



AEROSPACE STANDARD

AS85052™**REV. B**

Issued 2001-03
Reaffirmed 2015-07
Revised 2020-05

Superseding AS85052A

(R) Clamp Assembly, Loop Type, Cushioned,
General Specification for

RATIONALE

Qualification revised from PRI QPL to QML approved requirement. Note 2.1.1 updated to include documents specified herein. Terminology "Qualification" changed to "Performance Requirement." General updates incorporated. Test mandrel note revised. Notes 3.2.1, 4.4.2, and 4.4.3 revised. Figure 3 redrawn to include missing dimension of flame height for vertical burn test. Figure 2 redrawn to clarify location of accelerometers.

1. SCOPE

1.1 Application

This SAE Aerospace Standard (AS) defines the requirements for loop type clamps primarily intended for general clamping of tubing for aircraft hydraulic systems.

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.

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.

AMS2700	Passivation of Corrosion Resistant Steels
AMS3224	Nitrile-Butadiene Rubber Fuel, Fire, and Ozone Resistant 65 - 75
AMS3253	Ethylene Propylene Rubber Phosphate Ester Resistant 65 - 75
AMS3316	Silicone Rubber, Fiberglass Fabric Reinforced
AMS3660	Polytetrafluoroethylene (PTFE) Moldings, General Purpose Grade, As Sintered

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Full document details: SAE AS85052B

For more information on this standard, visit
<https://www.sae.org/standards/content/AS85052B>

Documents

Document Sharing Hub

AMS4944	Titanium Alloy Tubing, Seamless, Hydraulic, 3.0Al - 2.5V Cold Worked, Stress Relieved
AMS4945	Titanium Alloy Tubing, Seamless, Hydraulic 3Al - 2.5V, Controlled Contractile Strain Ratio, Cold Worked, Stress Relieved
AMS4946	Titanium Alloy Tubing, Seamless, Hydraulic 3Al - 2.5V, Texture Controlled, Cold Worked, Stress Relieved
AMS5528	Steel, Corrosion-Resistant, Sheet, Strip, and Plate 17Cr - 7.1Ni - 1.1Al Solution Heat Treated, Precipitation Hardenable
AMS5529	Steel, Corrosion Resistant, Sheet and Strip 17Cr - 7.1Ni - 1.1Al Solution Heat Treated and Cold Rolled, Precipitation Hardenable 0.0015 to 0.100 inch (0.038 to 2.54 mm) Nominal Thickness
ARP1527	Color Coding - Elastomers for Tube Clamp Cushions
AS478	Identification Marking Methods
AS9138	Aerospace Series – Quality Management Systems Statistical Product Acceptance Requirements
AS85052/1	Clamp, Loop, Tube, 17-7PH CRES, 275 °F, Fuel and Petroleum Based Hydraulic Fluid Resistant
AS85052/2	Clamp, Loop Tube 17-7PH CRES, 275 °F, Phosphate Ester Fluid Resistant
AS85052/3	Clamp, Loop, Tube 17-7 PH CRES, 500 °F
AS85052/4	Clamp Support, Loop, Clamp

2.1.2 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 A582/A582M	Standard Specification for Free-Machining Stainless Steel Bars
ASTM D412	Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
ASTM D1149	Standard Test Methods for Rubber Deterioration – Cracking in an Ozone Controlled Environment
ASTM D3182	Standard Practice for Rubber Material Equipment and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets
ASTM D3951	Standard Practice for Commercial Packaging
ASTM E18	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

2.1.3 PRI Publications

Available from Performance Review Institute, 161 Thorn Hill Road, Warrendale, PA 15086-7527, Tel: 724-772-1616, www.pri-network.org.

AC7112/3	Nadcap Audit Criteria for Fluid Distribution Systems, Couplings and Formed Sheet Metal Components Including Loop and Saddle Clamps
PD1100	Nadcap Program Requirements

2.1.4 ASME Publications

Available from ASME, P.O. Box 2900, 22 Law Drive, Fairfield, NJ 07007-2900, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

ASME Y14.5M Dimensioning and Tolerancing

2.1.5 Department of Defense Specifications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <https://assist.daps.dla.mil/quicksearch/>.

MIL-STD-1916 DOD Preferred Methods for Acceptance of Product

MIL-PRF-83282 Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Metric, NATO Code Number H-537

3. TECHNICAL REQUIREMENTS

3.1 Standard Sheets

The individual item requirements shall be as specified herein and in accordance with the applicable standard sheets. In the event of any conflict between the requirements of this standard and the standard sheet, the requirements of the standard sheet shall govern.

3.2 Performance Requirement

Clamps supplied in accordance with this document shall be representative of products which have been subjected to and which have successfully passed the performance testing requirements specified in this standard.

