

INCH-POUND

MIL-PRF-22191F  
w/AMENDMENT 1  
26 October 2009  
SUPERSEDING  
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## PERFORMANCE SPECIFICATION

### BARRIER MATERIALS, TRANSPARENT, FLEXIBLE, HEAT-SEALABLE

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 transparent, flexible, heat-sealable barrier materials having waterproof or low water vapor transmission characteristics for use in military packaging (see 6.1).

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

Type I – Watervaporproof, greaseproof

Class 1 – Suitable for hand operated or automated sealing equipment.

Class 2 – Suitable for automated sealing equipment.

Type II - Waterproof, greaseproof

Class 1 – Suitable for hand operated or automated sealing equipment

Class 2 – Suitable for automated sealing equipment

Type III - Waterproof

Class 1 – Suitable for hand operated or automated sealing equipment

Class 2 – Suitable for automated sealing equipment

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](mailto: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 <http://assist.daps.dla.mil>.

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## 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.

### 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 cited in the solicitation or contract.

#### DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-3010 - Test Procedures for Packaging Materials

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or <http://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)

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

(Copies of this document are available from [www.asq.org](http://www.asq.org) or the American Society for Quality, 600 Plankinton Avenue, Milwaukee, WI 53203.)

#### ASTM INTERNATIONAL

ASTM D471 - Rubber Property-Effect of Liquids, Standard Test Method For. (DoD adopted)

ASTM F1249 - Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor, Standard Test Method for.

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

2.4 Order of precedence. Unless otherwise noted herein or in the contract, 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. The 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 the performance requirements of this specification.

3.3 Construction. Barrier materials shall be constructed of one or more plies in any manner which ensures compliance with the performance requirements of this specification. Butting of component materials or the finished product shall not be permitted except in the direction perpendicular to the rolling direction. When a butt weld is made on the finished product or any ply thereof, the areas shall be externally flagged with colored markers to prevent use of that portion of the roll.

3.3.1 Splices. A roll shall not contain more than 3 splices (4 pieces) and each piece shall be not less than 45 yards in length. Splices within rolls shall be even the entire width of the roll material and shall not come apart during unwinding of the roll. Rolls containing splices shall be flagged at both ends of each splice with colored markers to indicate splices within the roll. Barrier material in flat cut sheets shall not contain splices (see 4.3.2.2).

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

3.4.1 Rolls. The width of roll material shall be 36 inches, with a tolerance of plus  $\frac{1}{4}$  inch or minus  $\frac{1}{8}$  inch. The average length of any 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 inside diameter of the core shall be not less than 3 inches, with a tolerance of plus  $\frac{1}{8}$  inch. The length of the core shall be equal to the width of the roll material, with a tolerance of plus  $\frac{1}{8}$  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 (see 4.3.2.2).

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3.4.2 Sheets. When flat cut sheets are specified, the length and width shall be as specified by the acquiring activity (see 6.2). If the length and width tolerances for cut sheets are not specified, the tolerance for each shall be plus  $\frac{1}{4}$  inch or minus  $\frac{1}{8}$  inch (see 4.3.2.3). Flat cut sheets shall be evenly stacked (see 4.3.2.2).

3.5 Sealing. Barrier materials shall be heat sealed under conditions recommended by the manufacturer. These sealing conditions shall be conditions that are considered reasonable for production line sealing operations with respect to commonly available sealing equipment and commercially practical fabrication time. The barrier material identification of material markings shall include the sealing conditions (see 3.6). The material shall exhibit no delamination at the heat-sealed area when sealed under 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 heat-sealing 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, manufacturer's name, manufacturer's designation, month and year of manufacture, lot number, heat-sealing conditions (temperature, pressure and dwell time) and the notation "Seal other Side" if applicable shall be clearly and legibly marked using water-resistant ink on the non-sealable side of the barrier material. The color of the markings shall be blue. The complete markings shall be continuous lengthwise and the distance between groups of markings shall be not greater than 2 inches. A complete group of markings shall appear once in each  $2\frac{1}{2}$  inches of width of the roll. The letters and figures shall be not less than  $\frac{1}{8}$  of an inch high (see 4.3.2.3).

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

3.8 Workmanship. Barrier material surfaces shall be free from any foreign matter. The barrier material edges shall be cut and trimmed of any selvage. Barrier material shall be free from holes, tears, cuts, sharp creases, wrinkles, or other imperfections (see 4.3.2.1).

