

MIL-P-23242B(AS)
~~22 March 1982~~
 SUPERSEDING
 MIL-P-23242A(WEPS)
 25 June 1964

MILITARY SPECIFICATION

PLASTIC COATING COMPOUND, STRIPPABLE, FOR ELECTROPLATING

This specification is approved for use by the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for one type of hot-dip, stop-off, srippable plastic coating intended for masking metallic areas not to be plated during an electroplating process (see 6.1).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

PPP-B-576	-	Box, Wood, Cleated, Veneer, Paper Overlaid.
PPP-B-585	-	Boxes, Wood, Wirebound
PPP-B-591	-	Boxes, Fiberboard, Wood-Cleated
PPP-B-601	-	Boxes, Wood, Cleated-Plywood
PPP-B-621	-	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	-	Boxes, Shipping, Fiberboard

STANDARDS

MILITARY

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

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Engineering Specifications and Standards Department (Code 93), Naval Air Engineering Center, Lakehurst, NJ 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1436) appearing at the end of this document or by letter.

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(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting 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. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM D 92-78 - Flash and Fire Points by Cleveland Open Cup.
- ASTM D 2240 - Rubber Property - Durometer Hardness.

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

UNIFORM CLASSIFICATION COMMITTEE, AGENT

Uniform Freight Classification Rules

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

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

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 First article. When specified, a sample shall be subjected to first article inspection (see 4.4 and 6.2.1).

3.2 Material. The plastic coating compound shall consist of 100 percent solids, hot-melt cellulose acetate butyrate in combination with plasticizers and stabilizers. Waxes, foreign resins, migrating plasticizers, chlorinated or toxic materials shall not be present.

3.2.1 Appearance. The appearance of the compound as received shall be in cake form, pink to red in color, visibly free of contaminants and exudation.

3.3 Chemical and physical properties. The cellulose acetate butyrate compound shall conform to the requirements specified in table I.

3.4 Workmanship. The plastic coating compound shall be manufactured by such processes as to meet all the requirements of this specification.

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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 purchase 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 supplies and services conform to prescribed requirements.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).

4.3 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in the applicable test paragraph herein.

4.4 First article inspection. First article inspection shall consist of all the inspection procedures of this specification (see 4.7). The responsibility for the performance of the first article inspection shall be as specified in the contract or order (see 6.2).

4.4.1 First article sample. Unless otherwise specified, first article test samples shall consist of two cakes of plastic coating compound.

4.4.2 Prior approval. When a contractor has previously delivered plastic coating compound in accordance with the requirements of this specification and his product has been found to be satisfactory, the requirements for a first article sample and first article inspection for any subsequent contract or order may be waived at the discretion of the acquiring activity (see 6.2).

4.5 Quality conformance inspection.

4.5.1 Lot formation. A lot shall consist of all plastic coating compound manufactured by the same process, in the same production run, and offered for delivery at one time.

4.5.2 Sampling and inspection.

4.5.2.1 Chemical and physical property inspection. Samples shall be selected in accordance with inspection level II of MIL-STD-105 and examined to the properties specified in table II. The AQL shall be 2.5 percent defective. The sample unit shall be one cake of plastic coating compound.

4.5.2.2 Packaging. The lot size for this inspection shall be the total number of shipping containers. The sample unit shall be one container fully prepared for delivery just prior to closure. The inspection level shall be S-2 and the AQL shall be 4.0 defects per 100 units. Inspection shall be in accordance with 4.8 and section 5 of this specification.

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4.6 Standard conditions. Unless otherwise specified, tests shall be conducted at a temperature of $75^{\circ} \pm 5^{\circ}\text{F}$ ($24^{\circ} \pm 3^{\circ}\text{C}$) with a relative humidity of 50 ± 5 percent.

4.7 Inspection procedures.

4.7.1 Visual examination. Each cake of plastic coating compound shall be examined to verify conformance with 3.2 and 3.4, and all other requirements which do not involve tests.

