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Introduction

The Ferulok fitting design and performance capabilities far exceed the strict requirements of SAE J514 and Military Standards (MIL-F-18866H). The Ferulok fitting is a flareless fitting that consists of a body, a one-piece ferrule, and a nut. On assembly, the ferrule "bites" into the outer surface of the tube with sufficient strength to hold the tube against pressure and seal the fluid, without considerable distortion of the inside tube diameter. Ferulok fittings have a visible bite, allowing the fitting assembler to visually inspect the bite quality, thus significantly minimizing the risk of improper assembly and related service problems. Ferulok fittings are especially suitable for use with tube wall thickness ranging from medium to extra heavy.

How Ferulok Fittings Work

The ferrule in the Ferulok fitting forms pressure tight seals with the tube and the fitting body. These seals are the result of several key characteristics graphically shown in Fig. C1. Below are detailed explanations of each of these key features.

A. When properly assembled, the wedging action of the Ferulok design will cause the end of the tube to press firmly against the seat in the body. This action will cause the tube to develop a small indentation circumferentially on the bottom of the tube. This indentation serves as a good post assembly inspection criterion.

B. As the ferrule moves forward, it contacts the tapered seat of the body, which causes the ferrule to cam inward into the tube. The leading edge of the hardened ferrule makes a clean 360° cut into the outside diameter of the tube. This cut is often termed a "bite" and thus "bite type fitting". As the ferrule makes its bite, a small ridge of material is plowed up in front of the ferrule. This intimate contact of the tube ridge with the ferrule's front face and bite edge gives the fitting its ability to retain high pressure without leaking or blowing off. A second seal point is also created between the now bowed ferrule and the fitting body seat.

C. As the ferrule bites into the tube, the mid section will bow and the inside diameter of the back area firmly grips the tube. This action keeps the stresses, caused by flexural and vibration loading, from being concentrated in the bite area. The "compression grip" at the back end is a key factor for long life in rigorous applications.

All Ferulok parts come with the ferrule, and nut. However, Ferulok fittings can be purchased without nuts and sleeves for use with hose crimp fittings (Fig. C2). This can be done by dropping the 'B' from the part number. For example, (4 CBU-S, 4 CU-S). Sealing occurs between the 24° cone of the fitting body and the hose swivel as shown.

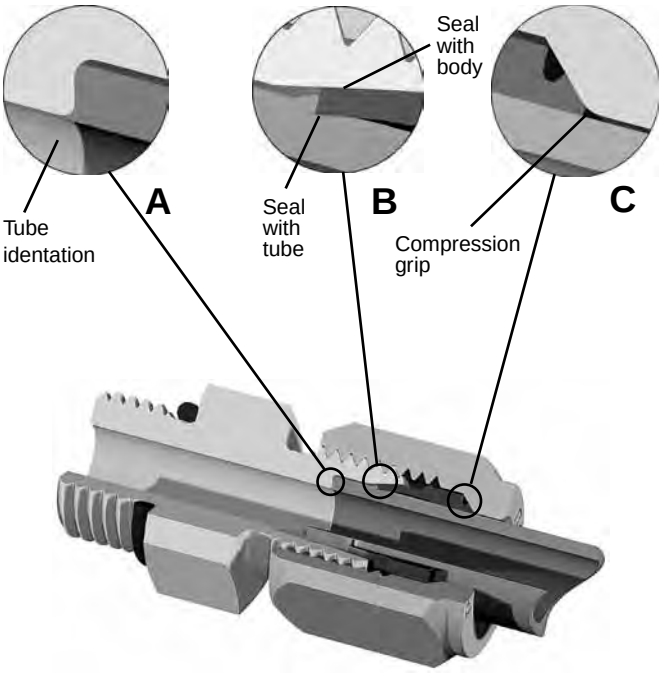

Fig. C1 – Assembled Ferulok Fitting with Tube

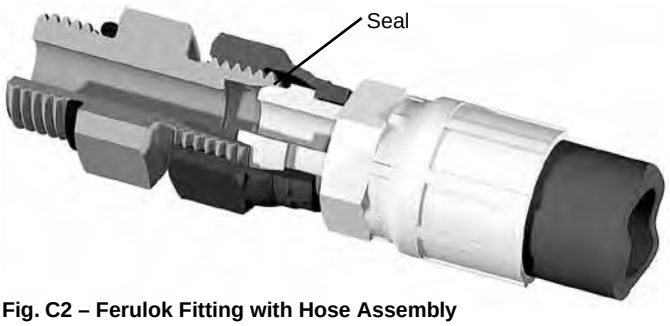

Fig. C2 – Ferulok Fitting with Hose Assembly

Dimensions and pressures for reference only, subject to change.

