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 SUPERSEDING
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MILITARY SPECIFICATION
 SEALING COMPOUND, TOPCOAT, FUEL TANK,
 BUNA-N TYPE

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

1. SCOPE

1.1 This specification covers one type of air drying protective coating.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specification and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

QQ-A-250/13	-	Aluminum Alloy Alclad 7075 Plate and Sheet
QQ-B-626	-	Brass, Leaded and Nonleaded: Rod, Shapes, Forgings, and Flat Products with Finished Edges (Bar and Strip)
TT-E-751	-	Ethyl Acetate, Technical
TT-I-735	-	Isopropyl Alcohol

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Systems Engineering and Standardization Department (Code 93), Naval Air Engineering Center, Lakehurst, NJ 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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

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SPECIFICATIONS

FEDERAL

- TT-M-261 - Methyl Ethyl Ketone, Technical
- TT-N-97 - Naptha, Aromatic
- TT-S-735 - Standard Test Fluids: Hydrocarbons
- CCC-C-432 - Cloth, Sheeting, Cotton, (Unbleached, Bleached, and Dyed)
- PPP-B-585 - Boxes, Wood, Wirebound
- PPP-B-636 - Boxes, Shipping, Fiberboard
- PPP-C-96 - Cans, Metal, 28 Gauge and Lighter

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- MIL-B-43666 - Boxes, Shipping, Consolidation
- MIL-L-6082 - Lubricating Oil, Aircraft Reciprocating Engine (Piston)
- MIL-L-23699 - Lubricating Oil, Aircraft Turbine Engines, Synthetic Base

STANDARDS

FEDERAL

- FED-STD-313 - Materials Safety Data Sheets, Preparation and Submission
- FED-STD-791 - Lubricants, Liquid Fuels and Related Products; Methods of Testing

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- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-147 - Palletized Unit Loads

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

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AMERICAN SOCIETY FOR TESTING AND MATERIALS

- ASTM D 130 - Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test
- ASTM D 381 - Existent Gum in Fuels by Jet Evaporation
- ASTM D 3951 - Commercial Packaging

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

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

3. REQUIREMENTS

3.1 Qualification. The topcoat material furnished under this specification shall be a product which is qualified for listing on the applicable qualified products list at the time set for opening of bids.

3.2 Composition. The topcoat material compound covered by this specification shall be formulated from butadiene acrylonitrile copolymer and such other ingredients as may be necessary to give a product of high quality and one suitable for the purpose intended.

3.3 Appearance. The topcoat compound shall be a clear uniform compound free of skins, lumps, and jelled or coarse particles.

3.4 Color. The topcoat materials shall be colored by the use of an oil soluble dye. The topcoat material shall be colored red.

3.5 Toxicity. The sealing compound shall have no adverse effect 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 medical service who will act as advisor to the contracting agency (see 4.3.2).

3.6 Solids content. The solids content of the topcoat material shall be not less than 17 percent, nor more than 22 percent when tested as specified in 4.6.2.

3.7 Viscosity. Viscosity of the topcoat materials shall be in the range of 400 to 2,000 centipoises when tested in accordance with 4.6.3.

3.8 Drying. A dipcoat of the topcoat material shall air-dry to a tack-free film in 4 hours when tested in accordance with 4.6.4.

3.9 Accelerated stability. The topcoat material shall not change in viscosity more than +10 percent from the original viscosity when tested in accordance with 4.6.12. The topcoat material shall not separate or gel.

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3.10 Working properties. Brush and dipcoats of the topcoat material, when prepared and cured in accordance with 4.5.3, shall be smooth, uniform, and free of sagging, bubbles, pinholes, cracks, and other film irregularities.

3.11 Film thickness. When the solids content of the topcoat materials is within the range of 17 to 22 percent, the film thickness of the single brush and dipcoats shall be not less than 0.5 mils nor more than 1.5 mils when cured to maximum hardness.

3.12 Recoating properties. A dipcoat of the topcoat material, when the solids content is within the range of 17 to 22 percent, when applied over a freshly dried film of topcoat material and also over a cured film of polysulfide sealing compound shall show satisfactory bonding and no lifting, blistering, or loss of adhesion.

3.13 Adhesion. The topcoat material when tested as specified in 4.6.11 shall have a minimum peel test value of 5 pounds per inch on the metal surface and 10 pounds per inch on the polysulfide sealant.

