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November 15, 1976

SUPERSEDING

(see 6.3)

## FEDERAL SPECIFICATION

## LEATHER, CATTLEHIDE, DEERSKIN AND HORSEHIDE, CHROME TANNED

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 full grain cattlehide, deerskin and horsehide; and cattlehide flesh splits.

1.2 Classification.

1.2.1 Types and classes. The leather shall be furnished in the following types and classes, as specified (see 6.2).

Type I - Cattlehide, full grain, for garments and equipage  
Type II - Deerskin, full grain, for garments and equipage  
Type III - Horsehide, full grain for garments and equipage  
Type IV - Cattlehide, flesh splits for garments and equipage  
(Classes 1 and 2 are applicable to types I, II, III and IV only.)  
Class 1 - Mildew resistant treated  
Class 2 - Not mildew resistant treated

Type V - Cattlehide, full grain for gloves  
Type VI - Deerskin, full grain for gloves  
Type VII - Horsehide, full grain for gloves  
Type VIII - Cattlehide flesh splits for gloves

## 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 Standards:

FED-STD-123 - Marking for Shipment (Civil Agencies)  
FED-STD-311 - Leather, Methods of Sampling and Testing

FSC 8330

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(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-L-43432 - Leather, Packaging and Packing of

(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.)

3. REQUIREMENTS

3.1 Materials.

3.1.1 Types I, II and III. The leather shall be full grain cattlehide, deerskin or horsehide as required for the type specified (see 1.2 and 6.2) and shall be suitable for use in garments and equipage. The flesh side of the leathers shall be smooth and free of loose flesh.

3.1.2 Type IV. The leather shall be flesh splits obtained from cattlehide bends. The leather shall be suitable for use in garments and equipage. Both sides of the leather shall be smooth and free of loose flesh. Middle splits, head splits, belly splits and shoulder splits shall not be used.

3.1.3 Types V, VI and VII. The leather shall be full grain cattlehide, deerskin or horsehide as required for the type specified (see 1.2 and 6.2) and shall be suitable for use in gloves. The flesh side shall be smooth and free of loose flesh.

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3.1.4 Type VIII. The leather shall be flesh splits from cattlehide bends. The leather shall be suitable for use in gloves. Both sides of the leather shall be smooth and free of loose flesh. Middle splits, head splits, belly splits and shoulder splits shall not be used.

3.2 Tannage. The leather shall be chrome tanned.

3.3 Physical requirements.

3.3.1 Trim (form and area). Types I and V cattlehide leather shall be furnished in the form of whole hides or sides. Types II and VI deerskin leather shall be furnished in the form of whole skins. Types III and VII horsehide shall be furnished in the form of horsehide fronts. Types IV and VIII cattlehide flesh splits shall be furnished in the form of bends. The leather shall be trimmed to conform with definition of hide, side, bend, skin or front as applicable and as listed under "Definition of terms" in FED-STD-311. The area of the leather in terms of square feet shall be legibly marked on the butt end on the flesh side.

3.3.2 Thickness. The thickness of the leather shall be as specified (see 6.2). A thickness tolerance of  $\pm 1/2$  ounce is permitted. (Note: 1 ounce = 1/64 inch.)

3.3.3 Color. The color of the leather shall be as specified (see 6.2). Both sides of the leather shall be the same color. Slight color variations on the flesh side resulting from buffing or shaving the leather shall be permitted.

3.3.4 Dyeing. The leather shall be drum dyed.

3.3.5 Finish. The grain side of types I, II and III leather shall have a light application of finish and dye containing only sufficient pigment to assist in making the color uniform. No finish shall be applied to types IV, V, VI, VII and VIII leather.

3.3.6 Finish stability (types I, II and III). The finish shall not crack, flake, part from the leather or become tacky when tested as specified in 4.3.

3.3.7 Staining (types I, II and III). Unless otherwise specified (see 6.2), the stain on the test pad shall have an expanded AATCC value of not less than 4 when the leather is tested for staining in accordance with 4.3.

3.3.8 Colorfastness (types I, II, III, V, VI and VII). The leather shall be tested for resistance to dry and wet crocking in accordance with 4.3. Unless otherwise specified (see 6.2), staining of the dry cloth shall be not lower numerically than Munsell value 8.5 and staining of the wet cloth shall be not lower numerically than Munsell value 8.0.

3.3.9 Cracking (types I, II and III). The grain surface or the finish shall not crack or part from the leather when tested as specified in 4.3.

