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MIL-M-85831 (AS)
6 November 1989

MILITARY SPECIFICATION

MASK, HELICOPTER AIRCREWMAN, CHEMICAL, BIOLOGICAL, RADIOLOGICAL PROTECTIVE, NON-OXYGEN

This specification is approved for use within the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the requirements for the manufacture and acceptance of a mask to be used with and form part of the Protective Assembly, Helicopter Aircrewman, Chemical, Biological, Radiological (PASS) .

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks 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.

SPECIFICATIONS

FEDERAL

PPP-B-566	Box, Folding, Paperboard.
PPP-C-795	Cushioning Material, Flexible, Cellular, Plastic Film for Packaging Applications.

Beneficial comments (recommendations, addltions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Engineering Center, Systems Engineering and Standardization Department (Code 53), Lakehurst, NJ 08733-5100, 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

MIL-N-18307		Nomenclature and Identification for Aero-nautical Systems Including Joint Electronics Type Designated Systems and Associated Support Systems
MIL-N-18307	-	Nomenclature and Identification for Aero-nautical Systems Including Joint Electronics Type Designated Systems and Associated Support Systems

FEDERAL

PPP-C-1842	Cushioning Material, Plastic, Open Cell (For Packaging Applications).
PPP-B-636	Box, Shipping, Fiberboard.

MILITARY

MIL-P-116	Preservation, Methods of.
NIL-B-117	Bags, Sleeves and Tubing Interior Packaging.
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys.
MIL-N-18307	Nomenclature and Identification for Aero-nautical Systems Including Joint Electronics Type Designated Systems and Associated Support Systems
MIL-V-43511	Polycarbonate Flying Helmet Visor.
MIL-C-85829	Coupling Assembly, Hose, Chemical, Biological , Radiological Protective.
MIL-P-85833	Protective Assembly, Helicopter Aircrewman, Chemical, Biological, Radiological.

STANDARDS

FEDERAL

FED-STD-595	Colors.

MILITARY

DOD-STD-100	Engineering Drawing Practices.
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	Marking for Shipment and Storage.

MIL STD 130	Identification Marking of U.S. Military Property.
MIL STD 143	Standards and Specifications, Order of Precedence for the Selection of.
MIL STD 210	Climatic Extremes for Military Equipment.
MIL STD 282	Filter Units, Protective Clothing, Gas Mask Components and Related Products: Performance Test Methods.
DOD STD 480	Configuration Control Engineering Changes, Deviations and Waivers.
MIL STD 483	Configuration Management Practices for Systems, Equipment, Munitions and Computer Programs.
MIL STD 490	Specification Practices.
MIL STD 781	Reliability Design Qualification and Production Acceptance Tests: Exponential Distribution.
MIL STD 794	parts and Equipment, Procedures for Packaging and Packing of.
MIL STD 810	Environmental Test Methods and Engineering Guidelines.
MIL STD 889	Dissimilar Metals.
MIL STD 1189	Standard Department of Defense Bar Code Symbology.
MIL STD 1472	Human Engineering Design Criteria for Military Systems, Equipment and Facilities.

HANDBOOKS

MIL HDBK 695	Rubber Products: Recommended Shelf Life.

2.1.2 Other Government documents. The following other Government documents 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,

Food, Drug and Cosmetic Law Journal

10:722	Draize Human Sensitization Test, Modified (Prophetic Human Patch Testing) 1955.

Chief of Naval Operations

OPNAVINST 3710.7	NATOPS General Flight and Operating Instructions; Promulgation of.

Naval Air Systems Command

SD 24	General Specification for Design and Construction of Aircraft Weapon Systems.

NAVAIR Manuals

13 1 6.7	Aviation Crew Systems Aircrew Personal Protective Equipment.
13 1 6.10	Aviation Crew Systems, Special Mission Aircrew Equipment.

Naval Air Development Center

NADC Report 86 60	NADC Fuel Fire Test Facility.

Headquarters, Department of the Army

Army field Manual FM 3 5	NBC Decontamination

Environmental Protection Agency

EPA 560/6 82 001	Report, Health Effects Test Guidelines, August 1982.

Code of Federal Regulations

21CFR 100 199	Food and Drugs.

(Copies of specifications, standards, handbooks and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the Issues of documents not listed in the DODISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

AEROSPACE MATERIALS SPECIFICATIONS

AMS 3238	Butyl Rubber, Phosphate Ester Resistant.

(Application for copies should be addressed to the Society of Automotive Engineers, 400 Commonwealth Drive, Marrendale, PA 15096.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D 3951 Commercial Packaging.

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

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this specification, however, shall supersede appl icable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Masks furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time set for the opening of bids (see 4.3 and 6.3).

3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.4 and 6.4).

3.3 Selection of specifications and standards. Specifications and standards for nessesary commodities and services not specified herein shall be selected as specified in MIL STD 143.

3.4 Materials. Materials referenced herein shall conform to applicable specifications and standards. Materials that are not covered by specifications and that are not specifically described herein shall be the best quality and the lightest practical weight. Materials shall be corrosion resistant, or suitably treated to resist corrosion due to fuels, salt spray, environmental , chemical or biological warfare conditions. All materials used in the mask shall be comparable with 100 percent oxygen atmospheres and shall not transfer odor of an obnoxious or unpleasant type.

3.4.1 Aluminum alloy parts. Aluminum alloy parts shall be anodically treated as specified in MIL A 8625.

3.4.2 Dissimilar metals. Dissimilar metals shall not be used in intimate contact with each other. Dissimilar metals are as specified in MIL STD 889.

3.4.3 Nonmetallic materials. Rubber seals and o rings shall meet the requirements as specified in AMS 3238 and the requirements specified herein.

3.4.4 Fungus proof materials. All materials shall be incapable of supporting fungoid growth.

3.4.5 Age Elastomeric components shall be comprised of materials with expected shelf storage llfe of greater than 5 years as specified in MIL HDBK 695 when consistent with the properties required for functional suitability. These components alone or as part of an assembly shall be delivered to the Government with less than 18 months elapsed from date of cure/manufacture to the date of delivery to the Government.

3.4.6 Toxic materials. The use of materials which produce toxic effects under any conditions shall be avoided.

3.4.7 Flammable materials. The use of materials which will support combustion shall be avoided.

3.5 Design and construction. The mask shall be used with and form part of the protective assembly (PASS), as shown on Figure 1. The mask shall meet the requirements as specified in MIL-P-85833 and this specification. The design and construction of the mask shall be as shown on Figures 2 and 3. The mask and all its accessories and components shall fit the 3rd to 98th percentile male aircrewman as specified in MIL-P-85833. The design and construction shall permit decontamination, using procedures of Army FM 3-5, without damage to or deterioration of the mask or its protective capability.

3.5.1 Interfaces. The mask is intended for use in all USN/USMC helicopters (H-1, H-2, H-3, H-46, H-53 and H-60 series) and shall be compatible with crew station hardware and the electrical power systems aboard the aircraft. It shall be compatible with all missions of these helicopters, including use of optical, targeting and sighting devices, and shall be compatible with and integrate with personal protective clothing and devices as required by OPNAVINST 3710.7 and NAVAIR manual 13-1-6.7, and chemical, biological, radiological (CBR) protective clothing in NAVAIR manual 13-1-6.10, including sequential use of the SRU-36/P, Helicopter Emergency Escape Device (HEED) . The mask shall also be compatible with laser protective equipment.

3.5.2 Storage life. The mask shall be designed to meet the performance requirements of this specification after five years storage under worldwide climatic conditions specified in MIL-STD-210, when packaged as specified in MIL-STD-794.

3.5.3 Interchanaeabi lity. All parts subassemblies and assemblies having the-same part number shall be identical as specified in DOD-STD-480 and DOD-STD-100. When any unit or part is Interchanged, the mask shall meet all performance requirements without adjustment or modification of any part or subassembly.

3.5.4 Thermal protection. The mask shall provide protection against thermal effects up to 10 cals./cm.z, to meet overall thermal load requirements of the PASS system (see MIL-P-85833).

