



# Value to Wood



For a More Competitive Value-added Wood Product Industry, in all Regions of Canada

Issue 22

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## Can Mass Customization Help Your Business?

In the context of market globalization, product differentiation must become an essential part of any manufacturers' business strategy. Mass customization is a strategy that enables product differentiation and a technique that is being used by an increasing number of wood products manufacturers to set their value offer apart from their competitors.

To find out more about the perceived value of customization, FPInnovations conducted a study using the household furniture industry as an example. The study's objective was to assess the value of four household furniture product attributes; product customization level, the time consumers needed to customize the product, product delivery time and price. The study clearly showed that customers value the possibility of customizing their furniture purchase. Results showed that roughly 50% of consumers' product choice was driven by price, 20% by product customization, 20% by delivery time and 10% by the time consumers needed to customize their product.

Particular consumer segments assigned an even higher importance to the possibility of product customization. For these segments, customization was as important as the product price, and higher prices were accepted in order to get customized products. The study showed that a company who could address the appropriate consumer segment with mass customized products could create a profitable business model while providing value to selected customers.

Is it an easy task to produce mass customized products at a competitive cost and within a reasonable lead time? For any manufacturer familiar with mass production, mass customization implies important changes at all levels – from production to

management and sales. Lean manufacturing is an essential enabler for mass customization and before moving to mass customization, the cost and benefits of its implementation have to be carefully assessed.

An increasing number of Canadian furniture manufacturers have already embraced mass customization but the concept is not limited to the furniture sector. It has been an inherent part of the kitchen cabinet industry for decades and trade statistics show that the kitchen cabinet industry is far less affected by off-shore imports than the furniture industry.



Through the Value to Wood program, Canadian companies have access to a wide variety of resources such as plant and process assessments, Lean manufacturing implementation and other tools that can help a company improve its manufacturing performance, and investigate the benefits of mass customization.

For more information on this topic contact **Torsten Lihra** [Torsten.lihra@fpinnovations.ca](mailto:Torsten.lihra@fpinnovations.ca)

# How Humidity and Temperature Affect Your Products Once They Leave Your Shop.

In order for your customers to enjoy many years of function from their purchase of your wood product, there are some things both of you can do to maintain the look and durability of the natural wood. Wood is a natural product that is hygroscopic – it responds to changes in surrounding humidity and as a result, will lose or gain moisture content as relative humidity (RH) fluctuates. This will cause the wood to shrink as RH drops, and swell as RH increases.

Under normal use conditions, all wood products used for millwork in kitchens and furniture are never completely moisture free. Woodwork products are manufactured from wood that has been kiln-dried to an average moisture content of 7 to 8% and maintained at that moisture content until the time of delivery to a woodworking shop. Even finished products that have been kiln-dried and coated with a protective finish will gain or lose moisture depending on the environment it is placed in.

The movement of moisture to and from wood from the surrounding environment continues to take place as the RH changes, whether this is due to seasonal changes in climate and/or building related conditions.

To avoid product failure or quality issues, it is recommended that in Canada, an interior RH of between 30% and 45% be maintained depending on the location. Uncontrolled RH extremes below 25% or above 50% will likely cause problems. In new home construction where there has been recent concrete work, drywall taping, mudding and painting, excessive moisture is often released into the building. In these environments, the heating system may not be operat-

ing yet or the heat may be set at high levels (above 30 C or 86 F) to speed the drying process of the aforementioned operations. Placing your finished wood products into these harsh conditions could lead to problems that could affect the warranty of your installation.

Even in older homes during the coldest winter months, if proper humidity and temperature controls are not maintained, panels in doors may shrink and some unstained areas may be exposed. As the wood shrinks, joints may open slightly, and stiles and rails on doors may not remain flush. In summer swelling of joints may take place due to excessive relative humidity. Cracks in the surface finish or the veneer may also occur due to the dimensional changes as the moisture content fluctuates. These are not defects but simply an inherent natural property of wood.

History has shown that wood products perform with complete satisfaction when correct design, construction techniques and use are followed. Manufacturing plants take every effort to control the RH and temperature of their facilities. They also make sure their raw material suppliers have followed proper storage and handling procedures.

While conditions were maintained during manufacturing, once the product is shipped to the site, it becomes more difficult to control the surrounding environment and stay within the product specifications.

Depending on the final location of your wood product, it is recommended that the RH and temperature be maintained

in the range of 30% to 45% RH and 18 C – 22 C (65 F-77 F) so that your customers can obtain many years of trouble free use from your product.

