

NOT MEASUREMENT SENSITIVE

MIL-PRF-81733D

15 May 1998

SUPERSEDING

MIL-S-81733C

13 March 1980

PERFORMANCE SPECIFICATION

SEALING AND COATING COMPOUND, CORROSION INHIBITIVE

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

1. SCOPE

1.1 Scope. This specification covers accelerated, room temperature curing synthetic rubber compounds used in the sealing and coating of metal components on weapons and aircraft systems for protection against corrosion. The Class 1 sealing compound is effective over a continuous operating temperature range of -65° to $+250^{\circ}$ F (-54° to $+121^{\circ}$ C). The Class 2 sealing compound is effective over a continuous operating temperature range of -80° to $+320^{\circ}$ F (-62° to $+160^{\circ}$ C).

1.2 Classification. The sealing compound is furnished in the following types, classes, grades, and application times (see 6.2).

1.2.1 Types. The types of sealing compound are as follows:

Type I - For brush or dip application

Type II - For extrusion application, gun or spatula

Type III - For spray gun application

Type IV - For faying surface application, gun or spatula

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Air Warfare Center Aircraft Division, Code 414100B120-3, Highway 547, Lakehurst, NJ 08733-5100, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.
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AMSC N/A

FSC 8030

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1.2.2 Classes. The classes of sealing compound are as follows:

Class 1 - Polysulfide rubber base material

Class 2 - Polythioether rubber base material

1.2.3 Grades. The grades of sealing compound are as follows:

Grade A - Contains chromate corrosion inhibitors

Grade B - Contains nonchromate corrosion inhibitors

1.2.4 Application time. The minimum application time, in hours, for each type and class is indicated by a dash number as follows:

Type I, Class 1 - Dash numbers are -1/2 and -2

Type I, Class 2 - Dash numbers are -1/4, -1/2, and -2

Type II, Class 1 - Dash numbers are -1/6, -1/4, -1/2, -2, and -4

Type II, Class 2 - Dash numbers are -1/4, -1/2, -2, and -4

Type III, Class 1 - Dash number is -1

Type III, Class 2 - Dash number is -1

Type IV, Class 1 - Dash numbers are -12, -24, -40, and -48

Type IV, Class 2 - Dash numbers are -4, -12, -24, -40, and -48

Example: Type I-1/2 designates a brushable material having an application time of 1/2 hour; Type I-2 designates an application time of 2 hours. All other types and dash numbers are identified in a similar manner.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

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2.2 Government documents.

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

SPECIFICATIONS

FEDERAL

A-A-58054	-	Abrasive Mats, Non-Woven, Non-Metallic
L-P-378	-	Plastic Sheet and Strip, Thin Gauge, Polyolefin
QQ-A-250/12	-	Aluminum Alloy 7075, Plate and Sheet
QQ-A-250/13	-	Aluminum Alloy Alclad 7075, Plate and Sheet
QQ-P-416	-	Plating, Cadmium (Electrodeposited)
CCC-C-419	-	Cloth, Duck, Unbleached, Plied-Yarns, Army and Numbered

DEPARTMENT OF DEFENSE

MIL-S-5002	-	Surface Treatments and Inorganic Coatings for Metal Surfaces of Weapons Systems
MIL-C-5541	-	Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-PRF-5624	-	Turbine Fuel, Aviation, Grades JP-4, JP-5, and JP-5/JP-8 ST
MIL-PRF-7808	-	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-S-7839	-	Screw, Structural, Aircraft
MIL-A-8625	-	Anodic Coatings for Aluminum and Aluminum Alloys
MIL-T-9046	-	Titanium and Titanium Alloy, Sheet, Strip and Plate
MIL-F-18264	-	Finishes: Organic, Weapons System, Application and Control of
MIL-PRF-23377	-	Primer Coatings: Epoxy, High-Solids
MIL-PRF-23699	-	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-S-38714	-	Sealant Cartridge for Two-Component Materials
MIL-C-38736	-	Cleaning Compound, Solvent Mixtures
MIL-C-81706	-	Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys
MIL-PRF-83282	-	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft

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STANDARDS

DEPARTMENT OF DEFENSE

MS24694 - Screw, Machine, Flat Countersunk Head, 100 Deg.,
Structural, Cross Recessed, UNC- 3A and UNF-3A

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

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

AEROSPACE INDUSTRIES ASSOCIATION

NAS679 - Nut, Self-locking, Hexagon, Low Height

(Application for copies should be addressed to the Aerospace Industries Association, 1250 Eye Street, Washington, DC.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM- A108 - Standard Specification for Steel Bars, Carbon, Cold Finished,
Standard Quality. (DoD adopted)
ASTM-B117 - Standard Test Method of Salt Spray (Fog) Testing. (DoD
adopted)
ASTM-D412 - Standard Test Method for Rubber Properties in Tension.
(DoD adopted)
ASTM-D2240 - Standard Test Method for Rubber Property, Durometer
Hardness. (DoD adopted)
ASTM-D3182 - Standard Practice for Rubber Materials, Equipment, and
Procedures for Mixing Standard Compounds and Preparing
Standard Vulcanized Sheets. (DoD adopted)

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

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SOCIETY FOR AUTOMOTIVE ENGINEERS (SAE)

SAE-AMS2629	-	Fluid, Jet Reference (DoD adopted).
SAE-AMS3819	-	Cloths, Cleaning, For Aircraft Primary and Secondary Structural Surfaces (DoD adopted).
SAE-AMS4376	-	Plate, Magnesium Alloy 3.0Al-1.0Zn-0.20Mn (AZ31B-H26) Cold Rolled and Partially Annealed (DoD adopted).

(Application for copies should be addressed to the Customer Service Department, Publications Group, SAE, 400 Commonwealth Drive, Warrendale, PA 15096.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated 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 corrosion inhibitive sealing compounds furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.3 and 6.3).

3.2 Material. The basic ingredient used in the manufacture of the Class 1 sealing compound shall be a polysulfide synthetic rubber; the basic ingredient for the Class 2 sealing compound shall be a polythioether synthetic rubber. The sealing compound shall cure by the addition of a separate curing agent to the base compound. Grade B compounds shall contain no chromium or lead compounds.

3.2.1 Soluble chromate compound (Grade A only). Soluble chromate compounds shall be formulated as an integral part of the base compound, the curing system, or both. Any soluble chromate compound shall be permitted provided the base compound, curing agent, and cured compound meet all the requirements contained herein.

3.2.2 Unit of issue. In order to interface with existing equipment and meet the required storage characteristics, the unit of issue for the sealing compound shall be in kits as described below.

<u>Kit Size</u>	<u>Amount of Base Compound</u>	<u>Volume Tolerance</u>
1/2 pint	6 fluid ounces	± 1/8 fluid ounce
1 pint	12 fluid ounces	± 1/4 fluid ounce
1 quart	24 fluid ounces	± 1/2 fluid ounce
1 gallon	96 fluid ounces	± 2 fluid ounces

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3.2.2.1 Kits. The base compound and the curing agent shall be packaged in individual containers. The base compound shall be furnished in 1/2-pint, 1-pint, 1-quart, or 1-gallon multiple friction top metal containers as specified by the acquiring activity. The appropriate amount of curing agent shall be furnished in inert, nonmetallic jars having smooth, vertical inside walls with screw caps (to facilitate removal of the curing agent). The air in the unfilled space of the kit shall be replaced with an inert gas (nitrogen or carbon dioxide) immediately prior to closing the container. The ratio of the quantity contained in the base compound container to the quantity contained in the accompanying curing agent container shall be the same as the manufacturer's recommended mixing ratio of the base compound and curing agent. Each curing agent container shall be packaged with one base compound container with a separator between the two containers in a manner which will prevent accidental separation but permit easy separation for mixing purposes.

3.2.2.2 Sectional-type kits (Types I, II, and IV). The base compound and curing agent shall be furnished in sectional-type 2-1/2-ounce or 6-ounce nonmetal containers, conforming to MIL-S-38714, as specified by the acquiring activity. The total amount of base compound and curing agent in each sectional-type container shall be as described below.

<u>Kit Size</u>	<u>Base Compound and Curing Agent</u>	<u>Volume Tolerance</u>
2-1/2 ounces	2 fluid ounces	± 1/8 fluid ounce
6 ounces	3-1/2 fluid ounces	± 1/8 fluid ounce

3.2.3 Marking of component containers. All component containers shall be marked with the date of manufacture and the date of packaging.

3.2.4 Skin contact warning labels. Skin contact warning labels shall be added by the manufacturer.

3.3 Performance characteristics.

3.3.1 Properties before cure.

3.3.1.1 Appearance. The base compound and curing agent shall be of uniform blend and shall be free of skins, lumps, and jelled or coarse particles. There shall be no separation of ingredients which cannot be readily dispersed by mechanical agitation or mixing by hand.

3.3.1.2 Color. Unless otherwise specified in the contract or order, the color of the sealing compound shall be as furnished by the manufacturer (see 6.2). The curing agent, if furnished separately, shall be of contrasting color to facilitate mixing.

