NOT MEASUREMENT SENSITIVE

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SUPERSEDING
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PERFORMANCE SPECIFICATION

BARRIER MATERIALS, TRANSPARENT, FLEXIBLE, SEALABLE, VOLATILE CORROSION INHIBITOR TREATED

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

1. SCOPE

1.1 Scope. This specification establishes the requirements for heat or pressure sealable, transparent, flexible barrier material containing a volatile corrosion inhibitor (VCI) for use in military packaging (see 6.1).

1.2 Classification. Barrier materials are furnished in the following types and classes.

1.2.1 Types:

Type I - Heat-sealable barrier materials are furnished as:

Class 1 - Medium duty (Thickness of 0.005 inch or greater)
Class 2 - Light duty (Thickness of less than 0.005 inch)

Type II - Pressure (cold) sealable

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 of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Comments, suggestions, or questions on this document should be addressed to: Commander, Naval Air Warfare Center Aircraft Division, Code 4L8000B120-3, Highway 547, Lakehurst, NJ 08733-5100 or emailed to michael.sikora@navy.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.daps.dla.mil.

AMSC N/A FSC 8135

2.2 Government documents.

2.2.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-131	-	Barrier Materials, Watervaporproof, Greaseproof, Flexible, Heat-Sealable

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-3010	-	Test Procedures for Military Packaging

(Copies of these documents are available online at https://assist.daps.dla.mil/quicksearch/ or https://assist.daps.dla.mil or 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 these documents are those cited in the solicitation or contract.

AMERICAN SOCIETY FOR QUALITY (ASQ)

ANSI/ASQ Z1.4	-	Procedures, Sampling and Tables for Inspection by Attributes (DoD adopted)

(Copies of this document are available online at www.asq.org or from the American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) INTERNATIONAL

ASTM-B152/B152M	-	Copper Sheet, Strip, Plate, and Rolled Bar (DoD adopted)
ASTM-D130	-	Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test Detection of (DoD adopted)
ASTM-D471	-	Rubber Property – Effect of Liquids (DoD adopted)
ASTM-D689	-	Paper, Internal Tearing Resistance (DoD adopted)

(Copies of these documents are available from www.astm.org or ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, 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. Barrier materials 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 4.2 and 6.4).

3.2 Material. Barrier materials shall be made from such materials and by such processes as to ensure compliance with all of the requirements of this specification. The barrier material shall have no adverse effect on the health of personnel when all precautions are followed for its usage in accordance with the applicable Material Safety Data Sheet (MSDS) (see 4.2.1 and 6.4.3).

3.3 Construction. Barrier materials shall be constructed in any manner that meets the performance requirements of this specification.

3.3.1 Type I, class 1. Type I, class 1 barrier materials shall be heat-sealable and have a thickness of 0.005 inch or greater.

3.3.2 Type I, class 2. Type I, class 2 barrier materials shall be heat-sealable and have a thickness less than 0.005 inch.

3.3.3 Type II. Type II barrier materials shall be coated on one side with a cohesive substance and shall be cold sealed by pressing coated sides together.

3.4 Form. Type I barrier material shall be furnished in rolls or flat cut sheets as specified in the contract or delivery order (see 6.2). Type II barrier material shall be furnished in rolls only.

3.4.1 Rolls. Unless otherwise specified (see 6.2), the width of roll material shall be 36 inches, with a tolerance of plus or minus $^{1}/_{8}$ inch. The average length of roll material shall be not less than 200 yards. The length of any individual roll shall be not less than 195 yards. The roll material shall be uniformly wound on nonreturnable cores. The core's inside diameter shall be not less than 3 inches, with a tolerance of plus $^{1}/_{8}$ inch. The length of the core shall be equal to the width of the roll material, with a tolerance of plus $^{1}/_{8}$ inch. The core shall be rigid to prevent distortion of the roll during use and shipment conditions. Each roll shall be restrained to prevent unwinding and shall be wrapped in at least one thickness of MIL-PRF-131, class 1 barrier material (see 4.3.2.2 and 4.3.2.3).

3.4.2 Sheets. When flat cut sheets are specified, the length and width shall be as specified (see 6.2). If the length and width tolerances for cut sheets are not specified, the tolerance for each shall be plus or minus $^{1}/_{8}$ inch (see 4.3.2.3). Flat cut sheets shall be evenly stacked (see 4.3.2.2).

