

P-P-560B
June 2, 1981
SUPERSEDING
Fed. Spec. P-P-560A
7 April 1970

FEDERAL SPECIFICATION

POLISH, PLASTIC

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 polish that are capable of removing accumulated service soils and of producing a smooth, lustrous finish on plastic acrylic materials.

1.2 Classification

1.2.1 Type. Polish furnished under this specification shall be of the following types, as specified (see 6.2):

Type I - Liquid
Type II - Paste

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:

QQ-A-250/5	-Aluminum Alloy Alclad 2024, Plate and Sheet.
QQ-M-44	-Magnesium Alloy Plate and Sheet (AZ31B).
TT-N-95	-Naphtha, Aliphatic.
TT-P-350	-Pigment, Lampblack-Dry.
TT-T-801	-Turpentine, Gum Spirits, Steam Distilled, Sulfate Wood, and Destructively Distilled.

P-P-560B

VV-G-632	-Grease, Industrial, General Purpose.
CCC-C-458	-Cloth, Flannel, Cotton.
PPP-B-636	-Box, Shipping, Fiberboard.
PPP-C-96	-Can, Metal, 28 Gage and Lighter.
PPP-C-186	-Containers, Packaging and Packing for Drugs, Chemicals, and Pharmaceuticals.
PPP-T-45	-Tape, Gummed, Paper, Reinforced and Plain, for Sealing and Securing.
PPP-T-60	-Tape: Packaging, Waterproof.

Federal Standards:

Fed. Std. No. 313	-Material Safety Data Sheets, Preparation and the Submission of.
Fed Test Method Std No. 406	-Plastic, Methods of Testing.
Fed Test Method Std No. 791	-Lubricants, Liquid Fuels, and Related Products; Methods of Testing.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

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

(Federal Government activities may obtain copies of Federal specifications, standards, commercial item descriptions, and the Index of Federal Specifications, Standards, and Commercial Item Descriptions from established distribution points in their agencies.)

Military Specifications:

MIL-A-356	-Asphaltum (Gilsonite).
MIL-P-5425	-Plastic, Sheet, Acrylic, Heat Resistant.
MIL-L-6082	-Lubricating Oil, Aircraft Reciprocating Engine (Piston).
MIL-P-25690	-Plastic, Sheets and Parts, Modified Acrylic Base, Monolithic, Crack Propagation Resistant.

P-P-560B

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.

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Association, Inc., Traffic Department, 1616 P Street, N. W., Washington, D. C. 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.)

Laws and Regulations

Code of Federal Regulations

CFR, Title 49, 100-199 - Transportation

(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof.)

P~P-560B

3. REQUIREMENTS

3.1 Qualification. The polish furnished under this specification shall be a product which is qualified for listing on the applicable Qualified Products List at the time set for opening of bids (see 4.3.1 and 6.3).

3.2 Materials. The composition of the polish shall be optional with the manufacturer, but shall be restricted by requirements specified herein. The polish shall contain no ingredient or impurities which may cause the formation of hydrogen sulfide.

3.2.1 Toxicity. The polish shall have no adverse effect on the health of personnel, when used for its intended purpose. Questions pertinent to this effect shall be referred by the procuring activity to the appropriate medical service who will act as adviser to the procuring activity (see 4.3.1 and 6.4). The manufacturer shall certify that the polish contains no substance known to be toxic to the user under normal conditions of use. Material safety data sheets shall be prepared and submitted in accordance with Fed. Std. No. 313 one copy of which shall be forwarded to the preparing activity of the specification.

3.3 Cleaning and anti-static characteristics. The polish shall dry sufficiently to permit easy removal 10 minutes after being applied, and shall continue to be removable for at least 24 hours. The compound, with no more than two applications, shall efficiently remove from plastic surfaces all residue, masking glue, lubricating oil, lubricating grease, and soil. The cleaned surfaces, after polishing, shall be free from any trace of oily film, residue or marring; and shall produce a parallel luminous transmittance reading of not less than 89.0 percent, and shall show no indication of static charge when tested as specified in 4.4.1.

3.4 Polishing efficiency. After being polished as specified in 4.4.2, the acrylic panels shall be free from residue, discoloration, or marring. The panels shall produce a parallel luminous transmittance of not less than 89.0 percent.

3.5 Stress crazing. The polish, when applied as specified in 4.4.3, shall not chemically attack or craze acrylic plastic under 2000 pounds per square inch (p.s.i.) stress.

3.6 Flash point. The polish when tested as specified in 4.4.4 shall have a flash point of not less than 27°C (81°F).

3.7 Corrosiveness. The polish, when tested as specified in 4.4.5, shall not discolor, chemically attack or cause corrosion on the surfaces or between the faying edges of aluminum-clad aluminum alloy or chrome pickle treated magnesium alloy. A slight discoloration of the faying surfaces shall not be considered objectionable.

3.8 Caking number (type I polish only). When the type I polish is tested as specified in 4.4.6, the caking number shall not exceed 30.

3.9 Accelerated storage stability. The polish, after being tested as specified in 4.4.7, shall not separate, crystallize nor show any other significant change in physical properties. The polish that has been subjected to the accelerated storage stability test shall then conform to the requirements of 3.3, 3.5, 3.7, and 3.8.

3.10 Room temperature storage stability. The polish, after being stored as specified in 4.4.8, shall not separate, crystallize, cause corrosion of the container, nor show any other significant change in physical properties. After completing the room temperature storage period, the polish shall then conform to the requirements of 3.3, 3.4, 3.5, 3.7, and 3.8.

3.11 Consistency (type I only). The type I polish, when tested in accordance with 4.4.9, shall flow to a point within the 10 cm and 15 cm marks in 50 seconds.

3.12 Scratching properties. The polish, when tested as specified in 4.4.10, shall not scratch either acrylic plastic surface to a greater extent than the control formula product prepared as specified in Table III.

