

INCH-POUND

MIL-C-19663D

4 August 1988

SUPERSEDING

MIL-C-19663C(NAVY)

20 August 1974

(See 6.6)

MILITARY SPECIFICATION

CLOTH, WOVEN ROVING, FOR PLASTIC LAMINATE

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

1. SCOPE

1.1 Scope. This specification establishes the requirements for woven fabrics of nominal 24 ounces per square yard made from "E" glass rovings for plastic laminates.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications. The following specifications form a part of this specification 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-F-320 - Fiberboard; Corrugated and Solid, Sheet Stock (Container Grade), and Cut Shapes.
- PPP-P-1136 - Packaging of Coated (Plastic; Rubber) and Laminated Fabrics.

MILITARY

- MIL-L-19140 - Lumber and Plywood, Fire-Retardant Treated.
- MIL-R-21607 - Resins, Polyester, Low Pressure Laminating, Fire-Retardant.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 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

DISTRIBUTION STATEMENT A Approved for public release; distribution unlimited

(Copies of specifications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- D 123 - Standard Terminology Relating to Textiles.
- D 578 - Standard Specification for Glass Fiber Yarns.
- D 638 - Standard Test Method for Tensile Properties of Plastics. (DoD adopted)
- D 790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials. (DoD adopted)
- D 1494 - Standard Test Method for Diffuse Light Transmission Factor of Reinforced Plastic Panels. (DoD adopted)
- D 1777 - Standard Test Method for Measuring Thickness of Textile Materials.
- D 2584 - Standard Test Method for Ignition Loss of Cored Reinforced Resins. (DoD adopted)
- D 3773 - Standard Test Methods for Length of Woven Fabric.
- D 3774 - Standard Test Methods for Width of Woven Fabric.
- D 3775 - Standard Test Method for Fabric Count of Woven Fabric.
- D 3776 - Standard Test Methods for Mass Per Unit Area (Weight) of Woven Fabric.
- D 3990 - Standard Terminology Relating to Fabric Defects.

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

(Nongovernment standards and other publications are normally available from the organizations which prepare or which 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 specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified in the contract or order, a sample shall be subjected to first article inspection (see 4.3 and 6.3).

3.2 Material. The glass composition used in the manufacture of the woven roving shall be type E. Asbestos, and components containing asbestos are prohibited. When specified in the contract or order, a certificate of compliance shall be prepared (see 6.2.2). Weave and construction shall be as specified (see 6.2.1). The textile terms used in this specification are defined in ASTM D 123.

3.2.1 Recovered materials. Unless otherwise specified herein, all material incorporated in the products covered by this specification shall be new and may be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used products is allowed under this specification unless otherwise specifically specified.

3.3 Dimensions.

3.3.1 Length. Unless otherwise specified (see 6.2.1), the woven roving shall be furnished in rolls having a minimum length of 60 yards. No roll shall contain more than two pieces and no piece shall be less than 15 yards in length. The material shall be wound on cardboard tubes 1 inch longer than the overall width of the cloth and having an inside diameter of not less than 2 inches (see 4.4.3).

3.3.2 Width. Unless otherwise specified (see 6.2.1), the contractor's standard widths of woven roving (38 inches, 44 inches, 50 inches, and 60 inches) shall be acceptable (see 4.4).

3.3.3 Thickness. Thickness shall be as specified (see 6.2.1 and 4.4).

3.4 Weight. The average weight shall be 24 ounces per square yard plus or minus 10 percent (see 4.4).

3.5 Fiber diameter. The average filament diameter shall conform to the letter type designations used commercially, as specified in table I (see 4.5.2).

TABLE I. Glass fiber nomenclature.

| Letter designation | Diameter in inches | |
|--------------------|--------------------|----------|
| | Minimum | Maximum |
| G <u>1/</u> | 0.00035 | 0.000399 |
| H | .00040 | .000449 |
| J | .00045 | .000499 |
| K <u>1/</u> | .00050 | .000549 |
| L | .00055 | .000599 |
| M <u>1/</u> | .00060 | .000649 |
| N <u>1/</u> | .00065 | .000699 |
| P | .00070 | .000749 |

1/ At present, filaments G, K, M and N are in commercial production for woven roving.

