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SUPERSEDING
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FEDERAL SPECIFICATION

RAG, WIPING, COTTON AND COTTON-SYNTHETIC

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 requirements for cotton wiping rags and cotton-synthetic blended wiping rags made from unused or reclaimed fabrics for use in the wiping of water, oil, and grease from miscellaneous items (see 6.1).

1.2 Classification.

1.2.1 Grades. Wiping rags shall be of the following grades, as specified (see 6.2).

Grade A - 2.0 to 7.0 ounces per square yard.
Grade B - 2.0 to 14.0 ounces per square yard.

1.2.2 Colors. Wiping rags shall be furnished in the following colors as specified, and shall be applicable to the grades indicated (see 6.2 and 6.3).

White - Grade A.
Mixed colors - Grade A or Grade B.

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:

Military Standard:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procurring 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 Associations, Inc., Traffic Department, 1616 P. Street, N.W., Washington, DC 20036.)

Uniform Classification Committee, Agent:

Uniform Freight Classification.

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

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American Society for Testing and Materials (ASTM) Standard:

D 276 - Standard Methods for Identification of Fibers In Textiles.

(ASTM Standards are available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

3. REQUIRMENTS

3.1 Material. Wiping rags shall be all cotton or cotton-synthetic blends made from either clean mill ends and mill remnants, or reclaimed fabrics from household articles and garments. Rags shall be soft, absorbent and either woven or knitted construction. Heavily napped fabrics, mesh fabrics constructed from hard twisted yarns, and starched or stiffened fabrics are not acceptable. Rags made from United States flags, National flags of foreign countries or remnants thereof are strictly prohibited.

3.1.1 Defective characteristics. Rags exhibiting any of the following characteristics shall be considered defective:

(a) Rags containing stains which cover more than one-tenth of the area of the rag.
(b) Rags containing an aggregate of more than 1 square inch of hardened surface.
(c) Rags containing dirt, dust, abrasives, or other clearly noticeable nonfibrous materials.
(d) Rags made of mesh fabrics, such as lace, scrim, and netting except that mesh will be acceptable as a border if not more than 1-inch in depth on an otherwise acceptable rag.
(e) Rags badly worn or tendered as to be unsuited for the intended purpose (see 4.2.6).
(f) Tattered parts less than 3 inches in width and more than 6 inches in length (see 6.3.5).
(g) Edges frayed or raveled continously or intermittently to a depth of over 2 inches.
(h) Rags made from unopened sleeves, pants, and drawer legs.
(i) Any rags made from United States flags, National flags of foreign countries or remnants thereof.
(j) Rags containing buttons, hooks, eyes, pins, or any other metallic or plastic fittings.
(k) Rags containing elastic yarns amounting to more than 5 percent of the area of the rag.
(l) Grade A (only) - Rags made from fabrics of which the crotch, cuffs, cuff hems, hems, waistbands, pockets, reinforcements, collars, weltings, and pipings over 1/2 inch in width that have not been completely removed. However, hems in bed sheets and pillowcases 4 inches wide and under will be acceptable.
(m) Any rag not containing cotton fiber.
(n) Grade B (only) - Rags, including those made from pants, overalls, jackets, and coats, weighing over 10.0 ounces per square yard having pockets, reinforcements (including collar, cuffs, buttonhole and waistband reinforcements), welting and piping (such as used slip covers, etc.) which have not been completely removed. Also, hems over 1 inch in width, unopened hems, and patches with an area in excess of 4 square inches are not acceptable.

3.1.2 The material offered shall contain not less than 85 percent of recovered materials. Recovered materials are defined as material which has been collected or recovered from solid waste.

3.2 Size and measurement. Each wiping rag shall have an area of not less than 200 square inches, and shall be not less than 9 inches wide and not more than 44 inches long.

3.3 Weight.

3.3.1 Grade A. Grade A wiping rags shall weigh not less than 2.0 more than 7.0 ounces per square yard (see 3.9.)

3.3.2 Grade B. Grade B wiping rags shall weigh not less than 14 ounces per square yard. At least 50 percent of the net weight of each bale shall be composed of rags weighing not less than 2.0 ounces nor more than 8.0 ounces per square yard (see 3.9.)

