

P-R-1420C

June 21, 1974

SUPERSEDING

Int. Fed. Spec. P-R-001420B(Army-GL)

December 17, 1971

FEDERAL SPECIFICATION

RINSE ADDITIVE, LAUNDRY

(FABRIC SOFTENER AND ANTI-STATIC AGENT)

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 compounds which are added to the final rinse water of a laundering operation to enhance the handling qualities of the laundered fabrics. Rinse additive, type II, imparts softness and may impart anti-cling properties to the fabric. Type III compound enhances the handling properties and imparts anti-static properties to fabrics which have tendencies to build up an electric charge under conditions of low humidity.

1.2 Classification.

1.2.1 Type. The rinse additives shall be of two types, as specified (see 6.2 and 6.6).

Type II - Fabric Softener, powder form

Type III - Anti-Static Agent, liquid form

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue 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:

- PPP-D-729 - Drums, Shipping and Storage, Steel, 55-Gallon
- PPP-P-45 - Packing of Bulk Quantities of Soaps, Detergents, and Related Products (Chip, Powdered or Granular Form) for Domestic and Overseas Shipment
- PPP-P-704 - Pails, Metal: (Shipping, Steel, 1 through 12 Gallon)

FSC 7930

P-R-1420C

Federal Standards:

- FED-STD-123 - Marking for Domestic Shipment (Civil Agencies)
- FED-STD-191 - Textile Test Methods

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

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

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Specification:

- MIL-C-43725 - Cloth, Bengaline, Polyester Warp and Polyester Cotton Filling

Military Standards:

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

(Copies of specifications and standards required by suppliers 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.

American Association of Textile Chemists and Colorists (AATCC)

AATCC Technical Manual

(Application for copies should be addressed to American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.)

P-R-1420C

American Society for Testing and Materials (ASTM) Standard:

D 1544-63T - Gardner Color Standards for Liquids

(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 Associations, Inc., Tariff Order Section, 1616 P Street, N.W., 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 Material. Type II rinse additive covered by this specification shall be a uniform powder consisting of a mixture of a quaternary ammonium compound and a water-soluble carrier, so formulated that it shall not cake. Type III rinse additive shall be a single-phase, homogeneous solution in liquid form.

3.2 Solubility. Rinse additives, types II and III, shall completely disperse in warm water to form homogeneous solutions or dispersions without any deposits when tested as specified in 4.4.1.1 or 4.4.1.2, as applicable.

3.3 Odor. Types II and III rinse additives shall not have an offensive odor. All compounds may be mildly perfumed in keeping with commercial practice.

3.4 Stability after storage.

3.4.1 Odor after storage. The compounds shall have no offensive odor after being stored for 12 months beyond the date of delivery (see 6.3).

3.4.2 Stability on fabric. The compounds shall not cause discoloration or have any other detrimental effect on treated fabrics during a 12 month period, under normal atmospheric storage. The softener effect shall persist through a 12 month storage period (see 6.3).

3.5 Rewettability of treated fabrics (type II). Test fabrics treated with fabric softener, type II, shall be readily rewetted when tested as specified in 4.4.2.

P-R-1420C

3.6 pH of aqueous dispersions. One percent dispersions of rinse additives in distilled water shall have pH values between 5 and 8 when tested as specified in 4.4.3.

3.7 Active ingredient (type II). The active ingredient in type II rinse additive shall be either dimethyl disteryl ammonium chloride or dimethyl benzyl steryl ammonium chloride. The active ingredient (100% active) content shall be a minimum of 26.5 percent.

3.8 Color (type II). A solution of type II rinse additive, prepared as specified in 4.4.4, shall have a color not higher than 1 on the Gardner Color Scale.

3.9 Electrical resistivity of treated fabric (type III).

3.9.1 Electrical resistivity of treated fabric before oven aging. Rinse additive, type III, shall impart to a polyester/cotton test fabric (see 6.4) an electrical resistivity not greater than 1.0×10^{12} ohms per square when applied, conditioned, and tested as specified in 4.4.5.

