3. Material Selection

3.1. DOOR PANEL AND FRAME

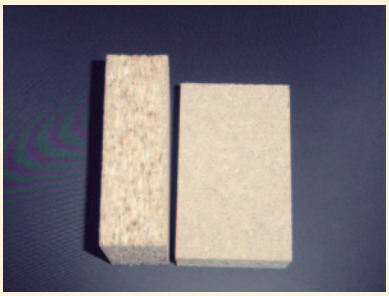
The following are the types of materials commonly used for door panel and frame.

Types of materials	Description and uses

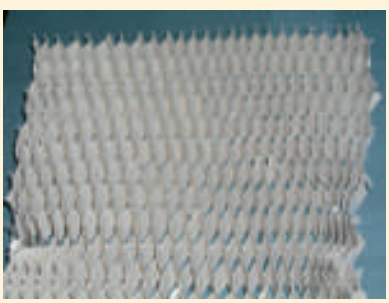
1. Timber
 
	• Timber used should comply with the requirements specified in SS 347. It may be in a single length or finger-jointed.
	• For finger-joint timber, the ends of the timber interlock with one another and are glued together using special resins under pressure to produce long length of timber.
	• It is important to treat the timber to prevent deformation in long term.
	• Features:
	  ○ More cost effective with reduced wastage
	  ○ Free of unsightly knots
	  ○ Less prone to bowing or warping
	  ○ Flexibility to join the sections to achieve the required length

2. Plywood
 
	• All plywood used should comply with the requirements specified in SS 347.
	• Plywood is formed by gluing layers of sliced timber together, e.g. veneers or plies of softwood or hardwood. The type of glue and veneer used will determine the application of the plywood.
	• Features:
	  ○ Available in different thickness and sizes
	  ○ Different strengths of the plywood can be achieved through the use of different types of glues

Types of materials	Description and uses

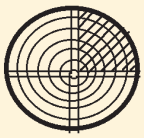
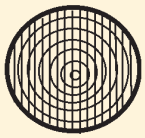
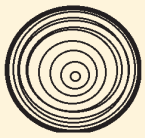
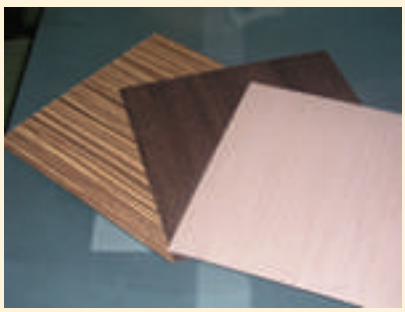
3. Particle board
 
	• Particle board is manufactured from small timber particles blended with a synthetic resin adhesive and compressed under heat and pressure.
	• Quality of adhesive/resin plays a vital role to withstand weather condition.
	• The particles are either chips, flakes, shaving or splinters produced through cutting or breaking process.
	• Features:
	  ○ Available in different thickness and sizes
	  ○ Lower tolerances in thickness
	  ○ Stable, tough and hardy surface. It is harder than solid timber
	  ○ Smooth surface that does not twist and turn
	  ○ Eco-friendly as it is made from the waste from producing other wood products

4. Medium density fibre (MDF) board
 
	• MDF board is manufactured from powder of timber materials blended with a synthetic resin adhesive and compressed under heat and pressure.
	• Quality of adhesive/resin plays a vital role to withstand weather condition.
	• Features:
	  ○ Available in different thickness and sizes
	  ○ Lower tolerances in thickness
	  ○ Stable, tough and hardy surface. It is harder than solid timber
	  ○ Smooth surface that does not twist and turn
	  ○ Eco-friendly as it is made from the waste from producing other wood products
	  ○ Good for profile cutting

5. Honeycomb
 
	• Honeycomb is made of recycled craft papers formed in hexagonal cells and sandwiched between plywoods or melamine boards.
	• It produces a strong and light weight structure. It is important to ensure good adhesion of each honeycomb cell to enhance uniform resistance to perpendicular crushing forces.
	• Features:
	  ○ Relatively light in weight but rigid in structure
	  ○ Minimum warping and twisting
	  ○ Relatively cheaper

3.2. DOOR FINISHES

The following are types of door finishes commonly used in the market.

Types of doors finishes	Description and uses
1. Veneer 	• Veneers are manufactured by slicing or peeling slices of wood skin from tree logs. The main methods of veneer cutting are as follows:  ○ Quarter cut The log is sliced at 90˚ to the growth rings  ○ Crown cut The log is sliced along its length  ○ Peeling The log is peeled to give a continuous veneer. It is generally used for construction plywood as the veneer sheets cannot be matched and its appearance is less attractive • As veneer is a natural material, variations in shade and colour will occur. Depending on the species of timber used, natural features such as sound knots, drops or buttons are commonly found in the veneer. Designer should be aware of the possible natural features of the species selected. • Features: ○ Easily sourced and available in various designs and patterns
2. Laminate 	• Laminate is made of multiple layers of paper saturated with resin and pressed together under high heat and pressure and then finished with a printed surface. • Features: ○ Can feature a variety of wood prints ○ More consistent in colour and grain pattern compared to veneer ○ Durable and has higher resistance against dents than the timber finishes ○ Easy to maintain

Types of doors finishes	Description and uses
3. Hardboard	• This is a low cost material which is produced from timber pulp blended with adhesive and pressed to the required thickness. • Paint finishes is normally applied over the hardboard for better appearance.

3.3. IRONMONGERY

There is a wide array of materials for ironmongery available in the market. The ironmongery used should conform to the requirements of endurance test as specified by products' manufacturer. The following should also be considered:

Types of ironmongery	Description
1. Hinges 	• Hinges used should comply with BS EN 1935. • Coating should be able to withstand the ambient weather conditions to prevent deterioration. For example, correct type of finishes should be specified if project is near seaside.
2. Door closer 	• Door closer used should comply with BS EN 1154.

Types of ironmongery	Description
3. Lock 	• It is recommended to specify the lock is tested to meet the standard required to ensure the quality and security level. For example, Mortice lock is tested to meet the BS EN 12209. • Quality of materials such as coatings, stainless steel should be able to resist the ambient weather conditions. For example, correct type of finishes should be specified if project is near seaside.