

**TT-F-325a**

September 16, 1965

**SUPERSEDING**

Int. Fed. Spec. TT-F-00325 (Army-MR)

March 20, 1964

(See 6.4)

**FEDERAL SPECIFICATION****FILLER, ENGRAVING, STAMPED MARKING**

*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.** The filler covered by this specification is a semisolidified compound of drying oil or resin and pigment which, when applied to engraved or stamped markings or graduations, hardens and becomes a permanent filler.

**1.2 Classification.** Filler shall be one of the following types as specified (see 6.2):

Type I—Crayon.

Type II—Paste.

**2. APPLICABLE SPECIFICATIONS AND STANDARDS**

**2.1** The following specifications and standards, of the issues in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein.

*Federal Specifications:*

P-D-680—Dry Cleaning Solvent.

TT-E-489—Enamel, Alkyd, Gloss, Synthetic (For Exterior and Interior Surfaces).

UU-T-101—Tape, Gummed; Mending and Reinforcing (Paper and Cloth).

PPP-B-566—Boxes, Folding, Paperboard.

PPP-P-636—Box, Fiberboard.

PPP-B-676—Boxes, Set-up, Paperboard.

PPP-C-96—Cans, Metal, 28 Gage and Lighter.

*Federal Standards:*

Fed. Std. No. 102—Preservation, Packaging, and Packing Levels.

Fed. Std. No. 123—Marking for Domestic Shipment (Civilian Agencies).

Fed. Test Method Std. No. 141—Paint, Varnish, Lacquer, and Related Materials; Methods of Inspection, Sampling, and Testing.

Fed. Std. No. 595—Colors.

(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 and 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, U. S. Government Printing Office, Washington, D. C. 20402.

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Washington, D. C., Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, and Seattle, Wash.

(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 Specification:*

MIL-H-5606—Hydraulic Fluid, Petroleum Base, Aircraft, Missile and Ordnance.

FSC 8010

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*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.)

**3. REQUIREMENTS**

**3.1 Materials.** Materials used shall be of the quality normally used for the purpose in good commercial practice and shall be free from ingredients which may be injurious to the skin (see 6.3).

**3.2 Form.** Type I filler shall be in the form of a cylindrical stick or crayon and shall be wrapped in paper. Type II shall be in the form of paste.

**3.3 Wrapping.** Each type I filler crayon shall be wrapped in durable paper, securely fastened around the filler.

**3.3.1** The wrapper shall cover the side of the filler to a point approximately 1/2 inch from the rounded end.

**3.3.2 Marking.** The wrapper shall be marked with the name of the manufacturer and with instructions for application.

**3.4 Size.** Type I filler shall have a diameter of  $1/2 \pm 1/16$  inch, with no minus tolerance allowed, and shall be  $4-3/4 \pm 1/6$  inches long with one end rounded.

**3.5 Color.** The color of types I and II filler shall be white, black, red, or translucent white as specified in the invitation for bids, and unless otherwise specified shall conform to the colors listed in Fed. Std. No. 595 as follows: for black, color No. 37038; for white, color No. 37778; and for red, color No. 31136.

**3.6 Aging.**

**3.6.1 Type I.** A crayon stick, when exposed to high and low temperature in accordance with 4.5.3, shall not discolor, soften or deform, and shall still be usable. It shall be permissible to peel off a thin skin from the surface before use, if necessary.

**3.6.2 Type II.** When tested as specified in 4.5.3, the paste shall still be usable. It shall be permissible to peel off a thin skin from the surface or to be dispersed before use, if necessary.

**3.7 Pigment content, type II only.** When tested as specified in 4.5.1, the minimum pigment content of the filler shall be 60 percent of the nonvolatile portion.

**3.8 Total nonvolatile, type II only.** When tested as specified in 4.5.2., the total nonvolatile content of the filler shall be 80 percent minimum.

