



AEROSPACE RECOMMENDED PRACTICE

ARP1231™

REV. C

Issued 1973-04
Reaffirmed 2012-10
Revised 2022-01

Superseding ARP1231B

(R) General Gland Design Criteria for Static and Dynamic
O-Ring Seal Applications Specifically for Engines and Engine Control Systems

RATIONALE

This standard has been updated to include technical and editorial changes.

NOTE: This standard was transferred from the E25 General Standards for Aerospace and Propulsion Systems Committee to A6C Seals Committee.

1. SCOPE

This document recommends general gland design criteria for static and dynamic O-ring seal applications specifically for engines and engine control systems.

1.1 Purpose

The purpose of this document is to provide the aerospace industry with basic information pertinent to the design and selection of elastomeric O-ring seal glands for use specifically in engine and engine control 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, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AIR786	Elastomer Compatibility Considerations Relative to Elastomeric Sealant Selection
ARP1232	Gland Design Criteria and Dimensions for Static Radial O-Ring Seal Applications without Anti-Extrusion Devices Specifically for Engine and Engine Control Systems
ARP1233	Gland Design Criteria and Dimensions for Dynamic Radial O-Ring Seal Applications Specifically for Engine and Engine Control Systems Operating at 1500 psi Max

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ARP1234 Static Axial O-Ring Seal Applications without Anti-Extrusion Devices for Engine Control Systems

AS568 Aerospace Size Standard for O-rings

3. GENERAL REQUIREMENTS

3.1 Gland Configuration

3.1.1 Radial O-Ring Seal Glands

Figure 1 depicts piston and rod radial O-ring seal glands. The piston configuration is preferred. Fabrication costs are lower, assembly is easier, and there is less likelihood of the seal buckling or twisting and being pinched as the rod is installed.

