

BI-LOK



**IHARA
SCIENCE**



BI-LOK[®]

TUBE FITTINGS

IHARA SCIENCE CORPORATION

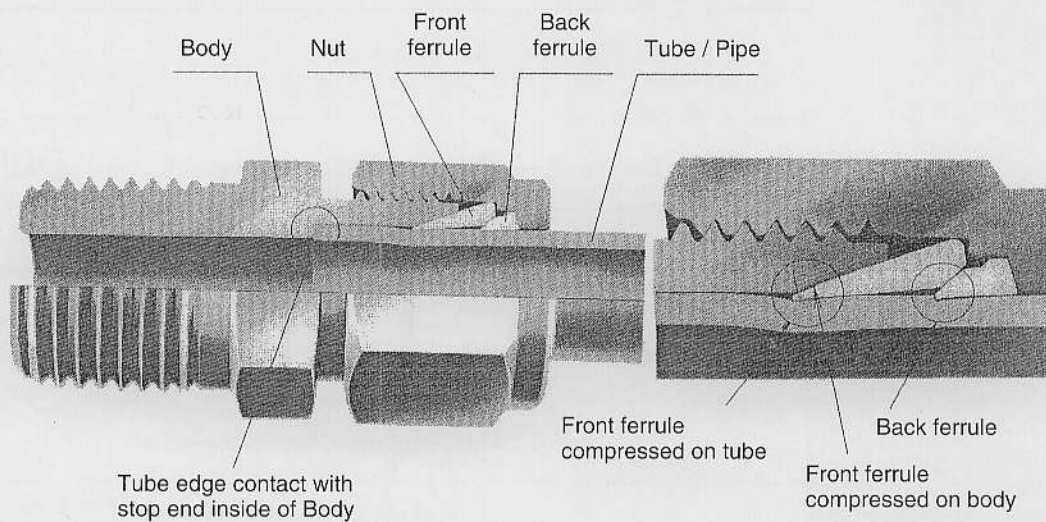
■ BI-Lok Tube Fittings have been made by Ihara Science Corporation

Ihara Science Corporation manufactures and markets **BI-Lok** tube fittings, which are double ferrule type high quality compression fittings, and other systems components through a global sales network as the best fit piping components for every application of every fluids in various fields. The high quality serviceability of **BI-Lok** tube fittings has been proven in 20 years of supply to customers over the world, which has been performed by **Ihara Science Corporation**.

■ ADVANTAGES OF BI-Lok

◎ The industrial leader in fluid power and instrumentation systems, Ihara Science Corporation has established and continues to upgrade the advantage of BI-Lok tube fittings as shown below.

1. Easy assembling without welding or threading
2. High quality tightness realized from high quality materials and precision manufacturing



- ① **Front ferrule** secures a perfect seal as compressed tightly on tube by back ferrule.
- ② **Back ferrule** bites tube tightly to prevent a disconnection upon receiving the reaction force from front ferrule.
- ③ **Body, Nut & Ferrules** are manufactured according to their requirements to achieve the best serviceability.
- ④ **Tube / Pipe** is inserted through nut so as to contact with internal stop end of body firmly.

Material and Applicable Temperature for BI-Lok

Stainless steel :	-196 ~ 360 °C
Brass :	-196 ~ 150 °C

Specification of Applicable Tube and Pipe

a) Applicable Codes & Standards

- 1) Stainless steel tube/pipe
 - ① ASTM A 269, TP304, TP316
 - ② JIS G 3459, SUS304TP, SUS316TP
- 2) Brass tube/pipe
 - ① ASTM B 68 class C10200, C10300, C10800, C12000, C12200
 - ② ASTM B 75 class C10100, C10200, C10300, C10800, C12000, C12200, C14200
 - ③ ASTM B 88 class C10200, C10300, C10800, C12000, C12200
 - ④ JIS H 3300 class C1020, C1100, C1201, C1220

b) Min. Wall Thickness

Minimum wall thickness of each size of tube / pipe is as shown in Table 3 and Table 4 for each series and material of tube / pipe.

c) Tolerance of Outside Diameter (OD)

