

MIL-C-12189G  
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SUPERSEDING  
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## MILITARY SPECIFICATION

CLOTH, COATED: BUTYL COATED, TOXICOLOGICAL AGENTS PROTECTIVE

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

### 1. SCOPE

1.1 Scope. This document covers one type of butyl coated nylon cloth (see 6.1).

### 2. APPLICABLE DOCUMENTS

#### \* 2.1 Government documents.

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

## SPECIFICATIONS

### FEDERAL

PPP-P-1136                      - Packaging of Coated (Plastic; Rubber) and Laminated Fabrics

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.

AMSC N/A

FSC 8305

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## MIL-C-12189G

- \* 2.3 Order of precedence. In the event of conflict between the text of this document and the references cited herein, the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1 Standard sample. The coated cloth 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).

3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3, 6.2, and 6.4).

3.3 Laboratory report approval. Unless otherwise specified (see 6.2), at the time of submission of a bid the contractor shall submit to the contracting officer a certified copy of a recent laboratory report certifying that the cloth was manufactured in a plant where the coating will be performed if a contract is awarded. The laboratory report shall also contain test data that demonstrate the finished product proposed by the contractor has been tested in conformance with and found to comply with the requirements of this document. All tests involving toxicological agents shall be conducted by the U.S. Army Armament Munitions and Chemical Command. A 7 yard sample shall be submitted to the U.S. Army Armament Munitions and Chemical Command (Edgewood Area), Chemical Test Branch, Building E 5100, Aberdeen Proving Ground, MD 21010-5423, and a minimum of 30 days shall be allowed for receipt of test results. Any of the following types of reports will be satisfactory for all other test requirements:

- a. An independent or commercial laboratory report.
- b. The prospective contractor's own laboratory report.
- c. A governmental laboratory report from a contract within one year of date of submission of bid.

The purpose of the above requirements are to assist the Government to determine the capability of bidders to manufacture a cloth meeting all the requirements of this document. The submission of an acceptable report under this requirement shall not be construed as relieving a contractor from subsequently meeting all requirements of the document on all deliveries.

## MIL-C-12189G

3.4 Material.

3.4.1 Base cloth. The base cloth shall be cloth, nylon, twill conforming to MIL-C-19377 except that the cloth shall be undyed.

3.4.2 Coating compound. The coating compound used for coating the base cloth shall be a composition of butyl rubber formulated to meet the requirements of this document. No natural rubber, reclaimed rubber, or synthetic rubber other than butyl shall be used (see 4.4.1.1).

3.4.3 Dusting powder. The dusting powder for application to the coated cloth shall be whiting, talc, or other finely divided mineral material that does not support mildew growth (see 4.4.1.1).

3.5 Coated cloth (see 6.6). The coating compound specified in 3.4.2 shall be applied to both sides of the base cloth, after which the coated cloth shall be fully vulcanized (see 4.4.1.1). The coating shall be uniformly distributed over both cloth surfaces, with a minimum of 65 percent to a maximum of 75 percent on one side and the balance of the coating on the other side (see 4.4.1.1). The coated cloth shall then be dusted on both sides with a minimum amount of the dusting powder specified in 3.4.3 necessary to prevent blocking. The application of dusting powder shall be controlled during processing or reduced by an after-processing brush or wash, so that both sides of the finished coated cloth shall show no less than "good" resistance to crocking when tested as specified in 4.4.3.

- \* 3.5.1 Physical requirements. The physical properties of the coated cloth shall conform to the requirements of table I when tested as specified in 4.4.3.

TABLE I. Physical requirements

Characteristic	Requirement	
	Minimum	Maximum
Weight, overall, oz/sq yd	11.0	13.5
Breaking strength, pounds:		
Initial:		
Warp	180	-
Filling	170	-

## MIL-C-12189G

TABLE I. Physical requirements - Continued

Characteristic	Requirement	
	Minimum	Maximum
After accelerated weathering:		
Warp	170	-
Filling	160	-
Stiffness, centimeters (warp only)		
At 70° ± 2°F	-	9.5
Adhesion of coating, lb/2-inch width	8.0	-
Hydrostatic resistance, psi:		
Initial	200	-
After strength of coating	200	-
After cold crack	200	-
Blocking, scale rating	-	No. 2
Abrasion resistance	<u>1/</u>	-
Colorfastness to weathering	<u>2/</u>	-

- 1/ After having been abraded the required number of cycles, no loose fibers of the base cloth shall be exposed in the abraded portion of the specimen.
- 2/ The colorfastness shall be equal to or better than the standard sample. When no standard sample is available, the colorfastness shall be "good".

