



AEROSPACE STANDARD	AS17852™	REV. A
	Issued 1999-07 Revised 2012-07 Reaffirmed 2023-01 Superseding AS17852	
(R) Reducers, Oxygen Pressure		FSC 1660

RATIONALE

AS17852A has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

1.1 Scope

This specification covers the requirements for two types of oxygen pressure reducers.

1.2 Classification

Reducers covered by this specification shall be of the following types, as specified (see 6.2).

Type I - On - Off

Type II - Emergency

2. APPLICABLE DOCUMENTS

2.1 Issues of Documents

The following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

FEDERAL SPECIFICATIONS

BB-A-1034	Air, Compressed, for Breathing Purposes
A-A-59503	Nitrogen, Technical
A-A-58092	Tape, Antiseize, Polytetrafluorethylene
PPP-B-576	Boxes, Wood-Cleated Panelboard

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MILITARY SPECIFICATIONS and STANDARDS

MIL-DTL-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-B-22191	Barrier Material, Transparent, Flexible, Heat Sealable
MIL-PRF-27210	Oxygen, Aviator's Breathing Liquid and Gas
MIL-STD-2073	Standard Practice for Military Packaging
MIL-STD-1916	DOD Preferred Methods for Acceptance of Product
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-889	Dissimilar Metals
7-104.55	Defense Acquisition Regulation

SAE STANDARDS and RECOMMENDED PRACTICES

ARP1176	Oxygen System and Component Cleaning and Packaging
AIR5742	Packaging and Transportation of Oxygen Equipment
AS8010	Aviator's Breathing Oxygen Purity Standard
AS8879	Screw Threads - UNJ Profile, Inch Controlled Radius Root with Increased Minor Diameter
AS71051	Pipe Threads, Taper, Aeronautical National Form, Symbol ANPT - Design and Inspection Standard
AMS-QQ-P-35	Passivation Treatments for Corrosion-Resistant Steel

ASTM STANDARDS

ASTM D 1974	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
ASTM D 5168	Standard Practice for Fabrication and Closure of Triple-Wall Corrugated Fiberboard Containers
ASTM D 5486	Standard Specification for Pressure-Sensitive Tape for Packaging, Box Closure, and Sealing
ASTM A967	Standard Specification for Chemical Passivation Treatments for Stainless Steel Parts

ATA

SPEC2000	E-Business Specification for Materials Management
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(Copies of specifications, standards, drawings and publications required by contractors in connection with specific acquisition functions should be obtained from the acquiring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 First Article

When specified, a sample shall be subjected to first article inspection (see 4.3 and 6.4).

3.2 Selection of Specifications and Standards

Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143 where applicable.

3.3 Materials

Materials shall conform to applicable specifications and shall be as specified herein and on applicable drawings. Materials which are not covered by specifications, or which are not specifically described herein, shall be of the required quality, of the lightest practicable weight, and suitable for the purpose intended.

3.3.1 Metal Parts

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

3.3.1.1 Dissimilar Metals

Dissimilar metals, such as defined in MIL-STD-889, shall not be used in intimate contact with each other unless suitably protected against electrolytic corrosion with protective coatings.

3.3.2 Nonmetallic Materials

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

3.3.2.1 Age

Elastomeric components, except silicone, shall not be more than 12 months old from the cure date of manufacture to the date of delivery to any Government Service or to any airframe or accessory manufacturer unless otherwise specified by contractual agreement. In such instances, the manufacturer must have demonstrated sufficient evidence that the elastomer will perform without degradation over a defined period of time.

3.3.2.2 Fungus-Proof Materials

Materials which are not nutrients for fungi shall be used to the greatest extent practicable. In cases where materials that are nutrients for fungi must be used, such materials shall be treated with an oxygen-compatible fungicidal agent, as approved by the acquiring activity (see 6.2). These fungicidal agents must also be non-toxic to humans under the conditions of exposure expected when using the pressure reducer.

