Perception of lightweight panels by U.S. manufacturers

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Study Overview[1]

Opportunities exist for the adoption of lightweight panels by the secondary wood industry in the United States, as 54 percent of respondents to a recent survey indicated they would seriously consider using such panels in their products. In particular, office/hospitality/contract furniture, as well as store and architectural fixtures, seemed to hold the most promise for lightweight panels according to respondents. Overall, respondents were somewhat neutral in their perception of lightweight panels, perhaps due to a lack of information about performance. The biggest challenges to greater adoption appeared to be the negative perceptions related to connecting lightweight panels to hardware and other components, issues that are being resolved by panel manufacturers.

About the Study

The internet-based survey was conducted by Virginia Tech and FDM magazine in the summer of 2008, with 141 responses being received from FDM subscribers. Most respondents were company owners (36 percent) or involved in corporate/operating management (32 percent) and came primarily from the kitchen/bath cabinets industry (35 percent), the furniture (household, office, hospitality, and contract) industry (25 percent) and the architectural fixtures industry (14 percent). Over 60 percent produced products at a medium-to-high to high price-point, while another 27 percent produced at a medium price-point. Most (58 percent) used a combination of solid wood and composite products as wood material inputs while 25 percent used mostly wood composite or engineered products in their manufacturing processes. Over 57 percent of the sample had 1 - 19 employees and another

[1] Contents of this paper originally appeared in *FDMONLINE*, posted October 16, 2008: *Office furniture, fixtures promising for lightweight panels* by U. Buehlmann, K. Forth, and M. Bumgardner

15 percent had 20-49 employees. Similarly, 44 percent had sales under $1 million and another 34 percent had sales of $1 to $10 million. Almost 22 percent of the respondents reported using lightweight panels in some of their products.

Perception of Lightweight Panels

Respondents were asked to indicate their level of agreement with several statements assessing their perception of lightweight panels. These results are shown in Figure 1. The trend was generally one of neutrality. Most scale averages hovered around the mid-point of 3.0, suggesting neither strong agreement nor disagreement with the statements. The strongest agreement came with the statement that external information sources (such as suppliers, other firms, universities, consultants, etc.) would be important to better understanding use of lightweight panels, and with the statement that it was possible to experiment with lightweight panels with existing personnel and machinery. There was relatively strong disagreement with the statement that it would be difficult to understand the technical aspects of lightweight panels.

Results of an attribute analysis for lightweight panels revealed several perceived strengths and weaknesses associated with the product. As shown in Table 1, respondents were asked to rate the importance of several attributes to their purchasing decisions for composite panel products such as particleboard and MDF, and then to rate the extent to which they perceived lightweight panels to possess these same attributes. Respondents rated the attributes *light in weight – easier handling for production workers*, *light in weight – lighter finished product for consumers/installers*, and *consistent dimensions* as the three attributes most associated with lightweight panels.

When ranked, these results show how lightweight panels are perceived to perform on the most important attributes. Lightweight panels were perceived to perform well on the important attributes of *panel strength*, *consistent quality, consistent dimensions*, and *ability to take veneer* (Table 2). The attribute of *consistent dimensions* seemed to be an especially favorable area for lightweight panels. However, lightweight panels faced less favorable perceptions in terms of the important attributes of *connection strength for hardware and other components* as well as *ease of connecting components.* Thus, suppliers need to improve their efforts to educate industry practitioners about lightweight panel connection solutions, as manufacturers have made improvements in solving connection problems. Interestingly, although perceived to be light in weight for production workers and consumers/installers (as would be expected), these attributes were perceived to be relatively unimportant to purchasing decisions for composite panel products generally.

In another set of questions, respondents were asked to indicate the industry sectors with the greatest potential for application of lightweight panels. Results are shown in Figure 2. Three sectors, including office/contract/hospitality furniture, store fixtures, and architectural fixtures, were reported to hold the best potential. Household furniture and cabinets scored near the scale mid-point, while millwork seemed to hold less potential for use of lightweight panels.

