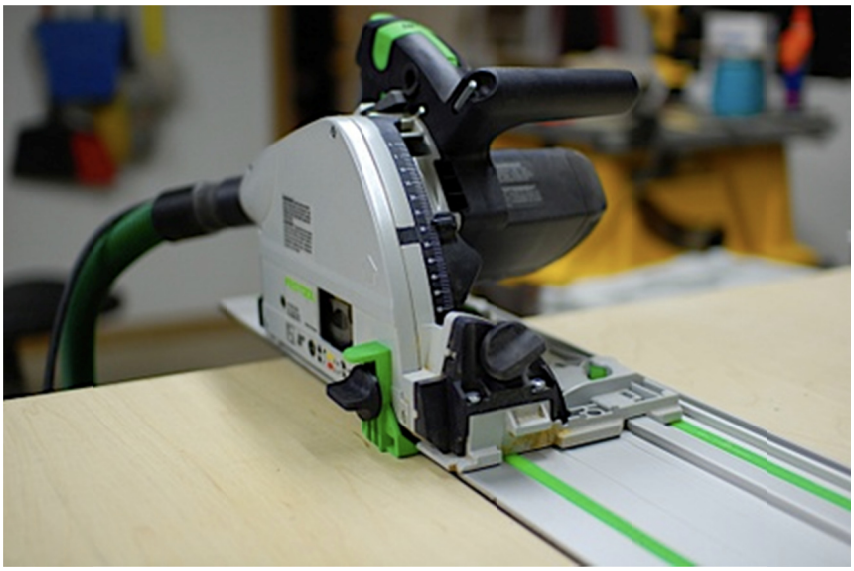
Sheet materials can be cut using a variety of techniques. Generally a panel is broken down into rectangular shaped pieces, so a circular saw is used. The circular saw can be in the form of a portable circular saw with a guide track, a panel saw, a beam saw or a simple table saw. Better quality panel saws will have a smaller blade in front of the main blade that rotates in the opposite direction called a scribing blade. This cuts the bottom of the panel to prevent the veneer or laminate from tearing on the bottom of the panel when it is cut. A CNC router can be used in industry to break down panels while also cutting the joinery and drilling holes. Irregular shapes can be cut from panels using a jigsaw or CNC router.

A beam saw (above) and panel saw (below)

A table saw



A vertical panel saw



A portable circular saw with guide track

A CNC router

Handling Sheet Material

Because sheet materials generally come in large sizes (2400x1200), they can be heavy and difficult to handle. The easiest solution is to have more than one person move the sheet until it is broken down into the smaller components required.

Other methods of handling the panels are available if only one person is moving the panel. Trolleys (right), vacuum/pneumatic handles and other gripping devices can all make moving large panels easier.

Care must also be taken not to damages the veneered surfaces, edge or corners of the materials as this will generate waste.

Pneumatic/vacuum handles moving glass panels. The same can be used for timber panels.

Assembly of Components

The assembly of projects made from manufactured boards is usually fairly simple as it is basic carcase construction. Kitchen cabinets are screwed together. A huge range of knock-down fittings are available and used by companies like Ikea and Freedom so their products can be assembled by the consumer. Traditional joinery using rebate and housing joints can be used for cabinets that are not designed to come apart. Other joinery methods such as dowel and biscuit joints can also be used.