

A BRIEF LOOK AT RAW MATERIAL USAGE IN THE FURNITURE AND CABINET INDUSTRIES IN THE SOUTHERN UNITED STATES

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ABSTRACT

Although particleboard and medium density fiberboard are primary products used in the manufacture of value-added wood products such as furniture, cabinets, and millwork, other raw materials such as engineered lumber and structural panels are also used. A study was conducted to examine the use of wood-based raw materials by furniture and cabinet manufacturers in the southern United States. The study addresses technical, economic, and performance characteristics. It was found that 42 percent of the total value of raw materials used by respondents in 1999 was comprised of hardwood lumber, followed by hardwood plywood. Newer engineered wood products (laminated veneer lumber [LVL] and laminated strand lumber [LSL]) were used by only 1 percent of respondents. No respondents used oriented strandboard (OSB). Respondents in all industry sectors studied said that they planned to increase usage of lumber and plywood. The main reason respondents are not using OSB, LVL, parallel strand lumber, and LSL is customer objections.

Solid lumber and plywood have traditionally been used as framing materials in the furniture and cabinet industries. However, prices for both solid lumber and plywood have been steadily increasing in recent years. Structural panels (i.e., oriented strandboard [OSB]) and engineered lumber, including laminated veneer lumber (LVL), parallel strand lumber (PSL), and laminated strand lumber (LSL), may provide an alternative to traditional framing materials. These products are manufactured with no core voids, knotholes, or delamination problems. They can be easily sawn, drilled, nailed, planed, filed, sanded, or painted to meet design specifications. As a result, the products have been designed for numerous industrial applications including

RV/campers, truck bodies, pallets, furniture frames, displays, shelving, construction barriers, racks, packaging, crating, void forms, bins, trunks, and overlaid cores (2).

Acceptance of new products by manufacturers and their customers has always been a slow process. A recent study

on the use of particleboard and medium density fiberboard (MDF) in the southern furniture industry (7) showed that customer objection was one of the primary reasons for the manufacturers not to use the industrial panels.

The objective of this study was to develop information on customer perspectives regarding lumber and engineered wood products and to determine the selection criteria used by the manufacturers based on technical, economic, or performance characteristics. A better understanding of reasons for acceptance or rejection of structural panels and engineered lumber as raw material for furniture and cabinet framing could lead to further expansion of their uses by manufacturers and better sales and marketing by the raw materials manufacturers and distributors. This study is a companion to research conducted by the authors on the use of particleboard, MDF, and plywood as raw materials in the furniture and cabinet industry in the southern United States (7).

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TABLE 1. — Percent of raw materials used (by value) by the manufacturing sector in 1999 (n = 80).

	Kitchen cabinets	Household furniture	Upholstered furniture	TV, radio, etc., cabinets	Office furniture	Office and store fixtures
	----- (%) -----					
Hardwood lumber	24	61	73	12	36	9
Hardwood plywood	27	13	4	38	19	27
Particleboard	16	4	3	23	12	28
MDF	6	10	0	7	18	12
Softwood plywood	11	2	5	8	6	12
Softwood lumber	6	4	8	8	6	7
LVL	1	1	2	0	1	4
LSL	1	0	0	0	0	0
Total	100	100	100	100	100	100

