

**MIL-B-51097B****30 SEPTEMBER 1964****SUPERSEDING****MIL-B-51097A(MU)****24 APRIL 1964**

## MILITARY SPECIFICATION

# BACKING MATERIAL, C18

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

### 1. SCOPE

1.1 This specification covers one type of backing material.

PPP-T-97 — Tape, Pressure-Sensitive Adhesive, Filament Reinforced.

### 2. APPLICABLE DOCUMENTS

2.1 Government documents. The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

#### MILITARY

MIL-A-101 — Adhesive, Water-Resistant, for Sealing Fiberboard Boxes.

MIL-A-140 — Adhesive, Water-Resistant, Waterproof Barrier-Material.

### SPECIFICATIONS

#### FEDERAL

UU-P-268 — Paper, Kraft, Untreated, Wrapping.

UU-P-271 — Paper, Wrapping, Waterproofed Kraft.

PPP-F-320 — Fiberboard: Sheet, Stock and Cut Shapes.

PPP-P-291 — Paperboard, Wrapping, Cushioning.

PPP-T-76 — Tape, Pressure-Sensitive Adhesive, Paper, (For Carton Sealing).

#### STANDARDS

##### MILITARY

MIL-STD-105 — Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-129 — Marking for Shipment and Storage.

MIL-STD-282 — Filter Units, Protective Clothing, Gas Mask Components and Related Products: Performance Test Methods.

(Copies of specifications, standards, drawings, and publications required by suppliers in connection

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**5.2 Marking.** In addition to any special marking required by the contract or order, shipments shall be marked in accordance with MIL-STD-129.

**5.2.1 Special marking.** The following special marking shall be minimum 1-inch high letters, and shall be applied in two places on the body of the roll in such location so as not to interfere with other specified markings:

"FRAGILE, HANDLE WITH CARE,  
DO NOT DROP"

**6. NOTES**

**6.1 Intended use.** This specification covers backing material intended to be used as a component of Gas-Aerosol Filter Material, C18.

AAA 475-106 J-M glass fibers .....	15 percent by weight
Vinyon HH (1/8 or 1/4-inch staple, 3 denier) .....	42.5 percent by weight
Viscose rayon (1/4-inch staple max, 11/2 denier .....	42.5 percent by weight

**6.4 Water repellency.** Any satisfactory method for the application of water repellent compound to the backing material may be used after approval by the procuring agency. An approved method is described in Edgewood Arsenal Directive 233A.

**6.5** For non-military procurement, approval shall be obtained from the procuring agency.

**6.6 Significant places.** For the purpose of determining conformance with this specification, an observed or a calculated value shall be rounded off "to the nearest unit" in the last right-hand place of figures used in expressing the limiting value, in accordance with the rounding-off method of the Recommended Practices for Designating

**6.2 Ordering data.** Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Roll width and diameter including tolerances.
- (c) Responsibility for treatment for water repellency and for approval of water repellency method.
- (d) Level of packing required.
- (e) Percent DOP penetration and air-flow resistance (see 6.7).

**6.3 Composition.** The following materials have been found to be satisfactory:

Significant Places in Specified Limiting Values (ASTM Designation: E29).

**6.7 International interest.** Certain provisions of this specification are the subject of ABC standardization agreement. When amendment, revision, or cancellation of this specification is proposed, the departmental custodians will inform their respective Departmental Standardization Offices so that appropriate action may be taken with respect to the international agreement concerned.

**6.8 Core and backing material.** Core and backing materials having the following physical properties are recommended for the manufacture of type II or III C18 Gas Aerosol Filter Material covered by MIL-F-51095.

TABLE I. *Physical properties* (Cont'd)

Property	Requirement	Test method
** Water repellency, inches .....	8 (min)	4.6.3
Average tensile strength, lbs/in width		4.6.4
machine direction .....	1.5 (min)	
cross direction .....	1.0 (min)	
***Basis weight, lbs/3000 sq. ft. ....	70 to 80	4.6.5
Moisture content, % .....	5.0 (max)	4.6.6

\* The Government or contractor, whichever is applicable, shall specify the air resistance and DOP smoke penetration at the time of procurement (see 6.2 and 6.8).

\*\* Responsibility for treatment for water repellency and approval of method shall be specified in the contract or order (see 6.2).

\*\*\* The basis weight of two consecutive samples, taken five minutes apart without adjustment to the equipment, shall be determined at the start of production. The material on the reel shall be flagged to indicate the start of acceptable material.

