

NOT MEASUREMENT  
SENSITIVE

MIL-PRF-32002C

29 August 2000

SUPERSEDING

MIL-PRF-32002B

18 September 1998

## PERFORMANCE SPECIFICATION

### COVER MATERIAL, VEHICLE, COATED TACTICAL AND COMBAT, HEAVY-DUTY, WATERPROOF

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

#### 1. SCOPE

1.1 Scope. This specification covers the requirements for heavy-duty, waterproof, coated tactical and combat vehicle cover material, known hereinafter as "cover material" (see 6.1).

1.2 Classification. The cover material is of the classes listed below (see 6.2):

- |         |   |
|---------|---|
| Class A | - Dual sided infrared protection/low gloss.   |
| Class B | - Single sided infrared protection/low gloss. |

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 Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/ IE, MS 270, Warren, MI 48397-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 25GP

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

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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 requirement documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 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).

## SPECIFICATIONS

## DEPARTMENT OF DEFENSE

|             |  |
|-------------|--|
| MIL-C-46168 | - Coating, Aliphatic Polyurethane, Chemical Agent Resistant. |
|-------------|--|

## STANDARDS

## FEDERAL

|             |  |
|-------------|--|
| FED-STD-191 | - Textile Test Methods.                  |
| FED-STD-595 | - Colors Used in Government Procurement. |

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

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

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DEPARTMENT OF TRANSPORTATION (DOT)

Code of Federal Regulations (CFR) - 49 CFR, Section 571.302.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

Code of Federal Regulations (CFR) - 40 CFR, Part 798.

(Copies of the Code of Federal Regulations are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.3 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).

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC Evaluation Procedure 1 - Gray Scale for Color Change.

(Application for copies should be addressed to the American Association of Textile Chemists and Colorists, 1 Davis Drive, PO Box 12215, Research Triangle Park, NC 27709-2215.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

|            |   |
|------------|---|
| ASTM D471  | - Standard Test Method for Rubber Property - Effect of Liquids (DOD Adopted).                                       |
| ASTM D523  | - Standard Test Method for Specular Gloss (DOD Adopted).  |
| ASTM D751  | - Standard Test Methods for Coated Fabrics (DOD Adopted).   |
| ASTM D2136 | - Standard Test Method for Coated Fabrics - Low-Temperature Bend Test (DOD Adopted).                                |
| ASTM D3045 | - Standard Practice for Heat Aging of Plastics Without Load (DOD Adopted).  |
| ASTM D3389 | - Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform, Double-Head Abrader) (DOD Adopted). |

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- |            |   |
|------------|---|
| ASTM D4833 | - Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.  |
| ASTM D5035 | - Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method) (DOD Adopted). |
| ASTM G21   | - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi (DOD Adopted).   |
| ASTM G155  | - Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.       |

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE)

- |           |  |
|-----------|--|
| SAE J883  | - Test Method for Determining Dimensional Stability of Automotive Textile Materials. |
| SAE J1351 | - Hot Odor Test for Insulation Materials.  |
| SAE J1966 | - Lubricating Oil, Aircraft Piston Engine (Nondispersant Mineral Oil) (DOD Adopted). |

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY (TAPPI)

- |               |   |
|---------------|---|
| TAPPI T451 CM | - Flexural Properties of Paper (Clark Stiffness). |
|---------------|---|

(Application for copies should be addressed to TAPPI, 15 Technology Parkway S, Norcross, GA 30092 or at their website: [www.tappi.org](http://www.tappi.org) .)

2.4 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.

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## 3. REQUIREMENTS

3.1 First article. When specified (see 6.2 and 6.3), a sample shall be subjected to first article inspection in accordance with (IAW) 4.2.

3.2 Material. The base cloth of the cover material shall conform to the requirements specified herein. Natural fibers shall not be used. The base cloth shall be coated with poly (vinyl chloride) (PVC), polyurethane or their equivalent. The cover material shall not be painted with chemical agent resistant coating (CARC) paint (see 4.4.1).

3.2.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3 Operating requirements.

