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FEDERAL SPECIFICATION

# ADHESIVE: PAPER LABEL

This Specification was approved by the Commissioner, Federal Supply Service, General Services Administration for the use of all Federal Agencies

## 1. SCOPE AND CLASSIFICATION

1.1 This specification covers the requirements for water-resistant, water-emulsion adhesives suitable for adhering paper labels on various substrates (wood, fiberboard, metal, glass, etc.)

1.2 Classification:

Type I - Water-Resistant

Type II - Water-Resistant, Water-Emulsion

## 2. APPLICABLE DOCUMENTS

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

Federal Specifications:

TT-E-485 - Enamel, Semigloss, Rust-Inhibiting
TT-I-1795 - Ink, Marking, Stencil, Opaque (Porous and Non-Porous Surfaces)
PPP-B-585 - Boxes, Wood, Wirebound
PPP-B-636 - Boxes, Shipping, Fiberboard
PPP-P-1892 - Paint , Varnish, Lacquer, and Related Materials; Packaging, Packing and Marking of

Federal Standards:

Fed. Std. No. 123 - Marking for Shipment (Civil Agencies)
Fed. Test Method Std. No. 141 - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling and Testing

(Activities outside the Federal Government may obtain copies of Federal specifications, standards and handbooks as outlined under General Information in the Index of Federal Specifications and Standards at the price indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, US Government Printing Office, Washington, D.C. 20402.

(Single copies of this specification and other Federal specifications required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Services Centers in Boston, Houston, New York, Philadelphia, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal government activities may obtain copies of Federal specifications, standards, and handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Standards:

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

(Copies of Military specifications and standards required by contractors 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 a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARDS

ASTM D56 - Flash Point by Tag Closed Tester, Test For

ASTM D1296 - Odor of Volatile Solvents and Diluents, Test For

ASTM D1545 - Viscosity of Transparent Liquids by Bubble Time Method

ASTM G21 - Determining Resistance of Synthetic Polymeric Materials To Fungi

ASTM G23 - Operating Light and Water-Exposure Apparatus (Carbon-Arc Type) For Exposure of Nonmetallic Materials

ASTM G26 - Operating Light Exposure Apparatus (Xenon-Arc Type) With and Without Water For Exposure of Nonmetallic Materials

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvannia 19103.)

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT:

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Traffic Department, 1616 P. Street N.W., Washington, DC 20036.)

UNIFORM CLASSIFICATION COMMITTEE, AGENT:

Uniform Freight Classification

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

3. REQUIREMENTS

3.1 Materials. The manufacturer shall be given latitude in the selection of raw materials, provided the finished product complies with all the requirements of this specification. Both Type I and Type II are water resistant with Type II being a water-emulsion type.

3.2 Condition in container. When tested as specified in 4.3.1 the adhesive shall be free from foreign matter and segregation or settling to such an extent as to render dispersion difficult, as determined by visual examination.

3.3 Toxicity. The adhesive must not present a health hazard to individuals from inhalation, skin contact, or ingestion, when used for its intended purpose, or as a result of exposure after its application (see 6.7).

3.3.1 The manufacturer shall furnish the contracting officer with a certificate stating that the adhesive, when applied in accordance with the manufacturer's instructions, is nontoxic (see 6.7).

3.4 Brushing properties. The adhesive, as received, shall be of brushing consistency throughout the temperature range of 50° to 100°F (10° to 38°C) when tested as specified in 4.3.2.

3.5 Odor. The dried film of adhesive shall be free from obnoxious or objectionable odor when tested as specified in 4.3.3.

3.6 Color. The adhesive, in bulk, shall be a light-colored, transparent or translucent liquid. After application to labels the adhesive shall dry to a substantially colorless, transparent finish (see 4.3.4), which will not reduce the legibility of printed label text when viewed at a distance of 20 ins. (508 mm) from observer's eye.

3.7 Blushing. There shall be no evidence of blushing of the film during the drying period when tested as specified in 4.3.5.