Lastly, respondents were asked to indicate their level of agreement with the following question: "Overall, our company would seriously consider using lightweight panels in our manufacturing process." A majority (54 percent) was in agreement, although nearly a third (32 percent) was neutral in their assessment of this statement. Fourteen percent disagreed.

Summary

Lightweight panels offer several potential market and production opportunities for many secondary woodworking companies. Survey results suggested that suppliers need to undertake efforts to educate industry practitioners about workable solutions, especially in the area of connecting lightweight panels to other components and hardware. Such efforts could offer helpful information to manufacturers in assessing the potential benefits from using lightweight panels in their respective shops.

Table 1. Importance of attributes to purchasing decisions for composite panel products (particleboard, MDF, etc.), and extent to which lightweight panels are perceived to possess the same attributes.

Attribute	Importance to composite panel purchases (average)[1]	rank	Lightweight panels possess (average)[2]	rank
Important Attributes				
Consistent quality between orders	4.60	1	3.68	6
Strength of connection to other components	4.54	2	3.16	14.5
Strength of hardware connection to panel	4.46	3	3.16	14.5
Consistent dimensions	4.44	4	3.94	3
Machineability	4.39	5	3.60	9
Ease of connecting panels to other components	4.32	6	3.23	12
Strength of panel	4.28	7	3.64	8
Ability to take veneer/other surface materials	4.26	8	3.87	4
Less Important Attributes				
Competitive price	4.20	9	3.07	16
Consistent density	4.19	10.5	3.66	7
Ease of attaching hardware	4.19	10.5	3.30	11
Availability of full-sized panel sheets	4.18	12	3.81	5
Ease of edgebanding	4.00	13	3.20	13
Light in weight – easier handling for production workers	3.53	14	4.46	1
Light in weight – lighter finished product for consumers/installers	3.50	15	4.14	2
"Greenness" or environmental friendliness	3.42	16	3.54	10
Availability of pre-cut panel sizes according to cut lists	2.39	17	2.99	17

[1] Scale anchored by 1=*Not at all important* to 5=*Critically important.*
[2] Scale anchored by 1=*Possess to a small extent* to 5=*Possess to a great extent.*

Table 2. Perceived performance of lightweight panels on attributes important to purchasing decisions for composite panels.

		Possession by lightweight panels	
		High	**Low**
Importance	**High**	- Consistent quality between orders - Consistent dimensions - Ability to take veneer/other surfaces - Strength of panel	- Strength of connection to other components - Strength of hardware connection to panel - Ease of connecting panels to other components - Machineability
	Low	- Consistent density - Availability of full-sized panel sheets - Light in weight for production workers - Light in weight for consumers/installers	- Competitive price - Ease of attaching hardware - Ease of edgebanding - "Greenness" or environmental friendliness - Availability of pre-cut panel sizes

Figure 1. Perceptions of lightweight panels (1=*Strongly disagree* to 5=*Strongly agree*).