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The Parker Advantage

Robust Port Stud: The adjustable port stud is manufactured with a longer locknut designed to cover the uppermost threads completely. Since the backup washer is never exposed to the upper threads, it cannot be damaged during assembly. During assembly, exposed upper threads, as common with fittings from other fitting manufacturers, can lead to a deformed backup washer that can pinch the o-ring and create an o-ring extrusion gap that has the potential to leak. The longer locknut also provides a greater grip area for the wrench.

Visible bite: The style A (SAE 08115A) ferrule design allows for an easy inspection of the bite in the tubing. A verification can quickly be achieved which reduces time and assures proper assembly. This assurance also eliminates the risk of leaks and catastrophic failures.

Rear compression grip: The ferrule is also designed with a rear bevel to firmly hold the nut and tubing. This enhancement dampens the effects of vibration in the connection; thus extending the life of the joint.

Metal-to-metal sealing: The metal to metal sealing function broadens the range of both temperatures and media types. The temperature and media range of Ferulok is not limited by an elastomeric seal, but by the range of steel and stainless steel (see page T9 of the General Technical section for material temperature and media compatibility).

Superior Plating: Superior plating gives Parker steel tube fittings unmatched protection against red rust. In neutral salt spray test per ASTM B117, Parker Ferulok fittings substantially exceeded the SAE requirement of 96 hours to red rest.

No special tooling required: Neither flaring nor flanging tools are required to make a Ferulok connection. Smaller sizes of Ferulok can be assembled by a wrench thus reducing tooling costs and assembly time. However, portable presetting equipment is available for larger sizes and/or high production (see Section R of the catalog for equipment available).

Reference locations

Standard Material Specifications: Refer to Table U1 in Appendix page U2.

Assembly and Installation: Please refer to Ferulok Assembly located within the Assembly/Installation section of this catalog.

Recommended Tube Wall Thickness: Please refer to Table U3 located in the Appendix section.

Dynamic Pressure Ratings: Please refer to the last column of the part number tables located on the following pages of this section for the appropriate dynamic pressure ratings.

Seal Material Selection: Please refer to Table T8 in the General Technical section of this catalog for elastomeric seal information.

Tube Recommendation

Maximum tube wall thickness is based on the pressure holding capability of Ferulok fittings. Tubes above the recommended range can be used. However, the pressure holding capability of the assembly will be limited to the fitting capacity. The proper Ferulok assembly procedures as outlined on pages S23 - S26 of this catalog are critical to the performance of the fitting. Steel Ferulok works best with seamless or welded and drawn fully annealed tube, SAE J356, SAE J524, SAE J525 (max. hardness, RB72) or equivalent specification steel tube. For stainless steel Ferulok fittings, types 304 and 316 of ASTM A269, ASTM A213 (max. hardness, RB90) or equivalent stainless steel tube is recommended.

Ferulok fittings are also suitable for use with soft metal tube and various types of plastic tubes such as nylon, polyethylene, etc. When used with plastic tube, it is strongly recommended that a tube insert, such as T23UI, be used to prevent tube pull out due to tensile loading.

See Table U3 in Appendix on Page U3. Consult the Parker Hannifin Tube Fittings Division for other combinations of tube and tube fitting materials not shown.

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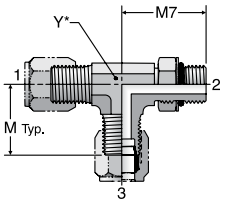
R5BU

Straight Thread Run Tee
Flareless / SAE-ORB

SAE 080428



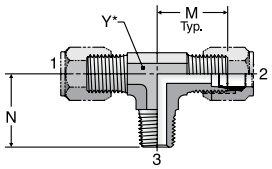
* Y – Across wrench flats

TUBE FITTING PART #	END SIZE 1 (in.)	2 UN/UNF-2A	3 (in.)	M (in.)	M7 (in.)	Y (in.)	Dynamic Pressure (x 1,000 PSI) -S	-SS
4 R5BU	1/4	7/16 - 20	1/4	0.89	1.03	7/16	5.0	5.0
6 R5BU	3/8	9/16 - 18	3/8	1.05	1.25	9/16	5.0	5.0
8 R5BU	1/2	3/4 - 16	1/2	1.25	1.45	3/4	5.0	5.0
10 R5BU	5/8	7/8 - 14	5/8	1.42	1.70	7/8	4.5	4.5
12 R5BU	3/4	1 1/16 - 12	3/4	1.58	1.94	1 1/16	4.0	4.0
16 R5BU	1	1 5/16 - 12	1	1.73	2.05	1 5/16	3.0	3.0