3.6 Appearance. The roving shall be finished to assure compliance with the requirements of 3.7, 3.8, 3.9, and 3.11. The finished roving shall be free of oil spots, grease spots, and other contaminations, creases, wrinkles, and other forms of permanent distortion, and shall not be brittle or fused (see 4.4.2.1).

3.7 Color. The cloth shall be any color and the color shall be uniform and shall be characteristic of clean natural glass cloth which has been finished.

3.8 Resin wet-out (wetability). The period of time for resin wet-out of the woven roving shall not exceed 5 minutes (50 percent light transmission) and 15 minutes (75 percent light transmission) (see 4.5.3).

3.9 Handleability. The cloth shall have drapability characteristics and shall be flexible to withstand normal handling without damage.

3.10 Mechanical properties after lamination. The properties of the cloth shall be such that when plastic laminates are fabricated the plastic laminates shall conform to table II and 3.10.1 (see 4.4 and 4.5.4).

TABLE II. Flexural and tensile strength of plastic laminate
(minimum pounds per square inch (lb/in²)).

| Flexural strength | | Tensile strength | |
|-------------------|-----------------|------------------|-----------|
| Lengthwise, face | Crosswise, face | Lengthwise | Crosswise |
| 50,000 | 40,000 | 38,000 | 30,000 |

3.10.1 Flexural strength (wet condition). Wet flexural strength, after conditioning (see 4.5.4.2.1.2 or 4.5.4.2.1.3) shall be not less than 40,000 lb/in² lengthwise and 32,000 lb/in² crosswise.

3.11 Odor. The material shall have no objectional odor. (An objectional odor shall be defined as that other than the typical odor of the material).

3.12 Workmanship. The finished fabric shall be clean, evenly woven, and shall conform to the quality and product established by this specification. 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 the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All material must meet all requirements of sections 3 and 5. The inspections 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 for 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.

4.2 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).

4.2.1 Inspection conditions. Unless otherwise specified (see 6.2.1), all inspections shall be performed in accordance with the test conditions specified herein.

4.3 First article inspection. First article inspection shall consist of the examinations and tests specified in table III. When specified in the contract or order, a first article inspection procedure and report shall be prepared (see 6.2.2).

TABLE III. First article inspection.

| Inspection | Requirement | Test |
|-------------------------|-------------|-------------|
| Weave | 3.2 | Table IV |
| Construction | 3.2 | Table IV |
| Length | 3.3.1 | Table IV |
| Width | 3.3.2 | Table IV |
| Thickness | 3.3.3 | Table IV |
| Weight | 3.4 | Table IV |
| Fiber diameter | 3.5 | 4.5.2 |
| Appearance | 3.6 | Table IV |
| Color | 3.7 | Table IV |
| Wetability | 3.8 | 4.5.3 |
| Flexural strength (dry) | 3.10 | 4.5.4.2.1.1 |
| Tensile strength | 3.10 | 4.5.4.3 |
| Flexural strength (wet) | 3.10.1 | 4.5.4.2.1.2 |

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with table IV and 4.4.1 through 4.4.3.2. When specified in the contract or order, test reports shall be prepared (see 6.2.2).

TABLE IV. Quality conformance inspection.

