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SUPERSEDING
MIL-P-38477 (USAF)
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MILITARY SPECIFICATION

PLASTIC MATERIAL, PRESSURE SENSITIVE ADHESIVE, FOR AEROSPACE IDENTIFICATION AND MARKING

1. SCOPE

1.1 Scope. This specification covers an adhesive-backed, pigmented or clear polyester plastic film for marking of aerospace interior and exterior surfaces. (see 6.1).

1.2 Classification. Marking material covered by this specification shall be of the following types and classes, as specified: (see 6.2).

Type I	Non perforated.
Type II	Perforated.
Class 1	Plain.
Class 2	With protective masking sheet applied to the face side of the marking material.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein.

SPECIFICATIONS

Federal

QQ-A-250/5	Aluminum Alloy Plate and Sheet, Alclad 2024
QQ-A-250/8	Aluminum Alloy Plate and Sheet 5052
QQ-A-250/11	Aluminum Alloy Plate and Sheet 6061

FSC 9330

QQ-S-766	Steel Plates, Sheets, and Strip-Corrosion Resisting
TT-S-735	Standard Test Fluids; Hydrocarbon
TT-T-291	Thinner; Paint, Volatile Mineral Spirits (Petroleum-Spirits)
TT-X-916	Xylene (For Use in Organic Coatings)
PPP-B-566	Box, Folding, Paperboard
PPP-B-601	Box, Wood, Cleated Plywood
PPP-B-636	Box, Fiberboard
PPP-B-640	Box, Fiberboard, Corrugated, Triple-Wall
PPP-C-843	Cushioning Material, Cellulosic
PPP-T-60	Tape, Pressure Sensitive Adhesive, Waterproof, for Packaging
PPP-T-97	Tape, Pressure Sensitive Adhesive, Filament Reinforced

Military

MIL-B-121	Barrier Material, Greaseproofed, Waterproofed, Flexible
MIL-L-7808	Lubricating Oil, Gas Turbine, Aircraft
MIL-P-7962	Primer Coating, Cellulose-Nitrate Modified Alkyd Type, Corrosion-Inhibiting, Fast Drying (for Spray Application Over Pre-treatment Coating)
MIL-C-8514	Coating Compound, Metal Pre-treatment, Resin-Acid
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-L-10547	Liners, Case and Sheet Overwrap, Water-vapor-proof or Waterproof, Flexible
MIL-L-19537	Lacquer, Acrylic-Nitrocellulose, Gloss (for Aircraft Use)

MIL-P-23377	Primer Coating; Epoxy-Polyamide, Chemical and Solvent Resistant
MIL-C-81706	Chemical Conversion Materials For Coating Aluminum and Aluminum Alloys
MIL-C-83286	Coating, Urethane, Aliphatic Isocyanate, For Aerospace Applications

STANDARDS

Federal

Federal Test Method Std 141	Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling and Testing
FED-STD-595	Colors

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or proposal shall apply.

Uniform Classification Committee, Agent

Uniform Freight Classification (Application for copies should be addressed to the Uniform Classification Committee, Room 202, Union Station, 516 W. Jackson Blvd., Chicago, Ill. 60606.)

3. REQUIREMENTS

3.1 Preproduction. This specification makes provisions for preproduction inspection. (see 4.3).

3.2 Composition

3.2.1 Material. The material shall consist of a pigmented or clear polyester plastic film, with a pressure sensitive adhesive applied to one side. The adhesive backing shall be protected by a suitable liner, treated paper or other material, which shall be easily removed without the use of water or other solvents for fast, distortion-free application of the marking material.

3.2.2 Color. The color of the pigmented plastic marking material shall be either inherent in the basic film or overlaid on the basic film. The basic film colors or the overlaid colors shall have either a specular or non-specular finishing coat and shall conform to any applicable color specified in FED-STD-595 as specified by the procuring activity. (see 6.2).

3.2.3 Configuration

3.2.3.1 Type I. Type I material shall consist of a smooth, uniform film without pinholes or other defects in the film surface.

