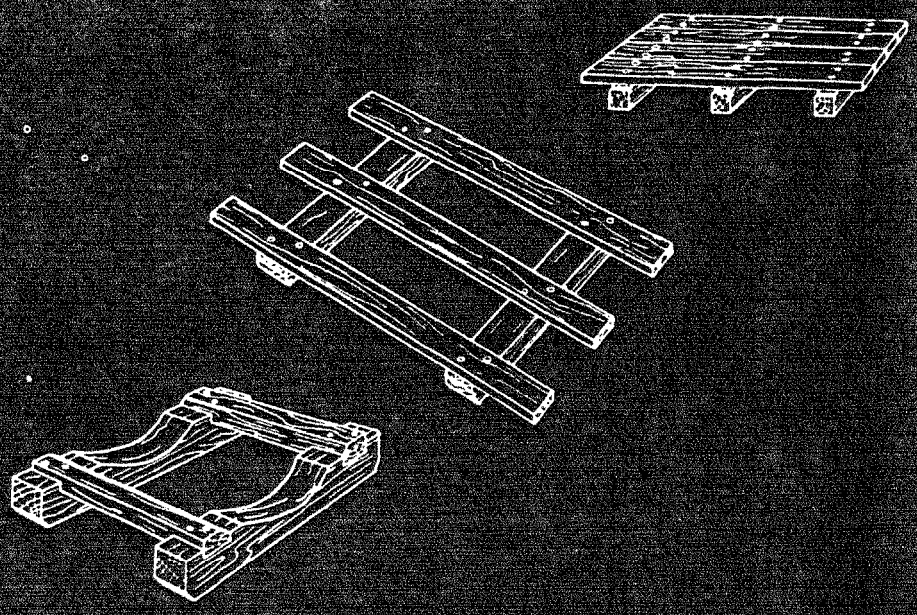
The market for WOOD PALLETS in the steel industry

by Tony C. Carlson



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The market for WOOD PALLETS in the steel industry

A Growing Industry

FROM almost nothing before World War II, the wood pallet industry has grown into a $220-million-per-year industry. It now provides the third largest market for domestic hardwood lumber. In 1963 it consumed nearly 1.3 billion board feet — more than 17 percent of the total national hardwood lumber production.[1] While serving nearly every other manufacturing industry, the wood pallet industry has also become important to the economies of forest-dependent communities in the hardwood region.

We know about some of the general problems of pallet manufacture, marketing, and use; and we know that demand is probably growing faster for wood pallets than for any other major lumber product.[2] Yet except for one study[3] we have little specific information about the characteristics of the various pallet markets. To maintain and expand the pallet industry, and to facilitate efficient utilization of the forest resource, we need to know more about the individual markets for wood pallets.

[1] Based on annual statistics of the National Forest Products Association and the National Wooden Pallet Manufacturers Association.

[2] Lucas, J. T. A PROBLEM ANALYSIS OF THE WOOD PALLET INDUSTRY. Unpublished report on file at the U. S. Forest Products Marketing Laboratory, Princeton, W. Va. 61 pp., illus., 1965.

[3] Sutherland, C. F., Jr. THE MARKET FOR WOOD PALLETS IN THE AUTO INDUSTRY — A CASE STUDY OF THE FORD MOTOR COMPANY. U. S. Forest Serv. Lake States Forest Exp. Sta. Paper 104, 10 pp., illus., 1962.

The Study

To examine the extent, stability, and opportunities for expansion of the market for wood pallets in the steel industry, a study was undertaken by the Forest Products Marketing Laboratory of the U. S. Forest Service's Northeastern Forest Experiment Station.

The wood pallet market cannot be considered as a homogeneous unit to be studied in its entirety. Each industrial segment served by the pallet industry has its own peculiar market characteristics and unique marketing problems. Therefore, these segments should be examined separately.

