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METRIC

MIL–PRF–51193E(EA)
24 November 1998
SUPERSEDING
MIL–DTL–51193D(EA)
30 December 1996

PERFORMANCE SPECIFICATION

FILTER, GAS, 283 L/M, M18A1

This specification is approved for use by the U.S. Army Edgewood 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 performance specification covers a 283 liters per minute (l/m) gas filter which filters out airborne toxic chemical agents as part of a Nuclear, Biological and Chemical (NBC) filtration system in armored weapons systems.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to insure the completeness of this list, document users are cautioned that they must meet all specified 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: Technical Director, U.S. Army Edgewood Research, Development and Engineering Center, ATTN: SCBRD–ENE–S, Aberdeen Proving Ground, MD 21010–5423 by using the self–addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 4240

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2.2 Government documents.

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 listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

STANDARDS

FEDERAL

FED–STD–191 – Textile Test Methods

DEPARTMENT OF DEFENSE

MIL–STD–810 – Environmental Test Methods and Engineering Guidelines

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111–5094.)

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

U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

PURCHASE DESCRIPTIONS

EA–C–1704 – Carbon, Activated, Impregnated,Copper–Silver–Zinc–Molydenum–Triethylenediamine (ASZM–TEDA)

DRAWINGS

E136–41–1755 – Tester, Filter Life, 12 CFM, Q223, Assembly

(Copies are available from Technical Director, U.S. Army Edgewood Research, Development and Engineering Center, ATTN: SCBRD–ENE–S, Aberdeen Proving Ground, MD 21010–5424.)

CODE OF FEDERAL REGULATIONS

40 CFR Part 261 – Hazardous Waste Managment

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(The Code of Federal Regulations is for sale on a subscription basis from theSuperintendent of Documents, U.S. Government Printing Office, Washington, DC20402. When indicated, reprints of certain regulations may be obtained from thefederal agency responsible for issuance thereof.)

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 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 issue of the documents cited in the solicitation (see 6.2).

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

ACGIH publication – Threshold Limit Values and Biological Exposure Indices (see 6.2)

(Application for copies should be addressed to American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadows Drive, Cincinnati, OH 45240)

ASTM STANDARDS

D2867 – Standard Test Methods for Moisture in Activated Carbon

(Application for copies should be addressed to ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959.)

AIR–CONDITIONING AND REFRIGERATION INSTITUTE

ARI STANDARD 700 – Standard for Specification for Fluorocarbons and Other Refrigerants

(Application for copies should be addressed to ARI, 4903 North Fairfax Drive, Arlington, VA 22203)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Materials and components.

3.1.1 Materials. The filter shall be constructed so that it conforms to the requirements of this specification. The contractor shall select materials which pose no potential inhalation haz-

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ard to the user in excess of the limits as recommended by the American Conference of Governmental Industrial Hygienists (ACGIH publication). Unused or uncontaminated filters and packaging materials at the time of disposal shall not be a Resource Conservation Recovery Act (RCRA) hazardous waste as defined in 40 CFR 261.21 − 261.24 or 40 CFR 261.33 (e) and (f).

3.1.2 Adsorbent Media. The adsorbent media shall fully meet all of the requirements of EA−C−1704 if ASZM−TEDA carbon is used, or the adsorbent media shall meet the hardness requirement of EA−C−1704 and performance requirements of 3.5.7 of this specification if ASZM−TEDA carbon is not used. In any case, the adsorbent shall be chromium free and pose no health hazards or potential environmental problems. For adsorbent other than ASZM−TEDA carbon, the lotting shall be equivalent to those requirements found in EA−C−1704.

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

3.3 Physical characteristics.

3.3.1 Filter body. The filter body shall be of a design strong enough to withstand all tests delineated in 4.3.6 of this specification without any visible damage and/or degradation, except for finish.

3.3.2 Filter weight. The weight of the complete unpackaged filter shall not be greater than 1.8 kilograms.

3.3.3 Color. The exterior surface of the filter shall be white, except for markings.

3.4 Interface.

3.4.1 Filter shape and size. The filter body shall be cylindrical in shape with ports on both ends of the filter that are concentric with the long axis of the filter. The body of the assembled filter shall be 12.65 to 13.15 centimeters in outside diameter at any point except for the ports and any circular shoulders on each end. The outer diameter of each port shall be 2.87 ± 0.03 centimeters and the external length of each port shall be 1.30 to 1.90 centimeters. The filter ends shall be so constructed as to have a flat circular area concentric with the port on each end. Each flat circular area shall be capable of mating with a 3.2 millimeter thick rubber gasket with a 3.0 centimeter inner diameter and an 8.9 centimeter outer diameter. The distance between these two flat circular surfaces shall be 24.28± 0.10 centimeters. The ends of the outer diameter of the assembled filter body shall not project beyond the parallel planes of these two flat circular areas.

