



# I-LOK®

# Tube Fittings

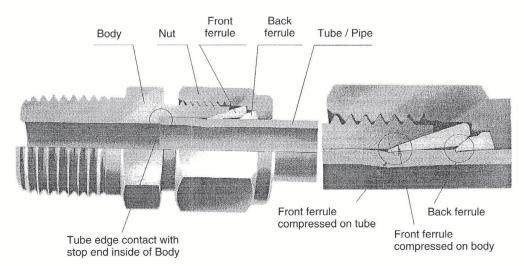
IHARA SCIENCE CORPORATION

# 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

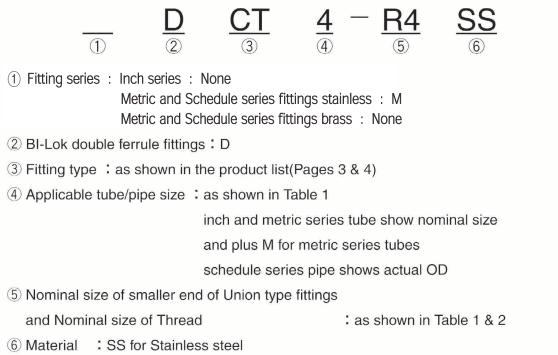
- The industrial leader in fluid power and instrumentation systems, Ihara Science Corporation has established and continues to upgrade the advantage of BI-Lok tube fittings as shown below.
  - 1. Easy assembling without welding or threading
  - 2. High quality tightness realized from high quality materials 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.

# Part Number / Ordering Number

Please indicate the following part number of BI-Lok tube fittings when you order or request for information.



6 Material : SS for Stainless stee B for Brass

#### Table 1. Applicable Tube/Pipe Size

Incl	n Tube	Met	ric Tube	S	chedule Pipe	Э
Nominal Size	OD inch	Nominal Size	OD mm	Nominal A	Nominal B	OD mm
1	1/16	2M	2	6A	1/8 B	10.5
2	1/8	ЗM	3	8A	1/4 B	13.8
3	3/16	4M	4	10A	3/8 B	17.3
4	1/4	6M	6	15A	1/2 B	21.7
5	5/16	8M	8			
6	3/8	10M	10	é a sta		
8	1/2	12M	12	1.11.11.1		
10	5/8	15M	15	<ul> <li>4 - 10</li> </ul>		
12	3/4	16M	16		(	
14	7/8	18M	18	i se se se	1.1.1	
16	1	20M	20			
		22M	22			
		25M	25			

#### Table 2. Nominal Size of Thread

Taper <sup>-</sup>	Thread	Parallel	Thread			
-	(SAE AS71051)	ANSI	B1.1			
N		Uni	fied			
Nominal Size	Thread Size	Nominal Size	Thread Size			
1	NPT1/16	2	5/16-24			
2	NPT1/8	3	3/8-24			
4	NPT1/4	4	7/16-20			
6	NPT3/8	5	1/2-20			
8	NPT1/2	6	9/16-18			
12	NPT3/4	8	3/4-16			
16	NPT 1	10	7/8-14			
		12	1 1/16-12			
		14	1 3/16-12			
		16	1 5/16-12			
Taper <sup>-</sup>	Thread	Parallel Thread				
	)3 / ISO 7	JIS B0202 / ISO 228				
	SO (Tapered)	JIS (G) / ISO (Parallel)				
Nominal Size	Thread Size	Nominal Size	Thread Size			
R1	R1/16					
R2	R1/8	G2	G1/8			
R4	R1/4	G4	G1/4			
R6	R3/8	G6	G3/8			
R8	R1/2	G8	G1/2			
R12	R3/4	G12	G3/4			
R16	R 1	G16	G 1			

# BI-Lok Tube Fittings Product List

BI-Lok tube fitting as shown below could be supplied even of small quantities meeting to the customer's requirements in various fields of industries.

