

INCH-POUND

MIL-C-44001B  
30 March 1990  
SUPERSEDING  
MIL-C-44001A  
31 March 1987

## MILITARY SPECIFICATION

### COVER, HELMET, CHEMICAL PROTECTIVE

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

#### 1. SCOPE

1.1 Scope. This specification covers one type and size of chemical protective helmet cover.

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

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Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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AMSC N/A

FSC 8415

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

## SPECIFICATIONS

## FEDERAL

- A-A-203 - Paper, Kraft, Untreated
- A-A-50199 - Thread, Polyester Core, Cotton- or Polyester-Covered
- JJ-W-155 - Webbing, Textile, (Cotton, Elastic)
- DDD-L-20 - Label: For Clothing, Equipage, and Tentage  
(General Purpose)
- PPP-B-636 - Boxes, Shipping, Fiberboard

## MILITARY

- MIL-T-3530 - Thread, and Twine; Mildew Resistant or Water  
Repellent Treated
- MIL-L-35078 - Loads Unit, Preparation of Semiperishable  
Subsistence Items; Clothing, Personal Equipment  
and Equipage: General Specification For
- MIL-C-51251 - Cloth, Coated: CBR Protective

## STANDARDS

## FEDERAL

- FED-STD-751 - Stitches, Seams, and Stitchings

## MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection  
by Attributes
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-147 - Palletized Unit Loads
- MIL-STD-731 - Quality of Wood Members for Containers and  
Pallets

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following documents 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).

THE COLOR ASSOCIATION OF THE UNITED STATES

Department of Defense Standard Color Card for Sewing Threads

(Color cards may be available from the Color Association of the United States, 343 Lexington Avenue, New York, NY 10016-0927. If color cards are not available from the Color Association, individual color samples may be obtained from the contracting activity or as directed by the contracting activity.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3951 - Standard Practice for Commercial Packaging

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

(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, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3), in accordance with 4.3.

3.2 Samples. Guide samples, when furnished, are solely for guidance and information to the contractor (see 6.4). Variations from the specification may appear in the sample, in which case the specification shall govern.

3.3 Material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

3.3.1 Cloth, coated, CBR protective. The coated nylon (ripstop) butyl cloth for the body piece shall conform to MIL-C-51251, with the exception of the bias bow requirement. The color shall be Olive Drab 177.

3.3.2 Webbing, elastic, cotton. The cotton elastic webbing shall conform to type II, class 3, unbleached, 1/2 inch wide of JJ-W-155 except that the requirement for accelerated aging shall not apply and the initial tension shall not exceed 2.30 pounds.

3.3.3 Thread. The thread for all stitching shall be polyester-covered, cotton-covered or rayon-covered, ticket number 50, 2 or 3 ply, color CA 66022, conforming to A-A-50199. The thread shall be water repellent treated in accordance with type II, class 3 of MIL-T-3530.

3.4 Design. The cover is made from a single piece of coated cloth with elastic webbing inserted within a hem which is sewn around the periphery of the cover.

3.5 Cut parts.

3.5.1 Body piece. Cut body piece  $25 \pm 1/2$  inches in diameter.

3.5.2 Webbing, elastic. Cut elastic webbing  $26 \pm 1/4$  inches long.

3.6 Construction. Overlap ends of elastic webbing  $3/4 \pm 1/2$  inch and box stitch together with a  $3/8$  by  $1/2$  inch pattern centered on the overlap. As an alternate, secure ends with a  $1/8$  inch wide, 28 stitch  $1/2$  inch long bartack centered on overlap and perpendicular to length of the elastic. Bartacking shall be free from the thread breaks and loose stitching. With the heavy coated side of the body piece facing down, double fold the edge back with the first fold  $3/8 \pm 1/16$  inch and the second fold  $3/4 + 1/8, - 1/16$  inch. Position the elastic webbing within the formed hem and stitch around entire periphery with stitching located  $1/16$  to  $1/8$  inch from the inner folded edge. During the stitching operation, the elastic webbing shall be stretched so that puckers caused by take-up of the elastic are not sewn into the seam. The elastic shall be inclosed within the hem with no twists and shall not be caught in the stitching.

3.6.1 Stitches, seams, and stitching. All stitching shall be 8-10 stitches per inch using stitch type 301 of FED-STD-751.

3.6.1.1 Type 301 stitching. Ends of all stitching shall be backstitched or overstitched  $1/2$  inch minimum. Thread tension shall be maintained so that there will be no loose stitching resulting in loose bobbin or top thread, or excessively tight stitching resulting in puckering of the materials sewn. The lock shall be embedded in the materials sewn.

