

# ASTON FITTINGS

MANUFACTURING LTD.

*Flanges*  
*Valves*



*Fittings*

MACHINING . VALVES . FITTINGS . PIPE & TUBE . INSTRUMENTATION PACKAGES

**ASTON** ARE MANUFACTURERS AND SUPPLIERS OF **VALVES, FITTINGS, FLANGES, TUBE AND PIPE** FOR MOST PROCESS AND CONTROL APPLICATIONS.

**ASTON** PRODUCTS ARE MANUFACTURED AND SUPPLIED TO QUALITY ASSURANCE PROCEDURES BASED ON EN ISO 9001:2000

**ASTON** LTD IS LOCATED CENTRALLY IN THE UK - MINUTES FROM THE MAIN MOTORWAY AND RAIL NETWORKS AND BIRMINGHAM INTERNATIONAL AIRPORT - FOR EASE OF DISTRIBUTION.



### COMPRESSION FITTINGS

Twin and single ferrule compression fittings in 316 Stainless/Aluminium Bronze/Alloy 400/Carbon Steel/Brass and other materials.  
Sizes from 1/16" OD Tube to 2" OD Tube (also 4mm to 54mm metric sizes).  
Working pressures up to 6,000Psi.  
'Swagelok', 'Parker' Equivalent  
DIN 2353, BS4368  
Nominal Bore

### INSTRUMENTATION PACKAGES

Specialist suppliers of packages for Petro-Chemical and Oil related Industries.  
Aston Fittings manufactures and supplies Valves, Fittings, Flanges, Tube and Pipe in a variety of materials and to internationally recognised standards.  
Aston Fittings services your needs by making One Shipment to any required destination.



### INSTRUMENTATION VALVES & MANIFOLDS

A range of high integrity valves and manifolds in most materials, including 316ss, Alloy 400, Carbon Steel and Brass.  
To suit working pressures up to 20,000 Psi.  
Female ends NPT, BSPT, BSPP standard.  
Compression ends also standard.  
Distribution manifolds available in a variety of sizes and materials to suit customers requirements.

### STAINLESS STEEL 316 150lb CLASS FITTINGS

These fittings are suitable for low pressure applications and, are generally known as 150lb class fittings.  
Pipe threads are to ANSI B2.1, dimensions are in accordance to ANSI 16.3.  
Female threads are BSP (Rp) parallel whilst Male threads are BSP taper.  
Valve bodies are made from CF8M material.





## CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

**Aston Fittings Manufacturing Ltd  
Birmingham, West Midlands  
United Kingdom**

has been approved by Lloyd's Register Quality Assurance  
to the following Quality Management System Standards:

**ISO 9001:2008**

The Quality Management System is applicable to:

**Manufacturing and stockist of compression, hydraulic,  
screwed, socket and butt welded pipeline, fittings and  
flanges, valves and sub-contract machinist. Manufacturing  
and specialist supplier of instrumentation packages  
for the petrochemical, chemical, oil, gas, power  
and general process industries.**

Approval  
Certificate No: LRQ 0961092

Original Approval: 23 February 1999

Current Certificate: 1 March 2011

Certificate Expiry: 28 February 2014

Issued by: Lloyd's Register Quality Assurance Limited



001

This document is subject to the provision on the reverse  
71 Fenchurch Street, London EC3M 4BS United Kingdom. Registration number 1879370  
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.  
The use of the UKAS Accreditation Mark indicates Accreditation in respect of those activities covered by the Accreditation Certificate Number 001  
Macro Revision 13

# ASTON

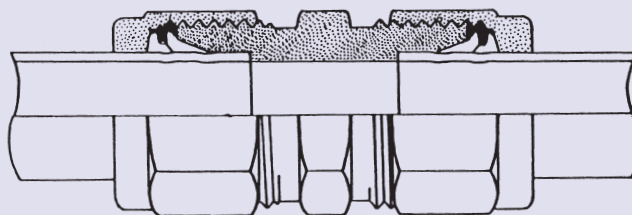
## Tube fittings, Pipe fittings & Valves for Instrumentation and General Process applications

### *Contents / Index*

<b>Assembly Instructions</b>	<b>Page 3</b>
<b>How to Order Tube Fittings</b>	<b>Page 3</b>
<b>Male Connectors</b>	<b>Page 4</b>
<b>Bulkhead Male Connectors</b>	<b>Page 4</b>
<b>Female Connectors</b>	<b>Page 5</b>
<b>Bulkhead Female Connectors</b>	<b>Page 5</b>
<b>Equal Unions</b>	<b>Page 6</b>
<b>Unequal Unions</b>	<b>Page 6</b>
<b>Bulkhead Unions</b>	<b>Page 7</b>
<b>Union Elbows</b>	<b>Page 7</b>
<b>Union Tees</b>	<b>Page 8</b>
<b>Equal Union Crosses</b>	<b>Page 8</b>
<b>Male Elbows</b>	<b>Page 9</b>
<b>Female Elbows</b>	<b>Page 9</b>
<b>Male Run Tees</b>	<b>Page 10</b>
<b>Male Branch Tees</b>	<b>Page 10</b>
<b>Female Branch Tees</b>	<b>Page 10</b>
<b>Caps</b>	<b>Page 11</b>
<b>Plugs</b>	<b>Page 11</b>
<b>Reducers</b>	<b>Page 11</b>
<b>Nuts</b>	<b>Page 12</b>
<b>Twin Ferrules</b>	<b>Page 12</b>
<b>Single Ferrules</b>	<b>Page 12</b>
<b>Conversion Fittings</b>	<b>Page 13</b>
<b>Single Ferrule Compression Fittings</b>	<b>Page 14</b>
<b>Hydraulic Fittings / Male Cone Seat Hex Adaptor</b>	<b>Page 15</b>
<b>Par<sup>+</sup> (CS)/Taper Male Hex Adaptor</b>	<b>Page 15</b>
<b>150lb 316 BSP Screwed Fittings</b>	<b>Page 16 - 17</b>
<b>3000/6000lb Screwed Fittings</b>	<b>Page 18</b>
<b>3000/6000lb Socket Weld Fittings</b>	<b>Page 19</b>
<b>Aston Tube Clamps &amp; Bracketry</b>	<b>Page 20 - 21</b>
<b>Aston Ball Valves</b>	<b>Page 22</b>
<b>Aston Valves</b>	<b>Page 22</b>
<b>Pipe Dimension Table</b>	<b>Page 24</b>
<b>Tubing Data</b>	<b>Page 25</b>
<b>Material Specifications Table</b>	<b>Page 26</b>
<b>Standard Thread Sizes</b>	<b>Page 27</b>
<b>Sub-contract Machining Facilities</b>	<b>Page 28</b>

# ASTON Twin Ferrule Fittings

This cut-away section of an ASTON fitting shows the sealing action which takes place when the assembly is fully tightened.



The ASTON stainless range of fittings is designed for use with stainless steel tubes and is suitable for installations where secure leak-proof joints are essential. Suitable for high pressures, vacuum and where vibration is inherent, these couplings are precisely manufactured to close tolerances from 316 stainless steel. To prevent galling of threads, nuts are silver plated.

The double ferrule design is such as to withstand extremely high pressures usually to the burst pressure of the tube. Additionally, the low torque characteristics of the coupling ensure that stresses are not transferred to the tube during assembly.

Fittings are supplied complete and ready to use, the units self aligning during assembly. Tubing for use with ASTON fittings should be fully annealed with a maximum hardness of Rockwell

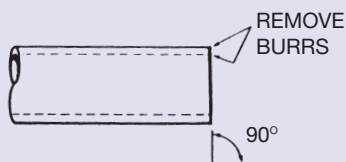
90 and should be clean and smooth without surface defects. We recommend where possible the use of tubing with maximum Rockwell 80 for ease of installation.

All common sizes of fitting are stocked, but specials can be made to order. The fittings are designed for tube sizes 1/16" to 1" and 3mm to 25mm outside diameter. Stud sizes are 1/16" to 1", NPT, API, ISO parallel and ISO tapered.

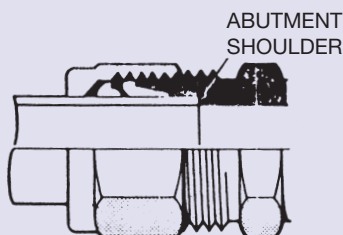
## Fittings in Other Materials

ASTON twin ferrule fittings are available in 316 stainless steel, brass, steel, aluminium bronze and monel 400. Other materials may be available on request. For 316 stainless steel no suffix is required to the part number. Suffix "B" for brass - "S" for steel - "HDB" for aluminium bronze - "M" for monel.

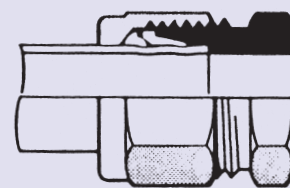
## Assembly of ASTON Fittings



Ensure that the end of the tube is cut as square as possible and is free from burrs.



Insert the tube into the coupling which is fully assembled and does not require dismantling. Ensure that the tube end butts firmly onto the seat in the coupling body.



Holding the body firmly, either in a bench vice or with a suitable spanner, rotate the nut one and a quarter turns after the finger tight position. A correctly made joint is then complete.

ASTON fittings may be disassembled and remade repeatedly. The following instructions should be carried out to reassemble a fitting.

1. Insert the tube with the previously assembled ferrules into the fitting body and tighten the nut to hand tight.
2. With a spanner, tighten the nut to the previous tight position, then a slight additional pressure to ensure a positive seal.

## Identification of ASTON Fittings

For ease of identification, ASTON fittings in metric sizes have an additional stepped shoulder on the nuts and the bodies to distinguish them from the imperial sizes.