The steel industry was selected for investigation because it comprises the major part of the fourth largest industrial user of wood pallets (fig. 1) and because it offers a concentrated and

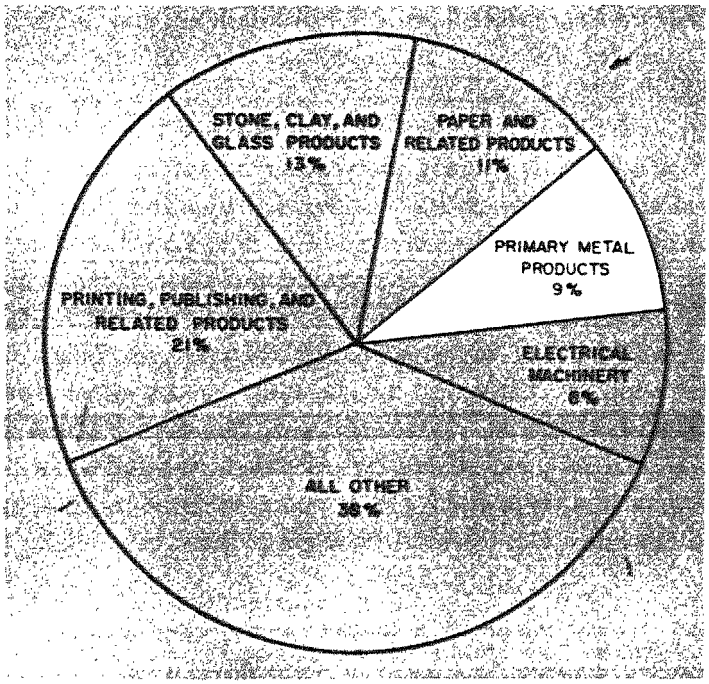


Figure 1.—Use of wood pallets by manufacturing industries in the United States, 1960. Source: Gill, T. G., WOOD USED IN MANUFACTURING INDUSTRIES; U. S. Forest Serv. Statist. Bull. 353, 1965.

Table 1. — Important concentrations of steel rolling and finishing mills in the United States[1]

State	Major cities	Number of firms		Number of employees
		Total	Firms with 20 or more employees	
Pennsylvania	Bethlehem Pittsburgh	69	53	100,000
Ohio	Akron Cleveland Youngstown	80	76	93,000
Indiana	Gary	26	24	58,000
Illinois	Chicago	71	52	45,000
New York	Buffalo	51	32	32,000
Michigan	Detroit	31	29	21,000
Alabama	Birmingham	21	21	21,000
California	Los Angeles San Francisco	61	39	19,000
West Virginia	Weirton Wheeling	14	11	16,000
Massachusetts	Worcester	39	31	6,000
Kentucky	Louisville	8	8	6,000

[1]States with more than 5,000 employees in the study category (SIC 331). Source: U. S. Department of Commerce, Census of Manufacturers vol. III, Area Statistics, 1958.

specialized market for pallet producers in the Appalachian Region (table 1).

Nine of the largest steel corporations in the United States were studied. Their combined production accounts for about 73 percent of the total American steel product output and, as nearly as could be determined, they use at least that percentage of the steel industry's wood pallets.[4, 5] So although the sample is not truly representative of the entire steel industry in size of firm, the unsampled portion is composed principally of the smaller mills, which, it has been assumed, follow the general pattern of the leaders in pallet use.

[4]United States Bureau of the Census. 1958 CENSUS OF MANUFACTURES. VOLUME 1: SUMMARY STATISTICS. Washington, D. C. 1958.
[5]Editors of Fortune. THE FORTUNE DIRECTORY. Time, Inc., N. Y. 40 pp., 1964.

The nine firms were sampled in three steel-producing states: Ohio, West Virginia, and Pennsylvania. Their operations here were reported to typify the pallet-using policies of other steel centers as well. Most of the sample companies have mills in several geographically separate areas; and among these plants, pallet use and purchasing practices are consistent. Therefore, no geographic bias is expected.

To obtain the required data, purchasing officers in the nine firms were personally interviewed. Emphasis was focused on obtaining the customer's point of view because it was felt that his products, problems, and attitudes finally determine the salability and market characteristics for wood pallets.

Since there is no clear distinction among the various types of industrial platforms, the term *pallet,* as used here, also means all units that might otherwise be called bases or skids.