| Inspection | Requirement | Test | Test method | No. of determinations per unit of product | Results reported as |
|-----------------------------------|-------------|-------------|-------------|---|---|
| Group A | | | | | |
| Weave | 3.2 | 4.4.2 | Visual | 1 | Pass or fail |
| Construction | 3.2 | 4.4.2.1 | ASTM D 3775 | 5 | Avg of 5 determinations to nearest whole number |
| Length | 3.3.1 | 4.4.3 | ASTM D 3773 | See 4.4.3 | Pass or fail |
| Width | 3.3.2 | 4.4.2.2 | ASTM D 3774 | 5 | Avg of 5 determinations to nearest 0.001 inch |
| Thickness | 3.3.3 | - | ASTM D 1777 | 5 | Avg of 5 determinations to nearest 0.001 inch |
| Weight | 3.4 | - | ASTM D 3776 | 5 | Avg of 5 determinations to nearest ounce |
| Fiber diameter | 3.5 | 4.5.2 | See 4.5.2 | See 4.5.2 | Pass or fail |
| Appearance | 3.6 | 4.4.2 | Visual | See 4.4.2 | Pass or fail |
| Color | 3.7 | 4.4.2.2 | Visual | See 4.4.2.2 | Pass or fail |
| Odor | 3.11 | 4.4.2.2 | | See 4.4.2.2 | Pass or fail |
| Group B | | | | | |
| Wetability | 3.8 | 4.5.3 | ASTM D 1494 | 3 | Avg of 3 determinations to nearest whole minute |
| Plastic laminate | | | | | |
| Flexural strength (Dry condition) | 3.10 | 4.5.4.2.1.1 | ASTM D 790 | 5 | Avg of 5 determinations to nearest 100 lb/in ² |
| Lengthwise | | | | | |
| Crosswise | | | | | |
| Flexural strength (Wet condition) | 3.10.1 | 4.5.4.2.1.2 | ASTM D 790 | 5 | Avg of 5 determinations to nearest 100 lb/in ² |
| Lengthwise | | | | | |
| Crosswise | | | | | |
| Tensile strength | 3.10 | 4.5.4.3 | ASTM D 638 | 5 | Avg of 5 determinations to nearest 100 lb/in ² |
| Lengthwise | | | | | |
| Crosswise | | | | | |

4.4.1 Lot. For purposes of sampling, a lot shall consist of all material of the same thickness, width, and length, produced under the same conditions and offered for delivery at one time. The lot shall be expressed in linear yards.

4.4.2 Visual examination of the end item. The woven roving shall be examined to determine conformance to the requirements of this specification. Defects found during this examination shall be identified in accordance with 4.4.2.1, 4.4.2.2, and 4.4.3.

4.4.2.1 Yard-by-yard examination. The entire yardage of each roll selected shall be inspected and the visual defects identified in accordance with table V. All 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 one defect shall be counted. A continuous defect shall be counted as one defect for each linear yard to fraction thereof in which it occurs. Defects shall be defined in accordance with ASTM D 3990. The unit of product for this examination shall be 1 linear yard. The lot size shall be expressed in units of 1 yard each. The sample size shall be in accordance with table VI. The acceptable quality level (AQL) shall be 6.5 defects per 100 units (yards).

TABLE V. Visual defects.

| Category | Defects |
|----------|---|
| Critical | None defined. |
| Major | |
| 101 | Crease or wrinkle, embedded; cannot be removed by hand rubbing. |
| 102 | Any knots. |
| 103 | Any brittle or fused area. |
| 104 | Any smash. |
| 105 | Any broken or missing end or pick. |
| 106 | Any hole, cut or tear. |
| 107 | Any spot, stain, or streak clearly visible. |
| 108 | Any pulled together or torn filament. |
| 109 | Any thick or thin place, clearly visible. |
| 110 | Foreign matter adhering to surface, clearly visible. |
| 111 | Any jerked-in filling or slough-off. |
| Minor | Any torn, broken or otherwise damaged selvage. |

TABLE VI. Sample sizes and acceptance numbers.

| Lot size in yards | Sample size in rolls | Acceptance number |
|-----------------------|----------------------|-------------------|
| Up to 1,200 <u>1/</u> | 3 | 0 |
| 1,201 to 3,200 | 5 | 0 |
| 3,201 to 10,000 | 8 | 0 |
| 10,001 to 35,000 | 13 | 0 |
| 35,001 and up | 20 | 1 |

1/ If a lot contains fewer than 3 rolls, each roll shall be examined.

4.4.2.2 Overall examinations. Each defect listed below shall not be counted more than once in each roll examined. The unit of product shall be one roll. The sample size (number of rolls selected as sample) and the acceptance number (maximum number of defects acceptable) shall be as shown in table VI.

