

JJ-U-513D

September 11, 1975

SUPERSEDING

Fed. Spec. JJ-U-513C

June 8 1971

(see 6.6)

FEDERAL SPECIFICATION

UNDERSHIRT, MAN'S, (QUARTER-SLEEVE)

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 the requirements for cotton and polyester/cotton blend quarter-sleeve undershirts.

1.2 Classification.

1.2.1 Types, classes, and sizes. The undershirt shall be of three types in the following types, classes and sizes as specified (see 6.2):

- | | | |
|----------|---|---------------------------------------|
| Type I | - | Crew neck, cotton |
| Type II | - | "V" neck, cotton |
| Class 1 | - | White, bleached |
| Class 2 | - | Olive green 109 |
| Type III | - | Crew neck, polyester and cotton blend |
| Class 1 | - | White, bleached |

Schedule of sizes

XX Small (types I & II only) (26-28)	Medium (38-40)	XX Large (50-52)
X Small (30-32)	Large (42-44)	XXX Large (types I & II only) (54-56)
Small (34-36)	X Large (46-48)	

FSC 8420

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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:

- | | |
|----------|--|
| V-T-276 | - Thread, Cotton |
| DDD-L-20 | - Label; For Clothing, Equipage, and Tentage,
(General Use) |

Federal Standards:

- Fed. Std. No. 123 - Marking for Shipment (Civil Agencies).
 Fed. Test Method Std. No. 191 - Textile Test Method.
 Fed. Std. No. 751 - Stitches, Seams, and Stitchings.

(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 require 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 Specifications:

- | | |
|-------------|--|
| MIL-B-17757 | - Boxes, Shipping, Fiberboard, (Modular Sizes) |
| MIL-C-43424 | - Clothing, Combat Type, Contour Packaging and
Packing of |

Military Standards:

- | | |
|--------------|--|
| MIL-STD-105 | - Sampling Procedures and Tables for Inspection by
Attributes |
| MIL-STD-129 | - Marking for Shipment and Storage |
| MIL-STD-1491 | - Glossary of Knitting Imperfections |

(Copies of Military 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.)

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LAWS AND REGULATIONS

Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies may be obtained without charge from the Federal Trade Commission, Washington, DC 20580.)

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., 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 Samples.

3.1.1 Guide sample. Guide samples, when furnished, are solely for guidance and information to the supplier (see 6.3). Variation from this specification may appear in the sample, in which case this specification shall govern.

3.1.2 Standard sample. The dyed class 2 undershirts shall match the standard sample for shade and shall be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (see 6.3).

3.1.3 First article. When specified (see 6.2) the supplier shall furnish a sample for first article inspection and approval (see 4.3 and 6.5).

3.2 Material.

3.2.1 Cloth, cotton, knitted (types I and II undershirts).

3.2.1.1 Body cloth, cotton (types I and II). The body cloth shall be made of single or 2-ply combed cotton yarn. The cloth shall be circular knit with a flat (jersey) stitch and shall have a minimum of 30 wales and 36 courses per inch and a minimum bursting strength of 55 pounds. Testing shall be as specified in 4.4.5.

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3.2.1.2 Collarette cloth. The knitted collarette cloth shall be made of 20/1 or 40/2 (\pm 5 percent), combed cotton yarn. The cloth shall be a true 1 by 1 ribbed knit and shall have a minimum of 24 wales and 32 courses per inch. Testing shall be as specified in 4.4.1.

3.2.2 Cloth, polyester and cotton blend, knitted (type III) undershirts.

3.2.2.1 Fibers.

3.2.2.1.1 Polyester fiber. The fiber shall be 1.5 denier per filament, 1-1/2 inch staple length, optically brightened polyethylene glycol terephthalate when tested as specified in 4.4.1.

3.2.2.1.2 Cotton fiber. The cotton shall be carded and combed when tested as specified in 4.4.1.

3.2.2.2 Yarns. The yarns shall be a blend of polyester and cotton drawn and spun into a 26/1 (\pm 8 percent) yarn when tested as specified in 4.4.1.

3.2.2.3 Fiber content. The finished cloth shall contain either of the following blends, based on the dry weight of the desized specimen when tested as specified in 4.4.1:

65 percent (\pm 3 percent) polyester fiber, and not less than 32 percent cotton.
50 percent (\pm 3 percent) polyester fiber, and not less than 47 percent cotton.

3.2.2.4 Physical requirements. The body cloth shall be flat circular knit and have a minimum of 30 wales and 32 courses per inch and a minimum bursting strength of 40 pounds. The collarette cloth shall be 1 X 1 rib knit with a minimum of 26 wales and 34 courses per inch. Testing shall be as specified in 4.4.1.