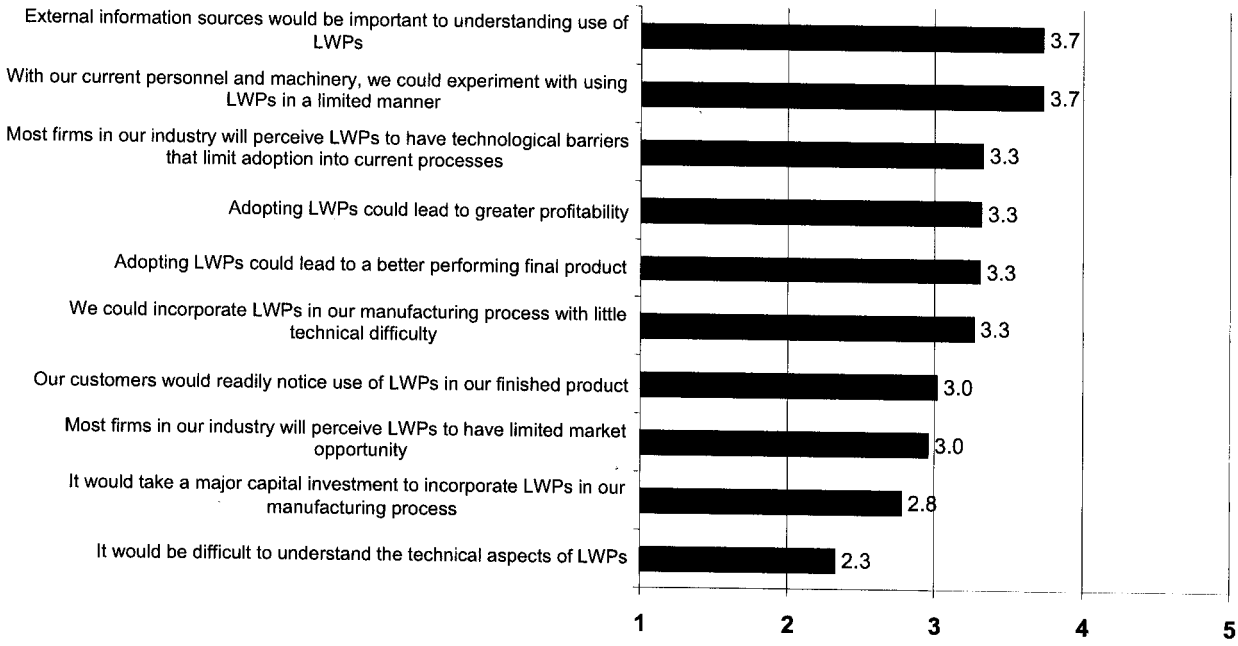
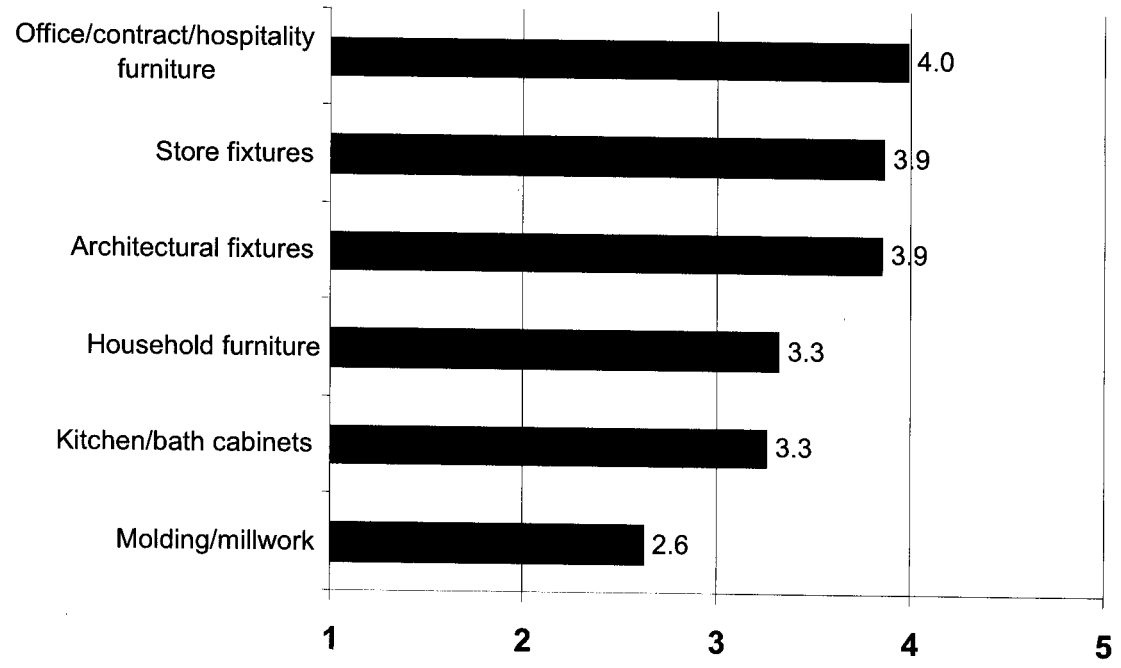


Figure 2. Potential applications for lightweight panels in different industry sectors (1=*Little potential* to 5=*Great potential*).



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