

## BC Coastal Hem-Fir Initiative – 2012/13

<b>Project Title</b>	Maximizing the Drying of Hem-fir Products
<b>Project Number</b>	H.11
<b>Project Leader</b>	Luiz Oliveira
<b>Project Team</b>	Diego Elustondo, Liping Cai, Vit Mlcoch, Bryce Granger
<b>Total Budget</b>	\$200,000

### Need(s)

The work carried out during the fiscal year of 2011/2011 brought a number of opportunities to coastal producers related to the following areas: a) green sorting strategies; b) drying schedule modification and c) troubleshooting drying issues through analysis of drying data. Some of the developments originated through different project activities have been successfully implemented. In addition, other **new** needs such as, kiln drying performance (energy and airflow), were identified during different phases of the project.

Although considerable progress related to drying technology is evident in many operations, lumber producers still face some significant challenges which, due to their inherent complexity, require a comprehensive approach to improve performance and position the industry to competitively offer high quality products for the domestic and international markets. To better focus research projects and industrial activities to assist the coastal industry, the **needs** related to drying operations are divided into two categories:

- a) Processing challenges
- b) Other related needs

As illustrated by the diagram in Figure 1, *processing challenges* refers specifically to all aspects related to the drying operation and are, therefore, closely linked to process variables. *Other related needs* refer to all critical areas that support industrial drying (human resources, equipment & technology and methods applied to drying).

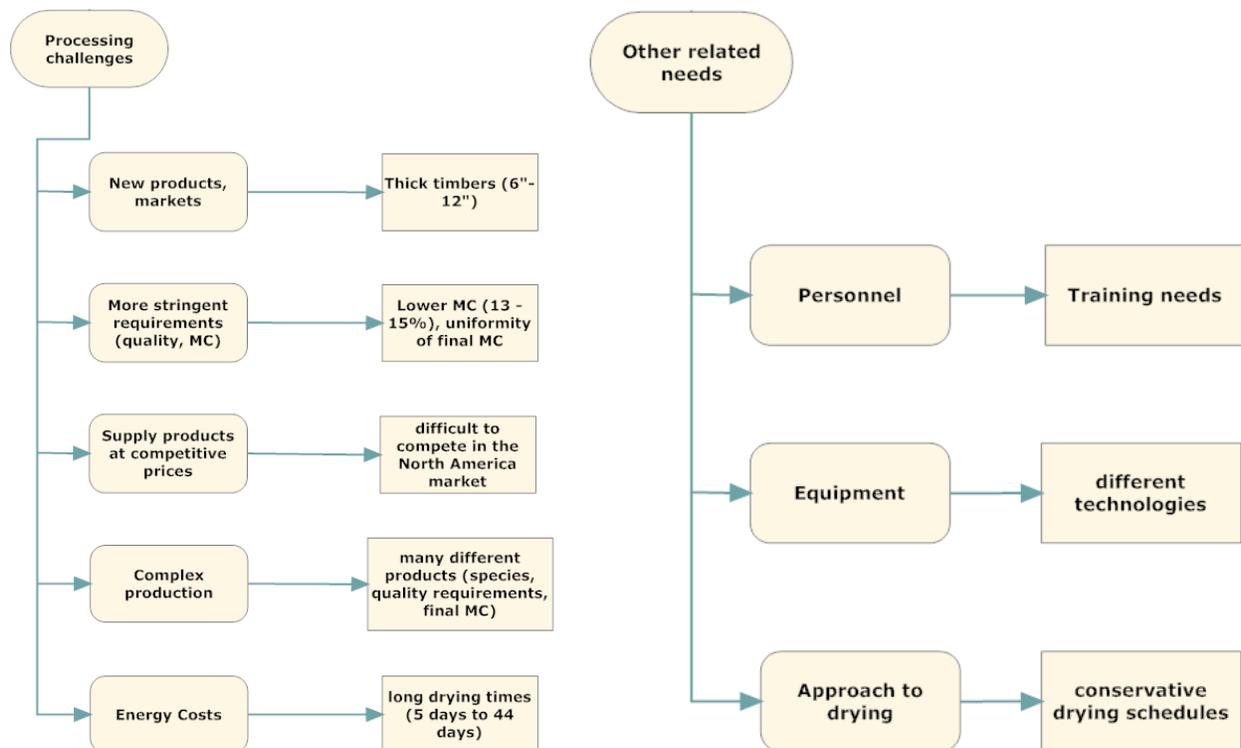


Figure 1 Needs related to drying

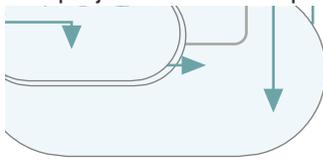
Thus, the categories described and illustrated above require sets of specific project activities which when combined, will ensure the desired development of the lumber drying sector of the coastal industry. The efforts related to sorting prior to drying and schedule modification will continue to be of high importance for maximizing drying operations through productivity increase, efficient energy utilization and more importantly higher grade recovery. Products manufactured by coastal mills differ significantly