#### 4. QUALITY ASSURANCE PROVISIONS

**4.1 Responsibility for inspection.** Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

#### 4.2 Special provisions.

**4.2.1 Alternative inspection.** The supplier may utilize any alternative inspection procedure which will provide equal or better assurance of quality by submitting a written proposal with justification and obtaining written approval from the Government or procuring agency (see 6.5) prior to instituting the procedure. In case of dispute, the procedures of this specification will govern.

**4.2.2 Objective evidence.** The supplier shall provide evidence acceptable to the contracting officer that the requirements of 3.1, 3.3 and section 5 have been satisfied.

**4.2.3 Inspection substations.** If the supplier elects to establish inspection substations for the purpose of conducting inspection for certain listed defects, the Acceptable Quality Levels (AQL's) for each inspection substation shall be equal to the AQL which is the next numerically lower value than the AQL specified for the total listed defects. The requirements of MIL-STD-105 are applicable to each substation and to the end item.

**4.3 Lotting.** A lot shall consist of the backing material produced during one work shift not to exceed 12 hours, by one manufacturer, from the same materials, and under essentially the same manufacturing conditions.

#### 4.4 Sampling.

**4.4.1 For examination.** A six-foot long sample, full width, shall be taken from

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each roll. Each sample shall be identified with the roll represented.

4.4.2 *For tests.* An appropriate size strip shall be taken across the width of each sample (4.4.1). Each strip shall be divided into specimens which shall be identified with the roll represented.

**4.5 Examination.**

4.5.1 *Rolls.* Prior to reeling, a visual examination of the backing material shall be conducted over a source of light under the full width of the reel. Ten square yards representing each component roll shall be examined for defects in accordance with table II. Re-examination shall be made on an additional 10 square yards if permitted by table II. In addition, each 6-foot sample shall be examined over a light box in accordance with table II, except that re-examination shall not be allowed.

4.5.2 *Preparation for delivery.* Sample reels shall be examined for the level B prep-

aration for delivery requirements in accordance with the classification of defects and with MIL-STD-105.

4.5.2.1. *Classification of defects.*4.5.2.1.1 *Preparation for delivery.*

<i>Categories</i>	<i>Defects</i>
<i>Critical:</i>	None Defined
<i>Major:</i>	AQL 2.5 percent defective
101	Spirally wound core not as specified.
102	Initial, intermediate or final wrap not as specified.
103	Circular pack not as specified.
104	Circular pads missing or incorrectly placed.
105	Sealing material missing or inadequate.
106	Marking missing, incorrect or illegible.

TABLE II. *Examination*

Defects	Number of defects		Action per roll
	1st sample	1st and 2nd sample combined	
Tears, punctures, holes, pickouts or pull-aparts (exceeding 1/16 inch)	1	2	Accept
	2		Re-examine
	3 or more	3	Reject
Thick or thin spots .....	1	2	Accept
	2		Re-examine
	3 or more	3	Reject
Burn holes, charring or scorching .....	0 (max)		Accept
Wrinkles .....	0 (max)		Accept
Pills or fiber agglomerates greater than 3/16 inch....	10/square foot (max)		Accept
Transparencies (maximum dimension at least 1/4 inch.	1/square foot (max)		Accept
Contamination, foreign matter, having an area exceeding 1/4 inch by 1/4 inch.	1		Accept
	2		Re-examine
	3 or more		Reject

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**4.6 Tests.** Each roll sample taken as specified in 4.4.2 shall be tested in accordance with table III. Test specimens shall be taken at random from each sample.

**4.6.1 Airflow resistance and DOP smoke**

**penetration.** The test specimens (5¼-inch diameter discs) shall be tested for airflow resistance and DOP smoke penetration at a flow rate of 32 liters per minute, using the Edgewood Arsenal Q127 DOP Filter Testing Penetrometer.

TABLE III. Tests

Test	Test paragraph	Test specimens at each end of roll*	Defective specimens at same end	Action per roll	Retest specimens at end that failed	Total defective specimens	Action per roll
Airflow resistance and DOP smoke penetration.	4.6.1	3	0	Accept		1	Accept
			1	Retest			
			2	Reject	3	2	Reject
Thickness .....	4.6.2	3	0	Accept		1	Accept
			1	Retest	3		
			2	Reject		2	Reject
Water repellency .....	4.6.3	3	0	Accept		1	Accept
			1	Retest	3		
			2	Reject		2	Reject
Tensile strength .....	4.6.4	3 in each direction	Reject the roll if the average in either direction does not meet the tensile strength requirement.				
Basis weight .....	4.6.5	2	0	Accept		1	Accept
			1	Retest	2		
			2	Reject		2	Reject
Moisture content .....	4.6.6	1	0	Accept		0	Accept
			1	Retest	2	1	Reject

\* If the end of one roll is adjacent to the beginning of the following roll, specimens need be taken only at one end and the results used for both rolls.