3.2.3.2 Type II. Type II material shall be the same as Type I material, except that the surface shall be perforated with clean die punched holes, 0.025 inches maximum diameter, positioned in a 1/4 inch square grid pattern. The perforated hole pattern may be extended into the protective liner to facilitate manufacture.

3.2.3.3 Class 1. Class 1 material shall consist of the plastic film, adhesive backing and protective backing liner, and shall be applicable to both Type I and Type II.

3.2.3.4 Class 2. Class 2 material shall be the same as Class 1 material, except that it shall incorporate a protective transfer sheet applied to the face side of the marking material. The transfer sheet shall be paper or film, suitably treated with a low tack, pressure sensitive adhesive on the surface in contact with the face side of the marking material. (see 6.1.1).

3.2.4 Size. The marking material shall be furnished in rolls or sheets in sizes as specified by the procuring activity (see 6.2).

3.2.5 Physical properties and performance characteristics of the Type I and Type II marking materials shall meet the requirements of table I when tested in accordance with the indicated method. The physical properties and performance characteristics of Type II material shall be determined to the requirements of table I prior to perforating the material.

TABLE I. REQUIREMENTS

PROPERTY	REQUIREMENT	TEST METHOD
Color	Conformance to FED-STD-595	4.8.1
Film Thickness	0.005 inch maximum	4.8.2
Tensile Strength	18 lbs/inch width minimum	4.8.3
Elongation	50% minimum	4.8.4
Shrinkage	1/64 inch maximum	4.8.5
Flexibility		
Standard Conditions	20 folds minimum without failure	4.8.6.1
Low Temperature	No failure	4.8.6.2
Heat Aging	No failure	4.8.6.3
Adhesion at Std. Conditions	40 oz/inch width minimum	4.8.7
Adhesion at Low Temperature	35 oz/inch width minimum	4.8.7.1
Overlaid Colors	No delamination	4.8.8
Ply	No separation of film and adhesive	4.8.9
Corrosivity	None	4.8.10
Immersion Resistance		
Water	No Effect	4.8.11.1
Fuel	No Effect	4.8.11.2
Hot Oil	No Effect	4.8.11.3
Salt Spray	No Effect	4.8.11.4
Accelerated Weather Resistance	No Failure	4.8.12
Outdoor Weather Resistance	No Failure	4.8.13
Storage Stability	12 Months Minimum	4.8.14

3.3 Toxicity. Solvents and other compounds retained in the marking material after manufacture shall have no effect on the health of personnel when the material is used for its intended purpose. Questions pertinent to this effect shall be referred by the procuring activity to the appropriate department medical service who will act as an advisor to the procuring activity.

3.4 Workmanship. The marking material shall be manufactured in accordance with high-grade commercial practice covering this class of work. The material shall be free from blisters, cracks, foreign matter, or any other defects.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.2 Classification of inspection. Inspection shall be classified as follows:

a. Preproduction inspection (see 4.3).

b. Quality conformance inspection (see 4.4).

4.3 Preproduction inspection. Preproduction inspection shall consist of the inspection procedures specified in 4.6 and 4.8.

4.3.1 Sampling instructions. The preproduction samples shall consist of a sufficient quantity of the marking material to complete all the tests. Samples shall be tested in a laboratory designated by the procuring activity, or, when so stated in the contract or order, at the contractor's plant under the inspection of the procuring activity (see 6.2).

4.3.2 Test report. A statement shall be furnished to the procuring activity certifying that the ingredient materials and the test results, except the outdoor weather resistance and storage stability tests, meet the requirements of this specification. Approval of preproduction inspection shall not relieve the contractor of his obligation to meet the quality conformance inspection.

4.3.2.1 For the outdoor weather resistance and storage stability tests, certification that the materials and processes meet the requirements of this specification shall be submitted at the time of inspection. At the end of the 12 months lapse time, the marking material shall be tested and shall pass the preproduction inspection as specified in 4.8.12 and 4.8.14.

4.4 Quality conformance inspection. Quality conformance inspection shall consist of all the examinations and tests of this specification except outdoor weather resistance and storage stability tests. Tests shall be conducted in accordance with Federal Test Method Standard No. 141.

