

AGA GATE UPDATE 7/2010

Question of the Month:

Question:

What should I tell my customers when they ask how hot-dip galvanized steel performs in salt-spray testing?

Answer:

The purpose of salt-spray testing steel that has a protective coating is to estimate the service life a particular coating might have in a specific environment. However, salt-spray tests do not always accurately predict how a protective coating may perform in the real world, as is the case with hot-dip galvanized steel.

ASTM B-117, *Standard Practice for Operating Salt Spray (Fog) Apparatus*, is probably the most popular standard used to salt-spray test coated steel. This test consists of exposing the coated steel to a 5% sodium chloride fog at room temperature for a given time. The salt-containing mist is sprayed on the coated surface continually without allowing for wet/dry cycling.

The fact the continuous salt-spray fog does not allow for wet/dry cycling is critical to the performance of hot-dip galvanized steel, because the zinc patina (zinc carbonate) is not able to form on the galvanized coating. If the zinc patina never forms, an accurate prediction of the real world performance of hot-dip galvanized steel is not possible since the zinc patina is responsible for the protective properties hot-dip galvanized steel is known for.

In other words, the salt-spray test attacks the wrong material (zinc metal instead of the zinc patina), and therefore will give an incorrect prediction of the performance of the hot-dip galvanized coating in the real world.

The best method to predict the performance of hot-dip galvanized steel in various environments is to look at its performance using real world case studies, of which there are many. In fact, there is a free application online that has combined many case studies of galvanized steel from around the world into an easy-to-use tool for predicting the time to first maintenance.

Using the *Zinc Coating Life Predictor*, your customer can input the atmospheric information where the structure will be located to get a personalized prediction of the time to first maintenance of hot-dip galvanized steel. This tool is much more accurate than salt-spray testing for accomplishing the task of predicting the performance of hot-dip galvanized steel, because it looks at real-world performance rather than artificial lab tests.

The next time your customer asks for salt-spray results for hot-dip galvanized steel, you will not only be able to explain why it is not appropriate for galvanized steel, but you will also be able to provide them with an accurate tool for estimating the performance of your product in the real world. You are welcome to contact the AGA Technical Department for more information and studies that demonstrate and explain in scientific terms why salt-spray testing is inappropriate for hot-dip galvanized steel.

AGA Technical Department: 720-554-0900 x21 or technical@galvanizeit.org.