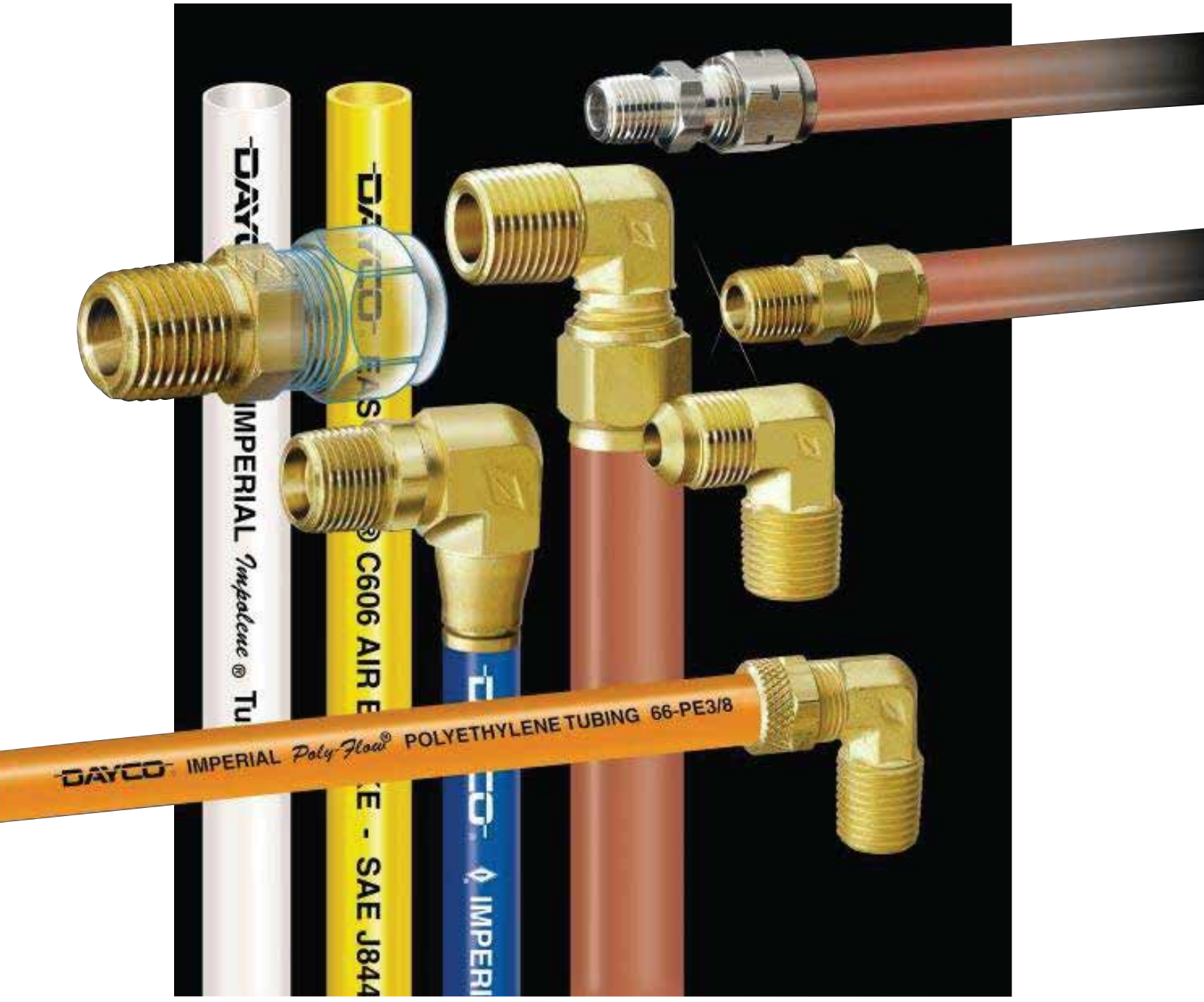
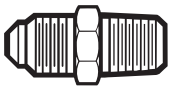
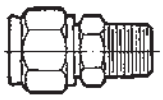
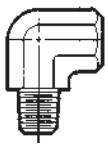
Imperial
TUBING & FITTING

Pneumatic Fittings & Tubing



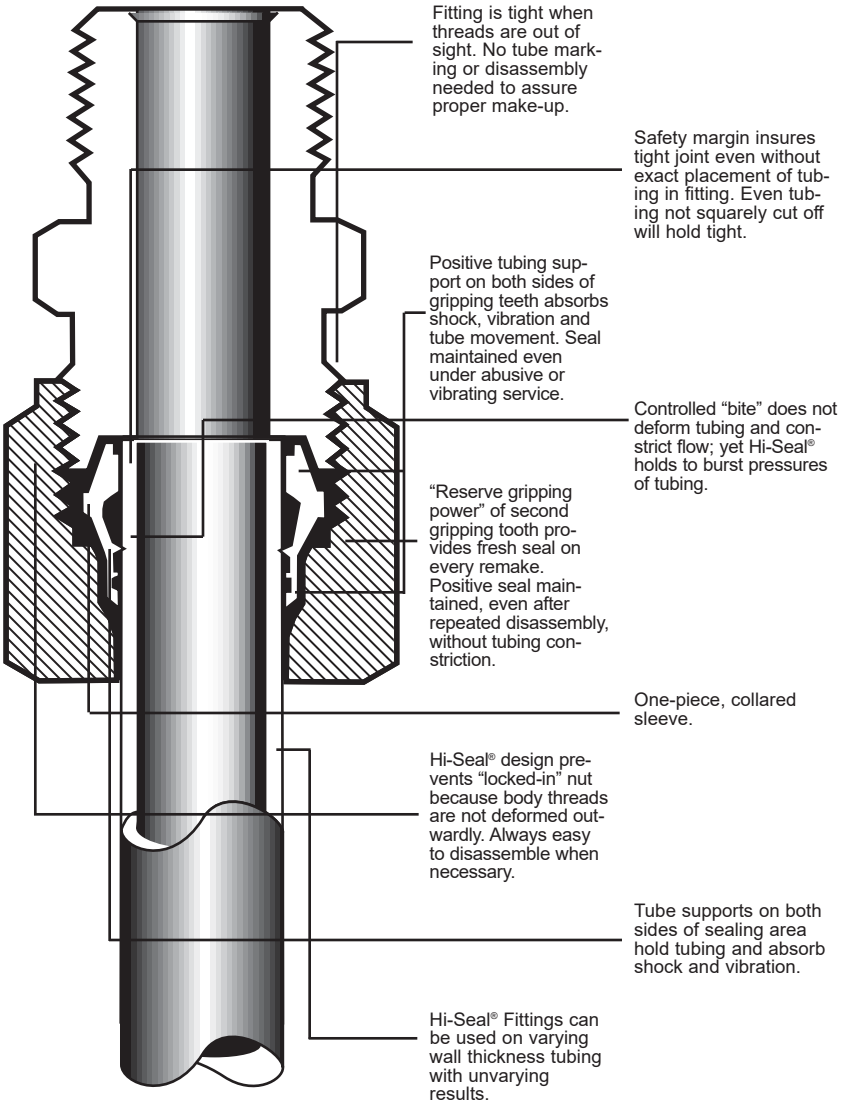
CONTROLS SUPPLY CHAIN
VALVES ACTUATORS INSTRUMENTATIONS

Fitting Descriptions

Style	Working Pressure Maximum	Working Pressure Nominal	Construction	Application	Compatible Tubing
45˚ Flare 	2,850 PSI[A]	225 PSI	• Two-piece: body and nut • Shapes: brass, forged SAE CA377 or equal • Straights: brass, SAE CA360 or equal • 45˚ flared	• Mobile equipment piping • Air compressor piping • HVAC applications (requires forged nut) • Marine • Meets SAE J512 and J513 • ANSI B31.1 and B70.1, ASME Boiler and Pressure Vessel Code	• Copper • Aluminum • Seamless steel
 Hi-Seal® Braze Seal®	19,250 PSI	5,000 PSI	• 3-Piece body, Nut and Sleeve • Available in brass, steel and stainless steel	• Instrumentation systems • Mobile farm and mobile construction equipment • Hydraulic and pneumatic controls • Process control systems • Laboratory equipment	• Copper • Brass • Seamless steel
Brass Pipe 	3,000 PSI	1,000 PSI	• Shapes: Brass, Forged SAE CA377 or equal • Straights: Brass, SAE CA377 or equal • Dryseal Threads • Meets all SAE Brass Pipe Fittings standards	• Air Compressor Piping • Water System Piping • Coolant Transmission Lines	• Brass Pipe • Iron Pipe

[A]Maximum working pressure based on 1/8” O.D. dead soft copper tubing. Please contact Dayco-Imperial for additional information.

Design Features



Compact design saves space. A butt-joint type design and freedom from flaring permit bends to be made exceptionally close to the tube end. In areas where space is limited, tubing must extend through the sleeve but exact placement of tubing in the fitting is not critical.

Available in a variety of metals, styles and sizes. Hi-Seal® variety allows you to specify one product to complete the entire job. Choose from brass, steel, stainless steel, and more.

Meets low and high pressure applications. Hi-Seal® fittings are recommended for low or high pressure service – within the safe pressure ranges of the most commonly used types of commercially available tubing.

Performance in vacuum applications. Independent lab tests of Hi-Seal® fittings indicate **no leakage** when tested by means of a mass spectrometer leak detector, adjusted to indicate a leakage rate of 1.0×10^{-10} standard cubic centimeters of helium per second.

‡Designed for high temperatures. Hi-Seal® fittings meet the following temperature limitations for tubing systems:
800˚F with stainless steel
425˚F with copper and brass
600˚F with steel

Exceeds vibration and shock standards. Hi-Seal® fittings far exceed the minimum requirement of 10,000,000 cycles of vibration required under Military Specification MIL-F-18280E. Hi-Seal® fittings permit overhang deflection because the sleeve gives positive tubing support on both sides of the seal with the tube. Pivot points are eliminated–the cause of failure in many fittings.

Handles repeated assembly. Military Specification MIL-F-18280E also requires that a fitting connection be taken apart and remade a minimum of eight times. Dayco Imperial engineering standards specify a minimum of TWICE the number of remakes required by military specifications. The reserve gripping action of Hi-Seal® fittings permits the fitting to exceed this minimum, while still remaining free from leakage.

Meets industry's conformance. Those conformances include:
- JIC Pneumatic and Hydraulic Standards
- ANSI Code for Pressure Piping
- ASME Code* for Pressure Piping
- DNV**. (Det Norske Veritas' rules for classification of steel ships and mobile offshore units.)
- MIL.** Conforms to MIL-F-18280E and MIL-F-18866G
- NFPA. Manufactured in accordance with NFPA recommended standard numbers T3.8.70.2, T3.8.3R2-1977 and T3.8.9-1976.

*
**Performance standard only. Not dimensionally interchangeable.
‡Temperature ratings given for non-O-ring connectors.

Eliminates welded connections. Say goodbye to welded connections! The Braze-Seal® fitting solves the problems of tubing installations which demand absolute reliability under very high pressures, vacuum, higher temperatures, cryogenics and vibration–applications which formerly required welded connections. That's because Braze-Seal® sleeves contain a special silver alloy brazing ring. This sleeve does not have gripping serrations like the standard Hi-Seal® sleeve.

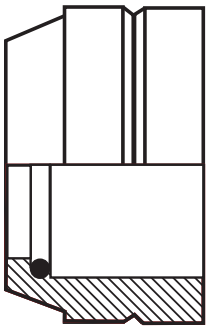
The Braze-Seal® sleeve is placed over the end of the tube and heated, causing the ring of brazing alloy to flow and form a tough, lasting bond between the tube and the sleeve. The Braze-Seal® sleeve and nut are then assembled to the standard Hi-Seal® fitting body.

Same performance as Hi-Seal® connections! This fitting assembly offers all the advantages of the standard Hi-Seal® fittings, including its ability to be repeatedly disconnected and reassembled without loss of original reliability.

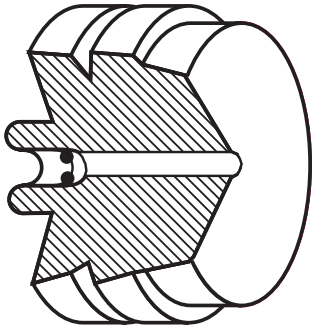
Assembly advantages. The Braze-Seal® fitting is more compact, economical and easier to install than any other fitting made for very high pressure, high and low temperature service. Braze-Seal® fittings require minimum tube preparation. No machining of the tube is necessary. Tube need only be cleaned and fluxed. The easy brazing operation is far faster and cleaner than welded joints.
Reliability for critical installations. The porosity which can occur in a welded joint is eliminated in a Braze-Seal® connection. The brazing ring was especially developed to give 100% coverage, providing a completely reliable connection.

Braze-Seal® fittings eliminate contamination of the system and the need for stress relieving which can be caused by welded connections. Braze-Seal® fittings can be readily inspected for cleanliness before assembly. They allow for correction of installation errors by reheating and removing the sleeve. All of these features eliminate the hazards of a permanently brazed or welded non-threaded connection.

Braze-Seal® fittings will hold high and low pressure volatiles and other fluids where zero leakage is required. These fittings are excellent for cryogenic applications where nitrogen, hydrogen or helium must be conducted under zero leakage conditions. These fittings have been used with complete success on applications which caused every other conventional connecting method to fail.



Braze-Seal® sleeves contain a special silver alloy brazing ring

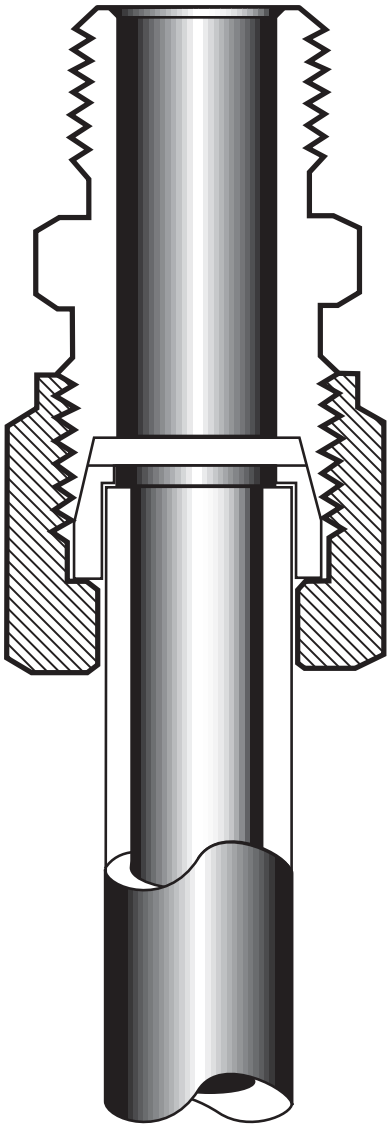


A typical Braze-Seal® reducing sleeve.