3.5.5 Intersystem leakage. The wearer shall be able to adjust the tension of the or inasal mask on his face, both on the ground and in flight, to hold a positive mask pressure without impairing the protection provided by the mask. The leakage between the head and neck region and the respiratory compartment of the mask shall be such that:

a. The inboard leakage into the respiratory compartment does not exceed 0.1 percent of the pulmonary ventilation when the mean pressure inthe compartment is four in. water gage (WG.) greater than that of the environment.

b. The outboard leakage is less than .02 cfm. when the mean pressure in the compartment is four in. MG. greater than that of the environment.

3.5.6 Visor compartment pressure. Under normal operating conditions the pressure in the visor compartment shall be greater than the local ambient pressure by 0.25 in. WG. With the head held still the pressure shall not exceed the ambient by more than 0.4 In. WG. On head movement transient pressure rises to not more than 1.0 in. WG greater than ambient shall be permitted.

3.5.7 Resistance.

3.5.7.1 Ventilation. The air flow resistance from the ventilator thru the manifold and the hood compartments shall be such that a nominal flow of 50 1pm and a minimum flow of 10 1 pm is achieved while maintaining a hood compartment pressure between 0.2 and 0.4 in of water gauge.

3.5.7.2 Respiration. The air flow resistance from the ventilator thru the manifold and the mask compartment shall be such that a nominal flow of 50 lpm and a peak Inspiratory flow of 170 lpm is achieved while maintaining a mask compartment pressure between 1.5 and 4.5 in. of water.

3.6 Hardware.

3.6.1 Fasteners. All fasteners, including bolts, screws, nuts, rivets, washers and hinges shall be as specified in SD 24.

3,7 Quantitative reliability requirements. When tested in accordance with MIL STD 781 as specified in 4.8.4, the mean time between failure for the mask, based on an exponential distribution of failure times, the lower single sided 907. confidence limit, shall be 500 hours. The performance requirements specified in 3.8.1, 3.8.2, 3.8.3, 3.8.4, 3.8.5. 3.8.6, and 3.8.7 shall be the reliability requirements for determining mean time between failures.

3.8 Performance.

3.8.1 Inspiratory and hood air supply components leakage. When tested as specified in 4.8.2.1, the leakage rate shall be not greater than .01 in. 3/mln. with the faceplece inlet valve sealed, and shall be not greater than 1.2 in. 3/min. with the faceplece inlet valve unsealed.

3.8.2 Mask facepiece cavity leakage. When tested as specified in 4.8.2.2, the leakage rate shall be not greater than .31 in.3/mln.

3.8.3 Reverse leakage throuqh exptratory valve assembly. When tested as specified In 4.8.2.3, the leakage rate shall be not greater than .31 in.3/min.

3.8.4 Load test on hood and mask facepiece tube connections. When tested as specified in 4.8.2.4, there shall be no signs of slippage or damage to the hood or mask facepiece tubes or their connections at each applied axial load.

3.8.5 Assembly leakage into the hood compartment. When tested as specified In 4.8.2.5, the leakage rate shall be not greater than .004 in.3/mln.

3.8.6 Microphone and plug assembly. The microphone and plug assembly shall show continuity when tested as specified in 4.8.2.6.

3.8.7 Overall leakage. When tested as specified In 4.8.2.7, there shall be no leakage during a one minute period.

3.8.8 Valsalva device. The valsalva device shall operate freely and smoothly when tested as specified In 4.8.2.8. There shall be no failure of the valsalva device or any of its components.

3.8.9 Restraint harness. The restraint harness assembly shall operate freely and smoothly when tested as specified in 4.8.2.9. There shall be no failure of the restraint harness or any of its components.

3.8.10 Anti-suffocation device. The anti-suffocation device shall operate freely when tested as specified in 4.8.2.10. There shall be no failure or damage of the anti-suffocation device or any of its components.

3.8.11 Chemical agent permeation. The materials of the mask shall be resistant to liquid agent permeation with an end point of not less than 360 minutes when tested as specified in 4.8.2.11.1, 4.8.2. 11.2 and 4.8.2.11.3.

3.8.12 Optical. The lens area of the facepiece shall meet the requirements of MTL-V-43511, Class I, except for the impact requirement, when tested as specified in 4.8.2.12.

3.8.13 Field of Vision. The unobstructed field of vision of the mask (without the helmet being worn) shall be:

a. Vertical - 90” without head rotation
b. Horizontal - 160” without head rotation,

when tested as specified in 4.8.2.13.

3.8.14 Cyclic Breathing. The mask shall show no damage or failure from the effects of cyclic breathing when tested as specified in 4.8.2.14.

3.8.15 Drinking. A drinking device for hot and cold liquids and liquid medication shall provide a flow of not less than one quart in 10 minutes. Drinking device preparation time shall be not more than two minutes and the start of water intake not more than 15 seconds when tested as specified in 4.8.2.15.

3.8.16 Flame and flash protection. The mask shall provide flame and flash protection so that not greater than 2 percent of the head and neck areas receive burns. The mask shall not melt and shall show minimal charring and shall be self extlnguishing when tested as specified in 4.8.2.16,

3.8.17 Toxicity. All materials of components that come in contact with the skin shall not cause undue sensitization or primary irritation of the wearers skin. As specified in EPA 560/6-82-001, objective evidence of the tests specifed in 3.8.17.1 thru 3.8.17.3 shall be submitted to substantiate this requirement.

3 .8.17.1 Primary dermal irritation. When tested as specified in 4.8.3.1, the mask materials shall meet the requirements of 3.8.17.

3.8. 17.2 Primary eye Irritation. When tested as specified In 4.8.3.2, the mask materials shall meet the requirements of 3.8.17.

3.8. 17.3 Dermal sensitization. When tested as specified in 4.8.3.3, the mask materials shall meet the requirements of 3.8.17.

3.8.174 Prophetic human patch testing. When tested as specified in 4.8.3.4, the mask materials shall meet the requirements of 3.8.17.

3.8.18 Environmental tests. Prior to and at the completion of each environmental test, the mask shall be tested and shall meet the requirements of 3.8.1, 3.8.2, 3.8.3, 3.8.4, 3.8.5, 3.8,6, and 3.8.7.

3.8. 18.1 High temperature. When tested as specified in 4.8.5.1. the mask shall operate without failure.

3.8. 18.2 Low temperature. When tested as specified in 4.8.5.2, the mask shall operate without failure.

3.8. 18.3 Salt fog. When tested as specified in 4.8.5.3, the mask shall withstand both the corrosive and physical effects of the salt fog environment, and operate without failure,

3.8. 18.4 Rain. When tested as specified in 4.8.5.4, the mask shall operate without failure.

3.8. 18.5 Fungus. When tested as specified in 4.8.5.5, the mask shall not support fungal growth and shall operate without failure.

3.8. 18.6 Low pressure and high humidity. When tested as specified In 4.8.5.6, the mask shall operate without failure.

3.8. 18.7 Dust. When tested as specified in 4.8.5.7, the mask shall withstand the effects of the blowing dust and shall operate without failure.

3.8. 18.8 Normal acceleration. When tested as specified In 4.8.5.8, the mask shall operate without failure.

3.8. 18.9 High temperature, diurnal cycle and hlgh humidity. When tested as specified in 4.8.5.9, the mask shall operate without failure.

3.8.18,10 Shock. When tested as specified in 4.8.5.10, the mask shall operate without failure.

3.8.18.11 Crash Acceleration. The mask shall be tested as specified in 4.8.5.11. The mask shall not be required to pass the requirements of 3.8.18 after exposure to acceleration. Any structural failure of the mask which could cause injury to the wearer shall be cause for rejection.

3.8.18.12 Solar radiation. When tested as specified in 4.8.5.12 the mask shall operate without failure.

3.8.18.13 Height and center of gravity. The weight of the mask with manifold and hoses shall be not greater than three pounds. The center of gravity of the head mounted portion, when worn, shall be as near to the center of gravity of the bare head as possible when measured as specified in 4.8.5.13.

3.9 Component parts. The mask shall consist of the components specified in 3.9.1. thru 3.9.12 and other parts as necessary which are essential to form a complete, assembled and operating mask.

