

INCH-POUND

MIL-I-15265C(SH)

11 JUNE 1992

SUPERSEDING

MIL-I-15265B(SHIPS)

15 March 1987

**MILITARY SPECIFICATION****INSULATION, ELECTRICAL, PLASTIC  
(SUBMARINE BUS BAR COVERING)**

*This specification is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all departments and agencies of the Department of Defense.*

**1. SCOPE**

**1.1 Scope.** This specification covers plastic, electrical insulating materials used primarily for covering submarine bus bars and battery intercell connections. Other applications may be considered where a tough plastic covering is needed over metal surfaces.

**1.2 Classification.** Plastic electrical insulation shall be of the following types, as specified (see 6.2):

Type	Description
P	Resin - plasticizer dispersion (plastisol)

**2. APPLICABLE DOCUMENTS****2.1 Government documents.**

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

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 55Z3, 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 5970

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

**MIL-Y-15265C(SH)****SPECIFICATIONS****FEDERAL**

- PPP-F-320** Fiberboard, Corrugated and Solid, Sheet Stock (Container Grade) and Cut Shapes
- PPP-P-1892** Paints, Varnish, Lacquer, and Related Materials; Packaging, Packing and Marking of

**MILITARY**

- MIL-L-19140** Lumber and Plywood, Fire Retardant Treated

**STANDARDS****FEDERAL**

- FED-STD-313** Material Safety Data Sheets, Transportation Data And Disposal Data For Hazardous Materials Furnished To Government Activities

**MILITARY**

- MIL-STD-104** Limits for Electrical Insulation Color

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19120-5094.)

**2.2 Non-Government publications.** The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

**AMERICAN SOCIETY FOR TESTING AND MATERIALS STANDARDS**

- C 800** Standard Specification for Glass Fiber Blanket Insulation (Aircraft Type) (DoD adopted)
- D 149** Standard Test Method For Dielectric Breakdown Voltage and Dielectric Strength of Electrical Insulating Materials at Commercial Power Frequencies (DoD adopted)
- D 257** Standard Test Method for Materials Insulating D-C Electrical Resistance or Conductance of (DoD adopted)

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| D 543  | Standard Test Method for Resistance of Plastics to Chemical Reagents (DoD adopted)                         |
| D 2240 | Standard Test Method for Rubber Property Durometer Hardness (DoD adopted)                                  |
| D 4060 | Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser                      |
| F 74   | Standard Test Practice for Determining Hydrolytic Stability of Plastic Encapsulants for Electronic Devices |

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

**UNDERWRITERS LABORATORIES (UL)**

- UL94 - Standard for Safety Tests for flammability of Plastic Materials for Parts in Devices and Appliances

(Applications for copies may be obtained from Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096)

**UNIFORM CLASSIFICATION COMMITTEE**

**Uniform Freight Classification Rules**

(Application for copies should be addressed to the Official Classification Committee, 1 Park Avenue, at 33rd Street, New York, NY 10016.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

**2.3 Order of precedence.** In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

**3. REQUIREMENTS**

**3.1 Qualification.** Electrical insulating material furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4.3. and 6.3).

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**3.2 Materials - Type P.** The resin, plasticizer, filler and coloring matter shall be formulated to comply with the requirements specified herein; the material shall fuse to tough, flexible non-porous coating at temperature between 300 and 400 Fahrenheit (°F) when applied to lead coated copper bars and to battery intercell connections.

**3.3 Color.** The color of the type P material after heat curing shall be red in accordance with MIL-STD-104.

**3.4 Size - Type P.** Type P shall be furnished as a liquid in quantities as specified (see 5.2.1.1.1).

**3.5 Property values.** Standard specimens of the material shall conform to the property values shown in tables I, II (qualification), IV, and V (batch acceptance).

**3.6 Instructions for use.** Each can or pail shall have a label attached thereto covering the method of application including preparation of surface, precautions in handling, cure time and temperature, build.

**3.7 Workmanship.** The plastic insulating materials shall be uniform in appearance, free from lumps and other foreign matter.

**3.8 Material safety data sheet (MSDS).** The contracting activity shall be provided a material safety data sheet at the time of contract award. The MSDS shall be provided in accordance with the requirements of FED-STD-313. The MSDS shall be included with each shipment of the material covered by this specification (see 6.5).