3.8 Viscosity (Type I). The adhesive shall have a viscosity of not less than 12.1 seconds and not more than 17.1 seconds at 77° ± 2°F (25° ± 1.1°C) using Gardner-Holt tubes, when determined as specified in 4.3.6.

3.9 Drying time. The adhesive shall dry tack-free in a maximum of 5 minutes for Type I and 15 minutes for Type II. The adhesive shall dry hard in a maximum of 16 hours, when tested as specified in 4.3.7.

3.10 Water resistance. There shall be no whitening, dulling or other visible defects of one coat of adhesive after an 18-hour immersion in distilled water and a 2-hour room temperature drying period, when tested as specified in 4.3.8.

3.11 Transparency. There shall be no appreciable difference in transparency of films of the adhesive on heated and unheated panels, when tested as specified in 4.3.9.

3.12 Adhesion. The adhesive shall show no loss of adhesion and shall not become tacky. The label shall not strip from the test surface except in small chips, and shall adhere smoothly and firmly with no blistering, buckling, curling, or cracking, when tested as specified in 4.3.10 (as applicable) for the following:

a) Resistance to high temperature.
b) Resistance to low temperature.
c) Resistance to oil.
d) Resistance to salt water.
e) Resistance to water.
f) Resistance to accelerated aging.

3.13 Bleeding. The adhesive shall not cause a bleeding of the original stenciling when applied and tested as specified in 4.3.11.

3.13.1 Additional bleeding requirements (stencil ink applied directly to substrate - no paper label). When specified by the procuring agency, the adhesive shall not cause a bleeding of the original stenciling when applied and tested as specified in 4.3.11.1.

3.14 Flexibility. The adhesive shall adhere tightly, without cracking or flaking, on the bend of the test panel prepared and tested as specified in 4.3.12.

3.15 Accelerated weathering. A film of the adhesive shall show no loss in transparency or other film defects which obscure the label after exposure for 60 hours, and the labels shall continue to adhere to the test panels, when prepared and tested as specified in 4.3.13.

3.16 Flash point (type I). The flash point of the adhesive shall be not lower than 40°F (4.4°C) when tested as specified in 4.3.14.

3.17 Flame resistance (type I). When specified by the procuring agency, the adhesive shall be flame resistant. It shall cease burning upon removal of an externally applied flame when tested as specified in 4.3.15.

3.18 Application over ink. The adhesive shall cause no smearing nor running action of the stencil ink or colored border, or discoloration of the paper when tested as specified in 4.3.16.

3.19 Fungus resistance. The adhesive shall support no more than traces of fungus growth (Rating "1") when tested as specified in 4.3.17. Visible growth rating higher than "1" shall be cause for rejection.

3.20 Storage life. After storage as specified in 4.3.18, the adhesive shall conform to the requirements specified in 3.2, 3.4, 3.5, 3.6, 3.9, 3.11 and 3.12.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order the contractor 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 the prescribed requirements.

4.2 Quality conformance inspection.

4.2.1 Lot. A lot shall consist of material from the same batch or blending operation subjected to the same processing operations and conditions, and submitted for inspection at the same time. A batch shall be defined as that quantity of adhesive which has been subjected to some unit chemical process or physical mixing process intended to make the final product substantially uniform.

4.2.2 Classification of tests. All tests shall be performed in accordance with 4.1 and shall be classified as follows:

a) Lot acceptance tests (see 4.2.2.1)
b) Periodic lot-check tests (see 4.2.2.2)

4.2.2.1 Lot acceptance tests. Lot acceptance tests shall be made on each lot of product and shall be the basis for acceptance or rejection of the lot. The lot acceptance tests shall consist of those tests listed as such in table I.

TABLE I. Lot acceptance tests

| Test | Test method (para.) |
|---|---|
| Brushing properties | 4.3.2 |
| Color and transparency | 4.3.4 & 4.3.9 |
| Drying time | 4.3.7 |
| Adhesion after conditioning | 4.3.10 |
| Bleeding | 4.3.11 & 4.3.11.1 |

4.2.2.2 Periodic lot-check tests. Periodic lot check tests shall be made on the first lot of each product furnished by each supplier under this specification, and once from each succeeding 10 lots of that product, or once each year, whichever is the more frequent. The periodic lot-check tests shall consist of all the tests specified in 4.3.