*For more information on this topic, or to learn about ways in which you can minimize the effect of the environment on your products, contact Ric Ptak, ric.ptak@fpinnovations.ca*

## References

*Understanding Wood by R. Bruce Hoadely*

*Architectural Woodwork Standards (AWMAC) Edition 1 2009*

*Diagnostic Guide for Evaluating Surface Distortions in Veneered Furniture and Cabinetry USDA General Technical Report FPL-GTR-143 by A.W.*

*Christiansen and M. Knaebe Cabinetmaking and Millwork Second Edition Revised by Freirer*



## Densified Engineered Wood Flooring for Heavy-Duty Use

High density wood is required for wood flooring, especially for engineered wood flooring for heavy-duty use, as most mechanical properties of wood are correlated to its density. However, high density wood resources are limited and at a high cost. Densification treatment makes it possible for low or moderate density woods to be substituted for harder species such that low or moderate-density wood species can be modified into high performance and high value products, such as engineered wood flooring for heavy-duty use. The objectives of this project were to develop suitable densification processes for thin lumber of sugar maple and red oak, and develop a new type of engineered wood flooring with high surface hardness and good dimensional stability. This project was performed based on our previous work. The densification process was improved for the wood species used for wood flooring. From the results of this project, we can conclude that thin sugar maple lumber densified at 200°C under the effect of steam, heat and pressure showed good potential for the manufacture of engineered wood flooring for heavy-duty use due to its high density and improved mechanical properties, as well as relatively high dimensional stability. The surface hardness of densified sugar maple was about twice as much as non-densified sugar maple. The most dimensionally stable engineered wood flooring under varying relative humidity was that made of densified sugar maple. The densification of thin red oak lumber appeared to be difficult due to blisters developing on the surface during the process.



For more information on this study, contact **Alain Cloutier**, [alain.cloutier@sbf.ulaval.ca](mailto:alain.cloutier@sbf.ulaval.ca)

### Value to Wood Webinars Coming This Fall

Applying new R&D knowledge on the plant floor can lead to significant improvements in productivity and product quality, and provide Canadian manufacturers the information to grow and develop new markets for their products.

Through concise, informative webinars, research results from many of the completed Value to Wood R&D projects are being scheduled for 2011- 2012.

Over the next few months, information will be sent to you regarding the topic and date of upcoming webinars. The webinars will be delivered in both official languages, and will begin in this October and in March.

If you missed any of last year's webinars, you can download the presentations and listen to the audio clip by following this link.

[http://www.valuetowood.ca/html/english/resources\\_for\\_industry/webinars.php](http://www.valuetowood.ca/html/english/resources_for_industry/webinars.php)

### Value to Wood R&D Can Help your Business Succeed in Today's Market!

Every year in fall, we put our R&D plan together for next year. Since the Value to Wood program started, over 50 new areas and topics have been investigated.



If you have an R&D idea that has the potential to improve processes, develop new products, open new markets, or show a benefit in other areas that can improve business performance, we want to hear from you!

To see what R&D has been done already or to submit your idea, go to the [valuetowood.ca](http://www.valuetowood.ca), and follow this link:

[http://www.valuetowood.ca/html/english/research\\_development/index.php](http://www.valuetowood.ca/html/english/research_development/index.php)

The Value to Wood program is an opportunity for wood product manufacturers across Canada to have access to the expertise and information they need to extract greater value from wood resources.

### Manufacturing Solutions

Through Value to Wood, FPInnovations – Wood Products Division has established a network of Industry Advisors across the country. Their role is to help wood product manufacturers resolve their manufacturing issues and improve their competitiveness.

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### Research and Development

Value to Wood has a strong Research and Development component designed to address the knowledge and technology needs of Canada's value-added wood product sector. It draws on the expertise of leading wood research capabilities across the country:

- FPInnovations – Wood Products Division
- University of New Brunswick – Wood Science and Technology Centre
- Laval University – Centre de recherche sur le bois
- University of Toronto – Natural Fibre Science Group
- University of British Columbia – Centre for Advanced Wood Processing

Together, these organizations are working on projects that have high potential for direct and significant benefits to Canadian wood product manufacturers in two areas: structural wood products and appearance products. For more information on the research under way visit [www.valuetowood.ca](http://www.valuetowood.ca).



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## The Illustrated Guide to Log Home Construction

This is a very unique book that focuses exclusively on converting the log shell into a finished home. It is a must-have guide for builders, general contractors and do-it-yourself enthusiasts. It covers steps right from the foundations to ensure that the sill log will be tightly

sealed, all the way to the installation of kitchen cabinets in a manner that will allow the logs to settle without damaging the cabinetry. Each chapter of this book shows one aspect of the finishing process and provides several options using a diverse selection of techniques and products available today. Three-dimensional colour drawings depict the placement of sealants, e.g., gaskets, wind-proofing membranes and vapour barriers, and explicitly show how to use and install them so that they effectively perform their function. The book contains invaluable educational material and food-for-thought when developing new log building solutions and assemblies.

*"This book is a giant step towards demystifying the process of turning a log shell into an outstanding dream home."*

Wayne Sparshu, Spar-Log Homes Inc., Alberta, Canada

*"Log Homes are everyone's dream home. Building with logs is truly an art and a science. This essential guide details the necessary provisions to complete the dream and avoid the nightmares of guesswork."*

Robert Savignac, Arbor Vitae Log Craft, British Columbia, Canada

*"This book promotes the observation and understanding of the separate parts of the building process puzzle. It provides creative common sense solutions that have evolved through the open sharing of ideas by a network of focused log building professionals. The result yields enduring end-user satisfaction, creating more work for all."*

Donald L. Breimhurst, Home Field Advantage Ltd., Pennsylvania, USA

*"This is critical, timely information that has been long overdue!"*

John Boys, Nicola LogWorks, British Columbia, Canada

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