TREATED WOOD AND THE CONSUMER

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Introduction

Mr President, members and guests of the Canadian Wood Preservation Association; I am truly pleased and honored to be invited to attend and participate in the 14th Annual Meeting of the Canadian Wood Preservation Association here at the Riverfront Centre in Vancouver B.C. When I was asked by John Ruddick to be your keynote speaker I thought my goodness I've heard a lot of keynoters and I'm certainly not a keynote speaker. At best I can give a decent talk on my research results. John was very helpful. He said its nothing to it, all you have to do is set the tempo for the meeting, don't say anything negative, be witty and do not talk too long.

The topic I have selected for my talk today is "Treated Wood and the Consumer" or another way to put it is quality assurance as it relates to treated wood. As some of you know my entire career has been spent championing the cause of the users of treated wood. I plan to cover some early work which played a vital part in the development of what has come to be known as Results Type Specification. It is interesting and sometimes beneficial to look back and see how an established practice in wood preservation became accepted. I will review some of the considerations and events leading to the present results-type specification for achieving and monitoring the quality of preservative treated wood.

An Industry Change for the Good of the Consumer

In the 1950's preservative retention were determined by gauge or weight before the advent of the laboratory assay procedures. Gauge retentions were determined by measuring the amount of preservative used to treat a charge of wood in pounds and dividing this by the total volume of wood in cubic feet in the charge. The volume of wood was determined from tables or charts depending on the commodity being treated. A few plants used a weight before and a weight after treatment to determine the amount of preservative used and of course this was divided by the volume of wood in the charge. The treating industry liked this method because of its simplicity; a single measurement of retention could be applied to all the item in the charge. There were recognized disadvantages however, the system was generally accepted because there were no alternatives available. The shortcomings were:

1) Inaccuracies in measuring the true amount of preservative taken up by the wood.
   a. Any loss of preservative due to leaks was assumed to be on the wood.

2) The gauge retention told little about the adequacy of the treatment in individual pieces.

With increasing cost of labor and materials, consumers began to ask for treated wood on a basis whereby they could, if desired, check on the quality of the treatment and its conformance to a recognized standard. This led to efforts directed at the development of what

became known as results-type specification for poles. The specification did not provide the average preservative content attained in the charge, but rather stipulated the average preservative content attained in a prescribed assay zone of the sampled poles. On the same basis the quality of the treatment could be ascertained on individual poles received by the user. The Bell Telephone Laboratories, one of the nations largest user of poles at that time, gave primary impetus to the industries change from gauge to results-type specification. A paper by A.H. Hearn in 1954 laid the ground work for this new way to specify poles. Hearn related that they had 25 years experience using toluene extraction to determine individual retention on test posts in Gulfport, MS. He showed better correlation between incidence of decay and retention by toluene extraction than between incidence of decay and gauge retention.

As you can imagine a major problem in getting this system into the standard was establishing the proper assay zone. Following are some of the troublesome questions:

1) What minimum retention in the zone would be needed to satisfy particular requirements of service or the environment?

2) What zone would indicate most reliably the protective quality of the treatment?

3) How extensively should a treating charge be sampled?

4) How extensively should individual poles be sampled?

5) How should the zone be sampled and assayed?

6) What gauge retention would be needed to provide specified retention in the assay zone?

The same year that Hearn reported on the Bell Telephone system Dr. Roy Baechler (1954), chemist at the Forest Products Laboratory in Madison reported on a comprehensive study to determine the appropriate assay zone for poles. The study investigated the relation between gauge retention of creosote in pine poles and retention in the borings from various depths in the pole. Full length sapwood cores were removed and divided into 3 zones for analysis; 1) outer 1/2 inch; 2) the 1/2 inch to 2.0 inch; and 3) remainder of the sapwood. Baechler found that the 1/2 inch to 2.0 inch zone varied the least and could be correlated favorably with the gauge retention.

A change in the standard of this magnitude required extensive plant trials and laboratory follow-up to gather data and perform statistical analysis to compare gauge retentions to assay retentions. For example; southern pine poles that were treated to gauge retentions of 8, 10, and 12 pcf creosote were found to have assay retentions of 6, 7.5, and 9 pcf creosote based on a 20 boring sample. As you can well imagine, we had a difficult time convincing the consumer that he was getting a better product when he specified 9 pcf creosote by assay than he would get by specifying 12 pcf by gauge.

It was 5 years later, 1959 that the AWPA began to introduce results-type specification into the standards. This was only for pine species. It was another 10 years before the

Association added other round commodities such as piling to the standard.

After developing the assay retention data for the other species of poles and piling, work was started on dimension lumber. Four years of committee meeting and treatment data collection were needed before lumber assay retentions became standard in 1967. After about as many years of committee dialog and data collection the assay standard for timbers (5 inches and thicker) was completed in 1970. In the 70's more and more species and products were added to the results- type specifications. Now its basically the hardwoods which do not have assay retention requirements.

