

INCH-POUND

MIL-PRF-32016(EA)
26 November 1997

PERFORMANCE SPECIFICATION

CELL, GAS PHASE, ADSORBER

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 specification covers gas phase adsorber cells used to remove toxic chemical vapors exhausted from laboratory air filtration systems. This specification does not include requirements for the housing into which these adsorber cells are installed.

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 ensure 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 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

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

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2.2 Government Documents. The following Government documents 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-Molybdenum-Triethylenediamine (ASZM-TEDA)

(Copies of this purchase description are available from Technical Director, U.S. Army Edgewood Research, Development and Engineering Center, ATTN: SCBRD-ENE-M, Aberdeen Proving Ground, MD 21010-5423)

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).

AIR CONDITIONING & REFRIGERATION INSTITUTE

ARI Standard 700 - Standard for Specifications for Fluorocarbon and Other Refrigerants

(Application for copies should be addressed to ARI, 4301 North Fairfax Drive, Arlington VA 22203)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME AG-1 - Code on Nuclear Air and Gas Treatment)

(Application for copies should be addressed to ASME, 345 East 47th Street, New York NY 10017.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A240 - Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Fusion-Weld Unfired Pressure Vessels

ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

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ASTM D2867 - Moisture in Activated Carbon

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

2.4 Order of precedence. In the event of 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 First article. When specified (see 6.2), a sample shall be subjected to first article inspections in accordance with 4.2.

3.2 Materials. If another material is used other than one of those materials specified within 3.2, that material shall meet equivalent development performance requirements as the material it replaces, and it shall be approved by the Government prior to use by the contractor. At the time of disposal, materials shall not be a Resource Conservation Recovery Act hazardous waste as defined in 40 CFR 261.21-261.24 or 40 CFR 261.33.

3.2.1 Adsorbent media. The adsorbent media shall fully meet the requirements of EA-C-1704 when ASZM-TEDA carbon is used. The adsorbent media shall meet the hardness requirement of EA-C-1704 and performance requirements in 3.3.4.2 of this specification if ASZM-TEDA is not used.

3.2.2 Gasket. Gaskets shall be impermeable to conventional blood, blister, choking and nerve warfare agents (see 6.4). The gasket shall be capable of meeting the minimum physical property requirements of ASTM D1056-91, Type 2 - closed cell rubber, Class C - oil resistant with medium swell, Grade 2 - having compression-deflection range of 5 to 9 pounds per square inch.

3.2.3 Other. All inner and outer case materials shall meet the minimum strength and corrosion properties of type 304 stainless steel per ASTM A240. All fastener materials shall be compatible with and not cause corrosion with the case material. The cell material shall not induce corrosion with the material of each housing identified by the purchaser in the contract.

3.3 Performance.

3.3.1 Residence time and pressure drop. The residence time and pressure drop of the adsorber cell shall be a minimum of 0.250 seconds and 1.7 inches water gage (iwg) \pm 20% iwg, respectively, when the airflow rate is 500 standard cubic feet per minute (SCFM).

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3.3.2 Adsorber cell leakage. The downstream concentration of the leak tracer vapor shall not exceed 0.0005 times the upstream concentration.

3.3.3 Rough handling/dimethylmethylphosphonate (DMMP) gas life capacity. After rough handling, each assembled and filled adsorber test cell shall have a minimum DMMP gas life of at least 60 minutes when tested in accordance with 4.5.3. After rough handling, each cell shall show no evidence of cracks or dents.

3.3.4 Adsorbent media degradation. The adsorbent media shall not be degraded during manufacture, handling and storage.

3.3.4.1 Moisture content. The moisture content of each adsorber cell shall not exceed 3.0% by weight.

3.3.4.2 Cyanogen chloride (CK) gas life capacity. The adsorption media shall provide a minimum CK gas life of at least 50 minutes. 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), DMMP, sarin (GB), mustard (HD) and arsine (SA) and any additional chemical agents or simulants that are specified by the Government (see 6.5).

