

P-D-1747C
May 11, 1983
SUPERSEDING
P-D-1747B
September 16, 1977

FEDERAL SPECIFICATION
DETERGENT, GENERAL PURPOSE
(SPRAY-ON, WIPE OFF)

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers a ready-to-use spray-on, wipe-off hard surface cleaner (see 6.1).

1.2 Classification.

1.2.1 Classes. The general purpose detergents shall be of the following classes as specified (see 6.2):

Class 1 - Ready-to-use liquid.

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 Specification:

PPP-B-636 - Boxes, Shipping, Fiberboard.

Federal Standard:

Fed. Std. No. 123 - Marking for Shipment (Civil Agencies).

(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 Specification:

MIL-B-26701 - Bottles, Screw Cap and Carboys; Polyethylene Plastic.

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.)

P-D-1747C

Laws and Regulations:

16 CFR 1500 - Federal Hazardous Substances Act Regulations.

(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:

E 70 - pH of Aqueous Solutions with the Glass Electrode.

(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.

(Application for copies should be addressed to the American Trucking Association, Inc., Traffic Department, 1616 P Street, NW., Washington, DC 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.)

3. REQUIREMENTS

3.1 Finished product. The finished product shall be a clean, homogeneous ready-to-use solution with no sediment or foreign material.

3.2 Performance. When tested as specified in 4.3.2, the finished product shall perform equal to or better than the comparison formula in table I.

TABLE I. Comparison Formula

<u>Ingredient</u>	<u>Percent</u>
Triton X-100	1.0%
Sodium carbonate, anhydrous	1.5%
Tetrasodium EDTA	1.0%
Butyl cellosolve	5.0%
Distilled water	91.5%

3.3 pH. The pH of the finished product shall be not greater than 12.8 when tested as specified in 4.3.1.

3.4 Labeling. The containers of the product shall be labeled with directions for use. The label shall comply with the Federal Hazardous Substances Act Regulations.

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 Quality conformance inspection.

4.2.1 Examination of the finished product. The finished product shall be examined for compliance with paragraphs 3.1 and 3.4. Sampling and acceptance shall be in accordance with MIL-STD-105, inspection level S-3, AQL of 2.5 percent defective. The sample unit shall be one unit container of detergent.

4.2.2 Examination of the end item for net contents. The end item shall be examined for net contents less than specified in the contract. The sample unit shall be one unit container of detergent. Sampling and acceptance shall be in accordance with MIL-STD-105, inspection level S-3, AQL of 4.0 percent defective.

4.2.3 Examination of preparation of delivery. An examination shall be made to determine compliance with the requirements of Section 5. The sample unit shall be one shipping container fully prepared for delivery. Sampling shall be in accordance with MIL-STD-105. The inspection level shall be S-2 with an AQL of 4.0 expressed in terms of percent defective.

4.2.4 Testing of the end item. The detergent shall be tested as specified in 4.3 for compliance with the requirements of 3.2 and 3.3. The sample unit shall be one unit container of detergent. When the unit container is a 55-gallon drum, the sample unit shall be one quart of detergent taken from a well mixed 55-gallon drum. The lot size shall be the number of unit containers in the lot. Randomly select the number of samples from the lot specified below, label and send to the testing facility. The lot shall be rejected if any sample fails any of the tests.

<u>Lot Size</u>	<u>Sample Size</u>
2 - 50	2
51 - 500	3
501 - 35000	5
35001 and up	8

4.3 Test methods.

4.3.1 pH. The pH shall be determined in accordance with ASTM E 70.

4.3.2 Performance. Test the sample detergent and the reference formulation as specified in 4.3.2.1 and 4.3.2.2.

4.3.2.1 Chelating agent. Test the samples and comparison formula as specified in ASTM D 1767 Ethylene Diamine Tetraacetate (EDTA) in Soaps or Synthetic Detergents. The product shall have a chelating agent content equal or above that of the comparison formula.

4.3.2.2 Cleaning efficiency. Determine the cleaning efficiency of the samples and the comparison formula by the following procedure.