3.13 Ease of removal. The polish, after having been applied and dried as specified in 4.4.11, shall be easily wiped from the surface of the test panel. Drying time shall not exceed ten minutes and the dried film shall be completely removed by four passes of the flannel cloth covered holder.

3.14 Workmanship. The polish when examined visually, shall be a smooth homogeneous mixture, free of lumps.

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 contrac-

P-P-560B

tor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

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

- a. Qualification inspection (see 4.2.1)
- b. Quality conformance inspection (see 4.2.2)

4.2.1 Qualification inspection. The qualification inspection performed by the qualifying laboratory shall consist of a review for approval of the manufacturer's report (4.3.1) to determine compliance with all of the requirements of Section 3 of this specification. Unless otherwise specified, the qualification inspection will not be complete until conformance to the storage stability requirement (3.10) has been established.

4.2.1.1 Retention of qualification. In order to retain qualification of a product approved for listing on the Qualified Products List (QPL), the manufacturer shall verify by certification to the qualifying activity that the manufacturer's product complies with the requirements of this specification. The time of periodic verification by certification shall be in two-year intervals from the date of original qualification. The Government reserves the right to re-examine the qualified product whenever deemed necessary to determine that the product continues to meet any or all of the specification requirements.

4.2.2 Quality conformance inspection. The quality conformance inspection shall consist of an examination of the sample of filled containers (4.3.2.2) to determine conformance to packaging, packing and marking requirements of section 5 and the examination and testing of each sample (4.3.2.1) to determine compliance with the following requirements:

- Cleaning and antistatic characteristics (3.3)
- Stress crazing (3.5)
- Accelerated storage stability (3.9)
- Scratching properties (3.12)
- Workmanship (3.14)

4.3 Samples.

4.3.1 Qualification sample. This sample shall consist of eight 1-quart (0.95 l) containers of the polish. The sample shall be accompanied by a report from the manufacturer or an acceptable commercial laboratory. The report in duplicate shall show the product inspection results for all the requirements of this specification and shall refer specifically to the applicable requirements in the specification. The contractor shall furnish the toxicological data (3.2.1) necessary to evaluate the safety of the polish for its intended use. A statement shall include the chemical name and the percent of each ingredient. These reports shall be signed by an authorized representative and shall be accompanied by evidence of the agent's authority to bind his principal. The samples shall be forwarded to the Supply Officer, Naval Air Development Center, Warminster, PA 18974, ATTN: Director, Aircraft and Crew Systems Technology Directorate, Code 60622. Samples shall be plainly identified by securely attached durable tags with the following information:

Sample for qualification inspection

Polish, Plastic

Type

Name of Manufacturer

Product code number

Date of manufacture

Batch or lot number

Submitted by (name) (date) for qualification inspection in accordance with the requirements of specification P-P-560B under authorization of (reference authorizing letter) (See 6.3).

4.3.2 Quality conformance samples.

4.3.2.1 Quality conformance sample for tests. The sample unit shall be 16 ounces (0.47 l) for type I polish and 1 pound (0.45 kg) for type II polish. These samples shall be selected at random from each lot (4.3.2.3) in accordance with MIL-STD-105 at inspection level S-2. The lot shall be unacceptable if any sample fails to meet any of the test requirements specified.

4.3.2.2 Examination of preparation for delivery. An examination shall be made to determine that packaging, packing and marking comply with the requirements of Section 5. Defects shall be scored as in Table I. Sampling shall be in accordance with

P-P-560B

MIL-STD-105. The sample unit shall be one container fully prepared for delivery. The lot shall be the number of containers offered for inspection at one time. The inspection level shall be S-2 with an AQL of 4.0 expressed in terms of defects per hundred units.

TABLE I. Examination of preparation for delivery.

Examine	Defect
Containers	Not as specified
Contents	More or less than specified
Markings	Omitted; incorrect, illegible, improper size, location, sequence or method of application
Materials	Component missing or damaged
Workmanship	Bulging or distortion of containers

4.3.2.2.1 Examination of closure and strapping of shipping container. When shipping containers are required to be in accordance with PPP-B-636, examination for defects and strapping shall be in accordance with the appendix to PPP-B-636.

4.3.2.3 Size of a lot. A lot shall consist of all the polish manufactured at approximately the same time, from the same batch of material, and submitted for inspection at the same time. The lot size shall be expressed in pints for type I polish and in pounds for type II polish.

4.4 Test conditions. Unless otherwise specified herein, testing conditions shall be in accordance with Section 4 of Fed. Test Method Std. 406.

4.4.1 Cleaning and antistatic characteristics.

4.4.1.1 Test panels. Four pieces of acrylic plastic, measuring 4 by 4 by 1/4 inches, (10.2 by 10.2 by 0.64 cm) conforming to finish A, MIL-P-5425, and four pieces of acrylic plastic, measuring 4 by 4 by 1/4 inches, (10.2 by 10.2 by 0.64 cm) conforming to MIL-P-25690, shall have their masking paper removed. The plastic panels shall be annealed by suspending in an oven maintained at $90^{\circ}\pm 2^{\circ}\text{C}$ ($194^{\circ}\pm 4^{\circ}\text{F}$) for 2 hours. At the end of the annealing period, the temperature of the test panels shall be reduced to room temperature at the rate of

25°±5°C (40°±9°F) per hour maximum. The annealed test panels shall be conditioned at room temperature for at least 7 days before use. Three of the pieces from each set (the fourth piece to retain residual masking adhesive) shall be cleaned with flannel conforming to type III, class 2, CCC-C-458 that has been saturated with aliphatic naphtha, conforming to type II of TT-N-95. The six cleaned pieces shall be smeared lightly (on one side only) with grade 1100 lubricating oil conforming to MIL-L-6082; lubricating grease, medium grade II, conforming to VV-G-632 and soil, respectively applied with the flannel. The soil shall be grit free and shall be compounded from the materials specified in table II.

TABLE II. Composition of soil.

