PRODUCTION OF PRESERVED WOOD FOUNDATION MATERIAL

by

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INTRODUCTION

Although the PWF system is a combination of many different materials, my comments today will be confined solely to those aspects of the pressure treatment process related to treating lumber and plywood suitable for use in PWF. My presentation will be divided up into 3 areas:

1) Where are we? A Review of the current PWF material requirements.

2) Where are we going? Some comments on the areas the PWF industry should be concerned with in order to maintain and increase our market share.

3) How do we get there? Some general comments about research and development and materials testing which should be of concern to us all.

Where are we?

In the production of properly treated PWF lumber and plywood we are mainly concerned with two standards:

CSA 080.15 Preservative Treatment of Wood for Building Foundation Systems, Basements and Crawl Spaces by Pressure Processes.

CSA 0322 Procedure for Certification of Pressure Treated Wood Materials for Use in Preserved Wood Foundations.

I will refer to these as the wood treating spec. and the plant certification spec.

CSA 080 defines the requirements to properly treat PWF lumber and plywood:

A. Lumber

Species - treatable species are defined (spruce is excluded).
Grade - # 2 and better, not stud grade or standard and better.

Moisture Content - all material must be dried to 25% before treatment by either air drying,

kiln drying or steam conditioning.

- all material must be air dried or kiln dried after treatment to 19% M.C.

Incising - required on all lumber species but no pattern or depth of incision is listed.

Penetration - 10 mm determined by taking 20 cores, 80% must meet 10 mm spec. and all must be at least 6 mm penetrated.

Retention - 8.0 kg/m3 (0.5 lb/ft3).

B. Plywood

Species - Western Hemlock, Anabilis Fir, Grand Fir, Coast Douglas fir.
- normally only the hemlocks and true firs are used and plywood consisting of only treatable species is usually designated as HEM-BAL.

Grade - unsanded sheathing meeting CSA 0121 Douglas fir but more commonly CSA 0151 Canadian Softwood Plywood.
- plywood consisting of at least 4 plies.
- normally 1/2" and 5/8 is used.

Penetration - complete penetration of
- all outer plies
- 90% of all inner plies
- not less than 3 plies in each panel

Retention - 9.6 kg/m3 (0.6 pcf)

Moisture Content - dried back to 19% after treatment.

C. Wood Preservatives

- 2 allowed, CCA and ACA although only CCA is currently used in Canada.
- shall be non-leachable, non-bleeding, dry, paintable and free from objectionable odour.

CSA 0322 Plant Certification

CSA 0322 is basically the procedure the treating plants must follow to certify themselves as acceptable manufacturers of PWF lumber and/or plywood.

0322 certification is required by the PWF Construction Standard S406 which is referenced by the 1985 National Building Code of Canada.

Current enforcement of CSA 0322 calls for treating plants to be certified primarily on penetration and retention results of 2 successive lumber or plywood charges. However, other aspects of the treating operation are also inspected and form part of the certification:

1) treating cycles - especially pressure periods
2) wood preservatives - chemical composition
   - pH
3) plant equipment - annual gauge calibration
4) material - lumber species and sizes and/or plywood
5) personnel training - treating procedures
   - safety and environmental aspects of wood preservation
6) quality control procedures

If all aspects of the 0322 standard are met to the satisfaction of the CSA inspector the plant receives the right to stamp all PWF material with the CSA 0322 stamp which bears the following information:

- mill name
- mill number and name and year of treatment
- identification of lumber and/or plywood certification, also
- charge number on each lift of lumber or plywood
- wood preservative named in certification

PWF Market

With all this control you must be wondering how the PWF industry has been developing.

I am pleased to say that indeed we have been doing very well. Our market share has steadily increased over the years to the point where our market penetration had reached 9.3% in 1985, but dropped off in 1986 to 8.3%.

Housing start decreases in PWF hot spots as happened in Alberta in 1984 or housing start increases in non-PWF areas as in 1986 in Toronto negatively affect the PWF market share.

