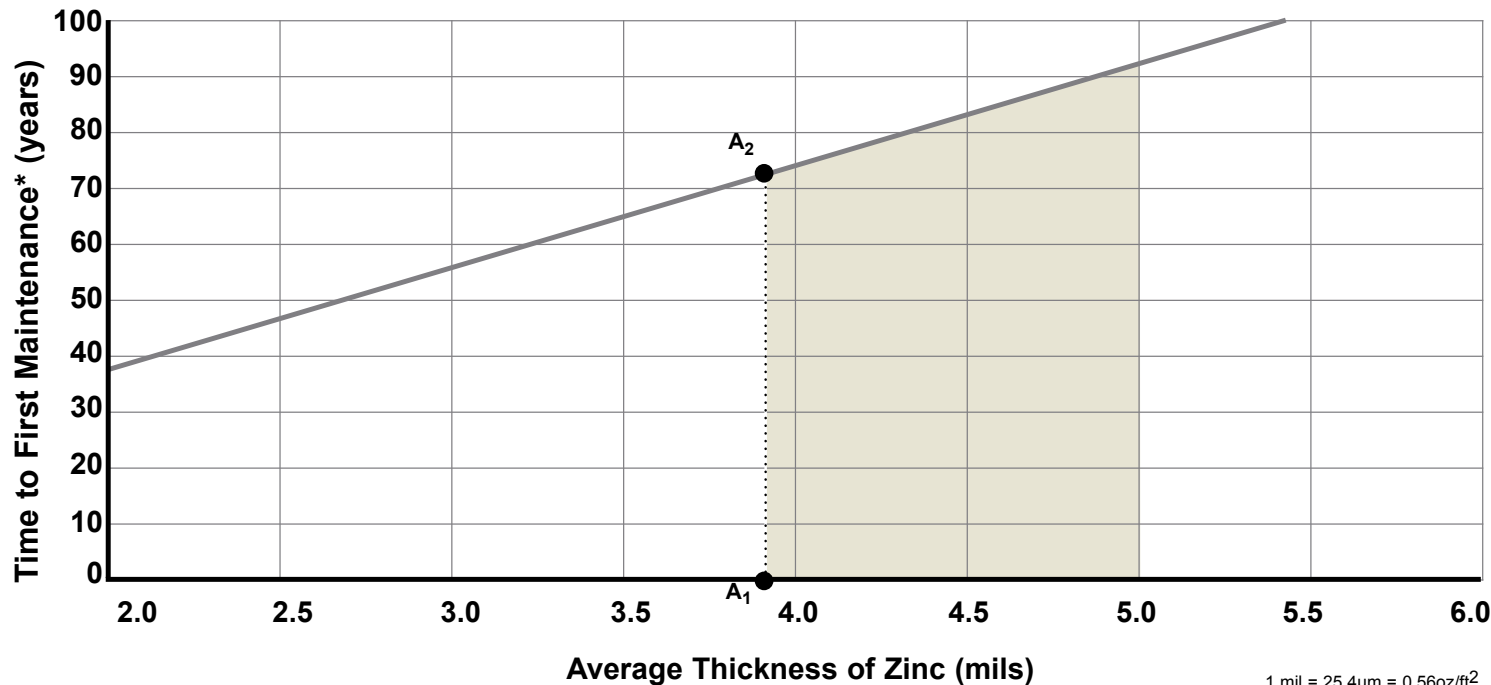


Time to First Maintenance Chart for Hot-Dip Galvanized Coatings

in an industrial environment



*Time to first maintenance is defined as the time to 5% rusting of the steel surface.

1 mil = 25.4µm = 0.56oz/ft²

Details

Steel chemistry and surface condition determine the metallurgical reaction between zinc and iron (steel), therefore generating a range of zinc coating thicknesses. Steel containing elevated amounts of silicon and phosphorus tend to exhibit thicker coatings. Steels with a silicon content below 0.04%, or between 0.15% and 0.22%, as well as a phosphorus level less than 0.04% are recommended for galvanizing.

Cost: The initial cost of hot-dip galvanized steel is equal to the final cost, thus there are no maintenance costs from year 0 to year 72.

Shaded Area: The coating thickness of hot-dip galvanized steel is commonly between 4 and 5 mils. The shaded area represents the maintenance-free zone of over 70 years for a typical galvanized coating.



Notes

A₁: ¼-inch thick steel must have at least 3.9 mils (100 µm) of zinc coating, per ASTM A 123.