3.5 Sealing. The barrier material shall exhibit no delamination of the sealed area when sealed according to the manufacturer's recommended conditions (see 4.5). Each roll or package (flat cuts) of barrier material shall include a tag secured to the core of rolls, or sheet inserted in the package of sheets with the sealing instructions for sealing type II material and for heat-sealing type I material on rotary, band, and jaw-type sealing equipment. The tag or sheet shall be visible upon opening the unit package (see 4.3.2.2).

3.6 Identification of material. The specification number, type, class (if applicable), manufacturer's designation, month and year of manufacture, lot number, and the notation "SEAL OTHER SIDE" shall be clearly and legibly marked using water-resistant ink on the backing surface of the material. Additionally for type I materials, the manufacturer's recommended heat sealing conditions: temperature (°F), pressure (psi), and dwell time (sec) shall be marked under the Manufacturer's Designation. The color of the markings shall be yellow for type I and green for type II. If either marking color (yellow or green) creates contrast issues with the color of the barrier material, black marking shall be used. The identification shall appear in continuous rows of constantly recurring symbols in the machine direction from one end of the sheet to the other (see 4.3.2.1). The separation between parallel rows of recurring symbols shall be not greater than 6 inches. The letter and the figures shall not be less than $^{1}/_{8}$ inch high a (see 4.3.2.3). Printing shall be alternating in accordance with the following example. (The lines in the example are not to be printed. The lines are shown to illustrate the offset of "SEAL OTHER SIDE."):

NOTE: Both Date and Lot Number shall change for each production run.

SEAL OTHER SIDE

Manufacturer's Designation Date of Manufacture Lot No. Specification No. Type, class (if applicable)
Sealing Conditions (xxx °F; yy psi; z sec)

6-inches
(max)

SEAL OTHER SIDE

Specification No. Type, class (if applicable) Manufacturer's Designation Date of Manufacture Lot No.
Sealing Conditions (xxx °F; yy psi; z sec)

3.7 Performance requirements. The performance of the barrier material shall conform to the requirements specified in table I, when tested as specified in 4.6.

TABLE I. Performance requirements.

Characteristics	Type I and Type II Requirements	Test Paragraph Reference
Thickness	Type I, class 1 – 0.005 inch or greater Type I, class 2 – Less than 0.005 inch	4.6.1
Seam Strength 1. As received material sealed and tested at room temperature (seal separation) 2. Sealed after aging at 160 °F for 12 days and tested at room temperature (seal separation)	Type I, classes 1 and 2 - 25 % (max) Type II - 50 % (max) Type I, classes 1 and 2 - 25 % (max) Type II - 50 % (max)	4.6.2
Seam and material water resistance	Seams and barrier shall have no leakage.	4.6.3
Puncture resistance	Type I, class 1 - 10 lb (min) Type I, class 2 – 6 lb (min) Type II - 6 lb (min)	4.6.1
Compatibility with copper	No pitting, etching, dark tarnish (classification 3), or corrosion (classification 4) of vapor exposed surface. Discount attacks within $^{1}/_{16}$-inch of specimen.	4.6.4
Vapor inhibitor ability (VIA)	No more than a total of 3 corrosion spots on 3 plugs. No corrosion spot greater than 300 microns in diameter.	4.6.1
Vapor inhibitor ability (VIA) after exhaustion	No more than a total of 3 corrosion spots on 3 plugs. No corrosion spot greater than 300 microns in diameter.	4.6.1
Contact Corrosivity	No corrosion, etching, or pitting in the contact area of the panel.	4.6.1
Low temperature flexibility	No delamination, cracks, or tears	4.6.6
Blocking resistance	No blocking, delamination, or rupture	4.6.1
Tearing strength (Elmendorf)	50 grams (min)	4.6.1
Transparency a. As received b. After aging 12 days at 160 °F	 Lettering shall be legible. Lettering shall be legible.	4.6.1
Delamination (oil resistance)	No swelling, delamination, embrittlement, or seal leakage	4.6.1

TABLE I. Performance requirements – Continued.

