Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 3130D
Superseding AMS 3130C
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PAINT VEHICLE
Glyceryl Phthalate

1. SCOPE:

1.1 Type: This specification covers a glyceryl-phthalate-base paint vehicle.

1.2 Application: Primarily as a vehicle for aluminum-pigmented paint but may be used as a transparent finish coating for metal and wood.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 3128 - Aluminum Pigment Paste
AMS 3165 - Solvent, Petroleum, Aromatic

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D56 - Flash Point by Tag Closed Tester
ASTM D445 - Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
ASTM D1639 - Acid Value of Organic Coating Materials

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Specifications:

PPP-P-1892 - Paint, Varnish, Lacquer, and Related Materials, Packaging, Packing, and Marking of

3. TECHNICAL REQUIREMENTS:

3.1 Composition (by weight):

3.1.1 Vehicle:

	min max
Resin	34 - 37%
Solvent, AMS 3165	63 - 66%
Drier	See 3.1.1.2

3.1.1.1 Resin: Shall be of glyceryl phthalate type, containing not less than 30% phthalic anhydride. It shall be free from rosin and rosin derivatives.

3.1.1.2 Drier: Shall be free from lead and shall be used as required to obtain the specified drying and curing properties with a high degree of package stability.

3.2 Properties:

3.2.1 Vehicle Properties:

3.2.1.1 Viscosity: Shall be 0.50 - 1.00 poise (0.05 - 0.10 Pa·s) at 77° F (25° C), determined in accordance with ASTM D445. Ø

3.2.1.2 Weight: Shall be not less than 7.3 lb per gal (876 kg/m^3) at 77° F ± 2 (25° C ± 1).

3.2.1.3 Ash: Shall be not more than 0.1% by weight.

3.2.1.4 Flash Point: Shall be not lower than 80° F (27° C), determined in accordance with ASTM D56.

3.2.1.5 Acid Number: Shall be not higher than 8.0, determined in accordance with ASTM D1639.

3.2.1.6 Skinning and Livering: Shall be absent in a 1/4-filled closed container after standing for not less than one week at room temperature.

3.2.2 Application Properties:

3.2.2.1 Clear Vehicle: Shall be a freely working product with leveling properties acceptable to the purchaser when applied by either brushing or spraying. Recoating after 7 hr and again after 18 hr shall produce no film irregularities.

3.2.2.2 Pigmented Vehicle: Vehicle pigmented with AMS 3128 paste in the proportion of 16 oz of paste per gallon of vehicle (120 g of paste per liter of vehicle) and reduced, if necessary, with AMS 3165 solvent shall produce a satisfactory aluminum paint suitable for application by either brushing or spraying.

3.2.3 Cured Film Properties: Shall be as follows, determined on panels of bright finish, low-carbon steel approximately 0.020 x 6 x 3 in. (0.5 x 150 x 75 mm) and having smooth edges and rounded corners, cleaned with steel wool, washed in clean toluene or other suitable solvent, dried with clean cloths, coated to dried film thickness of 0.0005 - 0.0075 in. (13 - 19 µm), and dried and/or cured as specified:

3.2.3.1 Clear Vehicle:

3.2.3.1.1 Hot Water Resistance: Film, cured at 250° F ± 5 (121° C ± 3) for 90 min. ± 10, immersed in boiling water for 10 min. ± 0.2, and observed 5 min. after removal, shall show no cracking, no blistering, no appreciable whitening, and only very slight dulling; when observed 15 min. after removal, film shall show no whitening. After 3 hr air-drying, the film on the immersed panel shall be equal in hardness, toughness, and adhesion to that on a duplicate, unimmersed panel, determined by drawing a knife blade over the respective films. The immersed film shall also be equal in gloss to the unimmersed film. Ø

3.2.3.1.2 Solvent Resistance: Film, cured at 250° F ± 5 (121° C ± 3) for 90 min. ± 10 and immersed in AMS 3165 solvent for 4 hr ± 0.2 at room temperature, shall resist removal by rubbing with the fingers.

3.2.3.2 Pigmented Vehicle: Films of vehicle pigmented as in 3.2.2.2 shall have the following properties:

3.2.3.2.1 Air Drying: Film shall air dry to touch in not more than 3 hr; the dried film shall be free from streaks, blisters, silking, and other surface irregularities.