## Objectives & Approach

The main objectives of the project are:

- To carry out a comprehensive review of the industrial drying schedules being used and suggest modification using a three-step approach. It is understood that some schedules will require confidentiality. For those cases, only the methodology and general impact will be disclosed;
- To evaluate the drying of the so-called 'super wet' squares (4 ½ by 4 ½ ) using different drying strategies and technologies;
- To carry out a comprehensive review of best practices for participating mills. Individual mill results will be confidential but the approach and methodology will be shared amongst different mills;
- To assess the technical and economic feasibility of using super-heated steam / vacuum drying technology (SS / V) for certain types of products;
- To investigate the drying of large timbers (strategies and technologies);
- To evaluate the impact of pre-drying / equalization on different products including large timbers
- To carry out a comprehensive analysis of heat and airflow distributions for selected kilns from participant mills;

The project is divided in phases as illustrated in the diagram below (Figure 2).



**Figure 2** Project Scope

Each phase of the diagram above will address at least of the needs identified and illustrated in Figure 1.

### **Benefits**

The project will be designed to have duration of 1 year. Although the benefits to be obtained will vary and will depend on each particular situation, it is expected that reduction in drying times can be 20 to 50%. For example, past experience with superheated steam/vacuum drying indicated potential reductions of 30 to 50% of the total drying time without compromising quality results. It is estimated that kiln energy (heat

distribution) performance evaluations will result in recommendations to ensure drying time reductions of 30% (for high value products) to 50% (for dimension products) as originally estimated. Thus, as indicated before, the potential implications to name a few are:

- Improve competitiveness;
- Possibility of re-entering certain markets with some products (supplying dried products);
- Increased productivity;
- Reduced energy consumption;
- Improved quality

The specific impact of the benefits listed above will vary amongst mills and therefore it is difficult if not impossible to generate an accurate dollar figure. On the other hand, it was clear from numerous discussions with mill representatives that in some cases individual mills might increase annual revenue in the range of \$300,000 to \$800,000.

### **Project Tasks and Outputs – Current fiscal year**

<b>Tasks / Outputs</b>	<b>Expected Delivery Date</b>
Schedule Review	September 2012
Sorting Evaluation	September 2012
Best Practices Review	December 2012
Strategic Drying Areas	March 2013
Final report and results presentation	March 2013

### **Status and Major Accomplishments – Previous year**

<b>Task</b>	<b>Status</b>
Determination of physical properties of hem-fir (diffusion and gas permeability coefficients)	Completed
DryTrend software installed at APD, SIR	On-going activity (gathering drying data)
Target MC optimization for Neda (quality model)	Completed
Evaluation of the impact of equalization on drying times, quality and dimensional stability for 4x4 hem-fir lumber	Completed
Evaluation of the impact of trimming before and after drying for 4x4 lumber	Completed
Drying schedule modifications (SIR, Value-Added)	Completed
Energy and airflow assessment (Saltair, SIR)	completed

## Performance Measures

Key Success Factor	Key Performance Indicator	Target	How the outcome of the Project supports the Program objectives
<ul style="list-style-type: none"> <li>• Increase in productivity</li> <li>• Quality improvement</li> </ul>	<ul style="list-style-type: none"> <li>• reduction of processing costs</li> <li>• productivity increase ratio</li> <li>• lower number of drying defects</li> </ul>	20 – 50% reduction drying times	<ul style="list-style-type: none"> <li>• Energy consumption</li> <li>• Reduction of the impact on environment</li> <li>• Improved competitiveness</li> <li>• Reduced drying costs</li> </ul>

## Communication Strategy for Information Dissemination

Several activities within each project phase will be carried out in collaboration with participant mills. Thus, in addition to formal communication of results (progress reports, final reports and presentations), several meetings with industry representatives will be used to transfer results. The main types for disseminating results and findings to the industry will be:

- a) Final report
- b) Summary reports (Technical notes)
- c) Publications (peer reviewed)
- d) Seminars

## Collaboration – Research Partners

Western Forest Products