TABLE I. Performance requirements.

Characteristics	Types I, II, III Requirements	Test Paragraph Reference
Thickness (inches)(max)	0.0060	4.6.1
Seam Strength		4.6.1
1. As received material sealed & tested:		
a. At room temperature (separation-inches)	No separation	
b. At 100 °F and at 160 °F (separation-inches)	No separation	

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TABLE I. Performance requirements – Continued.

Characteristics	Types I, II, III Requirements	Test Paragraph Reference
2. Sealed before aging at 160 °F for 12 days and tested: a. At room temperature (separation-inches) b. At 100 °F and at 160 °F (separation-inches) 3. Sealed after aging at 160 °F for 12 days and tested: a. At room temperature (separation-inches) b. At 100 °F and at 160 °F (separation-inches)	No separation No separation No separation No separation	
Seam fabrication	No leaks at any seams	4.6.2
Water Vapor Transmission Rate (WVTR) (Type I only) 1. After room temperature flexing: a. As received (gms/100 sq. in./24 hrs.) (max) b. Aged (gms/100 sq. in./24 hrs.) (max) 2. WVTR after low temperature flexing: As received (gms/100 sq. in./24 hrs.) (max)	0.02 0.02 0.03	4.6.1
Water Vapor Transmission Rate (WVTR) (Modulated Infrared Sensor) (Type I only) As received (gms/100 sq. in./24 hrs) (max)	0.02	4.6.5
Transparency a. As received b. After aging 12 days at 160 °F	Read lettering 3 inches behind material	4.6.1
Puncture resistance a. Type I (lbs, (min) b. Type II (lbs, (min) c. Type III (lbs, (min)	10 8.0 6.0	4.6.1
Blocking resistance	No blocking delamination or rupture	4.6.1
Resistance to curl (Class 1 only)	Shall not curl in excess of 5 % or back upon itself	4.6.1
Contact corrosivity	No corrosion, etching or pitting	4.6.1

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TABLE I. Performance requirements – Continued.

Characteristics	Types I, II, III Requirements	Test Paragraph Reference
Oil resistance (delamination) multi-ply materials only	No leakage, swelling, delamination, or embrittlement	4.6.1
Waterproofness (Type II and Type III only)	No dye penetration	4.6.4
Aging resistance (Multi-ply materials only)	No delamination	4.6.3
Water resistance of marking	Markings are clear and legible	4.6.1
Marking abrasion resistance	Shall be legible	4.6.6
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. Oil resistance (delamination). Multi-ply material only  3. Transparency  4. Water vapor proof transmission rate after room temperature flexing a. as received (gms/100 sq. in./24 hours)(max) b. Aged (gms/100 sq. in./24 hours) (max)	No separation  No separation  No leakage, swelling, delamination, or embrittlement  Read lettering 3 inches behind material  0.02 0.02	4.6.7

#### 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).

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

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.

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

TABLE II. Conformance tests.

Characteristics	Paragraph Reference
Seam strength (as received – at room temperature only)	4.6.1
Contact corrosivity	4.6.1
WVTR (as received only – after room temp flexing)	4.6.1
Puncture resistance	4.6.1
Resistance to curl (class 1 only)	4.6.1
Oil resistance (delamination)	4.6.1
Transparency	4.6.1
Seam fabrication	4.6.2
Waterproofness (type II and type III only)	4.6.4

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 (see table III). For examination of defects within rolls, the sample unit of product 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 material shall be examined.

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

EXAMINATION	DEFECT
Form	Not roll or flat cut, as specified. Incorrect type or class of material.
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.)

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

EXAMINATION	DEFECT
Workmanship	Blister, crack, cut, hole, tear, sharp crease or wrinkle, 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.
Construction	Not uniform; layer or section missing, selvage present.
Identification markings	Illegible, incorrect, incomplete, or omitted. Do not appear on backing surface of material if applicable; not continuous lengthwise. Color is not blue. Complete marking not repeated as specified in 3.6. Tags or sheets, when applicable, not properly located

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

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

EXAMINATION	DEFECT
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 continuous; more than 3 splices (4 pieces) in roll or more than 1 splice in any 45 or less consecutive yards. Splice(s) not evenly made; does not cover entire width of material; comes apart during unwinding of roll.
Sealing instructions	Manufacturer's instructions for sealing conditions of the material not attached to core of roll.