## 4. QUALITY ASSURANCE PROVISIONS

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

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

**4.2 Classification of inspection.** The inspection requirements specified herein are classified as follows:

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- a. Qualification inspection (see 4.3)
- b. Quality conformance inspection (see 4.5).

4.2.1 Qualification inspection<sup>1</sup>. Qualification inspection shall be conducted at a laboratory satisfactory to the Naval Sea Systems Command on samples produced with equipment and procedures normally used in production. Samples of type P plastisol material shall be furnished in one gallon containers for the qualification tests. Qualification tests shall consist of the tests specified in Tables I and II.

TABLE I. Qualification tests for property values of the vinyl plastisol.

Property to be tested	Test paragraph	Number of specimens for each size and type	Tests per specimen	Conditioning	Unit of value	Property value (PPM)
Color	3.3	1	2	A	-	Match standard
Viscosity, Brookfield	4.7.10	1	3	A	cps	4000-8000
Specific gravity	4.7.11	1	2	A	-	1.19-1.21
Nonvolatiles	4.7.12	1	2	A	%	97, minimum
Shelf life	4.7.13	1	2	Months @ room temp (max. 85°C)	%	±10, of qualification viscosity

<sup>1</sup>Application for qualification tests shall be made in accordance with Provisions Governing Qualification (see 6.3).

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TABLE II. Qualification tests for property values of insulation.

Property to be tested	Test paragraph	Number of specimens for each size and type	Tests per specimen	Conditioning (see 4.5)	Unit of value	Property value (PPM) <sup>3</sup>
General examination <sup>1</sup>	4.7.1	(see table I)	-	A	-	-
Dielectric strength <sup>2</sup>	4.7.2	1	3	D <sub>1</sub> -24/23 <sup>3</sup>	Minimum volts per mil	500
Insulation resistance	4.7.3	1	3	D <sub>1</sub> -24/23 <sup>3</sup>	Minimum megohms	2000
Impact	4.7.4	1	3	A	-	No damage
Abrasion resistance	4.7.5	1	3	A	Maximum grams per 1000 revolutions	0.05
Heat resistance plastic flow	4.7.6	1	3	E-1/2/120	Maximum inches	0.025
Acid resistance	4.7.7	1	1	D <sub>1</sub> -46/70 <sup>4</sup>	Percent swelling extrudation of plasticizer or other material deposited as sticky oily film on surface of specimen	2.0 max plasticizer
Flame resistance ignition time	4.7.8	1	3	A	Minimum seconds	50

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TABLE II. Qualification tests for property values of insulation - continued.

Property to be tested	Test paragraph	Number of specimens for each size and type	Tests per specimen	Conditioning (see 4.5)	Unit of value	Property value (PPM)
Burning time	-	-	-	-	Maximum seconds	75
Weight loss	-	-	-	-	Maximum percent	25
Hydrolytic stability	4.7.14	1	2	240/30/95	Shore A % of initial value	50
Hardness	4.7.15	1	3	A	Shore A at 25°C	65-75
Toxicity when heated	4.7.9	1	3	A	Exposure limits parts per million	-
Carbon dioxide	-	-	-	-	PPM	15,000
Carbon monoxide	-	-	-	-	PPM	1,500
Ammonia	-	-	-	-	PPM	500
Aldehydes	-	-	-	-	PPM	50
Hydrogen chloride	-	-	-	-	PPM	1,100
Sulphur dioxide	-	-	-	-	PPM	100
Hydrogen cyanide	-	-	-	-	PPM	30

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TABLE II. Qualification tests for property values of insulation - continued.

Property to be tested	Test paragraph	Number of specimens for each size and type	Tests per specimen	Conditioning (see 4.5)	Unit of value	Property value (PPM)
Oxides of nitrogen	-	-	-	-	-	100

<sup>1</sup>Materials, dimensions, and workmanship.

<sup>2</sup>Short time.

<sup>3</sup>Immersion in 1 percent salt water for the time and temperature shown.

<sup>4</sup>Immersion in 20 percent sulphuric acid for the time and temperature shown.

<sup>5</sup>PPM is part per million.

#### 4.4 Sampling for batch inspection.

4.4.1 Lot. All material of the composition and type 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 quality conformance inspection.

4.4.2 Sampling for examination. Samples for materials shall be selected from each lot for examination of visual characteristics in accordance with table III. The lot size and sample size shall be stated in terms of containers.

TABLE III. Sampling for examination.