The Present Market

The term *steel industry* as used in this paper is best defined by the Census Bureau's standard industrial classification (SIC) 331: blast furnaces, steel works, and rolling and finishing mills. Gill's statistics on wood-product consumption indicate that this industry used about 69 million board feet of lumber for pallets in 1960.[6]

Collectively, the nine sampled firms consumed about 59 million board feet of lumber for pallets in 1964. Based on this estimate, and assuming that the level of pallet use is proportional to company size, the entire steel industry used approximately 81 million board feet of pallet lumber in 1964, nearly all of which was hardwood. This amounted to about 1.9 board feet of lumber per ton of palletizable steel product.

The present market for wood pallets in the steel industry is characterized by four main features: pallet style and size, expendability of pallets, number and type of pallet producers, and the problem of who makes the pallets (fig. 2). On the one hand, these

[6]Gill, T. G. WOOD USED IN MANUFACTURING INDUSTRIES. U. S. Forest Serv. Statist. Bull. 353, 121 pp., 1965.

characteristics affect classical market forces and functions such as price, channel of distribution, and storage; and they are in turn influenced by several factors of both the pallet and steel industries.

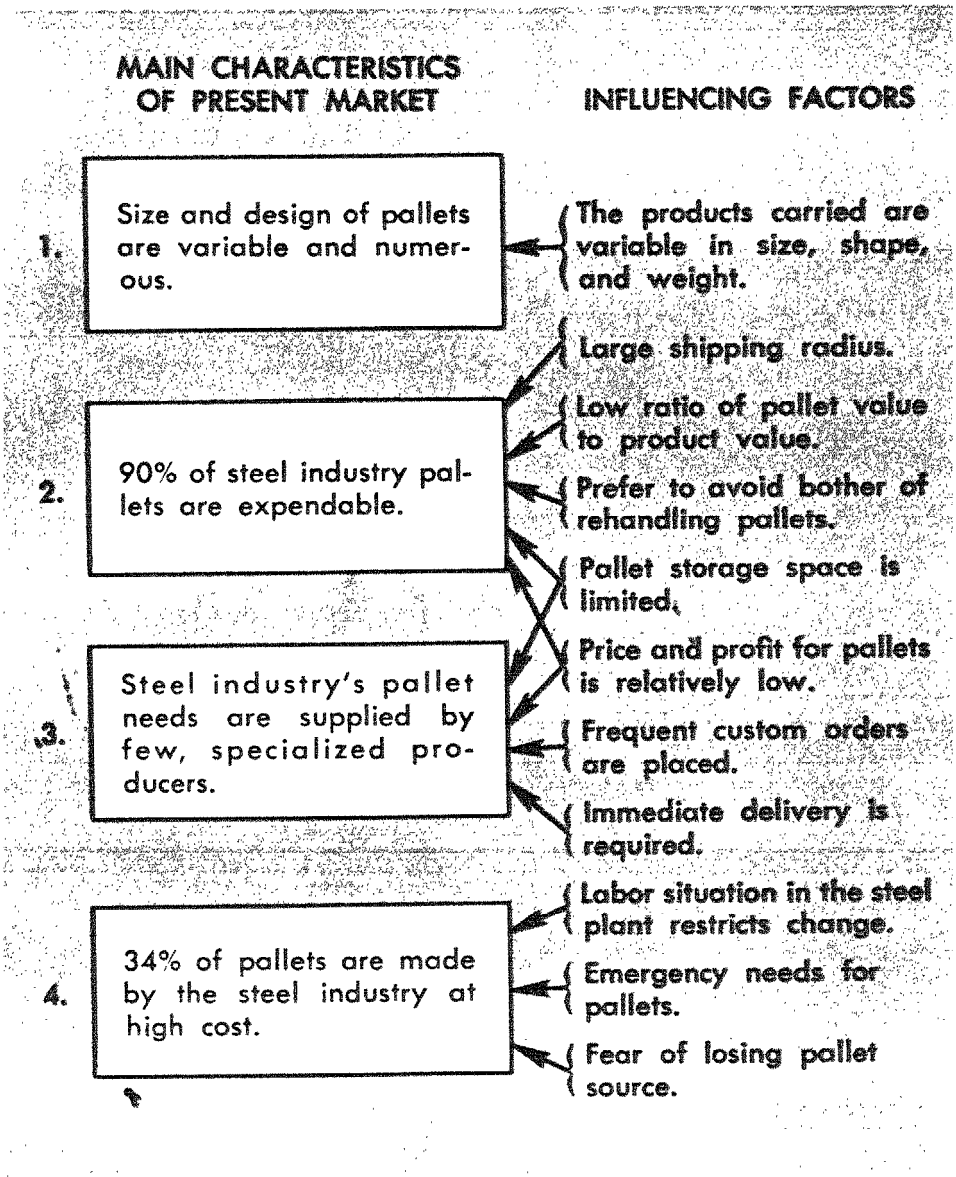


Figure 2. — Factors affecting the characteristics of the market for wood pallets in the steel industry.

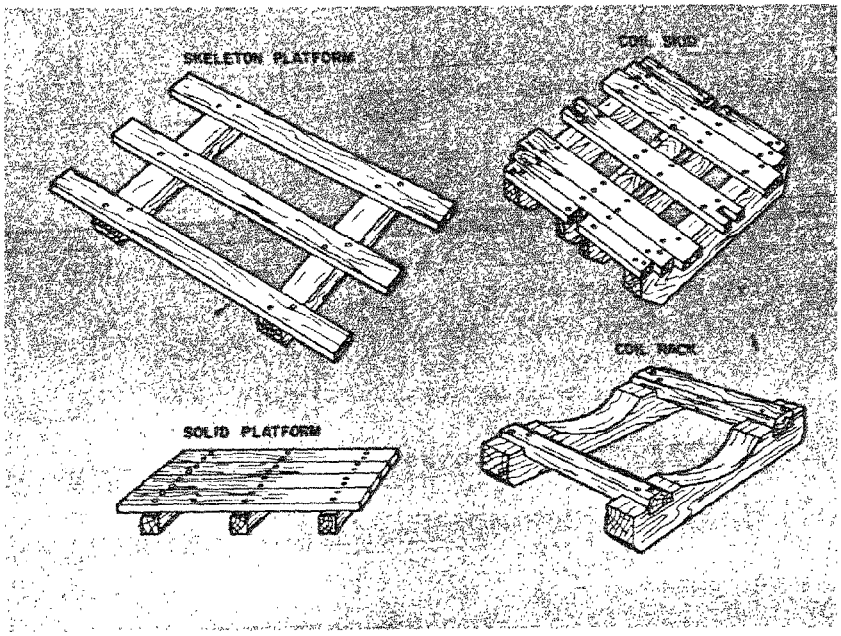
PALLETS USED

Variability and Products Carried

The style and size of pallets used in any establishment are determined mainly by the product to be carried. As it happens, palletizable products of the steel industry vary greatly in size and shape and, as a result, the design of pallets also varies — so much, in fact, that one company said it uses as many as 1,700 different style-size combinations. Besides the common double-faced warehouse pallet, as many as 30 other styles of wood platforms are in use — all in several sizes. So the wood pallet is essentially a custom item in the steel industry.

The more primary segments of the steel industry have little use for pallets: ingots, bars, rails, and pipe are so heavy and unwieldy that they are usually handled individually and not palletized. The greatest users of pallets are the mills that produce flat or formed rolled stock such as plain, galvanized, coated, or electrical sheet; strip metal; tin plate; and corrugated roofing.

Figure 3. — Examples of wood pallets used in the steel industry.



