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AEROSPACE STANDARD

AS 1197

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Revised

CONTINUOUS FLOW OXYGEN REGULATOR

1. PURPOSE

To establish requirements for construction, performance and testing of continuous flow oxygen regulators. This document supersedes in part AS 463, 12-15-56, which is cancelled.

2. SCOPE

This standard covers regulators of the following types:

Type I	-	Automatic Continuous Flow
Type II	-	Adjustable Continuous Flow
Type III	-	Pre-set Continuous Flow
Class A	-	Cylinder Mounted
Class B	-	Line Mounted
Special	-	Composite Continuous Flow (Appendix)

3. DESCRIPTION

The regulators described herein are intended to perform as oxygen supply regulators in aircraft supplemental oxygen breathing systems. The output of the regulator is delivered to a suitable sized outlet orifice at the pressures prescribed herein.

4. DEFINITION

The regulator types are defined as follows:

Type I - This type of regulator provides an output flow or pressure which varies automatically with cabin pressure to insure adequate delivery to the mask.

Type II - This type of unit may be manually adjusted to deliver the proper amount of pressure or flow for a selected cabin pressure.

Type III - This regulator has a fixed outlet flow or pressure which has been pre-set to provide adequate flow up to indicated cabin pressure.

Class A - The regulators in this class are designed to be cylinder mounted.

Class B - The regulators in this class are intended for use in a line between the oxygen source and the dispensing unit or on an oxygen cylinder valve.

5. REQUIREMENTS

5.1 General: The requirements set forth in AS861, "Minimum General Standards for Oxygen Systems" and AS1046, "Portable Oxygen Equipment," shall be considered as part of this standard, except that should there be any conflict the requirements of this standard shall take precedence.

5.2 Materials: Materials shall conform to applicable specifications, shall be of the best quality and shall be suitable for the purpose intended. Materials that are easily deteriorated or otherwise affected adversely by continued service when used with oxygen shall not be used.

5.2.1 Metals: Metals shall be of the corrosion-resistant type or suitably treated to resist corrosion due to salt spray, or atmospheric conditions likely to be met in storage or normal service life of the regulator.

5.2.2 Elastomers: All elastomers used shall be manufactured within 24 months or less of the date of regulator manufacture. The cure date (month and year) shall be stamped on the elastomer component providing there is sufficient area. The figures shall be at least 3/16 in. high. Cure dates and age limitation shall not apply to silicone. The cure date of the oldest elastomers shall be stamped on the outside of the regulator.

5.2.3 Protective Treatment: Materials which are used in the construction of the regulator that are subject to corrosion in oxygen, salt air, or other atmospheric conditions likely to occur during service usage, shall be protected against such corrosion in a manner that will in no way prevent compliance with the performance requirements of this Specification.

5.3 Design:

5.3.1 Class A Regulators: Class A regulators are intended to be mounted directly on the oxygen cylinder and in addition to the pressure regulating characteristics shall include the following provisions:

5.3.1.1 On-Off Control: A means shall be provided for manually turning the flow on or off. Both positions shall be clearly and permanently marked.

5.3.1.2 Cylinder Contents Indicator: A pressure gage or other suitable means shall be provided to give continuous indication of cylinder contents.

5.3.1.3 Charging: A self-closing charging valve or other suitable means shall be provided for charging the oxygen cylinder.

5.3.1.4 Wrench Flats: The valve body shall have adequate wrench flats and be sturdy enough to withstand removal from the cylinder and attachment of outlet fittings.

5.3.1.5 Standpipe: A standpipe shall be provided in the valve inlet to minimize the possibility of moisture and loose foreign matter from entering the regulator when the cylinder is inverted.

5.3.1.6 Safety Outlet: A safety outlet shall be provided in accordance with I.C.C. Regulations, Tariff 19, Section 173.302. The safety outlet shall be the frangible disc type with no fusible metal and shall be designed to provide force equilibrium while relieving.

5.3.2 Class B Regulators: Class B regulators are intended to be mounted in line downstream of a cylinder and valve or other suitable oxygen source. Its function is simply one of pressure regulation.

5.3.3 Oxygen Inlet Filter: A filter capable of filtering materials approximately 25 microns in size shall be provided in the oxygen inlet port and filler valve port where applicable on all regulators.

5.3.4 Relief Valve: A relief valve shall be provided to protect the regulator outlet from over-pressurization on all regulators.