- (a) Objectionable odor.
- (b) Not uniformly woven.
- (c) Overall uncleanness.
- (d) Color not uniform.
- (e) Width beyond specified tolerance.

4.4.3 Length examination.

4.4.3.1 Examination for length of individual rolls. The required rolls shall be examined for the defects listed below. The unit of product for this examination shall be one roll. The sample size and acceptance number shall be as shown in table VI.

- (a) Gross length of roll less than 60 yards.
- (b) Actual gross length found to be more than 2 yards below the gross length marked on the ticket.
- (c) More than two pieces in a roll.
- (d) Any one piece less than 15 yards in length.

4.4.3.2 Examination for total yardage in sample. The lot shall be unacceptable if the total of the actual gross lengths of rolls in the sample is less than the total of the gross lengths marked on the roll tickets.

4.4.4 Certification. The cloth shall meet the requirements as specified in 3.8. The cloth shall be manufactured from the same material and manufacturing process as the material being offered for delivery. The contracting activity shall be notified of any proposed changes in material or process. When specified in the contract or order, a certificate of compliance shall be prepared (see 6.2.2). The Government reserves the right to require additional testing and certification by the contractor when changes are made or when otherwise deemed necessary. Any changes in basic ingredients or processes shall be promptly reported to both the contracting activity and Commander, Naval Sea Systems Command, Non-Metallic Materials and Packaging Branch, Department of the Navy, Washington, DC 20362-5101.

4.5 Testing of the end item. The physical and chemical values specified in section 3 apply to the average of the determinations made on a unit of product for test purposes as specified in the applicable test method. The sample unit for test purposes shall be 1 yard of finished cloth. The sample size shall be as follows:

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

The lot shall be unacceptable if one or more units fails to meet the specified requirements. The lot size shall be expressed in units of 1 linear yard.

4.5.1 Conditioning of test specimens. Test specimens shall be conditioned in a standard laboratory atmosphere of 23 ± 1.1 degrees Celsius ($^{\circ}\text{C}$) (73.4 ± 2 degrees Fahrenheit ($^{\circ}\text{F}$)) and 50 ± 2 percent relative humidity for a minimum of 48 hours prior to testing.

4.5.1.1 Test conditions. Unless otherwise specified in the individual test method, tests shall be conducted in a standard laboratory atmosphere of $23 \pm 1.1^{\circ}\text{C}$ ($73.4 \pm 2^{\circ}\text{F}$) and 50 ± 2 percent relative humidity.

4.5.2 Fiber diameter. The diameter of the fiber shall be determined by either one of the following methods (see 3.5):

- (a) Microscopic. Diameter of fibers shall be determined microscopically on the basis of measuring 50 random fibers. The average diameter for purposes of determining conformance shall be the average of all measurements.
- (b) ASTM D 578.

4.5.3 Test for resin wet-out (wetability). This test only needs to be conducted if within 3 years prior to the last test approval the material has not been tested and found in compliance with 3.8 or the material being offered for delivery is not manufactured the same in all respects as that previously tested.

4.5.3.1 Apparatus. The apparatus shall consist of either a Transmissometer as described in ASTM D 1494 or be comprised of the following:

- (a) Film strip projector with a 75-watt bulb;
- (b) Photometer with a 2-inch diameter photoelectric cell;
- (c) Mirror;
- (d) Glass plate;
- (e) Several plies of 10 mil translucent polyethylene sheet;
- (f) Mylar film;
- (g) Timer.

The latter apparatus shall be assembled as follows: The photoelectric cell is placed on a flat surface and covered with the glass plate. The woven specimen, on a piece of Mylar or other transparent film, is placed on the glass plate. The projector is positioned on a ring stand above and to the left of the specimen. The mirror is positioned above the specimen at an angle of 45 degrees so that the horizontal light beam from the projector will be reflected onto the surface of the specimen. The projector and mirror are adjusted to a height such that the beam of light will focus on and cover the test area. If necessary, several plies of translucent polyethylene or other light-screening materials shall be placed between the glass plate and the photoelectric cell so that the light reading through the dry woven roving specimen will be close to the beginning of the scale. Any projector or photometer conforming to the general requirements may be used.