3.14 Low temperature flexibility. The topcoat material shall withstand the low temperature flexibility test described in 4.6.5 without cracking, checking, or loss of adhesion.

3.15 Resistance to heat. The topcoat material, when tested in accordance with 4.6.6 shall show no hardening, blistering, checking, cracking, shrinkage, loss of adhesion, or loss of flexibility.

3.16 Resistance to salt water and hydrocarbon. The topcoat material, when tested in accordance with 4.6.7, shall show no softening, blistering, leaching, apparent corrosion of the metal, or loss of adhesion.

3.17 Resistance to hot oil. The topcoat material, when tested in accordance with 4.6.8, shall show no cracking, flaking, or loss of adhesion.

3.18 Fuel contamination. When tested in accordance with 4.6.9, the nonvolatile extractable materials contributed by the material in contact with the test fluid, shall not exceed 20 milligrams per 100 milliliters. No more than slight discoloration shall be present on a freshly polished copper strip.

3.19 Shrinkage. A film of the topcoat material on a polysulfide sealant when applied and cured in accordance with 4.5.3, shall show no tendency to crack or pull away from the surface of the polysulfide sealant, caused by shrinkage.

3.20 Sealing compound protection. The topcoat material, when applied and tested in accordance with 4.6.10, shall adequately protect the approved sealing compound. The sealing compound shall show no appreciable leaching, change in hardness, flexibility, or signs of cracking. The topcoat materials shall not crack, check, or delaminate.

3.21 Workmanship. The workmanship shall be in accordance with high-grade manufacturing practice covering this type of material.

4. QUALITY ASSURANCE PROVISIONS

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

4.1.1 Responsibility for compliance. All items must 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 assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

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

- a. Qualification inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).

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

Table I. Qualification Inspection.

Characteristics	Requirement	Paragraph	Test
Composition	3.2		-
Appearance	3.3		4.6.1
Color	3.4		4.6.1
Toxicity	3.5		4.3.2
Solids content	3.6		4.6.2
Viscosity	3.7		4.6.3
Drying	3.8		4.6.4
Accelerated stability	3.9		4.6.12
Working properties	3.10		4.5.3
Film thickness	3.11		-
Recoating properties	3.12		-
Adhesion	3.13		4.6.11
Low temperature flexibility	3.14		4.6.5
Resistance to heat	3.15		4.6.6
Resistance to salt water and hydrocarbon	3.16		4.6.7
Resistance to hot oil	3.17		4.5.8
Fuel contamination	3.18		4.5.9
Shrinkage	3.19		4.5.3
Sealing compound protection	3.20		4.5.10
Workmanship	3.21		-

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4.3.1 Sampling instructions. The qualification samples shall consist of 3 quarts of the topcoat compound packaged as specified in section 5 upon which qualification is desired. Samples shall be identified as follows and forwarded to the Naval Air Development Center (Code 60621), Warminster, PA 18974 (qualifying activity) as designated in the letter of authorization (see 5.3).

Qualification Test Samples

Sealing Compound, Topcoat, Fuel Tank, Buna-N Type
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Name of manufacturer and product number

Submitted by (name) (date) for Qualification Testing in accordance with authorization (reference authorizing letter).

4.3.2 Manufacturer's data. The manufacturer shall furnish two copies of a certified test report showing that the material submitted for qualification meets the requirements of this specification. Material safety data sheets prepared in accordance with FED-STD-313 shall also be included with the report.

4.3.3 Retention of qualification. In order to retain qualification of a 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 as specified by the qualifying activity. 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 inspection.

4.4.1 Lot formation. A lot shall consist of all the topcoat compound produced by one supplier, at one plant, from the same materials, under essentially the same manufacturing conditions provided the operation does not exceed 24 hours. When the process is considered a batch operation, each batch shall constitute a lot.

4.4.2 Sampling and inspection.

4.4.2.1 Visual inspection. A random sample of filled containers, prior to closure, shall be selected from each lot in accordance with Inspection Level I and Acceptable Quality Level (AQL) of 2.5 defects per hundred units, of MIL-STD-105. The sample unit shall be one filled container. Inspection shall be in accordance with Table II.

Table II. Quality conformance visual inspection.