Ingredient	Specification	Parts by weight
Lanolin	U. S. P.	50
Asphalt	MIL-A-356	15
Turpentine	TT-T-801	25
Lubricating Oil	MIL-L-6082, Grade 1100	20
Lampblack	TT-P-350	20

4.4.1.2 Cleaning apparatus. The apparatus to be used is the Gardner Washability machine or equivalent. The brush holder of the machine shall be replaced by a holder made to accommodate a 4 by 4 inch (10.2 by 10.2 cm) piece of flannel cloth. The weight of the holder shall be adjusted to 3 lbs. (1.36 kg.). A template shall be prepared from 1/4 inch (0.64 cm) thick acrylic plastic, the same size as the bottom of the tray of the machine (approximately 7 by 18 inches) (17.8 by 45.7 cm). A rectangle shall be cut from the center of this template large enough to permit a tight fit for a plastic test panel, measuring 4 by 4 by 1/4 inches (10.2 by 10.2 by 6.4 cm).

4.4.1.3 Procedure. The eight panels shall be cleaned by applying the polish with a saturated flannel attached to an applicator device weighted to exert a pressure of 5 lbs (2.27 kg). This device consists of an inverted 8 ounce (0.24 l) glass jar containing lead shot as shown in Figure 1. The compound shall be applied by using a circular motion and be permitted to dry. The compound shall be considered to have dried within 10 minutes if an even powdery residue results and this residue can be completely and easily removed by wiping. After 10 minutes dwell time, the panels shall be wiped with clean dry flannel cloth employing the cleaning apparatus. If, after

P-P-560B

the first wiping, the panels retain an oily film, the template shall be cleaned and a second coat of compound applied in accordance with the foregoing procedure. Within two minutes after cleaning the plastic surfaces, the static qualities shall be determined by passing the cleaned surfaces within 1/4 inch (0.64 cm) of the antenna of the static detection device shown in Figure 2 and schematically diagramed in Figure 3. The panel surfaces shall be rewiped with dry flannel cloth 30 minutes after the initial cleaning by making 6 passes with the holder of the washability machine using 3 pounds (1.36 kg) pressure. The panel surfaces shall then be retested to determine the permanence of the antistatic characteristics. Polish shall be reapplied to a clean plastic panel of each type and allowed to dry for 24 hours. At this time the panel shall be cleaned with a clean flannel cloth and observation shall be made for ease of complete removability. The parallel luminous transmittance reading of the panels shall be determined by Method 3022 of Fed. Test Method Std. No. 406. The parallel luminous transmittance is calculated by subtracting the diffuse luminous transmittance from the total luminous transmittance.

4.4.2 Polishing efficiency. Two 2 by 2 by 1/4 inch (5.1 by 5.1 by 0.64 cm) pieces of acrylic plastic, having their 2 inch (5.1 cm) square surfaces flat and parallel to within a tolerance of 0.001 inch (0.0025 cm), conforming to finish A of MIL-P-5425 and two similar panels conforming to MIL-P-25690 shall have their masking paper removed and shall be cleaned with aliphatic naphtha conforming to type II of TT-N-95. The panels shall be abraded. Abrading shall be done on a Shiefer Abrasion Testing Machine, or equivalent, by using Minnesota Mining & Mfg. Co. sandpaper grit No. 600 A, Tri-M-ite, wet-or-dry, soft-back, or equal. The sandpaper disk shall be immersed in tap water for 3 to 5 minutes, installed in the abradant holder, and maintained in a wet condition by dabbing on water with a brush. One specimen from each set shall be inserted in a jig similar to that shown on Figure 4. The specimen shall be marked and the mark oriented with one of the jigs to assure identical positioning during both the abrading and polishing cycles. Under a total load of 6 pounds (2.72 kg), the acrylic specimen shall be abraded for 20 revolutions, removed from the abrasion machine, and washed with distilled water. The abrasion shall be uniform over the entire surface. Nonuniform abrasion indicates excessive variation in specimen thickness and such specimens shall be discarded. A piece of flannel conforming to type III, class 2 of CCC-C-458 shall then be inserted into the abradant holder, and the polish shall be applied copiously to the flannel. With a 6 pound (2.72 kg) load, and with the specimen oriented as before, the specimen shall be polished for 100 revolutions and washed with distilled water. The specimen shall then be visually inspected for material residue, surface discoloration, or marring of the plastic finish. The parallel luminous transmittance shall then be determined in accordance with Method 3022 of Fed. Test Method Std. No. 406 and as calculated in 4.4.1.3.

