INCH-POUND

MIL-DTL-17667E
21 April 2005
SUPERSEDING
MIL-P-17667D
10 September 1980

DETAIL SPECIFICATION

PAPER, WRAPPING, CHEMICALLY NEUTRAL (NON-CORROSIVE)

REACTIVATED AFTER 10 FEBRUARY 2005 AND MAY BE USED FOR NEW AND EXISTING DESIGN AND ACQUISITIONS.

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

1. SCOPE

1.1 Scope. This specification covers chemically neutral, non-corrosive wrapping paper used for packaging military supplies and equipment.

1.2 Classification. The types of chemically neutral, non-corrosive wrapping paper are as follows (see 6.2):

Type I - Flat
Type II - Creped

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 491000B120-3, Highway 547, Lakehurst, NJ 08733-5100 or emailed to thomas.omara@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.

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.

FEDERAL SPECIFICATIONS

A-A-51126	-	Anodes, Cadmium.

FEDERAL STANDARDS

FED-STD-595	-	Colors Used in Government Procurement.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-A-18001	-	Anodes, Sacrificial Zinc Alloy.

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	-	Procedures, Sampling and Tables for Inspection by Attributes. (DoD adopted)

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) INTERNATIONAL

ASTM-A265	-	Nickel and Nickel-Base Alloy-Clad Steel Plate. (DoD adopted)
ASTM-B121/B121M	-	Plate, Leaded Brass, Sheet, Strip, and Rolled Bar. (DoD adopted)

ASTM-B133	-	Copper Rod, Bar and Shapes. (DoD adopted)
ASTM-B209	-	Aluminum and Aluminum Alloy Sheet and Plate. (DoD adopted)

(Copies of these documents are available from www.astm.org or from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) INTERNATIONAL

SAE-AMS4375	-	Sheet and Plate, Magnesium Alloy 3.0 AL – 1.0 ZN – 0.20 MN (AZ31B-0) Annealed and Recrystallized. (DoD adopted)

(Copies of this document are available from www.sae.org or SAE World Headquarters, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY (TAPPI)

TAPPI-T403	-	Paper Bursting Strength.
TAPPI-T410	-	Paper and Paperboard (weight per unit area), Grammage of.
TAPPI-T414	-	Internal Tearing Resistance of Paper (Elemendorf-type method).
TAPPI-T494	-	Tensile Breaking Properties of Paper and Paperboard (using constant Elongation Apparatus).

(Copies of these documents are available from www.tappi.org or the Technical Association of the Pulp and Paper Industry, Technology Park/Atlanta, P.O. Box 105113, Atlanta, GA 30348.)

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 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.2 Material. Neutral wrapping paper shall be made from sulfate pulp. If reclaimed fiber is used, then traces of other fibers shall be not greater than 5 percent (see 3.2.1 and 6.5).

3.2.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3 Form. The wrapping paper shall be furnished in flat cuts or in rolls as specified in the contract or order (see 6.2)

3.3.1 Flat cuts. Flat cut sheets shall be 24 by 36 inches with a tolerance of ±1/8 inch in each direction.

3.3.2 Rolls. Rolls shall be either 24 or 36 inches wide (see 6.2) with a tolerance of ±1/8 inch. Roll length shall be 100 yards or multiples thereof. Roll length tolerance shall be +6 inches and -0 inches per 100 yards. The roll material shall be uniformly wound on non-returnable cores. The core inside diameter shall be not less than 3 inches with a tolerance of +1/16 inch. The length of the core shall be equal to the width of the roll material with a tolerance of +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. No roll shall contain more than two splices (3 pieces) and no piece shall be less than 20 yards in length. Splices shall be even and neat across the entire width of the roll and shall not come apart during unwinding of the roll. Splices shall be flagged at both ends of each splice with colored markers.

3.4 Basis weight. The wrapping paper shall be furnished in the basis weights specified in table I (see 6.2).

3.5 Identification. Wrapping paper shall be marked by continuous longitudinal blue stripes. The color shall conform to FED-STD-595, color number 35231. Minimum width of stripes shall be 1/8 inch. Spacing between stripes shall be 6 inches ±1/2 inch. Stripes shall be applied either during manufacture or prior to creping. Stripes shall be parallel to each other and to the machine direction of the material. The stripe color shall be distinct and permanent.