3.6.1.1.1 Repairs of type 301 stitching. Repairs of type 301 stitching shall be as follows:

a. When thread breaks or bobbin run-offs occur during sewing, the stitching shall be repaired by restarting the stitching a minimum of 1 inch behind the end of the stitching. 1/

b. Threads breaks or two or more consecutive skipped or run-off stitches noted during inspection of the item (in-process or end item) shall be repaired by overstitching. The stitching shall start a minimum of 1 inch before the

defective area and continue a minimum of 1 inch beyond the defective area onto the existing stitching (except on box stitching substitute 1/2 inch for 1 inch). Loose or excessively tight stitching shall be repaired by removing the defective stitching, without damaging the materials, and restitching in the required manner. 1/

1/ When making the above repairs the ends of the stitching are not required to be backstitched.

3.6.1.2 Use of automated apparel equipment. Automated apparel equipment may be used to perform any of the operations specified in 3.6, providing that the seam and stitch type are as specified and the finished component conforms to the required configuration. When a government furnished shaper pattern is forwarded, the component shall conform to that pattern.

3.6.1.3 Thread ends. All thread ends shall be trimmed to a length of not more than 1/4 inch.

3.6.2 Identification label. The cover shall have an identification label conforming to type IV, class 5 of DDD-L-20. The label shall be applied on the top inside (lightly coated side of cloth) surface of the cover.

3.6.3 Repairs. Repairs such as mends, darns, or patches are not permitted on the cover.

3.6.4 Replacement of defective components. During the spreading, cutting, and manufacturing process, components of the cover having material defects or damages that are classified as defects in 4.4.3 shall be removed from production and replaced with non-defective and properly matched components.

3.7 Workmanship. The cover shall conform to the quality of product established by this specification.

#### 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 (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for ensuring that all specified dimensions have been met. When dimensions cannot be examined on the end item, inspection shall be made at any point, or at all points in the manufacturing process necessary to ensure compliance with all dimensional requirements.

4.1.3 Certificates of compliance. Where certificates of compliance are submitted, the Government reserves the right to inspect such items to determine the validity of the certification.

4.2 Classification of inspections. 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 a first article is required (see 3.1 and 6.2), it shall be examined for the defects specified in 4.4.3 and 4.4.4.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.4.2 In-process inspection. In-process inspection shall be performed on the elastic webbing to assure that the cut length and joining operation are in accordance with specified requirements. Whenever nonconformance is noted, corrections shall be made to the items affected and lot in-process. Parts which cannot be corrected shall be removed from production. The Government reserves the right to exclude from consideration for acceptance, any material or service for which in-process inspection has indicated nonconformance.

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4.4.3 End item visual examination. The end items shall be examined for the defects listed in table I. The lot size shall be expressed in units of helmet covers. The sample unit shall be one helmet cover. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 1.5 for major defects and 6.5 for total (major and minor combined) defects.

TABLE I. End item visual defects

Examine	Defect	Classification	
		Major	Minor
Cloth, coated	Cut, tear or hole	101	
	Abrasion mark or scratch which extends through the coating to a point where base yarn or fabric weave can be seen	102	
	Uncoated area	103	
	Pit, blister, tunnel, or delamination of coating	104	
	Lump or imbedded foreign matter which protrudes so as to be readily abraded from material or easily removed	105	
	Crease or wrinkle which when flattened by pulling manually results in delamination of coating from base fabric	106	
Seams and stitching:			
Open seams	Up to 1/2 inch inclusive		201
	More than 1/2 inch	107	
NOTE: A seam shall be classified as an open seam when one or more stitches joining a seam are broken, or when two or more consecutive skipped or runoff stitches occur.			
Stitch type	Incorrect stitch type	108	
Seam type	Hem not double folded	109	
Stitch tension	Loose tension, resulting in a loose top or bobbin thread		202
	Excessively tight tension, resulting in puckering of material		203

TABLE I. End item visual defects (cont'd)

Examine	Defect	Classification	
		Major	Minor
Seams and stitching: (cont'd)			
Stitches per inch	One stitch less than minimum specified		204
	Two or more stitches less than minimum specified	110	
	One or more stitches in excess of maximum specified		205
Stitching ends	Not secured as specified		206
Thread breaks, skipped stitches, or runoffs	Thread breaks or two or more consecutive skipped or runoff stitches overstitched less than 1 inch in each direction beyond the defective stitching area		207
NOTE:	Thread break or two or more consecutive skipped or runoff stitches not overstitched shall be classified as open seam.		
Component and assembly	Elastic webbing omitted	111	
	Elastic webbing caught in stitching	112	
	Any unauthorized repair	113	
	Heavy coated side of cloth not on outside of cover (hem is on inside surface)	114	
Cleanness	Spot, stain, or streak more than 1 inch in combined directions which cannot be readily removed with naptha or water		208
	Thread ends not trimmed as specified		209
Identification label	Omitted, incorrect, illegible, or not as specified		210

4.4.4 End item dimensional examination. The end items shall be examined for conformance to the hem widths and stitch margin requirements specified in 3.6. Any dimension not within the specified tolerance shall be classified as a defect. The lot size shall be expressed in units of helmet covers. The sample unit shall be one helmet cover. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.