4.2.3 Sampling.

4.2.3.1 For examination of filled containers. A sample of filled containers shall be selected from each lot in accordance with MIL-STD-105 at inspection level I to verify compliance with all stipulations of this specification regarding inspection requirements not involving tests (see table II). The lot size shall be expressed in units of filled containers.

4.2.3.2 For tests. Samples for testing shall be selected at random from each lot. The sample shall be of sufficient size to prepare all the required test specimens. If the examination of 4.2.4.1 indicates that the material is uniform from container to container, the entire sample for tests may be taken from one large container or from a sufficient number of small containers to provide a sample large enough for testing. In this case, one pint (.473 liters) of adhesive should be sufficient for all tests of this specification except to storage life tests (see 4.3.18). If the examination of the adhesive indicates differences in color or consistency between containers (see 4.2.4.1), duplicate samples for testing shall be taken, one from each of the two containers or groups of containers which appear to differ most. The two samples shall be tested separately and both must pass all of the tests required of the particular lot.

4.2.4 Examination.

4.2.4.1 Visual. Sample units selected in accordance with 4.2.3.1 shall be examined for the defects and at the acceptable quality level (AQL) shown in table II.

TABLE II. Classification of defects

| Material | AQL percent | Classification of defects | Defect | Method of inspection |
|---|---|---|---|---|
| Adhesive (see 3.2, 4.2.3.1 and 4.3.1) | 2.5 | Major 101 | Foreign matter | Visual |
| | | Major 102 | Not homogeneous | Visual |
| Container open (see 4.2.3.1 and 5.1) | 2.5 | Major 103 | Improper fill | Visual |
| | | Major 104 | Improper type | Visual |
| | | Major 105 | Improper coating | Visual |
| Container closed (see 4.2.3.1 and 5.1) | 2.5 | Major 106 | Leakage | Visual |
| | | Major 107 | Improper closure | Visual |
| Box open (see 4.2.4.2) | 2.5 | Major 108 | Improper type | Visual |
| | | Major 109 | Lack of, or improper strapping | Visual |
| Box closed (see 4.2.4.2 and 5.2) | 2.5 | Major 110 | Gross weigth max. | Approved scale 1/ |
| | | Major 111 | Marking misleading or unidentifiable | Visual |
| | | Major 112 | Improperly closed | Visual |

1/ Approved by procuring agency.

4.2.4.2 Packaging, packing and marking for shipment. Examination shall be made for the defects and at the AQL as shown in table II to determine compliance with Section 5.

4.2.4.3 Resubmission of rejected lots. Rejected lots may be resubmitted for acceptance tests in accordance with MIL-STD-105 except that the lot shall be inspected by the contractor under supervision of the procuring agency using tightening inspection. Where the original acceptance number was zero, a sample size represented by the next higher sample size code letter shall be chosen. Before resubmission, full particulars concerning the cause of previous rejection and the action taken to correct the defects found in the inspection lot shall be furnished by the contractor to the procuring agency.

4.3 Test procedures.

4.3.1 Condition in container. Determine condition in container in accordance with Method 3011.1 of Fed. Test Method No. 141.

4.3.2 Brushing properties. A sample of the adhesive and some metal plates shall be placed inside a temperature controlled chamber and the temperature adjusted to plus 50°F (10°C). After the sample temperature has reached 50°F (10°C), the sample shall be brushed upon one of the metal plates inside the chamber. The brushing consistency shall also be tested at 10° intervals through plus 100°F (5.5° intervals through 38°C). Safety precautions should be taken so that flammable vapors will not be ignited.

4.3.3 Odor. The odor shall be determined in accordance with ASTM D1296 for compliance with 3.5.

4.3.4 Color. The color shall be determined by coating a glass test panel and printed label with the material, allowing the material to dry thoroughly and then visually examining the film and print for compliance with 3.6.