3.2.3 Shrinkage (types I, II and III). The knitted cloth shall be pre-shrunk by a mechanical shrinking process before being cut for undershirts. Type I and II undershirts shall not shrink nor elongate more than 12.0 and type III undershirts not more than 10.0 percent, in any of the measurements A, B, or C, (see figures 1 and 2) when tested as specified in 4.4.5. The preshrinking process used shall not be identified by name or trademark on the undershirt or package.

3.2.4 Nonfibrous material content. The starch and protein content, including chloroform-soluble material of the finished cloth, shall not exceed 6.0 percent for types I and II undershirts and 3.0 percent for type III undershirts when tested as specified in 4.4.1.

3.2.5 Color. The color of the knitted cloth for class 1 undershirts shall be white (bleached). The color of the knitted cloth for class 2 undershirts shall be Olive Green 109. The use of dyes and compounds containing elementary sulfur capable of oxidation to sulfuric acid is prohibited. The dyestuff shall be chosen and

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applied so that the dyed and finished cloth shall contain no more labile sulfur than shown by the standard sample when tested as specified in 4.4.1 and 4.4.5. When a standard sample is not available, the dyed and finished cloth shall show no more than a slight trace of labile sulfur as defined in the test method specified in 4.4.1 and 4.4.5.

3.2.6 Matching (class 2). The color of the dyed cloth shall match the standard sample under natural (north sky), daylight, or artificial daylight having a color temperature of 7500° Kelvin and shall be a good approximation to the standard sample under incandescent lamplight at 2800° Kelvin.

3.2.7 Colorfastness (class 2). The dyed cloth shall show colorfastness to laundering and crocking equal to or better than the standard sample (see 6.3). When no standard sample is available, the dyed cloth shall show "good" fastness to laundering and shall show a Munsell value for crocking not lower than 8.5 when tested as specified in 4.4.1 and 4.4.5.

3.2.8 Finish. The cloth for class 1 undershirts shall be scoured and bleached. The cloth for class 2 undershirts shall be dyed. No materials having a tendency to cause latent tendering or yellowing of the cloth shall be used in any of the dyeing or finishing operations. Resin finishes are prohibited. The finished cloth shall have a pH value (minimum 5.0, maximum 8.5). Testing shall be as specified in 4.4.1 and 4.4.5.

3.3 Thread, cotton (sewing). The thread shall be cotton, ticket No. 70, 3 ply, type IA2 or IA3 and ticket No. 30, 2 ply, type IC1 or IC2 of V-T-276, except that (a) direction of twist may be "S" or "Z", and (b) the thread shall not be singed or gassed. The thread for class 1 undershirts shall be bleached white. The thread for class 2 undershirts shall be dyed to match Olive Drab, S-1, C.A. 66022, and shall show colorfastness to laundering equal to or better than the standard sample (see 6.3). When no standard sample is available, the dyed thread shall show good colorfastness to laundering (3 cycles).

3.4 Design. The design of the undershirts shall be as shown on figures 1 and 2.

3.5 Patterns. Unless otherwise specified, standard patterns will be furnished by the contracting agency. The Government patterns shall be used as a guide for cutting the supplier's working patterns. In the event of a conflict between patterns and specified dimensions, the specification shall govern.

3.6 Stitches, seams, and stitching. Stitches, seams, and stitching types as specified in table I, shall conform to FED-STD-751. Whenever two or more methods of seams or stitches are given for the same part of the operation, any one of them may be used. Except for the alternate manufacturing operation No. 6 (with tape) for all stitch types, the lower (looper) thread shall be on the inside of the undershirt. When seam type EFC-1 is used, the stitching may be exposed on the face of the undershirt. Ends of all seams produced by stitch type 401 shall be caught in other seams or stitching.

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3.6.1 Stitches per inch. The minimum and maximum number of stitches per inch shall be as specified in table I.

3.6.2 Thread breaks and ends of seams. Ends of all seams and stitching, when not caught in other seams or stitching (except for hem seams and over-seaming of collarette) shall be securely tacked by one of the methods specified in operation No. 10 of table I. Thread breaks (all stitch types) shall be secured by stitching back of the break not less than 1/2-inch. Skipped stitches or 401 stitch type breaks may be repaired by using 301 stitch type.

3.7 Manufacturing operations requirements. The undershirts shall be manufactured in accordance with the operation requirements specified in table I. The supplier is not required to follow the exact sequence of operations.

