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Technical Course on Criteria for the  
Selection of Woodworking Machinery

Milan, Italy, 8 - 19 May 1978

SELECTION OF EQUIPMENT FOR PARQUETRY PRODUCTION\*

by

G. Gazzotti \*\*

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\*\* Consultant in the manufacture of parquetry.

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### Introduction

A plant for manufacturing wooden flooring must take many political, social, environmental and technical factors into account.

The following technical factors are particularly important:

- the estimated quantity of raw materials for a 10, 20 or 30 year period;
- the dimensions and characteristics of the available raw materials;
- the environmental conditions of both the production plant and the countries where the flooring will be used in relation to humidity and temperature changes;
- the type of flooring such as matched flooring or mosaic parquetry.

When using modern parquetry production equipment technical assistance should be provided by the machinery manufacturer over a given period of time for the purpose of providing initial training of technicians and machine operators so as to ensure continuous production by keeping the operation in good working order.

The implementation of a plant for the production of parquetry flooring in tropical countries is based on the following prior conditions having been taken into account:

- a) mixed production plant (i.e. matched flooring and mosaic parquetry);
- b) no premanufacturing necessary;
- c) environmental conditions: tropical climate
- d) material available: sawmill trim-ends or boards not suitable for high quality lumber.
- e) medium lumber grades of hard-woods or wood containing silicon which require special tooling;
- f) minimum annual required output which should be in the area of 250.000 m<sup>2</sup> for mosaic flooring and 500.000 m<sup>2</sup> matched flooring;
- g) technical consultants for training local staff to operate the plant at full capacity.

## Production Facilities

### Rough Mill

When the production of a plant is based on sawn lumber for parquet dimension it will require to be equipped with:

- a standard rip saw machine for single edging of the boards;
- one or more out-off saws for cross-cutting the boards according to the lumber grading rules for parquetry and production line requirements.

These saws may either be manual, semi-automatic or automatic.

The high-grade lumber will be selected for match flooring and mosaic parquetry.

- band saw machines will be used for rip-sawing boards for high capacity production. Naturally multi-blade circular sawing machines are used.

The latter require less manpower, however they create more wastage of wood.

A multi-blade twin shaft circular sawing machine can cut boards up to 120 mm in thickness.

### Kiln drying

If the rough sawn parquetry stock does not contain the moisture content necessary for final machining, it has to be piled under a roofed area for seasoning. As the air-seasoned parquetry dimension stock will be kiln dried it should be stacked on pallets and transported to the drying kilns. These kilns may consist of prefabricated units or be constructed from concrete or brick materials.

Some companies save considerable manpower by loading the wood into metal baskets which are then transported into the drying kilns. This system is especially useful for handling lumber for pattern type flooring. Each specie of wood has its own drying cycle, which varies in accordance with the type of equipment used.

These dry kilns<sup>are</sup> normally heated by boiler systems which can be fired with sawdust, chips or mill refuse for generating heat, hotwater or steam.

Once the moisture content has reached the desired level, the wood is stacked for storage under ambient temperature for conditioning over a

period of anywhere from one to two weeks, depending on the species of wood and the degree of internal stress. Additional details on the aspect of drying may be found in the report of Mr. R. Cividini, entitled "Kiln drying Saw Lumber".

#### Parquetry Machinery for Mosaio Parquetry.

The selection of machinery depends on price and the lumber to be machined. Some systems use four-side moulding machines for surfacing and thickening sawn material, while others use planing machines with special cutterblocks. While sometimes the wood is cut to length before planing, various cut-off systems are used to cut it to length after planing.

Output for each plant may vary from 200 to 800 m<sup>2</sup>, with different manpower requirements and more or less full use of the lumber. A factor which must also be taken into account is the length of the strips, which vary between 120 mm and 160 mm.

After machining, the strips are assembled by using sixteen squares which are glued to a coated paper or plastic web. When the production facility is selected, consideration must be given to the degree of automatic control. Occasionally the equipment which is selected is too sophisticated. Output is higher and less manpower is required, but the problems connected with technical assistance are too expensive even in Europe.

#### Production of matched parquetry flooring

The selection of machinery required for manufacturing this type of flooring depends on its level of investment and lumber grade as well as its characteristics such as hardness, presence of mineral ingredients, resins and other features.

Even though it may not seem relevant, the quantities of lamella of 10 mm or tongued and grooved strips of 23 mm thickness needs to be given consideration.

These factors influence the system applied to special machinery and the drive for the motor, as well as the rated horse power.

Standard parquetry machines are equipped with a hopper feed, a truing up unit for straightening the rough sawn lumber and a moulding machine with at least four spindles (two horizontal and two vertical) plus a double trim circular sawing machine (with five units) for reducing labor costs.