P-P-560B

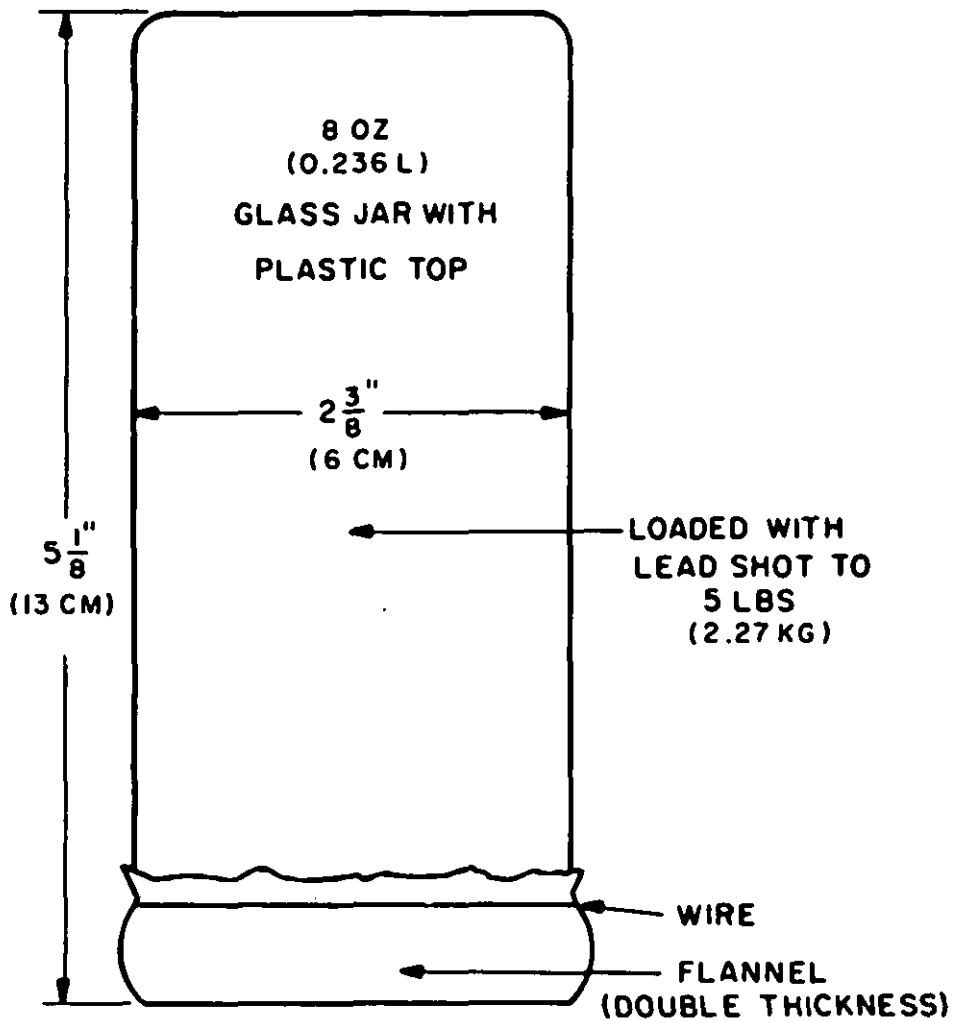


FIGURE 1. Polish applicator.

P-P-560B

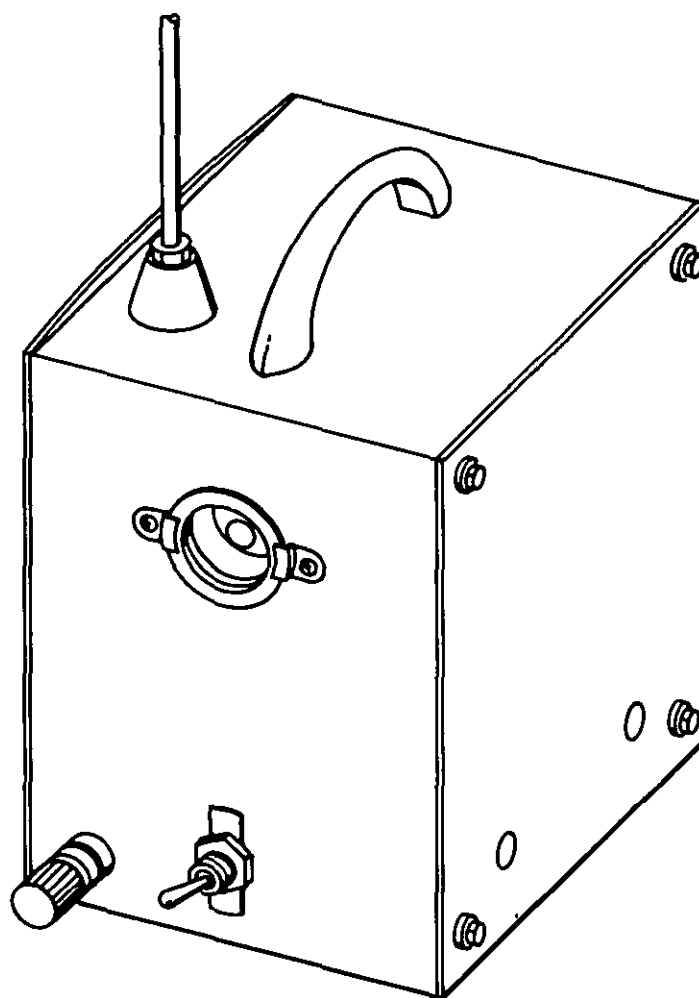
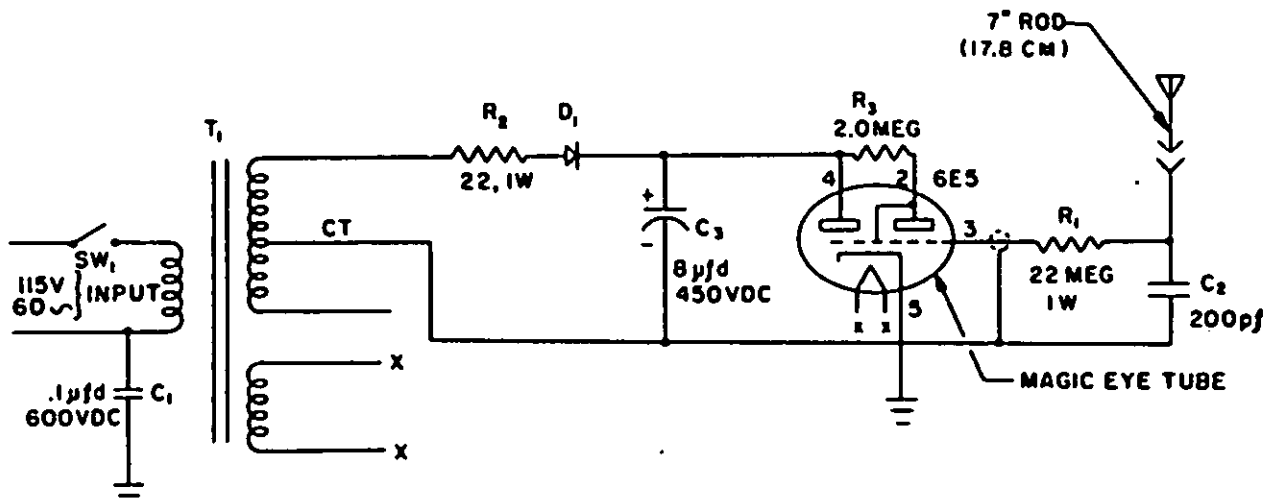


FIGURE 2. Static detector.

