

MANUFACTURE OF INDUSTRIAL PRODUCTS FROM OAK

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ABSTRACT. The three largest and fastest growing markets for oak are railroad crossties, reusable pallets, and truck and container flooring. Manufacturers of oak lumber are advised to keep these products in mind when planning their production.

INDUSTRIAL PRODUCTS are those products purchased by an industry for its own use. Industrial purchasers have definite specifications and requirements.

The "romance of wood" and its beauty are not applicable here. Competition is keen between manufacturers of wood products and with manufacturers of nonwood products.

For three industrial products, oak has an advantage over other wood and nonwood materials: railroad crossties, returnable pallets, and laminated truck flooring. In the market for each of these products, the potential for sales is large and expanding. The sizes of wood used in manufacturing each of these products are different. Crossties are made from big pieces of wood; pallets are made from smaller pieces; and flooring is laminated from very narrow pieces, some very short.

CROSSTIES

Consider the oak sawmiller who has good-size logs. Work at the Forest Products Marketing Laboratory by Garrett (1969) has shown that medium-quality factory-grade 2 red oak logs and poor-quality

factory-grade 3 red oak logs can be more profitably sawed into ties, timbers, and lumber than into lumber alone. The reasons for this are that sawing time per log is decreased, while the total volume recovered from the log is increased.

Log lengths and railroad crossties are not always compatible, and the wastage that occurs was taken into consideration in the study. Church (1969) has shown that the necessary grading and scaling needed to determine the type of log most profitably utilized for this purpose is easy and inexpensive.

Fifty to 55 percent of all ties used are made of oak. The plentiful supply of oak is one reason, but the desirable characteristics are more important. Toughness, durability, and strength are necessary for ties. Formerly the more decay-resistant white oak heartwood tie was preferred to the permeable red oak tie. Now all ties are preservative-treated, and the more permeable red oak is preferred.

In the past, railroads have delayed replacing old ties. Now the demand for ties is exceeding the supply, and prices have risen. Crosstie production rose above 1 billion

board feet—25 million ties—in 1970. Estimates for the next four decades are that this level of tie demand will hold fairly steady.

As railroads have been merging, crosstie requirements have become more stabilized; the boom-and-bust cycle is a thing of the past. The use of concrete ties—bigger ties spaced farther apart in the tract—has been disappointing. Laminated hardwood ties (3 by 8 inches, 4 by 6, 5 by 7, or 6 by 7) timbers have given the advantage of the wider spacing without the fracturing characteristic of the concrete tie. It is very nice to report that wood, especially oak, beat the competition for a change. Contracts for tie production are now common.

PALLETS

Now consider the oak sawmiller or manufacturer who has poor-quality logs. These are the logs that are too poor to yield good lumber and yet are not large enough for tie and timber production. However, these poor-quality logs are suitable for the market for returnable pallets. We at the Forest Products Marketing Laboratory have designed the SHOLO process (*Reynolds and Gatchell 1971*) to convert very low-grade hardwood logs to pallet parts and pulp chips. With slightly better logs, cants can be made and resawed into pallet parts. Some specialty sawmills purchase poor-quality sawlogs, make lumber, and immediately cut all this lumber into parts. Pallet-quality cants and pallet-quality lumber enjoy a steady though low-priced market.

Strobel and Wallin (1969) have completed a 4-year study of pallets in use in the food industry. Their findings show that oak pallets, assembled green, either outlast or equal the life of softwood or plywood pallets. Maintenance was no greater with oak, though initial prices per pallet were higher.

John Strobel, a cooperator in these studies, has developed a new organization to lease pallets. This one new firm alone may buy up to 100 million pallets annually when

full-scale operations are funded. This could raise the demand for pallet material from 3 billion board feet per year to 5 billion board feet per year.

As the demand for pallet material increases, prices will increase, and quality specifications will demand more attention. Annual contracts for cut-to-size pallet parts will become commonplace. Centrally located pallet-assembly plants will draw parts from many sawmillers. It is estimated that prices will rise to \$140/MBF for guaranteed quality parts ready for assembly.

FLOORING

But many pieces coming from oak logs are not wide enough for pallets that require a 4-inch minimum width. However, the narrower material can be used for laminated truck flooring. This market uses planed and kiln-dried lumber ripped into very narrow pieces. After the defects are cut out, the pieces are laminated on edge, the planed surfaces being glued together. Only the handling and drying costs dictate how small a piece of lumber can be used for this purpose.

In 1968 there was a demand for 36 million square feet of laminated truck flooring. One square foot of flooring required 4 board feet of lumber, so this demand translates into 144 million board feet. As the trucking industry grows and the use of containerization increases, the demand should continue to rise. Oak is the predominant species for this, and maple is a close second.

Oak is the preferred species for many wooden products produced for industrial use. Only three of these have been mentioned. Very large pieces can be used for making crossties; much smaller pieces can be used for making pallets; and narrow pieces can be used for making laminated truck and container flooring. So the oak manufacturer has a choice of products that he can produce. Which products he will produce will depend on his locality and the contracts offered for his products.

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