3.9.1 Head cowl assembly. The head cowl assembly shall consist of an apron, neck seal, and hood. The hood and apron shall be made of an impermeable rubber, cover the entire head and extend down the neck and over the shoulder. The neck seal shall also be made of Impermeable rubber and shall isolate the head and neck from the rest of the body.

3.9.2 Facepiece. The facepiece shall be sealed Into the front of the hood . The optical area shall be transparent and the lower part shall be black. Included in the facepiece shall be a valsalva device, restraint harness, inlet ports for filtered air, anti suffocation device connector, entry tube to facilitate drinking, and microphone assembly.

3.9.3 Or inasal mask. The or inasal mask shall be molded of a soft rubber to fit over the wearer's nose and mouth. The or i nasal mask shall incorporate a turned under edge to increase the mask's efficiency to seal around the wearers face. The or inasal mask shall be mounted within the faceplate.

3.9.4 Hood inlet adapter. The hood inlet adapter shall connect the hose from the manifold assembly to the hood compartment of the mask.

3.9.5 Valves. The mask shall contain sufficient valves designed and constructed to allow proper flow of air to the hood and respiratory areas to meet the requirements of protection factor, breathing and ventilation requirements of this specification and the PASS system specification.

3.9.6 Anti suffocation device. To prevent suffocation as a result of loss of air supply or after ditching, the anti suffocation device shall be capable of manual operation with one CBR gloved hand.

3.9.7 Drinking device. The drinking device for hot and cold liquids and liquid medication shall consist of an entry tube which passes through the the facepiece, terminating in the or inasal mask. The drinking device shall be capable of coupling with the entry tube and a canteen with an MK 17 cap. The entry tube/drinking device shall be capable of operation in the temperature range of +32°F to +131°F.

3.9.8 Restraint harness assembly. The restraint harness assembly shall be used to attach the mask to the helmet and prevent movement of the mask on the face during aircraft maneuvers and to permit adjusting the tension of the mask to the face.

3.9.9 Antifogging device. The mask shall have a device to deflect blown filtered air across the lens area to eliminate lens fogging and ensure a clear visual area.

3.9.10 Microphone. The mask shall have a microphone that is compatible with all aircraft radio and intercommunications devices. Cable terminals shall provide direct electrical interface compatible with communication plugs of USN/USMC aircrewmembers operating the aircraft series of 3.5.1 herein. Intercommunication shall be possible both on the ground and fn flight.

3.9.11 Mainfold and hose assembly. The mask shall have a manifold to distribute the airflow into the hood and respiratory areas of the mask. Hoses shall be flexible material Impermeable to CBR agents and fitted with a restraint cord to prevent overextension.

3.9.12 Valsalva device. The valsalva device shall provide for clearing the ears by occlusion of the nostrils during changes of environmental pressure in the external ear canal. Pressure shall also be balanced with that in the visor cavity at all times. The device shall be operated with one CBR gloved hand and shall not degrade CBR protection when operated.

3.9.13 Spectacle frames. The mask shall be compatible with standard spectacles or specially designed spectacle frames to provide a means to fit the aircrewman with corrective lenses.

3.9.14 Transit case. The transit case shall provide a means to protect the mask and Its components and accessories and the intercom during transit or storage .

3.10 Dimensions. The envelope dimensions of the mask shall be as shown on Figure 2.

3.11 Color. The mask shall be colored black, approximately matching color number 37038 as specified in FED STD S95.

3.12 Nameplates and identification markings. Nameplate approval, equipment identification marking and serial number assignment shall be as specified in MIL N 18307.

3.13 Configuration. The mask furnished in accordance with this specification shall be developed and produced under a program for managing system configuration as specified in DOD STD 480, MIL STD 483 and MIL STD 490.

3.14 Human engineering. Human performance and human engineering design criteria for the mask shall be as specified In MIL STD 1472.

3.15 Workmanship. The mask shall be manufactured in a manner that results in a product of uniform excellent quality free from defects which could effect safety, protection, function, reliability or durability. The mask shall be free of contamination and Imperfections such as dirt, grease, oil foreign matter, malfunctioning of hardware and damage such as cracks, burrs, sharp edges of metal parts and tears, punctures, permanent set of rubber parts, distortion of metal parts or scratches in the lens area.

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 arty 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.

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

a. Qualification inspection (see 4.3).
b. First article inspection (see 4.4).
c. Quality conformance inspection (see 4.5).
d. Quality conformance verification inspection (see 4.6).

4.3 Qualification inspection. Qualification inspection shall be performed in the order specified in Table I, consisting of all the tests and examinations listed in this specification.

4.3.1 Qualification samples. Qualification samples shall consist of fifteen masks consisting of at least 1 mask of each size. Samples shall be forwarded to a test facility set forth in the letter of authorization to submit samples (see 6.3). The samples shall be plainly identified by securely attached durable tags marked with the following information:

> Samples submitted by (name) (date) for qualification inspection as specified In MIL M 85831 (AS) and number under authorization (reference authorizing letter and number) (see 6.3).

4.3.11 Disposition of samples. Upon completion of qualification inspection, all samples shall be consumed or destroyed and shall not be considered as part of the quantity to be delivered under contract.

4.3.2 Retention of qualification. To retain qualification, the contractor shall forward a report at six month Intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of a summary of the results of the tests performed, indicatlng the number of samples that have passed and the number that have failed during the six month period. If the summary of the test results indicates non

conformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list Failure to submit the report within 30 days after the end of each six month period may result in loss of qualiftcation for the product. In addltion to the periodic reports, the contractor shall immediately inform the qualifying activity of inspection data indicating failure of the qualified product to meet this specification. In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods, there has been no production, the manufacturer may be required at the discretion of the quallfying activity, to submit the qualified products to testing in accordance with qualification inspection requirement and the reason for no production.

4.4 First article inspection. First article Inspection shall be performed in the order specified in Table II.

4.4.1 First article samples. After award of the contract or order, the manufacturer shall submit three complete masks. The samples shall be representative of the construction, workmanship and materials to be used during production. In addition, the manufacturer shall submit a certification from the source verifying that the materials used in fabricating the couplings were as specified herein prior to such fabrication. In the the event of the absence of certification from the source, a certificate of analysis or certified inspection data shall be required as proof of conformance to applicable requirements. When a manufacturer is in continuous production of these assembles from contract to contract, submission of further first article samples on a new contract may be waived at the discretion of the acquiring activity (see 6.2.1). Approval of the first article samples or the waiving of the first article inspection does not preclude the requirements of submitting to the quality conformance inspection. The first article inspection samples shall be furnished to the Government as directed by the contracting officer (see 6.2.1).

4.4.1.1 Disposition of samples. Upon completion, of the first article inspection, one approved coupling shall be returned to the manufacturer for use in monitoring production. The other samples shall be consumed or destroyed In the first article inspection and shall not be considered as part of the quantity to be delivered under contract.

4.5 Quality conformance Inspection. Quality conformance inspection shall consist of all the examinations and tests specified in Table III. The sampling and inspection levels shall be as specified in MIL STD IO5.

4.5.1 Inspection lot. An inspection lot size shall be expressed In units of one mask made by one manufacturer under essentially the same conditions and from the same materials and components.

4.5.1.1 Packaging. An inspection lot size shall be expressed in units of one fully prepared shipping container, containing masks, fully prepared for delivery, made from essentialy the same materials and components. The sample unit shall be one shipping container, containing masks, fully prepared for delivery, with the exception that the shipping container need not be sealed.

4.5.2 Sampling for tests and examinations of masks. The sample size, acceptance criteria, tests and examinations required for the mask shall be as specified in Table III.

4.6 Quality conformance verification inspection. At the option of the Government and upon completion of the quality conformance inspection requirements of 4.5, a random sample, one for every 150 or fraction thereof, shall be selected from each lot of masks (see 6.2,1). Each mask, selected as a sample unit, shall be forwarded to a laboratory designated at the time of the award (see 6.2.1). The designated laboratory shall conduct any or all the tests and examinations of 4.8. The serial numbers of the units in the lot, represented by the sample units, shall be included with the data accompanying the samples to the laboratory. The Government activity responsible for conducting the quality conformance verification program shall report the results of the tests and examinations to the designated Inspection and acceptance activity specified In the acquisition document. Final acceptance of the lot from which the sample units were selected shall be based upon successful completion of the inspection program by the cognizant Quality Assurance Representative/Specialist at the contractor's facility; applying the applicable acceptance criteria specified in Table III.

