

MIL-M-87163A(USAF)  
 18 February 1983  
 SUPERSEDING  
 MIL-M-87163(USAF)  
 3 December 1982

## MILITARY SPECIFICATION

### MASK, OXYGEN MBU-12/P

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

#### 1. SCOPE

1.1 Scope. This specification covers the requirements for one type of pressure-demand breathing oxygen mask, designated MBU-12/P.

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents

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

#### SPECIFICATIONS

##### FEDERAL

BB-N-411	Nitrogen, Technical
BB-A-1034	Air, Compressed, For Breathing Purposes
UU-P-268	Paper, Kraft, Wrapping
ZZ-R-765	Rubber, Silicone; Low And High Temperatures And Tear Resistance
PPP-B-576	Box, Wood, Cleated, Veneer, Paper Overlaid
PPP-B-585	Box, Wood, Wirebound
PPP-B-591	Box, Fiberboard, Wood-Cleated
PPP-B-601	Box, Wood, Cleated-Plywood
PPP-B-621	Box, Wood, Nailed And Lock-Corner
PPP-B-636	Box, Fiberboard
PPP-T-60	Tape, Pressure Sensitive Adhesive, Waterproof For Packaging

##### MILITARY

MIL-P-116	Preservation, Method Of
MIL-C-5040	Cord, Nylon
MIL-F-7179	Finishes And Coatings; Protection Of Aerospace Weapons Systems, Structures And Parts; General Specification For

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: ASD/ENESS, Wright-Patterson AFB, OH 45433 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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MIL-T-8363 Tape And Webbing, Textile, Woven, Nylon  
 MIL-L-10547 Liners, Case, And Sheet, Overwrap, Water-Vaporproof Or  
 Waterproof, Flexible  
 MIL-O-27210 Oxygen, Aviator's Breathing, Liquid And Gas  
 MIL-V-27296 Valve, Oxygen Mask, Combination Inhalation And Exhalation

## STANDARDS

## FEDERAL

FED-STD-595 Colors  
 FED-STD-601 Rubber: Sampling And Testing

## MILITARY

DOD-STD-100 Engineering Drawing Practices  
 MIL-STD-129 Marking For Shipment And Storage  
 MIL-STD-130 Identification Marking Of US Military Property  
 MIL-STD-143 Standards And Specifications, Order Of Precedence For  
 The Selection Of  
 MIL-STD-810 Environmental Test Methods  
 MIL-STD-831 Test Reports, Preparation Of  
 MIL-STD-889 Dissimilar Metals  
 MS27796 Connector - Bayonet, Three Pin, Oxygen Mask

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

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

## DRAWINGS

Scott Aviation - Sierra Products, Inc (Code 92114)

00-6268	Microphone Bracket
249-425	Upper Cable Guide
266-114	Bayonet Connector
339-06-1	Cord and Snap Assembly
450-13	Lower Cable Guide
450-134A	Two Position Clamp
834-11	Strap and Buckle Assembly
834-12	Capped "T" Nut
834-16	Identification Label
834-18	Delivery Tube
834-25	Hardshell and Facepiece
834-28-1, -2, -3, or -4	Mask and Strap Assembly
834-37	Receptacle Assembly
834-42	Gasket
834-48	Dust Cover
834-75	Mask, Oxygen, MBU-12/P

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

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2.2 Other publications. The following document forms a part of this specification to the extent specified herein. The issues of the documents which are indicated as DOD adopted shall be the issue in the current DODISS and the supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D624-81           Tear Resistance Of Vulcanized Rubber

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

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

### 3. REQUIREMENTS

3.1 Qualification. The masks furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids (see 4.4 and 6.3).

3.2 Selection of specifications and standards. Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143.

3.3 Materials. Materials shall conform to the applicable specifications and shall be as specified herein. Materials not covered by specifications, or not specifically described herein, shall be of the best quality, of the lightest practicable weight, and suitable for the purpose intended. Mask components that come in contact with oxygen shall be entirely free of oil, grease, or other combustible materials.

3.3.1 Metals. Metals shall be corrosion-resistant or suitably treated to resist corrosion due to fuels, salt spray, or any atmospheric conditions likely to be met in storage or normal service.

3.3.1.1 Dissimilar metals. Unless otherwise specified herein, dissimilar metals as defined in MIL-STD-889 having metal-to-metal contact shall not be acceptable. If necessary, combinations of dissimilar metals that have relatively weak galvanic potential may be used provided that their contact surfaces are separated and protected by a passive coating. Any dissimilar metal and protective coating combination proposed to be used shall be presented, prior to fabrication or installation, to the procuring activity for acceptance.

3.3.1.2 Protective treatment. If metals that are subject to deterioration from climatic and environmental conditions likely to occur during service are used, the metals shall be protected in accordance with MIL-F-7179 against this deterioration in a manner that will not in any way prevent compliance with the performance requirements specified herein. The protective coating shall not crack, chip, or scale with age or extremes of climatic and environmental conditions.