3.4 Absorbency rate. All rags shall absorb water and oil within 30 seconds when tested in accordance with 4.2.2.

3.5 Washing and sanitization. All rags shall be thoroughly washed, rinsed and sanitized except new and unused mill ends which have been dyed or bleached. New and unused mill ends which are greige goods do not require sanitizing; however, they are requried to be properly washed to break down natural cotton oils and waxes or any sizes which are water resistant. All rags must meet the absorbency requirements as specified in 3.4. (This processing shall be done within the United States, its possessions or Puerto Rico) (see 6.3.3).

3.6 Moisture content. Rags shall have a moisture content no greater then 7.5 percent when tested in accordance with 4.2.4.

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3.7 Put-Up. Unless otherwise specified rags shall be put-up in compressed bales of 50 pounds gross weight and with a volume of not more than 3-1/2 cubic feet. Bales shall be permitted a plus or minus tolerance of 3 pounds. Weight variations of more than a plus or minus 3 pounds will be cause for rejections (see 4.2.1).

3.8 Tare. The allowable average tare weight for each bale shall not exceed 1.75 pounds. Average tare exceeding 1.75 pounds per bale shall be cause for rejection (see 4.2.1).

3.9 Certificate of compliance. A certificate of compliance for each shipment is required for the following to verify that (1) grade A rags weigh between 2.0 and 7.0 ounces, 50 percent of each bale of grade B rags is composed of rags weighing between 2.0 and 8.0 ounces, (3) all rags have been sanitized except new and unused mill ends and, (4) all rags contain cotton fiber in accordance with 3.1. Where certificates of compliance or reports of analysis are submitted, the Government reserves the right ot check test such items to determine the validity of the certificates of analysis. Where Government inspection results indicate a certificate is not valid the Government may refuse to accept any more such certificates, and require the contractor to submit actual inspection (Including test) results.

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 where he is allowed to submit a certificate of compliance.

4.2 Test procedures.

4.2.1 Weight verification. Select not less than ten bales from the lot. Determine the gross weight per bale and the average gross weight. No bale may exceed the specifiec gross weight tolerance. Select five of the bales and check volume. Remove the outer bale coverings from 5 bales and determine their average tare weight.

4.2.2 Absorption. Sampling shall be in accordance with MIL-STD-105D. The lot size shall be expressed in terms of rags, each bale containing approximately 200 rags. Using inspection level S-3, AQL o. 6.5 percent defective, select a sample and test. This sample may be selected from the bales opened for weight verification. Each sample rag shall be laid on a non-absorbent surface. One drop of distilled water and one drop of light machine oil, each 0.04 ml in volume and 72° ±1°F, shall be applied separately to applicable sample rags through a capillary tube allowing the drops to fall freely onto the rag from a height of approximately 2 inches. After 30 seconds, the samples shall be examined and absorption or non-absorption of the water and oil reported. The rag is considered non-absorbent if the water or oil remains wholly or partly above the surface of the rag.

4.2.3 Cotton fiber content. The lot size shall be expressed in units of rags. The test sample unit shall consist of one rag. The sample rags shall be randomly selected using special inspection level S-3 with an AQL of 6.5 percent defective. Note that each bale contains approximately 200 rags. Rags chosen for the absorency test may be used. The rags shall be tested in accordance with paragraph 4.2.3.1 to determine the presence of cotton fiber (see 3.1).

4.2.3.1 Identification of cotton. To remove oils, waxes, and dirt, the specimen shall be washed in one of the following: ether, acetone, alcohol, or a 5 percent aqueous solution of sodium hydroxide. To remove dyes, one of the following methods shall be used:

(1) By oxidation, using nitric acid, hydrogen peroxide, or chlorine water,
(2) By solution, using alcohol, acetic acid, hydrochloric, acid, or pyridine, or
(3) By reduction, using hydrosulphite, stannous chloride, or hydrochloric acid with metallic zinc.

After dirt, oils, waxes, and dyes have been removed, place a dozen or so fibers from the sample onto a slide. The fibers shall be immersed in three or four drops of Herzberg's stain, covered with a slide avoiding air bubbles, and allowed to stand 2 minutes with surplus solution drained off. Examine with microscope using transmitted light and 100 diameters. Magnification up to 500 diameters may be used if a more detailed examination is necessary. The sample fibers shall be compared with a reference sample which has been treated in the same manner.