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3.5 Performance characteristics.

3.5.1 Air flow resistance. The air flow resistance of the filter shall not exceed 43 millimeters of water at a 283 standard liters per minute airflow with an air stream temperature of 21°C and a barometric pressure of 760 millimeters (mm) Hg when tested as specified in 4.3.6.1.

3.5.2 Filter leakage. The filter shall not leak when a concentration of 1000 parts per million (ppm) of R–134a (1,1,1,2 tetrafluoroethane) refrigerant is introduced at the inlet of the filter at a flow rate of 57 standard liters per minute when tested in accordance with 4.3.6.2. The refrigerant (R–134a) shall conform to the characteristics of ARI STANDARD 700 and shall be dispersed in air at 24± 5°C and 50 percent maximum relative humidity (RH). A filter leak shall be defined as the presence of 1 ppm or more of R–134a in the effluent air within two minutes after the introduction of the refrigerant at the inlet of the filter.

3.5.3 Moisture content of adsorbent. The moisture content of the adsorbent taken immediately before packaging shall not exceed 3.0 percent when tested as specified in 4.3.6.3

3.5.4 Structural Integrity. The filter shall withstand testing as specified in 4.3.6.4. Sample filters shall show no evidence of cracks, dents or structural damage upon visual inspection after completion of testing.

3.5.5 Dimethylmethylphosphonate (DMMP) Gas life (destructive). After meeting the requirements of 3.5.4, the filter shall have a DMMP gas life of not less than 100 minutes at rated flow (283 l/m) when subjected to a DMMP challenge of 3.0± 0.2 milligrams per liter with an air stream temperature of 30± 3°C and a maximum of 25 percent humidity. Break concentration shall be 0.04 micrograms per liter. This requirement shall be met when tested in accordance with 4.3.6.5.

3.5.6 Cyanogen Chloride (CK) gas life (destructive). The filter shall have a CK gas life of no less than 30 minutes at rated flow (283 l/m) when subjected to a CK challenge concentration of 4.0± 0.2 milligrams per liter, with an air stream relative humidity of 80± 3 percent and air stream temperature of 24± 3°C. Break concentration shall be 8 micrograms per liter. Filters shall be equilibrated to 80 percent relative humidity prior to test. This requirement shall be met when tested in accordance with 4.3.6.6.

3.5.7 Adsorbent media gas life capacity. If a material other than ASZM–TEDA carbon is proposed as the adsorbent media, the material must be pre–qualified in a gas life test program in advance of First Article inspection. The qualification test program should demonstrate to the Government that gas life before and after environmental open–air exposure is equal or greater than that of ASZM–TEDA carbon for agents hydrogen cyanide (AC), CK, phosgene (CG) and DMMP as listed in EA–C–1704 and any additional chemical agents or simulants that may be specified by the Government (see 6.6). For those agents or simulants not listed in this paragraph, the Government reserves the right to establish the gas life requirements for those agents or simulants.

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3.5.8 Fines retention. Internal fines media shall retain the adsorbent in the adsorbent bed, so that the adsorbent emission from any individual filter shall not exceed 50 milligrams when tested as specified in 4.3.6.8.

3.5.9 Fines media. The fines media material, if made from natural cloth, shall resist dampness and mildew when tested as specified in 4.3.6.9. The material shall have a minimum spray rating of 50.0 and no visible growth of mildew on the material shall be evident after testing.

3.6 Marking. The exterior filter body shall be marked with the filter nomenclature: "FILTER, GAS, 283 LITERS/MINUTE, M18A1", the National Stock Number, the lot number and the manufacturing date in a nominal 9.5 mm high lettering on the circumference perpendicular to the long axis of the filter. The distance between the lines of lettering shall be a nominal 6 mm. The marking shall be black paint or ink. A 5 cm long arrow shall be marked on the outside of the filter body parallel with the axis of the filter and pointing in the direction of the air outlet port. A nominal 9.5 mm high marking below and centered on the arrow shall read "AIR FLOW". The outlet end of the filter shall have the marking "OUTLET" in a nominal 9.5 mm high marking.