Examine	Defect
Fill	Average net content per container less than specified in contract or order.
Material	Not as specified.
Appearance	Presence of foreign matter. Not homogeneous. Wrong color.

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4.4.2.2 Physical property inspection. Two containers shall be randomly selected from each lot and tested to the requirements specified in Table III. The samples selected shall be thoroughly mixed prior to testing. Failure of the material to conform with any requirement specified in Table III shall be cause to reject the entire inspection lot.

Table III. Quality conformance physical testing.

Characteristics	Paragraph	
	Requirement	Test
Solids content	3.6	4.6.2
Viscosity	3.7	4.6.3
Drying	3.8	4.6.4
Adhesion	3.13	4.6.11

4.4.2.3 Packaging inspection.

4.4.2.3.1 Examination for packaging and marking. An examination shall be made to determine that packaging and marking comply with the requirements of Section 5 of this specification. Defects shall be scored in accordance with Table IV. The sample unit for this examination shall be one shipping container fully prepared for delivery except that it shall not be palletized and need not be sealed. The lot size shall be the number of shipping containers in the end item inspection lot. The samples for this examination shall be selected at random in accordance with MIL-STD-105, inspection level S-2 and an acceptable quality level (AQL) of 4.0 defects per hundred units.

Table IV. Packaging inspection.

Examine	Defect
Packaging	Container not as specified; closures not accomplished by specified or required methods or materials. Leakage or seepage of contents. Non-conforming component, component missing, damaged or otherwise defective. Bulged or distorted container.
Markings	Data omitted, illegible, incorrect, incomplete, or not in accordance with contract requirements.

4.4.2.3.2 Examination for palletization. An examination shall be made to determine that palletization complies with the requirements of Section 5 of this specification. Defects shall be scored in accordance with Table V. The sample unit shall be one palletized unit load fully prepared for delivery. The lot size shall be the number of palletized unit loads in the end item inspection lot. The samples for this examination shall be selected at random in accordance with MIL-STD-105, inspection level S-1 and an acceptable quality level (AQL) of 5.5 defects per hundred units.

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Table V. Palletization inspection.

Examine	Defect
Finished dimension	Length, width, or height exceeds specified maximum requirement.
Palletization	Not as specified. Pallet pattern not as specified. Interlocking of loads not as specified. Load not banded with required straps as specified.
Weight	Exceeds maximum load limits.
Marking	Omitted, incorrect, illegible, of improper size, location, sequence or method of application.

4.4.3 Rejection and retest. Failure to meet any quality conformance test shall result in rejection of the batch represented and may constitute sufficient justification for removal of the product from the Qualified Products List. Rejected material shall not be resubmitted for acceptance without prior approval from the Naval Air Development Center Code 6062. The application for resubmission shall contain full particulars concerning previous rejections and measures taken to correct these deficiencies. Samples for retest shall be randomly selected as in 4.4.2 and forwarded to the qualifying activity for evaluation.

4.5 Test conditions.

4.5.1 Standard conditions. Unless otherwise specified, standard conditions shall be $77^{\circ} \pm 2^{\circ}\text{F}$ ($25^{\circ} \pm 1^{\circ}\text{C}$) and a relative humidity (RH) of 50 ± 5 percent. Unless otherwise specified, all test specimens shall be prepared and cured under these conditions.

4.5.2 Cleaning of test panels. The metal test panels shall be thoroughly cleaned of all contaminants using the formulation as specified below, and wiped dry with clean, nonoily wiping cloths or tissues:

	<u>Percent by volume</u>
Aromatic petroleum naphtha (TT-N-97, type I, grade B)	50
Ethyl acetate (TT-E-751)	20
Methyl ethyl ketone (TT-M-261)	20
Isopropyl alcohol (TT-I-735)	10

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4.5.3 Application of coating. Unless otherwise specified, the test panels shall be given a single dipcoat of the topcoat materials to produce a film having a thickness of not less than 0.5 nor more than 1.5 mils when cured. The solids content of the the topcoat materials used shall be within the range of 17 to 22 percent. The coated panels shall be cured by suspending or placing vertically for a period of 48 hours in a draft-free enclosure such as a ventilated laboratory oven to reduce the tendency of blister formation.

4.6 Test methods.

4.6.1 Visual inspection. The sealing compound shall be visually examined for color and appearance requirements specified in 3.3 and 3.4.