3.3.1 Color, spectral and infrared reflectance. The cover material shall meet the color, spectral and infrared reflectance properties of MIL-C-46168. The color of the cover material shall be as specified in the contract. Class A cover material shall meet the infrared reflectance requirements on both sides, and Class B one side only (see 1.2, 4.4.2.1 and 6.2).

3.3.2 Color fade after accelerated weathering. The color of the cover material shall not fade more than 2 National Bureau of Standards (NBS) units from the original requirement after 500 hours of accelerated weathering. Additionally, the infrared reflectance shall remain within the limits specified in MIL-C-46168 (see 4.4.2.2).

3.3.3 Glossiness. There shall be low gloss on both sides (Class A) of the cover material or one side only (Class B) (see 1.2 and 6.2). The gloss reading at 60 degrees (°) shall be not greater than 1.5 units and, at 85°, shall be not greater than 3.5 units (see 4.4.2.3). Class B cover material shall have low gloss on the same side as infrared reflectance (see 3.3.1).

3.3.4 Dimensional stability. The cover material shall show no tendency to curl at the edges or wrinkle when lying flat, and shall have a maximum shrinkage/growth of 0.4 percent (%) in both the warp and fill directions (see 4.4.2.4).

3.3.5 Breaking force. The cover material shall have a minimum break force of 1446 Newton (N) (325 pounds (lb)) in the warp direction and 1334 N (300 lb) in the fill direction, and the percent elongation at break shall be within a range of 15 to 40% in the warp direction and a range of 25 to 50% in the fill direction (see 4.4.2.5).

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3.3.6 Breaking force after accelerated weathering. The cover material shall have a minimum break force of 1334 N (300 lb) in the warp direction and 1223 N (275 lb) in the fill direction after exposure to 500 hours of accelerated weathering (see 4.4.2.6).

3.3.7 Tearing strength. The cover material shall have a minimum tear strength of 222 N (50 lb) in both the warp and fill directions (see 4.4.2.7).

3.3.8 Hydrostatic resistance. The cover material shall exhibit no leakage in the body of the fabric when subjected to a static pressure head of 100 centimeters (cm) (39.37 inches (in.)) (see 4.4.2.8).

3.3.9 Coating adhesion. Both sides of the cover material shall have a minimum coating adhesion of 89 N per 5.1 cm width (20 pound-force (lbf) per 2 in. width) in the warp direction (see 4.4.2.9).

3.3.10 Stiffness. The cover material shall have maximum stiffness in the warp direction of 16.5 cm (6.50 in.) and 22 cm (8.66 in.) deflection at 21.1 degrees Celsius (°C) (70 degrees Fahrenheit (°F)) and -12.2°C (10°F), respectively (see 4.4.2.10).

3.3.11 Blocking resistance at elevated temperature. The cover material shall have a blocking rating of no greater than 2 (see 4.4.2.11).

3.3.12 Resistance to accelerated aging. The cover material shall not experience color change, nor increased softness, stiffness, tackiness, or brittleness when exposed to accelerated aging (see 4.4.2.12).

3.3.13 Resistance to aromatic hydrocarbon fluids. The cover material shall be resistant to aromatic hydrocarbon fluids (see 4.4.2.13).

3.3.14 Abrasion resistance. The cover material shall meet the requirements as specified in ASTM D3389 Method A using H-18 abrasive wheels and 1000 gram (g) (35.27 oz) weights. Samples shall show a minimum value of 300 cycles on the face and 100 cycles on the back (see 4.4.2.14).

3.3.15 Bursting strength/puncture resistance. The cover material shall provide a bursting strength of 3114 N (700 lbf) and puncture resistances of 333.6 and 1112 N (75 and 250 lbf) for the screwdriver and rod probes, respectively (see 4.4.2.15).

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### 3.4 Interface requirements.

3.4.1 Weight. The cover material shall have a maximum weight of 0.746 kilogram per square meter ( $\text{kg}/\text{m}^2$ ) (22  $\text{oz}/\text{yd}^2$ ) (see 4.4.3.1).