NO.	MANUFACTURING OPERATIONS REQUIREMENTS TABLE I	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN or LOOPER	COVER
1.	<p><u>Cutting:</u></p> <p>The undershirts shall be cut in accordance with patterns (see 3.5).</p> <p>All component parts shall be cut lengthwise in the direction of the wales except the collarette. A continuous (seamless) collarette may be used for types I and III.</p>						
2.	<p><u>Replacement of defective components:</u></p> <p>During the spreading, cutting and manufacturing process, components having material defects and damages that are classified as defects in section 4 of this specification shall be removed from production and replaced with non-defective and properly matched components.</p>						
3.	<p>a. For non-continuous collarette (type I and III) close one shoulder seam.</p>	504	SSa-1	12-16	70-3	70-4	70-3
	<p>b. For continuous collarette (all types) close both shoulder seams.</p>	504	SSa-1	12-16	70-3	70-3	70-3
4.	<p><u>Collarette:</u></p> <p>a. <u>Types I and III.</u> The collarette shall be made of double thickness of ribbed knit cloth and shall be seamed to the undershirt with wales running perpendicular to the seam. Stitching shall cover all raw edges and the collarette shall finish $7/8 \pm 1/8$ inch wide.</p>	504 or 406 (3/16 gage)	SSa-1 Bsb-1	12-16 10-12	70-3 70-3	70-3 30-2	70-3

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NO.	MANUFACTURING OPERATIONS REQUIREMENTS TABLE I (cont'd)	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN or LOOPER	COVER
4.	<u>Collarette. (cont'd)</u> b. <u>Type II.</u> The collarette shall be made of double thickness of ribbed knit cloth and shall be seamed to the undershirt with the wales running perpendicular to the seam. Stitching shall start at the point of the "V" continuing around the neck and back of point of "V" with the collarette overlapped and securely catching raw edges of each end of collarette in the seam. Collarette shall finish $7/8 \pm 1/8$ inch wide.	504	SSa-1	12-16	70-3	70-3	70-3
5.	<u>For non-continuous collarette (types I and III).</u> Close remaining shoulder seam and collarette.	504	SSa-1	12-16	70-3	70-3	70-3
6.	<u>Reinforcing the collarette.</u> a. <u>Types I, II and III.</u> A strip made of the body cloth (3.2.1.1 or 3.2.2), cut along the wales may be used. Both edges of the strip shall be turned under not less than $1/8$ inch and stitched from armhole seam to armhole seam across back of collarette. The distance between the two rows of stitching shall be $1/4$ to $5/16$ inch. The strip shall finish $7/16$ to $1/2$ inch wide. or b. <u>Types I and II only.</u> Overseam stitching from shoulder seam across back of collarette.	301 or 401	SSag-3(b)	12-16	70-3	70-3	
		406	-	12-16	70-3	30-2	

NO.	MANUFACTURING OPERATIONS REQUIREMENTS TABLE I (cont'd)	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN or LOOPER	COVER
7.	<u>Sleeves.</u> a. Close sleeves along underarm. b. Hem sleeve bottom to finish $1 \pm 1/4$ inch wide. Hem shall be stitched over the first end of stitching not less than 1 inch. or c. Hem sleeve bottoms to finish $1 \pm 1/4$ inch wide. d. Close sleeves along underarm. e. Bartack as specified in operation 10a or 10b.	504 503 503 504	SSa-1 EFc-1 EFc-1 SSa-1	12-16 10-14 10-14 12-16	70-3 70-3 70-3 70-3	70-3 70-3 70-3 70-3	70-3 70-3
8.	<u>Set sleeves to armholes.</u>	504	SSa-1	12-16	70-3	70-3	70-3
9.	<u>Hem bottom.</u> Hem bottom of undershirt to finish $1 \pm 1/4$ inch wide. The last end of the stitches shall be continued not less than one inch over the first end.	503	EFc-1	10-14	70-3	70-3	
10.	<u>Tacking.</u> The ends of all stitches when not caught in other seams or stitching (except for hem seams and over-seaming of collarette) shall be securely tacked by one of the following methods: a. Fold back end of stitching chain $1/4$ to $3/8$ inch and bartack perpendicular to seam $1/16$ to $1/8$ inch from folded edge. Bartack shall be $1/2 \pm 1/8$ inch long. or	Bartack		28 per bartack	70-3	70-3	

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NO.	MANUFACTURING OPERATIONS REQUIREMENTS TABLE I (cont'd)	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN or LOOPER	COVER
10.	<u>Tacking.</u> (cont'd) b. The first and last ends of stitching chain shall be stitched back into the seam by means of appropriate mechanical device.	504	SSa-1	12-16	70-3	70-3	70-3
11.	<u>Clean undershirt.</u> a. Trim and remove raw edges, and ends of thread of stitching inside and outside of undershirt. b. Remove all spots and stains.						
12.	<u>Press undershirt (optional).</u>						

STSNL Form 903
27 Jul 73

EDITION OF 16 JUN 72 WILL BE USED UNTIL EXHAUSTED.

