

Rivets, Blind, Corrosion Resistant Alloy  
67Ni - 31Cu  
Procurement Specification For

FSC 5320

RATIONALE

AS7234 has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Type:

This procurement specification covers tubular, blind rivets fabricated from a corrosion resistant nickel-copper alloy of the type identified under the Unified Numbering System as UNS N04405, and of 52 ksi minimum shear strength for self-plugging style rivets.

1.2 Application:

Intended for use on aerospace propulsion systems in blind or in open locations requiring high shear strength and corrosion resistance up to 800 °F. Pull through style rivets are for nonstructural applications.

2. REFERENCES:

2.1 Applicable Documents:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other documents shall be the issue in effect on the date of the purchase order.

2.1.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

2.1.1.1 Aerospace Material Specifications:

AMS 4674 Alloy Bars and Forgings, Corrosion Resistant, 67Ni-30Cu-0.04S, Free Machining  
AMS 4675 Alloy Bars and Forgings, Corrosion Resistant, 67Ni-30Cu  
AMS 4730 Nickel-Copper Alloy Wire, Corrosion Resistant, 67Ni-31Cu, Annealed

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2.1.2 U.S. Government Publications: Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

2.1.2.1 Military Standards:

MIL-STD-1312 Fasteners, Test Methods  
MIL-STD-2073-1 DOD Materiel, Procedures for Development and Application of Packaging Requirements

2.2 Definitions:

DEFECTIVE: A unit of product which 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 vendor's inspection at the same time.

2.3 Unit Symbols:

% - percent (1% = 1/100)  
ksi - kips (1000 pounds) per square inch  
lbf - pound-force  
°F - degree, Fahrenheit

3. TECHNICAL REQUIREMENTS:

3.1 Material:

- 3.1.1 Hollow Portion (Rivet Sleeve): Shall conform to AMS 4730, except that the sulfur content may be as high as 0.060% by weight. Shall be fabricated from cold drawn wire, or hot finished wire or rod which has been previously ground or has had surface preparation (other than by pickling) for removal of seams and other injurious imperfections.
- 3.1.2 Self-Plugging Stem or Mandrel: Shall conform to AMS 4730, except that the sulfur content may be as high as 0.060% by weight. Shall be fabricated from cold drawn wire or hot finished wire or rod.
- 3.1.3 Pull-Through Stem or Mandrel: Shall be low carbon steel.
- 3.1.4 Locking Collar: Shall conform to AMS 4674 or AMS 4675, unless otherwise specified, where the locking collar is specified as a separate piece.

3.2 Design:

Rivet shall be of multiple-piece construction but shall be an inseparable unit assembly comprising the following (see Figure 1):

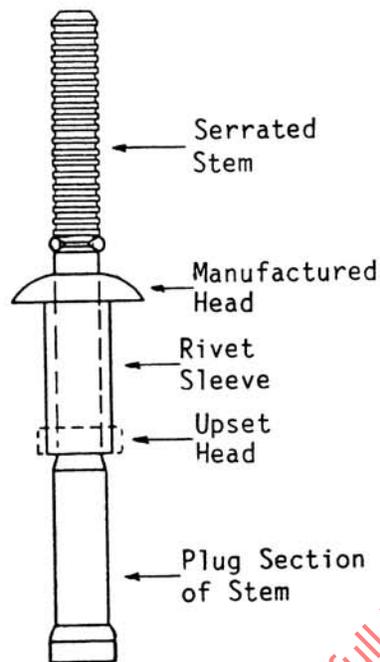


FIGURE 1 - Blind Rivet, Design Details

- Rivet sleeve (hollow portion) having a manufactured head (protruding or flush type, as specified on the part drawing).
- Stem (mandrel) having a serrated portion for gripping tool to pull the plug section of stem into the rivet sleeve to form the blind side upset head. The self-plugging type requires the stem to be trimmed flush with the rivet head after installation, resulting in a rivet having the appearance of a solid rivet (see Figure 2).