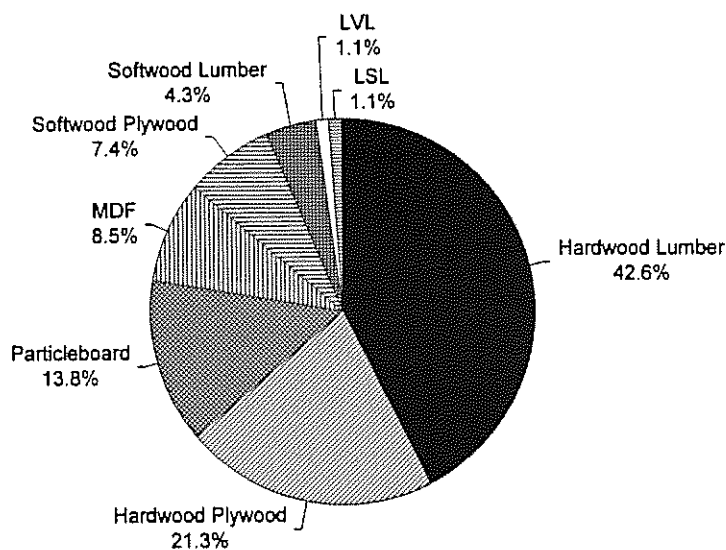


Figure 1. — Percent of 1999 total raw material usage by value. (No usage of PSL was reported.)

METHODOLOGY

We examined solid lumber (hardwood and softwood), OSB, and engineered wood products (PSL, LVL, and LSL) usage by furniture and other value-added manufacturers in the southern United States (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas) in six Standard Industrial Classification (SIC) categories.¹

A random sample of 1,340 companies in these SIC categories was drawn from the 1997 PhoneDisk PowerFinder CD-

ROM directory (1). This is the same sample frame used by Wu and Vlosky (7) in the study of panel usage in this industry. The study was conducted using mailed surveys. The survey instrument was modified from a 1999 study by Wu and Vlosky (7), which, in turn, was an iteration of surveys that examined the structure of the hardwood dimension and wood component industries (6) and the furniture industry in the southern United States (5). Survey development and implementation followed methods and procedures recommended by Dillman and described as the Total Design Method (TDM) (3). Accordingly, mail questionnaire procedures included pre-testing, pre-survey notification of the initial mailing, a post-survey reminder, and a second survey mailing. Of the 1,340 surveys mailed, 161 were undeliv-

erable because the company had moved or had gone out of business, 8 were inappropriate industries, and 8 companies requested removal from the study. Of the remaining companies, 88 surveys were returned and 80 were usable, resulting in a response rate of 7 percent. Due to the low response rate, we can only consider this study to be exploratory.

Second-mailing respondents, often used as a proxy for non-respondents (4), were compared to first-mailing respondents across all study questions. By examining differences between the respondents to the two mailings using two-tail t-tests, statistically significant differences (at $\alpha = .05$) were found for 2 of the 12 questions that could be compared in the study. Larger companies, as measured by 1999 gross sales and number of employees, were more prevalent in the second mailing.

RESULTS AND DISCUSSION

Just over 36 percent of respondents said kitchen cabinets were their major product line, with another 20 percent primarily in the non-upholstered furniture sector. Five percent of respondents produced TV, radio, and other cabinets. With regard to geographic location, just over a quarter of respondents were from Texas, followed by North Carolina with 17.7 percent. The least-represented states were South Carolina, Mississippi, Louisiana, and Arkansas with 2.5, 5.1, 8.9, and 5.1 percent of respondents, respectively.

Average 1999 sales for all respondents ($n = 76$) was \$5.4 million, with just under two-thirds of respondent companies having sales of less than \$1 million. Twelve percent of respondents had sales over \$10 million. Respondents that produced non-upholstered furniture as their primary product had the highest

¹ 2511-wood household furniture, except upholstered; 2512-wood household furniture, upholstered; 2521-wood office furniture; 2434 wood kitchen cabinets; 2517 wood television, radio and other cabinets and; 2541 wood office and store fixtures, partitions and shelving.