### Packaging

Either corrugated cardboard boxes or shrink wrap foils are used for packaging the mosaic flooring although in some instances both systems are used simultaneously.

For the standard strips and lamellas the most widely used system is wire or steel strapping. On some occasions plastic bands (which may be reinforced), shrink wrap foils and even corrugated cardboard boxes are used.

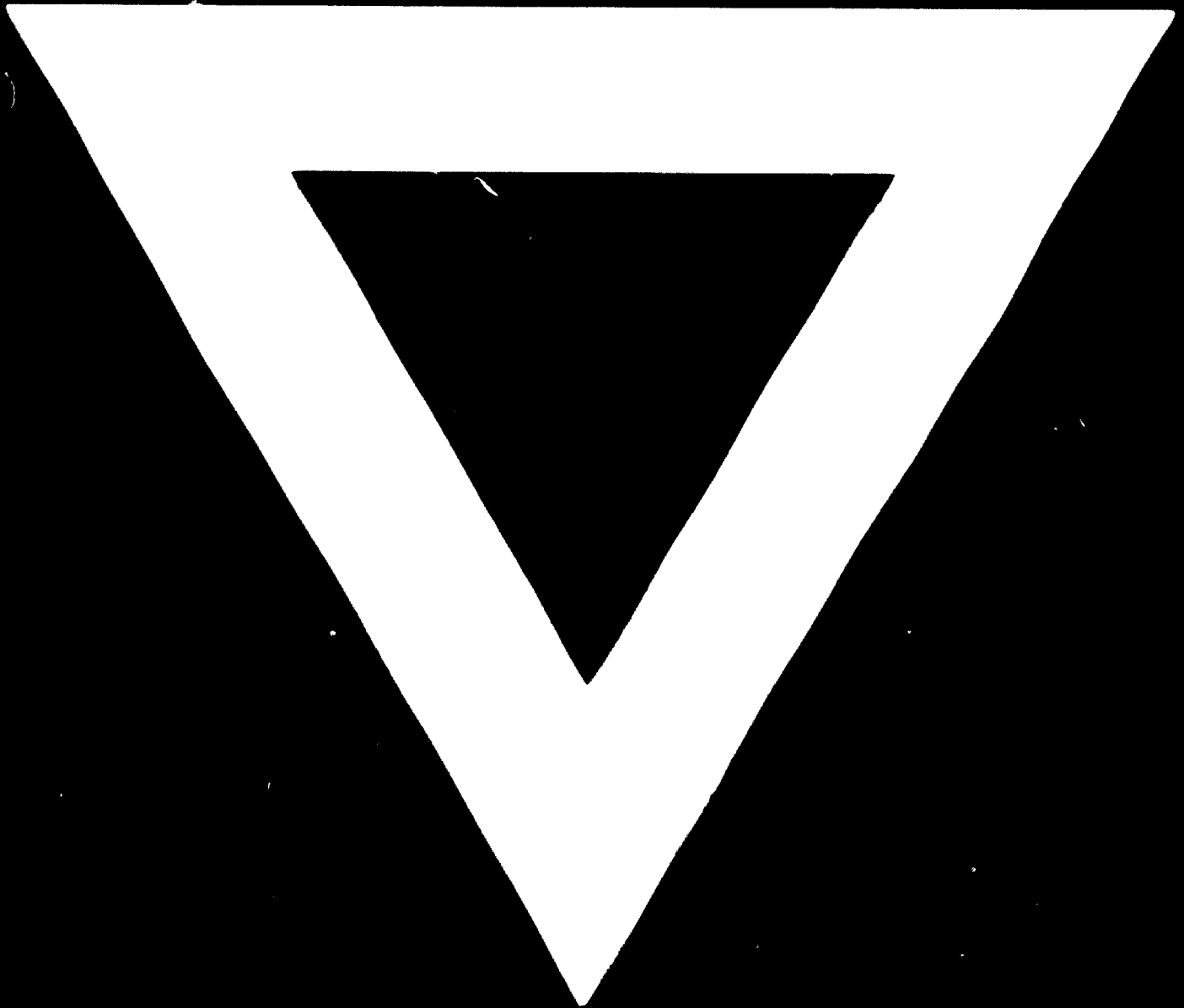
Packaging will be done at the end of each production line, which simplifies transport inside the factory. In special packaging departments modern machinery can be used to reduce labor costs.

From the technical point of view, there is still another point which we have to make.

It is worth bearing in mind that parquetry flooring material which is strapped and packed in cardboard boxes gradually adjusts to the temperature and humidity in the environment where it will be laid, whereas shrink wrapped flooring materials avoid such problems when kiln dried to meet conditions which are applicable in export requirements.



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