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3.8 Labeling. Each undershirt shall have an identification and size label marked on the inside center back just below the collarette. The label shall conform to type III or IV, class 4 of DDD-L-20, except that the legend and size of characters shall be as specified in 3.8.1. For the purpose of determining label colorfastness under DDD-L-20, the end item is intended to be laundered.

3.8.1 Label legend. The label shall contain the following information in the indicated order and size of character:

	Size of character (minimum)
Nomenclature	1/8 inch
Contract number	3/32 inch
Name of supplier	1/8 inch
Size *	1/8 inch
Stock number	3/32 inch
Textile Fiber Products	
Identification Act Information	3/32 inch

* The numerical sizes for each adjective size shall be stamped directly below the adjective size in same size characters. For example:

XX Small
(26-28)

3.8.2 Label legend, civil agencies. When specified by civil agencies (see 6.2), the label shall contain only the adjective size, the manufacturer's name or trade mark and the fiber content information. Size of characters shall be as specified in 3.8.1.

3.9 Sizes, measurements and weights. Sizes, measurements and weights shall conform to the requirements shown in table II. All measurements shall be in inches and shall be taken as shown on figures 1 and 2, the letters corresponding those in the table.

TABLE II. Sizes, measurements, and weights

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Size	Width <u>2/</u> A	Length <u>3/</u> B	Sleeve length C	Arm- hole length (flat) D	Sleeve width (bot- tom) E	Neck opening (circumference) <u>4/</u> F		Shoulder length G	Weight per dozen minimum			
						Types I and III	Type II		Types I and II	Type III		
						under- shirt	under- shirt					
									lbs.	oz.	lbs.	oz.
XX Small (Types I & II only) (26-28) <u>1/</u>	14	27	6-1/2	8	5-3/4	16	23-1/2	3-7/16	2	0	-	-
X Small (30-32) <u>1/</u>	16	29	7	8-1/4	6	16-1/2	24	44-1/16	2	8	1	9
Small (34-36)	18	30	7	8-3/4	6-1/2	17-1/2	25	4-11/16	2	12	1	15
Medium (38-40)	20	31	7-1/2	9-1/4	7	18-1/2	26	5-5/16	3	2	2	5
Large (42-44)	22	33	7-1/2	9-3/4	7-1/4	19-1/2	27	5-15/16	3	9	2	11
X Large (46-48)	24	33	8	10-1/4	7-1/2	20-1/4	27-3/4	6-9/16	3	14	3	1
XX Large (50-52)	26	34	8	10-3/4	7-3/4	20-3/4	28-1/4	7-3/16	4	5	3	3
XXX Large (54-56) Types I & II only)	28	34	8	11	8	21-1/4	28-3/4	7-13/16	4	12	-	-
Tolerance	<u>+ 1/2</u>	<u>+ 1</u>	<u>+1/2</u>	<u>+1/2</u> -1/4	<u>+ 1/2</u>	<u>+ 1</u>	<u>+ 1</u>	<u>+ 7/16</u> - 5/16	-	-	-	-

1/ Wherever the widths specified cannot be produced on a single machine, cloth may be taken from two smaller machines and seamed together to produce the specified widths using seam and stitch type FSa-1-606 or 607 with 70-3 and 30-2 thread, or seam and stitch type SSa-1-504 and 70-3 thread using 12 to 16 stitches per inch.

2/ Width measurement "A" shall be taken as shown on figures 1 and 2.

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- 3/ Length measurement "B" shall be taken from the bottom hem edge to the junction of the shoulder seam and the seam attaching collar to body.
- 4/ Neck opening shall be measured by grasping collar at center back and center front and forming a straight edge; measure, and multiply by two.

3.10 Workmanship. The finished undershirts shall conform to the quality and grade of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels.

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 that supplies and services conform to prescribed requirements.

4.1.1 Certificate of compliance. Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

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

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

4.3 First article inspection. When specified, the sample furnished in accordance with 3.1.3 shall be inspected as specified in 4.4.2.1, 4.4.2.2 and 4.4.2.3 for compliance with design, construction, workmanship and dimensional requirements.

4.4 Quality conformance inspection. Except as otherwise specified herein, sampling for inspection shall be performed in accordance with the provisions of MIL-STD-105.

