

TYLOK STANDARD 4 SEAL TUBE FITTINGS



TYLOK[®]

INTERNATIONAL, INC.

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www.tylok.com • email: info@tylok.com

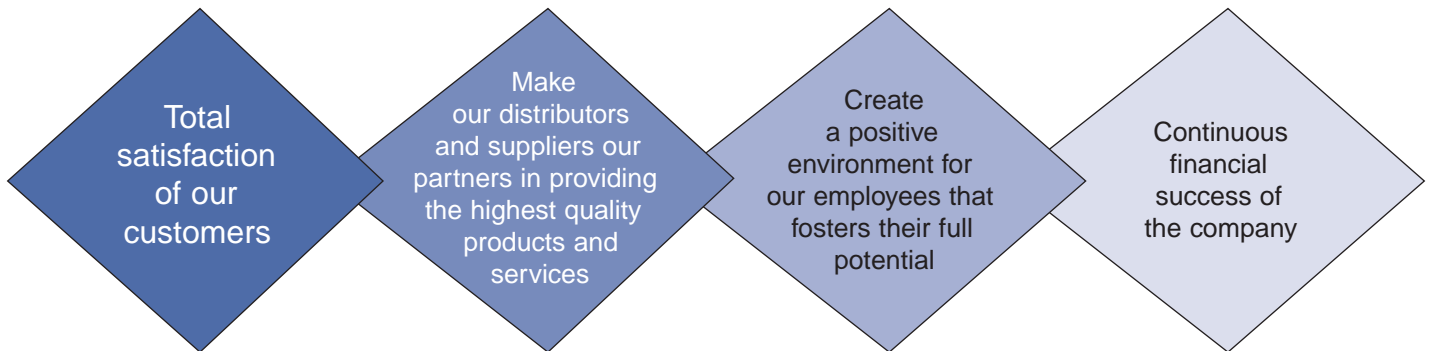


TYLOK PHILOSOPHY

MISSION

It is our mission, at Tylok International, Inc., to continuously strive for and achieve total customer satisfaction with both our products and services.

This objective falls within the framework of the larger movement toward "Total Quality" which is derived of four elements:



We accomplish this by maintaining an honest and ethical business relationship with our customers, suppliers and employees.

GOAL

Tylok's aggressive goal is to establish ourselves as an industry leader and expand our market share. This is maintained in every department within the organization. Our "total effort" will guard against losing the personal touch that makes our business enjoyable and prosperous for all involved.

TYLOK HISTORY

Cullen Crawford introduced the first flareless fitting in the mid 1940's. Well known throughout the fitting industry, Mr. Crawford founded Tylok International, Inc., in the late 1950's.

Mr. Crawford responded to the request of the Atomic Energy Commission for a fitting to hold liquid sodium. As a result, he developed the Tylok Standard Tube Fitting, which is still the only four-seal patented design in the industry today.

Manufactured in Euclid, Ohio, the Tylok Standard's unique design eliminates common installation problems and provides unparalleled sealing.



ABS CERTIFICATION



Tylok has received the Certificate of Type Approval from the American Bureau of Shipping (ABS). The following Part Families are ABS approved:

1FC – Female Connector, 1MC – Male Connector, 1U – Union, 2ELU – Union Elbow, 2ME – Male Elbow and 3TTT – Union Tee. For further information visit www.eagle.org.

QUALITY MANAGEMENT SYSTEM

QMI has registered Tylok International's Quality Management System to ISO 9001:2000. The quality system complies with the international standard ISO 9001:2000 and its technical equivalent, ANSI/ISO/ASQ Q9001:2000. Tylok strives to continuously improve the effectiveness of the Quality Management System by each member within the organization.



Certificate No. 012106



THE TYLOK STANDARD ADVANTAGE

Features

Benefits

- | | |
|--|---|
| Positive seal points • • • • • | Provides more effective sealing area than any other fitting |
| Cannot be cross-threaded or misaligned • • • • • | Saves money - prevents damage to threads |
| No special preparation of tubing necessary • • • • • | Fittings can be quickly and efficiently installed |
| Does not restrict flow through tubing • • • • • | Regardless of how tight the fitting is tightened, restriction of flow will be minimal |
| Collets skive tubing instead of biting • • • • • | Provides a more reliable seal without damaging or weakening the tubing |
| Visual inspection ensures proper fit • • • • • | No special tools or gages are required |
| Sealing design allows repeated connections or disconnections • • • • • | Sealing ability or holding power not affected by number of service connections |
| Cannot be assembled incorrectly • • • • • | Installation errors are avoided |
| Nut slips easily around 90° bend in tubing • • • • • | Prevents nut from getting "stuck" on tubing and reduces possibility of re-tubing due to shortened tube length |
| Three vibration dampeners • • • • • | Prevents vibration transmitted along tubing, from affecting seals |
| Locking features make Tylok fittings maintenance free • • • • • | Harsh operating environments will not loosen the nut or damage sealing ability |
| Tylok fittings can be rebuilt instead of being replaced • • • • • | Only collets need replaced when re-tubing |

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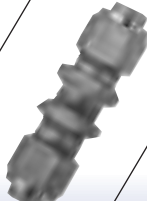









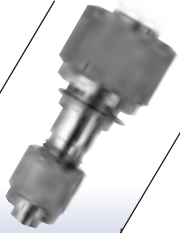
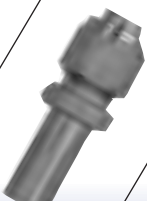





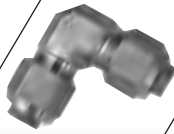
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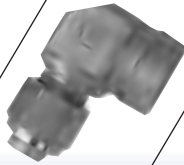
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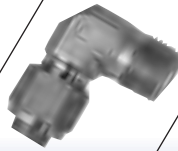
1UANF
Tube to
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Union
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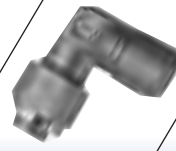
2ELU
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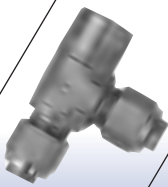
2ME
Male Elbow
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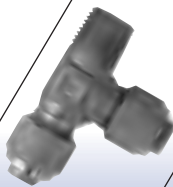
2TBWE
Tube to Butt
Weld Elbow
30



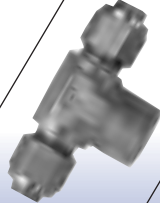
2TSWE
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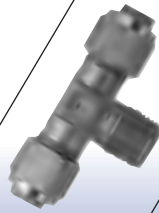
3TFT
Female Run
Tee
32



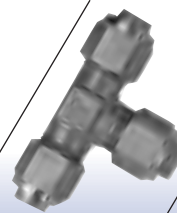
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Male Run
Tee
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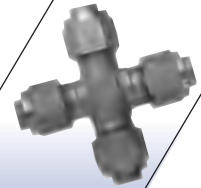
3TTF
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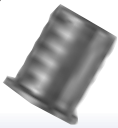
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Male
Branch Tee
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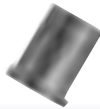
3TTT
Union Tee
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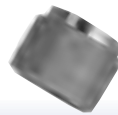
4CR
Union Cross
37



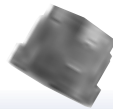
1BI
Barbed
Insert
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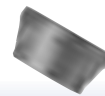
1PI
Plane
Insert
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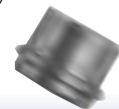
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HOW TO ORDER TYLOK STANDARD TUBE FITTINGS

Tylok Standard Tube Fittings are ordered as listed in this catalog by inserting the material code before the part number. Tylok Standard Tube Fittings can be identified through the part number as to material, tube size, configuration and thread connection. The part number describes a complete fitting assembly. The size nomenclature to describe a tee fitting is from left (1) to right (2) and down (3). **Special configurations available upon request.**

Example: A Stainless Steel Female Run Tee, 3/8" Tube Size to 1/4" Female Pipe to 3/8" Tube is designated as follows.....

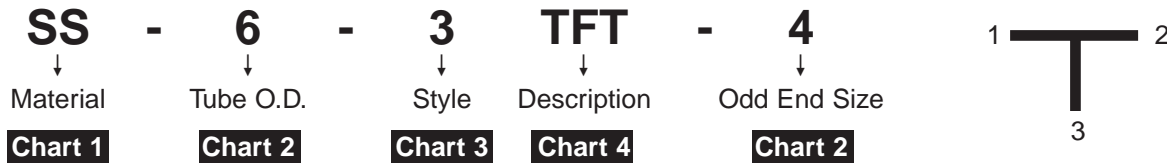


CHART 1 - MATERIAL*

A	Aluminum
B	Brass
I	Inconel
M	Monel
S	Steel
SS	Stainless Steel

*Additional materials available upon request.

CHART 3 - STYLE

1	Straight
2	Elbow
3	Tee
4	Cross

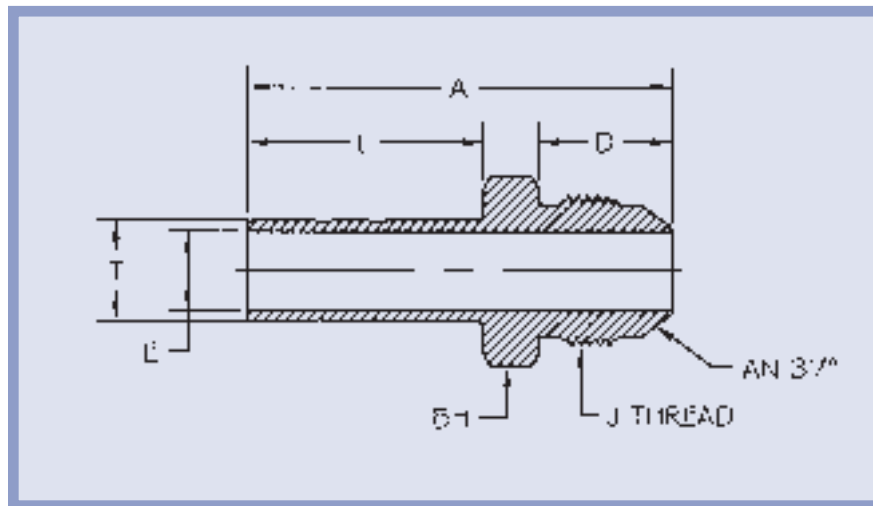
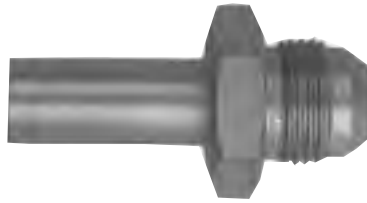
CHART 2 - TUBE O.D.

Designator	Tube or Hose OD (inches)	Pipe Thread (NPT)	AN Tube Flare Size (inches)	Pipe Thread BSPP/BSPT
1	1/16	1/16-27		1/16-28
2	1/8	1/8-27	1/8	1/8-28
3	3/16		3/16	
4	1/4	1/4-18	1/4	1/4-19
5	5/16		5/16	
6	3/8	3/8-18	3/8	3/8-19
8	1/2	1/2-14	1/2	1/2-14
10	5/8		5/8	
12	3/4	3/4-14	3/4	3/4-14
14	7/8		7/8	
16	1	1.0-11 1/2	1	1.0-11

CHART 4 - DESCRIPTION

1ATANF	Adapter Tube to AN Flare
1ATPF	Adapter Tube to Female Pipe
1ATPM	Adapter Tube to Male Pipe
1BHA	Bulkhead Adapter
1BHFP	Bulkhead Female Pipe Connector
1BHMP	Bulkhead Male Pipe Connector
1BHU	Bulkhead Union
1BUANF	Bulkhead to AN Flare Union
1CAP	Cap
1F PLUG	Fitting Plug
1FC	Female Connector
1MC	Male Connector
1MC-ORS	O Ring Straight Thread Male Connector
1MC-ORT	O Ring Pipe Thread Male Connector
1PCU	Port Connector Union
1PHC	Port Hose Connector
1PTC	Port Tube Connector
1RATT	Reducer Adapter Tube to Tube
1RPC	Reducing Port Connector
1RU	Reducing Union
1TBW	Tube to Butt Weld Connector

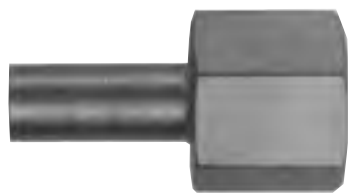
1TSW	Tube to Socket Weld Connector
1U	Union
1UANF	Tube to AN Flare Union
2ELU	Union Elbow
2FE	Female Elbow
2ME	Male Elbow
2TBWE	Tube to Butt Weld Elbow
2TSWE	Tube to Socket Weld Elbow
3TFT	Female Run Tee
3TMT	Male Run Tee
3TTF	Female Branch Tee
3TTM	Male Branch Tee
3TTT	Union Tee
4CR	Union Cross
1BI	Barbed Insert
1PI	Plane Insert
N	Nut
KN	Knurled Nut
FC	Front Collet
RC	Rear Collet



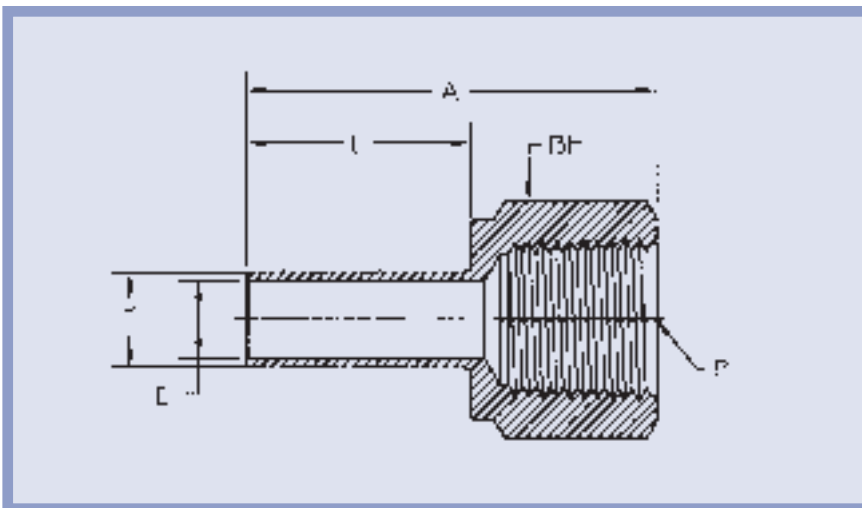
ADAPTER TUBE TO AN FLARE

PART NUMBER	T TUBE O.D.	J THREAD	A	D	E THRU HOLE	BH BODY HEX	L
2-1ATANF-2	1/8	5/16-24	1.328	.448	.062	3/8	.687
2-1ATANF-4	1/8	7/16-20	1.453	.550	.081	1/2	.687
3-1ATANF-3	3/16	3/8-24	1.437	.479	.125	7/16	.765
4-1ATANF-4	1/4	7/16-20	1.594	.550	.172	1/2	.828
5-1ATANF-5	5/16	1/2-20	1.609	.550	.234	9/16	.844
6-1ATANF-4	3/8	7/16-20	1.734	.550	.172	1/2	.968
6-1ATANF-6	3/8	9/16-18	1.812	.556	.297	5/8	.968
8-1ATANF-8	1/2	3/4-16	2.109	.657	.391	13/16	1.172
10-1ATANF-10	5/8	7/8-14	2.312	.758	.484	15/16	1.250
12-1ATANF-12	3/4	1-1/16-12	2.500	.864	.609	1-1/8	1.281
16-1ATANF-16	1	1-5/16-12	2.890	.911	.844	1-3/8	1.547

*NOTE: All dimensions subject to change, to be used for reference only.

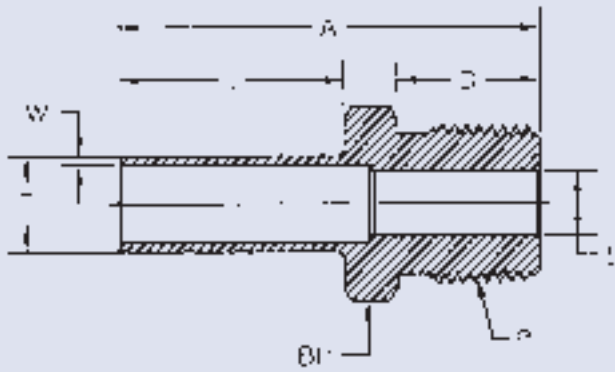


ADAPTER TUBE TO FEMALE PIPE



PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	E THRU HOLE	L	BH BODY HEX
1-1ATPF-1	1/16	1/16	.922	.018	.687	1/2
1-1ATPF-2	1/16	1/8	1.047	.018	.687	9/16
2-1ATPF-2	1/8	1/8	1.312	.081	.687	9/16
2-1ATPF-4	1/8	1/4	1.406	.081	.687	3/4
3-1ATPF-2	3/16	1/8	1.390	.140	.765	9/16
3-1ATPF-4	3/16	1/4	1.484	.140	.765	3/4
4-1ATPF-1	1/4	1/16	1.328	.187	.828	1/2
4-1ATPF-2	1/4	1/8	1.390	.187	.828	9/16
4-1ATPF-4	1/4	1/4	1.546	.187	.828	3/4
4-1ATPF-6	1/4	3/8	1.609	.187	.828	7/8
4-1ATPF-8	1/4	1/2	1.796	.187	.828	1-1/16
4-1ATPF-12	1/4	3/4	1.890	.187	.828	1-1/4
5-1ATPF-2	5/16	1/8	1.468	.250	.844	9/16
5-1ATPF-4	5/16	1/4	1.562	.250	.844	3/4
5-1ATPF-6	5/16	3/8	1.625	.250	.844	7/8
5-1ATPF-8	5/16	1/2	1.812	.250	.844	1-1/16
6-1ATPF-2	3/8	1/8	1.593	.281	.969	9/16
6-1ATPF-4	3/8	1/4	1.687	.281	.969	3/4
6-1ATPF-6	3/8	3/8	1.750	.281	.969	7/8
6-1ATPF-8	3/8	1/2	1.937	.281	.969	1-1/16
8-1ATPF-4	1/2	1/4	1.890	.406	1.172	3/4
8-1ATPF-6	1/2	3/8	1.953	.406	1.172	7/8
8-1ATPF-8	1/2	1/2	2.140	.406	1.172	1-1/16
8-1ATPF-12	1/2	3/4	2.203	.406	1.172	1-1/4
8-1ATPF-16	1/2	1	2.547	.406	1.172	1-5/8
10-1ATPF-6	5/8	3/8	2.000	.531	1.250	7/8
10-1ATPF-8	5/8	1/2	2.218	.531	1.250	1-1/16
12-1ATPF-8	3/4	1/2	2.234	.656	1.281	1-1/16
14-1ATPF-12	7/8	3/4	2.453	.781	1.500	1-1/4
16-1ATPF-8	1	1/2	2.515	.906	1.547	1-1/16
16-1ATPF-12	1	3/4	2.609	.906	1.547	1-1/4
16-1ATPF-16	1	1	2.922	.906	1.547	1-5/8

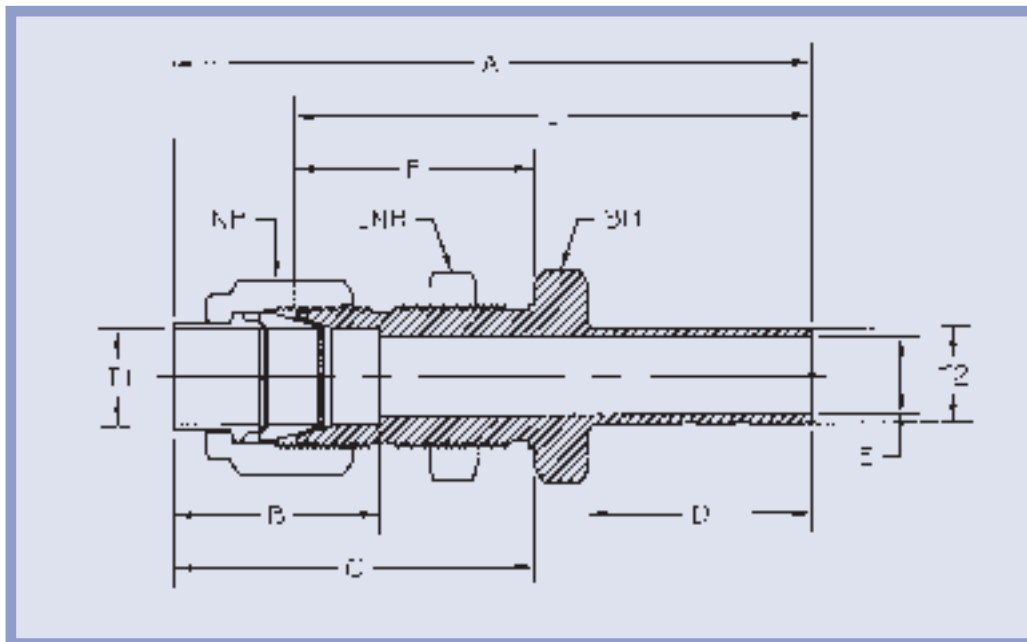
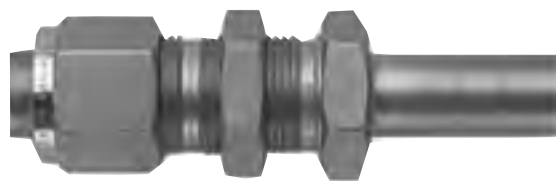
*NOTE: All dimensions subject to change, to be used for reference only.



