AEROSPACE STANDARD

AS1895™	REV. E

Issued 1985-12
Reaffirmed 2007-08
Revised 2020-03

Superseding AS1895D

(R) Coupling Assembly, V-Retainer, High Pressure High Temperature, Pneumatic Tube

RATIONALE

AS1895/1, /4, /7, /20, /22, and /23 have QPL requirements manufacturers are having difficulty qualifying as the specification is written. The seal (/7 and /23) test requirements were interpreted differently for the seal manufacturers and the QPG. The specification needs to define the way to qualify the seals and clarify coupling qualification. The bolt callout in the procurement spec and the coupling parts standards versus the AS4108 spec needs to be consistent. Define rotational movement for the torsional moment tests and allow equivalent axial plug load test for ATP.

1. SCOPE

1.1 This SAE Aerospace Standard establishes the requirements for a V-retainer coupling, flanges, and seal suitable for joining high pressure and high temperature ducting in aircraft bleed air systems. The rigid coupling joint assembly, hereafter referred to as “the joint,” shall operate within the temperature range of -65 to +1200 °F.

1.2 Types

The joint shall be classified into two basic flange profiles:

1.2.1 Type I

Standard Profile - Per AS24563 Type 2 (1.50 to 7.50 inch duct size), AS1895/12, and AS1895/13

1.2.2 Type II

Low Profile - Per AS24563 Type 1 (1.00 to 7.50 inch duct size), AS1895/14, and AS1895/15

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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ds/content/AS1895E/

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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.

AIR869 V-Couplings, Including V-Band and V-Retainer Coupling Assemblies, Flange and Seal Design, Application of

ARP699 High Temperature Pneumatic Duct Systems for Aircraft

AS478 Identification Marking Methods

AS4108 T-Bolt and Eye Bolt, A-286 CRES, 1000 °F Fatigue Rated

AS8879 Screw Threads - UNJ Profile, Inch Controlled Radius Root with Increased Minor Diameter

AS24563 Flange Profiles, V-Coupling, Design Standard

2.1.2 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 Y14.100 Engineering Drawing Practices

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 D3951 Standard Practice for Commercial Packaging

2.1.4 AWS Publications

Available from American Welding Society, 8669 NW 36 Street, #130, Miami, FL 33166-6672, Tel: 1-800-443-9353 or 305-443-9353, www.aws.org.

AWS D17.1 Specification for Fusion Welding for Aerospace Applications

AWS D17.2 Specification for Resistance Welding for Aerospace Applications

2.1.5 NAS Publications

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

NASM7873 Nut, Self-Locking, 1200 °F

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2.1.6 PRI Publications

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

PD1100 NADCAP Program Requirements

PD2001 Qualified Product Management Council Procedures for Qualified Products Group

PD2101 Aerospace Quality Assurance, Product Standards, Qualification Procedure, Fluid Systems

AC7112 Fluid Systems Manufactures Audit Criteria

2.1.7 U.S. Government Publications

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

MIL-STD-129 Military Marking for Shipment and Storage

MIL-STD-130 Identification Marking of U.S. Military Property

2.2 Definitions

2.2.1 OPERATING LOAD

The highest ambient temperature load per inch of circumference as defined in 3.5.2.1 due to the combined effects of pressure, bending, and axial loading. The operating load is calculated using the highest operating temperature, pressure, bending, and axial loading values corrected to an ambient temperature equivalent load using the temperature correction factors specified herein.

2.2.2 LIMIT LOAD

Limit load is two times operating load. Permanent deformation in excess of 0.2% residual strain of parts is not allowed except for dimensional increase across coupling retainer legs, and allowable leakage rate of air shall not exceed 0.06 SCFM per inch diameter.

2.2.3 ULTIMATE LOAD

Ultimate load is three times operating load. Allowable leakage of air may be exceeded, deformation of parts may occur, but the joint shall remain connected.

2.2.4 BREAK LOOSE TORQUE

The torque required to produce nut rotation from the seated condition.

2.2.5 BREAKAWAY TORQUE

The torque required to produce nut rotation in the unseated condition. Usually one full turn minimum from the seated condition.

2.2.6 RUNNING TORQUE

Sometimes called prevailing torque, is the torque required to produce continuous nut rotation. This torque is used to measure nut drag caused by the self-locking device.

2.2.7 MAXIMUM SELF-LOCKING TORQUE

The maximum acceptable running torque value (40 lb-in).

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2.2.8 INSTALLATION TORQUE

The required nut torque to properly install the coupling.

2.2.9 GAS MEASUREMENT UNIT, STANDARD CUBIC FOOT PER MINUTE (SCFM)

Gas must be defined to have identity. The most widely accepted unit of measurement in the United States is the standard cubic foot, fixed at 60 °F (519.7 °R) and 14.696 psia (760 mm, or 29.92 in Hg). A dry cubic foot of air at these conditions weighs 0.0763 pounds. It is common practice to accept the basic condition as 14.70 psia and 60 °F.

2.2.10 SUPPLIER

The manufacturer of the items described herein. The supplier is responsible for qualification testing (QPL placement) and accredited manufacturer approval (QML placement).