Braze-Seal® reducing sleeves connect any body size to a smaller tube O.D. size. An important advantage of a Braze-Seal® fitting is that tubing of a smaller diameter can be connected to any specified fitting body sleeve. (Jump size connections can be made).

This feature is extremely convenient on tees, for example, where any smaller size tube can be connected to the same tee body.

Braze-Seal® reducing sleeves are used with the standard Braze-Seal® nuts and Hi-Seal® bodies.



Maximum Working Pressures

FITTING MATERIAL: **Steel**
TUBING MATERIAL: **Steel, SAE 1010, Dead Soft, Cold Drawn and Brazed Steel**

Commercially Available Tubing Wall Thicknesses
Maximum Recommended Working Pressure
(PSI)

Service Conditions	Tube O.D. (In.)	Seamless Steel, SAE 1010, Dead Soft, Cold Drawn*								Brazed Steel (Such as Bundy or GM)		
		.028	.035	.049	.065	.083	.095	.109	.120	.028	.035	.049
4-to-1 Safety Factor	1/8	6050	7560							6050		
	3/16	4180	5050	7060						4180		7160
	1/4	3350	3800	6210						3350	3800	6210
	5/16	2630	3340	5190						2630	3340	4850
	3/8	1440	2760	3960	5430	7100				2160	2760	3960
	1/2		2020	2900	3940	5160	6000	6980	7750		2020	2900
	5/8			2280	3100	4040	4680	5450	6070			2280
	3/4			1880	2540	3310	3840	4460	5370			
	7/8			1610	2150	2800	3240	3760	4190			
	1			1390	1860	2430	2810	3260	3620			
	1 1/4				1470	1920	2200	2560	3060			
	1 1/2				1210	1580	1820	2120	2320			
6-to-1 Safety Factor	1/8	4040	5110							4040		
	3/16	2790	3360	4700						2790		
	1/4	2240	2530	4070						2240	2530	4070
	5/16	1750	2230	3450						1750	2230	3240
	3/8	960	1840	2740	3620	4740				1440	1840	2740
	1/2		1350	1930	2630	3440	4000	4650	5160		1350	1930
	5/8			1520	2060	2690	3120	3630	4050			1520
	3/4			1250	1690	2200	2560	2980	3550			
	7/8			1070	1440	1870	1260	2500	2800			
	1			920	1240	1620	1870	2180	2410			
	1 1/4				980	1280	1470	1710	2020			
	1 1/2				800	1050	1220	1410	1550			
8-to-1 Safety Factor	1/8	3030	3780							3030		
	3/16	2090	2530	3530						2090		
	1/4	1680	1900	3110						1680	1900	3110
	5/16	1320	1670	2590						1320	1670	2420
	3/8	720	1380	1980	2660	3650				1080	1380	1980
	1/2		1010	1450	1970	2580	3000	3490	3880		1010	1450
	5/8			1140	1550	2020	2340	2720	3040			1140
	3/4			940	1270	1660	1920	2230	2660			
	7/8			805	1080	1400	1620	1880	2100			
	1			700	930	1220	1400	1630	1810			
	1 1/4				735	960	1100	1280	1520			
	1 1/2				605	780	910	1060	1160			
10-to-1 Safety Factor	1/8	2420	3070							2420		
	3/16	1670	2020	2820						1670		
	1/4	1340	1520	2490						1340	1520	2490
	5/16	1050	1340	2080						1050	1340	1940
	3/8	575	1110	1580	2170	2840				865	1110	1580
	1/2		805	1160	1580	2060	2400	2790	3100		805	1160
	5/8			910	1240	1620	1870	2180	2430			910
	3/4			745	1020	1330	1540	1790	2130			
	7/8			590	860	1120	1300	1510	1680			
	1			555	745	970	1120	1300	1450			
	1 1/4				589	765	880	1020	1220			
	1 1/2				485	630	725	850	925			

*Above pressures are based on the use of steel Hi-Seal® fittings with SAE 1010 steel tubing. Higher pressures may be obtained with certain other high strength steel tubing. Check with factory for pressure limitations on type of tubing being used.
Note:
1. Working pressure based on room temperature (72˚F) service. For elevated temperature service, multiply these pressures by derating factors obtained from chart on page 17.
2. Fittings with tapered pipe threads (NPT or NPTF) may have pressure capabilities limited to that of the pipe threads. Such fittings should not be used at pressures exceeding those listed on page .

Maximum Working Pressures

FITTING MATERIAL: Type 316 bodies and nuts with 17-4 PH Sleeves or Stainless Steel
Type 316 assemblies with Type 316 Sleeves
TUBING MATERIAL: Annealed Stainless Steel, Type 304

Commercially Available Tubing Wall Thicknesses
Maximum Recommended Working Pressure
(PSI)

Service Conditions	Tube O.D. (In.)	Type 316 Assemblies 17-4 PH Sleeves (Welded or Seamless Tubing, Hardness Rockwell B 90 Maximum)								Type 316 Assemblies 316 Sleeved (Seamless Tubing, Hardness Rockwell B 90 Maximum)			
		.028	.035	.049	.065	.083	.095	.109	.120	.028	.035	.049	.065
4-to-1 Safety Factor	1/8	8180	10200							8180	10200		
	3/16	5650	6820	9710						5650	6820	9710	
	1/4	4520	5900	8400						4520	5900	8400	
	3/8	2920	3900	5500	7250					2920	3900	5500	7250
	1/2	2150	3000	4100	5500	6980	8100	9430	1050	2150	3000	4100	5500
	5/8	1710	2400	3300	4400	5450	6310	7360	8200	1710	2400	3300	4400
	3/4			2700	3600	4470	5170	6020	6700			2700	3600
	1			1870	2510	3270	3790	4380	4820			1400	1400
	1 1/4			1470	1980	2580	2970	3420	3760				
	1 1/2			1220	1640	2130	2460	2840	3130				
6-to-1 Safety Factor	1/8	5450	6800							5450	6800		
	3/16	3770	4500	6470						3770	4550	6470	
	1/4	3020	3940	5700						3020	3940	5700	
	3/8	1950	2700	3670	4840					1950	2700	3670	4840
	1/2	1430	2000	2740	3660	4650	5400	6290	7000	1430	2000	2740	3660
	5/8	1140	1600	2200	2940	3610	4210	4910	5470	1140	1600	2200	2940
	3/4			1800	2400	2980	3450	4010	4460			1800	2400
	1			1250	1670	2180	2530	2930	3210			925	925
	1 1/4			980	1320	1720	1980	2280	2510				
	1 1/2			814	1100	1420	1640	1900	2090				
8-to-1 Safety Factor	1/8	4090	5100							4090	5100		
	3/16	2830	3410	4860						2830	3410	4860	
	1/4	2260	2950	4200						2260	2950	4200	
	3/8	1460	1950	2750	3630					1460	1950	2750	3630
	1/2	1080	1500	2050	2750	3490	4050	4720	5250	1080	1500	2050	2750
	5/8	855	1200	1650	2200	2740	3160	3680	4100	855	1200	1650	2200
	3/4			1350	1800	2240	2580	3010	3350			1350	1800
	1			935	1260	1640	1900	2200	2410			700	700
	1 1/4			735	990	1290	1490	1710	1880				
	1 1/2			610	820	1070	1230	1420	1570				
10-to-1 Safety Factor	1/8	3270	4080							3270	4080		
	3/16	2260	2730	3890						2260	2730	3890	
	1/4	1810	2360	3360						1810	2360	3360	
	3/8	1170	1560	2200	2900					1170	1560	2200	2900
	1/2	860	1200	1640	2200	2790	3240	3770	4200	860	1200	1640	2200
	5/8	685	960	1320	1760	2180	2530	2950	3280	685	960	1320	1760
	3/4			1080	1440	1780	2070	2410	2680			1080	1440
	1			795	1000	1310	1520	1760	1930			550	550
	1 1/4			585	790	1030	1190	1370	1500				
	1 1/2			485	655	850	980	1100	1250				

Note:
1. Working pressure based on room temperature (72˚F) service. For elevated temperature service, multiply these pressures by derating factors obtained from chart on page 17.
2. Fittings with tapered pipe threads (NPT or NPTF) may have pressure capabilities limited to that of the pipe threads. Such fittings should not be used at pressures exceeding those listed on page .

Maximum Working Pressures

FITTING MATERIAL: Stainless Steel, Type 316, bodies and nuts with 17-4 PH Sleeves
TUBING MATERIAL: 1/8 Hard Stainless Steel, Type 304 (Hardness Rockwell C 25 Maximum)

Service Conditions	Tube O.D. (In.)	Commercially Available Tubing Wall Thicknesses Maximum Recommended Working Pressure (PSI)							
		.028	.035	.049	.065	.083	.095	.109	.120
4-to-1 Safety Factor	1/8	13400	16800						
	3/16	9300	11200	15700					
	1/4	7440	9500	13800					
	3/8	4800	6110	8820	12000				
	1/2	3520	4500	6450	8760	11500	13400	15600	
	5/8	2820	3540	5160	6970	8960	10400	12100	13500
	3/4	2310	2940	4170	5660	7350	8520	9930	11000
	1	1740	2160	3090	4140	4500			
	1 1/4		1740	2430	3270	4250			
	1-1/2		1440	2010	2700	3510			
6-to-1 Safety Factor	1/8	8940	11200						
	3/16	6200	7460	10500					
	1/4	4950	6330	9200					
	3/8	3200	4070	5880	8000				
	1/2	2340	3000	4300	5840	7660	8930	10400	
	5/8	1880	2360	3440	4550	5970	6940	8060	9000
	3/4	1540	1960	2780	3780	4900	5680	6610	7340
	1	1160	1440	2060	2760	3000			
	1 1/4		1160	1620	2180	2840			
	1 1/2		960	1340	1800	2340			
8-to-1 Safety Factor	1/8	6700	8400						
	3/16	4650	5600	7850					
	1/4	3720	4750	6900					
	3/8	2400	3060	4410	6000				
	1/2	1710	2750	3230	4380	5750	6700	7800	
	5/8	1410	1770	2580	3990	4480	5200	6050	6750
	3/4	1170	1470	2080	2840	3680	4260	4950	5500
	1	870	1080	1550	2070	2250			
	1 1/4		870	1220	1640	2120			
	1 1/2		720	1010	1350	1760			
10-to-1 Safety Factor	1/8	5360	6720						
	3/16	3720	4480	6280					
	1/4	3960	3800	5720					
	3/8	1920	2440	3520	4800				
	1/2	1410	1800	2680	3510	4600	5360	6240	
	5/8	1130	1420	2060	2790	3590	4160	4840	5400
	3/4	925	1180	1640	2270	2940	3410	3970	4400
	1	695	865	1240	1660	1800			
	1 1/4		695	972	1310	1700			
	1 1/2		575	805	1080	1410			

Note:
1. Working pressure based on room temperature (72˚F) service. For elevated temperature service, multiply these pressures by derating factors obtained from chart on page 17.
2. Fittings with tapered pipe threads (NPT or NPTF) may have pressure capabilities limited to that of the pipe threads. Such fittings should not be used at pressures exceeding those

Maximum Working Pressures

FITTING MATERIAL: Brass
TUBING MATERIAL: Copper, Dead Soft, Seamless

Service Conditions	Tube O.D. (In.)	Commercially Available Tubing Wall Thicknesses Maximum Recommended Working Pressure (PSI						
		.028	.032	.035	.042	.049	.065	.083
4-to-1 Safety Factor	1/8	3710	4480	5000				
	3/16	2710	2990	3300	3920	4580		
	1/4	2170	2250	2500	3400	4030		
	5/16	1710	1800	2000	2640	3120		
	3/8	1400	1500	1650	2170	2580	3520	
	1/2	1030	1150	1250	1590	1890	2560	3360
	5/8		935	1000	1250	1400	1800	2520
	3/4			850	1030	1150	1500	2140
	7/8				885	1030	1390	1810
	1					900	1210	1580
6-to-1 Safety Factor	1/8	2470	2980					
	3/16	1810	1990	2200	2620	3060		
	1/4	1450	1500	1670	2260	2680		
	5/16	1140	1200	1330	1630	2080		
	3/8	930	1000	1100	1450	1720	2340	
	1/2	685	765	830	1060	1260	1710	2240
	5/8		625	665	833	930	1200	1680
	3/4			565	685	765	1000	1430
	7/8				589	685	925	1210
	1					600	805	1050

FITTING MATERIAL: Brass
TUBING MATERIAL: Copper, Half Hard, Seamless

Service Conditions	Tube O.D. (In.)	Commercially Available Tubing Wall Thicknesses Maximum Recommended Working Pressure (PSI)						
		.028	.032	.035	.042	.049	.065	.083
4-to-1 Safety Factor	1/8	4210	5100	5700				
	3/16	3080	3400	3750	4450	5200		
	1/4	2470	2560	2840	3860	4580		
	5/16	1940	2040	2280	3000	3570		
	3/8	1170	1710	1880	2470	2940	4000	
	1/2		1310	1420	1810	2150	2910	3820
	5/8		1070	1140	1420	1590	2050	2860
	3/4			965	1170	1310	1710	2440
	7/8				1000	1170	1580	2060
	1					1030	1380	1800
6-to-1 Safety Factor	1/8	2800	3390	3780				
	3/16	2060	2260	2500	2980	3480		
	1/4	1650	1710	1900	2570	3270		
	5/16	1300	1370	1510	1850	2360		
	3/8	1110	1140	1250	1650	1960	2660	
	1/2	820	915	995	1210	1430	1940	2550
	5/8		745	795	995	1110	1360	1910
	3/4			675	815	915	1140	1630
	7/8				700	815	1110	1380
	1					715	965	1190

Note:
1. Working pressure based on room temperature (72˚F) service. For elevated temperature service, multiply these pressures by derating factors obtained from chart on page 17.
2. Fittings with tapered pipe threads (NPT or NPTF) may have pressure capabilities limited to that of the pipe threads. Such fittings should not be used at pressures exceeding those listed on page .