3.5.2 State of cure. The finished coated cloth shall be tightly and uniformly cured in such a manner that there is no evidence of the coating becoming soft and tacky or stiff and brittle when subjected to the solvent resistance test specified in 4.4.3.

3.5.3 Requirements for resistance to toxicological agents. The coated cloth shall conform to the requirements in table II when tested as specified in 4.3 and 4.4.3.3.

## MIL-C-12189G

TABLE II. Resistance to toxicological agents requirements

Characteristic	Requirement
Resistance to toxicological agents, minutes (minimum):	
Initial:	
Mustard (H)	100
GB	200
After accelerated weathering:	
Mustard (H)	75
GB	150
After decontamination:	
Mustard (H)	75
GB	150
Colorfastness after decontamination	<u>1/</u>
Breaking strength after decontamination, pounds of force (minimum):	
Warp	170
Filling	160

1/ The colorfastness shall be equal to or better than the standard sample. When no standard sample is available, the colorfastness shall be "good".

3.6 Color. The color of the coated cloth (both sides) shall be Olive Drab 177 and shall match the standard sample.

- \* 3.6.1 Matching. Before matching for color, the dusting powder shall be removed from the specimens by wiping with a damp cloth and the specimen shall be allowed to air dry. The color shall match the standard sample (see 6.3), when viewed under filtered tungsten lamps that approximate artificial daylight and that have a correlated color temperature of  $7500 \pm 200$  K, with illumination of  $100 \pm 20$  foot candles. The color shall be a good match to the standard sample under incandescent lamplight at  $2300 \pm 200$  K.

3.7 Width. The minimum overall width, after selvage trimming, shall be as specified (see 6.2). Selvages shall be trimmed to give a straight, uniform edge.

## MIL-C-12189G

- \* 3.8 Length and put-up. Each roll shall contain no less than 180 yards nor more than 220 yards. The maximum number of pieces per roll shall be four, and no single piece shall be less than 20 yards. The ends of the pieces shall be overlapped and not joined by a seam. The coated cloth shall be put up in rolls as specified in 5.1.

3.9 Odor. The coated cloth shall be free from any objectionable odor. Characteristic odor of coating is not considered objectionable.

3.10 Marking. The words HEAVY SIDE shall be stencilled in legible 1/2-inch black letters on the heavier coated side of each roll. The words shall be located on one edge at the beginning and end of each roll.

3.11 Workmanship. The finished cloth shall conform to the quality of product established by the document. 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 contractor is responsible for the performance of all inspection requirements 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 document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

- \* 4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirement in the document shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

- \* 4.1.2 Certificates of compliance. When certificates of compliance are submitted, the Government reserves the right to inspect such items to determine the validity of the certification.

## MIL-C-12189G

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 6.2), it shall be examined for the defects specified in table V and tested for the characteristics listed in table III. The presence of any defect or failure of any test shall be cause for rejection of the first article.

TABLE III. First article tests for toxicological agents resistance <sup>1/</sup>

Characteristic	Requirement reference	Test method
Initial:		
Mustard (H)	3.5	4.6.2
GB	3.5	4.6.3
After accelerated weathering:		
Mustard (H)	3.5	4.6.4
GB	3.5	4.6.5
After decontamination:		
Mustard (H)	3.5	4.6.6
GB	3.5	4.6.7
Colorfastness:		
After decontamination	3.5	4.6.8
Breaking strength:		
After decontamination	3.5	4.6.9 and 5100 <sup>2/</sup>

<sup>1/</sup> Forward 7 yards of the preproduction sample to the U.S. Army Armament Munitions and Chemical Command for performance of these tests (see 6.5).

<sup>2/</sup> Method of testing as specified in FED-STD-191.



## MIL-C-12189G

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 document or applicable purchase document.

4.4.1.1 Certification. Components, materials, and processes listed below shall be accepted on the basis of a contractor's certificate of compliance with the indicated requirements:

- a. The coating compound is a composition of butyl rubber, and no natural, reclaimed, or synthetic rubber was used other than butyl rubber.
- b. The distribution of coating requirement has been met.
- c. The dusting powder used does not support mildew growth.
- d. The cloth is fully vulcanized after coating is applied to both sides.