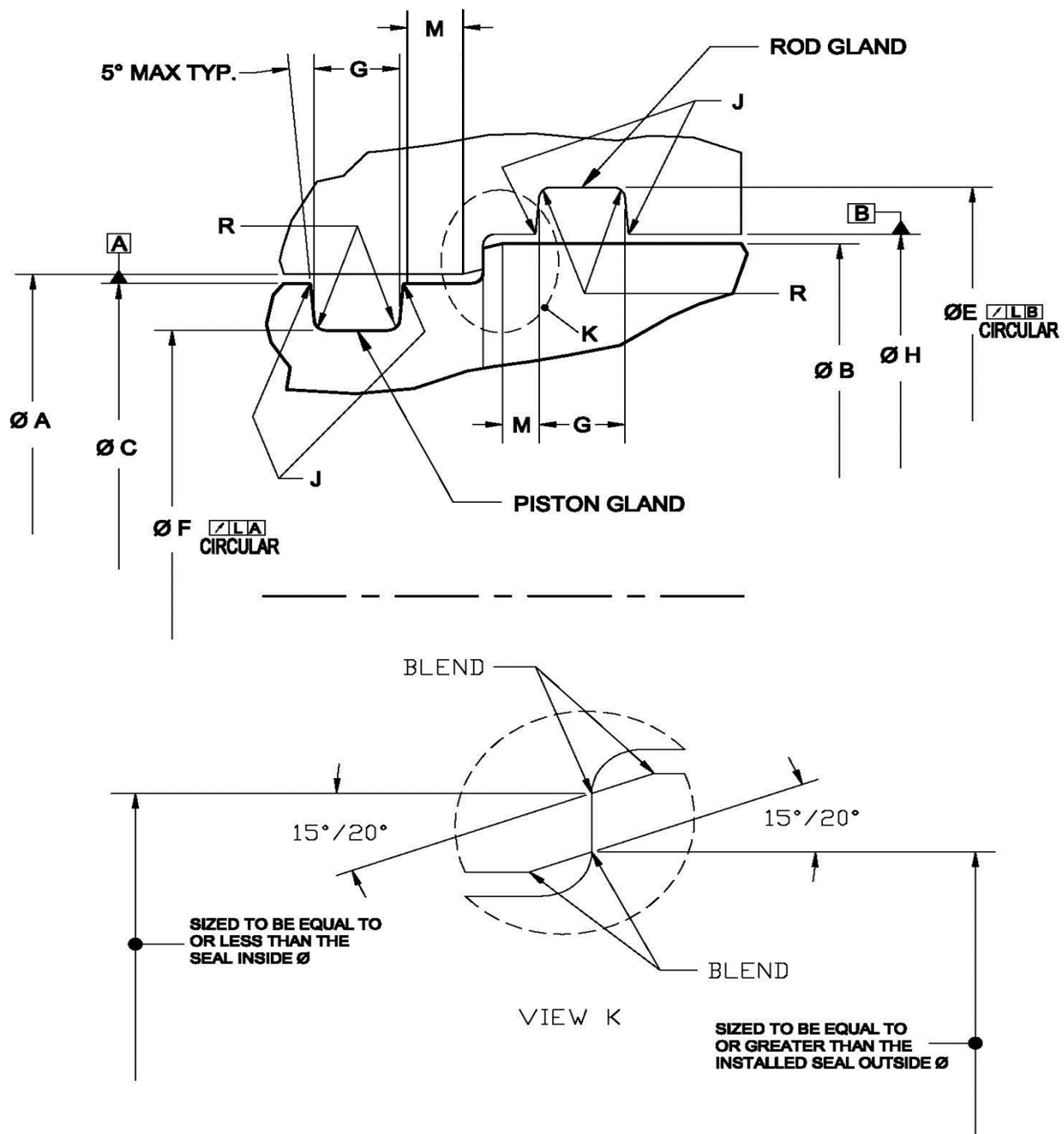


Figure 1 - Typical radial O-ring seal glands



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3.1.2 O-Ring Face Seal Glands

Figure 2 illustrates an O-ring face seal gland. In a face seal gland, sealing occurs on the flat surfaces of the gland rather than on the gland diameters.

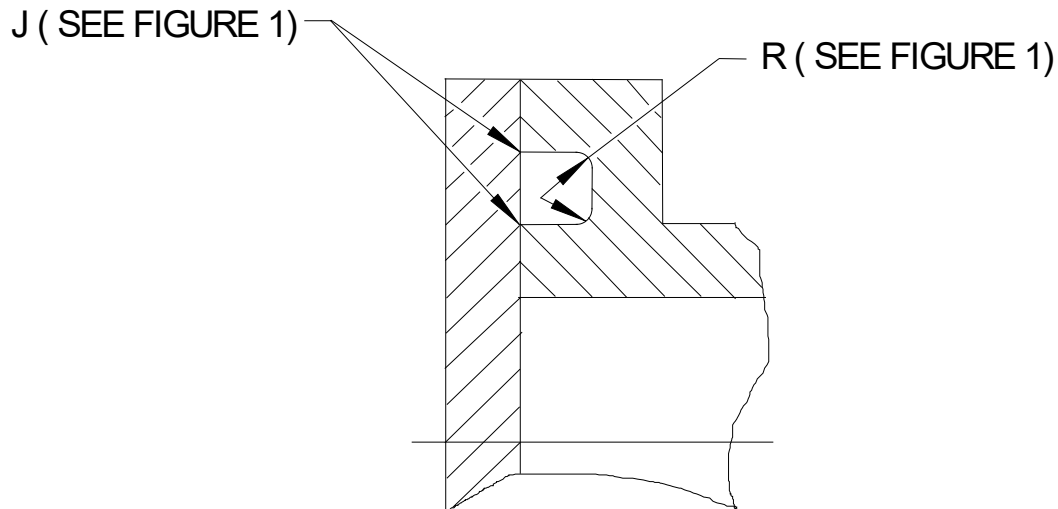


Figure 2 - O-ring face seal gland

3.2 Gland Dimensions

3.2.1 General

The best dimensions for a particular gland are functions of the fluids, elastomers, pressures, and temperatures employed in the system. However, the use of the best gland in each application is not always desirable or necessary. Within a given aerospace system, it may be necessary to change fluids or elastomers to achieve the desired fluid system performance. When such a change is required, O-ring seal gland dimensions should not be changed. Therefore, it is preferable to design O-ring seal glands which will operate satisfactorily with a number of different fluids and materials in varying environmental conditions.

3.2.2 Standard Gland Dimensions

Standard gland dimensions are provided in ARP1232, ARP1233, and ARP1234 for the O-ring seal sizes covered by AS568. These dimensions are computed in accordance with criteria in the above ARPs and are adjusted to the needs of the specific gland classification (radial or axial, static or dynamic, etc.).

3.2.3 Modified Gland Dimensions

The standard gland dimensions may be modified in a given application to achieve the best sealing configuration. In computing special gland configurations, the design criteria in Section 5 should be reviewed.

3.2.4 Lead-In Ramps

Radial seal applications require lead-in ramps to prevent seal damage as the rod is assembled into the bore. View K in Figure 1 depicts the preferred external and internal ramps. The entering diameters of the ramps should be sized such that the seals first contact the ramp slope.