3.4 Interface. Each assembled and filled adsorber cell shall comply with the dimensions, tolerances and notes specified herein and in figure 1 to assure interchangeability of adsorber cells and proper fit with the interfacing gasket and mounting frame of housing.

3.4.1 Outer dimensions. The outer dimensions of the face area (surface area normal to airflow) shall be 24 +0, -1/8 by 24 +0, -1/8 inches. The depth of the adsorber cell shall be 16 +0, -1/8 inches. See figure 1.

3.4.2 Case flanges. Case flange on front face is represented by shaded area in figure 1. Width of case flanges on front and back faces shall be $3/4 \pm 5/8$ inch (see figure 1.) Any material which extends beyond the plane of the case flanges on the gasketed face of the adsorber cell shall be ground flush with the plane of the flanges to enable proper sealing of the cell to its mounting frame. Flanges on the gasketed face of adsorber cell shall be flat within 3/32 inch.

3.4.3 Case panels. All case panels (top, bottom and side surfaces of adsorber cell) shall be flat within 1/16 inch by 24 inch. Side case panels shall be perpendicular to adjoining top and bottom case panels within 1/16 inch tolerance. Any front or back panels of compartments that hold the adsorbent media, fasteners (e.g. screws) and sealants shall be recessed, or, as a minimum, not extend beyond the plane of the front gasketed

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face and also not extend beyond the plane of the back ungasketed face to allow proper fit with the interfacing housings.

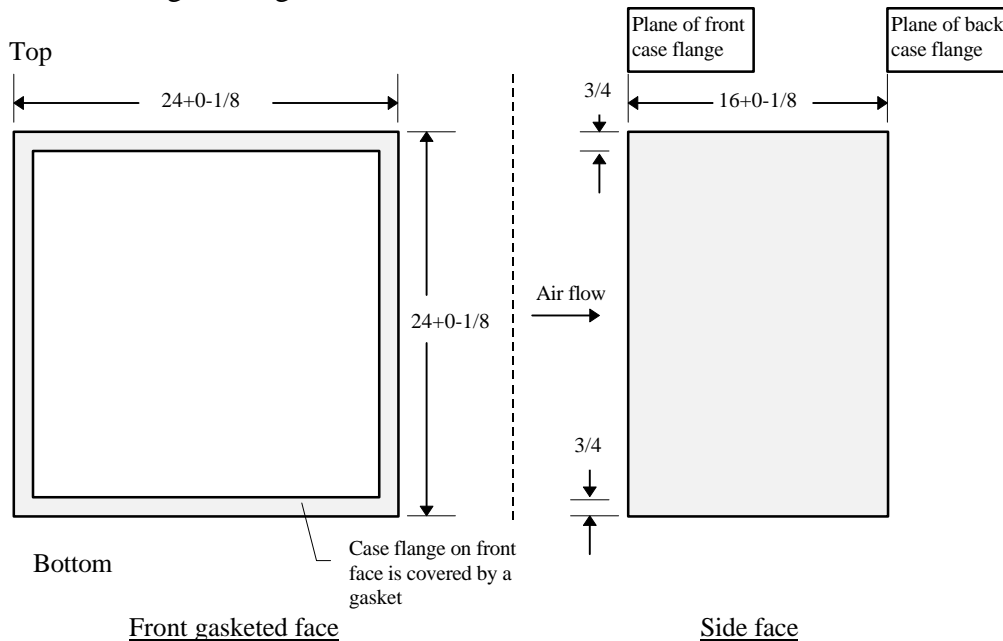


Figure 1. Gas-phase adsorber cell, interface-related dimensions

3.5 Identification and Marking. Each adsorber cell shall be permanently and legibly marked with the following information:

- (a) Manufacturer's name
- (b) Serial number
- (c) Date of manufacture
- (d) Unfilled cell weight (pounds)
- (e) Contract number
- (f) Carbon type and grade designation, lot and batch
- (g) Carbon dry weight (pounds - see 4.3.4.1)
- (h) Cell weight immediately upon assembly (pounds)
- (i) Airflow resistance at specified airflow rating (iwg)
- (j) Adsorber cell leakage (percentage)
- (k) Filling date

3.6 Workmanship. Each adsorber cell shall be free from foreign matter, such as dirt, grease, oil, and from minor damage that is non-mission essential, such as chipped, burred or bent sections, or loose or frayed gasket material.

