

MIL-S-52333B  
4 January 1984  
SUPERSEDING  
MIL-S-52333A  
19 January 1970

MILITARY SPECIFICATION

SLEEVES, FILTER ELEMENT; WATER PURIFICATION UNITS

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

1. SCOPE

1.1 Scope. This specification covers three sizes of filter element sleeves for diatomite-type filters.

1.2 Classification. The filter element sleeves shall be of the following sizes:

<u>Size</u>	<u>Application</u>
1	Water purification unit, trailer-mounted, 600 gph
2	Water purification units: (1) Van-type body-mounted, 1,500 and 3,000 gph (2) Base-mounted, 3,000 gph
3	Water purification unit, 420 gph

1.2.1 Part number. Specification part numbers for item described in this specification will be formulated as shown in paragraph 6.7.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA Belvoir Research and Development Center, ATTN: STRBE-DS, Fort Belvoir, VA 22060 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

SPECIFICATIONS

FEDERAL

- QQ-S-781 - Strapping, Steel, and Seals.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-636 - Box, Shipping, Fiberboard.

MILITARY

- MIL-B-131 - Barrier Material, Water Vaporproof, Flexible, Heat Sealable.

STANDARDS

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-1188 - Commercial Packaging of Supplies and Equipment.

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM D412 - Rubber Properties in Tension.
- ASTM D832 - Practice for Rubber Conditioning for Low Temperature Testing.
- ASTM D2240 - Test for Rubber Property - Durometer Hardness.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

National Interim Primary Drinking Water Regulations (EPA NIPDWR).

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.)

UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS)

Food and Drug Administration (FDA)

Public Health Service Drinking Water Standards.

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.)

(Copies of specifications, standards, and drawings required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

### 3. REQUIREMENTS

3.1 Description. The filter element sleeves shall be as shown on figure 1 and as specified herein.

3.2 First article. The contractor shall furnish nine filter element sleeves for examination and testing within the time frame specified, to prove, prior to starting production, that his production methods will produce filter element sleeves that comply with the requirements of this specification. Examination and tests shall be as specified in section 4, and shall be subject to surveillance and approval by the Government (see 6.3).

3.3 Material. Material shall be as specified herein and shall conform to Food and Drug Administration requirements for use with food products. The material shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the procuring activity to the Food and Drug Administration (FDA) or to the appropriate department medical service who will act as an advisor to the procuring agency (see 6.4).

3.3.1 Fungus-resistance. The sleeve material shall be inherently fungus-resistant or rendered fungus-resistant to prohibit propagation of fungi.

3.3.2 Polyvinyl chloride. Polyvinyl chloride material for filter element sleeves shall conform to the following:

Appearance	Translucent or opaque, color optional except that white or clear is not acceptable
Tensile strength, psi, minimum	1,250
Ultimate elongation, percent, minimum	300

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Tensile stress, psi, maximum at 100-percent elongation	600
Resistance to low temperature	Shall show no signs of cracking when bent back on itself at minus 20° F (minus 28.9° C).
Hardness, durometer: Initial (Shore A)	55 to 70

3.4 Heat and water immersion stability. When subjected to the testing procedures contained herein, the filter element sleeves shall meet the following criteria:

Heat stability, 1-1/2 hours at 212° F:

Size 1:

Length, inches, minimum	13-23/32
Length, inches, maximum	13-27/32
Diameter, inches, minimum	3.313
Diameter, inches, maximum	3.344

Size 2:

Length, inches, minimum	22-23/32
Length, inches, maximum	22-27/32
Diameter, inches, minimum	3.313
Diameter, inches, maximum	3.344

Size 3:

Length, inches, minimum	12-7/16
Length, inches, maximum	12-1/2
Diameter, inches, minimum	3.313
Diameter, inches, maximum	3.344

Water-immersion stability, distilled water at 73° F:

3-day immersion in distilled water:

Increase, percent maximum	1.0
Decrease, percent maximum	0.1

15-day immersion in distilled water:

