



Horizontal Settling of Cathodic ELPO with and without Agitation

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. To measure horizontal dirt as a function of pump shear and stability of an Electrodeposition (ELPO) Process Bath with/without agitation, which may be encountered in a production plant situation.

1.2 Applicability. This test method is applicable for all ELPO paint which is approved under GMW3008.

1.3 Remarks. Not applicable.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3008

2.3 Additional References. None.

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.2.1 Alternative test facilities and equipment may also be used by prior agreement between the Materials Engineer and the supplier.

3.2 Equipment.

3.2.1 Standard coating equipment.

3.2.2 Coating apparatus setup with up to 5 L (1.32 gal) bath and paint temperature of 30 °C.

3.2.3 Phosphated Cold Rolled Steel (CRS) panel 75 mm × 150 mm.

3.3 Test Vehicle/Test Piece. Not applicable.

3.4 Test Time. GM responsible engineer and the supplier shall work together to comprehend required test time.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. A person familiar with the coating equipment and apparatus.

4 Procedure

4.1 Preparation.

4.1.1 Properly apply and cure the coating or surface treatment over the specified substrate part or panel following all manufacturer's application, film build, and bake recommendations.

4.1.2 Calibrate instrument per manufacturer's instructions.

4.2 Conditions.

4.2.1 **Environmental Conditions.** Not applicable.

4.2.2 **Test Conditions.** Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Horizontal Settling with Agitation.

4.3.1.1 Bend bottom 60 mm of panel to a 90 degree angle to form an L-shaped panel.

4.3.1.2 Immerse L-shaped panel into ELPO bath to a depth of 50 mm from the top of the paint surface.

4.3.1.3 Coat panel with normal agitation (10 mm to 20 mm vortex) at tank temperature for 2 minutes targeting 18 μ m to 20 μ m.

4.3.1.4 Rinse with tap water, bake for normal time and temperature, and rate panels.

4.3.2 Horizontal Settling without Agitation.

4.3.2.1 Bend bottom 60 mm of panel to a 90 degree angle to form an L-shaped panel.

4.3.2.2 Immerse L-shaped panel into ELPO bath to a depth of 50 mm from the top of the paint surface.

4.3.2.3 Turn off agitation and allow panel to remain for 3 minutes, no voltage applied.

4.3.2.4 After 3 minutes, coat the panel at tank temperature for 2 minutes targeting 18 μ m to 20 μ m. Agitation should be off during deposition.

4.3.2.5 Rinse with tap water, bake for normal time and temperature, and rate panels.

5 Data

5.1 **Calculations.** Report the average of the readings for each agitation and non-agitation condition.

5.2 **Interpretation of Results.** Panels shall be rated per Table 1 by counting horizontal dirt on each panel and comparing the panels to a control paint system. Rating 4 and over is acceptable.

5.3 **Test Documentation.** The test report shall include: Report the material identification, thickness of ELPO layer and dirt ratings.

Table 1: Panel Rating

Rating	Number of Dirt Particles on Horizontal
5	0 to 1
4	2 to 4
3	5 to 10
2	11 to 20
1	> 20

6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.