3.3.1.3 Nonvolatile content. When tested as specified in 4.8.2, the nonvolatile content of the freshly mixed compound shall be as specified in table I.

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TABLE I. Nonvolatile content.

Type	Nonvolatile Content, minimum percent by weight	
	Class 1	Class 2
I	84	84
II	92	92
III	65	65
IV	90	95

3.3.1.4 Flow (Type II only). When tested as specified in 4.8.3, the flow measurement of the sealing compound shall be not less than 0.10 inch and not greater than 0.75 inch.

3.3.1.5 Application life. Application life shall consist of the initial viscosity of the base compound and an application time measurement of the mixed compound (see 4.8.4).

3.3.1.5.1 Initial viscosity. When tested as specified in 4.8.4.1, the initial viscosity of the base compound shall be as specified in table II.

TABLE II. Initial viscosity.

Type	Application	Viscosity, poises
I	Brush or dip	100–500
II	Extrusion or injection, gun or spatula	6,000–16,000
III	Spray	50–150
IV	Faying surface injection, gun or spatula	1,000–4,000

3.3.1.5.2 Application time. When tested as specified in 4.8.4.2, the application time of the compound that is prepared according to the manufacturer's instructions shall be as specified in table III. The end of the application time shall be considered to be not greater than 2,500 poises for Type I, not less than 15 grams per minute for Type II, not greater than 300 poises for Type III, and not less than 30 grams per minute for Type IV, Class 1 or 50 grams per minute for Type IV Class 2.

3.3.1.6 Tack-free time. When tested as specified in 4.8.5, the sealing compound shall cure to a tack-free condition within the time specified in table IV.

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TABLE III. Application time.

Type I	Minimum Time, hours	Type II	Minimum Time, hours	Type III	Minimum Time, hours	Type IV	Minimum Time, hours
		-1/6 ¹	1/6			-4 ²	4
-1/4 ²	1/4	-1/4	1/4	-1	1	-12	12
-1/2	1/2	-1/2	1/2			-24	24
-2	2	-2	2			-40	40
		-4	4			-48	48

¹ Class 1 only.² Class 2 only.TABLE IV. Tack-free time.

Type I	Time, hours		Type II	Time, hours		Type III	Time, hours	
	Class 1	Class 2		Class 1	Class 2		Class 1	Class 2
			-1/6	4	—			
-1/4	-	4	-1/4	8	1	-1	8	8
-1/2	16	8	-1/2	16	2			
-2	24	16	-2	24	12			
			-4	—	24			

3.3.1.7 Assembly time (Type IV only). The sealant shall squeeze out to a thickness no greater than 0.005 inch at the bolts when tested as specified in 4.8.6.

3.3.2 Properties after cure. Unless otherwise specified, all test specimens shall be cured as specified in 4.7.

3.3.2.1 Hardness. When tested as specified in 4.8.7, the Shore A-2 hardness of the cured sealing compound shall be not less than 35 for Types I, II, and III or 30 for Type IV.

3.3.2.2 Specific gravity. When tested as specified in 4.8.8, the specific gravity of the cured sealing compound shall be not greater than 1.65 for Class 1 or 1.50 for Class 2.

3.3.2.3 Corrosion. When tested as specified in 4.8.9, the cured sealing compound shall not in itself induce corrosion and shall protect the substrate metal. There shall be no visible evidence of corrosion at the metal-sealant interface.

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3.3.2.4 Low-temperature flexibility. When tested at temperatures and in accordance with the method specified in 4.8.10, the cured sealing compound shall withstand the bend test without cracking, checking, or separating from the panel.

3.3.2.5 Thermal stability. When tested at temperatures and in accordance with the method specified in 4.8.11, the cured sealing compound shall not blister, crack, or show evidence of "blowing" at rest or when wrapped 180° on a mandrel. The hardness, after exposure, shall be within -5 to +15 points of the original "as cured" hardness.

3.3.2.6 Tensile strength (Type II only). The tensile strength of the cured sealing compound shall be not less than 200 pounds per square inch (psi) for Class 1 or 250 psi for Class 2 (see 4.8.12).

3.3.2.7 Elongation (Type II only). The elongation of the cured sealing compound shall be not less than 150 percent for Class 1 or 250 percent for Class 2 (see 4.8.12).

3.3.2.8 Peel strength (Types I, II, and IV). When tested as specified in 4.8.13, the peel strength of the cured sealing compound, as received and after immersion, shall be not less than 15 pounds per inch width (piw) for Class 1 or 20 piw for Class 2. All specimens shall exhibit 100 percent cohesive failure.

3.3.2.9 Anchorage (wet tape test, Type III only). When tested as specified in 4.8.14, the cured sealing compound shall show no more than a slight widening (1/8 inch) of the scratch.

3.3.2.10 Repairability. The cured sealing compound shall be able to be used for repairing minor breaks in itself and all other materials qualified to this specification (see 4.3). A second coat of the sealing compound, applied over a freshly cured coating of the materials specified in 4.8.15, shall show satisfactory bonding with no lifting, blistering, loss of adhesion, or other coating irregularities. When tested as specified in 4.8.15, the adhesion strength of the compound shall be not less than 10 piw for Types I, II, and IV; Type III repairability shall be as specified in 3.3.2.9.

3.3.2.11 Air content (Type II only). When tested as specified in 4.8.16, the air content of the cured sealing compound shall be not greater than 4 percent.

3.3.3 Long-term storage. When tested as specified in 4.8.17, the base compound and curing agent shall show no hardening, separating, or settling of material after being stored for 9 months. After the storage period, the mixed sealing compound shall meet the requirements for flow (3.3.1.4), application life (3.3.1.5), tack-free time (3.3.1.6), and hardness (3.3.2.1).

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4. VERIFICATION

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

- a. Qualification inspection (see 4.3).
- b. Conformance inspection (see 4.4).

4.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in the applicable test method or test paragraph in this specification.

4.3 Qualification inspection. Qualification inspection shall consist of all the tests specified in table V.

4.3.1 Samples. Qualification test samples shall consist of 5 quarts of Type I, 8 quarts of Type II, 8 pints of Type III, and 5 quarts of Type IV base compound, together with sufficient curing agent for each type, of the class for which qualification is desired. The samples shall be furnished in units of issue as specified in 3.2.2.

4.4 Conformance inspection. Materials acquired by the Government under this specification shall be source inspected in accordance with 4.4.2 to ensure the material meets the conformance inspection prior to shipment from the manufacturer's plant. Conformance test samples shall be packaged and mixed in, as near as practical, the units of issue as specified in 3.2.2.

4.4.1 Sampling. A 1-quart container or a sufficient number of containers to allow preparation of test specimens shall be randomly selected from each lot and tested as specified in 4.4.2.

4.4.2 Examination. The sample selected in 4.4.1 shall be tested to the requirements specified in table VI. Nonconformance with any specified requirement shall be cause for rejection of the lot represented by the sample.

TABLE V. Qualification tests.

Characteristic	Test Method	Requirement Paragraph	Test Paragraph
Appearance	—	3.3.1.1	4.8.1
Color	—	3.3.1.2	4.8.1
Nonvolatile content	—	3.3.1.3	4.8.2
Flow	—	3.3.1.4	4.8.3
Application life	—	3.3.1.5	4.8.4

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TABLE V. Qualification tests.- Cont'd

Characteristic	Test Method	Requirement Paragraph	Test Paragraph
Tack-free time	—	3.3.1.6	4.8.5
Assembly time	—	3.3.1.7	4.8.6
Hardness	ASTM-D2240	3.3.2.1	4.8.7
Specific gravity	—	3.3.2.2	4.8.8
Corrosion	—	3.3.2.3	4.8.9
Low-temperature flexibility	—	3.3.2.4	4.8.10
Thermal stability	—	3.3.2.5	4.8.11
Tensile strength	ASTM-D412	3.3.2.6	4.8.12
Elongation	ASTM-D412	3.3.2.7	4.8.12
Peel strength	—	3.3.2.8	4.8.13
Anchorage (wet tape)	—	3.3.2.9	4.8.14
Repairability	—	3.3.2.10	4.8.15
Air content	—	3.3.2.11	4.8.16
Long-term storage	—	3.3.3	4.8.17
Unit of issue	—	3.2.2	Visual
Warning label	—	3.2.4	Visual

4.5 Test conditions.

4.5.1 Temperature and humidity. Unless otherwise specified, all mixing, curing, conditioning, and testing shall be conducted at a temperature of $77^{\circ} \pm 5^{\circ}$ F ($25^{\circ} \pm 3^{\circ}$ C) and a relative humidity of 50 ± 5 percent. These conditions shall be considered standard conditions.

4.5.2 Mixing. The base compound and its curing agent, both in their original unopened containers, and all required mixing equipment shall be held at standard conditions for 24 ± 1 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. Immediately after mixing, Type II sealing compound shall be placed into cartridges for extrusion from the Semco No. 250 gun, or equivalent, having a Semco 440 nozzle with an orifice of 0.125 ± 0.005 inch.

