

INCH-POUND

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w/AMENDMENT 1
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SUPERSEDING
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DETAIL SPECIFICATION

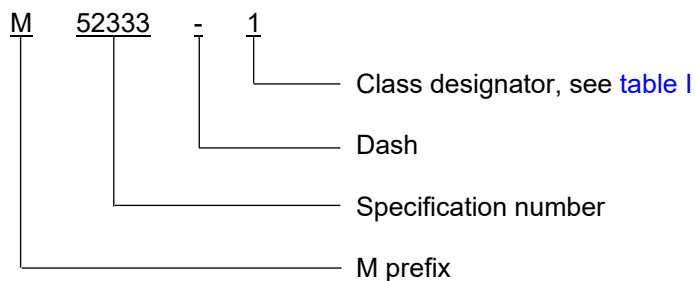
SLEEVE, FILTER ELEMENT, WATER PURIFICATION UNITS

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

1. SCOPE

1.1 scope. This specification covers sleeve, filter element, water purification units, for three sizes of filter element sleeves for diatomite-type filters.

1.2 Part or identifying Number (PIN). The PIN consists of the letter M, the specification number, a dash, and a number for class/size.



1.2.1 Class designator. Class designator for size and application location of filter element sleeve (see [table I](#)).

TABLE I. Class designator.

Class designator	Remarks		Application
	Length	I/D	
1	13-25/32 ($\pm 1/16$)	3.313 min. 3.344 max.	Water purification unit, trailer mounted 600, gph
2	22-25/32 ($\pm 1/16$)	3.313 min. 3.344 max.	Van-type body-mounted, 1,500 and 3,000 gph Base-mounted, 3,000 gph
3	12-7/16 ($\pm 1/16$)	3.313 min. 3.344 max.	Water purification unit, 420 gph

Comments, suggestions, or questions on this document should be addressed to DLA Land and Maritime, Attn: VAI, 3990 East Broad Street, Columbus, OH 43218-3990 or fluidflow@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online at <https://assist.dla.mil>.

AMSC N/A

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FSC 4610



2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 or 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 or 4 of this specification, whether or not they are listed.

2.2 Government publications.

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.

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications from a part of this documentation to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

National Interim Primary Drinking Water Regulations

(Copies of these documents are available online at <https://www.epa.gov>.)

National Interim Primary Drinking Water Regulations (EPA NIPDWR)

UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS)

(Copies of these documents are available online at <https://www.hhs.gov>.)

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 NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASQC-Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Copies of this document is available online at <https://www.ansi.org>.)

ASTM INTERNATIONAL

ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension

ASTM D832 - Standard Practice for Rubber Conditioning For Low Temperature Testing

ASTM D2240 - Standard Test Method for Rubber Property-Durometer Hardness

(Copies of these documents are available online at <https://www.astm.org>.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 17025 - General requirements for the competence of testing and calibration laboratories

(Copies of these documents are available online at <http://www.iso.ch>.)

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, (except for related specification sheets), 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 4.5.

3.1.1 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased 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.

3.1.1.1 Recovered materials. The term “recovered materials” means materials, which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification.

3.1.1.2 Used, rebuilt, or remanufactured components. No used, rebuilt, or remanufactured components, pieces, or parts shall be incorporated in the filter element.

3.1.2 Ozone depleting substances (ODS). Class I and II ozone depleting substances (ODS) shall not be used in MIL-DTL-52333 or any referenced procedures.

