

NOT MEASUREMENT SENSITIVE
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MILITARY SPECIFICATION

SEALING COMPOUND, POLYSULFIDE RUBBER, ELECTRIC CONNECTORS AND ELECTRIC SYSTEMS, CHEMICALLY CURED

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

1. SCOPE

1.1 Scope. This specification establishes requirements for a two-component, chemically cured organic polysulfide liquid polymer for insulating, sealing, reinforcement and corrosion protection of electric connectors, wiring and other electric apparatus. This specification has provisions for shelf life extension (See 3.2.5).

1.2 Classification. The sealing compound shall be furnished in the following types, classes and categories:

1.2.1 Types (see 3.3.1.3 and 6.2b).

Type I - Low viscosity (100-400 poises, initial mixed viscosity)

Type II - High viscosity (401-1200 poises, initial mixed viscosity)

1.2.2 Classes (see 4.7 and 6.2b).

Class 1 - 24 hour cure at 77°F

Class 2 - 48 hour cure at 77°F

Class 3 - 72 hour cure at 77°F

Beneficial comments, (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Warfare Center Aircraft Division Lakehurst, Code SR3, Lakehurst, NJ 08733-5100, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or letter.

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* 1.2.3 Categories (see 3.2.2 and 6.2b).

Category A - Two component package

Category B - Premixed, degassed, frozen package

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 6.2e).

SPECIFICATIONS

FEDERAL

A-A-55057	Panels, Wood/Wood Based, Construction and Decorative
J-C-30	Cable and Wire, Electrical (Power, Fixed Installation)
O-S-1926	Sodium Chloride, Technical
QQ-A-250	Aluminum Alloy, Plate and Sheet, General Specification For
QQ-P-416	Plating, Cadmium (Electrodeposited)
TT-I-735	Isopropyl Alcohol
TT-S-735	Standard Test Fluids, Hydrocarbon
TT-W-572	Wood-Preservative, Water-Repellent
CCC-C-419	Cloth, Duck, Unbleached, Plied-Yarns, Army and Numbered
PPP-B-566	Box, Folding, Paperboard
PPP-B-585	Box, Wood, Wirebound
PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-621	Box, Wood, Nailed and Lock-Corner
PPP-B-636	Box, Shipping, Fiberboard
PPP-B-676	Box, Set-up
PPP-C-96	Cans, metal, 28 Gage and lighter

FEDERAL

PPP-C-186	Container, Packaging and Packing For Drugs, Chemicals, and Pharmaceuticals
PPP-T-495	Tubes, Mailing and Filing

MILITARY

MIL-M-14/6	Molding Compounds, Diallyl Ortho-Phthalate, Thermo-setting, Containing Mineral Fillers, Glass or Poly-meric Fillers
MIL-P-5315	Packing, Preformed, Hydrocarbon Fuel Resistant
MIL-H-5606	Hydraulic Fluid, Petroleum Base, Aircraft Missile, and Ordnance
MIL-T-5624	Turbine Fuel, Aviation, Grades JP-4, JP-5 and JP-5/JP-8 ST
MIL-L-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, NATO Code Number O-148
MIL-S-8660	Silicone Compound, NATO Code Number S-736
MIL-W-22759/9	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Silver-Coated Copper Conductor, 1000-Volt
MIL-L-23699	Lubricating Oil, Aircraft Turbine Engines, Synthetic Base
MIL-P-38714	Sealant Cartridges For Two-Component Materials
MIL-C-38736	Compound, Solvent, for Use in Integral Fuel Tanks

STANDARDS

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MS3100	Connector, Receptacle, Electric, Wall Mounting, Solder Contacts, AN Type
MS3103	Connector, Receptacle, Electric, Potting Seal, Solder Contacts, AN Type
MS3106	Connector, Plug, Electric, Straight
MS25183	Connector, Plug, Electric, Potting Seal, Solder Contacts, AN Type

(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 19111-5094.)

2.1.2 Other Government documents. The following other Government document form a part of this document to the extent specified herein. Unless otherwise specified, the issue is that cited in the solicitation.

Code of Federal Regulations

49 CFR 171-178 Department of Transportation (DOT) Regulations for the Transportation of Explosives and Other Dangerous Articles by Land and Water.

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Orders for the publication should cite "The latest issue and supplements thereto.")

* 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 the documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2e).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 149	Test Method for Dielectric breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials of Commercial Power Frequencies
ASTM D 150	Test Method for A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Material
ASTM D 257	Test Method for Materials, Insulating, D-C Resistance or Conductance of
ASTM D 1195	Test Method for High Voltage, Low Current Arc Resistance of Solid Electrical Insulation
ASTM D 1457	Specification for Polytetrafluoroethylene (PTFE) Molding and Extrusion Materials
ASTM D 2240	Test Method for Rubber Property - Durometer Hardness
ASTM D 4066	Standard Specification for Nylon Injection and Extrusion Materials

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

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents may also 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. The sealing compound and curing agent 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).

3.2 Material. The sealing compound shall be a two-component systems consisting of an organic polysulfide liquid polymer base compound and a curing agent. Each component shall be homogeneous and free of lumps and foreign matter. The manufacturer shall certify that elemental sulfur is not present initially or as a by-product of the curing reaction (See 4.3.2).

3.2.1 Primer. The use of primer to promote adhesion is permitted. The primer(s) shall be recommended by the manufacturer and shall be included in the tests of this specification. The primer(s) shall be identified on the applicable qualified products list. The use and application of the acceptable primer(s) shall be in strict accordance with the manufacturers instructions.

3.2.2 Packaging categories. The sealing compound shall be furnished as a two-component kit system designated category A or as a premixed degassed frozen system designated category B (see 5.1.1.1).

3.2.3 Suitability. The sealing compound shall protect the electric connectors, wiring and other electric apparatus by sealing and insulating against moisture, solvents, dirt and other foreign materials, and shall not corrode nor otherwise affect the operating capabilities of the electric system.

* 3.2.4 Toxicity. The sealing compound shall have no adverse affect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the Contracting Activity to the appropriate departmental medical service who will act as an adviser to the contracting agency.

3.2.5 Extended shelf life. Sealing compound which has exceeded the storage life may be retested to extend its storage life. Sampling procedures and tests for the compound are identified in 4.4.4. The sealant shall meet the requirements of 3.3.1.6. The sealing compound shelf life shall be extended two times in increments of three (3) months for a total shelf life extension of six (6) months.

3.3 Characteristics and performance.

3.3.1 Properties before cure.

3.3.1.1 Color. Unless otherwise specified in the contract or order (see 6.2h), the base compound shall be supplied in the manufactured color and shall contrast with the curing agent to facilitate mixing.

3.3.1.2 Consistency. The mixed polysulfide shall pour easily at normal temperatures, but shall not flow through connectors during the potting operation (see 4.6.4).

3.3.1.3. Application life. The mixed category A polysulfide shall be tested for application life as specified in 4.9.2.1. Requirements shall be initial viscosity and application time, of the mixed (catalyzed) compound.

3.3.1.3.1 Initial viscosity. The initial viscosity shall be as follows:

Type I - 100 to 400 poises.
Type II - 401 to 1200 poises.

3.3.1.3.2 Application time. The application time (minimum specified time to reach 1000 poises for Type I and 2500 poises for Type II) of the mixed compound shall be as follows:

Class 1 - 30 minutes
Class 2 - 60 minutes
Class 3 - 120 minutes

3.3.1.4 Non-volatile content. The minimum non-volatile content of the polysulfide when determined in accordance with 4.9.2.2 shall be 94 percent.

3.3.1.5. Accelerated storage. Upon completion of the accelerated storage test of 4.9.2.11, the curing agent shall be stirred and shall return to a smooth workable consistency. The mixed compound shall not deviate from the initial viscosity (3.3.1.3.1) by more than plus 35, minus 5 percent and shall conform to application time (3.3.1.3.2), set time (Table I), and cure "A" hardness (initial, Table I).

* 3.3.1.6 Long term storage. After storage as specified in 4.9.2.12, the category A packaged sealing compounds shall conform to the application life (3.3.1.3) and cure A and cure B hardness (Table I) requirements.