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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 $\frac{1}{4}$ inch or minus $\frac{1}{8}$ inch from the dimensions specified.
Rolls: Width	Varies by more than plus $\frac{1}{4}$ inch or minus $\frac{1}{8}$ inch from width specified.
Length	Average length of roll material is less than 200 yards. The length of any individual roll is less than 195 yards.
Core	Length less than width of roll material, or greater by more than plus $\frac{1}{8}$ inch. Inside diameter less than 3 inches or greater than $3\frac{1}{8}$ inches
Identification markings	Lettering is less than $\frac{1}{8}$ inch in height. Do not appear once in each $2\frac{1}{2}$ inches of width of roll. The complete group does not appear every 2 inches lengthwise

4.4 Test conditions. Unless otherwise specified in the detail test methods herein, the physical tests contained in this specification shall be made with an atmosphere having a relative humidity of  $50 \pm 5$  percent and a temperature ranging from 70 to 76 °F. 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.

a. All seals for test purposes shall be not less than  $\frac{1}{2}$ -inch wide and shall be effected on a jaw-type heat-sealer (or equivalent as approved by the qualifying activity) utilizing the sealing conditions recommended by the manufacturer. These conditions shall be limited as follows:

- (1) Maximum temperature = 500 °F
- (2) Maximum dwell time = 3 seconds
- (3) Maximum pressure = 60 lbs/sq. in

b. Impulse seals for test purposes shall be a minimum of  $\frac{1}{16}$ -inch wide and shall be effected on impulse sealers, or equivalent as approved by the qualifying activity. The upper sealing limits on the sealer shall effect a seal and not cause thinning at the inside edges of the seal.

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4.6 Verification of performance requirements.

4.6.1 MIL-STD-3010 test methods. Unless otherwise specified, the tests in table VI shall be conducted in accordance with the identified methods of MIL-STD-3010.

TABLE VI. Test methods.

Tests	MIL-STD-3010 Test Method No.	Special Requirement or Exception Note
Seam strength	2024	<u>1/</u>
Water vapor transmission rate (type I only)	3030	
After room temperature flexing	2017	<u>2/</u>
As received		
After Aging		
After low temperature flexing (type I only)		<u>3/</u>
As received		
Thickness	1003	
Puncture resistance	2065	<u>4/</u>
Blocking resistance	3003	
Resistance to curl	2015	
Contact corrosivity	3005	<u>5/</u>
Oil resistance (delamination) (multi-ply materials only)	3015	<u>6/</u>
Water resistance of marking	3027	<u>7/</u>
Transparency	4034	---

1/ Any evidence of ply delamination in the heat-sealed area shall be cause for rejection. The evaluation shall be limited to the heat-sealed area.

2/ Full stroke shall be used for testing all type I materials. A WVTR test result for any specimen which is higher than that specified in table I shall be cause for rejection. In addition, any cracking in the heat-sealed area after low-temperature flexing shall be cause for rejection

3/ Conduct tests as specified in MIL-STD-3010, Method 2017 except that only 'as received' specimens shall be tested. Prior to flexing, test specimens shall be conditioned for at least 30 minutes at  $-20 \pm 2$  °F and the flexing operation shall be conducted at  $-20 \pm 2$  °F.

4/ Test shall be run on 5 specimens with the heat sealable face in contact with the probe and 5 specimens with the non-heat-sealable face contacting the probe. The average value of each set of specimens shall meet the requirement specified in table I.

5/ If corrosion is evident in the blank area, the test shall be repeated with a new test panel. Corrosion in the intermediate area shall not invalidate the test nor be cause for rejection.