4.5 Sampling

4.5.1 Lot. For sampling purposes, a lot shall consist of all the marking material manufactured at one time and forming part of one contract or order for delivery at one time.

4.5.2 For visual and dimensional examinations. A random sample of marking material shall be selected from each inspection lot in accordance with MIL-STD-105, inspection level I and acceptable quality level (AQL) of 2.5 percent defective to verify compliance with this specification regarding packaging, packing, marking, dimensions, and other requirements not involving physical tests.

4.5.3 For tests. A sufficient quantity of the marking material to perform the following quality conformance tests shall be selected at random from each lot.

a. Color
b. Film thickness
c. Tensile strength
d. Elongation
e. Shrinkage
f. Flexibility
g. Adhesion
h. Water resistance
i. Fuel resistance
j. Hot oil resistance
k. Salt spray resistance
l. Corrosivity

4.5.4 Examination of product. The marking material shall be examined to determine conformance of this specification with respect to material, workmanship, and preparation for delivery.

4.6 Test conditions

4.6.1 Standard conditions. Unless otherwise specified, specimens shall be conditioned and tested at an air temperature of 73.4° ± 2°F (23° ± 1.1°C) and a relative humidity of 50 ± 4 percent. Unless otherwise specified, the applied marking material shall be allowed to stand 72 hours at standard conditions prior to testing.

4.7 Panels

4.7.1 Test panel preparation. Unless otherwise specified, the marking material shall be evaluated for performance on four different test panel configurations as noted below. Test panels shall be exposed in duplicate simultaneously for each test condition.

4.7.2 Bare metal. For testing over bare metal, the marking material shall be applied to panels made from aluminum-clad aluminum alloy conforming to QQ-A-250/5 and cleaned using the alcoholic phospheric acid solution of table II, in accordance with Method 2013.1, Federal Test Method Standard 141 without MIL-C-81706 chemical conversion coating and without anodizing in accordance with MIL-A-8625. The panels shall be 0.020 inches by 3 inches by 6 inches in size.

4.7.3 Lacquer coated metal. For testing over lacquer coated metal, the marking material shall be applied to coated panels made from aluminum-clad aluminum alloy conforming to QQ-A-250/5. The panels shall be 0.020 inches by 3 inches by 6 inches in size. The panels to be coated shall be anodized in accordance with Type II, MIL-A-8625 and finished as follows: one coat of wash primer conforming to MIL-C-8514, dried 30 minutes; one coat of the primer conforming to MIL-P-7962, 0.0003 inch to 0.0005 inch thick, dried 30 minutes; and two coats of FED-STD-595 Color No. 17875 Insignia White acrylic-nitrocellulose lacquer conforming to MIL-L-19537, each 0.0005 to 0.0007 inch thick, applied 30 minutes apart. The panels shall be allowed to air dry for two hours and force dried at 180° ± 5°F for one hour.

4.7.3.1 Polyurethane coated metal. For testing over polyurethane coated metal, the marking material shall be applied to coated panels made from aluminum clad aluminum alloy conforming to QQ-A-250/5. The panels shall be 0.020 inch by 3 inches by 6 inches in size. The panels to be coated shall be anodized in accordance with Type II, MIL-A-8625 and finished as

follows: one coat of epoxy primer conforming to MIL-P-23377, 0.0006 inches to 0.0009 inches and dried 4 hours at standard conditions and then two coats of aliphatic polyurethane conforming to MIL-C-83286, FED-STD-595 Color No. 17875 Insignia White, to a dry film thickness of 0.0017 to 0.002 inch dry film thickness. The panels shall be either cured for 7 days at standard conditions prior to test or they may be cured 24 hours at standard conditions and then cured in a circulating air type oven maintained at 225°F for 24 hours.

4.7.3.2 Primer coated metal. For testing of Type II material over primer coated metal, the marking material shall be applied to coated panels made from aluminum clad aluminum alloy conforming to QQ-A-250/5. The panels shall be 0.020 inch by 3 inches by 6 inches in size. The panels to be primer coated shall be anodized in accordance with Type II, MIL-A-8625 and finished with one coat of epoxy primer conforming to MIL-P-23377, 0.0006 inches to 0.0009 inches and dried 4 hours at standard conditions. No further priming or conditioning is required or permitted.