4.7 Test conditions.

4.7.1 Air. Clean, dry, gaseous air shall be used for all tests unless a particular gas is specified in the contract.

4.7.2 Temperature and pressure. Unless otherwise specified in the contract, inspections shall be conducted at local ambient temperature and barometric pressure. Corrections shall be made to provide agreement with the temperature and pressure calibration of the instruments. Inspection data provided by an instrument not calibrated to normal temperature and pressure (NTP) conditions shall be corrected to determine NTP conditions. NTP conditions are 70 F and 29.92 in. Hg.

4.8 Inspection methods.

4.8.1 Visual examination.

4.8.1.1 Masks. Every mask shall be examined visually for critical defects to determine conformance to this specification. In addition, every mask, selected as a sample unit from the lot, shall be visually examined for major and minor defects to determine conformance to this specification. The classification of defects of Table IV shall be used to classify the defects found.

4.8. 1.1.1 Dimensions. Each mask, selected as a sample unit from the lot, shall be checked dimensionally to determine conformance to the dimensions specified herein.

4.8.1.2 Packaging. Each of the fully prepared shipping containers, containing masks, selected as a sample unit from the lot, shall be examined to determine that the packaging, packing and marking conform to this specification. The list of defects of Table V shall be used to enumerate the defects found.

4.8.2 Performance.

4.8.2.1 Inspiratory and hood air supply components leakage. The mask facepiece Inlet valve and the manifold assembly air inlet port shall be sealed. With a suction of 10.0 in WG applied to the hood Inlet adapter the leakage rate shall be measured. The mask facepiece inlet valve shall then be unsealed and a suction of 10.0 in. WG shall be applied to the hood Inlet adapter. The leakage rate shall again be measured. 'The mask facepiece leakage shall meet the requirements specified in 3.8.1.

4.8.2.2 Mask facepiece leakage. The mask facepiece inlet valve shall be sealed. The exhalation valve shall be restrained in the open position, and the reflected edge of the mask facepiece shall then be fitted with sealing plates to seal the mask facepiece cavity. With a suction of one in. WG applied to the mask facepiece cavity, the leakage rate shall be measured and shall meet the requirements specified in 3.8.2.

4.8.2.3 Reverse leakage through expiatory valve assembly. The expiratory valve assembly shall be fitted to the mask facepiece assembly with the valve tube coupled. The mask facepiece shall then be fitted to the respirator faceplate and the mask facepiece Inlet valve shall be sealed. The expiatory valve shall be restrained on the open position then the reflected edge of the mask facepiece shall be fitted with sealing plates to seal the mask facepiece cavity. A suction of one in. WG. shall be applied to the mask facepiece cavity. The leakage rate shall be measured and shall meet the requirements specified in 3.8.3.

4.8.2,4 Load test on hood and mask facepiece hose connections. An axial load of 25 pounds shall be applied to the hood inlet hose connection for a period of 10 seconds. An axial load of 25 pounds shall then be applied to the mask facepiece hose connection to the anti suffocation disconnect coupling for a period of 10 seconds. An axial load shall be applied, in turn, to the hood connection and the mask facepiece hose connection to the manifold assembly for a period of 10 seconds. The hood and mask facepiece tube connections shall meet the requirements specified in 3.8.4.

4.8.2.5 Assembly leakage Into the hood compartment. The mask facepiece inlet valve shall be sealed. The reflected edge of the mask facepiece shall be fitted with sealing plates to seal the facepiece cavity. The manifold assembly alr Inlet port shall be sealed. The mask shall be mounted on the test stand and the neck seal shall be sealed to the test stand. The hood outlet shall be closed. A suction of 0.5 in WG shall be applied to the hood compartment. The leakage rate shall be measured and shall meet the requirements specified in 3.8.5.

4.8.2.6 Microphone and pluq assembly. The microphone and plug shall be connected to a Functional Microphone Tester. The microphone shall be held against the tester sound source' and the sound source Increased until the ammeter/voltmeter moves. Any movement in excess of normal background reading shall indicate an acceptable microphone. The microphone and plug assembly shall meet the requirements of 3.8.6.

4.8.2.7 Overall leakage. The mask shall be supported on a test fixture. Blank the expiatory valve outlet and the neck seal opening. Close all valves in the mask to preclude air passage. Inflate the mask with a pressure source applied to the air hose Inlet until a reading of two Inches of water is indicated by manometer. Allow the pressure In the hood to stabilize for a one minute period. The mask shall meet the requirements of 3.8.7.

4.8.2.8 Valsalva device. The valsalva device shall be examined for full and free operation. The valsalva device assembled to a mask mounted on a dummy head shall be operated 1000 times and examined for any evidence of wear or damage. The valsalva device shall meet the requirements specified in 3.8.8.

4.8.2.9 Restraint harness. The restraint harness assembly shall operate freely when assembled to the facepiece. For the purpose of this test the facepiece, with mask faceplece, may be attached to a representative head stand complete with an aircrew helmet. An axial load of 10 pounds shall be applied to the left hand side cable and an axial load of 15 pounds shall be applied to the right hand side cable via the helmet attachment plates. The loads shall be applied simultaneously for a period of 10 seconds in the direction of the cable as normally worn. The test detailed shall be repeated with an axial loading of 15 pounds applied to the left hand side cable. The harness assembly shall meet the requirements specified in 3.8.9.

4,8,2.10 Anti-suffocation device. The anti-suffocation device shall be examined for damage and the tube portion examined for freedom from obstruction. The anti-suffocation device shall meet the requirements specified in 3.8.10.

4,8.2.11 Chemical agent permeation. Materials used to manufacture the mask shall be tested for chemical agent permeation. Test slabs made of the same formulation, thickness, cure time and cure temperature as the facepiece, lens, apron, hood and hoses may be used in lieu of mask materials.

4,8.2. 11.1 Mustard. Resistance to permeation by mustard shall be tested as specified in MIL-STD-282, Method T-209. The material shall meet the requirements as specified in 3.8.11.

4 8.2. 11.2 Vx. Resistance to permeation by Vx shall be tested as specified In MIL-STD-282, Method T-208. The material shall meet the requirements as specified in 3.8.11.

4.8.2. 11.3 Thickened soman. Resistance to permeation by thickened soman shall be tested as specified in MIL-STD-282, Method T-208. The material shall meet the requirements as specified in 3.8.11.

4.8.2.12 Optical. The lens area of the facepiece shall be tested as specified in MIL-V-43511. The mask shall meet the requirements as specified in 3.8.12.

4.8.2.13 Field of vision. Field of vision shall be tested with an Airmark Projection Perimeter, or equal at the mask lens area in the “as worn” position. The mask shall meet the requirements as specified in 3.8.13.

4.8.2.14 Cyclic breathing. The mask mounted to a test head and connected to a breather simulator and blower unit shall be operated for 1500 hours. The breather simulator shall operate at 2.5 cfm. at a rate of 25 cycles/minute. The mask shall meet the requirements as specified in 3.8.14.

4.8.2.15 Drinking. 10 test subjects shall be used to measure the flow rate and the device preparation time. Preparation time shall be the time required for a subject to detach the drink tube cap from the mask and properly insert the device Into the mask and into an MK-17 canteen drinking cap. The mask shall be worn on the subject and the canteen in its carrier at the start. The drinking device shall be wlthin an open carrying case. The test shall be conducted with subjects wearing CBR protective gloves. The mask shall meet the requirements as specified in 3.8.15.

4.8.2,16 Flame and flash protection. The mask shall be tested as specified in Naval Air Development Center Report No. NADC-86-60, NADC Fuel Fire Test Facility, February 86. The test time shall be 2 seconds (using the JP-4 fuel). The mask shall be fitted to a maniken with the aircrewmember's helmet and standard flight equipment. Heat sensors shall be placed on the dummy head. No sensors are required on the body of the maniken. The mask shall meet the requirements of 3.8.16.