4.4.2 End item examination.

4.4.2.1 Yard-by-yard examination. The coated cloth shall be examined for the defects listed in table V. The required yardage of each roll shall be examined on one side only, however, the side shall be alternated so that alternate rolls are examined on the face and back, respectively. The defects found shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition of the cloth, in which case only the more serious defect shall be counted. A continuous defect shall be counted as one defect for each warpwise yard or fraction thereof in which it occurs. The lot size shall be expressed in units of yards. The sample unit shall be 1 linear yard. The inspection level shall be III and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 1.5 for major defects and 4.0 for total (major and minor combined) defects. The number of rolls from which the sample yardage is to be selected shall be as specified in table IV. The sample yardage shall be apportioned equally among the selected rolls.

## MIL-C-12189G

TABLE IV. Sample size

Lot size (yards)	Sample size (rolls)	Acceptance number <u>2/</u>
Up to 1,200 inclusive <u>1/</u>	3	0
1,201 to 3,200 inclusive	5	0
3,201 to 10,000 inclusive	8	0
10,001 to 35,000 inclusive	13	0
35,001 to 150,000 inclusive	20	1
150,001 and over	32	2

1/ If a lot contains fewer than three rolls, each roll in the lot shall be examined.

2/ Applicable to length examination only (see 4.4.2.2).

TABLE V. Yard-by-yard examination defects

Defect	Classification	
	<u>Major</u>	<u>Minor</u>
Any cut, hole, or tear that extends beyond the base cloth	X	
Any abrasion mark or scratch that extends through the coating to a point where base cloth yarns or cloth weave can be seen		X
Any pinhole <u>1/</u>	X	
Any uncoated area	X	
Any pit, blister, tunnel, or delamination of coating	X	
Any lump or embedded foreign matter that protrudes so as to be readily abraded from material or easily removed	X	
Crease or wrinkle resulting in adhesion of surface or delamination of coating when corrected by manual pressure	X	
Any spot, stain, or streak, more than 1 inch in combined directions that cannot be readily removed with naphtha or water <u>2/</u>		X

## MIL-C-12189G

TABLE V. Yard-by-yard examination defects - Continued

Defect	Classification	
	<u>Major</u>	<u>Minor</u>
Spliced cloth (base cloth or coated) or impression in coating from splicing threads	X	
Width less than minimum specified	X	
Roll number missing, illegible, or not on lightly coated side		X
Color and shade not as specified		X
Coating improperly applied (i.e., not visibly heavier on one side)	X	
Dusting powder omitted	X	
Any tackiness or soft coating (coating will adhere and not unroll readily)	X	
Ripples, waviness, or dimensional distortion		X
Edges not straight and uniform, or edges folded, rolled, or scalloped		X
Any objectionable odor <u>3/</u>		X

1/ The examination for pinholes shall be performed in accordance with the through-light inspection procedure in MIL-STD-1487.

2/ Clearly visible at normal inspection distance (approximately 3 feet).

3/ Odors of chemicals commonly used in coating compounds shall not be regarded as objectionable.

- \* 4.4.2.2 Length examination. Each roll of cloth used in the yard-by-yard examination shall be examined for the defects listed below. If the total number of defects in the sample rolls exceeds the applicable acceptance number specified in table IV or if the total of the actual lengths of the sample rolls is less than the total of the lengths marked on the roll tickets, the lot shall be rejected.

Total length of roll less than 180 yards or more than 220 yards.

Total length of roll is 2 or more yards less than that marked on ticket.

Roll containing more than four pieces.

Any piece in roll less than 20 yards in length.

Ends of pieces in roll not overlapped, but joined by seam.

## MIL-C-12189G

4.4.3 End item testing. Test results obtained under testing conditions defined in FED-STD-191, FED-STD-406, or FED-STD-601 will be acceptable except in case of dispute. In dispute cases, tests shall be conducted with both the specimen and test apparatus under standard conditions as defined in FED-STD-191.

4.4.3.1 Physical testing. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in table VI shall be followed. The physical values specified in section 3 apply to the average of determinations made on a sample unit for test purposes as specified in the applicable test method. The sample unit for testing shall be four continuous yards full width of the coated cloth. The lot size shall be expressed in units of linear yards, and the sample size (number of sample units) shall be as specified below. The lot shall be unacceptable if any sample unit fails to meet any specified requirement. All test reports shall contain the individual values used in expressing the final results.