Even so we have almost 9% of the single family and low rise housing foundation market in Canada and treated more than 12 million square feet of plywood and 22 million feet of lumber to PWF specs. in 1986.

Where Are We Going?

First of all the current market for PWF is not fully developed with our current system and materials. Therefore market development should be, and has been, the first priority of the wood preservation industry. I feel that

realistically the PWF industry could expect to achieve 15 - 20% of the market although I hope I am proven wrong and the market share line rises far beyond this. That is not to say that the PWF industry should totally ignore research and development.

To encourage increased PWF growth rates with a view to increasing the total market, the PWF industry should be investigating alternative materials which provide equal or better performance and/or cost savings as compared to materials currently in use.

As far as I can tell, the only way that new materials will become approved is by initiating new research and development activities.

Some areas that I can see improvements coming are the following:

1) Chemical Retentions
   Perhaps we do not require increased retentions for PWF use, maybe 0.4 pcf is adequate for both lumber and plywood. History has shown that we have never had a failure at retentions even below the 0.4 pcf requirements for ground contact use. We need further investigation and substantiation if we are to be successful in reducing PWF chemical retentions.

2) Preservative Penetrations
   Perhaps the current strict penetration requirements for PWF plywood are unnecessary. Maybe we could allow plywood in which all outer veneers are completely penetrated with the acceptability criteria for inner veneers being the presence of preservative and not complete penetration. Only more research can provide our industry with the information required to back up such a change

3) Improved Materials
   Our current PWF construction system is based on the use of very traditional materials: plywood and lumber. There are indications that improvements are coming.

   Plywood - Incised veneer research is progressing well at Forintek and studies have shown increased preservative absorptions of up to 50% compared with unincised veneer. If this method proves successful in commercial installations it may increase the availability of treatable plywood as it may allow the use of lodgepole pine and/or interior hemlock for PWF blanks.

   Lumber - New advancements in incising technology may soon provide improved treatability for currently utilized species. These

improvements will decrease material and processing costs thereby improving the competitive position of the PWF system. These improvements have only come about because of research and development.

4) Alternate Materials

Another method of improving the economics of the PWF system would be to utilize alternative materials to the now familiar plywood sheathed studs wall. The use of structural wood composites as replacements for studs may be one such alternative. Studs made of plywood webs flanged with solid lumber may provide more strength and improved treatability using less wood at less cost as compared with conventional solid lumber.
As well there may be replacements for plywood which are more treatable than what our industry is used to. We know for instance that Oriented Strand Board - OSB is extremely treatable but during treatment undergoes unacceptable thickness swelling with an associated strength loss. If this problem can be overcome, OSB may be an extremely acceptable plywood alternative. No matter which alternative the PWF industry chooses to focus on, it must commit to increased research and development if these alternatives are to become viable and commercially acceptable.

How Do We Get There?

Quite simply, reaching these intermediate goals of improved and increased availability of raw materials and reduced processing costs which improve the economics and competitive position of the PWF system will allow our industry to obtain its ultimate objective: increased market share. This objective can only be reached, however, by an individual and cooperative commitment by the PWF industry, including chemical suppliers, treating operations and even distributors to increased research and development.

Without this commitment the important process of identification, testing and approval of new materials, standards or methods cannot take place.

Having said this I would like to take a step back and look at the current PWF industry. I feel that until our market share stops growing because of material shortages or price pressure, two barriers which we have not yet truly encountered, the PWF industry should concentrate on marketing. Unfortunately, if research and development is not initiated before we reach these barriers, market growth will be temporarily curtailed. In order to maintain market growth at this point the PWF industry must be waiting with new fully tested and approved alternatives and methods by which price pressures and material shortages can be minimized.

This backs up my previous point that although I believe we should concentrate on marketing the PWF system, we should not ignore research and development..

If we can achieve these goals I feel an excellent future exists for the PWF industry. Thank you for your attention.