Characteristics	Type I and Type II Requirements	Test Paragraph Reference
Long term protection	No corrosion of steel panels. Barrier material shall comply with transparency requirement.	4.6.5
Water resistance of marking	Markings shall be clear and legible.	4.6.1
One year storage stability: 1. Seam strength a. As received material sealed & tested at room temperature (seal separation) b. Sealed after aging at 160 °F for 12 days and tested at room temperature (seal separation) 2. Vapor inhibitor ability (VIA) 3. Transparency a. As received b. After aging 12 days at 160 °F.	 Type I: 25 % (max) Type II: 50 % (max) Type I: 25 % (max) Type II: 50 % (max) No more than a total of 3 corrosion spots on 3 plugs. No corrosion spot greater than 300 microns in diameter. Lettering shall be legible Lettering shall be legible	4.6.7

3.8 Workmanship. Type I barrier material shall have no loose surface deposits. Type II barrier material shall have no voids in the cohesive sealant (see 4.3.2.2). The barrier material shall be clean and free from holes, tears, cuts, sharp creases, wrinkles, or other imperfections. The barrier material shall be cut and trimmed of any selvage (see 4.3.2.1).

4. VERIFICATION

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

a. Qualification inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 Qualification inspection. The qualification inspection shall consist of all tests and examinations of this specification.

4.2.1 Health/hazard assessment (HHA). The barrier material shall be evaluated by the Navy Environmental Health Center (NAVENVIRHLTHCEN), using the administrative HHA (see 6.4.3).

4.3 Conformance inspection. Conformance inspections consist of the required tests listed in table II and the examinations listed in tables III through V for each production run.

TABLE II. Conformance tests.

Characteristics	Paragraph Reference
Thickness (Type I only)	4.6.1
Puncture	4.6.1
Tearing strength	4.6.1
Vapor inhibitor ability	4.6.1
Contact corrosivity	4.6.1
Transparency - as received	4.6.1
Seam strength - as received	4.6.2.2

4.3.1 Sampling for conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with the provisions set forth in ASQ-Z1.4.

4.3.2 Examination of the end item. For the purpose of determining the sample size in accordance with ASQ-Z1.4, the lot size shall be expressed in units of rolls or packages of sheets, as applicable, for examinations under 4.3.2.1 through 4.3.2.3.

4.3.2.1 Examination of the end item for defects in appearance, construction, and workmanship. For examination of defects within rolls, the sample unit of the end item shall be two yards, the full width of the roll. For examination of sheets, the sample unit shall be two sheets randomly selected from a package. No more than five sample units, randomly selected, shall be drawn from any one roll or package of sheets, as applicable. Both sides of the barrier material shall be examined.

4.3.2.2 Examination of the end item for defects in general construction. The sample unit for this examination shall be one roll or one package of sheets, as applicable.

TABLE III. Examination of end item for defects in appearance, construction, and workmanship.

EXAMINATION	DEFECT
Form	Not roll or flat cut, as specified.
Appearance	Surfaces not clean; presence of any foreign matter, dirt, sand, grit, or oil spots. (Note: Defects do not apply to outer convolution of roll.)
Workmanship	Blister, crack, cut, hole, tear, sharp crease, chafed spot, or scuff mark. (Note: Defects do not apply to outer convolution of roll.) Evidence of delamination or embrittlement. Edges not clean cut; ragged, crushed, or uneven. Loose surface deposits (type I only). Voids in the cohesive sealant (type II only).
Construction	Not uniform; layer or section missing, selvage present.
Identification markings	Illegible, incorrect, incomplete, or omitted. Not in a continuous row of constantly recurring symbols. Not in machine direction. Incorrect color. Printing is not alternating or as specified in 3.6.

TABLE IV. Examination of end item for defects in general construction.

EXAMINATION	DEFECT
Rolls or package of sheets	Loss of coating or impregnation causing bald spots. Coating or impregnation completely missing. Granular sandpaper surface.
Assembly of sheets	Not evenly and uniformly stacked; sheet containing manufacturer's sealing conditions not visible upon opening. Adjacent sheets stick together to the extent that separation causes tearing or injury to any surface. Splice within sheet.
Assembly of roll	Not restrained to prevent unwinding. Material not wound uniformly on roll causing soft or uneven edges, or telescoping of roll. Material not wound on a rigid core, core broken, collapsed, crushed, mutilated.
Unwinding of roll (check both sides)	When unwound, material sticks together to the extent that unrolling causes tearing or injury to any surface. Material wound unevenly causing wrinkles, sharp creases, or folds within roll. Roll not wrapped with at least one thickness of MIL-PRF-131, class 1 material.
Sealing instructions	Manufacturer's instructions for sealing conditions of the material not securely attached to core of roll as specified in 3.5.