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TABLE VI. Conformance tests.

Characteristic	Applicable Type	Test Paragraph
Nonvolatile content	I, II, III, IV	4.8.2
Flow	II	4.8.3
Application life	I, II, III, IV	4.8.4
Hardness	I, II, III, IV	4.8.7
Specific gravity	I, II, III, IV	4.8.8
Thermal stability	I, II, III, IV	4.8.11
Peel strength, initial (Adherend #1)	I, II, IV	4.8.13
Anchorage (wet tape)	III	4.8.14
Unit of issue	I, II, III, IV	Visual
Warning label	I, II, III, IV	Visual

4.6 Preparation of test specimens.4.6.1 Cleaning of test panels.

4.6.1.1 Aluminum alloys. Unless otherwise specified, aluminum alloy panels shall be cleaned with lint-free cheesecloth conforming to Grade A of SAE-AMS3819, using solvent conforming to MIL-C-38736 or equal, and immediately wiped dry with a clean, lint-free cloth.

4.6.1.2 Other panel materials. All other panels shall be wiped with solvent conforming to MIL-C-38736 or equal, scuffed with abrasive mats conforming to A-A-58054, and cleaned as specified in 4.6.1.1.

4.6.2 Application of sealing compound. Unless otherwise specified, sealing compound shall be applied to test panels to produce a coating thickness, when cured, of 0.125 ± 0.005 inch for Types I, II, and IV and 0.006 ± 0.001 inch for Type III.

4.7 Curing of test specimens. Unless otherwise specified, all test specimens shall be cured as specified in table VII. All molded specimens shall be removed from the mold after the first 24 hours of cure except for Type II-1/6. When specified by the manufacturer, Type IV sealing compound shall be completely covered with polyethylene film conforming to L-P-378 during the entire cure period (see 6.6).

4.8 Test methods.

4.8.1 Examination of product. The base compound and curing agent shall be visually examined for conformance to 3.3.1.1 and 3.3.1.2.

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TABLE VII. Standard cure cycle.

Type	Cure Conditions
Class 1, Types I and III	7 days at standard conditions or 24 hours at standard conditions plus 24 hours at 120° ± 2° F (49° ± 1° C)
Class 1, Type II	14 days at standard conditions or 48 hours at standard conditions plus 24 hours at 120° ± 2° F (49° ± 1° C)
Class 1, Type IV	
-12 hour application time	14 days at standard conditions or 24 hours at standard conditions plus 48 hours at 120° ± 2° F (49° ± 1° C)
-24 hour application time	21 days at standard conditions or 24 hours at standard conditions plus 96 hours at 120° ± 2° F (49° ± 1° C)
-40 hour application time	49 days at standard conditions or 24 hours at standard conditions plus 7 days at 120° ± 2° F (49° ± 1° C)
-48 hour application time	56 days at standard conditions or 24 hours at standard conditions plus 9 days at 120° ± 2° F (49° ± 1° C)
Class 2, All Types	14 days at standard conditions or 48 hours at standard conditions plus 24 ± 1 hours at 140° ± 2° F (60° ± 1° C)

4.8.2 Nonvolatile content. Five to 10 grams of the mixed sealing compound shall be transferred to a dish approximately 3.1 inches in diameter. The dish shall be tightly covered immediately and weighed to the nearest milligram. The cover shall then be removed and the sealing compound shall be heated for 72 ± 1 hours at 158° ± 2° F (70° ± 1° C). The compound shall be transferred to a desiccator and cooled to room temperature. The dish shall be covered again and weighed to the nearest milligram. The percent nonvolatile content shall be calculated as follows:

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

4.8.3 Flow (Type II only). A 250-gram lot of sealing compound shall be prepared for testing as specified in 4.5.2. The test shall be conducted by using a flow-test fixture as shown on figure 1. Depth of plunger tolerance is critical and shall be controlled as specified on figure 1.

4.8.3.1 Procedure. The flow-test fixture shall be placed on a horizontal surface with the front face upward and the plunger depressed to the limit of its travel. Within 5 minutes after the

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start of mixing for -1/6 material and within 15 minutes for all other dash numbers, the mixed compound shall be added to the recessed cavity of the fixture and leveled off evenly with the block. Within 10 seconds after leveling, the fixture shall be placed on its end and the plunger immediately advanced to the limit of its forward travel. The flow measurement shall be taken directly from the fixture exactly 30 minutes after the sealing compound has been applied to the cavity and shall meet the requirement of 3.3.1.4.

4.8.4 Application life.

4.8.4.1 Initial viscosity. A 1-quart container shall be filled with base compound to within 1/2 inch of the top, covered, and stored at standard conditions for not less than 8 hours. The base compound shall be thoroughly mixed by stirring for 3 minutes and allowed to stand, covered, for 1 hour. The Brookfield Model RVF viscometer, or equivalent, shall be used to determine the viscosity in poises. The spindle and speed required for the test shall be as listed below.

<u>Type</u>	<u>Spindle</u>	<u>Speed</u>
I	No. 6	10 rpm
II	No. 7	2 rpm
III	No. 5	10 rpm
IV	No. 6	2 rpm

4.8.4.2 Application time.

4.8.4.2.1 Types I and III. An amount of base compound and curing agent, sufficient to fill a standard 1/2-pint container (2-7/8 inches in diameter by 2-7/8 inches high) to within 1/2 inch of the top, shall be prepared for testing as specified in 4.5.2. The container shall be tightly covered except when testing the viscosity. At the end of the specified application time (see 3.3.1.5.2), measured from the beginning of the mixing period, the viscosity of the sealing compound shall be determined. The spindle and speed required for the test shall be as listed below.

<u>Type</u>	<u>Spindle</u>	<u>Speed</u>
I	No. 7	10 rpm
III	No. 5	10 rpm

4.8.4.2.2 Types II and IV. The Type II flow-test sample shall be used for Type II material; Type IV material shall be prepared for testing as specified in 4.5.2. From 2 to 3 inches of sealing compound shall be extruded initially to clear trapped air. At the end of the specified application time, measured from the beginning of the mixing period, the sealing compound shall be extruded through a Semco 440 nozzle, or equivalent, with an orifice of 0.125 ± 0.005 inch at 90 ± 5 psig air pressure onto a dish for 1 minute. The weight of the sealing compound shall be determined in grams.

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4.8.5 Tack-free time. A test panel, prepared from aluminum alloy 7075-T6 conforming to QQ-A-250/12 and measuring approximately 0.04 by 2.75 by 6 inches, shall be cleaned as specified in 4.6.1. Freshly mixed sealing compound shall be applied to the panel, to produce a coating thickness of 0.125 inch for Types I and II and from 0.005 to 0.007 inch for Type III, and cured as specified in 4.7. At the end of the specified tack-free time, two 1- by 6-inch pieces of clean polyethylene film conforming to L-P-378, 0.004 ± 0.002 inch thick, shall be applied to the sealing compound and held in place at a pressure of 0.5 ounce per square inch for 2 minutes. The film shall be slowly and evenly withdrawn at right angles to the sealing compound surface and shall come away clean and free of sealing compound.

4.8.6 Assembly time (Type IV only). Six test panels shall be prepared from aluminum alloy alclad 7075-T6 conforming to QQ-A-250/13 measuring approximately 0.4 by 1.5 by 4 inches. A number 11 drill shall be used to drill two holes in each panel 1.2 inches from one end with centers 0.75 inch apart and 0.375 inch from each side. The panels shall be deburred and cleaned as specified in 4.6.1 and the thickness of the panels around the holes shall be determined. Approximately 0.015 inch of freshly mixed sealing compound shall be applied to the drilled end of three panels and allowed to cure for 1/2 hour. Each of the three remaining clean panels shall be placed on a coated panel so that the holes line up to produce a 1-inch faying surface overlap area. Two steel bolts (10-32) that have been heat treated to 160,000 psi shall be inserted into the holes. The nuts (NAS 679-A3) shall be tightened only until the sealing compound starts to extrude. The thickness of the assembly shall be measured at this time. The thickness of the sandwiched sealing compound shall be from 0.010 to 0.015 inch. The specimens shall be exposed to standard conditions for the following times:

- Type IV-4 - 8 hours
- Type IV-12 - 24 hours
- Type IV-24 - 48 hours
- Type IV-40 - 120 hours
- Type IV-48 - 168 hours

The fasteners shall then be tightened to a torque value of 40 inch pounds. The thickness of the assembly shall be measured at the fasteners using a micrometer. The thickness of the sealing compound shall be determined by subtracting the panel thicknesses from the overall thickness of the assembly. Conformance to 3.3.1.7 shall be noted.

4.8.7 Hardness. Test specimens shall be prepared and cured as specified in 4.7. Instantaneous hardness (ASTM-D2240) shall be determined on an approximately 0.25-inch thick specimen using a Type A-2 Shore Durometer. Type III specimens shall be cut from a cured ASTM-D3182 standard sheet, or equivalent, and plied to the required thickness.