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4. VERIFICATION

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

- (a) First article inspection (see 4.2)
- (b) Quality conformance inspection (see 4.3)

4.2 First article inspection.

4.2.1 Sample. Unless otherwise specified in the contract, the first article sample shall consist of 8 adsorber cells consecutively manufactured using the same 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 Inspections to be performed. Unless otherwise specified by the terms of the contract, the sample first article items shall be subjected to all of the examinations and test 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.

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 requirements. The contractor shall obtain written approval from the proper authority of the contracting activity before proceeding with regular production. Once the contractor has proper approval to proceed into regular production, the contractor shall then meet the quality conformance inspection requirements (4.3).

4.3 Quality conformance inspection.

4.3.1 Lotting. A lot shall consist of the adsorber cells produced by one manufacturer, at one plant, from the same materials, under the same manufacturing and process conditions and without a break in production of more than 10 calendar days. Any one lot of cells shall contain no more than one lot of adsorbent media. A new lot of adsorber cells shall be started whenever any adsorbent media filling or final assembly process equipment change is made. Each lot shall be produced in its entirety before any adsorber cells of another lot are produced on that production line.

4.3.2 Sampling. Inspection and test of random samples shall be conducted in accordance with the classification of characteristics in 4.3.5 and, when specified, Table I.

4.3.3 Inspection procedure. Every item in the lot shall be inspected for critical characteristics. Sample adsorber cells shall be examined and tested in accordance with the

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classification of characteristics in 4.3.5. If an adsorber cell is found that does not conform to leakage and pressure drop requirements, the non-conforming adsorber cell shall be rejected and removed from the lot. For characteristics other than leakage and pressure drop, failure of any sample adsorber cell to conform to any characteristic in the classification of characteristics based on the sampling and acceptance criteria specified therein shall be cause for rejection of the lot represented (see footnote, table I).

4.3.4 Inspection characteristics. Critical characteristics are those whose nonconformance to specified requirements is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the product, characteristics whose nonconformance to specified requirements is likely to prevent performance of the tactical function of a major end item. Major characteristics are those 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 those 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 I for selection of sample sizes.

TABLE I. Sampling

Lot size	Inspection level and samples 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

• Asterisk means 100% inspection of lot. Accept the lot if there are zero non-conforming characteristics and reject the lot if there are one or more nonconforming characteristics for all inspection levels.

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CLASSIFICATION OF CHARACTERISTICS

PARAGRAPH	TITLE	Sheet 1 of 1	DRWG NO.	
4.3.5	Cell, Gas Phase, Adsorber			
CATEGORY	CHARACTERISTIC	SAMPLING	REQUIREMENT PARAGRAPH	INSPECTION METHOD
Critical				
1	Adsorber Cell Leakage	100 %	3.3.2	4.5.2
Major				
101	Adsorbent media	See 4.2.1	3.2.1	VI (COC)
102	Gasket material	See 4.2.2	3.2.2	VI (COC)
103	Other material(s)	See 4.2.3	3.2.3	VI (COC)
104	Pressure drop	100 %	3.3.1	4.5.1
105	Rough handling/DMMP gas life capacity	Table I, Level IX	3.3.3	4.5.3
106	Moisture content	See 4.3.4	3.3.4.1	4.5.4.1
107	CK gas life capacity	See 4.3.4	3.3.4.2	4.5.4.2
108	Exterior dimensional configuration of adsorber cell	Table I, Level VII	3.4	CE
Minor				
201	Label accurate, complete and legible	Table I, Level VII	3.5	VI
202	Workmanship	Table I, Level VII	3.6	VI
NOTES:				
CE - Commercial inspection equipment VI - Visual inspection COC - Certificate of Compliance				

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4.4 Materials verification. Performance-related materials requirements in 3.2.1, 3.2.2, and 3.2.3 shall be verified by test data acquired using test methods described in 4.4.1, 4.4.2, and 4.4.3, or by a Certificate of Compliance together with supporting evidence acquired from technical literature, supplier's specifications, or findings from technical experts which are Government approved.