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**3.3.2 Nonmetallic materials.** Nonmetallic materials shall be of the ozone resistant type. Materials that are not susceptible to fungus attack shall be used to the greatest extent possible. Materials that are susceptible to fungus attack, if used, shall be treated with a fungicidal agent that will not adversely affect the skin, eyes, and respiratory tract of the wearer.

**3.3.2.1 Silicone rubber.** The material for the facepiece, the delivery tube, and the microphone cable guides shall be silicone rubber conforming to class 3a, grade 5a of ZZ-R-765, except for the hardness and brittle point requirements described in 3.5.8.2 and 3.5.8.3 of this specification. In addition, conformance to the oil immersion, flex, and low temperature brittle point requirements of ZZ-R-765 shall not be required. The silicone rubber shall be smooth and free from flash, foreign materials, and imperfections. The silicone rubber shall be post-cured in a well ventilated forced air oven. The date (year and quarter) the silicone rubber was cured shall be molded on the facepiece and on the delivery tube.

**3.3.2.2 Plastic hardshell.** The material for the hardshell shall be polysulfone conforming to Union Carbide (Code 80524) type P1700, or equivalent.

**3.3.2.3 Plastic receptacle.** The body of the receptacle shall be injection molded from acrylonitrile-butadiene-styrene molding plastic Borg-Warner, Cycolac T, or equivalent and shall be black.

**3.3.2.4 Nylon cord.** The nylon cord for the cord and snap assembly shall conform to type 1A of MIL-C-5040.

**3.3.2.5 Webbing.** The webbing for the strap assembly shall conform to type V of MIL-T-8363.

**3.4 Design and construction.** The MBU-12/P mask shall be designed as an oxygen breathing device for use with a flight helmet. The mask and its components shall be constructed in accordance with Drawing 834-75, the subsidiary drawings listed below, and the requirements specified herein. If the requirements of the drawings conflict with the requirements of this specification, the requirements of this specification shall govern.

DRAWING	COMPONENT	QUANTITY
834-25	Facepiece and Hardshell (3.4.2)	1
834-18	Delivery Tube (3.4.3)	1
450-134A	Two-Position Hose Clamp (3.4.4)	2
339-06-1	Cord and Snap Assembly (3.4.5)	1
249-425	Upper Cable Guide (3.4.6)	1
450-13	Lower Cable Guide (3.4.6)	1
834-48	Dust Cover (3.4.7)	1
00-6268	Microphone Bracket (3.4.8)	1
834-37	Receptacle Assembly (3.4.9)	1
834-11	Strap and Buckle Assembly (3.4.10)	4
834-28-1, -2, -3, and -4	Mask and Strap Assembly	4 sizes
266-114	Bayonet Connector	1
834-12	Capped "T" Nut	1
834-42	Gasket	1

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3.4.1 Combination valve. A combination inhalation-exhalation valve conforming to MIL-V-27296 shall be inserted in the mask as shown on figure 1.

3.4.2 Facepiece and hardshell. The facepiece shall consist of a polysulfone hardshell to which the silicone rubber face seal is intimately bonded to produce a single composite facepiece assembly.

3.4.3 Delivery tube. The delivery tube for the mask shall be constructed of corrugated silicone. The delivery tube shall have cable guides (3.4.6) and hose clamps (3.4.4) as shown on figure 1.

3.4.4 Two-position hose clamps. An upper hose clamp (Drawing 450-134A) shall attach the delivery tube to the combination valve as shown on figure 1. A lower hose clamp shall be attached to the delivery tube as shown on Drawing 834-75.

3.4.4.1 Lower hose clamp. The lower hose clamp shall be packaged in a polyethylene bag together with the lower cable guide (3.4.6) and stapled to the cord and snap assembly (3.4.5) as shown on Drawing 834-75.

3.4.5 Cord and snap assembly. A nylon cord and snap assembly (Drawing 339-06) shall be installed inside the delivery tube by attaching a nylon loop to the combination valve retention pin and metal snap to the connector retention pin. The snap shall be 1-3/16 inches in length (110-pound test) and shall be attached to one end of the nylon cord as shown on figure 2.

3.4.6 Upper and lower cable guides. An upper cable guide (Drawing 249-425) shall be attached to the delivery tube as shown on figure 1. A lower cable guide (Drawing 450-13) shall be attached to the delivery tube as shown on Drawing 834-75.

3.4.6.1 Lower cable guide. The lower cable guide shall be packaged as specified in 3.4.4.1.

3.4.7 Dust cover. The mask shall be equipped with a dust cover to prevent dust, dirt, and foreign objects from entering the mask cavity when the mask is not in use. The cover shall be made of durable, nonbrittle, lightweight plastic material contoured to rest around the face edge of the hardshell and to be retained on the hardshell with an elastic webbing around the front edge of the hardshell at the microphone contour.

3.4.8 Microphone bracket. A microphone mounting bracket (Drawing 00-6268) shall be attached inside the mask facepiece as shown on figure 1.

3.4.9 Receptacle assembly. A receptacle assembly (Drawing 834-37) shall be installed on the flat center area of the mask hardshell as shown on figure 1. A silicone rubber gasket (Drawing 834-42) shall be placed between the receptacle and hardshell.