4.3.5 Blushing. The adhesive shall be tested for blushing over a glass substrate in accordance with Method 6091 of Fed. Test Method Std. No. 141 for compliance with 3.7.

4.3.6 Viscosity (Type I). The viscosity shall be determined in accordance with ASTM D1545 to determine compliance with 3.8.

4.3.7 Drying time. The drying time required to reach the tack-free condition shall be determined in accordance with Method 4061 of Fed. Test Method Std. No. 141 for compliance with 3.9. Glass test panels (see 4.3.10.1.1, materiel "d") shall be used as substrates.

4.3.8 Water resistance. Two test panels for each material for tests shall be prepared as specified in 4.3.10.1.1. The panels shall be immersed in distilled water for 18 hours and allowed to air dry for 2 hours at 73° ± 2°F (22.8° ± 1.1°C). At the end of the drying period, the adhesive shall be observed for whitening, dulling, or other visible defects to determine compliance with 3.10.

4.3.9 Transparency. One coat of the adhesive shall be brushed on two tinned panels, 4 x 6 x 0.031 in. (101.6 x 152.4 x 0.787 mm) thick, that have been lightly buffed with No. 00 steel wool. The adhesive shall be allowed to dry on the panels for 24 hours at room temperature 73° ± 2°F (22.8° ± 1.1°C). One of the test panels shall then be placed in an oven and heated for 24 hours at 212° ± 2°F. (100° ± 1.1°C). The test panel shall be removed from the oven and allowed to cool for 1 hour. Examination of the test panels shall be made to determine differences in transparency of the adhesive on the heated and unheated panels, to determine compliance with 3.11.

4.3.10 Adhesion.

4.3.10.1 Resistance To High Temperature.

4.3.10.1.1 Preparation of test panels. (For all tests in 4.3.10, 4.3.11, 4.3.12 and 4.3.15). Two test panels 4 x 6 ins. (101.6 x 152.4 mm) (except see 4.3.8.6 and 6.5) shall be prepared from each of the materials listed below for each test being conducted. Test panels (other than wood or fiberboard) shall be cleaned with petroleum naphtha having a boiling range from 145° to 205°F (62.8° to 96.1°C). The panels shall be coated with a thin continuous film of the adhesive. A non-gummed paper label, 3 x 4 ins. (76.2 x 101.6 mm) of approximately 40 pounds (18.14 kg) basis weight (17 x 22 inches - 1000) 43.18 x 55.8 cm - 1000) bond (suitable examples are DA Labels 129-2, 131-2, 131-3, 157-1 and 161-1; see 6.7) shall immediately be pressed and smoothed into place upon the adhesive. A thin continuous film of the adhesive shall then be brushed over the entire label and panel surfaces. The test panels shall then be allowed to air-dry at 73.4° ± 2°F (23° ± 1°C), and a relative humidity of 50 ± 4 percent for a period of 24 hours. See also 6.1 and 6.6. The materials are:

a) Soft wood (conforming to PPP-B-585, Group I) and prepared in accordance with Method 2031 of Fed. Test Method Std. No. 141.
b) Solid fiberboard conforming to PPP-B-636, type SF, class "weather-resistant".
c) Hot-rolled low-carbon steel having a tightly-adherent coating of black oxide, but without loose scale or red rust (sometimes called "black iron").
d) Smooth plate glass.
e) Tin-coated steel (0.031 inches (0.78 mm) thick, lightly buffed with steel wool).
f) Enamel-painted metal surface. The enamel shall conform to TT-E-485, type I, II or III.
g) Galvanized iron.
h) Rubber of the following composition (Type I).