DCT       MDCT       Male Connector         DSC2       MDSC       Bulkhead Male Connector         DSC2       Bore Through Bulkhead Male Connector         DSC2       Bore Through Bulkhead Male Connector         DSC2       MDCC       Male Long Connector         DLN       MDCC       Male Long Connector         DLN       MDLL       Male Long Elbow         DTK       MDTK       Male Run Tee         DTN       MDTN       Male Branch Tee         DLS       MDSA       Female Connector         DLF       MDLF       Female Connector         DLF       MDLF       Female Connector         DLF       MDLF       Female Elbow         DTF       MDTF       Female Branch Tee         DHA       MDUR       Bore Through Union         DUA       MDUR       Bore Through Bulkhead Union         DUAZ       MDURZ       Bore Through Bulkhead Union         DUX       MDUR       Bulkhead Reducing Union         DUX       MDUR       Bulkhead Inion Elbow         DUX       MDUR       Bulkhead Inion Elbow         DUX       MDUR       Bulkhead Inion Elbow         DIA       MDIA       Union Tee	DCT	o Taper	Female Pipe			
DSC       MDSC       Bulkhead Male Connector         DSCZ       MDCC       Male Long Connector         DLN       MDL       Male Long Connector         DLN       MDL       Male Long Elbow         DTK       MDTK       Male Run Tee         DTN       MDITN       Male Branch Tee         DSA       MDSA       Female Connector         DSS       MDSA       Female Connector         DSS       MDSA       Female Connector         DSS       MDFF       Female Connector         DSS       MDFF       Female Branch Tee         DTH       MDTF       Female Branch Tee         DTH       MDTF       Female Branch Tee         DTH       MDTH       Female Branch Tee         DTH       MDUA       Bore Through Bulkhead Union         DUAZ       Bore Through Reducing Union         DUR       MDUR       Bore Through Bulkhead Union         DSUZ       MDSU       Bulkhead Reducing Union         DUR       MDLR       Reducing Union         DUR       MDLR       Reducing Union         DUR       MDLR       Reducing Union Elbow         DSU       MDLR       Bore Through Reducing Union Tee <t< td=""><td>DOL</td><td>MDCT</td><td>Male Connector</td><td></td><td></td><td></td></t<>	DOL	MDCT	Male Connector			
DSCZ       Bore Through Bulkhead Male Connector         MDLN       Male Long Connector         DLN       MDLN         MDLN       Male Long Connector         DTK       MDLN         MDLN       Male Run Tee         DTN       MDTN         MBE       Female Connector         DSS       MDSA         Female Connector       MDCC         DLF       MDLF         Female Connector       DSA         DTF       MDLF         Female Run Tee       DSA         DTH       MDTF         MDTH       Female Run Tee         DTH       MDTH         MDTH       Female Run Tee         DTH       MDTH         DUA       MDUR         Bore Through Reducing Union         DUX       MDUR         Bore Through Bulkhead Union         DSUZ       MDSU         BUIK       Reducing Union Elbow         DLA       MDLR         Reducing Union Tee         DSL       Bore Through Reducing Union Tee         DTA       MDTA         DTA       MDTA         DTA       MDTA         DTA       Bore Th	DCTZ	MDCTZ	Bore Through Male Connector		The second secon	