3.7 Workmanship. Filters shall be free from sharp edges, all foreign matter and damage such as chipped or bent sections, cracks, punctures, pitting, tears, burrs or scratches.

4. VERIFICATION

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

(a) First article inspection (see 4.2)
(b) Conformance inspection (see 4.3)

4.2 First article inspection.

4.2.1 Sample. The first article sample shall consist of 20 consecutively produced filters which pass airflow resistance and leakage requirements (3.5.1 and 3.5.2). The first article sample shall be manufactured using the same design, methods, materials, equipment, and processes as will be used during regular production. The first article sample shall be submitted for inspection and approval in accordance with the terms of the contract.

4.2.2 Inspection Procedure. Unless otherwise specified by the terms of the contract the sample first article items shall be subjected to any or all of the examinations and tests specified in this specification and shall be inspected for compliance with all of the requirements of the applicable packaging requirements. All nondestructive tests shall be performed before destructive tests.

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4.2.2.1 For examination. The sample filters shall be examined for all required visual and measurable characteristics of this specification.

4.2.2.2 For test. Samples of at least 100 grams each of adsorbent shall be taken during the filling of the first, tenth and twentieth filters and placed in separate open containers. Those samples of adsorbent shall be exposed to the same conditions of temperature and humidity as their associated filters. Each filter shall be tested for air flow resistance (4.3.6.1) and leakage (4.3.6.2). Six of these filters shall then be tested in accordance with the fines retention test (4.3.6.8), the dampness and mildew resistance tests (4.3.6.9) after being visually examined for workmanship. Following leakage testing, the 14 remaining acceptable filters shall be packaged using the same methods, materials, equipment, and processes as will be used during regular production. Concurrent with or immediately following the packaging of the filters corresponding to each adsorbent sample, a 10 gram portion of each mixed adsorbent sample shall be tested for moisture content in accordance with 4.3.6.3. The packaged sample filters shall then be forwarded to the Government, and seven of them subjected to structural integrity testing in accordance with 4.3.6.4. These seven filters shall be tested by the Government in accordance with the DMMP gas life test (4.3.6.5) and the other seven filters shall be tested in accordance with the CK value test (4.3.6.6). If any sample filter from the lot fails to meet the requirements for structural integrity, fines retention, dampness and mildew resistance, DMMP gas life, CK gas life, dimensions or workmanship, the first article lot shall be rejected.

4.2.3 Acceptance criteria. If any first article sample item 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 to comply with any of the of the requirements. The contractor shall obtain written approval from the contracting activity prior to proceeding with regular production.

4.3 Conformance inspection.

4.3.1 Lotting. A lot shall consist of the filters produced by one manufacturer on one production line, from the same materials, with the same process, and without a break in production of more than 10 calendar days. However, any one lot of filters shall contain no more than one lot of carbon, and a new lot shall be started whenever any carbon filling or final assembly process equipment change is made. Each lot shall be identified and controlled in accordance with normal industry practice.

4.3.2 Sampling.

4.3.2.1 For examination. Sampling of packaged filters shall be conducted in accordance in accordance with the classification of characteristics in 4.3.5. Samples shall be selected at random.

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4.3.2.2 For tests. Sample sizes for DMMP and CK gas life testing shall be as follows:

TABLE I. Sampling Plan for Filter Gas Life

Lot size	DMMP sample size	CK sample size
30 to 150	5	5
151 to 500	8	8
501 to 5000	13	13

4.3.3 Inspection procedure.

4.3.3.1 For examination. Every item in the lot shall be inspected for critical characteristics. Sample filters shall be examined and tested in accordance with the classification of characteristics in 4.3.5. If a filter is found that does not conform to leakage or air flow resistance requirements, the non–conforming filter shall be rejected and removed from the lot. For major characteristics other than air flow resistance, failure of samples to conform to any characteristic based on sampling and acceptance criteria specified therein shall be cause for rejection of the lot. Failure of any sample filter to conform to any minor characteristic based on the sampling and acceptance criteria specified therein may be cause for rejection of the lot represented.