3.4.10 Strap and buckle assembly. Four strap and buckle assemblies shall be required for each mask. The assemblies shall be attached to the facepieces as shown on figure 3 with a self-sealing screw and capped "T" nut (Drawing 834-12).

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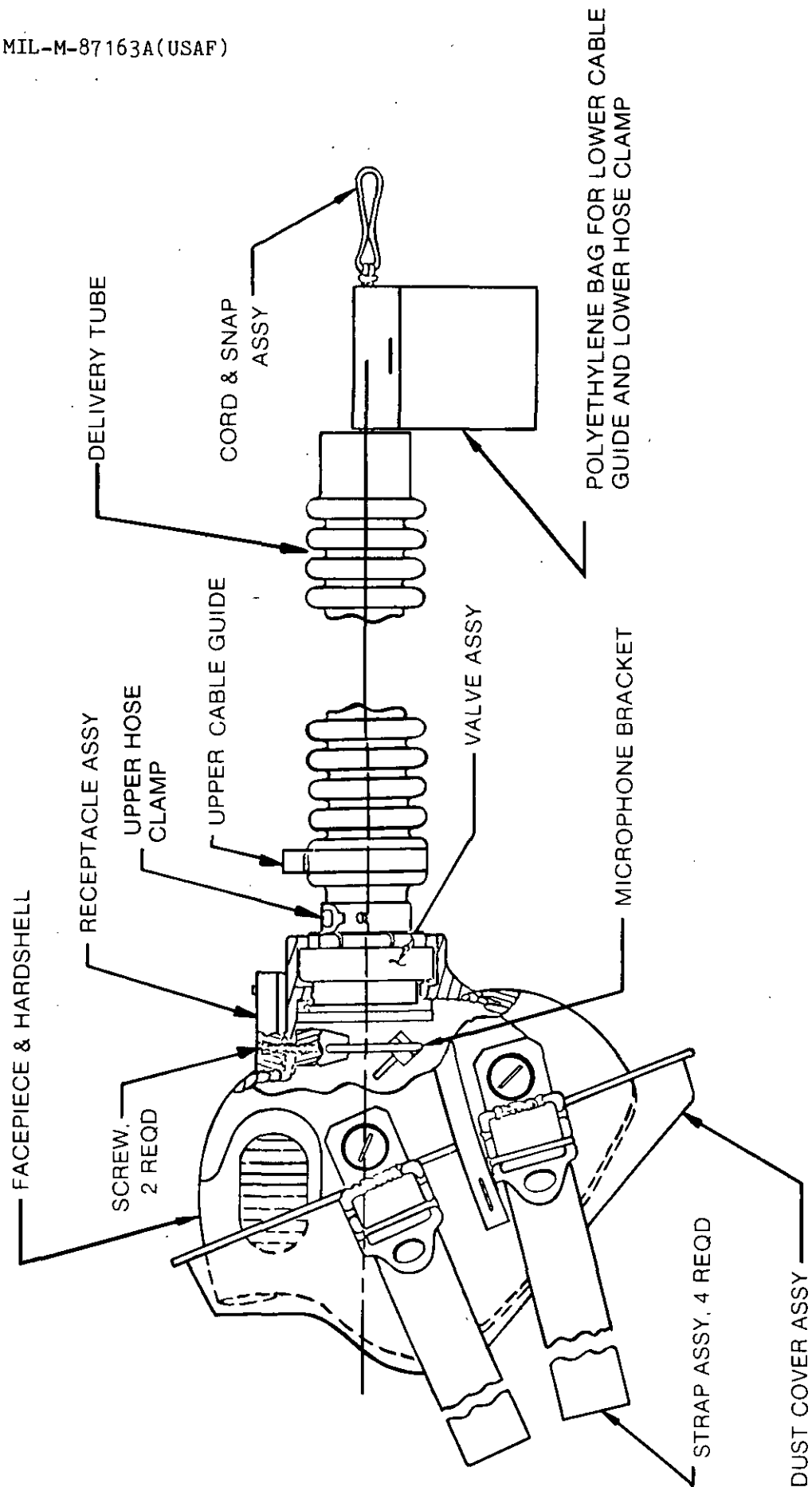


Figure 1. Mask assembly, MBU-12/P.

