

MIL-I-22444C (SHIPS)
 9 December 1968
 SUPERSEDING
 MIL-I-22444B (SHIPS)
 25 September 1967
 (See 6.4 and 6.5)

MILITARY SPECIFICATION

INSULATION TAPE, ELECTRICAL, SELF BONDING,

SILICONE RUBBER TREATED BIAS WEAVE OR SINUSOIDAL WEAVE GLASS,

CABLE SPLICING, NAVAL SHIPBOARD

1. SCOPE

1.1 This specification covers silicone rubber treated bias weave or sinusoidal weave glass, self-bonding electrical insulation tape intended for splicing power and control cables in shipboard electrical installations.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-E-17555 - Electronic and Electrical Equipment, Accessories and Repair Parts; Packaging and Packing of.
 MIL-I-19166 - Insulation Tape, Electrical, High-Temperature, Glass Fiber, Pressure-Sensitive.

STANDARD

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Sample for first article inspection. Prior to beginning production, a sample, manufactured by production tools and processes, shall be tested as specified in 4.2 (see 6.3).

3.2 Material. Material shall be as specified herein or shall meet the performance requirements as specified herein. Insulation tape shall consist of bias sinusoidal woven glass cloth backing, the weave of which has been filled and coated uniformly on both sides, without pinholes or blemishes, with silicone rubber compound with self-bonding characteristics. As an alternate construction, the silicone rubber compound may be applied to the glass backing tape by an extrusion process and sealing the tape edge by extending the rubber compound approximately 1/32 inch beyond each edge of the glass tape. A separator tape shall be used between adjacent layers on the roll of tape to prevent bonding on the roll.

3.3 Rolls. Unless otherwise specified in the contract or order, the material shall be supplied in rolls on a 1-inch diameter core and shall be furnished in lengths of 20 yards per roll.

3.3.1 Splices. Splices in the cloth tape shall be smooth in appearance and the finished tape thickness shall not increase more than 0.002 inch in the splice area. The tensile strength of the finished tape splice shall be not less than 80 percent of the ultimate strength of an unspliced length of tape.

3.4 Thickness and width. Tape shall be furnished in the following thicknesses and widths, as specified (see 6.2).

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Thickness
(Inch) (\pm 0.002)
0.015 to 0.020
0.050

Width
(Inches) (\pm 1/32 inch)
0.50
0.75
1.00
1.50

3.5 Tests on insulation tape.

3.5.1 Dielectric strength. The insulating tape, when tested as specified in 4.5.1.2, shall exhibit an average dielectric strength, after being conditioned for 96 hours at 23°C. and 96 percent relative humidity, of 500 volts per mil.

3.5.2 Tensile strength and elongation. Specimens of the insulating tapes, when tested as specified in 4.5.3, shall exhibit a tensile strength of not less than 40 pounds per inch of width and an ultimate elongation of not less than 15 percent.

3.5.3 Adhesion. Insulating tape, when tested as specified in 4.5.4, shall show a bonding strength of not less than 1 pound per inch of width.

3.5.4 Storage. The tape after storage under nominal conditions for periods of up to one year shall meet the requirements of this specification.

3.5.5 Identification of product. Tape shall be identified by marking of the interior packages in accordance with 5.1.2.

3.6 Workmanship. The workmanship shall be in accordance with high grade manufacturing practice for this type of product. The glass fiber backing shall not ravel and there shall be no adhesive transfer when the tape is unwound from the original roll.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 First article inspection. First article inspection shall consist of the examination and tests specified in 4.4 and 4.5.

4.3 Sampling for quality conformance.

4.3.1 Inspection lot. All rolls of tape of the same width and thickness manufactured under essentially the same conditions within a period of 15 days and offered for delivery at the same time shall be considered a lot for purposes of inspection and tests.

4.3.2 Sampling for examination. A random sample of rolls shall be selected from each lot of material offered for examination of visual and dimensional characteristics in accordance with MIL-STD-105 at inspection level I and Acceptable Quality Level equal to 2.5 percent defective.

4.3.3 Sampling for quality conformance tests. A random sample of rolls shall be selected in accordance with table I and shall be subjected to the tests specified in 4.5. If any sample fails one or more of the tests, this shall be cause for rejection of the lot represented by the sample.

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Table I - Sampling for tests

Number of rolls in lot	Number of rolls in sample
300 and under	2
301 to 500	3
501 to 800	4
801 to 1,300	5
1,300 and over	6

4.4 Quality conformance inspection. Quality conformance inspection shall include the examination and tests specified in 4.4.1 and 4.5 unless otherwise specified (see 6.2).