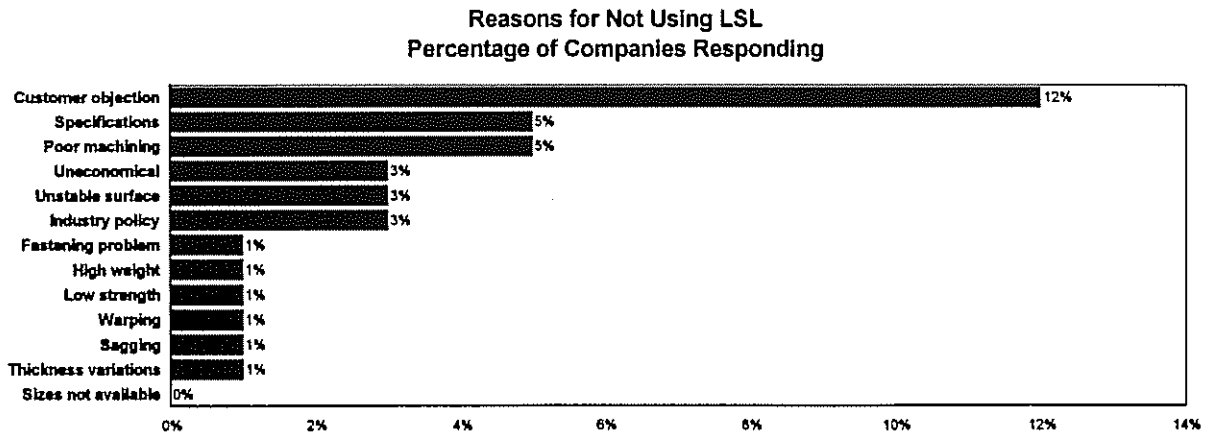
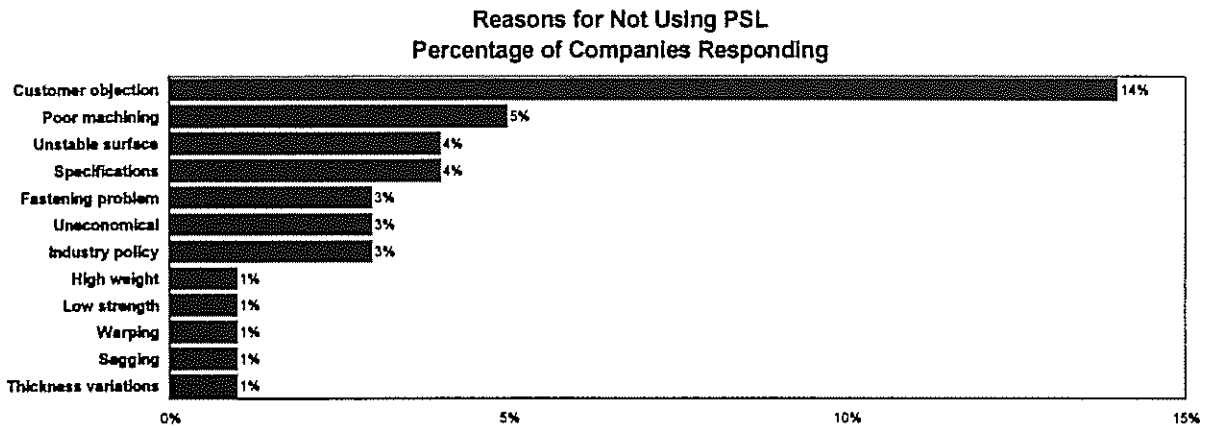
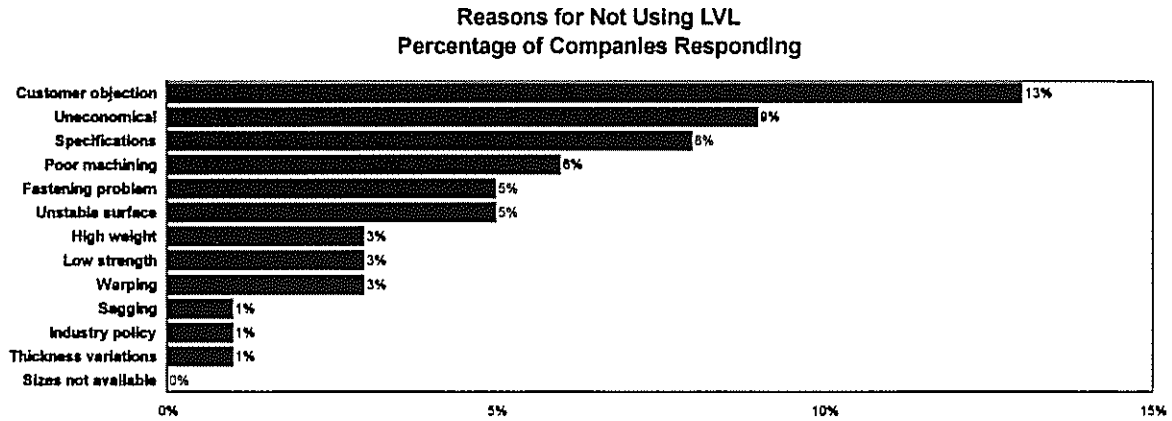
