

INCH-POUND

MIL-DTL-32067
July 12, 2000
SUPERSEDING
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**MILITARY DETAILED SPECIFICATION
LEATHER, SHEEPSKIN, CROME TANNED**

This specification is approved for use by all Department and Agencies of the Department of Defense.

1. **SCOPE** This Military Detailed Specification covers the requirements for chrome tanned sheepskin.

1.2. **CLASSIFICATION.** The leather will be in the following types, classes, and subclasses.

Type A - Hair sheep
Type B - Domestic

Class 1 - Mildew resistant treated
Class 2 - Not mildew resistant treated

Subclass a. - Perspiration resistant treated
Subclass b. - Not perspiration resistant treated

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Supply Center Philadelphia, Clothing and Textiles Directorate, Attn: DSCP-COC, bld 6-1-D, 700 Robbins Ave, Philadelphia, PA 19111-5096.

AMSC N/A

FSC 8330

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2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS

- D – 5053 Resistance to Crocking of Leather
- D – 3495 Hexane Extraction of Leather
- D – 2821 Measuring the relative stiffness of leather by means of a torsional wire apparatus
- D – 6012 Determination of Resistance of glove leather to bleeding
- D – 4705 Stitch tear strength single hole
- D – 6076 Shrinkable temperature of Leather
- D – 2322 Resistance of Chrome-Tanned white shoe upper leather to artificial perspiration.
- D – 2096 Colorfastness and transfer of color in the washing of leather
- D – 2831 Practice for sampling leather for physical and chemical tests.

(Applications for copies should be addressed to American Society For Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.)

ANSI/ASQC Z1.4

(Applications for copies should be addressed to ANSI/ASQC American Society for Quality Control 611 East Winconsin Ave. , Milwaukee WI 53202)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of Precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications or specification sheets), the text of this document takes precedence. Nothing in this document however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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3. REQUIREMENTS

3.1 Materials The strap leather shall be full grain, chrome tanned sheepskin. The flesh side of the leather shall be smooth and free of coarse loose fiber.

3.1.1 Type A, hair sheep. Type A leather shall be made from the skins of the hair sheep of the hair sheep of Brazil, Nigeria, Sudan, Abyssinia, Djeddah, or other origins. Wool, or coarse wool sheepskins, such as Iranian type sheepskins, are not acceptable.

3.1.2 Type B, domestic. Type B leather shall be made from the skins of the domestic sheep.

3.1.3 Subclass a. When subclass a is specified, glutaraldehyde shall be incorporated into the Leather.

3.2 Physical requirements.

3.2.1 Color. The color of the leather, the method of application (drum, spray or brush), and the degree of dye penetration shall be as specified (see 6.2 and 6.3). When the spray or brush method is required, the surface of the leather to be dyed shall be as specified (see 6.2)

3.2.2 Finish. Unless otherwise specified (see 6.2), a light application of finish and dye containing only sufficient pigment as to assist in making the color uniform shall be applied to the grain surface. The finish shall not shrink or change the appearance of the natural grain surface, mar the leather, or camouflage any defect.

3.2.3 Thickness. Unless otherwise specified (see 6.2) the thickness of the leather shall be $2 \pm 1/2$ ounces when examined in accordance with 4.2.2. The leather may be buffed or shaved to obtain the desired thickness. (Note: 1 ounce = 1/64 inch).

3.2.4 Form. The leather shall be in the form of whole skins and shall be trimmed. The area expressed in terms of square feet shall be legible marked in the butt area on the flesh side of the leather.

3.2.5 Stiffness. At least 80 percent of the specimens tested shall have stiffness value no greater than 60 degrees when tested as specified in 4.3.

3.2.6 Colorfastness (resistance to rubbing). Unless otherwise specified (see 6.2), staining of the dry crock cloth shall be not lower numerically than Munsell Value 9.5 and the staining of the wet crock cloth shall be not lower numerically than Munsell value 8.5 with the leather is tested as specified in 4.3.

3.2.7 Staining. Unless otherwise specified (6.2), staining of the test pad shall have an expanded AATCC value of not less than 4 when the leather is tested as specified in 4.3

3.2.8 Stitch tearing strength.

3.2.8.1 Type A. At least 80 percent of the specimens tested shall have stitch tearing strength values of not less than 15 pounds when tested as specified in 4.3.