Increase, percent maximum	1.5
Decrease, percent maximum	0.15

30-day immersion in distilled water:

Increase, percent maximum	1.8
Decrease, percent maximum	0.18

3.5 Performance. When subjected to the testing procedures contained herein, the filter element sleeves shall meet the following performance criteria:

- a. Produce filtered water having a turbidity not exceeding 0.2 turbidity unit determined with an EPA approved nephelometric turbidimeter.
- b. Precoat uniformly with no evidence of thin spots, bare spots, or corrugation.
- c. Withstand the normal backwashing pressure of approximately 50 psi without tearing of sleeve body or splitting of seams.
- d. After backwashing, no filter cake shall adhere to the filter element sleeve to the extent of covering a filtering area greater than 1/16 square inch.

3.6 Government-loaned property. A filter test assembly complete with accessories for testing all sizes of filter element sleeves will be loaned by the Government for tests specified in 4.3.2.3 (see 6.5).

3.7 Workmanship.

3.7.1 Sleeve fabrication. Perforations shall be free of all excess material. Seams shall be lap seams having a thickness not less than the thickness of the sleeve material. Lap seams shall be neatly joined, of uniform width and free of cracks, slits or extraneous material.

3.7.2 Cleaning. The filter element sleeves shall be cleaned of all dirt, grease and other contaminants. All test residue that would adversely effect the intended use of the sleeve shall also be removed. Cleaning shall be accomplished in a manner that will not leave a harmful residue. The filter element sleeves shall be completely dried before packaging.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by 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.

4.1.1 Material inspection. The contractor is responsible for insuring that materials used are manufactured, inspected and tested in accordance with referenced specifications and standards.

4.1.2 Inspection equipment. Special final inspection equipment shall be loaned to the contractor by the Government (see 3.6).

4.2 Classification of inspection. Inspection shall be classified as follows:

- a. First article inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).
- c. Inspection of packaging (see 4.6).

4.3 First article inspection.

4.3.1 Examination. A filter element sleeve shall be examined as specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.3.2 Tests.

4.3.2.1 Material tests. Samples of unperforated polyvinyl chloride material as used in the manufacture of filter element sleeves shall be tested in accordance with 4.5.2.1 and 4.5.2.5. Failure of any test shall be cause for rejection.

4.3.2.2 Heat and water immersion stability. Two filter element sleeves shall be tested in accordance with 4.5.2.3 and 4.5.2.4 respectively. Failure of any test shall be cause for rejection.

4.3.2.3 Operating tests. Six filter element sleeves shall be tested as specified in 4.5.2.6 through 4.5.2.6.6. Failure of any test shall be cause for rejection.

4.4 Quality conformance inspection.

4.4.1 Sampling.

4.4.1.1 For examination. Sampling for examination shall be in accordance with MIL-STD-105. Inspection level for examination of dimensions of perforations shall be S-2.

4.4.1.2 For tests.

4.4.1.2.1 Material. A sample of unperforated polyvinyl chloride material as used in the manufacture of filter element sleeves shall be furnished for each batch or lot of polyvinyl chloride material.

4.4.1.2.2 Heat and water immersion stability. Two filter element sleeves shall be furnished for each batch or lot of polyvinyl chloride material.

4.4.1.2.3 Performance. The first 24 sleeves produced shall be tested as specified in 4.4.3.3. If any of the first 24 sleeves is rejected, 100 percent testing shall be continued until 24 consecutive sleeves pass all tests. After 24 consecutive sleeves have passed the test, sampling shall be in accordance with level S-4 of MIL-STD-105 except that sample size shall be to the highest multiple of 6.

4.4.2 Examination. Samples selected in accordance with 4.4.1.1 shall be examined as specified in 4.5.1. AQL for the examination except dimensional examination of perforations shall be 1.5 percent defective. If any sample sleeve fails the dimensional examination of perforations, the lot represented by the sample shall be rejected.