4.4.1 Adsorbent media. Supporting test data shall be based on test paragraphs, conditions and methods described in EA-C-1704. Other supporting test data may be required (see 6.5).

4.4.2 Gasket. Supporting data for the gasket material shall comply with the test methods specified in ASTM D1056.

4.4.3 Other Material(s). Supporting data for the case material shall comply with the test methods specified in ASTM A240.

4.5 Performance verification.

4.5.1 Residence time and pressure drop. The residence time shall be determined for the rated flow by the procedure specified in mandatory appendix FD-I of ASME AG-1. The pressure drop, also called "airflow resistance", of the adsorber cell shall be determined at the rated flow with an air stream temperature of $70 \pm 2^\circ\text{F}$ and a barometric pressure of $29.9 \pm 1\%$ inches of Hg (standard conditions). The cell shall be placed in the test tunnel in its service orientation. Record the barometric pressure and the air stream temperature. Determine and record the difference in the static pressure head upstream of the cell to that downstream of the cell. Subtract the resistance of the test fixture from the recorded resistance so that the corrected resistance is that of the cell only. If test conditions depart from standard conditions, calculate and record the airflow resistance (ΔP (cal)) using the equation below to correct the measured airflow resistance to airflow resistance at standard conditions:

$$\Delta P \text{ (cal)} = P \text{ (test)} \times \Delta P \text{ (measured)} \times 86.21 \div [(460 + T)^{1.768}]$$

where:

ΔP (cal) - air flow resistance corrected to standard conditions in inches water gage (iwg).

P (test) - barometric pressure at time of test in millimeters of mercury (mm Hg).

ΔP (measured) - air flow resistance value recorded from test measurement in iwg.

T - temperature of air stream flowing through the adsorber cell in degrees Fahrenheit.

4.5.2 Adsorber cell leakage. Install the adsorber cell in the test tunnel in its service orientation. Adjust airflow to rated flow. The leak tracer vapor (refrigerant 134a) shall

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conform to the characteristics of ARI Standard 700. Challenge the cell with R-134a or equivalent refrigerant vapor at a concentration equal to at least 10,000 times the minimum sensitivity of the monitor used to measure cell leakage. The challenge-gas injection port shall be located in such a manner to ensure uniform mixing of the tracer gas. The downstream test port shall be located to ensure a representative sample. The leak tracer chemical shall be injected continuously into the adsorber cell over a duration sufficient to ensure the effluent monitor is capable of accurately measuring the required leakage level. This duration should be at least twice the response time of the effluent monitor to the tracer chemical injected in the normal manner. This response time can be checked at the time of calibration of the effluent monitor. To accurately measure response time, the standard gas mixture must flow (at the sampling flow rate used during testing) to the monitoring equipment through the entire sample line used in the conduct of the testing. The response time is the duration from the start of sampling to the attainment of a stable response from the monitor. When a monitor is used to exclusively sample the adsorber cell effluent stream, only one sample, taken at twice the system response time, need be quantified. If the same monitor is used to quantify the influent and effluent streams, at least three determinations must be taken at each location. The first of these determinations shall be no earlier than the system response time.

4.5.3 Rough handling/DMMP gas life capacity. Each filled test cell shall be mounted and subjected to rough handling as follows.