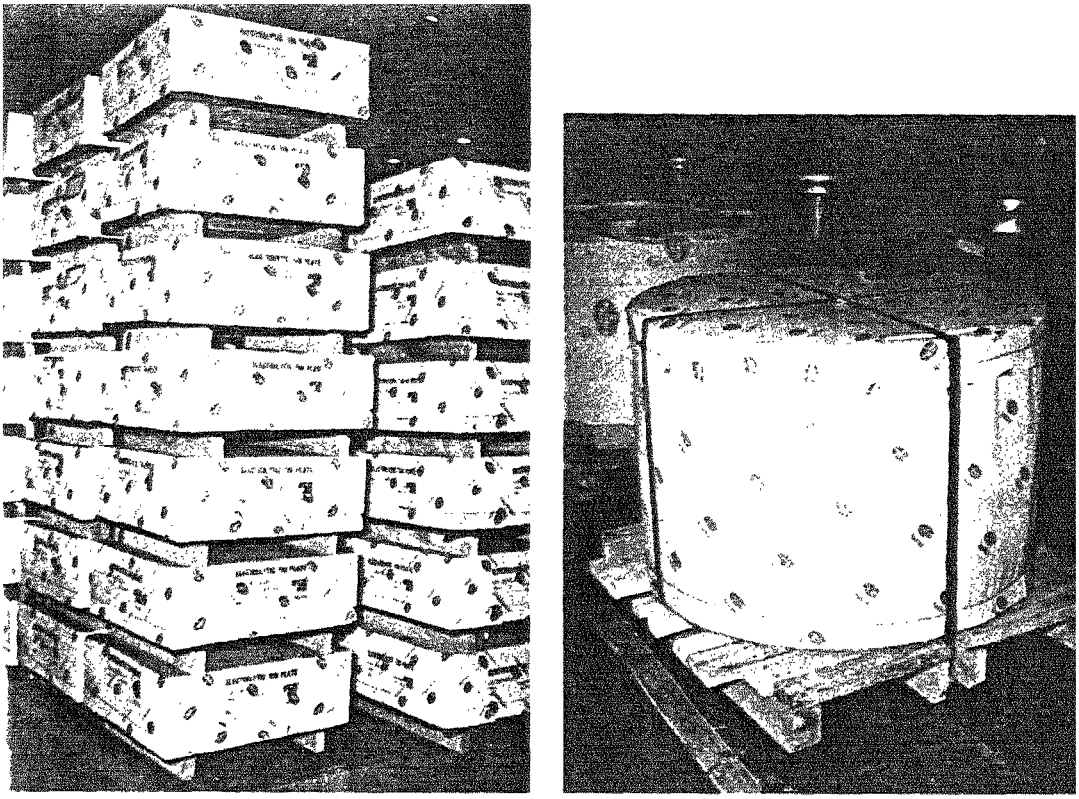


Figure 4. — Palletized steel products on wood pallets. Left, tin plate cut lengths on solid platforms. Right, tin plate coils on coil skids. (Photos by courtesy of Wheeling Steel Corporation.)

These products are handled both as cut-to-length sheets and in coils. The cut stock is stacked and palletized in loads that may weigh up to 5 tons. Coils commonly weigh as much as 10 to 15 tons and require specially designed platforms called coil skids (fig. 3). The coil skids comprise about 10 percent of the pallets used in the industry. Use of two common types of pallets is illustrated in figure 4.

Usual destinations for palletized loads of the rolled steel products are secondary manufacturers such as can companies and stamping mills.

Several other products are palletized in the steel industry, although not to the extent of the rolled sheet material. These include items such as drawn wire, nails, staples, and fencing stock.

Expendability

Pallet buyers reported consistently that about 90 percent of their wood pallets are the one-trip expendable type. Only certain types of coil skid are considered returnable by most companies; $6 is paid for the return of a $12 platform in good condition. Pallets are also considered returnable when they can be gathered and returned in carload lots, sorted by size and style. But this happens only occasionally in companies that ship a large number of a particular size of pallet load to a single steel buyer. In one such case, 40¢ was paid for returned pallets that cost about $1.50 new.

Although most pallets are not returned to the steel mills, they may be reused or burned by the receiver — and most probably are burned. These expendable platforms generally arrive in good condition because quality, especially strength, is important in their manufacture. Strength is almost always a design criterion, regardless of other factors, because of the heavy loads and high value of the product carried.

Several reasons were given for the high percentage of expendable pallets used. First, pallet storage space in the steel mills is limited. And with the large number of pallet variations needed, accumulation of a working inventory of each type would be virtually impossible. The largest pallet inventory mentioned was 300 to 400 pallets, a negligible amount compared with the number used.