3.2.3.2.2 Baking: Film, air-dried for approximately 15 min. and cured at 300° F ± 5 (149° C ± 3) for 60 min. ± 5, shall be hard, tough, smooth, lustrous, and free from checking, wrinkling, dulling, and other surface irregularities.

3.2.3.2.3 Heat Resistance: Film, air-dried for approximately 15 min. and cured at 400° F ± 5 (204° C ± 3) for 4 hr ± 0.25 shall not show discoloration when compared with the film of 3.2.3.2.2. The ø film shall not crack or flake at the end or loosen from the panel when bent rapidly, at 32° F ± 2 (0° C ± 1), through an angle of 180 deg around a 1/8-in. (3.2 mm) diameter.

3.2.3.2.4 Coating Adhesion: Film, applied over a primer and air-dried for 18 hr ± 0.5 shall show satisfactory adhesion of the top coat to the primer. It shall be impossible to separate any of the top coat from the primer by means of a diagonally applied knife or razor blade.

3.2.3.2.5 Weather Resistance: Film, applied by spraying, shall show no visually evident difference in appearance, integrity, or protection from those of a film of a control product agreed upon by purchaser and vendor. The panels shall be similarly prepared and simultaneously exposed to weather continuously for 1 yr at an angle of 45 deg (0.785 rad) from vertical, facing south, at approximately 40 deg north latitude.

3.3 Quality: Vehicle shall be clear, transparent, and homogeneous and shall contain no substance of known toxicity under normal conditions of use. Component ingredients shall be intimately mixed and processed in accordance with the best practice for high quality aircraft glyceryl phthalate vehicle to produce a product which is stable and not subject to abnormal change with age in a sealed container.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of vehicle shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required ø by 4.5. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the vehicle conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to composition (3.1.1), viscosity (3.2.1.1), hot ø water resistance of clear vehicle (3.2.3.1.1), and baking (3.2.3.2.2) and coating adhesion (3.2.3.2.4) of pigmented vehicle requirements are classified as acceptance tests.

4.2.2 Qualification Tests: Tests to determine conformance to all technical requirements of this specification ø are classified as qualification tests.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, qualification ø test material shall be submitted to the cognizant qualification agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be as follows:

4.3.1 Acceptance Tests: Sufficient vehicle shall be taken from each lot to permit making the following number of tests; a lot shall be all vehicle produced in one continuous manufacturing operation from the same lots of raw materials and presented for vendor's inspection at one time:

ø	Requirement	Reference Paragraph	Number of Tests
	Composition	3.1.1	1
	Viscosity	3.2.1.1	1
	Hot Water Resistance	3.2.3.1.1	2
	Baking	3.2.3.2.2	2
	Coating Adhesion	3.2.3.2.4	2

ø 4.3.2 Qualification Tests: Shall be as agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Vehicle shall be approved by purchaser before vehicle for production use is supplied, unless such approval be waived. Results of tests on production vehicle shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures and processes, and methods of inspection on production vehicle which are essentially the same as those used on the approved sample vehicle. If any change is necessary in ingredients or in manufacturing procedures or processing, vendor ø shall submit for reapproval a statement of the proposed changes in material or processing and, when requested, sample vehicle. Production vehicle made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports: The vendor of vehicle shall furnish with each shipment three copies of a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the ø vehicle conforms to the other technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, formula number, batch number, and quantity.

4.6 Resampling and Retesting: If any sample or panel fails to meet the specified requirements, disposition of the vehicle may be based on the results of testing three additional samples or panels for each original ø nonconforming sample or panel. Failure of any retest sample or panel to meet the specified requirements shall be cause for rejection of the vehicle represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 Vehicle shall be supplied in metal containers with sealed openings. Interior surfaces of containers ø shall be free from corrosion and, if treated to prevent corrosion, shall be coated with material which will be unaffected by the contents.

5.1.2 Each container shall be legibly marked to show this specification number and its revision letter, manufacturer's identification, formula number, batch number, date of manufacture, quantity, and any directions for use and precautions for storage.

5.1.3 Containers shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of this ø vehicle to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.