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MILITARY SPECIFICATION

REGULATORS, OXYGEN, DILUTER-DEMAND, AUTOMATIC-PRESSURE BREATHING

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

1. SCOPE

1.1 Scope. This specification covers automatic-pressure-breathing, diluter-demand, oxygen regulators.

1.2 Classification. Regulators shall be furnished as specified by the applicable part numbers listed in the contract or order (see 6.2a).

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

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SPECIFICATIONS

FEDERAL

BB-A-1034	-	Compressed Air, Breathing
BB-N-411	-	Nitrogen, Technical
PPP-B-601	-	Box, Wood, Cleated-Plywood
PPP-B-62I	-	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	-	Boxes, Fiberboard
PPP-B-640	-	Boxes, Fiberboard, Corrugated, Triple Wall

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MIL-P-116	-	Preservation - Packaging, Methods of
MIL-C-5541	-	Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-P-7788	-	Panel, Information, Integrally Illuminated
MIL-A-8625		Anodic Coatings, for Aluminum and Aluminum Alloys.
MIL-G-25507	-	Gage, Pressure, Dial Indicating, Oxygen, 0-2000 PSI, Type MF-2.
MIL-G-25520	-	Gage, Pressure, Dial Indicating, Oxygen, 0-500 PSI, Type MF-3.
MIL-L-25567	-	Leak Detection Compound, Oxygen System
MIL-O-27210	-	Oxygen, Aviator's Breathing, Liquid and Gas
MIL-L-85762	-	Lighting, Aircraft, Interior, Night Vision Imaging System (NVIS) Compatible.

STANDARDS

MILITARY

MIL-STD-105	-	Sampling Procedures and Tables for lnspecticn by Attributes
MIL-STD-129	-	Marking for Shipment and Storage
MIL-STD-130	-	Identification Marking of U.S. Military Property
MIL-STD-461	-	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
MIL-STD-889	-	Dissimilar Metals :
MIL-STD-970	-	Standards and Specifications, Order of Precedence for the Selection of
MS22062	-	Regulator, Oxygen, Dilutor Demand, Automatic, Pressure Breathing
MS25237	-	Lamp, Incandescent, Single Contact Midget Flanged Base (T-1-3/4 Bulb)

AIR FORCE- NAVY AERONAUTICAL

AN 815	-	Union - Flared Tube
AN 818	-	Nut, Coupling

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(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 40, 700 Robbins Avenue, Philadelphia, PA 19111-5094).

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

DRAWINGS

NAVAL AIR SYSTEMS COMMAND

62-A-116-C48 - Piezometer

62-A-116-C49 - Tube Piezometer

62-A-116-C50 - Ring Piezometer

62-A-116-C51 - Union Piezometer

(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.}

PUBLICATIONS

Defense Standardization Manual

SD-6 Provisions Governing Qualification

{Copies of defense standardization manuals are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelpia, PA 19111-5094.)

2.2 Non Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2b).

AMERICAN SOCIETY FOR TESTING AND MATERIALS {ASTM)

D1149-86 - Standard Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1137)

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(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for related associated detail specifications, specification sheets or MS standards), the text of this document shall take precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. The oxygen regulators 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 of award of contract (see 4.3 and 6.4). In addition, the retention of the qualification for the oxygen regulators on the applicable qualified products list shall be dependent on periodic verification of continued compliance with the requirments of this specification (see 4.3 and 4.3.2).

3.2 First article. When specified, an oxygen regulator sample shall be subject to first article inspection (see 6.5) in accordance with 4.4.

3.3 Selection of specifications and standards. Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-970.

3.4 Materials. Materials shall conform to referenced specifications and shall be as specified herein and on referenced drawings. Materals which are not covered by specifications, or which are not specifically described herein, shall be of the best quality, of the lightest practicable weight ana suitable for the purpose intended. Materials that produce toxic or corrosive substances shall not be used.

3.4.1 Metal parts. All metal parts shall be of a corrosion resistant material or treated in a manner to render them adequately resistant to corrosion.

3.4.1.1 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be used in intimate contact with each other. Dissimiliar metals are defined in MIL-STD-889.

3.4.2 Nonmetallic materials. Any nonmetallic material that is adversely affected by continued use with oxygen shall not be used.

3.4.2.1 Age. Elastomer components, except silicone, shall not be more than 12 months old from the date of manufacture to the date of delivery to any Government service or to any airframe or accessory manufacturer.

3.4.2.2 Elastomer components. The elastomer components shall be composed of an ozone-resistant composition, which shall not bloom, and shall meet the specified ozone-resistant performance requirements.

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3.4.3 Protective treatment. When materials are used in the construction of the regulator that are subject to deterioration when exposed to environmental conditions likely to occur during service usage, they shall be protected against such deterioration in a manner that will in no way prevent compliance with the performance requirements of this specification. Protective coating which might crack, chip, or scale during normal service life or under extremes or environmental conditions shall not be used.

3.5 Design and construction. The design and construction of the oxygen regulator shall be in accordance with MS22062 and the part number specified in the contract or order (see 6.2c).

3.5.1 Lighted panel. The regulator shall have a lighted panel conforming to MIL-P-7788, type III. When specified, the regulator shall be provided with a lighted panel conforming to MIL-L-85762. The panel lighting shall be designed to meet the interference control requirements of MIL-STD-461.

3.5.2 Plugs. All openings in the regulator shall be closed with caps or plugs to prevent foreign matter from entering the regulator during shipping and storage.

3.5.3 Diaphram. The regulator shall be designed to operate by means of a load diaphragm. The loading mechanism shall alter the load of the diaphragm with varying attitudes. The demand diaphragm shall be fabricated of silicone compound or silicone-coated cloth which shall be approved by the procuring activity.

3.5.4 Oxygen inlet filter. The oxygen inlet shall be provied with a filter capable of preventing foreign particles, larger than 20 microns, from entering the regulator. The inlet filter shall be located upstream from the oxygen supply valve, and shall in no way interfere with normal connections to the inlet of the regulator.

3.5.5 Air port. An air port shall be provided for mixing of varying quantities of air with oxygen. The air port shall be provided with a screen, not finer than l00 mesh, nor coarser than 30 mesh, to prevent foreign particles from entering the regulator.

3.5.6 Supply valve toggle. The supply valve toggle when placed in the “off” position shall automatically place the diluter assembly in the 100 percent oxygen position.

3.5.7 Oxygen gage. The regulators shall contain a Type MF-2 high pressure gage conforming to MIL-G-25507 or a Type MF-3 low pressure gage conforming to MIL-G-25520. The type gage shall be as specified in MS22062.

3.6 Performance.

3.6.1 Flow characteristics. The outlet pressures of the regulator, when tested as specified in 4.8.2, shall be in accordance with the requirements in Table 1.

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3.6.2 Oxygen-ratio. The percentage, by volume, of oxygen delivered with respect to the total oxygen-air mixture delivered, when tested as specified in 4.8.3, shall be in accordance with Table II.

3.6.3 Pressure-breathing characteristics. The outlet pressure of the regulator, when tested as specified in 4.8.4, shall be in accordance with Table III.

3.6.4 Relief valve. When tested as specified in 4.8.5, the relief valve shall begin to vent at a pressure no greater than 27 inches of water pressure and shall vent a minimum of 45 lpm at a pressure no greater than 40.7 inches of water pressure (3.0 inches of mercury). Relief valve leakage shall not exceed 0.01 lpm with a pressure of 17 inches of water pressure applied after completion of the flow test.