4.8.8 Specific gravity. Three specimens, measuring approximately 0.03 by 1 by 2 inches, shall be prepared and cured as specified in 4.7. The specimens shall be weighed in air and then in

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water by means of an analytical or Jolly balance. The specific gravity shall be computed as follows:

$$\begin{array}{l} \text{Specific gravity} \\ \text{(Analytical balance)} \end{array} = \frac{\text{Weight in air}}{\text{Weight in air} - \text{weight in water}}$$

$$\begin{array}{l} \text{Specific gravity} \\ \text{(Jolly balance)} \end{array} = \frac{\text{Weight in air}}{\text{Weight in water}}$$

4.8.9 Corrosion. Corrosion testing shall consist of stressed aluminum assemblies (see 4.8.9.1) and mixed metal assemblies (see 4.8.9.2) undergoing exposure to a corrosive environment.

4.8.9.1 Aluminum assembly preparation. A sufficient number of panels, prepared from aluminum alloy 7075-T6 conforming to QQ-A-250/12 and chemically treated with materials conforming to MIL-C-81706 Class 1A to produce coatings conforming to MIL-C-5541, shall be configured to produce test assemblies as shown on figure 2. All surface treatments shall conform to MIL-S-5002. Sealing compound shall be prepared for testing as specified in 4.5.2. Two assemblies shall be used for the corrosion test. Each corrosion test assembly shall be prepared using all four types of sealing compound as specified in table VIII and shall be tested as specified in 4.8.9.3.

4.8.9.2 Mixed metals. All four types of sealing compound shall be subjected to mixed metal corrosion testing. Two assemblies, as specified in table IX and configured as shown on figure 3, shall be used for each sealant.

4.8.9.2.1 Assembly preparation. From 0.005 to 0.007 inch of sealing compound shall be applied to one side of each metal (see figure 3). The coated portions shall be mated using inert nonmetal fasteners tightened to produce a total sealant thickness of approximately 0.007 inch. Excess sealant shall be carefully removed from the panel surface. Type IV sealing compound shall not be mated until 1 to 2 hours after panels are coated.

4.8.9.2.2 Exposure. Mixed metal assemblies shall be exposed as specified in 4.8.9.3.2 and evaluated as specified in 4.8.9.3.3.

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TABLE VIII. Aluminum assemblies.

Step	Procedure for Preparation of Aluminum Corrosion Test Assemblies
1	Approximately 0.005 inch of Type IV sealing compound shall be applied to one side of each panel by spatula. After 1 to 2 hours, the coated sides of the panels shall be mated.
2	Threaded fasteners conforming to MIL-S-7839 shall be dipped into Type I sealing compound, inserted into the freshly mated panels, and torqued to 40 inch pounds.
3	Type II sealing compound shall be applied by gun to the butt joint. The fastener head, backs (nuts), and all edges shall be completely covered with compound by using a spatula.
4	Type III sealing compound shall be sprayed over the entire assembly to a thickness of from 0.005 to 0.007 inch.
5	The assembly shall be cured as specified in 4.7 (use the longest cure time based on material used).
6	After curing, one half of the front side of each assembly shall be scribed as shown on figure 2. Assemblies are now ready to be tested.

TABLE IX. Mixed metal assemblies.

Assembly	Metal B (see figure 3)	Metal A (see figure 3)
1	Aluminum ¹	Titanium ²
2	Aluminum ¹	Magnesium ³

¹7075-T6 conforming to QQ-A-250/12 treated with materials conforming to MIL-C-81706 Class 1A.

²MIL-T-9046 Type III, Composition C (6 Al - 4V).

³SAE-AMS4376, treated with materials conforming to MIL-C-81706 Class 1A.

4.8.9.3 Stress cycling, exposure, and evaluation of assemblies.

4.8.9.3.1 Cyclic loading. Assemblies prepared as specified in 4.8.9.1 shall be installed vertically in the jaws of a machine capable of cycling between 0 and 5,000 pounds for 250 cycles with a loading rate of 10 inches per minute. For Class 1 materials, the assembly shall be subjected to 250 cycles at a temperature of $-65^{\circ} \pm 2^{\circ}$ F ($-54^{\circ} \pm 1^{\circ}$ C) after a 30-minute soak at

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the same temperature under no load. For Class 2 materials, the assembly shall be subjected to 250 cycles at a temperature of $-80^{\circ} \pm 4^{\circ}$ F ($-62^{\circ} \pm 2^{\circ}$ C) after a 30-minute soak at the same temperature under no load.

4.8.9.3.2 Exposure. The prestressed or mixed metal assemblies shall be exposed for a period of 4 weeks in a salt-SO₂ spray cabinet meeting the requirements of ASTM-B117 Appendix 1. The butt joints of Type III and Type IV assemblies shall be masked with wax prior to salt-SO₂ exposure. The test shall be conducted under the following conditions:

Salt solution: 5 percent by weight sodium chloride

Cabinet temperature: $95^{\circ} \pm 2^{\circ}$ F ($35^{\circ} \pm 1^{\circ}$ C)

Saturator tower temperature: $115^{\circ} \pm 2^{\circ}$ F ($46^{\circ} \pm 1^{\circ}$ C)

Cycle: continuous spray; sulfur dioxide injected for 1 hour in every 6 hours (four times daily) at a flow rate of 1cc/min/ft³ of box.

NOTE: The collected solution in the cabinet shall be tested weekly and shall conform to the following conditions:

1 to 2 ml/hour collection rate

pH of from 2.5 to 3.2

Specific gravity of from 1.02 to 1.04

4.8.9.3.3 Evaluation. The test assemblies shall be removed from the exposure cabinet and disassembled. After the sealant has been carefully stripped from all surfaces, the assembly shall be evaluated for corrosion with respect to sealant function (for example, Type I for fasteners). Countersinks, as well as adjacent areas, and faying surfaces shall be examined under a zoom microscope up to 30X magnification. All surfaces shall be examined for conformance to 3.3.2.3.

4.8.10 Low-temperature flexibility. Three test panels, prepared from aluminum alloy 7075-T6 conforming to QQ-A-250/12 and measuring 0.032 by 1 by 6 inches, shall be treated with MIL-A-8625 Type I. Sealing compound shall be applied to one side of each panel to produce a coating thickness of approximately 0.075 inch (from 0.005 to 0.007 inch for Type III) leaving 1 inch at the end of each panel uncoated. Upon completion of the curing time (see 4.7), panels shall be placed in an air-circulating oven and conditioned for 48 ± 1 hours at $250^{\circ} \pm 5^{\circ}$ F ($121^{\circ} \pm 2^{\circ}$ C) for Class 1 and at $320^{\circ} \pm 5^{\circ}$ F ($160^{\circ} \pm 2^{\circ}$ C) for Class 2. The panels shall then be placed in a flexibility fixture as shown on figures 4 and 5 so that the uncoated side touches the contour block and the weight touches only the uncoated end of the panel. The flexibility fixture and Class 1 or Class 2 panels shall be subjected to conditioning temperatures of $-65^{\circ} \pm 2^{\circ}$ F ($-54^{\circ} \pm 1^{\circ}$ C) or

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$-80^{\circ} \pm 2^{\circ}$ F ($-62^{\circ} \pm 1^{\circ}$ C), respectively, for 4 hours. After the specified conditioning, the specimens shall then be bent around the curved portions of the flexibility fixture by releasing the fastening hook. The panels shall be removed and examined for conformance to 3.3.2.4.

4.8.11 Thermal stability. Cured specimens measuring approximately 0.25 by 1 by 2 inches (for Type III, a 0.007-inch cured coating on a panel conforming to QQ-A-250/12 and measuring 0.02 by 1 by 6 inches shall be used) shall be conditioned in an air-circulating oven for 48 ± 1 hours at $250^{\circ} \pm 5^{\circ}$ F ($121^{\circ} \pm 2^{\circ}$ C) for Class 1 and $320^{\circ} \pm 5^{\circ}$ F ($160^{\circ} \pm 2^{\circ}$ C) for Class 2. Specimens shall be removed from the oven, returned to standard conditions, and tested for hardness as specified in 4.8.7. (Type III panels shall not undergo hardness testing.) The specimen (including the panel for Type III) shall then be bent through 180° on a 0.25-inch diameter mandrel (0.125 inch mandrel for Type III) and examined while on the mandrel for conformance to 3.3.2.5.

4.8.12 Tensile strength and elongation (Type II only). Molded sheets approximately 0.125 inch thick shall be cured as specified in 4.7. Tensile strength and elongation shall be determined as specified in ASTM-D412 using die C.

4.8.13 Peel strength (Types I, II, and IV).

4.8.13.1 Adherends, cleaning and surface treatment, and immersion media. Test specimens shall be prepared as specified in table X. Cleaning and surface treatment methods for panels shall conform to MIL-S-5002. Immersion media shall be as described below.