3.2 Construction. The filter elements shall be as shown on figure 1 and as specified herein.

3.3 Materials and Components.

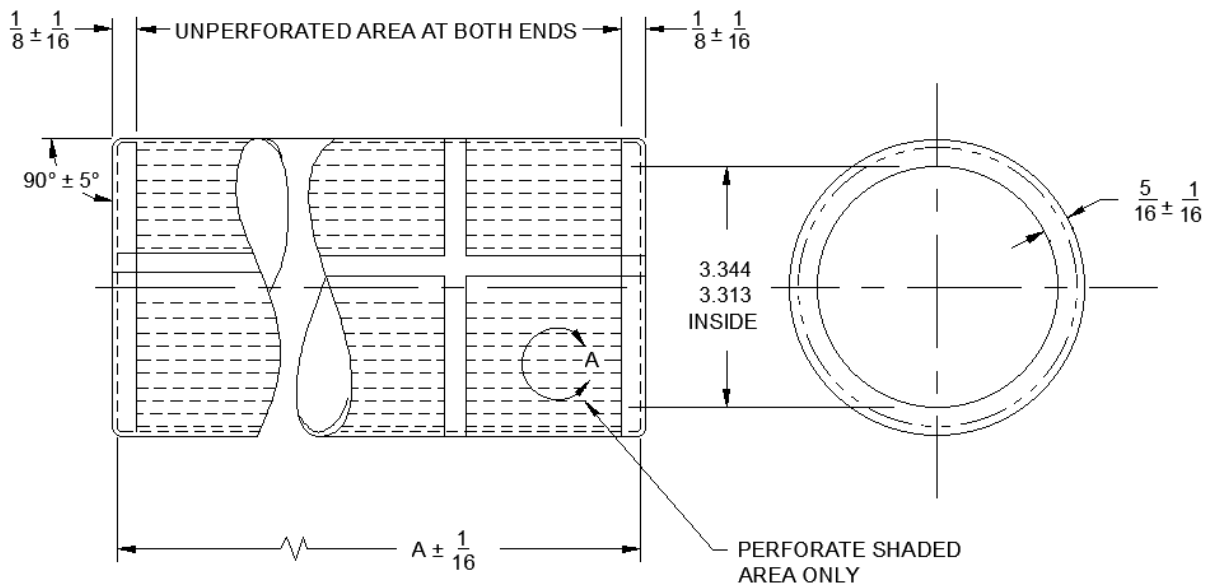
3.3.2 Materials. Materials shall be as specified herein and shall conform to Food and Drug Administration requirements for use with food products. The materials shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred 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).

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

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3.3.2.2 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	1250
Ultimate elongation percent minimum	300
Tensile stress, psi maximum at 100 percent elongation	600
Resistance to low temperatures	No signs of cracking shall show when bent back on itself at minus 20°F (minus 28.9°C)
Hardness, durometer: (Initial Shore A)	55 to 70

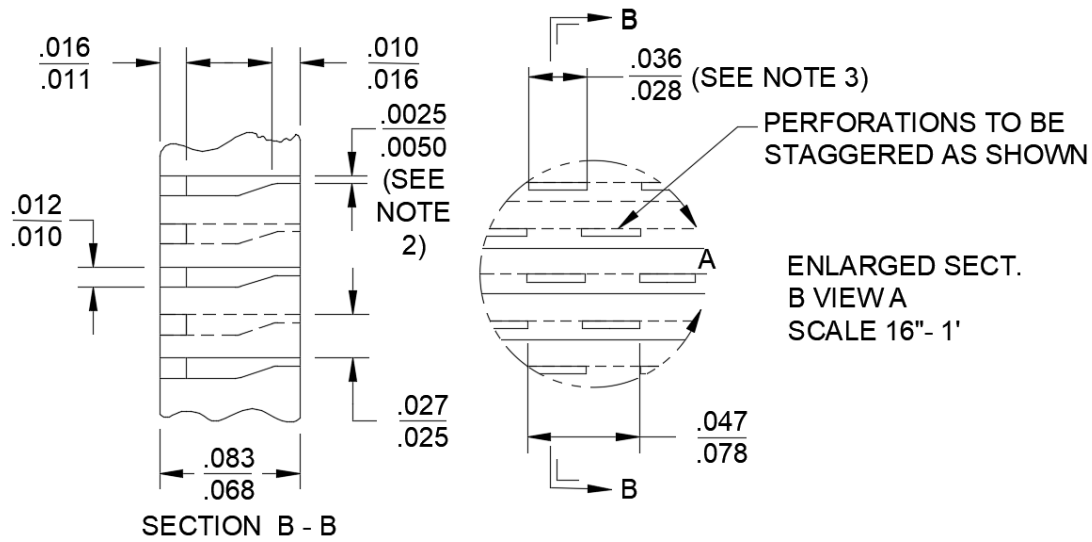


Size	Dimension A
1	13-25/32 ± 1/16
2	22-25/32 ± 1/16
3	12-7/16 ± 1/16

See notes at end of figure.

FIGURE 1. Filter Element sleeve.