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3.3.10 Elongation. At least 80 percent of the specimens tested shall meet the following elongation values at a load of 25 pounds when tested as specified in 4.3. Any specimen that ruptures or shows grain crack below 25 pounds shall be reported as a failing specimen.

<u>Types</u>	<u>Elongation percent</u>	
	<u>Minimum</u>	<u>Maximum</u>
I, II, III, IV	25.0	60.0
V, VI, VII, VIII	25.0	----

3.3.11 Stitch tearing strength. At least 80 percent of the specimens tested shall meet the stitch tearing strength values indicated below when tested as specified in 4.3.

<u>Types</u>	<u>Thickness of leather (ounces)</u>	<u>Stitch tearing strength, pounds, minimum</u>
I, IV, V, VIII	2-1/2 and less	17.0
	Over 2-1/2	30.0
II, VI	2 and less	15.0
	Over 2	20.0
III, VII	2-1/2 and less	20.0
	Over 2-1/2	30.0

3.3.12 Shrinkage temperature.

3.3.12.1 Types I, III, IV, V, VII and VIII. Shrinkage of the leather shall not occur at a temperature below 97°C when the leather is tested as specified in 4.3.

3.3.12.2 Types II and VI. Shrinkage of the leather shall not occur at a temperature below 92°C when the leather is tested as specified in 4.3.

3.3.13 Stiffness. At least 80 percent of the specimens tested shall have stiffness values as indicated below when tested as specified in 4.3.

<u>Types</u>	<u>Thickness of leather (ounces)</u>	<u>Stiffness value before soaking (degrees, maximum)</u>	<u>Stiffness value after soaking (degrees, maximum)</u>
Types V, VII	2-1/2 or less	116	132
	Over 2-1/2	260	320
Type VI	2 or less	60	1/
	Over 2	90	<u>1</u> /
Type VIII	Over 2	260	320

1/ Type VI leather shall not be tested for stiffness after soaking.

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3.4 Chemical requirements. The leather shall conform to the requirements of table I when tested as specified in 4.3.

TABLE I. Chemical requirements

Characteristic	Minimum	Maximum
Chloroform-soluble material, percent <u>1/</u>	-	25.0
Ash, percent <u>1/</u> :		
Types I, II, III, V, VI, VII	-	9.0
Types IV and VIII	-	12.0
Chromic oxide, percent <u>1/</u>	3.0	-
pH value	3.3	-

1/ Moisture free basis.

3.4.1 Paranitrophenol (class 1). When class 1 is specified (see 6.2), the leather shall contain not less than 0.18 percent and not more than 0.70 percent paranitrophenol fungicide when tested as specified in 4.3.

3.5 Workmanship. The finished leather shall conform to the quality and grade of product established by this specification. The occurrence of defects shall not exceed the applicable 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 certifications.

4.2 Quality conformance inspection. Sampling for inspection shall be performed in accordance with FED-STD-311, except where otherwise indicated hereinafter.

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4.2.1 Component and material inspection. In accordance with 4.1 above, components and materials shall be inspected 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.

4.2.2 Examination of the end item. The classification of defects found during examination of the leather for visual and dimensional characteristics shall be in accordance with 4.2.2.1 and 4.2.2.2. The sample unit for these examinations shall be one hide, side, skin, front or bend as required for the type specified. The lot size shall be expressed in units of one hide, side, skin, front or bend. Sampling for these examinations shall be performed in accordance with FED-STD-311 except that 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.

4.2.2.1 Examination for visual characteristics.

Examine	Defect
Type I, II, III, V, VI, VII	Not full grain.
Type IV, VIII	Not flesh splits.
Trim:	
Type I, V	Not in the form of a whole hide or side.
Type II, VI	Not in the form of a whole skin.
Type III, VII	Not in the form of a front.
Type IV, VIII	Not in the form of a bend.
Color	Not as specified. Not same color on both sides.
Dyeing	Not drum dyed.
Finish:	
Type I, II, III	Finish missing on grain side.
Type IV, V, VI, VII, VIII	Any application of finish

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Examine	Defect
Quality of leather	Not clean; stain or other foreign matter. Coarse loose fiber on flesh side. Not soft and pliable. Hard, bony, boardy, or loose spongy leather. Any cut, hole, brand, hip mark, scratch, heavy vein, deep wrinkle, or surface imperfections which individually or col- lectively impair the cutting value of more than 12 percent of the total area of the side, whole hide, skin, front or bend.