**3.9 Performance requirements.**

**3.9.1 Adhesion of filler.** After panels are prepared as specified in 4.5.4.1 and tested as specified in 4.5.4.2, the filler shall be examined for adhesive filling properties. A layer shall remain in the graduation and the marking remain clearly legible while the excess on surrounding areas shall be removable.

**3.9.2 Humidity, gasoline vapor, oil, and solvent resistance.** When panels, as described in 4.5.4.1 are subjected to humidity, gasoline vapors, oil and solvent exposure (see 4.5.4.3) and tested for adhesion as described in 4.5.4.2, the filler shall remain in the graduations and the graduations shall be clearly legible.

**3.9.3 Accelerated exposure resistance.** When panels, as described in 4.5.4.1, have been exposed to the accelerated conditions described in 4.5.4.4, the filler shall remain in the graduations and the graduations shall be clearly legible.

**3.10 Workmanship.** The component ingredients shall be intimately mixed and

processed as required to produce a high quality engraving filler.

#### 1. SAMPLING, INSPECTION, AND TEST PROCEDURES

**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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 Lot.** For the purpose of sampling, a lot shall consist of all crayons or cans of filler of one color offered for delivery at the same time.

#### 4.3 Sampling.

**4.3.1 Sampling for acceptance testing.** From each lot, 15 crayons or 3 cans of filler shall be selected at random for purposes of acceptance testing (see 4.4.1).

**4.3.2 Sampling for examination.** For purposes of examination as specified in 4.4.2, samples shall be selected from each lot in accordance with inspection level II of MIL-STD-105 and at an acceptable quality level (AQL) of 2.5 percent defective.

**4.3.3 Sampling for examination of the preparation for delivery.** Sample packs for examination of the preparation for delivery shall be selected from each lot in accordance with inspection level II of MIL-STD-105 and at an AQL of 2.5 percent defective.

#### 4.4 Inspection.

**4.4.1 Acceptance testing.** Testing for acceptance of individual lots shall consist of all tests of 4.5. If any sample selected as in 4.3.1 fails to comply with all the requirements of section 3 when tested as specified, the lot shall be rejected.

**4.4.2 Visual examination.** Each sample selected as in 4.3.2 shall be examined for the defects listed in table I at AQL of 2.5 percent defective. Any sample having one or more defects shall be rejected. If the number of rejected samples exceeds the acceptance number for the applicable sampling plan, the lot represented by the samples shall be rejected.

TABLE I—Classification of defects

Examine	Defects
Form	Not cylindrical crayon or paste as applicable (see 3.2).
Wrapping (type I only)	Not wrapped in paper as specified (see 3.3). Paper wrapping not fastened securely (see 3.3). Termination point of wrapper not as specified (see 3.3.1).
Marking	Required marking missing or incorrect (see 3.3.2).
Size (type I only)	Size of crayon varies by more than tolerance permitted (see 3.4).
Color	Color not as specified (see 3.5).

**4.4.3 Examination of the preparation for delivery.** The packaging, packing, and marking of the samples selected as in 4.3.3 shall be examined for compliance with section 5 at AQL of 2.5 percent defective. Any sample which fails to meet the requirements shall be rejected. If the number of rejected samples exceeds the acceptance number for the applicable sampling plan, the lot represented by the samples shall be rejected.

#### 4.5 Tests.

**4.5.1 Pigment content.** The pigment content of type II filler shall be determined in accordance with method 4021 of Fed. Test Method Std. No. 141.

**4.5.2 Total nonvolatile.** The total nonvolatile of type II filler shall be determined in accordance with method 4042 of Fed. Test Method Std. No. 141 except that the temperature of test shall be 170 ± 5 F.

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**4.5.3 Aging.** Two or more crayons or one can of paste shall be placed in an oven at a temperature of  $160^{\circ} \pm 5^{\circ}$  F. for a period of 10 days. Upon removal from the oven, the crayons or paste shall be allowed to return to room temperature and then placed in a cold chamber at  $-65^{\circ}$  F. for a period of two hours, following which the crayons or paste shall be allowed to return to room temperature. The filler shall then be tested for compliance with 3.6.