4.3.2.3 Examination of the end item for dimensional defects. The sample unit for this examination shall be one roll or one package of sheets, as applicable.

TABLE V. Examination of the end item for dimensional defects.

EXAMINATION	DEFECT
Sheets	Length or width varies by more than plus or minus $^{1}/_{8}$ inch from dimensions specified.
Rolls:	
Width	Varies by more than plus or minus $^{1}/_{8}$ inch from width specified.
Length	Average length of roll material is less than 200 yards, length of any individual roll is less than 195 yards.
Core	Length is less than width of roll material, or greater by more than plus $^{1}/_{8}$ inch. Inside diameter less than 3 inches or greater than $3^{1}/_{8}$ inches.
Identification markings	Lettering is less than $^{1}/_{8}$ inch in height Parallel rows over 6 inches apart.

4.4 Test conditions and preparation.

4.4.1 Test conditions. Unless otherwise specified in the detailed test method herein, the physical tests contained in this specification shall be made with an atmosphere having a relative humidity of 50 ± 5 percent and a temperature of 75 ± 5 °F (24 ± 3 °C). Material shall be considered in equilibrium after exposure to the above conditions for a minimum of 24 hours.

4.5 Sealing instructions for qualification and conformance testing.

4.5.1 Type I seals.

4.5.1.1 Heat seals. The width of heat seals for test purposes shall be not less than ½ inch and shall be not greater than 1 inch. Heat seals for test purposes shall be effected on a jaw-type heat-sealer (or equivalent as approved by the qualifying activity) having one heated jaw and one resilient unheated jaw utilizing the sealing conditions recommended by the manufacturer. These conditions shall be limited as follows (see 6.3):

(a) Maximum temperature = 450 °F
(b) Maximum dwell time = 3 seconds
(c) Maximum pressure = 60 psig

4.5.1.2 Impulse seals. The width of impulse seals for test purposes shall be not less than ¼ inch and shall be not greater than ½ inch and shall be effected on electronic sealers, or equivalent as approved by the qualifying activity.

4.5.2 Type II seals. Cold seals shall be not less than ½ inch and shall be not greater than 1 inch and shall be effected using either of the procedures given below:

a. Use a sealer having two sets of rubber coated pullwheels and opposing jaws, using 40 psi as the upper sealing conditions;

b. Cut two sheets of Type II barrier material of the appropriate size. Cut a sheet of copier paper to use as interleaving. Place the first sheet of material, adhesive side up, on a hard, smooth horizontal surface. Place the interleaving sheet on top of the material to mask areas that are not to be sealed. Place the second sheet of material, adhesive side down, so that its edges are superimposed on the first. Roll the unmasked areas using a 2 inch wide, 1½ inch diameter hard rubber roller applying no more than 40 psi pressure normal to the horizontal surface. Roll each area forward and backward no more than 3 times.

4.6 Verification of performance requirements.

4.6.1 Test methods. Unless otherwise specified, the tests in table VI shall be conducted in accordance with the identified methods.

TABLE VI. Test methods.

Tests	MIL-STD-3010 Test Method No.	ASTM Test Method No.	Special Requirement or Exception Note
Vapor inhibitor ability (VIA)	4031 procedure B	--	1/
Vapor inhibitor ability (after exhaustion)	4031 procedure B	--	1/
Puncture resistance	2065	--	2/
Blocking resistance	3003	--	3/
Contact corrosivity	3005	--	
Transparency	4034	--	4/
Water resistance of marking	3027	--	
Tearing strength	--	D689	
Delamination (oil resistance)	3015	--	5/
Thickness	1003		

1/ The following apply to the VIA and VIA after exhaustion tests:

a. The apparatus used for these procedures shall be cleaned in a solution of hot water and detergent, followed by thorough rinsing in hot tap water.

b. Four specimens shall be tested.

c. After immersion cleaning in methanol, each specimen shall be allowed to dry for 30 seconds in a draft free area, with the test surface in a vertical position.

d. Immediately after insertion into the VIA test apparatus, each specimen shall be blown free of dust using a short burst from a self pressurized can of 1,1,1,2 – tetrafluoroethane.

e. After eliminating the plug with the most corrosion spots, the remaining three plugs shall meet the requirements in table I.