4.4.3 Test.

4.4.3.1 Material. Samples selected in accordance with 4.4.1.2.1 shall be tested as specified in 4.5.2.1 and 4.5.2.5. Failure of any test shall be cause for rejection.

4.4.3.2 Heat and water immersion stability. Sample sleeves selected in accordance with 4.4.1.2.2 shall be tested as specified in 4.5.2.3 and 4.5.2.4.

4.4.3.3 Performance. Sample sleeves selected in accordance with 4.4.1.2.3 shall be tested as specified in 4.5.2.6.1 through 4.5.2.6.6 and as follows:

- a. The filter shall be started and backwashed for not less than two complete 1/2-hour starting and backwashing cycles under filtering tests (see 4.5.2.6.3).
- b. If one or more of the last four turbidity readings is greater than 0.2 turbidity unit and precoat appears uniform, the filter element connections shall be examined for leaks and the filter element sleeves for proper placement on the element. The filtering test shall be repeated. If one or more of the last four turbidity readings is again greater than 0.2 turbidity unit, the lot represented by the sample shall be rejected.

4.5 Inspection schedule.

4.5.1 Examination. The filter element sleeves shall be examined for the defects listed below:

101. Length not as specified.
102. Diameter not as specified.
103. More than one seam in each direction.
104. Width of flange not as specified.
105. Unperforated area at either end greater than 3/16 inch or less than 1/16 inch.
106. Seam width not as specified.
107. Color incorrect or material not opaque or translucent.
108. Angle or flange not as specified.
109. Thickness not as specified.

4.5.1.1 Examination of perforations. The filter element sleeves shall be examined as follows:

- a. Width and length of perforation. A filter element sleeve shall be cut longitudinally at the seam, laid flat, and marked in three even divisions across the top (circumference) and five even divisions along the length for size 1 and 3 and seven even divisions for size 2. The width and length of 30 perforations in each division shall be measured with a Bausch and Lomb measuring projector, or equal, using not less than 25X magnification. The measurements, made in each division shall not be concentrated in one area.
- b. Distance between perforations. The distance between perforations in both the circumferential and longitudinal directions shall be measured as specified in "a". Not less than 15 measurements in each direction shall be made in each division.
- c. Incomplete perforations. Each division shall be inspected for incomplete (closed) perforations.
- d. Staggering. Each division shall be inspected for improperly staggered perforations.

In lieu of determining exact dimensions, a template may be used to determine dimensional conformance of perforations on a "go, no-go" basis.

4.5.1.1.1 Dimensional failure of perforations. The filter element sleeve shall have failed this test if any one of the following conditions exists:

- a. Three or more perforations in any division are less than 0.0025 inch or greater than 0.0050 inch in width.
- b. More than 4 percent of the total number of perforations measured are less than 0.0025 inch or greater than 0.0050 inch in width.
- c. More than 4 percent of the total number of perforations measured are less than 0.028 inch or greater than 0.036 inch in length.
- d. Spacing between any two adjacent perforations is less than 0.047 inch or greater than 0.078 inch in longitudinal direction.
- e. Spacing between any two adjacent perforations is less than 0.025 inch or greater than 0.027 inch in circumferential direction.
- f. Four or more perforations in any division are incomplete (closed).
- g. Less than two acceptable perforations between incomplete perforations in any direction.
- h. Perforations in any division are not staggered as specified.

4.5.2 Tests.

4.5.2.1 Material. The following tests shall be in accordance with ASTM test methods as shown:

Tensile strength	- ASTM D412 Die C Specimens.
Ultimate elongation	- ASTM D412 Die C Specimens.
Tensile stress	- ASTM D412 Die C Specimens.
Hardness	- ASTM D2240

Failure to meet the requirements of 3.3.1 and 3.3.2 shall constitute failure of this test.

4.5.2.2 Resistance to low temperature. Material specimens 1-1/2 inch wide by 5 inches long shall be conditioned in accordance with ASTM D832 at minus 20° F plus or minus 2° F for 4 hours plus or minus 1/4 hour in a low-temperature cabinet. After conditioning and while the specimen is still in the cabinet, bend each strip back on itself. Any signs of cracking shall constitute failure of this test.

