



Sustainability in kitchen and bathroom cabinet manufacturing



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Acknowledgement

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ISS institute

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Introduction

Over the past few years there have been concerns about the environmental impact of manufacturing, and questions have been asked by the consumer about the green credentials of your product. This resource is to help you develop the knowledge to manufacture kitchen and bathroom cabinets in a sustainable way. The areas covered are.

- The use of sustainable materials for manufacturing of cabinets
- Identifying environmentally unfriendly materials
- New Materials
- Designing cabinets with sustainability in mind
- Energy consumption
- Giving the consumer a green choice
- Quality & Guarantee
- Waste
- Rating system

What does sustainability mean?

Meeting the needs of the current generation without compromising the needs of future generations

(Insert Video)

<http://www.hermanmiller.com/About-Us/Environmental-Advocacy>

The use of sustainable materials for manufacturing of cabinets

Carcass material

Carcass material for kitchen and bathroom construction in Australia consists of melamine board. The sustainable option for this would be to use melamine that has been certified sustainable which means it has been manufactured from plantation timber that has been sustainably grown. Three other alternatives to melamine are Ply, core stock and finger jointed board as long as they have been produced from a sustainable source. Companies like ALFA products produce a core stock which has a light weight timber core with grooves and a 4mm veneer so it can be sanded. This is a light weight alternative to traditional core stock. These materials have good stability properties but do need to be either edged in solid timber for seen ends ;or left as a feature in the case of core stock materials. Bamboo is another alternative. Bamboo is a grass not a timber and is very quick growing. It comes in a core stock form and can be edged, or left bare as a feature. Bamboo needs to be sealed on both sides to reduce movement and deterioration.

Definitions of Boards

- **Ply - thin layers of timber veneer of varying thicknesses glued together across grain in many layers**
- **Core stock - narrow pieces of timber glued side by side with a veneer top and bottom**
- **Finger jointed - narrow and short pieces of timber glued together by a finger joint at each end**

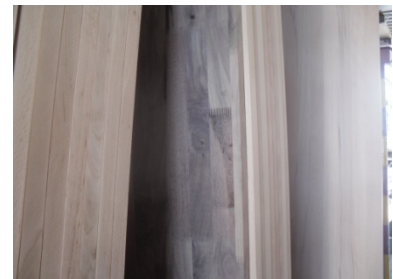
Core stock



Alfa board



Finger jointed



Carcass with ply construction

LETO Bamboo

www.letobamboo.com



Bamboo with natural edge

Door & Drawer front Material

One of the best options for doors is veneer board on chip board or core stock produced from a sustainable source. The options for edge strips for this type of door would be solid timber edge strip. The solid timber would be a different colour against the veneer on the doors due to the way the veneer is cut. One option is to use a contrasting colour for the edge strip to the front veneer of the door for a contrasting effect. The other option is to have doors pre edge stripped before veneering.



Pre edge before veneering

Another option for edge strip on core stock or veneer board door is to use polypropylene edge strip which is more environmentally friendly. PVC edge strip is not an environmentally friendly product but the waste can be recycled.

Another two options for doors are solid timber raised panel door or ply door as long as the timbers are certified sustainable or come from a recycled source. Bamboo can also be considered for door or drawer panels.



Raised panel door



Ply door

One other alternative is glass fronted doors which can give a clean line and a surface that is easy to wipe clean like a two pack finish of Vinyl wrap but less damaging to the environment than two pack or vinyl wrap.



Glass being fitted to a timber framed door with a Ply insert at Team & factory Reid Austria



Glass fronted door with ladder Frame

Drawers

The use of drawer systems instead of doors can have an advantage for the environment. By using a drawer system like tandem box in a large width (1200mm max 65kg) you can reduce the amount of carcass needed for the cabinet construction and it will give you more storage in your drawers because of less sides need for carcass. Full extension drawers gives better access to what is stored in the drawers which may reduce the amount of storage needed. The Blum drawer system is of high quality being tested for 200,000 actions under veering conditions with a life time guarantee. The quality of the product can have an impact on the environment by how durable it is. The back and base of the tandem box drawer is made from melamine and can be replaced if damaged without replacing the whole drawer.

Hardware

Hardware for doors and drawers can be purchased from companies like Blum that have certification ISO 14001 and 9001 quality systems for sustainability. Selection of particular hardware can have a positive impact on the environment. Blum also has produced the incerta hinge since 1993 which makes it easy to replace doors on kitchens if the customer wishes to retro fit their old kitchen with new doors at a later date.