3.3.2 Properties after cure.

3.3.2.1 Non-electric properties. The non-electric properties of the cured polysulfide compound shall be in accordance with Table I.

3.3.2.2 Electric properties. The electric properties of the cured polysulfide shall be in accordance with Table II.

TABLE I. Non-electric properties of cured compound.

Property	Requirement 1/		Test Paragraph
Set Time Shrinkage, percent, max	No sag or flow		4.9.2.3
	10		4.9.2.4
	Cure A (see 4.7.1)	Cure B (see 4.7.2)	
Hardness, Shore A-2 initial, points	Type I-20, min; Type II-25, min;	30 to 60	4.9.2.5
Adhesion, (piw), min.			4.9.2.6
Aluminum Alloy	2	15	
Chromated Cadmium Plate	2	15	
Diallyl Phthalate Plastic	-	15	
Nylon Plastic	2	15	
Polytetra- fluoroethylene (TFE), treated	2		
Fluid resistance Adhesion after immersion, pounds, min.	-	10	4.9.2.7
Change in Hardness, points, max.	-	±10	
Low temperature flexibility	-	No checking, crack- ing or separation from test panel	4.9.2.8
Corrosion	No greater corro- sion than control wire		4.9.2.9
Hydrolytic sta- bility, physical Change in Hardness after exposure, points	-	+15 - 5	4.9.2.10

1/ Unless otherwise specified, the given value is for all types and classes.
The "-" indicates a requirement not tested.

TABLE II

Table II. Electric properties of cured compounds.

Property	Requirement 3/		Test Paragraph
	Cure A(see 4.5.4.1)	Cure B(see 4.5.4.2)	
Resistance to arc, seconds, min. 1/	25	50	4.9.3.1
Dielectric Strength, volts/mil, min.	200	200	4.9.3.2
Dielectric constant max.			4.9.3.3
1 KHz at 77°F(25°C)	9.5	9.5	
1 MHz at 77°F(25°C)	9.5	9.5	
1 KHz at 185°F(85°C)	-	9.0	
1 MHz at 185°F(85°C)	-	9.0	4.9.3.3
Dissipation factor, max.			
1 KHz at 77°F (25°C)	0.03	0.01	
1 MHz at 77°F (25°C)	0.03	0.03	
1 KHz at 185°F (85°C)	-	Type I - 0.090 Type II - 0.030	
1 MHz at 185°F (85°C)	-	Type I - 0.095 Type II - 0.030	
Resistivity, min.			4.9.3.4
Volume at 77°F (25°C), OHM-CM	1×10^{10}	1×10^{10}	
Surface at 77°F (25°F), OHM	1×10^{11}	1×10^{11}	
Volume at 185°F (85°C) OHM-CM	-	Type I - 5×10^9 Type II - 2×10^{10}	
Surface at 185°F (85°C), OHM	-	2×10^{11}	
Insulation resistance, megohm, min. 2/			4.9.3.5
As received			
Plastic inserts	4,000	10,000	
Resilient inserts	4,000	8,000	
After Thermal Shock			4.9.3.6
Plastic inserts	-	10,000	
Resilient inserts	-	8,000	

Table II. Electric properties of cured compounds - Continued

Property	Requirement <u>3/</u>		Test Paragraph
	Cure A(see 4.7.1)	Cure B(see 4.7.2)	
After hydrolytic stability, electrical			4.9.3.7
Plastic inserts	-	4,000	
Resilient inserts	-	4,000	
High potential resistance	-	No breakdown	4.9.3.8
Air leakage, max./hour	-	1 cubic inch	4.9.3.9
Overload	-	Shall not ignite	4.9.3.10

- 1/ The arc resistance shall be the number of seconds required to cause continuous burning or the formation of a conducting path in the specimen, whichever occurs first.
- 2/ When unpotted connectors which have an insulation resistance of 5,000 to 10,000 megohms (as determined in 4.9.3.5) are used, the value 4,000 megohms, min., shall be substituted for all insulation resistance values listed.
- 3/ Unless otherwise specified the given value is for all classes and types. The "-" indicated a requirement not tested for.

* 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 this 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 manufacturing operations, is an

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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.

4.1.2 Source inspection. Materials purchased for delivery to the Government under this specification shall be source inspected so there is assurance the sealing compound meets the quality conformance inspection prior to leaving the manufacturer's plant. The sealing compound shall be packaged and mixed in, as near as practical, the containers specified in Section 5 of this specification.

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

- a. Qualification inspection (see 4.3).
- b. Qualification retention (see 4.3.4).
- c. Quality conformance inspection (see 4.4).
- d. Shelf life extension inspection (see 4.4.4).

4.3 Qualification inspection. Qualification inspection shall consist of all the tests specified in Table III.

4.3.1 Sampling instructions. Qualification tests samples shall consist of six quarts of the base compound, together with the necessary curing agent, of the type and class on which qualification is desired. The compound and curing agent shall be furnished in containers of the type specified in Section 5. Samples shall be forwarded to the Commanding Officer, Naval Air Warfare Center Aircraft Division Warminster, Supply Department, Warminster, Pennsylvania 18974-5000. The samples shall be plainly and durably marked with the following information:

Sample for Qualification Test
 SEALING COMPOUND, POLYSULFIDE RUBBER, ELECTRIC CONNECTORS
 AND ELECTRIC SYSTEMS, CHEMICALLY CURED
 Specification MIL-S-8516F
 Type, Class and Category
 Date of manufacture
 Name and address of manufacturer
 Plant address which produced the compound
 Manufacturer's product identification
 Submitted by (name and date) for qualification in accordance with the requirements of MIL-S-8516F under authorization (reference authorizing letter).

4.3.2 Manufacturer's data. Two copies of the manufacturer's test report, containing complete test data showing that the material submitted for qualification conforms to the requirements of this specification, along with the certification required by 3.2, shall be submitted with qualification samples. In addition, two copies of the manufacturer's instructions for use of the compound and primer, if applicable, shall be submitted at this time.

TABLE III. Qualification inspection.

Inspection	Requirement Paragraph	Test Paragraph
Material	3.2	4.9.1
Color	3.3.1.1	4.9.1
Consistency	3.3.1.2	4.6.4
Application Life		
Initial viscosity	3.3.1.3.1	4.9.2.1
Application time	3.3.1.3.2	4.9.2.1
Non-volatile content	3.3.1.4	4.9.2.2
Set-time	Table I	4.9.2.3
Shrinkage	Table I	4.9.2.4
Hardness	Table I	4.9.2.5
Adhesion	Table I	4.9.2.6
Fluid resistance	Table I	4.9.2.7
Low temperature flexibility	Table I	4.9.2.8
Corrosion	Table I	4.9.2.9
Hydrolytic stability physical	Table I	4.9.2.10
Accelerated storage	3.3.1.5	4.9.2.11
Long term storage	3.3.1.6	4.9.2.12
Resistance to arc	Table II	4.9.3.1
Dielectric strength	Table II	4.9.3.2
Dielectric constant	Table II	4.9.3.3
Dissipation factor	Table II	4.9.3.3
Volume resistivity	Table II	4.9.3.4
Surface resistivity	Table II	4.9.3.4
Insulation resistance	Table II	4.9.3.5
as received		4.9.3.5
after thermal shock		4.9.3.6
after hydrolytic stability		4.9.3.7
High potential resistance	Table II	4.9.3.8
Air leakage	Table II	4.9.3.9
Overload	Table II	4.9.3.10

4.3.4 Retention of qualification. In order to retain qualification of the product approved for listing on the Qualified Products List (QPL), the manufacturer shall verify by certification to the qualifying activity that the manufacturer's product complies with the requirements of this specification. The time of periodic verification by certification shall be in two year intervals from the date of the qualification certification and shall be initiated by the Government. The Government reserves the right to re-examine the qualified product whenever deemed necessary to determine that the product continues to meet any or all of the specification requirements.

4.4 Quality conformance tests.

4.4.1 Lot formation. Unless otherwise specified, a lot shall consist of all the sealing compound of the same type and class, manufactured at one time from one batch, forming part of one contract or order, and submitted for acceptance at the same time and place.

