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MIL-M-51113D(EA)
22 September 1986
SUPERSEDING
MIL-M-51113C(EA)
18 October 1974

MILITARY SPECIFICATION

MASK, CHEMICAL-BIOLOGICAL, AIRCRAFT, ABC-M24

This specification is approved for use within the Chemical 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 one type of chemical-biological mask.

1.2 Classification. Masks shall be of the following sizes, as specified (see 6.2) :

Small (small faceblank-medium nosecup) - PN 5-1-296-10
Medium (medium faceblank-medium nosecup) - PN 5-1-296-20
Large {medium faceblank-large nosecup) - PN 5-1-296-30

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein, Unless otherwise specified, the issues of' these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

: Beneficial cements recommendations, additions, deletions) and any perti- :
: nent data which may be of.use in improving this document should be addressed:
: -to: Commander, U.S. Army Chemical Research, Development and Engineering :
: Center, ATTN: SMCCR-SPD-TS, 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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SPECIFICATIONS

FEDERAL

QQ-S-781 - Strapping, Steel, and Seals.
NNN-P-40 - Paper, Lens.
PPP-B-601 - Boxes, Wood, Cleated-Plywood.
PPP-B-636 - Boxes, Shipping, Fiberboard.
PPP-T-76 - Tape, Packaging, Paper, (For Carton Sealing).

MILITARY

MIL-P-116 - Reservation, Methods of.
MIL-B-117 - Bags, Sleeves, and Tubing - Interior Packaging.

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129 - Marking for Shipment and Storage.
MS24535 - Fasteners, Container Closure.

.2.1.2 Drawings. The following drawings form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DRAWINGS

U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND

CHEMICAL RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

5-1-296 - Mask, Chemical-Biological, Aircraft, M24.
136-30-114 - Microphone Tester.
136-42-750-1 - 'Tester, Leakage, Protective Mask, M14.
136-44-20-1 - Indicator, Inhalation and Exhalation Resistance, Q213.
136-45-202-14 - Indicator, Outlet Valve, Leakage, M4A1
136-15-220 - Tester, Microphone, Q12A1,

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specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Materials and components. All materials and components shall conform to Drawing 5-1-296 and the subsidiary drawings listed thereon.

3.2 Manufacture and assembly. The mask shall be manufactured and assembled in accordance with Drawing 5-1-296,

3*3 Outlet valve leakage. Outlet valve leakage shall not exceed 15 milliliters of air per minute, at a pressure differential of 25 millimeters of water, when tested as specified in 4.4.4.1.

3.4 Exhalation resistance. The exhalation resistance of the mask shall not exceed 25 millimeters of water at an airflow rate of 85 liters per minute when tested as specified in 4.4.4.2.

3.5 Lens optical defects.

3.5.1 Zone A. Zone A (see figure 1) of the lens shall not contain more than an aggregate total of two bubbles, imbedded particles, or spots of 1/16 inch diameter or less which are at least two inches apart. Zone A of the lens shall not contain any imbedded particles or spots greater than 1/16 inch diameter, any two imbedded particles or spots closer than two inches, any scratches, abraded areas, creases, or other surface imperfections

3.5.2 Zone B. Zone B (see figure S) of the lens shall not contain more than five bubbles of 1/16 inch diameter or less which are all at least one inch apart. Zone B shall not contain any bubbles greater than 1/16 inch diameter or any imbedded particles or spots closer than one inch. Zone B shall not contain any creases or concave contoured areas (with permanent set) which distort vision. Zone B shall not contain more than three scratches which are 1/4 inch or shorter and 0.020 inch or narrower. Zone B shall contain no scratches which are longer than 1/4 inch, wider than 0.020 inch, or closer than one inch from any other scratch.

3.6 Microphone and plug assembly. The microphone and plug, after assembly to the facepiece, shall. function properly when tested as specified in 4.4.4.3.

3.7 Mask assembly leakage. Overall leakage of the finished mask assembly (excluding leakage of' the facepiece periphery, outlet valve seat, and through the canister),shall not exceed 0.003 percent penetration when tested as specified in 4.4.4.4.