3.9.2 Electrical resistivity of treated fabric after oven aging. Polyester/cotton test fabric, when treated, oven aged, conditioned, and tested as specified in 4.4.5 shall have an electrical resistivity not greater than 1.0×10^{12} ohms per square.

3.9.3 Electrical resistivity of treated fabric after laundering. Polyester/cotton test fabric, when treated, laundered, conditioned, and tested as specified in 4.4.5 shall have an electrical resistivity not less than 1.0×10^{13} ohms per square.

3.10 Labeling.

3.10.1 Type II. Each container of rinse additive shall be durably and legibly marked with the following information and directions for use:

Rinse Additive, Laundry, type II

(Fabric Softener)

Add rinse additive to the final rinse, blue or sour of a laundry operation to impart softness to such items as towels, linens, diapers, and to garments of synthetic fabrics and wool.

Directions for use

Use 2-4 ounces of rinse additive for each 100 pound washer load. Dissolve rinse additive in 2-3 quarts of warm water, add mixture to washer and run for 5-7 minutes.

3.10.2 Rinse additive, laundry type (anti-static agent). Each container of rinse additive shall be clearly marked with the following information and directions: Add the additive to the final rinse (low water level not lower than 6 inches) during the final operation to impart anti-static properties to synthetic fabrics such as cotton/polyester blends and other fabrics which build up an electric charge when worn under conditions of low humidity.

Directions for use

Use rinse additive (anti-static agent) at the rate of 24 ounces for each 100 pound washer load. Dilute rinse additive with at least an equal volume of water before adding to the washer at low level (6 inches) and run for 5-7 minutes. Extract garments lightly (1 minute) and tumble dry at a temperature not exceeding 150°F., turn off the dryer and tumble load until cooled to room temperature, remove from dryer and immediately place on hangers.

3.11 Workmanship. The finished products shall be uniform in appearance and free from foreign material.

4. QUALITY ASSURANCE PROVISIONS

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

4.1.1 Certificate of compliance (type II). The supplier shall submit to the contracting officer a certificate identifying the quaternary ammonium compound as specified in 3.7 and the amount contained in the product he is supplying. He also shall certify that his product conforms to the stability requirements for storage and on treated fabrics.

4.1.2 Certificate of compliance (type III). The supplier shall submit to the contracting officer a certificate identifying the active ingredient in the product he is supplying. He also shall certify that his product conforms to the stability requirements for storage and on treated fabrics.

4.2 Sampling for inspections and tests. Sampling for inspections and tests shall be in accordance with the provisions of MIL-STD-105, except where otherwise indicated herein.

P-R-1420C

4.2.1 Inspection of materials and components. In accordance with 4.1 above, components and materials shall be inspected and tested in accordance with all the requirements of referenced specifications and standards unless otherwise excluded, amended or qualified in this specification or applicable purchase document.

4.3 Inspection of the end item.

4.3.1 Examination of the end item. The end item shall be examined for the defects in the applicable subparagraphs at the inspection levels and acceptable quality levels (AQLs) set forth in 4.3.1.4. The lot size, for purpose of determining the sample size in accordance with MIL-STD-105, shall be expressed in units of filled shipping containers of the same capacity, manufactured in one batch, for examination in 4.3.1.1 and 4.3.1.2, and in units of shipping containers for examination in 4.3.1.3.

4.3.1.1 Examination of contents of the shipping container. The sample unit for this examination shall be one filled shipping container.

<u>Examine</u>	<u>Defect</u>
Appearance	Not clean; foreign matter present. Not uniform. Not homogeneous.
Form	Not a powder (type II), Lump (type II); not a liquid (type III).
Odor	Offensive.

4.3.1.2 Examination of the shipping container for net contents. The sample unit for this examination shall be one filled shipping container. The lot shall be unacceptable if the average net content is less than specified.

4.3.1.3 Examination of preparation for delivery requirements. An examination shall be made to determine that the packaging, packing, and marking complies with the section 5 requirements. Defects shall be scored in accordance with the list below. The sample unit shall be one shipping container fully prepared for delivery with the exception that it need not be closed. Defects of closure listed below shall be examined on shipping containers fully prepared for delivery. The lot size shall be the number of shipping containers in the end item inspection lot.

