SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

SAE AS7112/3
Issued 2003-12

Nadcap
Requirements for
Couplings and Formed Sheet Metal Components

1. SCOPE:

This Aerospace Standard (AS) is to be used as a supplement to SAE AS7112. In addition to the requirements contained in AS7112, the requirements contained herein shall apply to suppliers seeking Nadcap Fluid System Components Accreditation for the manufacture of Couplings and formed Sheet Metal Components.

2. REFERENCES:

2.1 SAE Publications:

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

AS7112 Nadcap Fluid System Components Manufacturing Requirements

2.2 PRI Publications:

Available from Performance Review Institute, 161 Thornhill Road, Warrendale, PA 15086-7527.

AC7112 Nadcap Fluids Systems Manufacturers Audit Criteria

3. WORK INSTRUCTIONS:

3.1 There shall be properly identified and referenced work instructions for the manufacture of the product(s).

3.2 Work instructions shall be available at the point of use.

3.3 Equipment to be used shall be defined.

TO PLACE A DOCUMENT ORDER:
Tel: 877-606-7323 (inside USA and Canada)
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: custsvc@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

4. RAW MATERIAL:

4.1 There shall be a clearly identified and referenced procurement specification.

4.2 The procurement specification shall provide for lot identification.

4.3 Applicable handling and storage requirements shall be followed.

4.4 Purchase order requirements shall be defined for certification by the raw material supplier as applicable.

a. Chemical/physical properties

b. Heat lot

c. Surface treatment

d. A copy of certification or other traceability identification shall be attached to or maintained with material throughout its processing to preclude co-mingling and maintain lot traceability?

5. FABRICATION OF COMPONENT PARTS:

5.1 The manufacturer shall have controlled design standard(s)/drawing(s) for component parts.

5.2 The design standard/drawing shall be traceable to the “as qualified” assembly.

5.3 If fabrication is to a detailed industry/customer standard, or license, the design standard/drawing shall be traceable to the source design.

5.4 There shall be documented procedures for machining/forming (rolling, flaring, beading, linear or axial swaging, welding, etc.). Procedures shall address:

a. Sequence of operations

b. Tooling

c. Lubricant(s)/Coolant(s)

d. Cleaning for joining (EPA compliance)

5.5 Inspection criteria shall be established.

6. FABRICATION OF THREADS:

6.1 There shall be documented procedures for all thread forming operations.

6.2 Written instructions shall designate the tooling to be used.

6.3 Inspection gaging shall be listed.

6.4 The inspection interval shall be listed.

6.4.1 Dimensional evaluations shall be performed on the first piece and at established intervals.

6.5 The inspection gaging instructions shall be adequate.

6.6 The heating method shall be included in instructions when hot forming.

6.7 There shall be a method of controlling heating temperature.

6.8 When heat is required, instructions shall list maximum temperature permitted for each material.

6.9 Metallurgical evaluation shall be performed on the first piece and at established intervals.

6.10 Records shall reflect metallurgical and dimensional evaluations.

6.11 Procedures for controlling the manufacturing operations and lab analysis on heated formed parts for metallurgical and dimensional control shall be formalized and approved.

6.12 Work instructions shall specify the thread series in fabrication.

6.13 UNJF/UNF Thread Series:

6.13.1 Variable thread gages shall be used to measure the pitch and functional diameters.

6.13.2 The minor diameter shall be measured.

6.13.3 For external threads, the major diameter shall be measured.

6.13.4 The root radius shall be measured (external threads UNJF series).

6.13.5 For safety critical threads, the following measurements shall be taken:

a. Flank

b. Lead (including helix variation)

c. Functional/pitch differential in lieu of ANPT requirements.

d. Circularity

e. Taper

f. Run-out

g. Surface finish

6.13.6 For coated/plated threads, the pre-plated thread pitch diameter shall be within the allowable limits as defined in AS8879.

6.13.7 For coated/plated threads, the pitch/functional diameters shall be within tolerance after coating/plating.

6.13.8 If SPC is required on threads, there shall be evidence of data on thread key characteristics.

6.14 ANPT Thread Series:

6.14.1 L1, L2, and L3 ring/plug gages shall be used to verify pipe thread conformance.

6.14.2 The finish of the threads shall be verified for conformance to specification/drawing requirements and free from chatter, flaws, blow holes, and abrupt terminations.

7. GRINDING, DRILLING, BROACHING AND STAMPING/BLANKING:

7.1 There shall be documented procedures for grinding, drilling, broaching, and stamping/blanking.