3.6 Workmanship. The wrapping paper shall be uniform, free from holes, tears, sharp creases, cuts, or other imperfections.

3.7 Performance requirements. The wrapping paper shall meet the performance requirements specified in table I, when tested in accordance with 4.5.

TABLE I. Performance requirements.

Property	Requirement	Test paragraph reference
Basis Weight	Stipulated basis weight verified	4.5.1
Bursting Strength		4.5.1
Type I		
30 Basis wt	21 pts (min)	
50 Basis wt	35 pts (min)	
80 Basis wt	56 pts (min)	
Type II		
35 Basis wt	14 pts (min)	
50 Basis wt	20 pts (min)	
70 Basis wt	27 pts (min)	
Tearing Resistance		4.5.1
Type I		
30 Basis wt	45 grams (min avg) (each direction)	
50 Basis wt	90 grams (min avg) (each direction)	
80 Basis wt	160 grams (min avg) (each direction)	
Type II		
35 Basis wt	90 grams (min avg) (each direction)	
50 Basis wt	130 grams (min avg) (each direction)	
70 Basis wt	160 grams (min avg) (each direction)	
Tensile Breaking Strength		4.5.1
Type I		
30 Basis wt	10 lbs/in. width (min avg) (each direction)	
50 Basis wt	18 lbs/in. width (min avg) (each direction)	
80 Basis wt	35 lbs/in. width (min avg) (each direction)	
Type II		
35 Basis wt	8 lbs/in. width (min avg) (each direction)	
50 Basis wt	10 lbs/in. width (min avg) (each direction)	
70 Basis wt	18 lbs/in. width (min avg) (each direction)	
Elongation (type II only)	Not less than 20% elongation in creped direction	4.5.1
Contact Corrosivity	No induced corrosion in the contact area	4.5.1
Spring Back		4.5.2
Type I	Less than 70° of spring back in each direction (avg)	
Type II	Less than 70° of spring back in creped direction only (avg)	
Hydrogen Ion Concentration	pH not less than 6.5 and not greater than 7.5 (avg)	4.5.3

4. VERIFICATION

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

a. First article inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 First article inspection. First article inspection shall consist of all examinations and tests of this specification.

4.3 Conformance inspection. Conformance inspection shall consist of the required tests listed in table II and the examinations specified in 4.3.2.1.

TABLE II. Conformance tests.

Test	Paragraph
Basis Weight	4.5.1
Bursting Strength	4.5.1
Tearing Resistance	4.5.1
Tensile Breaking Strength	4.5.1
Elongation (Type II only)	4.5.1
Spring Back	4.5.2
Hydrogen Ion Concentration	4.5.3

4.3.1 Sampling for conformance inspection. Unless otherwise specified in the contract or order, sampling for inspection shall be performed in accordance with the provisions specified in ASQ-Z1.4 (see 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 reams (500 sheets) of flat stock for examinations specified in 4.3.2.1.

4.3.2.1 Examination of the end item for form, identification, and workmanship. The sample unit for the end item shall be one roll or one ream. The sample unit shall be visually inspected and measured to ensure it meets the requirements specified in 3.3, 3.5, and 3.6.

4.4 Test conditions. Unless otherwise specified in the test methods herein, tests shall be conducted in an atmosphere having a relative humidity of 50 ±5 percent and a temperature of 70 to 76 °F. Material shall be considered in equilibrium after exposure to these conditions for a minimum of 24 hours.

4.5 Verification of performance requirements.

4.5.1 Standard test methods. The tests listed in table III shall be conducted in accordance with the specified test methods.

TABLE III. Test methods.

Tests	Test method	Special requirement or exception note
Basis Weight	TAPPI T410	1/
Bursting Strength	TAPPI T403	2/
Tearing Resistance	TAPPI T414	3/
Tensile Breaking Strength	TAPPI T494	
Elongation (Type II only)	TAPPI T494	4/
Contact Corrosivity	MIL-STD-3010, Method 3005	5/ 6/

1/ Sample size shall be five sheets, each measuring 24 by 36 inches. Basis weight shall be verified by extrapolation to a ream quantity.

2/ Sample size shall be six specimens. Test shall be conducted three times with material face-up and three times face-down. All samples must meet the requirement.