## How to Order ASTON Fittings

Twin or Single Ferrule	Tube Size	Type of Coupling	Thread Size	Thread Type	Material	Description / Part No.
No Prefix (Twin Ferrule)	8 (1/2" OD)	MC (Male Connector)	4 (1/4")	BSPT	M (Monel 400)	= 1/2" OD x 1/4" BSPT Male Connector Twin Ferrule in Monel 400 = 8 MC 4 BSPT-M
X (Single Ferrule)	10M (10mm OD)	MC (Male Connector)	6 (3/8")	NPT	No Suffix (316 ST.STL)	+ 10mm OD x 3/8" NPT Male Connector Single Ferrule in 316 ST.STL = x 10 MMC6 NPT

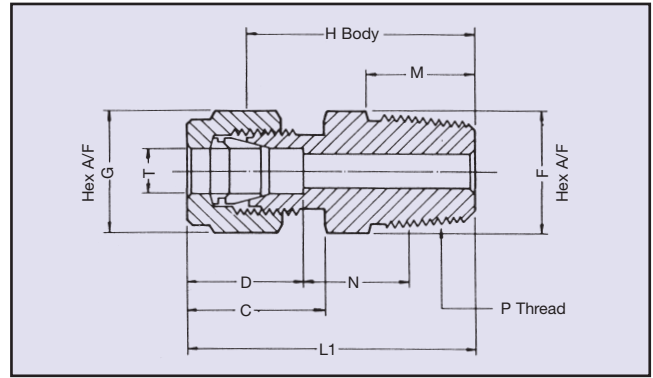
## ASTON Single Ferrule Fittings

ASTON single ferrule fittings are available in 316 stainless steel, steel and brass and are dimensionally the same as the twin ferrule fittings and are stocked in the same size ranges.

Working pressures are the same as for the twin ferrule fittings. ASTON single ferrule fittings are assembled as illustrated above. Identification of ASTON single ferrule fittings is the same as for twin ferrule fittings. When ordering ASTON single ferrule fittings use the part numbers in this catalogue suffixed as above for material type **but** prefix with "X" to identify **single** ferrule.

# MALE CONNECTORS

Available with NPT, BSPT or BSP Parallel Threads



METRIC RANGE (Dimensions in mm)

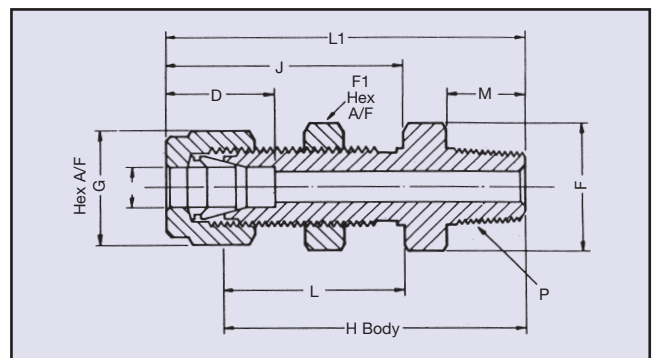
Part No.	T o/d	P Thread	L1 Length	M	C	D	F A/F	G Nut	H Body	N
4mMC2	4	1/8	30.5	9.7	15.7	13.5	12	12	24.1	10.8
4mMC4	4	1/4	35.4	14.2	15.7	13.5	14	12	28.8	15.8
6mMC2	6	1/8	32.8	9.7	17.3	15.3	14	14	25.6	11.2
6mMC4	6	1/4	32.8	14.2	17.3	15.3	14	14	30.2	12.7
6mMC6	6	3/8	38.2	14.2	17.3	15.3	19	14	30.9	13.5
6mMC8	6	1/2	43.6	19.0	17.3	15.3	22	14	36.4	15.9
8mMC2	8	1/8	33.9	9.7	18.3	16.2	14	17	26.6	11.6
8mMC4	8	1/4	38.5	14.2	18.3	16.2	14	17	31.3	13.1
10mMC2	10	1/8	35.0	9.7	19.0	16.6	17	19	28.0	12.0
10mMC4	10	1/4	39.5	14.2	19.0	16.6	17	19	32.6	13.5
10mMC6	10	3/8	39.5	14.2	19.0	16.6	19	19	32.6	13.5
10mMC8	10	1/2	45.1	19.0	19.0	16.6	22	19	38.1	15.9
10mMC12	10	3/4	45.8	19.0	19.0	16.6	27	19	38.9	15.1
12mMC4	12	1/4	43.5	14.2	22.1	22.9	22	22	33.3	11.2
12mMC6	12	3/8	43.5	14.2	22.1	22.9	22	22	33.3	11.2
12mMC8	12	1/2	48.3	19.0	22.1	22.9	22	22	38.1	12.7
12mMC12	12	3/4	49.1	19.0	22.1	22.9	27	22	38.9	12.0
16mMC6	16	3/8	44.9	14.2	22.6	24.9	24	27	34.0	10.4
16mMC8	16	1/2	49.7	19.0	22.6	24.9	24	27	38.9	11.9
16mMC12	16	3/4	49.7	19.0	22.6	24.9	27	27	38.9	10.4
18mMC12	18	3/4	51.8	19.0	22.8	25.0	27	30	40.8	10.4
25mMC12	25	3/4	57.1	19.0	27.0	31.7	36	41	45.2	12.0

IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	P Thread	L1 Length	M	C	D	F A/F	G Nut	H Body	N
1MC2	1/16	1/8	1.00	.38	.44	.34	7/16	5/16	.85	.41
2MC2	1/8	1/8	1.17	.38	.60	.50	7/16	7/16	.91	.41
2MC4	1/8	1/4	1.39	.56	.60	.50	9/16	7/16	1.13	.50
3MC2	3/16	1/8	1.19	.38	.60	.54	7/16	1/2	.94	.43
3MC4	3/16	1/4	1.41	.56	.60	.54	9/16	1/2	1.16	.54
4MC2	1/4	1/8	1.29	.38	.68	.60	1/2	9/16	1.01	.45
4MC4	1/4	1/4	1.47	.56	.68	.60	9/16	9/16	1.19	.50
4MC6	1/4	3/8	1.50	.56	.68	.60	11/16	9/16	1.22	.56
4MC8	1/4	1/2	1.71	.75	.68	.60	7/8	9/16	1.43	.67
5MC2	5/16	1/8	1.33	.38	.73	.64	9/16	5/8	1.04	.46
5MC4	5/16	1/4	1.51	.56	.73	.64	9/16	5/8	1.22	.54
6MC2	3/8	1/8	1.38	.38	.76	.66	5/8	11/16	1.10	.48
6MC4	3/8	1/4	1.50	.56	.76	.66	5/8	11/16	1.28	.57
6MC6	3/8	3/8	1.60	.56	.76	.66	11/16	11/16	1.29	.56
6MC8	3/8	1/2	1.78	.75	.76	.66	7/8	11/16	1.50	.67
6MC12	3/8	3/4	1.81	.75	.76	.66	1-1/16	11/16	1.53	.68
8MC4	1/2	1/4	1.71	.56	.86	.90	13/16	7/8	1.31	.47
8MC6	1/2	3/8	1.71	.56	.86	.90	13/16	7/8	1.31	.46
8MC8	1/2	1/2	1.90	.75	.86	.90	7/8	7/8	1.50	.54
8MC12	1/2	3/4	1.93	.75	.86	.90	1-1/16	7/8	1.53	.55
10MC6	5/8	3/8	1.74	.56	.86	.96	15/16	1	1.34	.43
10MC8	5/8	1/2	1.95	.75	.86	.96	15/16	1	1.53	.51
12MC8	3/4	1/2	2.03	.75	.91	1.00	1-1/16	1-1/8	1.59	.57
12MC12	3/4	3/4	2.03	.75	.91	1.00	1-1/16	1-1/8	1.59	.55
12MC16	3/4	1	2.25	.94	.91	1.00	1-3/8	1-1/8	1.81	.68
16MC12	1	3/4	2.28	.75	1.06	1.25	1-3/8	1-1/2	1.78	.55
16MC16	1	1	2.47	.94	1.06	1.25	1-3/8	1-1/2	1.97	.65

# Bulkhead Male Connectors

Available with NPT, BSPT or BSP Parallel Threads



METRIC RANGE (Dimensions in mm)

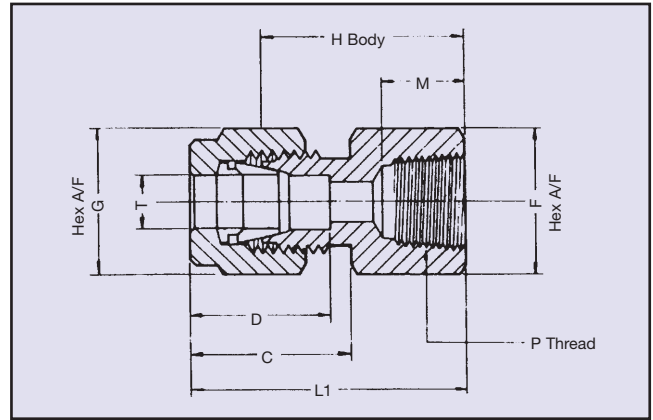
Part No.	T o/d	P Thread	M	D	F A/F	G Nut	F1	H	J	L	L1	Panel Hole	Max. Panel Thkns
6mMBH4	6	1/4	14.2	15.3	17	14	17	46.7	32.2	26.1	53.8	11.5	10.1
10mMBH4	10	1/4	14.2	16.6	19	19	50.0	36.5	29.4	56.8	16.2	11.1	
12mMBH8	12	1/2	19.0	22.9	24	22	24	57.7	41.9	31.7	68.3	19.4	12.7

IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	P Thread	M	D	F A/F	G Nut	F1	H	J	L	L1	Panel Hole	Max. Panel Thkns
4MBH4	1/4	1/4	.56	.60	5/8	9/16	5/8	.84	1.31	1.03	2.12	29/64	.40
6MBH4	3/8	1/4	.56	.66	3/4	11/16	3/4	1.97	1.44	1.16	2.24	37/64	.44
8MBH8	1/2	1/2	.75	.90	15/16	7/8	15/16	2.28	1.65	1.25	2.69	49/64	.50

# FEMALE CONNECTORS

Available with NPT, BSPT or BSP Parallel Threads



METRIC RANGE (Dimensions in mm)

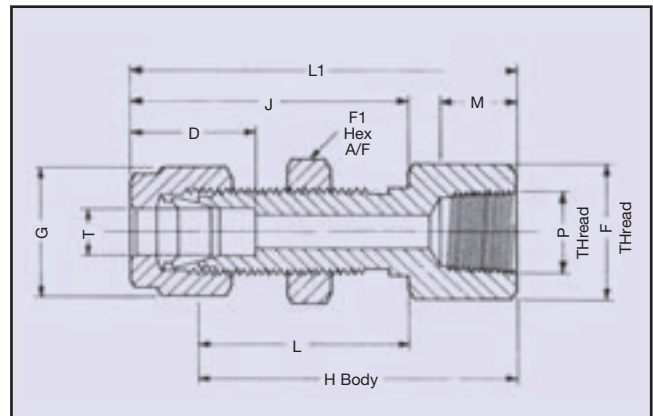
Part No.	T o/d	P Thread	L1 Length	M	C	D	F A/F	G Nut	H Body
6mFC2	6	1/8	31.	9.9	17.3	15.3	14	14	23.9
6mFC4	6	1/4	35.7	15.0	17.3	15.3	19	14	28.4
6mFC6	6	3/8	37.2	15.0	17.3	15.3	22	14	30.0
6mFC8	6	1/2	42.1	19.8	17.3	15.3	27	14	34.8
8mFC2	8	1/8	29.5	10.0	18.3	16.2	14	17	24.7
8mFC4	8	1/4	36.7	15.0	18.3	16.2	19	17	29.4
10mFC4	10	1/4	37.3	15.0	19.0	16.6	19	19	30.2
10mFC6	10	3/8	38.8	15.0	19.0	16.6	22	19	31.8
10mFC8	10	1/2	43.6	19.8	19.0	16.6	27	19	36.6
12mFC4	12	1/4	41.9	15.0	22.1	22.9	22	22	31.8
12mFC6	12	3/8	41.9	15.0	22.1	22.9	22	22	31.8
12mFC8	12	1/2	46.8	19.8	22.1	22.9	27	22	36.6
16mFC8	16	1/2	47.4	19.8	22.6	24.9	27	27	36.6
18mFC12	18	3/4	49.0	20.6	22.8	25.0	32	30	38.1
20mFC8	20	1/2	46.8	19.8	22.8	25.0	30	32	36.5
25mFC12	25	3/4	62.9	20.6	27.0	31.7	36	41	50.2

IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	P Thread	L1 Length	M	C	D	F A/F	G Nut	H Body
1FC1	1/16	1/16	.97	.39	.43	.33	1/2	5/16	.82
2FC2	1/8	1/8	1.14	.39	.60	.50	9/16	7/16	.88
2FC4	1/8	1/4	1.32	.59	.60	.50	3/4	7/16	1.06
4FC2	1/4	1/8	1.22	.39	.68	.60	9/16	9/16	.94
4FC4	1/4	1/4	1.40	.59	.68	.60	3/4	9/16	1.12
4FC6	1/4	3/8	1.47	.59	.68	.60	7/8	9/16	1.19
4FC8	1/4	1/2	1.69	.78	.68	.60	1-1/16	9/16	1.41
5FC2	5/16	1/8	1.26	.39	.73	.64	3/4	5/8	.97
5FC4	5/16	1/4	1.45	.59	.73	.64	3/4	5/8	1.16
6FC2	3/8	1/8	1.28	.39	.76	.66	5/8	11/16	1.00
6FC4	3/8	1/4	1.47	.59	.76	.66	3/4	11/16	1.19
6FC6	3/8	3/8	1.53	.59	.76	.66	7/8	11/16	1.25
6FC8	3/8	1/2	1.72	.78	.76	.66	1-1/16	11/16	1.44
8FC4	1/2	1/4	1.65	.59	.86	.90	13/16	7/8	1.25
8FC6	1/2	3/8	1.66	.59	.86	.90	7/8	7/8	1.25
8FC8	1/2	1/2	1.85	.78	.86	.90	1-1/16	7/8	1.44
12FC8	3/4	1/2	1.88	.78	.91	1.00	1-1/16	1-1/8	1.44
12FC12	3/4	3/4	2.00	.81	.91	1.00	1-5/16	1-1/8	1.51

# BULKHEAD FEMALE CONNECTORS

Available with NPT, BSPT or BSP Parallel Threads



METRIC RANGE (Dimensions in mm)

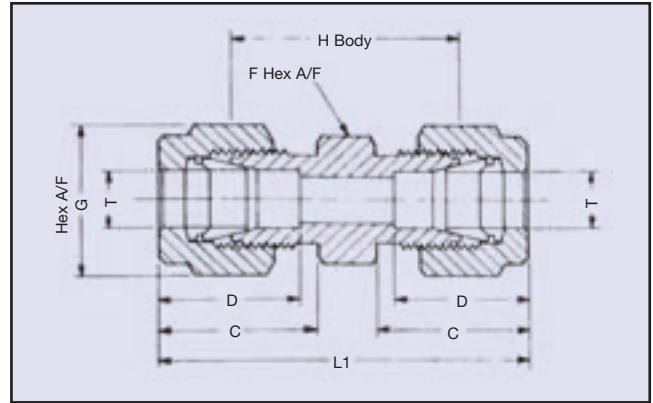
Part No.	T	P	M	D	F	G	F1 Nut	H A/F	J	L	L1	Panel Hole	Max. Panel Thkns
6mFBH4	6	1/4	15.0	15.3	19	14	17	44.5	33.2	26.1	51.7	11.5	10.1
10mFBH4	10	1/4	15.0	16.6	19	19	19	47.7	36.8	29.4	54.7	16.2	11.1
12mFBH8	12	1/2	19.8	22.9	27	22	24	56.3	41.8	31.7	66.4	19.4	12.7

IMPERIAL RANGE (Dimensions in inches)

Part No.	T	P	M	D	F	G	F1 Nut	H A/F	J	L	L1	Panel Hole	Max. Panel Thkns
4FBH4	1/4	1/4	.59	.60	3/4	9/16	5/8	1.75	1.31	1.03	.03	29/64	.40
8FBH8	1/2	1/2	.78	.90	1-1/16	7/8	15/16	2.22	1.75	1.25	2.72	49/64	.50

Other sizes, materials and configurations available on request

# EQUAL UNIONS



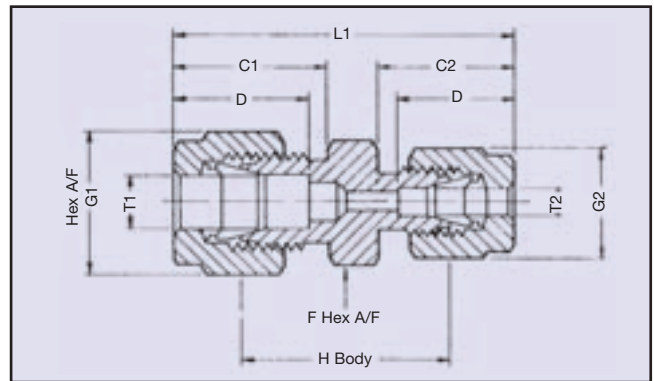
METRIC RANGE (Dimensions in mm)

Part No.	T o/d	L1 Length	C	D	F A/F	G Nut	H Body
4mU	4	36.4	15.7	13.5	12	12	23.7
6mU	6	39.6	17.3	15.3	14	14	26.2
8mU	8	42.7	18.3	16.2	14	17	28.0
10mU	10	44.2	19.0	16.6	17	19	30.3
12mU	12	51.4	22.1	22.9	22	22	31.0
16mU	16	53.1	22.6	24.9	24	27	31.8
18mU	18	55.0	22.8	25.0	27	30	33.3
20mU	20	55.0	22.8	25.0	32	32	33.3
25mU	25	65.8	27.0	31.7	36	41	40.4

IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	L1 Length	C	D	F A/F	G Nut	H Body
1U	1/16	1.14	.43	.33	5/16	5/16	.68
2U	1/8	1.40	.60	.50	7/16	7/16	.88
3U	3/16	1.45	.62	.54	7/16	1/2	.95
4U	1/4	1.58	.68	.60	1/2	9/16	1.03
5U	5/16	1.69	.73	.64	9/16	5/8	1.11
6U	3/8	1.74	.75	.66	5/8	11/16	1.19
8U	1/2	2.03	.86	.90	13/16	7/8	1.22
10U	5/8	2.09	.89	.98	15/16	1	1.25
12U	3/4	2.19	.91	1.00	1-1/16	1-1/8	1.31
16U	1	2.59	1.06	1.25	1-3/8	1-1/2	1.59

# UNEQUAL UNIONS



METRIC RANGE (Dimensions in mm)