Rubber Type I

| Materials | Parts by weight |
|---|---|
| Natural rubber (pale crepe) or synthetic (GR-S 1500) | 100 |
| Zinc oxide | 3 |
| Stearic acid | 2 |
| *Anti-oxidant | 1 |
| Polymerized trimethyl dihydroquinoline | 1 |
| MAF type carbon black | 50 |
| N-cyclohexyl-2-benzothiozole sulfenamide | 1 |
| Sulfur | 1.75 |

* Mix 1/2 pint Aldo-Alpha-Napthylamine with 1/2 pint Octylated-diphenylamine

4.3.10.1.2 Procedure for testing test panels. The test panels, prepared as specified in 4.3.10.1.1, shall be stacked, one on top of the other, so that each pair of labels is face-to-face, and shall be conditioned at a temperature of 60° ± 1.7°C (140° ± 3°F) and a maximum relative humidity of 20 percent for 24 hours. The test specimens shall then be allowed to cool at room temperature for 1 hour, after which they shall be visually examined for evidence of tackiness indicated by sticking to adjacent test surfaces, in accordance with Method 4061 of Fed. Test Method Std. No. 141. By any appropriate or convenient means, a corner of each label shall be loosened slightly and, by grasping it between the thumb and forefinger, an attempt shall be made to remove each label from the test panels by a slow, steady peeling action.

Examination shall be made to determine that the labels are not stripped from the test panels except in small chips not greater than 1/4 in. (6.3 mm) in any dimension. All panels shall be examined to determine that the adhesive adheres and firmly to determine compliance with 3.12.

4.3.10.2 Resistance to low temperature. Two test panels for each of the materials listed in 4.3.10.1.1 shall be prepared as specified. The panels with labels affixed shall be conditioned for 24 hours at -25° ± 2°F (-32° ± 1°C) and examined at this temperature for evidence of tackiness in accord- ance with Method 4061 of Fed. Test Method Std. No. 141. By any appropriate or convenient means, a corner of each label shall be loosened slightly and, by grasping it between the thumb and forefinger, an attempt shall be made to remove each label from the test panels by a slow, steady peeling action. Examination shall be made to determine that the labels are not stripped from the test panels except in small chips not greater than 1/4 in. (6.3 mm) in any dimension. All specimens shall be examined to determine that the adhesive adheres smoothly and firmly to determine compliance with 3.12.

4.3.10.3 Resistance to oil. Two test panels for each of the 6 materials listed in 4.3.10.1.1 shall be prepared as specified. The panels with labels affixed shall be coated with a light film of ASTM No. 2 oil and allowed to lie flat for 24 hours and examined for evidence of tackiness in accordance with Method 4061 of Fed. Test Method Std. No. 141. By any appropriate or convenient means, a corner of each label shall be loosened slightly and, by grasping it between the thumb and forefinger, an attempt shall be made to remove each label from the test panels by a slow, steady peeling action. Examination shall be made to determine that the labels are not stripped from the test panels except in small chips not greater than 1/4 in. (6.3 mm) in any dimension. All specimens shall be examined to determine that the adhesive adheres smoothly and firmly to determine compliance with 3.12.

4.3.10.4 Resistance to salt water. Two test panels for each of the materials listed in 4.3.10.1.1 shall be prepared as specified. Three coats of a 4 percent sodium chloride solution shall be brushed on each of the 6 test panels with labels affixed. The specimens shall be allowed to dry completely between each application. During the wetting and drying, the specimens shall be kept flat. After the last wetting, the test panels shall be thoroughly dried at room temperature, then examined for evidence of tackiness, in accordance with Method 4061 of Fed. Test Method Std. No. 141. By any appropriate or convenient means, a corner of each label shall be loosened slightly and, by grasping it between the thumb and forefinger, an attempt shall be made to remove each label from the test panels by a slow, steady peeling action. Examination shall be made to determine that the labels are not stripped from the test panels except in small chips not greater than 1/4 in. (6.3 mm) in any dimension. All specimens shall be examined to determine that the adhesive adheres smoothly and firmly to determine compliance with 3.12.