<u>Examine</u>	<u>Defect</u>
Marking (exterior)	Omitted, incorrect; illegible; of improper size, location, sequence or method of application.
Materials	Any component missing, damaged or not as specified.
Workmanship	Inadequate application of components, such as: incomplete or improper closure of drum liners. Bulged or distorted container.
Weight or content	Greater or less than specified.

4.3.1.4 Inspection levels and acceptable quality levels (AQLs) for examination. The inspection levels, for determining the sample size, and the acceptable quality levels (AQLs), expressed in defects per one hundred units, shall be as follows:

Examination paragraph	Inspection level	AQLs
4.3.1.1	S-2	2.5
4.3.1.2	S-2	N.A.
4.3.1.3	S-1	2.5

4.3.2 Testing of the end item. The rinse additive shall be tested for the characteristics specified in table I. The sample unit for type II shall be a one pound composite and for type III, the unit shall be a one pint composite. The lot shall be unacceptable if any sample unit fails to meet any test requirement specified. The number of containers to be sampled for obtaining the composite sample, shall be as indicated below:

<u>Lot size (pounds or gallons)</u>	<u>No. of containers</u>
800 or less	2
801 up to and including 22,000	3
22,001 or more	5

INSTRUCTIONS FOR TESTING OF THE END ITEM

TABLE I

CHARACTERISTIC	Specification Reference		Requirements Applicable To		Number Determinations Per Unit	Results Reported As		Inspect Level	AQL
	Requirement	Test Method	Sample unit	Lot Aver		Pass or Fail	Numerically to Nearest		
Solubility	3.2	4.4.1			1	X			
Rewettability of treated fabric (type II)	3.5	4.4.2			1	X			
pH of aqueous dispersions	3.6	4.4.3			2		.1		
Color (type II)	3.8	4.4.4			1	X			
Odor	3.3 & 3.4.1				1	X			
Electrical resistivity of treated fabric (type III)	3.9	4.4.5			1		.1 ohm/square		

AMXRE Form 598
8 February 1965

4.4 Test method.

4.4.1 Solubility.

4.4.1.1 Solubility (type II). Pour 500 ml of hot ($120^{\circ} + 5^{\circ}\text{F}$) distilled water into a 1-liter beaker. Add 5.0 grams of the powder additive to the distilled water without agitation. At the end of 1 minute the powder shall be completely wetted out, considerably dispersed. With a stirring rod, stir the mixture vigorously for 2 minutes. The mixture shall then be homogeneous and free from undispersed material or deposit on the bottom of beaker.

4.4.1.2 Solubility (type III). Pour 5 ml of the liquid rinse additive into a 1-liter beaker, then add 500 ml of hot ($120^{\circ} + 5^{\circ}\text{F}$) distilled water and stir gently for 1 minute. The mixture shall be homogeneous and free from undispersed material or deposit on the bottom of the beaker.

4.4.2 Rewettability of treated fabric (type II). Pour 1 gallon of hot water ($120^{\circ} + 5^{\circ}\text{F}$) into a 10-quart pail. Disperse 40 ml of rinse additive in the hot water, then add 1 pound of bleached, white, cotton crash toweling to the solution. The toweling shall have previously been thoroughly laundered to remove sizing. Manually work solution into the fabric for a period of 10 minutes. Wring excess solution from fabric and tumble dry at a temperature not exceeding 160°F . A 1-pound bundle of the above treated fabric shall be placed on the surface of clean tap water at room temperature, without agitation, and at the end of 60 seconds the bundle of fabric shall be completely wetted-out and submerged.

4.4.3 pH of aqueous dispersions, types II and III. Disperse 1 gram of rinse additive into 100 ml distilled water. Determine the pH value of this dispersion using a pH meter with glass electrode at a temperature of 25°C .

4.4.4 Color (type II). The color of the solution prepared as specified in 4.4.1.1 shall be determined in accordance with Method ASTM D1544-63T (Gardner Color Standards).