4.7.4 Application of film. Wipe the surface of the test panels with lint free paper or cloth toweling. Remove protective liner of the marking material. The marking material shall then be carefully set in place, starting at one end of each panel and securing contact progressively toward the other end while avoiding wrinkling and entrapment of air under the material, and shall be rolled down with two passes of a rubber covered roller 3-1/2 inches in diameter by 1-3/4 inches in width and weighing 4-1/2 pounds. The surface of the roller shall have a Shore A durometer hardness value within the range of 70 to 80. The protective transfer sheet on Class 2 marking material shall then be removed and the marking material rerolled to assure good edge adhesion. Once in place, the marking material shall not be moved. The test panels shall then be conditioned for 24 hours at standard conditions before subjecting to tests.

4.8 Test methods

4.8.1 Color. The pigmented marking material shall be applied to bare metal panels prepared as specified in 4.7.2 with marking material applied as specified in 4.7.4 and color compared against FED-STD-595 color standards, as applicable, in accordance with Method 4250, Federal Test Method Standard 141.

4.8.2 Film thickness. Strips of the marking material, approximately 1 inch by 6 inches, shall be cut from the roll or sheet. The protective liner shall be removed and the material shall be applied to strips of aluminum foil 0.001 inch thick and firmly rolled down. The protective transfer sheet for Class 2 material shall then be removed. The thickness

of the aluminum foil shall have been previously measured by micrometer. Four micrometer readings shall be taken at random locations on each strip. All the measurements shall fall below the 0.005 inch specfied value after subtraction of the aluminum foil thickness.

4.8.3 Tensile strength. Five strips of the marking material, each 1 inch by 6 inches, shall be cut from the sample and stabilized at standard conditions for 24 hours. The protective liner and the protective transfer sheet, if Class 2 material, shall be removed and the material tested for tensile strength in accordance with Method 6224.1, Federal Test Method Standard 141, except that the test machine crosshead travel rate shall be 12 inches per minute. The average strength of the 5 specimens shall not be less than 18 pounds per inch of width.

4.8.4 Elongation. Specimens prepared and tested as specified in 4.8.3 shall be simultaneously tested for elongation in accordance with Method 6224.1, Federal Test Method Standard 141.

4.8.5 Shrinkage. The marking material, 6-1/2 inches by 6-1/2 inches, shall be applied to the entire surface of 6 inches by 6-inch bare metal panels and trimmed to the dimensions of the panel. The panels shall then be baked at 150°F for 48 hours, allowed to cool, and examined for shrinkage. Shrinkage shall not be more than 1/64 inch in any one direction.

4.8.6 Flexibility.

4.8.6.1 Standard conditions. At standard conditions, a 1 inch by 2-inch portion of the marking material, with liner removed and adhesive covered with talc to prevent sticking, shall be folded forward and backward on itself 20 times with pressure of the thumb and forefinger being exerted on the creased section each time the material is folded. After 20 folds, the marking material shall be examined and shall exhibit no evidence of breaking or cracking.

4.8.6.2 Low temperature. Bare and coated test panels, prepared in accordance with 4.7.2 and 4.7.3, with marking material applied in accordance with 4.7.4, shall be placed in a cold chamber maintained at -65° $\pm$ 5°F for a period of four hours. A suitable one inch diameter cylinderical mandrel shall be similarly exposed. After 4 hours, bend the test panels over the mandrel in the test chamber, in accordance with Method 6221, Federal Test Method 141. There shall be no cracking or loss of adhesion of the marking material.

4.8.6.3 Heat aging. Bare and coated test panels prepared in accordance with 4.7.2 and 4.7.3, with marking material applied in accordance with 4.7.4, shall be exposed vertically to dry heat for four hours at 250° ± 5°F, then removed from the heat chamber and stabilized at standard conditions for one hour. After the one hour stabilization period, the panels shall be flexed over a one inch diameter mandrel in accordance with Method 6221, Federal Test Method Standard 141. There shall be no cracking or loss of adhesion of the marking material.