Hi-Seal®

Maximum Working Pressures

PIPE THREAD ENDS

Service Conditions	Pipe Size (In.)	Pipe thread ends–Maximum Recommended Working Pressures (PSI) Fitting Body Material		
		Brass	Carbon Steel	Type 316 Stainless Steel
4-to-1 Safety Factor	1/4	4000	5000	5000
	3/8	3000	4500	5000
	1/2	2000	4000	4000
	3/4	1750	3000	3000
	1	1500	2250	2500
6-to-1 Safety Factor	1/4	2650	3350	3350
	3/8	2000	3000	3350
	1/2	1325	2650	2650
	3/4	1150	2000	2000
	1	1000	1500	1675
8-to-1 Safety Factor	1/4	2000	2500	2500
	3/8	1500	2250	2500
	1/2	1000	2000	2000
	3/4	875	1500	1500
	1	750	1125	1250
10-to-1 Safety Factor	1/4	1600	2000	2000
	3/8	1200	1800	2000
	1/2	800	1600	1600
	3/4	700	1200	1200
	1	600	900	1000

Note:
1. Fittings with tapered pipe ends (male or female) are not recommended if system pressure exceeds these values.
2. Some codes may set lower limits than are indicated here.
3. Refer to previous charts for maximum tube working pressures based on material and on all thickness which may lower values of the above.

Braze-Seal®

Maximum Working Pressures

FITTING MATERIAL: Type 316 Stainless Steel
TUBING MATERIAL: 316 Stainless Steel

Service Conditions	Tube O.D. (In.)	Maximum Recommended Working Pressures (PSI)
Based On 80% Braze Coverage 4-to-1 Safety Factor	1/4	19,250
	3/8	16,000
	1/2	15,600
	9/16	15,400
	5/8	15,400
	3/4	15,000
	7/8	14,000
	1	13,000
	1 1/4	12,000
	1 1/2	11,000

Note: 1. These maximum ratings, which are based on a 4-to-1 safety factor, apply to the brazed connection only. Actual installations must be derated to allow for tube strength, other style ends (if any), fitting body strength and elevated temperatures.
2. It is recommended that tubing with an O.D. of nominal to plus tolerance be used to provide optimum clearance for the brazed joint.
3. Working pressure based on room temperature (72˚F) service. For elevated temperature service, multiply these pressures by derating factors obtained from chart on page 17.
4. Fittings with tapered pipe threads (NPT or NPTF) may have pressure capabilities limited to that of the pipe threads. Such fittings should not be used at pressures exceeding those listed on page .

Maximum Working Pressures

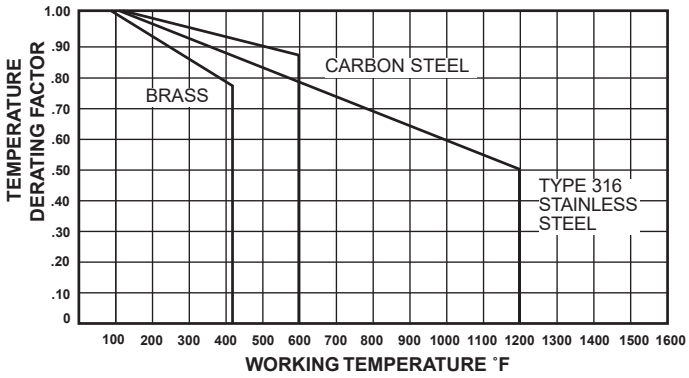
FITTING MATERIAL: Carbon Steel
TUBING MATERIAL: Carbon Steel

Service Conditions	Tube O.D. (In.)	Maximum Recommended Working Pressures (PSI)
Based On 80% Braze Coverage	1/4	15,000
	3/8	12,000
	1/2	11,700
	9/16	
	5/8	11,500
	3/4	11,250
	7/8	10,500
	1	9,700
	1 1/4	9,000
	1 1/2	8,200

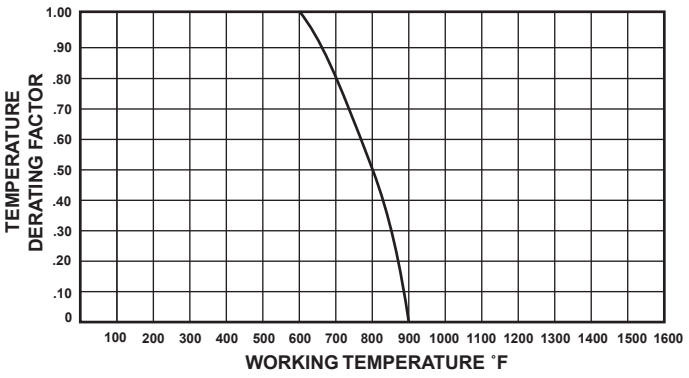
Note: 1. These maximum ratings, which are based on a 4-to-1 safety factor, apply to the brazed connection only. Actual installations must be derated to allow for tube strength, other style ends (if any), fitting body strength and elevated temperatures.
2. It is recommended that tubing with an O.D. of nominal to plus tolerance be used to provide optimum clearance for the brazed joint.
3. Working pressure based on room temperature (72˚F) service. For elevated temperature service, multiply these pressures by derating factors obtained from chart on page 17.
4. Fittings with tapered pipe threads (NPT or NPTF) may have pressure capabilities limited to that of the pipe threads. Such fittings should not be used at pressures exceeding those listed on page .

Derating Factors

DERATING FACTORS for Elevated Temperature Applications for Hi-Seal®



DERATING FACTORS for Elevated Temperature Applications for Braze-Seal®

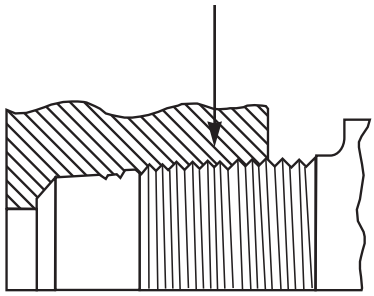


PRESSURE RATING PROCEDURE FOR HI-SEAL® & BRAZE-SEAL® FITTINGS

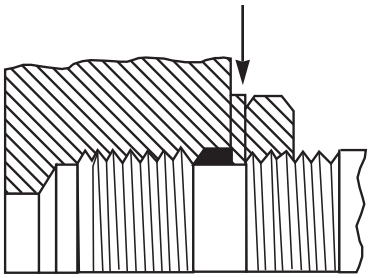
1. For applications involving service at elevated temperatures the pressure rating must be multiplied by an appropriate temperature derating factor obtained from the temperature derating chart above.
2. Carbon Steel fittings not normally recommended above 600˚F.
3. 316 Stainless Steel fittings not normally recommended above 800˚F.
4. These working pressures are not necessarily valid for system components other that Braze-Seal® fitting ends. Prudent system design requires that all other system components be evaluated for their specific proper pressure capabilities.

Assembly Instructions

Male and Female Pipe Thread



SAE Straight Thread Port, Back-Up Washer and Lock Nut



General Information

Port Sealing Methods–Hi-Seal® fittings are furnished with two types of port connections:

1. NPTF Tapered Pipe Threads. Carbon steel, stainless steel, and brass fittings are supplied with dryseal threads, which meet all the appropriate requirements of SAE standards. Fitting bodies are machined with dryseal threads, which are designed to assure better thread contact and to prevent spiral leakage.

The length of dryseal pipe threads is highly valuable when reconnecting. It allows for further takeup; and in combination with the thread form, gives a tighter joint with less chance of leakage.

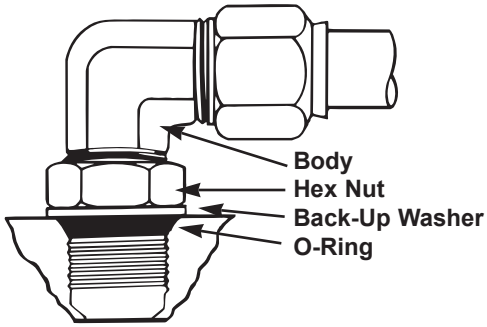
2. Straight Thread O-Ring Seal. For connecting into ports of hydraulic valves and other parts, the O-ring seal offers the following advantages. It eliminates the possibility of broken fittings, deformed housings, and cracking of ports which can result from over-torquing with pipe threads. An O-ring seal also lets you position elbows and tees so that tube ends will always be in proper alignment.

Hi-Seal® elbows and tees with straight thread O-ring seal have a back-up washer crimped into position in the O-ring groove ahead of the lock nut. This washer prevents the O-ring from extruding into threads when the joint is under pressure.

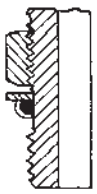
When specifying O-rings, they must be of a compound compatible with the fluid in the system.

Assembly Instructions for Fittings with Straight Thread O-Ring Seal

1. Turn the locknut as far back on the fitting as is possible. Lubricate O-ring by coating with a light oil or petrolatum and position to the extreme rear of the O-ring groove.
2. Turn the locknut down until it just contacts the back-up washer.
3. Holding the fittings and the locknut in position, screw the fitting into the straight thread boss until the back-up washer just contacts the face of the boss.
4. Position the fitting by turning the fitting out (counter clockwise) up to 359˚ and tighten the locknut.
5. On a Hi-Seal® connector the hex on the body takes the place of the locknut. Screw fully into straight thread boss and tighten hex against face of boss.

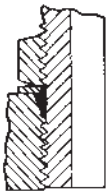


Assembly Instructions for Adjustable Fittings

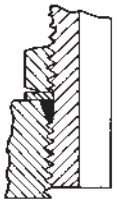


1. Turn the locknut as far back on the fitting as is possible. Lubricate O-ring by coating with a light oil or petrolatum and position to the extreme rear of the O-ring groove.

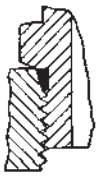
2. Turn the locknut down until it just contacts the back-up washer.



3. Holding the fittings and the locknut in position, screw the fitting into the straight thread boss until the back-up washer just contacts the face of the boss.



4. Position the fitting by turning the fitting out (counter clockwise) up to 360˚ and tighten the locknut.



5. On a Hi-Seal® connector the hex on the body takes the place of the locknut. Screw fully into straight thread boss and tighten hex against face of boss.

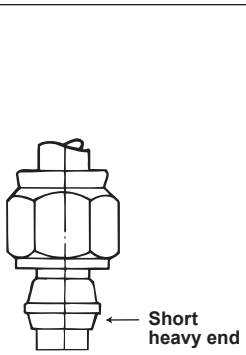


Figure 1

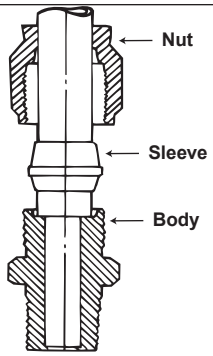


Figure 2

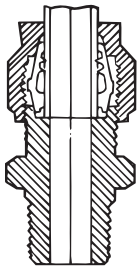


Figure 3

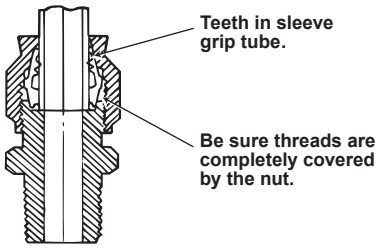


Figure 4

Hi-Seal® Assembly Instructions

1. For best results

A. Always use a fitting whose materials are compatible with the tubing that is used. (e.g when using stainless steel tubing, use 316 stainless steel fittings). This will minimize the possibility of chemical or galvanic corrosion. **B.** Keep in mind that the sleeve should always have a hardness at least equal to that of the tubing used. Type 316 sleeves may be used with seamless annealed stainless steel tubing. **C.** When assembling fittings to both ends of a length of tubing, partly tighten the nut at one end until the tube cannot be turned by hand; then fully tighten the fitting at the other end until the threads are completely covered. Finally, finish tightening the first end until those threads are completely covered.

2. Preparation of Tubing

A. Cut tubing with a tube cutter or a hacksaw with a fine tooth blade and a sawing vise. **B.** Deburr inside and outside of tubing sufficiently to remove burrs to assure that sleeve will slip freely onto the tube.

3. Assembly.

A. Lubricate the threads and the camming area of the nut with a lubricant that will be compatible with the system fluid. Lubrication is especially important with stainless steel assemblies. B. Slide nut onto tubing, place sleeve over end of tube with short, heavy end towards end of tubing (Figure 1). Butt tubing end against tubing stop in body (Figure 2). **C.** Assemble nut, sleeve, and tube to body hand tight (Figure 3). **D.** Tighten nut with a wrench until **threads on body are completely covered by the nut** as shown in Figure 4. This visual check provides positive assurance of a tight joint.

4. Remake(s)

A. When a Hi-Seal® connection is to be reassembled, retighten the Hi-Seal® nut 1/6 turn (one hex flat) beyond the previously assembled position. This will properly reseal the connections.

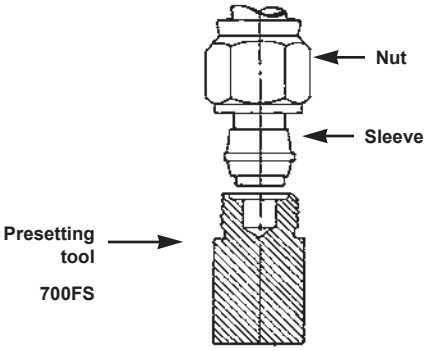


Figure 1

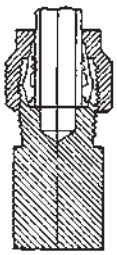


Figure 2

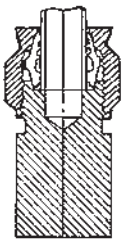


Figure 3

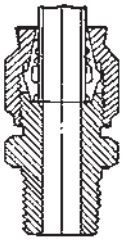


Figure 4

Presetting Instructions for Hi-Seal® Fittings

Normally it is not necessary to preset Hi-Seal® fittings. Presetting is ordinarily used only where adequate torque cannot be applied at point of installation due to space restrictions, or for pre-production assembly. For these cases, special presetting tools are available. In an emergency, a fitting body may be used as a presetting tool.

1. Preparation of Tubing

A. Cut tubing with a tube cutter or a hacksaw with a fine tooth blade and a sawing vise. **B.** Deburr inside and outside of tubing sufficiently to remove burrs and to assure that sleeve will slip freely onto the tube.

2. Presetting

A. Select the proper size presetting tool. **B.** Lubricate the threads and the camming area of the nut with a lubricant that will be compatible with the system fluid. **C.** Slide nut onto tubing and place sleeve over end of tube with short, heavy end facing toward end of tubing as shown in Figure 1. Butt tubing end against tubing stop in tool. **D.** Assemble nut, sleeve and tube to presetting tool hand tight as shown in Figure 2. **E.** Tighten nut with a wrench until **threads on presetting tool are covered by the nut** as shown in Figure 3.