4.4.2 Sampling.

4.4.2.1 Sampling for tests. A sufficient number of containers shall be selected at random to allow preparation of specimens for the tests specified in Table IV. The sample shall be examined and tested as specified in 4.4.3.1.

4.4.2.2 Sampling for packaging.

4.4.2.2.1 Unit containers. A random sample of filled containers shall be selected from each lot in accordance with inspection level I of MIL-STD-105 and examined as specified in 4.4.3.2. The lot size shall be the total number of containers.

4.4.2.2.2 Shipping containers. Shipping containers, just prior to closure, shall be randomly selected from each lot in accordance with inspection level I of MIL-STD-105 for examination as specified in 4.4.3.2. Lot size shall be the number of shipping containers.

4.4.3 Inspections.

4.4.3.1 Quality conformance. Two specimens for each test shall prepared from the containers selected in 4.4.2.1. The test specimens shall be examined and tested to the requirements of Table IV. In addition, the samples may be subjected to any other test specified herein, when considered necessary by the acquisition activity, to ensure conformance to the requirements of this specification. Nonconformance of a test specimen to a single requirement (Table IV) shall be cause for rejection of the lot represented by the sample.

4.4.3.2 Packaging examination. Samples selected in accordance with 4.4.2.2 shall be visually examined to the requirements in Table V and all other applicable container requirements to determine conformance to Section 5 of this specification. The acceptable quality level (AQL) for this inspection shall be 2.5 percent defective. In addition, shipping containers fully prepared for delivery shall be inspected for closure defects.

* 4.4.4 Shelf-life extension. The storage life of the sealing compound may be extended when tested at the end of its 9 month shelf life. The sealing compound shall be tested as specified in 4.9.2.12 for conformance to 3.3.1.6. Sampling of the stored sealing compound shall be as follows:

<u>Remaining units</u>	<u>Randomly select and test</u>
Up to 100	3
101 to 500	5
over 500	7

The shelf life of the sealant may be extended two times (a total of six months) by repeating the sampling and test at the end of the first extension.

4.5 Tests conditions.

4.5.1 Standard conditions. Unless otherwise specified herein, all mixing, curing, and tests shall be performed at $77 \pm 2^{\circ}\text{F}$ ($25 \pm 1^{\circ}\text{C}$) and a relative humidity of 50 ± 5 percent.

4.5.2 Mixing. The base compound and its curing agent, both in the original unopened containers, together with the required spatulas, beakers, and other mixing equipment shall be held at standard conditions (4.5.1) for a minimum of 16 hours. The base compound and curing agent shall then be thoroughly mixed in the proportions recommended by the manufacturer. Proper care should be taken to avoid incorporation of air by excessive stirring or folding action. Deaeration by centrifuge (1800 rpm for a maximum of 3 minutes) shall be used. The mixing operation shall be conducted at standard conditions (4.5.1).

* 4.5.3 Thawing of category B cartridges. Premixed frozen cartridges shall be thawed in accordance with the manufacturer's instructions.

4.6 Preparation of test specimens.

4.6.1 Preparation of parts. All molds, test panels and electric connectors shall be thoroughly cleaned with solvent cleaning compound conforming to MIL-C-38736, and wiped dry prior to any operation. Mold interiors and test panels shall, if necessary, be brush coated with the mixed compound to insure subsequent contact of the test compound with all surfaces.

4.6.2 Disc molds. Disc and other special shaped molds shall be constructed of polyethylene, a suitable metal coated with a silicone type varnish, or any composition that has a surface which will not transfer to the specimen. The mold shall be constructed in a manner that will permit easy release of the specimen. The mold shall be filled by slowly pouring or extruding the mixed compound into the cavity until a slight excess is obtained. The mold shall then be covered with a flat smooth surfaced metal plate and a pressure of approximately 2 pounds per square inch applied. Curing time shall be as specified in 4.7 and the applicable test method.

4.6.3 Panels. Sealing compound test panels are required for the tests specified in Table VI, and shall be prepared and cured in accordance with 4.7 and the applicable test method.

Table IV. Quality conformance tests.

Inspection	Test paragraph
Examination of product	4.9.1
Consistency	4.6.4
Application life	4.9.2.1
Non-volatile content	4.9.2.2
Set time	4.9.2.3
Shrinkage	4.9.2.4
Hardness (Cure A and B)	4.9.2.5
Adhesion (To PTFE, Treated and Aluminum)	4.9.2.6
Insulation resistance, as received values only (Cure A & B) 1/	4.9.3.5

1/ One each resilient and diallyl phthalate connector.

TABLE V. Packaging examinations.

Examination	Defect
Fill	Not volume specified in contract or order
Unit package	Wrong size cans or kits Material or construction not as specified Components damaged or missing Unit package closure incomplete or damaged Not level required by contract or purchase order Base compound and accelerator not properly separated
Packing	Not level required by contract or purchase order Any nonconforming component, incomplete closures Bulged or damaged shipping containers
Count	Less than specified or indicated quantity per shipping container
Markings	Unit package and packing - Omitted, illegible, incorrect, incomplete or not in accordance with contract requirements

* **4.6.4 Electric connector assemblies.** Four connector assemblies equipped with diallyl phthalate inserts and four assemblies equipped with resilient inserts, conforming to the following shall be used:

Assembly #1 MS3103 Connector, receptacle
MS25183 Connector, plug

Assembly #2 Type MS3100 A22-19P Connector, receptacle
Type MS3106 A22-19S Connector, plug

12 inch lengths of polytetrafluoroethylene (PTFE) insulated wire conforming to MIL-W-22759/9 shall be chemically treated to provide a bondable surface, then soldered to each pin of the connector. Insulation resistance determinations are required before potting the wired assemblies (see 4.9.3.5). The mixed polysulfide shall be poured or extruded slowly into the connector until a slight excess is obtained. During all potting operations conformance to 3.3.1.2 shall be noted. Two of the four assemblies of each insert type shall be subjected to Cure A of 4.7.1. The remainder shall be subjected to Cure B. The cured potted connector assemblies shall be tested as specified in 4.6.3.5.

4.7 Curing of specimens.

4.7.1 Cure "A". All specimens shall be cured at $77 \pm 2^{\circ}\text{F}$ ($25 \pm 1^{\circ}\text{C}$) for the times indicated below.

Class 1 - $24 \pm 1/2$ hours

Class 2 - $48 \pm 1/2$ hours

Class 3 - $72 \pm 1/2$ hours

Class 1 molded specimens shall be removed from the mold after 6 hours of cure has elapsed; Classes 2 and 3 after 24 hours. The polyethylene molds used in potting connectors shall also be removed at these times. The prescribed tests shall be initiated not later than 1 hour after completion of the applicable cure time.

4.7.2 Cure "B". Follow procedure of 4.7.1. Immediately following completion of cure "A", the specimens shall be transferred to an air circulating oven maintained at $148 \pm 2^{\circ}\text{F}$ ($70 \pm 1^{\circ}\text{C}$) for a period of $48 \pm 1/2$ hours. Specimens from molds shall be placed on a flat plate. Mated connector assemblies and panels shall be placed on a metal screen. After the completion of cure "B", the specimens shall be removed from the oven and maintained at standard conditions (4.5.1) at least 2 hours but not more than 7 days before starting tests.

4.8 Finished specimens. The surfaces of molded and potted polysulfide specimens shall be clean, smooth, free from holes and bubbles, and all corners and edges shall be well defined.

4.9 Test methods.

4.9.1 Examination of product. The base compound and curing agent shall be examined for conformance to 3.2, 3.3.1.1 and to requirements for which no test methods are specified herein.

TABLE VI. Test panels required.