3.2.8.2 Type B. At least 80 percent of the specimens tested shall have stitch tearing strength values of not less than 10 pounds when tested as specified in 4.3.

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3.2.9 Elongation. At least 80 percent of the specimens tested shall have elongation values of not less than 25 percent when tested as specified in 4.3. The elongation of Type A shall be determined at a load of 25 pounds and the elongation of type B shall be determined at a load of 20 pounds. Any specimen that ruptures or exhibits grain crack below the specified load shall be recorded as a failing specimen.

3.2.10 Shrinkage temperature. Shrinkage of the leather shall not take place at or below 92° C, when tested as specified in 4.3.

3.2.11 Area stability to perspiration (subclass a). At least 80 percent of the specimens shall have an area loss no greater than 15 percent when tested as specified in 4.3.

3.2.12 Area stability to laundering (subclass a). When specified (see 6.2), the subclass a leather shall be tested for area stability to laundering and at least 80 percent of the specimens shall have an are loss no greater than 20 percent when tested as specified in 4.3.

3.3. Fungicide. Unless otherwise specified (paragraph 6.2), one of the following leather fungicides is required.

3.3.1 TCMTB. The leather shall contain not less than 100ppm and not more than 400ppm of active ingredient 2- (thiocyanomethylthio) benzothiazole (TCMTB), (see paragraph 4.4.1).

3.3.2 Ortho- Phenyl Phenol. The leather shall not contain less than 540 ppm and not more than 2580 ppm. (see paragraph 4.4.2)

3.3.3 Diiodomethyl para Tolysulfone . The leather shall contain not less than 300 ppm and not more than 2000 ppm. (see paragraph 4.4.3)

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3.4 Chemical requirements.

3.3.2 The leather shall conform to the chemical requirements specified in table I, when tested as specified in 4.3.

TABLE I Chemical requirements

<u>Characteristic</u>	<u>Minimum</u>	<u>Maximum</u>
Chloroform-soluble material, percent <u>1</u> /	-	25.0
Total ash, percent <u>1</u> /	-	9.0
Chromic oxide (percent) <u>1</u> /	2.5	
PH value	3.0	-

1/ Calculated on the moisture free basis.

3.5 Workmanship. The finished leather shall conform to the quality established by this specification. The occurrence of defect shall not exceed the applicable acceptable levels.

4.0 VERIFICATION.

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

4.1.2 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 Quality conformance inspection. Sampling for inspection shall be in accordance with the provisions of ANSI/ASQC Z1.4, except where otherwise indicated hereinafter.

4.2.2 Component and material inspection. Components an material shall be tested in accordance with all the requirements of referenced specification, drawings, and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

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4.2.3 Examination of the end item. The classification of defects found during the examination shall be in accordance with the lists shown in 4.2.2.1 and 4.2.2.2. The sample unit for these examinations shall be one sheepskin. The lot size shall be expressed in units of one sheepskin. A sample size of 15 and a rejection number of 2 shall be applicable for thickness determinations on lots consisting of 51 or more units of product. Separate examinations shall be performed for visual and dimensional characteristics, but the same sample may be used for each examination.

4.2.3.1 Examination for visual characteristics.

<u>Examine</u>	<u>Defect</u>
Color	Not as specified Not dyed as specified Not uniform
Finish	Unless otherwise specified, grain side not finished. Streaky, flaky, cracked or tacky. Excessively pigmented.
Form	Not whole sheepskin
Quality of leather	Any cut hole tear, scratch, brand, vein, wrinkle, cockle Coarse loose fiber or flesh side, boardy area, Flanky area and other imperfections that individually Or collectively cause more than 12 percent loss in The total area of the leather.

4.2.3.2 Examination for dimensional characteristics.

<u>Examine</u>	<u>Defect</u>
Area (expressed in Terms of square feet)	Not as marked on leather
Marking	Omitted
Thickness <u>1/</u>	Not as specified

1/ Thickness shall be measured in accordance with ASTM-D-1814

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4.3 End item testing. The methods of testing specified in ASTM wherever applicable and as listed in table II, shall be followed. Sampling procedure and location from which the sample unit is to be obtained shall be in accordance with ANSI/ASQC Z1.4. All test reports shall contain the individual values utilized in expressing the final result . The lot shall be rejected if any one of the following conditions exists:

- a. More than three test specimens fail to meet stiffness requirements.
- b. More than three specimens fail to meet stitch tearing strength requirements or more than 3 specimens fail to meet elongation requirements.
- c. When subclass a is specified, for than 3 specimens fail to meet perspiration resistance requirements.
- d. When subclass a is specified and the leather is required to be tested for area stability to laundering (see 6.2), more than 3 specimens fail to meet the laundering requirement
- e. One or more specimens fail to meet any of the remaining requirements applicable to The sample unit.
- f. Any composite test result fails to meet the specified requirement

TABLE II Tests

Requirement to	Requirement paragraph	Test method	Sample unit	<u>Applicable</u>
Composite Characteristic sample				
Material identification	3.1	<u>1</u> /		—
Stiffness	3.2.5	ASTM-D-2821	X	
colorfastness	3.2.6	ASTM-D-5053	X	
Staining	3.2.7	ASTM-D-6012	X	
Stitch tear strength	3.2.8	ASTM-D-4705	X	

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Elongation	3.2.9	ASTM-D-6012	X
Shrinkage temperature	3.2.10	ASTM-D-6076	X

TABLE II Test (cont'd)

Area stability to perspiration (subclass a)	3.2.12	ASTM-D-2322 <u>2/</u>	X
Area stability to laundering (subclass a)	3.2.11	ASTM-D-2096 <u>3/</u>	X
Fungicide	3.3	3.4	X
Chloroform soluble Material	3.3.2	ASTM-D-3495	- X
Total ash	3.3.2	ASTM-D-2617	- X
Chromic oxide	3.3.2	ASTM-D-2807	- X
pH value	3.3.2	ASTM-D-2810	- X

1/ Unless otherwise specified, a certificate of compliance is required and will be acceptable for the stated requirement.

2/ The suction flask shall contain 15 ± 1 ml of artificial perspiration solution per specimen and the circulating air oven shall be preheated to $68 \pm 2^\circ\text{C}$.

3/ Only one specimen shall be tested for each 8 by 8 inch sample unit.

4.4 Fungicide

4.4.1 TCMTB. Testing to determine the concentration of Busan 30 L in the leather shall be conducted by using Buckman Laboratories standard test method for 2- (Thiocyanomethylthio) Benzothiazole Analysis of Leather by HPLC. This method may be obtained by contacting Buckman Laboratories at 1256 North McLean Blvd., Memphis, TN 38108 (800) 282-5625.

4.4.2 Ortho-phenyl phenol. Testing to determine chemical concentration in leather shall be conducted in accordance with Test I, Type I of the MIL-L-8067 specification.

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4.4.3 Diiodomethyl para Tolysulfone. The chemical concentration in the leather shall be conducted using the High Pressure Liquid Chromatography (HPLC) test method as follows:

4.4.3.1 Grinding. Grind the leather according to paragraph 6.3.7 of ASTM Method D2813 Standard Practice for Sampling Leather for Physical and Chemical Tests.

4.4.3.2 Stock Standard Preparation. Weigh accurately approximately 100mg of Diiodomethyl-para-tolylsulfone Internal Reference Standard (IRS), into a 100ml volumetric flask. Add approximately 50ml of acetonitrile, stopper and sonicate to aid dissolution (about 1 minute). Dilute to volume with acetonitrile.

4.4.3.3 Working Standards Preparation. Transfer 3ml aliquots of the Stock Standard Preparation in to 25, 50, 100, and 250ml volumetric flasks. Dilute to volume with acetonitrile. These standards contain approximately 12, 30, 60 and 120ppm of Diiodomethyl-para-tolylsulfone.

Note: (1) A lower standard may be required for samples containing very low levels of Diiodomethyl para tollylsulfone

(2) Solutions must be stored in darkness to prevent degradation. Minimize exposure to light during preparation and use. The Standard Preparations may be retained one month.

(3) Internal Reference Sample (IRS) is available from Chemtan Company, Inc., P.O. Box C, Exeter, NH 03833 Tel.: 603-772-3741

4.4.3.4 Sample preparation. Accurately weigh approximately 3 to 5g of sample into a 150ml beaker. Add 75-100ml of acetonitrile. Cover samples with parafilm; mix 16 to 24 hours on magnetic stir plate. The following day, allow samples to settle; remove necessary amount of acetonitrile and inject Note: Samples may have to be diluted further to fall within standard curve.