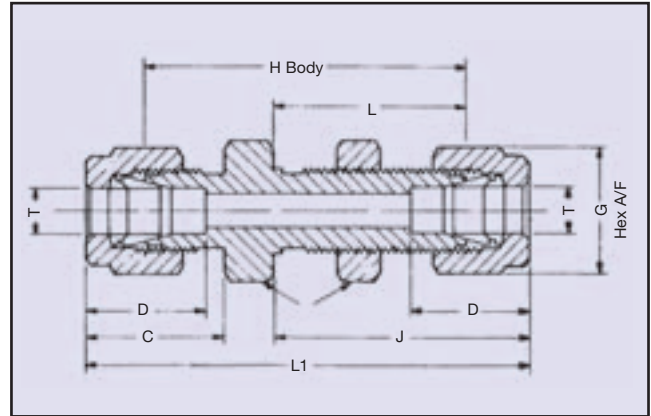
Part No.	T1 o/d	T2 o/d	L1 Length	C1	C2	F A/F	G1 Nut	G2 Nut	H Body
6-4mRU	6	4	40.48	17.3	15.7	14	14	12	25.4
8-6mRU	8	6	43.26	18.3	17.3	14	17	14	27.1
10-6mRU	10	6	44.45	19.0	17.3	17	19	14	28.5
10-8mRU	10	8	45.24	19.0	18.3	17	19	17	29.4
12-6mRU	12	6	47.63	22.1	17.3	22	22	14	29.3
12-10mRU	12	10	49.21	22.1	19.0	22	22	19	31.0
16-10mRU	16	10	50.01	22.6	19.0	24	27	19	31.8
16-12mRU	16	12	52.39	22.6	22.1	24	27	22	31.8
20-12mRU	20	12	53.98	22.8	22.1	27	30	22	33.4
20-16mRU	20	16	53.98	22.8	22.6	27	32	27	33.4
25-20mRU	25	20	60.32	27.0	22.8	36	41	32	38.1

IMPERIAL RANGE (Dimensions in inches)

Part No.	T1 o/d	T2 o/d	L1 Length	C1	C2	F A/F	G1 Nut	G2 Nut	H Body
3RU2	3/16	1/8	1.42	.62	.60	7/16	1/2	7/16	.89
4RU2	1/4	1/8	1.51	.68	.60	1/2	9/16	7/16	1.00
4RU3	1/4	3/16	1.55	.68	.62	1/2	9/16	1/2	1.00
5RU4	5/16	1/4	1.97	.73	.69	9/16	5/8	9/16	1.40
6RU4	3/8	1/4	1.68	.75	.69	5/8	11/16	9/16	1.12
6RU5	3/8	5/16	1.72	.75	.73	5/8	11/16	5/8	1.16
8RU4	1/2	1/4	1.84	.88	.68	13/16	7/8	9/16	1.16
8RU6	1/2	3/8	1.90	.90	.75	13/16	7/8	11/16	1.22
10RU8	5/8	1/2	2.08	.89	.90	15/16	1	7/8	1.25
12RU8	3/4	1/2	2.10	.91	.90	1-1/16	1-1/8	7/8	1.33
16RU12	1	3/4	2.44	1.06	.91	1-3/8	1-1/2	1-1/8	1.50



# Bulkhead Unions



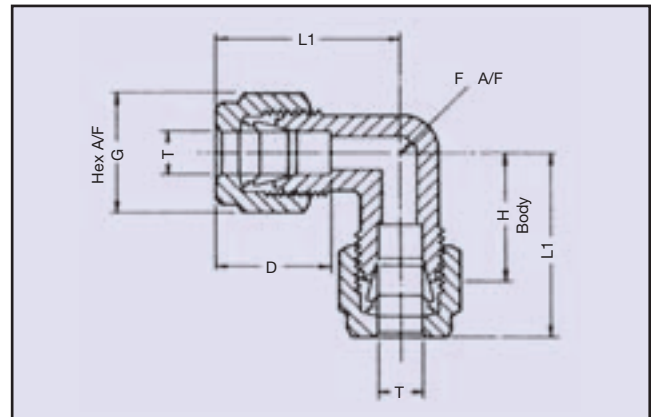
METRIC RANGE (Dimensions in mm)

Part No.	T1 o/d	L1 Length	C	D	F Body	G Nut	H Body	J	L
4mBHU	4	53.1	15.7	13.5	14	12	40.4	31.8	25.4
6mBHU	6	57.1	17.3	15.3	17	14	42.7	33.4	26.2
8mBHU	8	61.6	18.3	16.2	17	17	45.9	35.8	28.5
10mBHU	10	61.8	19.0	16.6	19	19	47.8	36.5	29.4
12mBHU	12	71.2	22.1	22.9	24	22	50.8	41.9	31.8
16mBHU	16	73.7	22.6	24.9	27	27	52.3	43.1	32.5
18mBHU	18	80.6	22.8	25.0	30	32	58.0	48.2	37.3

IMPERIAL RANGE (Dimensions in inches)

Part No.	T1 o/d	L1 Length	C	D	F Body	G Nut	H Body	J	L
2BHU	1/8	2.02	.60	.50	1/2	7/16	1.51	1.22	.97
4BHU	1/4	2.25	.68	.60	5/8	9/16	1.68	1.31	1.03
5BHU	5/16	2.39	.73	.64	11/16	5/8	1.81	1.41	1.12
6BHU	3/8	2.43	.75	.66	3/4	11/16	1.88	1.44	1.16
8BHU	1/2	2.81	.86	.90	15/16	7/8	2.00	1.66	1.25
10BHU	5/8	2.91	.89	.98	1	1	2.07	1.70	1.28
12BHU	3/4	3.20	.91	1.00	1-3/16	1-1/8	2.32	1.91	1.47

# Union Elbows



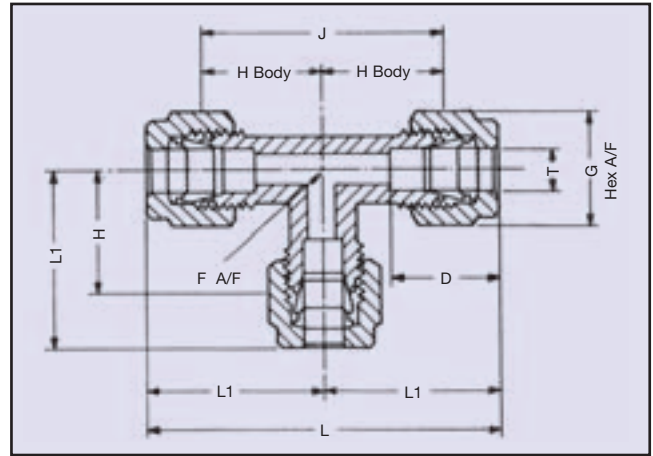
METRIC RANGE (Dimensions in mm)

Part No.	T o/d	L1 Length	D	F A/F	G Nut	H Body
4mELU	4	25.4	13.5	12	12	19.0
6mELU	6	27.0	15.3	12	14	19.8
8mELU	8	29.5	16.2	14	17	22.2
10mELU	10	30.0	16.6	14	19	23.2
12mELU	12	35.2	22.9	19	22	24.9
16mELU	16	37.6	24.9	24	27	27.0
18mELU	18	39.7	25.0	27	30	29.4

IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	L1 Length	D	F A/F	G Nut	H Body
1ELU	1/16	.82	.33	.47	5/16	.67
2ELU	1/8	.97	.50	.47	7/16	.72
4ELU	1/4	1.06	.60	.47	9/16	.78
5ELU	5/16	1.17	.64	.55	5/8	.88
6ELU	3/8	1.18	.66	.55	11/16	.91
8ELU	1/2	1.38	.90	.75	7/8	.98
10ELU	5/8	1.48	.98	.94	1	1.06
12ELU	3/4	1.59	1.00	1.06	1-1/8	1.15
16ELU	41	1.81	1.25	1.26	1-1/2	1.31

# UNION TEES



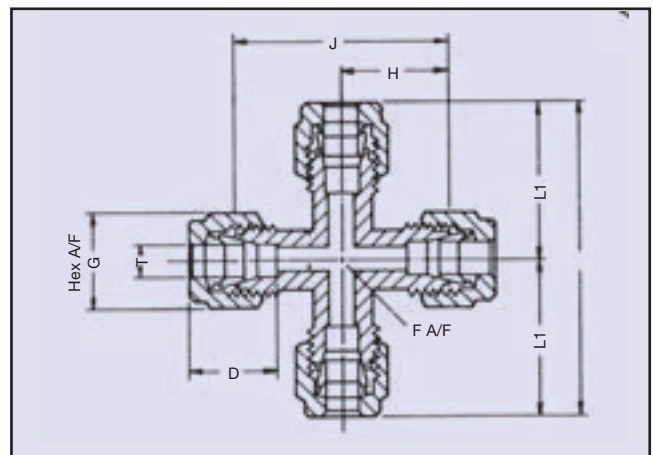
METRIC RANGE (Dimensions in mm)

Part No.	T o/d	L1 Length	D	F Body	G Nut	H Body	J	L
4mTTT	4	25.4	13.5	12	12	19.0	38.0	50.8
6mTTT	6	27.0	15.3	12	14	19.8	39.6	54.0
8mTTT	8	29.6	16.2	14	17	22.2	44.4	59.1
10mTTT	10	30.1	16.6	14	19	23.1	46.2	60.2
12mTTT	12	35.2	22.9	19	22	24.9	49.8	70.2
16mTTT	16	36.8	24.9	24	27	26.2	52.3	73.7
18mTTT	18	40.2	25.0	27	30	29.3	58.7	80.4
25mTTT	25	46.0	30.9	32	41	33.5	66.6	92.0

IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	L1 Length	D	F Body	G Nut	H Body	J	L
2TTT	1/8	.97	.50	.47	7/16	.72	1.44	1.94
4TTT	1/4	1.06	.60	.47	9/16	.78	1.56	2.12
5TTT	5/16	1.17	.64	.55	5/8	.88	1.76	2.34
6TTT	3/8	1.19	.66	.55	11/16	.91	1.82	2.40
8TTT	1/2	1.38	.90	.75	7/8	.98	1.96	2.76
10TTT	5/8	1.48	.98	.94	1	1.06	1.12	2.96
12TTT	3/4	1.60	1.00	1.06	1-1/8	1.15	2.30	3.20
16TTT	1	1.81	1.25	1.25	1-1/2	1.31	2.62	3.62