4.5.3.2 Procedure. The test, using either set of apparatus identified above, shall be run as follows: A light reading without a cloth specimen or resin (but through Mylar or other transparent film) is recorded. The woven roving specimen, size 4 by 4 inches, which has been marked with a 2-1/2 inch square is placed over the Mylar film. Fifteen grams of Hetron 92 polyester resin (manufactured by Ashland Chemical Company, Dublin, OH), or equal resin, with a viscosity of 2300 ± 50 Brookfield centipoises are weighed in a paper cup. The resin is poured and spread on the test specimen so that the entire 2-1/2 inch square test area is covered evenly with resin. Readings of light transmission (in foot candles) are taken every 1 minute with the photometer until the percent of light transmission reaches 75 percent or time of test exceeds 15 minutes. When using the transmissometer, the woven roving test specimen is placed on a Mylar or equal film and glass plate, which is placed over the hole in the marking plate.

4.5.3.3 Calculation. The percent light transmission shall be calculated by dividing the reading through the specimen by the reading without the specimen and multiplying by 100. Wet-out times shall be determined by the period of time required for the specimen to result in 50 percent and 75 percent light transmission values.

4.5.4 Plastic laminate.

4.5.4.1 Fabrication of plastic laminate. Glass fabric base plastic laminate panels shall be fabricated in the form of at least 14 by 14 by 1/8 inch thick flat sheets employing a parallel lay-up and using a resin conforming to MIL-R-21607. Cut the woven-glass fabric specimens along the warp and fill strands while pulling the strands to ensure right angle lay-up of all layers. Lay carefully in place with all warp strands parallel. Apply resin to each layer in such a manner as to wet out completely all layers of woven-glass fabric with the minimum inclusion of air. Enclose the laminate in a suitable plastic bag or cover with a transparent sheet of release film and roll with a round steel pipe so as to remove all air bubbles and produce an essentially void-free laminate. Fully cure the laminate in a mold, with or without shims, under conditions recommended by the resin manufacturer. A pressure of 10 lb/in^2 usually will be found sufficient to produce a uniform laminate thickness. The resin content by weight, as determined in accordance with 4.5.4.1.1, shall be not less than 40 percent.

4.5.4.1.1 Resin content of panel. The test specimens shall have a minimum weight of 3 grams and a maximum size of 1 by 1 inch. The sides shall be square to the faces and the edges shall not be frayed. Two specimens shall be tested in accordance with ASTM D 2584 and the results averaged.

4.5.4.2 Flexural strength.

4.5.4.2.1 Evaluation of plastic laminate. Specimens cut from the lengthwise and crosswise directions of the plastic laminate shall be prepared and tested in accordance with ASTM D 790. The axis of the specimen shall be parallel with the reinforcement.

4.5.4.2.1.1 Dry condition. The test specimens shall be exposed for at least 4 days at standard atmospheric conditions (see 4.5.1). The specimens may be tested without the 4-day exposure where there is a doubt that the materials will meet the requirement when the standard condition is specified. The average of five determinations shall be calculated.

4.5.4.2.1.2 Wet condition. The test specimens shall be immersed in boiling distilled water for 2 hours and then allowed to cool in the same water. The test shall be conducted on the wet test specimens immediately after their removal from the water. The average of five determinations shall be calculated as the flexural strength of the plastic laminate for this condition.

4.5.4.2.1.3 Wet condition referee procedure. In the event there is any question as to the validity of the results obtained when the test specimens are conditioned as specified in 4.5.4.2.1.2 another set of flexural test specimens shall be immersed in distilled water at room temperature for 30 days. The tests shall be conducted on the wet test specimens immediately after their removal from the water. The average of five determinations shall be calculated as the flexural strength of the plastic laminate for this condition and the strength determined under these conditions shall be final.