4.3.10.5 Resistance to water. Two test panels for each material being tested shall be prepared as specified in 4.3.10.1.1. The panels shall be immersed in distilled water for 18 hours and allowed to dry for 2 hours at 73° ± 2°F (22.8° ± 1.1°C). At the end of the drying period, the adhesive shall be observed for whitening, dulling, or other visible defects to determine compliance with 3.10. By any appropriate or convenient means, loosen a corner of each label slightly and, grasping it between the thumb and forefinger, attempt to remove each label from the test specimens by a slow, steady, peeling action. Examination then shall be made to determine that the labels are not stripped from the specimens except in small chips. All specimens shall be examined to determine that the adhesive adheres smoothly and firmly to determine compliance with 3.12.

4.3.10.6 Resistance to accelerated aging. Two test panels, preferably 3 x 9 ins. (76.2 x 228.6 mm), for each of the materials listed in 4.3.10.1.1 shall be prepared as specified, except that the adhesive shall be approximately 0.002 in. (0.05 mm) dry film, and shall be exposed for 60 hours in an operating light-and-water exposure apparatus. The apparatus could be a Carbon-Arc Type, ASTM G23-Type E, or an Xenon-Arc Type, ASTM G26-Type A (see 6.5). After exposure, the test specimens shall be examined of tackiness, in accordance with Method 4061 of Fed. Test Method Std. No. 141. By any appropriate or convenient means, a corner of each label shall be loosened slightly and, by grasping it between the thumb and forefinger, an attempt shall be made to remove each label from the test panels by a slow, steady peeling action. Examination shall be made to determine that the labels are not stripped from the test panels except in small chips not greater than 1/4 in. (6.3 mm) in any dimension. All speci- mens shall be examined to determine that the adhesive adheres smoothly and firmly to determine compliance with 3.12.

4.3.11 Bleeding. Two test panels for each of the test materials shall be prepared as specified in 4.3.10.1.1 and stenciled with black opaque stencil ink complying with TT-I-1795, type II. The ink shall be allowed to dry for 24 hours. The test panels shall then be completely coated with one coat of commercially-available water-emulsion stencil-obliterating paint and allowed to dry for 1 hour. One thin continuous coat of the adhesive shall then be applied over the obliterating paint and allowed to dry. The test panels shall then be visually examined to determine if the stencil ink has bled through the obliterating paint to determine compliance with 3.13.

4.3.11.1 Additional bleeding requirement (stencil ink applied directly to substrate - no paper label). Two test panels for each of the test materials shall be prepared as specified in 4.3.10.1.1 and shall be stenciled with black opaque stencil ink complying with TT-I-1795, type II. The ink shall be allowed to dry for 24 hours. The test panels shall then be completely coated with one coat of commercially-available water-emulsion stencil-obliterating paint and allowed to dry for 1 hour. One thin continuous coat of the adhesive under test shall then be applied over the obliterating paint and allowed to dry. The test panels shall then be visually examined for compliance with 3.13.1 by determining if the stencil ink has bled through the obliterating paint.

4.3.12 Flexibility. A 0.031 in. (0.78 mm) thick naphtha-cleaned tin-coated steel panel (material "e" in 4.3.10.1.1) shall have a 0.006 in. (0.15 mm) wet film thickness of the adhesive applied to it, using a draw-down blade. The film shall be allowed to dry for 72 hours at 73° ± 2°F (23° ± 1°C). After drying, the test panel shall be bent around a 1/4 in. (6.4 mm) mandrel with the adhesive coating outermost. The adhesive film shall be examined for cracking or flaking to determine compliance with 3.14.

4.3.13 Accelerated weathering. The specimens which were subjected to the resistance to accelerated aging test specified in 4.3.10.6 shall be examined for evidence of loss of transparency to determine compliance with 3.15.

4.3.14 Flash point (type I). The adhesive shall be tested for flash point in accordance with ASTM D56 to determine compliance with 3.16.

4.3.15 Flame resistance (type I). When specified by the procuring agency, a test panel shall be prepared, cured, and dried in accordance with 4.3.10.1.1. The panel shall be held in a vertical position and a small flame from a micro-burner shall be passed slowly back and forth along one edge of the panel. The flame shall be removed and the panel carefully observed to determine compliance with 3.17.