4.5.2.3 Heat stability. One filter element sleeve shall be cut lengthwise at seam and laid flat, except for end flanges. The length of sleeve, measured from inside edge of flanges, shall be determined at three places. The width of the flat sleeve shall be measured at three places. Measurements shall be located so as to divide sleeve into approximately four equal spaces in each direction. The sleeve shall then be placed between sheets of heavy wrapping paper lightly dusted with talc and not less than 5 inches longer than the sleeve in each direction. The paper sheets shall be clipped or stapled together, care being taken not to hold or restrict the sleeve. The sleeve shall then be placed horizontally in an air-circulating oven for not less than 1-1/2 hours at 212° F plus or minus 4° F. At the end of 1-1/2 hours, the sleeves shall be cooled to room temperature and measured as above. Measurements shall be to the nearest 1/32 inch. The diameter of the sleeve shall be determined as follows:

$$D = \frac{W}{3.141}$$

Where

D = diameter

W = width of flat sleeve

Failure to meet the requirements of 3.4 shall constitute failure of this test.

4.5.2.4 Water-immersion stability. Water-immersion stability determinations shall be made on one filter element sleeve as follows: With sleeve laid flat, mark three crosses on each end of the sleeve. Crosses shall be approximately 1 inch from each end and shall divide the width of the sleeve into four approximately equal parts. Draw pencil lines parallel to the length of the sleeve between crosses. Measure the length of the sleeve between crosses along the pencil line to the nearest 0.01 inch. Then immerse the sleeve (laid flat) in a covered pan of distilled water maintained at 73° F plus or minus 2° F. Determine the length to the nearest 0.01 inch at the end of 3, 15 and 30 days. The percent change in length to the nearest 0.1 percent shall be reported as an increase or decrease and shall be calculated as follows:

$$\text{Percent change in length} = \frac{(B - A) 100}{A}$$

Where

A = original length

B = length after specified immersion period.

Failure to meet the requirements of 3.4 shall constitute failure of this test.

4.5.2.5 Fungus resistance. The fungus resistance of the filter sleeve material shall be determined as follows.

4.5.2.5.1 Test organism. The organism used in this test shall be Aspergillus niger, ATCC No. 6275 (see 6.6). Cultures of this organism shall be carefully maintained on the culture medium specified in 4.5.2.5.2 with the exception that 30 gm. of sucrose shall be added to the other ingredients, and promptly renewed if there is evidence of contamination. The stock cultures may be kept for not more than 4 months in a refrigerator at approximately 3° to 10° C. Subcultures incubated at 28° to 30° C for 10 to 14 days shall be used in preparing the inoculum.

4.5.2.5.2 Culture medium. The culture medium shall have the following composition:

NaNO <sub>3</sub>	3.0 gm.
K <sub>2</sub> HPO <sub>4</sub>	1.0 gm.
MgSO <sub>4</sub> 7 H <sub>2</sub> O	0.5 gm.
KCl	0.25 gm.
Agar	15.0 gm.
Distilled water to make	1000 ml.

The pH shall be 5.5 to 6.5; if otherwise, adjust to that range with HCl or NaOH. After mixing, the above ingredients shall be sterilized by autoclaving for 15 minutes at 15 psi (121° C). Under sterile conditions, the medium shall be poured into 10-cm Petri dishes, about 30 ml per dish, and allowed to harden.

4.5.2.5.3 Inoculum. To a subculture (10 to 14 days old) of the test organism in a ripe fruiting condition, add about 10 ml of sterile distilled water containing about 0.005 percent of a nontoxic wetting agent. Force the spores into suspension with a sterile camel hair brush (or other suitable means) and dilute to 100 ml with sterile distilled water.

4.5.2.5.4 Test specimens. A minimum of three test specimens shall be cut at random from the filter sleeve material. The test specimens shall be 1-1/2-inch squares.