4.3.2.2.1 Equipment and reagents.

- a. Straightline Washability Apparatus (Henry A. Gardner Laboratory, Inc., Bethesda, MD 20014), equipped with sponges and sponge box.
- b. Photovolt Model 670 or equal with a 610 Y search unit and tristimulus green filter (range 520 to 540 millimicrons) manufactured by Photovolt Corporation, 1115 Broadway, New York, NY 10010.
- c. Motor stirrer.
- d. Template of black linoleum panel, 4.5 x 9.0 inch (11.5 x 23.1 cm) with four evenly spaced holes for making reflectance readings. See figure 1.
- e. White vinyl tiles, 4.5 x 9.0 inch (11.5 x 23.1 cm), may be purchased from American Biltrite, Inc., Trenton, NJ 08607 - Amtico VP-11.
- f. Gardner adjustable blade, model AG 382A (Henry A. Gardner Laboratory, Inc. Bethesda, MD 20014.)
- g. Soil.
- h. White mineral oil, USP.
- i. Deodorized Kerosene
- j. Oleic acid, USP.
- k. Morpholine.
- l. Modified Sanders and Lambert Urban soil, whose composition is:

P-D-1747C

	<u>Weight in grams</u>
Hyperhumus (Hyperhumus Co., Newton, NJ 07860)	38.0
Portland cement	15.0
Low color furnace carbon black (Cities Service Co. Raven 410 Powder or equal)	1.5
Synthetic red iron oxide (Cities Service Co. Mapico Red 387 or equal)	0.3
Powdered silica (200-300 mesh)	15.0
Bandy black clay (Spinks Clay Co., Newport, KY 41075)	16.7
Stearic acid (USP)	1.5
Oleic acid, (USP)	1.5
Palm Oil (USP)	3.0
Cholesterol (USP)	1.0
Vegetable Oil (Iodine value of 110 ± 10)	1.0
N-Octadecane, technical grade	1.0
1-Octadecene, technical grade	1.0
Linoleic acid, technical grade	2.0
White mineral oil	1.5

Mix the ingredients in a ball mill with 150 ml distilled water and about 210 9.5-mm diameter grinding media steel balls and grind for 24 hours. Air dry the mixture overnight, grind in a mortar and pass through 100 mesh screen.

4.3.2.2.2 Procedure.

4.3.2.2.2.1 Preparation of vinyl panels. Thoroughly clean 4.5 x 9.0 inch (12.7 x 22.9 cm) vinyl panels before and after use in the following manner: (a) clean the panels with petroleum ether and dry, (b) rough the panel surfaces by gently scrubbing with an abrasive oxygen-bleach scouring powder using a wet cellulose sponge, and (c) thoroughly rinse the panels with tap water and allow to dry at ambient temperature. Determine the reflectance of the panels (see 4.3.2.7) and record.

4.3.2.2.2.2 Preparation of soil emulsion. Mix in a 250-ml beaker, 2.0 g kerosene, 2.0 g mineral oil, 2.5 g oleic acid, and 30.0 g petroleum ether. Blend in 10.0 g Modified Sanders-Lambert Urban Soil. Into the oil-soil mixture, slowly blend, with higher shear mixing for 15 minutes, a mixture of 16.0 g distilled water and 1.5 g morpholine. Similarly, blend in a additional 41.0 g distilled water. Use at once, since this emulsion breaks rapidly.

4.3.2.2.2.3 Preparation of soiled panels. Apply the soil uniformly to the panels to a depth of 0.008 inch using the Gardner adjustable blade set at 0.008 inch. Air dry the panels for one hour, then heat the soiled panels at $103 \pm 2^{\circ}\text{C}$ for 1 hour. Cool at room temperature for four hours.

4.3.2.2.2.4 Washing procedure. Two vinyl panels are used to evaluate each cleaner.

- Cut to size a dry cellulose sponge to fit the sponge box. The thickness of the sponge shall be 1 inch (2.54 cm) when wet. Total weight of the sponge box and dry sponge shall be 454 g.
- Spray 3 to 4 ml of undiluted detergent uniformly over the soiled area of the panel. Allow the detergent to penetrate the soiled area for 1 minute.
- Wet two sponges with tap water and squeeze damp-dry.
- Insert the sponge in the sponge holder of the Gardner apparatus.
- Place the test panel in the apparatus and center it with two properly sized pieces of vinyl molding.
- Run apparatus for ten cycles (20 strokes), turn sponge over in holder, and continue wiping for an additional ten cycles (20 strokes).
- Insert the second clean damp-dry sponge in the holder and wipe for 5 cycles (10 strokes).
- Rinse panel with tap water and air dry.

4.3.2.2.2.5 Reflectance measurement. Using the reflectometer and search unit equipped with tristimulus green filter, measure the reflectance of the surface of the test panel before soiling and after washing using a black linoleum template of the dimensions specified in figure 1. Make four reflectance measurements on different areas of the soiled and washed portion of each panel examined. Measure the four readings to the nearest 0.5 percent and average the results. This procedure should be repeated for each of the two panels required to test each cleaner. Between panels, the search unit is rested on a standard white plaque of approximately 80 percent reflectance, and the instrument checked before each series of readings.

