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Common Questions and Concerns from Government Users of Industrial Treated Wood Products

Stan Lebow

James Wacker

USDA, Forest Service, Forest Products Laboratory
Madison, Wisconsin

ABSTRACT

Because pressure-treated wood is perceived as economical and relatively easy to install, federal, state and local government agencies sometimes utilize treated wood for industrial-type applications. When these agencies have questions or concerns about treated wood they may make inquiries to the US Forest Products Laboratory. These inquiries provide an indication of topics where there may be a lack of understanding and a need for more information about industrial treated wood products. The most common inquiry involves types of treated wood available and the appropriateness of a treatment for a given application. The increasing availability of new types of preservatives has created uncertainty for users who had some familiarity with conventional treatments. These inquiries often lead to further questions about specification of treated wood and code compliance. Questions about expected service life are also common, as are inquiries involving corrosion, environmental concerns and alternative products. These topics and several other types of frequently asked questions are discussed in this paper.

Keywords: Users, industrial treated wood, inquiries

INTRODUCTION

Pressure-treated wood is a unique construction material that combines the properties of different preservative formulations with those of a variable wood substrate. This unique combination provides treated wood with advantages over many other construction materials, but it also makes treated wood a relatively complex structural product. Personnel at government agencies that specify or use treated wood do not need to understand all these complexities, but they do need to understand the product well enough to feel comfortable using treated wood. Most of the structures built using industrial treated wood products represent a substantial investment and are expected to be serviceable for several decades. For some structures, such as bridges, premature failure could have severe consequences. For decades, treatments for industrial products were dominated by chromated copper arsenate (CCA), creosote and pentachlorophenol. Although these traditional preservatives continue to be widely used, newer alternative treatments are becoming increasingly available. In some cases federal agencies or state and local governments are taking steps to encourage use of these alternative preservatives. This transition has created substantial uncertainty for users of industrial wood products, as they may have much less familiarity with the newer preservatives. Although much information is available to guide users of treated wood, the uniqueness of the material and the importance of the construction projects may cause users to seek further information. These inquiries can provide insight into topics where more information is needed to guide users of industrial type treated wood products. In this paper we discuss some of the more common inquiries as well as steps that might be taken to educate users about industrial treated wood products.

COMMON INQUIRIES

Selecting and Specifying Preservatives

Given the changes in preservative formulations in recent years, it is not surprising that users of treated wood often have questions about the types of treated wood available. The majority of inquiries are in regards to the uses, properties and status of “newer” preservatives such as alkaline copper quat (ACQ), copper azole (CA-B), and the dispersed copper formulations such as micronized copper quat (MCQ) and micronized copper azole (MCA). Typical questions involve expected durability and the commodities for which these newer preservatives are standardized. The evolution of two separate paths to commercial acceptance (the American Wood Protection Association (AWPA) and the International Code Council Evaluation Service (ICC-ES)) sometimes adds to the confusion. The recently developed dispersed copper formulations are not listed in AWPA standards, but do have ICC-ES evaluation reports. The American Association of State Highway and Transportation Officials (AASHTO) Standard M133-10 (AASHTO 2010) lists dispersed copper formulations under the heading “*The following preservative systems are acceptable by means of a published and current ICC-ES Report (ESR) and are in compliance with AC326*” (AASHTO, 2010). However, users are less familiar with the ICC-ES process, and the use of acceptance criteria and evaluation reports rather than a listing in a consolidated book of standards.

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Among the conventional industrial preservatives, questions about the allowable uses of CCA treated wood continue, although the frequency of this type of inquiry has declined. CCA inquiries range from “is it completely banned” to more complex questions about specific applications that appear to fall into grey areas within the label language (Lebow, et al., 2004). Other inquiries involve limitations on use of creosote and pentachlorophenol treated wood. As occurs with CCA, users may be under the impression that creosote and pentachlorophenol have been banned. However, questions about the appropriateness of these preservatives for specific applications are more common. These appropriate use questions usually involve concerns about odor or extent of hand contact.