4.5.3.1 Rough handling apparatus. The apparatus shall consist of a vibrating machine that has been fitted with a steel movable plate and holding clamps. This plate shall measure 30 x 30 inches and have a total weight of 240 ± 20 pounds including the holding clamps. A steel base plate shall be part of the apparatus and shall be firmly anchored to a concrete floor suitable to absorb the necessary impact of the vertical vibrations

4.5.3.2 Rough handling procedure. Position and clamp the cell in its service orientation on the steel movable plate so that there shall be no distortion to the frame or body of the adsorber cell when it is securely clamped in place. The steel movable plate and adsorber cell shall be raised and let fall (free) by gravity $3/4 \pm 1/8$ inch onto the steel base plate at the rate of 200 drops per minute for 10 ± 0.1 minutes. The test shall be performed at a room temperature of 70 ± 25 degrees Fahrenheit. Throughout the test the adsorber cell shall remain in a firm position. Adsorber cells 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 cells. The movable steel plate must be parallel to the base plate at all times to eliminate any horizontal movement and/or force. (Approved safety procedures shall be observed while performing test.) Immediately following rough handling, each filled test cell shall be inspected and tested for DMMP gas life capacity. To minimize redistribution of adsorbent media, rough handling and DMMP gas life tests shall be done at the same test facility.

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4.5.3.3 DMMP gas life capacity.

a. Prior to running the test, verify that samples cells have been tested for airflow resistance and leakage and have been rough handled.

b. Install cell in test tunnel in its service orientation. Adjust airflow to 500 SCFM \pm 5%. The cell shall be tested using dimethylmethylphosphonate (DMMP) and run to cell life at the following test conditions:

Challenge concentration of DMMP: $5,000 \pm 400 \text{ mg/m}^3$

Breakthrough concentration of DMMP: 0.04 mg/m^3

Relative Humidity: less or equal to 40 %

Temperature: $45 \pm 5^\circ\text{C}$

c. The test tunnel shall be operated at the rated flow. The inlet face of the cell shall be challenged as specified above. The total time from the start of the cell challenge until the breakthrough concentration is reached (i.e., the life of the cell) shall be recorded as the breakthrough time.

d. The DMMP vapor in air challenge concentration shall be created to ensure uniform mixing of the DMMP vapor with the air once it reaches the test cell. Qualification testing to verify the DMMP vapor concentration is uniform across the cell face shall be on file and available for inspection.

e. The breakthrough time for the DMMP concentration of the adsorber cell effluent to increase to 0.04 mg/m^3 shall be 60 minutes or greater to accept the adsorber cell sample. While the challenge concentration is permitted to vary within the stated range during the course of the test, the breakthrough time measured must be normalized to the $5,000 \text{ mg/m}^3$ concentration by the following calculation:

Corrected breakthrough time = Measured breakthrough time * Average concentration during test \div $5,000 \text{ mg/m}^3$

4.5.4 Moisture content and CK gas life sampling method. A minimum one pound specimen of carbon shall be obtained during filling of the first cell, the middle cell and the last cell of the day. Each carbon specimen shall be placed in an open container or in a cloth bag and accompany its cell through the assembly line. The carbon specimen shall be labeled to match it to the sampled adsorber cell. Upon cell packaging, the specimen shall be placed in an airtight container. Upon completion of the lot, 4 samples shall be chosen from the group of daily production specimens, one from each quarter of the lot.. Each sample shall be halved and shall be labeled to match it to the sampled adsorber cell. One half shall be tested for moisture content as specified in 4.5.4.1 and the other half shall be tested for CK gas life as specified in 4.5.4.2.

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The 4 samples shall be submitted to: Technical Director, U.S. Army Edgewood Research, Development and Engineering Center, ATTN: SCBRD-ENM-N, 5232 Fleming Road, Aberdeen Proving Ground MD 21010-5423. The following documentation shall accompany the samples:

- Request for CK gas life testing as specified in this document;
- Adsorber serial number each specimen was taken from;
- Manufacturer name, address, and point of contact;
- Applicable contract number.

4.5.4.1 Moisture content. The moisture content of each of the 4 carbon samples shall be determined in accordance with ASTM D2867, except the oven drying temperature shall be 103° -107 °C.

a. For any sample failing to meet the requirements of 3.3.4.1:

(1) All cells represented by the failed sample, in turn, fail to meet the requirements of 3.3.4.1. These cells shall be removed from the lot. (See 6.3 (b).)

b. For any sample successfully meeting the requirements of 3.3.4.1:

(1) For each adsorber cell represented by the sample, calculate and record the adsorber cell dry weight. The cell dry weight is calculated by reducing the cell's total weight (determined at the time of final assembly - which is not necessarily the time of packaging) by the moisture content measured in the quarter lot carbon sample for that cell.