MDCC     Male Long Connector     DCT     MDCTZ     DSC       DLN     MAle Long Elbow     MAle Long Elbow     MDTK     Male Run Tee     MDTK     Male Branch Tee     MDCC     DLN     DTN     MDTK     Male Branch Tee     MDCC     DLN     DTK     DTN       Trube to Taper Male Pipe     DSA     MDSA     Female Connector     DSS     Bulkhead Female Connector       DSS     Bulkhead Female Connector     DSA     DLF     DTF     DTH     DTH       DUF     MDTF     Female Branch Tee     DSA     DLF     DTF     DTH       Tube to Tube Union     Bore Through Union     DURZ     Bore Through Reducing Union     DUA     DUR     DUR       DURZ     MDSUR     Bulkhead Reducing Union     DUA     DUR     DSU     DSU       DLR     MDLR     Reducing Union Elbow     DLA     DSL     DTA       DLR     MDTA     Union Tee     DLA     DSL     DTA       DTA     MDTA     Union Tee     DLA     DSL     DTA       DTA     MDTA     Bore Through Reducing Union Tee     DLA     DSL     DTA       DTA     MDTA     Union Cross     MDTA     DSL     DTA       DTA     MDTA     Bore Through Reducing Union Tee	DSC	MDSC	Bulkhead Male Connector		VIL S	
DLN       Male Elbow         MDL       Male Long Elbow         DTK       MDTK         MDTK       Male Run Tee         DTN       MDTN         Male Branch Tee       MDCC         DSA       MDSA         Female Connector         DLF       MDLF         MDTF       Female Connector         DLF       MDTF         MDTF       Female Elbow         DTH       MDTF         MDTH       Female Branch Tee         DTH       MDTF         MDTH       Female Connector         DLF       MDTF         MDTH       Female Branch Tee         DUA       DUF         DUA       MDUR         Bore Through Reducing Union         DURZ       MDSUR         Bulkhead Inion         DURZ       MDSUR         Bulkhead Reducing Union Elbow         DLA       MDL         DIR       MDTR         Bore Through Reducing Union Tee         DXA       MDTA         DIR       MDTA         MDTA       Bore Through Reducing Union Tee         DXA       MDTA         DTRZ       Bore T	DSCZ		Bore Through Bulkhead Male Connector			
MDLL DTK MDTK       Male Long Elbow Male Run Tee       MDCC       DLN       DTK       DTN         DTN       MDTN       Male Branch Tee       MDCC       DLN       DTK       DTN         Tube to Taper Male Pipe       Tube to Taper Male Pipe       Female Connector       BUKhead Female Connector       DSS       MDSS       Bulkhead Female Connector         DLF       MDLF       Female Run Tee       DSA       DLF       DTH		MDCC	Male Long Connector	DCT	MDCTZ	DSC
MDLL DTK MDTK MDTK       Male Long Elbow Male Run Tee MDTK       Male Run Tee MDTK       MDK Male Branch Tee       MDCC       DLN       DTK       DTN         Tube to Taper Male Pipe       Tube to Taper Male Pipe       MDCC       DLN       DTK       DTN         DSA DSS MDSS MDSS DIF       Female Connector Female Run Tee DTH       Bulkhead Female Connector Female Branch Tee       DSA       DLF       DTF       DTH         DTH       MDLF       Female Run Tee DTH       DSA       DLF       DTF       DTH         DUA DUAZ       MDUA DURZ       MDUA Bore Through Reducing Union DUAZ       Dore Through Reducing Union DUAZ       DUA       DUR       DSU         DUA DUAZ       MDUA DUR       Bore Through Reducing Union DSU       Bulkhead Reducing Union Bore Through Bulkhead Union DSU       DUA       DUR       DSU         DLA MDLA       Union Elbow DLA       Bulkhead Union Elbow Bulkhead Union Elbow DLA       DLA       DSL       DTA         DTA       MDTR       Reducing Union Tee Bore Through Reducing Union Tee DXA       Bore Through Reducing Union Tee Bore Through Reducing Union Tee       DLA       DSL       DTA         DTAZ       MDXA       Union Cross MDEA       Vent Plugged Union       Tee       Teo Fire       Teo Fire	DLN	MDLN	~			The second
DTK DTNMale Run Tee Male Branch TeeMDCCDLNDTKDTNTube to Taper Male PipeTube to Taper Male PipeDSA DSSMDSA Bulkhead Female Connector Female ElbowFemale Connector Female ElbowDTADTADTFDTFDTF DTFMDLF Female Branch TeeDSADLFDTFDTHDUA DUAZ DURZ DURZ DURZ DUR DUR DLA 		MDLL	Male Long Elbow			
