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THE USE OF PLYWOOD AND BLOCKBOARD
IN FURNITURE AND JOINERY INDUSTRIES ✓

by

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1. INTRODUCTION

1.1 General

It is commonly known that wood-based panels are one of the main raw materials of modern furniture and joinery industries. Their use has increased with the increase in the demand for smooth, uniform surfaces and simple furniture with straight lines, such as cupboards, chests, shelves, cabinets and other storage furniture. Accordingly, the construction of furniture has changed to make use of panels. At the same time, types of panels use have become more varied.

Plywood products, veneer, plywood and blockboard, are the oldest among wood-based panels, and technically as well as characteristically they represent a certain intermediate form in changing over from solid wood to modern panel products.

Although in the industrialized countries modern plywood and blockboard have developed particularly into structural building materials, plywood products are also widely used in furniture and joinery industries in many different ways. In the developing countries the relative importance of plywood and blockboard as raw materials for furniture can be even more pronounced, because these products are easily manufactured and their use is simple and closer to the traditional wood technology than the use of fiberboard or particle board.

1.2 Products and their use

There are various kinds of plywood products. This presentation is mainly concerned with the use of plywood panels and blockboard. However, it is worth mentioning that also veneer is used in many different ways in the manufacture of furniture. Its use for veneering various panels and for surfacing of wooden parts is well-known. Also, veneer is used in the manufacture of various moulded furniture parts, such as table and chair legs, seats, backs and arms, etc.

2. USE

2.1 General use

The table hereunder gives an outline of the main components in which plywood and blockboard are used in furniture and joinery industries.

Components made of plywood and blockboard

	Share of total consumption of the panels in question, (UK 1970) (expressed in percentages)	
	Flywood	Blockboard
Home and office furniture	17.0	18.0
- frames of upholstered furniture		
- table tops		
- side panels, plane surfaces, shelves		
- back panels		
- drawer sides and bottoms, etc.		
- doors		
Radio and TV cabinets	0.7	0.1
Built-in furniture	12.0	37.9
- sides, ends, shelves, backs of cupboards		
- doors		
Flush doors, exterior doors	<u>1.2</u>	<u>1.5</u>
Share of furniture industries in total consumption	<u>31.6</u>	<u>57.5</u>

In different countries the use of plywood and other panels has naturally been influenced by various factors, such as supply, traditions, competition, standard of living, etc.

U.S.A. and Canada are the largest consumers of plywood in the world, and both hardwood and softwood plywoods have an important role also in furniture industries. In U.S.A. approximately 25 % of the hardwood plywood is used in the furniture industry, and approximately the same proportion of softwood plywood is used for various home furniture mainly by do-it-yourself builders.

Elsewhere the significance of plywood and blockboard as raw materials for furniture is smaller.

In the industrialized countries the use of plywood in the fields concerned has decreased since the introduction of particle board. Earlier plywood was the main panel material in all possible components, but today it is mainly used for purposes where special strength and durability are required.

For several ordinary purposes, such as back panels, cupboard side panels and plane surfaces, plywood is often too good and also too expensive.

Earlier, when plywood could still be considered an inexpensive construction material, it was normally used for the frames of upholstered furniture, that is the hidden parts. Today such use is significant only in America, where practically every different plywood is available. Elsewhere the applications of plywood in the furniture industry are few because a primary product, which is used in many other fields, has become cheaper without even trying to reduce its price.

Also blockboard has suffered from the competition with particle board and other panels. However, it has most of the technical advantages of plywood, and since it is less expensive than plywood, it has generally maintained its position somewhat better than plywood.

Blockboard is particularly suitable for built-in furniture, cupboards and shelves. Due to its rigidity and stability it is used also in furniture parts requiring strength, rigidity and firmness, such as table and desk tops, cupboard shelves etc.

2.2 Use in the developing countries

As it was mentioned earlier, the situation in the developing countries can be completely different if there are prerequisites for manufacturing plywood, and above all suitable wood and a sufficient degree of industrial development. Pre-supposing that veneer, plywood and blockboard can be manufactured economically and also that the product range is technically of sufficiently high quality and offers variety, these products can be the main raw materials for furniture, in addition to solid wood. In many developing countries the use of wood is traditional and the wood technology is on a high level. In these cases plywood and blockboard can be adopted more easily than other wood-based panels which differ more from the traditional wood technology.

In the developing countries plywood and blockboard can be pioneer panel products and the main portion of furniture can be manufactured of them. Plywood gives structurally light and durable furniture even with simple manufacturing techniques which can be adapted to the prevailing conditions. Since high-quality decorative hardwood species are often found in the tropics and subtropics plywood with face veneers made of these species also has such an appearance that it can be used for very demanding purposes. Thus also surface finishing is easier.

The same applies to blockboard. Another advantage of blockboard is that its core can be manufactured of wood of poorer quality and only the surface veneer needs to be made of high-quality wood which can be peeled and/or sliced.