4.6.2 Solids content. Approximately 10 grams of the topcoat materials shall be transferred as rapidly as possible to a cup approximately 3 inches in diameter and 3/4 inch deep. A fitted cover shall immediately be placed over the cup and the weight determined accurately. The cup and cover shall be weighed accurately prior to use and subtracted from the gross weights in order to calculate the net sample weights. The cover shall then be removed and the material heated at $71^{\circ} \pm 1^{\circ}\text{C}$ ($160^{\circ} \pm 2^{\circ}\text{F}$) for 24 hours. It shall then be cooled, the cover replaced, and the weight determined accurately. The percentage of total solids shall be calculated as follows:

$$\text{percentage of solids} = \frac{\text{Final weight}}{\text{Initial weight}} \times 100.$$

4.6.3 Viscosity. The viscosity shall be determined after the sample has been stored at room conditions for 24 hours using the Brookfield Viscosimeter with a No. 2 spindle at 10 rpm. The instrument shall be run for 1 minute prior to first reading. The reading shall be converted to centipoises.

4.6.4 Drying. A dipcoat of the topcoat material shall be applied to a 1- by 6- by .032-inch bare metal panel conforming to QQ-A-250/13, and to panels which have been coated and cured with a polysulfide sealing compound. The coated panels shall then be suspended from a suitable rack at room conditions for 4 hours. A small sheet of smooth polyethylene film 0.004 ± 0.002 inch thick shall then be pressed with the thumb onto a 1-square-inch area of the topcoated panels and withdrawn. The film shall not adhere to the polysulfide coating.

4.6.5 Low temperature flexibility. Six panels of aluminum, 1 by 6 by 0.020 inches, conforming to QQ-A-250/13, shall be used for this test. Four of these panels shall be coated with a suitable polysulfide sealant and cured. The cured thickness of the polysulfide sealing compound shall be $0.125 \text{ inch} \pm 0.016 \text{ inch}$. Two of these coated panels and the two bare panels shall be coated with the topcoat material in accordance with 4.5.3. All six panels shall then be immersed for 48 hours at $49^{\circ} \pm 1^{\circ}\text{C}$ ($120^{\circ} \pm 2^{\circ}\text{F}$) in test fluid conforming to TT-S-735, type III. At the completion of the immersion period, the panels and the flexibility test fixture (see Figure 1) shall be subjected to a temperature of $-54^{\circ} \pm 1^{\circ}\text{C}$ ($-65^{\circ} \pm 2^{\circ}\text{F}$) for 2 hours. While at this temperature, one end of the test panel shall be held in the slotted position and the other end bent rapidly around the curved position of the fixture with the side coated with sealing compound on the exterior of the radius. The panels shall then be removed and examined. The two panels coated with polysulfide sealant, which were not topcoated, shall be considered as control panels to insure that any failure is not due to failure in the sealing compound.

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4.6.6 Resistance to heat. Six panels of aluminum, 3 by 6 by 0.032 inches, conforming to QQ-A-250/13, shall be used for this test. Four parallel fillets of polysulfide sealant shall be applied to four of the panels. The fillets shall be approximately 0.19 inch thick by 0.5 inch wide by 2 inches long. Two of these panels and the two bare panels shall be coated with the topcoat material as given in 4.5.3. All six panels shall then be immersed for 48 hours at $49^{\circ} \pm 1^{\circ}\text{C}$ ($120^{\circ} \pm 2^{\circ}\text{F}$) in test fluid conforming to TT-S-735, type III, in such a manner that one-half of the material is above the liquid level. The panels shall then be removed and air-dried at room conditions for 72 hours, then heated at $82^{\circ} \pm 1^{\circ}\text{C}$ ($180^{\circ} \pm 2^{\circ}\text{F}$) for 72 ± 1 hours. The panels shall then be examined for changes in film properties. The two panels coated with polysulfide which were not topcoated shall be considered as control panels to insure that any failure is not due to failure in the sealing compound.