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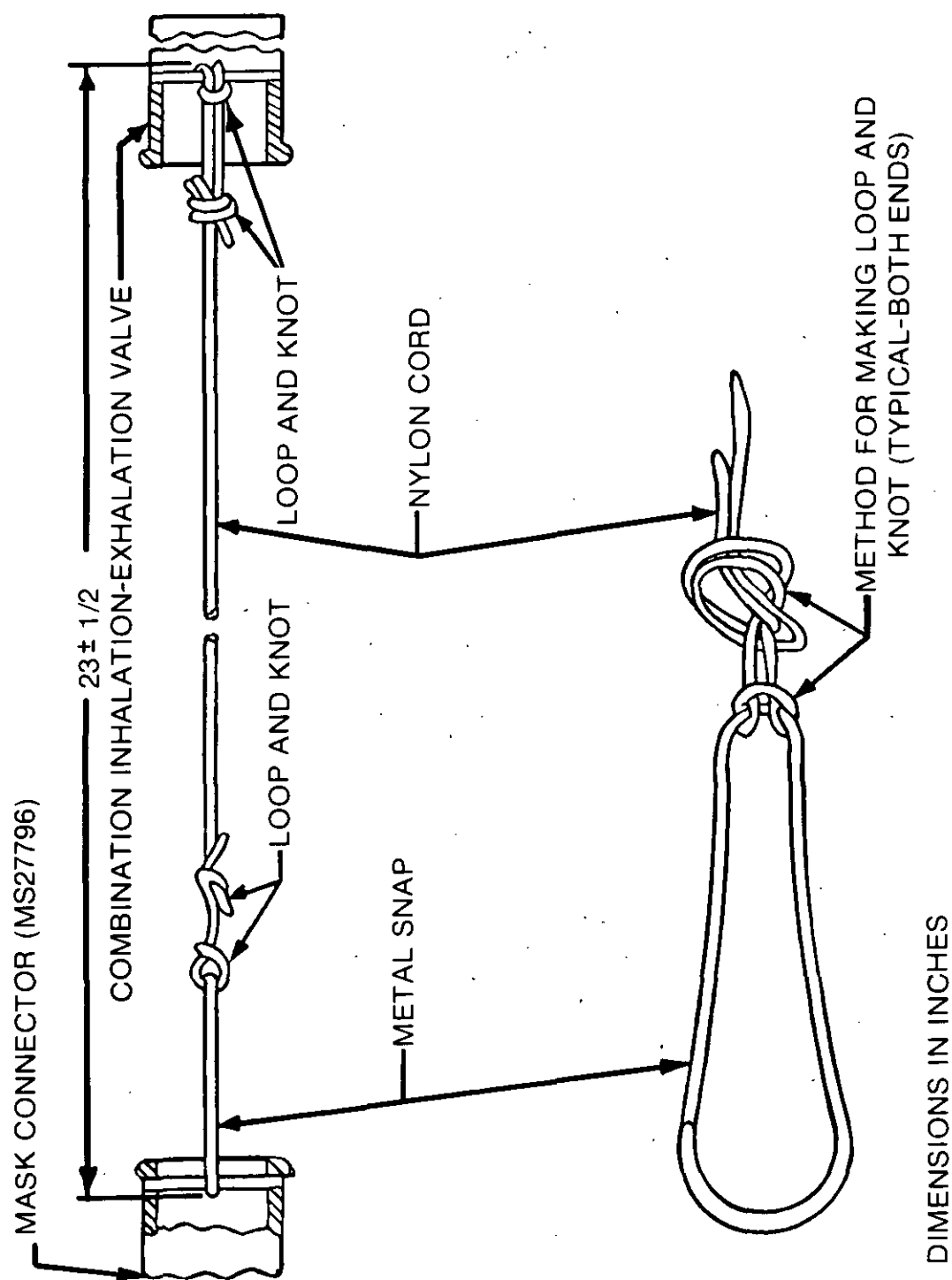
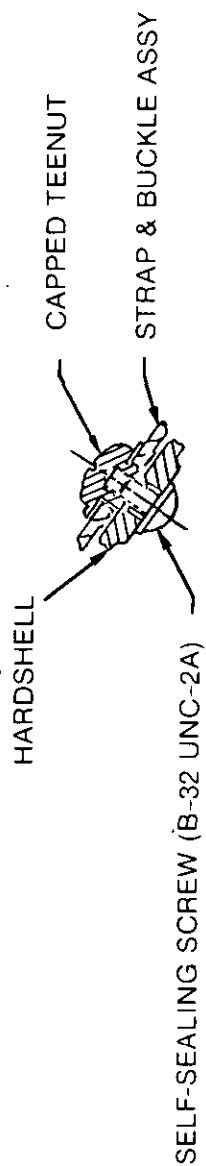


Figure 2. Cord and snap assembly.

