

QUESTION & ANSWER

Timing Matters When Painting Galvanized Metal

Q I have a customer who objects to the bare metal look of framing hardware such as post bases and joist hangers. Is there any reason not to paint them or have them powder coated before installation?

A Andy Engel, editor of *PDB*, replies: I asked the question of Jim Mailey, the training manager for Simpson Strong-Tie for the Northeast, Middle Atlantic, and Midwest. His answer, in a word, was yes. I was surprised to learn this myself, as a layer of paint seems like another layer of protection on top of the zinc galvanization.

And it can be, but timing is everything. As it turns out, galvanization isn't as simple as I thought. First, you have to understand that galvanization isn't permanent protection. Because zinc is a more chemically active metal than iron, when a galvanized connector is put in a situation that favors corrosion, the zinc corrodes first, which protects the iron. Eventually though, the zinc will be entirely consumed by the chemical reactions that cause corrosion, and then the iron in the steel hardware is next to go. The more zinc, the longer lasting the protection. That's why, for example, hot-dipped fasteners last longer than electro-galvanized ones. It's also why the IRC now requires the use of hardware galvanized to the G185 standard, which requires more than three times more zinc than was needed to comply with the old G60 standard.

What situations favor corrosion? Moisture; heat; electrolytes, like salt; contaminants that may be present in the atmosphere, like acid rain; and some chemicals used in pressure-treated wood all accelerate corrosion. You'd think that painting the hardware would help protect the metal from these things. Except, according to Mailey, when the zinc is exposed through a crack or scratch, the moisture and contaminants will initiate corrosion and begin to cause damage.

Salt is probably the biggest problem, most obviously in coastal environments, where Mailey recommends using stainless steel connectors (framing hardware is also available in stainless steel for most applications; check with the hardware manufacturer). He also commented on how, when he vacations at the Jersey shore, he rarely sees stain-

Rest a Little Easier

Concerns about hardware being corroded by the wood preservatives that replaced CCA remain forward in the minds of deck builders. However, anecdotal evidence suggests that it's not as big a problem as it was in 2004 and 2005. I've been told by representatives of both Viance and Osmose, two major preservative manufacturers, that they've reformulated their chemicals to use less copper, whose reaction with steel was what caused the problems. That's not to say you can go back to using G60 connectors, but you can probably stop worrying.

less steel hardware in use. Instead, he sees corroded galvanized hardware.

It's not just at the shore that salt is a problem. Mailey quoted a study by the Illinois Department of Transportation stating that there's as much salt in the air within 300 feet of a major highway that sees the use of winter de-icing salt as there is in marine environments. He also warns against using de-icing salt directly on decks.

Wouldn't painting the hardware help to keep salt off it? Yes, it would. But here's the problem with painting hardware. Zinc goes through a series of chemical reactions during the first year or so of exposure to the elements. At first, it reacts with oxygen to create zinc oxide, which is water soluble (you may have noticed a white zinc oxide powder on new hardware that's been stored wet). Some of the zinc literally washes away during this initial oxidation. Over time zinc oxide reacts with moisture to form zinc hydroxide, and then finally zinc carbonate. Zinc carbonate is a thin, tenacious, compact, and stable (insoluble in water) film that significantly reduces the corrosion rate of the zinc coating.

All of which is a long-winded way of saying that new hardware that gets painted doesn't get the chance to form the zinc carbonate layer. If you can wait a year or two to paint the hardware, you'll be in much better shape. For more information on painting galvanized steel, the American Galvanizers Association offers various publications (galvanizeit.org). ♦