4.3.3.2 For test. A 100 gram sample of adsorbent shall be taken during the filling of the first and last filter manufactured each day and placed in separate open containers. Those samples of adsorbent shall be exposed to the same conditions of temperature and humidity as their associated filters. Each filter shall be tested for air flow resistance (4.3.6.1) and leakage (4.3.6.2). Following leakage testing, filters shall be packaged. Concurrent with or immediately following the packaging of the filters corresponding to each adsorbent sample, a 10 gram portion of each mixed adsorbent sample shall be tested for moisture content in accordance with 4.3.6.3. Packaged sample filters shall then be forwarded to the Government and half of them subjected to structural integrity testing in accordance with 4.3.6.4. Following structural integrity testing (see Table I), the Government shall conduct gas life tests on sample filters in accordance with 4.3.6.5 and 4.3.6.6. Any filter failing leakage or air flow resistance requirements shall be rejected and removed from the lot. If any sample filter from the lot fails to meet the requirements for structural integrity, DMMP value, CK value, dimensions or workmanship, the lot represented shall be rejected.

4.3.4 Inspection characteristics. Critical characteristics are characteristics whose nonconformance to specified requirements is likely to result in hazardous or unsafe conditions for indi-

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viduals using, maintaining, or depending upon the product or whose nonconformance to specified requirements is likely to prevent performance of the tactical function of a major end item. Major characteristics are characteristics whose nonconformance to specified requirements is likely to result in failure or to reduce materially the usability of the item for its intended purpose. Minor characteristics are characteristics whose nonconformance to specified requirements is not likely to reduce materially the operation or usability of the item for its intended purpose.

4.3.5 Classification of characteristics. Conformance examinations and tests shall be as specified in the following classification of characteristics paragraphs. When specified herein, accept on 0 and reject on 1 attributes sampling inspection shall be performed on the designated characteristics using the stated levels in table II for selection of sample sizes.

TABLE II. Sampling

Lot size	Inspection levels and sample sizes										
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
2 to 8	*	*	*	*	*	*	*	*	5	3	2
9 to 15	*	*	*	*	*	*	13	8	5	3	2
16 to 25	*	*	*	*	*	20	13	8	5	3	3
26 to 50	*	*	*	*	32	20	13	8	5	5	5
51 to 90	*	*	*	50	32	20	13	8	7	6	5
91 to 150	*	*	125	50	32	20	13	12	11	7	6
151 to 280	*	*	125	50	32	20	20	19	13	10	7
281 to 500	*	315	125	50	48	47	29	21	16	11	9
501 to 1200	*	315	125	75	73	47	34	27	19	15	11
1201 to 3200	1250	315	125	116	73	53	42	35	23	18	13
3201 to 10000	1250	315	192	116	86	68	50	38	29	22	15
10001 to 35000	1250	315	294	135	108	77	60	46	35	29	15
35001 to 150000	1250	490	294	170	123	96	74	56	40	29	15
150001 to 500000	1250	715	345	200	156	119	90	64	40	29	15
500001 and over	1250	715	435	244	189	143	102	64	40	29	15

*Indicates one hundred percent inspection. If sample size exceeds lot size, perform one hundred percent inspection.
Accept the lot represented on zero nonconforming characteristics and reject the lot represented on one or more nonconforming characteristics for all inspection levels.

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CLASSIFICATION OF CHARACTERISTICS

PARAGRAPH	TITLE		DRAWING NUMBER
4.3.5	Filter, gas, 10	SHEET 1 OF 1	

CATEGORY	CHARACTERISTIC	SAMPLING AND ACCEPTANCE CRITERIA	REQUIREMENT PARAGRAPH	INSPECTION METHOD
Critical				
1	Leakage	100 percent inspection	3.5.2	4.3.6.2
Major				
101	Air flow resistance	100 percent inspection	3.5.1	4.3.6.1
102	Moisture content	See 4.2.2.2	3.5.3	4.3.6.3
103	Inlet and outlet ports correct	Table II, level IX	3.4.1	CE
104	Structural integrity	Table I	3.5.4	4.3.6.4
105	DMMP gas life	Table I	3.5.5	4.3.6.5
106	CK gas life	Table I	3.5.6	4.3.6.6
107	Overall dimensions	Table II, level IX	3.4.1	CE
108	Workmanship	Table II, level IX	3.7	VI
Minor				
201	Marking correct and legible	Table II, level XI	3.6	VI
202	Weight	Table II, level XI	3.3.2	CE
203	Color correct	Table II, level XI	3.3.3	VI

NOTES:

CE – Commercial inspection equipment
VI – Visual inspection

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4.3.6 Tests.

