



400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION



AMS 7290E

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Submitted for recognition as an American National Standard

DECALCOMANIAS

1. SCOPE:

1.1 Form:

This specification covers a face-up type of water-applied, solvent-applied, or adhesive-applied decalcomanias.

1.2 Application:

These decalcomanias have been used primarily for marking of parts, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 3006 Alcohol-Water Mixtures

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 117 Salt Spray (Fog) Testing

ASTM D 471 Rubber Property - Effect of Liquids

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2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-2073-1 DOD Materiel, Procedures for Development and Application of Packaging Requirements

3. TECHNICAL REQUIREMENTS:

3.1 General:

- 3.1.1 Material: Decalcomanias and adhesives shall be free of constituents, such as halide compounds, which may have a corrosive effect on parts when subjected to conditions normally encountered in service.
- 3.1.2 Opacity: Shall be such that the colors of the decalcomania will not be affected by the color of the surface to which it is applied.
- 3.1.3 Elasticity: Shall be such that the decalcomania, when placed on a flat surface having a local convex dimple 0.312 inch (7.92 mm) in diameter and 0.0625 inch (1.588 mm) high, will not break when rolled with a soft rubber roller. The decalcomania shall be sufficiently firm that it will not stretch out of shape during application.
- 3.1.4 Backing Release: Six months after manufacture, the decalcomania shall release from the backing in approximately the same length of time, and with approximately equal ease, as a freshly manufactured decalcomania will release from its backing.

3.2 Properties:

Decalcomanias shall conform to the following requirements: Decalcomanias shall be applied, in accordance with manufacturer's instructions, to anodized aluminum alloy panels which have been painted with a primer and an enamel, and cleaned immediately before applying decalcomanias. If decalcomanias are to be marked with data when applied to parts, tests shall be conducted on decalcomanias which have been stamped with some marking with a black imprint ink; in such cases, the markings shall be subject to the same requirements as the decalcomanias. If decalcomanias are too large to test conveniently as a whole, a section or sections may be tested provided that the section or sections tested include all colors of the decalcomanias. A separate decalcomania or separate sections of a decalcomania shall be used for each of the following tests. Testing shall be done without benefit of a varnish or similar protective coating.

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3.2.1 Adhesion:

3.2.1.1 Adhesion shall be such that four hours after application of the decalcomania to a panel surface as in 3.2, the panel may be subjected to normal handling without damage to the decalcomania.

3.2.1.2 After 24 hours drying at room temperature for solvent-applied and water-applied decalcomanias and after 96 hours drying at room temperature for adhesive-applied decalcomanias, it shall be impossible to separate the decalcomania, from the surface to which it is applied, by scratching with the thumb nail or with a diagonally applied knife or razor blade.

3.2.2 Abrasion Resistance: After drying for 12 hours at room temperature, the decalcomania shall withstand, without wearing through, 500 revolutions of a CS-17-F Calibrase wheel at 1000 grams pressure on the Tabor Abraser, or equivalent. Abrasive particles shall be removed continually during the test. The wheel shall be redressed before starting each test.

3.2.3 Heat Resistance: After heating for 8 hours at $300^{\circ}\text{F} \pm 2$ ($149^{\circ}\text{C} \pm 1$) and cooling to room temperature, the decalcomania shall be legible and shall not have separated from the panel. Discoloration of the decalcomania is acceptable.

3.2.4 Fluid Resistance: Decalcomanias, after being immersed in the test media in accordance with 4.5.1, at room temperature, and observed three hours after removal from water, three hours after rinsing following exposure to salt spray, and 24 hours after final removal from all other media, shall show no evidence of peeling, blistering, bleeding, fading, or appreciable whitening and no loss of adhesion, hardness, toughness, or gloss as compared to similar decalcomanias not exposed to the test media. Separate specimens shall be tested in each medium.

3.3 Mounting Instructions:

Complete and detailed instructions for mounting the decalcomanias on a surface shall be printed on the backing. If size prohibits printing this information on the backing, the backing of each decalcomania shall be marked with manufacturer's identification and type, and the mounting instructions shall be furnished in each package.

3.4 Quality:

Decalcomanias, as received by purchaser, shall be uniform in quality and condition, and free from foreign materials and from imperfections detrimental to usage of the decalcomanias.

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4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

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The manufacturer of decalcomanias shall supply all samples for required tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that decalcomanias conform to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for requirements shown in Table 1 are acceptance tests and shall be performed on each lot.

TABLE 1 - Acceptance Tests

Requirement	Paragraph Reference
Elasticity	3.1.3
Adhesion	3.2.1
Abrasion Resistance	3.2.2
Heat Resistance	3.2.3
Fluid Resistance	3.2.4
Quality	3.4

4.2.2 Preproduction Tests: Tests for all technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of the product to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

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

4.3 Sampling and Testing:

(R)

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient decalcomanias shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1.1 A lot shall consist of all decalcomanias of the same part number presented for manufacturer's inspection at one time.

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4.3.2 For Preproduction Tests: Shall be as agreed upon by purchaser and supplier.

4.3.2.1 When a statistical sampling plan has been agreed upon by purchaser and (R) supplier, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.6 shall state that such plan was used.

4.4 Approval:

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

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

4.5 Test Methods:

4.5.1 Test Media and Time:

4.5.1.1 Immerse in distilled water for 24 hours.

4.5.1.2 Expose for 24 hours to salt spray in accordance with ASTM B 117 and rinse with water.

4.5.1.3 Immerse in AMS 3006, Type 4, alcohol-water mixture for 8 hours $\pm$ 0.25 and air dry for 16 hours $\pm$ 0.5. Repeat this cycle. Immerse finally for 8 hours $\pm$ 0.25.

4.5.1.4 Immerse in ASTM Reference Fuel B (ASTM D 471) for 8 hours $\pm$ 0.25 and air dry for 16 hours $\pm$ 0.5. Repeat this cycle. Immerse finally for 8 hours $\pm$ 0.25.

4.5.1.5 Immerse in ASTM Reference Oil No. 3 (ASTM D 471) for 8 hours $\pm$ 0.25 and air dry for 16 hours $\pm$ 0.5. Repeat this cycle. Immerse finally for 16 hours $\pm$ 0.5.

4.6 Reports:

The supplier of decalcomanias shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the decalcomanias conform to the other technical requirements. This report shall include the purchase order number, lot number, AMS 7290E, part number, and quantity.