

SCS Corrosion Resistance - Post Paint #5

OBJECTIVES

- Determine performance in salt spray tests of painted SCS samples pretreated with a single stage water rinse.
- Assess feasibility of reducing or eliminating iron phosphate wash stage for select applications.

APPLICABLE STANDARDS

ASTM B117-02

Practice for Operating Salt Spray Apparatus

ASTM D1654-92

Evaluation of Painted Specimens Subjected to Corrosive Environments

ASTM D3359

Measuring Adhesion by Tape Test

Testing Lab is A2LA Accredited

TEST PROCEDURE

Four (4) flat panels of hot-rolled were put through the SCS process. The panels were given a single-stage pretreatment consisting of a high pressure water rinse, then powder coat painted. The paint was a TGIC Polyester – a good quality, common paint system – applied to between 2 and 3 mils thickness.

After the paint had cured, samples were scribed with a thin 'razor' cut all the way through to the SCS surface. All samples were placed in a salt spray fog chamber exposed to 5% NaCl mist operating between 93 and 95 °F. Samples were inspected at specified intervals to measure creep.

TESTING LAB

St. Louis Testing Laboratories, Inc.

Lab No. 06C-0044

Report dated January 6, 2006

The scribe marks through the paint expose the metal surface directly to the salt spray. This induces rusting and causes the paint to "creep" away from either side of the scribe mark under continued exposure. Creepage is measured as:

10 = 0 inch	6 = 1/16th to 1/8th inch
9 = 0 to 1/64th inch	5 = 1/8th to 3/16th inch
8 = 1/64th to 1/32nd inch	4 = 3/16th to 1/4th inch
7 = 1/32nd to 1/16th inch	3 = 1/4th to 3/8th inch

TEST RESULTS

Sample Number	Creepage from Scribe at increasing exposure					Results of Tape Pull Test conducted only at 384 hours exposure
	48 hrs	96 hrs	168 hrs	288 hrs	384 hrs	
1	10	10	10	10	3	removal of paint beyond scribe
2	10	10	10	10	3	removal of paint beyond scribe
3	10	10	10	10	3	removal of paint beyond scribe
4	10	10	10	10	4	removal of paint beyond scribe

CONCLUSIONS

All four samples maintained excellent corrosion resistance through the 288 hour inspection. Afterwards, corrosion set in and accelerated to failure level over the next 100 hours.

In the prior Test #4, all SCS samples passed a 500 hour, 3mm creep test with a very lean two stage paint pretreatment consisting of iron phosphate and rinse. In Test #5 SCS samples passed 300 hours without the iron phosphate wash – the pretreatment consisted of just a rinse. To achieve comparable results, other material types must undergo various paint pretreatment stages such as cleaning and phosphating. In Test #5 SCS passed this tough corrosion test level while applying only a one stage water rinse pretreatment followed by a very common polyester paint..