P-P-560B



T₁-STANCOR PSB416
SEC 6.3V @ 1.0A
250VCT @ 25 ma DC

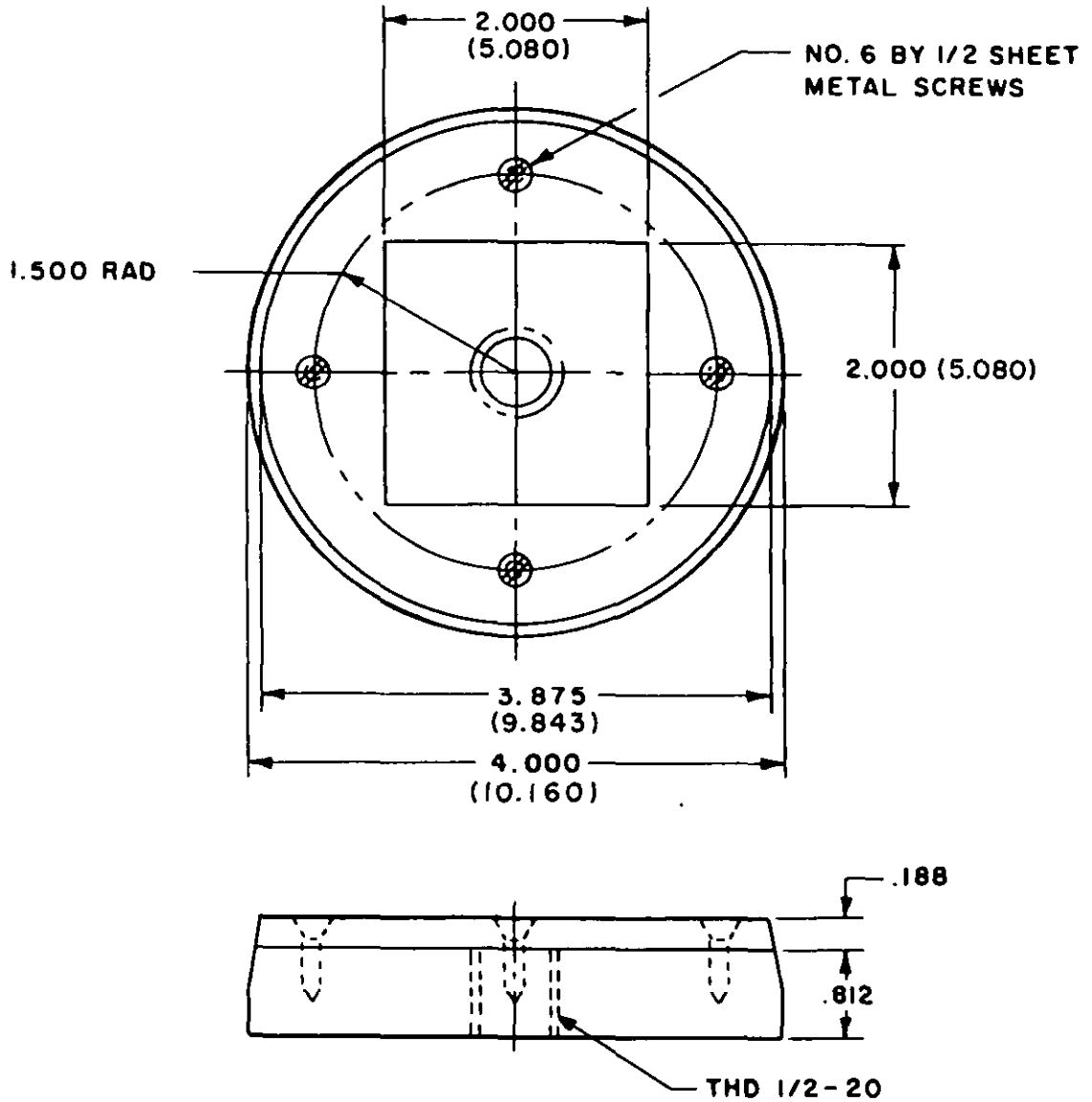
D₁-DIODE OR RECTIFIER (SILICON)
25 ma RATING

C₁-.1µf 600 VDC
C₂-200 pf DISK
C₃-8µfd 450V

R₁-22 MEG 10% 1W
R₂ 22.0 OHMS 10% 1W
R₃- 2.0 MEG ¼ WATT

FIGURE 3. Wiring diagram, static detector.

P-P-560B



DIMENSIONS IN INCHES (CM)
TOLERANCES: \pm .030 (0.076)

FIGURE 4. Jig for holding polishing efficiency specimen.

P-P-560B

4.4.3 Stress crazing. Three acrylic plastics specimens conforming to finish A, MIL-P-5425, shall be set up as cantilever beams as shown in Figure 5. Ten minutes after the calculated load is applied, the specimens shall be examined for craze (cracks or fissures); crazed specimens shall be replaced. The polish shall be applied, using a piece of flannel conforming to type III, class 2, CCC-C-458, to the top (tension side) of the specimens at time intervals of 0, 7, 24, and 31 hours after the initial 10 minute period. An increase of stress on the specimen through an exertion of pressure when applying the polish shall be avoided. After 48 hours, the specimens shall be examined for evidence of chemical attack and for craze while under stress. The specimens shall be observed for crazing over a light source at such an angle that the light will be reflected to the eye from the surfaces of any crazing fissures which are present. To prevent heating of the specimens, the light source shall be utilized only when examining the specimen for craze. The required load for 2000 psi stress, to be used for each specimen, shall be computed as follows:

$$P = \frac{Sbd^2}{6L}$$

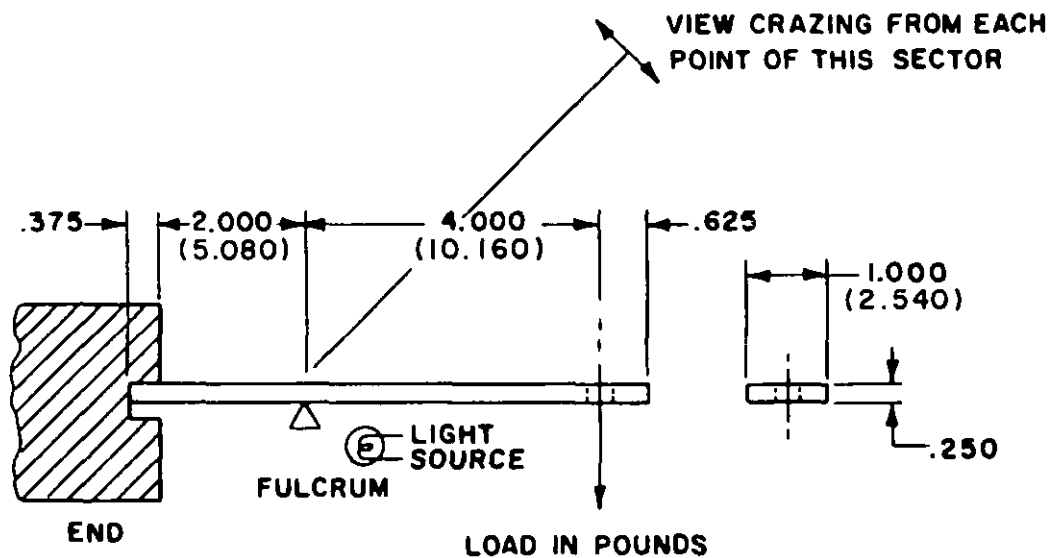
Where: P = Load in pounds
 S = Stress in pounds per square inch = 2,000
 L = Distance from fulcrum to load in inches = 4
 b = Width of specimen in inches (measured to the nearest 0.001)
 d = Thickness of specimen in inches (measured to the nearest 0.001)

All craze appearing at the edge of the specimen shall be disregarded unless they grow and extend 1/8 inch (0.32 cm) from either edge of the specimen.

4.4.4 Flash point. The flash point of the cleaning and polishing compound shall be determined by Method 1101 of Fed. Test Method Std. No. 791.

4.4.5 Corrosiveness. Two sets of test panels shall be prepared. One set shall be prepared using alclad aluminum alloy (QQ-A-250/5) and the second set shall use chrome pickled magnesium alloy (QQ-M-44). The panels measuring 1 by 6 inches (2.5 by 15.2 cm) shall be placed together with a 90-percent overlap. The two panels shall be tightly clamped using a spring clamp. One of the faying edges shall be coated with a quantity of polish just sufficient to cover the edge and the 10 percent exposed surface. After one minute, a second application of the polish shall be placed at the faying edges. After 24 hours, the panels shall be separated, wiped, and examined for any evidence of chemical attack, corrosion or discoloration at the faying edges.

P-P-560B



DIMENSIONS IN INCHES, TOLERANCES ON ALL DIMENSIONS SHALL BE ± 0.030 INCH, EXCEPT ON SPECIMEN THICKNESS WHICH SHALL BE IN ACCORDANCE WITH SPECIFICATION MIL-P-5425 (DIMENSIONS IN CENTIMETERS. ± 0.076 CM TOLERANCE)

FIGURE 5. Stress crazing beam.

P-P-560B

4.4.6 Caking number (type I only). Fifty milliliters of the polish shall be measured into a centrifuge tube having an inside diameter of 1-1/8 inches (2.9 cm). The sample shall be centrifuged for 1 minute at a speed of 500 revolutions per minute (rpm) in a centrifuge having a diameter of swing (tip-to-tip of whirling tubes) of 16 inches (40.1 cm). The tube shall then be gently inverted and returned to the upright position. The number of inversions necessary to free the abrasive cake shall be noted. These determinations shall be made on duplicate samples and the average number of inversions necessary to free the abrasive cake shall constitute the cake number. If the available centrifuge has a diameter of swing other than 16 inches (40.1 cm), it shall be run at the proper speed to give the same centrifugal force at the tips of the tubes as that obtained with the centrifuge having a 16-inch (40.1 cm) diameter of swing. The proper speed shall be calculated from the following formula:

$$\text{Revolutions per minute} = 500 \times \sqrt{\frac{16}{D}}$$

where: D = The diameter (inches) of swing (tip to tip of whirling tubes) of the centrifuge used.

4.4.7 Accelerated storage stability.

4.4.7.1 Cold cycle. An eight ounce portion of the polish in a capped 12 ounce pressure resistant clear glass bottle shall be placed in a 54°±2°C (129°±4°F) water bath for one hour. The bottle shall be cooled for one hour at room temperature, and shall then be placed in a -10°±2°C (14°±4°F) cold box for one hour. The bottle shall then be conditioned at room temperature for one hour.

4.4.7.2 Hotcycle. The bottle that was conditioned in 4.4.7.1 shall then be placed in an oil bath, and the oil bath shall then be heated within 2 hours to 60°±2°C (140°±4°F) and shall be held at this temperature for 3 hours. The bottle shall be removed from the oil bath and the bottle and contents shall then be subjected to the above hot cycle once a day for a total of five days. After the fifth cycle, the sample shall be conditioned at room temperature for 24 hours. The type I polish shall then be shaken thoroughly by hand for one minute. The type II polish shall be stirred for one minute. After sitting 4 hours, the contents shall then be examined for separation, crystallization, or other significant change in physical properties. After examination, the polish that has been subjected to the accelerated storage stability test, shall then be subjected to the tests specified in 4.4.1, 4.4.3, 4.4.5, and (for type I compound only) 4.4.6.