2.2.11 USER

The user is the activity procuring the qualified items described herein.

3. TECHNICAL REQUIREMENTS

3.1 Qualification

The parts tested to meet this qualification document shall be representative of production hardware shipped against their respective design standards. Parts, design, and installation standards covered by this document are listed in Table 1 with the part QML and QPL requirements.

3.1.1 Manufacturer Qualification

A manufacturer producing a product in conformance to this procurement specification shall be accredited in accordance with the requirements of PD2101, PD100, and AC7112, and shall be listed in a Performance Review Institute (PRI) Qualified Manufacturer's List (QML).

3.1.2 Product Qualification

All QPL accredited products shown in Table 1 shall conform to the requirements of this procurement specification and shall be approved in accordance with the requirements of PD2001 and PD2101 for listing in a Performance Review Institute (PRI) Qualified Parts List (QPL).

3.2 Materials

The joint materials shall be uniform in quality, free from defects, suitable for service, consistent with good manufacturing practices, and in conformance with the applicable specifications and requirements stated herein. Specific materials used in the joint components shall be specified on the applicable AS1895 part standard. Cadmium and zinc plating shall not be used.

3.2.1 Nickel Alloy 718, Marking

The flat angular areas between the lugs of the retainers shall have a black, permanent electrochemical etch or Laser marking, repeating "-1000F-" in a black lay line. Letters shall be to the full height of the flat area. Sufficient area shall be left for part marking of the retainers.

3.3 Design and Fabrication

The Type I (standard profile) and Type II (low profile) joints consisting of couplings, flanges, and seals as listed in Table 1 shall fulfill all design and performance requirements of this document. Mating flange profiles shall conform to AS24563 Type 2 (AS1895/12 and AS1895/13) for Type I and AS24563 Type 1 (AS1895/14 and AS1895/15) for Type II.

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Table 1 - Joint control numbers

Joint Type	General Description	Accreditation	Standard
I	Standard Profile Coupling, Single Latch	QPL	AS1895/1
I	Standard Profile Seam Welded Male Flange	QML	AS1895/2
I	Standard Profile Seam Welded Female Flange	QML	AS1895/3
II	Low Profile Coupling, Single Latch	QPL	AS1895/4
II	Low Profile Seam Welded Male Flange	QML	AS1895/5
II	Low Profile Seam Welded Female Flange	QML	AS1895/6
I & II	Seal	QPL	AS1895/7
II	Low Profile Butt Weld Male Flange	QML	AS1895/8
II	Low Profile Butt Weld Female Flange	QML	AS1895/9
I	Standard Profile Butt Weld Male Flange	QML	AS1895/10
I	Standard Profile Butt Weld Female Flange	QML	AS1895/11
I	Standard Profile Male Flange End*	N/A	AS1895/12
I	Standard Profile Female Flange End*	N/A	AS1895/13
II	Low Profile Male Flange End*	N/A	AS1895/14
II	Low Profile Female Flange End*	N/A	AS1895/15
II	Low Profile Male Flange Integral Weld Ring	QML	AS1895/16
II	Low Profile Female Flange Integral Weld Ring	QML	AS1895/17
I	Standard Profile Male Flange Integral Weld Ring	QML	AS1895/18
I	Standard Profile Female Flange Integral Weld Ring	QML	AS1895/19
II	Low Profile Coupling Double Latch	QPL	AS1895/20
I & II	Installation, V-Retainer Coupling Assembly**	N/A	AS1895/21
I	Standard Profile Coupling Double Latch	QPL	AS1895/22
I & II	High Conformance Seal	QPL	AS1895/23

* Design standards only; referenced by /12, /13, /14, /15 standards

** Installation standard only; referenced by /21 standard

3.3.1 Coupling

The material of the coupling shall be corrosion and heat resistant alloy as specified on the applicable AS1895 part standard. The coupling shall be fabricated with integral lugs for coupling hinge and latch. No welding is allowed. The coupling half shall be wrought, forged, or fully machined. The inside surface of the V-retainer shall be coated with dry film lubricant capable of meeting the requirements specified herein.

3.3.1.1 Coupling Half Strength

The coupling shall maintain joint integrity at operating pressure in the event of coupling half failure. The coupling shall be so designed that three-fourths of the coupling half circumference shall be sufficient to maintain joint integrity while at ambient temperature while at operating pressure of Table 2.

3.3.2 Flanges

The material of the flanges (male and female) shall be corrosion and heat resistant alloy as specified on the applicable AS1895 part standard shown in Table 1. The flange shall be designed for resistance seam, butt, or integral ring butt weld to tubing. The seam, butt, and integral ring butt weld flanges shall be intermateable. All flanges must fully conform to the appropriate AS1895 part standard prior to and after welding. The flatness shall conform before and after welding, without additional machining of flanges after welding to tubing. The tube to flange (seam, butt, integral ring butt) weld joint configurations are interchangeable within, material, size, profile type, and qualification by similarity may be used provided that welding flatness requirements are met.

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