3. Disassembly and Inspection

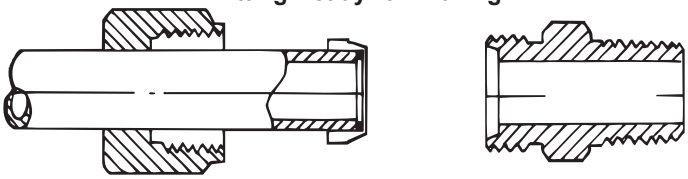
A. Disassemble from presetting tool. **B.** Make sure that: (1) Sleeve has been coined into tubing, leaving a slight concave surface on outside diameter of sleeve. (2) Sleeve does not move longitudinally. (It may rotate on tube).

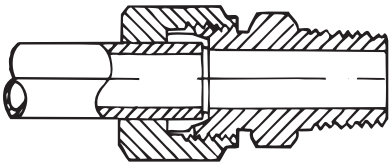
4. Final Assembly

A. Install the line in position and finger tighten nut on body of fitting. **B.** Tighten nut until an increased resistance to turning is felt. At this point the nut should completely cover the threads on the body; if not, tighten until it does. See Figure 4.

Tube O.D. Size (In.)	Typical Assembly Torque (Pounds-Inch)
1/4	600-650
3/8	750-800
1/2	825-875
5/8	875-925
3/4	1100-1175
7/8	1150-1225
1	1250-1350
1 1/4	1475-1575
1 1/2	1725-1825

Fitting Ready for Brazing





After Brazing and Assembly

General Information

To produce a satisfactory brazed joint, certain precautions must be taken. The parts to be brazed must be very thoroughly cleaned so that all scale, oxides, grease, oil, dirt and other foreign materials are removed.

A proper, silver brazing flux must be used. These fluxes are fluid and active at the flow point of the brazing alloy. (Note that sleeve is furnished with silver brazing ring.) Flux should be applied evenly to both the inside and outside of sleeve and outside of tubing with care so that no bare spots remain.

A method of applying heat should be used to heat the tube and sleeve uniformly. When heating with an oxy-acetylene torch, a tip sufficiently large with a soft neutral or slightly reducing flame should be used to give the necessary heat.

As a general rule, best results are obtained when the joint is heated rapidly and kept at the brazing temperature for the minimum time required for proper flowing of the alloy. Resistance heating is acceptable; however, the current must be kept low enough to prevent severe burning at the contact points.

Braze-Seal® Assembly Instructions

1. Preparation of Tubing. Cut tubing squarely with a tube cutter or a hacksaw with a fine tooth blade and a sawing vise. Deburr inside and outside of tubing to remove burrs and to assure that sleeve will slip freely onto the tube.

Inspect tube end for surface imperfections and ovality on the outer circumference. Make sure it conforms to tolerances and meets requirements of applicable specifications.

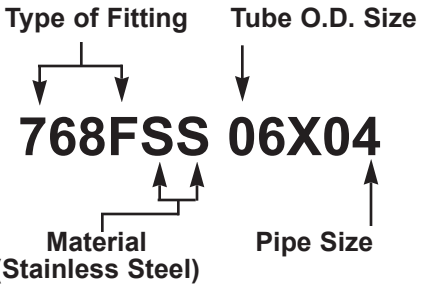
2. Assembly. **A.** Clean sleeve (with silver brazing ring intact) and tube with a solvent to remove all oils and dirt. With a piece of emery cloth, polish the outside surface of the tubing end over a two-inch length to remove any metal oxides which may have formed. **B.** Flux the inside of the sleeve, also covering the silver brazing ring, and place sleeve on tube. Flux the outside of the sleeve. Flux the outside of the tube to a point beyond the sleeve depth. **C.** Holding the tube upright if possible, heat tube and sleeve, concentrating the heat on the tube just beyond the sleeve. Slowly move the torch forward toward the far end beyond the sleeve and back to the tube repeatedly until the braze ring begins to melt. Then move the torch to the near end of the sleeve and hold until an even fillet begins to form. When fillet is formed, remove the torch.

At the flow temperature of the brazing alloy, the tube and sleeve should have a dull red color. While the alloy is still fluid, lightly press the sleeve down so that it abuts the end of the tubing. Push the sleeve all the way onto the tubing. Use a wood block or similar object to avoid damage. **D.** Any excess brazing alloy that runs down the tubing or flows on the seating surface of the sleeve should be wiped off before the alloy solidifies. Allowed the brazed assembly to cool. Then scrub in hot water to remove excess flux. Filing, scratch brush, or emery cloth should not be used to clean excess alloy from the precision seating surface of the sleeve, as scratch marks or flat spots will cause leakage. **E.** Assemble the fitting by tightening the nut. Lubricate the threads and the seat area of the body with an acceptable lubricant that will be compatible with the system fluid. Assemble fitting, using the recommended typical assembly torque values shown above.

Remake(s)

A. When fittings are disassembled, retighten to the original tightness or makeup.

EXAMPLE:



To order Hi-Seal® fittings, one of the following suffix letters must be added to the catalog number to indicate the metal desired:

S Steel. (Low Carbon) Elbows and tees are close grain forgings.

SS Stainless Steel (316)

B Brass

The size designation must also be included with the catalog number.

1. EXAMPLE: When specifying connector 768F in stainless steel, with 3/8" O.D. tube connection and 1/4" male pipe thread. This should be written: No. 768FSS06X04.

2. EXAMPLE: No. 768FSO06 would specify a steel connector for 3/8" O.D. tube with straight thread O-ring port seal on other end.

When fittings with O-ring port seal are desired, this specification must also be included in the catalog number. The letter "O" following the number indicates O-ring.

Materials for Standard Hi-Seal® Fittings

BRASS FITTINGS

Elbows and Tees: Brass forgings–S.A.E. CA377.
Connectors, Unions, Sleeves and Nuts: Stress relieved brass bar stock–S.A.E. CA360 or equivalent.

STEEL FITTINGS

Elbows and Tees: Close grained steel forgings–S.A.E. 12L14 or equivalent.
Connectors, Unions and Nuts: Steel bar stock–S.A.E. 12L14 or equivalent.
Sleeves: Steel bar stock–S.A.E. C-1144, stress relieved, black phosphate finish.
Bodies and Nuts are furnished with zinc plate finish as standard. (Dry film lubricant finish standard on 5/8" nuts and larger.) Black phosphate finish can be obtained on a special order.

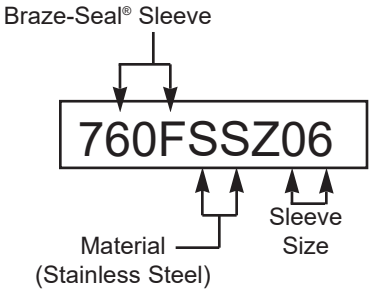
STAINLESS STEEL FITTINGS

Elbows and Tees: Stainless steel forgings–Type 316.
Connectors and Unions: Stainless Steel bar stock–Type 316.
Nuts: Stainless steel bar stock–Type 316. Dry film lubricant finished to provide lubricant for facilitating assembly.
Sleeves: Stainless steel bar stock–Type 316. Type 17-4PH is optional.

Braze-Seal®

Ordering Information

EXAMPLE: Sleeve



How to Specify and Order Braze-Seal® Fittings

Any Hi-Seal® steel or stainless steel fittings can be converted to an extra-reliable Braze-Seal® fitting by replacing the Hi-Seal® nut and sleeve with the Braze-Seal® nut and sleeve.

Braze-Seal®

Presetting Tool

Hi-Seal® Presetting Tool

Made of hardened stainless steel. For presetting Hi-Seal® fittings. Presetting is ordinarily used only when adequate torque cannot be applied at point of installation due to space restrictions, or for pre-production assembly.

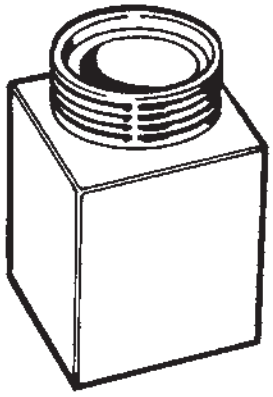
Maintenance of Presetting Tool

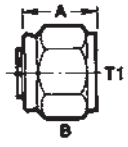
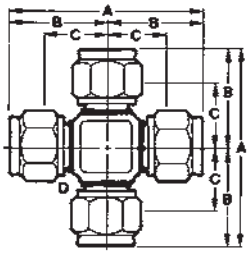
Handle presetting tools with care, being sure that the threads and 12° seat are not nicked or in any way damaged. Do not attempt to rework took if it becomes damaged—obtain a new tool.

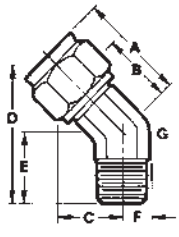
Keep tools stored so that they will not be damaged.

“Seal-peel” dip or a similar protective coating that is used for gauges and tools is recommended.

Part No.
700FS04
700FS06
700FS08

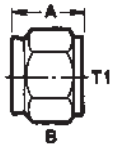
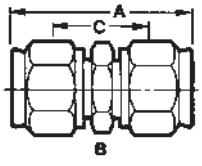
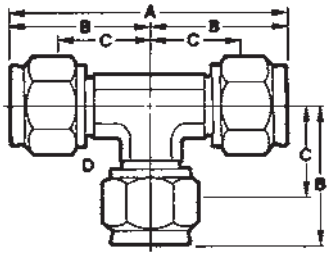
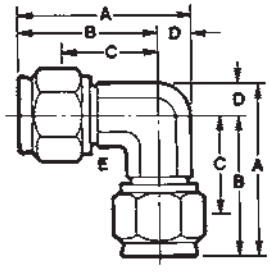


Style	Part No.	Tube O.D.	T1	T2	A	B	C	D
STYLE 708FS Fitting Cap  For capping tube end of any Hi-Seal® fitting. (Includes captive sleeve).	708FS04	1/4	1/2-20		0.594	0.625		
	708FS05	5/16	9/16-18		0.672	0.688		
	708FS06	3/8	5/8-18		0.750	0.750		
	708FS08	1/2	3/4-16		0.891	0.875		
	708FS10	5/8	15/16-16		1.000	1.125		
	708FS12	3/4	1 1/16-16		1.000	1.250		
	708FS16	1	1 5/16-16		1.000	1.500		
STYLE 721FS Tubing Cap  Used with 760FS sleeve and 761FS nut for capping end of tube.	721FS04	1/4	1/2-20		0.281	0.500		
	721FS05	5/16	9/16-18		0.563	0.563		
	721FS06	3/8	5/8-18		0.609	0.625		
	721FS08	1/2	3/4-16		0.656	0.750		
	721FS10	5/8	15/16-16		0.781	0.938		
	721FS12	3/4	1 1/16-16		0.781	1.063		
	721FS16	1	1 5/16-16		0.844	1.313		
STYLE 752FS Cross Tube to Tube to Tube to Tube 	752FS04	1/4			2.156	1.078	0.750	Across Flats 0.563
	752FS06	3/8			2.781	1.391	0.953	0.750
	752FS08	1/2			3.094	1.547	1.000	0.750
	752FS10	5/8			3.625	1.813	1.188	1.063
	752FS12	3/4			3.625	1.813	1.188	1.063

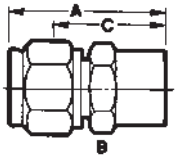
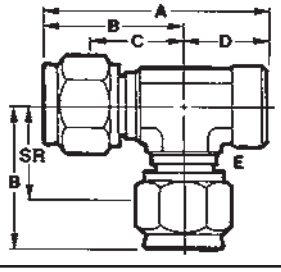
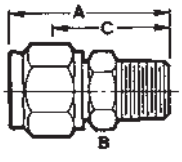
Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	G
STYLE 754FS Male 45˚ Elbow Tube to Male Pipe Thread 						Swing Radius				Across Flats
	754FS04X02	1/4	1/8	0.953	0.625	0.672	1.359	0.688	0.281	0.563
	754FS06X04	3/8	1/4	1.234	0.797	0.828	1.703	0.688	0.281	0.563
	754FS08X06	1/2	3/8	1.328	0.781	0.875	1.813	0.938	0.438	0.875
	754FS10X08	5/8	1/2	1.563	0.938	1.047	2.234	1..188	0.438	0.875
	754FS12X12	3/4	3/4	1.688	1.063	1.188	2.375	1.188	0.656	1.313
	754FS16X16	1	1	1.875	1.250	1.391	2.828	1.438	0.656	1.313
STYLE 760FS Sleeve 	760FS02	1/8								
	760FS03	3/16								
	760FS04	1/4								
	760FS05	5/16								
	760FS06	3/8								
	760FS08	1/2								
	760FS10	5/8								
	760FS12	3/4								
	760FS14	7/8								
	760FS16	1								
	760FS20	1 1/4								

Hi-Seal® Fittings

Material: Steel

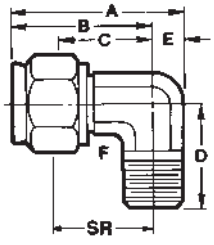
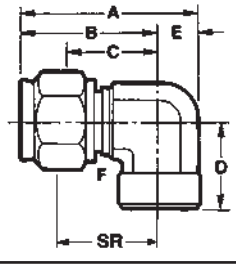
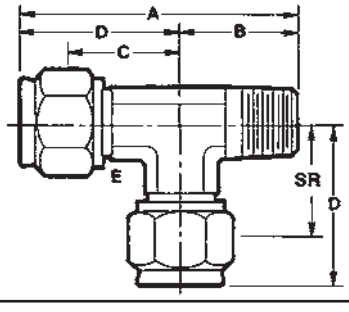
Style	Part No.	Tube O.D.	T1	A	B	C	D	E	F	G
STYLE 761FS **Nut** 	761FS02	1/8	3/8-24	0.516	0.500					
	761FS03	3/16	7/16-20	0.531	0.563					
	761FS04	1/4	1/2-20	0.594	0.625					
	761FS05	5/16	9/16-18	0.672	0.688					
	761FS06	3/8	5/8-18	0.750	0.750					
	761FS08	1/2	3/4-16	0.891	0.875					
	761FS10	5/8	15/16-16	1.000	1.125					
	761FS12	3/4	1 1/16-16	1.000	1.250					
	761FS14	7/8	1 3/16-16	1.000	1.375					
	761FS16	1	1 5/16-16	1.000	1.500					
STYLE 762FS **Union** **Tube to Tube** 	762FS02	1/8		1.344	0.375	0.797				
	762FS03	3/16		1.406	0.438	0.797				
	762FS04	1/4		1.563	0.500	0.953				
	762FS05	5/16		1.781	0.563	0.953				
	762FS06	3/8		1.875	0.625	1.063				
	762FS08	1/2		2.188	0.750	1.156				
	762FS10	5/8		2.500	0.938	1.313				
	762FS12	3/4		2.500	1.063	1.313				
	762FS14	7/8		2.563	1.188	1.375				
	762FS16	1		2.563	1.313	1.375				
	762FS20	1 1/4		3.063	1.375	1.438				
STYLE 764FS **Union Tee** **Tube to Tube to Tube** 	764FS04	1/4		2.156	1.078	0.750	Across Flats 0.437			
	764FS06	3/8		2.844	1.422	0.984	0.625			
	764FS08	1/2		3.344	1.672	1.125	0.750			
	764FS10	5/8		3.875	1.938	1.313	0.875			
	764FS12	3/4		4.125	2.063	1.438	1.063			
	764FS16	1		4.688	2.344	1.719	1.250			
STYLE 765FS **Union Elbow** **Tube to Tube** 	765FS02	1/8		1.172	0.953	0.656	0.219	Across Flats 0.437		
	765FS04	1/4		1.297	1.078	0.750	0.219	0.437		
	765FS05	5/16		1.406	1.156	0.750	0.250	0.500		
	765FS06	3/8		1.641	1.359	0.922	0.281	0.563		
	765FS08	1/2		2.047	1.672	1.125	0.375	0.750		
	765FS10	5/8		2.375	1.938	1.313	0.438	0.875		
	765FS12	3/4		2.594	2.063	1.438	0.531	1.063		
	765FS14	7/8		2.875	2.250	1.625	0.625	1.313		
	765FS16	1		2.969	2.344	1.719	0.625	1.313		

