

TECHNICAL SPECIFICATION

No. TS251™

MANUFACTURING, INSPECTION & QUALIFICATION REQUIREMENTS FOR

RIVET, BLIND, SELF-PLUGGING, FLUSH-BREAK, MECHANICALLY LOCKED STEM, ALUMINIUM ALLOY (2014A MATERIAL)

**AS64400™ & AS64403™
AS64400L™ & AS64403L™**



RATIONALE

Second issue of Technical Specification.

Specification updated to clarify testing sample plans & Sheet Take-up fixture & include the requirement for Sheet Take-up as a Production Acceptance test.

For full details of changes, refer to supplementary SAE ITC Amendment Record document TS251-AR.

To place a document order :

Tel from USA & Canada : 877 606 7323
Tel from outside USA : +1 724 772 7545
Fax : +1 724 776 0790

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Email : CustomerService@sae.org
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**SAE INDUSTRY TECHNOLOGIES CONSORTIA
AEROSPACE STANDARDS AND PART QUALIFICATION PROGRAM**

FOREWORD

On the 1st January 2015 the SAE Industry Technologies Consortia (SAE ITC) acquired the ADS Aerospace Standards, previously known as the Society of British Aerospace Companies (SBAC) Aerospace Standards. The SAE ITC established in 2003 operates as a trade association as part of the SAE International Enterprise, providing a unique framework serving the automotive, aerospace and commercial vehicle sectors. Clients include private companies, government agencies, individuals and trade associations. Building consensus and breakthrough barriers to achieve solutions, and the ways by which those solutions take shape are tailored to each client's individual needs.

The legal obligations and copyright authority of all Aerospace Standards that were issued by the ADS Group Limited are therefore assigned / transferred to the SAE ITC.

These Standards are produced by the SAE ITC with the assistance of, and for the benefit of the Aerospace Industry, as part of a continuous programme of Standardisation for Aerospace application under the control of the Technical Standards Committee (TSC) of the SAE ITC.

SAE ITC Standards are published as part of the series of SAE ITC Aerospace Industry Standards, and where appropriate, additional manufacturing and inspection requirements are issued as Reference Sheets (RS) or Technical Specifications (TS). It is the responsibility of those using or specifying a Standard to ensure the product, process, or manufacturer so used or specified, is appropriate for the task or role in question. The SAE ITC wishes to draw special attention to the fact Technical Specifications (TS) include testing and procedures by which a user or Design Authority can establish whether a particular manufacturer, *prima facie*, has the capability to produce hardware in accordance with the appropriate standards and related specifications.

The SAE ITC, its servants, or representatives accept no responsibility for the continued quality of hardware items produced against the relevant drawings and specifications; this responsibility remains with the user.

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It is recommended that Technical Specification TS260, Metallic Materials List of Alternative Material Standards, be consulted prior to manufacture of SAE ITC products.

Each Standard is a facsimile or electronic reproduction of a master drawing, and therefore, any outline view scales stated are not necessarily reproduced accurately. A Master Index of all SAE ITC Aerospace Standards is published separately on the SAE ITC website.

All references to Standards include reference to RS and TS publications.

Details of this and any further information can be obtained from the SAE ITC.

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1. SCOPE

- 1.1 This specification covers the technical requirements for SAE ITC AS series, blind, Aluminium alloy rivets that are self-plugging & have a mechanically locked, flush break stem, in both the plain & Lock Creator versions.

2. MANUFACTURING REQUIREMENTS

2.1 Material

The material shall be as specified in the relevant SAE ITC AS standard.

2.2 Method of Manufacture

Bodies & stems shall be cold forged.

2.3 Dimensions

Bodies & stems shall be manufactured to the dimensions specified in the relevant SAE ITC AS standard.

2.4 Heat Treatment

Bodies & stems shall be heat treated to a sealed process to meet the performance requirements of this technical specification. The sealed process shall not be changed without the agreement of the SAE ITC TSC.