<u>Fluid Number</u>	<u>Immersion fluids</u>
1	Hydraulic fluid, MIL-PRF-83282
2	Lubricating oil, MIL-PRF-7808
3	Lubricating oil, MIL-PRF-23699
4	Aqueous sodium chloride solution, 3 percent
5	Turbine fuel, JP-4, MIL-PRF-5624 or Jet Reference Fluid (JRF), SAE-AMS2629

4.8.13.2 Specimen preparation. Adherends, measuring 0.064 by 3 by 6 inches, shall be coated respectively with a 0.125 ± 0.005 inch thickness of Types I, II, and IV sealing compound. A 3- by 6-inch section of a 3- by 12-inch strip of cotton duck conforming to CCC-C-419 Type III or stainless steel wire fabric (20 to 40 mesh) shall be impregnated with the respective types of sealing compounds. The compound must be worked well into the fabric. The sealant-impregnated end of the fabric shall be placed on the coated panel and smoothed down such that air is not trapped beneath the fabric. An additional 0.031-inch-thick coating of Types I, II, and IV sealing compound shall be applied over the fabric. Curing shall be as specified in 4.7.

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TABLE X. Adherends.

Panel Number	Adherends	Number of Specimens
1	Aluminum alloy 7075-T6 conforming to QQ-A-250/12, chemically treated with materials conforming to MIL-C-81706 Class 1A.	6
2	Aluminum alloy 7075-T6 conforming to QQ-A-250/12, chemically treated with MIL-A-8625 Type II.	6
3	Cadmium-plated steel (4130) conforming to ASTM-A108 treated in accordance with QQ-P-416 Type II, Class 1.	6
4	Magnesium alloy conforming to SAE-AMS4376 treated with materials conforming to MIL-C-81706 Class 1A.	6
5	Titanium conforming to MIL-T-9046 Type III, Composition C (6 Al - 4V).	6
6	Aluminum alloy 7075-T6 conforming to QQ-A-250/12, chemically treated with MIL-A-8625 Type II, coated with MIL-PRF-23377 and cured 7 days @ standard conditions	6
7	Composite material ¹	6

¹As specified by the Qualifying activity.

4.8.13.3 Test procedure. After cure, one specimen of each adherend shall be tested at standard conditions and one specimen of each adherend shall be completely immersed for 48 ± 1 hours at $140^\circ \pm 2^\circ$ F ($60^\circ \pm 1^\circ$ C) in each of the five immersion test fluids. At the end of the test period, each fluid shall be returned to standard conditions. The specimens shall then be removed and adhesion determined within 10 minutes after removal from the fluids. Two 1-inch wide strips shall be cut lengthwise through the fabric and sealing compound to the panel surface and extended the full length of the loose end of the fabric. The edges of the panel shall not be used as one edge of the test strip. The panels shall be individually tested in an autographic testing machine whose capacity shall be such that the tension at failure is not greater 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 1-inch wide fabric strip will be folded 180° as it is pulled from the panel. Each strip shall be pulled by making a cut through the sealant to the panel at the junction of separation at an angle of 45° in the direction of separation. If the sealant separates from the fabric, similar 45° -angle cuts shall be made to promote separation of the sealant from the panel. A minimum of five cuts shall be made.

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The adhesion, in pounds, shall be automatically recorded on a chart as a continuous curve. The adhesion value shall be calculated by averaging the maximum forces required to separate the sealant from the panel. If cohesive failure occurs, the adhesion value shall be recorded as greater than the observed value.

4.8.14 Anchorage (wet tape test, Type III only). A test panel, prepared from aluminum alloy 7075-T6 conforming to QQ-A-250/12 and measuring 3 by 6 inches, shall be prepared as specified in 4.6 and tested for wet tape adhesion as specified in MIL-F-18264.

4.8.15 Repairability.

4.8.15.1 Types I, II, and IV. Previously qualified Class 1 and Class 2 materials as well as the sealing compound undergoing qualification testing shall each be used to coat two panels, prepared from aluminum alloy 7075-T6 conforming to QQ-A-250/12 and measuring 0.064 by 3 by 6 by inches and treated with materials conforming to MIL-C-81706 Class 1A, to a thickness of 0.125 inch. Curing shall be as specified in 4.7. Panels shall be placed in an air-circulating oven and conditioned for 48 ± 1 hours at $140^\circ \pm 2^\circ$ F ($60^\circ \pm 1^\circ$ C) for Class 1 and at $180^\circ \pm 2^\circ$ F ($82^\circ \pm 1^\circ$ C) for Class 2. The panels shall be removed from the oven and returned to standard conditions. The sealant shall be cleaned with isopropyl alcohol and air dried for 2 hours. Another coating of freshly mixed sealing compound undergoing qualification testing shall be applied as above over the conditioned sealant. A 3- by 6-inch section of a 3- by 12-inch strip of cotton duck conforming to CCC-C-419 Type III or stainless steel wire fabric (20 to 40 mesh) shall be impregnated with the sealing compound. The compound must be worked well into the fabric. The sealant-impregnated end of the fabric shall be placed on the coated panel and smoothed down such that air is not trapped beneath the fabric. An additional 0.125-inch-thick coating of sealing compound shall be applied over the fabric. After the standard cure (see 4.7), the specimen shall be tested for peel strength as specified in 4.8.13.

4.8.15.2 Type III. Previously qualified Class 1 and Class 2 materials as well as the sealing compound undergoing qualification testing shall each be used to coat a panel, prepared from aluminum alloy 7075-T6 conforming to QQ-A-250/12 and measuring 3 by 6 inches, to a thickness of from 0.005 to 0.007 inch. Curing shall be as specified in 4.7. The panel shall be placed in an air-circulating oven and conditioned for 48 ± 1 hours at $140^\circ \pm 2^\circ$ F ($60^\circ \pm 1^\circ$ C). The sealant shall be cleaned with isopropyl alcohol or solvent conforming to table VII and air dried for 2 hours. Another coating of freshly mixed sealing compound undergoing qualification testing shall be applied as above over the conditioned sealant. After the standard cure (see 4.7), each specimen shall be tested for wet tape adhesion as specified in 4.8.14.

4.8.16 Air content (Type II only).

4.8.16.1 Equipment. A sectional-type container, conforming to a Semco 3-1/2-ounce cartridge having a Semco 254 nozzle and Semco dasher rod (6-ounce, No. 220278) with valve assembly, separate plug, and ramrod, shall be used.

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4.8.16.2 Procedure. The sealing compound shall be conditioned at standard conditions for a minimum of 8 hours prior to testing as follows:

- a. Sealing compound shall be carefully placed in the cartridge, taking care not to introduce air. The Semco 254 nozzle, with 1-1/8 inch cut from the tip, shall be attached to the cartridge and approximately 2 inches of sealant shall be extruded to remove any entrapped air.
- b. The dasher rod should have the seal ring just touching the dasher end and the valve is not closed (see figure 6).
- c. The tip of the filled cartridge shall be firmly inserted into the handle of the dasher rod and the sealant slowly delivered until the dasher is about three-fourths full. The handle end of the dasher should be completely filled with sealant.
- d. The wider flange side of the plug shall be filled with sealant and placed in the rod behind the sealant with the wide flange side toward the sealant, taking care not to entrap air. Excess sealant shall be removed with a gauze pad that has been wet with methyl ethyl ketone.
- e. The length of the sealant in the dasher shall be measured in millimeters. Measurements shall be between the interior bottom of the plug and the middle of the curve sealant bead at the other end of the dasher rod (length X, as shown on figure 6).
- f. The ramrod shall be inserted into the dasher rod and pushed until the valve is in full open position as shown on figure 6.
- g. The ramrod shall be removed and any remaining excess sealant at the handle end of the dasher rod shall be cleaned off.
- h. The valve body shall be slowly pushed into the dasher, finally forcing a seal.
- i. The ramrod shall be lightly inserted again into the dasher until it just touches the top of the plug. A "B" shall be marked on the ramrod at the handle end of the dasher.
- j. Firm hand pressure shall be applied on the ramrod while the valve end of the dasher is held against a table edge. A "C" shall be marked.
- k. The distance between the two marks on the ramrod shall be measured.

4.8.16.3 Calculation. The percentage of air present in the sealant shall be calculated as follows:

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$$\text{Percent air present} = \frac{\text{Distance between marks B and C}}{\text{Original length X of sealant}} \times 100$$

Three test runs shall be made using fresh equipment for each run and the average results shall be recorded.