4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be tested in accordance with all the requirements of referenced specifications, drawings and standards unless otherwise excluded, amended, modified or qualified in this specification or applicable purchase document. In addition, testing shall be performed on the undershirt materials for the characteristics noted in tables IV or V as applicable. The methods of testing specified in Fed. Test Method Std. No. 191, wherever applicable and as specified in tables IV or V, shall be followed. All test reports shall contain the individual values utilized in expressing the final results. The lot size shall be expressed in units of one yard each and the sample unit shall be one yard. The sample size shall be determined in accordance with table III and the lot shall be unacceptable if one or more sample units fail to meet any of the requirements specified.

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TABLE III. Sample size

<u>Lot size</u>	<u>Sample size</u>
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

TABLE IV. Component testing types I and II undershirts

<u>Material</u>	<u>Characteristic</u>	<u>Reference paragraph</u>	<u>Test method</u>
Collarette cloth	Yarn sizes	3.2.1.2	4021
	Combed cotton	3.2.1.2	1200 <u>1/</u>
	Type of knit	3.2.1.2	Visual <u>2/</u>
	Texture:		
	Wales	3.2.1.2	5070
	Courses	3.2.1.2	5070
	Nonfibrous material	3.2.4	2611
	Presence of labile sulfur	3.2.5	2020
	Colorfastness:		
	(Class 2)		
	Laundering	3.2.7	5610 <u>3/ 4/</u>
	Crocking	3.2.7	5651
	Finish	3.2.8	<u>1/</u>
	pH	3.2.8	2811

- 1/ Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirements.
- 2/ One determination per sample unit and the results reported as "pass" or "fail".
- 3/ Using 3 laundering cycles with drying after each cycle.
- 4/ Evaluation of the multifiber cloth for color transfer shall be made only on the cotton fiber float.

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TABLE V. Component testing, type III undershirt

Material	Characteristic	Reference paragraph	Test method
Body and Collarette Cloth Polyester/cotton	Polyester fiber	3.2.2.1.1	<u>1/</u>
	Cotton fiber	3.2.2.1.2	<u>1/</u>
	Yarn size	3.2.2.2	4021 <u>1/</u>
	Fiber content:		
	Polyester	3.2.2.3	2100
	Cotton	3.2.2.3	2100
	Yarns per inch:		
	Wales	3.2.2.4	5070
	Courses	3.2.2.4	5070
	Knit stitch	3.2.2.4	Visual <u>2/</u>
	Nonfibrous material	3.2.4	2611
	Bursting strength	3.2.2.4	5120

1/ Unless otherwise specified in the contract or order, a supplier shall submit a certificate of compliance for this characteristic. The certificate shall be accompanied by actual test, inspection, or other verifiable data.

2/ One determination shall be performed per sample unit and the results reported as "pass" or "fail".

4.4.1.1 Polyester and cotton fiber content. The general procedures of method 2100 shall be followed with the fiber content percentages calculated as follows:

$$\text{Polyester, percent} = \frac{\text{Weight of dry residual fiber} \times 100}{\text{Weight of dry desized specimen}}$$

$$\text{Percent, cotton} = 100 - \text{percent polyester}$$

4.4.1.2 Report. Two specimens shall be tested from each unit and the average percent polyester and the average percent cotton of the two specimens shall be reported to the nearest 1.0 percent.

4.4.2 Examination of the end item. Defects found during this examination shall be classified in accordance with the lists shown in 4.4.2.1 and 4.4.2.2. The sample unit for these examinations shall be one undershirt. The lot size shall be expressed in units of one undershirt. The inspection levels and acceptable quality levels (AQL's) for these examinations shall be in accordance with 4.4.2.3.

4.4.2.1 Visual examination. The undershirt shall be visually examined for defects listed in table VI. The material defects shall be as defined in MIL-STD-1491.

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TABLE VI. Classification of defects

<u>Examine</u>	<u>Defect</u>	<u>Classification</u>	
		<u>Major</u>	<u>Minor</u>
Material	Any hole, cut, tear, drop stitch, thin area, mends.	X	
	Any slub more than twice the thickness of normal yarn.		X
	Any accumulation of slubs, clearly visible *, causing nonuniform overall appearance.		X
	Rowey yarn or tiger stripes, loose knitting causing sleaziness, or giving the appearance of shade bars in the OG-109.		X
	Birdseye or miss-knit.		X
Color (class 1)	Not bleached white.	X	
Shade (class 2)	Shade not comparable to standard or approved sample (off shade).		X
	Shaded part clearly visible. *		X
	Dye streaks clearly visible. *		X
Thread	Not type, size or color specified.	X	
Cleanness	Spot or stain on outside (largest dimension any direction) $\frac{1}{4}$:		
	More than $\frac{1}{4}$ inch up to $\frac{1}{2}$ inch inclusive.		X
	More than $\frac{1}{2}$ inch.	X	
	Two or more untrimmed ends more than 1 inch in length inside or outside.		X
Components	Any component missing, or other than specified.	X	
Seams and stitching	Any seam twisted, puckered or pulled, affecting appearance.		X
	Needle chews.	X	
	Tight tension (stitches break when normal strain is applied to seam or stitching).		X
	Loose tension resulting in a loosely secured seam.		X
	Any part of undershirt badly pleated, caught or twisted in any unrelated row of stitching.	X	

