

P-C-444B  
 26 May 1983  
 SUPERSEDING  
 P-C-444A  
 April 27, 1967

## FEDERAL SPECIFICATION

### CLEANING COMPOUND, SOLVENT SOLUBLE, GREASE EMULSIFYING

This specification was approved by the Assistant Administrator, Office of Federal Supply and Services, General Services Administration, for use of all Federal agencies.

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers two types of emulsifying solvent soluble cleaning compounds used to remove oil, grease and other foreign matter from various surfaces.

#### 1.2 Classification.

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

Type I - Non-phenolic  
 Type II - Phenolic

#### 2. APPLICABLE DOCUMENTS

2.1 Government publications. 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-250/4	-	Aluminum Alloy 2024, Plate and Sheet
QQ-A-250/5	-	Aluminum Alloy Alclad 2024, Plate and Sheet
QQ-A-250/12	-	Aluminum Alloy 7075, Plate and Sheet
QQ-M-44	-	Magnesium Alloy Plate and Sheet (Az31b)
QQ-P-416	-	Plating, Cadmium (Electrodeposited)
TT-L-32	-	Lacquer, Cellulose Nitrate, Gloss, for Aircraft Use
TT-P-1757	-	Primer Coating, Zinc Chromate, Low Moisture-Sensitivity

FSC 6850

P-C-444B

- TT-T-291 - Thinner; Paint, Mineral Spirits, Regular and Odorless
- PPP-B-636 - Boxes, Shipping, Fiberboard
- PPP-C-96 - Cans, Metal, 28 Gage and Lighter
- PPP-D-729 - Drums, Shipping and Storage, Steel 55 Gallon (208 Liters)
- PPP-P-704 - Pail, Metal (Shipping, Steel, 1 Through 12 Gallon)

#### Federal Standards

- FED-STD-313 - Material Safety Data Sheets, Preparation and the Submission of
- FED-STD-595 - Colors

(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, and other Federal specifications and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston, MA; New York, NY; Philadelphia PA; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Houston, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.

(Federal Government activities may obtain copies of Federal standardization documents and the Index of Federal Specifications, Standards, and Commercial Item Descriptions from established distribution points in their agencies.)

#### Military Specifications

- MIL-M-3171 - Magnesium Alloy, Processes for Pretreatment and Prevention of Corrosion on
- MIL-A-8625 - Anodic Coatings for Aluminum and Aluminum Alloys
- MIL-T-9046 - Titanium and Titanium Alloy, Sheet, Strip and Plate
- MIL-P-23377 - Primer Coating, Epoxy Polyamide, Chemical and Solvent Resistant
- MIL-L-35078 - Loads, Unit, Preparation of Nonperishable Subsistence Items, General Specification for
- MIL-C-83286 - Coating, Urethane, Aliphatic Isocyanate, for Aerospace Applications

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.)

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.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM) Standards

- ASTM A 109 - Steel, Carbon, Cold-Rolled Strip  
ASTM D 56 - Flash Point by Tag Closed Tester  
ASTM D 97 - Pour Point of Petroleum Oils  
ASTM D 605 - Magnesium Silicate Pigment  
ASTM D 820 - Chemical Analysis of Soaps Containing Synthetic Detergents  
ASTM F 483 - Total Immersion Corrosion Test for Aircraft Maintenance Chemicals  
ASTM F 484 - Stress Cracking of Acrylic Plastics in Contact with Liquid or Semi-Liquid Compounds

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

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification.

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

Uniform Classification Committee, Agent

Uniform Freight Classification Rules.

P-C-444B

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

### 3. REQUIREMENTS

3.1 Qualification. The cleaning compound 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 and 6.3).

3.2. Material. The formulation of the cleaning compound shall be optional with the manufacturer, but the material shall conform to the requirements specified herein.

3.2.1 Toxicity. The cleaning compound 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. The manufacturer shall certify that the cleaning compound contains no substance known to be toxic to the user under normal conditions of use (see 4.3.3).

#### 3.3 Chemical and physical properties.

##### 3.3.1 Phenolic content.

3.3.1.1 Phenolic (phenols and cresols) content (type I). The type I cleaning compound, when tested as specified in 4.5.1, shall contain less than 0.01 percent by weight of phenolic material.