### 3.5 Support and ownership requirements.

3.5.1 Hazardous materials. The cover material shall not be toxic to the skin, eyes, or epidermis when used as intended (see 4.4.4.1).

3.5.2 Odor. The cover material odor rating shall not exceed a rating number of 2 IAW SAE J1351 and no toxic fumes shall be present (see 4.4.4.2).

### 3.6 Operating environmental requirements.

3.6.1 Resistance to low/high temperatures. The cover material shall provide acceptable uninterrupted performance, without deterioration, in ambient air temperatures from  $-45.6^\circ\text{C}$  to  $51.7^\circ\text{C}$  ( $-50^\circ\text{F}$  to  $+125^\circ\text{F}$ ). The performance of the cover material shall not deteriorate at temperature extremes for exposure duration of up to 6 months. Additionally, the cover material shall be capable of being stored, without degradation of performance, for two years at a time at temperatures that may cycle daily to  $60^\circ\text{C}$  ( $140^\circ\text{F}$ ) (see 4.4.5.1 and 4.4.5.2).

3.6.2 Mildew resistance. The cover material shall not exhibit growth of mildew or fungus (0 rating), when subjected to a fungi laden atmosphere at  $27.8 - 30^\circ\text{C}$  ( $82 - 86^\circ\text{F}$ ), at not less than 85% relative humidity for 28 days (see 4.4.5.3).

3.6.3 Flame resistance. The cover material shall not permit flame progression of more than 10.16 cm per minute ( $\text{cm}/\text{min}$ ) (4 in. per minute ( $\text{in.}/\text{min}$ )) (see 4.4.5.4).

3.6.4 Oil resistance. Lubricating oil conforming to SAE Viscosity Grade 50 of SAE J1966 shall not leak through, seep through, or permeate the cover material (see 4.4.5.5).

## 4. VERIFICATION

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

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

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4.2 First article inspection. When specified (see 6.2 and 6.3), first article inspection shall consist of the first article tests specified in table I. First article samples shall be as specified in the contract (see 6.2 and 6.3).

4.3 Conformance inspection. When specified (see 6.2 and 6.4), a sample selected IAW 4.3.1 shall be subjected to the conformance tests and examinations specified in table I.

4.3.1 Sampling. Samples from an inspection lot shall be selected as specified in the contract (see 6.2 and 6.4). Noncompliance with any specified requirement shall be cause for rejection.

4.4 Verification methods. The types of verification methods included in this section are visual, inspection, measurement, sample tests, full-scale demonstration tests, simulation, modeling, engineering evaluation, component properties analysis, and similarity to previously-approved or previously-qualified designs.

4.4.1 Materials. Conformance to 3.2 shall be determined by inspection of contractor records providing proof of certification that materials conform to requirements.

TABLE I. Verification methods.

| Title                                       | Requirements | Inspections | First article inspection | Conformance inspection |
|---|--------------|-------------|--------------------------|------------------------|
| Material                                    | 3.2          | 4.4.1       | X                        |                        |
| <b>Operating requirements</b>               | 3.3          | 4.4.2       |                          |                        |
| Color, spectral and infrared reflectance    | 3.3.1        | 4.4.2.1     | X                        | X                      |
| Color fade after accelerated weathering     | 3.3.2        | 4.4.2.2     | X                        | X                      |
| Glossiness                                  | 3.3.3        | 4.4.2.3     | X                        | X                      |
| Dimensional stability                       | 3.3.4        | 4.4.2.4     | X                        | X                      |
| Breaking force                              | 3.3.5        | 4.4.2.5     | X                        | X                      |
| Breaking force after accelerated weathering | 3.3.6        | 4.4.2.6     | X                        | X                      |
| Tearing strength                            | 3.3.7        | 4.4.2.7     | X                        | X                      |
| Hydrostatic resistance                      | 3.3.8        | 4.4.2.8     | X                        | X                      |
| Coating adhesion                            | 3.3.9        | 4.4.2.9     | X                        | X                      |
| Stiffness                                   | 3.3.10       | 4.4.2.10    | X                        | X                      |
| Blocking resistance at elevated temperature | 3.3.11       | 4.4.2.11    | X                        |                        |
| Resistance to accelerated aging             | 3.3.12       | 4.4.2.12    | X                        |                        |