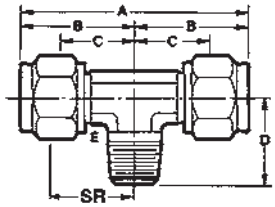
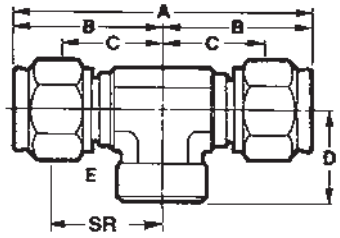
Material: Steel

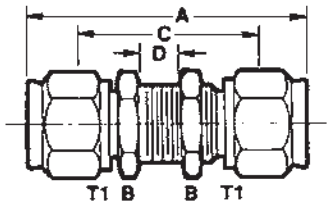
Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	G
STYLE 766FS **Female Connector** **Tube to Female Pipe Thread**  	766FS02X02	1/8	1/8	1.141	0.563	0.844				
	766FS04X02	1/4	1/8	1.281	0.563	0.953				
	766FS04X04	1/4	1/4	1.391	0.750	1.063				
	766FS05X02	5/16	1/8	1.359	0.563	0.953				
	766FS05X04	5/16	1/4	1.469	0.750	1.063				
	766FS06X04	3/8	1/4	1.609	0.750	1.172				
	766FS06X06	3/8	3/8	1.672	0.875	1.234				
	766FS08X04	1/2	1/4	1.766	0.750	1.219				
	766FS08X06	1/2	3/8	1.828	0.875	1.281				
	766FS08X08	1/2	1/2	2.109	1.063	1.563				
	766FS10X08	5/8	1/2	2.188	1.063	1.563				
	766FS12X08	3/4	1/2	2.188	1.063	1.563				
	766FS12X12	3/4	3/4	2.281	1.250	1.656				
	766FS14X12	7/8	3/4	2.281	1.250	1.656				
	766FS16X16	1	1	2.500	1.625	1.875				
STYLE 767FS **Female Run Tee** **Tube to Female Pipe Thread to Tube**  						Body		Across Flats	Swing Radius (SR)	
	767FS04X02	1/4	1/8	1.797	1.109	0.781	0.688	0.500	0.859	
	767FS04X04	1/4	1/4	2.109	1.219	0.891	0.828	0.688	0.953	
	767FS06X04	3/8	1/4	2.391	1.516	1.078	0.875	0.750	1.172	
	767FS08X06	1/2	3/8	2.672	1.734	1.188	0.938	0.875	1.297	
	767FS12X12	3/4	3/4	3.500	2.125	1.500	1.375	1.250	1.641	
	767FS16X16	1	1	3.875	2.250	1.625	1.625	1.625	1.797	
STYLE 768FS **Male Connection** **Tube to Male Pipe Thread**  	768FS02X02	1/8	1/8	1.141	0.437	0.844				
	768FS03X02	3/16	1/8	1.172	0.437	0.844				
	768FS04X02	1/4	1/8	1.281	0.500	0.953				
	768FS04X04	1/4	1/4	1.484	0.625	1.156				
	768FS04X06	1/4	3/8	1.453	0.750	1.125				
	768FS04X08	1/4	1/2	1.828	0.875	1.500				
	768FS05X02	5/16	1/8	1.359	0.563	0.953				
	768FS05X04	5/16	1/4	1.563	0.625	1.156				
	768FS06X02	3/8	1/8	1.438	0.625	1.000				
	768FS06X04	3/8	1/4	1.641	0.625	1.203				
	768FS06X06	3/8	3/8	1.641	0.750	1.203				
	768FS06X08	3/8	1/2	1.969	0.875	1.531				
	768FS06X12	3/8	3/4	1.984	1.125	1.547				
	768FS08X06	1/2	3/8	1.797	0.750	1.250				
	768FS08X08	1/2	1/2	2.141	0.875	1.594				
	768FS08X12	1/2	3/4	2.109	1.125	1.563				
	768FS10X06	5/8	3/8	1.969	0.938	1.344				
	768FS10X08	5/8	1/2	2.250	0.938	1.625				
	768FS10X12	5/8	3/4	2.219	1.063	1.406				
	768FS12X06	3/4	3/8	2.031	1.063	1.406				
	768FS12X08	3/4	1/2	2.250	1.125	1.625				
	768FS12X12	3/4	3/4	2.250	1.125	1.625				
	768FS14X12	7/8	3/4	2.250	1.250	1.625				
	768FS16X12	1	3/4	2.250	1.375	1.625				
	768FS16X16	1	1	2.438	1.375	1.813				

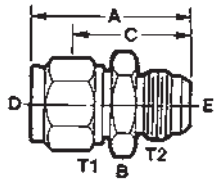
Hi-Seal® Fittings

Material: Steel

Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	Swing Radius (SR)
STYLE 769FS **Male Elbow** **Tube to Male Pipe Thread**  	769FS02X02	1/8	1/8	1.172	0.953	0.656	0.750	0.219	0.437	0.688
	769FS03X02	3/16	1/8	1.203	0.984	0.656	0.750	0.219	0.437	0.734
	769FS04X02	1/4	1/8	1.297	1.078	0.750	0.781	0.219	0.437	0.828
	769FS04X04	1/4	1/4	1.484	1.203	0.875	1.063	0.281	0.563	0.969
	769FS04X06	1/4	3/8	1.641	1.203	0.875	0.969	1.156	0.437	0.750
	769FS05X02	5/16	1/8	1.406	1.156	0.750	0.781	0.250	0.500	0.844
	769FS05X04	5/16	1/4	2.563	1.281	0.875	1.094	0.281	0.563	0.969
	769FS06X02	3/8	1/8	1.641	1.359	0.922	0.875	0.281	0.563	1.016
	769FS06X04	3/8	1/4	1.641	1.359	0.922	1.094	0.281	0.563	1.016
	769FS06X06	3/8	3/8	1.922	1.359	1.109	1.219	0.375	0.750	1.172
	769FS06X08	3/8	1/2	2.000	1.563	1.125	1.250	0.438	0.750	1.313
	769FS06X12	3/8	3/4	2.172	1.641	1.203	1.594	0.531	1.063	1.281
	769FS08X04	1/2	1/4	2.047	1.672	1.125	1.094	0.375	0.750	1.234
	769FS08X06	1/2	3/8	2.047	1.672	1.125	1.219	0.375	0.750	1.234
	769FS08X08	1/2	1/2	2.047	1.672	1.125	1.250	0.375	0.750	1.938
	769FS08X12	1/2	3/4	2.328	1.797	1.250	1.594	1.219	1.063	1.359
	769FS10X06	5/8	3/4	2.375	1.938	1.313	1.219	0.438	0.875	1.438
	769FS10X08	5/8	1/2	2.375	1.938	1.313	1.469	0.438	0.875	1.438
	769FS12X08	3/4	1/2	2.594	2.063	1.438	1.563	0.531	1.063	1.625
	769FS12X12	3/4	3/4	2.594	2.063	1.438	1.594	0.531	1.063	1.625
	769FS14X12	7/8	3/4	2.875	2.250	1.625	1.688	0.625	1.250	1.719
	769FS16X12	1	3/4	2.969	2.344	1.719	1.688	0.625	1.250	1.859
	769FS16X16	1	1	2.969	2.344	1.719	1.969	0.625	1.250	1.859
STYLE 770FS **Female Elbow** **Tube to Female Pipe Tube**  	770FS04X02	1/4	1/8	1.359	1.109	0.781	0.688	0.250	0.500	0.859
	770FS04X04	1/4	1/4	1.703	1.328	1.000	0.875	0.375	0.750	1.078
	770FS06X04	3/8	1/4	1.922	1.547	1.109	0.875	0.375	0.750	1.203
	770FS06X06	3/8	3/8	2.063	1.578	1.078	0.938	0.438	0.875	1.234
	770FS06X08	3/8	1/2	2.031	1.500	1.063	1.188	0.531	1.063	1.313
	770FS08X06	1/2	3/8	2.016	1.703	1.156	0.938	0.438	0.875	1.266
	770FS08X08	1/2	1/2	2.328	1.797	1.313	1.188	0.531	1.063	1.359
	770FS10X08	5/8	1/2	2.469	1.938	1.313	1.266	0.531	1.063	1.438
	770FS12X08	3/4	1/2	2.469	1.938	1.313	1.188	0.531	1.063	1.469
	770FS12X12	3/4	3/4	2.750	2.125	1.500	1.375	0.625	1.250	1.641
	770FS16X16	1	1	3.063	2.250	1.625	1.625	0.203	1.625	1.797
STYLE 771FS **Male Run Tee** **Tube to Male Pipe Thread to Tube**  	771FS04X02	1/4	1/8	1.859	0.781	0.750	1.078	Across Flats 0.438		Swing Radius (SR) 0.828
	771FS04X04	1/4	1/4	2. 047	0.938	0.781	1.109	0.500		0.828
	771FS06X04	3/8	1/4	2.484	1.063	0.828	1.422	0.625		1.078
	771FS08X06	1/2	3/8	2 859	1.188	1.125	1.703	0.750		1.234
	771FS08X08	1/2	1/2	3.141	1.375	1.219	1.766	0.875		1.750
	771FS12X12	3/4	3/4	3.625	1.563	1.438	2.063	1.063		1.625

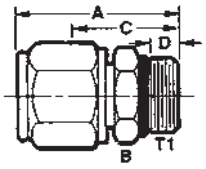
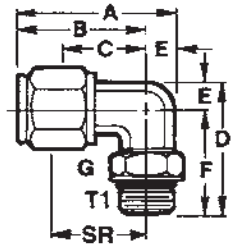
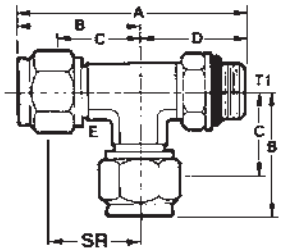
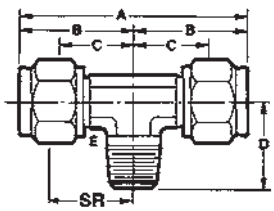
Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	Swing Radius (SR)	
STYLE 772FS **Male Branch Tee** **Tube to Tube to Male Pipe Thread**								Across Flats		
	772FS04X02	1/4	1/8	2.156	1.078	0.750	0.781	0.437	0.828	
	772FS04X04	1/4	1/4	2.219	1.109	0.781	0.938	0.500	0.859	
	772FS05X02	5/16	1/8	2.438	1.219	0.813	0.781	0.500	0.906	
	772FS06X04	3/8	1/4	2.844	1.422	0.984	1.063	0.625	1.078	
	772FS08X06	1/2	3/8	3.344	1.672	1.125	1.188	0.750	1.234	
	772FS08X08	1/2	1/2	3.531	1.766	1.219	1.375	0.875	1.750	
	772FS10X08	5/8	1/2	3.875	1.938	1.313	1.438	0.875	1.438	
	772FS12X12	3/4	3/4	4.125	2.063	1.438	1.563	1.063	1.625	
STYLE 777FS **Female Branch Tee** **Tube to Tube to Female Pipe Thread**								Across Flats	Swing Radius (SR)	
	777FS06X04	3/8	1/4	3.031	1.516	1.078	0.875	0.750	1.172	
	777FS08x06	1/2	3/8	3.469	1.734	1.188	0.938	0.875	1.297	
	777FS10X08	5/8	1/2	3.875	1.938	1.313	1.188	1.063	1.438	
	777FS12X12	3/4	3/4	4.250	2.125	1.500	1.375	1.250	1.641	
	777FS16X16	1	1	4.500	2.250	1.625	1.625	1.625	1.797	

Style	Part No.	Tube O.D.	T1	A	B	C	D	E		
STYLE 782FS **Bulkhead Union** **Tube to Tube**							Max. Bulkhead			
	782FS04	1/4	1/2-20	2.219	0.688	1.563	0.375			
	782FS06	3/8	5/8-18	2.531	0.813	1.656	0.375			
	782FS08	1/2	3/4-16	2.844	0.938	1.750	0.375			
	782FS12	3/4	1 1/16-16	3.438	1.250	2.188	0.625			

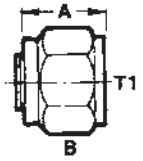
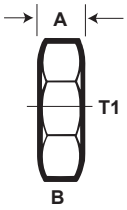
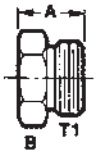
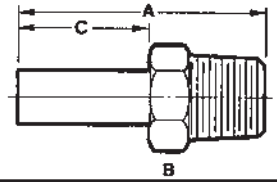
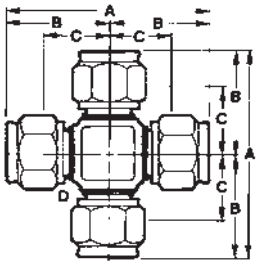
Style	Part No.	Tube O.D. Hi-Seal	Tube O.D. AN	T1	T2	A	B	C	D	E
STYLE 792FS **Adapter** **Hi-Seal® to AN Thread**									Drill	Drill
	792FS04	1/4	1/4	1/2-20	7/16-20	1.406	0.688	1.078	0.203	0.172
	792FS06	3/8	3/8	5/8-18	9/16-18	1.766	0.688	1.203	0.281	0.297
	792FS08	1/2	1/2	3/4-16	3/4-16	1.891	1.000	1.344	0.422	0.391
	792FS16	1	1	1 5/16-16	1 5/16-12	2.781	1.625	1.766	0.750	0.844