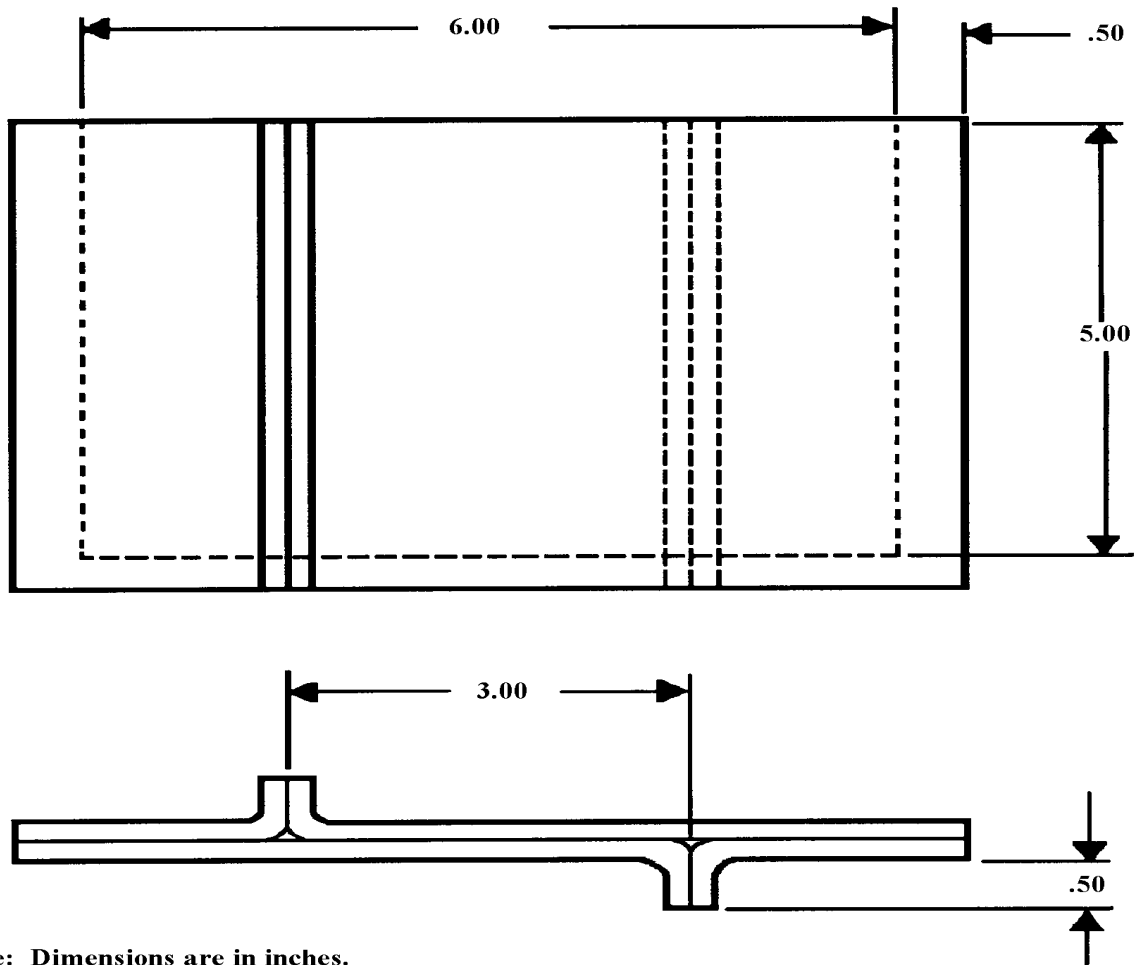
6/ Oil conforming to ASTM oil number 3, as specified in ASTM-D471, and a di-2-ethylhexyl sebacate synthetic oil shall both be used.

7/ Three specimens shall be tested, each one containing a complete set of markings.

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4.6.2 Seam fabrication.

4.6.2.1 Preparation of test specimens. Four pouches sealed in accordance with the manufacturer's recommended sealing conditions shall be fabricated from the barrier material. Each pouch shall be prepared by cutting four specimens: two 2½ by 5½ inches and two 5½ inches by 5½ inches. The pouch shall be fabricated by sealing as shown on figure 1. The butt seals projecting at ½-inch seams perpendicular to the faces shall be made prior to sealing the bottom. The butt seams shall be folded flat at the point of juncture with the bottom seams before the bottom seals are made.



**Note: Dimensions are in inches.**

FIGURE 1. Pouch for seam fabrication test.

4.6.2.2 Procedure. A water solution, containing dye and a 1 percent sodium dioctylsulfosuccinate) or equivalent as approved by the qualifying activity, shall be made to produce a distinct color. The solution shall be poured into each sealed pouch to a level of two inches above the top of the bottom seam. The pouch shall then be suspended vertically. After a

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period of 15 minutes at room temperature, the pouches shall be examined for dye leakage at all seams and especially at the double seam junctions (the points where the vertical seams intersect the bottom seam at points other than at the corners of the pouch).

4.6.3 Aging resistance (multi-ply materials only). Three specimens, 36 by 6 inches, cut from across the roll of material, at points which shall be not less than 1 yard apart, shall be used for this test.