4.6.7 Resistance to salt water and hydrocarbon. Two panels of aluminum, 3 by 6 by 0.032 inches, conforming to QQ-A-250/13, shall be coated with the topcoat material and cured in accordance with 4.5.3. They shall then be immersed vertically for 20 days in a covered glass vessel containing a 2-layer liquid, consisting of a 3 percent aqueous solution of sodium chloride and test fluid conforming to TT-S-735, type III, in such a manner that 2 inches of the panels are exposed to the salt solution, 2 inches of the panels exposed to the test fluid, and the rest of the panels exposed to the air-vapor mixture. The temperature during the test shall be maintained at $49^{\circ} \pm 1^{\circ}\text{C}$ ($120^{\circ} \pm 2^{\circ}\text{F}$). Immediately upon removal from the liquid, panels shall be examined.

4.6.8 Resistance to hot oil. Two panels of aluminum 1 by 6 by 0.032 inches conforming to QQ-A-250/13 shall be dipcoated with the topcoat material. After drying 1 hour at room conditions, a second dipcoat of the topcoat material shall be applied and cured in accordance with 4.5.3. They shall then be immersed for 14 days in oil conforming to MIL-L-6082, grade 1065, at a temperature of $121^{\circ} \pm 2^{\circ}\text{C}$ ($250^{\circ} \pm 5^{\circ}\text{F}$). Likewise, another two panels of aluminum 1 by 6 by 0.032 inches conforming to QQ-A-250/13 shall similarly be prepared and immersed in oil conforming to MIL-L-23699. The four panels shall then be removed from the oils, cleaned, cooled to room temperature, and bent swiftly 180 degrees around a 0.125-inch mandrel and examined.

4.6.9 Fuel contamination. A 1- by 5- by 0.032-inch panel of aluminum conforming to QQ-A-250/13 shall be coated and cured in accordance with 4.5.3 and immersed in a flask containing 250 milliliters of test fluid conforming to TT-S-735, type III, for 48 hours at room conditions. The contaminated fuel shall be decanted off and the nonvolatile material determined by air jet evaporation according to ASTM D 381 and at 71° to 74°C (160° to 165°F), except that the total evaporation time shall be 45 minutes. The nonvolatile material shall be calculated on the basis of 100 milliliters of the contaminated fuel. The beakers containing the nonvolatile material shall be placed in an appropriate bath maintained constantly at $300^{\circ} \pm 5^{\circ}\text{C}$ ($572^{\circ} \pm 9^{\circ}\text{F}$) for 30 minutes. After cooling in a closed container, the beakers shall be weighed and the stored gum residue calculated for 100 milliliters of the contaminated fuel. Necessary corrections shall be made for preformed gum already present in the test fuel. A corrosion test for free sulfur shall be run in accordance with ASTM D 130, except that a copper strip conforming to QQ-B-626 shall be suspended in the contaminated fuel during the 48 hour extraction period previously outlined.