Hi-Seal® Fittings

Material: Steel/O-Ring

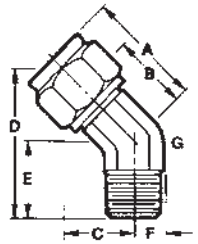
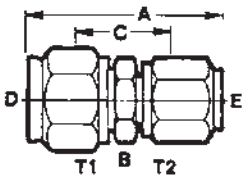
Style	Part No.	Tube O.D.	T1	A	B	C	D	E	F	G	Swing Radius (SR)
STYLE 768FSO **Male Connector** **Tube to Straight Thread** 	768FSO04	1/4	7/16-20	1.203	1.563	0.875	0.359				
	768FSO06	3/8	9/16-18	1.453	0.688	1.016	0.391				
	768FSO08	1/2	3/4-16	1.672	0.875	1.125	0.438				
	768FSO10	5/8	7/8-14	1.906	1.000	1.281	0.500				
	768FSO12	3/4	1 1/16-12	2.063	1.250	1.438	0.594				
	768FSO14	7/8	1 3/16-12	2.063	1.375	1.438	0.594				
	768FSO16	1	15 5/16-12	2.063	1.500	1.438	0.594				
STYLE 769FSO **Male Elbow** **Tube to Straight Thread** 	769FSO04	1/4	7/16-20	1.297	1 .078	0.750	1.266	0.219	1.078	0.437	0.828
	769FSO06	3/8	9/16-18	1.625	1.344	0.906	1.828	0.281	1.250	0.563	0.828
	769FSO08	1/2	3/4-16	1.922	1.547	1.000	1.813	0.375	1.438	0.750	1.125
	769FSO10	5/8	7/8-14	2.344	1.906	1.281	2.125	0.438	1.688	0.875	1.406
	769FSO12	3/4	1 1/16-12	2.609	2.078	1.906	2.469	0.531	1.938	1.063	1.625
	769FSO14	7/8	1 3/16-12	2.875	2.250	1.625	2.656	0.625	2.031	1.250	1.781
	769FSO16	1	1 5/16-12	2.969	2.344	1.719	2.656	0.625	2.031	1.250	1.859
STYLE 771FSO **Male Run Tee** **Tube to Straight Thread to Tube** 	771FSO04	1/4	7/16-20	2.156	1.094	0.750	1.063	0.563	0.828		
	771FSO06	3/8	9/16-18	2.688	1.438	1.000	1.250	0.563	1.078		
	771FSO08	1/2	3/4-16	3.141	1.688	1.141	1.453	0.750	1.234		
STYLE 772FSO **Male Branch Tee** **Tube to Tube to Straight Thread** 	772FSO04	1/4	7/16-20	2.625	1.078	0.750	1.047	0.437	0.828		
	772FSO06	3/8	9/16-18	2.844	1.422	0.984	1.234	0.563	1.078		
	772FSO12	3/4	1 1/16-12	4.125	2.063	1.438	1.938	1.063	1.625		

Material: Stainless Steel

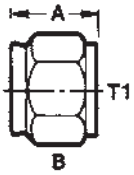
Style	Part No.	Tube O.D.	T1	A	B	C	D	E	F	G
STYLE 708FSS **Fitting Cap** 	708FSS02	1/8	3/8-24	0.516	0.500					
	708FSS04	1/4	1/2-20	0.594	0.625					
	708FSS06	3/8	5/8-18	0.750	0.750					
	708FSS08	1/2	3/4-16	0.891	0.875					
	708FSS10	5/8	15/16-16	1.000	1.125					
	708FSS12	3/4	1 1/16-16	1.000	1.250					
STYLE 711FSS **Lock Nut** 	711FSS04	1/4	1/2-20	0.250	0.688					
	711FSS06	3/8	5/8-18	0.250	0.813					
STYLE 721FSS **Tubing Cap** 	721FSS04	1/4	1/2-20	0.281	0.500					
	721FSS06	3/8	5/8-18	0.609	0.625					
	721FSS08	1/2	3/4-16	0.656	0.750					
	721FSS12	3/4	1 1/16-16	0.781	1.063					
STYLE 722FSS **Adapter** **Straight Tube to Male Pipe Thread** 	722FSS04X04	1/4	1/4	1.438	0.563	0.625				
	722FSS06X04	3/8	1/4	1.563	0.563	0.750				
	722FSS08X04	1/2	1/4	1.625	0.563	0.813				
STYLE 752FSS **Cross** **Tube to Tube to Tube to Tube** 	752FSS04	1/4		2.031	1.016	0.688	Across Flats 0.500			
	752FSS06	3/8		2.719	1.359	0.922	0.750			
	752FSS08	1/2		3.031	1.516	0.969	0.750			

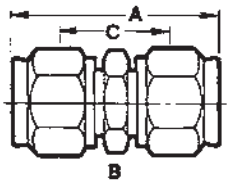
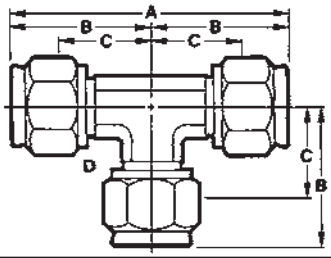
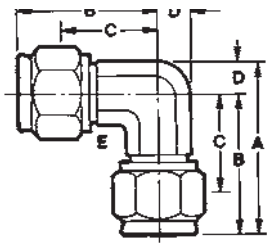
Hi-Seal® Fittings

Material: Stainless Steel

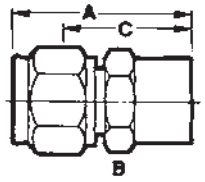
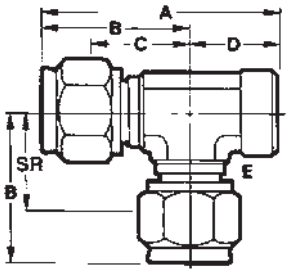
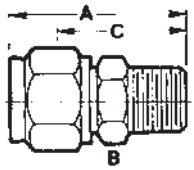
Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	G
STYLE 754FSS **Male 45˚ Elbow** **Tube to Male Pipe Thread** 						**Swing Radius**				**Across Flats**
	754FSS04X02	1/4	1/8	0.859	0.531	0.625	1.203	0.656	0.219	0.438
	754FSS06X04	3/8	1/4	1.078	0.641	0.750	1.547	0.875	0.250	0.500
	754FSS08X06	1/2	3/8	1.234	0.688	0.828	1.484	0.875	0.313	0.375
STYLE 756FSS **Reducing Union** **Tube to Tube** 									**T1**	**T2**
	756FSS04X02	1/4 x 1/8		1.469	0.625	0.844	0.203	0.156	1/2-20	3/8-24
	756FSS06X04	3/8 x 1/4		1.688	0.750	0.922	0.281	0.203	5/8-18	1/2-20
	756FSS08X04	1/2 x 1/4		1.875	0.875	1.000	0.422	0.203	3/4-16	1/2-20
	756FSS08X06	1/2 x 3/8		2.000	0.875	1.016	0.422	0.281	3/4-16	5/8-18
STYLE 760FSS **Sleeve** 	760FSS02	1/8								
	760FSS03	3/16								
	760FSS04	1/4								
	760FSS05	5/16								
	760FSS06	3/8								
	760FSS08	1/2								
	760FSS10	5/8								
	760FSS12	3/4								
	760FSS16	1								
STYLE 760FT **Teflon® Sleeve** 	760FT02	1/8								
	760FT04	1/4								
STYLE 760FPH **Sleeve** **17-4 PH** 	760FPH02	1/8								
	760FPH04	1/4								
	760FPH06	3/8								
	760FPH08	1/2								
	760FPH12	3/4								
	760FPH16	1								

Teflon® is a registered trademark of E.I.DuPont DeNemours &Co., Inc.

Style	Part No.	Tube O.D.	T1	A	B	C	D	E	F	G
STYLE 761FSS **Nut** 	761FSS02	1/8	3/8-24	0.516	0.500					
	761FSS03	3/16	7/16-20	0.531	0.563					
	761FSS04	1/4	1/2-20	0.594	0.625					
	761FSS05	5/16	9/16-18	0.672	0.688					
	761FSS06	3/8	5/8-18	0.750	0.750					
	761FSS08	1/2	3/4-16	0.891	0.875					
	761FSS10	5/8	15/16-16	1.000	1.125					
	761FSS12	3/4	1 1/16-16	1.000	1.250					
	761FSS16	1	1 5/16-16	1.000	1.500					

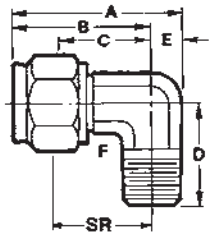
Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	G
STYLE 762FSS **Lock Nut** 	762FSS01	1/16		1.156	0.250	0.625				
	762FSS02	1/8		1.344	0.375	0.797				
	762FSS03	3/16		1.406	0.437	0.797				
	762FSS04	1/4		1.563	0.500	0.953				
	762FSS05	5/16		1.781	0.563	0.953				
	762FSS06	3/8		1.875	0.625	1.063				
	762FSS08	1/2		2.188	0.750	1.156				
	762FSS10	5/8		2.500	0.938	1.156				
	762FSS12	3/4		2.500	1.063	1.156				
	762FSS14	7/8		2.563	1.188	1.375				
	762FSS16	1		2.563	1.563	1.375				
STYLE 764FSS **Union Tee** **Tube to Tube to Tube** 	764FSS02	1/8		1.781	0.891	0.594	Across Flats 0.375			
	764FSS04	1/4		2.094	1.047	0.719	0.437			
	764FSS05	5/16		2.375	1.188	0.781	0.500			
	764FSS06	3/8		2.469	1.234	0.797	0.500			
	764FSS08	1/2		2.969	1.484	0.938	0.625			
	764FSS10	5/8		3.875	1.938	1.313	1.000			
	764FSS12	3/4		4.125	2.063	1.438	1.000			
	764FSS16	1		3.875	1.938	1.313	1.313			
STYLE 765FSS **Union Elbow** **Tube to Tube** 	765FSS02	1/8		1.109	0.953	0.656	0.156	Across Flats 0.375		
	765FSS04	1/4		1.266	1.047	0.719	0.219	0.437		
	765FSS05	5/16		1.438	1.188	0.781	0.250	0.500		
	765FSS06	3/8		1.516	1.266	0.828	0.250	0.500		
	765FSS08	1/2		1.797	1.484	0.938	0.313	0.625		
	765FSS10	5/8		2.438	1.938	1.313	0.500	1.000		
	765FSS12	3/4		2.563	2.063	1.438	0.500	1.000		
	765FSS16	1		2.594	1.938	1.313	0.656	1.313		

Material: Stainless Steel

Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	G
STYLE 766FSS **Female Connector** **Tube to Female Pipe Thread**  	766FSS02X02	1/8	1/8	1.141	0.563	0.844				
	766FSS04X02	1/4	1/8	1.281	0.563	0.953				
	766FSS04X04	1/4	1/4	1.391	0.750	1.063				
	766FSS05X04	5/16	1/4	1.469	0.750	1.063				
	766FSS06X02	3/8	1/8	1.438	0.625	1.000				
	766FSS06X04	3/8	1/4	1.609	0.750	1.172				
	766FSS06X06	3/8	3/8	1.672	0.875	1.234				
	766FSS06X08	3/8	1/2	1.938	1.063	1.500				
	766FSS08X04	1/2	1/4	1.766	0.750	1.219				
	766FSS08X06	1/2	3/8	1.828	0.875	1.281				
	766FSS08X08	1/2	1/2	2.109	1.063	1.563				
	766FSS10X08	5/8	1/2	2.188	1.063	1.563				
	766FSS12X12	3/4	3/4	2.281	1.250	1.656				
	766FSS16X16	1	1	2.500	1.625	1.875				
STYLE 767FSS **Female Run Tee** **Tube to Female Pipe Thread to Tube**  								Across Flats	Swing Radius (SR)	
	767FSS04X04	1/4	1/4	2.063	1.172	0.844	0.891	0.750	0.938	
	767FSS06X04	3/8	1/4	2.203	1.313	0.875	0.891	0.750	0.984	
STYLE 768FSS **Male Connector** **Tube to Male Pipe Thread**  	768FSS02X02	1/8	1/8	1.141	0.437	0.844				
	768FSS02X04	1/8	1/4	1.391	0.563	1.094				
	768FSS03X02	3/16	1/8	1.172	0.437	0.844				
	768FSS04X02	1/4	1/8	1.281	0.500	0.953				
	768FSS04X04	1/4	1/4	1.484	0.625	1.156				
	768FSS04X06	1/4	3/8	1.453	0.750	1.125				
	768FSS04X08	1/4	1/2	1.828	0.875	1.500				
	768FSS05X02	5/16	1/8	1.359	0.563	0.953				
	768FSS05X04	5/16	1/4	1.563	0.625	1.156				
	768FSS06X02	3/8	1/8	1.438	0.625	1.000				
	768FSS06X04	3/8	1/4	1.641	0.625	1.203				
	768FSS06X06	3/8	3/8	1.641	0.750	1.203				
	768FSS06X08	3/8	1/2	1.969	0.875	1.531				
	768FSS06X12	3/8	3/4	1.984	1.125	1.547				
	768FSS08X04	1/2	1/4	1.797	0.750	1.250				
	768FSS08X06	1/2	3/8	1.797	0.750	1.250				
	768FSS08X08	1/2	1/2	2.141	0.875	1.594				
	768FSS08X12	1/2	3/4	2.109	1.125	1.563				
	768FSS10X08	5/8	1/2	2.250	0.938	1.625				
	768FSS12X08	3/4	1/2	2.250	1.125	1.625				
	768FSS12X12	3/4	3/4	2.250	1.125	1.625				
	768FSS16X12	1	3/4	2.250	1.375	1.625				