P-D-1747C

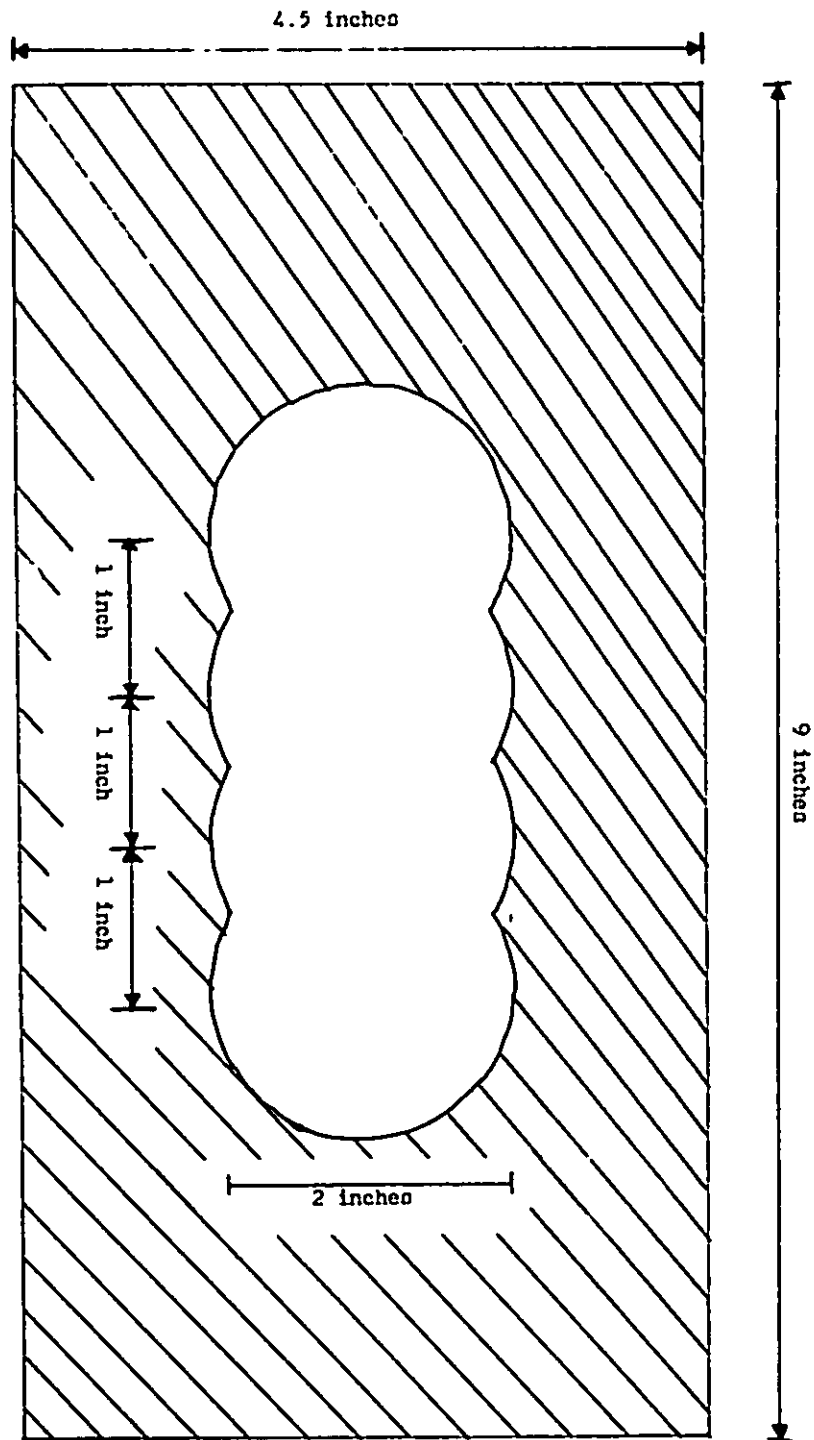


Figure 1. Template dimensions.

P-D-1747C

4.3.2.2.2.6 Cleaning efficiency (C.E.).

$$\text{Percent C.E.} = \frac{R_2}{R_1} \times 100$$

where: R_1 = reflectance of unsoiled, unwashed panel.
 R_2 = reflectance of soiled, washed panel.