4.8.3 Toxicity.

4.8.3.1 Primary dermal Irritation. The mask shall be tested for primary dermal irritation as specified in EPA 560/6-82-001, using the following parameters:

a. Albino rabbit is the preferred species.
b. Four hour exposure period.
c. 14 day observation period.

The mask shall meet the requirements specified in 3.8.17.1.

4.8.3.2 Primary eye irritation. The mask shall be tested for primary eye irritation as specified in EPA 560/6-82-001, using the following parameters:

a. Albino rabbit is the preferred species.
b. An artificial sweat extract of the formulation shall be used.
c. 14 day observation period.

The mask shall pass the requirements specified in 3.8.17.2.

4.8.3.3 Dermal sensitization. The mask shall be tested for dermal sensitization as specified in EPA 560/6-62-001, using the following parameters:

a. Guinea pig maximization test.
b. An artlficial sweat extract of the formulation shall be used.

The mask shall pass the requirements specified in 3.8.17.3.

4.8.3.4 Prophetic human patch testing. The mask shall be tested as specified in the Food Drug and Cosmetic Law Journal, 10:722, "Draize Human Sensitization Test." For the testing, there shall be 200 free living volunteers. Each volunteer shall have the formulation to be tested applied to the same site of skin nine times. A negative control shall be administered concurrently. The substances shall be covered by an occlusive patch and be kept in contact with the skin for 48-72 hours, each application. Irritation shall be scored upon removal of each patch. A rest or incubation period period of 14 days shall then be allowed and a final application of each of the substances to be tested to a fresh site of the skin.shall be. performed. The. results of the test shall be scored on a O to 4 basis. with:

0 = Negative
1 = Erythema
2 = Erythema and Induration
3 = Erythema, Induration and vesicles
4 = Erythema, induration and bullae

Volunteers partlcipating In the test shall receive a general medical examination to include a complete medical history by the principal investigator or his designated representatives to assure that the subjects are free of any medical condition which might preclude them from participating in this test or or any medical condition which might be aggravated as a result of their participation in this test. Conditions which shall exclude Individuals from participating include the presence of dermatitis or a history of allergy to components of the materials being tested. Nurses and physicians shall always be on-call 24 hours a day during the course of the test as well as the principal investigator or his associates and be at the site within one hour should the need arise. Such an emergency, as a result of patch testing, is not anticipated. The tests shall be "read" by the principal investigator and his staff and reported in accordance with the scoring procedure outlined above. In these tests, each volunteer acts as his own control in that the materials used to cover the substances applied are known to have extremely low sensitizing potential, thus any responses, consistant with sensitization, elicited after application of a substance are considered evidence of sensitization to that substance. Such evidence in one or more volunteers shall , for any particular substance tested, identify that the substance as having skin sensitizing potential. The mask shall pass the requirements specified in 3.8.17.4.

4.8.4 Reliability. Five masks shall be tested using Test Plan IVC of MIL-STD-781. Each mask shall be subjected to 315 hours of testing. The test cycle shall be 14 hours in duration and shall consist of a 7 hour hot mission and a 7 hour cold mission. Cold mission temperature levels shall start at +131 F, rise to +158°F for 1 hour followed by 1 hour at +131°F with the remaining 5 hours at -14°F. Hot mission temperature levels shall start at -14°F lowered to -40 F for 1 hour, followed by 1 hour at -14 F, with the remaining 5 hours at +131 F. The masks shall be subject to the performance tests of 4.8.2.1, 4.8.2.2, 4.8.2.3, 4.8.2.4, 4.8.2.5, 4.8.2.6, 4.8.2.7, and meet the requirements of 3.7.

4.8.5 Environmental tests. Environmental tests shall be conducted in the sequence specified in Table VI. Prior to and at the completion of each test the mask shall be tested in accordance with the requirements of 4.8.2.1, 4.8.2.2, 4.8.2.3, 4.8.2.4, 4.8.2.5, 4.8.2.6, and 4.8.2.7 and shall meet the requirement of 3.8.18.

4.8.5.1 High temperature. The high temperature test shall be performed as specified in MIL-STD-810, method 501.2, Procedure II, Operation. The mask shall be fitted to a dummy head and connected to a breathing simulator set at a flow of 110 lpm at a rate of 44 cycles per minute. With the breathing simulator off, the chamber temperature shall be raised to 158°F at a rate of 5°F per minute. The chamber temperature shall be maintained for one hour. The relative humidity shall be not greater than 75 percent. The temperature shall then be reduced to 131°F at a rate of 5°F per minute and maintained at that temperature for a period of six hours. At the completion of the six hour period the breather simulator shall be selected to the 'ON' position. The mask shall meet the requirements specified in 3.8.18 and 3.8.18.1.

4.8.5.2 Low temperature. The mask shall be subjected to the low temperature test as specified In MIL-STD-810 Procedure II, Method 502.2, Operation. The mask shall be fitted to a dummy head and connected to a breathing simulator set at a flow of 110 1 pm at a rate of 44 cycles per minute. With the breathing simulator off, the chamber temperature shall be lowered to -40°F at a rate of 5°F per minute. The chamber temperature shall be maintained for one hour. The temperature shall then be raised to -14°F at a rate of 5°F per minute and maintained at that temperature for a period of six hours. At the completion of the six hour period the breather simulator shall be selected to the 'ON' position. The mask shall meet the requirements specified In 3.8.18 and 3.8.18.2.

4.8.5.3 Salt fog. The mask shall be tested as specified in MIL-STD-810, Method 509.2. The mask shall be fitted to a dummy head and the air inlet hose and microphone socket sealed. The mask shall be placed In the test chamber and subjected to four alternating periods of 24 hour exposure and 24 hours drying time. The mask shall be examined for corrosion and deterioration of metal parts, finishes, materials and components. The mask shall meet the requirements specified in 3.8.18 and 3.8.18.3.

4.8.5.4 Rain. The mask shall be subjected to the rain test as specified in MIL-STD-810, Method 506.2, Procedure I, Blowing Rain, for a period of one hour at a rate of four inches per hour. The mask shall be fitted to a dummy head and connected to a breathing simulator set at a flow of 3.9 cfm at a rate of 44 cycles per minute. With the breathing simulator 'ON' the mask shall meet the requirements specified in 3.8.18 and 3.8.18.4.

4.8.5.5 Fungus. The mask shall be subjected to the fungus test as specified in MIL-STD-810, Method 508.3, for a period of 28 days. The mask shall be fitted to a dummy head. The mask shall meet the requirements specified in 3.8.18 and 3.8.18.5.

4.8.5.6 Low pressure and high humidity. The mask shall be tested as specified in MIL-STD-810, Method 500.2, Procedure II, Operation. The mask shall be fitted to a dummy head and connected to a breathing simulator set at a flow of 110 1 pm at a rate of 44 cycles per minute. The chamber temperature shall be reduced to -14°F at a rate not exceeding 5F per minute and the condition maintained for a period of 30 minutes. The pressure in the chamber shall then be reduced to .7 standard atmospheres over a period of 15 minutes and maintained at this pressure for 30 minutes. The chamber humidity shall then be raised and maintained at, or close to saturation. The chamber temperature shall then be raised to 32°F and the pressure Increased to NTP pressure at an approximately linear rate over a period of 15 minutes. The chamber temperature shall then be raised at an approximately llnear rate to 86°F with the humidity maintained at or near saturation, over a period of 30 minutes. The chamber conditions shall be maintained for a period of not less than one hour and until all frost has melted. The mask shall meet the requirements specified in 3.8.18 and 3.8.18.6.

4.8.5.7 Dust. The mask shall be subjected to the dust test as specified in MIL-STD-810, Method 510.2, Procedure I, Blowing Dust, for a period of six hours at 73°F and 300 ft./rein. air velocity and six hours at 131°F and 1750 ft./rein. The relative humidity shall be not greater than 30 percent. The mask shall be fitted to a dummy head and connected to a breathing simulator set at a flow of 110 lpm at a rate of 44 cycles per minute. With the breathing simulator 'ON', the mask shall meet the requirements specified In 3.8. 18 and 3.8.18.7.