4.5.4.3 Tensile strength.

4.5.4.3.1 Evaluation of plastic laminate. Specimens cut from the lengthwise and crosswise directions of the plastic laminate shall be prepared and tested in accordance with ASTM D 638. Specimen size shall be modified as for type I (over 1/4 inch to 1/2 inch) of ASTM D 638. The axis of the specimen shall be parallel with the reinforcement.

4.5.4.3.2 Standard conditions. The standard conditions for the test specimens shall be in accordance with 4.5.4.2.1.1.

4.6 Inspection of packaging. Sample packs, and the inspection of the preservation, packing and marking for shipment, stowage, and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition.)

5.1 Packing requirements. Woven roving cloth assemblies shall be preserved level A or commercial, packed level A, B, or commercial, and marked in accordance with PPP-P-1136, as specified (see 6.2.1), and shall include bar codes and applicable packaging acquisition options stated therein. In addition, for Navy acquisitions, the following applies:

(a) Navy fire-retardant requirements.

- (1) Treated lumber and plywood. Unless otherwise specified (see 6.2.1), all lumber and plywood including laminated veneer material used in shipping containers and pallet construction, members, blocking, bracing, and reinforcing shall be fire-retardant treated material conforming to MIL-L-19140 as follows:

Level A and B - Type II - weather resistant.

Category 1 - general use.

Level C - Type I - non-weather resistant.

Category 1 - general use.

- (2) Fiberboard. Unless otherwise specified (see 6.2.1), fiberboard used in the construction of class-domestic, non-weather resistant fiberboard, cleated fiberboard boxes including interior packaging forms shall meet the flame spread index and the specific optic density requirements of PPP-F-320 and amendments thereto.

5.2 Special marking. Unless otherwise specified (see 3.2 and 6.2.1), each roll shall be marked "ASBESTOS FREE".

6. NOTES

6.1 Intended use. The woven fabrics covered by this specification are intended for use in laminated plastics for structural or non-structural parts.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) When first article inspection is required (see 3.1).
- (c) Material weave and construction (see 3.2).
- (d) Length, if other than specified (see 3.3.1).
- (e) Width, if other than specified (see 3.3.2).
- (f) Thickness required (see 3.3.3).

- (g) Inspection conditions, if other than specified (see 4.2.1).
- (h) Level of preservation, packing and marking required (see 5.1).
- (i) When fire-retardants are not required (see 5.1(a)(1) and (2)).
- (j) Special marking requirements (see 5.2).

6.2.2 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.475-1 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraphs:

| <u>Paragraph no.</u> | <u>Data requirement title</u> | <u>Applicable DID no.</u> | <u>Option</u> |
|----------------------|---------------------------------------|---------------------------|---------------|
| 3.2 and 4.4.4 | Certificate of compliance | DI-E-2121 | ---- |
| 4.3 | First article inspection procedure | DI-T-4901 | ---- |
| 4.3 | First article inspection report | DI-T-4902 | ---- |
| 4.4 | Test reports | DI-T-2072 | ---- |

(Data item descriptions related to this specification and identified in section 6 will be approved and listed as such in DoD 5010.12-L., AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4, or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.3 First article. When a first article inspection is required, the item should be a first article sample. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Sub-contracted material and parts. The packaging requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.5 Subject term (key word) listing.

Fire-retardant
Flexural strength
Lamination
Resin
Wetability

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.

Custodian:
Air Force - 99

Preparing activity:
Navy - SH
(Project 8305-0208)

Review activities:
Navy - AS, CG
Air Force - 82

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

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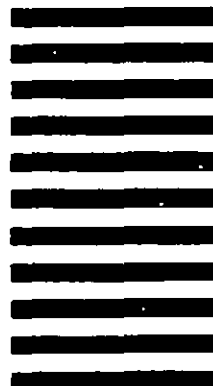
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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER

MIL-C-19663D

2. DOCUMENT TITLE

CLOTH, WOVEN ROVING, FOR PLASTIC LAMINATE

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

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OTHER (Specify): _____

b. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional

b. WORK TELEPHONE NUMBER (include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YYMMDD)