- 1) Stainless steel tube/pipe.. Inch series(all sizes) : ± 0.005 inch(± 0.13 mm)
Metric series(all sizes) : ± 0.1 mm
Schedule series(all sizes) : ± 0.1 mm
- 2) Brass tube/pipe..... Inch series(all sizes) : ± 0.002 inch(± 0.05 mm)
Metric series(all sizes) : ± 0.05 mm

d) Tolerance of Wall Thickness

- 1)Stainless steel tube/pipe... Inch series: $\pm 15\%$ for OD < 1/2"
 $\pm 10\%$ for 1/2" \leq OD \leq 1"
Metric series(all sizes): $\pm 10\%$
Schedule series(all sizes): $\pm 10\%$
- 2) Brass tube/pipe..... Inch series: ± 0.0035 inch(± 0.09 mm) for OD < 5/8"
 ± 0.0045 inch(± 0.11 mm) for 5/8" \leq OD \leq 1"
Metric series: ± 0.08 mm for OD ≤ 15 mm
 ± 0.09 mm for OD ≥ 16 mm

e) Tolerance of OD Roundness(Max. OD—Min. OD): Max. 0.1mm for all sizes

f) Surface Hardness

- 1) Stainless steel tube/pipe: Max. Hv 190(HRB90 max.)
- 2) Brass tube/pipe: Max. Hv 70

g) Surface Condition : All tubes and pipes are free from any harmful dent, dirt, crack or roughness on their surfaces.

Maximum Applicable Pressure

The maximum applicable pressure of Bi-Lok tube fittings shall be same as the maximum applicable pressure P(MPa) calculated by the FORMULA (1), which is specified in Para.304.1.2, ANSI/ASME B31.3-1996. is listed in Table 3 and 4 for each size, wall thickness, material and series.

$$\text{Formula(1)} : P(\text{MPa}) = 2t \times SE / (D - 2tY)$$

Applicable Temp.: -196~38°C for SS
 -196~38°C for Brass

SE(N/mm²) : Permissible stress of tube/pipe
 137.8(20,000psi) for SS
 41.3(6,000psi) for Brass

D: Maximum OD(include tolerance)

t: Minimum wall thickness of tube/pipe

Y = 0.4 when $t < D/6$

Y = D-t when $t \geq D/6$

Table 3 : Maximum Applicable Pressure of SS Tube/Pipe (MPa)

Inch Series

OD	Wall Thickness (Inch)				
	0.010	0.012	0.014	0.016	0.020
1/16	38.0	48.6	57.3	66.1	83.9

OD	Wall Thickness (Inch)												
	0.028	0.035	0.039	0.049	0.059	0.065	0.079	0.083	0.095	0.098	0.109	0.120	
1/8	58.8	75.3	85.5										
3/16	37.7	48.9	55.5	71.0									
1/4	27.7	35.5	40.4	52.0	63.8	70.6							
5/16		28.0	31.7	40.6	49.9	55.6							
3/8		23.1	26.1	33.3	40.7	45.3							
1/2		18.1	20.5	26.0	31.7	35.2	43.6	46.3					
5/8				20.5	24.9	27.6	34.1	36.1	41.9	43.7			
3/4				17.0	20.6	22.7	28.0	29.6	34.3	35.7	40.0		
7/8				14.4	17.5	19.3	23.7	25.1	29.0	30.2	33.8		
1					15.2	16.8	20.6	21.8	25.1	26.1	29.2	32.4	

Metric Series

OD	Wall Thickness (mm)							
	0.5	0.8	1.0	1.2	1.5	2.0	2.5	3.0
2 M	69.8							
3 M	45.3	6.4						
4 M	33.2	56.1	71.9					
6 M		35.9	46.1	56.6	72.6			
8 M		26.4	33.6	41.1	53.0			
10M		20.8	26.4	32.2	41.2			
12M		17.2	21.8	26.5	33.8	46.7		
15M				20.9	26.5	36.3	46.8	
16M				19.5	24.8	33.8	43.4	
18M				17.3	21.9	29.8	38.0	
20M				15.5	9.6	26.6	33.9	
22M					17.7	24.0	30.5	
25M					15.5	21.0	26.6	32.4

Schedule Series

OD		Wall Thickness (Inch)									
Nominal	mm	0.039	0.047	0.059	0.067	0.079	0.083	0.087	0.091	0.098	0.110
6 A 1/8 B	10.5	25.1	30.6	39.1	46.0						
8 A 1/4 B	13.8		22.8	29.0	33.3	39.8	42.0	44.3			
10A 3/8 B	17.3		18.0	22.8	26.1	31.1	32.8	34.5	36.2		
15A 1/2 B	21.7				20.5	24.4	25.7	27.0	28.3	31.0	35.1

■ SPECIAL REQUIREMENTS OF MATERIAL FOR BI-Lok TUBE FITTINGS

Materials for BI-Lok tube fittings shall be in accordance with the specification of stainless steel or brass as shown in the Paragraph "Specification of Applicable Tube and Pipe" as the standard materials. Ihara Science Corporation will respond to customers who have special requirements for material such as Monel, Hastelloy. So please consult us if you have such special requirements on material of fittings.