4.7.2 Life. A 5 pound sample of the coating compound shall be placed in a closed pot, heated to, and then operated continuously at $350^{\circ} \pm 5^{\circ}\text{F}$ ($177^{\circ} \pm 3^{\circ}\text{C}$) for a period of 500 hours. The pot shall be opened for 2 hours each 24 hour period to reflect shop conditions. The method of heating the pot shall not produce "hot" spots. The coating compound shall be mechanically agitated. After the 500 hour period, the coating compound shall be examined for conformance to the flexibility, odor, sealing and adhesion, contaminants, workability, strippability and corrosion requirements specified in table I.

4.7.3 Flexibility. An aluminum panel, 3 by 6 inches, shall be submerged vertically in the plastic coating compound for 3 to 5 seconds, and then removed from the compound. After the coating has hardened (60 seconds minimum), it shall be stripped from the panel, and placed in a cold box at $-30^{\circ} \pm 1^{\circ}\text{F}$ ($-34.4^{\circ} \pm 0.5^{\circ}\text{C}$) for one hour. While at this low temperature, the plastic coating shall be bent through an angle of 180° over a $1/8$ inch diameter rod. Evidence of fracture shall be cause for rejection.

4.7.4 Odor. The "as received" plastic coating compound shall have a characteristic butyric odor and the compound shall not develop an obnoxious odor after being heated as described in 4.7.2.

4.7.5 Weight. The material shall be weighed on an accurate scale, calibrated in pounds and ounces.

4.7.5 Fire point. The fire point of the material shall be determined in accordance with ASTM D 92-78, except that the melted compound in the cup shall be continuously stirred with the thermometer during the test. The thermometer shall be hung in the specified position and then given a circular motion of 2 cycles per second. The stirring motion shall be interrupted momentarily for every 5 degree rise in temperature to permit passage of the test flame across the surface of the compound.

4.7.7 Hardness. Type A hardness shall be determined in accordance with ASTM D 2240. Hardness shall be the average of 5 instantaneous readings.

4.7.8 Operating temperature. A piece of coating compound, weighing approximately 16 ounces, shall be placed in a thermostatically controlled heating vessel. The temperature shall be slowly raised to $350^{\circ} \pm 5^{\circ}\text{F}$ ($177^{\circ} \pm 3^{\circ}\text{C}$), at which temperature all of the compound shall be in the liquid phase.

4.7.9 Sealing and adhesion. A chromium bath, self regulating high speed (SRHS), or equivalent, shall be used. After plating and removal of the strippable mask-off compound, plating solution seepage shall not be evident.

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4.7.10 Contaminants. A sample of the compound shall be placed in boiling water. After the water has been allowed to cool there shall be no evidence of scum or other contaminants on the surface of the water.

4.7.11 Re-use. The used compound from 4.7.10, after rinsing in a hot alkaline solution, followed by rinsing in clear hot water, and allowed to dry, shall be suitable for re-use without danger of contaminating plating solutions (see 6.3). A sample of this compound shall be subjected to the test described in 4.7.10 to determine if contaminated.

4.7.12 Weight loss. Approximately 10 grams of compound shall be accurately weighed on a tared 4 inch pyrex watch glass. The sample shall be heated at $350^{\circ} + 5^{\circ}\text{F}$ ($177^{\circ} + 3^{\circ}\text{C}$) for 5 hours in a gravity convection oven. After cooling to room temperature, the sample and watch glass shall be re-weighed. The heat loss shall be calculated as follows:

$$\text{Weight loss, (\%)} = \frac{\text{Wt. compound (initial)} - \text{Wt. compound (after heating)}}{\text{Wt. compound (initial)}} \times 100$$

4.7.13 Immersion time. The metals to be coated shall be immersed 3 to 5 seconds in the melted compound, at a temperature of $350^{\circ} + 5^{\circ}\text{F}$ ($177^{\circ} + 3^{\circ}\text{C}$). Only one immersion shall be permitted. The plastic compound shall then be subjected to the examinations specified in 4.7.14, 4.7.15 and 4.7.16.

4.7.14 Hardening time. After the immersion operation, the coating on the metals shall harden and be ready to trim in 60 seconds.

4.7.15 Workability. The hardened compound from 4.7.14 shall be easily trimmed with a sharp knife.

4.7.16 Strippability. The hardened compound (see 4.7.14) shall be easily removed by stripping or peeling, after cutting with a sharp knife.