Lot size number of containers	Containers to be examined
3 to 8	3
9 to 15	3
16 to 25	5
26 to 40	7
41 to 65	10
66 to 110	15
111 to 180	30

4.4.2.1 Sampling for quality conformance tests. One fifth of the containers selected for the visual or dimensional examination shall be subjected to the quality conformance tests specified in tables IV and V, however, the smallest number of containers selected for any sample shall be two. If the contract calls for delivery of 5 gallons or less, only one container shall be selected.

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TABLE IV. Quality conformance tests for property values of vinyl plastisol.

Property to be tested	Test paragraph	Number of specimens for each size and type	Tests per specimen	Conditioning (see 4.5)	Unit of value	Property value
Color	3.3	1	2	A	-	Match standard
Viscosity	4.7.10	1	2	A	cpa	±10% of qualification values
Specific gravity	4.7.11	1	2	A	-	±1% of qualification

## 4.5 Quality conformance examination.

4.5.1 Examination. Each of the samples selected in accordance with 4.4.1.1 shall be visually and dimensionally examined to verify compliance with the requirements 3.3, 3.4, 3.6, and 3.7. Any sample container having one or more visual or dimensional defects shall be considered defective, and this shall be cause for rejection of the lot.

4.5.2 Quality conformance tests. Quality conformance tests shall be conducted on samples of material selected in accordance with 4.4.1.2. One quart from each container shall be subjected to the tests specified in Tables IV and V. Any sample having one or more test failures shall be cause for rejection of the lot.

4.6 Conditioning. Materials shall be conditioned before being tested, as specified in table II or IV, as applicable.

4.6.1 Equipment. Conditioning chambers and baths shall be such as to maintain the specified temperature plus or minus 2 Degree of Celsius (°C) and the specified relative humidity plus or minus 2 percent.

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TABLE V. Quality conformance tests for property values of insulation.

Property to be tested	Test paragraph	Number of specimens for each size and type	Tests per specimen	Conditioning (see 4.5)	Unit of value	Property value
General examination <sup>1</sup>	4.7.1	<sup>3</sup>	-	A	-	-
Dielectric strength <sup>2</sup>	4.7.2	<sup>3</sup>	3	D <sub>1</sub> -24/23	Minimum volts per mil	500
Insulation resistance	4.7.3	<sup>3</sup>	3	D <sub>1</sub> -24/23	Minimum megohms	2,000
Acid resistance	4.7.7	<sup>3</sup>	1	D <sub>1</sub> -46/70 <sup>4</sup>	Percent swelling Exudation of Plasticiser or other material deposited as sticky oily film on surface of specimen	2.0 max None

<sup>1</sup>Materials, dimensions, and workmanship.

<sup>2</sup>Short time.

<sup>3</sup>As required by lot size (see 4.1.2).

<sup>4</sup>Immersion in 20 percent sulphuric acid for the time and temperature shown.

#### 4.6.2 Designation. Conditioning procedures shall be designated as follows:

- a. A capital letter indicating the general condition of the specimen; that is humidity, immersion, and temperature conditioning
- b. A number indicating in hours the duration of the conditioning
- c. A number indicating in degrees centigrade the conditioning temperature

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- d. A number indicating relative humidity whenever relative humidity is controlled. (Relative humidity obtained over calcium chloride shall be taken as zero.)

The number shall be separated from each other by slant marks, and from the capital letter by a dash.

**4.6.3 Nomenclature.** The following letters shall be used to indicate the respective general conditioning.

Condition A - As received, no special conditioning

Condition C - The specimens shall be conditioned for the first time and at the temperature and relative humidity specified in tables II and IV, as applicable.

Examples:

C-96/23/0 - 96 hours, 23 °C, 0 percent relative humidity  
 C-96/23/50 - 96 hours, 23 °C, 50 percent relative humidity  
 C-96/23/96 - 96 hours, 23 °C, 96 percent relative humidity

Condition D, - The specimen shall be immersed in 1 percent by weight salt water for the time and at the temperature specified.

Example:

D<sub>1</sub>-24/23 - 24 hours, 23 °C, in 1 percent salt water

Condition E - The specimen shall be conditioned for the time and at the temperature specified.

Examples:

E-400/100 - 400 hours, 100 °C  
 E-2/100 - 2 hours, 100 °C  
 E-400/130 - 400 hours, 130 °C

**4.7 Methods of tests.** The methods and procedures shall be as specified in 4.7.1 to 4.7.15 inclusive. Unless otherwise specified herein, all tests shall be conducted under room conditions (23 °C, 50 percent relative humidity).