3.3.1.2 Cresol content (type II). The type II cleaning compound, when tested as specified in 4.5.1, shall contain not less than 12 percent nor more than 25 percent by weight of cresol material.

3.3.1.3 Phenol content (type II). The type II cleaning compound, when tested as specified in 4.5.1, shall contain less than 3.0 percent by weight of phenol ( $C_6H_5OH$ ).

3.3.2 Free alkali. The cleaning compound, when tested as specified in 4.5.2, shall contain no free alkali.

3.3.3 Volatile matter. When the cleaning compound is tested as specified in 4.5.3, the volatile matter shall not exceed 10.0 percent.

3.3.4 Flash point. The cleaning compound, when tested in the closed cup as specified in 4.5.4, shall have a flash point of not less than 43°C (110°F).

3.3.5 Pour point. When the cleaning compound is tested as specified in 4.5.5, the pour point shall not exceed 2°C (35°F).

3.3.6 Form. The cleaning compound shall be a liquid at room temperature. When exposed as specified in 4.5.6, stirring the cleaning compound shall readily dissolve any surface skin which may have formed.

3.3.7 Solubility in mineral spirits. When tested as specified in 4.5.7, the cleaning compound shall dissolve readily, be clear and show no evidence of separation or undissolved matter.

3.3.8 Solubility in hard water. When tested as specified in 4.5.8, the cleaning compound shall readily dissolve or emulsify and show no evidence of emulsion breakdown such as separation of water or oil phase. The floating out of a creamy top layer shall be permissible.

3.3.9 Emulsion stability. When tested as specified in 4.5.9, the cleaning compound shall form an emulsion which shows no free oil, clear solvent layer or other evidence of breakdown. Creaming or floating out of a creamy top layer shall be permissible.

3.3.10 Cleaning performance. When tested as specified in 4.5.10, the cleaning compound shall remove oil and carbon with no visible evidence of soil, soap film or other residue.

3.3.11 Total immersion corrosion. When tested as specified in 4.5.11, the cleaning compound shall not show evidence of corrosion nor cause a weight change in any test panel specimen greater than that listed in Table VI.

3.3.12 Effects on acrylic base plastic (type I only). The type I cleaning compound, when tested as specified in 4.5.12, shall cause no crazing, cracking or other kinds of attack on acrylic base plastic.

3.3.13 Effect on lacquered surfaces (type I only). The type I cleaning compound, when tested as specified in 4.5.13, shall cause no permanent softening, loss of gloss, discoloration, bleeding or any film irregularity on lacquered surfaces.

3.3.14 Cold stability. The cleaning compound, when tested as specified in 4.5.14, shall return to its original condition.

3.3.15 Storage stability. The cleaning compound, after storage as specified in 4.5.15, shall be stable to the extent that it shall not require agitation prior to use. There shall be no evidence of layer formation, gelation or heavy precipitation.

3.4 Workmanship. The ingredient materials shall be assembled and processed to produce a homogenous liquid cleaning compound free of foreign material.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.2 Classification of examinations and tests. The examinations and tests of the solvent soluble cleaning compound shall be classified as follows:

- (a) Qualification inspection (see 4.3).
- (b) Quality conformance inspection (see 4.4).

4.2.2 Inspection conditions. Unless otherwise specified, all examinations and tests shall be conducted at 21° to 27°C (70° to 81°F).

4.3 Qualification inspection. The qualification inspection shall consist of all the examinations and tests specified herein.

4.3.1 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.

4.3.2 Qualification samples. The qualification sample shall consist of one gallon of each type of cleaning compound for which qualification is desired. Samples shall be forwarded to the Commander, 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  
 Cleaning Compound, Solvent Soluble, Grease Emulsifying  
 Manufacturer's formula number  
 Date compounded  
 Manufacturer's name  
 Batch or lot number  
 Submitted by (name) (date) for qualification inspection in accordance with the requirements of P-C-444B under authorization of (reference authorizing letter) (see 6.3).

**4.3.3 Inspection report.** The manufacturer shall submit a report, in duplicate, to accompany the qualification inspection sample. This report shall include the results of the manufacturer's tests, reported quantitatively, where applicable, in the units specified for all of the requirements specified herein, except storage stability. Tests not conducted due to lack of special test facilities or materials shall be so noted in the report. Material safety data sheets (see 3.2.1) shall be prepared in accordance with FED-STD-313. One copy of each shall be forwarded to the qualifying laboratory, the preparing activity of this specification and to the activity specified in 6.5. In addition, the manufacturer shall submit a complete statement of the formulation including the chemical name and weight percent of each ingredient.