ADAPTER TUBE TO MALE PIPE

PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	D	E THRU HOLE	L	W	BH BODY HEX
1-1ATPM-1	1/16	1/16	1.218	.375	.018	.687	.022	5/16
1-1ATPM-2	1/16	1/8	1.281	.375	.018	.687	.022	7/16
2-1ATPM-2	1/8	1/8	1.250	.375	.081	.687	.022	7/16
2-1ATPM-4	1/8	1/4	1.437	.562	.081	.687	.022	9/16
2-1ATPM-6	1/8	3/8	1.500	.562	.081	.687	.022	11/16
3-1ATPM-2	3/16	1/8	1.328	.375	.140	.766	.022	7/16
3-1ATPM-4	3/16	1/4	1.578	.562	.140	.766	.022	9/16
4-1ATPM-2	1/4	1/8	1.453	.375	.187	.828	.032	7/16
4-1ATPM-4	1/4	1/4	1.640	.562	.187	.828	.032	9/16
4-1ATPM-6	1/4	3/8	1.640	.562	.187	.828	.032	11/16
4-1ATPM-8	1/4	1/2	1.859	.750	.187	.828	.032	7/8
5-1ATPM-2	5/16	1/8	1.406	.375	.187	.844	.032	7/16
5-1ATPM-4	5/16	1/4	1.656	.562	.250	.844	.032	9/16
5-1ATPM-6	5/16	3/8	1.656	.562	.250	.844	.032	11/16
5-1ATPM-8	5/16	1/2	1.875	.750	.250	.844	.032	7/8
6-1ATPM-2	3/8	1/8	1.593	.375	.187	.969	.032	7/16
6-1ATPM-4	3/8	1/4	1.781	.562	.312	.969	.032	9/16
6-1ATPM-6	3/8	3/8	1.781	.562	.312	.969	.032	11/16
6-1ATPM-8	3/8	1/2	2.000	.750	.312	.969	.032	7/8
8-1ATPM-4	1/2	1/4	1.984	.562	.281	1.172	.047	9/16
8-1ATPM-6	1/2	3/8	2.015	.562	.375	1.172	.047	11/16
8-1ATPM-8	1/2	1/2	2.203	.750	.406	1.172	.047	7/8
8-1ATPM-12	1/2	3/4	2.234	.750	.406	1.172	.047	1-1/16
8-1ATPM-16	1/2	1	2.546	.937	.406	1.172	.047	1-3/8
10-1ATPM-6	5/8	3/8	2.062	.562	.375	1.250	.047	11/16
10-1ATPM-8	5/8	1/2	2.281	.750	.468	1.250	.047	7/8
10-1ATPM-12	5/8	3/4	2.375	.750	.531	1.250	.047	1-1/16
12-1ATPM-8	3/4	1/2	2.296	.750	.468	1.281	.047	7/8
12-1ATPM-12	3/4	3/4	2.390	.750	.625	1.281	.047	1-1/16
12-1ATPM-16	3/4	1	2.640	.937	.656	1.281	.047	1-3/8
14-1ATPM-12	7/8	3/4	2.546	.750	.625	1.500	.047	1-3/8
14-1ATPM-16	7/8	1	2.796	.937	.781	1.500	.047	1-3/8
16-1ATPM-8	1	1/2	2.671	.750	.468	1.547	.047	1-1/16
16-1ATPM-12	1	3/4	2.671	.750	.625	1.547	.047	1-1/16
16-1ATPM-16	1	1	2.921	.937	.875	1.547	.047	1-3/8

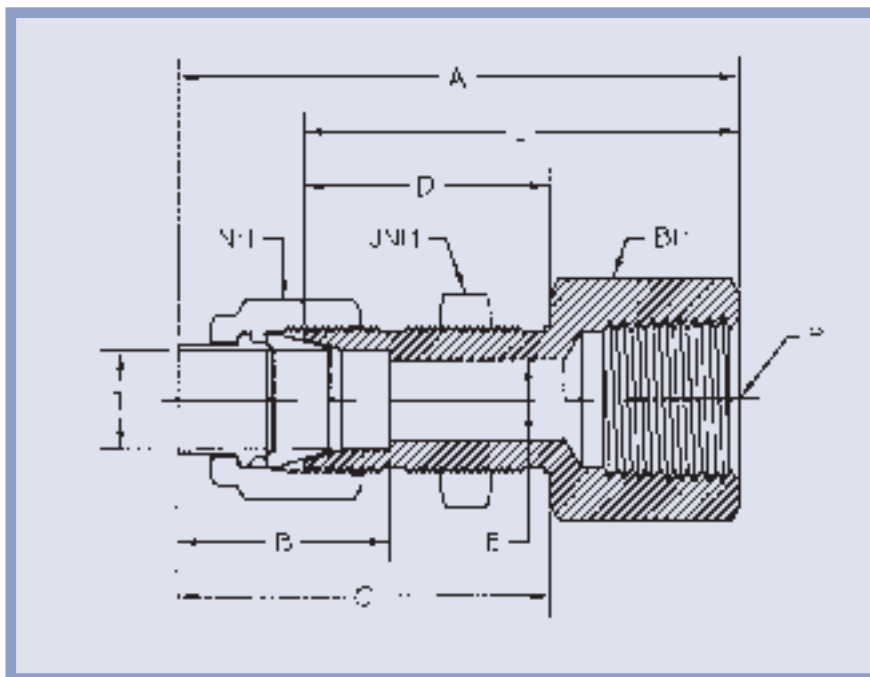
*NOTE: All dimensions subject to change, to be used for reference only.



BULKHEAD ADAPTER

PART NUMBER	T1 TUBE O.D.	T2 TUBE O.D.	A	B	C	D	E THRU HOLE	F	L	NH NUT HEX	JNH JAM NUT HEX	BH BODY HEX	PANEL HOLE
1-1BHA-1	1/16	1/16	2.109	.609	1.234	.687	.031	.906	1.781	3/8	7/16	7/16	17/64
2-1BHA-1	1/8	1/16	1.968	.640	1.359	.687	.031	.969	1.578	7/16	1/2	7/16	21/64
2-1BHA-2	1/8	1/8	2.234	.640	1.359	.687	.078	.969	1.842	7/16	1/2	7/16	21/64
3-1BHA-3	3/16	3/16	2.375	.703	1.422	.765	.125	1.000	1.952	1/2	9/16	9/16	25/64
4-1BHA-2	1/4	1/8	2.484	.796	1.515	.687	.078	1.031	2.000	9/16	5/8	5/8	29/64
4-1BHA-4	1/4	1/4	2.671	.796	1.515	.828	.187	1.031	2.187	9/16	5/8	5/8	29/64
5-1BHA-5	5/16	5/16	2.796	.796	1.578	.828	.250	1.125	2.343	5/8	3/4	3/4	33/64
6-1BHA-6	3/8	3/8	2.968	.937	1.718	.969	.281	1.156	2.405	11/16	3/4	13/16	37/64
8-1BHA-8	1/2	1/2	3.437	1.140	1.890	1.171	.406	1.250	2.796	7/8	15/16	15/16	49/64
10-1BHA-10	5/8	5/8	3.609	1.203	1.922	1.250	.500	1.281	2.968	1	1-1/16	1-1/16	57/64
12-1BHA-12	3/4	3/4	3.843	1.250	2.156	1.281	.625	1.469	3.156	1-1/4	1-1/4	1-1/8	1-5/64
14-1BHA-14	7/8	7/8	4.328	1.453	2.515	1.500	.781	1.687	3.500	1-3/8	1-3/8	1-1/4	1-13/64
16-1BHA-16	1	1	4.609	1.515	2.609	1.546	.906	1.781	3.781	1-1/2	1-1/2	1-3/8	1-21/64

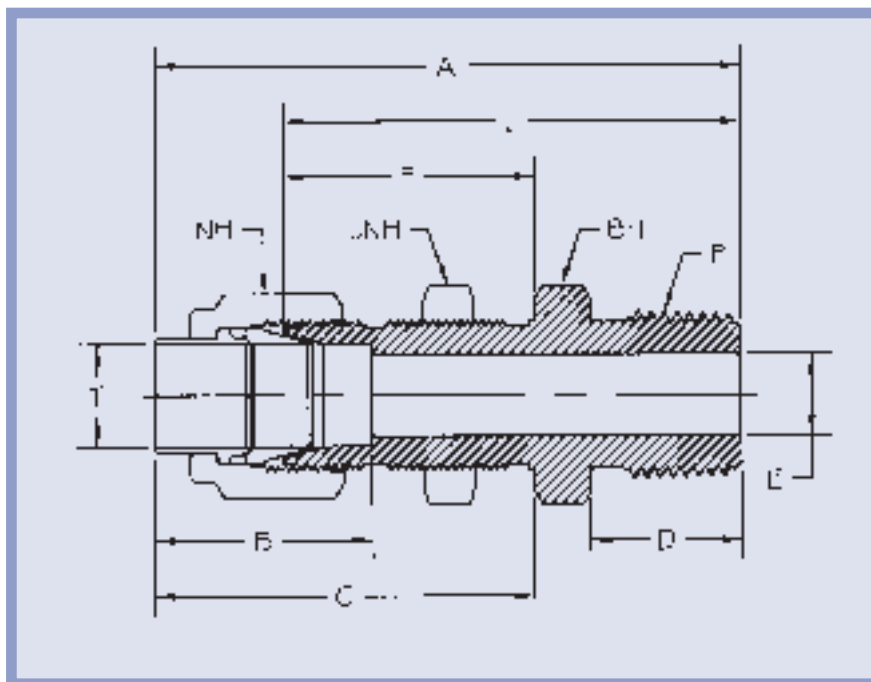
*NOTE: All dimensions subject to change, to be used for reference only.



BULKHEAD FEMALE PIPE CONNECTOR

PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	B	C	D	E THRU HOLE	L	NH NUT HEX	JNH JAM NUT HEX	BH BODY HEX	PANEL HOLE
1-1BHFP-1	1/16	1/16	1.734	.609	1.234	.906	.052	1.406	3/8	7/16	1/2	17/64
1-1BHFP-2	1/16	1/8	1.859	.609	1.234	.906	.052	1.531	3/8	7/16	9/16	17/64
2-1BHFP-2	1/8	1/8	1.984	.640	1.359	.969	.094	1.594	7/16	1/2	9/16	21/64
3-1BHFP-2	3/16	1/8	2.046	.703	1.422	1.000	.125	1.625	1/2	9/16	9/16	25/64
4-1BHFP-2	1/4	1/8	2.140	.796	1.515	1.031	.187	1.656	9/16	5/8	5/8	29/64
4-1BHFP-4	1/4	1/4	2.234	.796	1.515	1.031	.187	1.750	9/16	5/8	3/4	29/64
4-1BHFP-6	1/4	3/8	2.296	.796	1.515	1.031	.187	1.812	9/16	5/8	7/8	29/64
5-1BHFP-2	5/16	1/8	2.203	.796	1.578	1.125	.250	1.750	5/8	3/4	3/4	33/64
6-1BHFP-4	3/8	1/4	2.437	.937	1.718	1.156	.281	1.875	11/16	3/4	3/4	37/64
6-1BHFP-6	3/8	3/8	2.500	.937	1.718	1.156	.281	1.937	11/16	3/4	7/8	37/64
6-1BHFP-8	3/8	1/2	2.687	.937	1.718	1.156	.281	2.125	11/16	3/4	1-1/16	37/64
8-1BHFP-4	1/2	1/4	2.609	1.140	1.890	1.250	.406	1.968	7/8	15/16	13/16	49/64
8-1BHFP-6	1/2	3/8	2.671	1.140	1.890	1.250	.406	2.031	7/8	15/16	1	49/64
8-1BHFP-8	1/2	1/2	2.859	1.140	1.890	1.250	.406	2.219	7/8	15/16	1-1/16	49/64
10-1BHFP-8	5/8	1/2	2.890	1.203	1.922	1.281	.500	2.250	1	1-1/16	1-1/16	57/64
10-1BHFP-12	5/8	3/4	2.921	1.203	1.922	1.281	.500	2.281	1	1-1/16	1-1/4	57/64
16-1BHFP-12	1	3/4	3.671	1.515	2.609	1.781	.875	2.843	1-1/2	1-1/2	1-3/8	1-21/64
16-1BHFP-16	1	1	3.984	1.515	2.609	1.781	.875	3.156	1-1/2	1-1/2	1-5/8	1-21/64

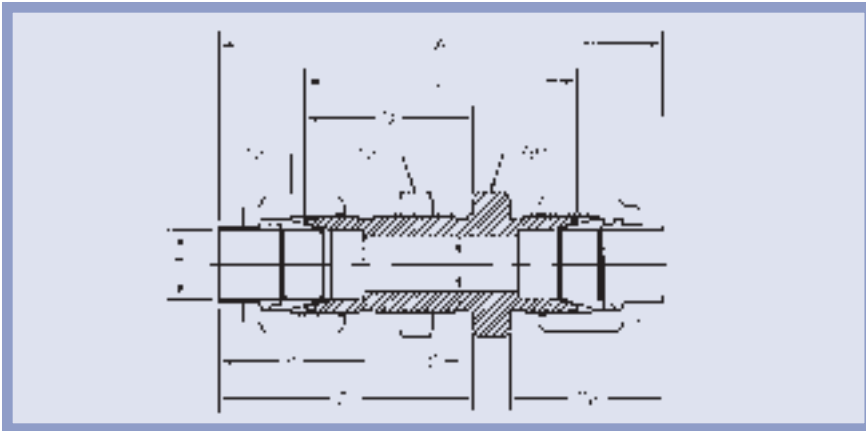
*NOTE: All dimensions subject to change, to be used for reference only.



BULKHEAD MALE PIPE CONNECTOR

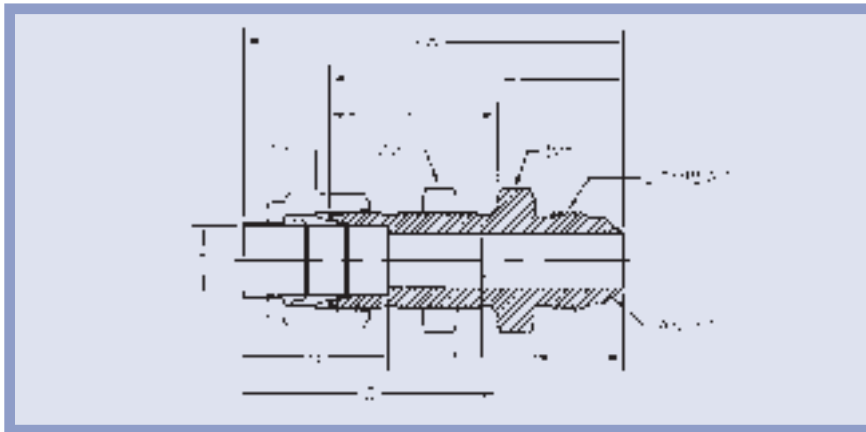
PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	B	C	D	E THRU HOLE	F	L	NH NUT HEX	JNH JAM NUT HEX	BH BODY HEX	PANEL HOLE
1-1BHMP-1	1/16	1/16	1.781	.609	1.234	.375	.052	.906	1.469	3/8	7/16	7/16	17/64
1-1BHMP-2	1/16	1/8	1.828	.609	1.234	.375	.052	.906	1.500	3/8	7/16	9/16	17/64
2-1BHMP-2	1/8	1/8	1.921	.640	1.359	.375	.094	.969	1.531	7/16	1/2	1/2	21/64
3-1BHMP-2	3/16	1/8	2.015	.703	1.422	.375	.125	1.000	1.594	1/2	9/16	9/16	25/64
4-1BHMP-2	1/4	1/8	2.140	.796	1.515	.375	.187	1.031	1.656	9/16	5/8	5/8	29/64
4-1BHMP-4	1/4	1/4	2.328	.796	1.515	.562	.187	1.031	1.843	9/16	5/8	5/8	29/64
4-1BHMP-6	1/4	3/8	2.359	.796	1.515	.562	.187	1.031	1.875	9/16	5/8	13/16	29/64
4-1BHMP-8	1/4	1/2	2.546	.796	1.515	.750	.187	1.031	2.062	9/16	5/8	7/8	29/64
6-1BHMP-4	3/8	1/4	2.531	.937	1.718	.562	.281	1.156	1.968	11/16	3/4	3/4	37/64
6-1BHMP-6	3/8	3/8	2.562	.937	1.718	.562	.281	1.156	2.000	11/16	3/4	13/16	37/64
6-1BHMP-8	3/8	1/2	2.750	.937	1.718	.750	.281	1.156	2.187	11/16	3/4	7/8	37/64
8-1BHMP-4	1/2	1/4	2.734	1.140	1.890	.562	.281	1.250	2.093	7/8	15/16	15/16	49/64
8-1BHMP-6	1/2	3/8	2.734	1.140	1.890	.562	.406	1.250	2.093	7/8	15/16	15/16	49/64
8-1BHMP-8	1/2	1/2	2.921	1.140	1.890	.750	.406	1.250	2.281	7/8	15/16	15/16	49/64

*NOTE: All dimensions subject to change, to be used for reference only.



BULKHEAD UNION

PART NUMBER	T TUBE O.D.	A	B	C1	C2	D	E THRU HOLE	L	NH NUT HEX	JNH JAM NUT HEX	BH BODY HEX	PANEL HOLE
1-1BHU-1	1/16	2.093	.609	1.234	.670	.906	.052	1.437	3/8	7/16	7/16	17/64
2-1BHU-2	1/8	2.312	.640	1.359	.765	.969	.094	1.531	7/16	1/2	1/2	21/64
3-1BHU-3	3/16	2.406	.703	1.422	.796	1.000	.125	1.562	1/2	9/16	9/16	25/64
4-1BHU-4	1/4	2.671	.796	1.515	.906	1.031	.187	1.703	9/16	5/8	5/8	29/64
5-1BHU-5	5/16	2.734	.796	1.578	.906	1.125	.250	1.828	5/8	3/4	3/4	33/64
6-1BHU-6	3/8	3.015	.937	1.718	1.015	1.156	.281	1.890	11/16	3/4	3/4	37/64
8-1BHU-8	1/2	3.312	1.140	1.890	1.140	1.250	.406	2.031	7/8	15/16	15/16	49/64
10-1BHU-10	5/8	3.453	1.203	1.922	1.217	1.281	.500	2.109	1	1-1/16	1-1/16	57/64
12-1BHU-12	3/4	3.875	1.250	2.156	1.343	1.469	.625	2.500	1-1/4	1-1/4	1-1/4	1-5/64
14-1BHU-14	7/8	4.375	1.453	2.515	1.484	1.687	.718	2.722	1-3/8	1-3/8	1-3/8	1-13/64
16-1BHU-16	1	4.531	1.515	2.609	1.484	1.781	.875	2.878	1-1/2	1-1/2	1-3/8	1-21/64



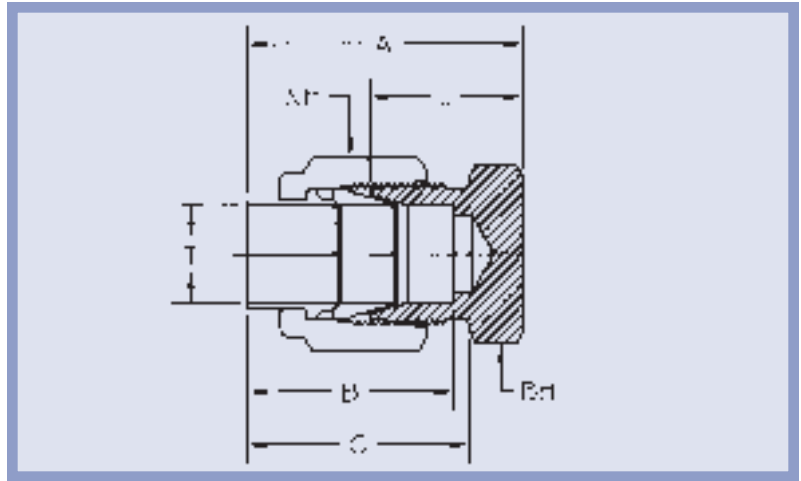
BULKHEAD TO AN FLARE UNION

PART NUMBER	T TUBE O.D.	J THREAD	A	B	C	D	E THRU HOLE	F	L	NH NUT HEX	BH BODY HEX	JNH JAM NUT HEX	PANEL HOLE
2-1BUANF-2	1/8	5/16-24	2.000	.640	1.359	.448	.062	.969	1.605	7/16	1/2	1/2	21/64
3-1BUANF-3	3/16	3/8-24	2.093	.703	1.422	.479	.125	1.000	1.667	1/2	9/16	9/16	25/64
4-1BUANF-4	1/4	7/16-20	2.312	.796	1.515	.550	.172	1.031	1.831	9/16	5/8	5/8	29/64
5-1BUANF-5	5/16	1/2-20	2.375	.796	1.578	.550	.234	1.125	1.925	5/8	3/4	3/4	33/64
6-1BUANF-6	3/8	9/16-18	2.656	.937	1.718	.556	.297	1.156	2.093	11/16	3/4	3/4	37/64
8-1BUANF-4	1/2	7/16-20	2.719	1.140	1.890	.550	.391	1.250	2.081	7/8	15/16	15/16	49/64
8-1BUANF-8	1/2	3/4-16	2.953	1.140	2.015	.657	.391	1.375	2.313	7/8	15/16	15/16	49/64
10-1BUANF-10	5/8	7/8-14	3.000	1.203	1.922	.758	.484	1.281	2.359	1	1-1/16	1-1/16	57/64
12-1BUANF-12	3/4	1-1/16-12	3.390	1.250	2.156	.864	.609	1.468	2.703	1-1/4	1-1/4	1-1/4	1-5/64
16-1BUANF-16	1	1-5/16-12	3.953	1.515	2.609	.911	.844	1.781	3.130	1-1/2	1-1/2	1-1/2	1-21/64

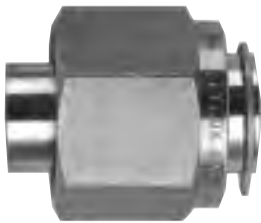
*NOTE: All dimensions subject to change, to be used for reference only.



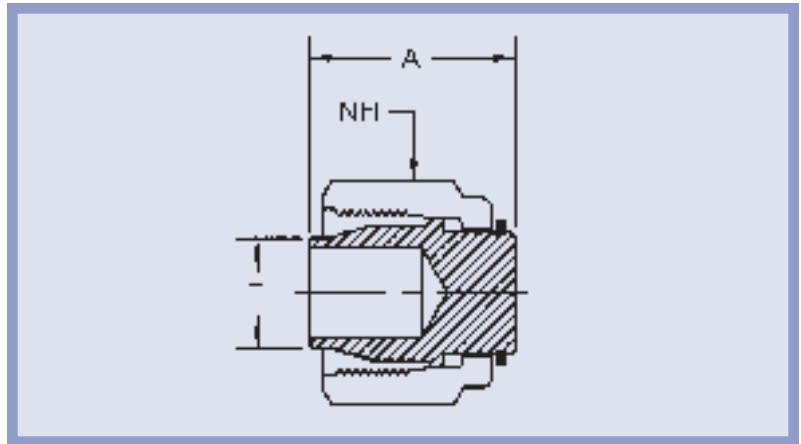
CAP



PART NUMBER	T TUBE O.D.	A	B	C	L	BH BODY HEX	NH NUT HEX
1-1CAP	1/16	.828	.609	.670	.500	5/16	3/8
2-1CAP	1/8	.969	.640	.765	.578	7/16	7/16
3-1CAP	3/16	1.000	.703	.796	.578	7/16	1/2
4-1CAP	1/4	1.156	.796	.906	.672	1/2	9/16
5-1CAP	5/16	1.125	.796	.906	.672	9/16	5/8
6-1CAP	3/8	1.265	.937	1.015	.703	5/8	11/16
8-1CAP	1/2	1.421	1.140	1.140	.781	13/16	7/8
10-1CAP	5/8	1.515	1.203	1.217	.875	15/16	1
12-1CAP	3/4	1.718	1.250	1.343	1.031	1-1/8	1-1/4
14-1CAP	7/8	1.921	1.453	1.484	1.093	1-1/4	1-3/8
16-1CAP	1	1.921	1.515	1.484	1.097	1-3/8	1-1/2

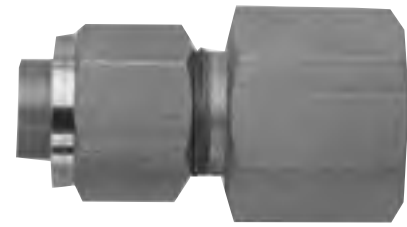
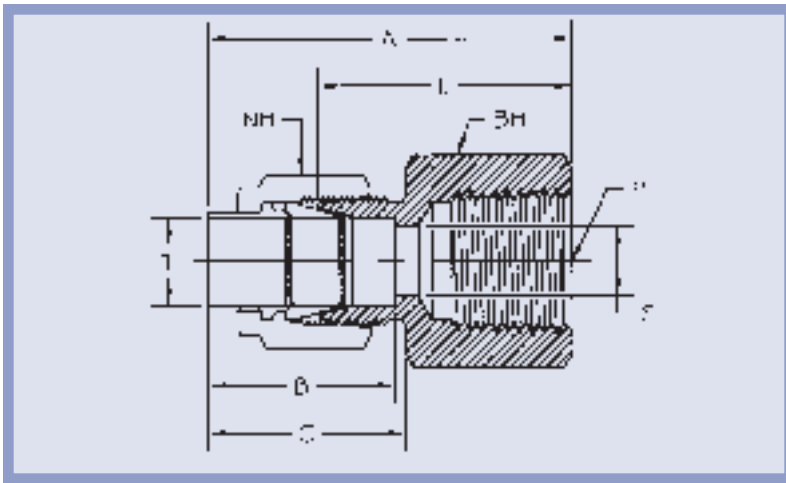


FITTING PLUG



PART NUMBER	T TUBE O.D.	A	NH NUT HEX
1-1F PLUG	1/16	.642	3/8
2-1F PLUG	1/8	.580	7/16
3-1F PLUG	3/16	.617	1/2
4-1F PLUG	1/4	.602	9/16
5-1F PLUG	5/16	.645	5/8
6-1F PLUG	3/8	.785	11/16
8-1F PLUG	1/2	.929	7/8
10-1F PLUG	5/8	.979	1
12-1F PLUG	3/4	1.137	1-1/4
14-1F PLUG	7/8	1.093	1-3/8
16-1F PLUG	1	1.092	1-1/2

*NOTE: All dimensions subject to change, to be used for reference only.