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

TABLE VI. Physical tests

<u>Characteristic</u>	<u>Requirement reference</u>	<u>Test method</u>
Resistance to crocking	3.5	5651 <u>1</u> /
Weight, overall	3.5.1	5041
Breaking strength:		
Initial	3.5.1	5100
After accelerated weathering	3.5.1	4.6.1 and 5100
Tearing strength	3.5.1	ASTM D 1424
Stiffness (warp only):		
At 70° ± 2°F	3.5.1	5204 <u>2</u> /

## MIL-C-12189G

TABLE VI. Physical tests Continued

Characteristic	Requirement reference	Test method
Adhesion of coating	3.5.1	5970
Hydrostatic resistance:		
Initial	3.5.1	5512 <u>3/</u>
After strength of coating	3.5.1	5972 and 5512 <u>3/</u>
After cold crack	3.5.1	5874 <u>4/</u> and 5512 <u>3/</u>
Blocking	3.5.1	5872
Abrasion resistance	3.5.1	5302 <u>5/</u>
Colorfastness to weathering	3.5.1	5671 <u>6/</u>

1/ A dry crocking resistance test only shall be conducted on the coated cloth. Rating shall be performed in accordance with method B, using blue crock cloth.

2/ Specimens for stiffness test at 70°F shall be conditioned at the test conditions for not less than 4 hours prior to the test. All tests shall be made in still air.

3/ The lightly coated side of the cloth shall be exposed to the water pressure.

4/ Except that Method 5512 shall be used for determination of hydrostatic resistance, and that the specimens shall be exposed at a temperature of minus 40° ± 2°F for a period of not less than 4 hours.

5/ The following exceptions to Method 5302 shall apply:

- a. The heavily coated side of the cloth shall be tested.
- b. No metallic contact pin shall be used.
- c. The specimens shall be abraded 100 multidirectional cycles using fine emery cloth as the abradant.
- d. Before cutting the test specimens, the coated cloth shall be cleaned by washing with mild soap and water, rinsing in distilled water, and drying at room temperature.

## MIL-C-12189G

- 6/ The heavily coated side of the specimen shall be exposed and the time of exposure shall be 100 hours.

4.4.3.2 State of cure testing. This test shall be performed on every separate piece of cloth in every roll. Specimens approximately 1 inch in diameter shall be taken from the center of the width of the piece at the middle. Each specimen shall be separately tested by submerging in 10 mL of toluene in a 3 to 4-inch diameter watch glass. The toluene shall be allowed to contact both sides of the specimen for 15 minutes. The toluene shall then be poured off, and the specimen allowed to dry for 5 minutes at standard test conditions before examination. The piece shall be unacceptable if one or more of the specimens from the piece becomes soft and tacky or stiff and brittle.

4.4.3.3 Toxicological agents resistance testing. Every roll of coated cloth shall have a sample of 3 continuous yards full width removed and forwarded to the U.S. Army Armament Munitions and Chemical Command for testing in accordance with table VII. Any test failure shall be cause for rejection of the roll from which the failed sample was taken.

TABLE VII. End item toxicological agents resistance tests (see 6.5)

Characteristic	Requirement reference	Test method
Resistance to mustard (H)	3.5.3	4.6.2
Resistance to GB	3.5.3	4.6.3

4.5 Packaging inspection. The inspection shall be in accordance with the quality assurance provisions of PPP-P-1136.

4.6 Methods of inspection.

4.6.1 Weathering procedure. The test shall be performed with filters for a period of 100 hours on specimens 4 by 6 inches minimum with the heavily coated side of the cloth exposed as specified in Method 5804 of FED-STD-191. After exposure, the specimens shall be allowed to dry and then be conditioned at standard conditions for 4 hours.

## MIL-C-12189G

4.6.2 Resistance to mustard (H) test. Resistance to permeation by mustard (H) shall be determined as specified in Method 204 or T209 of MIL-STD-282. Test specimens shall be obtained by quartering a 3-yard piece of the coated cloth and selecting one specimen from each quarter, with one determination made on the heavily coated side of each specimen. No test specimen shall be taken within 2 inches from the selvage edge. All specimens shall meet the requirements listed in table II. In the event that three of the four tested specimens meet the requirements but one does not, then two additional specimens from each quarter shall be tested with one determination made on each specimen. If seven of the eight specimens tested meet the requirements in table II and the eighth specimen is not less than 75 minutes, the material shall be considered acceptable.

4.6.3 Resistance to GB test. Resistance to permeation by GB shall be determined as specified in Method 206 or T208 of MIL-STD-282. Test specimens shall be obtained by quartering a 3 yard piece of the coated cloth and selecting two samples, at random, from each quarter, with eight determinations made on the heavily coated side of the cloth. No test specimen shall be taken within 2 inches of the selvage edge. All samples shall meet the requirements listed in table II. In the event that seven of the tested specimens meet the requirements but one does not, four additional test specimens from each quarter shall be tested. If all sixteen specimens meet the requirements, the material shall be considered acceptable.