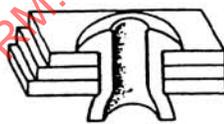
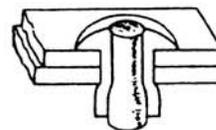
Pull-  
ThroughSelf-  
Plugging

FIGURE 2 - Installed Blind Rivets

## 3.2 (Continued):

- c. The stem of the pull-through type is pulled completely through the sleeve, leaving a hollow rivet of much lower strength than the self-plugging type (see Figure 2).
- d. Locking collar (when specified) within the head of the rivet sleeve mechanically locks the spindle at installation. The locking collar may be integral with the rivet sleeve or a separate piece (see Figure 3).
- e. Rivet sleeves, without the mechanical locking feature, rely on friction to lock the plug section of stem within the riveted sleeve at installation.

3.2.1 Dimensions: Shall be as specified on the part drawing.

3.2.2 Installation Flushness, Mechanically Locked Stem: The properly installed blind rivet that mechanically locks the stem shall have the trimmed stem and the separate piece locking collar flush within the limits shown on Figure 4.

## 3.3 Fabrication:

3.3.1 Hollow Portion: Cold headed, unless purchaser permits machining of the head, pierced or drilled hollow portion, annealed, and descaled if necessary.

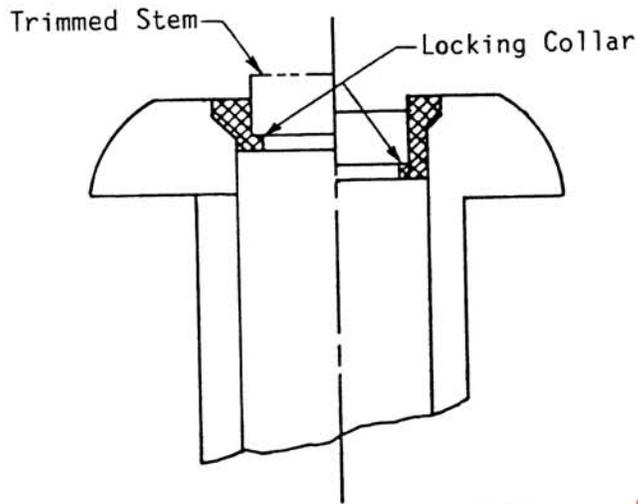
3.3.2 Self-Plugging Spindle or Mandrel: Cold headed, unless purchaser permits machining from cold worked material.

## 3.4 Runout of Head:

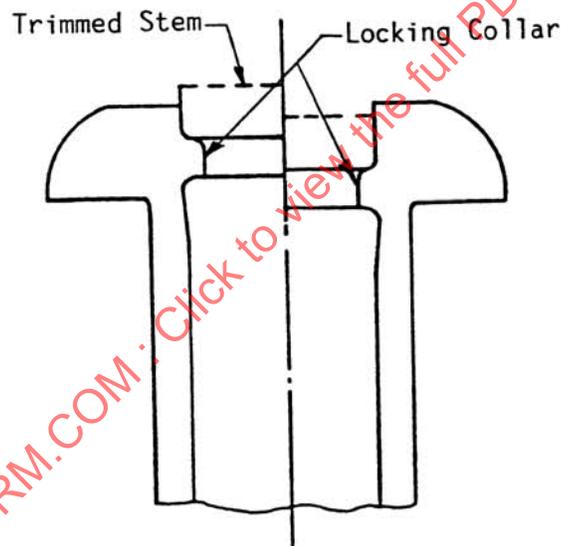
The circular runout of rivet head relative to the shank of the rivet body shall be within the full indicator movement (FIM) specified in Table 1, unless otherwise specified on the part drawing. The measurement shall be taken with the indicator stylus touching the periphery of the protruding head, or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

TABLE 1 - Circular Runout Tolerance

Rivet Shank Nominal Diameter inch	Rivet Head Runout Tolerance	Rivet Head Runout Tolerance
	FIM, inch Flush Head	FIM, inch Protruding Head
0.125	0.010	0.010
0.156	0.010	0.015
0.188	0.010	0.015
0.250	0.010	0.020