FEMALE CONNECTOR

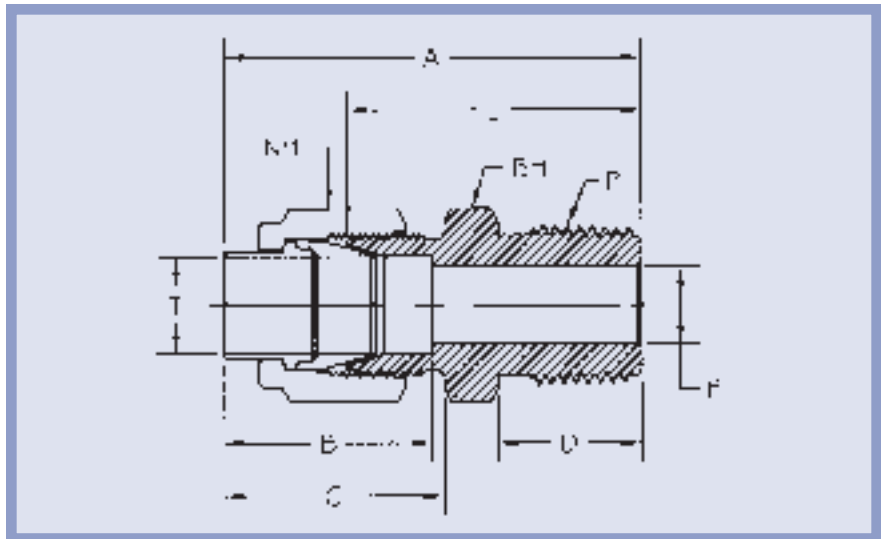


PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	B	C	E THRU HOLE	L	NH NUT HEX	BH BODY HEX
1-1FC-1	1/16	1/16	1.171	.609	.670	.052	.782	3/8	1/2
1-1FC-2	1/16	1/8	1.296	.609	.670	.052	.969	3/8	9/16
2-1FC-2	1/8	1/8	1.296	.640	.765	.094	.906	7/16	9/16
2-1FC-4	1/8	1/4	1.484	.640	.765	.094	1.093	7/16	3/4
2-1FC-6	1/8	3/8	1.546	.640	.765	.094	1.156	7/16	7/8
3-1FC-2	3/16	1/8	1.421	.703	.796	.125	1.000	1/2	9/16
3-1FC-4	3/16	1/4	1.515	.703	.796	.125	1.093	1/2	3/4
3-1FC-8	3/16	1/2	1.765	.703	.796	.125	1.344	1/2	1-1/8
4-1FC-1	1/4	1/16	1.406	.796	.906	.187	.922	9/16	1/2
4-1FC-2	1/4	1/8	1.437	.796	.906	.187	.953	9/16	9/16
4-1FC-4	1/4	1/4	1.625	.796	.906	.187	1.141	9/16	3/4
4-1FC-6	1/4	3/8	1.687	.796	.906	.187	1.203	9/16	7/8
4-1FC-8	1/4	1/2	1.875	.796	.906	.187	1.390	9/16	1-1/16
5-1FC-2	5/16	1/8	1.437	.796	.906	.250	.984	5/8	9/16
5-1FC-4	5/16	1/4	1.625	.796	.906	.250	1.172	5/8	3/4
5-1FC-6	5/16	3/8	1.687	.796	.906	.250	1.234	5/8	7/8
5-1FC-8	5/16	1/2	1.875	.796	.906	.250	1.421	5/8	1-1/16
6-1FC-2	3/8	1/8	1.640	.937	1.015	.281	1.078	11/16	5/8
6-1FC-4	3/8	1/4	1.734	.937	1.015	.281	1.171	11/16	3/4
6-1FC-6	3/8	3/8	1.796	.937	1.015	.281	1.234	11/16	7/8
6-1FC-8	3/8	1/2	1.984	.937	1.015	.281	1.422	11/16	1-1/16
6-1FC-12	3/8	3/4	2.078	.937	1.015	.281	1.516	11/16	1-1/4
8-1FC-4	1/2	1/4	1.859	1.140	1.140	.406	1.218	7/8	13/16
8-1FC-6	1/2	3/8	1.921	1.140	1.140	.406	1.281	7/8	7/8
8-1FC-8	1/2	1/2	2.109	1.140	1.140	.406	1.468	7/8	1-1/16
8-1FC-12	1/2	3/4	2.203	1.140	1.140	.406	1.562	7/8	1-1/4
8-1FC-16	1/2	1	2.515	1.140	1.140	.406	1.875	7/8	1-5/8
10-1FC-4	5/8	1/4	2.187	1.203	1.217	.281	1.547	1	15/16
10-1FC-6	5/8	3/8	2.000	1.203	1.217	.500	1.356	1	15/16
10-1FC-8	5/8	1/2	2.187	1.203	1.217	.500	1.484	1	1-1/16
10-1FC-12	5/8	3/4	2.281	1.203	1.217	.500	1.638	1	1-1/4
12-1FC-6	3/4	3/8	2.125	1.250	1.343	.500	1.441	1-1/4	1-1/8
12-1FC-8	3/4	1/2	2.312	1.250	1.343	.625	1.629	1-1/4	1-1/8
12-1FC-12	3/4	3/4	2.406	1.250	1.343	.625	1.722	1-1/4	1-1/4
12-1FC-16	3/4	1	2.718	1.250	1.343	.625	2.035	1-1/4	1-5/8
14-1FC-8	7/8	1/2	2.453	1.453	1.484	.687	1.629	1-3/8	1-1/4
14-1FC-12	7/8	3/4	2.546	1.453	1.484	.719	1.723	1-3/8	1-1/4
14-1FC-16	7/8	1	2.859	1.453	1.484	.719	2.035	1-3/8	1-5/8
16-1FC-12	1	3/4	2.546	1.515	1.484	.875	1.723	1-1/2	1-3/8
16-1FC-16	1	1	2.859	1.515	1.484	.875	2.035	1-1/2	1-5/8

*NOTE: All dimensions subject to change, to be used for reference only.



MALE CONNECTOR

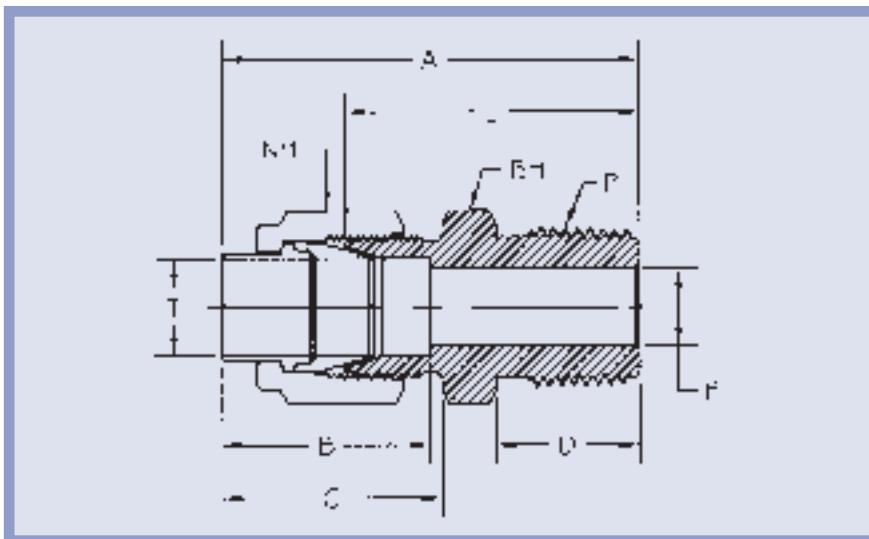


PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	B	C	D	E THRU HOLE	L	NH NUT HEX	BH BODY HEX
1-1MC-1	1/16	1/16	1.203	.609	.670	.375	.052	.875	3/8	3/8
1-1MC-2	1/16	1/8	1.234	.609	.670	.375	.052	.906	3/8	7/16
2-1MC-1	1/8	1/16	1.328	.640	.765	.375	.094	.937	7/16	7/16
2-1MC-2	1/8	1/8	1.328	.640	.765	.375	.094	.937	7/16	7/16
2-1MC-4	1/8	1/4	1.546	.640	.765	.562	.094	1.156	7/16	9/16
2-1MC-6	1/8	3/8	1.578	.640	.765	.562	.094	1.187	7/16	11/16
2-1MC-8	1/8	1/2	1.765	.640	.765	.750	.094	1.375	7/16	7/8
3-1MC-2	3/16	1/8	1.390	.703	.796	.375	.125	.969	1/2	7/16
3-1MC-4	3/16	1/4	1.656	.703	.796	.562	.125	1.234	1/2	9/16
4-1MC-1	1/4	1/16	1.500	.796	.906	.375	.125	1.016	9/16	1/2
4-1MC-2	1/4	1/8	1.500	.796	.906	.375	.187	1.016	9/16	1/2
4-1MC-4	1/4	1/4	1.718	.796	.906	.562	.187	1.234	9/16	9/16
4-1MC-6	1/4	3/8	1.750	.796	.906	.562	.187	1.265	9/16	11/16
4-1MC-8	1/4	1/2	1.937	.796	.906	.750	.187	1.453	9/16	7/8
4-1MC-12	1/4	3/4	2.031	.796	.906	.750	.187	1.547	9/16	1-1/8
4-1MC-16	1/4	1	2.281	.796	.906	.937	.187	1.797	9/16	1-3/8
5-1MC-2	5/16	1/8	1.500	.796	.906	.375	.187	1.047	5/8	9/16
5-1MC-4	5/16	1/4	1.718	.796	.906	.562	.250	1.265	5/8	9/16
5-1MC-6	5/16	3/8	1.750	.796	.906	.562	.250	1.296	5/8	11/16
5-1MC-8	5/16	1/2	1.937	.796	.906	.750	.250	1.484	5/8	7/8
6-1MC-2	3/8	1/8	1.640	.937	1.015	.375	.187	1.078	11/16	5/8
6-1MC-4	3/8	1/4	1.828	.937	1.015	.562	.281	1.265	11/16	5/8
6-1MC-6	3/8	3/8	1.828	.937	1.015	.562	.281	1.265	11/16	11/16
6-1MC-8	3/8	1/2	2.046	.937	1.015	.750	.281	1.484	11/16	7/8
6-1MC-12	3/8	3/4	2.046	.937	1.015	.750	.281	1.484	11/16	1-1/8
6-1MC-16	3/8	1	2.390	.937	1.015	.937	.281	1.828	11/16	1-3/8

*NOTE: All dimensions subject to change, to be used for reference only.



MALE CONNECTOR

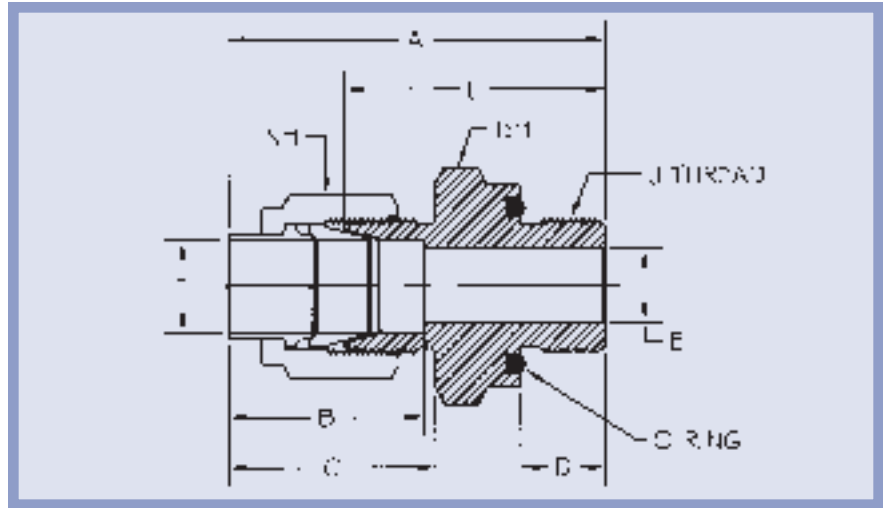


PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	B	C	D	E THRU HOLE	L	NH NUT HEX	BH BODY HEX
8-1MC-2	1/2	1/8	1.796	1.140	1.140	.375	.187	1.156	7/8	13/16
8-1MC-4	1/2	1/4	1.984	1.140	1.140	.562	.281	1.343	7/8	13/16
8-1MC-6	1/2	3/8	1.984	1.140	1.140	.562	.406	1.343	7/8	13/16
8-1MC-8	1/2	1/2	2.172	1.140	1.140	.750	.406	1.531	7/8	7/8
8-1MC-12	1/2	3/4	2.265	1.140	1.140	.750	.406	1.625	7/8	1-1/16
8-1MC-16	1/2	1	2.453	1.140	1.140	.937	.406	1.813	7/8	1-3/8
10-1MC-4	5/8	1/4	2.094	1.203	1.217	.562	.281	1.453	1	15/16
10-1MC-6	5/8	3/8	2.094	1.203	1.217	.562	.375	1.453	1	15/16
10-1MC-8	5/8	1/2	2.281	1.203	1.217	.750	.500	1.640	1	15/16
10-1MC-12	5/8	3/4	2.343	1.203	1.217	.750	.500	1.703	1	1-1/8
10-1MC-16	5/8	1	2.531	1.203	1.217	.937	.500	1.890	1	1-3/8
12-1MC-4	3/4	1/4	2.281	1.250	1.343	.562	.281	1.594	1-1/4	1-1/8
12-1MC-6	3/4	3/8	2.156	1.250	1.343	.562	.375	1.468	1-1/4	1-1/8
12-1MC-8	3/4	1/2	2.469	1.250	1.343	.750	.468	1.781	1-1/4	1-1/8
12-1MC-12	3/4	3/4	2.469	1.250	1.343	.750	.625	1.781	1-1/4	1-1/8
12-1MC-16	3/4	1	2.671	1.250	1.343	.937	.625	1.984	1-1/4	1-3/8
14-1MC-8	7/8	1/2	2.609	1.453	1.484	.750	.468	1.781	1-3/8	1-1/4
14-1MC-12	7/8	3/4	2.609	1.453	1.484	.750	.625	1.781	1-3/8	1-1/4
14-1MC-16	7/8	1	2.796	1.453	1.484	.937	.718	1.968	1-3/8	1-3/8
16-1MC-4	1	1/4	2.484	1.515	1.484	.562	.281	1.656	1-1/2	1-3/8
16-1MC-6	1	3/8	2.484	1.515	1.484	.562	.375	1.656	1-1/2	1-3/8
16-1MC-8	1	1/2	2.671	1.515	1.484	.750	.468	1.843	1-1/2	1-3/8
16-1MC-12	1	3/4	2.609	1.515	1.484	.750	.625	1.781	1-1/2	1-3/8
16-1MC-16	1	1	2.859	1.515	1.484	.937	.875	2.031	1-1/2	1-3/8

*NOTE: All dimensions subject to change, to be used for reference only.



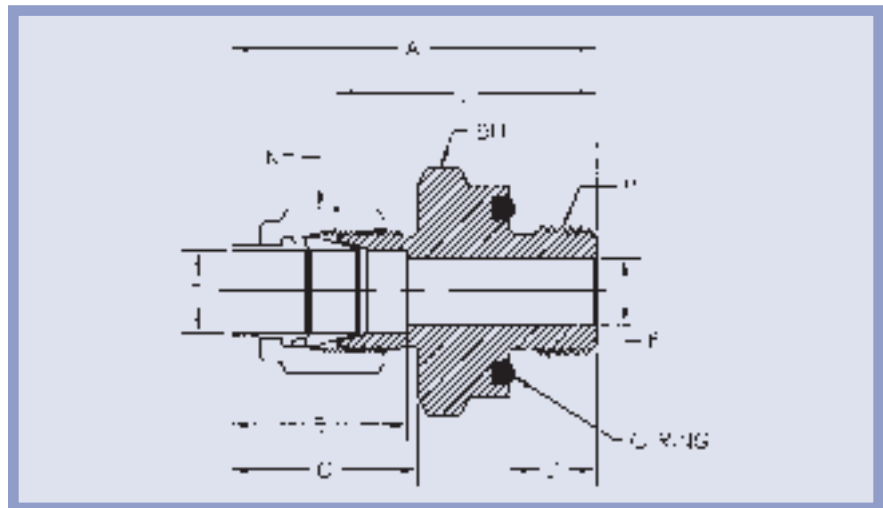
**O-RING STRAIGHT
THREAD MALE
CONNECTOR**



PART NUMBER	T TUBE O.D.	J THREAD	A	B	C	D	E THRU HOLE	L	NH NUT HEX	BH BODY HEX	O-RING
2-1MC-ORS	1/8	5/16-24	1.453	.640	.765	.343	.094	1.062	7/16	9/16	AS-011
3-1MC-ORS	3/16	3/8-24	1.515	.703	.796	.375	.125	1.093	1/2	5/8	AS-012
4-1MC-ORS	1/4	7/16-20	1.750	.796	.906	.406	.187	1.265	9/16	3/4	AS-111
5-1MC-ORS	5/16	1/2-20	1.781	.796	.906	.437	.250	1.328	5/8	7/8	AS-112
6-1MC-ORS	3/8	9/16-18	1.921	.937	1.015	.468	.281	1.359	11/16	15/16	AS-113
8-1MC-ORS	1/2	3/4-16	2.078	1.140	1.140	.468	.406	1.436	7/8	1-1/8	AS-116
12-1MC-ORS	3/4	1-1/16-12	2.531	1.250	1.343	.562	.625	1.847	1-1/4	1-1/2	AS-215
16-1MC-ORS	1	1-5/16-12	2.734	1.515	1.484	.562	.875	1.909	1-1/2	1-3/4	AS-219

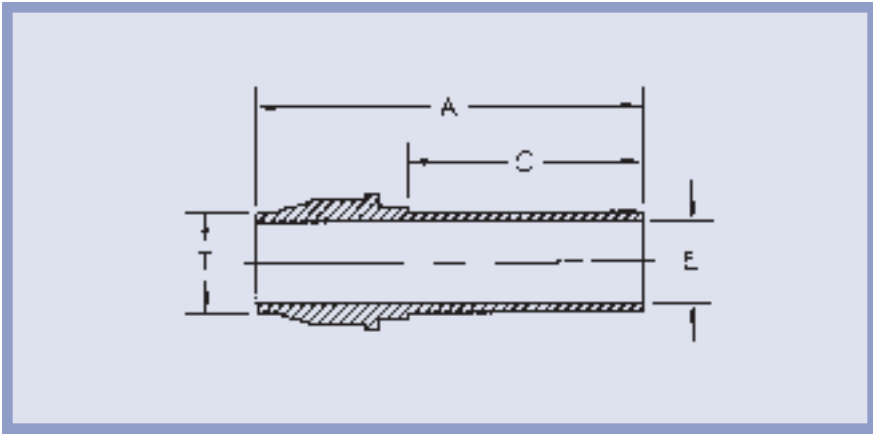


**O-RING PIPE THREAD
MALE CONNECTOR**



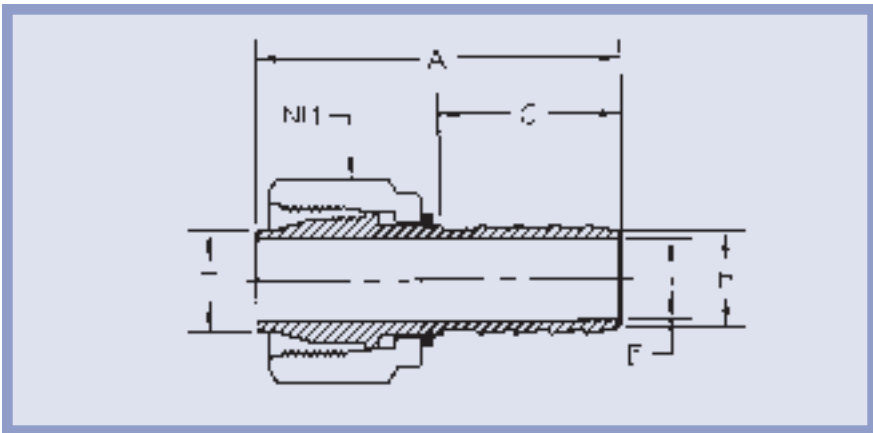
PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	B	C	D	E THRU HOLE	L	NH NUT HEX	BH BODY HEX	O-RING
2-1MC-2-ORT	1/8	1/8	1.453	.640	.765	.280	.094	1.061	7/16	3/4	AS-111
2-1MC-4-ORT	1/8	1/4	1.578	.640	.765	.375	.094	1.187	7/16	15/16	AS-113
3-1MC-4-ORT	3/16	1/4	1.609	.703	.796	.375	.125	1.187	1/2	15/16	AS-113
4-1MC-2-ORT	1/4	1/8	1.593	.796	.906	.280	.187	1.108	9/16	3/4	AS-111
4-1MC-4-ORT	1/4	1/4	1.718	.796	.906	.375	.187	1.234	9/16	15/16	AS-113
6-1MC-6-ORT	3/8	3/8	1.859	.937	1.015	.406	.281	1.296	11/16	1-1/8	AS-116
6-1MC-8-ORT	3/8	1/2	2.109	.937	1.015	.531	.281	1.547	11/16	1-5/16	AS-212
8-1MC-4-ORT	1/2	1/4	1.953	1.140	1.140	.375	.281	1.312	7/8	15/16	AS-113
8-1MC-8-ORT	1/2	1/2	2.234	1.140	1.140	.531	.406	1.593	7/8	1-5/16	AS-212
10-1MC-12-ORT	5/8	3/4	2.406	1.203	1.217	.562	.500	1.762	1	1-1/2	AS-215
12-1MC-12-ORT	3/4	3/4	2.531	1.250	1.343	.562	.625	1.847	1-1/4	1-1/2	AS-215

*NOTE: All dimensions subject to change, to be used for reference only.



PORT CONNECTOR UNION

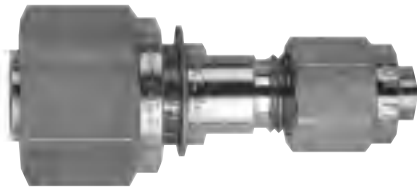
PART NUMBER	T TUBE O.D.	A	C	E THRU HOLE
1-1PCU-1	1/16	1.093	.531	.047
2-1PCU-2	1/8	1.156	.672	.062
3-1PCU-3	3/16	1.237	.734	.125
4-1PCU-4	1/4	1.314	.827	.187
5-1PCU-5	5/16	1.339	.827	.250
6-1PCU-6	3/8	1.593	.969	.297
8-1PCU-8	1/2	1.921	1.171	.406
10-1PCU-10	5/8	2.009	1.234	.531
12-1PCU-12	3/4	2.173	1.281	.625
14-1PCU-14	7/8	2.312	1.484	.718
16-1PCU-16	1	2.457	1.546	.875



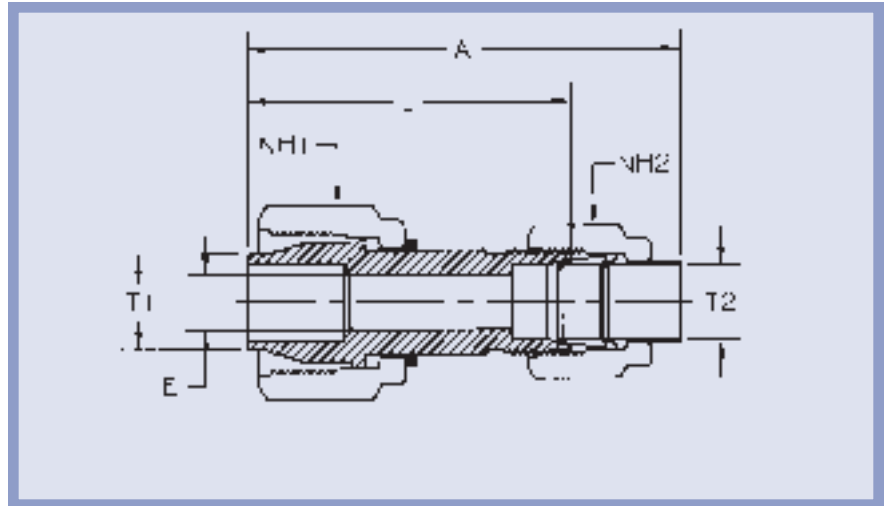
PORT HOSE CONNECTOR

PART NUMBER	T TUBE O.D.	H HOSE I.D.	A	C	E THRU HOLE	NH NUT HEX
4-1PHC-3	1/4	3/16	1.192	.590	.125	9/16
4-1PHC-4	1/4	1/4	1.392	.790	.171	9/16
6-1PHC-3	3/8	3/16	1.375	.590	.125	11/16
6-1PHC-4	3/8	1/4	1.575	.790	.187	11/16
6-1PHC-6	3/8	3/8	1.675	.890	.281	11/16
8-1PHC-4	1/2	1/4	1.719	.790	.187	7/8
8-1PHC-6	1/2	3/8	1.819	.890	.281	7/8
8-1PHC-8	1/2	1/2	1.819	.890	.406	7/8

*NOTE: All dimensions subject to change, to be used for reference only.

