



**SK Valves & Fittings**

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## **Instrumentation Fittings**

- ❖ Available in tube sizes from 1/16 in. to 2 in. & 2mm to 50 mm.
- ❖ Easy to disconnect and retighten.
- ❖ Wide variety of materials and configurations.

## Introduction:

SK tube fittings are manufactured to stringent quality control program and internal standards which assure the highest quality available in the industry. Two ferrule tube fittings are designed and manufactured to provide effective gas sealing in variety of industrial applications comprising tubing connections. SK tube fittings are commonly used in various industries like oil and gas, petro-chemical/chemical processing, research laboratories, Instrumentation process and control systems, aerospace and defense, chemical processing, power generation, cryogenic, shipbuilding and heavy industrial industries.

## Design and Standard:

Two ferrule compression tube fittings are manufactured under strict quality control program and close tolerances. There is no international / national standard which is followed by tube fitting manufacturers to manufacture these fittings. Every manufacturer have their own design and tolerances which governs the product specifications. Hence for safety purpose, we do not recommend interchange and intermix the components manufactured by different manufacturers.

## Basic Tube Fitting Components:

Available in numerous configurations and size up to two inches, SK tube fittings are made up of four parts consisting of a body, front ferrule, back ferrule, and nut. The fitting make up with compression type two ferrule technology is leak tight and consistent as the design compensates for any tolerances in tube outer diameter, wall thickness, and material hardness.



## Functioning:

SK tube fittings feature a low torque assembly and leak free seal for easy assembly and reassembly. Double ferrule tube fitting uses its design features and geometry to make a connection. When nut is tightened both ferrules moves axially in a controlled manner which does not allow any torque transfer from fitting to the tubing. This ensures there is no stress on the tube and tube do not twist or get distorted. Front and back ferrules play vital role individually while fitting make up. Front ferrule does the sealing whereas back ferrule performs gripping action. The firm grip of back ferrule on tube surface provides excellent vibration fatigue resistance.

Silver plating on the nut threads act as lubricant and prevents galling. The nut can be backed off easily for disassembly and remakes. Usually the fittings are pulled up one and a quarter turn to make leak free assembly. During each re-assembly the nut should be advanced a quarter turn from its previous pulled up position to ensure the adequate tightening and consistent leak free joint. Tube Fittings in smaller sizes less than 6 mm need three quarter to one turn to make up the leak free joint.

## Material of Construction:

Tube Fittings are available in MOC 316 stainless steel as a standard. Tube fittings can also be manufactured in Brass, SS 316L, Monel and other exotic alloys upon request. Raw material outsourced meets requirements of one or more following ASTM specifications.

Material	Bar Stock	Forging
Stainless Steel	ASTM A 276 / A479 SS316	ASTM A 182 SS316
	DIN 4401	DIN 4401
	BS970316-S31	BS970316-S31
Brass	ASTM B16 Alloy 360	ASTM B 124 Alloy 377
	CA-360	CA-377
	CA-345	CA-345
	ASTM B 453 Alloy 345	BS 2872 CZ 122
Alloy 400 (Monel)	ASTM B 164 / ASME SB 164	ASTM B 564 / ASME SB 564
Alloy 825 (Inconel)	ASTM B 425	ASTM B 564 / ASME SB 564
Alloy C-276 (Hastelloy)	ASTM B 574	ASTM B 564
SAF 2507 (Super Duplex)	ASTM A 479	ASTM A 182

## Thread Specifications:

Specifications/standards given in the following table are followed for threaded end of the tube fittings.

End Connection Thread Type	Reference Specifications
NPT	ASME B1.20.1, SAE AS71051
ISO/BSP Parallel	ISO 228
ISO/BSP Tapered	ISO 7, BS EN 10226-1
SAE (Unified)	ASME B1.1

Always use thread sealants on pipe threads. Do not apply sealant / PTFE on tube end of fitting.

Always use O-rings / Gaskets with parallel threads.

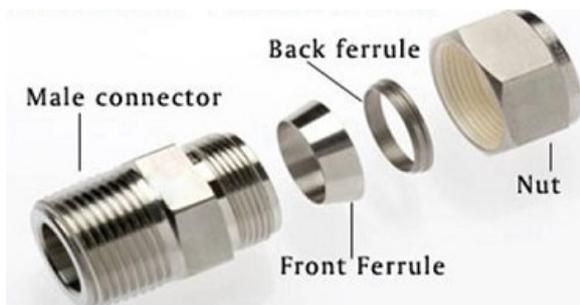
## Cleaning:

All the Fitting manufactured by us are ultrasonically cleaned and free from oil and other impurities.