3.8 Preproduction. Prior to the start of regular production, a preproduction sample of masks shall be produced, in accordance with this specification~ for examination and tests (see 4.3).

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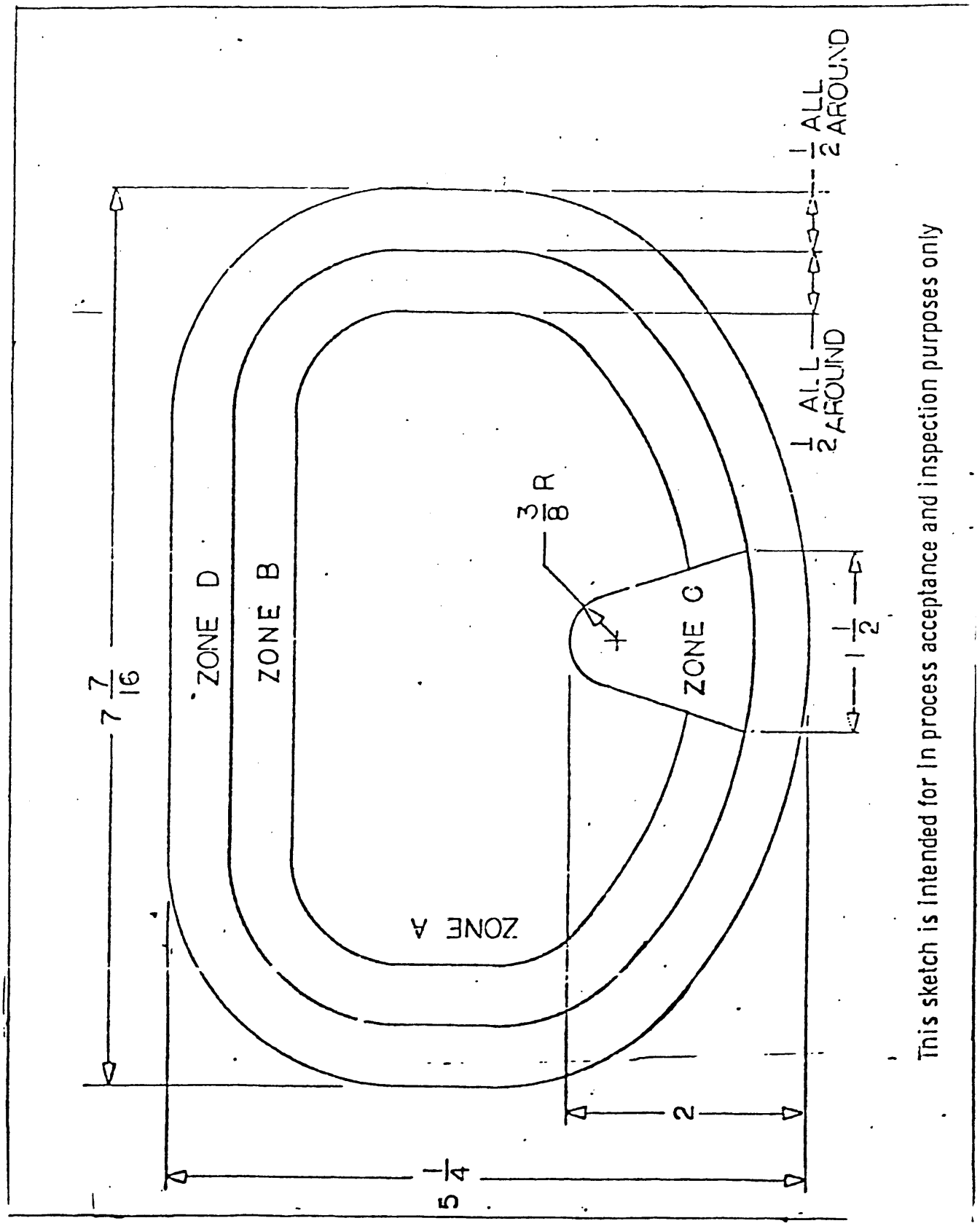

FIGURE 1.