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NOTES:

1. One .250 $\pm$.063 inch 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.
4. Size see 1.2.2.

FIGURE 1. Filter Element sleeve - Continued.

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

Water stability, 1 - 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. The filter element sleeves shall meet the following performance criteria when verified using procedures contained herein.

- a. Produce filtered water having a turbidity not exceeding 0.2 turbidity unit determined with an EPA approved nephelometric turbidimeter.
- b. Holes other than perforations.
- c. Precoat uniformly with no evidence of thin spots, bare spots, or corrugation.
- d. Withstand the normal backwashing pressure of approximately 50 psi without tearing of sleeve body or splitting/cracking of seams.
- e. 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 (incomplete backwashing).

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 4.5.9 (see 6.5).

3.7 Workmanship. The filter element sleeves shall be constructed and finished in accordance with high-grade production techniques. 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.

3.8 Cleanliness. The filter element sleeves shall be free of all dirt, grease and other contaminants, including test residue which could adversely effect the intended use. Final cleaning shall be accomplished with a method not leaving any harmful residue. The filter element sleeves shall be dry before packaging.

4. VERIFICATION

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

- a. First article inspection (see 4.5)
- b. Conformance inspection (see 4.6).

4.2 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained or identified by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with ISO 17025 and NCSL Z540.3 as applicable.

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4.3 Responsibility for compliance. All items shall meet all requirements of sections 3 and 4. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.3.1 Lot records. Manufacturers shall keep lot records for 3 years minimum. Manufacturers shall monitor for compliance to the prescribed procedures, and observe that satisfactory manufacturing conditions and records on lots are maintained for these filter element sleeves. The records, including as a minimum, an attributes summary of all quality conformance inspections conducted on each lot, shall be available to review by customers at all times.

4.4 First article inspection. All samples shall be subjected to first article testing in accordance with table II.

4.4.1 First article inspection labs. First article inspection shall be performed at a laboratory acceptable to the procuring activity on sample units produced with equipment and procedures used in production.

4.4.2. Samples for first article. Samples for first article shall be representative of the products proposed to be furnished to this specification. Sampling for filter element sleeves shall be in accordance with 4.3.3.

TABLE II. First article inspection.

Inspection	Requirement paragraph	Test paragraph	Sample
Examination	3.2, 3.7, and 3.8	4.4.1	4.4.1
Material	3.3.2	4.4.2	4.4.2
Appearance	3.3.2.2		
Tensile strength	3.3.2.2		
Ultimate elongation	3.3.2.2		
Tensile stress	3.3.2.2		
Resistance to low temperatures	3.3.2.2		
Hardness	3.3.2.2		
Heat and water immersion stability	3.4	4.4.3	4.4.3
Performance	3.5	4.4.4	4.4.4
Fungus resistance	3.3.2.1	4.6.2.5	4.6.2.5.4

4.4.3 First article sampling. Samples shall be selected at random from each lot in accordance with table II.

4.5 First article inspection tests.

4.5.1 Examination samples. The contractor shall furnish nine filter element sleeves for examination in accordance with 4.5.5 and testing within the time frame specified, to verify, prior to starting production, that the production methods will produce filter element sleeves that comply with the requirements of this specification.

4.5.2 Material. A sample of un-perforated polyvinyl chloride material, as used in the manufacture of filter element sleeves, shall be furnished for each batch or lot of polyvinyl chloride material, test in accordance with [4.5.6](#).

4.5.3 Heat and water immersion stability. Two-filter element sleeves shall be furnished for each batch or lot of polyvinyl chloride material and tested as specified in [4.5.7](#).

4.5.4 Performance. The first 24 sleeves produced shall be tested as specified in [4.5.8](#). If any of the first 24 sleeves are rejected, 100 percent testing shall be continued until 24 consecutive sleeves pass all tests.

4.5.5 Examination. Samples selected in accordance with [4.5.1](#) shall be examined as specified in [4.7.1](#). If any sample sleeve fails the dimensional examination of perforations, the lot represented by the sample shall be rejected.

4.5.6 Material. Samples selected in accordance with [4.5.2](#) shall be tested as specified in [4.7.2.1](#) and [4.7.2.5](#). Failure of any test shall be cause for rejection.