**4.5.4 Performance test.**

**4.5.4.1 Preparation of panels.** Five panels, 1- by 4- by 1/16-inch made of cold rolled steel or brass, and five of plastic acrylic shall be stamped or engraved at least 0.01 inch deep with 1/8 inch high numbers and 1 2 inch high letters. The brass panels shall be cleaned with either 40 percent nitric acid for 5 minutes or 10 percent nitric acid for 10 minutes at  $180^{\circ}$  to  $200^{\circ}$  F. A metal panel shall be coated with enamel, TT-E-489, class A, with the color contrasting to that of the filler. The plastic panels shall not be coated with enamel. Enameled panels shall not be used until after 72 hours drying time. When enameled panels are dry, rub the filler, aged as per 4.5.3, into graduations (white filler should be rubbed on black panels, and black or red on white), and the excess shall be wiped off with a dry cloth. Last traces of excess filler shall be readily removable by wiping with a rag, wet with soapy water and then with clean water. If not readily removable, the material shall be rejected. The panels shall be allowed to air-dry at room temperature for 24 hours. The plastic acrylic shall not be adversely affected. The panels shall be reserved for use in 4.5.4.2, 4.5.4.3, and 4.5.4.4.

**4.5.4.2 Adhesion test.** After 24 hours drying of the filled graduations, place cellulose gummed tape, UU-T-101, type C, over the filled graduations on one of each of the prepared metal and plastic panels, then peel off. A layer of the filler shall remain in the

graduations and the markings shall be clearly legible.

**4.5.4.3 Humidity, gasoline vapor, solvent and oil resistance test.** Two of each of the prepared metal and plastic panels shall be exposed to the following cycles:

Condition	Relaxation period
(a) Twenty-four hours at $160^{\circ}$ F. and 100 percent relative humidity ..	1 hour
(b) Gasoline vapor ( $95^{\circ}$ F.) for 24 hours .....	1 hour
(c) Rub by hand with a cloth which has been wetted with dry cleaning solvent (P-D-680) for 1 minute .....	1 hour
(d) Rub by hand with a cloth which has been wetted with hydraulic fluid (MIL-H-5606) for 1 minute	1 hour

**4.5.4.3.1** Each of these exposures shall be followed by a one hour relaxation period at room temperature and approximately 50 percent relative humidity. The final fifteen minutes of the relaxation period shall be used for test and examination of the specimens for compliance with adhesive properties indicated in 4.5.4.2.

**4.5.4.4 Accelerated exposure test.** Two of each of the prepared (see 4.5.4.1) metal and plastic panels shall be immersed in water at  $100^{\circ} \pm 5^{\circ}$  F. for 24 hours and then dried for one hour at room temperature ( $70^{\circ}$  F. and 50 percent relative humidity). Place the samples in a freezer at  $-65^{\circ} \pm 5^{\circ}$  F. for 24 hours, remove, and allow to come to room temperature for one hour. The panels shall then be placed in a twin arc weatherometer conforming to method 6152 of Fed. Test Method Std. No. 141 for 16 hours. The panels shall be removed, dried at room temperature for one hour and examined for the adhesive properties indicated in 4.5.4.2.

**5. PREPARATION FOR DELIVERY**

**5.1** For civil agency procurement, the definitions and applications of the levels of packaging and packing shall be in accordance with Fed. Std. No. 102.

**5.2 Packaging.** Packaging shall be level A or C as specified (see 6.2).

**5.2.1 Level A.**

**5.2.1.1 Type I.** Six sticks of filler of one color shall be unit packaged in folding or setup paperboard boxes conforming to PPP-B-566 or PPP-B-676, respectively.

**5.2.1.2 Type II.** Unless otherwise specified in the contract or order, the paste filler shall be furnished in 1.2 pint containers conforming to PPP-C-96, type V.

**5.2.2 Level C.** Unless otherwise specified, type I and type II filler shall be packaged in accordance with the manufacturer's commercial practice.