4.8.7 Adhesion. At standard conditions five strips of the marking material, each 1 inch by 8 inches, shall be applied separately in accordance with 4.7.4 over 2-inch by 4-inch bare and coated aluminum test panels, previously prepared in accordance with 4.7.2, 4.7.3, 4.7.4.1 and 4.7.3.2 respectively, to the configuration of figure 1. The free end of the panel shall then be clamped in the upper jaw of a suitable tensile testing machine and the free end of the marking material clamped in the lower jaw. Adhesion shall be determined on a dead-weight pendulum or cross-head type testing machine at a constant rate of head travel of 12 inches per minute. After the first inch of marking material is removed, the average tension required to remove the next inch shall be determined. If the material breaks at any point during test, the test shall be terminated and the marking material considered satisfactory if the value is above 40 ounces, and unsatisfactory if below 40 ounces.

4.8.7.1 Adhesion at low temperature. Five strips of the marking material each 1 inch by 8 inches, for each panel configuration specified in 4.7 and five each of the test panels shall be condition for one hour in a walk-in, or other suitable type cold chamber maintained at a temperature of 35°F. While in the cold chamber at 35°F the marking material shall be applied to the test panels as specified in 4.7.4. The prepared test panels shall be conditioned in the test chamber maintained at 35°F for 24 hours. Determine the adhesion of the marking material in the chamber maintained at 35°F on a dead weight pendulum or cross-head type testing machine at a constant rate of head travel of 12 inches per minute. After the first inch of marking material is removed, the average tension required to remove the next inch shall be determined. If the material breaks at any point during test, the test shall be terminated and the marking material considered satisfactory if the value is above 35 ounces, and unsatisfactory if below 35 ounces.

4.8.8 Overlaid colors. The marking material applied to bare metal panels prepared in accordance with 4.7 shall be tested in accordance with Method 6301, Federal Test Method Standard 141. The interval from the time of removal of the panels from the water to the time of application of the tape

shall be 60 ± 5 seconds. Stripping of the tape from the panel shall be done immediately after application. There shall be no separation or loss of adhesion of overlaid colors from the basic plastic film.

4.8.9 Ply. Bare metal test panels, prepared in accordance with 4.7.3, with marking material applied in accordance with 4.7.4, shall be placed in a cold chamber maintained at -65° ± 5°F for a period of 4 hours. While still in the chamber, shock edge of the marking sharply with the tip of a 1/2 inch wide by 3 inches long round tip steel laboratory spatula to induce separation between film and adhesive. There shall be no separation between the film and adhesive.

4.8.10 Corrosivity. Separate bare metal panels of aluminum alloy conforming to QQ-A-250/4 and QQ-A-250/12, and stainless steel conforming to Class 1 of QQ-S-766 (AISI equivalent No. 304), shall be prepared in accordance with Methods 2013.1 and 2011.1, respectively, Federal Test Method Standard 141. The aluminum alloy panels shall be cleaned in accordance with paragraph 4.3 of Method 2013.1, FED-STD-141, except they shall be cleaned with the alcoholic phosphoric acid cleaner. The steel panels shall be cleaned in accordance with procedure A of Method 2011.1, FED-STD-141. The marking material shall be applied to panels in accordance with 4.7.4 and the panels heated to 200°F ± 5°F for 168 hours. The marking material shall then be tested for the presence of acid, using moistened blue litmus paper applied to the body and edges of the film. The marking material shall be removed from the panels and the metal shall be examined for evidence of corrosion. There shall be no evidence of acid reaction or corrosion of the metal surfaces.

4.8.11 Immersion resistance

4.8.11.1 Water resistance. Bare and coated panels prepared in accordance with 4.7.2 and 4.7.3, with marking material applied in accordance with 4.7.4, shall be force dried at 150°F for two hours, then cooled at standard conditions. The panels should then be positioned vertically in a beaker or other suitable container filled with distilled water to a depth of 3 inches. The panels shall remain partially submerged in the distilled water for a period of 8 hours at standard conditions. The test panels shall then be removed from the water and examined 5 minutes after removal and 24 hours after removal. The marking material shall exhibit no evidence of blistering, peeling or color change and the immersed portion shall be equal in all respects to the non-immersed portion.