4.4.1 Visual and dimensional examination. The sample rolls selected in accordance with 4.3.3 shall be examined to verify compliance with the requirements of this specification which do not involve tests. Approximately 7 yards of tape shall be unwound from each sample roll. Any roll in the sample containing one or more visual or dimensional defects shall not be offered for delivery. If the number of defective rolls in any sample exceeds the acceptance number for that sample, this shall be cause for rejection of the lot represented by the sample.

4.5 Test procedures.

4.5.1 The thickness and width of tape shall be measured on a length of tape carefully removed from the roll along with the separator tape to prevent stretching the tape. The width shall then be measured before removing the separator tape. The thickness shall be measured, including the tape, taking care not to compress the silicone rubber. The thickness of the silicone rubber tape shall be obtained by subtracting the thickness of the separator tape from the combined measurement.

4.5.2 Dielectric strength. A dielectric strength test as specified in the table for physical requirements of MIL-I-19166 shall be conducted on specimens of the insulating tape.

4.5.3 Tensile strength and elongation. Tensile strength and elongation of tape shall be determined in a suitable tensile testing machine. The machine shall have a maximum tension-indicating capacity of 75 pounds, and graduations shall read 0.25 pound or less per scale division. The rate of jaw separation shall be 12 ± 1 inches per minute. Tensile strength of tape shall be determined on specimens which have been conditioned in the standard laboratory atmosphere for at least 40 hours. Elongation of tape shall be determined on specimens which have been conditioned in the standard laboratory atmosphere for at least 40 hours. The tape specimen shall be 5-1/2 inches long with bench marks 2 inches apart.

4.5.4 Adhesion. Any suitable mechanical device consisting of a 1-inch diameter mandrel mounted in essentially frictionless bearings with a means of clamping one end of the tape to the mandrel with a weight of 10 pounds per inch of tape width attached to the other end of the tape may be used. A general description of the apparatus is given in MIL-I-19166. Four layers of tape shall be wound on the mandrel and the specimen shall be maintained for 24 hours at 23°C. and 50 percent relative humidity with the tension applied. The weight shall then be removed and the bonded tape shall be pulled off the rotating mandrel at 90 degrees with a rate of 12 inches per minute. The bonding strength of the second and third layers shall be recorded and averaged.

5. PREPARATION FOR DELIVERY

(The preparation for delivery requirements specified herein apply only for direct Government procurements.)

5.1 Preservation and packaging, packing, and marking.

5.1.1 The electrical insulating tape shall be preserved and packaged, packed, and marked in accordance with MIL-E-17555. The tape shall be wound in rolls containing the length specified in 3.3.

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5.1.2 Additional marking. Each roll shall be durably and legibly marked with the following, in such a manner that the markings will not become damaged when the packages are opened:

- (a) Date of manufacturer.^{1/}
- (b) Each packaged roll and shipping container shall be marked with the following CAUTION:

"Store in original boxes and in a cool, dark location. Do not store in close proximity to steam pipes, radiators or other sources of heat."

^{1/} Date of manufacture is defined as the date on which the actual manufacturing process was completed.

6. NOTES

6.1 Intended use. The tape is suitable for use as an insulation and binder in making splices in shipboard power and control cables MIL-C-915 and MIL-C-2194.

6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Thickness and width required (see 3.4).
- (c) When a manufacturer's insulation tape of the same manufacture, material, thickness, and width has passed all tests on a previous submission, only the examination of 4.4.1 and 4.5.1.1 and the tests of 4.5.1.2 and 4.5.1.3 will be required (see 4.4).

6.3 First article inspection. Invitation for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection as to those bidders offering a product which has been previously procured 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 procurement.

6.4 International interest. Certain provisions of this specification are the subject of international standardization agreement AbC-NAVY-STD-17. When amendment, revision, or cancellation of this specification is proposed which will effect or violate the international agreement concerned, the preparing activity will take appropriate reconciliation action through international standardization channels including departmental standardization offices, if required.

6.5 CHANGES FROM PREVIOUS ISSUE. THE OUTSIDE MARGINS OF THIS DOCUMENT HAVE BEEN MARKED "*" TO INDICATE WHERE CHANGES (DELETIONS, ADDITIONS, ETC.) FROM THE PREVIOUS ISSUE HAVE BEEN MADE. THIS HAS BEEN 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.

Preparing activity:
Navy - SH
(Project 5970-M287)

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SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
INSTRUCTIONS		
This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).		
SPECIFICATION		
ORGANIZATION (Of submitter)		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OF REQUIRED INTERPRETATION IN PROCUREMENT USE?		
A. GIVE PARAGRAPH NUMBER AND WORDING		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE?		
<input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity)		DATE

DD FORM 1426
1 APR 53REPLACES NAVSHIPS FORM 4823 WHICH IS OBSOLETE
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