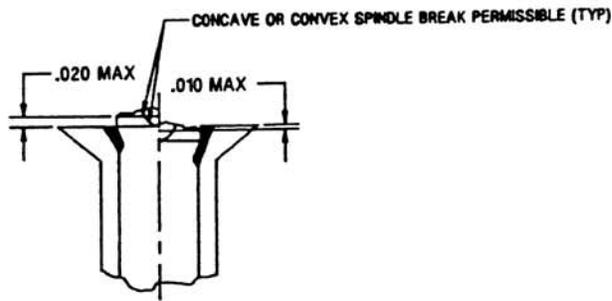
Separate Piece Locking Collar



Integral Locking Collar

FIGURE 3 - Mechanically Locked Plug

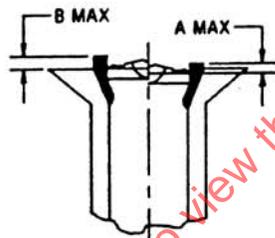
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Stem Limits

Stem shall be not more than 0.020 inch above top of rivet head or more than 0.010 inch below top of rivet head. This applies to both flush and protruding head rivets.

Note: Stem dimensions refer to the intersection of the rolled break notch and the stem locking land. No reference is made to the uneven break surface.



Collar Limits

Locking collar shall be not more than B max above top of rivet head when stem is above rivet head. If stem is flush or below flush with rivet head, locking collar should be not more than A max above stem. This applies to both flush and protruding head rivets.

Dimensions in inches.

Rivet Dia	0.094	0.125	0.156	0.190	0.250
A Max	0.015	0.015	0.020	0.025	0.030
B Max	0.010	0.010	0.010	0.015	0.020

A slight collar flash caused by the pressures necessary to drive the collar is acceptable within the limit shown.

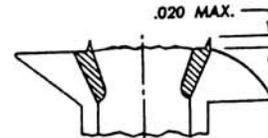


FIGURE 4 - Stem and Collar Flushness Limits

### 3.5 Properties:

#### 3.5.1 Self-Plugging Rivets:

3.5.1.1 Ultimate Shear Strength: Shall be not lower than 52 ksi, tested in lap joint shear in accordance with MIL-STD-1312-4.

3.5.1.2 Retention of Plug: The friction locked plug-section of installed rivets shall withstand an axial force of 15 lbf without being forced out of the riveted sleeve. Mechanically locked plugs shall withstand a push-out load as specified in Table 2.

3.5.2 Pull Through Rivets: Properties unspecified.

TABLE 2 - Plug Retention Load,  
Mechanically Locked

Rivet Shank Nominal Diameter inch	Axial Push-Out Load Installed Condition lbf, minimum
.125	150
.156	250
.187	450

### 3.6 Quality:

Parts shall be uniform in quality and condition, clean, sound, smooth, and free from burrs and foreign materials and imperfections detrimental to the usage of the parts.

## 4. QUALITY ASSURANCE PROVISIONS:

### 4.1 Responsibility for Inspection:

The vendor of parts shall supply all samples for vendor's test and shall be responsible for performing all required tests. 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 production of parts.

#### 4.3 Production Acceptance Tests:

The purpose of production acceptance tests is to check, as simply as possible, using a method which 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:

The inspection and testing of parts are classified as follows:

- a. Acceptance tests which are performed on each production inspection lot. A summary of acceptance tests is shown in Table 3.

TABLE 3 - Summary of Acceptance Tests

TABLE 3A - Nondestructive Tests

Characteristic	Req. Para.	Sample Size	Test Method
Packaging & Identification	5.1	none	Visual examination
Quality	3.6	Table 4	Visual examination
Dimensions	3.2.1	Table 4	Conventional measuring methods
Runout of Head	3.4	Table 4	Conventional measuring methods

TABLE 3B - Destructive Tests

Characteristic	Req. Para.	Sample Size	Test Method
Material	3.1	4.5.1	Per material specification
Ultimate Shear Strength	3.5.1.1	Table 5	MIL-STD-1312-4

- b. Periodic tests which are to be performed periodically on production lots at a frequency selected by the vendor unless frequency of testing is specified by the purchaser. Requirements for retention of plug as in 3.5.1.2 is classified as periodic test.