

INCH POUND
MIL-PRF-50449C (AR)
17 September 1997
SUPERSEDING
MIL-F-50449B (AR)
06 JULY 1988

PERFORMANCE SPECIFICATION

FILLER, SHEET FORM

(LAMINATED PAPER, FOR USE IN AMMUNITION CONTAINERS)

This specification is approved for use by the U.S. Army Armament Research, Development and Engineering Center, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers solid, water resistant sheet material for use as a filler or as a cushioning pad inside containers of ammunition during transportation and storage.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are needed to meet the requirements specified in sections 3 and 4 of this specification. This section does not include documents 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 requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document, should be addressed to: Commander, U.S. Army TACOM-ARDEC, ATTN: AMSTA-AR-EDE-S, Picatinny Arsenal, NJ 07806-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8135

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

MIL-PRF-50449C (AR)

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D 685 - Standard Practice for Conditioning Paper and Paper Products for Testing

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Bar Harbor Drive, West Conshohocken, PA 19420-2959).

2.3 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. (See contract provisions for additional precedence criteria).

3. REQUIREMENTS

3.1 First article. When specified in the contract or purchase order (See 6.2), a sample shall be subjected to first article inspection in accordance with the technical provisions herein (See 4.3).

3.2 General requirements.

3.2.1 Interface requirements.

3.2.1.1 Materials. Coated paper products or any other material shall be used provided all requirements specified herein are met.

a. The material shall produce a smooth and even sheet meeting dimensional requirements of this specification or purchase order. (see 6.2)

b. The material selected is certified as being chemically neutral, non-reactive, non-static, non-hazardous, and not able to generate any hazardous products when in use. (see 6.2)
Certification is not required for paper products.

c. The material is non-metallic (except for any metal foils used in paper lamination which are acceptable).

d. The material shall be of a clean and uniform appearance and shall not be contaminated with foreign materials such as grease, dirt, or oil.

MIL-PRF-50449C (AR)

3.2.1.2 Physical characteristics. The finished sheet shall have a thickness of .062 inch with a tolerance of +.010 inch and -0.008 inch. Unless otherwise specified in the contract or order, finished sheets shall be furnished in sheets that are 40 inches by 48 inches with a tolerance of plus or minus 1/8 inches. Finished sheets shall be sound and free of metal inclusions and odors not normally associated with the chemical composition of the finished material.

3.2.2 Environmental Requirements.

3.2.2.1 Water absorption. The finished sheet shall have a maximum water absorption of 15 percent by weight and shall show no delamination after being submerged under water for a minimum of 48 hours.

3.2.2.2 Stability. The finished sheet shall not delaminate, become tacky, ooze, blister, or show any evidence of off-gassing after being subjected to a temperature of 160 degrees F for 24 hours minimum.

3.2.2.3 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.

3.2.3 Operating Requirements.

3.2.3.1 Color. The finished sheet shall be of a dark non-reflective coloration. Black, gray, brown, or dark green are acceptable. The material may also be of natural kraft paper coloration.

3.2.3.2 Fracture. The finished sheet shall be capable of bending in both directions without cracking or delamination.

3.2.3.3 Stiffness. The finished sheet shall not exceed the permissible drape of 40 degrees.

4. VERIFICATION

4.1 General provisions. The inspections (examinations and tests) herein shall be performed to determine whether or not the item conforms to section 3 of this specification. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

MIL-PRF-50449C (AR)

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

- a. First article inspection (see 4.3)
- b. Conformance inspection (see 4.4).

4.2.1 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified herein.

4.3 First article inspection.

4.3.1 Submission. The contractor shall submit a first article sample as designated by the Contracting Officer for evaluation in accordance with provisions of 4.3.2. The first article samples shall consist of ten (10) sample sheets sufficient in size to perform the specified examinations and tests in the contract or purchase order (see 6.2).

4.3.2 Inspections to be performed. As determined by the Government, the first article assemblies, components and test specimens may be subjected to any or all of the examinations and tests specified in this specification. Unless otherwise specified, all the inspections in 4.4.2.1 shall be performed.