P-P-560B

4.4.8 Room temperature storage stability. Two 1-pint metal containers of the polish shall be stored in the dark for 6 months at $24^{\circ}\pm 3^{\circ}\text{C}$ ($75^{\circ}\pm 5^{\circ}\text{F}$). The can containing the type I polish shall then be removed from storage and shall be shaken thoroughly by hand for one minute. The type II polish shall be stirred for one minute. After sitting 4 hours, the sample shall then be examined for separation, crystallization or other significant change in physical properties. After examination, the polish that has been stored shall then be subjected to the tests specified in 4.4.1, 4.4.2, 4.4.3, 4.4.5, and (for type I polish only) 4.4.6. The metal container shall be examined for evidence of corrosion.

4.4.9 Consistency (type I). The consistence of the type I polish shall be determined with a Consistometer (Central Scientific Company Catalog No. 24925) or equivalent type instrument. This method of measuring consistency of the viscous material determines how far a material flows under its own weight along a level surface in a given amount of time. The reservoir of the consistometer shall be filled with the polish to a depth of 1 inch.

4.4.10 Scratching properties.

4.4.10.1 Preparation of control formula product.

4.4.10.1.1 Control formula (as in Table III).

TABLE III. Control formula.

Ingredients	Percent by weight
Water (distilled)	23.2
Surfactant DN 65 <u>1/</u>	4.3
Arquad <u>2/</u>	2.8
Aliphatic Naphtha (TT-N-95)	56.4
Glycerin (U.S.P.)	0.9
Aluminum Hydroxide <u>3/</u>	12.4

1/ A modified ethoxylated straight chain alcohol nonionic detergent manufactured by Rohm and Haas Co., Philadelphia, Pa. 19105.

2/ An-alkyl trimethyl ammonium chloride cationic detergent and antistatic agent manufactured by Armour and Co. Grocery Products Div., Chicago, Illinois.

3/ Aluminum Hydroxide C.P. $\text{Al}(\text{OH})_3$ (MOL.WT. 77.99) manufactured by Fisher Scientific Co. or equivalent.

75 percent of the particles shall be less than 25 microns.

4.4.10.1.2 Compounding procedure. The control formula product shall be prepared by combining the ingredients listed in table III in the order given accompanied by constant stirring at a moderate speed. Small increments shall be added and each portion shall be thoroughly dispersed before another is added. After combining the first five ingredients, the mixture shall be stirred for an additional 10 minutes. After adding the aluminum hydroxide the mixture shall again be stirred until smooth (approximately 10 minutes).

4.4.10.1.3 Test procedure. Equal quantities of cleaning and polishing compound test sample and control formula product shall be simultaneously centrifuged in separate centrifuge tubes until cakes are formed in each of the tubes used. After the supernatant liquids have been decanted from the tubes, equal small quantities of cakes from each tube shall be evenly spread on one side of each of two 2 by 2 by 1/4 (5.1 by 5.1 by 0.6 cm) inch plastic panels conforming to MIL-P-5425. The panels shall then be placed face down on a larger piece of plastic measuring 1/4 by 8 by 6 inches (0.6 by 20.3 by 15.2 cm). The small panels shall be simultaneously rubbed against the surface of the large plastic sheet using a circular motion and limiting each of the areas traversed to approximately 3-1/2 inches (8.9 cm) in diameter. After the small panels have been rotated thru 25 complete circles, the panels shall be separated. After wiping clean the areas where contact has been made, the large and small plastic panels shall be compared by visual inspection, noting carefully which scratches are attributable to sample polish and which to the control formula product.

4.4.11 Ease of removal. A plastic panel conforming to MIL-P-5425, measuring approximately 1/4 by 7 by 18 inches (0.6 by 17.8 by 45.7 cm), shall be placed in the tray of the Hunter-Gardner Washability Machine. Five milliliters of type I polish or 5 grams of type II polish shall be spread evenly over the entire surface of the panel using a small piece of flannel measuring 2 by 2 inches (5.1 by 5.1 cm). After the film has dried it shall be wiped with four passes of a clean, dry piece of flannel attached to the holder of the machine weighted to exert a pressure of 3 lbs (1.36 kg). The wiped surface shall be examined visually for evidence of residue.

P-P-560B

5. PREPARATION FOR DELIVERY

5.1 Civil Agencies.

5.1.1 Packaging. Packaging shall be level A or commercial as specified (see 6.2).

5.1.1.1 Level A. Type I polish shall be packaged in 8 ounce oblong metal cans with a screw cap conforming to Type V, Class 4 of PPP-C-96. Type II polish shall be packaged in one pound plastic jars conforming to Group A, Class A of PPP-C-186 and Closure A of PPP-C-186. The can, jar, closure and liner shall neither affect or be affected by the polish. Twelve cans or jars shall then be packaged in a close-fitting box conforming to PPP-B-636, class domestic. Closure of the boxes shall be in accordance with the appendix to PPP-B-636.

5.1.1.2 Commercial. The polish, in the unit pack size specified, shall be packaged in accordance with normal commercial practice. The complete package shall be designed to protect the polish against contamination and damage during shipment, handling and storage.

5.1.2 Packing. Packing shall be Level A or commercial as specified (see 6.2).

5.1.2.1 Level A. Twenty-four cans or jars of polish (two packages), packaged as specified in 5.1.1, shall be packed in a close-fitting box conforming to PPP-B-636, class weather resistant. The box shall be closed, waterproofed and reinforced in accordance with the appendix of PPP-B-636.

5.1.2.2 Commercial. The polish, packaged as specified in 5.1.1, shall be packed in a manner that will insure acceptance by common carrier and provide product protection against shipments, handling and storage. The shipping container shall be in compliance with the National Motor Freight Classification and Uniform Freight Classification.