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NOTE: Light, well healed scratches and grub holes, light fat wrinkles, and slight stains shall not be classified as defects.

4.2.2.2 Examination for dimensional characteristics.

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Examine	Defect
Area (expressed in terms of square feet)	Less than area marked on leather.
Marking	Omitted, illegible or not in area specified.
Thickness <u>1</u> /	Not as specified.

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1/ Thickness shall be determined in accordance with Method 1011 of FED-STD-311. No individual thickness measurement shall be less than the minimum or greater than the maximum specified.

4.2.3 Examination of preparation for delivery requirements. An examination shall be made in accordance with the provisions of MIL-L-43432 to determine whether packaging, packing, and marking requirements comply with Section 5 of this specification.

4.3 End item testing. The methods of testing specified in FED-STD-311 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 FED-STD-311. When types I, II or III are specified, the area of the leather from

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which the pieces are obtained for preparing the test specimens shall be expanded to 12 by 12 inches in order to provide the required test specimens. 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 exist:

- a. More than 3 specimens fail to meet elongation requirements.
- b. More than 3 specimens fail to meet stitch tearing strength requirements.
- c. More than 3 specimens fail to meet stiffness requirements.
- d. More than 1 specimen fails to meet any of the remaining requirements applicable to the sample unit.
- e. Any composite value fails to meet the specified requirement.

TABLE II. End item tests

Characteristic	Requirement paragraph	Test method	Requirement applicable to:	
			Sample unit	Composite
Materials	3.1	Visual <u>1/</u>	-	-
Tannage	3.2	<u>1/</u>	-	-
Finish stability (types I, II, III)	3.3.6	3202 <u>2/</u>	X	-
Staining (types I, II, III)	3.3.7	3021	X	-
Colorfastness (types I, II, III, V, VI, VII)	3.3.8	3031	X	-
Cracking, low temperature (types I, II, III)	3.3.9	4.3.1	X	-
Elongation	3.3.10	2021	X	-
Stitch tearing strength	3.3.11	2151	X	-
Shrinkage temperature	3.3.12	7011	X	-
Stiffness (types V, VI, VII, VIII)	3.3.13	4.3.2	X	-
Chloroform-soluble material	3.4	6341	-	X
Total ash	3.4	6421	-	X
Chromic oxide	3.4	6515	-	X
pH value	3.4	6621	-	X
Paranitrophenol (class 1)	3.4.1	6711	-	X

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

2/ Exception to Method 3202: The grain surface of the folded specimen shall be rubbed together under moderate pressure. The duration of the rubbing shall be 30 seconds.



4.3.1 Cracking, low temperature (types I, II, III). The leather shall be tested for cracking in accordance with Method 7211 of FED-STD-311 except that the specimen shall be a 4 by 1 inch rectangle of leather. The specimen shall be folded twice upon itself by folding the specimen along the length dimension with the flesh side in and then folding again at right angles to the original fold. The specimen shall be observed with the naked eye and the presence of cracking or parting of the finish from the leather shall be reported.

4.3.2 Measurement of stiffness (before and after soaking).

4.3.2.1 Stiffness before soaking (types V, VI, VII, VIII). The specimen shall be tested for stiffness in accordance with Method 4212 of FED-STD-311 with the following exceptions:

Exceptions to Method 4212:

Paragraph 5.2, next to last line. Delete "by applying a 90 degrees angular twist through two cycles".

Paragraph 5.2, subparagraph b. Delete subparagraph b and substitute the following:

"b. Reverse rotation to the clockwise direction and continue rotating slowly until the specimen clamp indicator (I) has passed the original reference line indicated on the lower dial (J) by approximately 45 degrees. Again reverse the direction of rotation and slowly realign the specimen clamp indicator (I) with the original reference line indicated on the lower dial (J)".

4.3.2.2 Stiffness after soaking (types V, VII, VIII). If the stiffness requirements specified for before soaking are not met, then do not test for stiffness after soaking. Any individual specimen exceeding the maximum stiffness values specified for before soaking shall not be tested for stiffness after soaking. The specimens shall be immersed in 1,000 milliliters of distilled water at  $140^{\circ} \pm 5^{\circ} \text{ F}$  ( $60^{\circ} \pm 3^{\circ} \text{ C}$ ) for  $20 \pm 2$  hours. Complete immersion of the specimens shall be accomplished by placing a floating cover on the vessel used for immersion of the specimens. After the required immersion period, the specimens shall be removed from the water and reconditioned in accordance with standard atmospheric conditions as specified in 5.1 of Method 4212. The reconditioned specimens shall be placed flesh side down on a rule graduated in decimal inches and the distance between the bench marks shall be measured to the nearest 0.05 inch. If the distance is 3.4 to 3.6 inches, test the specimen in accordance with Method 4212 and the exceptions noted in 4.3.2.1. If the distance is 3.2 inches or less, the specimen shall be reported as a test failure. If the distance between bench marks is 3.25 to 3.35 inches, the specimen shall be stretched before testing. To stretch the specimen, place the specimen on the