4.8.11.2 Fuel resistance. Bare and coated test panels preapred in accordance with 4.7.2 and 4.7.3, with marking material applied in accordance with 4.7.4, shall be partially immersed in hydrocarbon test fluid in a manner similar to 4.8.11.1. The hydrocarbon test fluid shall conform to Type III

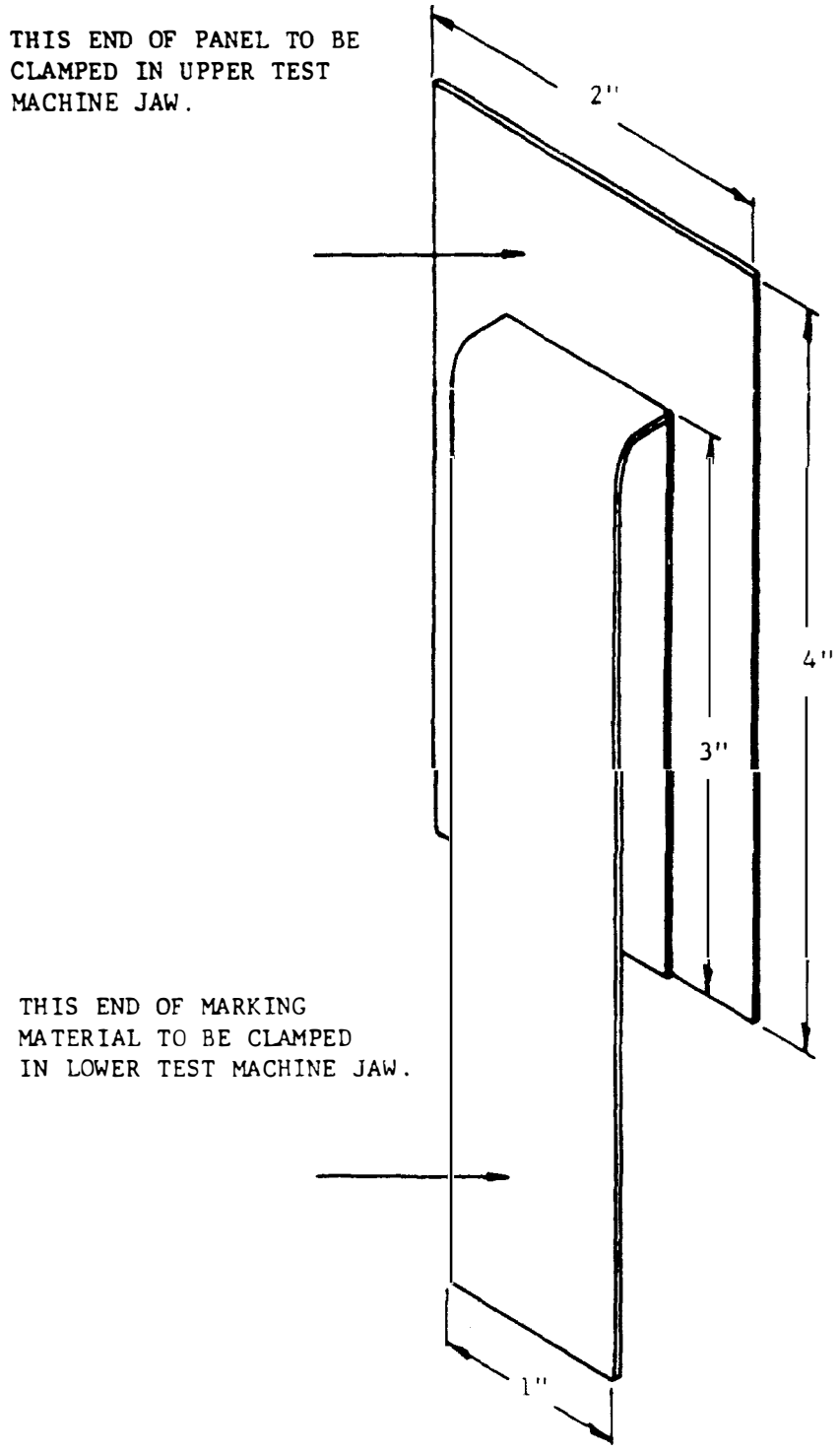

FIGURE 1. Adhesion Test Configuration

fluid of TT-S-735. Exposure shall be for one hour at standard conditions. After exposure, the test panels shall be removed from the hydrocarbon test fluid, stabilized at standard conditions for 24 hours and carefully examined. The immersed portion of the marking material shall be equal in all respects to the unexposed portion.

4.8.11.3 Hot oil. Bare and coated test panels prepared in accordance with 4.7.2 and 4.7.3, with marking material applied in accordance with 4.7.4, shall have edge sealer applied to exposed edges of the marking material with a suitable edge sealer recommended by the film manufacturer. Sealer shall be applied with a narrow striping brush so that sealer covers an area approximately 1/4 inch on both sides of the film edge. The test panels shall be partially immersed in MIL-L-7808 oil for two hours at 225° ± 5°F in a manner similar to 4.8.11.1. The test panels shall then be removed from the hot oil, cooled to standard conditions and wiped dry with absorbent, lint free cloth or paper, and examined for defects. The immersed portion of the marking material shall exhibit no discoloration, blistering or edge attack. A slight reduction in gloss, slight shrinkage, slight discoloration, and slight edge attack shall not be cause for rejection.

4.8.11.4 Salt spray. Separate bare metal panels of aluminum alloy conforming to QQ-A-250/5 and QQ-A-250/13, and stainless steel conforming to Class 1 of QQ-S-766 (AISI equivalent No. 304), shall be prepared in accordance with paragraph 4.3 of Method 2013.1 and 2011.1 respectively, of Federal Test Method Standard 141. Marking material shall be applied to panels in accordance with 4.7.4. The panels shall then be exposed to 5 percent salt spray in accordance with Method 6061, Federal Test Method Standard 141 for a period of 240 hours. After removal from the salt spray, the specimens shall be examined and the marking material shall exhibit no evidence of blistering, peeling, edge lifting or loss of color or gloss.