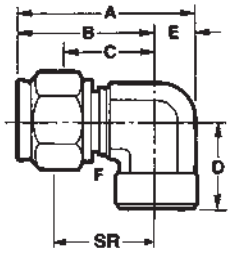
Material: Stainless Steel

STYLE 769FSS
Male Elbow
Tube to Male Pipe Thread



Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F Across Flats	G Swing Radius (SR)
	769FSS02X02	1/8	1/8	1.109	0.922	0.625	0.719	0.188	0.375	0.656
	769FSS02X04	1/8	1/4	1.203	0.984	0.688	1.031	0.219	0.437	0.719
	769FSS04X02	1/4	1/8	1.234	1.016	0.672	0.781	0.219	0.437	0.813
	769FSS04X04	1/4	1/4	1.297	1.078	0.750	1.094	0.219	0.437	0.828
	769FSS05X02	5/16	1/8	1.375	1.125	0.719	0.844	0.250	0.500	0.828
	769FSS05X04	5/16	1/4	1.406	1.156	0.750	0.938	0.250	0.500	0.844
	769FSS06X02	3/8	1/8	1.422	1.172	0.734	0.813	0.250	0.563	0.844
	769FSS06X04	3/8	1/4	1.484	1.234	0.797	1.063	0.250	0.500	0.906
	769FSS06X06	3/8	3/8	1.578	1.297	0.859	1.063	0.281	0.563	0.969
	769FSS06X08	3/8	1/2	1.734	1.391	0.953	1.250	0.344	0.688	1.000
	769FSS08X04	1/2	1/4	1.766	1.453	0.906	1.125	0.313	0.625	1.031
	769FSS08X06	1/2	3/8	1.766	1.453	0.906	1.125	0.313	0.625	1.031
	769FSS08X08	1/2	1/2	1.828	1.484	0.938	1.313	0.344	0.688	1.063
	769FSS10X08	5/8	1/2	2.094	1.656	1.031	1.500	0.438	0.875	1.188
	769FSS12X12	3/4	3/4	2.219	1.750	1.125	1.469	0.469	0.938	1.328
	769FSS16X16	1	1	2.594	1.938	1.313	1.969	0.656	1.313	1.516

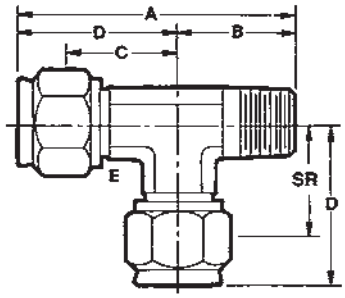
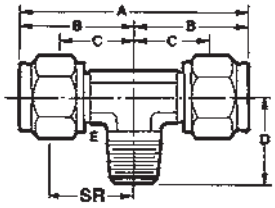
STYLE 770FSS
Female Elbow
Tube to Female Pipe Tube



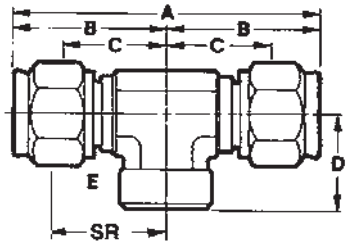
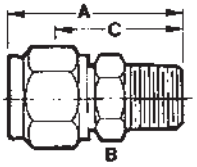
Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F Across Flats	G Swing Radius (SR)
	770FSS04X02	1/4	1/8	1.359	1.109	0.781	0.688	0.250	0.500	0.859
	770FSS04X04	1/4	1/4	1.703	1.328	1.000	0.875	0.375	0.750	1.078
	770FSS06X04	3/8	1/4	1.922	1.547	1.109	0.875	0.375	0.750	1.203
	770FSS06X06	3/8	3/8	2.063	1.578	1.141	0.938	0.438	0.875	1.234
	770FSS08X06	1/2	3/8	2.016	1.703	1.156	1.313	0.438	0.875	1.266
	770FSS08X08	1/2	1/2	2.328	1.797	1.313	1.188	0.531	1.063	1.359

Hi-Seal® Fittings

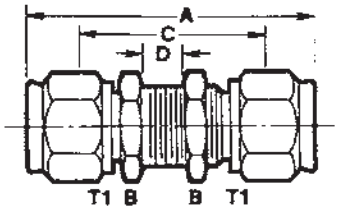
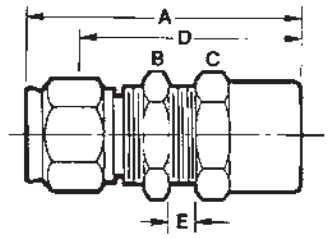
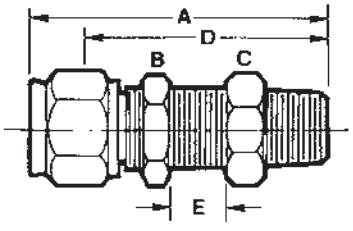
Material: Stainless Steel

Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E		G
STYLE 771FSS **Male Run Tee** **Tube to Male Pipe Thread to Tube**								Across Flats	Swing Radius (SR)	
	771FSS01X02	1/16	1/8	1.766	0.859	0.688	0.906	0.437	0.797	
	771FSS02X02	1/8	1/8	1.703	0.750	0.656	0.953	0.437	0.734	
	771FSS03X02	3/16	1/8	1.734	0.750	0.656	0.984	0.437	0.734	
	771FSS04X02	1/4	1/8	1.859	0.781	0.750	1.078	0.437	0.828	
	771FSS04X04	1/4	1/4	2.049	0.938	0.781	1.109	0.500	0.859	
	771FSS05X02	5/16	1/8	2.000	0.781	0.813	1.219	0.500	0.906	
	771FSS06X04	3/8	1/4	2.484	1.063	0.984	1.422	0.625	1.078	
	771FSS08X06	1/2	3/8	2.859	1.188	1.125	1.672	0.750	1.234	
	771FSS08X08	1/2	1/2	3.141	1.375	1.219	1.766	0.875	1.750	
	771FSS10X08	5/8	1/2	3.375	1.438	1.938	2.063	1.875	1.438	
	771FSS12X12	3/4	3/4	3.625	1.563	1.438	2.063	1.063	1.625	
	771FSS14X12	7/8	3/4	3.938	1.688	1.625	2.250	1.250	1.781	
	771FSS16X16	1	1	4.281	1.938	1.719	2.344	1.250	1.859	
	771FSS20X20	1 1/4	1 1/4	4.938	2.313	1.813	2.625	1.625	2.078	
STYLE 772FSS **Male Branch Tee** **Tube to Tube to Male Pipe Thread**								Across Flats	Swing Radius	
	772FSS04X02	1/4	1/8	2.094	1.047	0.719	0.750	0.437	0.813	
	772FSS04X04	1/4	1/4	2.156	1.078	0.750	0.938	0.437	0.828	
	772FSS06X04	3/8	1/4	2.531	1.266	0.859	1.000	0.500	0.938	
	772FSS08X06	1/2	3/8	2.656	1.484	0.938	1.063	0.625	1.063	
	772FSS08X08	1/2	1/2	3.406	1.703	1.156	1.344	0.813	1.219	

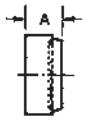
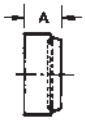
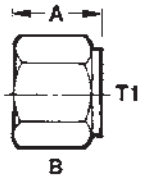
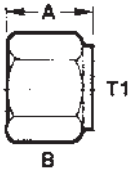
Material: Stainless Steel

Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E		G
STYLE 777FSS **Female Branch Tee** **Tube to Tube to Female Pipe Thread** 	777FSS04X04	1/4	1/4	2.344	1.172	0.844	0.891	0.750	Swing Radius (SR) 0.938	
	777FSS06X04	3/8	1/4	2.625	1.313	0.875	0.891	0.750	0.984	
	777FSS08X06	1/2	3/8	3.094	1.547	1.000	0.969	0.813	1.125	
STYLE 780FSS **Thermocouple Connector** 	780FSS02X02	1/8	1/8	1.141	0.437	0.844				
	780FSS03X02	3/16	1/8	1.172	0.437	0.844				
	780FSS03X04	3/16	1/4	1.422	0.563	1.094				
	780FSS04X02	1/4	1/8	1.281	0.500	0.953				
	780FSS04X04	1/4	1/4	1.484	0.625	1.156				
	780FSS06X06	3/8	3/8	1.641	0.750	1.203				
	780FSS08X08	1/2	1/2	2.141	0.875	1.594				

Material: Stainless Steel

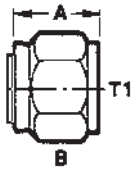
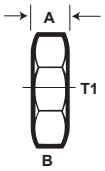
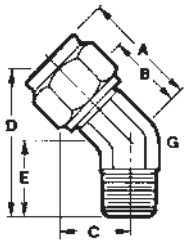
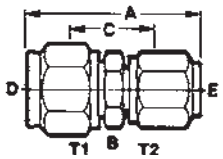
Style	Part No.	Tube O.D.	T1	A	B	C	D	E	F
STYLE 782FSS **Bulkhead Union** **Tube to Tube** 							Max. Bulkhead		Bulkhead Thread
	782FSS04	1/4	1/2-20	2.219	0.688	1.563	0.375		1/2-20
	782FSS06	3/8	5/8-18	2.531	0.813	1.656	0.375		5/8-18
	782FSS08	1/2	3/4-16	2.844	0.938	1.750	0.375		3/4-16
STYLE 786FSS **Bulkhead Female Connector** **Tube to Female Pipe Thread** 								Max. Bulkhead	Bulkhead Thread
	786FSS04X04	1/4	1/4	2.016	0.688	0.750	1.688	0.375	1/2-20
	786FSS06X04	3/8	1/4	2.172	0.813	0.750	1.734	0.375	5/8-18
STYLE 788FSS **Bulkhead Male Connector** **Tube to Male Pipe Thread** 								Max. Bulkhead	Bulkhead Thread
	788FSS04X04	1/4	1/4	2.109	0.688	0.688	1.781	0.375	1/2-20

Sleeves & Nuts Material: Steel & Stainless Steel

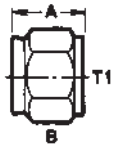
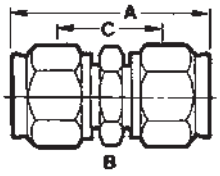
Style	Part No.	Tube O.D.	T1	A	B	C
STYLE 760FSZ **Braze-Seal® Sleeve** Material: Steel 	760FSZ04 760FSZ06 760FSZ08 760FSZ12 760FSZ14 760FSZ16 760FSZ24	1/4 3/8 1/2 3/4 7/8 1 1 1/2		0.250 0.281 0.313 0.500 0.500 0.563 0.750		
STYLE 760FSSZ **Braze-Seal® Sleeve** Material: Stainless Steel 	760FSSZ04 760FSSZ06 760FSSZ08	1/4 3/8 1/2		0.250 0.281 0.313		
STYLE 761FSZ **Braze-Seal® Nut** Material: Steel 	761FSZ04 761FSZ06 761FSZ08 761FSZ12 761FSZ14 761FSZ16 761FSZ24	1/4 3/8 1/2 3/4 7/8 1 1 1/2	1/2-20 5/8-18 3/4-16 1 1/16-16 1 3/16-16 1 5/16-16 1 7/8-16	0.656 0.766 0.813 1.000 1.000 1.063 1.281	0.625 0.750 0.875 1.250 1.375 1.500 2.250	
STYLE 761FSSZ **Braze-Seal® Nut** Material: Stainless Steel 	761FSSZ04 761FSSZ06 761FSSZ08 761FSSZ10 761FSSZ12	1/4 3/8 1/2 5/8 3/4	1/2-20 5/8-18 3/4-16 15/16-16 1 1/16-16	0.656 0.766 0.813 0.859 1.000	0.625 0.750 0.875 1.125 1.250	

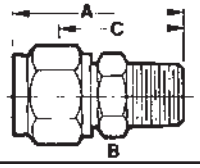
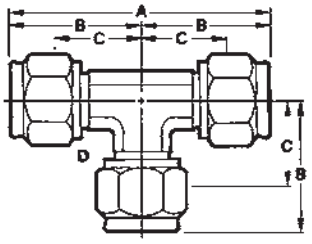
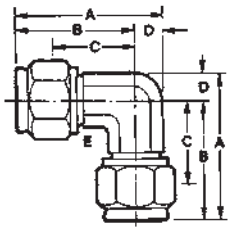
Hi-Seal® Fittings

Material: Brass

Style	Part No.	Tube O.D.	T1	A	B	C	D	E	F	G
STYLE 708FB **Fitting Cap** 	708FB04	1/4	1/2-20	0.594	0.625					
	708FB06	3/8	5/8-18	0.750	0.750					
	708FB08	1/2	3/4-16	0.891	0.875					
	708FB10	5/8	15/16-16	1.000	1.125					
STYLE 711FB **Lock Nut** 	711FB04	1/4	1/2-20	0.172	0.688					
	711FB06	3/8	5/8-18	0.172	0.813					
	711FB08	1/2	3/4-16	0.172	0.938					
STYLE 721FB **Tubing Cap** 	721FB04	1/4	1/2-20	0.281	0.500					
	721FB06	3/8	5/8-18	0.609	0.625					
	721FB08	1/2	3/4-16	0.656	0.750					
STYLE 754FB **Male 45˚ Elbow** **Tube to Male Pipe Thread** 	754FB04X02	1/4	1/8	0.859	0.531	Swing Radius 0.625	1.203	0.656		Across Flats 0.437
	754FB04X04	1/4	1/4	0.891	0.563	0.625	1.500	0.875		0.500
	754FB05X02	5/16	1/8	1.000	0.594	0.688	1.328	0.719		0.500
	754FB06X04	3/8	1/4	1.078	0.641	0.750	1.547	0.875		0.500
	754FB08X06	1/2	3/8	1.234	0.688	0.828	1.547	0.875		0.625
STYLE 756FB **Reducing UnionTube to Tube** 	756FB04X02	1/4 x 1/8		1.469	0.625	0.844	0.203	0.156	T1 1/2-20	T2 3/8-24
	756FB06X04	3/8 x 1/4		1.688	0.750	0.922	0.281	0.203	5/8-18	1/2-20
	756FB08X04	1/2 x 1/4		1.875	0.875	1.000	0.422	0.203	3/4-16	1/2-20
	756FB08X06	1/2 x 3/8		2.000	0.875	1.016	0.422	0.281	3/4-16	5/8-18
	756FB12X08	3/4 x 1/2		2.391	1.250	1.219	0.656	0.422	1 1/16-16	3/4-16
STYLE 760FB **Sleeve** 	760FB02	1/8								
	760FB03	3/16								
	760FB04	1/4								
	760FB05	5/16								
	760FB06	3/8								
	760FB08	1/2								
	760FB10	5/8								
	760FB12	3/4								
	760FB16	1								

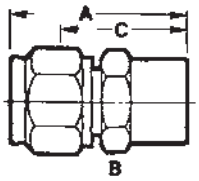
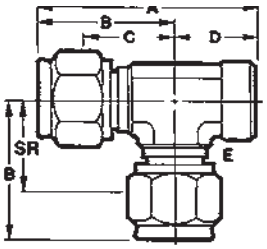
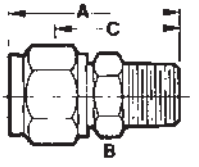
Material: Brass