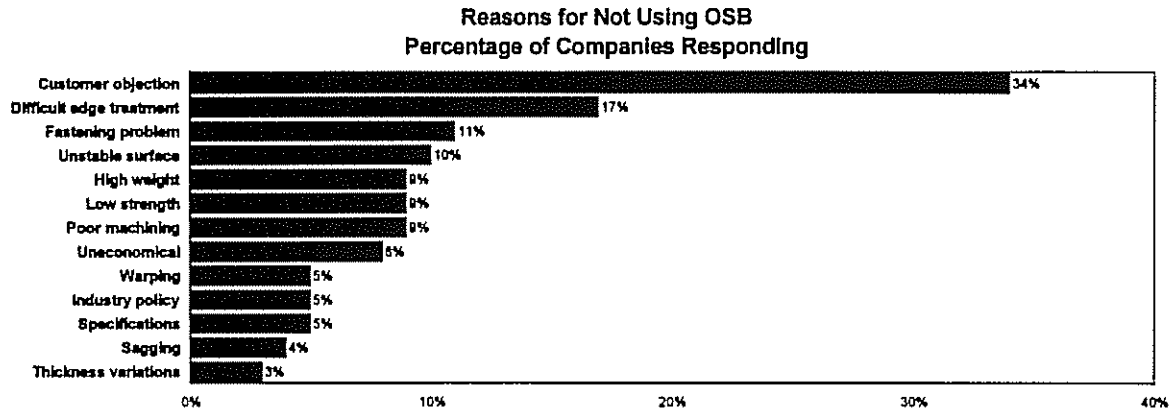
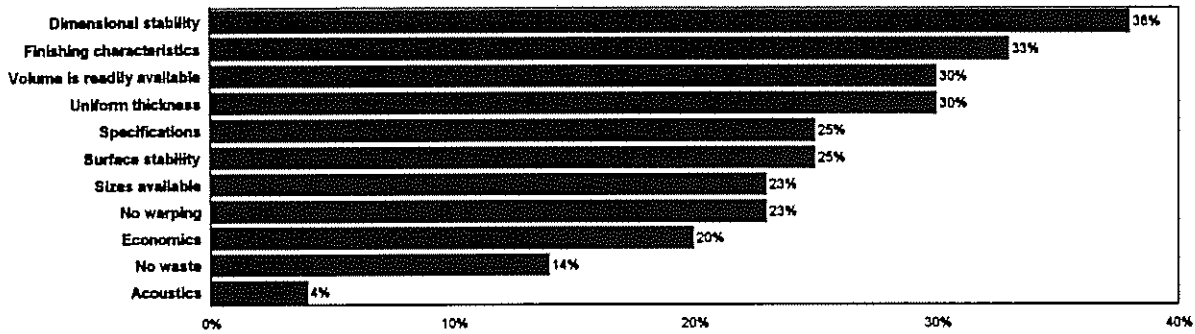
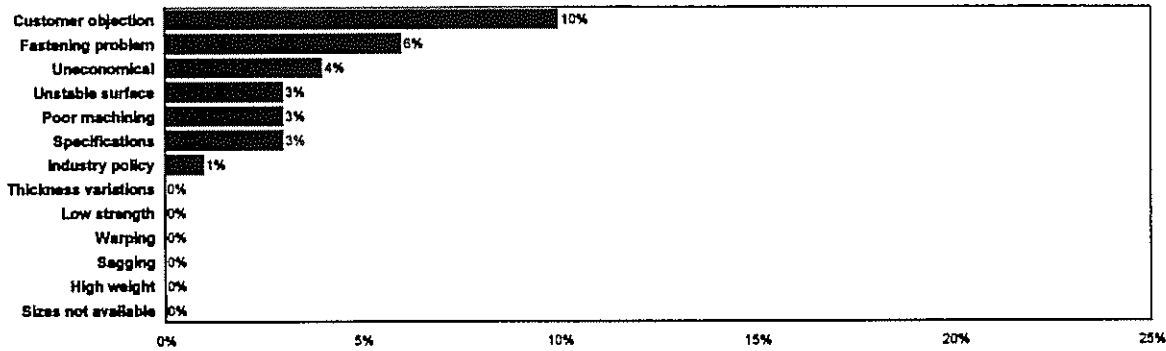