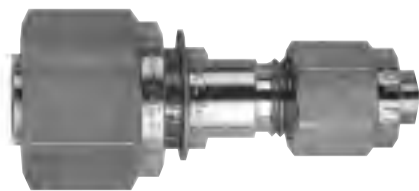


PORT TUBE CONNECTOR

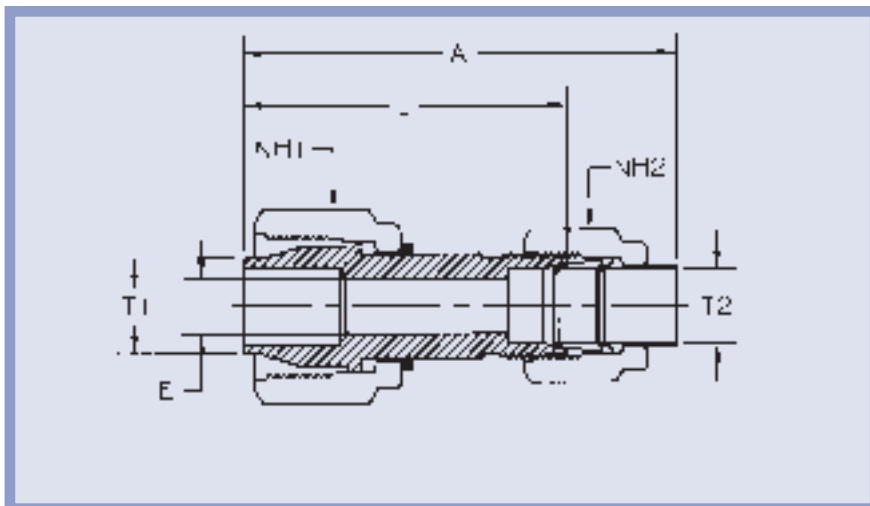


PART NUMBER	T1 TUBE O.D.	T2 TUBE O.D.	A	E THRU HOLE	L	NH1 NUT HEX	NH2 NUT HEX
4-1PTC-1	1/4	1/16	1.521	.052	1.193	9/16	3/8
4-1PTC-2	1/4	1/8	1.640	.094	1.250	9/16	7/16
5-1PTC-1	5/16	1/16	1.562	.052	1.234	5/8	3/8
5-1PTC-2	5/16	1/8	1.656	.094	1.265	5/8	7/16
5-1PTC-3	5/16	3/16	1.656	.125	1.265	5/8	1/2
6-1PTC-1	3/8	1/16	1.703	.052	1.375	11/16	3/8
6-1PTC-2	3/8	1/8	1.796	.094	1.406	11/16	7/16
6-1PTC-3	3/8	3/16	1.796	.125	1.406	11/16	1/2
6-1PTC-4	3/8	1/4	1.937	.187	1.453	11/16	9/16
8-1PTC-1	1/2	1/16	1.913	.052	1.585	7/8	3/8
8-1PTC-2	1/2	1/8	2.000	.094	1.609	7/8	7/16
8-1PTC-3	1/2	3/16	2.031	.125	1.609	7/8	1/2
8-1PTC-4	1/2	1/4	2.140	.187	1.656	7/8	9/16
8-1PTC-5	1/2	5/16	2.147	.250	1.694	7/8	5/8
8-1PTC-6	1/2	3/8	2.256	.281	1.694	7/8	11/16
10-1PTC-1	5/8	1/16	1.968	.052	1.640	1	3/8
10-1PTC-2	5/8	1/8	2.056	.094	1.666	1	7/16
10-1PTC-3	5/8	3/16	2.088	.125	1.666	1	1/2
10-1PTC-4	5/8	1/4	2.203	.187	1.718	1	9/16
10-1PTC-5	5/8	5/16	2.203	.250	1.750	1	5/8
10-1PTC-6	5/8	3/8	2.312	.281	1.750	1	11/16

*NOTE: All dimensions subject to change, to be used for reference only.

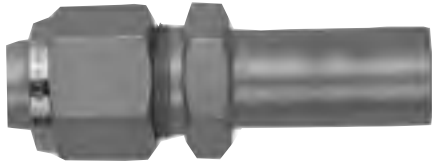


PORT TUBE CONNECTOR

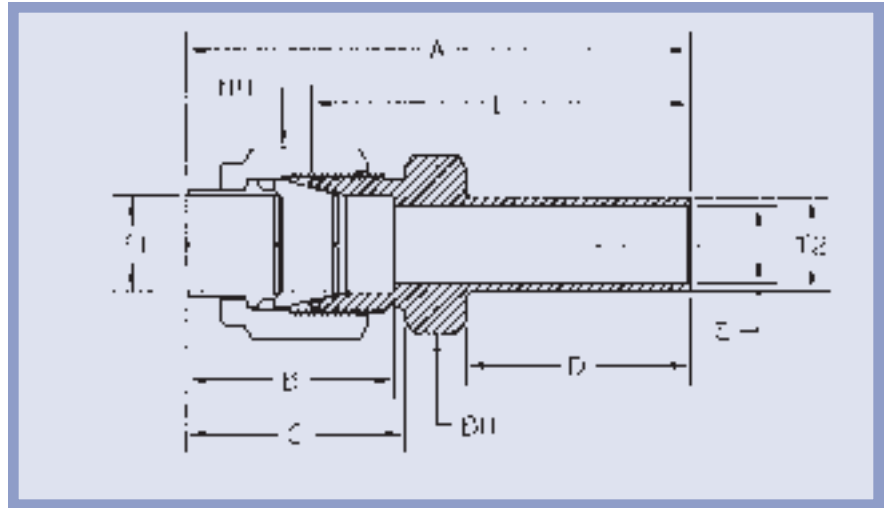


PART NUMBER	T1 TUBE O.D.	T2 TUBE O.D.	A	E THRU HOLE	L	NH1 NUT HEX	NH2 NUT HEX
12-1PTC-1	3/4	1/16	2.125	.052	1.796	1-1/4	3/8
12-1PTC-2	3/4	1/8	2.218	.094	1.828	1-1/4	7/16
12-1PTC-3	3/4	3/16	2.250	.125	1.828	1-1/4	1/2
12-1PTC-4	3/4	1/4	2.359	.187	1.875	1-1/4	9/16
12-1PTC-5	3/4	5/16	2.359	.250	1.906	1-1/4	5/8
12-1PTC-6	3/4	3/8	2.468	.281	1.906	1-1/4	11/16
12-1PTC-8	3/4	1/2	2.593	.406	1.953	1-1/4	7/8
12-1PTC-10	3/4	5/8	2.665	.500	2.024	1-1/4	1
14-1PTC-1	7/8	1/16	2.281	.052	1.953	1-3/8	3/8
14-1PTC-2	7/8	1/8	2.171	.094	1.781	1-3/8	7/16
14-1PTC-3	7/8	3/16	2.203	.125	1.781	1-3/8	1/2
14-1PTC-4	7/8	1/4	2.312	.187	1.828	1-3/8	9/16
14-1PTC-5	7/8	5/16	2.312	.250	1.859	1-3/8	5/8
14-1PTC-6	7/8	3/8	2.421	.281	1.859	1-3/8	11/16
14-1PTC-8	7/8	1/2	2.547	.406	1.906	1-3/8	7/8
14-1PTC-10	7/8	5/8	2.625	.500	1.984	1-3/8	1
16-1PTC-1	1	1/16	2.078	.052	1.750	1-1/2	3/8
16-1PTC-2	1	1/8	2.171	.094	1.781	1-1/2	7/16
16-1PTC-3	1	3/16	2.203	.125	1.781	1-1/2	1/2
16-1PTC-4	1	1/4	2.312	.187	1.828	1-1/2	9/16
16-1PTC-5	1	5/16	2.312	.250	1.859	1-1/2	5/8
16-1PTC-6	1	3/8	2.421	.281	1.859	1-1/2	11/16
16-1PTC-8	1	1/2	2.547	.406	1.906	1-1/2	7/8
16-1PTC-10	1	5/8	2.625	.500	1.984	1-1/2	1
16-1PTC-12	1	3/4	2.750	.625	2.062	1-1/2	1-1/4

*NOTE: All dimensions subject to change, to be used for reference only.



**REDUCER ADAPTER
TUBE TO TUBE**

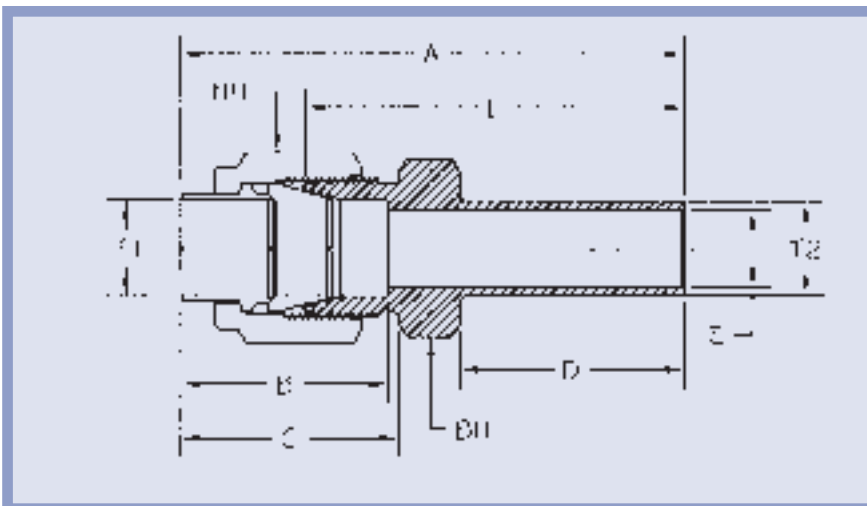


PART NUMBER	T1 TUBE O.D.	T2 TUBE O.D.	A	B	C	D	E THRU HOLE	L	NH NUT HEX	BH BODY HEX
1-1RATT-2	1/16	1/8	1.546	.609	.670	.687	.052	1.218	3/8	5/16
1-1RATT-3	1/16	3/16	1.578	.609	.670	.718	.052	1.250	3/8	7/16
1-1RATT-4	1/16	1/4	1.640	.609	.670	.781	.052	1.312	3/8	9/16
1-1RATT-6	1/16	3/8	1.796	.609	.670	.937	.052	1.468	3/8	7/16
2-1RATT-2	1/8	1/8	1.640	.640	.765	.687	.078	1.250	7/16	7/16
2-1RATT-3	1/8	3/16	1.671	.640	.765	.718	.094	1.281	7/16	7/16
2-1RATT-4	1/8	1/4	1.781	.640	.765	.828	.094	1.390	7/16	7/16
2-1RATT-5	1/8	5/16	1.796	.640	.765	.844	.094	1.406	7/16	7/16
2-1RATT-6	1/8	3/8	1.890	.640	.765	.937	.094	1.500	7/16	7/16
2-1RATT-8	1/8	1/2	2.109	.640	.765	1.156	.094	1.718	7/16	9/16
2-1RATT-12	1/8	3/4	2.328	.640	.765	1.312	.094	1.937	7/16	13/16
2-1RATT-16	1/8	1	2.671	.640	.765	1.531	.094	2.281	7/16	1-1/16
3-1RATT-2	3/16	1/8	1.703	.703	.796	.687	.078	1.281	1/2	7/16
3-1RATT-4	3/16	1/4	1.796	.703	.796	.781	.125	1.375	1/2	7/16
3-1RATT-5	3/16	5/16	1.859	.703	.796	.844	.125	1.436	1/2	7/16
3-1RATT-6	3/16	3/8	1.953	.703	.796	.937	.125	1.531	1/2	7/16
3-1RATT-8	3/16	1/2	2.171	.703	.796	1.312	.125	1.750	1/2	9/16
4-1RATT-2	1/4	1/8	1.812	.796	.906	.687	.078	1.328	9/16	1/2
4-1RATT-4	1/4	1/4	1.937	.796	.906	.781	.187	1.453	9/16	1/2
4-1RATT-5	1/4	5/16	2.000	.796	.906	.844	.187	1.515	9/16	1/2
4-1RATT-6	1/4	3/8	2.093	.796	.906	.937	.187	1.609	9/16	1/2
4-1RATT-8	1/4	1/2	2.312	.796	.906	1.156	.187	1.828	9/16	9/16
4-1RATT-10	1/4	5/8	2.375	.796	.906	1.218	.187	1.890	9/16	11/16
5-1RATT-6	5/16	3/8	2.093	.796	.906	.937	.250	1.640	5/8	9/16
5-1RATT-8	5/16	1/2	2.312	.796	.906	1.156	.250	1.859	5/8	9/16
5-1RATT-10	5/16	5/8	2.375	.796	.906	1.218	.250	1.921	5/8	11/16
5-1RATT-12	5/16	3/4	2.468	.796	.906	1.281	.250	2.015	5/8	13/16

*NOTE: All dimensions subject to change, to be used for reference only.

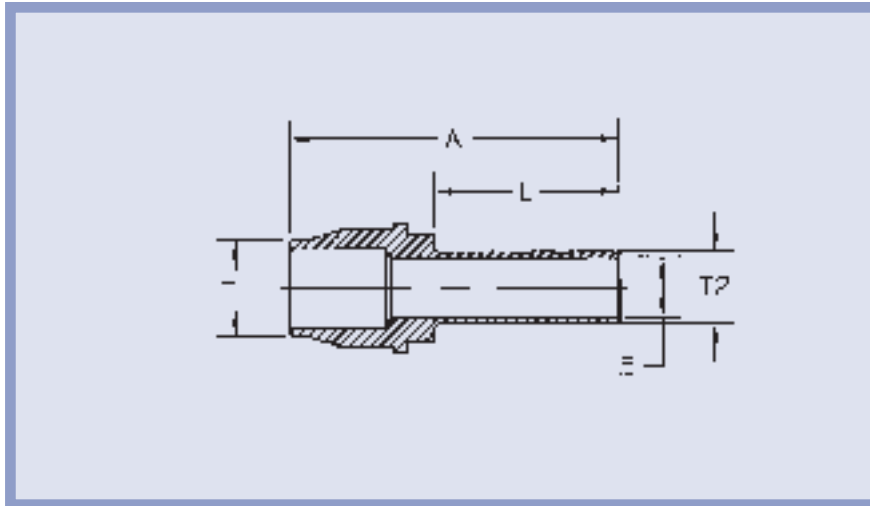


**REDUCER ADAPTER
TUBE TO TUBE**



PART NUMBER	T1 TUBE O.D.	T2 TUBE O.D.	A	B	C	D	E THRU HOLE	L	NH NUT HEX	BH BODY HEX
6-1RATT-6	3/8	3/8	2.234	.937	1.015	.937	.281	1.671	11/16	11/16
6-1RATT-10	3/8	5/8	2.515	.937	1.015	1.218	.281	1.952	11/16	11/16
6-1RATT-12	3/8	3/4	2.562	.937	1.015	1.281	.281	2.000	11/16	13/16
6-1RATT-14	3/8	7/8	2.828	.937	1.015	1.500	.281	2.265	11/16	15/16
8-1RATT-4	1/2	1/4	2.203	1.140	1.140	.781	.187	1.562	7/8	13/16
8-1RATT-6	1/2	3/8	2.390	1.140	1.140	.969	.281	1.749	7/8	13/16
8-1RATT-8	1/2	1/2	2.734	1.140	1.140	1.312	.406	2.093	7/8	13/16
8-1RATT-10	1/2	5/8	2.671	1.140	1.140	1.250	.406	2.031	7/8	7/8
8-1RATT-12	1/2	3/4	2.687	1.140	1.140	1.281	.406	2.047	7/8	7/8
8-1RATT-16	1/2	1	2.968	1.140	1.140	1.547	.406	2.328	7/8	1-1/16
10-1RATT-10	5/8	5/8	2.781	1.203	1.217	1.250	.500	2.140	1	15/16
10-1RATT-12	5/8	3/4	2.812	1.203	1.217	1.281	.500	2.168	1	15/16
10-1RATT-14	5/8	7/8	2.906	1.203	1.217	1.500	.500	2.265	1	15/16
10-1RATT-16	5/8	1	2.969	1.203	1.217	1.531	.500	2.328	1	1-1/16
12-1RATT-4	3/4	1/4	2.484	1.250	1.343	.828	.187	1.800	1-1/4	1-1/8
12-1RATT-6	3/4	3/8	2.593	1.250	1.343	.937	.281	1.906	1-1/4	1-1/8
12-1RATT-8	3/4	1/2	3.031	1.250	1.343	1.312	.406	2.343	1-1/4	1-1/8
12-1RATT-12	3/4	3/4	3.031	1.250	1.343	1.281	.625	2.343	1-1/4	1-1/8
12-1RATT-14	3/4	7/8	3.156	1.250	1.343	1.500	.625	2.468	1-1/4	1-1/8
12-1RATT-16	3/4	1	3.250	1.250	1.343	1.531	.625	2.562	1-1/4	1-1/8
14-1RATT-16	7/8	1	3.390	1.453	1.484	1.531	.718	2.566	1-3/8	1-1/4
16-1RATT-16	1	1	3.453	1.515	1.484	1.531	.875	2.628	1-1/2	1-3/8

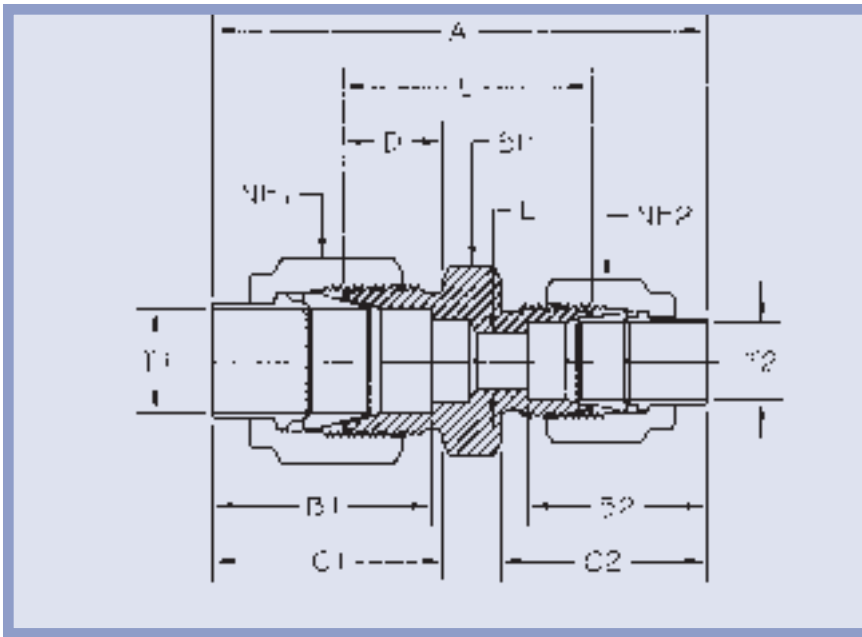
*NOTE: All dimensions subject to change, to be used for reference only.



REDUCING PORT CONNECTOR

PART NUMBER	T1 TUBE O.D.	T2 TUBE O.D.	A	E THRU HOLE	L
2-1RPC-1	1/8	1/16	1.016	.031	.531
3-1RPC-2	3/16	1/8	1.210	.078	.672
4-1RPC-2	1/4	1/8	1.159	.078	.672
4-1RPC-3	1/4	3/16	1.250	.140	.765
5-1RPC-4	5/16	1/4	1.344	.187	.828
6-1RPC-4	3/8	1/4	1.453	.187	.828
6-1RPC-5	3/8	5/16	1.469	.250	.843
8-1RPC-4	1/2	1/4	1.578	.187	.828
8-1RPC-6	1/2	3/8	1.719	.312	.969
10-1RPC-8	5/8	1/2	1.947	.406	1.172
12-1RPC-8	3/4	1/2	2.064	.406	1.172
12-1RPC-10	3/4	5/8	2.141	.531	1.250
14-1RPC-12	7/8	3/4	2.109	.656	1.281
16-1RPC-12	1	3/4	2.083	.656	1.281
16-1RPC-14	1	7/8	2.302	.781	1.500

*NOTE: All dimensions subject to change, to be used for reference only.