**4.4 Quality conformance inspection.** The quality conformance inspection shall consist of all the examinations and tests specified in table I.

TABLE I. Quality conformance inspection

Characteristics	Paragraph	
	Requirement	Test
Phenolic Content	3.3.1	4.5.1.2
Free alkali	3.3.2	4.5.2
Volatile matter	3.3.3	4.5.3
Flash point	3.3.4	4.5.4
Form	3.3.6	4.5.6
Solubility in mineral spirits	3.3.7	4.5.7
Solubility in hard water	3.3.8	4.5.8
Emulsion stability	3.3.9	4.5.9
Total immersion corrosion	3.3.11	4.5.11
Effect on acrylic plastic (type I)	3.3.12	4.5.12
Effect on lacquered surface (type II)	3.3.13	4.5.13

P-C-444B

4.4.1 Lot formation. A lot shall consist of all the cleaning compound produced by one manufacturer, at one plant, from the same materials, and under essentially the same conditions provided the operation is continuous and does not exceed 24 hours. In the event the process is a batch operation, each batch shall constitute a lot (see 6.4).

4.4.2 Sampling for tests. Quality conformance test samples shall be selected in accordance with table II. Unless otherwise specified, two 1-gallon composite samples, consisting of equal parts of the sample unit selected, shall be subjected to the tests in table I. The sample shall be clearly identified by the manufacturer's formula number as specified in 4.3.2. The manufacturer shall furnish with each lot a certificate to the effect that the material has been processed in the same manner and degree using the same base ingredients as the approved qualification sample. The lot shall be unacceptable if a sample fails to meet any of the test requirements.

TABLE II. Net content

Lot size (containers)	Sample size (containers)
Up to 50	5
51 - 500	7
501 - 35,000	8
35,001 and over	11

4.4.3 Examination of end items. The contents of each container shall be examined for the defects listed in table III. The sample size shall be in accordance with table II. The sample unit for this examination shall be one filled container. The lot shall be rejected if there is any evidence of nonconformance.

TABLE III. Examination of end item

Examine	Defect
Material	Not as specified
Appearance	Presence of foreign matter

4.4.4 Inspection of filled containers. The sample unit for this examination shall be one filled container. The sample size shall be as specified in table II. The lot shall be unacceptable if the average net content per container for all units examined is less than specified.



4.4.5 Examination of preparation for delivery. An examination shall be made to determine if the packaging, packing and marking comply with the requirements of section 5 of this specification. The sample unit shall be one shipping container fully prepared for delivery. Each sample unit shall be examined for the defects listed in table IV. The lot size shall be the number of shipping containers in the lot. The examination shall be in accordance with MIL-STD-105, inspection level S-2 and an acceptable quality level (AQL) of 2.5 defects per hundred units.

TABLE IV. Packaging inspection

Examine	Defect
Container	Evidence of leakage, bulging or distortion
Marking	Missing, incorrect, illegible. Improper size, location or method of application.

#### 4.5 Test methods.

##### 4.5.1 Phenolic content.

##### 4.5.1.1 Qualification.

4.5.1.1.1 Apparatus. A liquid chromatography apparatus capable of quantitative separation of phenol and cresol shall be used. One such apparatus is the Hewlett-Packard Model 1084-A equipped with a reverse phase column (RP-8-1/4 inch by 25 cm), an internal UV detector (254 nm), an automatic variable injector, an integrating recorder, and optionally, an external variable absorbancy detector. Any apparatus that is capable of quantitatively discerning phenol and cresol may be used.

4.5.1.1.2 Procedure. A weighed portion of the compound shall be diluted in a methyl alcohol (liquid chromatography grade) : demineralized water (4:1) solution to yield a solution suitable for analysis. Twenty microliters of the solution shall be injected into the apparatus in operation under the following conditions:

Flow rate	- 1.0 ml/min
Column temperature	- 40°C (104°F)
Pressure	- 140 bar
Recorder chart speed	- 0.5 cm/min
Attenuation	- 7 (equivalent to 0.0128 A-U/cm)

Elution times for phenol and cresol shall be determined by running standards consisting of appropriate (less than one percent) solutions of a mixture of phenol and cresol diluted in methyl alcohol (liquid chromatography grade): demineralized water (4:1). The percent by weight totals of phenol and cresol in the test samples shall be in accordance with the requirements in 3.3.1.