3.6.5 Inward leakage. The inward demand chamber leakage of the as regulator, where tested as specified in 4.8.6, shall not exceed 0.20 lpm.

3.6.6 Over-all regulator leakage. The over-all regulator leakage, when tested as specified in 4.8.7, shall not exceed 0.01 lpm.

3.6.7 Outward leakage. The outward demand chamber leakage of the regulator, when tested as specified in 4.8.8, shall not exceed 0.12 lpm. This leakage includes the allowable relief valve leakage.

3.6.8 Demand valve leakage. When tested as specified in 4.8.9, there shall be no demand valve leakage.

3.6.9 Supply valve leakage. The regulator, when tested as specified in 4.8.10, shall not show any evidence of leakage.

3.6.9.1 Pressure Gage Scale Error. The regulator pressure gage scale tolerance when tested as specified in 4.8.10.1, shall be within the limits specified in Table IV.

3.6.10 Lighting circuit. The lighting circuit of the regulator, when tested as specified in 4.8.11, shall provide electrical continuity to facilitate either 6 volt or 28 volt circuitry.

3.6.11 Emergency and test pressure. The regulator, when tested as specified in 4.8.12, shall operate satisfactorily.

3.6.12 Flow Indicator. The white flow indicator of the regulator, when tested as specified in 4.8.13, shall be fully visible. When the flow is reduced to zero lpm, at all altitudes, the flow indicator shall not be visible. The white flow indicator shall not operate in the “Normal Oxygen” position without an oxygen flow.

3.6.13 Overload. The regulator, when tested as specified in 4.8.14, shall not show any evidence of leakage or damage.

3.6.14 Low temperature operation. The regulator, when tested as specified in 4.8.15, shall operate satisfactorily.

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3.6.15 High temperature operation. The regulator, when tested as specified in 4.8.16, shall operate satisfactorily.

3.6.16 Supply valve cycling. The regulator, when tested as specified in 4.8.17, shall operate satisfactorily.

3.6.17 Toggle operating forces. The regulator, when tested as specified in 4.8.18, shall require a force of 33 ± 17 ounces to move the diluter lever in either direction, or to move the-pressure control lever from the “Normal” to “Emergency” position and to be returned to “Normal” position The force required to move the oxygen supply valve toggle in either direction, or to move the emergency pressure control from the “Normal” position to the “Test Mask” position shall be 53 ± 37 ounces. The emergency pressure control lever shall automatically return from the “Test Mask” position to the “Normal" position with no force applied.

3.6.18 Panel Lighting. The panel lighting of the regulator, when tested as specified in 4.8.19, shall operate satisfactorily.

3.6.19 Vibration. The regulator, when tested as specified in 4.8.20, shall operate satisactortily.

3.6.20 Endurance. The regulator, when tested as specified in 4.8.21, shall operate satisfactorily.

3.6.21 Orientation. The regulator, when tested as specified in 4.8.22, shall pass the requirements specified in Tables I, II and III.

3.6.22 Ozone resistance (elastomer components). The test slabs, when tested as specified in 4.8.23, shall not show any evidence of checking, cracking or damage.

3.6.23 External pressure. The regulator, when tested as specified in 4.8.24, shall not show any evidence of leakage or damage.

3.6.24 Oxygen regulator purge. When tested as specified in 4.8.25, the regulator shall not ignite and there shall not be any evidence of charring’ or deterioration.

3.6.25 Oxygen bomb test (2000 psi regulators only). When tested as specified in 4.8.26, 4.2.26.1, 4.8.26.2.3, and 4.8.26.3, the test material and regulators sall not ignite and there shall not be any evidence of charring or deterioration.

3.7 Interchangeability. All parts having the same manufacturer’s part number shall be functionally and dimensionally interchangeable.

3.8 Weight. The weight of the oxygen regulator shall not exceed 3 pounds.

3.9 Color. The color of the regulator shall be as specified in MS22062.

3.10 Finish. Aluminum and aluminum alloy parts shall be protected in accordance with MIL-A-8625 or MIL-C-5541.

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3.11 Identification of product. The oxygen regulator shall be marked for identification in accordance with MIL-STD-130, except that the Federal Stock Number shall be omitted from the nameplate.

3.11.1 Serial numbers. Serial numbers shall be assigned by the manufacturer and shall consist of a block of consecutive numbers to cover the entire acquisition quantity.

3.12 Workmanship. The oxygen regulators shall be uniform in quality and shall be free from irregularities, defects, or foreign matter which could adversely affect safety, performance, reliability, or durability.

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

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspections 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 inspection as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this 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 inspections. The inspection requirements specified herein are clasified as follows:

a. Qualification inspection. Qualification inspection shall consist of the examinations and tests performed on samples submitted for approval as a qualified product (see 4.3).

b. First article inspection. First article inspection shall consist of the examinations and tests performed on samples which are representative of the production item after award of contract to determine that the production production item conforms to the requirements of this specification (see 4.4).

c. Quality conformance inspection. Quality conformance inspection shall consist of examinations and tests performed on individual products or lots to determine conformance of the products or lots with the requirements specified in this specification (see 4.5).

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d. Quality conformance verification inspection. Quality conformance verification inspection shall consist of examinations and tests performed on individual products or lots to determine conformance of the products or lots with the requirements specified in this specification (see 4.6}.

4.3 Qualification inspection. Qualification inspection shall consist of the examinations and tests specified in Table V, listed sequence mandatory.

4.3.1 Qualification samples. Qualification samples shall consist of the following:

a. Two regulators of the part number for which qualification testing has been requested and authorized.

b. Six elastomer test slabs, 6 X 6 X 0.075 inches, composed of the identical ozone-resistance composition and cure that was used in manufacturing the samples.

c. Two sets of manufacturer's drawings as set forth in the provisions and terms of SD-6.

d. Wen applicable, certification from the original manufacturer, that the distributor requesting qualification status is authorized to distribute the item, or to rebrand and distribute the item.

Samples shall be forwarded to the test facility set forth in the letter of authorization to submit samples (see 6.4). The samples shall be plainly identified by securely attaching durable tags containing the following information:

> Samples submitted by (name and date) for qualification? inspection in accordance with the requirements Of MIL-R-25410G and test number under authorization (reference authorizing letter see 6.4).

4.3.2 Retention of Qualtfied Products Listing (QPL). The retention of qualification listinqs shall consist of verification every two years to determine compliance of the listed item with the requirements of this specification. Verification shall be by manufacturer's certification unless otherwise specified by the activity responsible for the QPL.

4.4 First article inspection. First article inspection shall consist of the tests and examinations. specified in Table VI, listed sequence mandatory. If there is no Qualifictions Products Listing for the regulator being procured, first article testing shall consist of the tests specified in Table V.

4.4.1 First article samples.

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4.4.1.1 Samples. Unless otherwise specified in the contract or order, as soon as practicable after the award of the contract or order, the manufacturer shall submit three complete regulators. The samples shall be representative of the construction, workmanship, components, and materials to be used during production. Men a manufacturer is in continous production of these units 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 6.2e). Approval of the first article samples or the waiving of the first article inspection does not waive 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 6.2f).

4.4.1.1.1 First article report. Upon completion of the first article inspection program, the Government activity responsible for conducting the program {see 6.2f) shall report to the contracting officer the results of the program, with appropriate recommendations.

4.4.1.1.2 First article sample disposition. Disposition of the first ai-title samples, after completion of testing shall be as follows:

a. One sample shall be returned to the contractor for reference in monitoring production.

b. One sample shall be retained by the test facility for reference during Quality Conformance Verification Inspection. This sample shall be returned to the contractor with the samples from the final production lot.

c. One sample shall not be returned to the contractor due to its having been subjected to destructive type testing during the inspection program.

