SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

SAE AS18280/1

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Sleeve, Bite Type, 24° Cone Flareless Fitting, 3000 psi

1. SCOPE:

1.1 Scope:

This SAE Aerospace Standard (AS) establishes the requirements for bite type sleeves for use with 24° cone flareless fluid connection fittings per AS18280.

1.2 Classification:

Sleeves shall be furnished in the types and styles designated by the applicable AS, MS and other engineering standard drawings. It is intended to serve as a procurement specification for the fittings described herein and in Section 6.

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, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AS5148	Assembly, Installation and Torque for Flareless and Straight Thread Fluid Fittings and Tube Assemblies
AS18280	Fittings, 24° Cone Flareless, Fluid Connection, 3000 psi
AMS-QQ-P-35	Passivation Treatments for Corrosion-Resistant Steel
AMS-QQ-S-763	Steel, Bars, Wire, Shapes and Forgings, Corrosion Resistant

2.1.2 ASTM Publications: Available from ASTM, 100 Barr Harbor, West Conshohocken, PA 19428-2959.

ASTM A 108	Steel Bars, Carbon, Cold-finished, Standard Quality
ASTM A 576	Steel Bars, Carbon, Hot-wrought, Special Quality

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Fittings shall be fabricated of materials listed in Table 1 and in compliance with requirements in this specification or as specified on the applicable part standard drawing.

3.1.1 Heat Treatment: Bite type sleeves shall be heat treated by case hardening or nitriding to metallurgical properties capable of meeting the performance requirements of 3.5. The acceptability of the heat treatment shall be by functional test only in accordance with 3.6. See 6.3 for historical detail metallurgical requirements.

TABLE 1 - Materials

Material	Form	Specification	Alloy & Temper	Material Code
Low alloy steel	Bars, rods	ASTM A 108	1213, 12L14, or 1215	None
		ASTM A 576	1213	None
Corrosion resistant steel	Bars, rods	AMS-QQ-S-763	Class 316	K

3.2 Design and Fabrication:

The design and fabrication of the fittings shall be in accordance with the applicable drawings. The bite type sleeves when assembled to tubing are intended to mate with the 24° cone flareless fitting end of AS18280.

3.3 Finish:

3.3.1 Carbon Steel Bite Type Sleeves: Carbon steel bite type sleeves shall be cadmium plated 0.0003 in minimum to 0.0005 in maximum in accordance with QQ-P-416, Type II. Sleeves shall not be dipped in oil. The ID shall not be subject to a plating thickness requirement and may exhibit bare areas.

3.3.2 Corrosion Resistant Steel Bite Type Sleeves: Class 316 corrosion resistant steel sleeves shall be passivated per AMS-QQ-P-35, Type VI or VII.

3.4 Identification of Product:

All bite type sleeves shall be marked as specified on the applicable drawing in a location not detrimental to the performance of the fitting and not detrimental to the corrosion protection of the fitting.

3.4.1 Manufacturer's Identification: Corrosion resistant steel bite type sleeves shall be trademarked but shall not be marked with the part number and size.

3.4.2 Material Identification: Bite type sleeves shall be marked with the material code letter as shown in Table 1.

3.5 Performance:

The bite type sleeves when assembled to tubing and then with fittings per AS18280 shall meet the performance requirements of AS18280 and the following additional requirements.

3.5.1 Joint Strength: This requirement applies to bite type sleeves in sizes 20 and smaller only on 1/8 hard cres tubing per Table 3 of AS18280. The test assembly when assembled at minimum torque shall withstand the loads as specified in Table 2 without slippage of the sleeve on the tubing or cracking of the sleeve when tested at room temperature per 4.1.3.

TABLE 2 - Minimum Joint Strength of Bite Type Sleeves

Nominal Tube Size in 0.062 Increments	02	03	04	05	06	08	10	12	16	20
Tubing Wall Thickness	0.012	0.016	0.020	0.020	0.028	0.035	0.042	0.058	0.065	0.049
Joint Strength lb	400	800	1300	1800	2500	4200	6200	8800	10,000	9500

3.6 Workmanship:

See AS18280.

4. QUALITY ASSURANCE PROVISIONS:

The quality assurance provisions shall be in accordance with the applicable portions of AS18280 with the following additional requirements.

4.1 Qualification Inspection:

The sleeves shall be subjected to a joint strength test per 4.1.3.

4.1.1 Test Samples: The test samples for the joint strength test shall be as specified in Table 3.

TABLE 3 - Test Samples for Qualification Inspection Tests

Test	Requirement Paragraph	Test Procedure Paragraph	Fitting Description	Material	Quantity Each
Joint Strength	3.5.1	4.1.3	Straight /1/	All /2/	6

NOTES:

/1/ Any straight fitting, union, adapter or plug may be used. There shall be at least one fitting end on each sample that shall be tested with a 24° cone fitting end, nut, and sleeve.
/2/ Each basic type of material shall be tested except that certain alloys and types may be tested in lieu of others as follows: for carbon steel, either 1213, 12L14, or 1215 may be used.

4.1.2 Presetting of Bite Type Sleeves: Bite type sleeves shall be preset on the tubing per AS5148 using a presetting machine or nut and mating fitting end to the number of turns specified. For tube ODs of 1.250 and larger, 5/6 turns shall be used.

4.1.3 Joint Strength Test Procedure: The test specimen shall be mounted in a tensile test machine and strained to rupture at a speed of 0.15 in/min ± 0.04 in/min. No internal pressure shall be applied during the test. The test shall be conducted at room temperature.

4.2 Quality Conformance Inspection:

4.2.1 Sampling: Sampling for the joint strength test shall be performed in accordance with ANSI/ASQC Z1.4, Inspection Level S-3, with an AQL of 4.0%.

4.2.2 Examination and Inspection Methods: Using the sampling of 4.2.1, each lot of sleeves shall be inspected as specified in 4.1.3 for the requirements of 3.5.1.

5. PREPARATION FOR DELIVERY:

See AS18280.

6. NOTES:

6.1 Intended Use:

See AS18280.

6.2 Assembly:

See AS5148.

6.3 Typical Metallurgical Properties for Carbon Steel Sleeves:

In order to meet the performance requirements of the joint strength and metallurgical properties tests for carbon steel sleeves, the following metallurgical properties have been found acceptable and were a performance requirement of MIL-F-18280. These metallurgical properties are now suggested as nominal values to assist in manufacturing sleeves that will meet the performance requirements.

6.3.1 Sleeve Case Depth: A mean case depth of 0.0013 to 0.0020 in should be maintained when determined by microscopic measurement. A minimum of five measurements should be taken at different points on the sleeve with at least two readings on the inner case (ID) and two in the outer case (OD). The cross section should be taken perpendicular to the axis of the sleeve 0.03 to 0.06 in back of the cutting edge, as illustrated on Figure 1.