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TABLE I. Verification methods - Continued.

| Title                                     | Requirements | Inspections         | First article inspection | Conformance inspection |
|---|--------------|---------------------|--------------------------|------------------------|
| Resistance to aromatic hydrocarbon fluids | 3.3.13       | 4.4.2.13            | X                        |                        |
| Abrasion resistance                       | 3.3.14       | 4.4.2.14            | X                        | X                      |
| Bursting strength/puncture resistance     | 3.3.15       | 4.4.2.15            | X                        | X                      |
| <b>Interface requirements</b>             | 3.4          | 4.4.3               |                          |                        |
| Weight                                    | 3.4.1        | 4.4.3.1             | X                        | X                      |
| <b>Support and ownership requirements</b> | 3.5          | 4.4.4               |                          |                        |
| Hazardous materials                       | 3.5.1        | 4.4.4.1             | X                        |                        |
| Odor                                      | 3.5.2        | 4.4.4.2             | X                        |                        |
| <b>Environmental requirements</b>         | 3.6          | 4.4.5               |                          |                        |
| Resistance to low/high temperatures       | 3.6.1        | 4.4.5.1,<br>4.4.5.2 | X                        |                        |
| Mildew resistance                         | 3.6.2        | 4.4.5.3             | X                        |                        |
| Flame resistance                          | 3.6.3        | 4.4.5.4             | X                        |                        |
| Oil resistance                            | 3.6.4        | 4.4.5.5             | X                        |                        |

4.4.2 Operating requirements verification.

4.4.2.1 Color, spectral and infrared reflectance. To determine conformance to 3.3.1, the color, spectral and infrared reflectance of four samples of the cover material shall be tested IAW MIL-C-46168, and shall meet the requirements specified therein. Class A cover material shall be tested and meet the infrared reflectance requirements on both sides, and Class B one side only.

4.4.2.2 Color fade after accelerated weathering. To determine conformance to 3.3.2, four samples of the cover material shall be obtained, three for testing and one for control. The color shall be determined IAW MIL-C-46168. Three samples shall then be exposed to 500 hours of accelerated weathering IAW ASTM G155, using cycle 1 exposure conditions. After exposure, the color shall be determined IAW MIL-C-46168, and compared against the control sample and the original color. The cover material shall not fade more than 2 NBS units. Additionally, the infrared reflectance shall be determined IAW MIL-C-46168, and shall remain within the specified limits.

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4.4.2.3 Glossiness. To determine conformance to 3.3.3, the cover material shall be tested IAW ASTM D523 and shall exhibit a gloss reading of not greater than 1.5 units at 60 degrees, and not greater than 3.5 units at 85°. Class B cover material shall also be examined to verify that the low gloss is on the same side that meets the infrared reflectance requirements.

4.4.2.4 Dimensional stability. To determine conformance to 3.3.4, the cover material shall be tested IAW SAE J883 and shall show no tendency to curl at the edges or wrinkle when lying flat, and shall exhibit a maximum shrinkage/growth of 0.4% in both the warp and fill directions.

4.4.2.5 Breaking force. To determine conformance to 3.3.5, the cover material shall be tested IAW ASTM D5035, Test Method 1C-E. The cover material shall exhibit a minimum break force of 1446 N (325 lb) in the warp direction and 1334 N (300 lb) in the fill direction and the percent elongation at break shall be within a range of 15 to 40% in the warp direction and a range of 25 to 50% in the fill direction.