4.8.17 Long-term storage. A 1-quart sample of sealing compound and the appropriate amount of curing agent shall be stored for 9 months at $77^{\circ} \pm 6^{\circ}$ F ($25^{\circ} \pm 3^{\circ}$ C). The curing agent shall be stirred if it shows signs of settling or hardening. Failure of the curing agent to return to a smooth, workable consistency shall be construed as a failure. At the end of the storage period, the base compound and the stirred curing agent shall be mixed together and tested for conformance with 3.3.3.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. The compounds covered by this specification are used in the production and maintenance of military aircraft exposed for prolonged periods to extreme seagoing environments not encountered by civilian aircraft (see 3.3.2.3 and 4.8.9). Peel strength (see 3.3.2.8) requires immersion in Military fluids. Only compounds identified on the Qualified Products List are used because of the repairability requirement (see 3.3.2.10). The intended use of sealing compounds covered by this specification are for sealing interior and exterior areas on weapons and aircraft systems to protect metal components against corrosion within a service temperature range of -65° to $+320^{\circ}$ F (-54° C to $+160^{\circ}$ C) with intermittent use to $+400^{\circ}$ F ($+205^{\circ}$ C) depending on the Class of compound selected. The sealing compounds are not intended for use as integral fuel tank sealants.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.

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- b. Type, class, grade, and application time required (see 1.2).
- c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2 and 2.3).
- d. Unit of issue required (see 3.2.2).
- e. Quantity required.
- f. Color, other than as manufactured (see 3.3.1.2).
- g. Packaging requirements (see 5.1).

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 on Qualified Products List QPL-81733 whether or not such products have actually been so listed by that date. The attention of 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 QPL is the Naval Air Warfare Center, Aircraft Division, Code 4.3.4.3, Building 2188, Mailstop 03, 48066 Shaw Road, Patuxent River, MD 20670-5304. Information pertaining to qualification of products may be obtained from that activity.

6.3.1 Inspection reports and manufacturer's data. When authorizing the forwarding of qualification samples, the qualifying activity will request the manufacturer to submit, along with the samples, 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, and a copy of the material safety data sheet (MSDS). In addition, two copies of the manufacturer's instructions for preparation, mixing, and application of the sealing compound will be submitted at this time. The samples should be plainly and durably marked with the following information:

Sample for Qualification Test

SEALING AND COATING COMPOUND, CORROSION INHIBITIVE

Specification MIL-PRF-81733D

Type, Class, and Grade

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-PRF-81733D under authorization (reference authorizing letter).

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6.3.2 Retention of qualification. In order to retain qualification of the product approved for listing on the QPL, the manufacturer should 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 will be every 2 years from the date of the qualification certification and will 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.

6.4 Lot formation. Unless otherwise specified, a lot consists of sealing compound of the same type, class, and grade, produced at one time from one batch, forming a part of one contract or order, and submitted for inspection at one time.

6.5 Toxicity. The sealing compound, when used for its intended purpose, should have no adverse effect on the health of personnel. Questions pertaining to this effect should be referred by the acquiring activity to the appropriate departmental medical service who will act as an adviser to the contracting agency.

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

6.6 Curing time. The time and temperature specified as the cure time in 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 application time, tack-free time, and cure time will be affected by changes in temperature and humidity. Approximate times for these properties will be halved or doubled when a 10° F increase or decrease, respectively, from the standard temperature is experienced.

6.7 Cross reference. Cross reference information is as follows:

Class 1, Grade A compounds are equivalent to the compounds purchased under MIL-S-81733C.

Class 1, Grade B; Class 2, Grade A and Grade B are new.

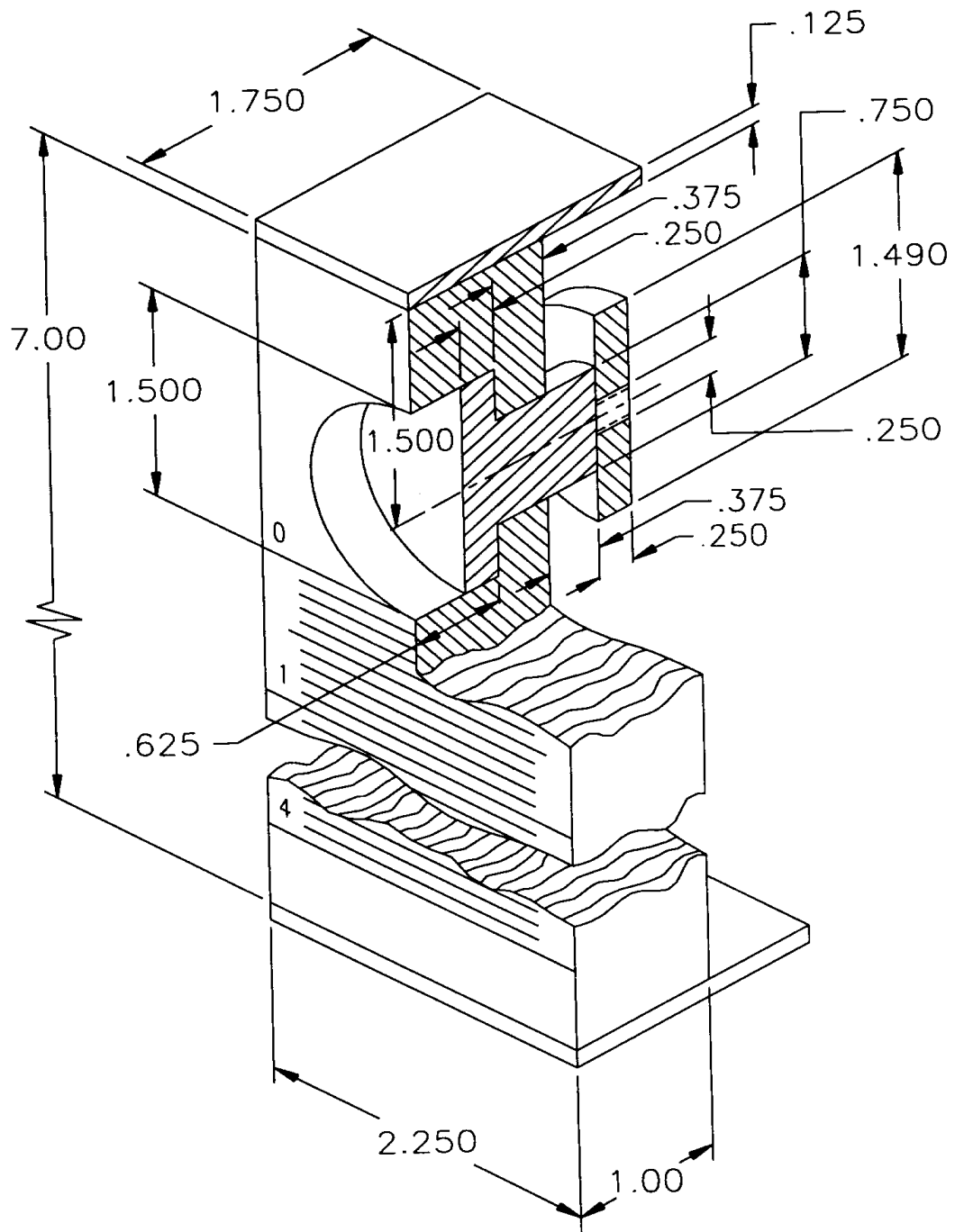
6.8 Subject term (key word) listing.

Aircraft
Brush application
Metal protection
Spray application
Synthetic rubber

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

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

FIGURE 1. Flow-test fixture.