Second, most steel mills service a variety of customers over a rather large shipping radius. Under these conditions, it would be difficult and costly to maintain control of a pallet-return program.

Third, the value of the pallet is low in relation to the value of load carried. Therefore it is considered to be a minor cost item when viewing the load and pallet as a unit. The relatively low initial price of the pallet allows it to remain an expendable item.

A fourth factor is probably quite important in influencing the decision to use expendable pallets: most mills simply do not want to be bothered with rehandling. Consequently, these pallets are expendable by virtue of business policy, not on the basis of quality.

Besides the stated advantages, using expendable pallets may have other effects. On the positive side, the use of low-quality raw material, which seems to be in abundance, is increased by manu-

facture of expendable pallets. More raw material is consumed than if the product were reusable. This is desirable considering the viewpoints of sawmill operators, pallet producers, and resource managers toward efficient raw-material utilization. On the other hand, the image of all pallets could be affected negatively because expendable items tend to be viewed as being of rather low quality.

Specifications

Besides dimensions, the most common pallet specification issued by the steel industry concerns the type of nail to be used. Helically threaded or annular grooved nails are usually called for.

Air-dry lumber is usually specified for deckboard material because water from green deckboards might bleed through into expensive packages and cause rusting or tarnishing of the steel products. This was so important in one plant producing lithographic sheet that steel pallets were used for in-plant transport and storage. The only requests for particular species turned out to be indirect moisture-content specifications: three of the largest users require deckboards made of gum (presumably *Nyssa sylvatica)* because it could be obtained air-dry and because it does not check so badly as oak. However, most of the companies requested mixed hardwoods.

Although all companies issue some quality specifications, these specifications are rather loose, and only one firm reported that it stipulates limits for defects in the pallet parts. The situation can be summed up in the statement of one respondent: "There are few really direct specifications given—just an understood level of quality. If nails are popping or too many checks occur, we just tell the supplier and he figures out what to do about it." The procedure seems to be effective as long as close interindustry relations are maintained.

Prices

The platforms for cut-sheet products represent about 90 percent of the pallets used in the steel industry. They vary in price, depending on design, from about 90¢ to $5 (11 to 17¢ per board foot).

Design and price of coil skids are less variable. Differences in the

few main styles depend on whether the eye of the coil is placed vertically or horizontally. The most common coil skid (eye vertical — see figures 3 and 4) is used almost universally and is exchanged freely among companies. It costs about $12. One firm pays $22 for a special type of heavy-duty skid.

All companies considered current prices to be fair and would not be willing to pay more for a better platform because, "We get what we want now." In other words, the customer is making his needs known and the supplier is meeting them.

USER-SUPPLIER RELATIONSHIPS

Purchasing Practices

Only minimal pallet inventories are maintained at the steel mills, so pallet orders are placed with manufacturers as fast as requests for palletizable steel products are received. Nearly all the mills that purchase pallets order at least twice a week; more than half order daily. Receipt of pallets at the steel mill is sometimes expected within hours of an order. This practice places a great burden of service on the pallet manufacturer: he must be able to supply on very short notice any of the numerous designs and sizes of platform.

The implications of this procedure are clear. To provide this specialized service, the pallet manufacturer is rarely located more than 30 miles from the steel mills he serves. And he must have a versatility of operation that enables him to fill the frequent, diverse, and hurried orders that come in.

All but one of the respondent firms bought directly from the pallet manufacturer; over 95 percent of the pallets purchased were procured in this way. It was stated that the level of service required of pallet suppliers demands close liaison between industries. The only company to complain of service and quality problems was one who purchased pallets through brokers.

Number of Suppliers

As a result of the demand by steel companies for hard-to-render services, a small number of manufacturers successfully dominate the pallet supply side. These are the few pallet producers who are

strategically located and equipped to supply their high-service, low-margin product.

The rather stable interdependence that has developed between the two industries appears to reduce the opportunities for other wood pallet manufacturers to enter and sustain themselves in the steel-industry market. Although most steel mills reported that they do search out other pallet sources, they tend to retain present suppliers who have proved themselves able to provide the necessary services. Therefore, it may be difficult for outside pallet producers to compete with those already established.