4.3.16 Application over ink. A standard white paper label with a red or blue border shall be marked with a black opaque ink complying with TT-I-1795. The ink shall be allowed to dry thoroughly. A thin continuous film of the adhesion shall then be brushed over the label. The label shall be visually examined to determine if the adhesive causes a smearing or running of the ink or discoloration of the label to determine compliance with 3.18.

4.3.17 Fungus resistance. The procedure and organisms prescribed in ASTM G21 shall be used. The test specimens shall consist of dried free film of adhesive 0.02 ± 0.004 in. (0.5 ± 0.1 mm) thick. The cured free film is prepared by drawing down a thin layer of liquid adhesive placed on a polytetrafluoro-ethylene (PTFE) surface. PTFE-coated metal or metal foil is satisfactory. A suitable coated foil is TRI-FOIL, a PTFE-coated aluminum foil supplied by Tri-Point Division, Oak Materials Group, 1st Street, Hoosick Falls, N.Y. 12090. The drawn-down film of adhesive is allowed to dry at ambient conditions for at least 48 hours. A suitable cover should be placed above the curing film to prevent dust from dropping onto the surface of the adhesive film while it is drying. Provision should be made, however, to allow

the liquid in the adhesive to evaporate by circulating air over the specimen. After drying, the adhesive film shall be peeled away from the PTFE surface and cut into test specimens of 0.1 x 2.6 in. (25 x 75 mm) dimensions. The free-film specimens shall be placed on the surface of the nutrient-salts agar in a large Petri dish 5.9 x 0.8 in. (150 x 20 mm), innoculated, incubated and evaluated for fungus growth as prescribed in ASTM G21.

4.3.18 Storage life. Adhesive packaged in accordance with 5.1 shall be stored for a period of 12 months from date of manufacture (see 5.3.3) at a temperature of 23° ± 1°C (73.4° ± 2°F). The adhesive shall then be tested for conformance with 3.20 (see 4.3.19).

4.3.19 Certification of storage life. The storage life test of this specification (4.3.18) may be waived by the procuring agency upon certification by the contractor that the lot submitted for acceptance meets the storage life requirements. The certificate shall be signed by a responsible agent of the certifying organization and shall be accompanied by evidence of this agent's authority to bind his principal. The procuring agency reserves the right to check test material submitted by the contractor under certification.

4.3.20 Rejection and retest. Rejection and retest of material shall be as specified in Method 1031 of Fed. Test Method Std. No. 141, even though this method is not normally applicable to adhesives.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be Level A, B, or Commercial, as specified (see 6.4).

5.1.1 Level A. The adhesive shall be packaged in 1-gallon (3.79-liter) or 5-gallon (18.9-liter) containers in accordance with the level A packaging requirements of PPP-P-1892.

5.1.2 Level B. The adhesive shall be packaged in 1-gallon (3.79-liter) or 5-gallon (18.9-liter) containers in accordance with the level B requirements of PPP-P-1892.

5.1.3 Commercial. The adhesive shall be packaged in 1-gallon (3.79-liter) or 5-gallon (18.9-liter) quantities as specified (see 6.4) in accordance with normal commercial practice. The complete package shall be designed to protect the adhesive against damage during shipment, handling, and storage.

5.2 Packing. Packing shall be level A, B, or commercial, as specified (see 6.4).

5.2.1 Level A. Adhesive packaged as specified in 5.1 shall be packed in accordance with the level A packing requirements of PPP-P-1892.

5.2.2 Level B. Adhesive packaged as specified in 5.1 shall be packed in accordance with the level B packing requirements of PPP-P-1892.

5.2.3 Commercial. The adhesive packaged as specified in 5.1 shall be packed in fiberboard boxes to insure delivery at destination, provide for redistribution by the initial receiving activity, and be acceptable by common carrier under the National Motor Freight Classification and Uniform Freight Classification.