4.5 Quality conformance inspection. Quality conformance inspoection shall consist of the examinations and tests in Table III, listed sequence mandatory.

4.5.1 Sampling.

4.5.1.1 Inspection lot.

4.5.1.1.1 Regulators. An inspection lot size shall be expressed in units of one regulator made under essentially the same conditions and from the same materials and components. The sampling unit shall be one regulator.

4.5.1.1.2 Packaging. An Inspection lot size shall be expressed in unitsof one fully prepared shipping conainer containing regulators, fully prepared for delivery, made from the same materials and components. The sample unit shall be one shipping container, containing regulators, fully prepared for delivery with the exception that it need not be sealed.

4.5.1.2 Sampling for tests and examinations of regulators. The sample size, acceptance criteria, tests and examinations required for the regulators shall be as specified in Table VII, listed sequence mandatory.

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4.6 Quality conformance verification inspection. Upon successful completion of the quality conformance inspection requirements of 4.5, a random sample, one for every 50 or fraction thereof, shall be selected from each lot of regulators. Each regulator, selected as a sample unit, shall be forwarded to a laboratory designated at the time of award (see 6.2g). The designated laboratory shall conduct the following tests and examinations (listed sequence mandatory):

a. Visual examination
b. Flow characteristics
c. Oxygen-ratio
d. Pressure-breathing characteristics
e. Over-all regulator leakage
f. Demand valve leakage
g. Relief valve
h. Flow indicator
i. Pressure gauge scale error

Submitted samples shall be identified by their assigned serial number (see 3.11.1) In addition 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 Govemnent activity responsible for conducting the quality conformance verification program {see 6.2g) 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/Speciaist at the contractor's facility.

4.7 Test conditions.

4.7.1 Test gas. Unless otherwise specified, water pumped oil free nitrogen conforming to BB-N-411 or compressed breathing air conforming to BB-A-1034 shall be used in testing of the regulators.

4.7.2 Oxygen. Oxygen conforming to MIL-0-27210, Type I shall be used for the oxyen regulator purge test (see 4.8.25) and the oxygen bomb test (see 4.8.26).

4.7.3 Temperature and pressure. Unless otherwise specified, tests shall be conducted at local ambient temperature and barmetric pressure. Test instruments shall be calibrated or adjusted according to their required usage in conducting individual tests. Any test results obtained at conditions other than normal temperature and pressure (NTP) conditions shall be mathematically corrected to NTP conditions. NTP conditions are 29.92 inches of mercury and 70°F. In the case of pressure drop measurements, the flow setting for conducting the test shall be corrected to NTP conditions before the test is conducted.

4.7.4 Test position. Unless otherwise specified, all tests shall be conducted with the panel in a horizontal plane (face up).

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4.7.5 Inlet supply pressure. For oxygen regulators having an operating pressure of 50 to 500 psig, the inlet oxygen pressure shall be adjusted to 50 psig, except where otherwise specified. For oxygen regulators having an operating pressure of 2000 psig, the inlet oxygen pressure shall be adjusted to 150 psig, except where otherwise specified.

4.7.6 Vibratory control. If during any of the tests, the regulator flutters, chatters, or makes noises which cannot be eliminated, the regulator shall be rejected. A flutter or vibration is that condition in the system that causes the output flow meter to fluctuate.

4.7.7 Test equipment. For qualification and quality conformance inspections, all flow and pressure tests should be performed on test stand models, 62A-116-E1, 1172AS100 or 1316AS100. Regulators, when tested on other stands, shall be capable of fulfilling all flow and pressure test requirements of this specification when tested on test stand models 62A-116-E1, 1172AS100, or 1316AS100.

4.7.7.1 Piezometer assembly. A piezometer assembly conforming to NAVAIR DRAWINGS 2-A-116-C48 62-A-116-C49, 62-A-116-C50 and 62-A-116-C51 shall be used to measure the outlet pressure of the regulator. The piezometer shall be connected to the mask end of the regulator as shown in Figure 3. The regulator outlet pressures shall be measured at the piezometer union shown in NAVAIR DRAWING 62-A-ll6-C48.

4.8 Inspection methods.

4.8.1 Visual examination.

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

4.8.1.1.1 Dimensions. Each regulator, selected as a sample unit from the lot, shall be checked dimensionally to determine conformance to the dimensions specified in MS22062.

4.8.1.2 Packaging. Each of the fully prepared shipping containers, containing regularors, 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 specified in Table IX, shall be used to enumerate the defects found.

4.8.2 Flow characteristics. The regulator shall be connected to a pressure source to provide an inlet pressure to the regulator as indicated in 4.7.5, with the oxygen supply valve placed in the "on” position. The outlet pressure shall be measured as specified in 4.7.7.1 with the diluter lever in both the “Normal Oxygen” and "100% Oxygen” positions. Under these conditions, a flow of 30, 50, and 85 lpm ambient shall be maintained at the outlet of the regulator from sea level to 27,000 feet. This test procedure shall be repeated by applying the regulators maximum pressure, 500 or 2000 psig, while maintaining an ambient flow of 135 lpm from the outlet of the regulator at altitudes from 10,000 to 27,000 feet.

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The regulator shall pass the requirements specified in 3.6.1.

4.8.2.1 Qualification inspection. Qualification inspection shall be conducted at sea level , then in increments of 5000 feet up to and including 27,000 feet.

4.8.2.2 Quality conformance inspection. Quality conformance inspection shall be conducted at sea level utilizing flows of 30, 50 and 80 lpm and at 27,000 feet altitude utilizing a flow of 135 lpm, with the inlet pressure to regulator as indicated in 4.7.5.

4.8.3 Oxygen ratio. The regulator shall be connected to a pressure source providng an inlet pressure to the regulator as indicated in 4.7.5. the oxygen-ratio shall be measured as specified in 4.7.7.1 with the diluter lever in the "Normal Oxygen" position. Under these conditions, the regulator shall be subjected to the flows and altitudes specified in Table II. The test procedure shall then be repeated utilizing the regulators maximum pressure. The oxygen-ratio shall be as specified in 3.6.2.

4.8.3.1 Quality conformance inspections. Quality conformance inspections shall be conducted in accordance with test procedure specified in the oxygen-ratio test, utilizing only the inlet pressure to the regulator indicated in 4.7.5.

4.8.4 Pressure breathing characteristics. The regulator shall be connected to a pressure source providing an inlet pressure to the regulator as indicated in 4.7.5. The supply valve shall be placed in the “on” position and the diluter lever placed in the “Normal Oxygen position. Under these conditions, the regulator shall be subjected to the flows and altitudes specified in Table II. This test procedure shall be repeated with the diluter level placed in the “100% Oxygen” positjon. These tests shall be repeated utilizing the regulator’s maximum pressure. The outlet pressure for the regulator shall be as specified in 3.6.3, when measured as specified in 4.7.2.1.

4.8.4.1 Quality conformance inspection. Quality conformance inspection shall be condcted in accordance with test procedure specified in the pressure-breathing characteristics tests, utilizing only “Normal Oxygen” position at the pressure to the regulator indicated in 4.7.5.