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3.9 Workmanship. The assembled mask shall be free of contamination (grease, oil, or foreign matter) and damage such as pemanent set of rubber components, scratched or distorted lens, cracks, dents, tears, and malfunctioning of hardware (see 4.4.3.3).

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. 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 assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Objective evidence. The contractor shall provide objective evidence acceptable to the contracting officer that the requirements of 3.1 and section 5, for which specific inspection has not been provided in this specification, have been satisfied.

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

(a) Preproduction inspection (see 4.3).
(b) Quality conformance inspection (see 4.4)

4.3 Preproduction inspection.

4.3.1 Sample. A preproduction sample of 25 masks shall be produced using the same methods, materials, and equipment as will be used during regular production.

4.3.2 Inspection procedure.

4.3.2.1 For examination. The preproduction sample shall be examined for all requirements of the drawings and of this specification.

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4.3.2.2 For tests. The preproduction sample shall be tested in accordance with 4.4.4.

4.3.3 Acceptance/rejection criteria. The preproduction sample shall meet the examinations and tests specified by 4.3.2 to be acceptable. The contractor shall obtain written approval from the contracting officer prior to proceeding with regular production.

4.4 Quality conformance inspection.

4.4.1 Lotting. A lot shall consist of the masks of one size produced by one manufacturer, from the same materials, and under essentially the same manufacturing conditions. However, no more than one lot of faceblank-lens assemblies, nosecups, or hoses and no more than two lots of canisters shall be represented in any one lot of finished masks.

4.4.2 Sampling.

4.4.2.1 For examination and nondestructive tests. Sampling shall be conducted in accordance with MIL-STD-105.

4.4.2.2 For destructive tests. Sampling shall be conducted in accordance with MIL-STD-105, using level S-3.

4.4.3 Inspection procedure.

4.4.3.1 For examination and nondestructive tests. Sampling masks shall be examined. and tested, prior to insertion in the carrier, in accordance with the classification of defects and MIL-STD-105. Each mask shall be tested for critical defects.

4.4.3.2 For destructive tests. Sample masks shall be tested in accordance with 4.4.4.5.

4.4,3.3 Classification of defects.

(a) Mask, chemical-biological, aircraft, ABC-M24 (Dwg 5-1-296).

Categories	Defects	Acceptance standards
Critical:		
1	Outlet valve leakage	4.4.4.1
2	Mask assembly leakage	4.4.4.4
3	Lens optical defects (3.5)	
Major: AQL	0.25 percent defective	
101	Exhalation resistance	4.4.4.2
102	Microphone and plug assembly nonfunctional	4.4.4.3

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AQL 1.0 percent defective

103	Component missing or incorrectly assembled
104	Damage
105	Contamination (grease or oil)
106	Hardware nonfunctional

Minor: AQL 2.5 percent defective

201	Sharp edges or burrs (metal components)
202	Contamination (other than major 105)
203	Protective finish missing or incorrect
204	Tape missing or improperly applied

(b) Facepieces, aircraft, chemical-biological~ mask, M19 (Drawing 5-2-1009).

Categories	Defects	Acceptance standards
Critical:	None defined	
Major: AQL 1.0 percent defective		
101	Multiple lot marking on single tab	
102	Marked lot characters superimposed over each other	
103	Tackiness of rubber in lot marking area	
104	Dimensions of lot characters incorrect	CE
105	Lot characters not legible or missing	

(c) Packaging inspection (section 5).

Categories	Defects
Critical:	None defined
Major: AQL 2.5 percent defective	
101	Faceform missing
102	Lens tissue paper missing
103	Carrier straps not positioned as specified
104	Packaging method incorrect

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4.4.4 Tests.

4.4.4.1 Outlet valve leakage. Outlet valve leakage shall be determined in accordance with the M4Al Outlet Valve Leakage Indicator (136-45-202-14).

4.4.4.2 Exhalation resistance. Exhalation resistance of the mask shall be determined with the Q213 Inhalation and Exhalation Resistance Indicator (136-44-20-1) .