Property	Test para.	Panel Composition	Panel Specification	Panel Size, inch	Coating Thickness, inch 1/	Number of panels and cure Procedure (4.5.4)
Adhesion	4.9.2.6	Aluminum Alloy Alclad	QQ-A-250/13	3 X 6 X 0.0625	0.125 ± 0.030	1 panel - Cure A 1 panel - Cure B
		Chromated, Cadmium Plated Steel, Type II, Class 3	QQ-P-416	3 X 6 X 0.0625	0.125 ± 0.030	1 panel - Cure A 1 panel - Cure B
		Diallyl Phthalate, Type MDG	MIL-M-14/6	3 X 6 X 0.125	0.125 ± 0.030	1 panel - Cure B
		Nylon	ASTM D 4066	1 X 6 X 0.125	0.125 ± 0.030	1 panel - Cure B
		Polytetrafluoroethylene (PTFE) <u>3/</u>	ASTM D 1457	1 X 12 X 0.010	0.125 ± 0.030	1 panel - Cure A 1 panel - Cure B
Fluid Resistance	4.9.2.7	Aluminum Alloy Alclad	QQ-A-250/13	3 X 6 X 0.0625	0.25 ± 0.050	8 panels - Cure B
Low Temperature Flexibility <u>2/</u>	4.9.2.8	Aluminum Alloy Alclad	QQ-A-250/13	1 X 6 X 0.032	0.058 ± 0.008	3 panels - Cure B

1/ Coating thickness after applicable cure.

2/ One inch (2.5 cm) at each lengthwise end of the panel shall not be coated.

3/ Prior to coating, the surface of the 0.010 skived polytetrafluoroethylene tape shall be chemically treated to provide a bondable surface.

4.9.2 Non-electric tests.

* 4.9.2.1 Application life. Initial viscosity and application time of Type I compounds shall be determined using a model RVF Brookfield Viscometer equipped with a No. 6 spindle and operated at 10 rpm. For Type II, the viscometer shall be equipped with a No. 7 spindle operated at 10 rpm.

4.9.2.1.1 Procedure. A quantity of the base compound and an appropriate amount of curing agent shall be mixed 5 minutes in a standard 1/2 pint can, approximately 2-3/4 inch diameter, or equivalent. The retaining flange of the can shall be removed. The mixed compound shall be of sufficient volume to allow immersion of the spindle to its depth mark. Initial viscosity shall be determined immediately following the mix period. Application time determinations for Class 1 shall commence 20 minutes after the initial viscosity reading; for Classes 2 and 3, viscosity shall be determined after 50 and 110 minutes respectively (time counted from start of mix). Subsequent readings shall be made at 10 minute intervals until a value of 1000 poises is obtained for Type I and 2500 poises for Type II compounds. The spindle shall remain immersed in the test compound for the duration of the test. Readings shall be taken after a minimum of 3 revolutions of the spindle.

4.9.2.2 Nonvolatile content. Five to ten grams of the mixed compound shall be transferred to a dish approximately 2.5 inches in diameter. The weight shall be determined to the nearest milligram. The compound shall be heated for 24 ± 2 , - 0 hours at $158 \pm 2^\circ\text{F}$ ($70 \pm 1^\circ\text{C}$), transferred to a desiccator, cooled to standard conditions, and weighed to the nearest milligram. The percent nonvolatile content shall be calculated as follows:

$$\text{Percent nonvolatile content} = \frac{\text{Final weight of base compound}}{\text{Initial weight of base compound}} \times 100$$

4.9.2.3 Set time. A flow test fixture conforming to Figure 1, shall be placed on a horizontal surface with the front face upward and the plunger depressed to the limit of its travel. A silicone mold release agent should be applied to the cavity side wall. 50 grams of base compound and appropriate curing agent shall be mixed thoroughly for 5 minutes. The mixed compound shall immediately be transferred to the cavity, leveled off to the face of the test fixture and covered with polyethylene film, 0.002 to 0.008 inch thick. Curing time shall be as follows:

Class 1 - 10 hours \pm 10 minutes
Class 2 - 16 hours \pm 10 minutes
Class 3 - 32 hours \pm 10 minutes

After curing, the polyethylene film shall be removed, the test fixture placed on its end, and the plunger advanced to the limit of its forward travel. Flow observations shall be made 5 minutes after the advancement of the plunger.

4.9.2.4 Shrinkage. A cubical mold, approximately 1.0 inch on each side and a suitable cover shall be constructed (4.6.2). The volume of the mold shall be determined at $77^{\circ} \pm 2^{\circ}\text{F}$ ($25^{\circ} \pm 1^{\circ}\text{C}$). The mixed compound shall be poured into the cavity as specified in 4.6.2, the cover set in place and then subjected to Cure A of 4.7.1. Extreme care should be exercised when mixing to assure air free specimens. Immediately following the cure period, the specimen shall be placed in an air circulating oven for 48 hours at $185^{\circ} \pm 2^{\circ}\text{F}$ ($85^{\circ} \pm 1^{\circ}\text{C}$). The specimen shall then be removed from the oven, cooled, examined and its volume determined by water displacement, using an analytical balance or a jolly balance. The percent shrinkage shall be calculated as follows:

$$\text{Percent Shrinkage} = \frac{V_1 - V_2}{V_1} \times 100$$

Where: V_1 = volume of mold
 V_2 - final volume of cured specimen

4.9.2.5 Hardness. Two disc specimens, 3 inch diameter face dimension and 0.25 inch (75 by 6 mm) approximate thickness, shall be prepared in accordance with 4.6.2. One specimen shall be subjected to Cure A, the other to Cure B of 4.7. The specimens, after cure, shall be tested for 3-second hardness in accordance with ASTM D2240 except that a Shore A-2 durometer shall be used.

4.9.2.6 Adhesion.

4.9.2.6.1 Preparation of test panels. The number and composition of panels to be coated shall be as specified in Table VI. One (1) by six (6) inch sections of two strips of one (1) by twelve (12) inch cotton cloth conforming to Type III of CCC-C-419 shall be coated with the mixed compound and placed coated side down on the freshly prepared panel. The strips shall be placed so they are 0.25 inch from each lengthwise edge of the panel while allowing a 6-inch uncoated cloth tail. When testing PTFE (Table VI), the cotton cloth shall be replaced by the PTFE. An aluminum panel conforming to QQ-A-250/13 shall be used as the backing. The panels with the cloth or PTFE strips in place, shall then be subjected to the applicable cure in Table VI.

4.9.2.6.2 Test of panels. The panels shall be individually tested in an autographic testing machine whose capacity shall be such that the tension at failure is not more than 85 percent nor less than 15 percent of the full scale load. If the machine is of the pendulum type, the weight shall swing as a free pendulum without engagement of the pawls. The rate of separation of the jaws shall be 2 inches per minute. Specimens shall be mounted in the machine so that the loose end of the cotton cloth strip will be folded 180 degrees as it is pulled off the panel. Each strip shall be pulled as follows: A cut through the sealant to the panel at the junction of separation shall be made at an angle of 45 degrees in the direction of separation. If the sealant separates from the cotton cloth, similar 45-degree cuts shall be made to promote separation of the sealant from the panel. A minimum of 5 cuts shall be made. The adhesion in pounds shall be automatically recorded on a chart as a continuous curve. The adhesion value shall be calculated by averaging maximum forces required to separate the sealant from the panel. If cohesive failure occurs, the adhesion value shall be reported as greater than the observed value.

4.9.2.7 Fluid resistance. Eight panels prepared and cured as specified in Table VI and 4.9.2.6.1 shall be immersed, one in each of the fluids listed below. The duration of immersion in the fluids shall be 48 ± 1 hours. The test temperature for fluid No. 8 shall be standard conditions (see 4.5.1). All other fluids shall be maintained at $140^\circ \pm 2^\circ\text{F}$ ($60^\circ \pm 1^\circ\text{C}$). Upon expiration of the test period each fluid shall be cooled to standard conditions (4.5.1). Each panel shall be tested for hardness (4.9.2.5) and adhesion (4.9.2.6.2) shall be determined on each panel within 10 minutes after removal from the fluid.

<u>Fluid No.</u>	<u>Immersion fluids</u>
1	Hydrocarbon test fluid, TT-S-735, Type III
2	Hydraulic fluid, MIL-H-5606
3	Lubricating oil, MIL-L-7808
4	Lubricating oil, MIL-L-23699
5	3 percent aqueous sodium chloride, O-S-1926
6	Distilled water
7	Isopropyl alcohol, TT-I-735
8	JP-4 fuel, MIL-T-5624

4.9.2.8 Low temperature flexibility. Three test panels shall be prepared in accordance with the applicable section of Table VI and footnote 2/ to that table. The panels shall be inserted into a flexibility fixture (Figures 2 and 3), so that the uncoated side of the panel will contact the contour block and the weight will contact only the uncoated end of the panel. The entire assembly shall be conditioned at $-60^\circ \pm 2^\circ\text{F}$ ($-51^\circ \pm 1^\circ\text{C}$) for 4 hours. After this period, and while still at the low temperature, the fastening hook on the fixture shall be released, permitting the weighted portion to fall on the panels causing them to bend around the curved portion of the assembly. The panels shall immediately be removed from the assembly and examined for conformance to the requirements in Table I.