4.3.3 Rejection. If any test specimen fails to comply with any of the applicable requirements, the first article sample shall be rejected. The Government reserves the right to terminate inspection upon any failure of a test specimen to comply with any of the requirements.

4.4 Conformance inspection.

4.4.1 Inspection lot formation. The term "inspection lot" is defined as a homogeneous collection of units of product (i.e. 40 inch by 48 inch sheets) from which a representative sample is drawn or which is inspected 100 percent to determine conformance with applicable requirements. Units of product selected for inspection shall represent only the inspection lot from which they are drawn and shall not be construed to represent any prior or subsequent quantities presented for inspection. Homogeneity shall be considered to exist provided the inspection lot has been produced by one manufacturer, in one unchanged process, using the same materials and methods, in accordance with the same specification revisions. All material submitted for inspection in accordance with this specification shall comply with the homogeneity criteria specified herein, regardless of the type of inspection procedure which is being applied to determine conformance with requirements.

MIL-PRF-50449C (AR)

4.4.2 Examinations and tests.

a. Classification of characteristics. Conformance examinations and tests are specified in the following Classification of Characteristics paragraphs. The contractor's quality program or detailed inspection system shall provide assurance of compliance of all characteristics with the applicable specification requirements utilizing as a minimum the conformance criteria specified. When cited herein, attributes sampling inspection shall be conducted in accordance with TABLE I below, using the inspection levels stated in the classification of characteristics paragraphs.

For the classification of characteristics, the following definitions apply:

Critical - A critical defect is a defect that judgment and experience indicate would result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the product, or a defect that judgment and experience indicate is likely to prevent performance of the tactical function of a major end item such as a tank, land vehicle, missile, aircraft, artillery, or other major weapon system.

Major - A major defect is a defect that is likely to result in failure, or to reduce materially the usability of the unit of product for its intended purpose.

Minor - A minor defect is a defect that is not likely to reduce materially the usability of the unit of product for its intended purpose, or is a departure from established standards having little or no bearing on the effective use or operation of the product.

TABLE I. ATTRIBUTES SAMPLE INSPECTION.

Lot Size (No. of Sheets)	<u>Inspection Levels</u>	
	I	II
2 to 50	5	3
51 to 150	13	5
151 to 1200	20	8
1201 to 10000	32	13
10001 to 500000	50	13
500001 and over	50	13

If sample size exceeds lot size, perform one hundred percent inspection. Accept on zero and reject on one or more for all inspection levels.

**CONFORMANCE INSPECTION
CLASSIFICATION OF CHARACTERISTICS**

MIL-PRF-50449C (AR)

PARAGRAPH	TITLE	SHEET 1 OF 1		DRAWING NUMBER Not applicable NEXT HIGHER ASSEMBLY
		EXAMINATION OR TEST	CONFORMANCE CRITERIA	
4.4.2.1	Filler, Sheet Form			
CLASSIFICATION				INSPECTION METHOD REFERENCE
<u>Critical</u>	None defined			
<u>Major</u>	Water absorption (see note)	Level I	3.2.2.1	4.5.1
101	Stability	Level I	3.2.2.2	4.5.2
102	Fracture	Level I	3.2.3.2	4.5.3
103	Stiffness	Level I	3.2.3.3	4.5.4
104	Thickness	Level I	3.2.1.2	Gage
105	Length	Level I	3.2.1.2	Scale
106	Width	Level I	3.2.1.2	Scale
<u>Minor</u>	Color	Level II	3.2.3.1	Visual
201	Evidence of poor material	Level II	3.2.1.1	Visual
202				
NOTES: If there is sufficient material in a given sample, that sample may be used for more than one test. For each test, there must be only one specimen from a given sample.				