4.4.5 Electrical resistivity of treated fabric (type III).

4.4.5.1 Apparatus.

- a. Launder - Ometer with auxillary equipment - 1 pint (3 X 5 inches) stainless steel cylindrical containers, 1/4 inch stainless steel balls as described in Method 5610 1/
- b. Laboratory wringer as described in Method 5630 1/
- c. Tumble dryer as described in Method 5556 1/
- d. Conditioning test chamber - a test chamber capable of maintaining an atmosphere of $30 + 2\%$ relative humidity and $70 + 2^{\circ}\text{F}$.
- e. Electrical resistivity test equipment consisting of an electrical resistance meter, standard resistors, and a radioactive bar as described in Method 76 - 1964 of AATCC Technical Manual.

1/ FED-STD-191

P-R-1420C

4.4.5.2 Materials.

- a. Test fabric - Cloth, Bengaline, polyester warp and polyester/cotton filling, 4.0 - 4.5 ounce per square yard, MIL-C-43725 (see 6.4).

4.4.5.3 Application of rinse additive to test fabric. Prepare three (3) test fabric specimens each measuring 9 inches (filling direction) by 4 inches (warp direction). Weigh each to the nearest 0.1 gram. Prepare a 2.5 percent solution of the rinse additive by dissolving 12.5 g. in distilled water, or deionized water to make a total volume of 500 ml. Place in each of three 1 pint Launder - Ometer containers, 35 mls of the 2.5 percent solution and 10, 1/4 inch stainless steel balls. Warm the containers and contents to $100^{\circ} + 2^{\circ}\text{F.}$, add a cloth specimen to each container. Seal the containers, clamp them in the Launder - Ometer and run at $100^{\circ} + 2^{\circ}\text{F.}$ for 10 minutes. Pass each of the treated cloth specimens, individually, between the squeeze rolls of the wringer which has been adjusted to give a 30-40 percent wet pick-up with the test fabric. 2/ Weigh each of the wet specimens to check on the wet pick-up. In a tumble dryer maintained at $200^{\circ} + 2^{\circ}\text{F.}$, dry each specimen for 5 minutes.

2/ The squeeze rolls should be cleaned before each use.

4.4.5.4 Preparation and conditioning of test fabric specimens for the determination of electrical resistivity. From each of the three treated specimens cut three specimens each measuring 4 inches in warp direction by W inches in the filling direction, where W equals the width of the electrodes used in the electrical resistivity apparatus. Make up three sets of electrical resistivity specimens, each set containing one specimen from each of the above treated (9 X 4) test fabric specimens. Process the three sets as follows:

Set 1 - Condition specimens at $30 + 2\%$ relative humidity and $70 + 2^{\circ}\text{F.}$ for 24 hours. Determine the electrical resistivity of each specimen in accordance with Test Method AATCC76-1964. Compute the resistivity in ohms per square for each specimen and report the average for the three specimens.

Set 2 - Suspend the three electrical resistivity specimens in a low velocity air circulating oven maintained at $120^{\circ} + 2^{\circ}\text{F.}$ for 6 hours. Remove specimens from oven and condition them at $30 + 2\%$ relative humidity and $70^{\circ} + 2^{\circ}\text{F.}$ for 24 hours. Determine the electrical resistivity as indicated for set 1.

Set 3 - The remaining set of electrical resistivity specimens shall be laundered in accordance with Method 5610 of FED-STD-191. Condition and determine the electrical resistivity as indicated for set 1.

5. PREPARATION FOR DELIVERY

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

5.1.1 Type II.

5.1.1.1 Level A, B, and C. Fifty or 175 pounds of rinse additive, as specified, shall be packed in a fiber drum described in PPP-P-45 for level A, B, or C, as specified (see 6.2).