4.5.2.5.5 Inoculation. Under aseptic conditions, the test specimens shall be immersed in 70-percent ethanol for a few seconds, rinsed thoroughly in sterile distilled water, and then laid flat on the surface of the hardened medium, one specimen to each dish. With a sterile pipette or other suitable means, 1.0 to 1.5 ml of the inoculum shall be distributed over the surface of the specimen and surrounding medium.

4.5.2.5.6 Incubation. The period of incubation shall be 14 days at a temperature of 29° to 32° C and 85 to 90 percent relative humidity.

4.5.2.5.7 Controls. Three samples of untreated porous grade filter paper shall be tested along with the test specimens to check the viability of the inoculum. At the end of the incubation period, the controls shall be covered with the fungus growth.

4.5.2.5.8 Failure criteria. Evidence that the filter sleeve material supported fungus growth shall constitute failure of this test.

4.5.2.6 Performance test.

4.5.2.6.1 Preparation for test. Place one sleeve on each filter element in one filter on the filter test assembly and test as specified herein. Test facilities, equipment and chemicals shall conform to the following:

- a. Filter Aid - Johns-Manville 535, Great Lakes Carbon Dicalite-4200, or Eagle-Picher-FW-50.
- b. Water - Tap water having a turbidity not exceeding 5 units as specified in 40 CFR, 141, National Interim Primary Drinking Water Standards.
- c. Hose - 1-1/2-inch ID with NPSH couplings.
- d. Turbidimeter - Nephelometric method as specified in the EPA NIPDWR.
- e. Ferric chloride solution prepared by dissolving 1 pound of anhydrous ferric chloride in 3 gallons of water.
- f. Power source - 115/208 volt, 3-phase, 4-wire, 60-hertz.
- g. Connect the filter test assembly to the power source and the water source.

4.5.2.6.2 Procedure for starting and backwashing filters. The following procedures shall be used for starting and backwashing filters:

Starting

- a. Close filter and filter pump drain valves.
- b. Turn air relief valves and influent plug valves to filter operation.
- c. Turn effluent plug valves to recirculation operation.
- d. Close drain valves on pressure gages.
- e. Close gate valves located below flow controllers.
- f. Open precoat tank valve and filter vent valve located above precoat tank.
- g. Pour 1-gallon of slurry, containing 1.0 pound of filter aid in water into precoat tank of filter for size 2 filter sleeves and 1-gallon of slurry containing 0.6 pound of filter aid in water, into precoat tank of filter for size 1 and 3 filter sleeves.
- h. Close precoat tank valve when slurry is completely drained from tank.
- i. Open valve on suction line of filter.
- j. Turn on filter pump.
- k. When water starts escaping through filter vent valve, close valve.
- l. When the effluent pressure gage reads 30 psi, open gate valve located below flow controller.
- m. Set flow controller on filter as follows:  
  
15-gpm for size 1 filter sleeve.  
25-gpm for size 2 filter sleeve.  
10.5 gpm for size 3 filter sleeve.

- n. Allow filters to operate on recirculation for 10 minutes after completion of step "k" or until precoat on elements is clearly visible through the window, whichever occurs first.
- o. Turn effluent plug valve for filter operation.

#### Backwashing

- a. Close gate valve located below flow controller.
- b. Operate filter pump until effluent pressure approximates influent pressure, then shut off filter pump.
- c. Close valve on suction line to pump.
- d. Turn air-relief valve to backwash and then immediately open filter-drain valve.
- e. After filter has drained, turn influent plug valve to wash position, open suction line to pump, turn on pump, and wash filter until water leaving filter drain is clear.