# EQUAL UNION CROSSES



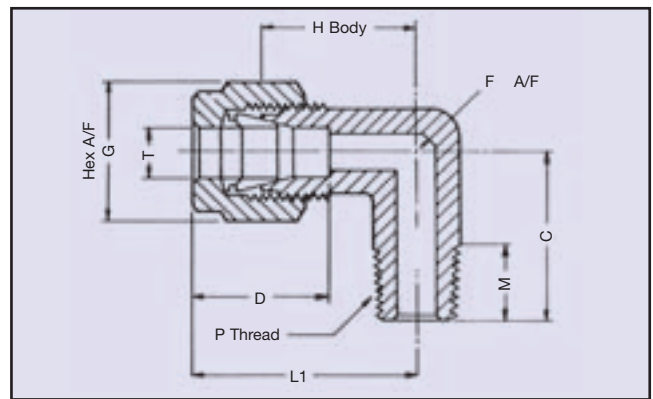
METRIC RANGE (Dimensions in mm)

Part No.	T o/d	L1 Length	D	F A/F	G Nut	H Body	J	L
6mCR	6	27.0	15.3	12	14	19.8	39.6	54.1
8mCR	8	29.6	16.2	14	17	22.2	44.4	59.1
10mCR	10	30.1	16.6	14	19	23.1	46.2	60.2
12mCR	12	35.1	22.9	19	22	24.9	49.8	70.3

IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	L1 Length	D	F A/F	G Nut	H Body	J	L
4CR	1/4	1.06	.60	.47	9/16	.78	1.56	2.13
5CR	5/16	1.17	.64	.55	5/8	.88	1.76	2.34
6CR	3/8	1.19	.66	.55	11/16	.91	1.82	2.37
8CR	1/2	1.38	.90	.75	7/8	.98	1.96	2.76

# MALE ELBOWS



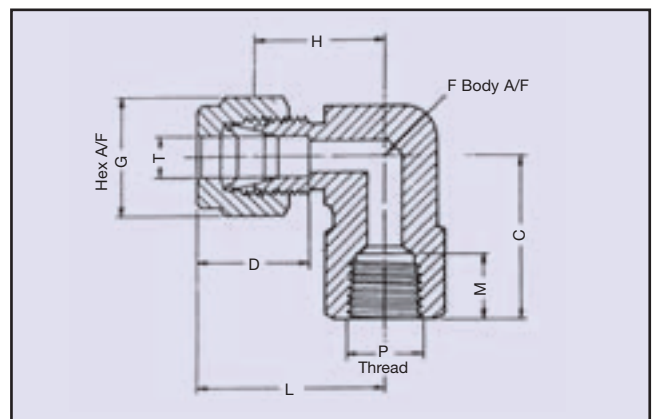
METRIC RANGE (Dimensions in mm)

Part No.	T o/d	P Thread	L1 Length	M	C	D	F A/F	G Nut	H Body
4mME2	4	1/8	25.4	9.7	19.3	13.5	12	12	19.0
6mME2	6	1/8	27.0	9.7	19.8	15.3	12	14	19.8
6mME4	6	1/4	27.0	14.2	23.9	15.3	12	14	19.8
6mME6	6	3/8	28.5	14.2	25.4	15.3	14	14	21.4
6mME8	6	1/2	30.3	19.0	3.0	15.3	19	14	23.2
8mME2	8	1/8	29.6	9.7	20.8	16.2	14	17	22.2
8mME4	8	1/4	29.6	14.2	25.4	16.2	14	17	22.2
8mME6	8	3/8	29.6	14.2	25.4	16.2	14	17	22.2
8mME8	8	1/2	31.3	19.0	32.0	16.2	19	17	24.0
10mME4	10	1/4	30.1	14.2	25.4	16.6	14	19	23.2
10mME6	10	3/8	30.1	14.2	25.4	16.6	14	19	23.2
10mME8	10	1/2	31.9	19.0	32.0	16.6	19	19	24.9
12mME4	12	1/4	35.1	14.2	27.4	22.9	19	22	24.9
12mME6	12	3/8	35.1	14.2	27.4	22.9	19	22	24.9
12mME8	12	1/2	35.1	19.0	32.0	22.9	19	22	24.9

IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	P Thread	L1 Length	M	C	D	F A/F	G Nut	H Body
2ME2	1/8	1/8	.97	.38	.76	.50	.47	7/16	.72
2ME4	1/8	1/4	.97	.56	.94	.50	.47	7/16	.72
4ME2	1/4	1/8	1.06	.38	.76	.60	.47	9/16	.78
4ME4	1/4	1/4	1.06	.56	.94	.60	.47	9/16	.78
4ME6	1/4	3/8	1.12	.56	1.00	.60	.55	9/16	.84
4ME8	1/4	1/2	1.19	.75	1.26	.60	.75	9/16	.91
5ME2	5/16	1/8	1.17	.38	.82	.64	.55	5/8	.88
5ME4	5/16	1/4	1.17	.56	1.00	.64	.55	5/8	.88
6ME2	3/8	1/8	1.18	.38	.82	.66	.55	11/16	.91
6ME4	3/8	1/4	1.18	.56	1.00	.66	.55	11/16	.91
6ME6	3/8	3/8	1.18	.56	1.00	.66	.55	11/16	.91
6ME8	3/8	1/2	1.25	.75	1.26	.66	.75	11/16	.98
8ME4	1/2	1/4	1.38	.56	1.08	.90	.75	7/8	.98
8ME6	1/2	3/8	1.38	.56	1.08	.90	.75	7/8	.98
8ME8	1/2	1/2	1.38	.75	1.26	.90	.75	7/8	.98
12ME8	3/4	1/2	1.59	.75	1.41	1.00	1.06	1-1/8	1.15
12ME12	3/4	3/4	1.55	.75	1.39	1.00	1.06	1-1/8	1.11

# FEMALE ELBOWS



METRIC RANGE (Dimensions in mm)

Part No.	T o/d	P Thread	L	M	C	D	F A/F	G Nut	H Body
6mFE2	6	1/8	26.2	9.9	19.0	15.3	12	14	19.0
6mFE4	6	1/4	30.5	15.0	22.3	15.3	19	14	22.3
8mFE4	8	1/4	31.2	15.0	22.3	16.2	19	17	23.8
10mFE4	10	1/4	30.9	15.0	22.3	16.6	19	19	23.8
12mFE4	12	1/4	34.9	15.0	22.3	22.9	19	22	24.8
12mFE8	12	1/2	38.7	19.8	28.5	22.9	27	22	28.5

IMPERIAL RANGE (Dimensions in inches)

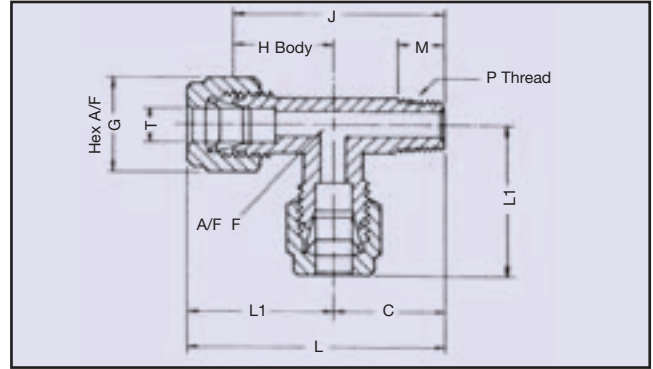
Part No.	T o/d	P Thread	L	M	C	D	F A/F	G Nut	H Body
4FE2	1/4	1/8	1.03	.39	.75	.60	.55	9/16	.75
4FE4	1/4	1/4	1.16	.59	.88	.60	.75	9/16	.88
5FE2	5/16	1/8	1.08	.39	.75	.64	.55	5/8	.79
5FE4	5/16	1/4	1.17	.59	.88	.64	.75	5/8	.88
6FE2	3/8	1/8	1.10	.39	.75	.66	.55	11/16	.91
6FE4	3/8	1/4	1.21	.59	.88	.66	.75	11/16	.94
6FE6	3/8	3/8	1.30	.59	.88	.66	.94	11/16	1.03
6FE8	3/8	1/2	1.39	.78	1.12	.66	1.06	11/16	1.12
8FE4	1/2	1/4	1.38	.59	.88	.90	.75	7/8	.98
8FE6	1/2	3/8	1.43	.59	.88	.90	.94	7/8	1.03
8FE8	1/2	1/2	1.52	.78	1.12	.90	1.06	7/8	1.12

# MALE RUN TEES

Available with NPT, BSPT or BSP Parallel Threads

METRIC RANGE (Dimensions in mm)

Part No.	T o/d	P Thread	L1 Length	M	C	F A/F	G Nut	H Body	J	L
6mTMT2	6	1/8	27.0	9.7	19.8	12	14	19.8	39.1	46.8
6mTMT4	6	1/4	27.0	14.2	23.8	12	14	19.8	43.7	50.9
6mTMT6	6	3/8	28.5	14.2	25.4	14	14	21.3	46.7	53.9
8mTMT4	8	1/4	29.6	14.2	25.4	14	17	22.2	47.6	54.8
10mTMT4	10	1/4	30.1	14.2	25.4	14	19	23.1	48.5	55.5
10mTMT6	10	3/8	30.1	14.2	25.4	19	19	23.1	48.5	55.5
12mTMT4	12	1/4	35.1	14.2	27.4	19	22	24.9	50.5	62.5
12mTMT8	12	1/2	35.1	19.0	32.0	19	22	24.9	56.9	67.1



IMPERIAL RANGE (Dimensions in inches)