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TABLE VI. Classification of defects (cont'd)

Examine	Defect	Classification	
		Major	Minor
Seam type	Wrong seam type.	X	
Stitch type	Wrong stitch type.	X	
Stitches per inch	Number of stitches per inch exceeding minimum or maximum specified.		X
Open seam (any broken stitch or two or more continuous skipped stitches)	Any open seam, except on hems.	X	
	Any open seam on hems 1/2 inch or more.		X
Stitches skipped or broken (stitches skipped or broken on same row of stitching but not amounting to an open seam)	Skipped or broken stitches more than 1/2 inch.	X	
Bartacks and tacks	Bartack or tack omitted on collarette.	X	
	Bartack or tack misplaced on collarette not serving purpose intended.	X	
	Bartack or tack insecure on collarette.		X
	Bartack on collarette less than 1/16 inch or more than 1/8 inch from folded edge or less than 3/8 inch or more than 5/8 inch long.		X
	Chain stitch run-off not secured.		X
Collarette	Not double thickness of ribbed cloth.	X	
	Improperly attached to body affecting appearance or serviceability.	X	
	Other than type specified.	X	
	Collarette not uniform in width.		X
Hem, sleeves and bottom	Width less than 3/4 inch or more than 1 inch.		X
	Omitted.	X	
	Width of hem not uniform throughout.		X

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TABLE VI. Classification of defects (cont'd)

Examine	Defect	Classification	
		Major	Minor
Hem, sleeves and bottom (cont'd)	Width of hem less than 3/4 inch or more than 1-1/4 inches.		X
	Hem not stitched over first end of stitching from 1 to 1-1/4 inches.		X
Labeling, size and identification	Omitted, incorrect, illegible or misplaced.		X
	Not type or size specified.		X

1/ Spot or stain within 5 inches from bottom of undershirt shall not be considered a defect.

* At normal inspection distance (approximately 3 feet).

4.4.2.2 Dimensional examination. Any measurement deviating from the dimensions and tolerances specified in table II shall be scored as a measurement defect. The sample unit shall be one finished undershirt. The lot size shall be expressed in units of finished undershirts.

4.4.2.3 Inspection levels and acceptable quality levels (AQL's). The inspection levels and acceptable quality levels expressed in defects per 100 units shall be as follows:

Examine	Inspection level	AQL	
		Major	Total
4.4.2.1	II	1.5	4.0 (Major & Minor)
4.4.2.2	S-3	—	10.0 (1 class)

4.4.3 Examination of preparation for delivery requirements. An examination shall be made to determine that the packaging, packing and marking comply with the Section 5 requirements. Defects shall be scored in accordance with table VII. 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. The inspection level shall be S-2 and the AQL shall be 2.5 defects per hundred units.

TABLE VII. Classification of preparation for delivery defects

<u>Examine</u>	<u>Defect</u>
Marking (exterior and interior)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application.
Materials	Any component missing or not as specified. Any component damaged, affecting serviceability.
Workmanship	Inadequate application of components, such as incomplete closure of container flaps, improper taping, loose strapping, inadequate stapling or bulging or distortion of containers. Polyethylene bags heat sealed seams open, non-continuous or crooked; vent hole missing or greater than 1/4-inch diameter. Incorrectly fabricated bag.
Content	Number of polyethylene bagged packages per shipping container is more or less than specified. Number of undershirts per polyethylene bag is more or less than specified. <u>1/</u>

1/ For this defect, four polyethylene bagged packages shall be examined from each shipping container in the sample.

4.4.4 Examination of preparation for delivery requirements for contour packaged items. An examination shall be made in accordance with the provisions of MIL-C-43424 to determine that the packaging, packing and marking comply with the Section 5 requirements.