The color of cotton (Gossypium sp.) in the natural state, ranges from white to ecru. The staple lenght of commercial cottons varies from about 1/4 inch to slightly more than 2 inches. Microscopically, most fibers appear much like a twisted ribbon with rounded edges. They have no longitudinal or cross markings; the lumens vary from very narrow to over two-thirds of the diametet of the fibers. Diameters of the fibers vary from about 9 to 25 microns and average from 16 to 20 microns. Undyed cotton fibers are stained pink to dark red in color by Herzberg's stain.

As an alternative, ASTM Method D 276 may be used to identify cotton fiber content.

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4.2.4 Moisture content. From the inspection sample for weight verification randomly select 5 rags each from 5 bales (25 rags) with the moisture content to be determined immediately. If this is not possible, the samples, immediately upon selection, shall be placed in an air tight container or plastic bag and sealed to prevent moisture loss. To determine moisture content place the rags in a tared air tight container and weigh. This weight minus the tare weight of the container is the original weight of the rags, W_o. Remove the lid from the container and immediately place in a 221° to 230°F (105° to 110°C) oven for a minimum of 10 hours. Remove the container and immediately reseal and allow to cool. After the container has cooled, reweigh and this weight minus the tare weight of the container is the dry weight of the rags, W_d. The percent moisture content shall be calculated from the following formula:

$$\text{Percent Moisture Content} = \frac{W_o - W_d}{W_o} \times 100$$

The moisture content of the samples shall be considered the moisture content of the entire lot. If the moisture content of the sample unit exceeds 7.5 percent, the entire lot shall be rejected.

4.2.5 Examination for visual and dimensional characteristics. For the purpose of visual and dimensional inspection, the sample unit shall be one rag. The number of bales shall be multiplied by 200 (approx number of rags per bale) to determine the number of individual rags in the inspection lot. Sampling shall be in accordance with inspection level S-4 of MIL-STD-105 and an AQL of 2.5 for majors and 4.0 for minors expressed as percent defective. Rag shall be selected at random with no more than 50 rags coming from any single inspection bale or box. During this examination, if any rag is suspected of not containing cotton by visual examination or by feel, the rag is to be tested in accordance with 4.2.3. If any rag fails the test in accordance with 4.2.3, it shall be classified as a major defect.

TABLE I. Examination for visual and dimensional characteristics

Characteristics	Defects	Classification	
		Major	Minor
	One or more rags made from United Stated *flags, National flags of foreign countries*, or remnants thereof (see 3.1) shall cause the entire lot to be rejected.		
Grades A and B	a. Rags containing no cotton fiber. (Any amount of linen, or flax fiber is acceptable).	X	
	b. Dirt, dust, and abrasive material.		X
	c. Rags containing elastic yarns amounting to more than 5 percent of the area of the rag.		X
	d. Objectionable odor.		X
	e. Rags not white (see 6.3.1) when specified in contract or order.	X	
	f. Not of specified dimensions (see 3.2).	X	
	g. An aggregate of more than 1 square inch of hardened surface.	X	
	h. Rags weighing less than or more than amount specified (see 3.3).	X	
	i. Rags made of mesh fabrics, such as laces, scrim, and netting, except that mesh will be acceptable as a border not more than 1 inch depth on an otherwise acceptable rag.	X	
	j. Rags made from starched or stiffened fabrics.	X	
	k. Rags made from heavy napped fabrics and fabrics woven with hard twisted yarns.	X	
	l. Stains which cover more than one-tenth of the area of the rag.	X	
	m. Badly worn or tendered as to be unsuited for the intended purpose.	X	
	n. Tattered parts less than 3 inches wide and more than 6 inches long.		X
	o. Edge frayed or raveled continuously or intermittently to a depth of over 2 inches.		X

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TABLE I. Examination for visual and dimensional characteristics