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SECTION A-A

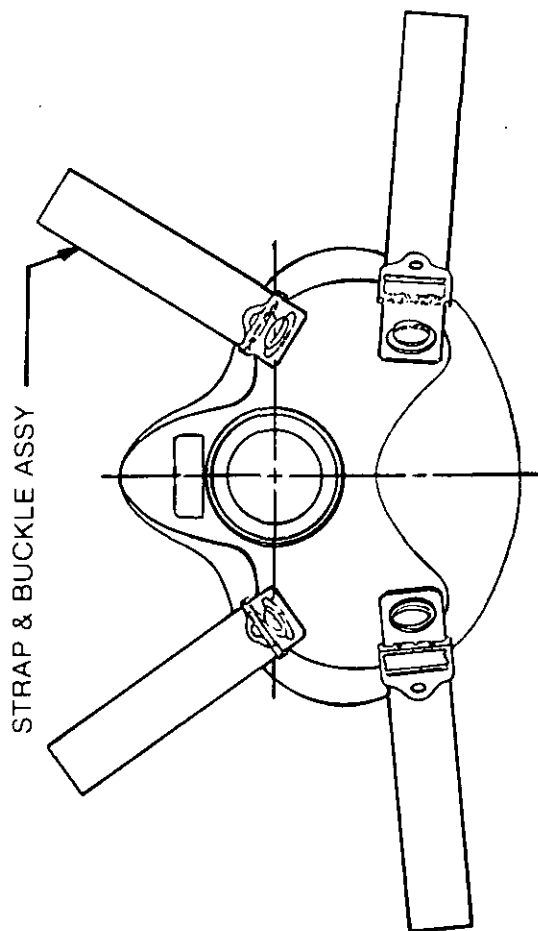
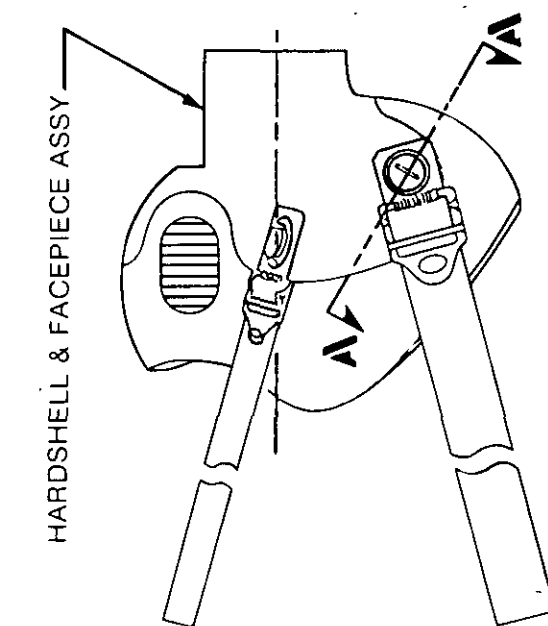


Figure 3. Mask and strap assembly.



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3.4.11 Weight. The weight (mass) of the mask assembly of each size shall not exceed 1.1 pounds. The components included in the mask assembly shall be those listed in 3.4.

### 3.5 Performance

3.5.1 Tensile bonding strength. The tensile strength of the bond between the silicone rubber and the hardshell material used in the facepiece shall be greater than the tensile strength of the silicone rubber, when tested in accordance with 4.6.1.

3.5.2 Mask leakage. The inboard leakage shall not exceed 100 milliliters per minute when tested in accordance with 4.6.2.

3.5.3 Combination valve installation, inlet performance (low suction). The total leakage through the combination valve inlet portion shall be 15 milliliters per minute or less when tested in accordance with 4.6.3.

3.5.4 Combination valve installation, inlet performance (high suction). The total leakage through the combination valve inlet portion shall be 150 milliliters per minute or less when tested in accordance with 4.6.4.

3.5.5 Combination valve installation, exhalation performance. A pressure of 20 millimeters of mercury in the facepiece and a pressure between 15 and 19.9 millimeters of mercury in the inlet tubing shall cause the exhalation portion of the valve to open when tested in accordance with 4.6.5.

3.5.6 Combination valve installation, exhalation resistance. The exhalation resistance shall not be greater than 4.67 millimeters of mercury with a flow of 100 liters per minute when tested in accordance with 4.6.6.

3.5.7 Combination valve installation, inhalation resistance. The inhalation resistance shall not exceed 2.80 millimeters of mercury at a flow of 50 liters per minute and shall not exceed 5.60 millimeters of mercury at a flow of 100 liters per minute when tested in accordance with 4.6.7.

3.5.8 Subjective use. The silicone rubber shall not produce any objectionable odors, shall not be tacky, and shall not have any other properties that cause discomfort or affect wearability when evaluated in accordance with 4.6.8. There shall be no freeze-up of the inhalation-exhalation valve and no obstruction to breathing when the mask is evaluated in accordance with 4.6.8.

3.5.8.1 Silicone-rubber tear resistance. The silicone rubber shall have a minimum tear resistance of 150 pounds per inch when tested in accordance with 4.6.9 and ASTM D624-81, die B.

3.5.8.2 Hardness. The Shore-A-durometer hardness of the silicone rubber for the facepiece shall be  $45 \pm 5$  when tested in accordance with 4.6.10.

3.5.8.3 Low temperature brittle point. The minimum low temperature brittle point of the silicone rubber shall be  $-40^{\circ}\text{C}$  when tested in accordance with 4.6.12.

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3.5.9 Toxicity. The materials used in the mask assembly shall not contain any chemicals or material that have toxic properties in accordance with 4.6.11. This prohibition also applies to any materials which would exhibit toxic properties as a result of being cleaned with a solution of mild dish washing liquid. This prohibition also applies to the combination valve.

3.5.10 Delivery tube leakage. The delivery tube shall not leak when subjected to an internal air pressure of 5 pounds per square inch and tested in accordance with 4.6.13.

3.5.11 Delivery tube collapse. The corrugated portion of the delivery tube shall not collapse when tested in accordance with 4.6.14.

3.5.12 Delivery tube strength. The delivery tube shall not tear or separate when tested in accordance with 4.6.15.

3.5.13 Microphone bracket - dielectric strength. The microphone bracket shall withstand, without flashover or breakdown, the application of a 250-volt alternating potential of commercial line frequency when tested in accordance with 4.6.16.