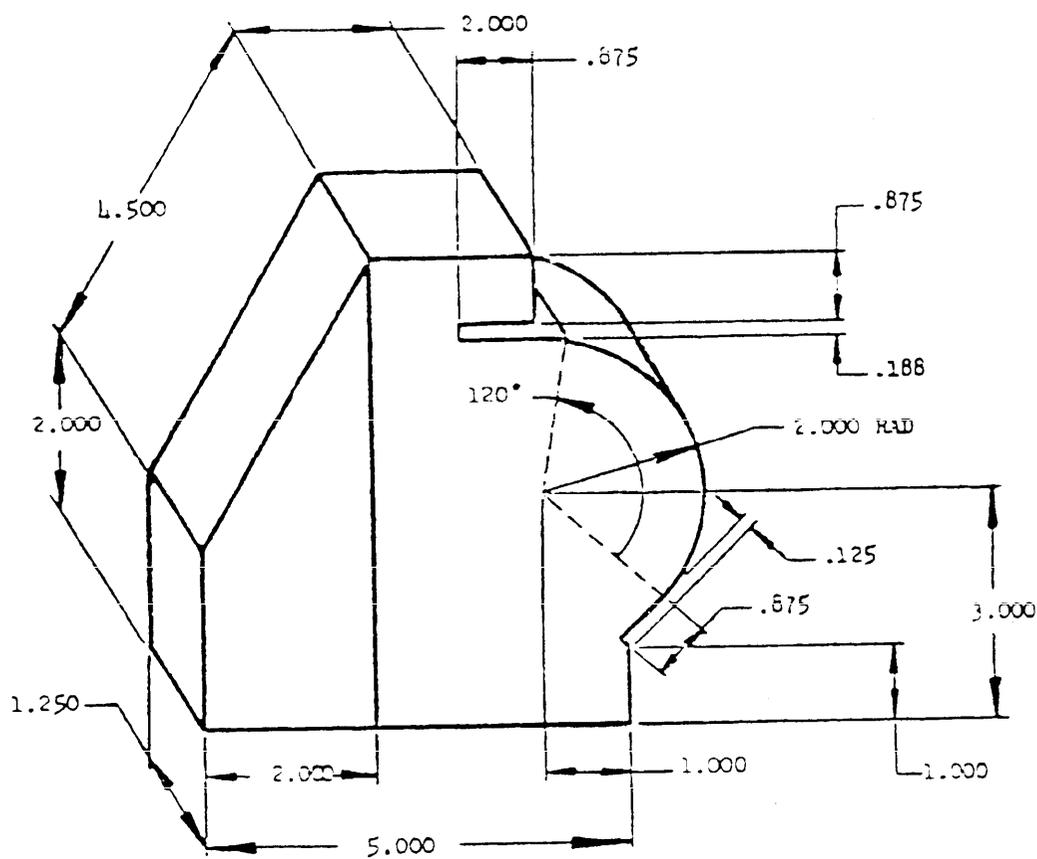
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4.6.10 Sealing compound protection. Five panels of aluminum, 3 by 6 by 0.032 inches, conforming to QQ-A-250/13 cleaned in accordance with 4.5.2 shall be prepared as follows: Five parallel fillets of suitable polysulfide cured according to the manufacturer's instructions shall be applied to each panel. The fillets shall be approximately 0.19 by 0.5 by 2 inches. Twenty four hours after application, a dipcoat of topcoat material shall be applied to four of the panels and allowed to dry at room conditions for a period of 6 days. Two of the panels which have been topcoated shall be immersed in a quart, wide-mouth jar which contains test fluid conforming to TT-S-735, type III. The full containers shall be maintained at $49^{\circ} \pm 1^{\circ}\text{C}$ ($120^{\circ} \pm 2^{\circ}\text{F}$) for a period of 20 days and agitated daily. At the end of this immersion period a fillet shall be cut cleanly from each of the metal panels, and bent through 180 degrees over a 0.125-inch mandrel with the fuel-exposed side on the outside of the bend. The stressed area shall be examined for defects. The panels shall be returned to the containers which shall be filled with fresh test fluids and the immersion and testing repeated four times for a total of 100 days of immersion. At the end of 100 days exposure, the specimens shall be examined and then dried at $49^{\circ} \pm 2^{\circ}\text{C}$ ($120^{\circ} \pm 5^{\circ}\text{F}$) for 16 hours and again examined. Hardness values shall be obtained prior to fuel immersion and at completion of the test. The fifth panel shall be considered as a control panel.

4.6.11 Adhesion. Two 3 by 6 by .032-inch panels of aluminum conforming to QQ-A-250/13, cleaned according to 4.5.2, shall be used for this test. One of these panels shall be coated with $0.125 \pm .016$ -inch thick polysulfide sealant cured according to the manufacturer's instructions. Two 3 by 12-inch strips of cotton sheeting conforming to CCC-C-432 shall also be used. The surface of the polysulfide sealant shall be wiped lightly with methyl ethyl ketone. The test panels shall then be given 3 brush coats of topcoat material, allowing 30 minutes air drying between coats. Five minutes after application of a fourth coat, the fabric strips shall be coated on one side with the topcoat material and placed on the test panels, followed by a final heavy coat of the topcoat material brushed on the topside of the fabric. In applying this topcoat, any bubbles of air existing between the applied fabric and the other surfaces shall be worked out and air-dried 30 minutes; one more heavy brush coat shall then be applied. After air-drying for 72 hours at standard conditions and heating for 24 hours at $49^{\circ} \pm 1^{\circ}\text{C}$ ($120^{\circ} \pm 2^{\circ}\text{F}$), the panels shall be immersed in test fluid conforming to TT-S-735, Type III, for 48 hours at room conditions. A 1-inch wide strip shall be made by cutting through the sealant and fabric to the metal substrate. The strip shall be cut the full length of the fabric. The edges of the panel shall not be used as one edge of the test strip. The specimens 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 1-inch wide fabric strip will be folded 180° as it is pulled from the panel. The adhesion shall be measured as the average pull in pounds per inch to separate the topcoat material from the metal surface or from the polysulfide sealant.

