

MMM-A-130B
December 9, 1974
SUPERSEDING
Fed. Spec. MMM-A-130A
June 15, 1964

FEDERAL SPECIFICATION

ADHESIVE, CONTACT

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 Scope. This specification covers two types of flexible adhesive for contact bonding of plastic decorative laminates to clean, dry, and smooth wood and metal surfaces. The adhesive will firmly bond such materials as leather, wood, fabrics, unglazed ceramics, wallboards, and carpet to themselves or to each other.

1.2 Classification. The adhesive shall be of the following types:

- Type I - Volatile organic solvent type.
- II - Water dispersion type.

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:

- L-P-508 - Plastic Sheet, Laminated, Decorative and Nondecorative.
- TT-E-485 - Enamel Semigloss, Rust-inhibiting.
- PPP-C-96 - Cans, Metal, 28 Gage and Lighter.
- PPP-D-729 - Drums, Shipping and Storage, Steel, 55-Gallon
- PPP-D-704 - Pails, Metal: (Shipping, Steel, 1 through 12 Gallon).

Federal Standards:

- Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).
- Fed. Test Method Std. No. 141/GEN - Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling and Testing.
- Fed. Test Method 141/5132 - Chlorinated Compounds (Presence of).
- Fed. Test Method 141/7356 - Solvent Content of Enamels and Enamel Thinners (Gas Liquid Chromatography).

(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 prices 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, DC 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 Business Service Centers at the General Services

Administration Regional Offices in Boston, New York, 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 suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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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:

- D 86 - Distillation of Petroleum Products.
- D 244 - Testing Emulsified Asphalts.
- D 297 - Chemical Analysis of Rubber Products.
- D 1002 - Strength Properties of Adhesive in Shear by Tension Loading (Metal-to-Metal).
- D 1084 - Viscosity of Adhesives.
- D 1183 - Resistance of Adhesives to Cyclic Laboratory Aging Conditions.
- D 1489 - Nonvolatile Content of Aqueous Adhesives.
- D 1875 - Density of Adhesives in Fluid Form.

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

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.)

National Motor Freight Traffic Association, Incorporated, Agent:

National Motor Freight Classification.

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

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 Material. The adhesive shall be composed of polychloroprene (neoprene) rubber and synthetic resins modified to the extent that the requirements of this specification are met (see 4.1.1).

3.1.1 The manufacturer is given latitude in the selection of solvents or blend of solvents used in type I adhesive provided the material meets the requirements specified in 3.1.1.1 and 3.1.1.2.

3.1.1.1 The volatile solvent when tested as specified in 4.4.2 shall contain no benzene (benzol) or halogenated compounds (See 4.3.3).

3.1.1.2 The volatile solvent when tested as specified in 4.4.2 shall conform by volume to the requirements controlling the emission of solvents into the atmosphere as called out in (a), (b), (c), (d), and (e). (See 4.3.3).

- (a) A combination of hydrocarbons having branched chain structures, alcohols, aldehydes, esters, or ethers: 5 percent maximum.
- (b) A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: 8 percent maximum.
- (c) A combination of ethylbenzene or toluene: 20 percent maximum.

- (d) Total of (a) + (b) + (c) = 20 percent maximum.
- (e) A combination of ketones and solvents with an olefinic or cyclo-olefinic type of unsaturation: trace.

3.1.2 Type II adhesive shall consist of the materials specified in 3.1 dispersed in water. The composition of the dispersing agent is not specified.

3.1.2.1 Type II adhesive shall contain no organic solvents.

3.2 Nonvolatile content. When tested as specified in 4.4.3 the nonvolatile content of the adhesive in percent by weight shall be as follows:

	Minimum	Maximum
Type I	18.0	25.0
Type II	46.0	54.0

3.3 Ash content. When tested as specified in 4.4.4, the ash content of the dry film of the adhesive shall be not less than 3.0 percent or more than 20 percent.

3.4 Viscosity. The viscosity of the adhesive shall be not less than 400 or more than 1500 centipoises when tested as specified in 4.4.5.