MIL-PRF-50449C (AR)

b. Alternative conformance provisions. Unless otherwise specified herein or provided for in the contract, alternative conformance procedures, methods or equipment, such as statistical process control, tool control, variables sampling or other types of sampling plans, etc., may be used by the contractor when they provide, as a minimum, the level of quality assurance required by the provisions herein. Prior to applying such alternative procedures, methods or equipment, the contractor shall describe them in a written proposal submitted to the Government for evaluation (see 6.5). When required, the contractor shall demonstrate that the effectiveness of each proposed alternative is equal to or better than the specified conformance provision(s) herein. In case of dispute as to whether the contractor's proposed alternative(s) provides equivalent assurance, the provisions of this specification shall apply. All approved alternative provisions shall be specifically incorporated in to the contractor's quality program or inspection system, as applicable.

4.4.3 Testing.

4.4.3.1 Conditioning. Unless otherwise specified, all specimens shall be brought to equilibrium in a circulation atmosphere maintained at a relative humidity and a temperature specified in ASTM D685.

4.5 Methods of Inspection. (see 6.3)

4.5.1 Water absorption. Thoroughly condition (see 4.4.3.1) specimens measuring 6 inches by 12 inches (min.) and then weigh them. Immediately thereafter immerse the specimens in clear tap water (ph 6.5 to 7.5) at room temperature for 48 hours minimum. Surface dry the specimens and reweigh them. Compute the moisture gain as a percentage of pre-immersion weight.

4.5.2 Stability. Thoroughly condition (see 4.4.3.1) specimens measuring 6 inches by 10 inches min. and place in an oven (without ingress or egress of air) at 160 plus or minus two degrees Fahrenheit and at a relative humidity of 10 percent maximum, for a period of 24 hours minimum. Remove the specimen from the oven and allow to stand for one hour at a temperature of 70 plus or minus five degrees Fahrenheit and a relative humidity of 50 plus or minus two percent. Examine for visible evidence of delamination, oozing, blistering, tacky surface, or any evidence of outgassing.

4.5.3 Fracture. Prepare ten specimens (five cut in the machined direction and five cut in the cross-machined direction) for this test. Condition the finished sheet to a minimum temperature of minus 20 degrees Fahrenheit for a period of 24 hours minimum. Upon completion of conditioning, the board specimens, measuring 4 inches by 12 inches, shall be bent around a mandrel 180 degrees with a radius equal to 96 times the thickness of the specimen. Failure of one or more specimens to

MIL-PRF-50449C (AR)

meet the applicable requirements shall be cause for the lot to be rejected.

4.5.4 Stiffness. Prepare and thoroughly condition (see 4.4.3.1) test specimens measuring 6 inches minimum by 18 inches minimum. Immediately upon removal from the conditioning chamber, position the test specimens on a table allowing 12 inches of the smaller width to extend off of the table. Apply a load, sufficient in weight to prevent movement of the specimen, to the base of the extended position (see Figure 1). Measure the angle of drape at both ends of the extended portion using standard measuring equipment. The lot will be considered rejected if either of the two sides of the specimen (draped portion) exceeds the specified requirements.

4.5.5 Inspection equipment. The inspection equipment required to perform the inspections specified herein is identified in the "Inspection Method Reference" column of the Classification of Characteristics listings starting with 4.4.2.1. Contractor inspection equipment designs shall be submitted for Government approval as specified in the contract. Designs which provide variable measurements instead of attributes data are preferred in order to facilitate the use of statistical process control. See paragraph 6.4 herein.

5. PACKAGING

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

MIL-PRF-50449C (AR)

