



AEROSPACE STANDARD

AS7982™

Issued	2019-11
Reaffirmed	2025-11

Static Seal Test Fixture and Procedure

RATIONALE

Continuing problems with seal leakage, especially at low temperatures, require a standardized method and tools for evaluating prospective solutions.

AS7982 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

This SAE Aerospace Standard (AS) provides dimensions and procedures for a standardized test fixture used to evaluate the static performance of O-rings and other seal types in glands per AS4716 and AS5857.

1.1 Purpose

The purpose of this document is to provide an easy to produce seal test block design and easy to perform test procedure to evaluate the sealing capability of static seals for typical aerospace applications.

2. APPLICABLE DOCUMENTS

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Telephone: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS4640	Aluminum Bronze, Bars, Rods, Shapes, Tubes, and Forgings, 81.5Cu - 10.0Al - 4.8Ni - 3.0Fe, Drawn and Stress Relieved (HR50) or Temper Annealed (TQ50)
AMS5659	Steel, Corrosion-Resistant, Bars, Wire, Forgings, Rings, and Extrusions, 15Cr - 4.5Ni - 0.30Cb (Nb) - 3.5Cu
ARP1383	Aerospace - Impulse Testing of Hydraulic Components
AS4716	Gland Design, O-ring and Other Seals
AS5781	Retainers (Backup Rings), Hydraulic and Pneumatic, Polytetrafluoroethylene Resin, Single Turn, Scarf-Cut, For Use in AS4716 Glands

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Full document details: SAE AS7982

For more information on this standard, visit
<https://www.sae.org/standards/content/AS7982/>

Documents

Standard, visit Sharing Hub

- AS5857 Gland Design, O-ring and Other Elastomeric Seals, Static Applications
- AS5860 Retainers, (Back-Up Rings), Hydraulic and Pneumatic, Polytetrafluoroethylene Resin, Single Turn, Static Gland
- SAE J1926-1 Connections for General Use and Fluid Power - Ports and Stud Ends with ASME B1.1 Threads and O-Ring Sealing - Part 1: Threaded Port with O-Ring Seal in Truncated Housing

2.2 ASME Publications

Available from ASME, P.O. Box 2900, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2900, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

ASME B46.1 Surface Texture (Surface Roughness, Waviness & Lay)

3. FIXTURE AND TEST PROCEDURE

3.1 Test Fixture

See Figures 1, 2, and 3 for fixture design. Dimensions are in inches. Surface texture callouts shall be interpreted per ASME B46.1.

3.1.1 Rod

Rod shall be a bronze alloy. Preferred material is Aluminum-Nickel Bronze C68000 per AMS4640. Other bronze alloys of equivalent strength could be used.

3.1.2 Housing

Housing shall be steel. Preferred material is 15-5PH per AMS5659, 155 ksi (1069 MPa) strength. Other steels of equivalent strength could be used. Drawing shows ports per SAE J1926-1. Other port types of equivalent size could be used to suit the test facility.

3.1.3 Assembly

Wet install the seals to be tested onto the rod using the test fluid. Backup rings shall be on the outboard ends. Note that each gland requires a specific backup ring part number. The rod can be installed into the housing from either end but it is easier to install the AS4716 end first since that gland has less seal squeeze. Hand tighten the set screws to prevent the rod from moving. High torque is not necessary.

3.2 Test Procedure

The following test procedure shall be used with the fluid or fluids that are required by the referencing specification.

- 3.2.1 DOP is the design operating pressure that is required by the referencing specification. Pressure tolerance shall be $\pm 4\%$ or 10 psi, whichever is greater.
- 3.2.2 DOT is the design operating temperature as required by the referencing specification, both HIGH and LOW. High temperature tolerance shall be -0, +10 °F (+6 °C) and cold temperature tolerance shall be +0, -10 °F (-6 °C).
- 3.2.3 Purge air from the fixture before start of testing via the bleed port. Temperature shall be stable for at least 1 hour before leakage checks.
- 3.2.4 Temperature shall be measured with a thermocouple placed down the middle of the rod and with a thermocouple on the outside of the housing. The cold air source shall not blow directly on the housing to avoid overcooling the housing.
- 3.2.5 Impulse wave form shall be per ARP1383, Figure 1.