4.9.2.9 Corrosion. Prepare three 1.5 inch lengths of copper wire AWG Size 10 conforming to J-C-30, by removing all insulation and cleaning with a degreasing agent. Encapsulate two wire specimens centrally into a suitable mold 1 by 2 by 0.5 inch thick. A previously cured section of the same polysulfide compound undergoing test shall be placed in the mold as a support for the wires (see Figure 4). The mixed compound, prepared in accordance with 4.5.2 shall be subjected to Cure A (4.7.1). The third wire (control) shall also be subjected to the Cure A condition. The test specimens shall be placed on end, in a humidity chamber, so that the encapsulated wires are in a vertical position. The control wire also shall be held in a vertical position by inserting one end into a pre-drilled polytetrafluoroethylene or polyethylene slab. The wires shall then be subjected to a 95 to 98 percent relative humidity at $120^\circ \pm 2^\circ\text{F}$ ($49^\circ \pm 1^\circ\text{C}$) for 28 days. At the end of this period the mold shall be slit open and the encapsulated wire compared with the control for compliance with the requirements in Table I.

4.9.2.10 Hydrolytic stability, physical

4.9.2.10.1 Specimen preparation. Sufficient base compound and curing agent shall be mixed (4.5.2) to prepare 3 test specimens, 2.5 inch (63 mm) in diameter by 0.5 inch thick. Each specimen shall be subjected to Cure B of 4.7.2. Hardness shall be determined using a Type A Shore durometer in accordance with ASTM D 2240 after 3-second application time. Hardness shall be determined at the same locations, before and after exposure.

4.9.2.10.2 Procedure. After determining hardness before exposure, the specimens shall be placed vertically on a tray in a suitable glass desiccator. The desiccator shall contain a glycerine (2 percent by weight) in water solution, in the bottom, which shall produce a relative humidity (RH) of 95 percent at the test temperature. The desiccator, containing the specimens, shall then be closed and inserted into an air circulating oven maintained at $160^{\circ} \pm 2^{\circ}\text{F}$ ($71^{\circ} \pm 1^{\circ}\text{C}$) for a period of 120 days \pm 4 hours. At the end of the exposure period, the desiccator shall be removed from the oven and cooled to standard conditions (4.5.1) for 16 to 24 hours. Hardness shall be determined as specified in 4.9.2.10.1 and the obtained values for each specimen shall be in accordance with the requirement in Table I.

4.9.2.11 Accelerated storage. A 1-quart sample of the base compound and an appropriate amount of curing agent, packaged in accordance with Section 5 of this specification, shall be conditioned 14 days at $120^{\circ} \pm 2^{\circ}\text{F}$ ($49^{\circ} \pm 1^{\circ}\text{C}$). The components shall conform to 3.3.1.5.

4.9.2.12 Long term storage. Category A sealing compound and curing agent containers specified in section 5, shall be stored for a period of nine (9) months \pm 1 day at standard conditions (4.5.1). Upon completion of this period, the base compound and curing agent shall be mixed together and tested to the application life and Cure A and Cure B hardness requirements in 3.3.1.6.

4.9.3 Electrical tests.

4.9.3.1 Arc resistance. Arc resistance shall be determined in accordance with ASTM D 495. Test specimens shall be prepared as specified in Table VII and 4.6.2. The specimens shall be smooth and free from dust.

4.9.3.2 Dielectric strength. Test specimens shall be prepared as specified in Table VII and 4.6.2. Dielectric strength determinations shall be made in accordance with ASTM D 149. Electrodes 0.25 inch in diameter shall be used and the tests shall be made under oil at a frequency not exceeding 100 Hz per second. The voltage shall be increased uniformly at a rate of 500 volts per second.

4.9.3.3 Dielectric constant and dissipation factor. Test specimens shall be prepared and cured as specified in Table VII and 4.6.2. Tests shall be conducted in accordance with ASTM D 150. Lead or tin foil electrodes shall be used and applied to the specimen with a thin film of silicone conforming to MIL-S-8660 or equivalent. The electrodes shall consist of two lead or tin foil discs, one of the same diameter as the specimen and the other 2 inches in diameter, centrally located on the opposite face of the specimen. The test current shall be introduced to the foil through two brass discs. The upper disc shall be 2 inches in diameter. Cure A specimens shall be tested at frequencies of 1 Kiloherzt and 1 Megahertz at a temperature of $77^{\circ} \pm 2^{\circ}\text{F}$ ($25^{\circ} \pm 1^{\circ}\text{C}$). Cure B specimens shall be tested at frequencies of 1 Kiloherzt and 1 Megahertz at temperatures of $77^{\circ} \pm 2^{\circ}\text{F}$ ($25^{\circ} \pm 1^{\circ}\text{C}$) and $185^{\circ} \pm 2^{\circ}\text{F}$ ($85^{\circ} \pm 1^{\circ}\text{C}$). Calculation shall include corrections for edge and ground capacitance.

4.9.3.4 Volume and surface resistivity. Disc specimens shall be prepared as specified in Table VII and 4.6.2. Resistivity tests shall be conducted in accordance with ASTM D 257, using a General Radio Type 544B bridge or equivalent instrument with a test voltage of 500 volts. Readings shall be made 1 minute after application of current. The lead or tin foil electrode shall be a disc, 2 inches in diameter, centrally located on one face of the specimen. The guard electrode shall be a concentric ring of 2.281 inches inside diameter, and an outside diameter

equal to that of the specimen. The unguarded electrode shall be a foil disc 4 inches in diameter applied to the opposite side of the specimen. The test current shall be introduced to the guarded electrode, the guard electrode, and the unguarded electrode by means of a brass disc 2 inches in diameter by 1 inch in thickness, a brass ring 2.313 inches inside diameter by 4 inches outside diameter by 0.125 inch thick, and a brass disc 4 inches in diameter, respectively. Calculations necessary for volume and surface resistivity shall be made using ASTM D 257. Each specimen shall meet the minimum requirement of Table II.

TABLE VII. Disc specimens.

Property	Test Para. No.	Disc Size (inch)		Number of Disc	Cure Procedure (4.7)
		Diameter	Thickness		
Arc Resistance	4.9.3.1	4	0.125	1	Cure A
		4	0.125	1	Cure B
Dielectric Strength	4.9.3.2	4	0.125	1	Cure A
		4	0.125	1	Cure B
Dielectric Constant & Dissipation Factor	4.9.3.3	4	0.125	3	Cure A
		4	0.125	3	Cure B
Volume & Surface resistivity	4.9.3.4	4	0.125	3	Cure A
		4	0.125	3	Cure B

4.9.3.5 Insulation resistance. Insulation resistance shall be determined on the wired, unpotted assemblies. Unpotted assemblies which exhibit less than 10,000 megohm resistance shall be discarded. If this is not practicable, footnote 2/ to Table II shall apply. All connector assemblies potted as specified in 4.6.4 regardless of cure procedure, shall undergo insulation resistance testing, "as received", after thermal shock (4.9.3.6) and after hydrolytic stability (4.9.3.7).

4.9.3.5.1 Procedure. Insulation resistance of each assembly shall be determined by a megohm bridge using a potential of approximately 500 volts. Electrification time shall not exceed 1 minute. Tests shall be conducted at $77^{\circ} \pm 2^{\circ}\text{F}$ ($25^{\circ} \pm 1^{\circ}\text{C}$). Two sets of readings shall be taken. The first set shall be between the shell and contacts A, E, and G; the second set shall be made between contacts L to P and M to N. The average value of each set of readings shall be reported independently. No single value within each set shall be less than the minimum specified value of Table II. When a single value deviates from the average values by more than 20 percent, additional determinations shall be made for each set as follows:

First set readings between the shell and contacts B, C, D, H, J and K
Second set readings between contacts B to C, D to E, G to H, and J to K

The average of all values within each set shall then be reported.