**4.7.1 General examination.** The insulation shall be examined to verify that the materials dimensions, labeling, workmanship and color, are in strict conformance with this specification (see 3.2 through 3.4, 3.6 and 3.7). Each sample filled container of type P selected in accordance with 4.4.1.1 shall be examined for defects of construction of the container and the closure, for evidence of leakage, for markings, and any other requirements not involving tests. Color of the insulation in its applied form shall be checked to determine compliance with MIL-STD-104. Any defective container in the sample shall be cause for rejection of the lot.

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**4.7.2 Dielectric strength.**

**4.7.2.1 Method of measurement.** Dielectric strength shall be determined in accordance with the method specified in ASTM D 149. The power supply shall consist of an alternating-current source having as nearly a true sine wave as possible at a frequency of  $50 \pm 5$  cycles per second. The application of voltage shall be made using the short-time method with a rate of rise of 1000 volts per second.

**4.7.2.2 Test electrodes.**

**4.7.2.2.1 Type P.** Apply an application of vinyl primer according to the instructions in the appendix (see 30.3.1.2 and 30.3.1.3). Then apply an eight inch length of fused coating of approximately 0.030 inch thickness to one end of a copper bus bar 1/4 inch thick and 4 inches wide. Three specimens shall be prepared. Immerse the coated end to a depth of 4 inches in a 1 percent salt water solution for  $24 \pm 1$  hours at  $23 \pm 2$  °C. After this conditioning the voltage shall be applied between copper bar and salt water and breakdown shall occur through the coating. The voltage per mil of thickness shall be determined by dividing the breakdown voltage through the coating by the thickness of the coating. The actual thickness of coating shall be determined after breakdown and adjacent to the breakdown area. The minimum average dielectric strength requirement shall be increased from 250 Vpm to 500 Vpm. The average dielectric breakdown expressed in volts as well as the average dielectric strength in volts per mil shall be reported.

**4.7.3 Insulation resistance.** Insulation resistance shall be determined in accordance with the method specified in ASTM D 257. The specimens used may be the same ones as prepared for the dielectric strength tests and may be tested prior to the dielectric tests. Samples and immersion testing shall be under the same condition as detailed in 4.7.2.2.1.

**4.7.4 Impact.** The effect of impact shall be determined by dropping a 5-1/2 pound cylindrical weight with a 5/8 inch hemispherical end from a height of 12 inches onto an insulated bus bar. The thickness of insulation shall be  $0.030 \pm 0.005$  inches. Three determinations shall be made.

**4.7.5 Abrasion resistance.** Abrasion wear (lose of weight) shall be determined in accordance with ASTM D 4060. Three determinations shall be made. Calibrase wheels, CS-10 with a load of 1000 grams shall be used. At least 5000 cycles shall be made.

**4.7.6 Heat resistance, plastic flow.** A sample of material  $0.100 \pm 0.010$  inch thick and not less than 1-inch wide shall be placed between the anvil and the special presser foot of a thickness micrometer described as follows: It shall be a dial micrometer having a raised anvil 3/8 inch in diameter and a spherical presser foot  $0.25 \pm 0.01$  inch in diameter which exerts a total force of  $3.0 \pm 0.1$  ounce on the specimen, the force being applied by means of a weight. The dial shall be graduated to read to 0.001 inch. A 100-gram weight shall be added to the 3-ounce weight and after one minute initial thickness shall be read. The micrometer and the specimen under load shall be placed in an oven for 30 minutes at  $120 \pm 0.5$  °C. The final thickness shall be read within 30 seconds after removal from the oven. Plastic flow to the nearest 0.001 inch shall be the difference between the initial and final thickness measurements. Three determinations shall be made.

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**4.7.7 Acid resistance.** Acid resistance shall be determined in accordance with ASTM D 543. Three specimens shall be tested by immersion in a 20 percent by weight sulfuric acid solution for  $46 \pm 1/4$  hours at  $70 \pm 1$  °C. Sample size shall be 2 by 1 inch with the thickness at 0.060 to 0.070 inch. The thickness shall be uniform to within  $\pm 0.005$  inch. After immersion in the sulfuric acid solution, the samples shall be measured with a micrometer, capable of measuring to 0.001 inch, to determine the percent thickness change after immersion in the sulfuric acid solution.