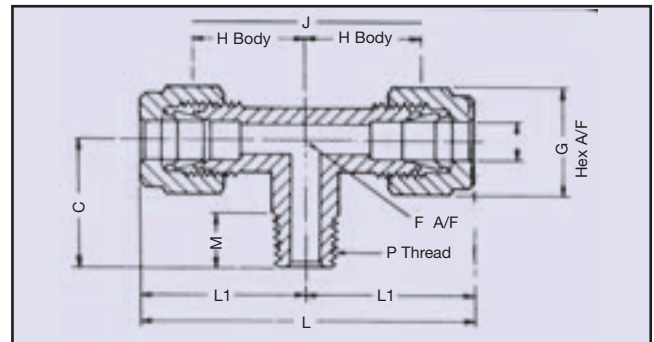
Part No.	T o/d	P Thread	L1 Length	M	C	F A/F	G Nut	H Body	J	L
2TMT2	1/8	1/8	.97	.38	.76	.47	7/16	.72	1.48	1.73
2TMT4	1/8	1/4	.97	.56	.94	.47	7/16	.72	1.66	1.91
4TMT2	1/4	1/8	1.06	.38	.76	.47	9/16	.78	1.54	1.82
4TMT4	1/4	1/4	1.06	.56	.94	.47	9/16	.78	1.72	2.00
6TMT4	3/8	1/4	1.19	.56	1.00	.55	11/16	.91	1.91	2.19
8TMT8	1/2	1/2	1.26	.75	1.26	.74	7/8	.98	2.24	2.52

# MALE BRANCH TEES

Available with NPT, BSPT or BSP Parallel Threads

METRIC RANGE (Dimensions in mm)

Part No.	T o/d	P Thread	L1 Length	M	C	F A/F	G Nut	H Body	J	L
6mTTM2	6	1/8	27.0	9.7	19.3	12	14	19.8	39.6	54.0
6mTTM4	6	1/4	27.0	14.2	23.9	12	14	19.8	39.6	54.0
6mTTM6	6	3/8	28.5	14.2	25.4	14	14	21.3	42.6	57.0
6mTTM8	6	1/2	30.3	19.0	32.0	19	14	23.1	42.6	60.6
8mTTM4	8	1/4	29.6	14.2	25.4	14	17	22.2	44.4	59.2
10mTTM4	10	1/4	30.1	14.2	25.4	14	19	23.1	46.2	60.2
10mTTM6	10	3/8	30.1	14.2	25.4	14	19	23.1	46.2	60.2
12mTTM4	12	1/4	35.1	14.2	27.4	19	22	24.9	49.8	70.2
12mTTM8	12	1/2	35.1	19.0	32.0	19	22	24.9	49.8	70.2



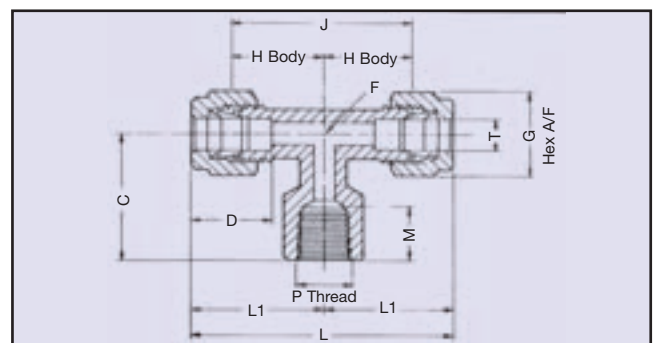
IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	P Thread	L1 Length	M	C	F A/F	G Nut	H Body	J	L
2TTM2	1/8	1/8	.97	.38	.76	.47	7/16	.72	1.44	1.95
2TTM4	1/8	1/4	.97	.56	.94	.47	7/16	.72	1.44	1.95
4TTM2	1/4	1/8	1.06	.38	.76	.47	9/16	.78	1.56	2.13
4TTM4	1/4	1/4	1.06	.56	.94	.47	9/16	.78	1.56	2.13
5TTM2	5/16	1/8	1.17	.38	.82	.55	5/8	.87	1.74	2.33
6TTM4	3/8	1/4	1.19	.56	1.00	.55	11/16	.91	1.82	2.37
8TTM4	1/2	1/4	1.39	.56	1.08	.75	7/8	.98	1.96	2.77
8TTM6	1/2	3/8	1.39	.56	1.08	.75	7/8	.98	1.96	2.77
8TTM8	1/2	1/2	1.39	.75	1.26	.75	7/8	.98	1.96	2.77

# FEMALE BRANCH TEES

METRIC RANGE (Dimensions in mm)

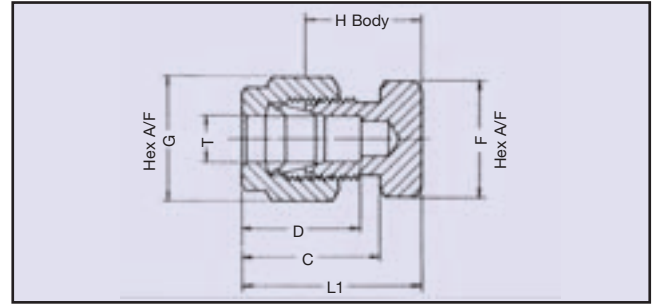
Part No.	T o/d	P Thread	L1 Length	M	C	F A/F	G BODY	H BODY	J	L	D
6mTTF2	6	1/8	27.2	9.9	19.3	12	14	20.0	40.0	54.4	15.3
6mTTF4	6	1/4	29.5	15.0	22.3	19	14	22.3	44.7	59.0	15.3
10mTTF4	10	1/4	31.5	15.0	22.3	19	19	24.5	49.0	63.0	16.6
12mTTF4	12	1/4	34.9	15.0	22.3	24	22	24.8	49.6	69.8	22.9
12mTTF8	12	1/2	38.6	19.8	27.5	24	22	28.5	57.0	77.2	22.9



# Caps

METRIC RANGE (Dimensions in mm)

Part No.	T o/d	L1 Length	C	D	F A/F	G Nut	H Body
<b>4mCAP</b>	4	21.1	15.7	13.5	12	12	14.7
<b>6mCAP</b>	6	23.2	17.3	15.3	14	14	16.0
<b>8mCAP</b>	8	24.3	18.3	16.2	14	17	16.9
<b>10mCAP</b>	10	25.3	19.0	16.6	17	19	18.3
<b>12mCAP</b>	12	29.2	22.1	22.9	22	22	19.0
<b>16mCAP</b>	16	30.6	22.6	24.9	24	27	19.9
<b>18mCAP</b>	18	32.3	22.8	25.0	27	30	21.4
<b>20mCAP</b>	20	31.8	22.8	25.0	30	32	21.5



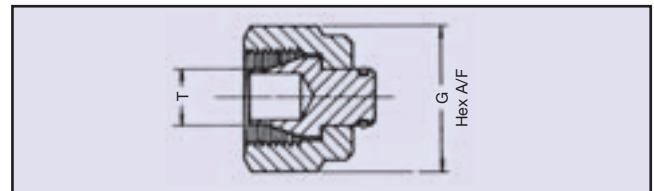
IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	L1 Length	C	D	F A/F	G Nut	H Body
<b>1CAP</b>	1/16	.55	.43	.33	5/16	5/16	.40
<b>2CAP</b>	1/8	.78	.60	.50	1/2	7/16	.53
<b>4CAP</b>	1/4	.89	.68	.60	1/2	9/16	.61
<b>5CAP</b>	5/16	.96	.73	.64	9/16	5/8	.67
<b>6CAP</b>	3/8	1.00	.75	.66	5/8	11/16	.72
<b>8CAP</b>	1/2	1.17	.88	.90	13/16	7/8	.76
<b>10CAP</b>	5/8	1.21	.89	.98	15/16	1	.79
<b>12CAP</b>	3/4	1.29	.91	1.00	1-1/16	1-1/8	.86
<b>16CAP</b>	1	1.53	1.06	1.25	1-3/8	1-1/2	1.03

# Plugs

METRIC RANGE (Dimensions in mm)

Part No.	T o/d	G Nut
<b>4mF PLUG</b>	4	12
<b>6mF PLUG</b>	6	14
<b>8mF PLUG</b>	8	17
<b>10mF PLUG</b>	10	19
<b>12mF PLUG</b>	12	22
<b>16mF PLUG</b>	16	27
<b>18mF PLUG</b>	18	30
<b>25mF PLUG</b>	25	41



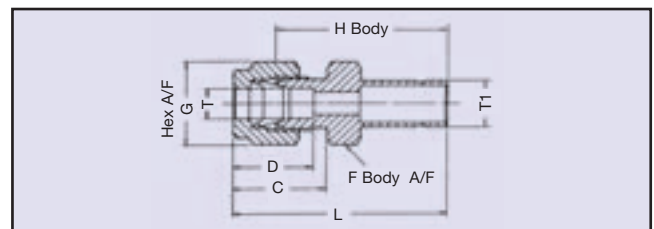
IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	G Nut
<b>2F PLUG</b>	1/8	7/16
<b>4F PLUG</b>	1/4	9/16
<b>5F PLUG</b>	5/16	5/8
<b>6F PLUG</b>	3/8	11/16
<b>8F PLUG</b>	1/2	7/8
<b>10F PLUG</b>	5/8	1
<b>12F PLUG</b>	3/4	1-1/8
<b>16F PLUG</b>	1	1-1/2

# Reducers

METRIC RANGE (Dimensions in mm)

Part No.	T o/d	T1 o/d	L	C	D	F	G	H BODY
<b>6mRED10</b>	6	10	41.9	17.3	15.3	14	14	34.7
<b>6mRED12</b>	6	12	47.5	17.3	15.3	14	14	40.3
<b>10mRED12</b>	10	12	55.3	19.0	16.6	17	19	48.3