3.5 Density. When tested as specified in 4.4.6, the density of the adhesive in pounds per gallon shall be as follows:

	Minimum	Maximum
Type I	6.5	7.3
Type II	8.5	9.3

3.6 Shear strength of bonded joints. When tested as specified in 4.4.7, the shear strength of the adhesive in pounds per square inch shall be as follows:

	Minimum
Before aging	150
After aging	200

3.7 Edge Life. When tested as specified in 4.4.8, the edge lift of a bonded sample shall be a maximum of 1/16 inch.

3.8 Bonding range. When tested as specified in 4.4.9, the bonding range of the adhesive shall be a minimum of one hour.

3.9 Accelerated aging. When tested as specified in 4.4.10, the adhesive shall change in viscosity not more than 10 percent plus or minus from the originally specified value (see 3.4), and there shall be no evidence of gelling or separation.

3.10 Shelf storage life. When the adhesive is stored as specified in 4.4.11, there shall be no gelling, stringing, or other nonuniformity; the viscosity shall have changed not more than 10 percent plus or minus from the originally specified viscosity (see 3.4); and the strength values shall be not less than those specified in 3.6, 3.7, and 3.8.

3.11 Freeze-thaw resistance. When tested as specified in 4.4.12, the adhesive shall remain homogeneous and shall change in viscosity not more than 10 percent plus or minus from the originally specified value (see 3.4).

3.12 Workmanship. The adhesive shall be uniform, even-spreading, and free of dirt, lumps, foreign matter, coarse particles, and all other defects which would adversely affect its usability.

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.

4.1.1 The supplier shall submit to the contracting officer a certificate of compliance indicating that the adhesive is composed of polychloroprene rubber and synthetic resin as specified in 3.1 and that the adhesive complies with the shelf storage life requirement as specified in 3.10. When certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certificate.

4.2 Sampling.

4.2.1 Lot. For the purposes of sampling, a lot of the adhesive shall consist of a manufacturer's batch. A batch is defined as the end product of all raw materials mixed, blended, or processed in a single operation.

4.2.2 Sampling for inspection of filled containers. A random sample of filled containers shall be selected in accordance with MIL-STD-105 at inspection level I and acceptable quality level (AQL) = 2.5 percent defective to verify compliance with this specification regarding fill, closure, and marking and other requirements not involving tests.

4.3 Inspection.

4.3.1 Inspection of containers. Each sample filled container shall be examined for defects of construction of the container and the closure, for evidence of leakage, and for unsatisfactory markings; each filled container shall also be gaged to determine the amount to contents. Any container in the sample having one or more defects or under required fill shall be rejected, and if the number of defective containers in any sample exceeds the acceptance number for the appropriate sampling plan of MIL-STD-105, the lot represented by the sample shall be rejected.

4.3.2 Inspection of preparation for delivery requirements. An inspection shall be made to determine that the packaging, packing, and marking comply with the requirements of section 5 of this specification. Defects shall be scored in accordance with table I. For examination of interior packaging the sample unit shall be one shipping container fully prepared for delivery selected at random just prior to the closing operations. Sampling shall be in accordance with MIL-STD-105. Defects of closure listed shall be examined on shipping containers fully prepared for delivery. The lot size shall be the number of shipping containers in the end item inspection lot. The inspection level shall be S-2 and the AQL shall be 4.0 defects per hundred units.

TABLE I. Classification of preparation for delivery defects

Examine	Defects
Markings (exterior and interior)	Omitted; improper size, location, sequence, or method of application
Materials	Any component missing or damaged.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose, strapping, inadequate stapling. Bulging or distortion of container.

4.3.3 Testing of the end item. The methods of testing specified in 4.4 shall be followed. For purposes of sampling, the lot shall be expressed in units of gallons of adhesive. The sample unit for testing shall be one quart of adhesive, randomly selected from containers in the lot. The adhesive shall be placed in separate clean, dry metal or glass containers, sealed, marked, and forwarded to the testing laboratories. The sample size shall be as follows:

Lot size (gallon)	Sample size
800 or less	2
801 up to and including 22,000	3
22,001 and more	5

Tests shall be performed on a sample unit basis. All test reports shall contain the individual values utilized in expressing the final result. The lot shall be unacceptable if one or more sample unit fails to meet any test requirement specified.

4.4 Test procedures.

4.4.1 Standard test conditions. Unless otherwise specified, all test specimens shall be prepared and tested in a room having a temperature of 73.5 deg. +/- 2 deg. F. (23.1 deg. +/- 1.1 deg. C) and a relative humidity of 50 + 5 percent.

