



AEROSPACE STANDARD

AS6837™

Issued 2021-06

Superseding ARP3050

Required O-ring Sizes for Quality Conformance Testing

RATIONALE

New specification to specify required O-ring sizes for quality conformance testing.

1. SCOPE

1.1 Purpose

The purpose of this document is to specify the O-ring sizes that are suitable for quality conformance testing (limited to hardness, tensile tests, compression set, specific gravity, and volume swell per ASTM D1414) required by AMS-7xxx series of specifications. In addition, suppliers and/or users, at their own discretion and/or according to their procurement documents, may choose to invoke this specification for procurement or other purposes for O-ring sizes that are not covered by AS568.

If additional tests are specified as quality conformance tests in any AMS-7xxx specification, then that specification shall also specify the required test size for that additional test. This document does not address O-ring size for qualification testing required by AMS-7xxx series of specifications since that is already specified in the AMS-7xxx specification. This document only covers O-ring sizes required by test type. These O-ring sizes include, but are not limited to, AS568-xxx O-ring sizes. Other testing details such as ASTM or other test methods, etc. are covered elsewhere such as the specific AMS-7xxx specification, etc. and are beyond the scope of this specification and are not addressed in this specification.

AS6837 supersedes ARP3050.

1.2 Background

O-ring specifications do not always specify the specific O-ring size as the appropriate test specimen for quality conformance testing. Typically, phrases like “the finished part,” “if of suitable size,” or “the end item” are used when quality conformance testing is referred to. Currently, this situation is handled by the O-ring manufacturer on a case-by-case basis and sometimes through discussions with the customer. The reason why this is problematic is that physical properties can change as the O-ring size being tested changes. Also, different entities interpret the various phrases listed above differently, leading to confusion and disagreements. It should be noted that some polymer families are more sensitive to this phenomenon than others.

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.

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Documents

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2.1 SAE Publications

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ARP3050 Suitable Test Sizes for O-ring Specifications

AS568 Aerospace Size Standard for O-Rings

3. REQUIREMENTS

Quality conformance testing for O-rings conforming to an AMS-7xxx specification shall be performed on the O-ring size shipped if it meets the size requirements listed below by test. If not, proxy AS568-214 size O-rings (having the same state of cure as O-ring shipped and made from the same batch within 90 days of cure of O-ring shipped) shall be used to perform quality conformance testing. This exception to use a proxy AS568-214 sized O-ring applies individually for each test; if other tests can be performed with the size of O-ring shipped, then those tests shall be run with the shipped O-ring size and not the proxy AS568-214 O-rings. If the test method requires replicate measurements, it shall be permitted to perform the replicate measurements on different O-rings (or sections cut from different O-rings) provided that all the O-rings are from the same lot and batch or sections cut from the same O-ring. Exceptions to these requirements may be agreed to between the seller and purchaser as documented in procurement documents.

3.1 Hardness

Hardness testing shall be on O-ring shipped if both the following conditions are met:

3.1.1 The nominal width of the O-ring shipped is 0.070 inch or larger.

NOTE 1: 1.1 of AS568 refers to O-ring cross-section, but Figure 1 and Table 1 refer to O-ring width (W). Both terms refer to the same dimension, and it is called width in this specification.

3.1.2 The nominal inside diameter (ID) of the O-ring shipped is 0.2 inch or larger.

3.2 Tensile Strength and Elongation

Tensile testing shall be on the O-ring shipped if both the following conditions are met:

3.2.1 The nominal width of the O-ring shipped is no smaller than 0.070 inch and no larger than 0.210 inch.

3.2.2 The nominal ID of the O-ring shipped is no smaller than 0.3 inch and no larger than 5.0 inches.

3.3 Compression Set

Compression set testing shall be on O-ring shipped if the following condition is met:

3.3.1 The nominal width of the O-ring shipped is 0.064 inch or larger, unless otherwise specified.

3.4 Specific Gravity and Volume Swell

The test specimen for specific gravity and volume swell shall always be the O-ring size shipped (or sections cut there-from). If a single O-ring is too small to serve as the complete test specimen, then it shall be permitted to use multiple such O-rings (or sections cut there-from) to perform a test provided all O-rings used shall be of the same lot and batch.