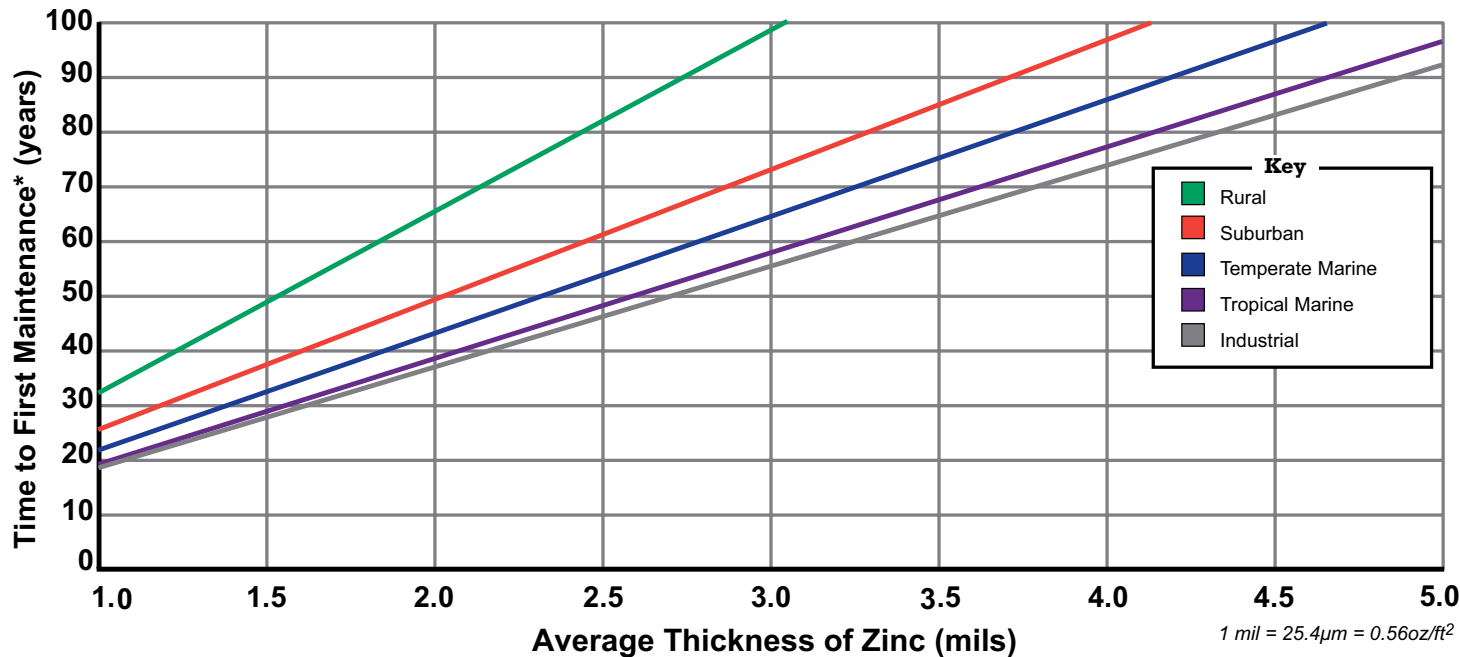
A₂: ¼-inch thick steel will be protected for approximately 72 years in an industrial environment before any touch-up or repair of the coating will be required.



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Time to First Maintenance Chart for Hot-Dip Galvanized Coatings

derived from the zinc coating life predictor



*Time to first maintenance is defined as the time to 5% rusting of the steel surface.

1 mil = 25.4µm = 0.56oz/ft²

Details

The Time to First Maintenance (TFM) Chart was developed from real world data and a corrosion prediction model, the Zinc Coating Life Predictor (ZCLP). The corrosion rate data was collected from galvanized steel samples exposed to the five defined environments in locations around the world and then coupled with the statistical methods and neural network technology of the ZCLP.

The data points of the TFM are based on macroscopic environmental data and, thus, may vary from the actual corrosion rate observed, due to site-specific environmental conditions.

Atmospheric levels of airborne salinity, precipitation, relative humidity, sulfur dioxide, and temperature influence actual corrosion rates in a specific geographic location.

Parameters such as alloying composition, surface orientation, and wind direction may also affect corrosion rates, but because of their variable and usually minor nature, are not included in the TFM model.

Zinc coating thickness is linearly related (on a macrolevel) to the time to first maintenance of hot-dip galvanized steel.

Cost

The initial cost of galvanizing is \$1.76 ft², assuming 250 ft²/ton of steel for a 100,000ft² project (according to a 2006 galvanizing industry survey).