4.5.1.1.3 Column purging. Prior to next sample injection, the column shall be purged as follows:

Demineralized water for 4.9 minutes, then  
30 percent methyl alcohol for 15 minutes, then  
95 percent methyl alcohol for 5 minutes, then  
demineralized water for 5 minutes.

4.5.1.2 Quality conformance. The manufacturer shall submit a certificate of compliance for the phenol content requirement. The certificate shall be signed by an authorized representative of the manufacturer and shall state that the compound is in conformance with 3.3.1.

4.5.2 Free alkali. The cleaning compound shall be tested for free alkali in accordance with ASTM D 820.

4.5.3 Volatile matter. Thirty grams of the cleaning compound shall be weighed in a tared dish measuring  $9.9 \pm 0.2$  cm inside diameter and  $1.3 \pm 0.2$  cm inside depth (such as the cover of a petri dish). The dish shall then be placed in a well ventilated room, in an area free of drafts, at a temperature of  $24^\circ \pm 3^\circ\text{C}$  ( $75^\circ \pm 5^\circ\text{F}$ ) and a relative humidity of  $50 \pm 4$  percent. After 24 hours exposure, the sample shall be weighed and the percent loss in weight determined.

4.5.4 Flash point. The flash point of the cleaning compound shall be determined with the Tag closed tester in accordance with ASTM D 56.

4.5.5 Pour point. The pour point of the cleaning compound shall be determined in accordance with ASTM D 97.

4.5.6 Form. Two hundred and fifty ml of the cleaning compound as received shall be placed in a clean metal container having a cross sectional area (top surface exposure) of 161.3 to 180.6 sq cm. The exposed surface of the compound shall be less than one inch from the top of the container. The open container shall be allowed to stand for 48 hours at a temperature of  $21^\circ$  to  $27^\circ\text{C}$  ( $70^\circ$  to  $80^\circ\text{F}$ ). If surface skin forms after the 48 hour exposure, stir the specimen vigorously with a glass stirring rod.

4.5.7 Solubility in mineral spirits. Ten ml of the cleaning compound shall be pipetted into a 100 ml graduated cylinder provided with a glass stopper. The pipette shall be rinsed with mineral spirits conforming to TT-T-291, type I and the rinsings shall be added to the cylinder. The cylinder shall be filled to the 100 ml mark with additional mineral spirits, stoppered, shaken thoroughly for 1 minute, and examined for clarity and absence of undissolved matter. The solution shall be allowed to remain undisturbed for 24 hours and then reexamined for clarity, separation and undissolved matter. The test shall be performed simultaneously with 10 ml of cleaning compound exposed as specified in 4.5.6.

4.5.8 Solubility in water. A solution of 12.5 grain hard water shall be prepared by dissolving 0.251 g of calcium acetate  $\text{Ca}(\text{CH}_3\text{COO})_2 \cdot \text{H}_2\text{O}$  and 0.176 g of magnesium sulfate  $\text{MgSO}_4 \cdot 5\text{H}_2\text{O}$  in 1 liter of boiled and cooled distilled water. Five ml of the cleaning compound shall be placed in a 100 ml graduated cylinder provided with a glass stopper. Ninety ml of 12.5 grain hard water shall be added. The stoppered cylinder shall be given a vigorous manual shaking for 10 seconds. The contents of the cylinder shall be observed immediately for the presence of undissolved or unemulsified ingredients. If necessary, the cylinder shall be held horizontally to facilitate observation of the contents. Foam shall be disregarded. The cylinder shall be allowed to stand for 6 hours and then observed for evidence of free oil, free water or other emulsion breakdown. Creaming, as evidenced by mild thickening at the surface, shall be disregarded. The test shall be performed simultaneously with 5 ml of cleaning compound exposed as specified in 4.5.6.