Thus blockboard can be manufactured economically in connection with a plywood mill and, if possible, also a sawmill or a similar plant. In such cases the raw material for core can be wood which otherwise would be wasted. The manufacturing method is simpler and more labour-intensive than that of other composite boards, and therefore, blockboard is suitable for the developing countries.

The properties and appearance of a blockboard product are almost the same as those of plywood, but it is clearly less expensive. An additional advantage is that blockboard differs from solid wood even less than plywood, so that there are no particular problems in its use. Therefore, blockboard is suitable also for small-scale production and less demanding manufacturing conditions.

In the developing countries blockboard can thus be, in addition to plywood, a basic material for built-in furniture, cabinets, cupboards, shelves and panel parts of furniture, i.e. for all furniture where wood panels can be used. The framework can be made of blockboard or of thick plywood and thinner plywood can be used as top and back panels, bottoms of drawers, bottoms of beds, etc.

3. REQUIREMENTS AND PROPERTIES

The purpose here is to deal briefly with the requirements that furniture manufacture sets on panel products, and how the properties of plywood and blockboard meet these demands.

3.1 Requirements set by furniture and filament industries

As it was pointed out earlier plywood is a particularly important structural building material. Building sets many such requirements which do not have much significance in furniture industries. Consequently, different panel products are needed for different purposes.

In general it can be established that some of the requirements set on panels intended to be used in furniture are as follows:

- dimensional stability
- smooth, good surface, which enables high-quality finishing, coating with various films, laminates, etc.
- sufficient strength and rigidity, particularly transverse tensile strength
- good screw-holding characteristics, ease of gluing, etc.
- suitable edge properties
- good workability and working endurance
- other special properties.

In addition, industrialized countries often have special requirements such as suitability for serial production, standardisation of dimensions and quality, homogeneity of quality, etc.

On the other hand, the developing countries may favour products which are simple and inexpensive to use which are suitable also for small-scale production and do not require special equipment or tools.

3.2 Properties of plywood and blockboard

In furniture the most common plywood used is thin 3- or 5-ply, except of course in frame parts, table tops, etc., in which thicker panels are required.

The most common thickness of blockboard is 18/19 mm but also thinner - 15/16 mm - and thicker - 22 and 25 mm - is commonly used. Also thinner and thicker dimensions than the ones mentioned are manufactured.

The properties of plywood and blockboard generally meet the requirements of furniture industries.

Plywood is particularly strong and durable. It has good rigidity and impact resistance, so that it provides light-weight structures which at the same time are strong. Screw-holding capacity is high perpendicular to the board, and no special fittings are needed.

Plywood is well suited for the use of edge-dulling of blades and tools. Plywood enters working as the panel itself as well as in its edges. In addition, the edge properties are fairly good.

Plywood has also better dimensional stability and moisture resistance than other wood-based panels. This wood may not retain their shape very well but this defect can be eliminated by using correct structures.

The surface of hard-wet plywood meets fairly high requirements and it can be finished and painted in various ways. Normally plywood, like veneered surfaced, is finished with clearness lacquer or stained. Naturally also paint can be applied. This type of finishing is relatively easy, and it usually turns out well, although there are noticeable differences between different species.

A disadvantage of plywood surfaces made of peeled veneer is that they do not resist the variations of humidity occurring in use very well. As a result smaller or larger checks may develop which crack the surface and make it less attractive.

What was said about plywood also largely applies to blockboard. Blockboard has the good properties of wood: light weight, durability and workability and also the properties of veneer: good surface, rigidity and dimensional stability. Thus blockboard is an excellent choice in furniture and fittings requiring good strength, rigidity and durability.

One of the disadvantages of blockboard, as well as of plywood, is that the properties of the board are different in directions of the plane, i. e. in the grain direction of surface veneer and perpendicular to the grain. In blockboard strength and rigidity are also dependent on the direction of the core strips in relation to the surface veneer. When these differences are duly considered and the panels used in a proper way, they cause very little trouble in use.

4.

CONCLUSION

Large-scale use of panels in furniture and fittings requires structures suitable for the panels and the technological arrangements in manufacture. Special machines and equipment are needed in working the panels, in surface finishing and in several other phases, including transfer and intermediate storage between the different phases. Most panels require special gluing and finishing techniques, which in large-scale production sometimes requires expensive machinery, equipment and manufacturing lines.

Such arrangements can seldom be considered in the developing countries, where the manufacture of furniture and fittings is still based on traditional wood technology. Therefore, plywood and blockboard are in a better position than other wood-based panels in these countries in regard to use as well as product properties.

The use of plywood in furniture and fittings could be considerably increased in developing countries where indigenous or plantation species suitable for plywood manufacture are available. An advantage of plywood is its workability and handling, good strength properties and simple manufacturing technology, which makes it suitable for labour-intensive and small-scale manufacturing.

Although it has been said that blockboard is a declining product in the developed countries it must still be seriously considered in areas where there are good natural prerequisites for its manufacture. While blockboard can be compared with solid wood, its use does not require any exceptional skills, tools or fittings. Therefore, blockboard is a natural development phase in changing over from the traditional manufacture of wooden furniture toward modern furniture industry.





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