



Paint Equipment Cleaning Solvent

1 Scope

1.1 Material Description. This standard covers the basic physical, chemical, and performance requirements of solvents used to clean the external surfaces of spray and other equipment used for applying solvent-borne (curing type) finishes including high solids primers and topcoats. These cleaners must have flash points greater than 16 °C (60 °F) to reduce fire hazards, particularly when used on electrostatic application equipment. The cleaner may be a single solvent or a blend of classes of solvents, such as aromatic hydrocarbons, ketones, and esters. Cleaners covered under this standard may not be effective for all paint materials or equipment and, therefore, are not interchangeable. Cleaners must be evaluated and approved for use with each specific plant application.

1.2 Symbols. Not applicable.

1.3 Applicability. Materials approved under this specification are used to clean the external surfaces of spray and other equipment used for applying solvent-borne primers and topcoats.

2 References

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

2.1 External Standards/Specifications.

40 CFR 261 Subpart D ASTM D56 ASTM D1298 ASTM D5682

2.2 GM Standards/Specifications.

GMW3059

3 Requirements

Materials submitted for qualification to this standard must meet all the physical, chemical, and performance requirements herein.

3.1 Requirements on Delivery.

3.1.1 Chemical Requirements.

3.1.1.1 Identification. Gas chromatography and/or gas chromatography and mass spectroscopy analysis will be used to identify, characterize, and qualify new materials for approval to this standard. All subsequent lots of the approved material must be compositionally identical to the initial samples submitted for qualification.

3.1.1.2 Purity. The material must be free of any suspended particles, corrosion products, undissolved water, silicones or any other materials detrimental to the painting process. Product must be essentially colorless and not impart any color to coating materials.

3.1.1.3 Odor. The odor of the material shall be reviewed in comparison with current production materials. Any significant change in the characteristic odor of the material must be evaluated in a GM approved laboratory and production trial. Any change in formulation must be reassessed for effect on odor.

3.1.1.4 Hazardous Materials Documentation. The supplier must provide all required safety documentation per Section 5 upon initial submission. Toxicity and flammability will be assessed by the Hazardous Materials Committee of the using plant to determine conditions for use and handling precautions. The supplier must comply with all governmental regulations regarding proper labeling of hazardous materials.

3.1.2 Physical Requirements. This standard covers individual solvents or blends of solvents having a wide range of physical properties. Upon submission, the physical properties in 3.1.2.1 through 3.1.2.3 shall be provided for each cleaner and shall form the standard requirement for all subsequent lots.

3.1.2.1 Flash Point, ASTM D56, °C. Should be at 16 °C (60 °F) minimum.

3.1.2.2 Specific Gravity, ASTM D1298. Should be at 25 °C.

3.1.2.3 Resistivity ASTM D5682 (Ransburg Meter 70367 or Equivalent). Minimum of 0.3 MΩ.

3.1.3 Additional Requirements. The supplier must provide pertinent data regarding composition, physical characteristics, usage, emissions, and test information as a part of a basic submission package.

3.1.3.1 Productive Material Review (PMRV). All materials must be evaluated through the Productive Material Review Process initiated by Manufacturing Engineering Vehicle System Paint Engineer prior to plant implementation.

3.1.3.2 Material Safety Data Sheet (MSDS). A full disclosure Material Safety Data Sheet must be provided to General Motors.

3.1.3.3 Source Shipment Responsibility. All shipments must be made in clean, sealed containers which are clearly identified. A Certificate of Analysis (COA) must accompany all batch shipments.

3.1.3.4 Certificate of Analysis. Information provided in COA must include product code, batch number, manufacturing date, composition identification, flash point, color, specific gravity and resistivity.

3.2 Performance Requirements. The following tests (3.2.1 through 3.2.6) will be used to screen the various different paint equipment cleaning solvent cleaner blends.

3.2.1 Test Data. Supplier must provide the Manufacturing Engineering Vehicle System (ME VS) Paint Engineer written reports of performance test results as part of the submission package.

3.2.2 Test Colors. Testing must be done with one or two primers, three basecoats, and clear-coat for generic approval. Specific supplier sources will be determined at the test initiation. Paint must be reduced to spray viscosity with the exact solvent blend used at the target plant.

Primer colors are gray and white. Where applicable for plant specific testing, red may be added. Topcoat colors are a clean white, a medium red, and a dark metallic.

3.2.3 Efficiency Screen Test. Apply 50.8 µm (2.0 mil) of wet paint with a drawdown bar on clear glass panel. Minimum paint area must be 100 mm high x 150 mm long (4 in high x 6 in long). Flash paint at room temperature for 2 minutes. Place the panel on a fixture at a 45 degree angle. From a 25 mL burette with tip positioned 25 mm (1 in) above the glass panel, apply 10 drops of thinner (one (1) drop per second) on the paint film in the same spot, which should be approximately 50 mm (2 in) from the top of the panel and allow thinner to run down the panel. Observe cleaning efficiency among the various solvent samples. Cure paint completely and photocopy panel for documentation. Report the technologies, product codes, and color codes for all materials used in the test.

3.2.4 Solvent Wipe Test. Apply 50.8 µm (2.0 mil) of wet paint with a drawdown bar on clear glass panel. Minimum paint area must be 100 mm high x 150 mm long (4 in high x 6 in long). Flash paint for 3 h at 40 °C (104 °F). Using a standard rag (approved by GM), apply roughly 3 mL of the equipment cleaner blend onto the rag. Wipe across the paint film with light pressure counting the number of wipes until the film is removed. Record the number of wipes per each equipment cleaner blend and compare cleaning efficiency.

3.2.5 Evaporation Test. Using a clean Cold Rolled Steel (CRS) panel 100 mm high x 300 mm long (4 in high x 12 in long), apply a drop of equipment cleaner solvent onto the surface. Using a stopwatch, determine the time required for the solvent to completely evaporate from the panel surface. The CRS panel must be placed in an area with low airflow

3.2.6 Mixing Compatibility Test. This evaluates solvent compatibility with paint. Reduce a paint sample 25% by volume with test solvent and spray a standard steel test panel with the paint at specified film build 25.4 µm ± 5.08 µm (1.0 mil ± 0.2 mil) for primer or basecoat; 50.8 µm ± 5.08 µm (2.0 mil ± 0.2 mil) for clear-coat. Cure the film at the recommended bake schedule and examine the surface for craters.

3.2.7 Evaporation Rate. The material must evaporate within five (5) minutes after its application to avoid any interference with paint application equipment.

3.2.8 Plant Trial. The cleaner shall be assessed and found satisfactory in plant trials with the intended paint material to be cleaned. Subsequently, the material must perform satisfactorily in the specified production