5.3.5 Type II Regulator: A means shall be provided to indicate setting of the manual control. Such means shall be clearly marked for proper cabin pressure setting.

5.3.6 Type III Regulator: This regulator shall be clearly and permanently marked to show maximum altitude at which the regulator will provide sufficient oxygen to meet physiological requirements.

5.4 Performance: The regulator shall meet the requirements specified in Section 5.5 when subjected to the applicable tests.

5.5 Quality Assurance Provisions:

5.5.1 Responsibility for Inspection: Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements specified herein.

5.5.2 Qualification Inspection: Qualification inspection shall consist of all tests specified in Section 5.5.4.

5.5.3 Test Media: The test media shall be dry oxygen, aviators breathing, conforming to MIL-O-27210 Type I.

5.5.4 Inspection Methods: Tests shall be conducted in the order indicated.

5.5.4.1 Visual Examination: The regulator shall be examined to determine conformance to this specification and applicable drawings with respect to materials, workmanship, construction, and marking.

5.5.4.2 Pressure Regulation: Pressure regulation and flow requirements shall be established by system design analysis. (AIR 825 may be used as a guide.) The regulator shall be tested with all specified combinations of minimum and maximum supply pressures, flows and altitudes. Type I and Type II regulators shall be tested at 5000 ft intervals of altitude between minimum and maximum prescribed limits and Type III regulators shall be tested at maximum rated altitude. The regulated pressures shall be within the design limits at all test points.

5.5.4.3 Leakage:

5.5.4.3.1 Internal Leakage: Inlet pressures of 1850 ± 50 psig and 150 ± 10 psig shall be applied to the regulator and zero flow conditions shall be maintained for a period of 10 minutes. There shall be no indications of leakage as noted by an increase of outlet pressure.

5.5.4.3.2 External Leakage in "Off" Position (Class A Regulators only): Inlet pressures of 1850 ± 50 psig and 150 ± 10 psig shall be applied to the regulator with the On-Off control in the "Off" setting. There shall be no evidence of leakage at the outlet port.

5.5.4.3.3 External Leakage: With an inlet pressure of 1850 ± 50 psig and the regulator flowing, all external connections and fittings shall be examined for leakage. There shall be no evidence of leakage.

Note: For Type I regulators an external bleed not exceeding 200 sccm is permissible to facilitate automatic programming.

5.5.4.4 Proof Pressure: A pressure of 3,000 psig shall be applied to the regulator inlet with all other ports closed with suitable cap or plug (remove and cap or plug safety outlet of Class A regulator) for a period of five minutes. The regulator shall show no evidence of damage and shall meet the requirements of the pressure regulation test (5.5.4.2).

5.5.4.5 Low Temperature Operation: The regulator shall be stabilized for 3 hr at a temperature of -40 F. While being maintained at this temperature the regulator shall meet the requiremenys of the pressure regulation test (5.5.4.2).

5.5.4.6 High Temperature Operation: The test described in paragraph 5.5.4.5 shall be repeated with the unit stabilized at a temperature of 120 F.

5.5.4.7 Vibration: The regulator shall be mounted on a vibration test fixture and vibrated for a period of 3 hr in each of the three axis. Using the vibration test schedule of MIL-E-5272C, automatically cycle the frequency between 5 and 500 Hertz in 15 min. cycles at an applied double amplitude of 0.036 in. or an applied acceleration of ± 5g, whichever is the lower value. The regulator shall then be subjected to and meet the requirements of paragraphs 5.5.4.2 and 5.5.4.3.

5.5.4.8 On-Off Control Cycling (Class A only): The regulator shall be placed in a test system with an inlet pressure of 1850 ± 50 psig and a flow of 5 lpm. The control knob shall be cycled from "On" to "Off" and back to "On" for 1000 cycles. The test shall be repeated with an inlet pressure of 100 ± 10 psig. The regulator shall then be subjected to and meet the requirements of paragraphs 5.5.4.2 and 5.5.4.3.

5.5.4.9 Safety Outlet (Class A only): The safety outlet shall be tested in accordance with the procedures of Compressed Gas Association Pamphlet S-1, Part I, Paragraph 5.3.3. The safety outlet shall comply with the requirements as set forth in Compressed Gas Association Pamphlet S-1, Part I, Paragraph 5.3.3 and/or DOT Regulation Tariff 19, Section 173.302 depending upon which document is applicable.