4.3.6.1 Air flow resistance. The pressure drop across the filter shall be in accordance with 3.5.1 and shall be determined at the rated air flow. The up–stream and down–stream static pressure measuring tubes shall be as close as possible to the filter and shall not be on a section of duct that has a changing cross sectional area. Test for air flow resistance as follows:

(a) Connect the filter to a source of forced air.
(b) Set the flow of air through the filter to 283 standard liters per minute
. (c) Record the barometric pressure.
(d) Measure and record the air stream temperature.
(e) Determine and record the difference in static pressure head up–stream of the filter to that down–stream of the filter. NOTE: If using test parameters different than those stated in 3.5.1, calculate and record the air flow resistance DP(cal) using the equation below to correct test measurements to standard conditions.

$$DP(cal) = \frac{P(test) \times DP(measured) \times 86.2}{(492 + 1.8T)^{1.768}}$$

DP(cal) – Air flow resistance corrected to standard conditions in millimeters of water gage
P(test) – Barometric pressure at time of test in millimeters of mercury
DP(measured) – Value recorded from test measurement in millimeters of water
T – Temperature of air stream flowing through filter in degrees C

If DP(cal) is more than the air flow resistance stated in 3.5.1, the filter shall be rejected.

4.3.6.2 Leakage. Position the filter to be tested rigidly with the long axis in the vertical position. Connect the filter to a source of forced air and place a mixing chamber at the influent side of the filter. Regulate the air flow from the blower to 57 standard liters per minute. Introduce R–134a into the intake of the blower; monitor and maintain a concentration of 1000 ppm by volume of R–134a in air at an air flow of 57 standard liters per minute on the influent side of the filter at the proper temperature and relative humidity for the specified period of time (see 3.5.2). Leakage shall be in accordance with 3.5.2 and shall be determined using a suitable leak detector (see 6.5) for sampling and detecting R–134a at the effluent side of the filter. Purge the filter by passing fresh air in the reverse direction of that indicated above through the filter at 283 standard liters per minute for 1 minute. Keep the exposure of the filter to air to a minimum. The air flow time for leakage should not exceed 3 minutes.

4.3.6.3 Moisture content of gas filter. The filters shall meet the moisture content specified in 3.5.3 when the moisture content of the carbon is determined in accordance with ASTM D

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2867, Oven–Drying Test Method, except that the oven temperature shall be 103°–107°C and the drying time shall be 3 hours. The moisture content may also be determined through the use of moisture teller devices. If the moisture content of the adsorbent exceeds the requirement, the filters represented by the samples shall be considered unacceptable.

4.3.6.4 Structural integrity. Each sample unpackaged filter shall be positioned vertically with inlet end down and clamped on a steel movable plate. The plate shall measure 76.2 by 76.2 centimeters and have a total weight of 109± 9 kilograms including the holding clamps. When the filter is securely clamped in place, there shall be no distortion of the frame or body of the filter. The steel movable plate and filter shall be raised and let fall (free) 19± 3 millimeters onto a steel base plate at the rate of 200 drops per minute for 15± 0.1 minutes. The steel base plate shall be part of the apparatus and shall be firmly anchored to a concrete floor capable of absorbing the impact of the vertical vibrations. The test shall be performed at a room temperature of 21± 11° C. Throughout the test the filter shall remain in a firm position. Filters may be padded or blocked where clamps press against the side or top of the frame, but not the bottom, to prevent distortion of the filter. The movable steel plate must be parallel to the base plate at all times to eliminate any horizontal movement and/or force. The filter shall meet the requirements of 3.5.4 after rough handling.

4.3.6.5 DMMP value (destructive). The DMMP gas life shall be determined by the Government laboratory in accordance with 3.5.5 using the Q223 tester (Drawing 136–41–1755) or an approved equivalent tester.

4.3.6.6 CK value (destructive). The CK gas life shall be determined by the Government laboratory in accordance with 3.5.6 using the Q223 tester or an approved equivalent tester.

4.3.6.7 Adsorbent Media. For adsorbent other than ASZM–TEDA carbon, allsupporting test data shall be based on test paragraphs, conditions and methods describedin EA–C–1704. Supporting test data will also be needed for any required test falling outside of the scope of EA–C–1704 (see 6.6).

4.3.6.8 Fines retention test. The filter shall be rigidly mounted with the inlet port in the upper vertical position and subjected to the test of MIL–STD–810, Method 516.4, Procedure I. A total of three half sine wave shock pulses shall be applied in both directions along each of three mutually perpendicular axes. Peak amplitude shall be 30± 3 g, 11± 0.2 milliseconds (ms). At the conclusion of the test, examine the filter for adsorbent fines emission and record the total amount of emission through the fines filters. The filter shall meet the adsorbent emission limits of 3.5.8.

