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Forest Products News from . . . **The Beck Group**

“If your actions inspire others to dream more, learn more, do more, and become more, you are a leader.”

John Quincy Adams

Cross-Laminated Timber – What Is It and Why Should One Care?

CLT – What is It?

Cross-laminated timber (or CLT for short) is a large wooden “panel” made of several layers from lumber that have been glued together. It is similar to plywood except that each ply is made up of sawn lumber, not veneer. Like plywood, the direction of the wood grain of the lumber in each layer is at right angles (i.e., 90 degrees) to the adjacent layer. CLT panels always have at least three layers, but can have as many as 11 layers, depending on the characteristics needed for a specific application. CLT panels typically range in thickness from about 2.5 inches to as much as 20 inches for 11 ply. The size of panels available varies depending on the capabilities of the manufacturer. Panels can be made into very large sizes of from 16 – 50 feet long or more and from 4 feet to 10 feet wide or greater. (See the accompanying photograph – courtesy of Mark Jablonski, Structurlam Products.)



While lumber used in CLT must be kiln dried to approximately 12% (plus or minus 2%), different species, sizes (e.g., 2 x 3, 2 x 4, 2 x 6, 1 x 4, 1 x 6) and grades of lumber can be used in manufacturing the product. The Canadian government and industry have both supported research into this product through the FPInnovations organization as a possible way to utilize as inner plies the low grade lumber resulting from the mountain pine beetle epidemic in Western Canada. Conceivably, dead and dying timber in the Western U.S. could be utilized in CLT as well.

The planks or pieces of lumber used for each layer may be finger-jointed to achieve the desired length and edge-glued to the desired width. The layers are then “face-glued” together into massive panels. Formaldehyde-free resins are typically used. To ensure proper bonding and uniform panel thicknesses, the layers are pressed together using a large hydraulic (or other type) press. Finished panels are planed or sanded to ensure proper thickness tolerances and smooth panel surfaces. The panels can be processed further with CNC routers to cut out door and window openings and to make other specialized cuts.

Cross-laminated timber is a product that has been used in parts of Europe for several years, but has only recently been introduced in North America. At this point, how widely this product will be adopted in the U.S. and Canada is uncertain. Some proponents, including the Canadian Wood Council, think it has substantial growth potential long-term in these markets. CLT was originally developed in the 1990s in Switzerland and Austria. It

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Cross-Laminated Timber

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began to grow in the early 2000s in response to several factors, including the emerging green market, code changes and increased awareness. Currently, there are at least eight European companies producing CLT products, including:

- KLH (Austria, UK and Sweden)
- Binderholz (Austria)
- Martinsons (Sweden)
- Moelven (Norway)
- Stora Enso (Austria)
- Thomas Holz Gmbh (Austria)
- FinnForest Merk (Germany, UK)
- HMS (Germany)

There are two companies in Canada manufacturing CLT products. The Nordic Engineered Wood Products plant is located in Northern Quebec, while Structurlam is located in the Southern interior of British Columbia. There is at least one plant under development in the U.S. in the state of Montana.

CLT – Why Should I Care?

CLT panels can be used in a variety of applications. Typically, they have been used as part of building systems for the construction of multi-story residential and commercial buildings and other special applications in structural timber



construction. They have been primarily used as exterior and interior wall panels, or floor/ceiling and roof systems (see accompanying photograph – courtesy of FPInnovations).

As solid (and massive) construction members, CLT panels have a number of characteristics that make them attractive, including high strength to allow for building designs that incorporate long spans and dimensional stability that allows for pre-installation of piping, electrical and other fixtures. Test structures made with CLT panels have performed well in seismic testing and have excellent earthquake survival characteristics. Since the panels are solid, with no voids, fire spread risk is reduced, and the panels have good fire resistance characteristics since they char – not burn. They also exhibit good thermal properties, and last, but not least, since they are built entirely of renewable and sustainable wood, they offer a number of environmental advantages over other building materials.

While CLT panels/buildings are not cheap to produce, they have characteristics that make them cost competitive in many applications. First, the time (and therefore cost) of erecting a structure is greatly reduced. As an example, a 9 story apartment building in London, containing 29 units, was recently completed in a remarkable 27 days with a crew of only four. Second, there is less noise associated with construction. Third, as CLT products have been designed for a specific structure, there is little waste generated on the jobsite. Fourth, there is less need for skilled construction labor since the prefabricated components need only to be assembled (not built) onsite. High quality is ensured since most of the work is done in the controlled environment of a plant. The openings required for wiring and piping are made at the plant with computer controlled CNC equipment.