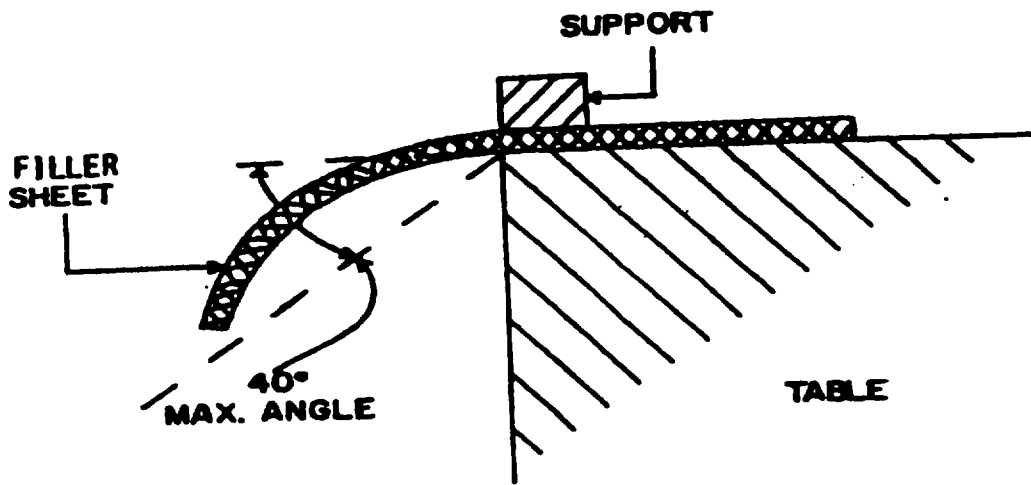


FIGURE 1. Setup for stiffness test.

MIL-PRF-50449C (AR)

6. NOTES

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

6.1 Intended use. Filler sheets are designed for cutting into filler pads for use where water resistant material is required and where resistance to dimensional change under compression, rather than resiliency, is important. The fillers must function over a service life of 20 years under adverse (hot, cold, high humidity) environments without degrading to the point where they are unusable. Under this specification, plastic materials, paper or fiberboard, combinations of both or any other material capable of meeting all the requirements specified herein are acceptable. Material that has historically been submitted under this specification and that has been found to meet all requirements has been paperboard or kraft paper laminated with an outer plastic waterproof layer.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and, if required the specific issue of individual documents referenced (see 2.3).
- c. Requirements for submission of first article sample.
- d. Requirements for submission of inspection equipment designs.
- e. Sheet dimensions other than 40 inches by 48 inches or other than .0625 inches thick.
- f. Material certification requirements for materials other than paper.

6.3 Equivalent test methods. Prior approval of the Contracting Officer is required for use of equivalent test methods. A description of the proposed method should be submitted through the Contracting Officer to: Commander, U.S. Army TACOM-ARDEC, ATTN: AMSTA-AR-QAT-P, Picatinny Arsenal, NJ 07806-5000. This description should include, but not be limited to the accuracy and precision of the method, test data demonstrating the accuracy and precision, and drawings of any special equipment required.

MIL-PRF-50449C (AR)

6.4 Submission of contractor inspection equipment designs for approval. Submit copies of designs as required to: Commander, U.S. Army TACOM-ARDEC, ATTN: AMSTA-AR-QAT-P, Picatinny Arsenal, NJ 07806-5000. The address will be specified on the Contract Data Requirements List, DD Form 1423 in the contract.

6.5 Submission of alternative conformance provisions. All contractor proposed alternative conformance provisions will be submitted to the Government for evaluation/approval as directed by the contracting activity.

6.6 Subject term (key word) listing.

Laminate
Packaging material
Paperboard
Spacer

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

Custodian:
ARMY - AR

Preparing activity:
ARMY - AR

Project Number: 8135-0710

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-50449C	2. DOCUMENT DATE (YYMMDD) 970917
3. DOCUMENT TITLE Filler, Sheet Form (Laminated Paper, For Use in Ammunition Containers)		
4. NATURE OF CHANGE (<i>Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.</i>)		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME (<i>Last, First, Middle Initial</i>)	b. ORGANIZATION	
c. ADDRESS (<i>Include Zip Code</i>)	d. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (2) AUTOVON (<i>if applicable</i>)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY		
a. NAME U. S. Army ARDEC	b. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (2) AUTOVON (201) 724-6671	(2) AUTOVON 880-6671
c. ADDRESS (<i>Include Zip Code</i>) ATTN: AMSTA-AR-EDE-S, B-12 Picatinny Arsenal, NJ 07806-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	