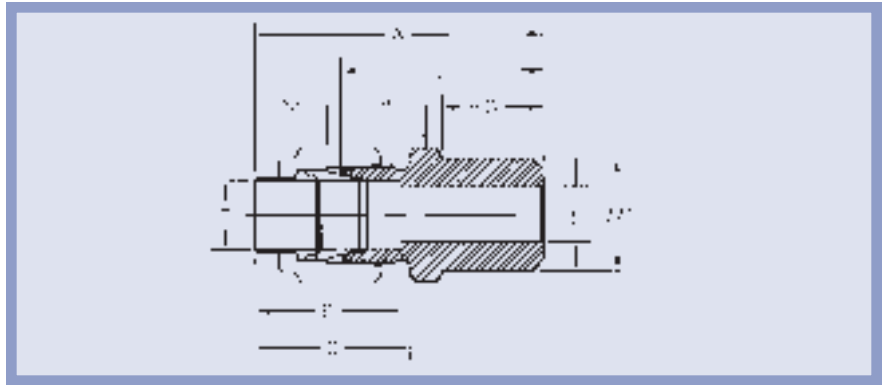
REDUCING UNION

PART NUMBER	T1 TUBE O.D.	T2 TUBE O.D.	A	B1	B2	C1	C2	D	E THRU HOLE	L	NH1 NUT HEX	NH2 NUT HEX	BH BODY HEX
2-1RU-1	1/8	1/16	1.625	.640	.609	.765	.670	.375	.052	.906	7/16	3/8	7/16
3-1RU-1	3/16	1/16	1.656	.703	.609	.796	.670	.375	.052	.906	1/2	3/8	7/16
3-1RU-2	3/16	1/8	1.750	.703	.640	.796	.765	.375	.094	.937	1/2	7/16	7/16
4-1RU-2	1/4	1/8	1.890	.796	.640	.906	.765	.422	.094	1.016	9/16	7/16	1/2
4-1RU-3	1/4	3/16	1.921	.796	.703	.906	.796	.422	.125	1.016	9/16	1/2	1/2
5-1RU-2	5/16	1/8	1.890	.796	.640	.906	.765	.453	.094	1.047	5/8	7/16	9/16
5-1RU-4	5/16	1/4	2.062	.796	.796	.906	.906	.453	.187	1.125	5/8	9/16	9/16
6-1RU-1	3/8	1/16	1.937	.937	.609	1.015	.670	.453	.052	1.047	11/16	3/8	5/8
6-1RU-2	3/8	1/8	2.031	.937	.640	1.015	.765	.453	.094	1.078	11/16	7/16	5/8
6-1RU-4	3/8	1/4	2.203	.937	.796	1.015	.906	.453	.187	1.156	11/16	9/16	5/8
6-1RU-5	3/8	5/16	2.171	.937	.796	1.015	.906	.453	.250	1.156	11/16	5/8	5/8
8-1RU-2	1/2	1/8	2.156	1.140	.640	1.140	.765	.500	.094	1.125	7/8	7/16	13/16
8-1RU-4	1/2	1/4	2.328	1.140	.796	1.140	.906	.500	.187	1.203	7/8	9/16	13/16
8-1RU-5	1/2	5/16	2.328	1.140	.796	1.140	.906	.500	.250	1.234	7/8	5/8	13/16
8-1RU-6	1/2	3/8	2.437	1.140	.937	1.140	1.015	.500	.281	1.234	7/8	11/16	13/16
10-1RU-6	5/8	3/8	2.546	1.203	.937	1.217	1.015	.575	.281	1.341	1	11/16	15/16
10-1RU-8	5/8	1/2	2.671	1.203	1.140	1.217	1.140	.575	.406	1.388	1	7/8	15/16
12-1RU-4	3/4	1/4	2.625	1.250	.796	1.343	.906	.660	.187	1.457	1-1/4	9/16	1-1/8
12-1RU-6	3/4	3/8	2.734	1.250	.937	1.343	1.015	.660	.281	1.488	1-1/4	11/16	1-1/8
12-1RU-8	3/4	1/2	2.859	1.250	1.140	1.343	1.140	.660	.406	1.535	1-1/4	7/8	1-1/8
12-1RU-10	3/4	5/8	2.875	1.250	1.203	1.343	1.217	.660	.500	1.547	1-1/4	1	1-1/8
14-1RU-6	7/8	3/8	2.828	1.453	.937	1.484	1.015	.660	.281	1.440	1-3/8	11/16	1-1/4
14-1RU-10	7/8	5/8	3.015	1.453	1.203	1.484	1.217	.660	.500	1.552	1-3/8	1	1-1/4
14-1RU-12	7/8	3/4	3.203	1.453	1.250	1.484	1.343	.660	.625	1.695	1-3/8	1-1/4	1-1/4
16-1RU-4	1	1/4	2.812	1.515	.796	1.484	.906	.660	.187	1.500	1-1/2	9/16	1-3/8
16-1RU-10	1	5/8	3.078	1.515	1.203	1.484	1.217	.660	.500	1.612	1-1/2	1	1-3/8
16-1RU-12	1	3/4	3.265	1.515	1.250	1.484	1.343	.660	.625	1.758	1-1/2	1-1/4	1-3/8
16-1RU-14	1	7/8	3.406	1.515	1.453	1.484	1.484	.660	.718	1.758	1-1/2	1-3/8	1-3/8

*NOTE: All dimensions subject to change, to be used for reference only.



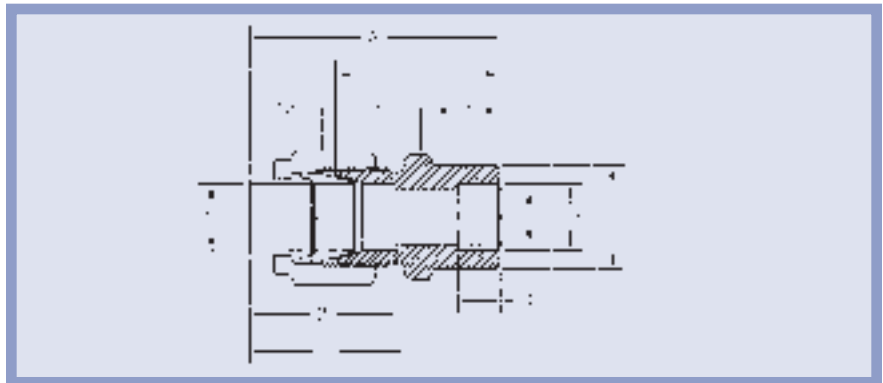
TUBE TO BUTT WELD CONNECTOR



PART NUMBER	T TUBE O.D.	BW	A	B	C	D	E THRU HOLE	L	NH NUT HEX	BH BODY HEX
2-1TBW-2	1/8	.405	1.359	.640	.765	.375	.094	.969	7/16	7/16
3-1TBW-2	3/16	.405	1.390	.703	.796	.375	.125	.969	1/2	7/16
4-1TBW-1	1/4	.312	1.500	.796	.906	.375	.125	1.016	9/16	1/2
4-1TBW-2	1/4	.405	1.500	.796	.906	.375	.187	1.016	9/16	1/2
4-1TBW-4	1/4	.540	1.687	.796	.906	.562	.187	1.203	9/16	9/16
5-1TBW-6	5/16	.675	1.718	.796	.906	.562	.250	1.265	5/8	11/16
6-1TBW-4	3/8	.540	1.828	.937	1.015	.562	.281	1.265	11/16	5/8
6-1TBW-6	3/8	.675	1.828	.937	1.015	.562	.281	1.265	11/16	11/16
6-1TBW-8	3/8	.840	2.015	.937	1.015	.750	.281	1.453	11/16	7/8
8-1TBW-6	1/2	.675	1.953	1.140	1.140	.562	.406	1.312	7/8	13/16
8-1TBW-8	1/2	.840	2.140	1.140	1.140	.750	.406	1.500	7/8	7/8
8-1TBW-16	1/2	1.315	2.453	1.140	1.140	.937	.406	1.812	7/8	1-3/8
10-1TBW-8	5/8	.840	2.250	1.203	1.217	.750	.500	1.609	1	15/16
12-1TBW-8	3/4	.840	2.468	1.250	1.343	.750	.406	1.781	1-1/4	1-1/8
12-1TBW-12	3/4	1.050	2.468	1.250	1.343	.750	.625	1.781	1-1/4	1-1/8
16-1TBW-12	1	1.050	2.671	1.515	1.484	.750	.625	1.844	1-1/2	1-3/8
16-1TBW-16	1	1.315	2.859	1.515	1.484	.937	.875	2.031	1-1/2	1-3/8

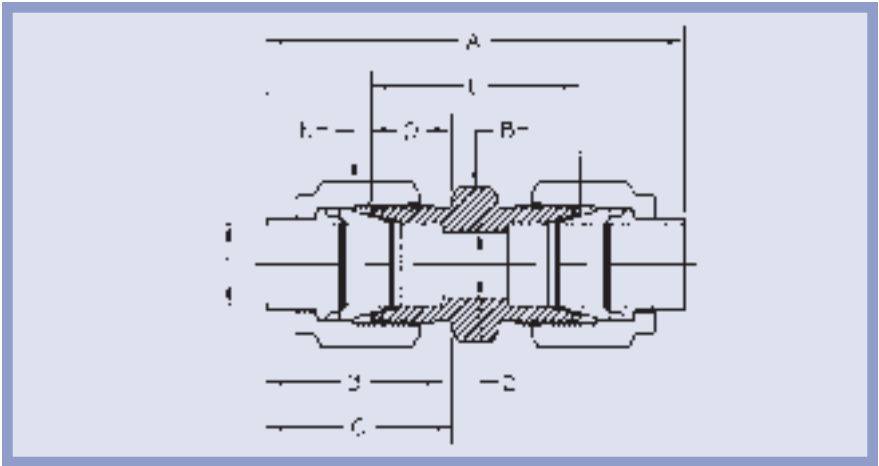


TUBE TO SOCKET WELD CONNECTOR



PART NUMBER	T1 TUBE O.D.	T2 TUBE O.D.	A	B	C	D	E THRU HOLE	F	G	L	NH NUT HEX	BH BODY HEX
2-1TSW-2	1/8	1/8	1.296	.640	.765	.344	.094	.406	.250	.906	7/16	7/16
3-1TSW-3	3/16	3/16	1.390	.703	.796	.375	.125	.406	.281	.969	1/2	7/16
4-1TSW-4	1/4	1/4	1.531	.796	.906	.406	.187	.468	.281	1.046	9/16	1/2
6-1TSW-4	3/8	1/4	1.671	.937	1.015	.406	.187	.468	.281	1.109	11/16	5/8
6-1TSW-6	3/8	3/8	1.765	.937	1.015	.469	.281	.594	.312	1.203	11/16	11/16
8-1TSW-8	1/2	1/2	1.859	1.140	1.140	.500	.406	.781	.375	1.217	7/8	13/16
8-1TSW-12	1/2	3/4	2.015	1.140	1.140	.500	.406	1.031	.437	1.375	7/8	1-1/16
10-1TSW-10	5/8	5/8	1.969	1.203	1.217	.500	.500	.875	.406	1.328	1	15/16
12-1TSW-12	3/4	3/4	2.218	1.250	1.343	.500	.625	1.031	.437	1.535	1-1/4	1-1/8
16-1TSW-12	1	3/4	2.437	1.515	1.484	.500	.625	1.031	.437	1.609	1-1/2	1-3/8
16-1TSW-16	1	1	2.484	1.515	1.484	.562	.875	1.344	.625	1.656	1-1/2	1-3/8

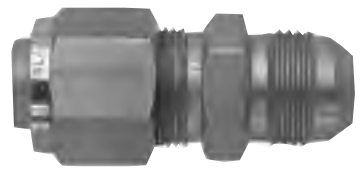
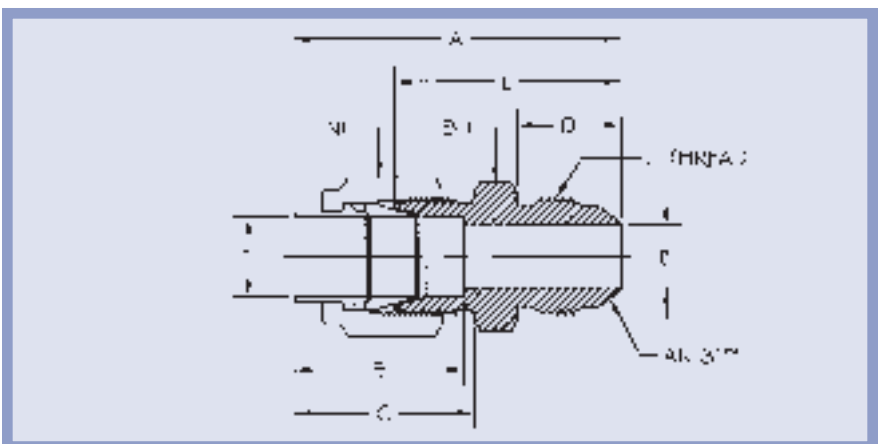
*NOTE: All dimensions subject to change, to be used for reference only.



UNION



PART NUMBER	T TUBE O.D.	A	B	C	D	E THRU HOLE	L	NH NUT HEX	BH BODY HEX
1-1U-1	1/16	1.468	.609	.670	.344	.052	.813	3/8	5/16
2-1U-2	1/8	1.718	.640	.765	.375	.094	.937	7/16	7/16
3-1U-3	3/16	1.781	.703	.765	.375	.125	.937	1/2	7/16
4-1U-4	1/4	2.031	.796	.906	.422	.187	1.062	9/16	1/2
5-1U-5	5/16	2.031	.796	.906	.453	.250	1.125	5/8	9/16
6-1U-6	3/8	2.312	.937	1.015	.453	.281	1.187	11/16	5/8
8-1U-8	1/2	2.562	1.140	1.140	.500	.406	1.281	7/8	13/16
10-1U-10	5/8	2.750	1.203	1.217	.575	.500	1.462	1	15/16
12-1U-12	3/4	3.062	1.250	1.343	.660	.625	1.695	1-1/4	1-1/8
14-1U-14	7/8	3.343	1.453	1.484	.660	.718	1.695	1-3/8	1-1/4
16-1U-16	1	3.406	1.515	1.484	.660	.875	1.757	1-1/2	1-3/8



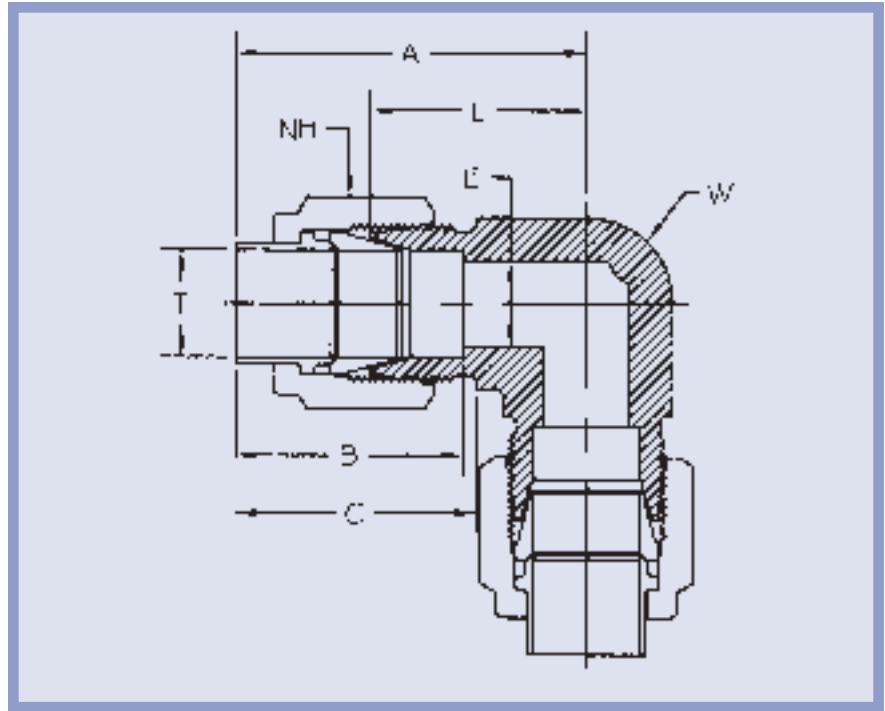
TUBE TO AN FLARE UNION

PART NUMBER	T TUBE O.D.	J THREAD	A	B	C	D	E THRU HOLE	L	NH NUT HEX	BH BODY HEX
2-1UANF-2	1/8	5/16-24	1.406	.640	.765	.448	.062	1.015	7/16	3/8
2-1UANF-4	1/8	7/16-20	1.593	.640	.765	.550	.094	1.206	7/16	1/2
3-1UANF-3	3/16	3/8-24	1.468	.703	.796	.479	.125	1.047	1/2	7/16
4-1UANF-4	1/4	7/16-20	1.671	.796	.906	.550	.172	1.187	9/16	1/2
5-1UANF-5	5/16	1/2-20	1.671	.796	.906	.550	.234	1.218	5/8	9/16
6-1UANF-4	3/8	7/16-20	1.843	.937	1.015	.550	.172	1.284	11/16	5/8
6-1UANF-6	3/8	9/16-18	1.843	.937	1.015	.556	.297	1.281	11/16	5/8
8-1UANF-8	1/2	3/4-16	2.078	1.140	1.140	.657	.391	1.437	7/8	13/16
10-1UANF-10	5/8	7/8-14	2.234	1.203	1.217	.758	.484	1.594	1	15/16
12-1UANF-12	3/4	1-1/16-12	2.578	1.250	1.343	.864	.609	1.899	1-1/4	1-1/8
16-1UANF-16	1	1-5/16-12	2.828	1.515	1.484	.911	.844	2.000	1-1/2	1-3/8

*NOTE: All dimensions subject to change, to be used for reference only.

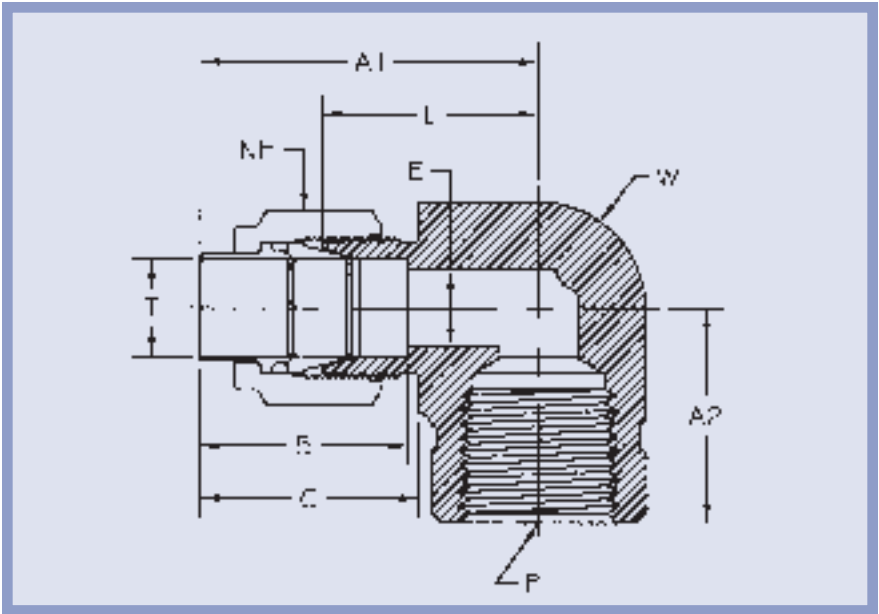


UNION ELBOW



PART NUMBER	T TUBE O.D.	A	B	C	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
1-2ELU-1	1/16	.953	.609	.670	.052	.625	3/8	3/8
2-2ELU-2	1/8	1.046	.640	.765	.094	.656	7/16	3/8
3-2ELU-3	3/16	1.109	.703	.796	.125	.687	1/2	1/2
4-2ELU-4	1/4	1.265	.796	.906	.187	.781	9/16	1/2
5-2ELU-5	5/16	1.265	.796	.906	.250	.812	5/8	19/32
6-2ELU-6	3/8	1.406	.937	1.015	.281	.844	11/16	5/8
8-2ELU-8	1/2	1.672	1.140	1.140	.406	1.031	7/8	13/16
10-2ELU-10	5/8	1.672	1.203	1.217	.500	1.031	1	1
12-2ELU-12	3/4	2.000	1.250	1.343	.625	1.312	1-1/4	1-1/16
14-2ELU-14	7/8	2.234	1.453	1.484	.718	1.406	1-3/8	1-1/2
16-2ELU-16	1	2.265	1.515	1.484	.875	1.438	1-1/2	1-1/2

*NOTE: All dimensions subject to change, to be used for reference only.



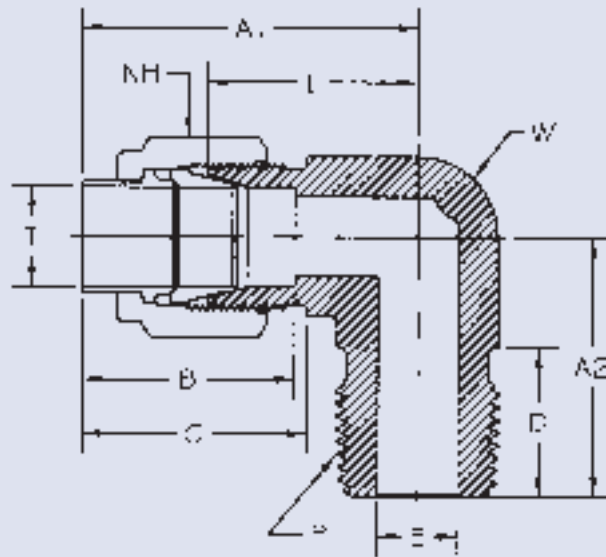
FEMALE ELBOW

PART NUMBER	T TUBE O.D.	P PIPE END NPT	A1	A2	B	C	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
1-2FE-2	1/16	1/8	1.015	.750	.609	.670	.052	.687	3/8	19/32
2-2FE-2	1/8	1/8	1.078	.750	.640	.765	.094	.687	7/16	19/32
2-2FE-4	1/8	1/4	1.203	.844	.640	.765	.094	.812	7/16	13/16
3-2FE-2	3/16	1/8	1.140	.750	.703	.796	.125	.719	1/2	19/32
4-2FE-1	1/4	1/16	1.203	.812	.796	.906	.187	.718	9/16	1/2
4-2FE-2	1/4	1/8	1.265	.781	.796	.906	.187	.781	9/16	19/32
4-2FE-4	1/4	1/4	1.359	.844	.796	.906	.187	.875	9/16	13/16
4-2FE-6	1/4	3/8	1.484	.844	.796	.906	.187	1.000	9/16	1
4-2FE-8	1/4	1/2	1.546	1.125	.796	.906	.187	1.062	9/16	1-1/16
5-2FE-2	5/16	1/8	1.328	1.000	.796	.906	.250	.875	5/8	19/32
5-2FE-4	5/16	1/4	1.390	.875	.796	.906	.250	.937	5/8	13/16
6-2FE-1	3/8	1/16	1.406	.812	.937	1.015	.281	.844	11/16	19/32
6-2FE-2	3/8	1/8	1.406	.844	.937	1.015	.281	.844	11/16	19/32
6-2FE-4	3/8	1/4	1.500	.844	.937	1.015	.281	.937	11/16	13/16
6-2FE-6	3/8	3/8	1.593	.875	.937	1.015	.281	1.031	11/16	13/16
6-2FE-8	3/8	1/2	1.687	1.250	.937	1.015	.281	1.125	11/16	1-1/16
8-2FE-2	1/2	1/8	1.640	.906	1.140	1.140	.406	1.000	7/8	13/16
8-2FE-4	1/2	1/4	1.671	.906	1.140	1.140	.406	1.031	7/8	13/16
8-2FE-6	1/2	3/8	1.671	.875	1.140	1.140	.406	1.031	7/8	1
8-2FE-8	1/2	1/2	1.765	1.125	1.140	1.140	.406	1.125	7/8	1-1/16
8-2FE-12	1/2	3/4	1.765	1.250	1.140	1.140	.406	1.125	7/8	1-1/2
10-2FE-6	5/8	3/8	1.734	.906	1.203	1.217	.500	1.093	1	1
10-2FE-8	5/8	1/2	1.890	1.125	1.203	1.217	.500	1.250	1	1-1/16
10-2FE-12	5/8	3/4	1.890	1.468	1.203	1.217	.500	1.250	1	1-1/2
12-2FE-6	3/4	3/8	1.906	.906	1.250	1.343	.625	1.218	1-1/4	1-1/16
12-2FE-8	3/4	1/2	2.062	1.125	1.250	1.343	.625	1.375	1-1/4	1-1/16
12-2FE-12	3/4	3/4	2.125	1.250	1.250	1.343	.625	1.437	1-1/4	1-1/2
14-2FE-12	7/8	3/4	2.078	1.250	1.453	1.484	.718	1.250	1-3/8	1-1/2
16-2FE-12	1	3/4	2.359	1.250	1.515	1.484	.875	1.531	1-1/2	1-1/2
16-2FE-16	1	1	2.703	1.875	1.515	1.484	.875	1.875	1-1/2	1-5/8

*NOTE: All dimensions subject to change, to be used for reference only.



