

## Features, ORFS Tube Fittings

O-ring face seal fittings are intended for general application in industrial and commercial hydraulic systems, where the use of elastomeric seals is acceptable to prevent leakage. These fittings are capable of operating at working pressures from 28 in. Hg (95-kPa) vacuum to 6,000 psi (41.3 MPa) as specified in the tables below. Fitting styles are available to provide connections between tubing, male or female NPTF pipe and SAE J1926/1/ISO-11926-1 O-ring ports.

ORFS fittings supplied by Air-Way feature the SAE J1453 "Style B" O-ring groove design for the tube connection end, which provides improved O-ring retention.

ORFS fittings are typically joined to tubing by means of a braze on tube sleeve and tube nut. Tube preparation and brazing processes follow standard industry practices for high quality braze joints.

The design of the ORFS fitting tube end is identical for either inch or metric tubing. With the exception of stock size, the tube fittings described in this section are interchangeable with equivalent fitting styles (unions, bulkheads, tees, etc.) per ISO 8434-3.

## Performance

Where applicable, fittings are designed and qualified to the requirements of SAE J1453

## Construction

Unless otherwise specified, fittings are machined from carbon steel barstock and forgings. Standard plating is Zinc with a yellow Dichromate finish per ASTM B633 (Type II SC2) and is rated at 96 hours minimum salt spray resistance.

## Threads

**Straight Threads:** Internal and external straight threads conform to the Unified National Class 2A and Class 2B Series respectively, with modified minor diameters where specified. Plated external threads may conform to Class 3A maximum diameters after plating.

**NPTF Threads:** Male and female pipe threads conform to the Dryseal American Standard Taper Pipe Thread (SAE J476a, NPTF) Series which will provide pressure tight joints without the use of a lubricant or sealer. Use of these fittings with non-dryseal NPT pipe or hose ends is not recommended for high-pressure applications.

**Note:** Where not functionally objectionable, use of a compatible lubricant/sealant is recommended for either NPT or NPTF threads to minimize the possibility of galling in assembly.

## Assembly Information

For brazing and assembly instructions, refer to the Technical Data Section for the appropriate fitting end. Also, refer to the Technical Data Section for recommendations regarding tubing pressure ratings and hose/tube routing information.

Please note the following:  
In the design and fabrication of tubing or hose runs for any hydraulic system, precautions should be taken to allow for sufficient adjustment of the hose or tubing so that proper alignment can be attained at the fitting connections. Improper fit-up or misalignment should be corrected before final connections are made. Location of fitting connections should be planned to maximize accessibility. Whenever possible, use a torque wrench to tighten connections to the recommended installation torque.

## Ordering Information

Size of fittings are indicated by dash number relating to sixteenths of an inch for the nominal O.D of the tube size used. Example: 1/2 inch tube = 8/16 or (-8) size.

Order standard fittings from appropriate chart indicating required dash numbers. For example, FF2501-8-6 is 1/2" tube end with 13/16-16 straight thread and 3/8" male pipe thread. Jump size FF2501-8-12 is 1/2" tube end with 13/16-16 straight thread and 3/4" male pipe thread. Pictorial views for each fitting style indicate the correct numbering sequence for fitting ends.

Bulkhead fittings may be ordered with or without lock nuts. To order fittings with lock nut, add (-LN) suffix to base catalog part number.

If information is needed for jump sizes not shown, please contact customer service for engineering assistance. Dimensions are rounded for brevity. Please contact factory for exact dimensions and tolerances.



Nominal Tube Size		Thread Size (Notes 1&2)		Working Pressures					
Nom SAE Dash Size	Nom Inch Tube O.D.	SAE J1453 ORFS Tube End	SAE J1926/2/ ISO 11926-2 O-Ring Port Thread Size	ORFS Tube Ends, Unions and Bulkheads		Heavy Duty Stud Ends Per SAE J1926/2/ISO 11926-2			
						Non-Adjustable Studs		Adjustable Studs	
				MPa	psi	MPa (3)	psi	MPa (3)	psi
-4	1/4	9/16-18 UNF	7/16-20 UNF	41.3	6,000	63	9,000	40	6,000
-5	5/16	5/8-18 UNF	1/2-20 UNF	41.3	6,000	63	9,000	40	6,000
-6	3/8	11/16-16 UNF	9/16-18 UNF	41.3	6,000	63	9,000	40	6,000
-8	1/2	13/16-16 UNF	3/4-16 UNF	41.3	6,000	63	9,000	40	6,000
-10	5/8	1-14 UNF	7/8-14 UNF	41.3	6,000	63	9,000	40	6,000
-12	3/4	1-3/16-12 UN	1-1/16-12 UN	41.3	6,000	40	6,000	40	6,000
-14	7/8	1-5/16-12 UN	1-3/16-12 UN	41.3	6,000	40	6,000	40	6,000
-16	1	1-7/16-12 UN	1-5/16-12 UN	41.3	6,000	40	6,000	31.5	5,000
-20	1 1/4	1-11/16-12 UN	1-5/8-12 UN	27.5	4,000	25	4,000	25	4,000
-24	1 1/2	2-12 UN	1-7/8-12 UN	27.5	4,000	25	4,000	20	3,000

1) Threads per SAE J475 Class 2A ext. Class 2B int. (Ref. ISO-263/ISO-R725)

2) Unified class 2B threads apply to swivel nuts and with minor diameter modified to class 3B limits for locknuts

3) MPa ratings for J1926/2/ISO 11926-2 stud ends are rationalized values as published in those standards.

Nominal Pipe Size		Thread Size	Working Pressures	
Nom SAE Dash Size	Nom Inch Pipe O.D.	Dryseal Pipe Thread (NPTF) Male and Female	Fittings With NPTF Pipe Threads	
			MPa	psi
-2	1/8	1/8-27	34.5	5,000
-4	1/4	1/4-18	27.5	4,000
-6	3/8	3/8-18	21	3,000
-8	1/2	1/2-14	21	3,000
-12	3/4	3/4-14	17	2,500
-16	1	1-11-1/2	14	2,000
-20	1 1/4	1-1/4-11-1/2	8	1,150
-24	1 1/2	1-1/2-11-1/2	7	1,000
-32	2	2-11-1/2	7	1,000

1) Dryseal American Standard Taper Pipe Thread