4.4*4.3 Microphone and plug assembly. The microphone and plug assembly shall be connected to a Microphone Tester, Q12A1, Drawing 136-15-220, or to a Microphone Tester, Drawing 136-30-114 (see 6.5). The microphone shall be held against the tester sound source and the tester sound source volume shall be increased until the tester ammeter/voltmeter needle moves. Any movement in excess of normal background reading shall indicate an acceptable assembly; no movement shall indicate a rejected assembly.

4.4.4.4 Mask assembly leakage. Overall leakage of the mask after assembly shall be determined in accordance with the M14 Protective Mask Leakage Tester (136-42-750-1).

4.4.4.5 Package leakage and heat seal test. Leakage and heat seal characteristics of the sealed water-vaporproof bag containing the mask assembly shall be determined by subjecting the samples to the vacuum chamber and heat seal test of MIL-P-116.

4.4.5 Acceptance/rejection criteria. The acceptance number for the pack leakage tests shall be zero, and the rejection number one.

5. PACKAGING

5.1 Unit packing, level A. No preservative compounds shall be applied to any portion of the mask or its components. Each mask shall be fitted with a faceform (Drawing 5-22-57 or 5-22-58, as applicable to mask size) as shown on Drawing 5-1-296. Prior to insertion of the faceform into the mask, two sheets of lens tissue paper, 5 by 7 inches, conforming to NNN-P-40, shall be placed between the mask lens and the faceform in such a manner to prevent physical contact between the lens and faceform. After insertion of the faceform into the mask, the mask lens shall be covered with paper, white, newsprint, 32 lb base. The paper shall be placed over the outside surfaces of the lens and shall be securely attached to the facepiece by taping to prevent movement, with three pieces of 1-1/2 inches long by 3/4 inches wide , pressure-sensitive adhesive tape. A larger size paper taped to the faceform is acceptable. The paper shall be taped to the mask facepiece, one on each side of the chin portion and one over the top portion of the facepiece. The tape shall be permitted to contact with the interior robber surfaces of the faceblank. The head harness assembly shall be tucked into the cavity of the faceform. The mask assembly shall then be placed inside the carrier~ The carrier straps shall be tucked inside the carrier in such a manner so that the strap hardware shall not come

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in contact with the lens, after which the carrier flaps shall be closed and fastened. The assembly shall then be inclosed in a water-vaporproof, heat sealable bag conforming to MIL-B-117, type I, class E, style 1, except that the heat sealable surface of the barrier material shall be a nonplasticized type (such as polyethylene), the exterior surface shall be a non-woven, spun bonded polyolefin, thickness 0.006 + 0.0006 inch. The bag shall have inside dimensions of 15 by 18-1/2 inches (opening at the 15 inch dimension). The bag shall be closed by heat sealing in accordance with the barrier material or bag manufacturers recommendations for dwell, temperature and pressure requirements. This assembly shall be in accordance with the performance requirements for method IA-8 of MIL-P-116. Prior to sealing the barrier bag, exhaust only the amount of air necessary so that the bag will conform to the exterior shape of the carrier assembly (mask inclosed) without exerting pressure on this assembly. CAUTION: Exhausting excessive amount of air will cause distortion of the rubber components of the mask. The packaged mask shall then be placed in a fiberboard box conforming to PPP-B-636, class WR, variety SW, type CF, grade W5C or V3c, having inside dimensions of 10-1/2 by 6-1/4 by 12-1/2 inches (length, width, and depth, respectively) . The box shall. be closed with PPP-T-76 tape in accordance with the method IV closure requirement in the appendix to PPP-B-636.

5.2 Packing. Levels shall be as specified (see 6.2).

5.2.1 Level A. Ten masks of one size, unit packed as specified in 5.1, shall be packed in an overseas type cleated plywood box conforming to PPP-B-601, style I, grade A, weight of contents 0-100 pounds, type 2 load, except that the bearing surface of mechanically driven fasteners shall not be overdrive more than 1/16 of an inch. The box shall have inside dimensions 33-1/4 by 21-1/2 by 13 inches (length, width, and depth, respectively). Filler pads fabricated from the same material as the fiberboard box shall be included, as necessary, to make a tight pack. The box shall be closed and strapped in accordance with the appendix to PPP-B-601 using strapping and seals conforming to QQ-S-781 [strapping - type I (regular' duty), finish B, grade 2, and seals - type D, style I or IV, finish B, grade 2].