3.5.14 Salt fog. The microphone bracket shall meet the requirements of salt fog as specified in 4.6.17.

3.6 Color. The color of the hardshell, webbing, and all silicone rubber used in the oxygen mask assembly shall be green, approximately matching color number 34079 of FED-STD-595.

3.7 Part number of interchangeable parts. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The drawing number requirements of DOD-STD-100 shall govern the manufacturer's part numbers and changes thereto.

3.8 Identification of product. The mask assembly shall be marked with a nameplate having the following specific information in accordance with MIL-STD-130. The Federal Stock Number shall be omitted from the nameplate.

Mask, Oxygen MBU-12/P  
Mask Size \*  
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Manufacturer \*  
Date of Manufacture (quarter and year) \*

\* The manufacturer shall include the applicable information.

3.8.1 Size nomenclature. The four sizes of the facepiece shall have the following nomenclature: short, regular, long, extra long.

3.8.2 Identification label. An identification label shall be in accordance with Drawing 834-16.

3.9 Workmanship. The mask shall be constructed in accordance with good commercial practice and shall be free of defects which might adversely affect aircrew performance or mask service life. The mask shall be clean and dry. Materials that will come in contact with oxygen shall be entirely free of oil, grease, and other combustible materials. The mask assembly shall not have

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sharp edges or other surface features upon which the user or service technician might injure themselves. All excess flash shall be properly trimmed. The facepiece and its related parts shall be free of blisters, porous areas, cracks, abrasion, bubbles, excessively rough areas, and foreign materials.

#### 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.

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

- a. Qualification inspection (see 4.4)
- b. Quality conformance inspection (see 4.5).

#### 4.3 Inspection conditions

4.3.1 Atmospheric conditions. Unless otherwise specified, all tests required by this specification shall be made at an atmospheric pressure of 28 to 32 inches of mercury at a temperature of  $25^{\circ}\text{C} \pm 10.0^{\circ}\text{C}$  and at a relative humidity of 80 percent or less. Where tests are made with atmospheric pressure or temperature substantially different from these values, proper allowance shall be made for the change in instrument reading.

4.3.2 Gas. The gas used in qualification testing shall be oxygen conforming to type I of MIL-O-27210, water pumped nitrogen conforming to type I, class 1 grade B of BB-N-411, or compressed air conforming to grades A or C of BB-A-1034. Appropriate density correction factors shall be applied to the flowmeter used.

#### 4.4 Qualification inspection

4.4.1 Test sample. The test sample shall consist of one mask of each size, and test sheets of silicone material. The test sheets shall consist of four sheets that are 6 inches by 6 inches by 1/16-inch or 1/8-inch. The test sample shall be representative of the production equipment and shall be identified with the manufacturer's part number, the compound number of the manufacturer of the silicone or polysulfone material, and such other information as required by the qualifying activity.

4.4.2 Reports and test sample for the qualifying activity. The following reports and samples shall be furnished to the qualifying activity.

- a. Three copies of a test report prepared in accordance with MIL-STD-831. The test report shall include the results of all tests and a detailed statement of compliance or noncompliance with each requirement of this specification, identified by the applicable paragraph number.

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b. Three copies of a report containing the following information and specific to silicone-rubber and polysulfone:

- (1) Compound number and name of manufacturer
- (2) Any additional information the manufacturer desires to furnish for better identification of the material or to show that the material has desirable characteristics for oxygen mask usage.

c. The samples that were tested.

4.4.3 Qualification tests. The qualification tests shall consist of all tests described under 4.6.

4.5 Quality conformance inspection. Quality conformance inspection shall consist of:

- a. Individual tests (4.5.1)
- b. Sampling plans and tests (4.5.2).

4.5.1 Individual tests. Each oxygen mask shall be subjected to the following tests:

- a. Examination of product (4.6.18)
- b. Mask leakage (4.6.2)
- c. Combination valve installation, inlet performance (low suction) (4.6.3)
- d. Combination valve installation, exhalation performance (4.6.5)
- e. Delivery tube leakage (4.6.13).

4.5.2 Sampling plans and tests

4.5.2.1 Sampling plan A. Two masks of each size specified in the contract or order shall be selected at random from each lot of each size of 1000 masks (or fraction thereof) and shall be subjected to the following tests:

- a. Combination valve installation, inlet performance (high suction) (4.6.4)
- b. Combination valve installation, exhalation resistance (4.6.6)
- c. Combination valve installation, inhalation resistance (4.6.7)
- d. Delivery tube strength (4.6.15)
- e. Delivery tube collapse (4.6.14).

4.5.2.2 Sampling plan B. One mask facepiece of each size specified in the contract or order shall be selected at random from each batch of silicone rubber compound received from the manufacturers. Test sheets fabricated in accordance with 4.4.1 shall also be made from each batch. The test sample shall be subjected to the following tests:

- a. Tear resistance (4.6.9)
- b. Hardness (4.6.10)
- c. Tensile bonding strength (4.6.1).