Bench Tops

The options for bench tops are

- Solid timber (Solid timber which is certified sustainable)
- Recycled timber
- Bamboo
- Core stock (alfa product)
- Natural stone (has less environmental impact than manufactured stone)
- Laminate on HMR (Laminate and HMR need to be manufactured from a sustainable sources)

Finishes

Water based clear finishes are an environmentally friendly option for solid timber bench tops, veneered doors and end panels. These finishes have no hydrocarbons and are safer to use than two pack polyurethanes or lacquers, and less damaging to the environment. There are now CNC spraying systems available which can give 100% waste recovery from over spray. This material can then be recycled. This type of system is expensive so generally only practical for large business'.

(Insert Video)

Identifying environmentally unfriendly materials

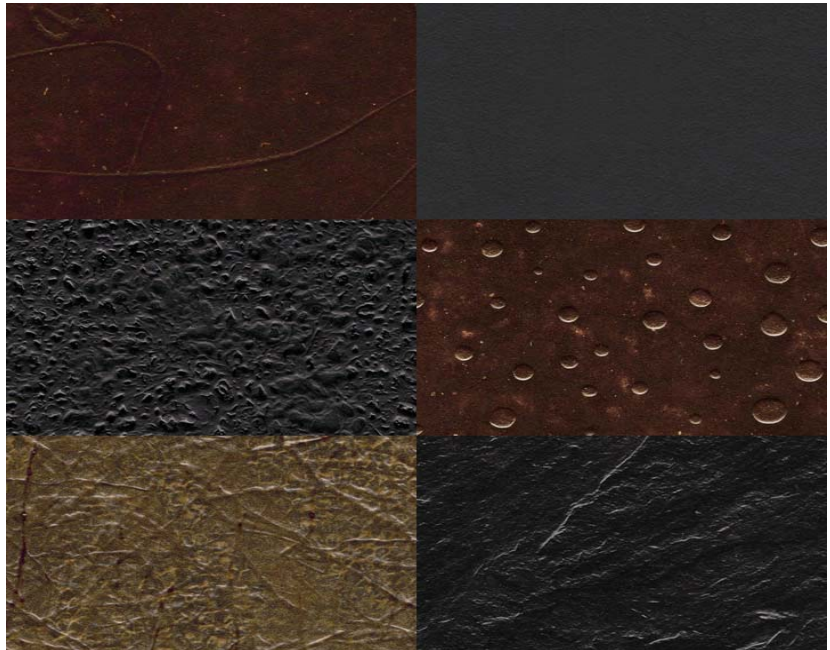
When manufacturing kitchen and bathroom cabinets materials used can be either environmentally friendly or unfriendly. For example manufactured board that has not come from a sustainable source could be replaced with a manufactured board that has environmentally friendly certification. If it is not possible to find an environmentally friendly material it could be red tagged to identify it as environmentally unfriendly. When an environmentally friendly alternative can be found the red tagged material could be replaced. This is a system that can be made available to customers to see that you have a process in place to replace environmentally unfriendly materials. (see if Herman miller has a visual for this)

New Materials

There are new and different types of material that are emerging with the growth in demand for green materials. Not all of these materials would be available in this country at this stage. Hopefully in the future local manufacturers will develop similar products or they will be imported into Australia by consumer demand.

Rey-stone for Laminate

- 100% ecological
- Non-polluting
- Made from Recycled Paper and natural resin from sugar production waste
- Smooth or textured surface
- Limited colour
- Hard & durable



<http://www.dekodur.com/en/reystone.html>

Palm veneer for doors, drawers and bench tops

- Non forest based grass
- No forest exploited
- Consistent deep colour
- Very Hard

<http://www.leyesenwood.com/>



Be Leaf veneer for doors and drawers

- Banana Fibre from The Trunks of Banana trees after harvesting
- Good supply
- The use of a waste product which is CO2 harmful
- WWF endorsed
- Flame retardant
- No extra land needed
- Very little energy for conversion process



www.beleaf.mc

Naturalia for bench top doors and drawers

- Can be cut to any shape
- For doors and bench tops
- Wear resistance
- Water repellent
- Wood fibres sourced from PEFC



www.arpaindustriale.com

Linoleum for bench tops

- Alternative to laminates



Moralt Bolsa Board for Carcase Bench tops doors and drawers

- Lightweight board which reduces handling costs
- Grown from sustainable sauce
- Good anchoring for hard wear

www.moralt-tischerplatten



Pfleiderer Balance Board for carcase bench tops doors and drawers

- Lightweight board which reduces handling costs
- Centre made from corn which is fast-growing alternative to timber

www.industries.pfleiderer.com



Dascanova Fibreboard for carcass Bench tops doors and drawers

- 30% lighter than standard MDF
- Stronger than standard MDF



www.dascanova.com

Glue less construction

- Tool less construction
- No screws or fittings
- Environmentally friendly Less raw materials needed
- Quick assembly
- Strong
- Can be disassembled easily and re assembled

