

# THE TRUTH ABOUT FASTENERS

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# ARE FASTENER SUPPLIERS RISKING YOUR FUTURE?

## SFS INTEC DISCUSSES ACQ/CA

BY GARY P. MARTINI

LAST YEAR, THE U.S. Environmental Protection Agency mandated the removal of arsenic from wood preservative treatments for most applications. This probably was a good decision environmentally, but like many government directed improvements, it has not gone without hardship. The hardship here: Arsenic was replaced with copper by most chemical-treatment manufacturers (in ACQ and CA), and copper is a bad actor when it comes in contact with the steel and zinc in fasteners and panels.

Steel-panel manufacturers have cried out for solutions from their steel and fastener suppliers. This has led to a flurry of information that has been difficult to digest and disseminate. You can pretty much find any answer that you're looking for if you search long enough. But at the end of the day, if the recommendation is incorrect, you have to ask yourself, "Who will pay the price?"

In the fastener world, most suppliers simply are too small and employ too few scientific resources to answer complex corrosion questions, such as ACQ/CA. Unfortunately, this has not prevented them from publishing opinions.

One manufacturer came out with a letter in January 2004 stating there was no reason to believe ACQ, while being clearly more corrosive than traditional treatments, would have an appreciable effect on its own products. The letter went on to note that this company made no predictions about expected fastener life. The industry should be outraged by such weak, misleading positions. At the time of the writing of this letter, there was so little information available about the ACQ product, any such claims were at minimum uninformed.

Another fastener manufacturer in the flat-roofing business published a letter stating ACQ was not a concern because treated lumber used on flat roofs is thoroughly dried. We'll give this supplier credit for understanding the science enough to recognize the effect of moisture in ACQ; nevertheless, we must be horrified at the complete lack of regard for the truth. Flat roofing contractors do not have a special "in" with lumber suppliers whereby they receive special "dried" lumber, nor are they immune to simple condensation.

The end result of the acceptance of misinformation about ACQ is

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going to be structural failures. When these failures occur in the skirt board of a post frame structure, this will simply mean a panel that is not attached at the bottom and probably some visible rust stains on the panel surface. When they occur on joist hangers or galvanized nails holding joist hangers in place on a deck or patio, people are going to get hurt, and the industries involved will pay a big price—because it won't be a limited, small-scale event.

The fastener industry has the responsibility to be correct—and to inform. Guessing is not allowed here. We must use science, and the science says steel and zinc in a copper solution (such as ACQ/CA lumber) will have an electrochemical reaction that rapidly corrodes the base steel material. There have been articles written that debate the speed with which this will occur, and the science is not clear here. There are too many variables, such as moisture content, condensation and temperature. There even have been articles that show a case for this reaction coming to a stop before catastrophic failure. All these are



These photos show accelerated testing performed at SFS intec. In the test, screws from the same production lot were installed through steel into untreated pine and ACQ-treated lumber and then held at high humidity for 154 days.

TOP: Fastener corrosion in untreated lumber—light rust  
BOTTOM: Fastener corrosion in ACQ lumber—heavy rust and loss of threads and holding power

based on the wishes of industry players and not founded in properly applied science. This is not how we design structures. We design structures with safety factors that exceed expected load demand by two to three times. Applying the same logic to fastener selection and steel panel use in ACQ/CA environments, certainty, if available, should be insisted upon.

Certainty is available. Carbon steel, coated or otherwise, must not be used to fasten steel to ACQ/CA. Coatings, regardless of the type, get breached during installation. Steel and zinc get exposed, and the galvanic reaction begins. Stainless steel does not adversely react with the copper in ACQ/CA. Stainless-steel fasteners should be used in all treated-lumber applications to be certain the intended integrity is permanent. Steel panels can be protected through the use of a barrier, such as ice and water shield or other water-resistant, permanent membrane. These solutions may sound expensive, but when taken structure by structure, they add very little total cost and ensure the long life of a building, just as though there were no ACQ/CA problem. ■

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