4.5.2.3 Sampling plan C. One microphone bracket shall be selected at random from each lot of 1000 brackets (or fraction thereof) and shall be subjected to the following tests:

- a. Dielectric strength (4.6.16)
- b. Salt fog (4.6.17).

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4.5.3 Reject criteria. When one item selected from a production run fails to meet the specification, no items still on hand or later produced shall be accepted until the extent and cause of failure are determined and corrected. Individual tests may be continued pending the investigation of a sampling test failure. However, final acceptance of items on hand or later produced shall not be made until it is determined that the items meet all the requirements of this specification. The investigation of a test failure could indicate that defects may exist in items already accepted. If so, the contractor shall fully advise the procuring activity of all defects likely to be found and methods of correcting them.

#### 4.6 Testing methods

4.6.1 Tensile bonding strength test. Two parallel cuts shall be made perpendicular to the hardshell edge 1/2 inch apart in the rubber element of the hardshell facepiece combination. The cuts shall be terminated within 5/16 inch of the hardshell edge. To prevent tearing, 1/8 inch diameter holes shall be punched at the terminus of the cuts. The mask shall then be mounted in a tensile tester with suitable jaws and drawn at crosshead speed of  $20 \pm 1$  inches per minute until failure occurs. The rubber shall fail in tension before the bonded area fails.

4.6.2 Mask leakage test. Each mask (with combination valve installed and plugged against leakage) shall be placed on a suitable test stand and adjusted so there is no leakage around the face seal. The inboard leakage shall not exceed 100 milliliters per minute when a suction of 13 millimeters of mercury is applied within the facepiece of the mask with the free end of the mask delivery tube plugged.

4.6.3 Combination valve installation, inlet performance (low suction) test. The inlet valve portion shall be completely dry throughout this test. The inlet valve shall be inspected for imperfect seating of the flapper on the seat and leaks around the valve seat by applying and maintaining a suction of 0.19 millimeter of mercury at the free end of the delivery tube. The total leakage through the combination valve inlet portion shall not be more than 15 milliliters per minute. Provisions shall be taken to ensure that there is no leakage around the face seal during this test.

4.6.4 Combination valve installation, inlet performance (high suction) test. This test shall conform to 4.6.3 except that a suction of 22.4 millimeters of mercury shall be used. The leakage through the combination valve inlet portion shall not exceed 150 milliliters per minute at this suction. Provisions shall be taken to ensure that there is no leakage around the face seal during this test.

4.6.5 Combination valve installation, exhalation performance test. Each mask shall be placed on a suitable test stand and all suction and pressure from the previous test exhausted. A pressure of 20 millimeters of mercury shall be applied at the mask tubing. The pressure at the mask tubing shall then be gradually reduced, causing the inlet valve to close and causing a pressure differential to be applied across the exhalation valve. The mask exhalation valve shall open with a pressure in the tube between 15 and 19.9 millimeters of mercury. If an extreme pressure is encountered, the inlet valve shall be checked for leakage. If the valve is properly seated and the mask still fails to function properly, the valve shall be replaced and the test repeated.

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4.6.6 Combination valve installation, exhalation resistance test. The mask (with the combination valve installed), shall be placed on a suitable test stand. At an exhalation flow of 100 liters per minute, the pressure inside the mask shall not exceed ambient pressure by more than 4.67 millimeters of mercury.

4.6.7 Combination valve installation, inhalation resistance test. The inhalation resistance of the mask (with the combination valve, delivery tube, limited stretch cord, and three-prong bayonet oxygen connector installed) shall not exceed 2.80 millimeters of mercury when exposed to a flow of 50 liters per minute and shall not exceed 5.60 millimeters of mercury when exposed to a flow of 100 liters per minute.

4.6.8 Subjective use. One mask of each size shall be evaluated by human subjects at altitudes from ground level to 50,000 feet at temperatures from  $-18^{\circ}\text{C}$  to  $71^{\circ}\text{C}$  or any combinations of such altitude and temperature for periods up to 2 hours. The evaluations will be conducted with the temperatures maintained for a minimum of one hour. These tests shall be conducted by the contractor (as optional tests at the discretion of the procuring activity).

4.6.9 Tear resistance test. The tear resistance of the test sheets and sections of silicone rubber cut from the sealing area of the facepiece shall be determined in accordance with ASTM D624-81, die B. Minimum tear resistance shall be 150 pounds per inch.

4.6.10 Hardness test. The hardness of the test sheets and sections of silicone rubber cut from the sealing area of the facepiece in both the nose and cheek areas shall be determined in accordance with method 3021 of FED-STD-601, and shall have a Shore-A-durometer hardness of  $45 \pm 5$ .

4.6.11 Toxicity. Toxicity shall be determined from an assessment of the chemical and physiological properties of the silicone rubber compound.

4.6.12 Low temperature brittle point. An ASTM test slab of each of the silicone rubbers used shall be subjected to the low temperature test requirements of FED-STD-601, except the low temperature brittle point shall be  $-40^{\circ}\text{C}$ .

4.6.13 Delivery tube leakage test. One end of the delivery tube shall be plugged and an air pressure of 5 pounds per square inch shall be applied to the other end. The tube shall be submerged just under the surface of water. Bubbles rising from the hose after 10 to 15 seconds of submersion shall be cause for rejection.