<http://www.didit-furniture.com/assembly.html>

Video



Designing cabinets with sustainability in mind

The design of cabinets can have an impact on the environment, so there are a few things you can keep in mind when designing. Galley style kitchens have less impact by not having to deal with corner drawer systems or corner doors as dealing with corners in construction uses up more materials and time. This can leave more money available to buy better quality products which have a longer life span. Leg and rail construction for island bench can also reduce the amount of material required for construction. The size of bench space should be considered when designing a kitchen. A 1.8 meter wide working space is all that is needed for a comfortable work space; anything extra is a waste of space and can encourage the collection of stuff in these extra spaces.



Island bench with leg and rail frame



Galley style kitchen with no corner drawers

Using design systems like dynamic space by Blum can help you utilise your storage space and reduce waste in space and storage. When planning your kitchen work out what you need to store first to save storage. Dynamic space sets up zones for consumables, cleaning, preparation and cooking zone This give you a very efficient kitchen. For more information on Dynamic space visit the web site

<http://dynamicspace.com/dynamicspace/en/02/index.html>



Dynamic space show room Melbourne

Energy consumption

Technology has been one of the causes of environmental pollution and many companies believe that technology must incorporate an awareness of environmental concerns. There have been some advances in energy savings on machinery in the past couple of years with more advances to come. Many of the machinery companies like Biesse have made such advances.

- A standby system that shuts down functions not being used
- Energy recovery from electro spindles
- Vacuum pump only for areas required to be held down
- Dust extraction only when required
- Dust extraction hood that reduces 60% of energy used for extraction
- Laser edge banding.

Biesse has been concentrating on two areas of sustainability, one, to reduce energy consumption and two, to make use of energy generation.

The savings in energy consumption include:

- A stand by system that shuts down parts of the machine when those systems are not being used
- The monitoring and display of the amount energy being used
- The recovery of energy from the electro spindle that can be fed back into the grid.

The vacuum pump, which is required to hold down material to be machined, can be reduced to the area required for machining. The machinery also has the ability to shut down the dust extraction function when it is not required. The automatic shut down of compressed air occurs when it is not required.

The other development is laser edge banding where a laser is pointed at the pre glued edge on the edge bander. This is heated by the laser and then pressed to the board. This will eliminate the use of a heated glue pot and the issues of excess glue having to be cleaned off the board being edged which thereby reduces the load on the machine.

Many European factories are using their large roof area for Solar panels . This energy is not used to run their factories but the power goes back into the grid which means they get paid for the power they produce. It would be too difficult to use the power generated from the roofs because you would need to store the power and you may not generate enough base load power to run their machines.



Austrian Factory with solar panels

Giving the consumer a green choice

There has been a push from consumers for a green product from manufacturers of kitchen and bathroom cabinets and for the product to be disposed of in a sustainable way when it has reached the end of its life. The idea that you can give the consumer an option for a green product puts the responsibility for the environment back on the consumer. Having a green choice of product can increase the cost of manufacturing when you compare it to the non green option. In offering a green product you can apply green principals to the design to reduce the cost to the environment.

Quality & Guarantee

To offer the consumer a quality product can increase the life of the product therefore reducing the need to replace it after a short time. In producing a quality cabinet you would need to use materials and hardware of a high standard to produce the quality cabinets. This may make the Kitchen or bathroom cabinet more expensive but in the long term it will be cheaper for the consumer not having to replace the kitchen or bathroom cabinets. Offering a guarantee for your product can reinforce that you have produced a quality product and offers security to the consumer.

Wastage

There is a large amount of waste produced from kitchen and bathroom cabinet manufacturing; the bulk of this is melamine. The challenge for the industry and governments is to find ways to recycle or find alternatives to using landfill. One is to use the waste as energy generation; this means the burning of materials in an environmentally suitable furnace. This can be justified as sustainable because the materials that have been burnt will be replaced sustainably grown timber. The balance will be more in favour of the environment because while the waste will be burnt the rest of the materials will be used for a number of years in kitchen and bathroom cabinets.

There can be micro solutions to waste by finding someone who can use the waste material i.e. A men's shed needs materials for community projects, schools, recycling centres.