4.6.12 Accelerated stability. An unopened 1-quart container shall be stored for 14 days at $49^{\circ} \pm 1^{\circ}\text{C}$ ($120^{\circ} \pm 2^{\circ}\text{F}$), and then cooled at room conditions for 24 hours and the viscosity determined as described in 4.6.3. The percentage change of viscosity from the original viscosity shall be reported.

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MATERIAL: MAPLE WOOD

DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED,
TOLERANCES: DECIMALS ± 0.016 .

Figure 1. Low temperature flexibility test fixture.

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5. PACKAGING

5.1 Preservation. Preservation shall be Level A or Commercial as specified (see 6.2).

5.1.1 Level A. The sealing compound shall be preserved in 1-pint, 1-quart and 1-gallon metal cans conforming to PPP-C-96, type V, class 2. Exterior Plan A coating of PPP-C-96 shall be used.

5.1.2 Commercial. The 1-pint, 1-quart and 1-gallon quantities of the sealing compound shall be preserved in accordance with ASTM D 3951. The commercial unit pack shall be designed to protect the sealing compound against damage during shipment, handling and storage.

5.2 Packing. Packing shall be Level A or Level B or Commercial.

5.2.1 Level A. The sealing compound preserved in accordance with 5.1.1 shall be packed in close fitting boxes conforming to PPP-B-585, Class 3 or MIL-B-43666, type I or type II. The wooden boxes shall be lined with waterproof barrier material. The barrier material shall be sealed with waterproof paper or adhesive.

5.2.2 Level B. The sealing compound preserved in accordance with 5.1.1 shall be packed in close fitting fiberboard box conforming to PPP-B-636, weather resistance. The boxes shall be closed, waterproofed and reinforced in accordance with the appendix of PPP-B-636.

5.2.3 Commercial. The sealing compound preserved in accordance with 5.1.2 shall be packed in shipping containers in accordance with ASTM D 3951.

5.3 Marking. The marking of the unit pack and shipping container shall be in accordance with MIL-STD-129.

5.3.1 Special marking. In addition to markings specified in 5.3, information shall appear on each unit container and shipping container as follows:

- (a) Manufacturers instructions for use (to include thinning directions if applicable)
- (b) Date of manufacture (by month and year, not by code)
- (c) Date of first reinspection (date one year from date of manufacture)
- (d) Flash point in degrees centigrade and degrees Fahrenheit.
- (e) Any special directions for storage or use of the adhesive.
- (f) In addition to the above the following instructions shall appear on each container:

DANGER! FLAMMABLE
KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAME
STORE BELOW 80°

5.4 Unitized loads. When specified in the contract or work order, the containers or packages shall be unitized on pallets or skids by securely anchoring to the unit media with tape, strapping or shrink film bonding where shrink capability exists. Unitized loads shall be constructed in accordance with MIL-STD-147.

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6. NOTES

6.1 Intended use. The compound covered by this specification is intended for use as a topcoat for protecting lead dioxide cured polysulfide sealing materials. It may also be used for temporary repair of aircraft fuel tanks using a "fill-and-drain" technique.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification
- (b) Required type and size of container (see 5.2)
- (c) Quantity of sealing compound wanted.
- (d) Levels of preservation-packaging and packing (see 5.1 and 5.2)

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time set for opening of bids, qualified for inclusion in Qualified Products Lists (QPL-4383) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Air Systems Command, Department of the Navy, Washington, DC 20361; however, information pertaining to qualification of products and letter of authorization for submittal of sample may be obtained from the Director, Aircraft and Crew Systems Technology Directorate, Code 6062, Naval Air Development Center, Warminster, PA 18974.

6.4 Polysulfide sealant source. One suggested polysulfide sealant to be used in those tests requiring such a sealant and its source are as follows: Polysulfide sealant: PR-1221; Source: Products Research and Chemical Corp., Glendale, CA.

6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
 Army - MR
 Navy - AS
 Air Force - 20

Preparing Activity
 Navy - AS
 DoD Project No. 8030-0523

Review activities:
 Army - MR

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-S-48830		2. DOCUMENT TITLE Sealing Compound, Topcoat, Fuel Tank, Buna-N Type	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
3b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> MANUFACTURER	
		<input type="checkbox"/> OTHER (Specify) _____	
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	

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