MALE ELBOW

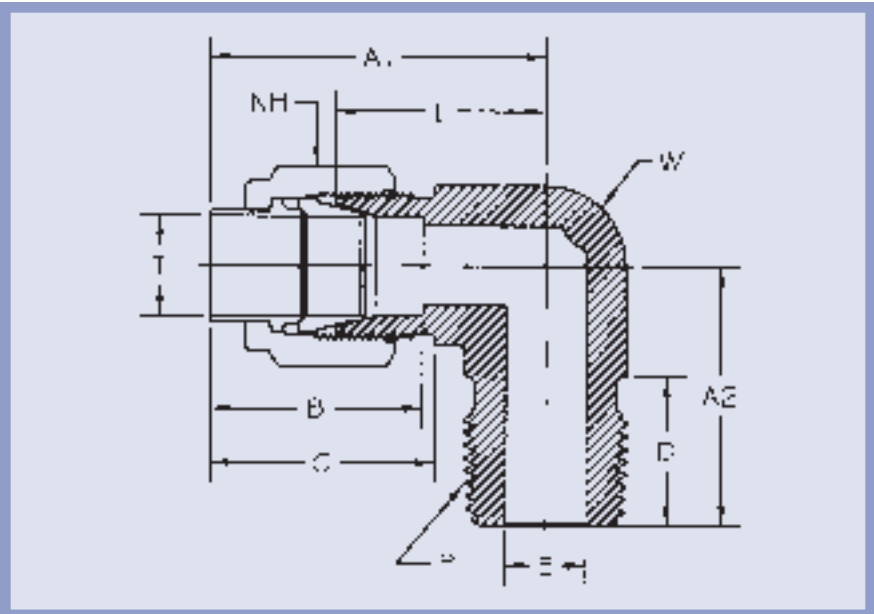


PART NUMBER	T TUBE O.D.	P PIPE END NPT	A1	A2	B	C	D	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
1-2ME-1	1/16	1/16	.953	.656	.609	.670	.375	.052	.625	3/8	3/8
1-2ME-2	1/16	1/8	.953	.656	.609	.670	.375	.052	.625	3/8	3/8
2-2ME-1	1/8	1/16	1.406	.656	.640	.765	.375	.094	.656	7/16	3/8
2-2ME-2	1/8	1/8	1.046	.718	.640	.765	.375	.094	.656	7/16	1/2
2-2ME-4	1/8	1/4	1.046	.937	.640	.765	.562	.094	.656	7/16	19/32
2-2ME-6	1/8	3/8	1.203	1.125	.640	.765	.562	.094	.812	7/16	13/16
3-2ME-2	3/16	1/8	1.109	.750	.703	.796	.375	.125	.687	1/2	1/2
3-2ME-4	3/16	1/4	1.109	.937	.703	.796	.562	.125	.687	1/2	1/2
4-2ME-1	1/4	1/16	1.203	.703	.796	.906	.375	.156	.719	9/16	1/2
4-2ME-2	1/4	1/8	1.203	.781	.796	.906	.375	.187	.719	9/16	1/2
4-2ME-4	1/4	1/4	1.265	.937	.796	.906	.562	.187	.781	9/16	19/32
4-2ME-6	1/4	3/8	1.421	1.125	.796	.906	.562	.187	.937	9/16	13/16
4-2ME-8	1/4	1/2	1.453	1.203	.796	.906	.750	.187	.969	9/16	1
4-2ME-12	1/4	3/4	1.546	1.500	.796	.906	.750	.187	1.063	9/16	1-1/16
5-2ME-2	5/16	1/8	1.328	.812	.796	.906	.375	.187	.875	5/8	19/32
5-2ME-4	5/16	1/4	1.265	1.000	.796	.906	.562	.250	.812	5/8	19/32
5-2ME-6	5/16	3/8	1.328	1.125	.796	.906	.562	.250	.875	5/8	13/16
6-2ME-2	3/8	1/8	1.437	.812	.937	1.015	.375	.187	.875	11/16	19/32
6-2ME-4	3/8	1/4	1.437	1.000	.937	1.015	.562	.281	.875	11/16	19/32
6-2ME-6	3/8	3/8	1.500	1.125	.937	1.015	.562	.281	.937	11/16	13/16

*NOTE: All dimensions subject to change, to be used for reference only.

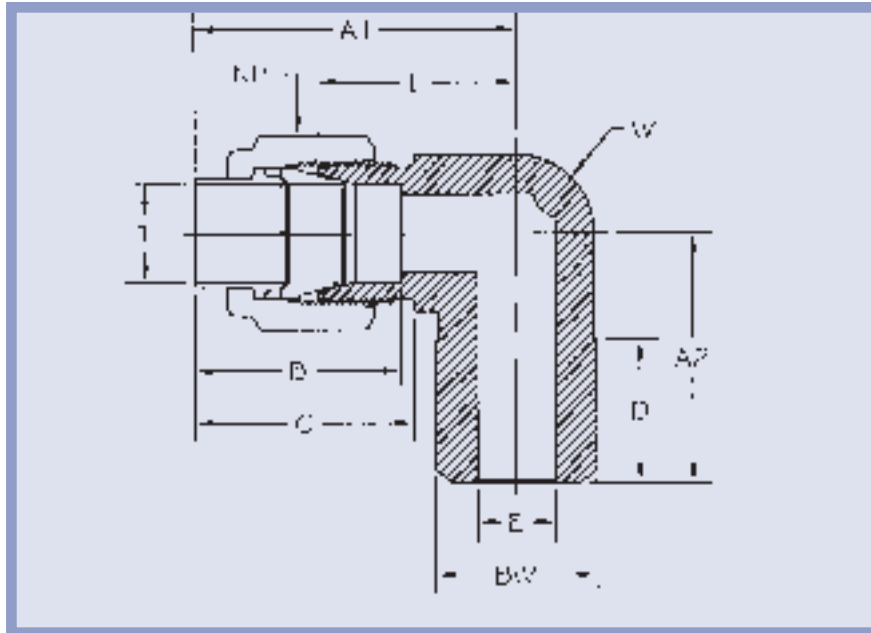


MALE ELBOW



PART NUMBER	T TUBE O.D.	P PIPE END NPT	A1	A2	B	C	D	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
6-2ME-8	3/8	1/2	1.593	1.312	.937	1.015	.750	.281	1.031	11/16	13/16
6-2ME-12	3/8	3/4	1.687	1.500	.937	1.015	.750	.281	1.125	11/16	1-1/16
8-2ME-2	1/2	1/8	1.609	.937	1.140	1.140	.375	.187	.969	7/8	13/16
8-2ME-4	1/2	1/4	1.609	1.125	1.140	1.140	.562	.281	.969	7/8	13/16
8-2ME-6	1/2	3/8	1.609	1.093	1.140	1.140	.562	.406	.969	7/8	13/16
8-2ME-8	1/2	1/2	1.671	1.312	1.140	1.140	.750	.406	1.032	7/8	13/16
8-2ME-12	1/2	3/4	1.765	1.500	1.140	1.140	.750	.406	1.125	7/8	1-1/16
10-2ME-4	5/8	1/4	1.734	1.125	1.203	1.217	.562	.281	1.093	1	1
10-2ME-6	5/8	3/8	1.734	1.125	1.203	1.217	.562	.406	1.093	1	1
10-2ME-8	5/8	1/2	1.734	1.312	1.203	1.217	.750	.500	1.093	1	1
10-2ME-12	5/8	3/4	1.890	1.500	1.203	1.217	.750	.500	1.250	1	1-1/16
10-2ME-16	5/8	1	2.015	1.844	1.203	1.217	.937	.500	1.375	1	1-1/2
12-2ME-4	3/4	1/4	2.062	1.250	1.250	1.343	.562	.281	1.375	1-1/4	1-1/16
12-2ME-6	3/4	3/8	2.062	1.250	1.250	1.343	.562	.406	1.375	1-1/4	1-1/16
12-2ME-8	3/4	1/2	2.062	1.500	1.250	1.343	.750	.500	1.375	1-1/4	1-1/16
12-2ME-12	3/4	3/4	2.062	1.500	1.250	1.343	.750	.625	1.375	1-1/4	1-1/16
14-2ME-12	7/8	3/4	2.359	1.656	1.453	1.484	.750	.625	1.531	1-3/8	1-1/2
16-2ME-4	1	1/4	2.359	1.437	1.515	1.484	.562	.281	1.531	1-1/2	1-1/2
16-2ME-8	1	1/2	2.359	1.625	1.515	1.484	.750	.500	1.531	1-1/2	1-1/2
16-2ME-12	1	3/4	2.359	1.656	1.515	1.484	.750	.625	1.531	1-1/2	1-1/2
16-2ME-16	1	1	2.359	1.844	1.515	1.484	.937	.875	1.531	1-1/2	1-1/2

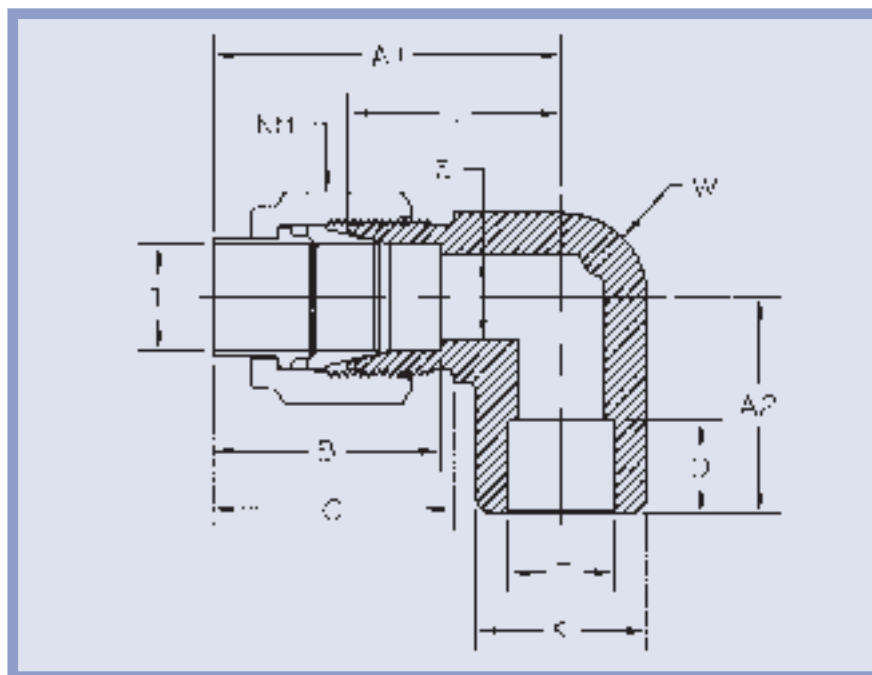
*NOTE: All dimensions subject to change, to be used for reference only.



TUBE TO BUTT WELD ELBOW

PART NUMBER	T TUBE O.D.	BW	A1	A2	B	C	D	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
2-2TBWE-2	1/8	.405	1.140	.750	.640	.765	.437	.094	.750	7/16	1/2
3-2TBWE-2	3/16	.405	1.172	.750	.703	.796	.437	.125	.750	1/2	1/2
4-2TBWE-2	1/4	.405	1.328	.781	.796	.906	.406	.187	.844	9/16	5/8
4-2TBWE-4	1/4	.540	1.328	.937	.796	.906	.562	.187	.844	9/16	5/8
6-2TBWE-4	3/8	.540	1.406	1.000	.937	1.015	.562	.281	.844	11/16	5/8
6-2TBWE-6	3/8	.675	1.593	1.125	.937	1.015	.562	.281	1.031	11/16	13/16
8-2TBWE-6	1/2	.675	1.672	1.125	1.140	1.140	.562	.406	1.031	7/8	13/16
8-2TBWE-8	1/2	.840	1.672	1.312	1.140	1.140	.750	.406	1.031	7/8	13/16
10-2TBWE-8	5/8	.840	1.890	1.375	1.203	1.217	.750	.500	1.250	1	1-1/16
12-2TBWE-12	3/4	1.050	2.062	1.500	1.250	1.343	.750	.625	1.375	1-1/4	1-1/16
16-2TBWE-12	1	1.050	2.359	1.656	1.515	1.484	.750	.625	1.531	1-1/2	1-1/2
16-2TBWE-16	1	1.315	2.359	1.843	1.515	1.484	.875	.875	1.531	1-1/2	1-1/2

*NOTE: All dimensions subject to change, to be used for reference only.

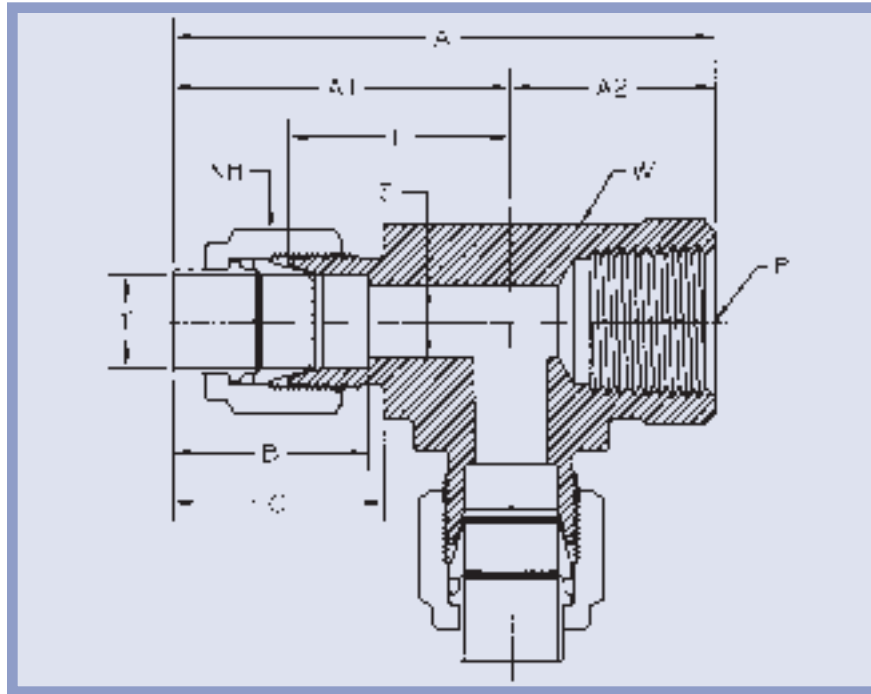


TUBE TO SOCKET WELD ELBOW

PART NUMBER	T TUBE O.D.	K	A1	A2	B	C	D	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
2-2TSWE-2	1/8	.375	1.077	.687	.640	.765	.250	.094	.687	7/16	1/2
3-2TSWE-3	3/16	.437	1.141	.719	.703	.796	.281	.125	.719	1/2	1/2
4-2TSWE-4	1/4	.500	1.249	.765	.796	.906	.312	.187	.765	9/16	5/8
6-2TSWE-6	3/8	.625	1.437	.875	.937	1.016	.375	.281	.875	11/16	13/16
8-2TSWE-8	1/2	.813	1.657	1.016	1.140	1.140	.500	.406	1.016	7/8	13/16
10-2TSWE-10	5/8	.937	1.796	1.156	1.203	1.217	.562	.500	1.156	1	1-1/16
12-2TSWE-12	3/4	1.125	1.968	1.281	1.250	1.343	.562	.625	1.281	1-1/4	1-1/16
16-2TSWE-16	1	1.375	2.359	1.531	1.515	1.484	.750	.875	1.531	1-1/2	1-1/2

*NOTE: All dimensions subject to change, to be used for reference only.

*Both tube ends are typical.

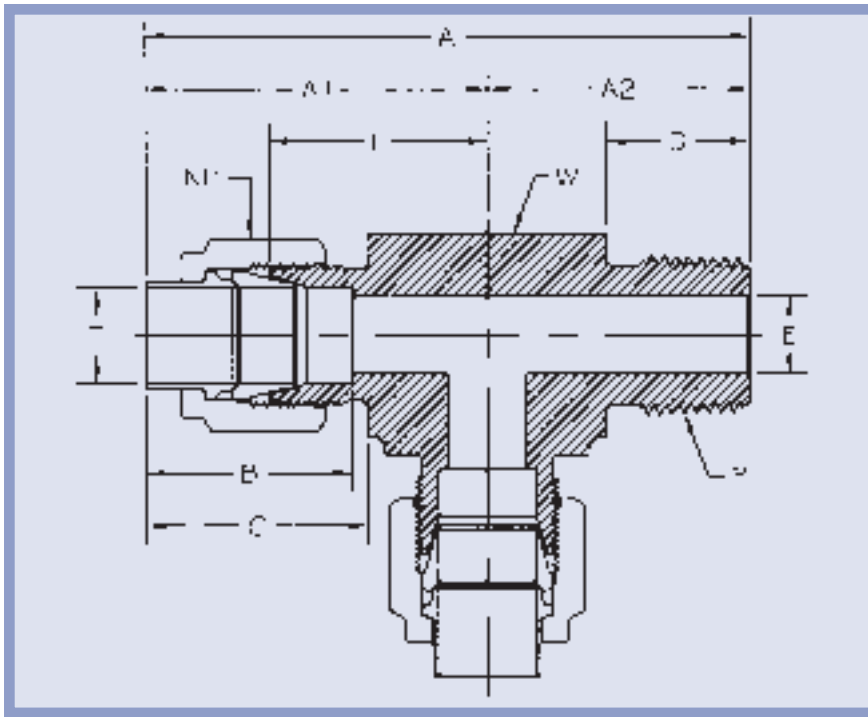


FEMALE RUN TEE

PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	A1	A2	B	C	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
1-3TFT-1	1/16	1/16	1.515	.953	.562	.609	.670	.052	.625	3/8	1/2
2-3TFT-2	1/8	1/8	1.828	1.078	.750	.640	.765	.094	.687	7/16	19/32
3-3TFT-2	3/16	1/8	1.859	1.109	.750	.703	.796	.125	.687	1/2	19/32
4-3TFT-4	1/4	1/4	2.265	1.359	.906	.796	.906	.187	.875	9/16	13/16
5-3TFT-2	5/16	1/8	2.015	1.265	.750	.796	.906	.250	.812	5/8	19/32
6-3TFT-4	3/8	1/4	1.937	1.500	.937	.937	1.015	.281	.937	11/16	13/16
6-3TFT-6	3/8	3/8	2.468	1.500	.969	.937	1.015	.281	.937	11/16	1
8-3TFT-4	1/2	1/4	2.984	1.796	1.187	1.140	1.140	.406	1.156	7/8	1-1/16
8-3TFT-6	1/2	3/8	2.578	1.671	.906	1.140	1.140	.406	1.031	7/8	1
8-3TFT-8	1/2	1/2	3.078	1.765	1.313	1.140	1.140	.406	1.125	7/8	1-1/16
10-3TFT-8	5/8	1/2	2.953	1.828	1.125	1.203	1.217	.500	1.188	1	1-1/16
12-3TFT-8	3/4	1/2	3.375	2.125	1.250	1.250	1.343	.625	1.437	1-1/4	1-3/8
12-3TFT-12	3/4	3/4	3.312	2.062	1.250	1.250	1.343	.625	1.375	1-1/4	1-3/8
14-3TFT-12	7/8	3/4	3.453	2.203	1.250	1.453	1.484	.718	1.375	1-3/8	1-3/8
16-3TFT-12	1	3/4	3.453	2.203	1.250	1.515	1.484	.875	1.375	1-1/2	1-3/8
16-3TFT-16	1	1	4.578	2.703	1.875	1.515	1.484	.875	1.875	1-1/2	1-5/8

*NOTE: All dimensions subject to change, to be used for reference only.

*Both tube ends are typical.



MALE RUN TEE

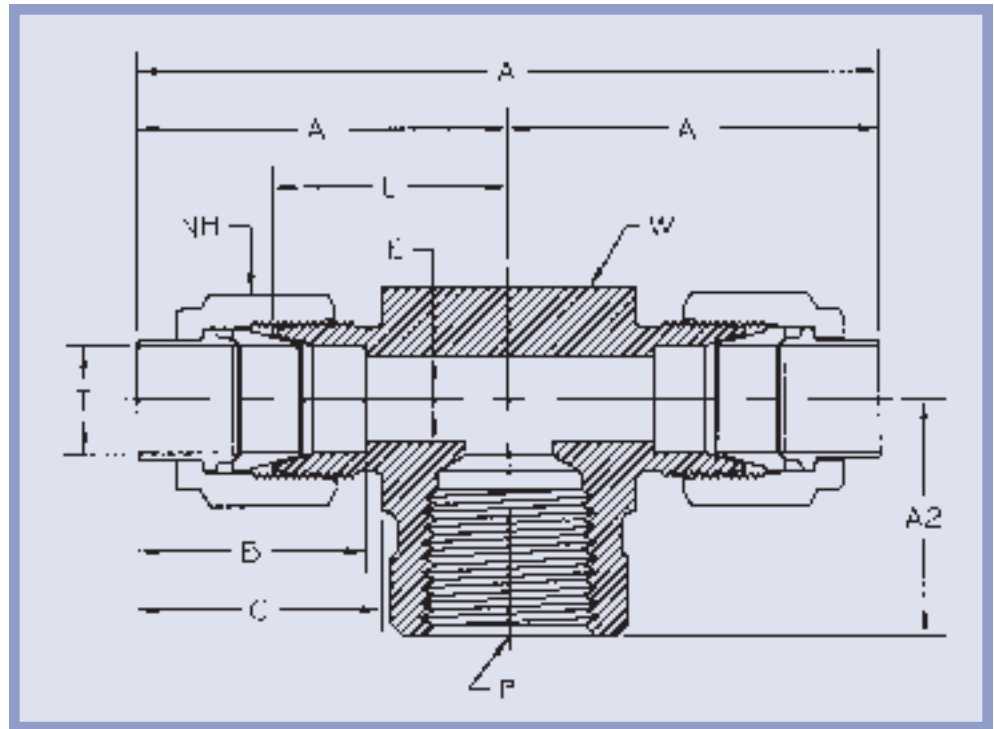
PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	A1	A2	B	C	D	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
1-3TMT-1	1/16	1/16	1.515	.890	.625	.609	.670	.375	.052	.562	3/8	3/8
2-3TMT-2	1/8	1/8	1.671	1.046	.625	.640	.765	.375	.094	.656	7/16	3/8
3-3TMT-2	3/16	1/8	1.890	1.140	.750	.703	.796	.375	.125	.718	1/2	1/2
4-3TMT-4	1/4	1/4	2.203	1.265	.937	.796	.906	.562	.187	.781	9/16	13/16
4-3TMT-6	1/4	3/8	2.406	1.406	1.000	.796	.906	.562	.187	.922	9/16	13/16
5-3TMT-2	5/16	1/8	2.140	1.328	.812	.796	.906	.375	.187	.875	5/8	19/32
5-3TMT-4	5/16	1/4	2.234	1.296	.937	.796	.906	.562	.250	.844	5/8	13/16
6-3TMT-2	3/8	1/8	2.250	1.437	.812	.937	1.015	.375	.187	.875	11/16	19/32
6-3TMT-4	3/8	1/4	2.406	1.406	1.000	.937	1.015	.562	.281	.844	11/16	13/16
6-3TMT-6	3/8	3/8	2.562	1.562	1.000	.937	1.015	.562	.281	1.000	11/16	13/16
6-3TMT-8	3/8	1/2	3.125	1.656	1.468	.937	1.015	.750	.281	1.093	11/16	1-1/16
8-3TMT-4	1/2	1/4	2.734	1.609	1.125	1.140	1.140	.562	.281	.969	7/8	13/16
8-3TMT-6	1/2	3/8	2.750	1.671	1.078	1.140	1.140	.562	.406	1.031	7/8	13/16
8-3TMT-8	1/2	1/2	3.140	1.765	1.375	1.140	1.140	.750	.406	1.125	7/8	1
10-3TMT-8	5/8	1/2	3.265	1.890	1.375	1.203	1.217	.750	.500	1.250	1	1-1/16
12-3TMT-12	3/4	3/4	3.500	2.000	1.500	1.250	1.343	.750	.625	1.312	1-1/4	1-1/16
14-3TMT-12	7/8	3/4	3.609	2.109	1.500	1.453	1.484	.750	.625	1.281	1-3/8	1-3/8
16-3TMT-12	1	3/4	3.984	2.140	1.844	1.515	1.484	.750	.625	1.312	1-1/2	1-3/8
16-3TMT-16	1	1	3.984	2.140	1.844	1.515	1.484	.937	.875	1.312	1-1/2	1-5/8

*NOTE: All dimensions subject to change, to be used for reference only.

*Both tube ends are typical.