Characteristics	Defects	Classification Major	Classification Minor
Grades A and B (con't)	p. Unopened sleeves, pants, and drawers legs.		
	q. Buttons, hooks, eyes, closed safety pins, or any other metallic or plastic fittings (one or more).		X
	r. Rags that have not been thoroughly washed, rinsed, and sanitized. (Except new or unused mill ends.)	X	
	s. Rags containing fiber content labels that declare 100 percent synthetic fiber.	X	
	t. Foreign objects or dangerous materials; such as nails, tacks, needles, pins, glass sharp edged metal items, etc.	3X 1/	
Grade A (only)	a. Rags made from bed sheets and pillow cases containing hems more than 4 inches wide.	X	
	b. Rags, except "a" above, containing crotches, cuffs, cuff hems, hems, wasitbands, pockets, collars, reinforcements, weltings, and pipings over 1/2 inch-in width.	X	
Grade B (only)	a. Rags from pants, overalls, coveralls, jackets and coats over 10.0 ounces containing crotches, cuffs, cuff hems, hems, pockets, and waistbands over 1 inch in width, reinforcements, welting, piping, unopened hems over 1 inch and patches over 4 square inches.	X	

1/ Defect is equivalent to 3 major defects as signified by "3X".

4.2.6 Examination for tenderness. Wiping rags which are in question as to tenderness (see 3.1.1-(e) shall be examined in the following manner:

The rag shall be grasped on opposite edges so that it remains fully opened and flat. There shall be approximately 3 inches of material gathered in each hand. With the arms extended, the rag shall be subjected to a steady outward force. If the rag pulls apart, it shall be consider tender.

4.2.7 Certification. A certification shall be submitted with each bid specifying that the material to be supplied will contain the percentage of recovered material required herein (see 3.1.2).

4.3 Examination of preparation for delivery. The following examination of packaging and marking requirements of section 5 of this specification shall be in accordance with MIL-STD-105 with an AQL of 4.0 expressed in terms of percent defective, and inspection level S-2.

5. PREPARATION FOR DELIVERY

5.1 Commercial packing. Wiping rags of one grade only shall be furnished in bales in weight and volume specified in paragraph 3.7. The bales shall be covered with clean serviceable material and secured with strapping, wire ties, or rope. The bales shall be packaged in accordance with normal commercial practice and in a manner that will assure acceptance by common carrier and provide product protection against breakage or loss during multiple shipments, handling, and storage. The shipping unit shall be in compliance with National Motor Freight Classification or Uniform Freight Classification.

5.2 Marking. Marking shall be as specified in the contract order.

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6. NOTES

6.1 Intended use. Rags are primarily used in wiping away of water, wiping of oil and grease from machinery, and for miscellaneous cleaning.

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

(a) Title, number, and date of this specification.
(b) Grade required (see 1.2.1).

Note: It is suggested that white rags, grade A be ordered only where better quality rags are required.

(c) Color required (see 1.2.2).

6.2.1 Purchasers should specify the following contractual requirement:

(a) That a certified copy of any affidavit, by a responsible officer of the contractor's organization, be submitted with each shipment to the effect that all rags furnished have been washed, rinsed, sanitized, and dried within the United States, its possessions, or Puerto Rico (see 3.5).

6.3 Interpretation.

6.3.1 White. The word "white" as contained in 2.2.2 shall be interpreted to mean the following type rags: unbleached or fully bleached, and colored rags which have had the dye color completely removed (known as stripped rags) except that evidence of a dye color on seams of stripped rags will be acceptable. Ornamental color trimmings are acceptable, provided they are not over 5 percent of the area of the rag.

6.3.2 Mixed colors. The words "mixed colors" as used in 1.2.2 is intended to include rags of any color, including "white" rags as acceptable.

6.3.3 Sanitization. The word "sanitized" as used in 3.5 implies that the rags have been submitted to temperatures of not less than 180° F during washing cycles and 210° F during heat drying (exhaust air 175° F).

6.3.4 Size and measurements. The width and length dimensions as specified in 3.2 are defined as follows:

The minimum width of a rag shall be the measurement between the two closest opposing points on the perimeter of a rag. The maximum length of a rag shall be the distance between the most distant points along the edges of a rag. When rags are nearly rectangular, the longer side shall be considered the "length".

6.3.5 Tatter. A tatter is a fabric part protruding from the body of the fabric.

6.4 In the process of rinsing rags, 3.5, it is permissible to use a wetting-out agent to increase the absorbency of rags provided that rags meet all requirements of this specification, and are nontoxic.

PREPARING ACTIVITY

GSA-FSS

Orders for this publication are to 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.