4.7.17 Corrosion. One weighed panel, each 2 inches square, of brass, lead, steel and zinc shall be immersed in the plastic compound for 8 hours at $350^{\circ} + 5^{\circ}\text{F}$ ($177^{\circ} + 3^{\circ}\text{C}$). The panels shall be removed, and the hardened plastic coating stripped. The panels shall be weighed after stripping to determine conformance with the corrosion requirements specified in table I.

4.8 Preservation, packing and marking. Packaging shall be examined for conformance with Section 5.

5. PACKAGING

5.1 Preservation. Unless otherwise specified, no preservation/packaging is required.

5.2 Packing. The plastic coating compound shall be packed level A, B, or C, as specified in the contract or order (see 6.2).

5.2.1 Level A. Compound shall be packed in overseas type or class boxes conforming to any of the following specification: PPP-B-585 (class 3), PPP-B-591, PPP-B-601, PPP-B-621 and PPP-B-576. Box closure and strapping shall conform to the box specification and the appendix thereto.

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5.2.2 Level B. The plastic compound shall be packed as specified for level A, except that domestic type of class boxes shall be used, and fiberboard boxes conforming to weather-resistant class of PPP-B-636 may be used. Closure shall be in accordance with the appendix thereto.

5.2.3 Level C. Cakes of plastic coating compound shall be packed in containers of the type, size and kind commonly used for the purpose, in a manner that will insure acceptance by common carrier and safe delivery at destination. Shipping containers shall comply with the Uniform Freight Classification Rules, or regulations of other carriers as applicable to the mode of transportation.

5.3 Marking. In addition to any special marking required by the contract or order, shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The plastic coating compound covered by this specification is intended for masking metallic areas not to be plated during an electroplating process. It is suitable for chromium, copper, cadmium, nickel and all common plating solutions. It is not suitable for use in electroless nickel, and has limited use in hot electro-cleaners, strong hot caustic solutions, and specified chemical milling solutions.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number and date of this specification.
- b. Quantity required.
- c. Responsibility for performance of first article inspection (see 4.3 and 6.2.2).
- d. Whether first article inspection is required (see 4.4.2 and 6.2.2).
- e. Level of packing (see Section 5).

6.2.2 First article. Contracts or purchase orders shall specify the following requirements for first article inspection:

- a. Where first article inspection is to be conducted when it is required (contractor's plant, Government or commercial facility).
- b. Method of reporting results.
- c. Whether first article inspection is required. Paragraph 4.4.2 establishes procedures for waiving first article inspection.

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6.3 Restrictions on re-use of compound. The plastic coating compound shall not be re-used after exposure to chromic acid.

6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

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TABLE I. Chemical and physical properties.

Property	Requirement	Test paragraph
Life, hours	500	4.7.2
Flexibility	No evidence of fracture	4.7.3
Odor	Butyric	4.7.4
Weight, lb	7 ± 0.25	4.7.5
Fire point, min	500°F (260°C)	4.7.6
Hardness, points, min	77	4.7.7
Operating temperature	Completely fluid at 350° $\pm 50^\circ\text{F}$ ($177^\circ \pm 30^\circ\text{C}$)	4.7.8
Sealing and adhesion	No seepage of plating solution under compound	4.7.9
Contaminants	No evidence of scum or or contaminants	4.7.10
Re-use	No evidence of scum or contaminants	4.7.11
Weight loss, percent, max	5	4.7.12
Immersion time, seconds	3 to 5	4.7.13
Hardening time, seconds, min	60	4.7.14
Workability	Hardened compound shall be easily trimmed with sharp knife	4.7.15
Strippability	Hardened compound shall be easily removed by stripping or peeling	4.7.16
Corrosion, weight change, milligrams per sq cm, max:		4.7.17
Brass	2.0	
Lead	22.0	
Steel	0.2	
Zinc	8.0	

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TABLE II. Quality conformance inspection.

Property	Paragraph	
	Requirement	Test
Visual examination	3.2 and 3.4	4.7.1
Flexibility	Table I	4.7.3
Sealing and adhesion	Table I	4.7.9
Contaminants	Table I	4.7.10
Immersion time	Table I	4.7.13
Hardening time	Table I	4.7.14
Workability	Table I	4.7.15
Strippability	Table I	4.7.16

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