Questions about specifications often follow from inquiries about the different types of treated wood. Some users inquire about selecting the appropriate AWPA Use Category for a specific application. One of the more common inquiries is whether wood used above-ground should be considered as falling into category 3B or 4A. The answer to this question is not always as clear-cut for industrial applications as it might be for residential applications. Similarly, questions arise whether an application should be considered as 4A, 4B or 4C. The listings of commodities in Table 3-1 of the AWPA User Specifications for Treated Wood (AWPA 2010) are beneficial in addressing these types of inquiries. Interpretation of the sapwood “and/or” provisions in the penetration standards also prompts occasional questions.

Another aspect of inquiries about types of preservatives is availability of the treated product. The inquiry may involve a few pieces or an amount of material amounting to multiple plant charges. In some cases the user would prefer to use a local wood species which may or may not be well suited for a specific preservative or application.

Durability and Service Life

One of the more challenging questions involves durability and estimating expected service life. Durability continues to be a major concern for users of industrial treated wood products, as they are increasingly being required to assess life-cycle costs over the structure’s anticipated service life instead of the traditional initial cost basis. As shown in Table 1, a recent survey of Iowa counties by Iowa State University found that durability was perceived as the greatest weakness for treated wood in bridge construction. Although service life questions are difficult to answer with any preservative, it is particularly challenging with newer preservatives. The person making the inquiry may be considering which type of treated wood to use, or comparing treated wood to other types of products. They are typically surprised that we cannot provide a more precise estimate of the expected service life, and that the results of accelerated tests used in evaluating preservatives do not have a more clearly defined relationship to long-term durability. This problem has been compounded in recent years by a trend towards designing and building bridges with a planned 100 year service life.

Table 1. Perceived advantages and disadvantages of treated timber bridges reported in a survey of Iowa counties (Bigelow, et al, 2007).

Ranking of Perceived Advantages	Ranking of Perceived Disadvantages
1. Ease of installation	1. Durability concerns
2. Cost	2. Maintenance concerns
3. Material availability	3. Cost
4. Appearance	4. Strength properties
5. Maintenance	5. Odor or surface cleanliness
6. Strength properties	6. Difficulty in specifying
7. Durability	7. Material availability
	8. Ease of installation
	9. Not accustomed to using timber
	10. Corrosion of connectors
	11. Appearance

Treatment prior to Glulam Manufacture

There is an understandable perception by some industrial users that treatment of laminates before gluing results in more uniform preservative distribution than treatment after gluing. This leads to inquiries about the bonding of newer preservative treatments for use in glue-laminated members. Unfortunately there is often little published information available to answer these questions. Gluing has been a grey area within AWPA as well, as current guidelines do not specify that bonding data be provided as a part of the data packet for a new preservative.

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Environmental Concerns

Environmental concerns continue to prompt inquiries from users of industrial wood products. In many of these situations the person making the inquiry does not have personal concerns about the environmental impact of treated wood, but is being asked to defend the use of treated wood to others. On the west coast many of these inquiries relate to restrictions or cautionary statements from state or Federal regulatory agencies. Questions involve use of coatings for treated wood to minimize environmental releases, methods of estimating releases and environmental impact, and selection of preservatives that are least likely to create concerns. In the latter case the preservative in question may have been suggested by a regulatory agency but may not be standardized by AWWPA or any other organization. The Best Management Practices (BMP's) guidance developed by the Western Wood Preservers Institute has been very helpful in addressing many of these concerns (WWPI, 2006). Most questions arise from use of treated wood in aquatic applications but terrestrial applications can prompt questions as well. For example, questions recently arose about the potential impacts of treated poles planned for construction of a transmission line through Forest Service land. In this case the inquiry involved both the pressure treatment and the future use of remedial treatments. Most inquiries involving environmental concerns are in regards to planning and specifying construction projects, but a few are about minimizing the visible oozing of preservative from wood in service or delivered to the job site. In making inquiries about minimizing preservative bleeding, users sometimes ask whether specifying lower retentions would help to lessen bleeding, and if a lower retention would be sufficient for their application.

Inquiries related to environmental concerns are often associated with questions about alternative types of durable wood products. The most common of these are naturally durable wood species, non-standardized treatments, and modified wood. Questions about naturally durable species involve both North American species and imports from other countries, and typically involve expected durability relative to pressure-treated wood. The motivation for use of the naturally durable wood species is usually the desire to be "chemical free". There is also interest in the use of non-standardized preservative treatments that claim to be environmentally benign. Inquiries about modified wood and thermally treated wood are infrequent, but will probably increase as these products become more visible within the United States.