Based on research completed (and several case studies), it appears that CLT can compete with concrete and steel in high-end housing, mid-to high rise residential and commercial structures, and large warehouses (e.g., tilt-up type structures). While the adoption of CLT in North America is in the early stages, it may provide the wood products industry with a window of opportunity to displace steel and concrete in several non-residential markets.

Sounds like the perfect recipe for getting the lumber industry out of the single-family housing rut!

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BECK Projects Update

BECK staffers have been busy completing a variety of industry projects, presentations and published articles, several of which are highlighted here.

Competitive Assessment Update

After a few years' hiatus, BECK staff has been active in recent months developing several industry sector competitive assessments/benchmarking studies. Outlined below is a summary of activity in this business area. If you are interested in learning more about any of these studies, please let us know.

Recently Completed

Western Studs/Short Lumber Mills – A total of 13 mills participated in this study, which for the first time included mills from British Columbia and Alberta in Western Canada. The impact of log costs and the focus of some mills on export markets, as well as premium grade (i.e., square edge) products were readily apparent.

Southern Pine Lumber – This well-received study provided its 30 participating mills with an excellent understanding of the industry's current cost structure, as well as what mills have done to survive the challenging times faced in recent years. Most mills were able to reduce their log cost (from prior years), achieve somewhat better by-product prices and implement different operating strategies to reduce costs and increase productivity.



Underway

Western Dimension Lumber Mills – A number of sawmills in Oregon, Washington and California are participating in this study that compares manufacturing costs, log costs, productivity, lumber recovery and lumber sales averages. The comparison period for the study is July 1, 2010 to June 30, 2011. We all look forward to seeing how mills have reacted to the challenges seen in recent years.

Coming Soon

Softwood Plywood – BECK has been active in planning for two softwood plywood competitive assessment/benchmarking studies – one for the U.S. South and the other for producers in the U.S. and Canadian West. These studies will cover the full calendar year 2011 and will kick off in early 2012.

North American OSB – Recruiting is underway for a new study of the economics of OSB manufacturing and sales in North America. The updated information of the industry should prove to be interesting to see how companies have reacted to the challenges faced in recent years.

Other Project Activities

Timber Procurement System Update – Beck staff helped two users of our Timber Procurement System computer model update their systems to address additional log grades and shifts in lumber markets. The updated system helped management refine timber procurement practices.

Expert Witness Research and Analysis – If you have the need for the services of a forest products industry expert to assist you in litigation, please think of our firm. Senior staff has substantial experience and success in helping our clients get the best possible results.

Chip Price Survey – BECK recently completed a chip price survey covering most of Oregon and parts of Washington and Idaho. This project provided the client with useful insights for negotiating future contracts.

Small Log Sawmill Planning – Beck is actively assisting a firm with planning for a new small log sawmill to better utilize small diameter timber in the region. This firm is positioning itself to have new, very competitive equipment in place to take advantage of the long-awaited lumber market recovery.

Acquisition Due Diligence – BECK is working with an investment group to assess the current and future performance of a Chilean company that includes several wood products facilities. Raw material supply, manufacturing facilities and markets were examined.

Sawmill Maintenance Audit – BECK's maintenance specialist recently completed an audit of the maintenance program at a studmill in the west. This assessment was the first step in helping the mill upgrade their maintenance efforts and improve mill performance.

Biomass Project Criteria – BECK is assisting in the development of biomass project criteria list. The objective is to develop a tool that allows users to relatively quickly identify biomass energy projects with the greatest potential for successful development.

Biomass Technology Assessment – BECK recently completed two projects whose objectives were to identify the most appropriate technology available for utilizing woody biomass in heating and power generation applications.



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NEW STRATEGIC ALLIANCE

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BIOMASS ENERGY CONSULTANTS

We are pleased to announce that The Beck Group has entered into a formal agreement with Mr. Bill Carlson, owner of Carlson Small Power Consultants (CSPC) of Redding, California. Under the agreement we have formed a new subsidiary called **Beck Carlson Biomass Energy Consultants**. The arrangement creates a structured way for BECK and CSPC to work together on biomass energy projects. We are excited about the new company because both firms possess unique expertise that complements the other and ultimately provides biomass energy clients with a comprehensive range of services related to biomass project development.

While the formal arrangement between the companies is new, BECK has worked with CSPC on numerous biomass projects over the past 3 to 4 years. Mr. Carlson is one of the industry's foremost experts on small scale biomass power generation/co-generation. He has over 40 years experience (although he does not look like it in the accompanying photo) with all aspects of biomass power, including operations management, plant design/engineering, power purchase agreement negotiation, government affairs, technology options, etc. We are very pleased to be able to work even more closely with Bill on biomass energy-related projects. He is truly an expert who understands the complexities of biomass power projects. If you are considering a biomass power or cogeneration project, give us a call.



More information about the new company's services will be available in early December at: www.beckcarlson.com.