



Aftermarket Solventborne Anticorrosion Wax Repair Material and Application Equipment

1 Scope

The following content details the general material performance, compatibility, and processing requirements for the approval of an aftermarket solventborne anticorrosion wax and application equipment.

1.1 Material Description. Materials qualified to this standard shall meet the performance shown in Appendix B, Table B1.

Suppliers materials approved to this specification must manufacture their own product and supply the appropriate application equipment. Application equipment must be able to apply material into closed and hidden cavities.

1.2 Symbols. Not applicable.

1.3 Applicability. This standard applies to aftermarket solventborne anticorrosion wax materials that are intended for use on automotive vehicles. These coatings must provide corrosion prevention for:

- Cavities.

1.4 Remarks. None.

2 References

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

2.1 External Standards/Specifications.

ASTM D93	ISO 1183	ISO 2719	ISO 3251
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2.2 GM Standards/Specifications.

GMW2	GMW3286	GMW14270	GMW14872
GMW3059	GMW14124	GMW14729	

2.3 Additional References. None.

3 Requirements

3.1 Chemical Fingerprint. GM may conduct analyses of the materials supplied to this specification. Analyses may also be performed on representative panels. The analyses established for initial approval shall constitute a reference standard and shall be part of the submission package. Information on the technology's ingredient formulation ranges and key manufacturing control characteristics must be provided as part of the submission package. If a product change is proposed that is outside the technology formulation limits, the responsible engineer must be notified. All ingredient ranges, key manufacturing control limits, and certificate of analysis ranges must pass standard gage repeatability and reproducibility study.

3.2 Physical Requirements.

3.2.1 Product Information. The engineer responsible for technical qualification shall be contacted prior to test initiation. A product data sheet, product composition and all related product processing information must be submitted for review at that time.

3.2.2 Mini-Submissions. Some approvals will require mini submissions when only minor changes are made to previously approved wax materials. Tests may be added or deleted according to the type and amount of material modifications. These shall be determined prior to testing by agreement between the supplier and responsible engineers.

3.2.3 Sample Size and Panel Substrate Panel Substrate. The number of samples for each test shall be two, unless the Design Responsible Engineer (DRE) and the supplier agree on a different number for specific tests, prior to the start of testing. All substrates, pre-treatments, and coating layers shall be fully identified with source, product code, batch number, and film build.

3.2.4 Conditioning. The samples shall be subject to an aging period of at least 7 days at 23 °C ± 5 °C (74 °F ± 41 °F) for solventborne materials.

3.2.5 Storage Requirements. The materials approved to this standard must be stable for 180 d, at 10 °C to 30 °C (50 °F to 85 °F), as defined by the ability to pass all initial test requirements after 180 d storage in the application facility. If there is any disagreement with these requirements, the supplier must contact the DRE.

3.3 Requirements on Delivery.

3.3.1 Appearance. The common color is yellow-brown. Other colors may be agreed between the supplier and the DRE. See Appendix B, Table B1 for details.

3.3.2 Prohibited Ingredients. Silicone and benzene are prohibited.

3.3.3 Homogeneity. The product must not separate when stored for up to the specified shelf life. A thin oil film on the surface is acceptable. There may be some agitating requirement based on usage and/or supplier's recommendation.

3.3.4 Impurities. No air, lumps, unmixed particles or foreign materials.

3.3.5 Percent Weight Solids. The solid content shall be determined using ISO 3251. Refer to Table 1 and Table 2 for deviations from ISO 3251.

Table 1: Deviations from ISO 3251

ISO 3251 Reference	Deviation
4.1	For Wax: Flat-bottomed dish, of metal or glass, 50 mm ± 5 mm in diameter, height of rim ≥ 5 mm.
4.3	Air Oven: The oven shall be fitted with natural convection with a perforated shelf placed at ⅓ of the height of the oven. Ovens with forced-ventilation equipment are inapplicable.
7	Supplementary test conditions.

3.3.5.1 Test Parameters for Waxes. See Table 2.

Table 2: Parameters for Solid Content Determination

Period of Heating	Temperature	Mass of Test Portion	Product
120 minutes	120 °C (248 °F)	2.0 g ± 0.1 g	Solventborne Waxes

3.3.6 Flashpoint. Test method per ISO 2719 or ASTM D93, Procedure B.

3.3.7 Density (ISO 1183, Part 1, Method B). The density of the uncured material shall be reported.

3.3.8 Conditions on Delivery. Temperature during shipment and on delivery: 10 °C to 30 °C (50 °F to 85 °F).

3.4 Processing Requirements.

3.4.1 Processing Equipment. Supplier must show that their application equipment is capable of applying wax into closed and hidden cavities. Validation of application equipment shall be in agreement with the DRE.

3.4.2 Processing Temperature. Must be sprayable at standard temperatures. See Appendix B, Table B1 for details.

3.4.3 Vertical Slide Resistance. Spray wax on a vertical panel (coated with cathodic electrodeposition primer (ELPO)) in one single operation. Determine dry film thickness that withstands sliding down, forming runners or forming drops. See Appendix B, Table B1 for requirements.

3.4.4 Penetration. Penetration means the ability of corrosion prevention waxes to reach cavities, folds, flanges and seams. See Appendix B, Table B1 for requirements.

3.4.5 Running Length (see also Appendix A, A2). The abstract reading permits conclusions on spray ability, penetration and drop behavior. See Appendix B, Table B1 for requirements.

3.5 Performance Requirements.

3.5.1 Heat Stability of the Dried Film. A dry film of defined thickness (conditioned per 3.3.4) must not drip or sag when exposed vertically for 4 h at 90 °C (194 °F). See Appendix B, Table B1 for film thickness requirements.

3.5.2 Spray Water Resistance (see also Appendix A, A3). Applicable for cavity waxes. See Appendix B, Table B1 for requirements.

3.5.3 Material Compatibility.

3.5.3.1 Other Materials. After 48 h at 23 °C ± 5 °C (74 °F ± 41 °F) and 96 h of GMW14729 (Option A or B), the dried wax must not cause any visible changes (e.g., swelling) or a quality loss with the material. The wax is brushed onto the tested parts at a dry film thickness of approximately 50 µm in a way that waxed and non-waxed areas can be compared with each other. To evaluate the differences between waxed and non-waxed areas, remove the wax film with an approved solvent (e.g., petroleum ether).

3.5.3.2 The following are typical material groups and some examples for compatibility tests. The full list of materials to be tested can be found in the local specifications.

- Cold Rolled Steel (CRS), zinc coated steel with and without organic thin film coating.
- Aluminum.
- Electrocoat, the color grey (for car body) and black (for chassis parts).
- Poly Vinyl Chloride (PVC) (seam sealer and underbody coating).
- Body Shop Adhesives.
- Baffles.
- Sound Deadener.
- Paint Materials (basecoat and clearcoat).
- Duroplastics (e.g., air filter, fender liner).
- Elastomers (e.g., brake hose, door seal, and radiator hose).

3.5.3.3 Cleanability. Wax shall be easily and completely removable from surfaces that may be unintentionally coated due to their proximity to intended application areas. Highly textured surfaces are exempt from this requirement. Supplier shall recommend cleaning solvent and provide a cleaning procedure.

3.5.4 Corrosion Prevention Properties.

3.5.4.1 Corrosion Panel Preparation. Clean panels. Use bare CRS panels per GMW2. Clean panels thoroughly by storing in mineral spirits for 48 h ± 1 h and rubbing with an approved cleaning solvent and a brush or cloth. Alternatively, use an ultrasonic cleaner.

3.5.4.1.1 Apply Wax. Spray the wax with a dry film thickness of 25 µm + 2/- 0 µm and 50 µm + 2/- 0 µm.

3.5.4.1.2 Conditioning per 3.3.4.

3.5.4.2 Corrosion Performance. Rim areas of 2 mm are excluded from the evaluation.

3.5.4.2.1 There shall be no corrosion of the base metal or other evidence that the wax film has been penetrated or weakened. No thinning of the wax film.

3.5.4.2.2 There shall be no lifting, peeling or loss of adhesion of the wax film.

3.5.4.2.3 The wax film may adsorb a little humidity, but humidity shall be released after 24 h storage at 23 °C ± 5 °C (74 °F ± 41 °F).

3.5.4.3 Salt Spray Fog Corrosion Test (GMW3286). Expose scribed panels, prepared per 3.6.4.1, (25 µm and 50 µm). Evaluate per 3.6.4.2. For exposure times and requirements, see Appendix B, Table B1.

3.5.4.4 Cyclic Climate Test (GMW14124, Cycle U). Expose panels prepared per 3.6.4.1, (25 µm and 50 µm). Evaluate per 3.6.4.2. For exposure times see Appendix B, Table B1.