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rule and align line one of the bench marks with a division line on the rule. Hold the specimen against the rule by placing the finger tip of one hand on the aligned bench mark. With the thumb and index finger of the other hand, lightly grip the specimen near the aligned bench mark, then slide the finger and thumb along the specimen to the other bench mark while exerting pressure on the specimen that is sufficient to obtain the required distance between the bench marks. If the required distance between the bench marks has been obtained (3.4 to 3.6 inches), test the specimens in accordance with Method 4212 and the exceptions noted in 4.3.2.1. If the distance between the bench marks is greater than 3.6 inches discard the specimen and test a new specimen selected from the same 8 by 8 inch test sample of leather from which the discarded specimen was obtained. The new specimen shall be tested for stiffness before and after soaking. The test results obtained when the discarded specimen was tested for stiffness before soaking shall not be reported.

## 5. PREPARATION FOR DELIVERY

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

5.1.1 Levels A and C. Leather shall be packaged in accordance with the applicable requirements of MIL-L-43432.

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

5.2.1 Levels A, B, and C. Leather shall be packed in accordance with the applicable requirements of MIL-L-43432.

5.3 Marking. Marking shall be in accordance with 5.3.1 or 5.3.2 (see 6.2).

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

5.3.2 Military agencies. In addition to any special marking required by the contract or order, shipments shall be marked in accordance with MIL-L-43432.

## 6. NOTES

6.1 Intended use. The leather is intended for use in gloves, garments, mittens and equipage.

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 and class required (see 1.2.1).
- (c) Thickness required (see 3.3.2).
- (d) Color required (see 3.3.3).
- (e) Staining and colorfastness requirement when values other than those specified are required (see 3.3.7 and 3.3.8).
- (f) Selection of applicable levels of packaging and packing (see 5.1 and 5.2).
- (g) Marking required (see 5.3).

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6.3 Supersession data. The correlation between types and classes of the superseded specifications KK-L-162B, KK-L-168C, KK-L-169D and the types and classes specified herein, are as follows:

KK-L-162B  
Types and classes

Type I - Full grain (cattlehide) for garments and equipage  
Type II - Full grain (cattlehide) for gloves  
Type III - Flesh splits (cattlehide) for garments and equipage  
Type IV - Flesh splits for gloves  
Class 1 - Mildew resistant treated  
Class 2 - Not mildew resistant treated

KK-L-168C  
Types and classes

Type I - Full grain (deerskin) for garments and equipage  
Type II - Full grain (deerskin) for gloves  
Class 1 - Mildew resistant treated  
Class 2 - Not mildew resistant treated

KK-L-169D  
Types and classes

Type I - Full grain (horsehide) for garments and equipage  
Type II - Full grain (horsehide) for gloves  
Class 1 - Mildew resistant treated  
Class 2 - Not mildew resistant treated

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Types and classes

Type I - Cattlehide, full grain for garments and equipage  
Type V - Cattlehide, full grain for gloves  
Type IV - Cattlehide, flesh splits for garments and equipage  
Type VIII - Cattlehide flesh splits for gloves  
Class 1 - Mildew resistant treated  
Class 2 - Not mildew resistant treated  
Type II - Deerskin, full grain for garments and equipage  
Type VI - Deerskin, full grain for gloves  
Class 1 - Mildew resistant treated  
Class 2 - Not mildew resistant treated  
Type III - Horsehide, full grain for garments and equipage  
Type VII - Horsehide, full grain for gloves  
Class 1 - Mildew resistant treated  
Class 2 - Not mildew resistant treated

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Custodians:

Army - GL  
Navy - SA  
Air Force - 99

Review activities:

Army - MD  
DSA - CT

User activities:

Army - EL  
Navy - MC

Preparing activity:

Army - GL

Civil Agency Coordinating Activities:

AGR - ARS  
DC - DCG  
GSA - FSS

Project No. 8330-0166

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