4.8.5 Relief valve. This test shall be performed with the supply valve toggle in the “off” position; the diluter lever in the “100% Oxygen” position; and the positive pressure lever set in the “Normal” position. An increasing pressure shall be applied to the outlet of the regulator to maintain a flow of 45 lpm for a period of 30 seconds out of the relief port and the pressure to provide the flow shall be recorded. At no time shall the pressure be applied to the outlet to maintain the 45 lpm flow exceed 40.7 inches of water pressure. The relief valve shall then be subjected to a pressure of 17 inches of water pressure and the pressure maintained for a period of 30 seconds to determine any leakage. when tested in this manner, the regulator shall pass the requirements of 3.6.4.

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4.8.6 Inward leakage. With the diluter lever placed in the “100% Oxygen’’ position, and the oxygen supply valve in the “off” position, a suction of 10 inches of water shall be applied at the outlet of the regulator, and the leakage from the outlet shall be measured. The leakage from the regulator shall pass the requirements specified in 3.6.5.

4.%.7 Over-all regulator leakage. With the diluter lever placed in the “Normal oxygen’” position and the oxygen supply valve open, the regulator shall be placed in a leakage chamber. A pressure source shall be connected to the regulator to provide the inlet pressure as indicated in 4.7.5. A suitable flow measuring device shall be attached to an open chamber port and then the chamber shall be sealed. After a 2 minute stabilization period, the regulator over-all leakage shall be measured. This test procedure shall then be repeated utilizing the regulators maximum pressure. The overall regulator leakage shall pass the requirements specified in 3.6.6.

4.8.8 Outward leakage. With the diluter lever placed in the "Normal Oxygen" position; the oxygen supply valve placed” in the “on” position; and the inlet capped, a pressure of 17 inches of water shall be applied to the outlet of the regulator through a metering device. With the pressure maintained for a period of 2 minutes, the regulator shall conform to the requirements of 3.6.7.

4.8.9 Demand valve leakage. With the diluter lever placed in the “Normal Oxygen” position, the regulator shall reconnected to a source of pressure to provide 30 psig inlet pressure to the regulator, and the oxygen supply valve shall be placed in the “on” position. Under these conditions, leakage at the outlet of the regulator shall be measured. The regulator shall pass the requirements specified in 3.6.8.

4.8.10 Supply valve leakage. The inlet pressure as Indicated in 4.7.5, shall be applied to the regulator for a period of 30 seconds with the oxygen supply valve placed in the "off" position and the pressure control lever placed in the "Emergency" position. Leakage at the outlet port of the regulator shall then be measured by the application, at the outlet fitting, of leak test compound conforming to MIL-L-25567. The regulator shall pass the requirements specified in 3.6.9.

4.8.10.1 Pressure gage scale error. The regulator shall be connected to a pressure source to provide maximum inlet pressure. With the regulator supply valve placed in the "off" position and the presure control lever placed in the “Emergency” position, the inlet pressure shall be increased from the inlet pressure indicated in 4.7.5 to maximum supply pressure using the test pressure increments specified in Table IV. The supply pressure shall then be decreased using the same increments to zero pressure. With the pressure increasing, the pressure shall be brought up to, but shall not exceed the pressure specified to give the desired reading and with the pressure decreasing, the pressure shall be brought down to but shall not fall below the pressure specified to give the desired reading. The regulator pressure gage scale error shall not exceed the tolerances specified in 3.6.9.1.

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4.8.11 Lighting circuit. A lamp in accordance with MS25237-327 shall be installed in the regulator. The regulator shall be connected to the appropriate power source and visually examined to determine its color and if the lamp is illuminated. A lamp in accordance with MS25237-328 shall be installed in the regulator. The regulator shall be connected to the appropriate power source and visually examined to determine its color and if the lamp is illuminated. In both cases, the regulator shall pass the requirements specified in 3.6.10.

4.8.12 Emergency and test pressures. The regulator shall be connected to a source of pressure to provide the inlet pressure to the regulator as indicated in 4.7.5, and the oxygen supply valve shall be placed in the "on" position. With the diluter lever in the "Normal Oxygen" position, a flow of 10 lpm shall be drawn from the outlet of the regulator. The pressure control lever shall then be placed in the "Emergency" position, at which time the outlet pressure of the regulator shall increase to 3.5, plus or minus 0.5 inches of water. The outlet flow from the regulator shall then be increased to 80 lpm, and the diluter lever shall be placed in the "100% Oxygen" position. Under these conditions, the outlet pressure of the regulator shall be not less than 2.0 inches of water. The outlet flow from the regulator shall then be reduced to zero, at which time the outlet pressure of the regulator shall not exceed 5.5 inches of water when in the "Emergency" position. The outlet flow from the regulator shall be adjusted to 10 lpm with the pressure control lever placed in the "Normal" position, and the diluter lever in the "Normal Oxygen" position. The pressure control lever shall then be placed in the "Test Msk" position. Under these conditions, the regulator outlet pressure shall be 11, plus or minus 5 inches of water. The outlet flow from the regulator shall then be reduced to zero, at which time the outlet pressure of the regulator shall not exceed 17.5 inches of water, when in the Test Mask" position. The regulator shall pass the requirements specified in 3.6,11.

4.8.13 Flow indicator. The regulator shall be connected to a source of Pressure to provide the inlet pressure to the regulator as indicated in 4.7.5. The oxygen supply valve shall then be placed in the "on" position and the regulator placed in an altitude chamber. The regulator shall be checked under the followlng conditions and shall pass the requirements specified in 3.6.12.

a. At ground level, with diluter lever in "100% Oxygen" position, and an ambient flow of 8 lpm.

b. At ground level, with diluter lever in "Normal Oxygen" position, and an ambient flow of 15 lpm.

c. At an altitude sufficient to give 17 inches of outlet water pressure, with the diluter lever in the "100% Oxygen" position, and an ambient flow of 12 lpm. Upon completion of these test procedures, the oxygen supply valve shall be placed in the "off" position and the diluter lever placed in the "Normal Oxygen" position. The regulator shall pass the requirements specified in 3.6.12.

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4.8.14 Overload. With the oxygen supply valve in the “off” position the diluter lever in the “100% Oxygen” position and the relief valve capped, a pressure of 27 inches of water shall be applied to the outlet of the regulator for a period of 2 minutes. The regulator shall pass the requirements specified in 3.6.13. The regulator shall then be subjected to and pass the flow characteristics, oxygen-ratio and pressure breathing characteristics tests.

4.8.15 Low temperature operation. The regulator shall be connected to a source of pressure to provide an inlet pressure to the regulator as indicated in 4.7.5, and shall be placed in a cold chamber maintained at a temperature of minus 65 ±5°F, for a period of 3 hours. At the end of this time, and while the regulator is maintained at this temperature, the regulator shall be subjected to cyclic operation for a minimum period of 2 minutes. A cyclic operation shall consist of alternate outlet flows from the regulator, of 0 and 70 lpm at a rate of 10 cycles per minute. The regulator shall pass the requirements specified in 3.6.14. While at this temperature, the regulator shall then be subjected to and pass the flow characteristics, oxygen-ratio, and pressure-breathing characteristics tests.

4.8.16 High temperature operation. The regulator shall be connected to a source of pressure to provide an inlet pressure to the regulator as indicated in 4.7.5, and shall be placed in an oven maintained at a temperature of plus 160 ± 5°F, for 3 hours. At the end of this time and while the regulator is maintained at this temperature, the regulator shall be subjected to cyclic operation for a minimum period of 2 minutes. This cyclic operation shall consist of alternate outlet flows, from the regulator, of O and 70 lpm at a rate of 10 cycles per minute. The regulator shall pass the requirements specified in 3.6.15. While at this temperature, the regulator shall then be subjected to and pass the flow characterktics, oxygen-ratio, and pressure-breathing characteristics test.