4.6.3.1 Procedure. The specimens shall be subjected to the following aging cycle:

8 hours in a humidity chamber of  $100 \pm 2$  °F and 90 to 95 percent relative humidity.  
16 hours in a circulating air oven at  $160 \pm 2$  °F.

The aging cycle shall be repeated every weekday, for five consecutive days. The specimens shall remain in the circulating air oven maintained at the conditions described above on Saturday, Sunday and holidays, except that holidays shall not exceed a total of two days over the entire aging period. The aging procedure shall continue for fourteen consecutive days. The specimens shall be folded loosely, hung, rolled loosely, or laid flat in the test chamber during the aging period. At the conclusion of the aging period the specimens shall be returned to room temperature and examined, particularly at all edges, for delamination brought about by the aging exposure. No supplemental attempt to delaminate the material, such as prying or picking at the plies, shall be carried out. For purposes of this test, delamination shall occur if ply separation at any one given point extending in more than  $\frac{1}{2}$  inch from the edge with an edge length separation greater than 1 inch.

4.6.4 Waterproofness (type II and type III). Prepare test specimens as specified in MIL-STD-3010, method 2017, except that only unaged samples shall be tested. Prior to flexing, test specimens shall be conditioned for at least 30 minutes at  $-20 \pm 2$  °F and the flexing operation shall be conducted at  $-20 \pm 2$  °F.

4.6.4.1 Procedure. After flexing the specimen, the sleeve shall be removed and allowed to come to room temperature and dried by wiping with absorbent material or by placing in a circulating air oven maintained at 160 °F for ten minutes. The sleeve shall then be made into a pouch by sealing one of the open ends. The pouch shall be filled with shredded absorbent paper and shall be placed in a water solution containing 1 percent aerosol OT and methyl violet for ten minutes. The pouch shall then be removed, wiped dry, and the shredded absorbent paper examined for dye stain.

4.6.5 WVTR (modulated infrared sensor). A suitably sized sample of barrier material shall be installed on a calibrated device for measuring moisture permeation through an area of approximately 50 cm<sup>2</sup> in accordance with ASTM F1249. The surface of the sample designed for heat sealing shall be oriented toward the dry gas with the other side oriented toward a 100 percent relative humidity environment. The test temperature shall be 100 °F (38 °C). The

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material shall be tested for permeation, allowing a minimum of 80 hours to reach steady state. Three samples shall be tested and the results averaged.

4.6.6 Marking abrasion resistance.

4.6.6.1 Preparation of test specimens. Strips 3-inches-wide containing markings shall be cut so that the amount of markings shall be at maximum. The length shall allow for a bifold seam to be formed and stapled. The resultant strip shall be 3 inches wide by 18 inches long (see figure 2).

4.6.6.2 Procedure. The test bar shall be  $1\frac{3}{8}$  to  $1\frac{1}{2}$  inches in diameter and shall be covered with 400 grit abrasive cloth. The strip shall be hung over the bar with a  $0.9 \pm 0.5$  pound weight attached to one end (see figure 2). The side with the print or raised embossing shall be in contact with the bar. The other end shall be pulled (stroked) at a rate of 50 to 70 strokes per minute for 1 minute. The stroke length shall be 13 to 16 inches. The angle of pull (stroke) shall be within 5 degrees of horizontal. The strip shall be removed and the weight detached. The printing shall be examined for legibility, smear, and blurring in accordance with the requirement in table I.