5.1.2 Type III.

5.1.2.1 Level A and B.

5.1.2.1.1 Fifty-five gallons quantity. Fifty-five gallons of rinse additive shall be packed in a 55-gallon capacity metal drum conforming to type IV of PPP-D-729. Each drum shall be provided with a 0.005-inch thickness (+ 20% tolerance) polyethylene bag liner having a depth great enough to permit the top of the liner to be pulled over the curl of the drum a minimum of 1-1/2 inches. A 0.002-inch thickness (+ 20% tolerance) polyethylene disc shall also be provided, which shall have a diameter 3 inches greater than the outside diameter of the cover. The disc shall be centered over the top of the drum. Each drum shall be closed in accordance with the applicable requirements of PPP-D-729.

5.1.2.1.2 Five gallon quantity. Five gallons of rinse additive shall be packed in a 5-gallon capacity metal pail conforming to type 1, class 3 of PPP-P-704. The closure shall be at the option of the rinse additive supplier.

5.1.2.2 Level C. Fifty-five gallons or 5-gallons of rinse additive shall be packed in a 55-gallon capacity metal drum conforming to type III of PPP-D-729 or 5-gallon capacity metal pail conforming to type 1, class 2 of PPP-P-704, as applicable. Each metal drum shall be provided with a polyethylene bag liner and disc as specified in 5.1.2.1.1. The drum and pail closure shall be effected in such a manner to insure carrier acceptance and safe delivery at destination at the lowest transportation rate for such supplies. Containers shall be in accordance with Uniform Freight Classification Rules or National Motor Freight Classification Rules, as applicable.

5.2 Marking.

5.2.1 Civil agencies. In addition to the labeling specified in 3.10 and to any special marking required by the contract or order, each shipping container shall be marked in accordance with FED-STD-123.

5.2.2 Military requirements. In addition to the labeling specified in 3.10 and to any special marking required by the contract or order, each shipping container shall be marked in accordance with MIL-STD-129.

P-R-1420C

6. NOTES

6.1 Intended use. The type II rinse additive is intended for use in the final rinse water of a laundering operation to enhance the handling qualities of the laundered fabrics. Type III rinse additive is used for the treatment of nurses' polyester/cotton white uniforms or other items that require good antistatic properties.

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) Type required (see 1.2.1).
- (c) Quantity of rinse additive required in shipping containers (see 5.1.1.1, 5.1.2.1.1 and 5.1.2.1.2).
- (d) Level of packing required (see 5.1).

6.3 Long term stability. In 3.4.1 and 3.4.2 product performance is specified for a 12 month period. No test is offered to verify this requirement before accepting shipment, but product defective in this respect should be reported to the contracting officer.

6.3.1 The following statement should be included in the purchase contract: "If latent defects are discovered within a period of 12 months after material has been accepted, the Government reserves the right to reject the delivery, require replacement, or cancel the contract and surcharge the contractor for any expense incurred by the cancellation of the contract and in securing satisfactory material".

6.4 Test fabric. The test fabric required in the evaluation of anti-static properties imparted by treatment in type III laundry rinse additive is available from the Commanding General, U.S. Army Natick Laboratories, Natick, MA 01760, ATTN: STSNL-CCP. This fabric conforms to the requirements of Military specification MIL-C-43725, Cloth, Bengaline, Polyester Warp and Polyester/Cotton Filling except that it shall be free from any finishing additives.

6.5 Compounds which have been found to meet the requirements of this specification for type III product include the following: "Avitex DN", E. I. duPont de Nemours & Co., Wilmington, Delaware; "ZELEC TY", E. I. duPont de Nemours & Co.,; "Aerotex Antistatic CSN Concentrate", American Cyanamid Organic Chemical Div., Bound Brook, NJ; "Aston 456", Refined Anyx Div., Millmaster Anyx Corps, Lyndhurst, NJ.

6.6 Deletion. The type I additive covered in P-R-1420B has been deleted in this revision since there are no requirements for the paste form additive.

P-R-1420C

Custodians:

Army - GL
Navy - SH
Air Force - 84

Review activity:

Army - MD

Preparing activity:

Army - GL

CIVIL AGENCY COORDINATING ACTIVITY:

GSA-FSS

Project No. 7930-0284

Orders for this publication are to be placed with 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. Price 35 cents each.