4.8.17 Supply valve cycling. The regulator shall be connected to a source of pressure to provide the maximum inlet pressure to the regulator as indicated in 4.7.5, and the oxygen supply valve shall be cycled back and forth between the “on” and "off” positions for at least 1000 cycles, at the rate of 10 cycles per minute. A cycle shall consist of one full operation from “off” to “on” and back to “off”. Each time the supply valve is cycled to the "off” position, the diluter assembly shall automatically move to the 100% position. The regulator shall pass the requirements specified in 3.6.16. The regulator shall then be subjected to and pass the supply valve leakage, emergency and test pressures, and toggle operating forces tests.

4.8.18 Toggle operating forces. The regulator shall be connected to a pressure source to provide the inlet pressure to the regulator as indicated in 4.7.5, and the forces required to actuate the oxygen supply valve, the diluter lever, and the pressure control lever shall be measured at a point not more than 1/8 inch from the tip of each toggle, in the direction of intended movement, and parallel to the panel of the regulator. The regulator shall pass the requirements specified in 3.6.17.

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4.8.19 Panel lighting. The plastic lighting plate portion of the regulator shall be subjected to and pass all the tests specified in MIL-P-7788. The regulator shall pass the requirements specified in 3.6.18.

4.8.20 Vibration. The regulator shall be vibrated for 3 hours, in each of three mutually perpendicular planes, at a frequency from 300 to 3000 and back to 300 cycles per minute, at a constant rate of change and a double amplitude of 0.018 to 0.020 inches. The vibration test shall be conducted with an inlet pressure applied to the regulator as indicated in 4.7.5. The regulator shall pass the requirements specified in 3.6.19. The regulator shall then be subjected to and pass the flow characteristics and pressure-breathing characteristics tests.

4.8.21 Endurance. The regulators shall operate without failure during and after 500,000 cycles. The peak delivery rate shall be 30 lpm nomal temperature and pressure (NTP) flow for 90 percent of the time and 90 lpm (NTP) for 10 percent of the time. The regulator shall pass the requirements specified in 3.6.20. The regulator shall then be subjected to and pass the flow characteristics and pressure-breathing characteristics tests.

4.8.22 Orientation. The regulator shall be subjected to the flow characteristics, oxygen-ratio and pressure-breathing characteristics tests while mounted with the panel of the regulator in a horizontal position, facing downward, and with the panel of the regulator in a vertical position. The regulators shall pass the requirements specified. in 3.6.21.

4.8.23 Ozone-resistant [elastomer components). Three of the six test slabs submitted for qualification inspection shall be tested for ozone-resistance. The test apparatus shall be in accordance with ASTM D 1149-86. The test slabs shall be elongated 20 percent, placed in an ozone-free atmosphere for 24 hours, then placed in the ozone chamber. The chamber shall be adjusted to 100 ± 2 F and to give an exposure of ozone concentration of 120 ± 10 parts by volume of ozone per million parts by volume of air. The air-ozone velocity in the chamber shall be at least 2 feet per second. The material shall be exposed to these conditions for 60 minutes. The test slabs shall be examined under a 10X magnification and pass the requirements specified in 3.6.22.

4.8.24 External pressure. With the diluter lever placed in the "Normal Oxygen" and "100% Oxygen" position, the regulator shall be connected to a source of pressure to provide the applicable maximum inlet pressure. Under these conditions, and with the oxygen supply valve placed in the "off" position, the regulator shall be subjected to an external pressure of 11.0 psig for a period of one minute. The regulator shall pass the requirements specified in 3.6.23. Upon completion of this test, the regulator shall then be subjected to and pass the flow characteristics, oxygen-ratio and pressure-breathing characteristics test.

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4.8.25 Oxygen regulator purge. The regulator inlet shall be connected to a regulated source of oxygen (see 4.7.2). With the supply valve in the "on" position, the diluter toggle in the 100 percent position, and the emergency pressure control in the emergency position, apply the required pressure (see 4.7.5) to the inlet and allow the regulator to flow freely for five minutes The regulator shall conform to the requirements of 3.6.24.

WARNING

Do not perform this test on test stand models
62A-116-E1, 1172AS100, or 1316AS100.

4.8.26 Oxygen bomb (2000 psi regulators only). Nonmetallic parts and the regulator shall be subjected to oxygen bomb tests to determine compatibility of the items with high pressure oxygen.

4.8.26.1 Equipment. The equipment used in performing these tests shall be in accordance with Figures 1 and 2. The main valve shall be a rapid-opening 1/4 inch valve shall require no internal lubrication for operation, and shall be rated for at least 3,000 psi operation. The valve shall be leak tight when closed and shall open with such rapidity that at least 95 percent of the total pressure rise shall have occured within the test chamber in 20± 7 mlliseconds. The pressure rise time may be determined by measurement with a fast-responding small volume pressure transducer substituted for the test chamber in the test setup. The tubing and fitting connecting the valve to the test chamber shall be 3/16 inch size and shall be fabricated from corrosion-resistant steel. The run of tubing between the valve and the test chamber shall not be bent more than 4 degrees. The bleed valve shall be of a type which uses no organic material to accomplish its seal and requires no interior lubrication for operation. The bleed valve shall be installed so that when it is closed the test chamber does not communicate with the packing side of the valve. Test samples 3/16 inch diameter by 0.75 inch thick, shall be made from three of the test slabs submitted for qualification before the test slab is exposed to the ozone-resistance test.

4.8.26.2 Procedure (elastomeric material). Each elastomer sample used in the high pressure portion of the regulator shall be subjected to the following procedure: A sample shall be inserted in the corrosion-resistant steel recess of the test chamber and the test chamber assembled. The quick-acting valve shall be fully opened, and the test chamber pressurized with oxygen at 2175 ± 25 psig for 30 seconds. At the end of the 30 second period, the pressure in the test chamber shall be released by means of the bleed valve, the test chamber opened and the sample shall be visually examined. If there is no indication of ignition, the pressurizing operation shall be repeated at 60-second intervals. The pressurizing operations shall be repeated until either ignition occurs, or until three pressurizing operations have been performed. Remove the sample from the test chamber; the sample shall not show any evidence of charring or deterioration. With a fresh sample, the series of three pressurizing operations shall be repeated. This procedure shall be continued until either a sample has ignited, or until five test samples have been tested. The test material shall pass the requirements specified in 3.6.25.

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4.8.26.3 Procedure (regulator). The high pressure inlet connection of the regulator shall be installed in the test setup on figure 1 in place of the test chamber. This test procedure shall be conducted with the oxygen supply valve both open and closed. The quick-acting valve shall be fully opened and the regulator pressurized with oxygen to a pressure of 2,000 psig. This pressure shall be maintained for 30 seconds. The quick-acting valve shall be fully closed and the pressure to the regulator shall be released through the bleed valve. The regulator shall be disconnected and examined for indication of charring or deterioration of any nonmetallic material. The regulator shall pass the requirements specified in 3.6.25.

5. PACKAGING

5.1 Preservation. Unless otherwise specified in the contract or order, preservation shall be Level A, using Method llb of MIL-P-116, with one regulator per unit package (see 6.2h). Preservatives shall not be used. All openings in the regulator shall be closed with suitable closures to prevent entry of dirt or foreign matter during shipment and storage.