4.8.12 Accelerated weather resistance. Bare and coated test panels prepared in accordance with 4.7.2 and 4.7.3 with marking material applied in accordance with 4.7.4, shall be placed in a suitable enclosed twin carbon arc accelerated weathering unit and exposed for 500 hours in accordance with Method 6152, Federal Test Method Standard 141. After exposure, the panels shall be examined and the marking material shall exhibit no evidence of deterioration or failure such as cracking, checking or loss of adhesion. Slight loss of gloss and slight color change is acceptable. "Slight" is defined as those changes which are visually noticeable when compared to unexposed material and can be considered minor changes.

4.8.13 Outdoor weather resistance. Bare and coated test panels prepared in accordance with 4.7.2 and 4.7.3, with marking material applied in accordance with 4.7.4, shall be exposed on an outdoor test rack in Florida facing south at an angle of 45 degrees to the horizon for a period of one year in accordance with Method 6160 of Federal Test Method Std No. 141. After exposure, the panels shall be examined and the marking material shall exhibit no deterioration or failure, such as peeling, fading, cracking, blistering, diffusion or bleeding of color or loss of adhesion. Slight loss of gloss and slight color change is acceptable. "Slight" is defined as those changes which are visually noticeable when compared to unexposed material and can be considered minor changes. After weathering for four months the adhesion shall be such that the marking cannot be removed without destroying it.

4.8.14 Storage stability. The marking material, in its original packaging container, shall meet all requirements of this specification after 12 month storage in a temperature range of 40° - 90°F.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be as specified in the procurement document (see 6.2).