4.4.5 Testing of the end item. The test methods listed in tables VIII and IX shall be in accordance with FED-STD-191 except as otherwise noted, and as described herein. The physical and chemical values specified in Section 3 apply to the average of the number of test specimens selected for a sample unit for test purposes as specified in the applicable test methods. The lot size shall be expressed in units of one undershirt. The sample unit for test purposes, except for weight, shall be three undershirts of each size in the lot for determination of shrinkage or elongation and one undershirt (any size in lot) for all physical and chemical tests. The sample size shall be in accordance with table III and the lot shall be unacceptable if one or more sample units fail to meet any requirement specified. For the weight characteristic, the sample unit shall be one dozen undershirts of each size in the lot, and the sample size, regardless of lot size, shall be one sample unit with an acceptance number of zero.

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TABLE VIII. End item testing, types I and II undershirts

Characteristic	Requirement reference	Test method
Ply, yarn	3.2.1.1	Visual
Combed cotton	3.2.1.1	1200 <u>1/</u>
Type of knit	3.2.1.1	Visual
Texture:		
Wales	3.2.1.1	5070
Courses	3.2.1.1	5070
Bursting strength (pounds)	3.2.1.1	5120
Shrinkage or elongation:		
Body width	3.2.3	7556 <u>2/</u>
Body length	3.2.3	7556 <u>2/</u>
Sleeve length	3.2.3	7556 <u>2/</u>
Nonfibrous material	3.2.4	2611
Presence of labile sulfur	3.2.5	2020
Colorfastness:		
(Class 2)		
Laundering	3.2.7	5610 <u>4/ 5/</u>
Crocking	3.2.7	5651
Finish	3.2.8	<u>1/</u>
pH	3.2.8	2811
Weight (conditioned undershirts per dozen)	Table II	<u>3/</u>

- 1/ Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirements.
- 2/ Undershirts shall not be moistened or pressed before measuring. Undershirts shall be conditioned after drying for 1 hour in a relaxed supported state before measuring. Measurements shall be taken to the nearest 0.1 of an inch with undershirts laid flat as shown on figures 1 and 2. Shrinkage or elongation shall be reported to the nearest 0.1 of a percent. Elongation shall be reported prefixed with a (-) sign.

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- 3/ The twelve undershirts of each size comprising the sample unit for testing shall be allowed to reach equilibrium, under standard conditions, as defined in FED-STD-191. Upon reaching equilibrium, each size (one dozen) shall be weighed as a unit under standard conditions and the results reported to the nearest 1.0 ounce.
- 4/ Using 3 laundering cycles with drying after each cycle.
- 5/ Evaluation of the multifiber cloth for color transfer shall be made only on the cotton fiber float.

TABLE IX. End item testing, type III undershirt

Characteristic	Requirement paragraph	Test method
Shrinkage or elongation:		
Body width	3.2.3	7556 <u>1/</u>
Body length	3.2.3	7556 <u>1/</u>
Sleeve length	3.2.3	7556 <u>1/</u>
Weight (conditioned undershirts per dozen)	Table II	<u>2/</u>

- 1/ Undershirts shall not be moistened or pressed before measuring. Undershirts shall be conditioned after drying for one hour in a relaxed supported state before measuring. Measurements shall be taken to the nearest 0.1 of an inch and shrinkage or elongation reported to the nearest 0.1 percent. Cotton laundering procedure shall be followed.
- 2/ The twelve undershirts of each size comprising the sample unit for testing shall be allowed to reach equilibrium, under standard conditions, as defined in FED-STD-191. Upon reaching equilibrium, each size (one dozen) shall be weighed as a unit under standard conditions and the results reported to the nearest 1.0 ounce.

5. PREPARATION FOR DELIVERY

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

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5.1.1 Level A. Each undershirt shall be folded in accordance with standard practice to approximate dimensions of 11 by 7-1/4 inches. Three folded undershirts, of one type, class and size only, shall be inserted in a snug-fitting flat style clear polyethylene film bag of 0.00125 inch thickness (+ 25 percent tolerance). The bag may be fabricated from polyethylene tubing or sheeting. The polyethylene bag shall be formed with heat sealed seams that are straight, continuous, and parallel to each other and the formed edges of the bag. The final closure of the bag shall be heat sealed with the heat seal made as close as possible to the open end. A 1/4-inch diameter hole shall be made at one corner of each polyethylene bag to allow excess air to escape. Alternatively, the final closure of the polyethylene bag may be accomplished by means of a tuck or reverse flap. When specified (see 6.2), undershirts shall be contour packaged in accordance with MIL-C-43424.

5.1.2 Level B (Civil agencies). Undershirts shall be packaged in accordance with 5.1.1 (see 6.2).

5.1.3 Level C. Undershirts shall be packaged to afford adequate protection against physical damage during shipment from the supply source to the first receiving activity. The supplier may use his standard practice when it meets this requirement.