IMPERIAL RANGE (Dimensions in inches)

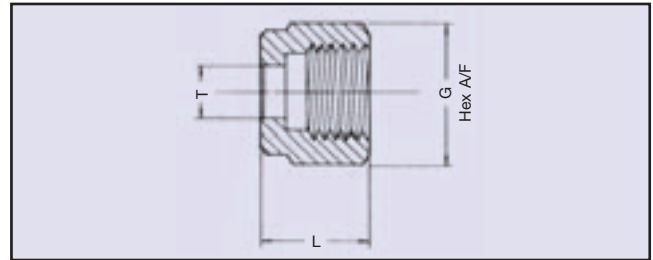
Part No.	T o/d	T1 o/d	L	C	D	F	G	H BODY
<b>2RED4</b>	1/8	1/4	1.43	.60	.50	7/16	7/16	1.18
<b>4RED6</b>	1/4	3/8	1.60	.69	.60	1/2	9/16	1.32
<b>4RED8</b>	1/4	1/2	1.82	.69	.60	9/16	9/16	1.54
<b>6RED4</b>	3/8	1/4	1.61	.75	.66	5/8	11/16	1.34
<b>6RED8</b>	3/8	1/2	1.91	.75	.66	5/8	11/16	1.63

Other sizes, materials and configurations available on request

# NUTS

METRIC RANGE (Dimensions in mm)

Part No.	T o/d	G Nut	L
4mN	4	12	11.9
6mN	6	14	12.7
8mN	8	17	13.5
10mN	10	19	15.1
12mN	12	22	17.5
16mN	16	27	17.5
18mN	18	30	17.8
20mN	20	32	17.4
25mN	25	41	20.7



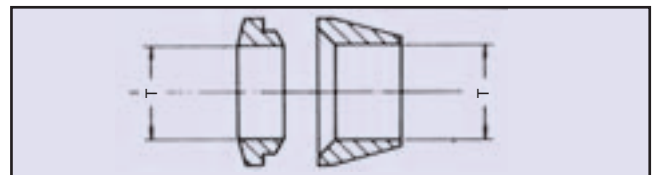
IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	G Nut	L
1N	1/16	5/16	.31
2N	1/8	7/16	.47
3N	3/16	1/2	.47
4N	1/4	9/16	.50
5N	5/16	5/8	.53
6N	3/8	11/16	.56
8N	1/2	7/8	.69
10N	5/8	1	.69
12N	3/4	1-1/8	.69
16N	1	1-1/2	.81

# TWIN FERRULES

METRIC RANGE (Dimensions in mm)

Back Ferrule Part No.	T o/d	Front Ferrule Part No.
4mRC	4	4mFC
6mRC	6	6mFC
8mRC	8	8mFC
10mRC	10	10mFC
12mRC	12	12mFC
16mRC	16	16mFC
18mRC	18	18mFC
20mRC	20	20mFC
25mRC	25	25mFC



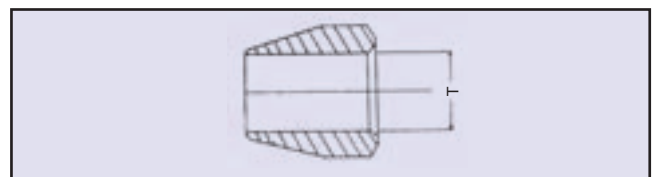
IMPERIAL RANGE (Dimensions in inches)

Back Ferrule Part No.	T o/d	Front Ferrule Part No.
1RC	1/16	1FC
2RC	1/8	2FC
3RC	3/16	3FC
4RC	1/4	4FC
5RC	5/16	5FC
6RC	3/8	6FC
8RC	1/2	8FC
10RC	5/8	10FC
12RC	3/4	12FC
16RC	1	16FC

# SINGLE FERRULES

METRIC RANGE (Dimensions in mm)

Single Ferrule Part No.	T o/d
4mSF	4
6mSF	6
8mSF	8
10mSF	10
12mSF	12
16mSF	16
18mSF	18
20mSF	20
25mSF	25

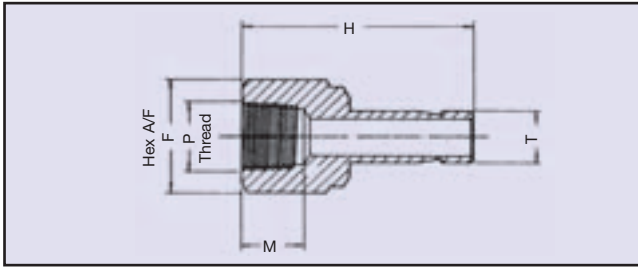


IMPERIAL RANGE (Dimensions in inches)

Single Ferrule Part No.	T o/d
2SF	1/8
3SF	3/16
4SF	1/4
5SF	5/16
6SF	3/8
8SF	1/2
10SF	5/8
12SF	3/4
16SF	1

# CONVERSION FITTINGS

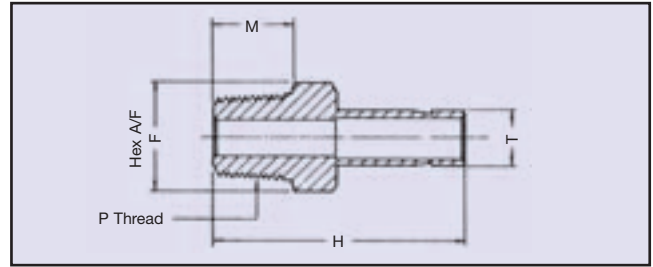
## FEMALE ADAPTORS



METRIC RANGE (Dimensions in mm)

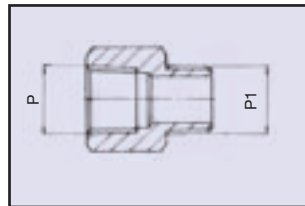
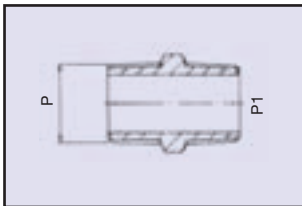
Part No.	T o/d	P Thread	M	F	H
4ATPF2	1/4	1/8	.39	9/16	1.16
4ATPF4	1/4	1/4	.59	3/4	1.34
5ATPF4	5/16	1/4	.59	3/4	1.38
6ATPF4	3/8	1/4	.59	3/4	1.40
6ATPF6	3/8	3/8	.59	7/8	1.46
6ATPF8	3/8	1/2	.78	1-1/16	1.71
8ATPF4	1/2	1/4	.59	3/4	1.63
8ATPF6	1/2	3/8	.59	7/8	1.68
8ATPF8	1/2	1/2	.78	1-1/16	1.83

## MALE ADAPTORS



IMPERIAL RANGE (Dimensions in inches)

Part No.	T o/d	P Thread	M	F	H
2ATPM2	1/8	1/8	.38	7/16	1.13
4ATPM2	1/4	1/8	.38	7/16	1.21
4ATPM4	1/4	1/4	.56	9/16	1.40
4ATPM6	1/4	3/8	.56	11/16	1.43
4ATPM8	1/4	1/2	.75	7/8	1.65
5ATPM4	5/16	1/4	.56	9/16	1.46
5ATPM6	5/16	3/8	.56	11/16	1.46
6ATPM4	3/8	1/4	.56	9/16	1.50
6ATPM6	3/8	3/8	.56	11/16	1.50
6ATPM8	3/8	1/2	.75	7/8	1.68
8ATPM4	1/2	1/4	.56	9/16	1.68
8ATPM6	1/2	3/8	.56	11/16	1.75
8ATPM8	1/2	1/2	.75	7/8	1.93
12ATPM8	3/4	1/2	.75	7/8	2.00
12ATPM12	3/4	3/4	.75	1-1/16	2.03



## Hex Nipples & Reducing Nipples

(Dimensions in inches)

Part No.	P Thread	P1
HN1	1/16	1/16
HN2-1	1/8	1/16
HN2	1/8	1/8
HN4-2	1/4	1/8
HN4	1/4	1/4
HN6-2	3/8	1/8
HN6-4	3/8	1/4
HN6	3/8	3/8
HN8-2	1/2	1/8
HN8-4	1/2	1/4
HN8-6	1/2	3/8
HN8	1/2	1/2
HN12-4	3/4	1/4
HN12-8	3/4	1/2
HN12	3/4	3/4
HN16-4	1	1/4
HN16-8	1	1/2
HN16-12	1	3/4
HN16	1	1

## FEMALE/MALE ADAPTORS & REDUCERS

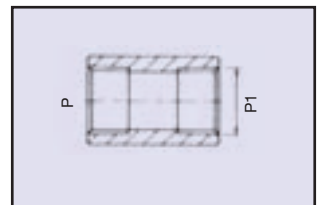
(Dimensions in inches)

Part No.	P Thread	P1
2FMA1	1/8	1/16
2FMA2	1/8	1/8
4FMA2	1/4	1/8
4FMA4	1/4	1/4
6FMA2	3/8	1/8
6FMA4	3/8	1/4
6FMA6	3/8	3/8
8FMA2	1/2	1/8
8FMA4	1/2	1/4
8FMA6	1/2	3/8
8FMA8	1/2	1/2
12FMA4	3/4	1/4
12FMA6	3/4	3/8
12FMA8	3/4	1/2
12FMA12	3/4	3/4
16FMA4	1	1/4
16FMA8	1	1/2
16FMA12	1	3/4
16FMA16	1	1

## Hex Couplings & Reducing Couplings

(Dimensions in inches)