5.1.1 Level A

5.1.1.1 Rolls. Each roll shall be packaged in its own individual container. The roll shall be held in suspension within the container by a centering device. A cushioning material, conforming to PPP-C-843, shall be placed between the roll edge and the centering device on rolls over 3 inches in width. Rolls 3 inches and less in width shall be packed in boxes conforming to PPP-B-566 and bulk packaged in snug-fitting fiberboard boxes conforming to type CF of PPP-B-636. Rolls over 3 inches in width to 24 inches in width shall be packed in corrugated boxes of 275 pounds minimum Mullen test. Rolls 25 inches in width and above shall be packaged in corrugated boxes of 350 pounds minimum Mullen Test. Void areas around rolls shall be filled with creased "Traps" of corrugated board conforming to type CF of PPP-B-636. Boxes shall be sealed by a combination of tapes conforming to PPP-T-60 and PPP-T-97. Tape shall extend over all corners and edges.

5.1.1.2 Sheets. Sheets shall be packaged flat in quantities of not more than 75 sheets per package or as specified by the procuring activity. Each package of sheets shall be overwrapped with a wrap conforming to grade A, class 1, type II of MIL-B-121. All flaps shall be sealed with tape conforming to PPP-T-60.

5.1.2 Level C. Rolls or sheets shall be packaged in accordance with commercial practice in a manner that will afford protection against physical damage during direct shipment to the first receiving activity for immediate use.

5.2 Packing

5.2.1 Level A. Sheets or rolls packaged as specified in 5.1.1.1 and 5.1.1.2 shall be packed in boxes conforming to PPP-B-601, class 2 PPP-B-636 water resistant type; or PPP-B-640, class 2. All seams and manufactured joints of PPP-B-636 and PPP-B-640 boxes shall be sealed with tape conforming to PPP-T-60, class 1. Case liners conforming to MIL-L-10547 shall be furnished for PPP-B-601 containers.

5.2.2 Level B. Sheets or rolls packaged as specified in 5.1.1.1 and 5.1.1.2 shall be packed in domestic type shipping containers conforming to PPP-B-636 or PPP-B-640.

5.2.3 Level C. Sheets or rolls shall be packed for shipment in commercial exterior shipping containers in a manner that will ensure safe transportation at the lowest rate to the first receiving activity. Containers shall comply with the Uniform Freight Classification Rules or regulations of other carriers as applicable to the mode of transportation.

5.3 Marking of materials. Interior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129 and shall include the following:

Plastic Material, Pressure Sensitive Adhesive, for Aircraft Identification and Marking

Specification MIL-P-38477

Type and Class

Color

Date of Manufacture

Store in a Cool Place Where Temperature Does Not Exceed 90°F.

6. NOTES

6.1 Intended use

6.1.1 Pigmented material. The pigmented plastic material covered by this specification is intended for marking of exterior and interior

surfaces of aerospace equipment. The markings are not to be used on surfaces subjected to heat above 225°F. Type I material is intended for general usage on painted surfaces, except that Type I, Class 2 material may be applied to primed surfaces and the Class 2 protective transfer sheet removed after final finish coatings have been applied. Type II material is intended for use on painted surfaces containing brazier head rivets and other protrusions where air entrapment would normally occur with non-perforated material; however, Type II material shall not be used in areas subject to hot synthetic engine oils including MIL-L-7808 oil.

6.1.2 Clear material. The clear plastic material covered by this specification is intended for use in applying minor instructions such as "HAND HOLD" or "GROUND HERE" type instructions. The transparent marking will permit visibility of the underlying substrate. The instructional marking may be applied in specular or nonspecular gloss . The size of these decals shall be limited to an area of 36 square inches. The clear material may be used for marking of interior and exterior surfaces of aircraft and associated aeronautical equipment. The markings are not to be used on surfaces subject to heat above 225°F. The clear material shall be purchased in a Type I, Class 1 or Class II configuration only.

6.2 Ordering data. Procurement documents should specify:

a. Title, number, and date of this specification

b. Type and class (see 1.2)

c. Color required (see 3.2.2)

d. Size required (see 3.2.4)

e. Sampling Instructions (see 4.3.1)

f. Required level of packaging (see 5.1)

g. Required level of packing (see 5.2).

Custodian:
Air Force - 11

Reviewer
AF - 84

Preparing activity:
Air Force - 11

Project Number:
9330-F580