(2) Immediately before packaging (which may not immediately follow when the cell was assembled and weighed), weigh each cell. If this weight is higher than the weight taken at the time of final assembly, the weight increase shall be attributed to an additional moisture gain. In turn, the cell's moisture content shall be increased by this gain. Any cell failing to meet the requirements of 3.3.4.1 shall be removed from the lot (See 6.3(b).)

4.5.4.2 CK gas life. The CK gas life of adsorbent samples shall be determined in accordance with EA-C-1704. (See 6.5.)

4.6 Interface. Measure and inspect the assembled and filled cell against the requirements in 3.4.

4.7 Identification and markings. Visually inspect the adsorber cell label information as specified in 3.5 for accuracy, completeness and legibility.

5. 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

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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 phase adsorber cell is used to remove toxic chemical vapors exhausted from laboratory air filtration systems. The effluents from laboratory work involving blister, blood, choking and nerve agents may be exhausted through these adsorber cells. This item is military unique because of the need for adequate gas life using chemical warfare agents.

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)
- (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. To enhance shelf life, packaging design should not allow moisture to adsorb on gas sorption media during periods of packaged storage.
- (e) Exceptions or deviations to the specification.

6.3 Moisture control.

(a) The manufacturer may implement various process controls to minimize the damaging impact of moisture to the carbon. Ensuring any air streams entering the adsorber cell, especially during refrigerant leakage testing, is not laden with excessive moisture is strongly recommended.

(b) Each cell not meeting the requirements of 3.3.4.1 should be dried at a temperature not exceeding 150°F.

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6.4 Gasket design. A 1/4" thick gasket made of butyl rubber which meets ASTM D1056-91, Grade Number 2C2, Type 2 - closed cell rubber, Class C - oil resistant with medium swell, Grade 2 - having compression-deflection range of 5 to 9 pounds per square inch has been used successfully with the adsorber cell in the past and is considered to meet baseline requirements for permeation resistance.

6.5 Adsorbent Media. Although manufacturers may consider using alternate adsorbent media, development tests comparable to those done on the 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.

6.6 Lot Size. Planned lot size and sample size should be such that no more than 10% of the product is destroyed during destructive gas life testing. Sample quantities in this specification are based on the assumption of low volume (less than 100 cells) procurement of gas phase adsorber cells.

6.7 Submission of alternative inspection methods. Proposed alternative inspection methods and sampling plans may be submitted by the contractor to the procuring contracting officer (PCO) for evaluation and approval by the appropriate government technical activity. The contractor should not implement alternative inspection methods and plans unless this written approval is granted by the PCO.

6.8 DMMP test equipment. The DMMP gas life test requires expensive and unique test equipment. A known source for this testing is:

Non-Surety Test Team, SCBRD-ENM-N, Engineering Directorate
U.S. Army Edgewood Research, Development and Engineering Center
Aberdeen Proving Ground, MD 21010-5423

(Voice): 410-671-2284

(Fax): 410-671-4804

6.9 Subject term (key word) listing.

Adsorber cell
Air purifier
Filtered air
Gas filter
CK (Cyanogen chloride)
DMMP (Dimethylmethylphosphonate)
R-134a (1,1,1,2 Tetrafluoroethane)

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Custodian:

Army - EA

Preparing Activity:

Army - EA

Project No. 4240 - A224

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

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

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

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-32016(EA)	2. DOCUMENT DATE (YYMMDD) 971126
3. DOCUMENT TITLE CELL, GAS PHASE, ADSORBER		
4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	c. DATE SUBMITTED (YYMMDD)
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (3) HOME	
7. PREPARING ACTIVITY		
a. NAME Cdr, U.S. Army ERDEC ATTN: SCBRD-ENE-S, E5027	b. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (410) 671-1851 (DSN) 584-1851	
c. ADDRESS (Include Zip Code) 5232 Fleming Road Aberdeen Proving Ground, MD 21010-5423	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	