4.5.7 Heat and water immersion stability. Sample sleeves selected in accordance with [4.5.3](#) shall be tested as specified in [4.7.2.3](#) and [4.7.2.4](#).

4.5.8 Performance. Sample sleeves selected in accordance with [4.5.4](#) and shall be tested as specified in [4.7.2.6.1](#) through [4.7.2.6.5](#) and as follows:

- a. The filter shall be started and backwashed for not less than two complete ½-hour starting and backwashing cycles under filtering tests (see [4.7.2.6.3](#)).
- 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.
- c. The filtering test shall be repeated.
- d. 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.

4.5.9 Special inspection equipment. Special final inspection equipment shall be loaned to the contractor by the Government (see [3.6](#)).

4.5.10 Failures. All samples must meet all of the contract requirements. Failure of a sample unit to pass any test shall be cause for rejection of the entire lot and to grant first article approval.

4.5.11 Disposition of samples. First article samples shall be furnished to the Government as directed by the contracting officer (see [6.2](#)). Unless otherwise specified, after award of the contract or order, the manufacturer shall forward, from randomly selected samples, 1 filter element sleeve. The sample shall be representative of the construction, workmanship, components, and materials to be used during production.

4.5.12 First article information. Upon completion of first article inspection, the Government activity responsible for conducting the inspection program (see [6.2](#)), shall report the results of the inspection, with appropriate recommendation, to the contracting officer. Approval of the first article samples or the waiving of first article inspection does not preclude the requirements for performing conformance inspection.

4.5.13 Waivers or deviations to specification requirements. All waivers or deviations to specification requirements shall be coordinated through the preparing activity: DLA Land and Maritime, Attn: VAI, P.O. Box 3990, Columbus, Ohio 43218-3990 or e-mailed to FluidFlow@dla.mil.

4.6 Conformance inspection.

4.6.1 Conformance inspection first article requirements. For manufacturers that have successfully passed first article inspections and are continuously producing filter element sleeves to this specification on going inspections shall consist of individual inspections, see 4.3 and 4.4.1. If first article is waived due to prior successful first article inspection, the individual inspections shall be the manufactures in-house inspection procedures, except for performance testing, see 4.6.1.2. Test reports shall be made available to the procuring activity.

4.6.1.2 Individual inspection for performance testing. After 24 consecutive sleeves have passed the performance test (see 4.5.4), sampling shall be in accordance with ANSI/ASQC-Z1.4, normal inspection, except that the sample size shall be to the highest multiple of 6.

4.6.2 Nonconformance of individual tests. If one or more defects are identified, then the entire production lot shall be screened for that defect and all defects shall be removed. A second inspection sample shall then be selected and the sampling tests shall be performed again. If one or more defects are identified from the second inspection lot, then the entire production lot shall be rejected and not supplied to this specification.

4.6.3 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.

4.7 Test methods.

4.7.1 Visual examination. The filter element sleeves shall be examined for the defects listed below, presence of one or more defects shall be cause for rejection.

- a. Length not as specified.
- b. Diameter not as specified.
- c. More than one seam in each direction.
- d. Width of flange not as specified.
- e. Un-perforated area at either end greater than 3/16 inch or less than 1/16 inch.
- f. Seam width not as specified.
- g. Color incorrect or material not opaque or translucent.
- h. Angle or flange not as specified.
- i. Thickness not as specified.

4.7.1.1 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.
- b. The width and length of 30 perforations in each division shall be measured with a Bausch and Lomb measuring projector, optical comparator, or equal, using not less than 25X magnification. The measurements, made in each division, shall not be concentrated in one area.
- c. Distance between perforations. The distance between perforations in both the circumferential and longitudinal directions shall be measured as specified in "a." above. Not less than 15 measurements in each direction shall be made in each division.
- d. Incomplete perforations. Each division shall be inspected for incomplete (closed) perforations.
- e. Staggering. Each division shall be inspected for improperly staggered perforations.

NOTE: In lieu of measuring exact dimensions, a template may be used to determine dimensional conformance of perforations on a “go, no-go” basis.

4.7.1.1.1 Dimensional failure of perforations. The filter element sleeve shall have failed this test if any 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.

4.7.2 Tests.

4.7.2.1 Material. The following tests shall be in accordance with ASTM test methods as shown and shall meet the requirements of 3.3.2.2:

Tensile strength	ASTM D412 Die C Specimens
Ultimate elongation	ASTM D412 Die C Specimens
Tensile stress	ASTM 412 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.