4.4.5 Packaging examination. The fully packaged end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container fully packaged. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

<u>Examine</u>	<u>Defect</u>
Marking (exterior and interior)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application including frequency of shipping tags on unit packs
Materials	Any component missing, damaged, or not as specified
Workmanship	Inadequate application of components, such as: incomplete sealing or closure of flap, improper taping, loose strapping or inadequate stapling Bulged or distorted container
Content	Number per container or unit pack is more or less than required

4.4.6 Palletization examination. The fully packaged and palletized end items shall be examined for the defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

<u>Examine</u>	<u>Defect</u>
Finished dimensions	Length, width, or height exceeds specified maximum requirement
Palletization	Pallet pattern not as specified Interlocking of loads not as specified Load not bonded as specified
Weight	Exceeds maximum load limits
Marking	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

## 5. PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial as specified (see 6.2).

5.1.1 Level A preservation. Twenty covers shall be evenly stacked with inside facing up and last one facing down to form a neat bundle. The bundle shall be securely crosstied with cotton tape or twine.

5.1.2 Commercial preservation. The covers shall be preserved in accordance with ASTM D 3951.

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

5.2.1 Level A packing. Two-hundred and forty covers preserved as specified in 5.1, shall be packed in a snug-fitting fiberboard shipping container conforming to style RSC-L, grade V2s of PPP-B-636. The inside of each shipping container shall be fitted with a box liner conforming to type CF, class weather-resistant, variety DW, grade V15c of PPP-B-636. Each container shall have the contents completely covered on the top and bottom with a sheet of 30-pound minimum basis weight kraft paper conforming to A-A-203. Each fiberboard container shall be closed in accordance with method III, waterproofed in accordance with method V, and reinforced as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.5. Shipping containers shall be arranged in unit loads in accordance with MIL-L-35078 for the type and class of load specified (see 6.2). Strapping shall be limited to nonmetallic strapping except for type II, class F loads.

5.2.2 Level B packing. Two-hundred and forty covers, preserved as specified in 5.1, shall be packed in a snug-fitting fiberboard shipping container conforming to style RSC-L, type CF (variety SW) or SF, class domestic, grade 275 of PPP-B-636. The inside of each container shall be fitted with a box liner conforming to type CF, class domestic, variety DW, minimum grade 200 of PPP-B-636. Each container shall have the contents completely covered on the top and bottom with a sheet of 30-pound minimum basis weight kraft paper conforming to A-A-203. Each fiberboard container shall be closed in accordance with method II as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.5.

5.2.2.1 Weather-resistant fiberboard containers. When specified (see 6.2), the fiberboard shipping container shall be a grade V3c, V3s, or V4s fiberboard box fabricated in accordance with the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.5.

5.2.3 Commercial packing. Covers, preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

5.3 Palletization. When specified (see 6.2), helmet covers packed as specified in 5.2.2 or 5.2.3, shall be palletized on a 4-way entry pallet in accordance with load type Ia of MIL-STD-147. Pallet types shall be type I (4-way entry), type IV, or type V in accordance with MIL-STD-147. Pallets shall be fabricated from wood groups I, II, III, or IV of MIL-STD-731. Each prepared load shall be bonded with primary and secondary straps in accordance with bonding means C and D or film bonding means F or G. Pallet pattern shall be in accordance with appendix of MIL-STD-147. Interlocking of loads shall be effected by reversing the pattern of each course.

5.4 Marking. In addition to any special marking required by the contract or purchase order, unit packs, shipping containers, and palletized unit loads shall be marked in accordance with MIL-STD-129 or ASTM D 3951, as applicable. Each third unit pack shall have attached a manila colored paper shipping tag for the identification information.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The cover provides chemical protection for the Ground Troops - Parachutists Helmet.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- c. When first article is required (see 3.1, 4.3, and 6.3).
- d. Levels of preservation and packing (see 5.1 and 5.2).
- e. Type and class of unit load (see 5.2.1).
- f. When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2.1).
- g. When palletization is required (see 5.3).

6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.4 Sample. For access to samples, address the contracting activity issuing the invitation for bids or request for proposal.

6.5 Subject term (key word) listing.

Chemical protection  
Clothing, special purpose  
Parachutist's helmet

6.6 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:

Army - GL  
Navy - NU  
Air Force - 99

Preparing activity:

Army - GL  
(Project 8415-0720)

Review activities:

Army - MD  
Air Force - 11, 82  
DLA - CT

User activities:

Navy - MC  
Air Force - 45