4.5.9 Emulsion stability. Ten ml of the cleaning compound shall be placed in a 100 ml graduated cylinder provided with a glass stopper. Ninety ml of mineral spirits conforming to TT-T-291, type I shall be added and the cylinder shall be stoppered and shaken thoroughly. Ten ml of diluted compound (1 part cleaning compound to 9 parts mineral spirits) shall be placed in another similar cylinder and 90 ml of 12.5 grain hard water shall be added. The second cylinder shall be stoppered and an emulsion shall be formed by 10 inversions followed by a vigorous 15 second shake. The 15 seconds of agitation shall be repeated after the emulsion has stood for 5 minutes. The cylinders shall then be allowed to stand for 6 hours and at the end of that time observation shall be made for evidence of free oil, solvent or emulsion breakdown. A creamy top layer shall be disregarded. The test shall be performed simultaneously with 10 ml of cleaning compound exposed as specified in 4.5.6.

#### 4.5.10 Cleaning performance.

4.5.10.1 Preparation of cleaning solution. Twenty-five ml of the cleaning compound shall be dissolved in 225 ml of mineral spirits conforming to TT-T-291, type I.

4.5.10.2 Preparation of test panels. Test panels, of any suitable substrate, measuring 10.6 by 21.2 cm shall be finished as specified in Table V. Three grams of magnesium silicate conforming to ASTM D 605 and 4 g of Norit A carbon shall be added to 15 g of lubricating oil grade SAE 80 to form a paste. Five g of this paste shall be spread in a thin even film to soil the surface of the panel.

TABLE V. Test panel finishes

Process step	Coating material	No. of coats	Thickness per coat mil	Drying time between coats	Drying time after final coat
1.	Primer, coating epoxy polyamide MIL-P-23377	1	0.6-0.9	1 to 2 hrs @ room temp.	- -
2.	Coating, urethane aliphatic iso - cyanate MIL-C-83286 (Color No. 36440)	Mist Coat	- -	15 minutes @ room temp.	- -
3.	Coating, urethane aliphatic iso - cyanate MIL-C-83286 (Color No. 36440)	Wet Coat	1.5-2.5	- -	Air dry one week @ room temp. Then oven dry one week @ 150°F

NOTE: The 60 degree gloss of the dried panels shall be between 7 and 12

4.5.10.3 Cleaning procedure. Ten ml of the prepared cleaning solution shall be poured on the soiled panel surface and the surface shall be brushed gently with a test tube brush. The surface shall then be rinsed with tap water and allowed to drain for a few minutes. The panel surface shall then be cleaned twice more, using 10 ml of the cleaning solution and rinsing with tap water each time. After rinsing thoroughly with tap water, the panel shall be allowed to dry in a 45 degree position for 1 hour and shall then be examined for evidence of soil, soap film or other residue. The test shall be performed simultaneously with 25 ml of solution prepared with cleaning compound exposed as specified in 4.5.6.

4.5.11 Total immersion. The cleaning compound shall be tested in accordance with ANSI/ASTM F483. Test duration shall be 168 hours. Panels shall be those specified in Table VI. The compound shall be tested concentrated (as received) and at 10 percent by volume in water.

TABLE IV. Metal test panels and corrosion limits

Test panel	Weight change mg/cm <sup>2</sup> /24 hrs
Aluminum alloy, QQ-A-250/4, Bare	0.04
Aluminum alloy, QQ-A-250/12, Bare	0.04
Steel, ASTM A 109	0.04
Steel, ASTM A 109; Cadmium plated (QQ-P-416, Type I, Class 1)	0.20
Magnesium, QQ-M-44, Chromepickle (MIL-M-3171, Type I)	0.20
Titanium, 6A14V, untreated, MIL-T-9046	0.04

4.5.12 Effect on acrylic base plastics (type I only). Type I cleaning compound shall be tested in accordance with ASTM F 484, except as follows: Only the type A panel shall be tested. Type I cleaning compound shall be applied to the panel to cover the area measuring approximately 2.5 cm (1 inch) on either side of the fulcrum. The duration of the exposure shall be 3 hours. After the exposure period, the type A panel shall be removed from the test set-up and examined for crazing, cracking or other visible signs of degradation. At least 3 panels shall be tested.