4.6.14 Delivery tube collapse test. The ends of the delivery tube shall be restrained so that its length remains  $17\frac{1}{2} \pm 3\frac{3}{8}$  inches for this test. One end of the delivery tube shall be plugged. A suction of 5 inches of mercury shall be applied at the other end for a minimum of 3 seconds. The corrugated portion of the delivery tube shall not collapse.

4.6.15 Delivery tube strength test. One end of the tube shall be attached to the combination valve mounted on the mask body. The other end shall be connected to a fitting simulating a connector conforming to MS27796. Clamps for the connections shall be of the type specified on Drawing 834-75. One of the end connections shall be attached to a support. A force of  $63 \pm 1$  pounds



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shall be applied to the other connection so that a straight pull is exerted on the tubing for a period of  $3 \pm 2$  seconds. The tubing shall not tear or separate from the end connections. The nylon antistretch cord shall be attached during this test. Upon completion of this test, the delivery tube shall be subjected to the test of 4.6.13.

4.6.16 Dielectric strength test. A 250-volt alternating potential of commercial line frequency shall be applied for at least 1 second between each of the terminals and each of the metal parts adjacent to the terminals of the microphone bracket. Any flashover or breakdown shall be cause for rejection.

4.6.17 Salt fog test. The microphone bracket shall be tested in accordance with procedure I, method 509 of MIL-STD-810.

4.6.18 Examination of product. Each oxygen mask assembly shall be carefully examined to determine conformance to the requirements of this specification with respect to materials, construction, workmanship, dimensions, and marking.

## 5. PACKAGING

### 5.1 Preservation - packaging

5.1.1 Level A. The mask shall be placed in the container in such a manner as to prevent distortion, bending, and flattening of any part of the mask. The mask shall be packaged in accordance with method 1A-15 of MIL-P-116. An overwrap of 30 pound paper conforming to UU-P-268, or equal, shall be provided to protect the barrier materials from abrasion. The overwrap shall be secured with tape or any other suitable means.

5.1.2 Level C. The mask shall be packaged in a manner to prevent distortion of the mask and to afford adequate protection against deterioration and physical damage during shipment from the supply source to the receiving activity.

### 5.2 Packing

5.2.1 Level A. The mask shall be packed in an overseas type shipping container conforming to PPP-B-576, PPP-B-585, PPP-B-591, PPP-B-601, PPP-B-621, or PPP-B-636. As far as practical, the container shall be of uniform shape and size, shall be of minimum cube and tare consistent with the protection required, and shall contain identical quantities. The containers shall be provided with a case liner conforming to MIL-L-10547 and shall be sealed in accordance with the appendix thereto. The case liner shall not be required when the container conforms to type I or II, class 2 or 3 of PPP-B-636, and is sealed at all joints and seams with tape conforming to PPP-T-60. The container shall be limited to a gross weight of approximately 200 pounds and shall be sealed and strapped in accordance with the applicable specification and appendix thereto.

5.2.2 Level B. The mask shall be packed in a domestic type shipping container conforming to PPP-B-576, PPP-B-585, PPP-B-591, PPP-B-601, PPP-B-621, or PPP-B-636. As far as practical, the container shall be of uniform shape and size, shall be of minimum cube and tare consistent with the protection required, and shall contain identical quantities. The gross weight of each container shall be limited to approximately 200 pounds and shall be closed in accordance with the applicable specification and appendix thereto.

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5.2.3 Level C. Masks that have been preserved, and packaged as specified in 5.1.1 and 5.1.2 shall be packed in shipping containers that will be acceptable to the carrier at the lowest rates and insure safe transportation to the point of delivery. The shipping containers shall comply with the rules and regulations applicable to the modes of transportation.

5.3 Marking for shipment. Interior and exterior containers shall be marked in accordance with MIL-STD-129.

5.4 Precautionary markings. The following precautionary marking shall appear on each unit package:

LIFE SUPPORT ITEM

ALL OIL, GREASE, SHOP RESIDUE, OR OTHER  
CONTAMINANTS HAVE BEEN REMOVED

Do Not Open Until Ready For Use

6. NOTES

6.1 Intended use. The oxygen mask covered by this specification is for use in dispensing gaseous oxygen from pressure demand regulators to aircrew members engaged in high altitude flying.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this specification
- b. Size or sizes required (see 3.8.1)
- c. Qualification requirements
- d. Levels of preservation, packaging, and packing required (see section 5).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is ASD/ENECE, Wright-Patterson AFB, OH 45433 and information pertaining to qualification of products may be obtained from that activity.

Custodian:  
Air Force - 11

Preparing activity:  
Air Force - 11

Reviewer:  
Air Force - 99

(Project No. 1660-F487)



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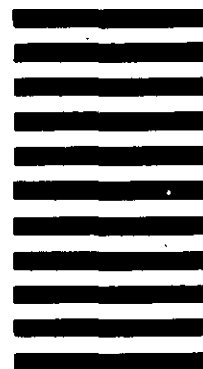
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