4.3.6.9 Dampness and mildew resistance tests. The dampness resistance test shall be in accordance with Test Method 5526 of FED–STD–191 and the mildew resistance test shall be in accordance with Test Method 5750 of FED–STD–191. A minimum of two samples of fines

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media from filters shall be subjected to each test. The dampness resistance and mildew resistance shall meet the requirements of 3.5.9.

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 System Command. 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 gas filter covered by this performance specification is intended to be used as a component of NBC filtration systems in military armored vehicles such as the M1 series tanks. This filtration system (M13A1 GPFU) normally provides purified air to four crew members inside a closed armored vehicle in a chemical agent contaminated environment, with the M18A1 gas filter being the part of this system which purifies the air from chemical agents. The M18A1 gas filter is military unique with no known commercial application.

6.2 Acquisition requirements. Acquisition documents should 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 2.2.1).
(c) First article:
(1) Time allowed for contractor submission of samples for Government test and evaluation after award of contract when testing is performed by the Government.
(2) Name and address of test facility and shipping instructions when testing is performed by the Government.
(3) Time required for the Government to notify the contractor whether or not to proceed with production.
(d) Packaging requirements.
(e) Additional identification or marking requirements, if required, must be in the con-

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tract and cite the identification method and responsibility for the items affected, such as test units, components, serial numbers, Julian date, lot numbers, etc.

6.3 DMMP value and CK value tests. Samples for these tests should be forwarded by the contractor, together with DD Form 1222, to Director, U.S. Army Edgewood, Research, Development and Engineering Center, ATTN: SCBRD–ENM–N, Building E5165, Aberdeen Proving Ground, MD 21010–5423.

6.4 Submission of alternative inspection provisions. Proposed alternative inspection provisions should be submitted by the contractor to the procuring contracting officer for evaluation and approval by the technical activity responsible for preparation of this specification.

6.5 Leakage detector. The halide leak detector, model F1000, manufactured by Nuclear Consulting Services, Inc. has been found suitable for this purpose. When using this detector, the presence of high vapor pressure halogenated contaminants in the refrigerant could interfere with the filter leak test, resulting in false indications of filter leakage. Should false leakage indications be suspected, the refrigerant should be checked for the presence of such contaminants.

6.6 Adsorbent media. Although manufacturers may consider using alternate adsorbent media, development tests comparable to or beyond those done on ASZM–TEDA carbon specified by EA–C–1704 must first be performed by the contractor, and then approved for use by the Government. Contractors are forewarned that such testing, which includes gas life capacity testing using a variety of chemical agents before and after open–air environmental exposure, may be lengthy and costly. All such costs will probably be borne by the contractor, including costs for Government testing.

6.7 Lot numbering. MIL–STD–1168 outlines a lot numbering procedure that has beenused successfully in the past.

6.8 Drying of filters. Filters not meeting the moisture requirement may be dried by passing contaminant free air at a temperature not to exceed 100°C through the filters. After drying, two filters may be chosen at random and disassembled. The moisture content of the adsorbent from these filters may be redetermined in accordance with ASTM D 2867, Oven–Drying Test Method, using an oven temperature of 103°–107°C and drying time of 3 hours. The moisture content of the adsorbent may also be determined through the use of moisture teller devices.

6.9 Subject term (key word) listing.

CK (cyanogen chloride)
DMMP (dimethylmethylphosphonate)
Filtered air
Gas filter

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R–134a (1,1,1,2 tetrafluoroethane)
Toxic gas filter

6.10 Other. The filter depicted on drawing 5–19–2300 (Filter, Gas, 10 CFM, M18A1) is known to be capable of meeting the requirements of this performance specification but is not mandatory for use in manufacture as the drawing is for information purposes only.

6.11 Changes from previous issues. 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 – EA

Preparing activity:

Army – EA

Project No. 4240–A247

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U.S. Army Edgewood Chemical Biological Center	(1) Commercial (	(2) DSN 584-3230
c. ADDRESS *(Include ZIP Code)* ATTN: AMSSB-REN-SS, E3331 5183 Blackhawk Road Aberdeen Proving Ground, MD 21010-5424	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman Road, Suite 2533 Fort Belvoir, Virginia 22060-6221 Telephone (703) 767-6888 DSN 427-6888	