5.3 Marking.

5.3.1 Civil agencies. Interior packages and shipping containers shall be marked in accordance with Fed. Std. No. 123.

5.3.2 Military activities. Interior packaged and shipping containers shall be marked in accordance with MIL-STD-129.

5.3.3 Special marking. In addition to the marking required by 5.3.1 or 5.3.2, each can or pail shall be marked with the following information:

a) Information regarding thinning for spray application and for thinning of stored adhesives when viscosity has increased to the point where thinning is necessary.

b) Date packaged (month and year, not code).

c) Date of first reinspection. (Insert date one year after date of manufacture. Apply this also to shipping containers.)

d) Lot number.

e) Exterior containers shall include the following additional marking: "Precaution: Store in a dry place at moderate temperatures. Do not freeze!"

f) Packing - Container labels or marking should include all applicable information as contained below under "Notes" regarding intended use of the adhesive.

6. NOTES

6.1 Intended use. Adhesive procured under this specification is intended for adhering printed paper labels to soft wood, solid fiberboard, hot-rolled low-carbon steel with a black iron oxide coating ("black iron"), glass, tin-coated steel, and enamel-painted metal (see 4.3.10.1.1). When the adhesive is intended for application to other surfaces, the using agency should ascertain that it performs satisfactorily.

6.2 Additional comment. Type I is intended for use with organic solvents, consequently adhesives supplied under type I may be objectionable because of their possible toxicity and flammability.

6.3 This specification supersedes MMM-A-179A dated 19 August 1977 and MMM-A-178A dated 28 August 1973.

6.4 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

a) Title, number and date of this specification

b) Whether or not additional bleeding test is required (see 3.13.1)

c) Number and style of containers

d) Size of unit container (see 5.1)

e) Inspection responsibility, method and tests (see 4.2.3.2)

f) Whether civil or military agency marking is required (see 5.3)

g) Selection of applicable level of packaging (and packing) (see 5.1 and 5.2)

h) Whether or not flame resistance is required (see 3.17)

i) Whether extra protective coating on containers is required (see 5.1.1)

j) If exterior coating for the 5-gallon pails is different than specified (see 5.1.1)

6.4.1 The unit of purchase is the U.S. liquid gallon of 231 cubic inches (3.785 liters) at 20°C (68°F).

6.5 The apparatus called for in 4.3 10.6 is available from the Atlas Electric Devices Company, 4114 N. Ravenswood Avenue, Chicago, IL 60613. The 3 by 9 inch (76.2 by 228.6 mm) test panels suggested in 4.3.10.6 were selected so that they would fit the 54-specimen VPR (Vertical Panel Rack) sample rack frequently supplied with the XW-W Weather-Ometer. Other sizes, such as the 4 by 6 inches (101.6 by 152.4 mm) used for the test panels in 4.3.10.1.1, would result in haphazard sample mounting. They may be used, however.

6.6 Application. In applying adhesive procured under this specification, the using agency should maintain flexibility in its application techniques. For example, variations in temperature and humidity are known to influence drying time. Variations in surface conditions may require cleaning of the surface to remove waxes, oils, or greases. Porous surfaces may require a preliminary coat of adhesive to seal the surface. Care must be taken to ensure intimate contact between label and bonding surface. This is especially important in irregular or curved surfaces.

6.7 Toxicity. Any questions raised regarding toxicity should be referred to appropriate medical authority. In the case of Army procurement, the Surgeon General of the Army will act as advisor to the procuring agency.

6.8 DA labels are Department of the Army labels and are available through ordinary military channels. For questions of current availability, contact Headquarters, Department of the Army (DAAG-PAP-F), Washington, D.C. 20314.

MILITARY CUSTODIANS:

Army - MR
Navy - AS
Air Force - 99

Review activities:

Army - SM, GL
Navy - SA

User activities:

Army - EL, GL, AR, MI
Navy - OS, SH, YD

Preparing acitivity:

Army - MR

CIVIL AGENCY COORDINATING ACTIVITY:

GSA, FSS

Project No. 8040-0411

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