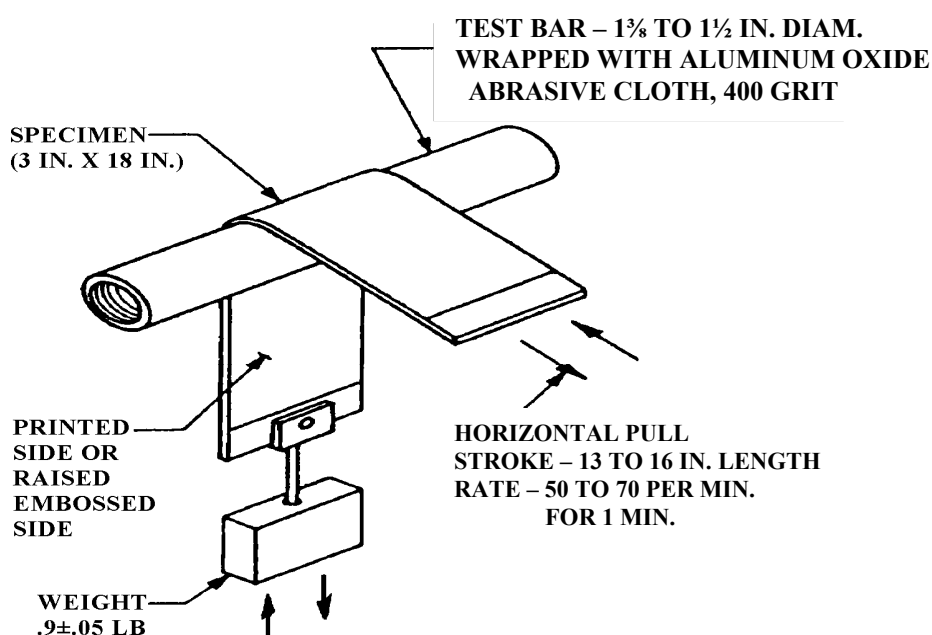


FIGURE 2. Apparatus for testing identity markings resistance to abrasion.

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4.6.7 One year storage stability. After one year of sheltered storage at  $75 \pm 2$  °F and  $50 \pm 5$  percent relative humidity, a sample of material (or sheets, if applicable) shall be tested for conformance to the requirements of the following tests:

Seam strength at room temperature (no accelerated aging required).

Oil resistance (delamination) (multi-ply materials only).

Transparency (accelerated aging not required).

Watervapor transmission rate after room temperature flexing (as received and aged), type I only.

## 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 requisite 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 are 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-22191; water vapor transmission rate; transparency; contact corrosivity; storage stability; seam strength and fabrication; puncture, aging, blocking, and curl resistance; delamination; waterproofness; water resistance of markings provide 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, Methods of Preservation 31, 32, 33, 41 and 51 of MIL-STD-2073-1 use MIL-PRF-22191 as the premier source of barrier materials that are transparent and provide waterproof and watervaporproof (and watervaporproof with desiccant) protection for applicable items encountering the above conditions. MIL-PRF-22191 provides the building blocks for applying specialized military preservation techniques approved under MIL-STD-2073-1.

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6.1.1 Type I use. Type I material is intended to be used in all packaging applications where watervaporproof, greaseproof barrier materials are required.

6.1.2 Type II use. Type II material is intended to be used in all packaging applications where waterproof, greaseproof barrier materials are required.

6.1.3 Type III use. Type III material is intended to be used in all packaging applications where waterproof barrier materials are required.

6.1.4 Class 1 use. Class 1 materials have no significant tendency to curl and could be heat sealed using hand operated heat-sealing equipment and automated heat-sealing equipment.

6.1.5 Class 2 use. Some Class 2 materials have a strong tendency to curl, but are suitable for automated heat-sealing equipment. Class 2 materials should not be sealed with hand operated equipment since this results in compromised heat seals due to the difficulty in holding curling surfaces in the proper position by hand.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of the specification.
- b. Type and class 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. It is not intended that the operating temperature of heat-sealing equipment be limited to 500 °F or less. While equipment may be operated at temperatures exceeding 500 °F to accomplish a seal, the barrier material must also be capable of being heat sealed at temperatures of 500 °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-22191 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 and the letter of authorization for submittal of sample may be obtained from: Commander, Naval Air Warfare Center Aircraft Division, Code 6.7.2.4, Building 596-2, Highway 547, Lakehurst, NJ 08733-5049. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at <http://assist.daps.dla.mil>.

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Barrier material supplied under contract should be identical in every respect to the samples tested and found to meet the requirements of this specification. Any unapproved changes from the qualification sample should constitute cause for rejection for material submitted and for removal from the list of qualified products. However, acceptability under this specification is based on the performance characteristics of the barrier material, and since there is no color requirement, it is not mandatory that the color of the visible surfaces of the material supplied under contract be the same as the samples tested and accepted by the qualifying activity.

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.

Bags  
Greaseproof  
Packaging  
Preservation  
Water vapor transmission

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.



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w/AMENDMENT 1

CONCLUDING MATERIAL

Custodians:

Army - SM  
Navy - AS  
Air Force - 11

Preparing activity:

Navy - AS

(Project 8135-2009-007)

Review activities:

Army - AT, CR4, EA, MI  
Navy - MC, OS, SA, SH, YD  
DLA - CC

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 <http://assist.daps.dla.mil>.