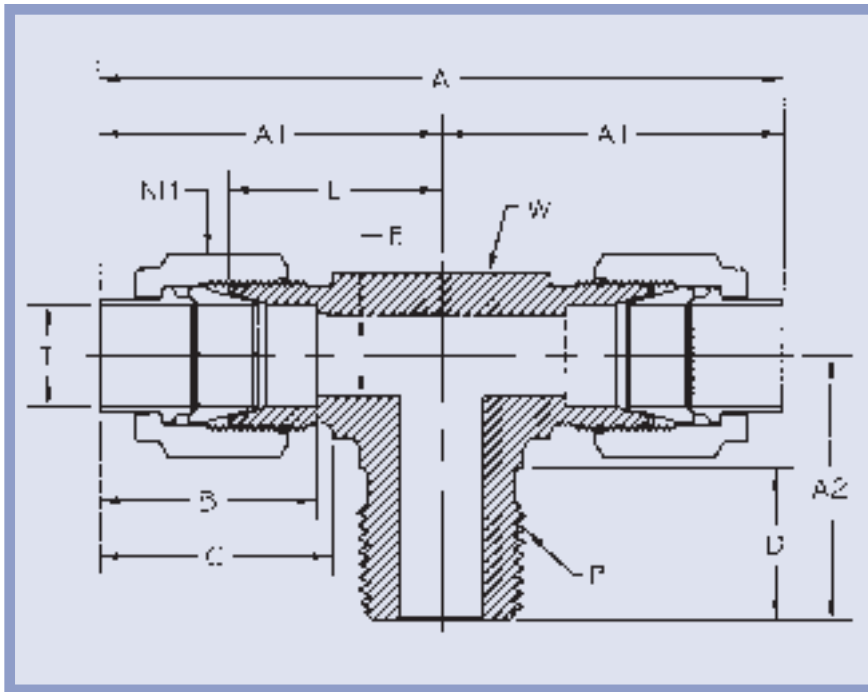
**FEMALE
BRANCH TEE**



PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	A1	A2	B	C	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
1-3TTF-1	1/16	1/16	1.781	.890	.562	.609	.670	.052	.562	3/8	1/2
2-3TTF-2	1/8	1/8	2.156	1.078	.750	.640	.765	.094	.687	7/16	19/32
2-3TTF-4	1/8	1/4	2.531	1.265	.844	.640	.765	.094	.875	7/16	3/4
3-3TTF-2	3/16	1/8	2.343	1.172	.750	.703	.796	.125	.750	1/2	19/32
4-3TTF-2	1/4	1/8	2.468	1.234	.750	.796	.906	.187	.750	9/16	19/32
4-3TTF-4	1/4	1/4	2.718	1.359	.844	.796	.906	.187	.875	9/16	13/16
4-3TTF-6	1/4	3/8	2.843	1.421	1.000	.796	.906	.187	.937	9/16	3/4
4-3TTF-8	1/4	1/2	2.968	1.484	.875	.796	.906	.187	1.000	9/16	1-1/16
5-3TTF-2	5/16	1/8	2.468	1.234	.750	.796	.906	.250	.781	5/8	19/32
5-3TTF-4	5/16	1/4	2.781	1.390	.844	.796	.906	.250	.937	5/8	19/32
6-3TTF-4	3/8	1/4	3.031	1.515	.844	.937	1.015	.281	.953	11/16	13/16
6-3TTF-6	3/8	3/8	3.000	1.500	1.000	.937	1.015	.281	.937	11/16	13/16
8-3TTF-4	1/2	1/4	3.218	1.609	.844	1.140	1.140	.406	.969	7/8	13/16
8-3TTF-6	1/2	3/8	3.343	1.671	1.031	1.140	1.140	.406	1.031	7/8	1
8-3TTF-8	1/2	1/2	3.593	1.796	1.312	1.140	1.140	.406	1.156	7/8	1
10-3TTF-6	5/8	3/8	3.343	1.672	1.031	1.203	1.217	.500	1.031	1	1
10-3TTF-8	5/8	1/2	3.625	1.812	1.187	1.203	1.217	.500	1.172	1	1
12-3TTF-6	3/4	3/8	4.000	2.000	1.187	1.250	1.343	.562	1.317	1-1/4	1
12-3TTF-12	3/4	3/4	4.188	2.094	1.250	1.250	1.343	.625	1.406	1-1/4	1-3/8
14-3TTF-12	7/8	3/4	4.468	2.234	1.250	1.453	1.484	.718	1.406	1-3/8	1-3/8
16-3TTF-6	1	3/8	4.281	2.140	1.375	1.515	1.484	.562	1.312	1-1/2	1-3/8
16-3TTF-8	1	1/2	4.406	2.203	1.375	1.515	1.484	.687	1.371	1-1/2	1-3/8
16-3TTF-12	1	3/4	4.468	2.234	1.250	1.515	1.484	.875	1.406	1-1/2	1-3/8
16-3TTF-16	1	1	5.156	2.578	1.750	1.515	1.484	.875	1.750	1-1/2	1-5/8

*NOTE: All dimensions subject to change, to be used for reference only.

*Both tube ends are typical.

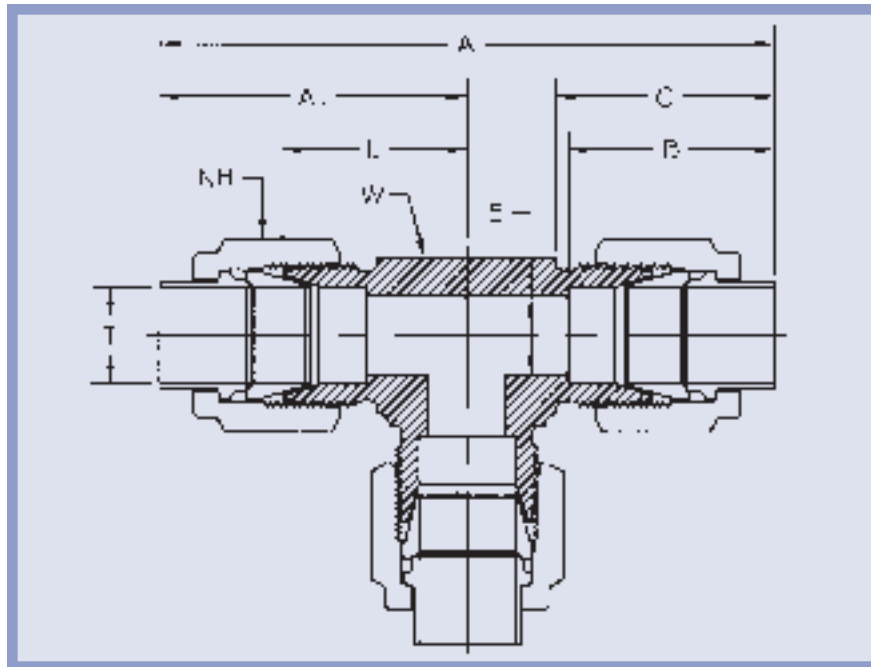


MALE BRANCH TEE

PART NUMBER	T TUBE O.D.	P PIPE END NPT	A	A1	A2	B	C	D	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
1-3TTM-1	1/16	1/16	1.781	.890	.750	.609	.670	.375	.052	.562	3/8	3/8
2-3TTM-1	1/8	1/16	2.093	1.046	.719	.640	.765	.375	.094	.656	7/16	3/8
2-3TTM-2	1/8	1/8	2.093	1.046	.719	.640	.765	.375	.094	.656	7/16	3/8
2-3TTM-4	1/8	1/4	2.218	1.109	.937	.640	.765	.562	.094	.719	7/16	19/32
3-3TTM-2	3/16	1/8	2.344	1.172	.750	.703	.796	.375	.125	.687	1/2	1/2
4-3TTM-2	1/4	1/8	2.406	1.203	.750	.796	.906	.375	.187	.719	9/16	1/2
4-3TTM-4	1/4	1/4	2.500	1.250	.937	.796	.906	.562	.187	.765	9/16	19/32
4-3TTM-6	1/4	3/8	2.656	1.328	1.000	.796	.906	.562	.187	.844	9/16	13/16
5-3TTM-2	5/16	1/8	2.406	1.203	.812	.796	.906	.375	.187	.750	5/8	19/32
5-3TTM-4	5/16	1/4	2.406	1.203	1.000	.796	.906	.562	.250	.750	5/8	19/32
6-3TTM-2	3/8	1/8	2.812	1.406	.844	.937	1.015	.375	.187	.844	11/16	19/32
6-3TTM-4	3/8	1/4	2.812	1.406	1.000	.937	1.015	.562	.281	.844	11/16	19/32
6-3TTM-6	3/8	3/8	3.062	1.531	1.000	.937	1.015	.562	.281	.969	11/16	13/16
6-3TTM-8	3/8	1/2	3.125	1.562	1.312	.937	1.015	.750	.281	1.000	11/16	1
8-3TTM-4	1/2	1/4	3.218	1.609	1.000	1.140	1.140	.562	.281	.969	7/8	13/16
8-3TTM-6	1/2	3/8	3.218	1.609	1.125	1.140	1.140	.562	.375	.969	7/8	13/16
8-3TTM-8	1/2	1/2	3.406	1.703	1.312	1.140	1.140	.750	.406	1.062	7/8	1
10-3TTM-6	5/8	3/8	3.344	1.672	1.250	1.203	1.217	.562	.375	1.031	1	1
10-3TTM-8	5/8	1/2	3.344	1.672	1.375	1.203	1.217	.750	.468	1.031	1	1
12-3TTM-6	3/4	3/8	2.938	1.843	1.250	1.250	1.343	.562	.375	1.281	1-1/4	1-1/16
12-3TTM-8	3/4	1/2	3.687	1.843	1.375	1.250	1.343	.750	.468	1.156	1-1/4	1-1/16
12-3TTM-12	3/4	3/4	4.125	2.062	1.500	1.250	1.343	.750	.625	1.375	1-1/4	1-1/16
14-3TTM-12	7/8	3/4	4.218	2.109	1.500	1.453	1.484	.750	.625	1.281	1-3/8	1-1/2
16-3TTM-4	1	1/4	4.406	2.203	1.265	1.515	1.484	.562	.281	1.375	1-1/2	1-3/8
16-3TTM-12	1	3/4	4.468	2.234	1.625	1.515	1.484	.750	.625	1.406	1-1/2	1-1/2
16-3TTM-16	1	1	4.468	2.234	1.843	1.515	1.484	.937	.875	1.406	1-1/2	1-1/2

*NOTE: All dimensions subject to change, to be used for reference only.

*Both tube ends are typical.



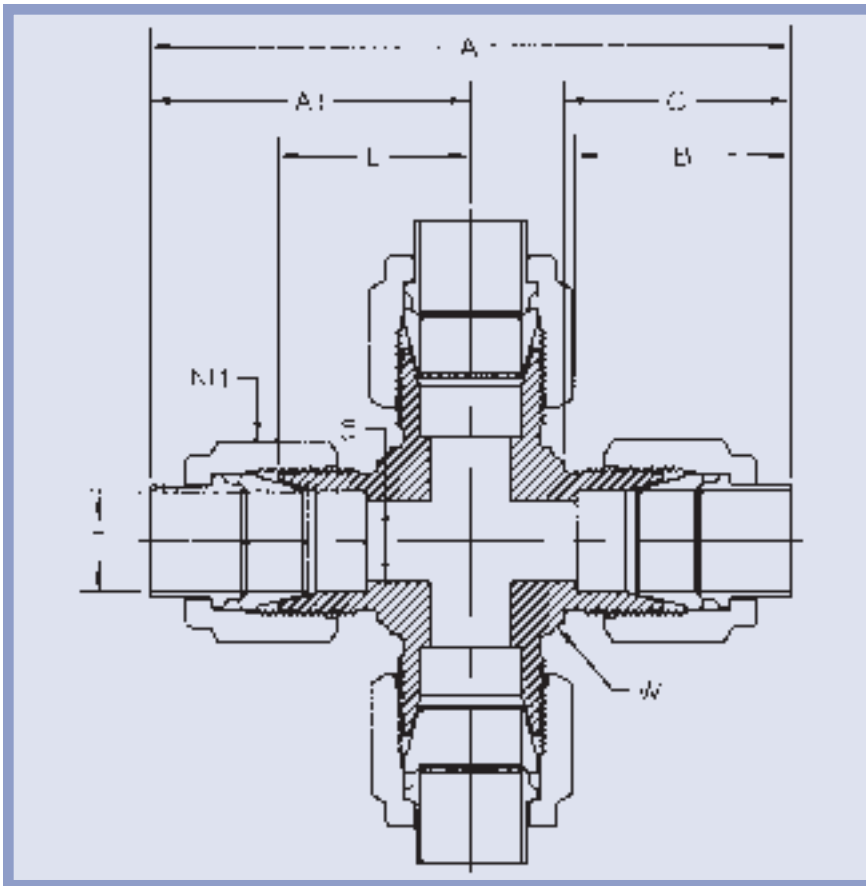
UNION TEE



PART NUMBER	T TUBE O.D.	A	A1	B	C	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
1-3TTT-1	1/16	1.781	.890	.609	.670	.052	.562	3/8	3/8
2-3TTT-2	1/8	2.093	1.046	.640	.765	.094	.656	7/16	3/8
3-3TTT-3	3/16	2.281	1.140	.703	.796	.125	.718	1/2	3/8
4-3TTT-4	1/4	2.406	1.203	.796	.906	.187	.718	9/16	1/2
5-3TTT-5	5/16	2.531	1.265	.796	.906	.250	.812	5/8	19/32
6-3TTT-6	3/8	2.812	1.406	.937	1.015	.281	.844	11/16	19/32
8-3TTT-8	1/2	3.218	1.609	1.140	1.140	.406	.969	7/8	13/16
10-3TTT-10	5/8	3.656	1.828	1.203	1.217	.500	1.187	1	1-1/16
12-3TTT-12	3/4	4.000	2.000	1.250	1.343	.625	1.312	1-1/4	1-1/16
14-3TTT-14	7/8	4.406	2.203	1.453	1.484	.718	1.375	1-3/8	1-3/8
16-3TTT-16	1	4.406	2.203	1.515	1.484	.875	1.375	1-1/2	1-3/8

*NOTE: All dimensions subject to change, to be used for reference only.

*All tube ends are typical.



UNION CROSS

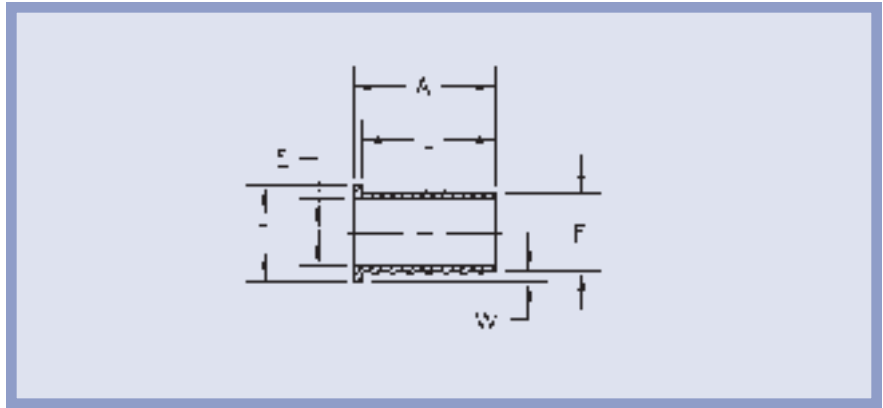
PART NUMBER	T TUBE O.D.	A	A1	B	C	E THRU HOLE	L	NH NUT HEX	W WRENCH FLAT
1-4CR	1/16	1.906	.953	.609	.670	.052	.625	3/8	1/2
2-4CR	1/8	2.156	1.078	.640	.765	.094	.687	7/16	1/2
3-4CR	3/16	2.281	1.140	.703	.796	.125	.718	1/2	1/2
4-4CR	1/4	2.406	1.203	.796	.906	.187	.718	9/16	1/2
5-4CR	5/16	2.531	1.265	.796	.906	.250	.812	5/8	19/32
6-4CR	3/8	2.812	1.406	.937	1.015	.281	.844	11/16	19/32
8-4CR	1/2	3.218	1.609	1.140	1.140	.406	.969	7/8	13/16
10-4CR	5/8	3.594	1.797	1.203	1.217	.500	1.156	1	1-1/16
12-4CR	3/4	4.000	2.000	1.250	1.343	.625	1.312	1-1/4	1-1/16
14-4CR	7/8	4.156	2.078	1.453	1.484	.718	1.250	1-3/8	1-3/8
16-4CR	1	4.281	2.140	1.515	1.484	.875	1.312	1-1/2	1-3/8

*NOTE: All dimensions subject to change, to be used for reference only.

*All tube ends are typical.

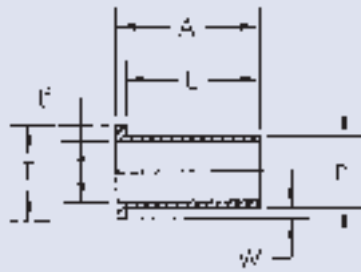


BARBED INSERT



PART NUMBER	T TUBE O.D.	W REF.	A	E THRU HOLE	F TUBE I.D.	L
3-1BI-030	3/16	.030	.566	.062	1/8	.518
4-1BI-022	1/4	.022	.566	.141	13/64	.518
4-1BI-031	1/4	.031	.566	.125	3/16	.518
4-1BI-040	1/4	.040	.566	.109	11/64	.518
4-1BI-062	1/4	.062	.566	.062	1/8	.518
5-1BI-031	5/16	.031	.566	.187	1/4	.518
5-1BI-062	5/16	.062	.566	.125	3/16	.518
5-1BI-094	5/16	.094	.566	.062	1/8	.518
5-1BI-103	5/16	.103	.566	.045	7/64	.518
6-1BI-049	3/8	.049	.566	.218	9/32	.518
6-1BI-062	3/8	.062	.566	.187	1/4	.518
6-1BI-094	3/8	.094	.566	.125	3/16	.518
6-1BI-159	3/8	.159	.566	.032	1/16	.518
8-1BI-035	1/2	.035	.750	.375	7/16	.702
8-1BI-049	1/2	.049	.750	.344	13/32	.702
8-1BI-062	1/2	.062	.750	.312	3/8	.702
8-1BI-125	1/2	.125	.750	.187	1/4	.702
10-1BI-049	5/8	.049	.750	.468	17/32	.702
10-1BI-062	5/8	.062	.750	.437	1/2	.702
10-1BI-125	5/8	.125	.750	.312	3/8	.702
10-1BI-187	5/8	.187	.750	.187	1/4	.702
12-1BI-049	3/4	.049	.750	.562	21/32	.702
12-1BI-062	3/4	.062	.750	.562	5/8	.702
12-1BI-125	3/4	.125	.750	.437	1/2	.702
14-1BI-049	7/8	.049	1.031	.687	25/32	.938
14-1BI-062	7/8	.062	1.031	.687	3/4	.938
14-1BI-125	7/8	.125	1.031	.562	5/8	.938
16-1BI-062	1	.062	1.031	.812	7/8	.938
16-1BI-125	1	.125	1.031	.687	3/4	.938

*NOTE: All dimensions subject to change, to be used for reference only.



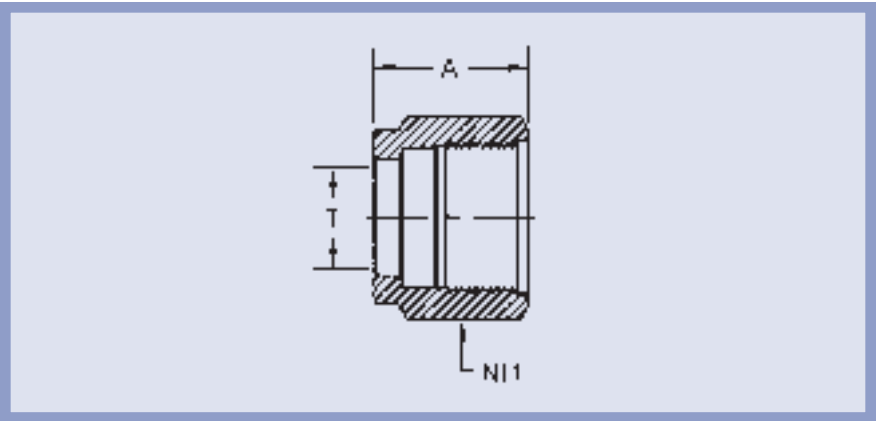
PLANE INSERT

PART NUMBER	T TUBE O.D.	W REF.	A	E THRU HOLE	F TUBE I.D.	L
3-1PI-030	3/16	.030	.566	.062	1/8	.518
4-1PI-022	1/4	.022	.566	.140	13/64	.518
4-1PI-031	1/4	.031	.566	.125	3/16	.518
4-1PI-040	1/4	.040	.566	.109	11/64	.518
5-1PI-031	5/16	.031	.566	.187	1/4	.518
5-1PI-062	5/16	.062	.566	.125	3/16	.518
5-1PI-094	5/16	.094	.566	.062	1/8	.518
6-1PI-049	3/8	.049	.566	.218	9/32	.518
6-1PI-062	3/8	.062	.566	.187	1/4	.518
6-1PI-094	3/8	.094	.566	.125	3/16	.518
8-1PI-035	1/2	.035	.750	.375	7/16	.702
8-1PI-049	1/2	.049	.750	.344	13/32	.702
8-1PI-062	1/2	.062	.750	.312	3/8	.702
8-1PI-125	1/2	.125	.750	.187	1/4	.702
10-1PI-049	5/8	.049	.750	.468	17/32	.702
10-1PI-062	5/8	.062	.750	.437	1/2	.702
10-1PI-125	5/8	.125	.750	.312	3/8	.702
12-1PI-049	3/4	.049	.750	.562	21/32	.702
12-1PI-062	3/4	.062	.750	.562	5/8	.702
12-1PI-125	3/4	.125	.750	.437	1/2	.702
14-1PI-049	7/8	.049	1.000	.687	25/32	.952
14-1PI-062	7/8	.062	1.000	.687	3/4	.952
14-1PI-125	7/8	.125	1.000	.562	5/8	.952
16-1PI-050	1	.050	1.000	.844	57/64	.952
16-1PI-062	1	.062	1.000	.812	7/8	.952
16-1PI-125	1	.125	1.000	.687	3/4	.952

*NOTE: All dimensions subject to change, to be used for reference only.



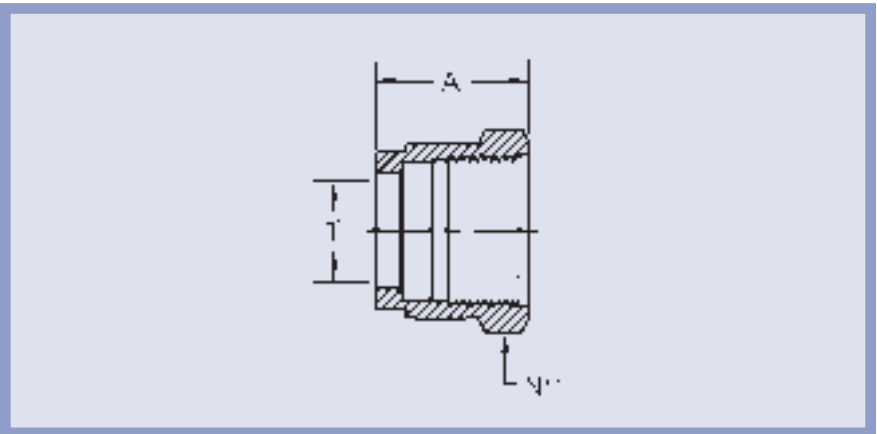
NUT



PART NUMBER	T TUBE O.D.	A	NH NUT HEX
N-1	1/16	.476	3/8
N-2	1/8	.517	7/16
N-3	3/16	.517	1/2
N-4	1/4	.585	9/16
N-5	5/16	.596	5/8
N-6	3/8	.641	11/16
N-8	1/2	.760	7/8
N-10	5/8	.780	1
N-12	3/4	.882	1-1/4
N-14	7/8	.904	1-3/8
N-16	1	.925	1-1/2

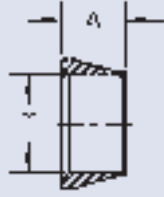


KNURLED NUT



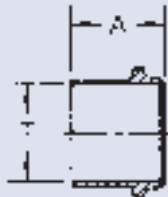
PART NUMBER	T TUBE O.D.	A	NH NUT HEX
KN-1	1/16	.468	3/8
KN-2	1/8	.517	7/16
KN-3	3/16	.517	1/2
KN-4	1/4	.585	9/16
KN-5	5/16	.596	5/8
KN-6	3/8	.643	11/16
KN-8	1/2	.760	7/8
KN-10	5/8	.780	1
KN-12	3/4	.887	1-1/4
KN-14	7/8	.904	1-3/8
KN-16	1	.925	1-1/2

*NOTE: All dimensions subject to change, to be used for reference only.