SBU

Male Branch Tee
Flareless / NPTF

SAE 080425



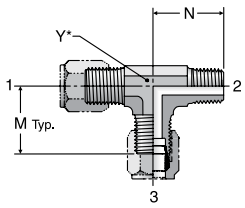
* Y – Across wrench flats

TUBE FITTING PART #	END SIZE 1 (in.)	2 (in.)	3 NPTF	M (in.)	N (in.)	Y (in.)	Dynamic Pressure (x 1,000 PSI) -S	-SS
2 SBU	1/8	1/8	1/8 - 27	0.77	0.72	7/16	5.0	5.0
4 SBU	1/4	1/4	1/8 - 27	0.89	0.78	7/16	5.0	5.0
4-4-4 SBU	1/4	1/4	1/4 - 18	1.03	1.09	9/16	5.0	5.0
5 SBU	5/16	5/16	1/8 - 27	0.95	0.81	9/16	5.0	5.0
6 SBU	3/8	3/8	1/4 - 18	1.05	1.09	9/16	5.0	5.0
8 SBU	1/2	1/2	3/8 - 18	1.25	1.22	3/4	5.0	5.0
8-8-8 SBU	1/2	1/2	1/2 - 14	1.35	1.47	7/8	5.0	5.0
10 SBU	5/8	5/8	1/2 - 14	1.42	1.47	7/8	4.5	4.5
12 SBU	3/4	3/4	3/4 - 14	1.58	1.59	1 1/16	4.0	4.0
14 SBU	7/8	7/8	3/4 - 14	1.66	1.69	1 5/16	3.0	3.0
16 SBU	1	1	1 - 11 1/2	1.73	1.97	1 5/16	3.0	3.0

RBU

Male Run Tee
Flareless / NPTF

SAE 080424



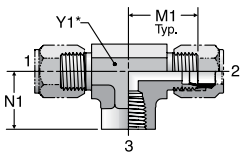
* Y – Across wrench flats

TUBE FITTING PART #	END SIZE 1 (in.)	2 NPTF	3 (in.)	M (in.)	N (in.)	Y (in.)	Dynamic Pressure (x 1,000 PSI) -S	-SS
4 RBU	1/4	1/8 - 27	1/4	0.89	0.78	7/16	5.0	5.0
4-4-4 RBU	1/4	1/4 - 18	1/4	1.03	1.09	9/16	5.0	5.0
5 RBU	5/16	1/8 - 27	5/16	0.95	0.81	9/16	5.0	5.0
6 RBU	3/8	1/4 - 18	3/8	1.05	1.09	9/16	5.0	5.0
8 RBU	1/2	3/8 - 18	1/2	1.25	1.22	3/4	5.0	5.0
8-8-8 RBU	1/2	1/2 - 14	1/2	1.35	1.47	7/8	5.0	5.0
10 RBU	5/8	1/2 - 14	5/8	1.42	1.47	7/8	4.5	4.5
12 RBU	3/4	3/4 - 14	3/4	1.58	1.59	1 1/16	4.0	4.0
14 RBU	7/8	3/4 - 14	7/8	1.66	1.69	1 5/16	3.0	3.0
16 RBU	1	1 - 11 1/2	1	1.73	1.97	1 5/16	3.0	3.0

OBU

Female Branch Tee
Flareless / NPTF

SAE 080427



* Y1 – Across wrench flats

TUBE FITTING PART #	END SIZE 1 (in.)	2 (in.)	3 NPTF	M1 (in.)	N1 (in.)	Y1 (in.)	Dynamic Pressure (x 1,000 PSI) -S	-SS
4 OBU	1/4	1/4	1/8 - 27	0.89	0.66	9/16	5.0	5.0
4-4-4 OBU	1/4	1/4	1/4 - 18	1.03	0.88	3/4	5.0	5.0
6 OBU	3/8	3/8	1/4 - 18	1.05	0.88	3/4	5.0	5.0
8 OBU	1/2	1/2	3/8 - 18	1.23	1.02	7/8	3.0	3.0
10 OBU	5/8	5/8	1/2 - 14	1.42	1.23	1 1/16	3.0	3.0
12 OBU	3/4	3/4	3/4 - 14	1.58	1.36	1 5/16	3.0	3.0
14 OBU	7/8	7/8	3/4 - 14	1.62	1.42	1 5/16	3.0	3.0
16 OBU	1	1	1 - 11 1/2	1.73	1.63	1 5/8	1.7	1.7
20 OBU	1 1/4	1 1/4	1 1/4 - 11 1/2	2.08	1.70	1 7/8	1.5	1.5

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