4.6.4 Resistance to mustard (H) after accelerated weathering. Test specimens shall be exposed to accelerated weathering as specified in 4.6.1 and tested for resistance to mustard (H) as specified in 4.6.2.

4.6.5 Resistance to GB after accelerated weathering. Test specimens shall first be exposed to accelerated weathering as specified in 4.6.1 and then tested for resistance to GB as specified in 4.6.3.

4.6.6 Resistance to mustard (H) after decontamination. Test specimens shall first be subjected to decontamination as specified in 4.6.9 and then tested for resistance to mustard (H) as specified in 4.6.2.

4.6.7 Resistance to GB after decontamination. Test specimens shall first be subjected to decontamination as specified in 4.6.9 and then tested for resistance to GB as specified in 4.6.3.

4.6.8 Colorfastness to decontamination. Test specimens shall be exposed to decontamination as specified in 4.6.9. The standard sample shall be exposed to decontamination together with the test specimens and evaluated for conformance to the requirement. When no standard sample is available, the exposed specimen shall not show an "appreciable change in color" when

## MIL-C-12189G

compared to the unexposed material. "Appreciable change in color" means a change that is immediately noticeable in comparing the test specimen with the original unexposed material. If closer inspection or a change of angle of light is required to make apparent a slight change in color, the change is not considered appreciable.

- \* 4.6.9 Decontamination procedure. Strips of coated cloth, 10 by 22 inches, shall be cut along both the warp and filling directions. Immerse strips for 10 minutes in a decontaminating slurry made up of Super Tropical Bleach (STB) conforming to MIL-D-12468 at a concentration of 50 pounds of STB per 5 gallons of water. (Note: STB is corrosive to most metals and is injurious to most fabrics. A protective mask and gloves should be worn when handling this material.) At the end of 10 minutes, remove strips from the slurry and immerse in 4 gallons of boiling water for 2 hours. At the end of the 2 hours, remove strips from wash and air dry at room temperature.

## 5. PACKAGING

5.1 Put-up and preservation. Put-up and preservation shall be level A or Commercial, as specified (see 6.2).

5.1.1 Levels A and Commercial. The coated cloth shall be put up and packaged in accordance with the applicable requirements of PPP-P-1136.

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

5.2.1 Levels A, B, and Commercial packing. The coated cloth shall be packed in accordance with the applicable requirements of PPP-P-1136.

5.3 Marking. In addition to any special marking required by the contract or purchase order, interior packages and shipping containers shall be marked in accordance with PPP-P-1136.

## 6. NOTES

6.1 Intended use. The coated cloth is intended for use in the fabrication of impermeable clothing affording protection against toxicological warfare agents.



## MIL-C-12189G

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this document.
- b. When a first article is required (see 3.2, 4.3, and 6.4).
- c. When laboratory report approval is not required (see 3.3).
- d. Width required (see 3.7).
- e. Selection of applicable levels of put-up, preservation, and packing (see 5.1 and 5.2).

6.3 Sample. For access to standard samples, address the contracting activity issuing the invitation for bids (see 3.1).

6.4 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 include specific instructions in all acquisition instruments regarding arrangements for selection, inspection, and approval of the first article.

6.5 Conductance of tests. Because of the extreme dangers involved in handling toxicological warfare agents, and the special equipment required in connection with their use, all document tests involving toxicological agents will be performed by the U.S. Army Armament Munitions and Chemical Command (Edgewood Area), Chemical Test Branch, Building E5100, Aberdeen Proving Ground, MD 21010-5423.

6.6 Suggested methods of coating cloth. In order to meet the requirements for toxicological agents resistance, a dense nonporous coating showing no voids at a cross section magnification of 60X has been found necessary. The following methods of coating cloth have been found to produce a coated cloth that will pass the toxicological agents resistance test:

a. A spreader operation in which not less than nine passes are made on each side of the base cloth, with drying passes after every third spreader pass.

b. A combination of calender and spread coating employing the use of a high pressure curing process.

6.7 Toxicity. Any questions raised regarding toxicity should be referred by the contracting activity through channels to the departmental medical activity. In case of Army acquisition, the Surgeon General will act as advisor to the contracting activity.

MIL-C-12189G

\* 6.8 Subject term (key word) listing.

Cloth, butyl coated  
Protection, toxicological warfare agents

6.9 Changes from previous issue. The margins of this document are marked with an asterisk (\*) to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only, and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content, as written, irrespective of the marginal notations and relationship to the last previous issue.

## Custodians:

Army - GL  
Navy - NU  
Air Force - 99

## Preparing activity:

Army - GL  
Project No. 8305-0102

## Review activities:

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

## User activity:

Navy - MC