Most steel-company purchasing offices had been visited by several pallet manufacturers who, for the most part, did not seem to be effective salesmen. A common statement in this respect was, "They know how to make pallets but don't know how to sell them. They seem to be afraid to sell their products." This viewpoint indicates that opportunities may exist for improving the pallet market by improving salesmanship and by maintaining more direct sales contacts with steel-industry customers.

MAKE OR BUY?

In 1964 about 66 percent (53 million board feet) of the steel industry's pallets were purchased in finished form. The remainder (28 million board feet) were made within the steel mills.

In pursuing the question of why steel manufacturers are in the business of making pallets, only one firm expressed a real desire to continue doing so. Purchasing agents agreed that homemade pallets cost steel companies up to twice as much as those purchased from independent pallet manufacturers. For profit and cost-conscious organizations such as steel firms, production of large quantities of wood pallets at unnecessarily high cost is rather difficult to understand. The reasons given for making pallets in the steel mills were to satisfy special rush orders or special designs and to hedge against loss of outside pallet sources. The fact remains that this practice is admittedly uneconomical, and it may present pallet manufacturers with opportunities to extend their markets.

Circumstances leading to the present practice go back to the beginning of large-scale pallet use in the steel industry, when there

were few commercial sources of pallets. Small carpenter shops were set up in the steel mills and some mills even established complete box factories. Since operation of these shops was usually intermittent, the labor force often consisted of union steelworkers. As the demand for palletized material grew, the operations became continuous; and at present, labor policies restrict the replacement of these men by the unskilled labor commonly used in independent pallet plants. Consequently, respondents said that the extra cost of platform production by steel mills is due mostly to higher labor costs.

The Outlook

The role of wood in this market seems assured. Steel-industry officials expressed a high level of satisfaction with the pallets they receive. They consistently referred to expendability and adaptability to fabrication as the factors that favor wood as the best raw material for pallets. Most of the sample firms have considered and experimented with other materials such as steel, plastics, and fiberboard; but in all cases these materials were considered too costly to merit use.

Figure 5. — Changes in production of palletizable steel products, 1959-64.

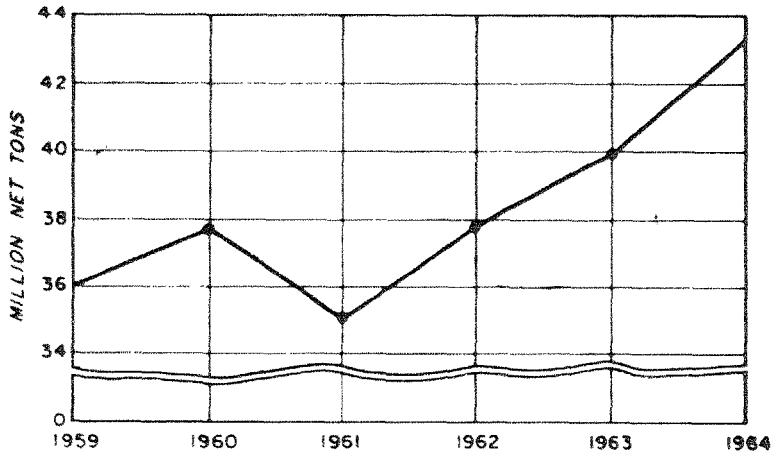


Table 2. — Shipments of palletizable steel products in the United States, 1959-64

(In millions of net tons)

Product	1959	1960	1961	1962	1963	1964
Rolled products:						
Hot-rolled sheets	7.8	8.0	7.0	7.8	8.8	9.9
Cold-rolled sheets	12.7	14.5	12.2	13.5	14.5	15.7
Galvanized sheets	2.7	3.1	3.3	3.5	3.9	4.4
Coated sheets	.3	.3	.3	.3	.4	.5
Electrical sheets	.6	.6	.5	.6	.5	.6
Strip	2.6	2.7	2.5	2.8	2.9	3.0
Black plate	.6	.6	.5	.5	.4	.4
Tin plate	5.2	5.5	5.6	5.6	5.4	5.7
Wire products:						
Drawn wire	2.7	2.4	2.4	2.5	2.5	2.5
Nails and staples	.4	.3	.3	.3	.3	.3
Other	.2	.2	.3	.3	.3	.3
Total	35.8	38.2	34.9	37.7	39.9	43.3

Source: American Iron and Steel Institute. Form AIS-16: Shipments of steel products by market classifications. 1959-64.