4.4.2.6 Breaking force after accelerated weathering. To determine conformance to 3.3.6, the cover material shall be exposed to 500 hours of accelerated weathering IAW ASTM G155, using cycle 1 exposure conditions, followed by 24 hours conditioning at  $21^{\circ}\text{C} \pm 1^{\circ}\text{C}$  ( $70^{\circ}\text{F} \pm 2^{\circ}\text{F}$ ) and  $65 \pm 2\%$  relative humidity. After accelerated weathering, the cover material shall then be exposed for 2 hours at  $82.2^{\circ}\text{C} \pm 2.8^{\circ}\text{C}$  ( $180^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ), followed by 40 hours at  $21^{\circ}\text{C} \pm 1^{\circ}\text{C}$  and  $65 \pm 2\%$  relative humidity. The cover material shall then be tested IAW ASTM D5035, Test Method 1C-E, and shall exhibit a breaking strength of at least 1334 N (300 lb) in the warp direction and at least 1223 N (275 lb) in the fill direction.

4.4.2.7 Tearing strength. To determine conformance to 3.3.7, the cover material shall be tested IAW ASTM D751, Tongue Tear Test Method, using a fixed rate of extension of 30.5 cm/min (12 in./min). The tearing strength shall be the average of the five highest peak loads of resistance registered during the separation of the tear. The cover material shall exhibit an average tearing strength of not less than 222 N (50 lb) in both the warp and the fill directions.

4.4.2.8 Hydrostatic resistance. To determine conformance to 3.3.8, the cover material shall be tested IAW hydrostatic resistance, Procedure B, Procedure 2 of ASTM D751, and shall exhibit no leakage when subjected to a static pressure head of 100 cm (39.37 in.) for 1 hour at  $60^{\circ}\text{C}$  ( $140^{\circ}\text{F}$ ).

4.4.2.9 Coating adhesion. To determine conformance to 3.3.9, the cover material shall be tested IAW ASTM D751 at a pulling clamp speed of 5 millimeters per second (mm/sec) (0.197 in./sec). Both sides of the cover material shall exhibit a minimum coating adhesion of 89 N per 5.1 cm width (20 lbf per 2 in. width) in the warp direction.

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4.4.2.10 Stiffness. To determine conformance to 3.3.10, the cover material shall be tested IAW TAPPI T451 CM, Preferred Procedure 1, in still air, with the specimens conditioned at the test temperatures for a minimum of 4 hours before testing. The cover material shall exhibit a maximum stiffness in the warp direction of 16.5 cm and 22 cm (6.50 in. and 8.66 in.) deflection at 21.1°C (70°F) and -12.2°C (10°F), respectively.

4.4.2.11 Blocking resistance at elevated temperature. To determine conformance to 3.3.11, the cover material shall be tested IAW ASTM D751, and shall exhibit a blocking rating of no greater than 2 after 1 hour of exposure at 82.2°C ± 1°C (180°F ± 2°F).

4.4.2.12 Resistance to accelerated aging. To determine conformance to 3.3.12, the cover material shall be subjected to accelerated aging IAW ASTM D3045 for 14 days at a temperature of 71° C (160° F). Additionally, exposed samples shall be evaluated for color change IAW AATCC Evaluation Procedure 1 with a minimum rating of 4-5. Stiffness shall be evaluated IAW 4.4.2.10. No softness, tackiness or delamination shall be observed. Brittleness shall be evaluated by the percent elongation at break, which shall be obtained IAW ASTM D5035. The breaking elongation after aging shall not be less than 80% of the original value.

4.4.2.13 Resistance to aromatic hydrocarbon fluids. To determine conformance to 3.3.13, the cover material shall be immersed in Reference Fuel D conforming to ASTM D471 for 5 minutes and then shall be allowed to dry at room temperature for 2 hours ± 5 minutes. The sample for immersion shall be at least 15.24 cm by 15.24 cm (6 in. by 6 in.) in order to minimize edge effects of penetration of the fuel. Evaluation shall be in the center of the sample, and any cracking or flaking after creasing in both the warp and fill directions shall constitute failure of this test.

4.4.2.14 Abrasion resistance. To determine conformance to 3.3.14, the cover material shall be tested IAW ASTM D3389, Method A using H-18 abrasive wheels and 1000 g (35.27 oz) weights to increase the load. Samples shall exhibit a minimum value of 300 cycles on the face and 100 cycles on the back.