4.4.2 Solvent analysis for type I adhesive.

4.4.2.1 Solvent extraction. The solvent shall be distilled from 100 milliliters of type I adhesive according to ASTM D 86.

4.4.2.2 Solvent composition. The solvent composition shall be determined in accordance with 4.4.2.2.1, method 7356 of Fed. Test Method Std. No. 141, 4.4.2.2.2, 4.4.2.2.3, and 4.4.2.2.4 to determine compliance with the requirement of 3.1.1.

4.4.2.2.1 Aromatic and oxygenated solvents. The 6-ft. column shall be installed and the operating conditions described in method 7356 shall be followed. About 3 microliters of the isolated distillate shall be injected and the chromatogram scanned. The aliphatic solvents will emerge within 1 minute and the completed chromatogram should develop in about 5 minutes. From the position of the peaks observed on the chromatogram, an internal standard

that will be free of interference shall be selected, such as cyclopentanol or cyclohexanol. Six-tenths of a milliliter of internal standard shall be added to 3 milliliters of the distillate. The sample shall be analyzed according to the above procedure. Peaks emerging after 1 minute are aromatic solvents along with any oxygenated solvents that may be present. The percent of aromatic and oxygenated solvents shall be calculated as follows:

$$\% \text{ aromatic and oxygenated solvent, v/v} = \frac{20^* \times A}{1.02^{**} \times B}$$

Where, A = area of aromatic and oxygenated solvents.

B = area of internal standard.

* = is percent of internal standard added.

** = is correction factor if cyclopentanol is used. If another internal standard is used, calibrate to determine the correction factor.

NOTE: If the above determination exceeds 8 percent, proceed with method 7356.

4.4.2.2.2 Ketones.

4.4.2.2.2.1 Reagent. Two grams of 2, 4-dinitrophenylhydrazine + 4 milliliters of concentrated sulfuric acid + 30 milliliters of methanol (slowly added) + 10 milliliters of water.

4.4.2.2.2.2 Procedure. One milliliter of reagent shall be pipetted into a 20 x 170 mm. test tube. Ten drops of distillate shall be added and the test tube shaken for 30 seconds. A yellow precipitate or cloud in the reagent layer indicates the presence of ketones. A blank shall be run using one milliliter of reagent and 10 drops of mineral spirits.

4.4.2.2.3 Halogenated compounds. The presence of halogenated compounds shall be determined in accordance with method 5132 of Fed. Test Method Std. No. 141.

4.4.2.2.4 Benzene. When the solvent is tested in accordance with 4.4.2.2.1, a trace benzene peak of not more than 2 percent of the toluene peak will be allowed.

4.4.3 Nonvolatile content. The nonvolatile content of the adhesive shall be determined in accordance with ASTM D 1489 to determine compliance with the requirement of 3.2.

4.4.4 Ash content. The ash content of the adhesive shall be determined in accordance with the Referee Ash Method of Fillers Analysis of ASTM D 297 to determine compliance with the requirement of 3.3.

4.4.5 Viscosity. The viscosity of the adhesive shall be determined in accordance with method B of ASTM D 1084 to determine compliance with the requirement of 3.4. A Brookfield Viscosimeter Model RVT or equal, equipped with a No. 2 spindle and operated at 20 r.p.m. shall be used.

4.4.6 Density. The density of the adhesive shall be determined in accordance with ASTM D 1875 to determine compliance with the requirement of 3.5.

4.4.7 Shear strength of bonded joints.

4.4.7.1 Before aging. The shear strength before aging shall be determined in accordance with ASTM D 1002 to determine compliance with the requirement of

3.6. Adherends shall be 1/4-inch-fir plywood, commercial Grade A, and a high pressure decorative plastic laminate of 0.062 inches nominal thickness conforming to L-P-508.

4.4.7.2 After aging. Specimens prepared as specified in 4.4.7.1 shall be exposed to the aging conditions specified in procedure A of ASTM D 1183. After the required conditioning, the exposed specimens shall be subjected to the shear strength tests as specified in 4.4.7.1 to determine compliance with the requirement of 3.6.