3.2.1 Manufacturer Accreditation

A manufacturer producing a product in conformance to this procurement specification shall be accredited in accordance with the requirements of PD1100, and AC7112/3, and shall be listed in a Nadcap Qualified Manufacturers List (QML). The QML is available at www.eAuditNet.com.

Users shall regulate source approval by any internal standard qualifying documentations or similar means.

3.3 Materials

Clamp band material and cushioning material shall be as specified on the applicable standard sheet.

3.4 Design and Construction

The design and construction of the clamp shall be as specified herein and in accordance with the applicable standard sheets.

3.4.1 Dimensions and Tolerances

Dimensions and tolerances shall be as specified on the applicable standard sheet.

3.5 Performance

Clamp cushions, clamp bands, and clamp assemblies shall conform to the requirements of this specification and the applicable standard sheet when subjected to the applicable tests specified in this specification and the applicable standard sheets.

3.5.1 Clamp Cushion Performance

3.5.1.1 Physical Properties

When tested in accordance with 4.5.3.1, cushion material must meet the physical property requirements specified in the applicable cushion material specification.

3.5.1.2 Compression Set

The average compression set value of three cushion material specimens shall not exceed the value specified in the applicable cushion material specification (see 4.5.3.2).

3.5.1.3 Flammability

The cushion material shall be tested for flammability in accordance with the applicable cushion material specification and as specified herein (see 4.5.3.3).

3.5.1.4 Titanium Compatibility

When tested in accordance with 4.5.3.4, there shall be no evidence of cracking or pitting of the titanium tubing when observed with a 5 to 10 power magnifying glass.

3.5.1.5 Color Coding

The cushion material shall be color coded in accordance with ARP1527 as specified on the applicable cushion material specification.

3.5.2 Clamp Band Performance

3.5.2.1 Clamp Band Hardness

When tested in accordance with 4.4.4, clamp band hardness shall be 51-59 hardness reading (HR) Rockwell Superficial Scale, 30N.

3.5.3 Clamp Assembly Performance

3.5.3.1 Diametral Retention

Each clamp sample shall be tested in accordance with diametral retention test (see 4.5.4.1) both before and after being subjected to the vibration test (see 4.5.4.2). When tested in accordance with 4.5.4.1, each clamp shall withstand an axial mandrel force as specified in Table 1.

Table 1

Clamp Band Thickness (Inch)	Axial Force (lb)
0.020	15-45
0.032	25-55
0.040	35-65

3.5.3.2 Vibration and Transmissibility

When tested in accordance with 4.5.4.2, no clamp shall exhibit any evidence of cushion separation or other deterioration. There shall be no cracking or separation of metal components. The transmissibility ratio shall be recorded.

3.5.3.3 Ozone Resistance (AS85052/1)

When tested in accordance with 4.5.4.3, the clamps shall not exhibit any evidence of cracking on the outside circumference of the cushion visible to the unaided eye. Cracks in cushion material pinched between the metal band and the cushion shall be considered a failure.

3.5.3.4 Thermal Shock

When tested in accordance with 4.5.4.4, the clamps shall not exhibit evidence of cracking, tackiness, or degradation of the cushion material.

3.6 Surface Texture

All surfaces shall have a smooth finish and be free from burrs and sharp edges. The inside edges of the clamp band shall be rolled or provided with a radius to eliminate sharp edges.

3.7 Identification of Product

3.7.1 Identification of Clamps

All clamps shall be marked as specified on the applicable standard sheet.

3.7.2 Part Numbering and Drawing Numbering

The manufacturer's basic part number and drawing number shall be the same.

3.8 Workmanship

Workmanship shall be of a sufficiently high grade to ensure that clamps are of uniform quality and free from burrs, slivers, sharp edges, or other defects which would affect their service, and shall be uniform in appearance without any mold flash.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the procuring activity. The procuring activity reserves the right to perform any of the inspections set forth in the specification, where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of Inspections

The examination and testing of clamps shall be classified as:

- a. Performance Test Inspection (see 4.3)
- b. Quality Conformance Inspection (see 4.4)

4.3 Performance Inspection

4.3.1 Performance Test Samples

Test samples for testing of AS85052/1, AS85052/2, and AS85052/3 shall consist of 12 clamps of size -02, -04, -06, -08, -10, -12, -16, -20, and -24, plus 20 additional size of -16 clamps for each standard sheet. For the AS85052/1 clamp only, submit 20 additional size -02 clamps. In addition, 20 clamp cushion material slabs shall be provided conforming to ASTM D3182 for each type of cushion material to be tested. Each slab shall identify with the standard sheet number and the direction of weave for fabric reinforced material. Both clamps and material test slabs shall be supplied for each standard sheet to be tested in the quantities as indicated herein.

4.3.2 Inspection Routine

Sample units shall be subjected to the performance testing inspection specified in Table 2 in the order specified, conducted on applicable specimens.