4.7.2.2 Resistance to low temperatures. Material specimens 1-1/2 inches wide by 5 inches long shall be conditioned in accordance with ASTM-D832 at $-20 \pm 2^{\circ}\text{F}$ for 4 hours, $\pm 1/4$ hour in a low-temperature cabinet. After conditioning and while the specimens are still in the cabinet, bend each strip back on itself. Any signs of cracking shall constitute failure of this test.

4.7.2.3 Heat stability. One filter element sleeve shall be heat stability tested and shall meet the criteria specified in 3.4, the following details shall apply:

- a. One filter element sleeve shall be cut lengthwise at the seam and laid flat, except for end flanges.
- b. The length of sleeve, measured from inside edge of flanges, shall be determined at three places.
- c. The width of the flat sleeve shall be measured at three places.
- d. Measurements shall be located so as to divide the sleeve into approximately four equal spaces in each direction.
- e. 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.
- f. The paper sheets shall be clipped or stapled together, care being taken not to hold or restrict the sleeve.
- g. The sleeve shall then be placed horizontally in an air-circulation oven for not less than 1-1/2 hours at $212 \pm 4^{\circ}\text{F}$.

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- h. At the end of the 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

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

4.7.2.4 Water-immersion stability. Water-immersion stability determinations shall be made on one filter element sleeve the following details shall apply:

- a. With sleeve laid flat, mark three crosses on each end of the sleeve.
- b. Crosses shall be approximately 1 inch from each end and shall divide the width of the sleeve into four approximately equal parts.
- c. Draw pencil lines parallel to the length of the sleeve between crosses.
- d. Measure the length of the sleeve between crosses along the pencil line to the nearest 0.01 inch.
- e. Then immerse the sleeve (laid flat) in a covered pan of distilled water maintained at 73 °F plus or minus 2°F.
- f. Determine the length to nearest 0.01 inch at the end of 3, 15 and 30 days.
- g. 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

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

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

4.7.2.5.1 Test organism. The organism used in the test shall be *Aspergillus Niger*, ATCC No. 6275 (see 6.6), the following details shall apply:

- a.. 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.
- b. The stock cultures may be kept for not more than 4 months in a refrigerator at approximately 3°C to 10°C.
- c. Subcultures incubated at 28°C to 30°C for 10 to 14 days shall be used in preparing the inoculum.

4.7.2.5.2 Culture medium. The culture medium shall have the following composition. The following details shall apply:

NaNO ₃	3.0 gm
K ₂ HPO ₄	1.0 gm
MgSO ₄ 7 H ₂ 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.

4.7.2.5.3 Inoculum. To a subculture (10 to 14 days old) of the test organism in 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 hairbrush (or other suitable means) and dilute to 100 ml with sterile distilled water.

4.7.2.5.4 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.

4.7.2.5.5 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.

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

4.7.2.5.7 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 fungus growth.

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

4.7.2.6 Performance test. The filter sleeves shall meet the criteria specified in 3.4, the following details shall apply.

4.7.2.6.1 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:

- Filter Aid - Johns-Manville 535, Great Lakes Carbon Dicalite - 4200, or Eagle-Picher-FW-50.
- Water - Tap water having a turbidity not exceeding 5 units as specified in 40 CFR, 141, National Interim Primary Drinking Water Standards (NIPDWR).
- Hose - 1-1/2-inch ID with NPSH couplings.
- Turbidimeter - Nephelometric method as specified in the EPA National Interim Primary Drinking Water Regulations (NIPDWR).

- e. Ferric chloride solution prepared by dissolving 1 pound of ferric chloride anhydrous (FeCl_3) 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.

4.7.2.6.2 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 re-circulation 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:
 - Size 1 filter sleeve - 15-gpm
 - Size 2 filter sleeve - 25-gpm
 - Size 3 filter sleeve - 10.5-gpm
- n. Allow filters to operate on re-circulation 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 of pump and wash filter until water leaving filter drain is clear.