4.5.13 Effect on lacquered surface (type I only).

4.5.13.1 Preparation of panels. Panels shall measure 0.5 by 7.6 by 15.2 cm and shall be made from alclad aluminum conforming to QQ-A-250/5 and anodized to conform to MIL-A-8625. The panels shall be coated with zinc chromate primer, conforming to TT-P-1757, to a thickness of 0.3 to 0.4 mil and air dried at room temperature for 6 hours. The panels shall then be coated with a 1.0 to 1.2 mil thickness of lacquer, conforming to TT-L-32, in the following manner, with colors matching FED-STD-595 colors as follows:

One third of the area of each panel shall be glossy sea blue, color no. 15042.

One third of the area of each panel shall be insignia white, color no. 17875.

One third of the area of each panel shall be insignia red, color no. 11136.

The finished panels shall be air dried overnight, at room temperature, and then baked at 105°C (221°F) for 2 hours.

4.5.13.2 Procedure. The type I cleaning compound shall be diluted with one part compound to four parts mineral spirits conforming to TT-T-291, type I. The test panels shall be placed so that one half of each color is immersed in the cleaning solution for one half hour. The panels shall then be removed, rinsed thoroughly with tap water at 25° ± 3°C (77° ± 5°F) and allowed to air dry for one hour. The panel surfaces shall now be examined for evidence of softening, loss of gloss, bleeding, color change or any other film irregularity. The portion of each panel which has been immersed in the cleaning solution shall be examined to determine whether or not it is equal in all respects to the portion of the panel which has not been immersed. Surfaces which have been softened shall be allowed to remain undisturbed at room temperature for 4 hours and shall then be examined again for evidence of recovery.

4.5.14 Cold stability. Approximately 50 ml of the cleaning compound shall be poured into a suitable test tube. The temperature of the compound shall be lowered to -26° ± 1°C (-15° ± 2°F) and shall remain at this temperature for one hour. The cleaning compound shall be allowed to warm to room temperature at 24° ± 3°C (75° ± 5°F) and shall then be examined for evidence of a precipitate, layer formation or any other change from the original physical condition of the cleaning compound.

4.5.15 Storage stability. The cleaning compound, as received, shall be thoroughly mixed, and a 100 ml sample shall be poured into a graduated ASTM long form oil tube of 125 ml capacity. The tube shall be stoppered and stored for 6 months in a place relatively free from vibration. At the end of that time, the compound shall be examined for evidence of layer separation, gelation and heavy precipitation. The settling out of a light sediment or soap material shall be considered unobjectionable.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging for civil agencies shall be level A, B or commercial and for military activities, level A or commercial, as specified (see 6.2).

5.1.1 Levels A and B. The cleaning compound shall be packaged in 1-gallon, 5-gallon or 55-gallon (3.8, 18.9 or 208.2-liter) containers, as specified (see 6.2). The 1-gallon container shall conform to PPP-C-96, type V, class 4. The 5-gallon container shall conform to PPP-P-704, type I, class 3, with a flexible spout. The 55-gallon container shall conform to type II of PPP-D-729. All interior surfaces of the container shall be lined with a material that will not affect nor be affected by the cleaning compound.

5.1.2 Commercial. The cleaning compound, in quantities specified in the contract or order, shall be packaged in accordance with normal commercial practice. The complete package shall be designed to protect the cleaning compound against damage during multiple shipments, handling, and storage, while complying with the requirements of the Department of Transportation Code of Federal Regulations, Parts 100-199.

5.2 Packing. Packing for all civil agencies and military activities shall be level A, B or commercial, as specified (see 6.2).

5.2.1 Level A. Four 1-gallon containers, packaged as specified in 5.1.1, shall be packed in a box conforming to PPP-B-636, class weather resistant and closed, waterproof sealed, and reinforced in accordance with the appendix of PPP-B-636. For Army use, supplemental protection of a unitization method will be provided in accordance with MIL-L-35078. The four 1-gallon containers, arranged 2 by 2, shall fit snugly in the box. Each unit shall be nested in a snug fitting, full height, half slotted style partition. The partition and the box shall be made of the same material. The cleaning compound, when packaged in 5-gallon or 55-gallon containers, shall require no overpacking. Standard 4-way entry pallets are required for handling by mechanical equipment.