5.2 Packing. Packing shall be Level A, B or C, as specified in the contract or order (see 6.2h).

5.2.1 Level A. Each unit, packaged as specified in 5.1, shall be packed for shipment in containers conforming to PPP-B-601 or PPP-B-621, overseas Type.

5.2.2 Level B. Each unit, packaged as specified in 5.1, shall be packed for in containers conforming to PPP-B-601 or PPP-B-621, Domestic Type; fiberboard boxes conforming to PPP-B-636 or PPP-B-640, Weather Resistant may be used provided that the gross weight is not greater than the applicable specification limitation.

5.2.3 Level C. Units, packaged as specified in 5.1, shall be packed for shipment in exterior-type shipping containers Conforming to rules and regulations pertaining to mode of transportation and acceptable to carrier at the lowest possible tariff rate that will ensure safe delivery. Contractor’s commercial/inciustrial packing procedure may be used when the above criteria are met.

5.3 Marking. The exterior and interior Containers shall be marked in accordance with MIL-STD-129. In addition, the following, or slmiliar, precautionary marking shall be required on each unit package and shipping container:

CAUTION

DO NOT ALLOW PETROLEUM CONTAMINANTS OF ANY KIND TO BE USED/STORED ON OR ABOUT THESE CONTAINERS.

5.4 Special requirements. All wrappings, cushioning, dunnage and containers used in preservation, packaging and packing of regulators shall be completely free of contaminations

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6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but it is not mandatory).

6.1 Intended use. The oxygen regulators covered by this specification are intended to provide crew members breathing oxygen with dilution at altitudes up to 30,000 feet and with automatic pressure breathing at altitudes from 27,000 to 43,000 feet and for emergency use up to 50,000 feet.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification, including any amendments.
b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
c. Applicable Government part number.
d. Applicable Qualified Products List.
e. Whether first article inspection is waived (see 4.4.1.1).
f. Name and address of the first article inspection laboratory (see 4.4.1.1) and the name of the Government activity responsible for conducting the first article inspection program (see 4.4.1.1.1).
9. Name and address of the quality conformance verification inspection laboratory {see 4.6) and the name of the Govenxmnt activity responsible for conducting the quality conformance verification inspection program (see 4.6).
h. Applicable levels of preservation, packaging, and packing (see 5.1 and (see 5.2) including marking requirements (see 5.3) and special requirements

i. Items if data required (see 6.3).

6.3 Consideration of data requirements. The following data requirements should be considered when this specitication is applied on a contract. The applicable Data Item Description (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID’s are tailored to reflect the requirements of the specific acquisition, To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
4.4.1.1	DI-T-5329	First Article Inspection Reports	Use Contractor Format

The above DID’s were those cleared as of the date of this specification. The current use of DOD 5010.12-L Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID’s are cited on the DD Form 1423.

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6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time set for opening of bids, qualiiled for inclusion in the Qualified Products List (QPL-25410) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, 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 purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is Commander, Naval Air Systems Commond, Washington, DC 20361; however, information pertaining to qualification of products should be obtained from the Conmmander, Naval Air Development Center, Warminster, Pennsylvania 18974-5000, Attention: Code 6031.

6.4.1 Documentation. When requested, the manufacturer shall make available engineering drawings and inspection reports in accordance with SD-6 .

6.5 First article. When a first article Inspection is required, the item(s) should be a first article sample. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement 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.

6.6 Laboratory information. The successful bidder will be furnished with the name of the quality conformance verification inspection laboratory and the Government activity responsible for conducting the inspection program at the time of award. Samples from a rejected lot shall not be resubmitted for tests and examinations, as required by 4.6, without the approval of the contracting officer.

6.7 Changes from previous issue. Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

6.8 Subject term (keyword) listings.

Gas Contaminant
Sea Level Operation
Altitude operation
Oxygen System
Breathing Gas
Pressure Breathing
Diluter Demand

Custodians:
Navy- AS

Review activities:
Army - AV

Preparing activity:
Navy - AS

(Project No. 1660-0569)

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TABLE I. Flow Characteristics.

Regulator Inlet Pressure (psig)	Outlet Flow (Liters/minute)	Outlet Pressure (Inches of water)	Altitude (1,000 feet)
50 or 150	30	0.0 to -0.45	0 - 27
50 or 150	50	0.0 to -0.70	0 - 27
50 or 150	85	0.0 to -1.0	0 - 27
500 or 2000	135	-1.0 to +1.0	10 - 27

TABLE II. Oxygen-Ratio.

Altitude (1000 Feet)	Outlet Flow (Liters/Minute)	% Oxygen Added from Source	
		Minimum	Maximum
0	15	0	30
0	50	0	30
5	15	1	33
5	50	1	33
10	15	6	45
10	50	6	45
10	135	6	60
15	15	14	52
15	50	14	52
15	135	14	70
20	15	24	55
20	50	24	55
20	135	24	80
25	15	40	80
25	50	40	80
25	135	40	90
28	15,50,135	60	100
32	135	98	100
	With diluter at 100%		
All altitudes	15, 50, 135	98	100

TABLE III. Pressure-Breathing Characteristics.

Altitude (1000 Feet)	Outlet Flow (Liters/Minute)	Pressure Limits (Inches of Water)	
		Minimum	Maximum
30	0,10,50,100	0.01	2.5
40	0,10,50,100	0.3	5.6
43	0,10,50,100	5.3	10.2
50	0,10,50,100	11.2	18.2

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TABLE IV. Pressure Gage Scale Tolerance.

Low Pressure Regulators Only		High Pressure Regulators Only	
Pressure Gage (PSIG)	Tolerance (PSIG)	Pressure Gage (PSIG)	Tolerance (PSIG)
50	± 10	500	± 50
100	± 25	1000	± 50
500	± 25	1500	± 50

TABLE V. Qualification Inspections.

Inspection	Paragraph Requirement	Test Method
Visual examination	-	4.8.1.1
Dimensions	-	4.8.1.1.1
Flow characteristics	3.6.1	4.8.2
Oxygen-ratio	3.6.2	4.8.3
Pressure-breathing characteristics	3.6.3	4.8.4
Relief valve	3.6.4	4.8.5
Inward leakage	3.6.5	4.8.6
Over-all leakage	3.6.6	4.8.7
Outward leakage	3.6.7	4.8.8
Demand valve leakage	3.6.8	4.8.9
Supply valve leakage	3.6.9	4.8.10
Pressure gage scale error	3.6.9.1	4.8.10.1
Lighting circuit continuity	3.6.10	4.8.11
Emergency and test pressures	3.6.11	4.8.12
Flow indicator	3.6.12	4.8.13
Overload	3.6.13	4.8.14
Low temperature		4.8.15

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TABLE V. Qualification inspections (Cont'd).

Inspection	Paragraph Requirement	Paragraph Test Method
High temperature operation	3.6.15	4.8.16
Supply valve cycling	3.6.16	4.8.17
Toggle operating forces	3.6.17	4.8.18
Panel lighting	3.6.18	4.8.19
Vibration	3.6.19	4.8.20
Endurance	3.6.20	4.8.21
Orientation	3.6.21	4.8.22
Ozone-resistance test (elastomer components)	3.6.22	4.8.23
External pressure	3.6.23	4.8.24
Oxygen regulator purge	3.6.24	4.8.25
Oxygen bomb	3.6.25	4.8.26

TABLE VI. First Article Inspection.