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4.9.3.6 Thermal shock. Connector assemblies used for insulation resistance with an "O" ring seal conforming to MIL-P-5315, or equivalent, placed over the barrel of the plug to seal the void between insert surfaces, shall be thermally cycled as follows:

start 45 minutes in chamber at $185^{\circ} \pm 2^{\circ}\text{F}$ ($85^{\circ} \pm 1^{\circ}\text{C}$)
 45 minutes in chamber at $-67^{\circ} \pm 2^{\circ}\text{F}$ ($-55^{\circ} \pm 1^{\circ}\text{C}$)

One chamber for each temperature shall be used. The time required to effect transfer of the assemblies shall be no more than 2 minutes. This procedure shall be repeated a total of 5 cycles at each temperature. After the last cycle, insulation resistance shall be determined as specified in 4.9.3.5.1.

4.9.3.7 Hydrolytic stability, electrical. The mated connector assemblies tested as specified in 4.9.3.6 shall be tested for hydrolytic stability. The assemblies shall be placed in a humidity test chamber of the type described in 4.9.2.11.2. The ends of the wire leads shall be sealed by wrapping with a glass filament-polyester insulation tape, or equivalent. The assemblies shall be exposed to a relative humidity (RH) of 95 percent at $160 \pm 2^{\circ}\text{F}$ ($71 \pm 1^{\circ}\text{C}$) for 120 days \pm 4 hours. After exposure, the entire test chamber shall be removed from the heat source and cooled to room temperature for 16 to 24 hours before testing for insulation resistance as specified in 4.9.3.5.1.

4.9.3.8 High potential resistance. Connector assemblies tested in 4.9.3.7 shall be tested for high potential resistance. A potential of 1500 volts root mean square (RMS), 60 hertz, shall be applied between all contacts and the shell for a period of one minute. The test voltage shall be applied at the rate of approximately 500 volts per second until the specified voltage is reached.

4.9.3.9 Air leakage. Diallyl phthalate insert potted plugs tested in 4.9.3.8 shall be subjected to a pressure differential of 30 pounds per square inch (psi) while totally submerged in water for the time and temperature specified below:

<u>Temperature</u>	<u>Time</u>
Room Temperature	1 hour
$185^{\circ} \pm 2^{\circ}\text{F}$ ($85^{\circ} \pm 1^{\circ}\text{C}$)	1 hour

Air leakage shall be measured after one hour by fluid displacement method.

4.9.3.10 Overload of wire. A cylindrical test specimen 1.5 inches long by 0.5 inch diameter shall be prepared. Centered within and along the lengthwise axis of the specimen shall be a 12 inch length of insulated wire (size 16) conforming to MIL-W-22759/9. The lengthwise axis of the specimen shall be centered on the wire. The test specimen shall then be held taut in a horizontal position and 55 amperes of direct current applied for a period of 2.5 minutes. The specimen shall meet the requirement of Table II.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or C as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Kits. The sealing compound and curing agent shall be supplied in kit form as follows:

<u>Kit No.</u>	<u>Size of Container</u>	<u>Category</u>	<u>Paragraph</u>
1	1 gallon	A	5.1.1.2.1
2	1/2 gallon	A	5.1.1.2.1
3	1 quart	A	5.1.1.2.1
4	1/2 pint	A	5.1.1.2.2
5	6 fluid ounce	A	5.1.1.2.3
6	2 1/2 fluid ounce	A	5.1.1.2.3
7	12 fluid ounce frozen cartridge	B	5.1.1.2.4
8	6 fluid ounce frozen cartridge	B	5.1.1.2.4
9	2 1/2 fluid ounce frozen cartridge	B	5.1.1.2.4

Unless otherwise specified, the base compound and the curing agent shall be packaged in individual containers. Each curing agent container shall be packaged with one base compound container with a suitable separator between the two containers, in a manner which will prevent accidental separation but which will permit easy separation for mixing purposes. The ratio of the quantity contained in the base compound container to the quantity contained in the attached curing agent container shall be the same as the manufacturer's recommended mixing ratio of the base compound and curing agent. Category B cartridge is a premixed frozen compound.

5.1.1.2 Kit description.

5.1.1.2.1 Kit Nos. 1, 2 and 3. The base compound shall be furnished in 1 quart, 1/2 or 1-gallon cans conforming to Type V, class 2 of PPP-C-96. Terneplate cans shall not be used. The amount of base compound contained in each can shall fill the container to three-fourths of its capacity. The appropriate amount of curing agent shall be furnished in light resistant glass or plastic jars having vertical smooth inside walls, with projection or lips not exceeding 1/16 inch. The inside bottom shall be approximately horizontal. The glass jars shall have one rolled thread such that the cap will turn a minimum of 1/4 revolution to fully secure. The jars shall be provided with enameled metal or plastic screw type caps which will not adversely affect the curing agent. Jars shall be cushioned as necessary to protect against breakage.

5.1.1.2.2 Kit No. 4. The base compound shall be furnished in 1/2-pint cans containing 6 ± 0.5 fluid ounces. The curing agent shall be furnished in 1 ounce light resistant glass jars or plastic containers with inside bottom concave and without corners. The caps of the glass jars shall be externally sealed at the lip with a cellulosic type band or cellulose acetate pressure sensitive adhesive tape with the tape overlapping 1/2 inch (see 6.2). Each kit shall contain one Group B, class 1, aluminum applicator tube conforming to PPP-C-186, opened at one end and having a nozzle at the other end, and closed with a screw-type cap. The nozzle shall be 31/32 to 1-1/32 inches in length and shall have an orifice with a diameter of 0.300 to 0.325 inch. The overall length, including cap, shall be not less than 6-7/8 inches. The tube diameter shall be 2 inches. Each tube shall be supplied with one winding key for use in extruding the mixed compound from the tube. In each kit shall be included one wooden mixing spatula, having one corner rounded to a curvature equal to or slightly greater than that of the bottom of the curing agent container. Contents shall be placed in a folding carton conforming to PPP-B-566, a set up box conforming to PPP-B-676, or a mailing tube conforming to PPP-T-495.

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5.1.1.2.3 Kits No. 5 and 6 - sectional type cartridge. The base compound and curing agent shall be furnished in high density polyethylene sectional-type cartridges, Type I or II, Size A or B of MIL-P-38714 as specified by the acquiring activity. The total volume content of base compound and curing agent in each sectional-type container shall be as follows:

<u>Container Size</u>	<u>Base & Curing Agent</u>	<u>Volume Tolerance</u>
A	3-1/2 fluid ounces	±1/8 fluid ounce
B	2-fluid ounces	±1/8 fluid ounce

5.1.1.2.4 Kits No. 7, 8, and 9 Category B Frozen Cartridge. The premixed, degassed quick frozen sealing compound and curing agent shall be supplied in 2-1/2, 6 or 12 ounce plastic cartridge as specified in MIL-P-38714.

5.1.2 Level C. The base compound and curing agent shall be packaged in accordance with the manufacture's commercial practice.

5.2 Packing. Packing shall be Level A, B, or C as specified (see 6.2).

5.2.1 Level A. Base compound and curing agent packaged in accordance with 5.1.1 shall be packed in overseas exterior type containers conforming to PPP-B-585, PPP-B-601, PPP-B-621, or PPP-B-636, as specified (see 6.2). Weight of contents shall conform to the weight limitations of the applicable box specification and shall not exceed 200 pounds. Plywood shall conform to Type A of A-A-55057, and surface treated in accordance with TT-W-572. Containers shall be of uniform size and designed in such a manner to enclose the contents in a tight fitting manner. Each shipping container shall be closed and sealed in accordance with the appendix of the applicable specification.

5.2.2 Level B. The base compound and curing agent packaged as specified in 5.1.1 shall be packed as specified in 5.2.1, except that shipping containers shall be domestic type or class, as applicable.

5.2.3 Level C. Base compound and curing agent packaged as specified in 5.1 shall be packed to afford protection against damage during direct shipments from source of supply to the first receiving activity for immediate use. Containers shall comply with the carrier rules and regulations applicable to the mode of transportation.

