

## Fundamentals of OSB Thickness Swell

<b>Project Leader:</b>	Chunping Dai, Composites & Treated Wood Products		
<b>Program Area:</b>	Composites	<b>Start Date:</b>	April 1, 1999
<b>Program Goal:</b>	CN1	<b>Completion Date:</b>	March 31, 2001
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### Long Term Goals / Strategies

To reduce OSB thickness swell.

### Key Objectives

- To investigate cellular behaviour of wood strands under the interaction of heat, moisture, pressure and time;
- To improve the basic understanding of OSB dimensional stability by linking the cellular behaviour of wood and OSB hot pressing processes; and
- Based on the improved understanding, to develop the best strategies to reduce OSB thickness swell.

### Key Actions and Deliverables

Deliverable	Expected Delivery Date
Conduct a comprehensive literature search	June 1999
Test cellular behaviour of wood strands under hot pressing conditions	March 2000
Determine optimal manufacturing conditions for OSB dimensional stability	September 2000
Prepare report with recommendation for strategies to reduce OSB thickness swell	March 2001

### Partners

University of New Brunswick  
University of Kyoto

### Rationale and Potential Impact

Reducing thickness swell is probably the most critical and challenging problem facing OSB manufacturers. While current OSB products may be sufficient for sheathing, extended uses of OSB for such applications as sub-flooring, web stock and concrete forming require improved dimensional stability. Traditional approaches to reducing thickness swell are often associated with cost addition and/or strength property reduction. By its polymeric nature, the dimensional stability of wood is affected by the environmental conditions under which OSB is manufactured. In particular, heat, moisture and pressure applied during hot pressing can significantly alter the cellular behaviour of wood and their relationships may well be highly interactive and non-linear. Therefore, it is necessary to find out the interactive relationships in order to minimize thickness swell.

Stabilizing wood is an issue common in other fields of wood industry, i.e., pulp and paper and wood densification or hardening, in which steam and pressure are normally used. It is reasonable to believe that the principles should be applicable to OSB manufacture, although the latter might be more complex because of the potential interference with glue bonds.