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

5.2.1 Level A. One hundred and twenty undershirts of one type, class and size only, packaged as specified in 5.1, shall be packed in a fiberboard shipping container assembled, closed and reinforced conforming to class weather-resistant, grade V2s, size 3A of MIL-B-17757. The fiberboard for the box liner shall conform to type CF, class weather-resistant, variety DW, grade V15c of MIL-B-17757. Level A packages shall be packed flat two in length, two in width and 10 in depth within a shipping container. Toward the end of the contract or when there are less than the required amount per container of the same size, mixed sizes of one type and class only may be packed within the same shipping container. When specified (see 6.2), undershirts contour packaged as specified in 5.1.1 shall be packed in accordance with level A of MIL-C-43424.

5.2.2 Level B. One hundred and twenty undershirts of one type, class and size only, packaged as specified in 5.1 shall be packed in a fiberboard shipping container assembled and closed conforming to class domestic, grade 275, size 3A of MIL-B-17757. The fiberboard for the box liner shall conform to type CF, class domestic, variety DW, grade 275 of MIL-B-17757. Level A packages shall be packed flat two in length, two in width and 10 in depth within a shipping container. Toward the end of the contract or when there are less than the required amount per container of the same size, mixed sizes of one type and class only may be packed within the same shipping container.

5.2.2.1 When specified (see 6.2), the shipping container shall be a grade V3c, V3s or V4s fiberboard box fabricated in accordance with MIL-B-17757 and closed in accordance with the appendix of the container specification.

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5.2.3 Level C. Undershirts packaged as specified in 5.1, shall be packed in 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 or National Motor Freight Classification, as applicable.

5.3 Marking.

5.3.1 Civil agencies. In addition to any special marking required by the contract or order, shipping containers shall be marked in accordance with FED-STD-123.

5.3.2 Military requirements. In addition to any special marking required by the contract or order, contour packages (when applicable) and shipping containers shall be marked in accordance with MIL-STD-129.

5.3.2.1 Labels, mixed sizes. Each shipping container packed with mixed sizes of one type and class only, shall have securely attached to the end and side, directly under the printing or stenciling, a white paper label 5 by 4 inches with the words "MIXED SIZES" plainly stamped or printed thereon and under these words shall be legibly stamped or printed the correct quantity and sizes contained herein.

5.3.2.2 Polyethylene bagged packages. Polyethylene bagged packages shall have the required identification information legibly printed or stamped in black directly on the bag across the center face or on a white paper label inserted within the bag so as to permit ready identification.

6. NOTES

6.1 Intended use. The type I undershirt covered by this specification is intended for use by personnel of Government agencies. The type II undershirt is intended for use by Air Force personnel. The type III undershirt is intended for wear by Navy personnel.

6.2 Ordering data. Purchasers should exercise any desired options offered herein and procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type and class required (see 1.2.1).
- (c) Size required (see 1.2.1).
- (d) When a first article is required (see 3.1.3, 4.3 and 6.5).
- (e) When civil agency label legend is required (see 3.8.2).
- (f) Selection of the applicable levels of packaging and packing (see 5.1 and 5.2).
- (g) When level B packaging is required for civil agencies (see 5.1.1.1).
- (h) When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2.1).
- (i) When contour packaging, packing and marking is required (see 5.1.1, 5.2.1, and 5.3).

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6.3 Sample. For access to samples, address the procuring office issuing the invitation for bids.

6.4 Dyestuff formulation. A suggested but not mandatory dyestuff formulation for Olive Green 109 is as follows:

New color index

Vat Black, CI 69525
 Vat Green 3, CI 69500
 Vat Green 8, CI 71050

Shaded with either or both of the following:

Vat Brown 3, CI 69015
 Vat Yellow of suitable fastness

The redness of shade should result from the predominant use of the main colors specified and not from the shading colors.

6.5 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of paragraph 7-104.55 of the Armed Services Procurement Regulations. The first article should be a preproduction sample and consist of one undershirt. The contracting officer should include specific instructions in all procurement instruments, regarding arrangements for inspection and approval of the first article.

6.6 Supersession data. This specification includes the requirements of MIL-U-82247B(SA) dated 22 February 1974.

Custodians:

Army - GL
 Navy - SA
 Air Force - 82

Preparing activity:

Army - GL

Civil Agency Coordinating Activities:

Review activities:

Army - MD
 Navy - MC

GSA-FSS
 AGR-AMS
 COM-NBS
 VA-DMS

User activity:

Navy - CG

Project No. 8420-0060

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