

HISTORY

Since the early 1930's, the lumber industry has been using a chemical solution known as Chromated Copper Arsenate (CCA) as the primary preservative in its production of pressure treated lumber used in commercial and residential applications. The purpose of pressure treating wood was to prevent premature wood failures due to insect infestations and deterioration due to rot. After many decades of use, the Environmental Protection Agency (EPA) cited the arsenic and chromium contained in CCA as possible human and environmental hazards. In response, the lumber industry voluntarily ceased manufacturing pressure treated lumber with the CCA preservative in 2004. After that, several alternative preservatives, such as Alkaline Copper Quaternary (ACQ) and Copper Azole (CA), were introduced as the new generation of wood preservatives. These were found to be equally toxic to insects and provide resistance to mold and rot.

There were both gains and losses with this change. The gains were obvious with the elimination of the hazardous arsenic and chromium compounds. The key loss is that these new preservative solutions contain a significant increase in their copper levels. Copper is known to be extremely corrosive when in contact with certain metals such as carbon steel, aluminum, or zinc. These metals are dissimilar to copper and will create a galvanic reaction when in contact and in the presence of moisture. Therefore, ZINCALUME® zinc-aluminum metallic coated panels, and galvanized (zinc) coated panels are very vulnerable to this increased potential for corrosion. Galvanized steel clips and fasteners also pose a high corrosion risk.

The change in wood preservatives and the associated increase in corrosion potential was a major concern and challenge for the construction industry. The initial response by some manufacturers, as well as consultants and trade organizations, was to recommend that asphalted barrier coatings be applied to any metals contacting this new generation of treated lumber. In addition, that all fasteners be changed over to an austenitic (300 series) stainless steel. These responses were not welcomed by many in the industry because of the added product and installation costs.

Widespread industry testing over the years has confirmed that the new generation of ACQ and CA treated lumber is in fact highly corrosive and some form of additional protection absolutely required. Aluminum, was found to be highly reactive with treated lumber. In the case of both ZINCALUME® and galvanized coated products, even when post-painted, a protective barrier of self-adhered bitumen membrane (ice & water shield type material) is recommended between them and the treated lumber. Minimally, a 30# felt membrane that is complete and uncompromised could be used if permanently secured and moisture, including condensation, is reasonably absent. Direct contact with any treated lumber voids all of AEP Span's paint and material warranties.

FASTENERS

Fasteners are susceptible to high levels of corrosion due to their significant contact with treated lumber. The general consensus within the industry is that austenitic (300 series) stainless steel fasteners should be utilized when fastening to lumber treated with copper based preservatives. Epoxy coated, proprietary coated fasteners specifically for treated lumber, and hot dip galvanized fasteners may be alternative solutions; most are generally not considered to provide the same level of protection as stainless fasteners. All fastener selection and attachment should be carefully evaluated for the applications for which they are to be used.

Some alternative wood preservatives are in use that have less corrosive compounds, notably inorganic boron (SBX), and micronized copper (MCQ). Although the risk of galvanic corrosion is potentially reduced, the above fastener recommendations remain.

THE IBC PRESCRIPTIVE REQUIREMENTS FOR TREATED WOOD FASTENERS ARE AS FOLLOWS

2304.10.5.1 Fasteners And Connectors For Preservative-Treated Wood.

"Fasteners, including nuts and washers, in contact with preservative-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum. Connectors that are used in exterior applications and in contact with preservative treated wood shall have coating types and weights in accordance with the treated wood or connector manufacturer's recommendations. In the absence of manufacturer's recommendations, a minimum of Fasteners in Treated Wood ASTM A 653, Type G185 zinc-coated galvanized steel, or equivalent, shall be used.

Exception: *Plain carbon steel fasteners, including nuts and washers, in SBX/DOT and zinc borate preservative-treated wood in an interior, dry environment shall be permitted."*

In lieu of code-approved alternatives, IBC requires the fasteners to be of stainless steel, or a hot dip galvanized construction (the additionally noted silicon bronze and copper fasteners are not compatible with coated steel roof and wall products).

IN SUMMARY

AEP Span requires all panels to be isolated from pressure treated lumber using a self-adhered bitumen membrane, or similar barrier, to avoid galvanic corrosion. Fasteners should be of 300 series stainless steel. Alternative fastener materials/ protective coatings should be carefully considered to confirm their appropriate usage in specific applications.