2/ Both orientations of the film shall be tested and both shall meet the requirements in table I.

3/ Samples shall be tested at both room temperature and 160 °F.

4/ Samples shall be held one inch away from the legibility standard.

5/ Oil conforming to ASTM-D471 (IRM 903 oil) and a di-2-ethylhexyl sebacate synthetic oil shall both be used.

4.6.2 Seam strength.

4.6.2.1 Seam strength samples. Eight type I samples or 4 type II samples measuring 6 by 12 inches shall be randomly selected from the test material. For type I, both heat sealed and impulse sealed samples shall be tested.

4.6.2.2 Seam strength “as received”.

4.6.2.2.1 Preparation of test specimen. The samples for this test shall be folded in half with the crease parallel to the long axis. The open or unfolded length shall be sealed. After 1 hour, the folded length shall be cut off ½ inch from the end. From each of the samples, three adjacent 1-inch-wide specimens shall be cut from the center of the sample and perpendicular to the heat-seal. Each of the three sealed specimens shall then be laid on a horizontal surface. A beveled (45 ± 5 degrees) plastic straight edge shall be slid between the unsealed ends of the specimen and held against the seal. On the outside of the specimen, the position of the straight edge against the seal shall be marked using a fine ball point pen.

4.6.2.2.2 Test at room temperature. The three marked 1-inch-wide specimens selected for this test (see 4.6.2.2.1) shall be opened and one end of each specimen shall be clamped so that the other end of the specimen hangs freely. A 3½ pound weight for type I and a ½ pound weight for type II shall then be carefully attached to the free end of the specimen so as not to impact load the seal. The weight shall be allowed to act for 5 minutes, whereupon the weight shall be removed and the specimen examined for separation of the sealed faces. The beveled straight edge shall be slid to the seal as before and the position of the straight edge marked. The distance between the two pen lines shall be measured to the nearest $^{1}/_{32}$ of an inch to indicate seam separation. Any evidence of delamination of one ply away from the other in the sealed area shall be cause for rejection.

4.6.2.3 Seam strength (sealed after aging).

4.6.2.3.1 Test specimens. The specimens for this test, in the flat unsealed condition as taken from the sample roll shall be aged in a circulating air oven maintained at 160 ± 2 °F for 12 consecutive days (288 hours). After removal from the oven, the unsealed sections shall return to room temperature. Test specimens shall then be obtained as specified in 4.6.2.2.1.

4.6.2.3.2 Test at room temperature. The three 1-inch-wide specimens selected for this test (see 4.6.2.3.1) shall be tested as specified in 4.6.2.2.2.

4.6.3 Seam and material water resistance.

4.6.3.1 Preparation of test solution. Add one part by weight Aerosol OT (or equivalent), one part by weight Erythrosin B (or equivalent), and 98 parts by weight distilled water. Allow the mixture to stand with periodic shaking for 4 hours. Dilute one volume of the mixture with four volumes of distilled water.

4.6.3.2 Procedure. Five pouches having inside dimensions of 5 by 6 inches, shall be completely filled with shredded white absorbent tissue and sealed. No strain shall be placed on the material or seams when filling. The sealed pouches shall then be immersed in the test solution for 5 minutes so that the seals are one inch below the solution surface. At the end of 5 minutes the pouches shall be removed from the solution and rinsed with tap water. The tissue shall then be examined for evidence of staining. Absence of staining shall indicate that sample pouches resisted penetration of water.

4.6.4 Compatibility with copper.

4.6.4.1 Preparation of test assembly panel. Three panels of cold rolled, hard temper copper conforming to ASTM-B152/B152M and measuring $^{1}/_{16}$ by ½ by 3 inches shall be polished to remove pits and irregularities from all surfaces. The panels shall be polished with 240 grit aluminum oxide. The use of “wet or dry” paper is prohibited. Iron oxide abrasives shall not be used. The final abrasion shall be in a direction parallel to the length of the panel. Each panel shall be bent into a “U” shape having a radius of ¼ inch and a distance of ½ inch between side walls at the ends. The U-shaped panel shall be wiped clean using laboratory tissue dampened with methanol. A sample of barrier material measuring ¾ by 3½ inches shall be tightly wrapped around each “U” shaped panel with the sealable side in contact with the copper, so that the material is perpendicular to the longitudinal axis and at the base of the open section of the “U”. The barrier material shall be secured with nylon thread.