4.7.2.6.3 Filtering tests. A filter shall be subject to filtering testing, the following details shall apply;

- a. Start the filter (see 4.7.2.6.2) and, upon completion of step "o" of 4.7.2.6.2, add ferric chloride solution to the inlet water to the filter in an amount necessary to cause a pressure differential of no less than 35 psi, as indicated on the filter pressure gages.
- b. Then backwash the filter.
- c. Restart the filter and backwash until not less than twelve ½-hour starting and backwashing cycles have been accomplished.
- d. A ½-hour starting and backwashing cycle shall start upon completion of step "j" under "Starting" of 4.7.2.6.2 and end upon completion of step "e" under "Backwashing" of 4.7.2.6.2.

- e. Take turbidity readings of filter effluent for each cycle 10 minutes after completion of step “n” of [4.7.2.6.2](#) and five minutes before backwashing.
- f. Determine turbidity with a Baylis or St. Louis type turbidimeter.

4.7.2.6.4 Precoating test. Upon completion of the filtering tests, restart the filter in accordance with [4.7.2.6.2](#) except for step “o”, the following details shall apply:

- a. Collect a sample of filter effluent 10 minutes after completion of step “m” of [4.7.2.6.2](#).
- b. Add a prepared solution of ferric chloride in accordance with [4.7.2.6.3](#) to influent of the filters.
- c. Operate the filters on re-circulation for 5 minutes after addition of the solution.
- d. At the end of the 5 minutes, slowly open the drain valve on the filter effluent line and then stop the filter pump.
- e. Allow the filter shell to drain through the effluent drain valve only.
- f. Open the filter vent valve when influent and effluent pressure gages both read 0 psi.
- g. Remove the filter dome, and then carefully remove the filter elements so as not to disturb the filter precoat.
- h. Examine each element using a magnifying glass having not less than 3X magnification for non-uniform distribution of precoat such as bar spots, thin spots and corrugation.

4.2.6.5 Backwash. Upon completion of precoat test, replace the coated filter elements and dome. Restart the filter in accordance with [4.7.2.6.2](#), the following details shall apply:

- a.. Upon completion of step “n” in [4.7.2.6.2](#), backwash filter.
- b. Restart the filter in accordance with [4.7.2.6.2](#) and upon completion of step “n”, backwash the filter.
- c. Remove the filter dome and elements and inspect the filter elements for incomplete backwashing using the magnifying glass specified in [4.7.2.6.4](#).

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

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this specification
- b. PIN required (see [1.2](#) and [6.3](#)).
- c. Whether first article inspection is waived (see [4.5.12](#)).
- d. Name and address of the Government activity responsible for conducting the first article inspection program (see [4.5.12](#)).

- e. Name and address of the Government activity responsible for receiving a production sample (see 4.5.11).
- f. If test reports for conformance inspections are required, see 4.5.12
- g. Packaging requirements (see 5.1).

6.3 First article. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first article samples. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.3.1 Defense Logistics Agency (DLA) waiver of first article test. A waiver of a first article testing will only be considered by DLA when the contractor has delivered the same item within the last 3 years, has no unfavorable quality history, has not changed processes, or changed any subcontractors. DLA will not accept first article testing results outside the stated requirements.

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 4.6.2.5 may be obtained from the American Type Culture Collection (ATCC), at <https://www.atcc.org/>, or from the USDA culture collection catalog at <https://www.ars.usda.gov/>.

6.6.1 Culture stock replenishment interval. Stock cultures must be replaced after 4 months unless subcultures are actively grown. Subcultures from pure stock. Stocks of each fungus may be maintained by actively growing them from stock cultures obtained originally from USDA or ATCC. To ensure purity of the actively growing stock cultures, the stock must be renewed every 4 years or less. Risk of contamination occurs each time the stock culture is transferred to prepare the subcultures. Stock cultures are not be kept more than 4 months at 43°F + 7°F (6°C + 4°C). After four months at 43°F + 7°F (6°C + 4°C), new subcultures must be prepared and used for the new stock.

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 the specification. The part number will be formulated by selection from the requirement option available in this specification as follows:

6.8. Key word listing.

Drinking water
Turbidity
Diatomite Filter
FDA
EPA

6.9 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 - AT
Navy - YD
Air Force - 84
DLA - CC

Preparing activity:

DLA - CC

(Project 4610-2025-001)

Review activities:

Army - MD
Navy - CG, MC, SH

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 <https://assist.dla.mil>.