Barring new innovations and drastic changes in the present market structure then, the use of wood pallets in the steel industry will undoubtedly increase as production of palletizable goods increases. Although no estimates of future production of palletizable steel products are available, statistics for the last 6 years reveal a definite rising trend (fig. 5 and table 2). The average increasing rate of production for palletizable steel products has been about 4 percent per year over the 6-year period. If the trend can be taken as an approximation of normal growth, and if it continues for the next 5 years, pallet use in the steel industry could rise from the present level of 81 million board feet to 104 million board feet by 1970.

A longer-range indication of what the future might bring is the Forest Service projection of total demand for wood pallets (fig. 6). Assuming that steel mills will retain their current share of the pallet market, continuation of this trend could mean an annual steel-industry consumption of 154 million board feet of pallet lumber by the year 2000.

The opportunities for pallet manufacturers to enter or increase

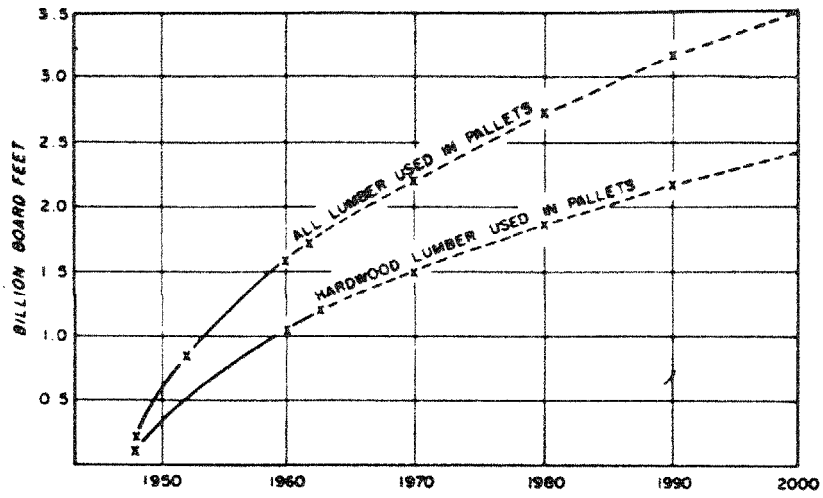


Figure 6. — Projection of total wood pallet use in the U. S. Source: U. S. Forest Service, TIMBER TRENDS IN THE UNITED STATES. U. S. Forest Serv. Forest Resource Rep. 17, 235 pp., 1965.

operations in the steel industry market appear to hinge on exploiting two of its characteristics:

- By maintaining the quality of pallets and the favorable status of wood, they can take advantage of increasing manufacture of palletizable steel products.
- Through better salesmanship and more direct sales contact with steel-mill customers, they may be able to invade the "home-made" pallet market; that is, to substitute, at a cost advantage, commercial pallets for pallets made in the steel mills.

An excerpt from a recent article on industrial-materials handling indicates a prevailing attitude that could affect all future pallet markets: "It took a lot of doing to introduce the pallet, which allowed mechanical handling. The next step may be to move from the pallet to some standardized form or forms of unit load so that greater savings may be had . . . then, of course, the pallet as we know it can be eliminated." [7]

[7] Berkwitt, G. J. MATERIAL HANDLING — A LOOK AT THE FUTURE. Mill and Factory 74(11): 91-100, 1964.

And this statement is essentially fair, for wood pallets could not long survive in competition with truly superior products. Although superiority of substitutes has not been shown, they are becoming more competitive; and the wood pallet industry can expect to maintain and accelerate its economic growth only by continual improvement of production efficiency, product quality, and merchandising techniques.