**4.7.8 Flammability.** Flammability rating shall be determined in accordance with UL 94 using the vertical burning test and either 1/16, 1/8, 1/4 inch thick specimen record as rating/thickness in inches.

**4.7.9 Toxicity when heated.** The method of test and sample size shall be the same as described for the flame resistance test (see 4.7.8). Except the test shall be run in a scaled 18 cubic feet enclosure and sampling of gases determined in accordance with ASTM 800.

**4.7.10 Viscosity, Brookfield.** Determination of viscosity shall be the average of three readings using a Brookfield model RVF viscometer with a number 4 spindle at 20 revolution per minutes (rpm). The as-received plastisol shall be allowed to temperature stabilize for a minimum of 24 hours at  $23 \pm 2$  °C. After temperature stabilization, the container shall be opened and any solid films or skins over the top surface of the dispersed plastisol shall be carefully removed and discarded. The contents shall be hand stirred for 5 minutes with a wide blade spatula with caution taken to avoid introducing air into the material. Measurements shall be made according to ASTM D 2240.

**4.7.11 Specific gravity.** Determine the specific gravity by using a wide-mouth pycnometer (25-milliliters (ml) minimum capacity) at  $23 \pm 1$  °C. Determine the specific gravity by dividing the weight of the plastisol by the weight of an equal volume of distilled water at the same temperature. A hydrometer is another method of determining this property.

**4.7.12 Nonvolatiles.** Determine the percentage of nonvolatiles by placing preweighted samples of the plastisol in a forced air oven at  $135 \pm 2$  °C for 3 hours,  $\pm 5$  minutes and within 30 minutes after weighing the samples. Weigh the container and its contents immediately after cooling. Determine the residue weight and calculate the nonvolatile matter as the ratio of the residue weight to the weight of the original specimen, expressed as a percentage.

**4.7.13 Shelf life.** The supplier shall supply certified data showing the change in viscosity after a sample of the plastisol has been stored for the required time (see table I).

**4.7.14 Hydrolytic stability.** The test method shall be in accordance with ASTM F 74. Change in hardness, after the material is subjected to 95 percent humidity at various elevated temperatures, shall be used as the test criteria. The time to failure criteria shall be based on a 5 year exposure at 30 °C, 95 percent relative humidity.

**4.7.15 Hardness.** Three specimens of any convenient size shall be tested in accordance with ASTM D 2240, using a type A durometer.

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

**MIL-I-15265C(SH)****5. PACKAGING**

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

**5.1 Packaging requirements.** The resin shall be packaged level A, B or C, packed level A, B or C as specified (see 6.2) and marked in accordance with PPP-P-1892 and shall include bar codes and applicable packaging acquisition options therein as specified (see 6.2). The product shall be furnished in 1-gallon multiple friction plug type cans or 5-gallon lug cover pails as specified (see 6.2). In addition, for Navy acquisitions, the following applies:

a. **Navy fire-retardant requirements.**

1. **Treated lumber and plywood.** Unless otherwise specified (see 6.2), all lumber and plywood including laminated veneer materials used in shipping container and pallet construction, members, blocking, bracing, and reinforcing shall be fire-retardant treated material conforming to MIL-L-19140 as follows:

Levels A and B	Type II – weather-resistant. Category I – general use.
Level C	Type I – non-weather resistant. Category I – general use.

- b. **Fiberboard.** Fiberboard used in the construction of interior (unit and intermediate) and exterior fiberboard boxes including interior packaging forms shall conform to the class-domestic/fire retardant or class-weather resistant/fire retardant materials requirement as specified (see 6.2), of PPP-F-320 and amendments thereto.

**5.2 Material safety data sheet.** A copy of the material safety data sheet shall be attached to the shipping document for each destination (see 3.8).

**6. NOTES**

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

**6.1 Intended use.** This insulation is intended for covering bus bars, primarily on submarines, where a flame resistant, tough, non-porous, good dielectric covering is needed. The type P material provides a build of approximately 0.060 to 0.070 inches. This insulation shall not be used in applications where the continuous operating hot spot temperature exceeds 221 °F (105 °C) Instructions for applying these materials to submarine battery bus bars and connectors is contained in the appendix to this specification.