Inspection	Paragraph Requirement	Paragraph Test Method
Visual examination	-	4.8.1.1
Dimensions	-	4.8.1.1.1
Flow characteristics	3.6.1	4.8.2
Oxygen-ratio	3.6.2	4.8.3
Pressure-breathing characteristics	3.6.3	4.8.4
Relief valve	3.6.4	4.8.5
Inward leakage	3.6.5	4.8.6
Over-all leakage	3.6.6	4.8.7
Outward leakage	3.6.7	4.8.8

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TABLE VI. First Article Inspection (Cont'd).

Inspection	Paragraph Requirement	Paragraph Test Method
Demand valve leakage	3.6.8	4.8.9
Supply valve leakage	3.6.9	4.8.10
Pressure gage scale error	3.6.9.1	4.8.10.1
Lighting circuit continuity	3.6.10	4.8.11
Emergency and test pressures	3.6.11	4.8.12
Flow indicator	3.6.12	4.8.13
Overload	3.6.13	4.8.14
Supply valve cycling	3.6.16	4.8.17
Toggle operating forces	3.6.17	4.8.18

TABLE VII. Quality conformance inspection.

Inspection 1/	Method	Sample Size	Acceptance Criteria
Visual examination	4.8.1.1	a. Every regulator for critical defects b. Inspection Level II 2/ for minor defects	a. Reject all units with any critical defect b. An Acceptable Quality Level of 2.5 defects per hundred units for minor defects
Dimensions	4.8.1.1.1	Inspection Level S-1 2/	Acceptance number zero, rejection number 1
Flow Characteristics	4.8.2	Every regulator	Reject all defective units
Oxygen-ratio	4.8.3	Every regulator	Reject all defective units
Pressure-breathing characteristics	4.8.4	Every regulator	Reject all defective units

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TABLE VII. Quality conformance inspection (Cont'd).

Inspection 1/	Method	Sample Size	Acceptance Criteria
Relief valve	4.8.5	Every regulator	Reject all defective units
Over-all regulator leakage	4.8.7	Every regulator	Reject all defective units
Demand valve leakage	4.8.9	Every regulator	Reject all defective units
Pressure gage scale error	4.8.10.1	Every regulator	Reject all defective units
Lighting circuit continuity	4.8.11	Every regulator	Reject all defective units
Emergency and test pressures	4.8.12	Every regulator	Reject all defective units
Flow indicator	4.8.13	Inspection Level S-2 2/	Acceptance number zero, rejection number 1
Toggle operating	4.8.18	Inspection Level S-2 2/	Acceptance number zero, rejection number 1
Packaging	4.8.1.2	Inspection Level S-2 2/	An Acceptable Quality Level of 4.0 defects per hundred units

1/ The results of the inspections shall be identifiable by the assigned serial number (see 3.11.1)

2/ The sample size shall be based only on the applicable sample size code letter corresponding to the specified inspection level of MIL-STD-105.

TABLE VIII. Classification of defects for visual examination of the regulator.

Critical	Minor
1. Material imperfections - foreign matter embedded	201. Marking - missing, insufficient incorrect, illegible or not permanent.

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TABLE VIII. Clasification of defects for visual examination of the regulator (Cont'd).

Critical	Minor
2. Surface - unclean, rough, misaligned, or containing cracks, nicks, or other flaws. 3. Any component missing, malformed, fractured, or otherwise damaged 4. Any component loose or otherwise not securely retained 5. Incorrect assembling or improper positioning of components 6. Any functioning part that works with difficulty 7. Faulty workmanship of other irregularities	202. Color not as specified.

TABLE IX. 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 missing, damaged, or otherwise defective
Workmanship	Inadequate application of the components such as incomplete closure of the unit package, intermediate package, container flaps, loose strappings, etc.; bulging or distortion of the containers
Exterior and interior	Number per container is more or less than required; gross or net weight exceeds the requirements

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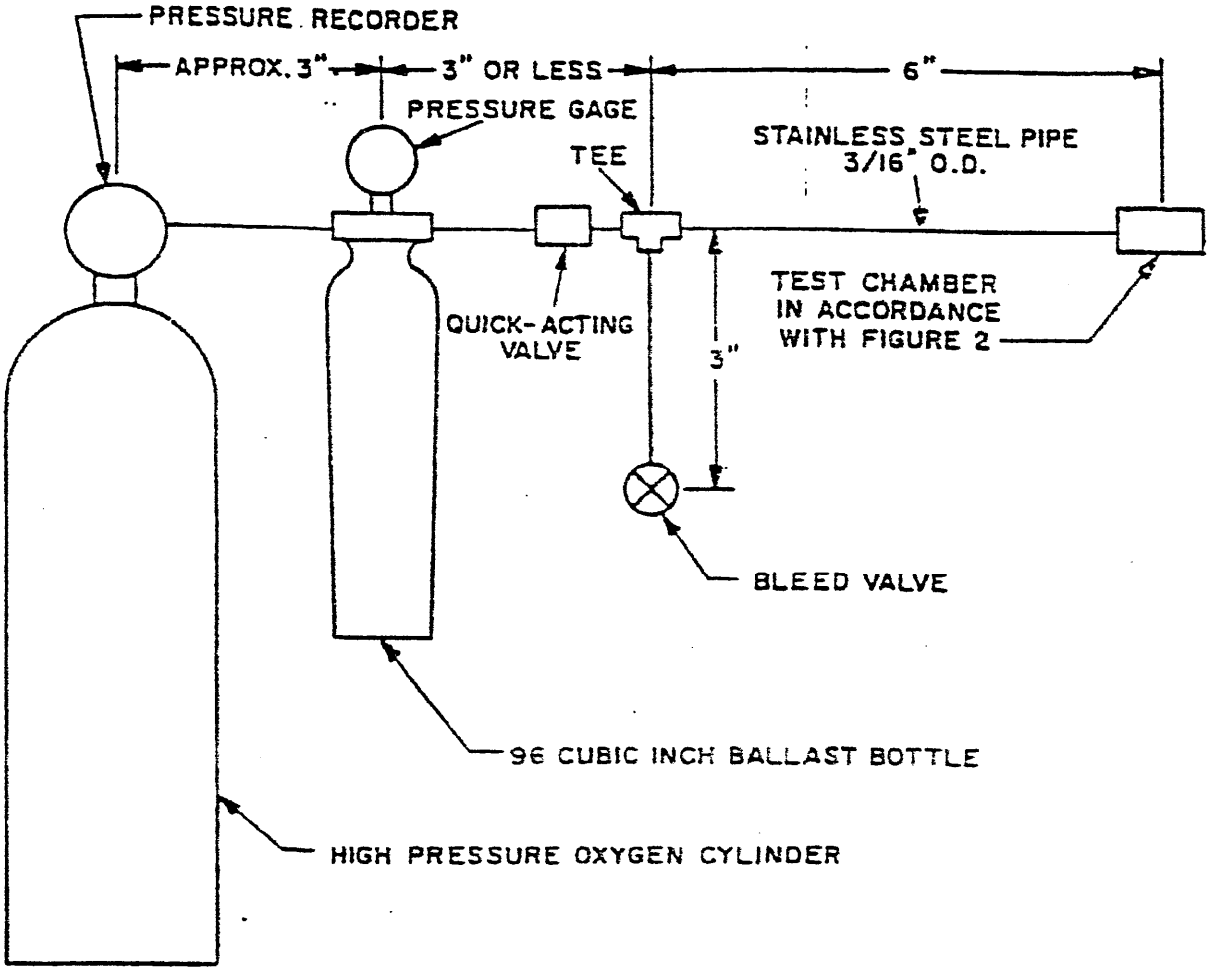

