



Material Use in the US Deck Market

In 1995 CINTRAFOR established a longitudinal survey of material substitution within the residential construction industry. The objective of this longitudinal survey was to track changes in material use between softwood lumber and substitute materials in structural end-use applications. In 1999 we expanded our survey to consider home builders use of lumber and substitute materials for the decks they build. Responding to strong interest within the deck building and softwood lumber industries, CINTRAFOR initiated a longitudinal survey of material substitution within both the residential construction industry as well as the deck building industry in 2004. During the summer of 2004 a telephone survey of deck contractors and home builders was carried out. A total of 368 surveys were completed that included responses from 156 deckbuilders and 212 homebuilders across the US. The results of this survey look at material usage in deck building applications as well as identifying the factors that influence material specification in decking applications. A summary of the results of the first residential decking survey is provided below.

The deck building industry is going through a period of rapid growth and dramatic change with respect to the types of materials available to build decks. A recently completed study by the Center for International Trade

Table 1. Market shares based on survey data, 2004.

Total Residential Demand (mmbf)	3,060
Total Value (\$millions)	\$2,480
Wood	2,338 (76.5%)
<i>Pressure-Treated</i>	1,732 (74.1%)
<i>Redwood</i>	201 (8.6%)
<i>W. Red Cedar</i>	239 (10.2%)
<i>Tropical Hardwoods</i>	56 (2.4%)
<i>Untreated Wood</i>	101 (4.3%)
WPC	575 (18.8%)
Plastic	37 (1.2%)
Other	107 (3.5%)

in Forest Products (CINTRAFOR) at the University of Washington estimates that the demand for decking materials will increase by almost 12% between 2003 and 2008. While wood is the dominant material used to build decks, the market share for wood-plastic composite decking products has reached 18.8% and is projected to reach 23.5% by 2008 (Table 1). In contrast, this study estimates that the market share for wood decking materials will drop from 76.5% in 2003 to 70% in 2008. To better understand material use and contractor preferences within the deck building industry, CINTRAFOR recently completed a survey of 368 home builders and deck builders across the US.

Home builder market segment

The home building industry is dominated by small to medium-sized firms with over 60% of the companies surveyed reporting annual sales revenues of less than \$2.5 million and over 80% earning less than \$5 million. Home builders indicated that, on average, they built almost three times as many spec homes as custom homes (35 spec homes vs. 12 custom homes). The survey data shows that while almost three quarters of custom homes include a deck, just over half of spec homes had a deck. In addition, decks built for custom homes are 35% larger (491 ft² vs. 362 ft²) and 50% more expensive (\$5,984 vs. \$3,900) than decks built for spec homes. As a result, the average unit construction cost for decks built on custom homes was \$12.19 per ft² as compared to \$10.77 per ft² for decks built on spec homes. Home builders reported that they used subcontractors to build almost half (45.8%) of their decks.

Deck builder market segment

Similar to the home building industry, the deck building industry is dominated by small to medium-sized firms. Over 63% of survey respondents indicated that their sales revenue was less than \$1 million in 2003. The average deck contractor built 93 decks with an average deck size of 456 square feet (Table 2). Since the average construction cost for a new deck was \$6,161, the average construction cost for deck contractors was \$13.51 per ft². Approximately 45% of the construction cost was attributed to the deck surface while another third was for the substructure and 21% was for accessories. Just over 40% of deck builder projects

were new (first time) decks built on existing homes while 25% were new decks built on new homes and almost a third were replacement decks built on existing homes.

Material use in deck building

For the purposes of this research the deck structure was broken down into three component sections: the deck substructure, the deck surface and deck accessories (primarily the deck railing).

Material use in the deck substructure was dominated by treated lumber with a market share of over 90% (Table 3). The primary materials used for deck surfaces were wood-plastic composites and treated lumber while western red-cedar was a distant third. Approximately 30% of deck accessories were built using wood-plastic composites and treated lumber while an additional 18% were built from western red cedar.

Table 2. Summary data for the deck building industry.

Average deck size	456 ft ²
Number of decks built	93
Ave. construction cost of decks built	\$6,161
Ave. construction cost: deck structure	34.2% (\$2,108)
Ave. construction cost: deck surface	45.1% (\$2,776)
Ave. construction cost: deck accessories	21.2% (\$1,306)
% of new decks built on existing home	42.2%
% of new decks built on new home	25.2%
% of repair/replacement decks built	31.9%

Table 3. Material use for specific decking applications.

	Substructure	Surface	Accessories
Alaska Yellow Cedar	0.0	0.9	0.9
Western Red Cedar	0.7	10.8	17.5
Redwood	0.0	5.3	6.6
Treated Lumber	91.2	28.3	27.8
Untreated Lumber	6.0	1.5	1.8
Wood-Plastic Composite	0.6	39.6	29.5
Tropical Hardwood	0.7	5.8	4.4
Plastic	0.0	4.2	4.8
Other	0.8	3.5	5.6

Survey respondents were asked to rank the relative importance of a variety of product attributes in their material specification decision. The most important attributes in the material specification process were found to be long material life, relative beauty of the material, consistent material quality and material availability. In contrast, one of the lowest rated attributes was low price. This suggests that deck builders are less price sensitive in the specification of decking materials, preferring high quality, durability and ease of maintenance over low price. Further analysis of the survey data highlights interesting differences in material use between decking contractors and home builders as well as providing important distinctions in material use based on the geographic location of the firm. Perceptual maps were also produced to provide a visual comparison of the different decking materials based on survey respondents' perceptions on their relative durability, decay resistance and beauty.

Copies of the 81 page decking report (CINTRAFOR Working Paper Number 98) can be purchased from the Center for International Trade in Forest Products at (www.cintrafor.org).