Figure 2. — Respondent reasons for non-usage of OSB and engineered wood products.

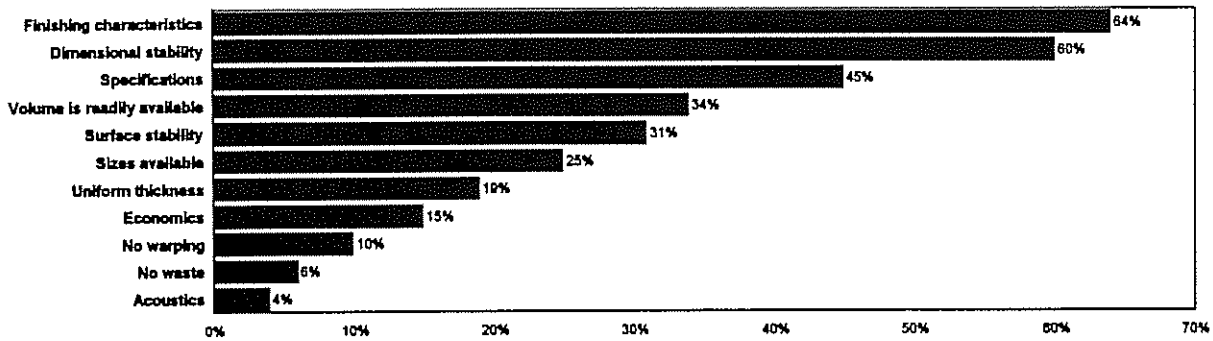
**Reasons for Using Plywood
Percentage of Companies Responding**



**Reasons for Not Using Plywood
Percentage of Companies Responding**



**Reasons for Using Solid Lumber
Percentage of Companies Responding**



**Reasons for Not Using Solid Lumber
Percentage of Companies Responding**

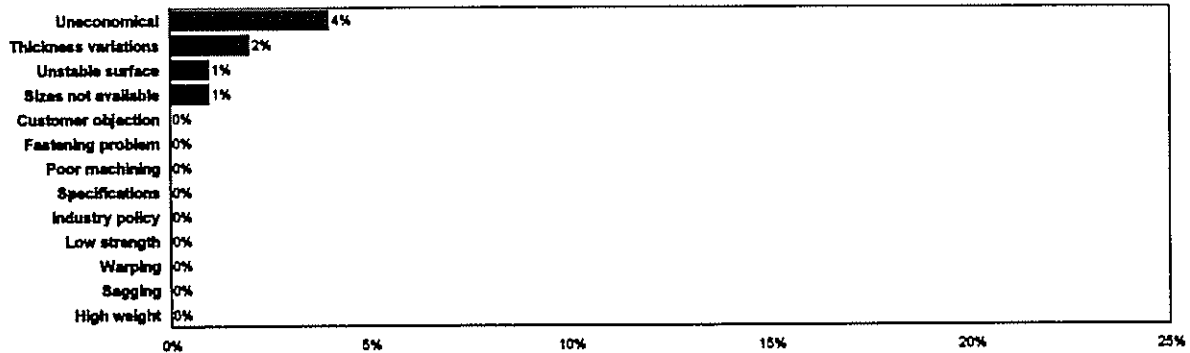


Figure 3. — Respondent reasons for usage and non-usage of plywood and solid lumber.