Figure 1. Oxygen bomb equipment

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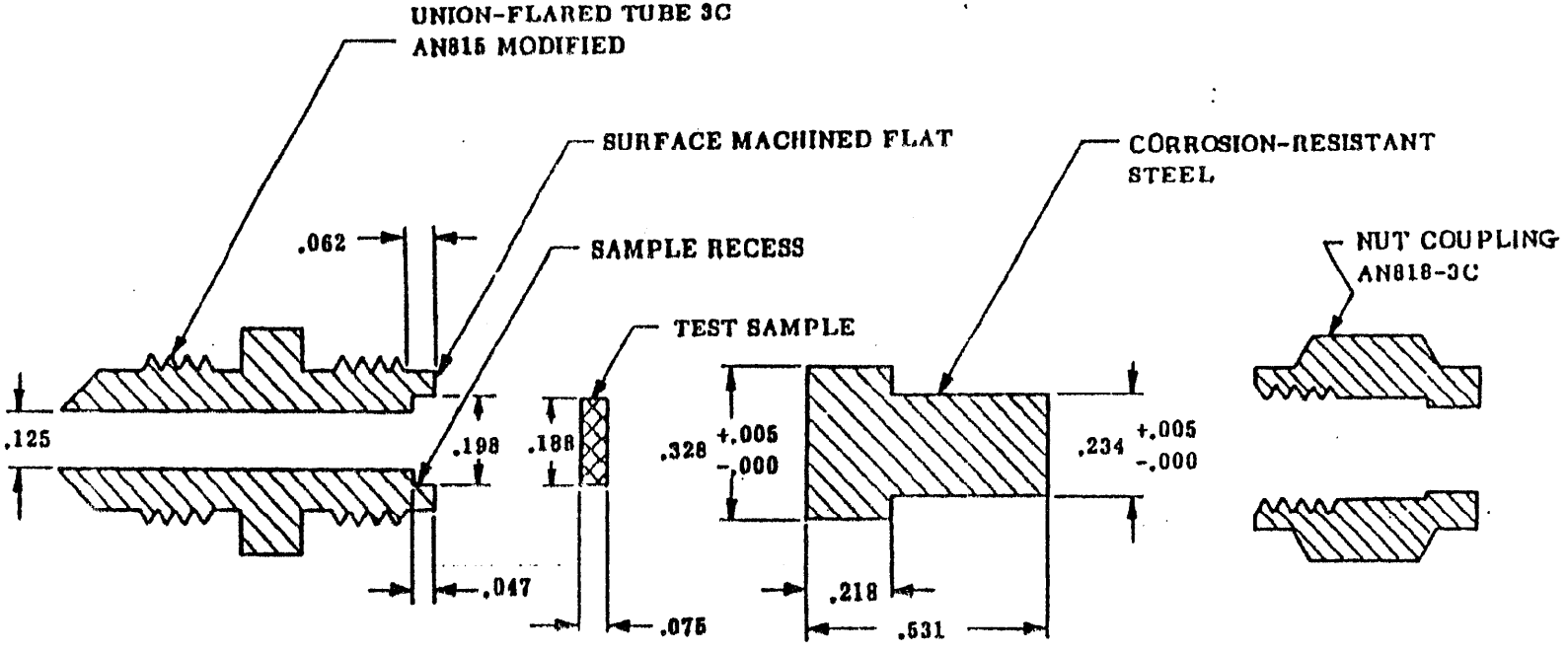

Figure 2. Test chamber

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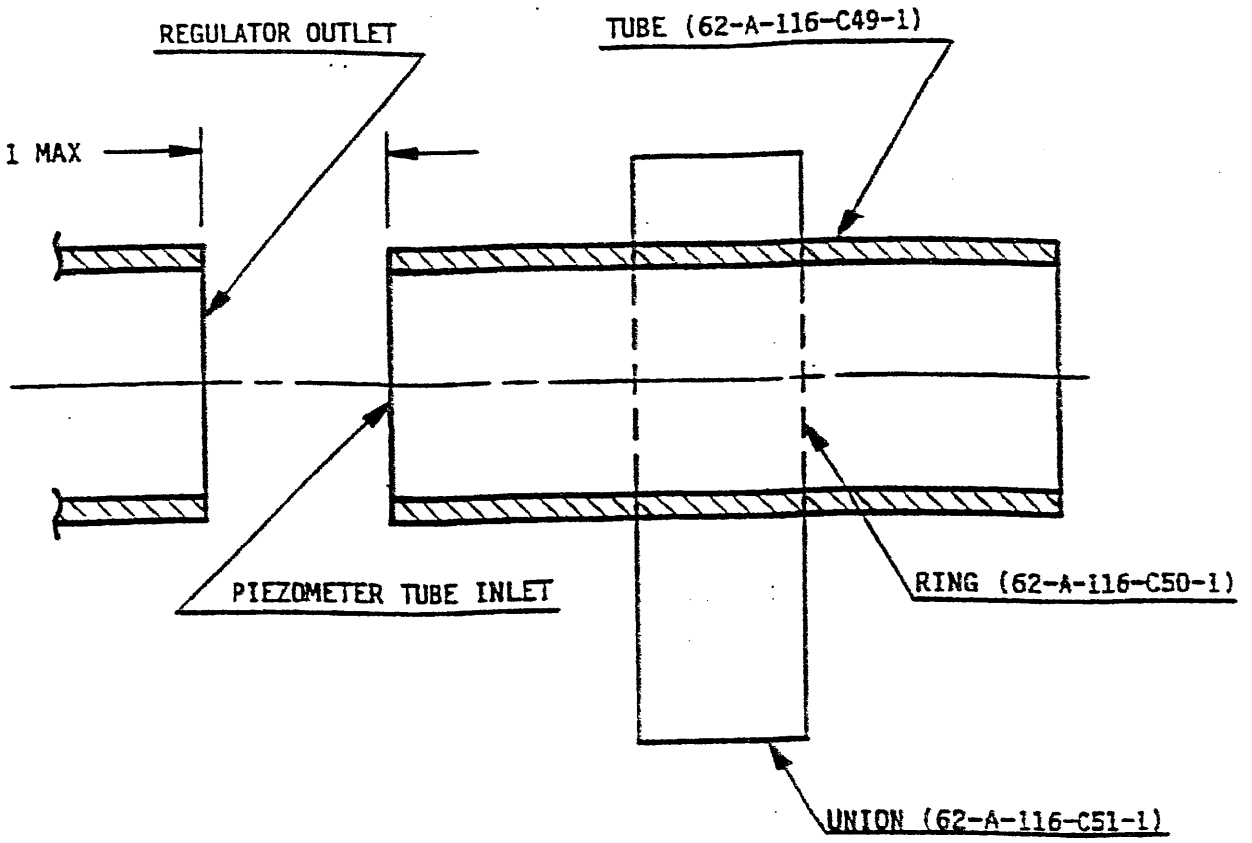

Figure 3. Location of regulator outlet of piezometer (620A-116-C48)

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

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

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

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE (YYMMDD)
	MIL-R-25410G	04/15/91

3. DOCUMENT TITLE
REGULATORS, OXYGEN, DILUTER-DEMAND, AUTOMATIC-PRESSURE BREATHING

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	e. DATE SUBMITTED (YYMMDD)

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a. NAME	b. TELEPHONE (Include Area Code)	
Commanding Officer NAEC, SESD Code 53	(1) Commercial (908) 323-1280	(2) AUTOVON 624-1280
c. ADDRESS (Include Zip Code) Lakehurst, NJ 08733-5100	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	