4.6.4.2 Procedure. Fifty ml of a solution of glycerine and distilled water having a specific gravity of 1.103 at 75 ± 3 °F shall be poured into a wide-mouth glass jar of one pint capacity to provide a relative humidity of 85 ± 3 percent at 150 ± 2 °F. A glass vessel for use as a stage shall be inverted and placed inside the jar. The three wrapped panels shall be placed around the

perimeter of the stage with both legs of the inverted "U" resting on the stage in the test jar avoiding contact with glycerine solution. The test jar shall be sealed with a screw cap using an aluminum foil gasket and placed in a circulating air oven at 150 ± 2 °F for 7 days. The test jar shall then be removed from the oven, allowed to cool, and the copper panels removed and unwrapped. The "U" shaped specimen shall be examined on the inside surface of the "U" for evidence of corrosive effects from the vapor in accordance with ASTM-D130.

4.6.5 Long term protection.

4.6.5.1 Preparation of panel. Three 2 by 4 by 1/8 inch, cold rolled 1010 steel panels with rounded edges shall be finished and cleaned as specified in the contact corrosivity test (see 4.6.1).

4.6.5.2 Assembly and exposure. The panels shall be placed individually in a 3 by 5 inch (inside dimensions) pouch fabricated from the material. After insertion of the panel, the excess air shall be exhausted from the pouch by hand, and the pouch sealed. The sealed panels shall then be exposed outdoors for 12 months in a louvered shed. Upon completion of this exposure period the panels shall be examined visually for conformance to the long term protection requirement in table I.

4.6.6 Low temperature flexibility.

4.6.6.1. Preparation of specimens. Cut five specimens, 4 by 12 inches, and condition in a low temperature cabinet for 3 hours at -25 ± 2 °F. The specimens shall be arranged in the cabinet in a manner that shall allow circulation of air against all surfaces of the specimens.

4.6.6.2 Test procedure. After conditioning for 3 hours, each specimen shall be drawn over a ¼ inch diameter round steel mandrel at the conditioning temperature in such a manner that the specimen is subjected to a 180-degree-bend. The mandrel shall be placed in the low temperature cabinet ½ hour prior to the flexing operation. This operation shall take 2 to 3 seconds for a complete draw over the mandrel. Each specimen shall be drawn over the mandrel three times, and then turned over so that the opposite face is toward the mandrel and the drawing process repeated as above.

4.6.6.2.1 Alternate test procedure. After conditioning for 3 hours, each specimen shall be drawn over three ¼ inch diameter round steel mandrels at the conditioning temperature in such a manner that the specimen is subjected to a 180-degree-bend, followed by a reverse 180-degree-bend, followed by another 180-degree-bend. This operation shall take 2 to 3 seconds to draw each specimen over the mandrels. Each specimen shall be drawn over the mandrels three times.

4.6.7 Storage stability. Enough barrier material to conduct the tests indicated below plus additional material for two retests shall be overwrapped with one layer of MIL-PRF-131, Class 1 barrier material and placed in storage for one year. After one year storage the MIL-PRF-131 barrier material shall be removed, and the barrier material shall be tested for conformance to seam strength (see 4.6.2), vapor inhibitor ability (VIA) (see 4.6.1), and transparency (see 4.6.1).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. 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 barrier materials covered by this specification are intended for use in specialized military methods of preservation. The combination of all performance characteristics of MIL-PRF-22019; vapor inhibitor ability; vapor inhibitor ability after exhaustion; transparency; storage stability; long term protection; contact corrosivity; seam and fabrication strength; compatibility with copper, blocking and puncture resistance; delamination; water resistance of markings, provides the necessary requirements for protection from exposure to the extremes of the navy/naval aviation environment. Navy/naval aviation items are exposed to high moisture, high salt concentration, transfer at sea, rough handling, and minimal storage conditions. There are no commercial equivalents that meet the physical, mechanical, and corrosion requirements necessary to protect materiel that is exposed to the operational naval aviation environment. Specifically, specialized Method of Preservation GS of MIL-STD-2073-1 uses MIL-PRF-22019 as the premier source of barrier materials that provides volatile corrosion inhibitor protection for applicable items encountering the above conditions.