Report the cleaning efficiency results on individual determinations of the cleaning efficiencies obtained from the two test panels. The results shall be reported to the nearest 0.5 percent. The product shall have a cleaning efficiency equal or better than the comparison formula.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A, B, or commercial as specified (see 6.2).

5.1.1 Levels A and B. Detergent shall be packaged in 10 pint, 22-ounce, 1/2-gallon, or 1-gallon capacity polyethylene bottles as specified (see 6.2). The polyethylene bottles shall be fabricated and closed in accordance with the applicable requirements of MIL-B-26701, except that the 1-pint bottles and 22 ounce bottles shall be fitted with a sprayer closure unit (Bakan Plastics No. 5 sprayer, or equal) in such a way as to prevent leakage during shipment. Twelve filled pint bottles shall be further packaged in a snug-fitting box conforming to style RSC, type CF, variety SW, class domestic, grade 200 of PPP-B-636. Each box shall be closed in accordance with the appendix to the box specification. Filled 22-ounce, 1/2-gallon and 1-gallon bottles do not require additional packaging.

5.1.2 Commercial. The detergent shall be preserved and packaged in accordance with normal commercial practice. The complete package shall be designed to protect the detergent against damage during shipment, handling and storage.

5.2 Packing. Packing shall be level A, B or commercial as specified (see 6.2).

5.2.1 Level A. Forty-eight filled 1-pint bottles (four packages), twelve filled 22-ounce bottles, six filled 1/2 gallon bottles, or six filled 1-gallon bottles of detergent, packaged as specified in 5.1, shall be packed in a snug-fitting box conforming to style RSC or RSC-L (as applicable), grade V2s of PPP-B-636. The inside of each box packed with 22-ounce, 1/2-gallon, or 1-gallon bottles of detergent shall be fitted with a box liner conforming to type CF, class weather resistant, variety DW, grade V15c of PPP-B-636. In addition, each box fitted with a liner shall be provided with a tier separator pad (when applicable) and top and bottom pads fabricated of weather-resistant grade fiberboard material. The pads shall measure 1/4 inch less than the inside length and width of the box liner. Each box shall be closed in accordance with method III, waterproofed in accordance with Method V and reinforced as specified in the appendix of the box specification. When specified (see 6.2), in addition to the liner, boxes for 12 ounce, 1/2 gallon and 1 gallon bottles shall be fitted with full-height corrugated partitions to provide a snug-fitting cell for each bottle. The flutes of the liner and partitions shall be perpendicular to the opening of the box.

5.2.1.1 When specified (see 6.2), the fiberboard shipping container shall be grade V3c, V3s, or V4s fiberboard box fabricated in accordance with PPP-B-636 and closed in accordance with Method III, waterproofed in accordance with Method V and reinforced as specified in the appendix of the box specification.

5.2.2 Level B. The filled bottles of detergent, packaged as specified in 5.1 shall be packed as specified in 5.2.1 except that the fiberboard shall be class domestic of equal strength as that specified in 5.2.1 and waterproof sealing of the boxes shall be required.

5.2.3 Commercial. The packaged detergent shall be packed in fiberboard boxes to insure safe delivery at destination, to provide for safe redistribution by the initial receiving activity and shall be acceptable by common carrier under National Motor Freight Classification and Uniform Freight Classification.

5.3 Marking.

5.3.1 Civil agencies. Marking shall be in accordance with Fed. Std. No. 123.

5.3.2 Military activities. Marking shall be in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The ready-to use cleaner covered by this specification is intended for the cleaning of walls, woodwork, molding, linoleum, ceramic tile, porcelain fixtures, venetian blinds, exhaust fans, stainless steel, and plastics. It may be used to clean soap scum from bathroom and shower surfaces.

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) Class required (see 1.2.1).
- (c) Quantities required (see 5.1.1).
- (d) Packaging and packing (see 5.1 and 5.2).
- (e) When V3c, V3s or V4s grade fiberboard shipping containers are required for level A packing (see 5.2.1).
- (f) When partitions are required for packing of 22 ounces, 1/2-gallon and 1 gallon bottles of detergent (see 5.2.1.1).
- (g) Marking required (see 5.3).

6.3 Class 2 has been deleted due to lack of procurement requirements.

Military Military

Custodians:

Army - GL
Air Force - 99

PREPARING ACTIVITY:

GSA - FSS

Review Activity:

Army - MD

User Activities:

Navy - MC, MS, SH

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