4.4.8 Edge lift.

4.4.8.1 Sample preparation. A 12-inch by 12-inch by 0.062-inch piece of high pressure decorative plastic laminate, conforming to L-P-508, shall be bonded with the adhesive to a 12-inch by 12-inch by 1/2-inch piece of fir plywood. The directions given by the adhesive manufacturer shall be followed closely in bonding. The bonded specimen shall be aged for 24 hours at standard conditions (see 4.4.1). A one-inch selection from each of the four edges of the assembly, shall be trimmed off with a saw, leaving a 10-inch by 10-inch test specimen.

4.4.8.2 Procedure. The aged sample shall be exposed to a temperature of 60 deg. C. (140 deg. F.) in an air circulating oven for 2 consecutive hours. Afterward, the sample shall be removed from the oven and cooled at standard conditions (see 4.4.1). The distance that the plastic decorative laminate has separated from the plywood shall be measured accurately to determine compliance with the requirement of 3.7.

4.4.9 Bonding range.

4.4.9.1 Sample preparation. One brush coat of adhesive shall be applied with a two-inch-wide brush to one surface of interior-grade fir plywood, 6 inches by 6 inches by 1/2-inch, and the adhesive shall be allowed to dry for 20 minutes. A second brush coat of adhesive shall be applied to the plywood, and as soon as possible thereafter a brush coat of adhesive shall be applied to the reverse side of a 6 inch by 6 inch by 0.062 inch piece of high-pressure decorative plastic laminate conforming to L-P-508.

4.4.9.2 Procedure. After one-hour drying time for the coated specimen, the adhesive-coated surface of the decorative laminate shall be placed squarely on the coated plywood so that one inch of the laminate extends over the plywood on two sides. The entire laminate surface shall be rolled with a small hand roller not over 3 inches wide using the body pressure to establish the bond. The bond shall be determined by attempting to peel the laminate from the plywood.

4.4.10 Accelerated aging. A wide-mouth, 1-pint container of aluminum or steel shall be filled with the adhesive. The container shall be closed securely and stored for 15 days at 140 deg. +/- 2 deg. F. (60 deg. +/- 1 deg. C.). The container of adhesive shall then be stored at standard conditions (see 4.4.1) for 24 hours. The viscosity of the adhesive shall be determined in accordance with 4.4.5 to determine compliance with the requirement of 3.9. Tests shall be conducted in duplicate and averaged. The test specimen shall be examined for separation and gelling.

4.4.11 Shelf storage life. A one pint container, or an equivalent amount of smaller size containers, of the adhesive shall be stored in the original unopened container or containers for 12 months from the date of manufacture at standard conditions (see 4.4.1) and then shall be tested to determine compliance with the requirements of 3.10.

4.4.12 Freeze-thaw resistance. The freeze-thaw resistance of the adhesive shall be determined in accordance with the freezing test of ASTM D 244, and the viscosity of the adhesive shall be determined in accordance with 4.4.5 to determine compliance with the requirement of 3.11.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Adhesive shall be packaged level A, B, or C, as specified in the contract or order (see 6.2).

5.1.1 Level A.

5.1.1.1 Cans. Quantities of one gallon or less shall be packaged in round cans conforming to type V, class 2 of PPP-C-96. Cans for type II adhesive shall have an interior coating which shall neither affect, nor be affected by, the adhesive. Exterior plan B coating and side seam stripping shall be required. Containers of one half gallon capacity and above shall be provided with wire handles which shall be galvanized or otherwise protectively coated to resistant corrosion.

5.1.1.2 Pails. Quantities of five gallons shall be packaged in pails

conforming to type II of PPP-P-704. Pails for type II adhesive shall have an interior coating which shall neither affect, nor be affected by, the adhesive. Exterior coating of pails shall be required and conform to TT-E-485. Wire handles or bails shall be required. Wire handles or bails shall be galvanized or otherwise protectively coated to resist corrosion.

5.1.1.3 Drums. Quantities of fifty-five gallons shall be packaged in drums conforming to type II of PPP-D-729. Type II adhesive shall be packaged in drums conforming to type III of PPP-D-729 with a lining of a material which shall neither affect, nor be affected by, the adhesive. Exterior coating of drums shall be required and shall conform to TT-E-485.

5.1.2 Level B.

5.1.2.1 Cans. Quantities of one gallon or less shall be packaged in round cans conforming to type V, class 2 of PPP-C-96. Cans for type II adhesive shall have an interior coating which shall neither affect, nor be affected by, the adhesive. The cans shall have exterior coating plan A. Containers of one half gallon capacity and above shall be provided with wire handles as specified in 5.1.1.1.