DTNMDTNMale Branch TeeMDCCDLNDTKDTNTube to Taper Male PipeDSAMDSAFemale ConnectorDLFMDLFFemale ConnectorDLFMDLFFemale ElbowDTHMDTHFemale Branch TeeDTHMDTHFemale Branch TeeDUAMDUAUnionDUAMDUABore Through UnionDURMDURReducing UnionDSUZMDSUZBore Through Bulkhead UnionDSUZMDSUZBore Through Bulkhead UnionDURMDURReducing UnionDUAMDLRReducing UnionDURMDURBulkhead Reducing UnionDSUZMDSUZBore Through Bulkhead UnionDSULMDSUBulkhead Reducing UnionDLAMDLRReducing Union TeeDTAMDTRReducing Union TeeDTAMDTRReducing Union TeeDTAMDTRBore Through Reducing Union TeeDTAMDTRReducing Union TeeDTAMDTRReducing Union TeeDTAMDTAUnion CrossMDXAUnion CrossVent Plugged UnionMDTAVent Plugged Union	DTK	MDTK	-			
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DSS DLF DLF MDLF THBulkhead Female Connector Female Elbow Female Run Tee DTHDIF Female Run Tee DSADLF DLFDTF DTFDUA DUA DUAZ DURZ DURZ DURZ DURZ DSUZ DSUZ DSUZ DLA DLA DLA DLA DLA DLA DLA DLA DLA DLA DLA DLA DLA DURZ DSUZ DTA DTA DTA DTA DTA DTRZ DTRZ DTRZ MDTA Union Cross MDEA Vent Plugged UnionUIA DUA <br< td=""><td>Tube t</td><td>o Taper</td><td>Male Pipe</td><td></td><td></td><td></td></br<>	Tube t	o Taper	Male Pipe			
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Tube to Tube Union         DUA       MDUA       Union         DUA       MDUA       Bore Through Union         DUR       MDUR       Reducing Union         DURZ       MDURZ       Bore Through Reducing Union         DSU       MDSU       Bulkhead Union         DSUZ       MDSUZ       Bore Through Bulkhead Union         DSUZ       MDSUZ       Bore Through Bulkhead Union         DSUR       MDSUR       Bulkhead Reducing Union         DLA       MDLA       Union Elbow         DL       Bulkhead Union Tee       DLA         DTA       MDTA       Union Tee         DTAZ       Bore Through Reducing Union Tee       DLA         DTAZ       Bore Through Reducing Union Tee         DTAZ       Bore Through Reducing Union Tee         DTA       MDTR       Reducing Union Tee         DTA       MDTA       Union Cross         MDEA       Vent Plugged Union       Union				DSA	DLE DTE	DTH
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DTRZ Bore Through Reducing Union Tee DXA MDXA Union Cross MDEA Vent Plugged Union		MOTO				
DXA MDXA Union Cross MDEA Vent Plugged Union		MDTR		Real Lang		
MDEA Vent Plugged Union		84DX4				
	DXA		Contraction and the second	r Ah		
						MOLT
		MDET	Vent Plugged Union Tee	DXA	MDEA	MDET
Tube to Straight Female Thread						
DUD MDUD Male Connector with Hose Adapter	DUD		Male Connector with Hose Adapter		1 Alexandre	
MDLD Male Elbow with Hose Adapter			The second			
DLO MDLO Positional Male Elbow	DLO	MDLO	Positional Male Elbow		715	been present
DCU MDCU O-ring seal Male Connector for Parallel Thread	DCU	MDCU	O-ring seal Male Connector for Parallel Thread			
DCUZ         Bore Through O-ring seal Male Connector for Parallel Thread         DUD         DLO         DCU	DCUZ		Bore Through O-ring seal Male Connector for Parallel Thread	DUD	DLO	DCU
DCO MDCO O-ring Groove Male Connector for Parallel Thread	DCO	MDCO	O-ring Groove Male Connector for Parallel Thread			
DCM MDCM O-ring Groove Male Connector for Taper Thread	DCM	MDCM	O-ring Groove Male Connector for Taper Thread		Contraction of the second	free to
DCF O-ring seal Male Connector for Parallel Thread			O-ring seal Male Connector for Parallel Thread			
DCQ MDCQ Bonded seal Male Connector for Parallel Thread	DCF		Development of the Develop Thread	Land the	the part	
DCJ MDCJ Gasket seal Male Connector for Parallel Thread		MDCQ	Bonded seal Male Connector for Parallel Thread	4		
DCG Gasket seal Male Connector for Parallel Thread DCM DCQ DCG	DCQ					