4.8.5.8 Normal acceleration. The mask shall be subjected to the test as specified in MIL-STD-810, Method 513.3, Procedure II, Operation, The mask shall be fitted to a dummy head and connected to a breathing simulator set at a flow of 110 lpm at a rate of 44 cycles per minute. With the breathing simulator 'ON', the mask shall be subjected to six g's in each of the six directions. The mask shall meet the requirements specified in 3.8.18 and 3.8.18.8.

4.8.5,9 High temperature, diurnal cycle and high humidity. The mask shall be subjected to the high temperature test as specified in MIL-STD-810, Method 507.2, Procedure II, Cycle 4, normal test duration. The mask shall be examined and tested every five days. The mask shall meet the requirements specified in 3.8.18 and 3.8.18.9.

4.8.5.10 Shock. The mask shall be tested as specified in MIL-STD-810, Method 516.3, Procedure IV, Transit Drop. The mask shall be tested both in its carrying case and out of its carrying case. The mask properly secured in its carrying case shall be dropped on each face, edge and corners for a total of 26 drops from a height of 48 inches from its center of gravity to the impact surface. Another mask out of its case shall be dropped on each front and back a total of 26 times from a height of 48 inches from its center of gravity to the impact surface. The mask shall meet the requirements of 3.8.18 and 3.8.18.10.

4.8.5.11 Crash acceleration. The mask shall be subjected to the test as specified in MIL-STD-810, Method 513.3, Procedure II. The mask shall be fitted to a dummy head and connected to a breathing simulator set at a flow of 3.9 cfm. at a rate of 44 cycles per minute. With the breathing simulator 'ON', the mask shall be subjected to an acceleration of 25 g's for 10 seconds applied to the x-axis. The mask shall meet the requirements specified in 3.8.18.11.

4.8.5.12 Solar radiation. The mask shall be subjected to the test as specified in MIL-STD-810, Method 505.2, Procedure II, for 10 cycles. The mask shall be fitted to a dummy head. The mask shall meet the requirements specified in 3.8.18 and 3.8.18.12.

4.8.5.13 Height and center of gravity. The center of gravity location shall be measured with the mask mounted on a 50th percentile Hybrid 111 headform (Government loaned property) detached from the neck. 'The mask shall be fitted to the Hybrid III headform using the same procedures to fit the system to a human head. When properly mounted on a 50th percentile Hybrid III headform, the center-of-gravity of the mask and the Hybrid III headform shall be measured. The Government suppl led Hybrid III headform will be instrumented and weigh 10 pounds. The center of gravity of the mask/headform combination shall meet the requirements as specified In 3.8.18.13. The coordinate system shall be defined as follows: The origin of the coordinate system shall lie in the mid-sagittal plane on the line Interconnecting the centers of the Hybrid III. headform pivot points. (See General Motors Corporation Drawing Number 78051-61, Head Assembly Complete - Hybrid III, supplied by the Goverment with loaned head form)) This line shall be the Y axis. The Z axis is perpendicular to the base plane. The X axis is parallel to the base plane. The head and neck supported weight of the mask shall meet the requirements of 3.8.)8.13.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial (see 6.2.1).

5.1.1 Level A. The mask shall be preserved Method IA-8 as specified in MIL-P-116.

5.1.1.1 Cleaning and drying. Cleaning shall be "C-1", any applicable process, as specified in MIL-P-116 and any drying process of MIL-P-116 may be applied.

5.1.1.2 Preservative. No preservative is required.

5.1.1.3 Unit Packaging. The mask shall be cushioned with material specifed in PPP-C-795, or PPP-C-1842, and shall be placed in a sealed bag conforming to MIL-B-117, Types I, II or III, Classes E, F or G, Styles 1,.2 or 3. The bag shall then be placed into a PPP-B-566 unit container.

5.1.1.4 Intermediate Packaging. When specified in the contract (section 6.2), units packaged in accordance with 5.1.1.3 shall be placed into an intermediate" container as specified in PPP-B-636, Type CF. Class Heather Resistant Container. The number of the unit containers per intermediate container and the number of intermediate containers per shipping container shall be specified in the contract (6.2.1). The intermediate container shall be closed as specified in PPP-B-636.

5.1.2 Commercial. The mask shall be preserved and unit packed as specified in ASTM D 3951.

5.2 Packing. Packing shall be Level A, B or Commercial as specified in 6.2.1.

5.2.1 Level A. The mask, preserved as specified in 5.1.1.3 and 5.1.1.4, shall be packed in containers conforming to Table I of MIL-STD-794, as specified for Level A.

5.2.2 Level B. The mask preserved as specified in 5.1.1.3 and 5.1.1.4 shall be packed in containers conforming to Table I of MIL-STD-794, as specified for Level B.

5.2.3 Commercial. The mask, preserved and unit packed as specified above, shall be provided packing in accordance with ASTM D 3951.

5.3 Marking. All unit, intermediate and shipping containers shall be marked as specifed in MIL-STD-129, Including bar code markings as specified in MIL-STD-129 and MIL-STD-1189.

6. NOTES

6.1 Intended use. The mask covered by this specification is intended to provide the wearer of the PASS continuous protection, on the ground and in flight, to the eyes, skin (of the head and neck) and respiratory system against CBR warfare agents.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification.
b. Applicable Government part number.
c. Whether first article inspection is waived, or the name and address of the first article Inspection laboratory and the name of the Goverment activity responsible for conducting the first article Inspection program (see 4.4.1).
d. If quality conformance verification is required, the name and address of the designated laboratory and the Goverment activity responsible for the verification program (see 4.6).
e. Applicable levels of preservation, packaging and packing (see 5.1 and 5.2).

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 contractors is called to these requirements. 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 might be eligible to be awarded contracts or purchase orders for the products covered by this specification.

The activity responsible for the Qualified Products List is the Commander, Naval Air Systems Command (Code 51122), Department of the Navy, Washington, DC 20361-5110; however, authorization for qualification of products shall be obtained from the Commander, Naval Air Development Center, Warminster, PA 18974, (Code 6031). Prior to submission of the samples for quallfication Inspection, the manufacturer shall submit a request to the Naval Air Development Center (Code 6031) Indicating a date on which the samples can be forwarded and also request an authorization number to accompany the samples.

6.4 First article. When a first article inspection is required, the item should be a first article sample. The first article should consist of three complete masks. The contracting officer should include specific Instructions in acquisition documents, regarding arrangements for examinations, tests and approval of the first article. Invitations for bids should provide that the Government reserves the right to waive the requirements for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.5 Keyword listing.

Agent permeation
Biological
CBR
Chemical
Faceplate
Helicopter aircrewman
Hood
Leakage
Manifold
Mask
Orinasal mask
Radiological
Toxicity
Valve

Preparing activity:
Navy - AS
(Project 4240-N879)

Table I. Qualification inspection.

