AEROSPACE STANDARD

AS7236™ REV. A

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Superseding AMS7236

Rivets, Alloy, Corrosion and Heat Resistant 52Co-20Cr-10Ni-15W Solution Heat Treated Procurement Specification For

FSC 5320

RATIONALE

In 3.5.1 and Table 3, add ASTM E92 as alternate method of measuring hardness.

1. SCOPE

1.1 Type

This procurement specification covers aircraft-quality solid rivets made from a corrosion- and heat-resistant cobalt alloy of the type identified under the Unified Numbering System as UNS R30605.

1.2 Application

Primarily for joining parts where a high shear strength is required up to 1500 °F and oxidation resistance up to 2000 °F.

1.3 Dimensions and Tolerances

Unless otherwise specified herein, dimensions and tolerances are in inches.

2. REFERENCES

2.1 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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https://www.sae.org/standards/content/AS7236A

2.1.1 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.

AMS2750 Pyrometry

AMS5759 Cobalt Alloy, Corrosion and Heat-Resistant, Bars, Forging Stock, Forgings, and Rings, 52Co - 20Cr - 10Ni - 15W

2.1.2 U.S. Government Publications

Copies of these documents are available online at https://quicksearch.dla.mil.

MIL-STD-1312 Fasteners, Test Methods

MIL-STD-2073-1 DoD Materiel, Procedures for Development and Application of Packaging Requirements

2.1.3 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E92 Vickers Hardness Testing

2.2 Definitions

DEFECTIVE: A unit of product that contains one or more defects.

PRODUCTION INSPECTION LOT: Shall be all finished parts of the same part number, made from a single heat of alloy, heat treated at the same time to the same specified condition, produced as one continuous run, and submitted for the vendor's inspection at the same time.

2.3 Unit Symbols

° degree, angular

HV10 hardness, Vickers, measured under a 10-kg load

% percent (1% = 1/100)

kg kilogram

3. TECHNICAL REQUIREMENTS

3.1 Material

Shall be AMS5759 corrosion- and heat-resistant alloy wire.

3.1.1 Condition

Wire cold drawn from hot-finished wire or rod that has been previously ground or has had surface preparation (other than by pickling) for removal of seams and other injurious surface imperfections; solution heat treated.

3.2 Design

Rivets furnished to this specification shall conform to the design, dimensions, and other requirements specified on the applicable part drawing.

3.3 Fabrication

Cold headed or hot headed (unless the purchaser permits forming heads by machining), solution heat treated as in 3.3.1, and descaled unless solution heat treatment was done in an atmosphere that prevents scaling.

3.3.1 Heat Treatment

Rivets shall be solution heat treated by heating to 2150 °F ± 25 °F, holding at heat for 10 to 20 minutes, and either quenching in water or rapidly cooling to meet the requirements of 3.5. Furnaces shall be equipped with and operated by automatic controllers and data recorders conforming to AMS2750.

3.4 Runout of Head

The circular runout of rivet head relative to its shank shall be within the full indicator movement (FIM) specified in Table 1, unless otherwise specified on the part drawing. The measurement shall be taken with the indicator stylus touching the periphery of the protruding head, or the conical surface near the top of the flush head, as the rivet is rotated with its shank as an axis.

Table 1 - Circular runout tolerance

Rivet Shank Nominal Diameter Inches	Rivet Head Runout Tolerance FIM, Inches Flush Head	Rivet Head Runout Tolerance FIM, Inches Protruding Head
0.062	0.003	0.010
0.094	0.003	0.010
0.125	0.005	0.010
0.156	0.005	0.015
0.188	0.005	0.015
0.250	0.005	0.020
0.312	0.010	0.020
0.375	0.010	0.020

3.5 Properties

Rivets shall conform to the following requirements:

3.5.1 Hardness

Shall be not higher than 285 HV10, determined in accordance with ASTM E92 or MIL-STD-1312-6.

3.5.2 Formability

Solid-shank rivets shall withstand being driven cold to form a crack-free upset head having a diameter of 1.25 to 1.50 times the nominal shank diameter and a height within the range shown in Table 2 and with expansion of the shank to the full diameter of the hole in which it is installed, using a rivet having a grip length of 1.5 times the nominal shank diameter, provided that the hole diameter is not more than 0.006 inch greater than the nominal shank diameter.

Table 2 - Rivet driven head height

Rivet Shank Nominal Diameter Inches	Head Height Proportion of Nominal Diameter
0.062 and 0.094	0.5 to 1.0
0.125 and 0.156	0.5 to 0.8
0.188 and 0.250	0.5 to 0.8
0.312 and 0.375	0.5 to 0.7

3.6 Quality

Rivets as received by the purchaser shall be sound, smooth, and free from foreign materials and from imperfections detrimental to usage of the parts.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of parts shall supply all samples for the vendor's tests and shall be responsible for performing all required tests. The purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the parts conform to the requirements of this specification.

4.2 Responsibility for Compliance

The manufacturer's system for parts production shall be based on preventing product defects, rather than detecting the defects at final inspection and then requiring corrective action to be invoked. An effective manufacturing in-process control system shall be established, subject to the approval of the purchaser, and used during the production of parts.

4.3 Production Acceptance Tests

The purpose of production acceptance tests is to check, as simply as possible, using a method that is inexpensive and representative of the part usage, with the uncertainty inherent in random sampling, that the parts comprising a production inspection lot satisfy the requirements of this specification.

4.4 Classification of Tests

4.4.1 Acceptance Tests

Tests to determine conformance to requirements for material (see 3.1), design, dimensions, tolerances (see 3.2), runout of head (see 3.4), and hardness (see 3.5.1) are classified as acceptance tests and shall be performed on each production inspection lot. A summary of acceptance tests is specified in Table 3.

Table 3 - Summary of acceptance tests

Characteristic	Req Para	Sample Size	Test Method
Nondestructive Tests			
Design and Dimensions	3.2	4.5.2	Conventional measuring methods
Runout of Head	3.4	4.5.2	Conventional measuring methods
Destructive Tests			
Material Composition	3.1	4.5.1	Per AMS5759
Hardness	3.5.1	4.5.3	ASTM E92 or MIL-STD-1312-6

4.4.2 Periodic Tests

Tests to determine conformance to requirements for formability (see 3.5.2) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by the purchaser.

4.5 Acceptance Tests Sampling

4.5.1 Material

One sample from bars or wire from each heat of alloy.

4.5.2 Nondestructive Tests - Visual and Dimensional

A random sample shall be selected from each production inspection lot in accordance with Table 4.