**5.3 Packing.** Packing shall be level A, B, or C as specified (see 6.2).

**5.3.1 Level A.** Type I filler material, packaged as specified in 5.2, shall be packed in a snug-fitting fiberboard shipping container conforming to class weather-resistant V3c or V3s, style RSC of PPP-B-636. The weight of the contents of each shipping container shall not exceed 65 pounds. Each shipping container shall be closed, water-proofed, and strapped or banded in accordance with the appendix to the container specification. Type II filler material, packaged as specified in 5.2, shall be packed in accordance with the appendix to PPP-C-96 for overseas shipment.

**5.3.2 Level B.** Type I filler material, packaged as specified in 5.2, shall be packed in a snug-fitting fiberboard shipping container conforming to type CF or SF class domestic, style RSC of PPP-B-636, except that the minimum bursting strength shall be 275 p.s.i. The weight of the contents of each shipping container shall not exceed 65 pounds. Box closure shall be in accordance with the appendix to the container specification. Type II filler material, packaged as specified in 5.2, shall be packed in accordance with the appendix to PPP-C-96 for domestic shipment.

**5.3.3 Level C.** Filler material shall be packed for shipment in compliance with common carrier regulations, applicable to that mode of transportation, to ensure safe delivery at destination at lowest transportation cost without assessment of penalty charged for improper packing.

**5.4 Marking.**

**5.4.1 Civil agencies.** Interior packages and exterior containers shall be marked in accordance with Fed. Std. No. 123.

**5.4.2 Military activities.** Interior packages and exterior containers shall be marked in accordance with MIL-STD-129 and as follows:

Filler, engraving, stamped marking  
Specification TT-F-325  
Type I or II, as applicable  
Color, as applicable  
Contract or order number  
Name and address of the manufacturer  
Month and year of manufacture

**6. NOTES**

**6.1 Intended use.** The filler covered by this specification is to be used for filling stamped or engraved markings on metals, glass, ceramics, and plastics.

**6.2 Ordering data.** Purchasers should exercise any desired options offered herein and procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type required (see 1.5).
- (c) Color required (see 3.5).
- (d) Quantity required.
- (e) Level of packaging and packing required (see section 5).

**6.3 Questions** pertaining to the adverse effect of materials on the health of personnel shall be referred to the appropriate department medical service who will act as an advisor to the procuring agency.

**6.4 Supersession data.** This specification includes the requirements of Frankford Ar-

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senal Purchase Description FED-1633 dated March 30, 1954, Defense Industrial Supply Center Purchase Description DISC-PD-8010-111 dated April 13, 1961, and General Services Administration purchase Description PD-8010-2-086 (GSA-FSS) dated August 23, 1963.

**6.5 Transportation description.** Transportation description and minimum weights applicable to this commodity are:

*Type I**Rail:*

Crayons, marking.  
Carload minimum weight, 36,000 pounds.

*Motor:*

Crayons, marking.  
Truckload minimum weight, 36,000 pounds, subject to Rule 115, National Motor Freight Classification.

*Type II**Rail:*

Paints, paste.  
Carload minimum weight, 36,000 pounds.

*Motor:*

Paints, paste.  
Truckload minimum weight, 36,000 pounds, subject to Rule 115, National Motor Freight Classification.

**Preparing Activity:**

Army—MR

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Navy—SA  
Air Force—69

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Navy—SA  
Air Force—69

*User Activities:*

Navy—MC

**CIVIL CUSTODIAN:**

GSA

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GSA

*User Activities:*

GSA  
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Review/User information is current as of the date of this document; draft circulation should be based on the information in the current DOD Standardization Documents.

Copies of this specification may be purchased for 5 cents each.

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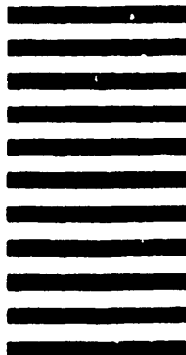


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