

C I N T R A F O R

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A Comparative Assessment of the North American and Japanese 2x4 Residential Construction Systems: Opportunities for US Building Materials

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Executive Summary

The purpose of this project was to perform a comparative assessment of the US and Japanese 2x4 construction technologies, evaluate Japanese builders perceptions of US value-added wood building materials and identify opportunities to increase the use of US wood building materials within the Japanese 2x4 construction sector.

In 2008, housing starts in the US and Japan totaled 906,200 and 1.05 million units, respectively. Two by four housing starts in Japan totaled 107,747 (up 9.3% from 2007) and reached a record market share of 21.3% of total wooden housing starts and 9.8% of total housing starts. Approximately half of the prefectures in Japan had a ratio of 2x4 housing starts above the national average of 20.8%. However, in many of these prefectures, the total number of 2x4 housing starts is relatively small. The prefectures where the adoption of the 2x4 construction technology is well established, as well as where the housing market is relatively large, include Saitama, Tokyo, Hyogo, Kanagawa, Chiba, Hokkaido, Fukuoka and Aichi. These 8 prefectures represented 51.7% of 2x4 housing starts in Japan in 2008.

While the global economy performed poorly in 2008, exports of wood products from the US to Japan increased substantially. Total wood exports from both the US and Washington to Japan, which had been declining since 2004, recorded increases in 2008, with US wood exports growing by 6.6% while Washington exports rose by 5.2%. Softwood logs and lumber remain the primary wood products exported to Japan, although exports of OSB and veneer sheets increased significantly in 2008. Exports of value-added wood products from Washington to Japan were dominated by prefabricated buildings (25.3% of total value-added wood exports), builder's joinery (44.8%), wooden windows (16.9%) and wooden doors (6.4%).

Despite the success of the 2x4 construction system in Japan, imports of US wooden building materials are constrained due to the fact that there is a Japanese version of the 2x4 construction technology that co-exists with the North American-style. The primary difference between the two systems relates to the size of the basic construction module used in the construction process. The Japanese-style 2x4 system utilizes a 3'x6' panel size which is based on the size of a traditional tatami mat, whereas the North American-style 2x4 system employs 4'x8' panels in the construction process. Another difference between the two construction systems is the spacing of studs and joists; 17.9 inches (455 mm) on center in the Japanese system versus 16 inches (405 mm) on center in the North American system. In addition, the Japanese system tends to use more wood in the construction process (particularly in the structural framing) and thus tends to have higher material and labor costs, making the Japanese system less cost effective. Finally there is less labor specialization and efficient scheduling of construction tasks with specialist crews; significantly slowing down the construction process, reducing housing quality and increasing labor costs.

Despite the fact that most builders interviewed in this project recognize the cost effectiveness of the North American-style 2x4 construction system, relatively few Japanese builders have adopted it. Discussions with Japanese 2x4 home builders point to a broad range of factors that influence this decision. Perhaps the most important factor is that home builders in Japan are not customer-oriented in the sense that they work closely

with their customers to maximize customer satisfaction and reduce overall cost. Another factor which contributes to the widespread use of the 3x6 module relates to the strong relationship that exists between Japanese 2x4 builders and Japanese manufacturers of wooden building materials, particularly commodity wood products. Home builders interviewed during this study universally emphasized that reliability of supply and just-in-time delivery of building materials to the construction site are very important to them. Domestic manufacturers of structural panels and wood products are willing to provide this service for them whereas few foreign suppliers will.

This same bias is somewhat less evident in the use of value-added wood products such as wood windows, door and cabinets. In this case, we found that 2x4 home builders were much more willing to use imported building materials. However, the biggest concern for them when specifying these products is that they should be readily available in Japan and they must be able to obtain spare parts and installation support in a timely manner. For example, some home builders indicated that they do not use US wood windows because they have difficulty obtaining spare parts and replacement windows in a timely manner and because technical support in Japan is generally not available (although some US wood window manufacturers do have representatives in Japan to handle product and installation issues quickly).

Another issue that affects the use of US wood building materials is Japanese home builders' perception that US manufacturers and exporters are not committed to the Japanese market for the long-term. The perception that US exporters are 'innies and outers' is problematic and must be overcome in order to make greater inroads in Japan.

This project included a survey of Japanese 2x4 builders, with survey respondents representing 62.1% of total 2x4 housing starts in 2007. Not surprisingly, given the design of the sample frame, almost 85% of the houses built by respondents were 2x4 houses with the remaining houses being post and beam. Virtually all of the P&B builders reported that they used the 3'x6' module. While over a third of the 2x4 builders reported that they have used the 4'x8' module, the number of houses that they build using the 4x8 module was less than 5% of the total houses they built in 2008.

With respect to the specification and sourcing of value-added wooden building materials, the survey found that home owners specified these products between 17% and 30% of the time, depending on the type of product. The survey also found that 2x4 homebuilders are quite willing to use imported value-added wood building materials, with their use of these products ranging from 20% in the case of kitchen and bathroom cabinets to almost 50% for hardwood flooring and wood windows. Japanese 2x4 builder's use of US value-added wood products was highest for hardwood flooring (18.4% of total use), interior doors (16%), wood windows (16%) and exterior doors (14%). It was lowest for kitchen cabinets (4%), bathroom cabinets (6%) and softwood flooring (7%).

Survey respondents reported that the most important product attributes for them were high quality (6.6 rating out of 7), reliability of supply (6.4) and low price (6.2). In terms of product quality, they reported that US value-added wood products were perceived as having only average quality. Interestingly, small builders rated the quality of US value-added building materials much higher than did large builders. Respondents also reported that US suppliers provide below average levels of products support, although small builders again reported substantially higher ratings than did large builders.

The survey results clearly show that the large, national 2x4 builders have a poor perception of US value-added wooden building materials, both in terms of quality and service, relative to small and medium-sized local builders. This suggests that US manufacturers and exporters should focus their marketing efforts on small and medium-sized 2x4 builders in the short-term. However, long-term success in Japan will require that US manufacturers and exporters understand and address those factors that adversely affect large builder's perceptions of US value-added wood building materials. This should provide the basis for additional research in the future.

One product for which there is strong market potential is dimension lumber. Many of the 2x4 home builders reported that they were having trouble sourcing 2x8 and 2x10 joist material, as well as most other sizes of dimension lumber. More 2x4 home builders are now willing to accept a “home center” grade of lumber rather than the traditional higher quality J grade. This suggests that now may be a good time for dimension sawmills in Washington to reenter the Japanese market.

In summary, the struggling domestic housing market in the US combined with the relatively weak US dollar and strong Japanese yen provide a unique for manufacturers and exporters of wood building materials increase their presence in Japan. However, they must demonstrate a long-term commitment to the Japanese market in order to be successful.

The Japanese 2x4 market continues to represent a good opportunity for US manufacturers and exporters of wood products who are confronted with the worst US housing market since 1945. However, re-establishing US wood products in the Japanese market will require substantial effort on the part of manufacturers and exporters, especially those who abandoned the market during the period 1996-2006. US manufacturers and exporters who are returning to the Japanese market or who are new to this market will need to demonstrate a long-term commitment to their Japanese customers if they are going to be successful. They also need to develop a strategy for providing after sales support for their products in a variety of areas, including: timely claims evaluations, assistance with installation questions and providing spare parts and replacement products.

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