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**4.6.2 Thickness.** Thickness of the test specimens shall be determined in accordance with Method C of ASTM D645, except that conditioning of specimens shall be omitted. Three determinations shall be made on each specimen and the average reported as the thickness.

**4.6.3 Water repellency.** The test specimens (2¾ by 5½-inch rectangles) shall be tested for water repellency in accordance with method 603.1 of MIL-STD-282. The two surfaces of each test specimen shall be identified as top and bottom. The specimen shall then be cut into two equal squares. The top surface of one square and the bottom surface of the other square shall be tested. The lesser of the two results shall be considered the water repellency of the specimen.

**4.6.4 Tensile strength.** Tensile strength of the test specimens shall be determined in accordance with ASTM D828 except that conditioning of specimens shall be omitted.

**4.6.5 Basis weight.** Basis weight shall be determined in accordance with ASTM D646, except the conditioning of specimens shall be omitted.

**4.6.6 Moisture content.** Each test specimen (5¼-inch diameter disc) shall be weighed to the nearest 0.01 gram (wet weight). The specimens shall be placed in a forced air drying oven at 105° to 110°C. until constant dry weight is reached. The final weighing (dry weight) shall be recorded to the nearest 0.01 gram. The percent moisture shall be calculated as follows:

$$\text{Per cent moisture content} = \frac{100 (\text{wet weight} - \text{Dry weight})}{\text{wet weight}}$$

**5. PREPARATION FOR DELIVERY**

**5.1 Packing.** Levels shall be as specified (see 6.2).

**5.1.1 Level B.** The material shall be wound evenly on a spirally wound minimum ¾ inch thick wall hollow core constructed of fiberboard or other suitable material having an inside core diameter of  $3 \pm \frac{1}{8}$  inch. Individual rolls of material shall have an initial wrap of grade B, 40 pound basis weight Kraft wrapping paper conforming to UU-P-268, secured in place with minimum two-inch wide pressure-sensitive tape conforming to PPP-T-76. Each roll shall then have an intermediate wrap, consisting of a minimum of three complete wraps of type III, class 2, paperboard, conforming to PPP-P-291, secured in place with the tape cited above. Four circular pads, fabricated from type CF, class weather-resistant, variety SW, grade V3c fiberboard, conforming to PPP-F-320, laminated together with water-resistant adhesive, conforming to

MIL-A-101, shall be placed at each end of the wrapped roll. The diameter of the circular fiberboard pads shall be the same as the overall diameter of the intermediate wrapped rolls. Each circular fiberboard pad shall be secured in place with a minimum of ten strips of 2 inch wide by 12 inch long pressure sensitive tape, conforming to type IV of PPP-T-97, equally spaced around the circumference of the fiberboard pad. Each roll shall then be overwrapped with class E-3 or M-3 waterproofed kraft wrapping paper conforming to UU-P-271, sealing all folds, laps, and seams in place with water-resistant adhesive conforming to MIL-A-140.

**5.1.2 Level C.** The material shall be packed to insure carrier acceptance and safe delivery at first domestic destination. Containers shall comply with Uniform Freight Classification ratings, rules and regulations of other carriers applicable to the mode of transportation.

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Percent of each shipment	Core material		Backing material			
	For type II or III		For type II		For type III	
	Percent DOP	Air resistance	Percent DOP	Air resistance	Percent DOP	Air resistance
85 min	70 max	2.7 max	5 max	13 max	8 max	12 max
15 max	80 max	3.0 max	8 max	14 max	10 max	13 max

**Custodian:**

Army—MU

Navy—SH

Air Force—84

**Preparing activity:**

Army—MU(EA)

Project No. 4240-0055

**International interest (see 6.7)****Review activities:**

Army—MD

Navy—SH

**User activities:**

Navy—MC

Air Force—84

**NOTICE OF INACTIVATION  
FOR NEW DESIGN**

**INCH-POUND**

**MIL-B-51097B  
NOTICE 1  
11 March 1996**

**MILITARY SPECIFICATION**

**BACKING MATERIAL, C18**

This notice should be filed in front of MIL-B-51097B  
dated 30 September 1964.

MIL-B-51097B is inactive for new design and is no longer used except for replacement purposes.

**Custodian:**

Army - EA  
Navy - SH  
Air Force - 84

**Preparing activity:**

Army - EA  
  
(Project 4240-0629)

**Review Activities:**

Army - MD  
Navy - MC

AMSC N/A

FSC 4240

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