3.3.3 Protective Treatment

When materials are used in the construction of the reducers 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 of environmental conditions shall not be used. All materials and processes shall be compatible with oxygen environments.

3.4 Standard Parts

AS, MS, and AN standard parts shall be used where they suit the purpose. They shall be identified on the manufacturer's drawings by their part numbers. Parts which are not covered by specifications or military standards, or which are not specifically described herein or on the drawings, shall be completely described on manufacturer's drawings.

3.5 Design and Construction

3.5.1 Type I

The reducer shall be of the type suitable in all respects for use in aircraft oxygen systems and shall operate at supply pressures of 250 to 2400 psig, unless otherwise specified in the procurement specification which shall define the range of supply pressures uniquely required by the application. The outlet pressure shall be a predetermined fixed pressure within the range of 80 psig $\pm$ 10 psig for oxygen flow rates from 0 to 140 lpm (NTPD), unless otherwise specified in the procurement specification which shall define the range of supply pressures and flows uniquely required by the application.

3.5.1.1 Mounting

The reducer shall be designed for permanent mounting on the airplane console. The location of the mounting holes shall have sufficient clearance between the mounting and inlet and outlet ports to allow for easy connection of fittings.

3.5.1.2 Shut-Off Feature

The reducer shall be provided with a shut-off feature which shall be capable of allowing the flow to be turned on or off. The shut-off feature shall be provided with a handle so that the valve may be actuated with one hand.

3.5.1.3 Ports

The reducer shall be provided with industry standard AS, MS, or AN ports and fittings for the inlet, relief, outlet, and fill connections. Pipe threads shall be avoided where possible, but if required, shall conform to 1/8-in internal pipe threads per AS71051. Ports shall be clearly visible and functions permanently marked where possible.

3.5.2 Type II

The reducer shall be capable of reducing emergency oxygen between the pressures of 250 and 1800 psig, unless otherwise specified in the procurement specification which shall define the range of supply pressures uniquely required by the application. The outlet pressure shall be a predetermined fixed pressure within the range of 45 to 80 psig for oxygen flow rates from 0 to 140 lpm (NTPD), unless otherwise specified in the procurement specification which shall define the range of supply pressures and flows uniquely required by the application.

3.5.2.1 Emergency Supply Release Assembly Shut-Off Valve

The emergency reducer shall be provided with a manual and automatic emergency supply release assembly. The valve shall be designed so that it may be actuated with one hand. The assembly may consist of a common pin or disc attached to two pull cable assemblies. One pull cable assembly, for manual release, shall be attached to a ball handle (preferably green in color); the other pull cable, for automatic release, shall be attached to the aircraft structure. A means shall be provided to prevent accidental actuation of the oxygen supply during an emergency aircraft egress event. The emergency supply release assembly, when engaged, shall prevent operation of the reducer.

3.5.2.2 Ports

The reducer shall be provided with industry standard AS, MS, or AN ports and fittings for the inlet, relief, outlet, and fill connections, as specified by the acquiring activity (see 6.2). Pipe threads shall be avoided where possible, but if required, shall conform to 1/8-in internal pipe threads per AS71051 for the relief and outlet ports. Ports shall be clearly visible and functions permanently marked where possible.

3.5.3 Types I and II

The reducer shall not induce or sustain audible oscillation or vibration, accompanied by rapid fluctuations in outlet pressure or flow, within its operating range of pressure and flow, nor shall it sustain such oscillation induced by the aircraft vibration spectrum as specified in 4.6.8.

3.5.3.1 Filter

A filter consisting of a 74 micron rating sintered bronze, a monel or stainless steel 200 mesh wire screen, or equivalent shall be firmly secured in the high pressure oxygen inlet of the reducer. The filter shall be easily removable for cleaning and replacement.

3.5.3.2 Orientation

The reducer shall operate satisfactorily in any orientation in which it is mounted (see 4.5.3).