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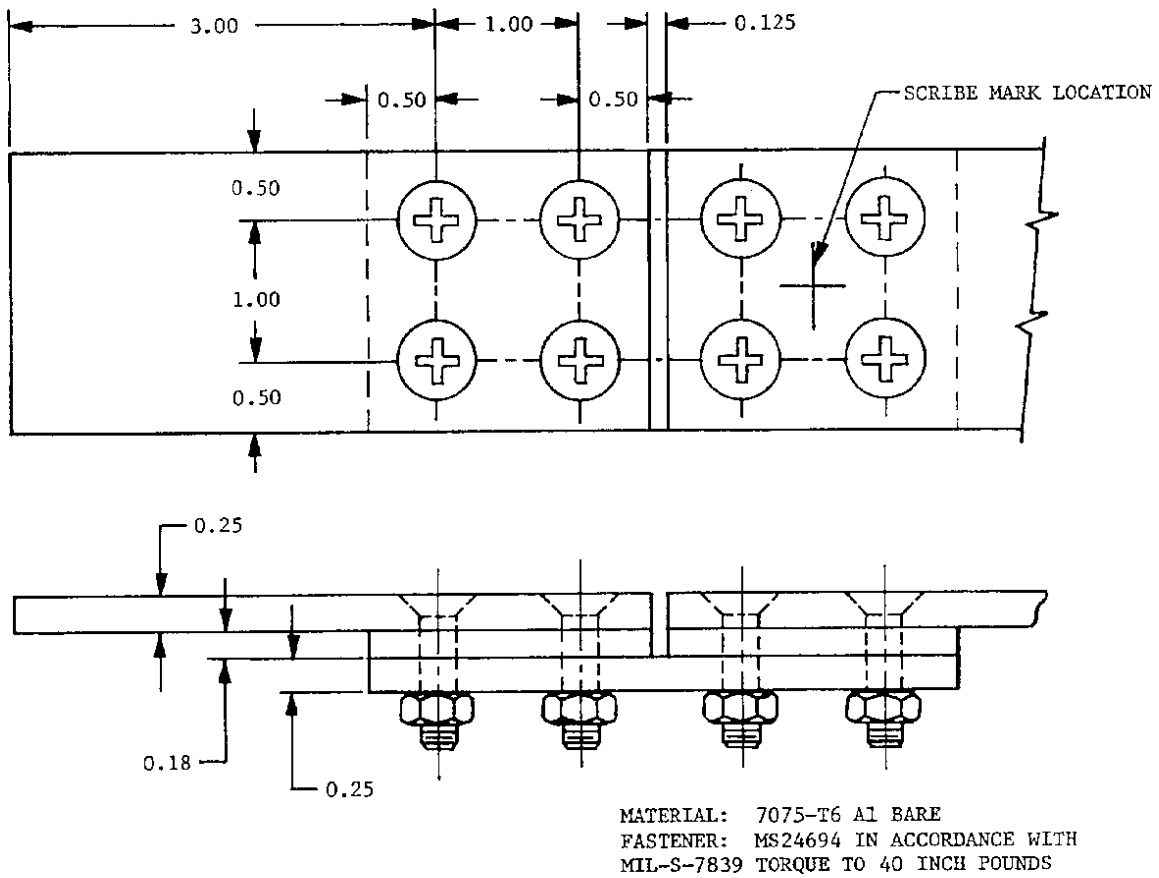
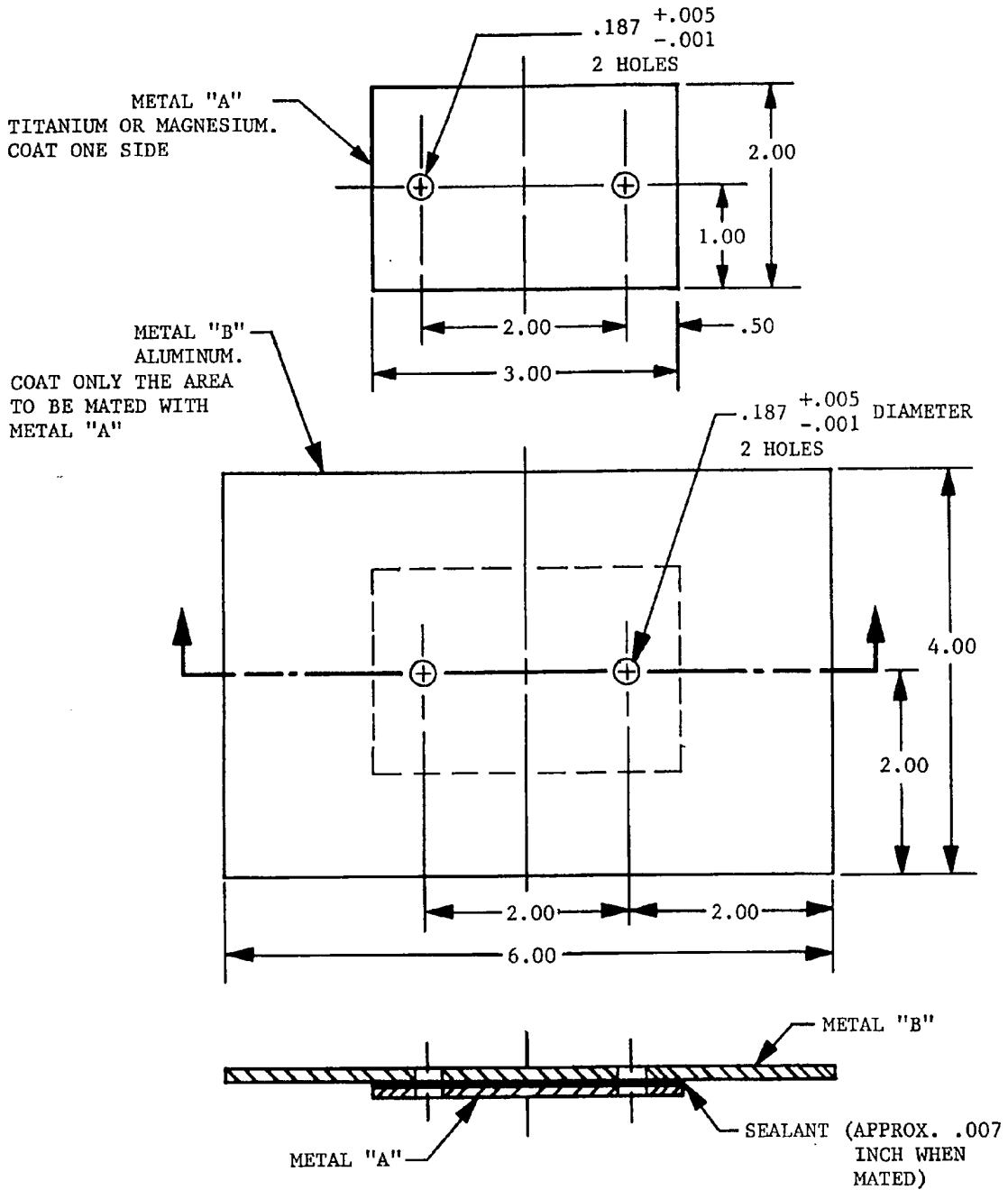


FIGURE 2. Aluminum assembly configuration.

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METAL THICKNESS APPROXIMATELY 0.063 INCH
 DIMENSIONS IN INCHES
 UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE APPROXIMATE

FIGURE 3. Mixed metal assembly configuration.