Tube t	to Press	ure gauge					· ·
DGA DGB	MDGA MDGB	Gauge Connector					
		Bulkhead Gauge Connector				1	
DHF	MDHF	Gauge Adapter	DGA		DGB	D.	HG
DHG	MDHG	Gauge Adapter	DGA	L	JGB	U	па
		d System					
DCB	MDCB	Male Pipe Weld Connector					
DCBZ		Bore Through Male Pipe Weld Connector					
DLB	MDLB	Male Pipe Weld Elbow		the second		Luca -	
DOW	MDTB	Male Pipe Weld Tee			Land -		
DCW DLW	MDCW MDLW	Tube Socket Weld Connector Tube Socket Weld Elbow	DCB	DLB	DCW		LW
			DCB	DLD	DCW	D	
		g to BI-Lok					
DAN	MDAN	BI-Lok to AN Adapter	Entra		Las Fr		1 m
DUC	MDUC	AN Union					
DUE	MDUE	AN Bulkhead Union		DUC		DUE	
			DAN	DUC		DUE	
		or to BI-Lok					
DRE	MDRE	Reducer		1000			
DREZ	MDREZ	•					
DSE	MDSE	Bulkhead Reducer		1 mg			
DPC	MDPC	Port Connector	DRE		DSE	L	)PC
	er for Bl		[				
DHA	MDHA	Male Adapter					- 40 -
DHC	MDHC	Female Adapter				D	T
DHO	MDHO	O-ring Groove Male Adapter for Parallel Thread		-			
DHB	MDHB	O-ring seal Male Adapter for Parallel Thread	DHA	D	HC		
DHQ	MDHQ	Bonded seal Male Adapter for Parallel Thread	be				
DHJ	MDHJ	Gasket seal Male Adapter for Parallel Thread		-			51.11
DLH	MDLH	Elbow Adapter	DHB	DHQ			DLH
Hose t	to Heren						
	to Hose						
DAH		Hose Adapter	min	F			م. م. م. م.
DAH DAT		Hose Adapter to NPT	DAH	DAT		DTI	
DAH DAT DTI		Hose Adapter to NPT Insert(Saw Type)	DAH	DAT		DTI	
DAH DAT DTI		Hose Adapter to NPT	DAH	DAT		DTI	
DAH DAT DTI	Plug, Nut MDCA	Hose Adapter to NPT Insert(Saw Type)	DAH	DAT		DTI	
DAH DAT DTI Cap, F	Plug, Nut MDCA MDBA	Hose Adapter to NPT Insert(Saw Type) t, Ferrules Cap Plug	DAH	DAT (		DTI	
DAH DAT DTI <b>Cap, F</b> DCA DBA DNA	Plug, Nut MDCA MDBA MDNA	Hose Adapter to NPT Insert(Saw Type) t, Ferrules Cap Plug Nut	DAH	DAT		DTI	
DAH DAT DTI Cap, F DCA DBA DNA DOF	Plug, Nut MDCA MDBA MDNA MDOF	Hose Adapter to NPT Insert(Saw Type) t, Ferrules Cap Plug Nut Front Ferrule					
DAH DAT DTI <b>Cap, F</b> DCA DBA DNA	Plug, Nut MDCA MDBA MDNA	Hose Adapter to NPT Insert(Saw Type) t, Ferrules Cap Plug Nut	DAH DCA	DAT DAT		DTI DOF	DOB
DAH DAT DTI DCA DBA DNA DOF DOB	Plug, Nut MDCA MDBA MDNA MDOF	Hose Adapter to NPT Insert(Saw Type) t, Ferrules Cap Plug Nut Front Ferrule Back Ferrule					DOB
DAH DAT DTI DCA DBA DNA DOF DOB	Plug, Nut MDCA MDBA MDNA MDOF MDOB	Hose Adapter to NPT Insert(Saw Type) t, Ferrules Cap Plug Nut Front Ferrule Back Ferrule					
DAH DAT DTI Cap, F DCA DBA DNA DOF DOB Specia	Plug, Nut MDCA MDBA MDNA MDOF MDOB	Hose Adapter to NPT Insert(Saw Type) <b>c, Ferrules</b> Cap Plug Nut Front Ferrule Back Ferrule <b>s</b> 45° Male Elbow Positional Male Run Tee					
DAH DAT DTI DCA DBA DNA DOF DOB <b>Specia</b>	Plug, Nut MDCA MDBA MDNA MDOF MDOB	Hose Adapter to NPT Insert(Saw Type) <b>Ferrules</b> Cap Plug Nut Front Ferrule Back Ferrule <b>S</b> 45° Male Elbow				DOF	DOB