5.1.3 Marking. Marking shall be as specified in the contract or order.

5.2 Military activities.

5.2.1 Packaging. Packaging shall be level A or Commercial as specified (see 6.2).

5.2.1.1 Level A.

5.2.1.1.1 Type I. Unless otherwise specified, type I polish shall be furnished in 8-ounce oblong metal containers conforming to type V, class 4 of PPP-C-96. The container shall be equipped with a screw cap. Cans, closures and closure liners that have a deleterious effect on the plastic polish or vice versa shall be coated or lined on all internal surfaces with a material that will neither affect nor be affected by the plastic polish.

5.2.1.1.2 Type II. Unless otherwise specified, type II polish shall be furnished in 1 pound plastic jars conforming to group A, class 2, style 4, grade 2 of PPP-C-186. The closure shall conform to Closure A of PPP-C-186. The closure, the liner and the jar shall neither affect nor be affected by the polish.

5.2.1.2 Intermediate packaging. Twelve 8-ounce cans or twelve one pound plastic jars shall be packaged in a snug fitting fiberboard box conforming to type CF or SF, class domestic, style RSC of PPP-B-636, except that the minimum bursting strength of the fiberboard shall be 275 psi. The fiberboard box shall be provided with full size top and bottom pads and full height half slotted style partitions, constructed of the same material as the box and forming an individual snug fitting cell for each can or jar. Each box shall be closed by covering all seams full length with strips of 2-1/2 inch minimum width tape conforming to type III, grade B of PPP-T-45. The center strip shall extend a minimum of 2-1/2 inches onto the end panels. Alternatively, the bottom flaps may be sealed with adhesive or by metal stitching.

5.2.1.3 Commercial. The polish shall be packaged in compatible containers in the specified quantities in a manner that will afford adequate protection necessary to prevent contamination and damage during shipment under environmental conditions, utilizing containers required by the Code of Federal Regulations, Title 49, Parts 100-199.

5.2.2 Packing Packing shall be Level A, B, or Commercial as specified (see 6.2).

5.2.2.1 Level A. Two intermediate packages of 8-ounce cans or 2 intermediate packages of one-pound jars, packaged as specified in 5.2.1.2, shall be packed in two tiers in a snug fitting fiberboard shipping container conforming to class weather resistant, grade-V3, style-RSC of PPP-C-636. Each fiberboard shipping container shall be sealed in accordance with the appendix of PPP-B-636 using tape conforming to PPP-T-60. Each shipping container shall be reinforced in accordance with the appendix to PPP-B-636. Standard 4-way entry pallets are required for handling by mechanical equipment.

P-P-560B

5.2.2.2 Level B. Two intermediate packages of 8-ounce cans or 2 intermediate packages of one-pound jars, packaged as specified in 5.2.1.2, shall be packed in two tiers in a snug fitting fiberboard shipping container conforming to type CF (variety SW) or type SF class domestic, grade 275 of PPP-B-636. Closure shall be in accordance with Method II as specified in the appendix of PPP-B-636, except that the entire area of all flaps shall be sealed with adhesive. Standard 4-way entry pallets are required for handling by mechanical equipment.

5.2.2.3 Commercial. The packaged plastic polish shall be packed in shipping containers in a manner that will afford adequate protection, at the lowest rate, against damage during direct shipment from the supply source to the first receiving activity. The shipping containers shall be in compliance with the requirements of the National Motor Freight Classification and the Uniform Freight Classification.

5.2.3 Marking. In addition to any marking required by the contract or order (see 6.2), each unit, intermediate and exterior container shall be marked in accordance with MIL-STD-129. The marking shall also include the following:

Keep from freezing

CAUTION

- a. Remove rings or other hard objects from the hands before cleaning or polishing plastic surfaces.
- b. Do not use hard, dirty, or gritty cloths.
- c. Do not apply water, solvent, or polish to acrylic type plastic unless the plastic is cool and is protected from the heating effects of sunlight.

Application instructions:

- a. Wipe the plastic with a cloth saturated with water or aliphatic naphtha conforming to type II of TT-N-95. Use a bare hand to remove any dirt, sand, or mud that may cause scratches.
- b. Apply the polish evenly, let dry, then wipe clean. (Light scratches can be removed by vigorous rubbing, but care should be taken not to rub too long in one place.)

Cans containing type I polish shall be marked with the following:

Shake well before using.

P-P-560B

6. NOTES

6.1 Intended use. The polish is intended for use in the cleaning and polishing of plastic materials in the removal of light scratches, and in the application of an anti-static film which will prevent the electrostatic attraction of dust, lint, ash, etc. to the acrylic plastic.

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. Polish type (see 1.2).
- c. Quantity.
- d. Levels of packaging and packing (see 5.1, 5.2).
- e. Additional markings, if required.
- f. Size of container.

6.3 Qualification. With respect to products requiring qualification, awards will be made only for such products as have prior to the time set for opening of bids, been tested and approved for inclusion in the applicable Qualified Products List, whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Air Systems Command, Department of the Navy, Washington, D. C. 20361; however, information pertaining to qualification of products may be obtained from the Director, Aircraft and Crew Systems Directorate, Code 60622, Naval Air Development Center, Warminster, PA 18974.

6.3.1 Material furnished under contract shall be identical with polish samples which have been submitted by the manufacturer and have been inspected and approved for inclusion in the Qualified Products List. In the event that material furnished under contract is found to deviate from the composition of the approved product or that the product fails to perform satisfactorily in service, approval of such material will be subject to immediate withdrawal from the Qualified Products List.

P-P-560B

6.4 Toxicity. Any question regarding toxicity should be referred by the procuring agency to the departmental medical authority. In the case of Army procurement, the Surgeon General will act as advisor to the procuring activity.

MILITARY INTEREST:

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - FSS

HHS - FDA

Custodians:

Army - GL

Navy - AS

Air Force - 99

Review activities:

Army-MD, EA

PREPARING ACTIVITY

NAVY - AS

Project No. 7930-0345

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DOCUMENT IDENTIFIER (Number) AND TITLE

P-P-560B POLISH, PLASTIC

NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

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1 OCT 76

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