6.1.1 Type I use. Type I, classes 1 and 2 materials are intended for use where a heat-sealable barrier material with corrosion inhibiting ability is required. The use of class 1 or class 2 barrier materials is dependent upon the nature of the items requiring protection.

6.1.2 Type II use. Type II material is intended for use where either production or custom hand processing requires a cold-sealable barrier material with corrosion inhibiting ability.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of the specification.
b. Type (and Class for Type I only) of barrier material (see 1.2).
c. Form (rolls or flat cut) and size required (see 3.4).
d. Packaging requirements (see 5.1).

6.3 Heat-seal equipment. In the interest of standardization and for ease of manipulation, the seals for test under this specification should be effected on a jaw-type heat-sealer. This, however, should not be construed as an indication of Governmental preference in regard to sealing equipment. It is not intended that the operating temperature of heat-sealing equipment be limited to 450 °F or less. While equipment may be operated at temperatures exceeding 450 °F to accomplish a seal, the barrier material should also be capable of being heat-sealed at temperatures of 450 °F or less.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL-22019 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 orders for the products covered by this specification. Information pertaining to qualification of products (including the letter of authorization for submittal of sample) may be obtained from the Qualifying Activity: Commander, Naval Air Warfare Center Aircraft Division, Code 6.7.2.4, Building 596-2, Highway 547, Lakehurst, NJ 08733. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at https://assist.daps.dla.mil/.

6.4.1 Submission of qualification samples. Prior to submitting samples for qualification testing, manufacturers must request authorization from the qualifying activity. Upon receipt of authorization, samples are to be forwarded as directed by the qualifying activity.

6.4.2 Additional information required. In addition to the qualification sample, the manufacturer will furnish the following to the qualification activity:

a. One copy of the product MSDS (see 3.2.1 and 6.6).
b. A certified test report showing the product conforms to all of the requirements of this specification.

6.4.3 Health/hazard assessment (HHA). The qualifying activity will request the Navy Environmental Health Center (NAVENVIRHLTHCEN) to perform an HHA on the barrier material furnished. Prior to listing on the Qualified Products List, the results of the NAVENVIRHLTHCEN HHA must be deemed acceptable by the qualifying activity. A flowchart for the HHA process can be found as enclosure (1) of BUMEDINST 6270.8. The

HHA is a review of the product based on information submitted by the manufacturer, to assess health hazards associated with the handling, application, use and removal of the product. Sufficient data to permit an HHA of the product is to be provided by the manufacturer to the Commanding Officer, Navy Environmental Health Center, ATTN: Hazardous Materials Department, Industrial Hygiene Directorate, 620 John Paul Jones Circle, Suite 1100, Portsmouth, VA 20378-2103.

6.4.4 Qualified products. Barrier material supplied directly or indirectly to the Government is to be identical in every respect to the samples tested and found to meet the requirements of this specification. Any unapproved change from the qualification sample is cause for rejection of material submitted and for removal from the QPL.

6.5 Conformance inspection lot. For purposes of sampling, an inspection lot for examinations and tests should consist of all material of the same class made by the same process from the same components by one manufacturer during one production run.

6.6 Material Safety Data Sheets (MSDSs). Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in FED-STD-313; and 29 CFR 1910.1200 requires that the Material Safety Data Sheet for each hazardous chemical used in an operation must be readily available to personnel using the material. Contracting officers will identify the activities requiring copies of the Material Safety Data Sheet.

6.7 Subject term (key word) listing.

Cold-sealable
Heat-sealable
Packaging
Preservation

6.8 Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

CONCLUDING MATERIAL

Custodians:
Army - SM
Navy - AS
Air Force - 69

Review activities:
Army - AT, CR, CR4, EA, MI
Navy - MC, OS, SA, SH
Air Force - 11, 71, 99
DLA - CC

Preparing activity:
Navy - AS

(Project 8135-2010-002)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.daps.dla.mil .