



Transit Coating, Peelable

1 Scope

1.1 Material Description. This specification covers the requirements for coatings designed to protect exterior paint from damage caused by iron particles that fall on the vehicle during rail shipment and other environmental damage. These coatings are liquids applied by spray application. Coatings are essentially air-dried but may require supplemental heating.

1.2 Symbols. Not applicable.

1.3 Applicability. Vehicle bodies and parts.

1.4 Remarks. None.

2 References

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

2.1 External Standards/Specifications.

ASTM D3960	ISO 2811	ISO 3251	SAE J2527
ASTM D4212			

2.2 GM Standards/Specifications.

GMW3002	GMW3059	GMW14729	GMW16170
GMW3008	GMW14124	GMW14873	GMW16625
GMW3011	GMW14270		

2.3 Additional References.

- J.T.Baker 2226 Iron Powder available at www.capitolscientific.com.

3 Requirements

Transit coating must be submitted along with a corresponding overspray remover as a complete system. There must be no damage to any current production paints or any other components of the vehicle (glass, rubber, plastics, etc.) from contact with properly applied coating or remover.

3.1 Material Requirements. As part of the initial submission package, the following information must be provided. Complete material identification by:

- Code.
- Batch.
- General Chemical Composition.
- Physical Description.

3.1.1 Physical Constants. Formula values for weight and volume solids. Analytical values for Volume Organic Content (VOC) per ASTM D3960, percent (%) weight solids per ISO 3251, and density per ISO 2811. Application viscosity per ASTM D4212 and pH.

3.1.2 Material Safety Data Sheets (MSDS).

3.1.3 Film build range and target film build plus the recommended method for measuring the films for testing and quality control.

Note: Film build target and range is supplier specified. Maximum film thickness is the thickest film that can be removed easily after 6 months (1200 kJ at 340 nm) Florida exposure.

3.1.4 Document material disposal requirements and all other health and safety concerns/control methods.

3.1.5 VOC Limits. Product must be no more than 4.8 g/L (0.04 lb/gal) VOC of coating as received.

3.1.6 Health and Safety. Both the transit coating and the transit coating remover must meet all local and federal standards for air quality and waste water treatment.

3.2 Processing Requirements. The product must have sufficient latitude to perform in the range of conditions typically encountered in an automotive production facility. The following data must be submitted as part of the original submission package.

- Recommended application equipment.
- Film build as a function of gun distance versus viscosity.
- Drying time as a function of film build, air temperature and relative humidity.
- Define oven conditions if coating requires supplemental heating.
- Define conditions that allow the coating to withstand a light rain after 1 minute of drying time.

3.2.1 Test. Pour 1 L of water on a coated 10 cm × 30 cm (4 in × 12 in) panel at a rate of 10 mL/s at an angle of 45 degrees. Check coating integrity, finger imprint sensitivity and recovery time to a hard film.

3.2.2 Removability. Film should be easily peeled off after exposure without marring the paint surface.

3.3 Performance Requirements. Performance is measured by protection from environmental contaminants at the low end of film build and ease of removal after environmental conditioning at the high end of the film build range, see Table 1.

Table 1: Test Panel Matrix

Test	Topcoat Color	Transit Coating Film Thickness	Evaluation
Moisture Resistance (3.3.2)	B	T	Water Resistance
Heat Age (3.3.3)	B	L, T, H	Protection, Removal
Spotting Resistance (3.3.4)	B	L, T, H	Protection, Removal
Rust Resistance (3.3.5)	W	L, T, H	Protection, Removal
Environmental Cycle plus Spot Resistance (3.3.6)	B	L, H	Compatibility, Protection, Removal
Florida Exposure plus Spot Resistance (3.3.7) • 2 Months • 4 Months • 6 Months • 12 Months	B	L, T, H	Compatibility, Protection, Removal
Xenon Exposure (3.4.8) • 250 kJ • 500 kJ	B	T, H	Compatibility, Removal
Field Exposure (3.3.9)	B	T	Compatibility, Protection, Removal

Note: B = Black, H = High, L = Low, T = Target, W = White.

3.3.1 There must be no cracking, hazing, discoloration, distortion, and adhesion loss to the paint finish or pronounced edge effects caused by the transit coating film. The degree of protection is measured by a subjective scale.

Where:

- 0 = No effect etching from contaminants.
- 1 = Trace/slight effect.
- 2 = Moderate effect.
- 3 = Pronounced/severe effect.

3.3.2 Moisture Resistance (GMW14729). No loss of adhesion, film integrity or softening after 96 h exposure at 100% relative humidity, 38 °C (100 °F) plus a 24 h recovery period. Measure adhesion peel strength.

3.3.3 Heat Age. 14 d at 82 °C (180 °F) plus removability. No discoloration or cracking or paint film.

3.3.4 Spotting Resistance. There shall be no detrimental effects on the paint finish under the film from any of the spotting solutions at 60 °C (140 °F). At other temperatures, performance should equal or better than the control coating. Apply drops of the solutions to the test panels. Check removability and spotting resistance under the following conditions:

- 24 h at room temperature.
- 2 h or until drops are dry at 82 °C (180 °F).
- 2 h or until drops are dry at 71 °C (160 °F).

Note: Conditions at elevated temperatures for maximum of 7 h. Allow 24 h recovery prior to removing coating.

Solutions:

- a. 3 pH acid rain per GMW16625.
- b. 4 pH acid rain per GMW16625.
- c. Tap water.
- d. Egg albumin, 2% by weight in deionized water.

3.3.5 Rust Resistance. Iron filings/powder, 150 mesh to 200 mesh, 99.5% purity, such as J.T.Baker 2226 or agreed upon equivalent.

- Apply the iron filings/powder over white panels approximately 1.2 mL (¼ teaspoon) per 100 mm × 300 mm panel.
- Mist with 4 pH acid rain solution per GMW16625 on ½ of the panel. Heat age 7 h at 82 °C (180 °F) and then test for 96 h humidity.
- Test panels horizontally. Evaluate removability and staining resistance.

3.3.6 Environmental Cycle (GMW14124) plus Spot Resistance. Test panels in ten (10) cycles of GMW14124, Cycle I, plus spotting resistance test per 3.3.4 with the following conditions:

- 2 h, or until dry, at 60 °C ± 3 °C (140 °F ± 5 °F), with 3 pH acid rain solution per GMW16625. No paint cracking, discoloration, or adhesion loss.

3.3.7 Florida Exposure (GMW14873) Plus Spot Resistance. Measure exposure time in kilojoules (kJ) at 340 nm and record dates of exposure and removal from test.

- 2 Months (Approximately 500 kJ).
- 4 Months (Approximately 1000 kJ).
- 6 Months (Approximately 1500 kJ).
- 12 Months (Approximately 3000 kJ).

3.3.7.1 After each exposure interval, apply spots of 3 pH and 4 pH acid rain (per GMW16625) on ½ of the panel. Condition for 2 h (or until dry) at 60 °C (140 °F), and then remove coating. There must be no hazing, marring, cracking, or other detrimental effects to the painted surface or other components. There should be no significant change in the acid resistance compared to results prior to exposure. After exposing the panels for 1000 kJ/m², transit film must be removed. Paint samples without transit coating shall be exposed as controls to measure the effectiveness of the transit coating.