3.5.3.3 Antiseize Tape

Antiseize tape shall be used on all male pipe thread fittings. Antiseize tape shall conform to, and shall be applied as specified in, A-A-58092. Tape shall NOT be used on straight flare tube fitting threads, coupling sleeves, on the outer side of tube flares, or on any other style fitting that is not a pipe thread. None of the tape shall be allowed to enter the inside of a fitting where it could enter the oxygen flow path, as it creates an oxygen fire hazard and could lead to flow restrictions.

3.5.3.4 Cleaning, Degreasing, and Non-Volatile Residue

Prior to assembly, all reducer components shall be cleaned degreased, and a Non-Volatile Residue (NVR) test shall be performed in accordance with ARP1176, and per the cleanliness level specified in the procurement specification.

3.6 Performance

3.6.1 Leakage

The reducer, when tested as specified in 4.6.2, shall not show any evidence of leakage as evidenced by the presence of sustained bubbles, unless otherwise specified in the procurement specification.

3.6.2 Pressure and Flow

3.6.2.1 Type I

The outlet pressure of the reducer, when tested as specified in 4.6.3.1, shall at no time be less than 70 psig nor greater than 90 psig, unless otherwise specified in the procurement specification.

3.6.2.2 Type II

The outlet pressure of the reducer, when tested as specified in 4.6.3.2, shall at no time be less than 45 psig nor greater than 80 psig, unless otherwise specified in the procurement specification.

3.6.3 Shut-Off Valve

3.6.3.1 Type I

The shut-off valve on the reducer, when tested as specified in 4.6.4.1, shall permit a minimum oxygen flow of 140 lpm (NTPD) in the "on" position, and shall not allow any flow when the valve is in the "off" position, unless otherwise specified in the procurement specification. The maximum torque required to turn the valve on or off shall be 15 in-lb, unless otherwise specified in the procurement specification.

3.6.3.2 Type II

The emergency supply release shut-off valve on the reducer, when tested as specified in 4.6.4.2, shall permit a minimum oxygen flow of 140 lpm (NTPD) when actuated and shall not allow any flow when engaged, unless otherwise specified in the procurement specification. The pull force required to actuate the emergency supply release assembly shall be a minimum of 10 lb and a maximum of 28 lb, unless otherwise specified in the procurement specification.

3.6.4 Pressure Relief

The pressure relief valve, when tested as specified in 4.6.5, shall open at 120 psig $\pm$ 10 psig and shall allow a minimum oxygen flow of 80 lpm at 130 psig through the valve, unless otherwise specified in the procurement specification. The pressure relief valve shall reseal at 110 psig minimum, unless otherwise specified in the procurement specification, and show no evidence of leakage when leak detection fluid is applied and monitored over a minimum of 15 min, as evidenced by the presence of sustained bubbles, unless otherwise specified in the procurement specification.

3.6.5 Proof Pressure

The reducer, when tested as specified in 4.6.6, shall show no evidence of leakage when leak detection fluid is applied and monitored over a minimum of 15 min, as evidenced by the presence of sustained bubbles, unless otherwise specified in the procurement specification. No evidence of permanent damage, distortion, or functional degradation after proof testing is allowed.

3.6.6 High and Low Temperature Operation

The reducer, when tested as specified in 4.6.7 shall operate without failure and shall show no evidence of mechanical or material failure, nor functional degradation beyond specification performance limits.

3.6.7 Vibration

The reducer, when tested as specified in 4.6.8, shall show no evidence of mechanical or material failure, nor functional degradation beyond specification performance limits.

3.6.8 Endurance (Type I)

The on-off shut off valve, when tested as specified in 4.6.9, shall operate satisfactorily.

3.6.9 Oxygen Slam-Start Test

The reducer, when tested as specified in 4.6.10, shall not ignite, nor shall there 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 Dimensions

3.8.1 Type I

The reducer shall have maximum overall dimensions of 4.25 by 1.50 by 1.50 in, or as defined in the procurement specification.