5.3 Marking.

5.3.1 Packaging.

5.3.1.1 Component packages. All component packages shall be marked as required in the Code of Federal Regulations, 49 CFR 171-178.

5.3.1.2 Base compound container. Each base compound container shall be durably and legibly marked in accordance with MIL-STD-129 and include the following information:

SEALING COMPOUND, POLYLSULFIDE RUBBER, ELECTRIC CONNECTORS
AND ELECTRIC SYSTEMS, CHEMICALLY CURED

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Type

Class

Category

Date of Manufacture

Date of Packaging

Manufacturer's name, address, and product designation

Batch Number

Contract No.

Federal Stock number

5.3.1.3 Curing agent container. Each curing agent container marking shall include the following:

Curing Agent for (insert product designation
and batch

Date of manufacture

Date of packaging

5.3.1.4 Sectional cartridge kit. The marking of Kit No.'s 5, 6, 7, 8 and 9 include the information required in 5.3.1.

5.3.2 Exterior markings. Each exterior shipping container shall be marked as required in 5.3.1.1, 5.3.1.2 and in accordance with MIL-STD-129.

5.3.3 Mixing instructions. The manufacturer shall include in each unit package complete mixing instructions for the sealing compound and curing agent.

6. NOTES

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

6.1 Intended use. The cured polysulfide sealing compound is intended for use as a reinforcing and protecting medium for electric connectors and other related applications within the electric systems. Used within its operating temperature range (-60 to +200°F), the cured compound acts as a deterrent to fatigue, corrosion, contamination, and aids in reducing arc-over between pins of an electric connector.

6.1.1 Type I. Type I material is intended for use with electrical connectors, relays and switches. Type I material should not be used in coaxial cable potting operations.

6.2 Acquisition requirements. Acquisition documents should specify the following:

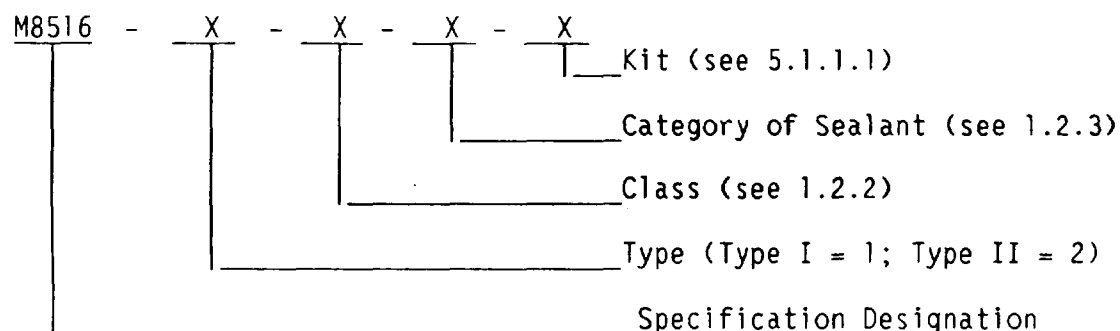
- a. Title, number and date of this specification
- b. Type, class and category required
- c. Kit size (see 5.1.1.1)

- d. Quantity required
- e. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referred (see 2.1.1 and 2.2)
- f. Levels of preservation and packaging required (see Section 5)
- g. Special markings required
- h. Color, other than as manufactured.

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-8516) 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 products covered by this specification. The activity responsible for the Qualified Products List is the Naval Air Systems Command, Code NAVAIR-5304C, Washington, DC 20361-5110; however, information pertaining to qualification of products and letter of authorization for submittal of sample may be obtained from the Commanding Officer, Naval Air Warfare Center Aircraft Division Warminster, ACSTD (Code 6064), Warminster, PA 18974-5000.

6.4 Curing time. The time and temperature specified as the cure time in 1.2.2 and 4.7 are for laboratory preparations. These conditions may be considered as the optimum for curing each class of compound. In actual field use, the curing cycle will be affected by changes in temperature and/or humidity.

6.5 Part number. A specification part number for Cataloging purposes shall be derived as follows:



Example: Type I, Class 2, Two-component system supplied in 1-gallon kit shall be described: M8516-1-2-A-1.

6.6 Metric conversion. Dimensional metric conversion can be accomplished by multiplying the given inch dimension by 25.4 to obtain millimeters.

6.7 Cross reference. Category B is new to this revision. All Category A sealants supplied to this revision are the same as those supplied to MIL-S-8516E.

6.8 Subject term (key word) listing.

Base Compound
Curing Agent
Organic rubber
Primer
Viscosity

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

Custodians:

Army - MR
Navy - AS
Air Force - 99

Preparing activity:

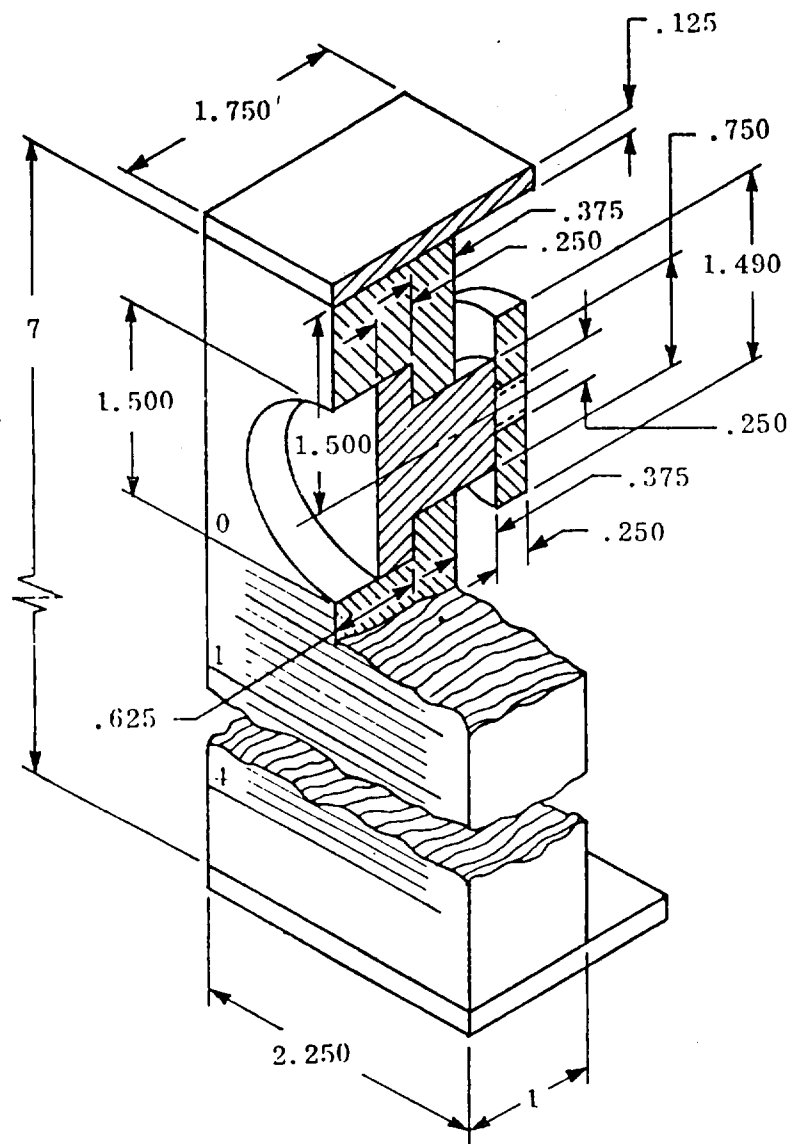
Navy - AS
(Project No. 8030-0642)

Review activities:

Army - MI, AV
Navy - OS
Air Force - 11

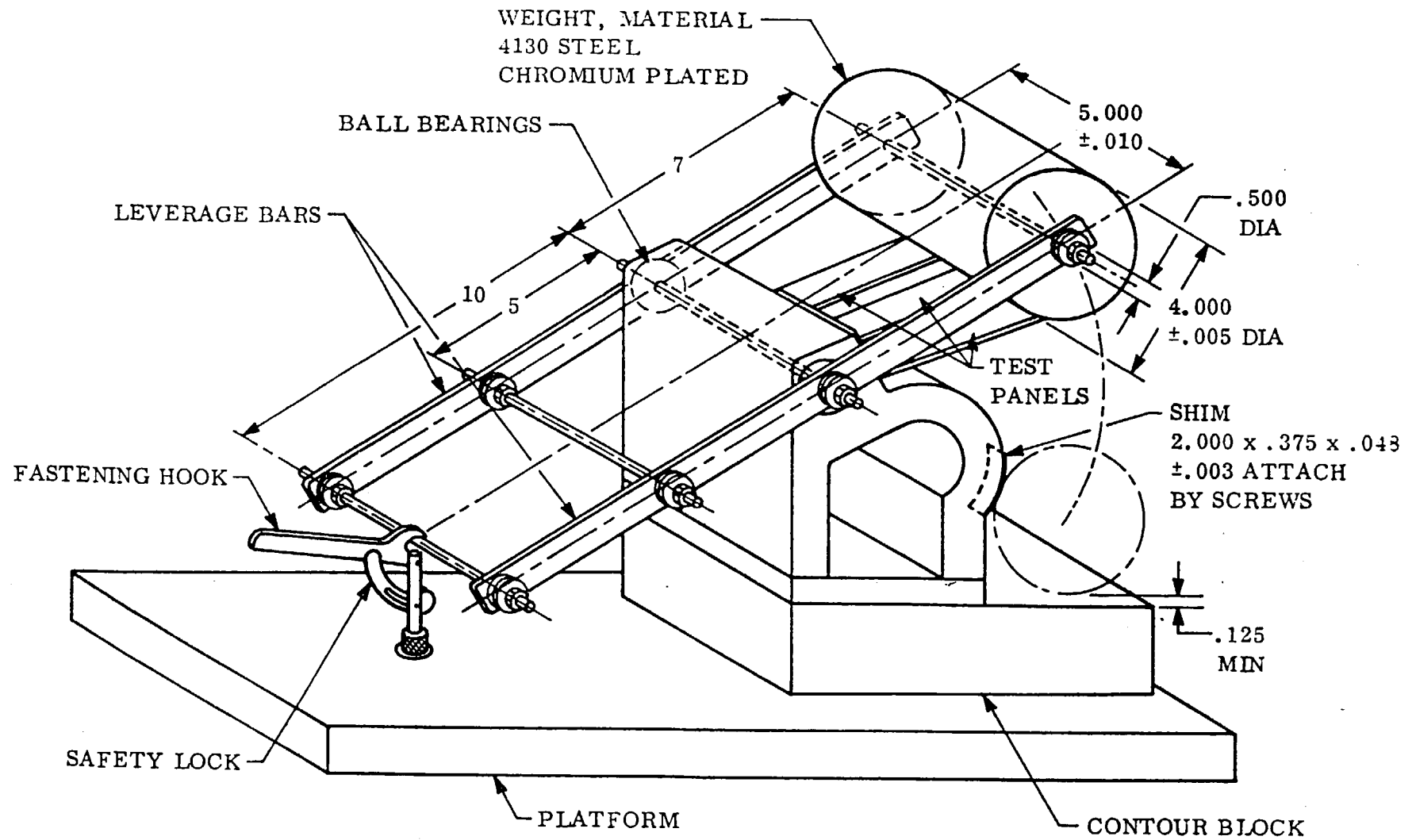
User activities:

Army - AR
Navy - MC



MATERIAL: 4130 STEEL, CHROMIUM PLATED
DIMENSIONS IN INCHES.
TOLERANCES: DECIMALS $\pm .016$

FIGURE 1. FLOW-TEST JIG



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FIGURE 2. LOW TEMPERATURE FLEXIBILITY APPARATUS

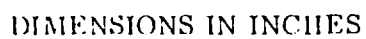
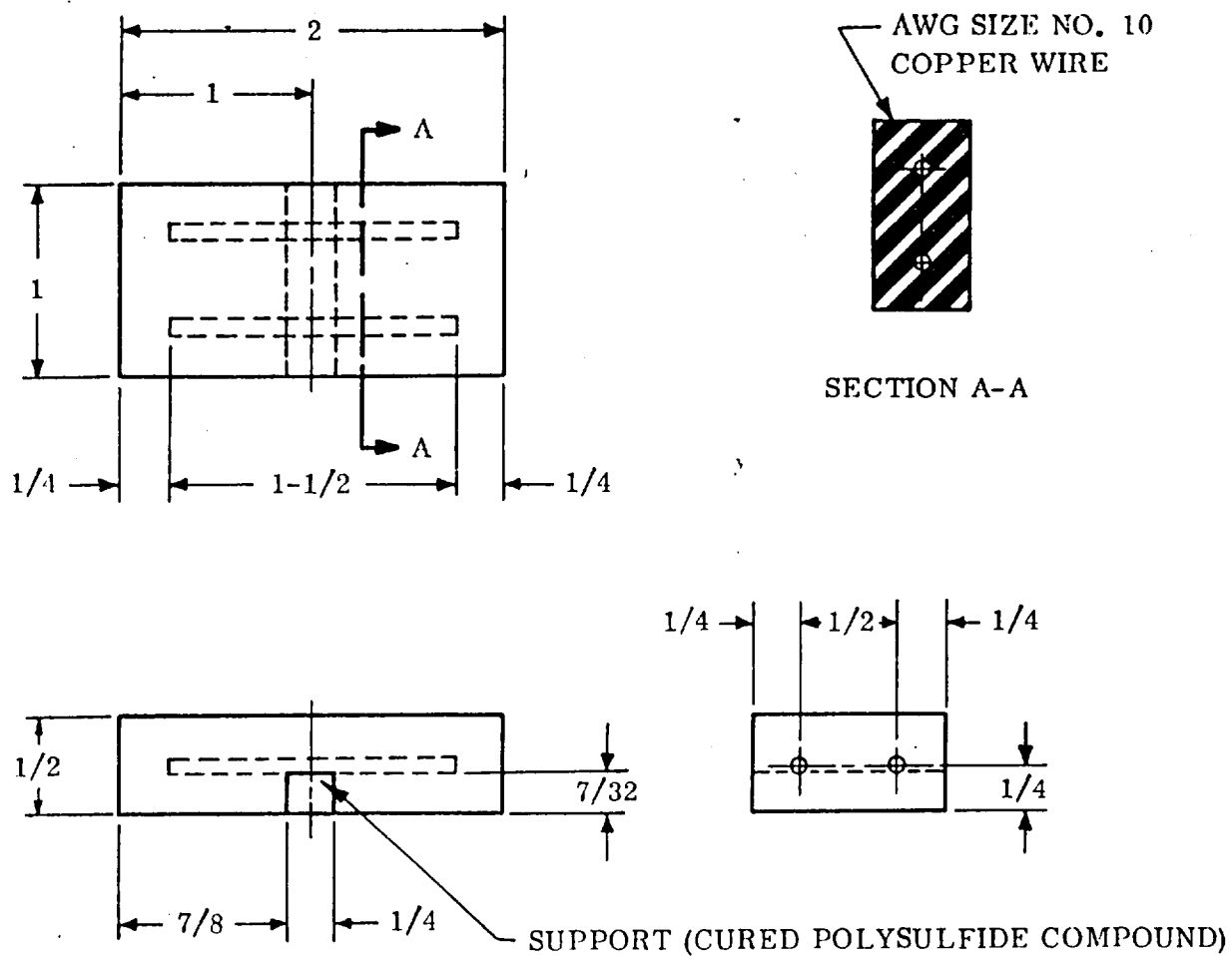


FIGURE 3. CONTOUR BLOCK



UNLESS OTHERWISE SPECIFIED, DIMENSIONS IN INCHES.

FIGURE 4. LOCATION OF THE WIRE SPECIMENS IN THE POLYSULFIDE CASTING

Commanding Officer
Naval Air Warfare Center Aircraft Division Lakehurst
Systems Requirements Department (Code SR3)
Lakehurst, NJ 08733-5100

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SEALING COMPOUND, POLYSULFIDE RUBBER, ELECTRIC CONNECTORS & ELECTRIC SYSTEMS, CHEMICALLY CURED

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

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