Inspection	Requirement	Test method	Sample number 1	2	3
Visual	-	4.8.1	X	X	X
Inspiratory and hood air supply components leakage	3.8.1	4.8.2.1	X	X	X
Mask facepiece cavity leakage	3.8.2	4.8.2.2	X	X	X
Reverse leakage through expiratory valve assembly	3.8.3	4.8.2.3	X	X	X
Load test on hood and mask facepiece tube connections	3.8.4	4.8.2.4	X	X	X
Assembly leakage into the hood compartment.	3.8.5	4.8.2.5	X	X	X
Microphone and plug assembly	3.8.6	4.8.2.6	X	X	X
Overall leakage	3.8.7	4.8.2.7	X	X	X
Valsalva device	3.8.8	4.8.2.8	X	X	X
Restraint harness	3.8.9	4.8.2.9	X	X	X
Anti-sulffocation device	3.8.10	4.8.2.10	X	X	X
Agent permeation/mustard	3.8.11	4.8.2.11.1		-	
Agent permeation/Vx	3.8.11	4.8.2.11.2		-	
Agent permeation/thickened soman	3.8.11	4.8.2.11.3		-	
Optical	3.8.12	4.8.2.12	X	X	X
Field of vision	3.8.13	4.8.2.13	X	X	X
Cyclic breathing	3.8.14	4.8.2.14	X		
Drinking	3.8.15	4.8.2.15		X	
Flame and flash protection	3.8.16	4.8.2.16			X
Primary dermal irritation	3.8.17.1	4.8.3.1		-	
Primary eye irritation	3.8.17.2	4.8.3.2		-	
Dermal sensitization	3.8.17.3	4.8.3.3		-	
Prophetic human patch testing	3.8.17.4	4.8.3.4		-	
High temperature	3.8.18.1	4.8.5.1	See Table VI		
Low temperature	3.8.18.2	4.8.5.2	See Table VI		
Salt fog	3.8.18.3	4.8.5.3	See Table VI		
Rain	3.8.18.4	4.8.5.4	See Table VI		
Fungus	3.8.18.5	4.8.5.5	See Table VI		
Low pressure and high humidity	3.8.18.6	4.8.5.6	See Table VI		
Dust	3.8.18.7	4.8.5.7	See Table VI		
Normal acceleration	3.8.18.8	4.8.5.8	See Table VI		
High temperature, diurnal cycle and high humidity	3.8.18.9	4.8.5.9	See Table VI		
Shock	3.8.18.10	4.8.5.10	See Table VI		
Crash Acceleration	3.8.18.11	4.8.5.11	See Table VI		
Solar radiation	3.8.18.12	4.8.5.12	See Table VI		
Weight and center of gravity	3.8.18.13	4.8.5.13	X	X	X

Table II. First article inspection.

Inspection	Requirement	Test method	Sample number 1	2	3
Visual	-	4.8.1	X	X	X
Inspiratory and hood air supply components leakage	3.8.1	4.8.2.1	X	X	X
Mask facepiece cavity leakage	3.8.2	4.8.2.2	X	X	X
Reverse leakage through expiratory valve assembly	3.8.3	4.8.2.3	X	X	X
Load test on hood and mask facepiece tube connections	3.8.4	4.8.2.4	X	X	X
Assembly leakage into the hood compartment.	3.8.5	4.8.2.5	X	X	X
Microphone and plug assembly	3.8.6	4.8.2.6	X	X	X
Overall leakage	3.8.7	4.8.2.7	X	X	X
Valsalva device	3.8.8	4.8.2.8	X	X	X
Restraint harness	3.8.9	4.8.2.9	X	X	X
Anti-suffocation device	3.8.10	4.8.2.10	X	X	X

Table III. Sample size, acceptance criteria, tests and examinations of the mask.

Inspection	Section	Sample size	Acceptance criteria
Visual	4.8.1	Every mask shall be visually inspected for critical defects	Reject all units with critical defects
		Minor defects - Normal level II S	Minor defects AQL 2.5%
Inspiratory and hood air supply components leakage	4.8.2.1	Normal level II S	AQL 0.65%
Mask facepiece cavity leakage	4.8.2.2	Normal level II S	AQL 0.65%
Reverse leakage through expiratory valve assembly	4.8.2.3	Normal level II S	AQL 0.65%
Load test on hood and mask facepiece tube connections	4.8.2.4	S-3	No defects
Assembly leakage into the hood compartment	4.8.2.5	Normal level II S	AQL 0.65%
Microphone and plug assembly	4.8.2.6	Normal level II S	AQL 0.65%
Overall leakage	4.8.2.7	100%	No defects
Packaging	4.8.1.2	Normal level II S	AQL 2.5%

Table IV. Classification of defects for visual examination of the mask.

Critical	Minor
1. Material imperfections-foreign matter embedded, cuts, tears, damage to hood apron, bellows neck seal.	201. Marking missing, insufficient, incorrect, illegible or not permanent.
2. Surface unclean, rough, mis-aligned, or containing cracks, nicks or other flaws.	
3. Any component missing, malformed, fractured, or otherwise damaged.	
4. Any component loose or otherwise not securly retained.	
5. Incorrect assembling or improper positioning of components.	
6. Any functioning part that works with difficulty.	
7. Faulty workmanship or other Irregularities.	
8. Separation of the hood from the facepiece greater than .0625 inch for a .500 inch length.	

Table V. List of defects for packaging.

Item	Defects
Exterior and interior markings.	Missing, incorrect, incomplete, illegible; of Improper size, location, sequence; or method of application; markings not the same on the interior and exterior containers.
Packaging and packing materials.	Any non conforming component; any component miss ing, damaged, or otherwise defective.
Workmanship.	Inadequate application of the components such as Incomplete closure of the unit package, Interrne diate package. container flaps, loose strapping, etc .; bulging or distortion of the containers.
Exterior and interior weight or content.	Number per container is more or less than required; gross or net weight exceeds the requirements.

Table VI. Environmental qualification test sequence (mask).

Test	Unit Number*						
	1	2	3	4	5	6	7
Visual	X	X	X	X	X	X	X
Low Pressure/High Humidity	X	X					
Low Temperature	X	X					
High Temperature	X	X					
Blowing Dust	X	X					
Rain			X	X			
Solar Radiation			X	X			
Fungus			X	X			
Salt Fog			X	X			
Crash Acceleration			X	X			
Flame and Flash			X	X			
Acceleration						X	X
High Temp/Diurnal/ High Humidity						X	X
Shock - Transit Drop With Case							X
Shock - Transit Drop Without Case							X

*These units shall not include the five masks used in reliability testing (4.8.4).