**6.2 Acquisition requirements.** Acquisition documents must specify the following:

- a. Title, number, and date of this specification
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of

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individual documents referenced (see 2.1)

- c. Level of packaging, level of packing and packaging acquisitions options required (see 5.1)
- d. When fire retardant lumber and plywood are not required (see 5.1.a)
- e. Class of fire retardant fiberboard required (see 5.1.b).

**6.3 Qualification.** With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No. 15265 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Sea Systems Command, SEA 51222, Department of the Navy, Washington, DC 20362-5101 and information pertaining to qualification of products may be obtained from that activity.

(Copies of "Provision Governing Qualification SD-6" may be obtained upon application to Standardization Documents Order Desk, Building 4D, 700 Robbins Ave., Philadelphia PA 19111-5094.)

**6.4 Material safety data sheets.** Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in FED-STD-313.

**6.5 Subject term (key word listing).**

Abrasion resistance  
Acid resistance  
Flame resistance  
Gravity  
Nonvolatiles

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

Preparing activity  
Navy - SH  
(Project 5970-N674)

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**APPENDIX**

**APPLICATION INSTRUCTIONS (SUBMARINE BUS BARS)**

**10. SCOPE**

**10.1** This appendix covers instructions for applying plastic insulation to submarine bus bars and intercell connections.

**20. APPLICABLE DOCUMENTS**

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

**SPECIFICATIONS**

**FEDERAL**

P-D-680

Dry Cleaning Solvent

**MILITARY**

MIL-T-81533A

Trichloroethane 1,1,1

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

**30. REQUIREMENTS**

**30.1 Surface preparation.** It is most important to remove all sharp edges, burrs and sharp projections on bus bar, terminal posts, bolts and nuts with a file and sandpaper or crocus cloth, removing the minimum amount of metal. Renew all damaged nuts and bolts. All bolts must be of the same length.

**30.2 Cleaning.** Place bus bars in a vapor degreaser and clean. Solvent used in cleaning operation should consist of 9 parts of dry cleaning solvent in accordance with P-D-680 (Stoddard Solvent) and 1 part trichloroethane 1,1,1 and trichloroethylene in accordance with MIL-T-81533A. After cleaning, all bus bars should be handled only with clean cotton gloves. Any oil or grease on surfaces to be insulated will result in failure of the coating to adhere.

**30.3 Parts to be insulated.** The center portion of the cell connectors shall be insulated with type P material. All remaining exposed parts of cell connectors, terminal posts, bolts, washers, and securing nuts are to be insulated with slip-on caps using type P material.

**30.3.1 Cell connectors, bus bar section.**

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**30.3.1 Cell connectors, bus bar section.**

**30.3.1.1 Marking the center portion.** Handling the cleaned bus bar cell connector with clean cotton gloves, mark off 2 to 2-1/16 inches from each end.

**30.3.1.2 Primer for type P.** Apply an adhesive primer to the central portion of the bus bars and allow to air dry at room temperature for 20 minutes.

**30.3.1.3 Applying type P.** Suspend the primed bus bar in an oven preheated to 375 °F (109 °C) and heat for about 15 minutes or until the part has attained oven temperature. Prolonged heating or heating at too high a temperature may destroy the primer. Remove the heated bar and dip quickly into the type P compound to within 2 inches of the upper end of the bar. Keep the bar immersed for 30 seconds, withdraw slowly and return immediately to a preheated oven. Bake for 12 minutes at 375 °F (190 °C) to fuse the dipped coating. A change in color and slight "smoking" of the coating also indicates complete fusing. Remove from the oven and hang the bar up until cool. Type P coating should be about 0.060 to 0.070 inch thick. Cut through the coating, 2 to 2-1/16 inch from each end and strip off the excess resin. Pill box holes should be reopened.

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

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<b>1. RECOMMEND A CHANGE:</b>	1. DOCUMENT NUMBER MIL-I-15265C(SH)	2. DOCUMENT DATE (YYMMDD) 11 JUNE 1992
3. DOCUMENT TITLE INSULATION, ELECTRICAL, PLASTIC (SUBMARINE BUS BAR COVERING)		
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) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY		
a. NAME COMMANDER NAVAL SEA SYSTEMS COMMAND (SEA 56Z23)	b. TELEPHONE (Include Area Code) (1) Commercial (703) 602-3123	(2) AUTOVON (AV) 332-3123
c. ADDRESS (Include Zip Code) WASHINGTON, DC 20362-5101	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	