5.2.2 Level C. Ten masks of one size, unit packed as specified in 5.1, shall be packed as specified in 5.2.1, except that the shipping container shall be a weather resistant fiberboard box conforming to PPP-B-636, style RSC, grade V3C, weight of contents 90 pounds, type I load. The box shall be closed in accordance with Method V closure requirements and reinforced using non-metallic strapping or tape banding in accordance with the appendix to PPP-B-636.

5.3 Marking. In addition to special marking required by the contract or order, unit packs (5.1 and 5.2.2) and shipping containers (5.2.1 and 5.2.2) shall be marked in accordance with MIL-STD-129. Each unit pack (5.1) and shipping containers (5.2.1 and 5.2.2) shall be marked to show the lot number, shelf life, and date of' manufacture of mask in accordance with MIL-STD-129. Omit nomenclature marking (i.e., Mask, Chemical-Biological, Aircraft, ABC-M24) on outside shipping containers for this item. Do not omit other identification marking on outside shipping containers.

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6. NOTES

6.1 Intended use. The mask covered by this specification is intended for use by aircraft personnel to protect their eyes and respiratory system against toxicological agents. It is not intended for protection against carbon monoxide or ammonia.

6.2 Ordering data. Acquisition documents should specify the following:

(a) Title, number, and date of this specification.
(b) Size of mask.
(c) Level of packing.
(d) Preproduction:

(1) Time allowed for contractor submission of sample for Government test and evaluation after award of contract.
(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 to proceed with production.

(e) Shelf life code

6.3 International interest. Certain provisions of this specification are the subject of international standardization agreement QSTAG-234. When amendment, revision, or cancellation of this specification is proposed which will modify the international agreement concerned, the preparing activity will take appropriate action through international standardization channels including departmental standardization offices to change the agreement or make appropriate accommodations,

6.4 Component specifications.

Title	Number
Adapter, Oxygen Supply Chemical-Biological Mask, ABC-M8	MIL-A-51306
Antifogging Kit, ABC-M1	MIL-A-13550
Carrier, Aircraft Chemical-Biological Mask, ABC-M17	MIL-C-51108
Cloth, Antifogging	MIL-C-10857
Cover, Outlet Valve	MIL-C-10113
Discs, Inlet and Nosecup Valve	MIL-D-50082
Disks, Inlet Valve	MIL-D-10131
Faceblank, Chemical-Biological Mask, C12R4	MIL-F-51109
Faceblank-Lens, C14R3	MIL-F-51110
Harness, Head, C15	MIL-H-51111
Hood, Aircraft Chemical-Biological Mask, ABC-W	MIL-H-51290
Nosecup-Deflector, C11	MIL-N-51112
Outsert, Eyelens AntSiglare, Chemical-Biological Mask, ABC-M2	MIL-O-51142

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Valve, Outlet, Chemical-Biological Mask, C15	MIL-V-10134
Plastic Sheets, Vinyl Chloride Polymer and Copolymer, Flexible	MIL-P-51406
Plastic Sheets, Polyether Urethane, Flexible	MIL-P-51514

6.5 Microphone tester. The 136-15-220 Q12A1. Microphone Tester and the 136-30-114 Microphone Tester are alternate testing units. The Q12A1 Microphone Tester (136-15-220) should be procured if no microphone tester is available.

6.6 Subject term (key word) listing.

Chemical-biological mask
Mask, aircraft
Protective equipment
Protective mask

Custodian:

Army - EA

Preparing activity:

Army - EA

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-M-51113D(EA)	MASK, CHEMICAL-BIOLOGICAL, AIRCRAFT, ABC-M24

3a. NAME OF SUBMITTING ORGANIZATION

b. ADDRESS *(Street, City, State, ZIP Code)*

4. TYPE OF ORGANIZATION *(Mark one)*

- ☐ VENDOR
- ☐ USER
- ☐ MANUFACTURER
- ☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional

b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional

c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional

8. DATE OF SUBMISSION *(YYMMDD)*

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