4.4.2.15 Bursting strength/puncture resistance. To determine conformance to 3.3.15, the cover material shall be tested IAW ASTM D751 for bursting strength and puncture resistance. Samples shall exhibit a ball bursting strength of not less than 3114 N (700 lbf) and a screwdriver puncture resistance of not less than 333.6 N (75 lbf). Additionally, when tested IAW ASTM D4833, the cover material shall exhibit a rod puncture resistance of not less than 1112 N (250 lbf).

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4.4.3 Interface requirements verification.

4.4.3.1 Weight. To determine conformance to 3.4.1, the cover material shall be weighed and the mass per unit area determined. The weight shall be a maximum of 0.746 kg/m<sup>2</sup> (22 oz/yd<sup>2</sup>).

4.4.4 Support and ownership requirements verification.

4.4.4.1 Hazardous material test. To determine conformance to 3.5.1, the cover material shall be tested IAW CFR, Title 40, Sections 798.4100, 798.4470, and 798.4500, and shall not produce allergenic reactions, including but not limited to, dermal sensitization, dermal irritation and eye irritation. (NOTE: As an alternative to animal and human testing, the contractor may provide information, which certifies that the finished product was composed of chemicals or materials, which have been safely used commercially where prolonged skin contact has occurred.)

4.4.4.2 Odor. To determine conformance to 3.5.2, the cover material shall be tested IAW SAE J1351, and shall exhibit an odor rating not to exceed a rating number of 2 and no toxic fumes shall be present when subjected to 60°C (140°F) for 6 hours minimum under wet and dry conditions.

4.4.5 Operating environmental requirements verification.

4.4.5.1 Low temperature bend test. To determine conformance to 3.6.1, the cover material shall rate a “pass“ when tested IAW ASTM D2136 at  $-45.6^{\circ}\text{C} \pm 2.8^{\circ}\text{C}$  ( $-50^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ) for a minimum of 6 hours. Additionally, use one or more of the methods specified in 4.4 to verify that the cover material is capable of being stored, without degradation in performance, for two years at storage temperatures that cycle daily to 60°C (140°F).

4.4.5.2 High temperature deformation test. To determine conformance to 3.6.1, the cover material shall be exposed to a temperature of  $76.7^{\circ}\text{C} \pm 1^{\circ}\text{C}$  ( $170^{\circ}\text{F} \pm 2^{\circ}\text{F}$ ) for a minimum of 6 hours, and then while still maintained at  $76.7^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , shall withstand a 180° bend over a 0.3175 cm (0.125 in.) diameter steel rod with no cracking, delamination, tackiness, or blistering. At least five specimens, 50 millimeters (mm) x 150 mm (1.97 in. x 5.91 in.), shall be tested in both the warp and fill directions. Samples shall be cut according to the guidelines in ASTM D5035. Specimens shall be rated on a pass/fail basis. A “fail” rating for one or more of the specimens shall be considered a failure of the test.

4.4.5.3 Mildew resistance. To determine conformance to 3.6.2, the cover material shall be tested IAW ASTM G21 and shall pass with a rating of zero, when subjected to a fungi laden atmosphere at 27.8-30°C (82 - 86°F), at not less than 85% relative humidity for 28 days.

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4.4.5.4 Flame resistance. To determine conformance to 3.6.3, the cover material shall be tested IAW CFR, Title 49, Section 571.302, and shall exhibit a flame progression of not more than 10.16 cm/min (4 in./min).

4.4.5.5 Oil resistance. To determine conformance to 3.6.4, a 1.27 cm (0.5 in.) circle of Viscosity Grade 50 lubricating oil IAW SAE J1966 shall be poured onto an area of approximately one square inch on one side of the cover material and shall be allowed to stand for 1 hour. The lubricating oil shall not leak through, seep through, or permeate the cover material.

## 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

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

6.1 Intended use. The cover material covered by this specification is intended for use on the cab and/or cargo compartment of military combat and tactical vehicles. Due to the infrared reflectance requirements and the extreme environmental conditions under which the cover material must perform, this item is military unique.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Classification of cover material (see 1.2, 3.3.1 and 3.3.3)
- c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
- d. If first article inspection is required (see 3.1).
- e. Color of the cover material (see 3.3.1).
- f. If first article testing is required or other than as specified (see 4.2).
- g. Specification of first article sampling plan (see 4.2).
- h. If conformance testing is required or other than as specified (see 4.3).