Independent Inspection Companies and Agencies

As the standards became converted from gauge retentions to chemical assay retentions, a number of independent inspection companies were started and began to perform the inspection duties for the treating industry. The inspection protocol was set up to have 2 levels of inspection plus an overview. A description of the inspection levels and the duties of each may be as follows:

1) Internal quality control (QC), this is a treating plant employee with knowledge in collecting boring and carrying out the chemical assay analysis. The QC is to inspect each and every charge of treated material at the treating plant. This is spelled out in the AWPA M3 standard.

2) Independent inspector, this is a representative of an inspection company that will visit the plant on a regular basis and perform an inspection on a percent of production, for example it may be one charge in ten or 100% inspection. This is spelled out in the AWPA M2 standard.

3) Overview, is a third party inspection to carry out spot checks to verify the adequacy of the inspection performed by the independent inspector and the internal quality control program. Presently this is performed by American Lumber Standards (ALS).

The third party or overview agency was the American Wood Preservers Bureau for many years. Now the overview responsibilities are carried out by the American Lumber Standards (ALS). All the inspections are conducted to determine if the treated material conforms to the written specifications or standards. This may seem complicated but it is quite simple if everyone performs their duty properly. In some cases the treating plant has no QC program at all, in stead he will only inspect one charge in ten charges like the independent inspection company.

Up to this point I have talked primarily about retention determinations and requirements. The other side of the coin is penetration testing for conformance to standard. The procedure is quite straight forward but the standards vary a great deal in their requirements. Kelso, 1976 reviewed 75 utility specifications and found 35 different penetration requirements for southern pine poles. There have been changes in utility standards so I'm sure the situation is not that bad today. The AWPA penetration requirements for southern pine poles have

remained about the same for more than 50 years

The System is Good but it can Stand some Improvements

The consumer wants a treated wood product that will provide adequate service life. This is accomplished by sound specifications and the good inspection to assure conformance to the specification.Large utilities and other large users generally hire their own inspectors while others rely on the independent inspection system which is in place as described above. Under this procedure the inspector is generally paid by the producer and as a result may tend to have a greater allegiance to the the person who paying his salary. The users needs could be better served if he would pay for the inspection directly rather than to have the cost built into price of the treated wood.

Presently the responsibility for quality rests with the treater. Some treaters are not quality conscious and thus lack credibility with the consumer. The treater must develop and maintain a satisfactory quality control program which will cover all phases of the manufacturing process from raw material to the finished product, to shipping and handling.

Future

American Lumber Standards (ALS)—Is now the overview agency having replaced the American Wood Preservers Bureau

International Standards Organization (ISO) 9000 series—According to the document submitted AWPA Subcommittee T–7 by J. N. Kressbach 1992, the International Quality Standards are basically three fold:

1) The standard provides sufficient information so that a producer may develop and implement an acceptable quality control system.

2) The standard provides sufficient information so that consumers and producers may contractually agree on quality standards.

3) The standard provides information on how third party facility registration can be accomplished in the event it is so desired.

The ISO 9000 membership consists of representatives from standards groups of over 90 countries and is headquartered in Geneva, Switzerland. The standard is generic in nature and therefore can be used on a broad range of products and services thus providing a common base to address international quality requirements. The installation of an ISO 9000 system and subsequent registration by an accredited registrar is regarded as demonstration to consumers and the marketplace in general, that the company has a good internal quality system. This demonstration gives confidence to consumers that the product itself is subject to good quality management. It is important to note that the ISO is merely a suppler/purchaser relationship based on a mutual concern for quality. It is the consumer's prerogative to require that a potential supplier be ISO registered. The cost of becoming registered, depends or the

number of employee and number and type of product, I've heard figures as high $200,000. The ISO 9000 series quality system is really five individual core standards as follows:

1) ISO 9000 provides basic definitions and concepts and summarizes how to select and use the other standards in the series.

2) ISO 9001 is a quality systems model for quality assurance in design and development, production, installation, and servicing.

3) ISO 9002 is a quality systems model for quality assurance in production and installation.

4) ISO 9003 is a quality systems model for quality assurance in final inspection and test.

5) ISO 9004 contains generic guidelines for quality management and quality systems.

I have covered about 40 years of changes in the wood preserving industry, which historically has been slow to accept change. I think you will agree that these were giant steps for an old line industry that had it beginning, October 10 &11, 1904 at an organizational meeting in St. Louis. We only guess at what the next 40 years will bring. Thank you for your attention.

Baechler, R. H. 1954. Relations between gauge retentions and amounts of creosote extractable from borings taken from treated pine poles. AWPA Proceedings 50: 113-119.

Hearn, A. H. 1954. Creosote retention as determined by toluene extraction of treated wood. AWPA Proceedings 50: 122-136.

Kelso Jr., W. C. 1976. Standardization of wood pole treatment specification. AWPA Proceedings 72: 27-28.

Kressbach, J. N. 1992. ISO 9000 quality standards for consumers and producers of treated wood products. Appendix to the AWPA Subc. T–7 Report AWPA Proceedings 88: