



Flexible Reinforcement Patch

1 Scope

This Material Specification is intended to detail the physical properties, and performance requirements of a Flexible Reinforcement Patch which is applied in the body shop. The patch material is applied to “oily” metal body panels. It is cured in the heat of the Electro Deposition Primer (ELPO) paint oven.

1.1 Material Description. This Flexible Reinforcement Patch is a composite material, having a woven or (non-woven) outer layer, which, as constructed, supports an uncured polymer layer, that is covered by a removable release paper. The release paper is removed prior to application in the body shop of the Reinforcement Patch to body panel that is to be reinforced. After removal of the release paper, these materials shall have satisfactory pressure sensitive tack to cold rolled steel, electro galvanized, hot dip galvanized steel, and aluminum substrates, contaminated with production processing oils. The Flexible Reinforcement Patch shall withstand production phosphatizing, ELPO dip operations without movement or delamination. The Flexible Reinforcement Patch shall also be compatible with production ELPO, primer/surfacers and topcoat bake operations exhibiting temperatures up to +190 °C.

1.2 Symbols. Not applicable.

1.3 Typical Applications. The Flexible Reinforcement Patch shall typically be used to provide localized stiffness, or additional resistance to “oil canning” or deflection of exterior body panels in the finished vehicle.

2 References

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

2.1 External Standards/Specifications.

ASTM D790	DIN 53423
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2.2 GM Standards/Specifications.

9986321	GMW3011	GMW14729	GMW15635
GMW2	GMW3059	GMW15192	GMW15735
GMW8	GMW3205	GMW15416	GMW16700
GMW11	GMW14093	GMW15477	GMW16723
GMW3008	GMW14124	GMW15634	

2.3 Additional References.

TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

3 Requirements

3.1 Uncured Material Requirements.

3.1.1 Odor. The uncured patch material shall not have objectionable odor.

3.1.2 Solids Content. The uncured material shall be 99% solids by mass (minimum).

3.1.3 Structure. The patch material, as supplied, shall be homogeneous, without gas bubbles, or voids.

3.1.4 Shipping and Storage Stability (GMW15735).

3.1.4.1 Elevated Temperature Stability. The material, as shipped, shall have a shelf life, and pass all requirements of this specification when exposed to a temperature not to exceed 35 °C for a period of 90 days. The shelf life shall commence upon receipt of the material.

3.1.4.2 Low Temperature Stability. The material, as shipped, shall be tested according to GMW15735, Cycle A, Low Temperature Stability Cycle.

3.1.4.3 Storage Stability Shelf Life. The material, after receipt at the production facility, shall meet all requirements of this specification when stored for a period of 90 days, at a temperature not to exceed 35 °C.

3.2 Material Application Guidelines for Testing.

3.2.1 Test Panel Preparation.

3.2.1.1 Required Test Substrates. Testing is required on the following substrates:

- GMW2 (cold rolled steel)
- GMW8 (electro galvanized steel)
- GMW11 (hot dip galvanized steel)
- GMW15192 (aluminum)
- Other substrates may be identified and required by the Regional Materials Engineering Group.

3.2.1.2 Test Substrate Preparation. Panel preparation according to GMW15477 with “approved lubricants”, identified by the Regional Materials Engineer, prior to application of the Reinforcing Patch material.

The “approved lubricant” coating weight shall be 3 g/m² for corrosion protection oils/lubricants and 1.7 g/m² for dry lubes, unless otherwise specified by the Regional Materials Engineer.

3.2.2 Release Paper Removal Characteristics. The “release paper” associated with the material shall remove “cleanly”, that is, there shall be no delamination of the polymer layer from the body on the patch, with no residual polymer that stays on the release paper.

3.2.3 Material “Wet Out” Requirements. A 100 mm × 300 mm piece of patch material shall be applied to a clean glass plate. The patch shall be immediately rolled with two (2) passes of an 1160 g roller and the glass plate shall immediately be inverted. A 100% grid pattern, lined at 10 mm divisions, is then used to determine adhesive “wet out”. The number of complete squares is then counted and divided by three (3). They are to be recorded as percent adhesive “wet out”.

3.2.4 Uncured Material Resistance to “Sag/Slide”. The uncured test samples, or production parts shall not “sag or slide” when properly applied to the associated substrate when held in a vertical lane. There shall also be no perceived “sag or slide” of the test samples, or production parts, during the cleaning or pretreatment process associated with the painting process or during ELPO dip, or the ELPO bake.

3.2.5 Flame Resistance (GMW16723). The material shall resist 50 passes with an open flame and be self-extinguishing.

3.3 Cured Material Requirements.

3.3.1 Odor (GMW3205).

Note: Odor testing shall be performed after completion of the tests according to GMW15634 and GMW15635. Odor shall be determined according to GMW3205, Coding 4: Test Volume Ratio 1:500; Coding B: Dry Condition. In deviation to GMW3205, the required amount of adhesive to be tested shall be taken from the cured test sample and afterwards stored open at room temperature for seven (7) days. The minimum rating of the odor shall be six (6).

3.3.2 Structure. The patch material after cure shall not exhibit blisters, or cracking.

3.3.3 Compatibility with Cavity Wax. When coated with a GMW15416 approved cavity wax, the sealer shall not show any loss of adhesion, collapse or other negative effects from contact with the wax. Testing shall include a 100% **solids content** cavity wax technology, a **solventborne** cavity wax technology, and a non-waxed control panel, as specified by the approving materials engineer.

3.3.3.1 Cavity Wax Compatibility Test Procedure. Prepare panel according to GMW15477 using one (1) substrate, oily hot dipped galvanized (HDG), and the most challenging regional oil as specified by the approving materials engineer. Panel configuration shall be unconstrained. Bake sealer at Minimum and Maximum bake. Cavity Wax Application:

- Brush 5 g to 20 g of cavity wax (dry film thickness approximately 50 µm) on to the cured sealer, being sure to apply wax to the sealer-to-substrate interface