## Installation and Operational Instructions:

SK Instrumentation tube fittings are double ferrule tube fittings which provides leak-proof tubing connections. Tube fittings are supplied completely assembled and ready to use. To make a connection, one will need tube fitting, appropriate tooling, tube and trained personnel.

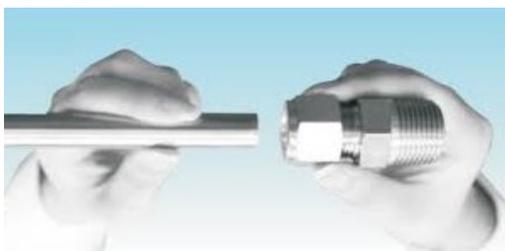
The basic Double-Ferrule Tube Fitting is a four-piece fitting consisting of the nut, back ferrule, front ferrule and the fitting body as shown below.



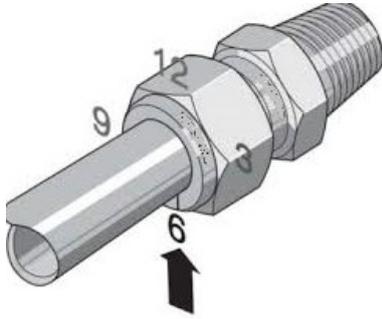
The tube needs to be prepared for making up fittings. Tube ends should be cut at right angle and must be free from burrs, scratches and dent marks for a leak-proof joint. Use of appropriate tools like tube cutter, deburring tools are recommended for preparing tube for connection.

SK tube fittings can be installed in following three easy steps.

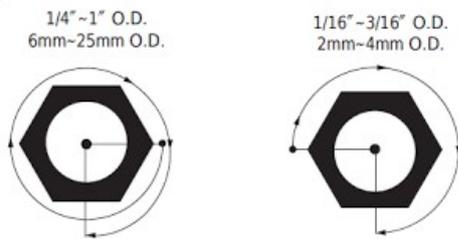
1. Insert the squarely cut and deburred tubing into the fitting and ensure the tubing rests firmly against the fitting body shoulder. Rotate the nut finger-tight until tube does not rotate by hand.



2. Mark the nut at 6 o'clock position.



3. While holding fitting body steady with a spanner, tighten the nut  $1\frac{1}{4}$  turns, from the marked position.



For smaller sizes 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, only 3/4 turn from finger tight is required.

For higher sizes above 1" (25 mm), Pre-swage the ferrules on tubing and tighten  $\frac{1}{2}$  turn.

## Reassembly Instructions:

You may disassemble and reassemble SK tube fittings repeatedly to achieve the same reliable leak-proof connection. We suggest following reassembly steps.

1. Before disassembling mark the position of the nut with respect to fitting body.
2. While making up reassembly, simply insert tube assembly firmly to bottom into fitting body. Hold the body with the spanner and tighten nut to the original position as indicated by the previous mark.
3. Tighten until you feel some resistance (increase in torque) and then give a snug (Approximately  $\frac{1}{4}$  turn) to complete reassembly.

## Preassembly Instructions:

Installations at overhead locations or in the confined areas makes it difficult to make connections with standard assembly procedure. Pre-swaging tools are available which pre-swages ferrules on the tubing. This pre-swaged assembly can then be used to achieve leak proof joints by following installation instructions.

1. Inspect the pre-swaging tool to confirm it is free from burrs and is in good condition. Assemble ferrules and nut on the Preassembly Tool and tighten the nut to finger tight position.
2. Insert the prepared tube through nut and ferrules and ensure the tubing rests firmly against the tool shoulder.
3. From the finger tight position, mark the 6 o' clock position and rotate the nut 1-1/4 turns.
4. Dis-engage the nut from the preassembly Tool and take out the tube with the ferrules pre- swaged onto the tube with axial force. Do not rotate the tubing.
5. Insert tube with pre-swaged ferrules into the fitting body where the desired connection is to be made. Tighten the nut to the finger tight position.
6. To make the final connection, hold the body with the spanner and tighten nut to the original position as indicated by the previous mark. An increase of torque will be felt, from this point give a snug.

For smaller sizes 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, only 3/4 turn from finger tight is required.

\*\* Metric tube fittings are identified by a stepped machined shoulder on both, the body and threaded side of the nut.