2.5 Surface Treatment

All surface treatments shall be as specified in the relevant AS standard.

2.6 Lubrication

To ensure proper function of the rivet it is permissible to lubricate. All lubricants used shall pass the Lubricant Coating Corrosion Test of Section 10 & shall not be changed without requalification as required by SAE ITC TS201.

3. QUALIFICATION & INSPECTION REQUIREMENTS

3.1 Qualification

The Qualification procedure shall be as specified in SAE ITC TS202. For a summary of the tests required for qualification, see Appendix-G, Table 13.

3.2 Qualification Authority

The Qualification Authority is the SAE ITC Technical Standards Committee.

3.3 Inspection

Clauses 3.4 to 3.7 detail the inspection procedures & requirements that shall be met during both qualification & production.

3.4 Batches

A batch shall consist of the output of a continuous production run of one size of component, from one cast of material, heat treated at one time, free from any interruption or changes such as might be expected to result in a significant variation in the quality of the finished product.

A batch of rivets shall consist of bodies from only one batch, & stems from only one batch.

For a summary of the tests required for batch release, see Appendix-G, Table 14.

3.5 Records

The manufacturer shall maintain batch records for a minimum of 5 years to show the results of the inspection & tests made to the requirements of this specification. The records shall show the batch quantity & the serial numbers of certificates covering acceptance of the material. The acceptance records shall be made available to the customer when required.

3.6 Dimensional Control during Manufacture

The manufacturer shall carry out dimensional checks during manufacture of each batch to a sampling plan in accordance with ISO2859 or ANSI / ASQC Z1.4, to ensure that the quality of the product satisfies the requirements of this Technical Specification.

3.7 Materials, Heat Treatments & Surface Treatments

The manufacturer shall ensure that all materials, heat treatments & surface treatments comply with the relevant requirements & that material identity has been maintained throughout all stages of manufacture.

3.8 Production Tests

In addition to the inspection requirements of clause 3.3, production testing shall be carried out by the manufacturer on every batch of rivets produced & shall consist of the following tests :

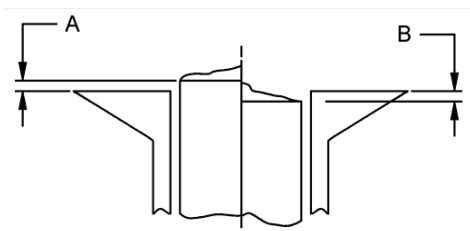
- (a) Installation tests in accordance with Section 4.
- (b) Metallographic inspection, in accordance with Section 9, shall be carried out at the start & finish of each production batch run.
- (c) Sheet Take-up, Shear Tests & Tension Tests, in accordance with Sections 5, 6 & 7 respectively, shall be carried out with sufficient frequency to ensure that the quality of the rivet is maintained.

4. INSTALLATION TESTS

From each batch of rivets sufficient samples shall be withdrawn to satisfy the requirements of the following clause :

4.1 Stem Flushness

Rivet samples representing both the minimum grip/maximum hole size & the maximum grip/minimum hole size shall be installed in test plates which comply with Appendix-A. The sampling frequency shall be in accordance with ISO2859 or ANSI / ASQC Z1.4, level S-3, AQL=4. The incidence of split or cracked bodies shall not exceed 1.5% of batch quantity being tested. The lock shall form satisfactorily in the head of the rivet during the placing operation & shall be flush within the limits of Table 1.



The position of the stem shall lie within the dimensions shown. These apply to both flush & protruding head rivets.

Note : All stem dimensions refer to the intersection of the breaker groove & stem surface. No reference is made to the uneven break surface.

Figure 1

Code	Rivet Nominal Diameter		See Figure 1 Dimension 'A'		See Figure 1 Dimension 'B'	
	mm	ins	mm	ins	mm	ins
4	3,2	.125	0,13	.005	0,38	.015
5	4	.156	0	.000	0,51	.020
6	4,8	.190	0	.000	0,76	.030

Table 1 - Stem Flushness Limits