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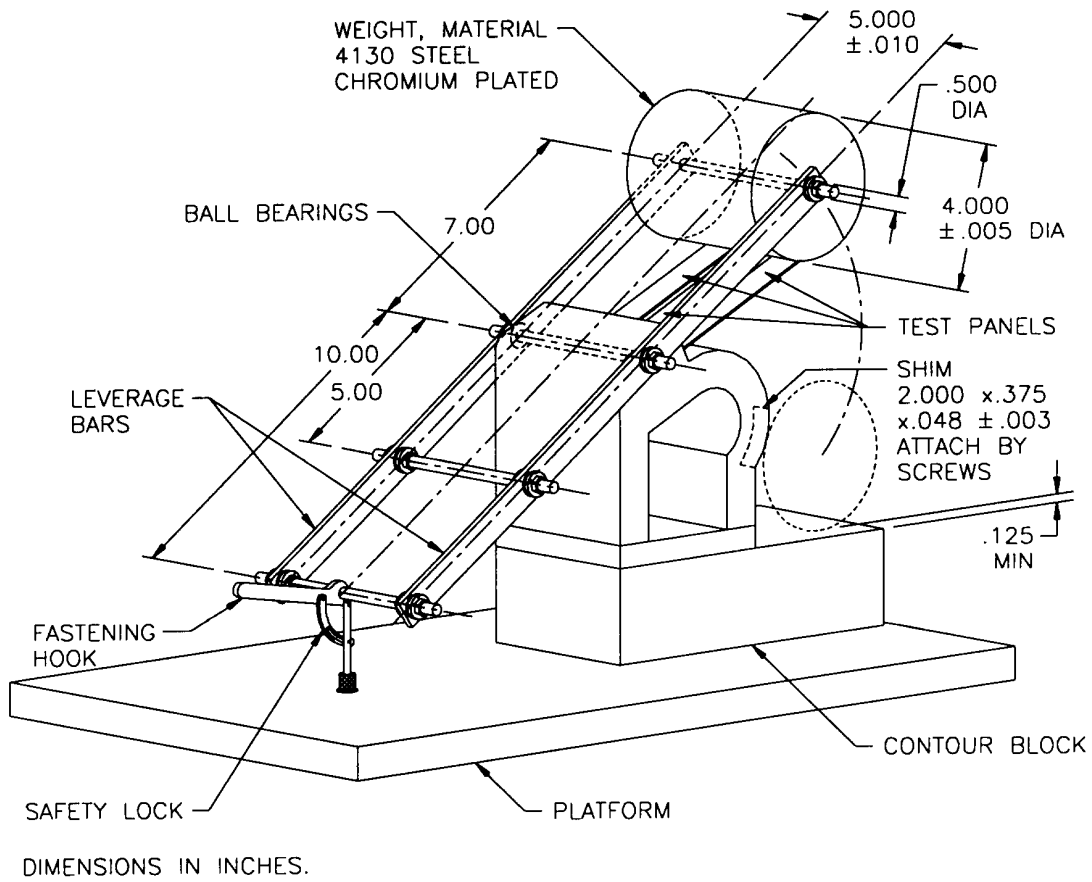
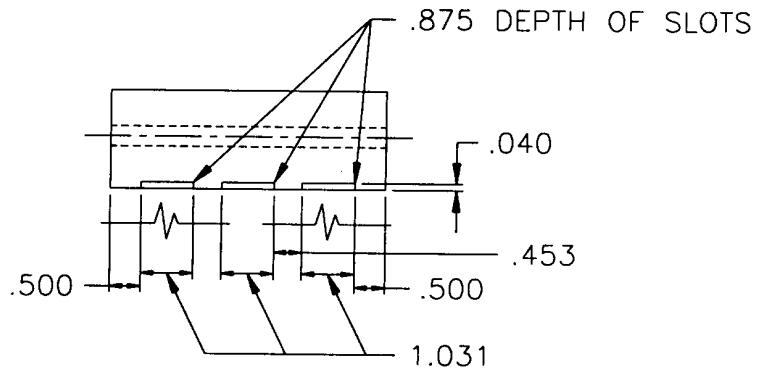
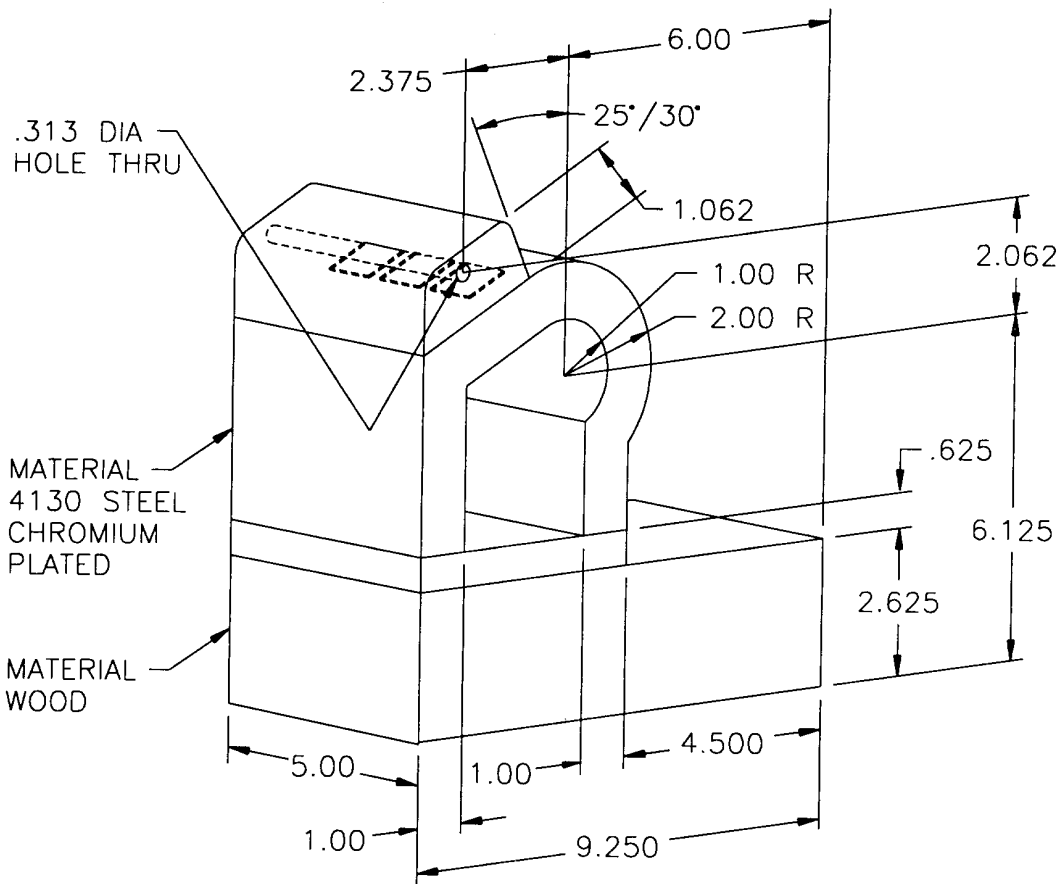


FIGURE 4. Low-temperature flexibility fixture.

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VIEW SHOWING SLOTS FOR PANELS



DIMENSIONS IN INCHES.

FIGURE 5. Contour block.

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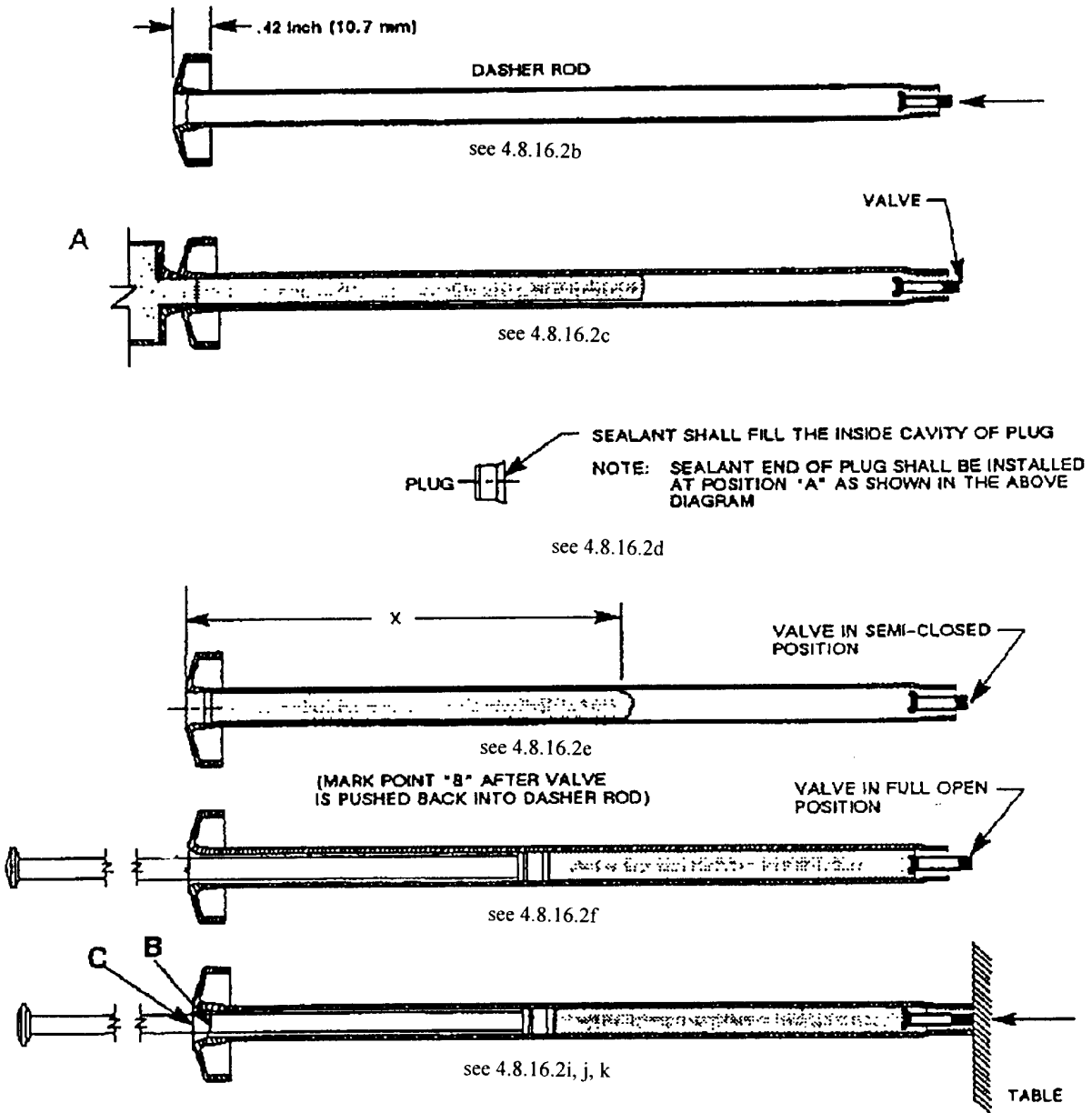


FIGURE 6. Diagram of stages in filling Semco dasher rod.

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CONCLUDING MATERIAL

Custodians:

Army - MR
Navy - AS
Air Force - 11

Preparing activity:

Navy - AS
(Project No. 8030-0730)

Review activities:

Army - AV, CR4, MI
Navy - MC, YD1
Air Force - 99

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.
NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-PRF-81733D

2. DOCUMENT DATE (YYMMDD)
980515

3. DOCUMENT TITLE

SEALING AND COATING COMPOUND, CORROSION INHIBITIVE

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:

7. DATE SUBMITTED
(YYMMDD)

(2) DSN:
(If Applicable)

8. PREPARING ACTIVITY

a. NAME
COMMANDER
NAVAL AIR WARFARE CENTER
AIRCRAFT DIVISION

b. TELEPHONE NUMBER *(Include Area Code)*
(1) Commercial (732) 323-2947 (2) DSN 624-2947

c. ADDRESS *(Include Zip Code)*
CODE 414100B120-3
HIGHWAY 547
LAKEHURST, NJ 08733-5100

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT
Defense Logistics Agency (DLSC-LM)
Attn Carla Jenkins/John Tascher
8725 John J. Kingman Road, Ste 2533
Fort Belvoir, VA 22060-6221 Telephone (703) 767-6874