5.1.2.2 Pails and drums. Quantities of five gallons in pails and 55 gallons in drums shall be furnished as specified in 5.1.1.2 and 5.1.1.3, respectively.

5.1.3 Level C. Adhesive in the quantities as specified (see 6.2) shall be packaged in accordance with the manufacturer's commercial practice, provided that this insures protection for the adhesive during shipment and provides for safe delivery to its destination.

5.2 Packing.

5.2.1 Levels A and B.

5.2.1.1 Cans. Adhesive furnished in quantities of one gallon or less, packaged as specific (see 6.2), shall be packed for domestic or overseas shipment as specified (see 6.2) in accordance with the appendix of PPP-C-96.

5.2.1.2 Pails and drums. Adhesive furnished in 5-gallon pails and 55-gallon drums shall require no additional packing.

5.2.2 Level C. The adhesive, packaged as specified, shall be packed in containers that will assure carrier acceptance and safe delivery at destination in compliance with the Uniform Freight Classification or National Motor Freight Classification, as applicable.

5.3 Marking.

5.3.1 Civil agencies. In addition to any special marking required by the contract or order, marking of shipping containers shall be in accordance with Fed. Std. No. 123.

5.3.2 Military agencies. In addition to any special marking required by the contract or order, marking of shipping containers shall be in accordance with MIL-STD-129.

5.3.3 Special marking. In addition to markings specified in 5.3.1 or 5.3.2 as applicable, information shall appear on each unit container and shipping container as follows:

- (a) Manufacturers instructions for use (to include thinning directions if applicable).
- (b) Date of manufacture (by month and year, not by code).
- (c) Date of first reinspection (12 months from date of manufacture).
- (d) Flash point in degrees Centigrade and degrees Fahrenheit.
- (e) Any special directions for storage or use of the adhesive.

6. NOTES

6.1 Intended use. The adhesive covered by this specification is intended for high strength contact bonding of a wide variety of materials including metal, wood, plastics, and fabrics to themselves and each other. The adhesive may be used to install cove base corners and roll edge counter top materials.

6.2 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) Type required (see 1.2).
- (c) Size and type of container required (see 5.1).
- (d) Quantity required.

- (e) Level of packaging and packing required (see 5.1 and 5.2).
- (f) Special marking required (see 5.3).

MILITARY INTEREST:

CIVIL AGENCY COORDINATING ACTIVITIES:

Custodians:

COM - NBS

GSA - PCD

Army - ME

Air Force - 84

Preparing activity:

Coordinating activity:

GSA - FSS

Army - ME

Review activity:

Army - MI

User activity:

Navy - YD

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Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein. Price 30 cents each.

MMM-A-130B
INTERIM AMENDMENT-3
April 7, 1976
SUPERSEDING
Int. Amendment-2
August 5, 1975, and
Int. Amendment-1
May 6, 1975

INTERIM AMENDMENT
TO
FEDERAL SPECIFICATION
ADHESIVE, CONTACT

This interim amendment was developed by the General Services Administration, Federal Supply Service, Washington, D.C. 20406, based upon currently available technical information. It is recommended that Federal agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

The General Services Administration has authorized the use of this interim amendment as a valid exception to Federal Specification MMM-A-130B, dated December 9, 1974.

PAGE 2

Paragraph 3.1.1.2, delete in its entirety and substitute:

3.1.1.2 The volatile solvent when tested as specified in 4.4.2 shall conform by volume to the requirements controlling the emission of solvents into the atmosphere as called out in (a), (b), (c), (d), and (e) (see 4.3.3).

- (a) Total of aldehydes and branched chain ketones: 20 percent maximum.
- (b) Total of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: 8 percent maximum.
- (c) Total of ethylbenzene and toluene: 20 percent maximum.
- (d) Total of solvents with olefinic or cyclo-olefinic unsaturation: 5 percent maximum.
- (e) Total of (a) + (b) + (c) + (d) = 20 percent maximum.

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Paragraph 4.4.2.2., line 2, delete "4.4.2.2.3, and 4.4.2.2.4" and substitute "and 4.4.2.2.3".

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Paragraphs 4.4.2.2.2, 4.4.2.2.2.1, and 4.4.2.2.2.2, delete in their entirety.