4.5.2.6.3 Filtering tests. Start the filter (see 4.5.2.6.2) and, upon completion of step "o" of 4.5.2.6.2 add ferric chloride solution to the inlet water to the filter in an amount necessary to cause a pressure differential of not less than 35 psi as indicated on the filter pressure gages. Then backwash the filter. Restart the filter and backwash until not less than twelve 1/2-hour starting and backwashing cycles have been accomplished. A 1/2-hour starting and backwashing cycle shall start upon completion of step "j" under "Starting" of 4.5.2.6.2 and end upon completion of step "e" under "Backwashing" of 4.5.2.6.2. Take turbidity readings of filter effluent for each cycle 10 minutes after completion of step "n" of 4.5.2.6.2 and 5 minutes before backwashing. Determine turbidity with a Baylis or St. Louis type turbidimeter.

4.5.2.6.4 Precoating test. Upon completion of the filtering tests, restart the filter in accordance with 4.5.2.6.2 except for step "o". Collect a sample of filter effluent 10 minutes after completion of step "m" of 4.5.2.6.2. Add a prepared solution of ferric chloride in accordance with 4.5.2.6.3 to influent of the filters. Operate the filters on recirculation for 5 minutes after addition of the solution. At the end of the 5 minutes, slowly open the drain valve on the filter effluent line and then stop the filter pump. Allow the filter shell to drain through the effluent drain valve only. Open the filter vent valve when influent and effluent pressure gages both read 0 psi. Remove the filter dome, and then carefully remove the filter elements so as not to disturb the filter precoat. Examine each element using a magnifying glass having not less than 3X magnification for nonuniform distribution of precoat such as bare spots, thin spots and corrugation.

4.5.2.6.5 Backwash test. Upon completion of precoat test, replace the coated filter elements and dome. Restart the filter in accordance with 4.5.2.6.2. Upon completion of step "n" in 4.5.2.6.2, backwash filter. Restart the filter in accordance with 4.5.2.6.2 and upon completion of step "n", backwash the filter. Remove the filter dome and elements and inspect the filter elements for incomplete backwashing using the magnifying glass specified in 4.5.2.6.4.

4.5.2.6.6 Failure. Presence of any of the following shall constitute failure of the tests:

- a. One or more of the last 10 turbidity readings exceeds 0.2 turbidity unit.
- b. Tears.
- c. Split seams or evidence of crack in seams.
- d. Holes other than perforations.
- e. Filter aid cake adhering to any filter element sleeve and covering a filtering area greater than 1/16 square inch (incomplete backwashing).
- f. Nonuniform distribution of precoat, such as bare spots, thin spots or corrugation over perforated area.

#### 4.6 Inspection of packaging.

##### 4.6.1 Quality conformance inspection of pack.

4.6.1.1 Unit of product. For the purpose of inspection, a completed pack prepared for shipment shall be considered a unit of product.

4.6.1.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105.

4.6.1.3 Examination. Samples selected in accordance with 4.6.1.2 shall be examined for the following defects. AQL shall be 2.5 percent defective.

110. Materials and containers not as specified for level A or B. Each incorrect material or container shall be considered one defect.
111. Pads not as specified and inserted in the sleeve as specified for level A or commercial.
112. Bag not sealed as specified for level A or commercial.
113. Quantities consolidated together different from those specified for level A.
114. Consolidation boxes not closed and sealed by method specified for level A.
115. Strapping not as specified for level A.
116. Gross weight of fiberboard boxes exceeds the weight or size limitations of the box specification for level B.
117. Preservation and packing not in accordance with the referenced document as specified for commercial.
118. Marking missing, illegible, incorrect, or incomplete for level A, B, or commercial.

## 5. PACKAGING

5.1 Preservation. Preservation shall be level A or commercial as specified (see 6.2).

5.1.1 Level A. Each sleeve shall have a corrugated, flat fiberboard pad inserted inside the sleeve. The pad shall be not less than 1/2 inch thick by 4-3/8 inches wide. The length shall be 13 inches for size 1, 22 inches for size

2, and 11-3/4 inches for size 3. The pad may be comprised of one or more pieces in order to achieve desired thickness. Each sleeve shall be inserted into a bag fabricated from material conforming to MIL-B-131, class 2, and the bag sealed by heat sealing.