Table 4. Maximum Applicable Pressure(MPa) of Brass Tube/Pipe

Inch Series

OD	Wall Thickness (Inch)										
	0.028	0.035	0.039	0.049	0.059	0.065	0.079	0.083	0.095	0.098	0.109
1/8	18.6	24.6	27.9	35.3	44.8						
3/16	11.9	15.8	18.0	23.8	29.2						
1/4	8.7	11.5	13.6	17.4	21.6	24.1					
5/16		9.0	10.2	13.6	16.9	19.0					
3/8		7.4	8.4	11.1	13.8	15.5					
1/2		5.5	6.4	8.1	10.0	11.2	14.1	15.9			
5/8				6.3	7.8	8.7	10.9	11.5	13.5	14.0	
3/4				5.2	6.4	7.1	8.9	9.4	11.0	11.4	12.9
7/8				4.4	5.4	6.0	7.6	8.0	9.3	9.7	10.9

Metric Series

OD	Wall Thickness (mm)											
	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.5	2.0	2.5	2.75	3.0
2 M	9.7	14.2	15.2									
3 M	6.3	9.5	12.8	16.3	23.3							
4 M	4.7	7.0	9.1	11.8	17.0	22.3	27.6					
6 M	3.1	4.6	6.1	7.6	10.9	14.3	22.5					
8 M	2.3	3.4	4.5	5.6	8.0	10.4	14.1	16.9	23.5			
10M	1.8	2.7	3.6	4.5	6.3	8.2	10.1	13.1	18.5			
12M		2.2	3.0	3.7	5.2	6.7	8.3	10.7	15.1			
15M			2.4	2.9	4.1	5.3	6.5	8.4	11.7			
16M			2.2	2.7	3.8	4.9	6.0	7.8	10.9	14.1		
18M				2.4	3.4	4.3	5.3	6.8	9.5	12.3		
20M				2.1	3.0	3.9	4.8	6.2	8.5	11.0		
22M				1.9	2.7	3.5	4.3	5.6	7.7	9.9	11.0	
25M				1.7	2.4	3.1	3.8	4.9	6.7	8.6	9.6	10.1

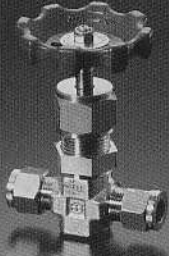
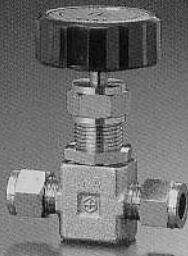





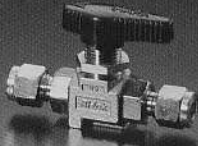


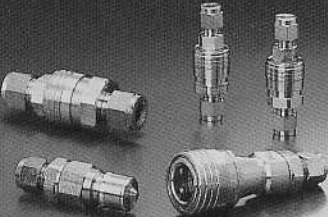
Table 5. Coefficient of Permissible Stress of Piping Mterials

Temperature °F	Tube/Pipe Materials		
	TP304	TP316	Copper
-321	100	100	100
32	100	100	100
100	100	100	100
200	100	100	80
300	100	100	78
400	94	97	50
500	88	90	
600	82	85	
650	81	84	
700	80	82	

* The allowable stresses shown above are specified in ANSI/ASME B31.3 (Chemical Plant and Petroleum Refinery Piping-1980 for TP304 and 316 of ASTM A269 and for Copper of ASTM B75 Annealed material.)

* Maximum Applicable Pressure at elevated temperatures shall be derated by mulliplying Maximum Applicable Pressure at 32°F by the above coefficient/100.

VALVES CONNECTING TO BI-LOK

	<p>VN Series Needle Stop Valve</p>	<p>VB Series Needle Stop Valve (Compact Type)</p>	
	<p>VQ Series Needle Stop Valve (Outside Screw Type)</p>	<p>VBM Series Fine Metering Stop Valve</p>	
	<p>VC Series Needle Stop Valve for Low Temp. Service</p>	<p>VH Series Needle Stop Valve for High Temp. Service (Outside Screw Type)</p>	
	<p>TVR Series Ball Valve for Multipurpose</p>	<p>BOFR Series Ball Valve Oil/Water Free</p>	
	<p>CV Series Bellows Valve</p>	<p>DV Series Diaphragm Valve</p>	
	<p>QJ Series Quick Joint</p>	<p>CH Series Check Valve</p>	