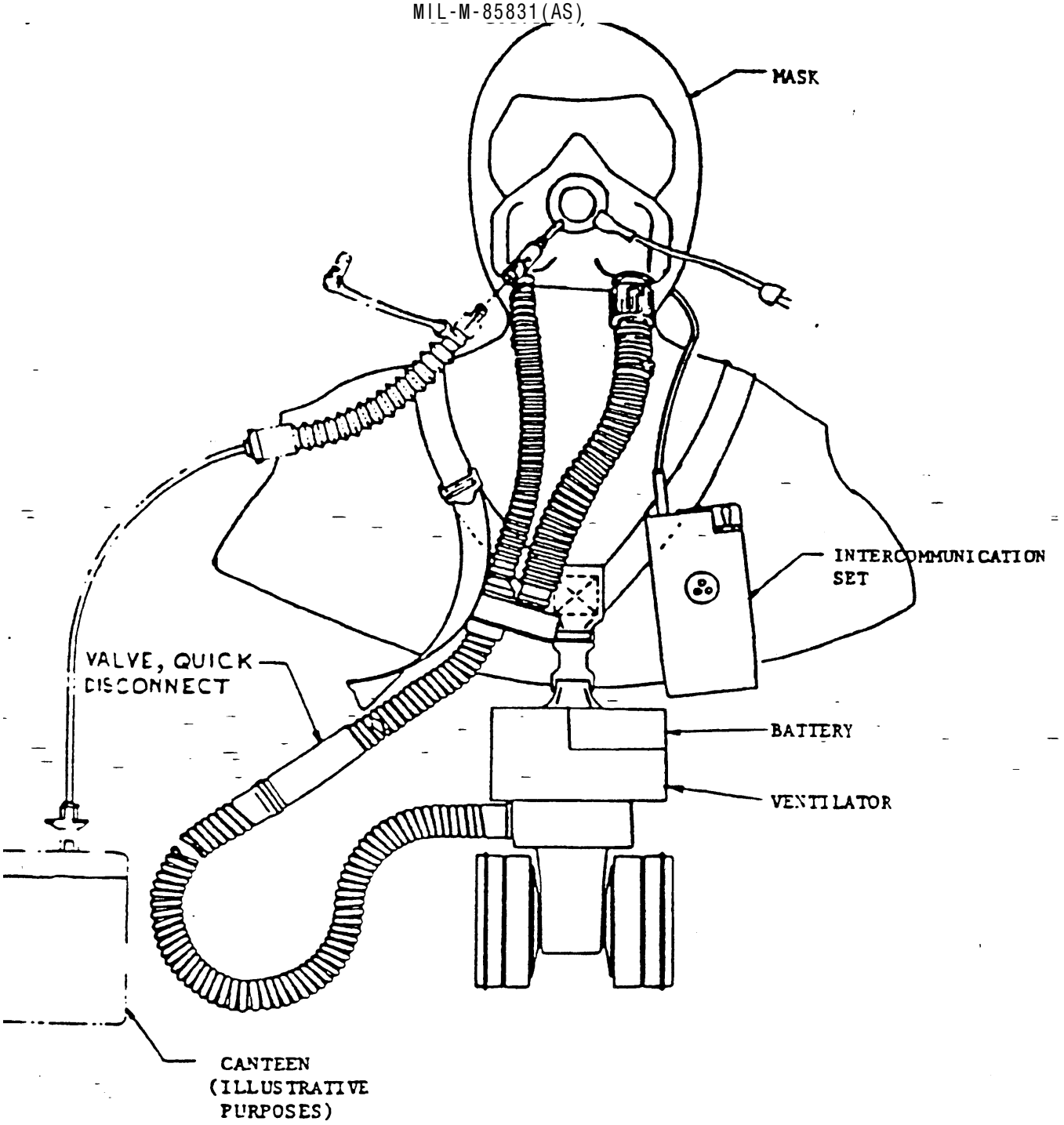

FIGURE 1. PROTECTIVE ASSEMBLY , CBR, HELICOPTER AIRCREWMEMBER

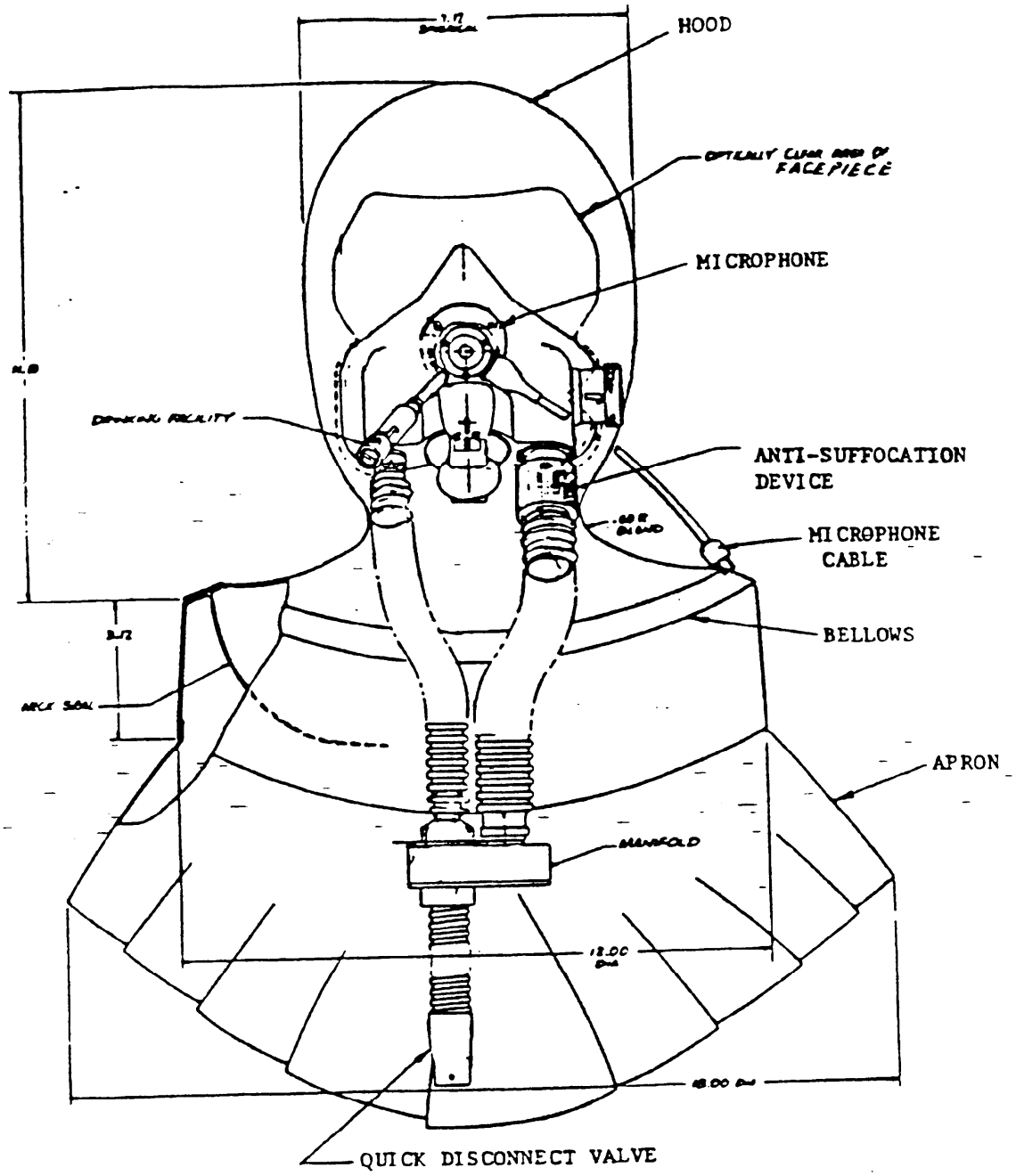

FIGURE 2. MASK

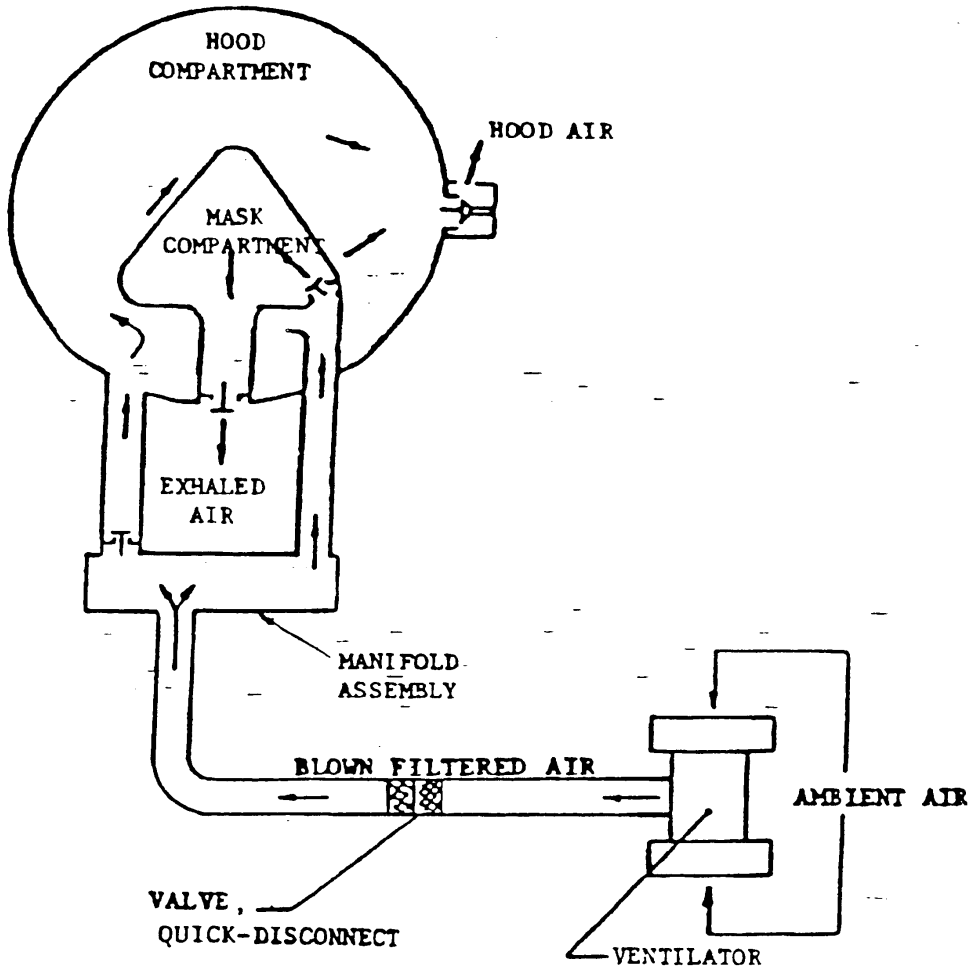

FIGURE 3. PASS AIR FLOW SCHEMATIC.

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