Switchgear Assemblies S/C – Task Force Report on Organic Coating Text History from C37.20.3
Reported by Chuck Ball – 2013-05-01 during SA S/C Meeting

EXTERNAL SURFACE PROPOSED TEXT

6.2.8 ~~Paint~~ External surface qualification test

The ~~paint~~ external surface qualification test applies to all enclosures incorporating external ferrous parts. Nonferrous enclosures with no external ferrous parts need not be tested.

The ~~paint~~ external surface qualification test shall be performed to ensure the adequacy of finishes to inhibit the buildup of rust on ferrous metal materials used for enclosures.

The paint qualification methods used are given in 6.2.8.1 through 6.2.8.7.

6.2.8.1 Test specimens

Representative test panels of a 7.6 cm **x** 15 cm (3 in **x** 6 in) minimum size that can be accommodated by the test chamber shall be provided. Each specimen shall be uniformly processed in the standard production paint-finishing system. At least four panels shall be selected for the test. All the test specimens shall be of standard gauge ferrous metal equivalent to that used for the enclosure. The specimen shall he allowed to age for a minimum of seven days before being tested.

6.2.8.2Test apparatus

The test apparatus shall consist of a fog chamber, salt solution reservoir, compressed-air supply, provisions for heating, and means of control. The conditions in the salt spray chamber (including the positioning of the specimens, content of the salt solution, and temperature and pressure to be maintained) shall he as defined in ASTM B 1 17-97.

6.2.8.3 Preparation of test specimens

Two of the test panels shall be suitably scribed for testing in accordance with ASTM D1654-92.

6.2.8.4 Exposure of test specimens

All test specimens shall be tested in the salt spray chamber for a period of 200 h continuously except for the short daily interruptions necessary to inspect the test specimen or replenish the solution in the reservoir.

6.2.8.5 Procedure

After completion of the exposure period, the scribed specimens shall be processed in accordance with ASTM D1654-92, either Method A (tape) or Method B (scraper).

6.2.8.6 Evaluation

The scribed specimens shall then be evaluated for creepage from the scribe mark in accordance with ASTM D1654-92, Rating Schedule #I. The nonscrihed specimen shall be evaluated for degree of blistering in accordance with ASTM D714-87.

6.2.8.7 Performance

The scribed specimens shall be judged to have met the requirements of the test if their rating number is 5 or higher as determined by ASTM D1654-92. The nonscribed specimens shall be judged to have met the requirements of the test if their blistering size is No. 6 or higher and if their frequency designation is F or M as determined by ASTM D714-87.

The other finishes shall comply with the qualification methods given in 6.2.8.8 and 6.2.8.9

6.2.8.8 Sheet steel enclosures may be protected from corrosion by one of the following coatings:

6.2.8.8.1. Hot-dipped mill-galvanized sheet steel conforming with the coating Designation G90 in Table I of ASTM Designation A525-87, with not less than 40 percent of the zinc on any side, based on the minimum single-spot test requirement in this ASTM designation. The weight of the zinc coating may be determined by any acceptable method; however, in case of question the weight of coating shall be established in accordance with the test method of ASTM Designation A90-81.

6.2.8.8.2 A zinc coating, other than that provided on hot-dipped mill-galvanized sheet steel, uniformly applied to an average thickness of not less than 0.00061 inch (0.015 mm) on each surface with a minimum thickness of 0.00054 inch (0.014 mm). The thickness of coating shall be establishedby the metallic- coating-thickness test described in ASTM Designation B555-91. An annealed coating shall comply with 15.4 and 15.5.

6.2.8.8.3 A zinc coating conforming with 6.2.8.8.3.1 or 6.2.8.8.3.2 with one coat of an organic finish of the epoxy or alkyd-resin type or other outdoor paint applied after forming on each surface. The acceptability of the paint may be determined by consideration of its composition or by corrosion tests if these are considered necessary:

6.2.8.8.3.1 Hot-dipped mill-galvanized sheet steel conforming with the coating Designation G60 or A60 in Table I of ASTM Designation A525-87, with not less than 40 percent of the zinc on any side, based on the minimum single-spot test requirement in this ASTM designation. The weight of zinc coating may be determined by any acceptable method; however, in case of question the weight of coating shall be established in accordance with the test method of ASTM Designation A90-81;

6.2.8.8.3.2 A zinc coating, other than that provided on hot-dipped mill-galvanized sheet steel, uniformly applied to an average thickness of not less than 0.00041 inch (0.010 mm) on each surface with a minimum thickness of 0.00034 inch (0.009 mm). The thickness of the coating shall be established by the metallic-coating-thickness test described in Section 44;

6.2.8.8.4 Other finishes, such as special metallic finishes, or metallic finish combined with paint may be accepted when comparative tests with galvanized sheet steel (without annealing, wiping, or other surface treatment) conform with 6.2.8.8 or, when found to provide equivalent protection after exposure to both of the following:

6.2.8.8.4.1 A 600 hour salt spray test conducted in accordance with the Standard for Organic Coatings for Steel Enclosures for Outdoor-Use Electrical Equipment, UL 1332; and

6.2.8.8.4.1 A 1200 hour moist carbon-dioxide sulphur-dioxide air mixtures test conducted in accordance with UL 1332;

6.2.8.9 If flaking or cracking of the zinc coating, on sheet steel, at the outside radius of the bent or formed section is visible at 25 power magnification, the zinc coating is considered to be damaged. Simple sheared or cut edges and punched holes are not required to be additionally protected.

7.5.2 Finishes and color

All steel surfaces are to be protected from corrosion. All steel surfaces to be painted shall receive a phosphatizing treatment or equivalent prior to applying paint.

Painted external and internal surfaces shall be coated with at least one coat of corrosion-resistant paint. The finish paint system shall comply with the requirement of clauses 6.2.81 through 6.2.8.7.

Steel surfaces that are galvanized may not require a paint coating. These surfaces shall comply with the requirements of clauses 6.2.8.8 thru 6.2.8.X. Galvanized surfaced should not be used as external surfaces on outdoor equipment.

Hinges and other attachments used to maintain the integrity of an enclosure intended for outdoor use shall be resistant to corrosion.

Metals used in combinations shall be galvanically compatible.

The under-surfaces of outdoor assemblies shall additionally receive either a corrosion-resistant undercoating or an additional thickness of corrosion-resistant paint.

The preferred color for the finish on switchgear assemblies shall he light gray No. 61 per ASTM D1535-97, (munsell notation 8.3 G6.1010.54).

NOTES

I -Internal detail **parts** may have metallic plating or equivalent in lieu of paint finish.

A.3.12.1 Test requirements

Outdoor enclosures shall be tested and evaluated by

a) Rain test per 6.2.9

b) ~~Paint~~ External surface qualifications per 6.2.8