FRONT COLLET

PART NUMBER	T TUBE O.D.	A
FC-1	1/16	.211
FC-2	1/8	.210
FC-3	3/16	.213
FC-4	1/4	.206
FC-5	5/16	.201
FC-6	3/8	.251
FC-8	1/2	.337
FC-10	5/8	.331
FC-12	3/4	.386
FC-14	7/8	.396
FC-16	1	.396



REAR COLLET

PART NUMBER	T TUBE O.D.	A
RC-1	1/16	.145
RC-2	1/8	.294
RC-3	3/16	.330
RC-4	1/4	.360
RC-5	5/16	.371
RC-6	3/8	.404
RC-8	1/2	.475
RC-10	5/8	.488
RC-12	3/4	.523
RC-14	7/8	.611
RC-16	1	.641

*NOTE: All dimensions subject to change, to be used for reference only.

INSTRUMENT TEE

The Instrument Tee may be ordered with any standard tube or pipe size. When ordering, specify sizes in the following order:

1. Tube Size O.D.
2. Female Pipe Size
3. Male Pipe Size

Example: 1/2" tube, 3/8" female pipe, 1/4" male pipe.
SS-8-3TFM-6-4



HEAT EXCHANGER TEE

The Heat Exchanger Tee may be ordered in any standard tube size. The process tube is bored through. When ordering, specify sizes in the following order:

1. Jacket Tube O.D.
2. Process Tube O.D. followed by "BT" for bore through designation
3. Branch Tube O.D.

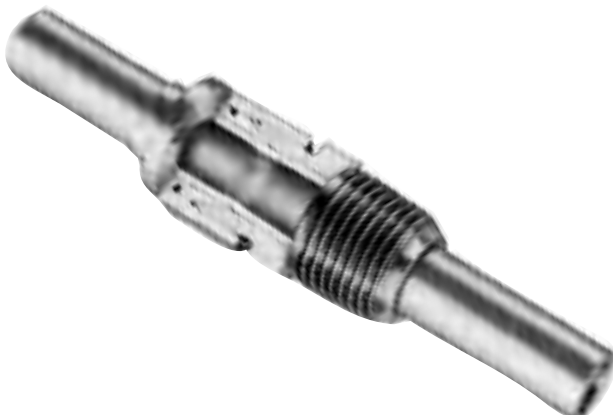
Example: 1/2" tube, 1/4" tube bored through, 1/2" tube.
SS-8-3TTT-4BT-8



THERMOCOUPLE BORE THROUGH

A Thermocouple Connector can be furnished already bored through for an additional charge. When ordering:

1. Select required size male connector. See pages 14 and 15 for a listing of available Male Connectors.
2. Add the letters "BT" to designate bore through.
Example: 4-1MC-2-BT



TYLUBE™ THREAD LUBRICANT

Tylube™ is an anti-gall compound to be used on stainless steel, steel and nickel based alloys. Temperature range to 500°F. Not recommended for plastic and aluminum products.

Tylube™ is made from distilled water with inert ingredients and contains no silicones, heavy metals, chlorine or sulfur. For a complete list of ingredients request an MSDS to be sure of its compatibility with your installation.

Available in handy 8 oz. plastic bottles.



TYLOK STANDARD INSTALLATION INSTRUCTIONS

Tylok Standard Tube Fittings come completely assembled and ready for use, no disassembly required. Although there are some general guide lines to follow, no special preparation of the tubing is necessary, reference page 44. In overhead applications Tylok recommends using a Pre-SetTool, see page 47.

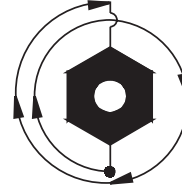
Size		Tighten # Turn(s)
1	1/16"	1
2	1/8"	
3	3/16"	
4	1/4"	1-1/2
5	5/16"	
6	3/8"	
8	1/2"	
10	5/8"	
12	3/4"	1-1/4
14	7/8"	
16	1"	

Size #1 Thru #3
(1/16" – 3/16")



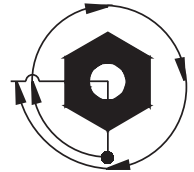
Finger Tight Plus
1 Full Turn

Size #4 Thru #10
(1/4" – 5/8")



Finger Tight Plus
1-1/2 Turns

Size #12 Thru #16
(3/4" – 1")



Finger Tight Plus
1-1/4 Turns



Simply insert tubing into fitting assembly making sure the tubing seats firmly against the shoulder of the body and the nut is finger tight.



Tighten the nut with a wrench an additional number of turns indicated above, while holding the fitting body with a second wrench.

TO REMOVE TUBE AND RE-CONNECT TUBE FITTING

Mark the location of the nut with reference to the body before disassembly. For reassembly, re-insert the tubing into the body until it is seated. With proper size wrench, retighten nut to original location by realigning previous marks. A noticeable amount of torque will develop when the nut is turned to original position. Next, rotate the nut slightly past original position to fully re-set the seal.



Mark the location of the nut with reference to the body.



Back off the nut until it is clear of the body and remove the tubing from the fitting.

TYLOK STANDARD TUBING SELECTION & PREPARATION

Proper selection of tubing is key to the performance of the fitting. When selecting the proper wall thickness and material, all tubing should be compatible with the process fluid, temperature, application, flow and system pressure.

For proper sealing it is recommended that the tubing and fitting be of like material to allow for positive sealing (i.e., stainless on stainless, brass on copper, steel on steel). Galvanic corrosion could occur if the tubing and fitting are not of like material, with the exception of a brass fitting on copper tubing.

When using stainless steel tubing, Tylok recommends using Type 304 or 316 fully annealed, seamless or welded redrawn meeting ASTM-A-213, ASTM-A-269 or equivalent, with a suggested maximum hardness of 80 Rb.

For copper tubing, Tylok suggests using soft annealed, seamless tubing per ASTM-B75 or equivalent. Copper water tube type K or L, soft annealed (Temper O) per ASTM-B88 can also be used.

When using carbon steel, all tubing should be fully annealed and conform to ASTM-A-179, or equivalent, with a maximum hardness of 72 Rb.

In general, all tubing should be free of nicks, scratches, imperfections of any kind and be suitable for bending. Out of round tubing that does not easily go through fitting components should not be used. It is recommended that the charts be used for tube selection. Ideally, the tube end should be cut square so that when it bottoms out inside the fitting an extra seal is provided. Avoid installing contaminated tubing into your system. For elevated temperatures see page 46.

Tylok Standard Tube Fittings skive the tubing rather than bite to achieve its seals. Thin wall tubing (wall thicknesses with working pressures highlighted in reverse text, in the charts) is not recommended for Gas Service. For Gas Service see page 45.

When using tubing of a thinner or thicker wall than shown, it is recommended that you consult with your local Distributor or contact Tylok International directly if there is any doubt in selecting tubing.

Values in reverse text are not recommended for Gas Service.

Note: Tables calculated, to the right, are suggested pressure ratings, in accordance with ANSI 31.3, but should be used for reference only. Tylok International, Inc., is not responsible for its accuracy nor designs using these figures. All compatible Tylok fittings will withstand pressures above those listed for maximum tubing working pressures.

SUGGESTED ALLOWABLE WORKING PRESSURE TABLES (psig)

Stainless Steel								
Tube Size O.D.	Tube Wall Thickness (inches)							
	.028	.035	.049	.065	.083	.095	.109	.120
1/8"	8550	10900						
3/16"	5500	7000	10250					
1/4"	4000	5100	7500	10200				
5/16"		4050	5900	8050				
3/8"		3300	4800	6550				
1/2"		2500	3500	4700	6250			
5/8"			2900	4000	5200	6050		
3/4"			2400	3300	4250	4950	5800	
7/8"			2050	2800	3600	4200	4850	
1"				2400	3150	3650	4200	4700

75,000 PSI Tensile

Carbon Steel								
Tube Size O.D.	Tube Wall Thickness (inches)							
	.028	.035	.049	.065	.083	.095	.109	.120
1/8"	8100	10200						
3/16"	5150	6650	9700					
1/4"	3750	4850	7100	10000				
5/16"		3750	5500	7600				
3/8"		3100	4500	6200				
1/2"		2300	3250	4500	5950			
5/8"			2600	3500	4600	5350		
3/4"			2150	2900	3750	4350	5100	
7/8"			1800	2450	3200	3700	4300	
1"				2100	2750	3200	3700	4100

47,000 PSI Tensile

Copper								
Tube Size O.D.	Tube Wall Thickness (inches)							
	.028	.035	.049	.065	.083	.095	.109	.120
1/8"	2750	3700						
3/16"	1700	2300	3500					
1/4"	1300	1650	2550	3550				
5/16"		1300	1950	2750				
3/8"		1050	1600	2250				
1/2"		800	1150	1600	2100			
5/8"			900	1250	1650	1950		
3/4"			750	1000	1350	1550	1850	
7/8"			600	850	1100	1300	1550	
1"			550	750	950	1150	1350	1500

30,000 PSI Tensile

Aluminum								
Tube Size O.D.	Tube Wall Thickness (inches)							
	.028	.035	.049	.065	.083	.095	.109	.120
1/8"		8550						
3/16"		4600	6600					
1/4"		3300	4850					
5/16"		3000	4400					
3/8"		2550	3650					
1/2"		1850		3650				
5/8"			2100	2850				
3/4"			1700	2350	3050			
7/8"			1500	2000				
1"				1700	2250	2650		

42,000 PSI Tensile

GAS SERVICE

Extra care must be taken when tubing is used in gas service applications. Small gas molecules easily escape through minute leak paths, therefore, the tubing must be free of nicks, scratches and imperfections of any kind. In particular, when using large diameter tubing the possibility of surface defects is increased due to greater surface area. It is strongly recommended that heavier wall thicknesses be selected. Penetration of the collets on thin wall tubing or soft material will not offer enough radial resistance for sealing. In such cases, Tylok recommends using a Plane Insert (Part descriptor 1PI, page 39). In the tables on page 44, note the suggested allowable working pressure for gas service.

Values in reverse text are not recommended for Gas Service.

PRECAUTIONS FOR WELD ENDS

Tylok Tube Fittings with weld ends offer the same positive sealing as all other Tylok fittings. Welding could deform the assembly, making pull ups or disassembly difficult. Some precautions should be taken...

- Remove the nut and collets from the fitting
- It is important that the fitting threads and sealing surfaces be protected from weld splatter
- A heat sink should be used to dissipate heat
- Ensure alignment by tack welding symmetrically
- Once welded, remove the weld splatter protection and reassemble nut and collets on fitting

SAFETY GUIDELINES

- Never connect, disconnect or remake a fitting with pressure in the system
- Make sure all fittings are properly installed, reference Installation Instructions - page 43, before pressurizing the system
- Tubing material should be softer than fitting material
- Tylok recommends using Tylok replacement parts
- Although the fittings will hold to the pressure rating of the tubing, it is not recommended to go beyond this rating. Elongation could occur in the tubing, shrinking the wall thickness and causing potential harm to anyone in the area
- Always use proper thread lubricants and sealants on tapered pipe threads
- If process fluids are toxic and/or hazardous, exercise extra caution
- Never bleed a system by loosening a fitting
- For proper sealing it is recommended that the tubing and fitting be of like material

TYSPTY LEAK DETECTOR

Tylok offers a leak detector, Tyspty, for use in all sealing applications. Tyspty meets standard MIL-L-25567D, Sect. 4.4.9 for use on oxygen systems. Available in 1 pt. spray bottles. Specify number of bottles needed when ordering. Part Number: TYSPY

- All temperature formula: -55°F to 200°F
- Ultra-sensitive
- Long-lasting bubbles
- Available in handy spray bottle
- Fluorescent for improved visibility
- Safe for oxygen systems
- Non-corrosive, non-toxic

GAP GAGES

Gap gages can be purchased to ensure the Installer and Inspector that the nut has been properly tightened. Available upon request.

Part Number	Tube Size	Part Number	Tube Size
#1-GG	1/16"	#8-GG	1/2"
#2-GG	1/8"	#10-GG	5/8"
#3-GG	3/16"	#12-GG	3/4"
#4-GG	1/4"	#14-GG	7/8"
#5-GG	5/16"	#16-GG	1"
#6-GG	3/8"		



When fitting is properly tightened, **gap gage should not fit** between nut and shoulder of body.

INTERCHANGEABILITY

Tylok does not recommend interchanging its fitting components with that of other manufacturers. Tylok fitting components are made to strict quality control standards and cannot guarantee that of other manufacturers. Damage or injury may result when mixing Tylok tube components with that of other manufacturers.

QUALITY CONTROL

All components are manufactured and inspected to meet strict quality control standards in each phase of production. All employees are orientated to follow rigid procedures to ensure a quality product from the start of each job through completion. At Tylok our primary concern is quality, reliability and service to our customers.

PIPE THREAD SPECIFICATIONS

Tylok Pipe Fittings are manufactured from materials meeting applicable ASTM or ASME specifications, with pipe threads which meet or exceed ANSI B1.20.1 requirements. Strict quality control procedures are followed throughout production. All parts are individually inspected to provide the finest possible product.

Materials: Brass ■ Steel ■ 316 Stainless Steel
Aluminum ■ Additional materials available as special order

Suggested Maximum Operating Pressures for Male Pipe Threads

MNPT Size	316 Stainless Steel PSI Rating	Brass PSI Rating	Steel PSI Rating
1/16"	10,100	5,700	10,500
1/8"	9,200	5,300	9,800
1/4"	7,500	4,100	8,000
3/8"	7,250	4,000	7,700
1/2"	6,900	3,900	7,300
3/4"	6,600	3,700	7,000
1"	5,000	2,700	5,000

Suggested Maximum Operating Pressures for Female Pipe Threads

FNPT Size	316 Stainless Steel PSI Rating	Brass PSI Rating	Steel PSI Rating
1/16"	6,200	3,500	6,800
1/8"	6,000	3,400	6,600
1/4"	6,100	3,300	6,500
3/8"	5,000	2,700	5,400
1/2"	4,700	2,500	4,800
3/4"	4,300	2,400	4,600
1"	4,100	2,300	4,500

These charts are to be used as a guide only and are based on normal wall thicknesses, used for the various sizes. These ratings may vary widely from effects such as the proper use of sealants, size of stock, temperature, corrosion factors, etc. Therefore, Tylok International, Inc., assumes no responsibility for its accuracy in any individual design.

TEMPERATURE RATINGS

The standard Tylok Instrumentation Fittings are rated at the following temperatures:

316 Stainless -325°F to 1200°F (-198°C to 648°C) Brass -40°F to 400°F (-40°C to 204°C) Steel¹ -65°F to 400°F (-54°C to 204°C) Aluminum -40°F to 400°F (-40°C to 204°C)

Note: Consideration should be given to maximum temperature ratings if fittings and/or tubing are coated or plated.

¹Special attention should be considered when selecting coated and/or plated materials such as Steel.

TUBE PRESSURE DERATING FACTORS AT ELEVATED TEMPERATURES

The following table lists derating factors that must be considered in applications above that of ambient temperatures.

Temperatures		Multiplier Factors				
°F	°C	304 SS	316 SS	Carbon Steel	Brass	Aluminum
200	93	1.00	1.00	.95	.80	1.00
400	204	.94	.97	.86	.50	.40
600	315	.82	.85	.77		
800	427	.76	.80	.59		
1000	538	.69	.77			
1200	649	.30	.37			

Example

Type 316 Stainless Steel 1/4" O.D. x .049" wall at 800°F is...

$$7,500 \text{ PSI} \times .80 = \underline{6,000 \text{ PSI}}$$

Therefore, the maximum allowable working pressure for 316 Stainless Steel - 1/4" O.D. with .049" tube wall - at 800°F is 6,000 PSI.

These charts are to be used as a guide only and are based on normal wall thicknesses, used for the various sizes. These ratings may vary widely from effects such as the proper use of sealants, size of stock, temperature, corrosion factors, etc. Therefore, Tylok International, Inc., assumes no responsibility for its accuracy in any individual design.

HEAT TRACEABILITY

Tylok Standard Tube Fittings can be traced back to the original mill heat from which it was made. Starting with the original billet, the mill creates a certificate which completely describes the chemical and physical makeup. This is useful for providing a method for complete material accountability for the manufacturer and end customer.

RAW MATERIAL SPECIFICATIONS

Fitting Material	Bar Stock	Forging	*Tubing Specification	Max Recommended Hardness (Tubing)
Brass	ASTM-B16 Alloy 360 ASTM-B453 Alloy 345	ASTM-B124 Alloy 377	ASTM-B75 Copper (Temper O)	60 Max. Rockwell 15T
Stainless Steel	ASTM-A276 ASME-SA-479 Type 316-SS	ASME-SA-182 Type 316-SS	ASTM-A213 ASTM-A269	90 Rb
Steel	ASTM-A108	—	ASTM-A179	72 Rb
Aluminum	ASTM-B-211	ASTM-B-211	ASTM-B-210	56 Rb

TYLOK STANDARD PRE-SETTING TOOL

The Tylok Standard product line offers a Pre-Setting Tool when fittings need to be installed in hard to reach places. The Pre-Setting Tool is designed to be used in any tabletop vice. After tightening the nut the specified number of turns, as stated in Installation Instructions-page 43, loosen the nut from the Pre-Setting Tool. Once the collets have skived the tubing surface, the assembly is ready for installation (reference To Remove and Re-Connect Tube Fitting, page 43). Notice that the extension on the rear collet allows the nut to slip easily around 90° bend in tubing.

When ordering the Tylok Standard Pre-Set Tool, reference the part number in the chart. The Pre-Set Tool is made from carbon steel and is hardened for maximum durability. The Pre-Set Tool can be used repeatedly to set the collets onto the tubing for easy installation.



Part Number	Tube Size
#1-PST	1/16"
#2-PST	1/8"
#3-PST	3/16"
#4-PST	1/4"
#5-PST	5/16"
#6-PST	3/8"
#8-PST	1/2"
#10-PST	5/8"
#12-PST	3/4"
#14-PST	7/8"
#16-PST	1"



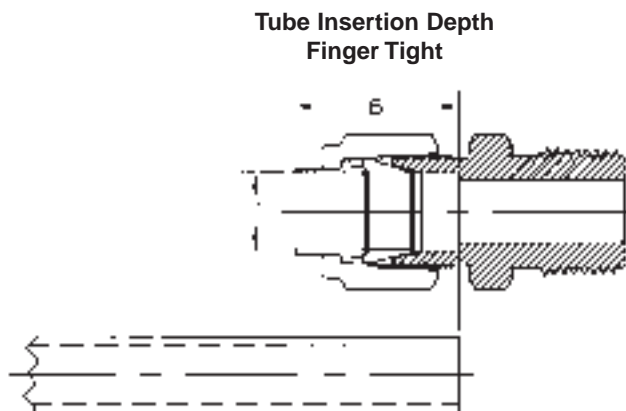
Place Pre-Setting Tool in a vice and tighten nut specified number of turns.



Back nut off of Pre-Setting Tool. Notice the collets have skived onto the tubing. Now take tubing to installation area.

TUBE INSERTION CHART

For pre-cutting tubing to length, the following chart shows the additional length inside the fitting assembly.



Tube Size	T Tube O.D.	B Dimension
#1	1/16	.609
#2	1/8	.640
#3	3/16	.703
#4	1/4	.796
#5	5/16	.796
#6	3/8	.937
#8	1/2	1.140
#10	5/8	1.203
#12	3/4	1.250
#14	7/8	1.453
#16	1.0	1.515

*NOTE: All Dimensions Subject to Change.

TUBING – GENERAL APPLICATIONS

Tylok Standard Tube Fittings are designed to perform in a variety of applications that demand high performance. The Tylok Standard product line has been engineered to provide optimal performance, however tubing should always be considered as an important factor in the design stages of any system. Below is a table that describes some general uses for different types of materials. The table is provided as a reference to the Engineer in the design process.

Tylok suggests the use of seamless, fully annealed tubing. Welded tubing may be used with Tylok fittings. However, due to the manufacturing of welded tubing, variables may be encountered. The media flowing through the tubing must be compatible with the tubing itself. It is always a good rule to use like tubing material on like fitting material. If this format is not followed, the collets may have difficulty penetrating the tubing causing an adverse affect on the sealing ability. In addition, dissimilar materials in contact may be sensitive to galvanic corrosion. Tylok recommends ordering tubing material to meet ASTM specifications to ensure that it will be dimensionally, physically and chemically within precise limits (see Raw Material Specifications chart - page 47).

Tubing Material	General Applications	Recommended Temperature Range
Aluminum	Low Temperature, Low Pressure Water, Oil, Air, Non-Flammable Gases	-20°F to 400°F
Carbon Steel	Air Lines, High Pressure, High Temperature, Oil, Air, Specialty Chemicals, Hydraulic Gases	-20°F to 800°F
Copper	Low Temperature, Low Pressure Water, Oil, Air, Pneumatic Controls, Lube Lines	-20°F to 400°F
Stainless Steel	High Pressure, High Temperature, Nitrogen, Helium, Flammable Gases, Hydraulic, Gases, generally corrosive media	-40°F to 1200°F

NOTICE

In designing a system incorporating tube fittings and valves, it is the designer's or user's obligation and responsibility to determine the appropriate fittings and valves to be used for each application, and to insure proper installation and maintenance.

LIMITED WARRANTY

Tylok fittings and valves are warranted solely against defects in material and workmanship in the performance of the specific functions for which they are designed, as set forth in the published specifications for a period of 12 months. Should any fitting and valve or its component fail due to a defect in material or workmanship, Tylok will replace said fitting and valve without charge upon return of the failed part and evidence of its failure being due to materials or workmanship.

The Warranty above set forth is the only warranty applicable to Tylok products, and is in lieu of any and all other warranties either express or implied, including any warranty of merchantability or fitness. Tylok's sole responsibility or liability as a result of any loss or damage due to failure shall be to replace the failed part or fitting and valve, and it shall bear no liability for any incidental or consequential damages to person or property.

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TYLOK PHILOSOPHY

TYLOK HISTORY

Cullen Crawford introduced the first flareless fitting in the mid 1940's. Well known throughout the fitting industry, Mr. Crawford founded Tylok International, Inc., in the late 1950's.

Mr. Crawford responded to the request of the Atomic Energy Commission for a fitting to hold liquid sodium. As a result, he developed the Tylok Standard Tube Fitting, which is still the only four-seal patented design in the industry today.

Manufactured in Euclid, Ohio, the Tylok Standard's unique design eliminates common installation problems and provides unparalleled sealing.

MISSION

It is our mission, at Tylok International, Inc., to continuously strive for and achieve total customer satisfaction with both our products and services.

GOAL

Tylok's aggressive goal is to establish ourselves as an industry leader and expand our market share. This is maintained in every department within the organization. Our "total effort" will guard against losing the personal touch that makes our business enjoyable and prosperous for all involved.

**INSTRUMENTATION TUBE FITTINGS – Tylok Standard
4 Seal, CBC-Lok™, CS-Lok™ • PIPE FITTINGS •
WELD FITTINGS • BALL VALVES – Ty-Flo® Standard &
Ty-Flo® 3 Piece • NEEDLE VALVES • INSTRUMENTATION
MANIFOLDS • FLEXIBLE METAL HOSE •**

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