5.1.1.1 Consolidation. The sleeves shall be consolidated together in quantities of four each for sizes 1 and 3 and in quantities of six each for size 2, in a close-fitting box conforming to PPP-B-636, W5c or W6c. Box closure and sealing shall be as specified for method V in accordance with the appendix to the box specification.

5.1.2 Commercial. The sleeves shall be preserved in accordance with MIL-STD-1188 and the following specific requirements. Each sleeve shall have a pad inserted inside the sleeve as specified in 5.1.1 and the sleeve inserted into a commercial type polyethylene bag with a film thickness of not less than 3 mil. Closure shall be by heat sealing.

5.2 Packing. Packing shall be level A, level B, or commercial as specified (see 6.2).

5.2.1 Level A. Sleeves of like description, preserved as specified in 5.1, shall be packed together in a close-fitting box conforming to PPP-B-601, overseas type, style optional, in quantities not to exceed 200 pounds. Box closure and strapping shall be in accordance with the appendix to the box specification. Strapping shall conform to QQ-S-781, class 1, type I or IV, size as applicable. Unless otherwise specified (see 6.2), strapping shall be finish B. When specified (see 6.2) strapping shall be finish A.

5.2.2 Level B. Sleeves of like description, preserved as specified in 5.1, shall be packed together in close-fitting fiberboard boxes conforming to PPP-B-636, V3c, style optional. The gross weight or size of each box shall not exceed the limitations of the box specification. Box closure and strapping shall be in accordance with the appendix to the box specification.

5.2.3 Commercial. Sleeves, preserved as specified in 5.1, shall be packed in accordance with MIL-STD-1188.

### 5.3 Marking.

5.3.1 Military. Marking for military levels of protection (level A or B) shall be in accordance with MIL-STD-129.

5.3.2 Commercial. Marking for commercial packaging shall be in accordance with MIL-STD-1188.

## 6. NOTES

6.1 Intended use. The filter element sleeves are intended for use in pressure diatomite-type filters of water purification equipment.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. Size required (see 1.2).
- c. Date of issue of DoDISS applicable and exceptions thereto (see 2.1.1).
- d. Time frame required for submission of first article model (see 3.2).
- e. Degree of preservation and degree of packing required (see 5.1 and 5.2).
- f. When other than finish B strapping is required (see 5.2.1).

6.3 First article model. Any changes or deviations of production filter element sleeves from the approved first article model during production will be subject to the approval of the contracting officer. Approval of the first article model will not relieve the contractor of his obligation to furnish filter element sleeves conforming to this specification.

6.4 Medical advisor. For Army procurement, the Surgeon General of the Army will act as advisor in making the health hazard determination.

6.5 Government-loaned property. The contracting officer should arrange to loan the property specified in 3.6.

6.6 Fungus test organisms. The organism used in the fungus-resistance test specified in 4.5.2.5 may be obtained from the American Type Culture Collection, 12301 Parklawn Drive, Rockville, Maryland 20852, or for Service use, from the Science and Advanced Technology Laboratory, U.S. Army Natick R & D Center, Natick, Massachusetts.

6.7 Definitive specification part number. The specification part number is a definitive part number which will be formulated to identify each item covered by this specification. The part number will be formulated by selection from the requirement option available in this specification as follows:

Definitive specification part number	M52333-X
Military specification number	_____
Class designator (see table 6.7.1)	_____

6.7.1 Class designator. A one position field used to designate the required size/APP location of filter element sleeve (see table I).

TABLE I. Specification part numbering.