5.2.2 Level B. Four 1-gallon containers, packaged as specified in 5.1.1, shall be packed in a box conforming to PPP-B-636, class domestic and closed and reinforced in accordance with the appendix of PPP-B-636. The four 1-gallon containers, arranged 2 by 2, shall fit snugly in the box. Each unit shall be nested in a snug fitting, full height, half slotted style partition. The partition and the box shall be made of the same material. The cleaning

compound, when packaged in a 5-gallon or 55-gallon container, shall require no overpacking. Standard 4-way entry pallets are required for handling by mechanical equipment.

5.2.3 Commercial. The cleaning compound in containers of like description, packaged as specified in 5.1.1, shall be packed to insure delivery at destination, provide for redistribution by the initial receiving activity, and be acceptable by common carrier under the National Motor Freight Classification and Uniform Freight Classification Rules.

### 5.3 Marking.

5.3.1 Civil agencies. Shipping containers shall be marked as specified in the contract or order.

5.3.2 Military activities. In addition to any special marking required by the contract or order, unit packages and shipping containers shall be marked in accordance with MIL-STD-129. The marking shall also include the following:

Directions: The cleaning compound is normally used in mineral spirits solutions in concentrations ranging between 1 part compound and 9 parts mineral spirits to 1 part compound and 4 parts mineral spirits by volume depending on the degree of soil. The cleaning solution may be applied by rag, spray or immersion; followed by rinsing with clear water immediately after application. The compound will generally remove hard and soft film corrosion preventive coatings and hence should not be used on parts thus protected unless removal of such films is desired.

Containers of the type I cleaning compound shall also include the following:

Intended use: For general cleaning of painted as well as unpainted surfaces and parts.

Containers of type II cleaning compound shall also include the following:

The cleaning compound is primarily intended for heavy duty cleaning on unpainted surfaces. When this compound is mixed with 1,1,1-Trichloroethane, it can be used for ultrasonic cleaning of heavily soiled general aircraft bearings. It should be used with extreme caution on rubber, plastics, decalcomanias, painted surfaces, etc., as the compound will soften these if allowed to remain on the surface too long. The compound will have an irritating action in contact with the skin and eyes; therefore, rubber gloves and goggles are recommended to be worn by personnel using this compound.

## 6. NOTES

6.1 Intended use. The material covered by this specification is intended for use in cleaning grease, oil, dirt, etc., from various surfaces.

Type I cleaning compound is intended for general cleaning of painted and unpainted surfaces.

Type II cleaning compound is primarily intended for heavy duty cleaning of unpainted surfaces.

6.2 Ordering data. Purchasers should select the preferred options permitted herein, and include the following information in procurement document:

- (a) Title, number and date of this specification
- (b) Type (see 1.2.1)
- (c) Quantity of cleaning compound required in terms of U.S. Gallons, measured at 15.6°C (60°F) or corrected to corresponding volume at that temperature
- (d) Type and capacity of containers in which cleaning compound is to be furnished, if other than as specified in section 5
- (e) Applicable levels of packaging, packing and marking with requirements in detail, if other than as specified in section 5

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids qualified 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 supplier is called to this requirement, and manufacturers are urged to arrange to have the products 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, DC 20361; however, information pertaining to qualification of products and letter of authorization may be obtained from the Director, Aircraft and Crew Systems Technology Directorate, Code 60622, Naval Air Development Center, Warminster, PA 18974.

6.3.1 Qualification information. Material furnished under contract shall be identical within commercial limits with cleaning compound 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.



6.4 Batch. A batch is defined as that quantity of material which has been manufactured by some unit chemical process or subjected to some physical mixing operation intended to make the final product substantially uniform.

6.5 Material safety data sheets. One copy of the material safety data sheets required in 4.3.3 shall be forwarded to the Commanding Officer, Navy Environmental Health center, Building X-353, Naval Station, Norfolk, VA 23511.

## MILITARY INTERESTS:

Custodians

Army - AR  
Navy - AS  
AF - 68

Review Activities

Army - EA, SM  
Navy - MS  
AF - 20  
DLA - GS

User Activity

Navy - OS

## CIVIL AGENCY COORDINATING ACTIVITIES:

HHS - FDA  
VA - OSS  
GSA - FSS

PREPARING ACTIVITY

Navy - AS

DoD Project No. 6850-0714

Orders for this publication are to be placed with the 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.