# Material and Applicable Temperature for BI-Lok

Stainless steel :	-196~600°C (-320~680°F)
Brass :	-196~200°C (-320~400°F)

# 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)

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

Metric series(all sizes) : +/- 0.05mm

#### d) Tolerance of Wall Thickness

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

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.

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

Inch Series

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

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

Applicable Temp.:  $-196 \sim 38$  °C for SS  $-196 \sim 38$  °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  $\ge$  D/6

OD	Wall Thickness (Inch)												
OD	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	1.1	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. Y		
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			Wal	l Thickne	ess (mm	1)		
OD	0.5	0.8	1.0	1.2	1.5	2.0	2.5	3.0
2 M	69.8	21	1. A.					
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		2 E I	c = 1 + c + c	20.9	26.5	36.3	46.8	
16M				19.5	24.8	33.8	43.4	
18M			211.6	17.3	21.9	29.8	38.0	
20M		Ĺ LL		15.5	9.6	26.6	33.9	
22M		$b_{1} \geq b_{2}$			17.7	24.0	30.5	
25M	1. s. l.	-1-6-1	$\{ x_i \}_{i \in I} \in \mathcal{C}$		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					1200 - Jack	
8 A 1/4 B	13.8		22.8	29.0	33.3	39.8	42.0	44.3		$i > 1 \leq \dots \leq n$	
10A 3/8 B	17.3		18.0	22.8	26.1	31.1	32.8	34.5	36.2	et de la const	
15A 1/2 B	21.7		L		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.

men oenes											
OD	Wall Thickness (Inch)										
OD	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

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

Inch Series

#### Metric Series

OD					W	all Thick	ness (m	m)				
00	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		1.1	
12M		2.2	3.0	3.7	5.2	6.7	8.3	10.7	15.1			1.1
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	Tube/Pipe Materials		
°F	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	

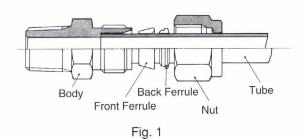
\* The allowable stresses shown above are specified in ANSI/ASME B31.3 (Chemical Plant and Petroleum Refinery Piping-1980 for TP304 and 316 of ASTM A269 and for Copper of ASTM B75 Annealed material.)

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

# Assembly Instruction

Assembly BI-Lok as per Fig. 1.

- a) At first, tube shall be cut square and end surface shall be deburred to prevent any damage on internal surface of BI-Lok.
- b) Insert tube through nut so as to contact firmly on internal stop end of BI-Lok body
   Take care for inserting tube straight to prevent any damage on internal surface of BI-Lok. (Fig. 2)



- c) Tighten nut with fingers as much as possible. This position is called as "Finger Tight Position" (FTP). Put a mark on both body and nut to notice the finger tight position by a marker.
- d) Holding hexagon of BI-Lok body rigidly by a spanner, screw nut tightly by a spanner as shown in the table below. (Fig. 3)

Fitting Size OD	Tightening from FTP	
1/16" ~ 3/16", 2mm~4mm	3/4 turn	
1/4" ~ 1" , 6mm~25mm	1-1/4 turn	
Plug, Port Connector		
1/16" ~ 3/16" , 3mm~4mm	1/8 turn	
$1/4"\sim1"$ , 6mm $\sim$ 25mm	1/4 turn	
Fig. 2	Fig. 3	

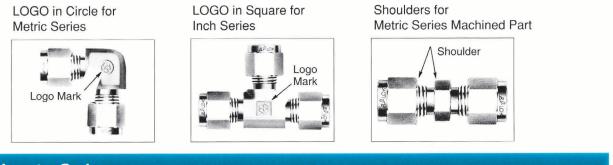
Note: BI-Lok tube fittings are supplied in assembled condition, which are available for application as they are without any disassembling. If you disassemble BI-Lok tube fittings, please reassemble each part carefully for direction referring to Fig. 1.

### Instruction for Disassembly & Reassembly

- a) When you disassemble BI-Lok tube fittings, put a mark on nut and body to notice the tightening position before disassemble nut.
- b) When you reassemble nut, tight a little more from the marked position. If you repeat this sequence several times, BI-Lok tube fittings keep their tightness as of original state.
- c) Tightness of BI-Lok tube fittings are secured even after 25 times of disassemble and reassemble tests. (increase of tightness: 15° from FTP)

# Identify Fitting Series

Metric Series and Inch Series have a LOGO Mark on forged part and Metric Series Machined Part has shoulders on body.