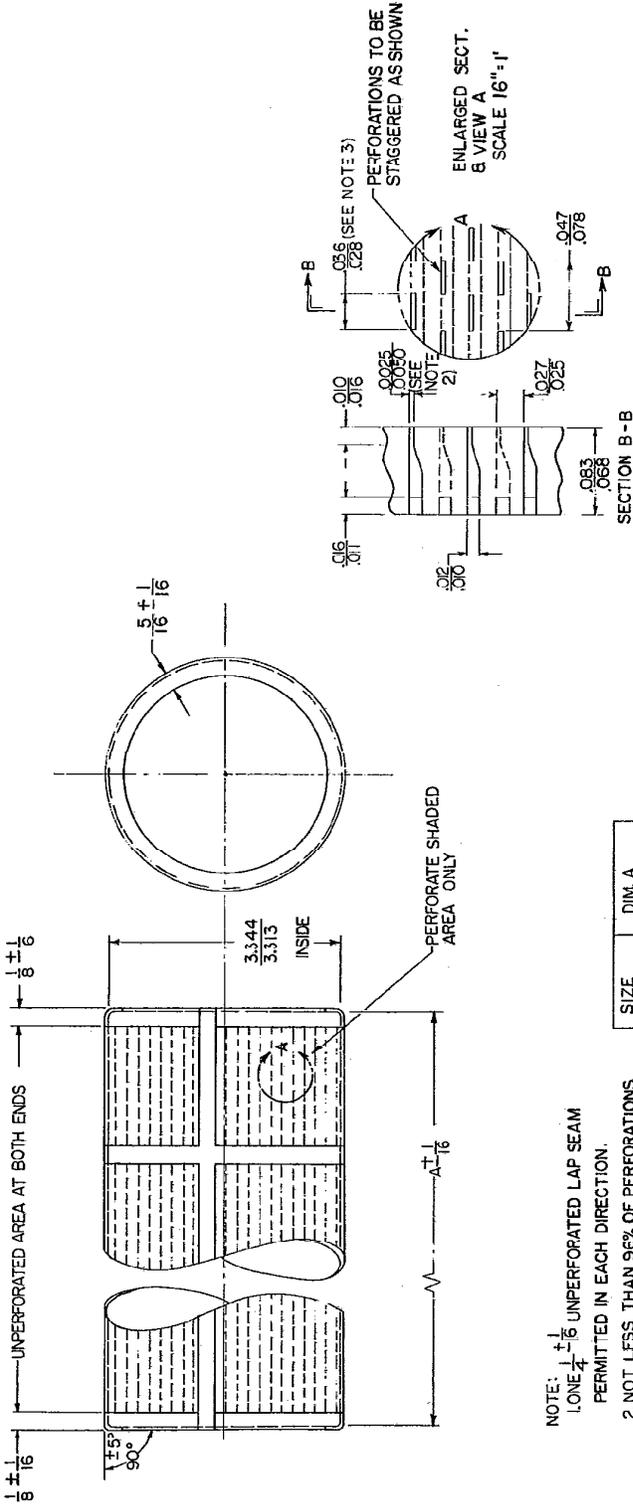
Class designator	Remarks	
	Inside LG in inches	I/D
1	13-25/32 ( <u>+1/16</u> )	3.313 min. 3.344 max.
2	22-25/32 ( <u>+1/16</u> )	3.313 min. 3.344 max.
3	12-7/16 ( <u>+1/16</u> )	3.313 min. 3.344 max.

Custodians:  
 Army - ME  
 Navy - YD  
 Air Force - 99

Preparing activity:  
 Army - ME  
 Project 4610-0098

Review activities:  
 Army - MD  
 Navy - MC, MS  
 Air Force - 84

User activities:  
 Navy - CG



DX-847 E

SIZE	DIM. A
1	$13 \frac{5}{8}$
2	$22 \frac{5}{8}$
3	$12 \frac{7}{16}$

FIG. 1 FILTER ELEMENT SLEEVE;  
WATER PURIFICATION UNIT

- NOTE:
1.  $\frac{1}{4} \pm \frac{1}{16}$  UNPERFORATED LAP SEAM PERMITTED IN EACH DIRECTION.
  2. NOT LESS THAN 96% OF PERFORATIONS SHALL HAVE A WIDTH WITHIN THE SPECIFIED DIMENSIONS.
  3. NOT LESS THAN 96% OF PERFORATIONS SHALL HAVE A LENGTH WITHIN THE SPECIFIED DIMENSIONS.