



April, 2010

Sheet Steel Products and Pressure Treated Wood

Introduction

Many buildings will include wood members in applications such as sill plates, splash boards, strapping, purlins, door or window bucks, and posts. In some of these end-uses it is a requirement that the wood be chemically treated (pressure treated) to extend the service life.

Designers and builders need to be aware that changes in the available wood preservatives may impact the durability of any connected steel components or fasteners.

Effective January 1, 2004 the Environmental Protection Agency (EPA) banned the use of Chromated Copper Arsenate (CCA) as a preservative in treated lumber for residential construction. This was done in an effort to reduce the use of chromate and arsenic thereby mitigating the potential health and environmental problems. The wood preservative industry has been switching to alternative waterborne compounds including Sodium Borate (SBX), Alkaline Copper Quat (ACQ), Copper Azole (CBA-A and CA-B), and Ammoniacal Copper Zinc Arsenate (ACZA).

Unfortunately, research has indicated that ACQ, CBA-A, CA-B and ACZA, the new generation copper-based products, are more corrosive to galvanized steel than the former CCA. Since ACQ is becoming the predominant preservative in use, the discussions in this paper will refer to it exclusively.

The purpose of this Fact Sheet is to convey the recommendations of the sheet steel industry for the application of steel products with ACQ pressure treated wood.

Sheet Steel Roofing and Siding

In the construction of a wood frame building (i.e. pole barn), pressure treated wood is commonly used for the framing poles, roof purlins and skirt boards. The balance of the building wood components (i.e. trusses, strapping and girts) are from non-treated lumber.

It is common practice to attach the roofing or siding to strapping or sheathing (i.e. plywood or OSB) that are in turn attached to the pressure treated wood structural members. Strapping and sheathing are generally not made from pressure treated wood and standard installation practices can be followed. The connection of the strapping or sheathing to the pressure treated framing requires added consideration.

It is recommended that all galvanized or painted sheet steel roofing or siding products be separated from ACQ pressure treated wood with Ice & Water Shield membrane or similar product. The use of roofing felts is not an adequate separator.

Lightweight Steel Framing

The following are options for cold-formed steel framing that should be considered:

- Isolate the steel and wood components
- Avoid use of pressure treated wood

Isolate the Steel and Wood Components

Isolating the steel framing from the pressure treated wood components could be done with an appropriate isolating material. However, care needs to be taken during construction to assure that integrity of the barrier is maintained.

Avoid Use of Pressure Treated Wood

The pressure treated wood components commonly used in steel framed buildings can often be eliminated. This obviously avoids the problem altogether. For example, wood sill plates are not always required between the steel framing and the foundation: when needed, relatively inexpensive felt paper or closed cell foam sill seal products are available. Pressure treated wood top plates are also not required if in-line framing practices are followed or a steel load bearing top track is used. Avoiding the use of pressure treated wood probably provides the greatest assurance that the design intent will be realized.

Fasteners

Fasteners for use with pressure treated wood include:

- Hot-dipped galvanized fasteners (for limited applications such as connecting strapping to an ACQ treated framing member)
- Stainless steel (300 series recommended)
- Other fasteners or coatings as recommended by the fastener manufacturer

As the industry continues to carry out research and field observations, improved fasteners or coatings specifically designed to perform in severe exposure conditions will be introduced. The fastener manufacturer is the best source for information on the correct product selection.

Accessories

Connectors made from stainless steel or that are galvanized after fabrication to have a heavier coating, are recommended for use with pressure treated wood.

- Due to the uncertainties, which are out of the specifier's control in regard to the chemicals used in pressure treated wood, stainless steel fasteners, anchors and connectors should be used with treated wood when possible.
- Z180 (G60) galvanized products should not be used with treated woods.
- Z275 (G90) galvanized connectors can be used with Sodium Borate treated woods.
- Sodium Borate treated woods are not suitable for applications where moisture exposure is likely. They are suitable for splash board applications when transported, stored and installed appropriately.
- Uncoated and painted products should not be used with treated woods.
- When using stainless steel or hot-dip galvanized connectors, the connectors and fasteners should be made of the same material.
- Testing has shown that 300 series stainless steel products corrode substantially less than other alternatives when used with the alternative wood treatments.

Conclusions

From the research that has been reported to date, some conclusions can be put forward with respect to the interaction between steel components and ACQ treated wood:

- Fasteners with standard zinc coatings or epoxy barrier coatings are of little use. Other improved zinc coatings may show a lowered corrosion rate, but remain inadequate in the long term.
- Austenitic (300 series) stainless steel fasteners and accessories are recommended because they are virtually unaffected by the wood preservatives.
- Consult the individual fastener manufacturer for recommendations about the performance of their products with treated wood.
- Galvanized sheet steel (painted or unpainted) needs to be separated from the treated wood using an impermeable product such as Ice & Water Shield.
- **These changes by the wood industry will change the performance of any application where galvanized steel products are in contact with pressure treated wood. For this reason please review any future applications and practices where these materials will be used.**

For More Information

Refer to the treated wood industry websites (www.awpa.com or www.treatedwood.com) for additional information on their products.

For more information on sheet steel building products, or to order any CSSBI publications, contact the CSSBI at the address shown below or visit the website at www.cssbi.ca



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