# How to Order

Please confirm BI-Lok's part number by refering the paragraph "Part Number / Order Number" or other Ihara's catalog.

#### a) Expression of Different Sizes

For preventing a incorrect order of tube fittings having two or more sizes of OD, such as connectors, elbows, tees and crosses, please obey to the instruction for expression of different sizes of OD  $^{\circ}$  as shown below.

Expression of Sizes	Layout of OD and its size		
1) - 2)	①——② Connectors, elbows	① : Bigger OD of run or	
1)-2-3	①2 tees ③	Biggest OD of lines ② : Smaller OD of run or Smaller OD on same line of ①	
1-2-3-4	(1)	<ul> <li>③ : Branch OD or Bigger OD of sub-run(another line of ①)</li> <li>④ : Smaller OD on sub-run</li> </ul>	

#### b) Requirements for Materials

Standard material for BI-Lok tube fittings : SUS 316 and Brass (Consult for Hastelloy, Monel or others)

#### c) Requirements for Cleaning

Please consult with Ihara for tube fittings according to special cleaning requirements such as those for a high purity gas piping system in semi-conductor manufacturing facilities .

- d) Please consult with Ihara for special tube fittings having the special corrosion resistance.
- e) Please consult with Ihara for special requirements of coloring identification on tube fittings.

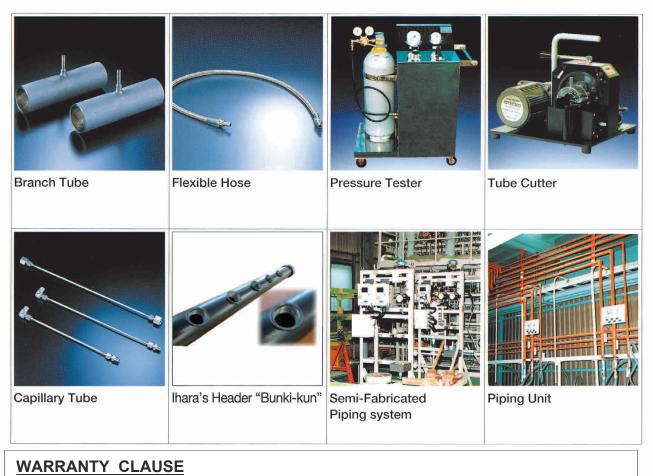
# SPECIAL CAUSION

- Please note that brass tube fittings seem to be sensitive to stress corrosion cracking in the environment containing ammonium, oxygen and humidity simultaneously and also are sensitive to dezincing corrosion in piping system of water with salt or pure water, so please manage them carefully.
- · Please disassemble nut and ferrules when you weld a BI-Lok tube fitting.

# VALVES CONNECTING TO BI-LOK

	VN Series Needle Stop Valve	VB Series Needle Stop Valve (Compact Type)				
	VQ Series Needle Stop Valve (Outside Screw Type)	VBM Series Fine Metering Stop Valve				
	VC Series Needle Stop Valve for Low Temp. Service	VH Series Needle Stop Valve for High Temp. Service (Outside Screw Type)				
	TVR Series Ball Valve for Multipurpose	BOFR Series BO5 Series Ball Valve Oil/Water Free				
	GCV Series Bellows Valve	DVF Series Diaphragm Valve				
	QA Series Quick Joint	CH Series ZD Series Check Valve				

# ACCESSORIES AND PIPING



1. Warranty Period

The warranty period of the products is one (1) year from putting into service or one and half (1.5) years after delivery whichever comes earlier.

However, the products specially specified and/or the cases used under deviating from the specification shall be exempted.

2. Scope of Warranty

Any failure and damage under maker's responsibility will be found during the warranty period, the substitutes and/or replacement parts shall be provided free of charge. The warranty shall not be applied to a claim for the liquidated damages.

WARNING: If you don't select and handle fittings, valves and related accessories in an adequate manner, it may damage human beings and applicable systems.

Within the responsibility and authorization of users and piping designers, fittings,

- valves and related accessories shall be adequately selected, assembled, used and
- maintained based on the applicable conditions and product conformity to the system

to be applied. Please read carefully our operation manual and feel free to contact with Ihara if you have any question or request.



 บริษัท นานดีอินเตอร์เทรด จำกัด

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