Corrosion of Fasteners

Although corrosion of fasteners in treated wood has always been a concern, inquiries increased greatly as copper-based preservatives became more prevalent. In the last few years both preservative suppliers and fastener manufacturers have generated information that is helpful in addressing some of these questions (Zelinka, et al, 2007). However, questions still arise about the compatibility of specific treatment/fastener combinations, and these questions are likely to continue as new types of preservatives are introduced. Examples of specific questions include the compatibility of aluminum signs with treated signpost, protection of major connectors in bridges, and use of wooden decking on steel supports. These questions are typically accompanied with requests for information on the effectiveness of coatings or other barriers placed between the metal and the treated wood. As with treated wood durability, questions arise about expected service life of fasteners and users question why there are not accelerated corrosion tests that can provide a reliable estimate of expected service life.

Other Questions

Questions on a range of other topics occur intermittently or in clusters associated with some change in a product or a media report. Questions about maintenance/inspection/remedial treatment of existing structures are fairly common and in some cases the structures involved have historical significance and the inquiry involves performing the maintenance or remedial treatment with minimal impact on appearance. There are occasional inquiries about recycling and disposal of treated wood products regarding both what is allowed by regulations and what is considered environmentally preferable.

RECOMMENDATIONS

It is worth noting that information currently provided through websites and publications of organizations such as Southern Pine Council, Western Wood Preservers Institute, Timber Piling Council, APA-The Engineered Wood Association, and the American Institute of Timber Construction is very beneficial, as is that provided on some of the individual websites of treaters and chemical suppliers. Often inquiries can be referred to directly to one or more of these websites and it is likely that many other inquiries are prevented because users access information provided on these websites and do not need further assistance.

There are areas where sufficient information may not be readily available to users of treated wood, and where additional focus may be worthwhile. The most apparent of these may be the question of durability or expected service life. Unfortunately, service life information is not readily available and simply does not exist for newer preservatives. There are at least two possible approaches to increasing the availability of durability/service life information in the future. One approach is to place greater emphasis on collection of service life data for both older and newer preservatives. An instruction to collect and report service life data exists in several of the AWWPA Subcommittees, but with the possible exception of the Subcommittee T-4 (Poles) this instruction typically is not greeted with great enthusiasm. A second approach to providing

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greater confidence in durability estimates to further our understanding of the relationship between evaluation test data and in-service performance. This is certainly not a new concept, and has been the focus of substantial research, but remains an important objective.

Another area where more information may be useful is sources of supply, whether it be treating plants or on the retail/wholesale level. Some of this information is available through associations and preservative suppliers but it is not as comprehensive or detailed as it might be. Substantial information is available in the area of preservative selection, but it is reassuring for the user to see examples of their specific end-use. Continued expansion and refinement of Table 3-1 AWPA User Specifications for Treated Wood (AWPA, 2010) is worthwhile.

Addressing environmental concerns is challenging, but the BMP's developed by the Western Wood Preservers Institute have been helpful (WWPI, 2006). Consideration should be given to making environmental BMP's more widely used and recognized by other associations and organizations. The spreadsheet model developed by Dr. Brooks and available on WWPI's website (<http://www.wwpinstitute.org/>) is a valuable tool. It may be worthwhile considering the creation of a simplified web-based screening tool that would allow users to determine if their project is likely to warrant further review.

More information has become available in regards to corrosion in recent years, but further clarity would be beneficial. As with durability and service life questions, the information available is limited by our lack of understanding of the relationship between laboratory corrosion tests and in-service corrosion. Hopefully, on-going research and task force activities on methods of evaluating corrosion will help to provide additional answers.

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ADDITIONAL SOURCES OF INFORMATION

1. Southern Pressure Treaters' Association: <http://www.spta.org/>
2. Western Wood Preservers Institute: <http://www.wwpinstitute.org/>
3. Southern Forest Products Association: <http://www.sfpa.org/>
4. Timber Piling Council: <http://www.timberpilingcouncil.org/>
5. North American Wood Poles Council: <http://www.woodpoles.org/>
6. American Institute of Timber Construction: <http://www.aitc-glulam.org/>
7. APA-The Engineered Wood Association: <http://www.apa-wood.org/>

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