Style	Part No.	Tube O.D.	T1	A	B	C	D	E	F	G
STYLE 761FB **Nut** 	761FB02	1/8	3/8-24	0.516	0.500					
	761FB03	3/16	7/16-20	0.531	0.563					
	761FB04	1/4	1/2-20	0.594	0.625					
	761FB05	5/16	9/16-18	0.672	0.688					
	761FB06	3/8	5/8-18	0.750	0.750					
	761FB08	1/2	3/4-16	0.891	0.875					
	761FB10	5/8	15/16-16	1.000	1.125					
	761FB12	3/4	1 1/16-16	1.000	1.250					
	761FB16	1	1 5/16-16	1.000	1.500					
STYLE 762FB **Union** **Tube to Tube** 	762FB02	1/8		1.344	0.375	0.797				
	762FB03	3/16		1.406	0.438	0.797				
	762FB04	1/4		1.563	0.500	0.953				
	762FB05	5/16		1.781	0.563	0.953				
	762FB06	3/8		1.875	0.625	1.063				
	762FB08	1/2		2.188	0.750	1.156				
	762FB10	5/8		2.500	0.938	1.313				
	762FB12	3/4		2.500	1.063	1.313				
	762FB14	7/8		2.563	1.188	1.375				

Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	G
STYLE 763FB **Male Connector Check Valve** **Tube to Male Pipe Thread** 	763FB04x02	1/4	1/8	1.281	0.500	0.953				
	763FB06x04	3/8	1/2	1.641	0.625	1.203				
STYLE 764FB **Union Tee Tube to Tube to Tube** 							Across Flats			
	764FB02	1/8		1.781	0.891	0.594	0.313			
	764FB03	3/16		1.969	0.984	0.656	0.375			
	764FB04	1/4		2.094	1.047	0.719	0.437			
	764FB05	5/16		2.375	1.188	0.781	0.500			
	764FB06	3/8		2.469	1.234	0.797	0.500			
	764FB08	1/2		2.969	1.484	0.938	0.625			
	764FB10	5/8		3.875	1.938	1.313	1.000			
	764FB12	3/4		4.125	2.063	1.438	1.000			
STYLE 765FB **Union Elbow Tube to Tube** 								Across Flats		
	765FB02	1/8		1.109	0.953	0.656	0.156	0.375		
	765FB04	1/4		1.266	1.047	0.719	0.219	0.437		
	765FB05	5/16		1.438	1.188	0.781	0.250	0.500		
	765FB06	3/8		1.516	1.266	0.828	0.250	0.500		
	765FB08	1/2		1.797	1.484	0.938	0.313	0.625		
	765FB10	5/8		2.438	1.938	1.313	0.500	1.000		
	765FB12	3/4		2.563	2.063	1.438	0.500	1.000		
	765FB14	7/8		2.594	1.938	1.313	0.656	1.313		
	765FB16	1		2.594	1.938	1.313	0.656	1.313		

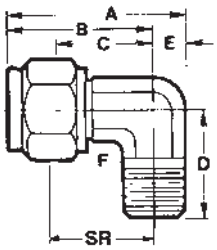
Hi-Seal® Fittings

Material: Brass

Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	G
STYLE 766FB **Female Connector** **Tube to Female Pipe Thread**  	766FB02X02	1/8	1/8	1.141	0.563	0.844				
	766FB04X02	1/4	1/8	1.281	0.563	0.953				
	766FB04X04	1/4	1/4	1.391	0.750	1.063				
	766FB04X08	1/4	1/2	1.828	1.063	1.500				
	766FB06X02	3/8	1/8	1.438	0.625	1.000				
	766FB06X04	3/8	1/4	1.609	0.750	1.172				
	766FB06X06	3/8	3/8	1.672	0.875	1.234				
	766FB06X08	3/8	1/2	1.938	1.063	1.500				
	766FB08X04	1/2	1/4	1.766	0.750	1.219				
	766FB08X06	1/2	3/8	1.828	0.875	1.281				
	766FB08X08	1/2	1/2	2.109	1.063	1.563				
	766FB10X08	5/8	1/2	2.188	1.063	1.563				
	766FB12X08	3/4	1/2	2.188	1.063	1.563				
	766FB12X12	3/4	3/4	2.281	1.250	1.656				
STYLE 767FB **Female Run Tee** **Tube to Female Pipe Thread to Tube**  	767FB04X02	1/4	1/8	1.797	1.109	0.781	0.688	Across Flats 0.500	Swing Radius (SR) 0.859	
	767FB04X04	1/4	1/4	2.109	1.219	0.891	0.891	0.688	0.953	
	767FB06X04	3/8	1/4	2.391	1.516	1.078	0.875	0.750	1.172	
STYLE 768FB **Male Connector** **Tube to Male Pipe Thread**  	768FB02X02	1/8	1/8	1.141	0.437	0.844				
	768FB03X02	3/16	1/8	1.172	0.437	0.844				
	768FB04X02	1/4	1/8	1.281	0.500	0.953				
	768FB04X04	1/4	1/4	1.484	0.625	1.156				
	768FB04X06	1/4	3/8	1.453	0.750	1.125				
	768FB04X08	1/4	1/2	1.828	0.875	1.500				
	768FB05X02	5/16	1/8	1.359	0.563	0.953				
	768FB05X04	5/16	1/4	1.563	0.625	1.156				
	768FB05X06	5/16	3/8	1.563	0.750	1.156				
	768FB06X02	3/8	1/8	1.438	0.625	1.000				
	768FB06X04	3/8	1/4	1.641	0.625	1.203				
	768FB06X06	3/8	3/8	1.641	0.750	1.203				
	768FB06X08	3/8	1/2	1.969	0.875	1.531				
	768FB08X04	1/2	1/4	1.797	0.750	1.250				
	768FB08X06	1/2	3/8	1.797	0.750	1.250				
	768FB08X08	1/2	1/2	2.141	0.875	1.594				
	768FB08X12	1/2	3/4	2.109	1.125	1.563				
	768FB10X06	5/8	3/8	1.969	0.938	1.344				
	768FB10X08	5/8	1/2	2.250	0.938	1.625				
	768FB12X08	3/4	1/2	2.250	1.125	1.625				
	768FB12X12	3/4	3/4	2.250	1.125	1.625				
	768FB14X12	7/8	3/4	2.250	1.250	1.625				
	768FB16X12	1	3/4	2.250	1.375	1.625				
	768FB16X16	1	1	2.438	1.375	1.813				

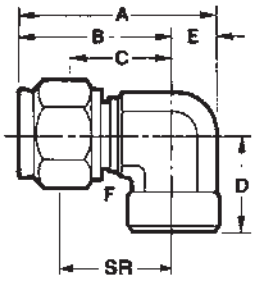
Material: Brass

STYLE 769FB
Elbow
Tube to Male Pipe Thread



Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F Across Flats	G Swing Radius (SR)
	769FB02X02	1/8	1/8	1.109	0.922	0.625	0.719	0.188	0.375	0.656
	769FB03X02	3/16	1/8	1.141	0.953	0.625	0.719	0.188	0.437	0.688
	769FB04X02	1/4	1/8	1.234	1.016	0.672	0.781	0.219	0.437	0.406
	769FB04X04	1/4	1/4	1.297	1.078	0.750	1.094	0.219	0.437	0.828
	769FB04X06	1/4	3/8	1.453	1.172	0.844	1.000	0.281	0.563	0.875
	769FB04X08	1/4	1/2	1.578	1.234	0.906	1.250	0.344	0.688	0.938
	769FB05X02	5/16	1/8	1.375	1.125	0.719	0.844	0.250	0.500	0.828
	769FB05X04	5/16	1/4	1.406	1.156	0.750	0.938	0.250	0.500	0.844
	769FB06X02	3/8	1/8	1.422	1.172	0.734	0.813	0.250	0.563	0.844
	769FB06X04	3/8	1/4	1.484	1.234	0.797	1.063	0.250	0.500	0.906
	769FB06X06	3/8	3/8	1.578	1.297	0.859	1.063	0.281	0.563	0.969
	769FB06X08	3/8	1/2	1.734	1.391	0.953	1.250	0.344	0.688	1.000
	769FB08X04	1/2	1/4	1.766	1.453	0.906	1.125	0.313	0.625	1.031
	769FB08X06	1/2	3/8	1.766	1.453	0.906	1.125	0.313	0.625	1.031
	769FB08X08	1/2	1/2	1.828	1.484	0.938	1.313	0.344	0.688	1.063
	769FB10X08	5/8	1/2	2.094	1.656	1.031	1.500	0.438	0.875	1.188
	769FB12X08	3/4	1/2	2.219	1.750	1.125	1.500	0.469	0.938	1.328
	769FB12X12	3/4	3/4	2.219	1.750	1.125	1.469	0.469	0.938	1.328
	769FB16X16	1	1	2.594	1.938	1.313	1.969	0.656	1.313	1.516

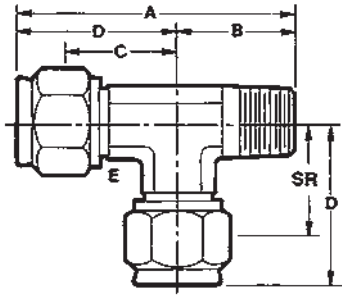
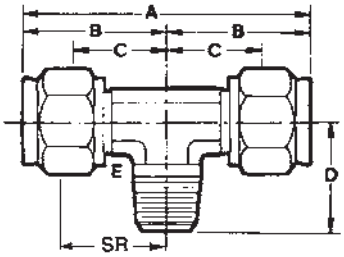
STYLE 770FB
Elbow
Tube to Female Pipe Thread



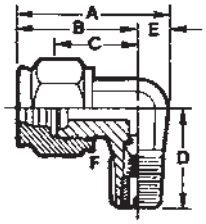
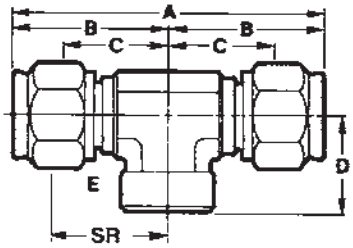
Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F Across Flats	G Swing Radius (SR)
	770FB02X02	1/8	1/8	1.141	0.984	0.688	0.688	0.156	0.375	0.766
	770FB04X02	1/4	1/8	1.266	1.047	0.719	0.688	0.218	0.437	0.797
	770FB04X04	1/4	1/4	1.391	1.141	0.813	0.875	0.250	0.500	0.906
	770FB06X04	3/8	1/4	1.547	1.297	0.859	0.688	0.250	0.500	0.969
	770FB06X06	3/8	3/8	1.719	1.406	1.969	0.938	0.313	0.625	1.078
	770FB08X04	1/2	1/4	1.891	1.578	1.031	0.938	0.313	0.625	1.125
	770FB08X06	1/2	3/8	1.891	1.578	1.031	0.938	0.313	0.625	1.125
	770FB08X08	1/2	1/2	2.000	1.672	1.125	1.188	0.328	0.688	1.250
	770FB12X12	3/4	3/4	2.719	2.063	1.438	1.344	0.656	1.313	1.578

Hi-Seal® Fittings

Material: Brass

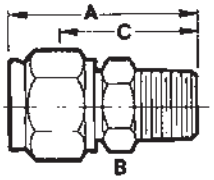
Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E		G
STYLE 771FB **Male Run Tee** **Tube to Male Pipe Thread to Tube**								Across Flats	Swing Radius (SR)	
	771FB04X02	1/4	1/8	1.859	0.781	0.750	1.078	0.437	0.828	
	771FB04X04	1/4	1/4	2.047	0.938	0.781	1.109	0.500	0.859	
	771FB06X04	3/8	1/4	2.484	1.063	0.984	1.422	0.625	1.078	
	771FB08X06	1/2	3/8	2.859	1.188	1.125	1.672	0.750	1.234	
	771FB08X08	1/2	1/2	3.141	1.375	1.219	1.766	0.875	1.750	
STYLE 772FB **Male Branch Tee** **Tube to Tube to Male Pipe Thread**								Across Flats	Swing Radius (SR)	
	772FB04X02	1/4	1/8	2.094	1.047	0.781	0.750	0.437	0.813	
	772FB04X04	1/4	1/4	2.156	1.078	0.750	0.938	0.437	0.828	
	772FB05X02	5/16	1/8	2.375	1.188	0.781	0.813	0.500	0.891	
	772FB06X04	3/8	1/4	2.531	1.266	0.828	1.000	0.500	0.938	
	772FB08X06	1/2	3/8	2.656	1.484	0.938	1.063	0.625	1.063	
	772FB08X08	1/2	1/2	3.406	1.703	1.156	1.344	0.813	1.219	

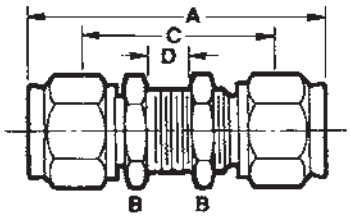
Material: Brass

Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	
STYLE 773FB **Male Elbow Check** **Tube to Male Pipe Thread** 	773FB04X02	1/4	1/8	1.234	1.016	0.688	0.750	0.219	Across Flats 0.500	Swing Radius (SR) 0.766
STYLE 777FB **Female Branch Tee** **Tube to Tube to Female Pipe Thread** 	777FB04X02	1/4	1/8	2.219	1.109	0.781	0.688	0.500	0.859	
	777FB04X04	1/4	1/4	2.469	1.234	0.906	1.219	0.688	0.938	
	777FB06X04	3/8	1/4	3.031	1.516	1.078	0.875	0.750	1.172	
	777FB12X12	3/4	3/4	4.250	2.125	1.500	1.375	1.250	1.641	

Hi-Seal® Fittings

Material: Brass

Style	Part No.	Tube O.D.	Pipe Thread	A	B	C	D	E	F	G
STYLE 780FB **Thermocouple Connector** 	780FB04X02 780FB04X04	1/4 1/4	1/8 1/4	1.281 1.484	0.500 0.625	0.953 1.156				

Style	Part No.	Tube O.D.	Bulkhead Thread	A	B	C	D	E	F	G
STYLE 782FB **Bulkhead Union** **Tube to Tube** 							Max. Bulkhead			
	782FB02	1/8	3/8-24	1.938	9/16	1.344	0.375			
	782FB04	1/4	1/2-20	2.219	11/16	1.563	0.375			
	782FB05	5/16	9/16-18	2.406	0.750	1.594	0.375			
	782FB06	3/8	5/8-18	2.531	13/16	1.656	0.375			
	782FB08	1/2	3/4-16	2.844	15/16	1.750	0.375			
	782FB10	5/8	15/16-16	3.313	1.125	2.063	0.625			
	782FB12	3/4	1 1/16-16	3.438	1.250	2.188	0.625			