3/ Sample size shall be ten specimens, five from each principal direction of the material.

4/ Test in creped direction only.

5/ The following test surface shall be used for testing and shall be exposed for 72 hours:

- Brass per ASTM-B121
- Cadmium per A-A-51126
- Copper per ASTM-B133
- Zinc per MIL-A-18001
- Aluminum per ASTM-B209
- Magnesium per SAE-AMS4375
- Nickel per ASTM-A265

6/ Light brown, purplish, pinkish, bluish or “peacocking” staining and other discoloration of the copper panels normally associated with oxidation of copper shall not be considered cause for final rejection of the material. In case of apparent corosion on copper panels, a sodium azide-iodine test shall be conducted to check for the presence of sulfur bearing compounds on the panels. A drop of freshly prepared sodium azide-iodine solution, prepared by dissolving 1.3 g of iodine and 4 g of potassium iodide in 100 ml of water to which is added 3 g of sodium azide to the mixture, shall be placed in the test panels. An immediate and profuse deverlopment of gas, in the form of tiny bubbles rising through the liquid, indicates a positive test for sulfides. A magnifying glass or microscope is necessary for observing the bubble formation. A slow steady evolution of scattered bubbles is not a positive test for sulfides.

4.5.2 Spring back. Cut ten strips, each 2 inches by 8 inches, in both the machine and cross machine direction of representative sample sheets. Lay the specimen on a hard smooth surface and fold, without creasing, 2 inches of the strip onto itself. Gently place a 1-pound flat bottom weight, 1-3/4 inches in diameter on the fold. The weight shall be centered on the fold. After 30 seconds, gently remove the weight and, by means of a protractor, determine the angle of spring back 30 seconds after removing the weight. Determine the spring back angle for ten specimens in each direction of the paper, testing five in each direction for each side of the paper. Record the average in each direction.

4.5.3 Hydrogen Ion concentration (pH). Place 5 grams of air-dried shredded neutral paper in a 500 milliliters (mL) heat resistant Pyrex Erlenmeyer (or equivalent) flask and add 250 mL of boiling distilled or deionized water free of CO_2 and having a pH between 6.7 and 7.1. To avoid the tendency of the fibers to float on the surface, the flask shall be well shaken. Attach a water-cooled condenser and reflux gently for one hour with occasional shaking to ensure that all of the fibers are immersed in the water. Stopper the flask, then cool the solution to test conditions. Determine the pH of the extract electrometrically, using a glass or quinhydrone electrode and calomel cell, or colorimetrically, using isohydric indicators. The average of three separate tests shall be determined. Electrometric determination of pH is preferred for control testing.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD 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 chemically neutral, non-corrosive wrapping paper covered by this specification is intended for use in specialized military methods of preservation. MIL-DTL-17667 is a premier material required for the Navy's Prime Program. It provides a neutral wrap or cushioning material for unique Navy plastic disposal requirements in a marine environment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

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

b. Type of material (see 1.2).

c. When first article inspection is required (see 3.1).

d. If material should be furnished in rolls or flat cuts, and the required size of each (see 3.3).

e. Basis weight of material (see 3.4).

f. Packaging requirements (see 5.1).

6.3 First article test samples. Samples for first article inspection should consist of a sample of the wrapping material which has been produced by the contractor using the same production process, procedures, and equipment that is going to be used in fulfilling the contract.

6.4 Conformance inspection lot. For purposes of sampling, an inspection lot for examinations and tests should consist of all material made by the same process from the same components by one manufacturer and submitted for delivery at one time.

6.5 Reclaimed fiber. Reclaimed fiber is fiber collected from solid waste, or from waste collected as a result of an agricultural or manufacturing process, but not including material generated from and reused within the plant as a part of its own papermaking process. The papermaking process is the manufacturing process of producing paper up to and including the cutting and trimming of the machine reel into smaller rolls or rough sheets.

6.6 Subject term (key word) listing.

Corrosion protection
Packaging
Preservation

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

Custodians:
Army – SM
Navy – AS

Preparing activity:
Navy – AS

(Project 8135-0743)

Review activities:
Army – AT, EA, GL3, MI
Navy – MC, OS, SA, SH
Other – DS
DLA - GS

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.