average 1999 sales (\$62.0 million) and highest average number of employees (592 employees). This was followed by upholstered household furniture (\$3.3 million; 47 employees). TV, radio, and other cabinet producers had the lowest level of sales (averaging \$270,000 in 1999 sales) and they had an average of 4 employees per firm. An interesting demographic is the average sales per employee. Non-upholstered furniture respondents had the highest average at \$105,000/employee and TV, radio, and other cabinet employees produced the least at an average of \$68,000/employee.

Hardwood lumber was the most used raw material (by value) in 1999 by all respondents combined, accounting for 42.6 percent of total raw material value (Fig. 1). Following hardwood lumber was hardwood plywood, particleboard, MDF, softwood plywood, softwood lumber, and engineered wood products (LVL and LSL). When analyzed by end-use segment, hardwood lumber was the most cited raw material, by value, non-upholstered household, upholstered and office furniture. Hardwood plywood was most cited for kitchen cabinets and TV, radio, and other cabinets while particleboard ranked first for office and store fixture manufacturing (Table 1).

Respondents were asked if they planned to increase or decrease their usage of solid lumber, plywood, LVL, PSL, and LSL in the future. An average of 61 percent and 54 percent of respondents said that they planned to increase usage of solid lumber and plywood. The few companies that currently use engineered wood products (LVL, PSL, LSL) in the kitchen cabinet sector plan to increase their usage, while those in the office and store fixture sector said they plan to decrease usage.

Respondents were asked the reasons that they use or do not use the wood-

based materials discussed in this study. Very few respondents currently use OSB, PSL, LVL, and LSL; Figure 2 shows the main reasons for not using these products. The common element for the four products is that customer objection is the number one reason for respondents not using them. Therefore, the inference is that derived demand from downstream customers is an influence on whether these raw materials are used by the manufacturers in this study. The absence of OSB and OSB-like products for use in furniture may be for the simple reason that they are aesthetically challenged. Unfortunately, this was not on the menu of choices that respondents could check because the assumption was that OSB would be used in non-appearance applications. This omission may have altered the result of "customer objection" being the chief reason for product rejection. The same argument could be made for LVL, LSL, and PSL. OSB and similar structural products are used in furniture, but mostly in upholstered furniture where they are hidden from view.

With regard to the raw materials that respondents are currently using in great volumes, Figure 3 shows the reasons for respondent usage and non-usage of plywood and solid lumber. For plywood (hardwood and softwood combined), the top-rated reasons for usage were dimensional stability, finishing characteristics, readily available volumes, and uniform thicknesses. The main reason for non-usage was customer objection, followed by fastening problems.

For solid lumber, 64 percent of respondents said they used this product due to finishing characteristics, closely followed by dimensional stability (60% of respondents). The main reason that respondents do not use solid lumber is that it is uneconomical for their desired

uses. However, this was cited by only 4 percent of respondents.

SUMMARY

Panel products such as particleboard and MDF are important raw material inputs for the furniture, cabinet, and allied industries. However, there are other wood-based products that are currently used or have the potential to be used in these applications.

This study identified the usage and relative importance of these additional inputs for six value-added secondary wood manufacturing industries. Survey respondents indicated the characteristics that encourage or discourage them from using these products. This information is useful to companies in the secondary industries discussed in the paper because it helps them to understand their own industry structure. In addition, the information is important to suppliers to furniture and cabinet manufacturers.

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