4.4.3.5 Testing equipment:

- a. HPLC System with variable UV detector and integrating computer. Suitable syringe and glassware.
- b. A micro-Bondapak C18 column (Waters Associates P/N 2734) or equivalent.
- c. 0.45-micron polycarbonate filters (Nuclepore Corporation, Catalog No. 111107) or equivalent.
- d. Calculator capable of doing linear regression.
- e. Reagents: Acetonitrile (Chromatographic grade).

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4.4.3.5.1 Typical mobile phase. Mix 550ml of distilled water and 450ml of acetonitrile. Filter and degas the solution. The concentration may be varied to meet system suitability requirements within range 50% to 40% acetonitrile.

4.4.3.5.2 Typical chromatographic conditions:

Injection Volume	20 Microliters
Flow	2.5 ml/minute
Detector	235 nm

4.4.3.6 System suitability. Inject the highest working standard until 2 percent agreement is reached between two successive injections. Chromatograph for approximately 15 minutes. Determine that, after the solvent front, one impurity peak elutes before the major peak. Elution for monoiodomethyl-para-tolylsulfone is about 6 minutes and for Diiodomethyl-para-tolylsulfone is about 8.5 minutes.

4.4.3.7 Procedure. Inject each standard and sample preparation in duplicate allowing each injection to run for at least 15 minutes. Measure the peak response for the Diiodomethyl-para-tolylsulfone.

Note: The run time may have to be increased for samples with late eluting peaks. Perform a linear regression of peak response (area) versus concentration for each of the components.

For each component:

Concentration (ppm) in leather =

$$\frac{\text{Concentration (ppm) from linear regression.} \times 75}{\text{Sample wt(g)}}$$

4.5 Cracking. The leather shall be tested for cracking in accordance with ASTM-D-6075. The diameters of the mandrels for the indicated thickness shall be as follows:

4.6 Workmanship. The finished leather shall conform to the quality established by this specification. The occurrence of defect shall not exceed the applicable acceptable levels.

<u>Thickness of leather (ounces)</u>	<u>Diameter of mandrel (inches)</u>
2 to 5 ½	¼
5 ¾ to 9 ½	3/8
9 ¾ and over	½

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5. PACKAGING.

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

6.1 Intended use. The strap leather covered by this document is intended primarily for use in post office mail bags, cases, belts, holsters, shoulder straps, and cap visors.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification
- b. Type and class required (see 2.0)
- c. Color, method of application, and degree of dye penetration required (see 3.2.1).
Surface of the leather to be dyed when brush or spray methods are specified (see 3.2.1).
- d. When finish is not required (see 3.2.2).
- e. When required thickness is not in accordance with thickness specified (see 3.2.4).
- f. When colorfastness and resistance to staining are not to be in accordance with Specified requirements (see 3.2.6 and 3.2.7).
- g. When subclass a leather is to be tested for area stability to laundering (see 3.2.12).

6.3 Chrome tanned sheepskin leather may be purchased as a commercial item in the following colors: cream, black, darkbrown and saddle brown.

6.4 subject term (key word) listing.

Hair sheep
Mildew resistant
Fungicide
Domestic

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MILITARY INTERESTS:

Custodians

Army – GL
Air Force - 11
Navy - NU

Review Activities

ARMY – MD,
Air Force – 99, 11.6

CIVIL AGENCY COORDINATING
ACTIVITY:

DLA
GSA – FSS

PREPARING ACTIVITY:
DLA - CT

Project 8330-0202

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity.
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NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-DTL-32067

2. DOCUMENT DATE (YYYYMMDD)
20000712

3. DOCUMENT TITLE LEATHER, SHEEPSKIN, CROME TANNED

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*

b. ORGANIZATION

c. ADDRESS *(Include Zip Code)*

d. TELEPHONE *(Include Area Code)*
(1) Commercial
(2) AUTOVON
(if applicable)

7. DATE SUBMITTED
(YYYYMMDD)

8. PREPARING ACTIVITY

a. NAME DEFENSE SUPPLY CENTER PHILADELPHIA DSCP-C

b. TELEPHONE *Include Area Code)*
(1) Commercial (2) AUTOVON

c. ADDRESS *(Include Zip Code)*
700 ROBBINS AVENUE (bldg. 6, C & T)
PHILADELPHIA, PA 19111-5092

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:
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