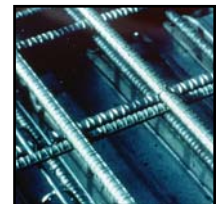
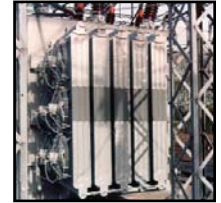
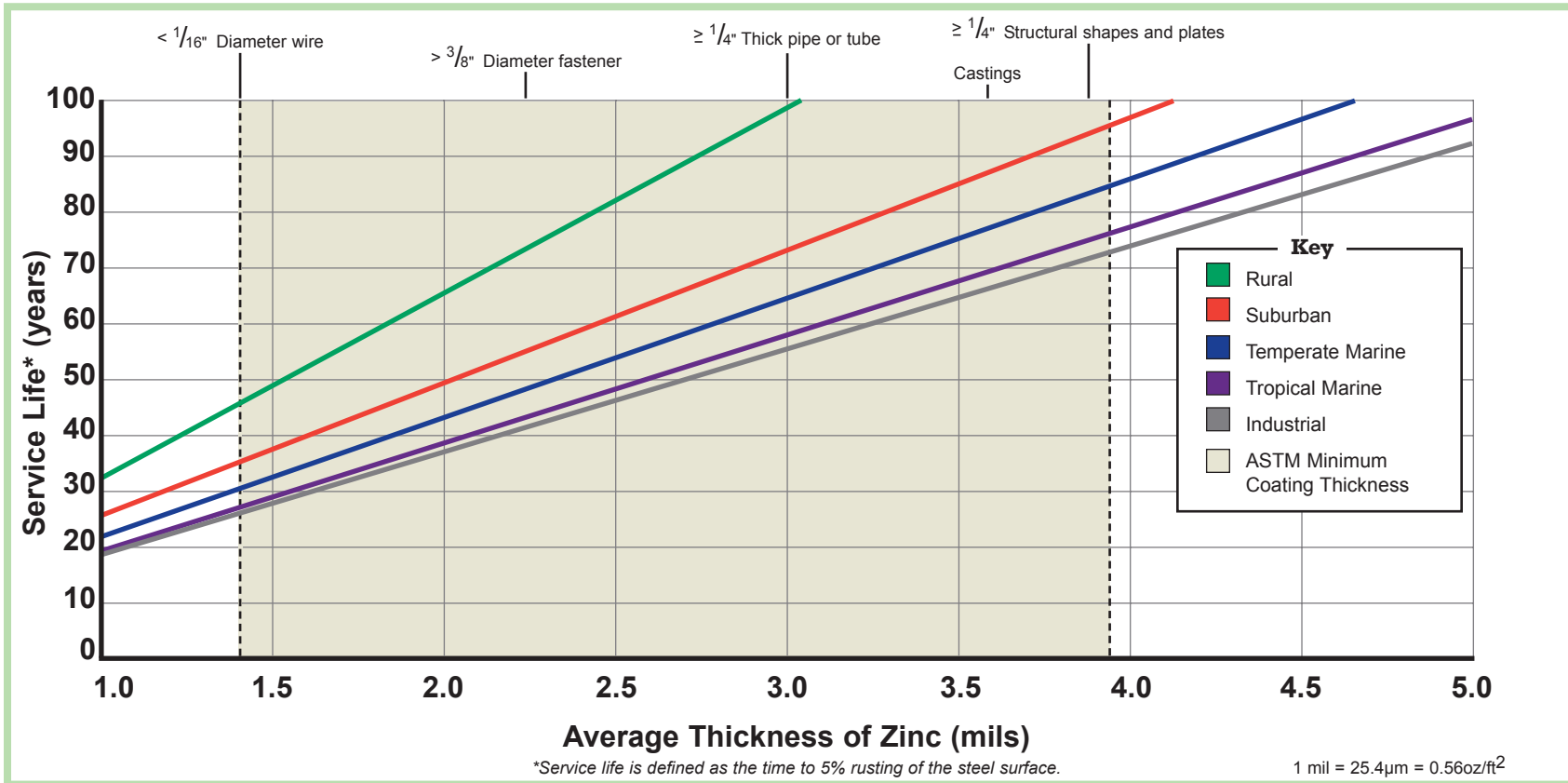


Service Life Chart for Hot-Dip Galvanized Coatings

derived from the zinc coating life predictor



Details

The Service Life Chart (SLC) was developed based on decades of corrosion rate data collected from galvanized steel samples exposed to the five defined environments in cities all over the world, and a corrosion prediction model based on statistical methods and neural network technology.

The data points of the SLC 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 relative humidity, sulfur dioxide, airborne salinity, precipitation, and temperature influence actual corrosion rates in a specific geographic location.