The waste from the manufacturing process can be monitored, making sure that you optimise the material that you are using to its full extent. By giving the waste material a money value and calculating the waste every day to compare if there is an increase in waste on any particular day. If there is an increase in waste you can investigate where it is happening; employee error or machine error.

OH&s on handling waste

When handling waste you need to wear the appropriate PPE for handling shavings and dust. You will need safety glasses, properly fitted face mask, work boots and disposable overalls. When manually handling waste you need to use correct lifting techniques or use appropriate lifting equipment. Good housekeeping is also important so there is no danger of tipping hazards. Waste of all types from the kitchen and bathroom industry needs to be disposed of safely or recycled where possible. You need to keep informed of what is the latest available for the recycling and safe disposal of waste. Separation of waste is important e.g. Separation of solid timber waste for manufactured board.

Waste from the old kitchen

When replacing an old kitchen you can end up with the old kitchen left on the front lawn and the customer asking what can be done with it, not wanting it to go to land fill. Old kitchens can be offered to people who would like more cabinet space in their shed or garage. The cabinet maker could offer to fit the old cabinets as part of the contract for the new kitchen. Old kitchens could also be used to update a kitchen in a rental property or holiday house. Ebay, garage sale or recycle centre could be an option for the client to dispose of the old kitchen.

Rating system

Having a green check list on what you produce can give a guide to yourself and the client on how you perform as a sustainable manufacturer. This can also prove that you take sustainability seriously and have identified the areas that you have tagged as RED.

How Sustainable is your kitchen			
Item	Justification	Sustainable YES	Unustainable NO
Product (from a sustainable source or not)			
Carcass	Melamine Laminex ISO 14001 quality systems for sustainability.	√	
Hardware	Blum which has ISO 14001 and 9001 quality systems for sustainability.	√	
Bench Top	Solid stone Benchtops	√	
Doors	Solid timber doors made from rain forest timber		X
Finish on Doors	Two pack finish		X
Quality of cabinets (construction & materials)	12 year warranty on cabinets	√	
Replacement Kitchen	Old kitchen fitted Clients Garage	√	
Design			
Kitchen Plan	Galley style	√	
Size of bench tops	Bench tops over size of required work space (1.8 Meters)		X
Drawer systems		√	
Factory			
Solar Panels for power generation			X
Workers use bikes and public transport to travel to work			X
Paperless office		√	
Waste	Board waste to land fill		X
Logistics	Diesel Truck		X

Questions

Select the correct answer

1. Select What is Core stock board?

- a. A board that is made up of small chips of timber pressed and glued together
- b. Small pieces of timber glued together by being jointed at each end
- c. Small strips of timber glued together side by side with veneer top and bottom

2. Select 3 sustainable materials that can be used for carcass construction

- a. Bamboo
- b. Manufactured board made from timber that is not certified sustainable
- c. Core stock made from certified plantation timber
- d. Imported manufactured board made from an unknown source
- e. Finger jointed material from certified plantation timber

3. Which is a substitute for vinyl wrap or two pack plastic for door and drawer fronts which can be easily cleaned?

- a. Timber
- b. Glass
- c. Bamboo

4. Which provides the most effective storage?

- a. 2 drawers 600mm wide made from melamine with standard runners
- b. 1 tandem box with full extension drawer runners 1200 wide
- c. 2 600mm wide doors with one standard shelf behind

5. When making a sustainable choice on materials and hardware what would you be looking for?

- a. MSDS

- b. ISO certification
 - c. Price
6. Select one environmentally unfriendly material below
- a. Ray stone laminate
 - b. Be leaf banana Fiber
 - c. Formaldehyde
 - d. Bamboo
7. When designing a Kitchen what is the maximum bench space required
- a 2m
 - b 3.1m
 - c 1.8m
 - d 2.3m
8. Select 2 environmentally friendly materials to offer a green chose to a customer
- a ISO certified melamine board
 - b Rain forest timber from unknown source
 - c Bamboo
 - d Constituted stone bench top
- 9 Select 1 that would give your kitchen a guarantee of quality
- a The price
 - b offering a guarantee
 - c the time it takes to manufacture
- 10 Select 1 that reduces waste in the cutting up of melamine board
- a Checking the cutting list
 - b Optimisation of the melamine board
 - c measure twist and cut once
- 11 Select 2 appropriate PPE,s when handling waste
- a Hard Hat
 - b Face mask
 - c Disposable overalls

12 Select 1 environmentally friendly option for the reuse of an old kitchen

a Send it to land fill

b re fit the old kitchen in the clients garage

In your own words write an email to a customer on how you can offer to build a green kitchen