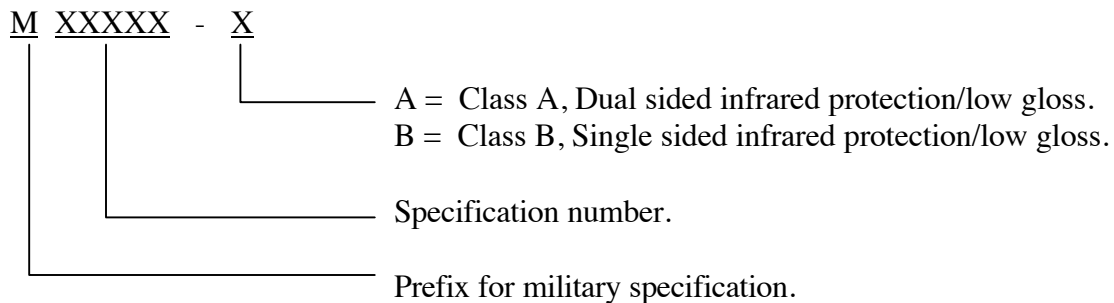
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- i. Specification of conformance testing sampling plan (see 4.3.1).
- j. Packaging requirements (see 5.1).

6.3 First article. When requiring a first article inspection, contracting documents should provide specific guidance to offerors. This guidance should cover whether the first article is a first article sample, a first article production item, or the number of test items. These documents should also include specific instructions regarding arrangements for examinations, approval of first article test results, and disposition of first articles. Pre-solicitation documents should provide Government waiver rights for samples for first article inspection to bidders offering a previously acquired or tested product. Bidders offering such products who wish to rely on such production testing must furnish evidence with the bid that prior Government approval is appropriate for the pending contract.

6.4 Conformance inspection. Affordable conformance inspection with confidence varies depending upon a number of procurement risk factors. Some of the factors include: Contractor past performance, Government schedules and budget, product material and design maturity, manufacturing capital equipment and processes applied, the controlled uniformity of those processes, labor skill and training, and the uniformity of measuring processes and techniques. During the solicitation, contracting documents should indicate those tests desired from table I and their designated frequency based on a risk assessment for the procurement.

6.5 Part or Identifying Number (PIN). The PINs to be used for cover materials acquired to this specification are created as shown below.



6.6 Subject term (key word) listing.

Cab  
 Cargo  
 Fill  
 Flame resistance  
 Mildew  
 Warp  
 Weather resistant

MIL-PRF-32002C

Custodians:

Army - AT  
Air Force - 99

Review Activities:

Air Force - 84  
DLA - CC

Preparing Activity:

Army - AT

(Project 25GP-0013)

## 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.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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-PRF-32002C**
**2. DOCUMENT DATE (YYYYMMDD)**
**20000829**
**3. DOCUMENT TITLE**
**COVER MATERIAL, VEHICLE, COATED TACTICAL AND COMBAT, HEAVY-DUTY, WATERPROOF**
**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) DSN**  
*(If applicable)*
**7. DATE SUBMITTED**
**(YYYYMMDD)**
**8. PREPARING ACTIVITY**
**a. NAME**
**b. TELEPHONE (Include Area Code)**
**(1) Commercial**  
**(810) 574-8745**
**(2) DSN**
**786-8745**
**c. ADDRESS (Include Zip Code)**
**Commander**  
**U.S. Army Tank-automotive and Armaments Command**  
**ATTN: AMSTA-TR-E/IE**  
**Warren, MI 48397-5000**
**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:**  
**Defense Standardization Program Office (DLSC-LM)**  
**8725 John J. Kingman Road, Suite 2533**  
**Fort Belvoir, Virginia 22060-6221**  
**Telephone (703) 767-6888 DSN 427-6888**