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

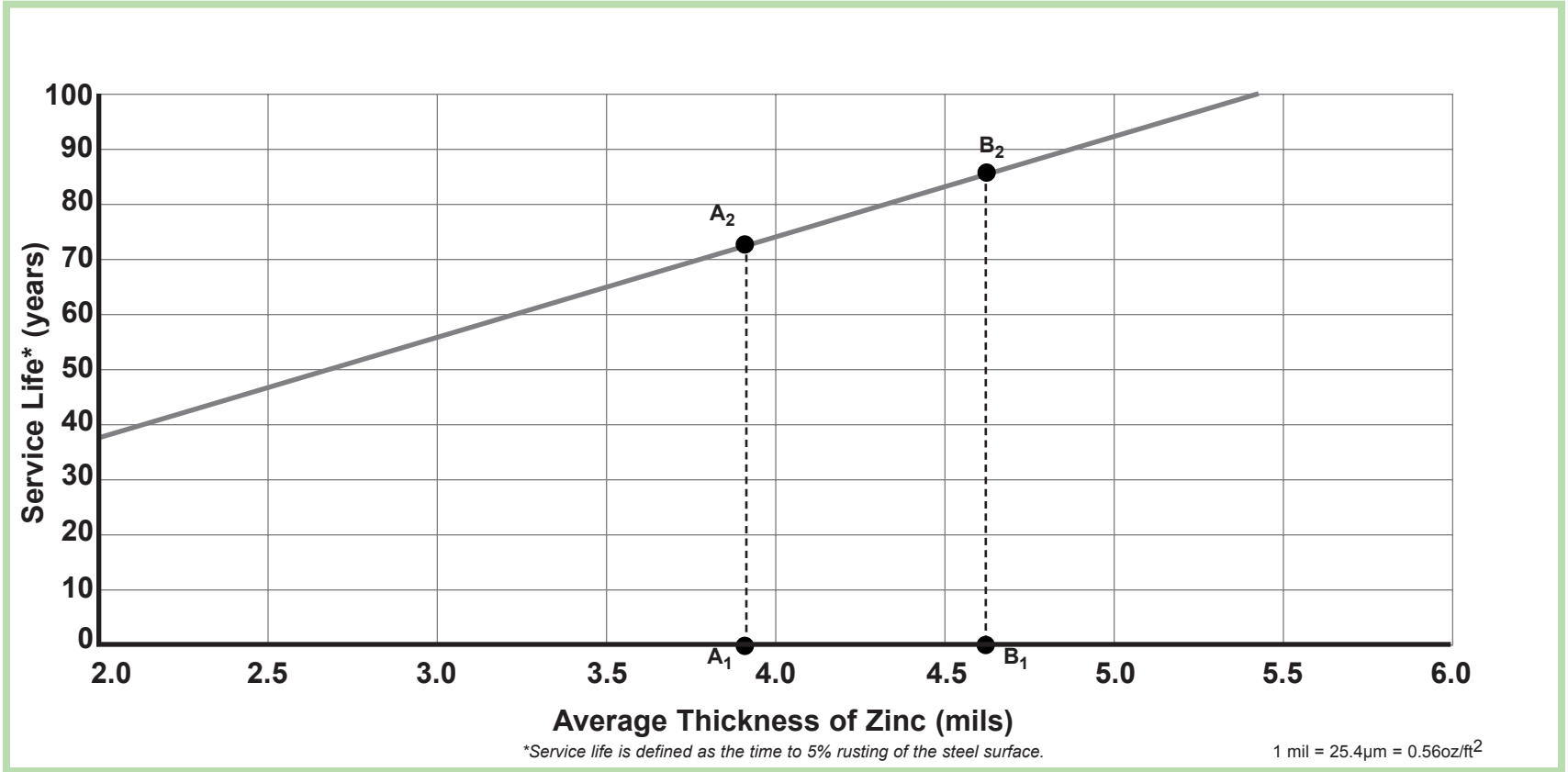
Zinc coating thickness is linearly related (on a macrolevel) to the service life of hot-dip galvanized steel.

Cost

The initial cost of galvanizing is \$1.67/ft², assuming 250 ft²/ton of steel for a 100,000 ft² project (average size job according to NACE Paper #509, *Costing Considerations for Maintenance and New Construction Coating Work*).

Service Life Chart for Hot-Dip Galvanized Coatings

in an industrial environment



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. It is recommended that steels have a silicon content below 0.04%, or between 0.15% and 0.22%, as well as a phosphorus level less than 0.04%.

Notes

A₁: ¼-inch thick steel has at least 3.9 mils (99 microns) of zinc coating, per ASTM A123.

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

B₁ and B₂: ¼-inch thick steel often has a zinc coating of four mils or more, resulting in a maintenance-free performance for approximately 85 years.

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.

Zn