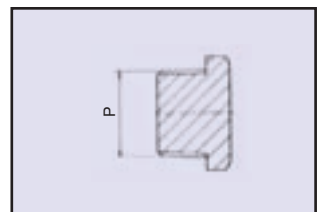
Part No.	P Thread	P1
2FA2	1/8	1/8
4FA2	1/4	1/8
4FA4	1/4	1/4
6FA4	3/8	1/4
6FA6	3/8	3/8
8FA2	1/2	1/8
8FA4	1/2	1/4
8FA6	1/2	3/8
8FA8	1/2	1/2
12FA4	3/4	1/4
12FA8	3/4	1/2
12FA12	3/4	3/4
16FA4	1	1/4
16FA8	1	1/2
16FA12	1	3/4
16FA16	1	1



## Hex Head Plug

(Dimensions in inches)

Part No.	P Thread
HP2	1/8
HP4	1/4
HP6	3/8
HP8	1/2
HP12	3/4
HP16	1



# SINGLE FERRULE COMPRESSION FITTINGS



## PRODUCT INFORMATION

- 316 stainless steel
- Pressures up to 630 Bar
- Dimensions in mm
- Dimensions to DIN 2353
- Sizes 4mm to 42mm
- Elbows
- Male Elbows
- Tees
- Straight Couplings
- Male & Female Connectors
- Threads to BSPP/BSPT/NPT

## PRESSURE Tube (O/D) Body Th'd SERIES

PN

Ø

M

L & S

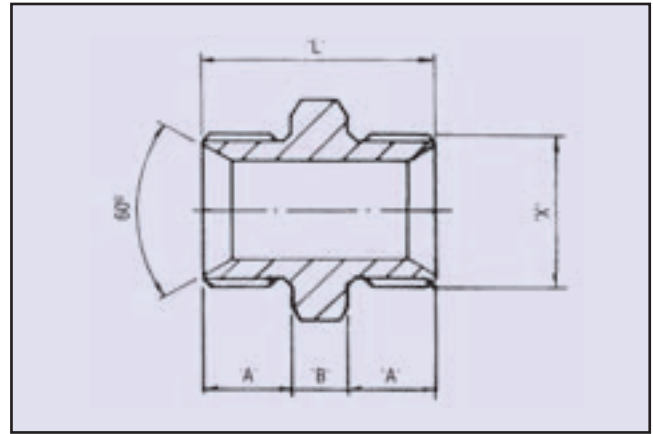
L	PN	Ø	M
	315	6	M 12 x 1,5
8		M 14 x 1,5	
10		M 16 x 1,5	
12		M 18 x 1,5	
15		M 22 x 1,5	
18		M 26 x 1,5	
160	22	M 30 x 2,0	
	28	M 36 x 2,0	
	35	M 45 x 2,0	
	42	M 52 x 2,0	

S	PN	Ø	M
	630	6	M 14 x 1,5
8		M 16 x 1,5	
10		M 18 x 1,5	
12		M 20 x 1,5	
14		M 22 x 1,5	
16		M 24 x 1,5	
400	20	M 30 x 2,0	
	25	M 36 x 2,0	
	30	M 42 x 2,0	
315	38	M 52 x 2,0	



# HYDRAULIC FITTINGS TO BS5200

## MALE CONE SEAT HEX ADAPTOR



METRIC RANGE (Dimensions in mm)

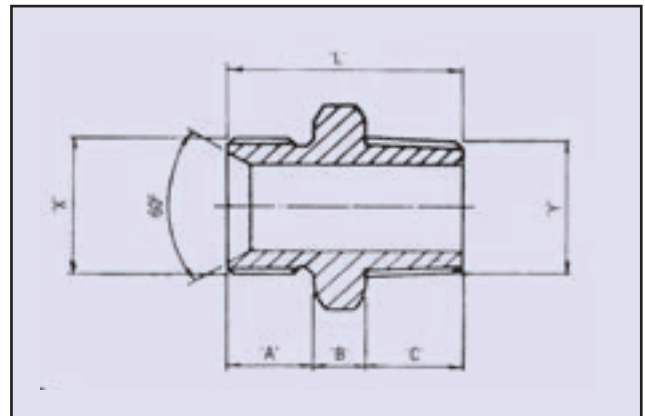
Part No.	X	A	B	L
HCA2	1/8"	10.0	6.0	16.0
HCA4	1/4"	10.0	6.0	16.0
HCA6	3/8"	12.5	8.0	20.5
HCA8	1/2"	14.0	10.0	24.0
HCA10	5/8"	16.0	10.0	25.0
HCA12	3/4"	16.0	10.0	25.0
HCA16	1"	19.0	12.5	32.0
HCA20	1-1/4"	20.5	14.0	35.0
HCA24	1-1/2"	22.0	14.0	37.0
HCA32	2"	25.0	17.5	43.0

IMPERIAL RANGE (Dimensions in inches)

X	A	B	L
1/8"	.375	.250	.625
1/4"	.375	.250	.625
3/8"	.500	.312	.812
1/2"	.562	.375	.937
5/8"	.625	.375	1.000
3/4"	.625	.375	1.000
1"	.750	.500	1.250
1-1/4"	.812	.562	1.375
1-1/2"	.875	.562	1.437
2"	1.000	.687	1.687

Other threads and Reducing Adaptors are available on request.

## PAR<sup>L</sup> (CS)/TAPER MALE HEX ADAPTER



METRIC RANGE (Dimensions in mm)

Part No.	X	Y	A	B	C	L
2HCMA2	1/8"	1/8"	10.0	6.0	10.0	26.0
4HCMA4	1/4"	1/4"	10.0	6.0	12.5	28.5
6HCMA6	3/8"	3/8"	12.5	8.0	14.0	35.0
8HCMA8	1/2"	1/2"	14.0	10.0	17.5	41.0
12HCMA12	3/4"	3/4"	16.0	10.0	19.0	45.0
16HCMA16	1"	1"	19.0	12.5	22.0	54.0
20HCMA20	1-1/4"	1-1/4"	10.5	14.0	24.0	58.5
24HCMA24	1-1/2"	1-1/2"	22.0	14.0	24.0	60.0
32HCMA32	2"	2"	25.0	17.5	27.0	70.0

IMPERIAL RANGE (Dimensions in inches)

X	Y	A	B	C	L
1/8"	1/8"	.375	.250	.375	1.00
1/4"	1/4"	.375	.250	.500	1.125
3/8"	3/8"	.500	.312	.562	1.375
1/2"	1/2"	.562	.375	.687	1.625
3/4"	3/4"	.625	.375	.750	1.750
1"	1"	.750	.500	.875	2.125
1-1/4"	1-1/4"	.812	.562	.937	2.312
1-1/2"	1-1/2"	.875	.562	.937	2.375
2"	2"	1.000	.687	1.062	2.750

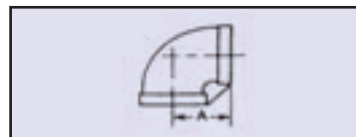
Other threads and Reducing Adaptors are available on request.

# DIMENSIONS of 150lb 316 BSP SCREWED FITTINGS

## 90° Elbow (E)

(Dimensions in mm)

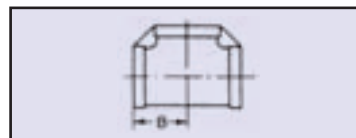
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
A	18	20	24	28	33	38	44	49	57	68	78	96



## Equal Tee (T)

(Dimensions in mm)

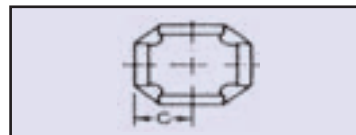
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
B	18	20	24	28	33	38	44	49	57	68	78	96



## Equal Cross (C)

(Dimensions in mm)

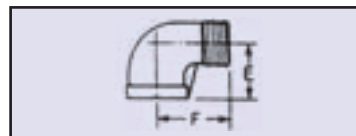
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
C	18	20	24	28	33	38	44	49	57	68	78	96



## Street Elbow (SE)

(Dimensions in mm)

Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
E	18	20	24	28	33	38	44	49	57	68	78	96
F	25	29	37	41	48	54	61	70	84	96	103	125



## 45° Elbow (EA)

(Dimensions in mm)

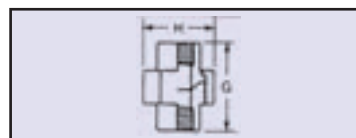
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
D	18	19	20	23	25	29	33	37	43	50	56	67



## Union F/F Conical (UC)

(Dimensions in mm)

Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
H	25	31	37	42	50	59	69	78	93	112	127	158
G	30.5	34	38	41	43	51.5	54.5	58.5	65.5	83	92	113



## Union M/F Conical (UCM)

(Dimensions in mm)

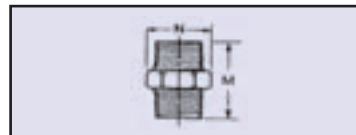
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
S	25	31	37	42	50	59	69	78	93	112	127	158
T	40.5	45	52	57	61	71	76	81	90	111	122	150



## Hex Nipple (HN)

(Dimensions in mm)

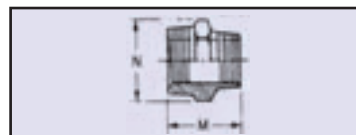
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
N	12	15	19	23	29	36	45	50	63	78	91	116
M	22	24	28	34	40	46	52	54	60	70	76	92



## Hex Red Nipple (RHN)

(Dimensions in mm)

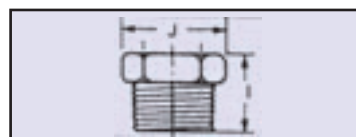
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
N	-	15	19	23	29	36	45	50	63	78	91	116
M	-	34	35	38	42	50	54	59	64	73	81	92



## Hex Plug (HP)

(Dimensions in mm)

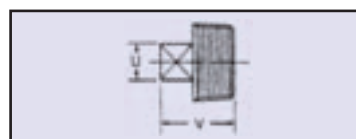
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
J	12	15	19	23	29	36	45	50	63	78	91	116
I	13	15	17	20	24	27	31	33	38	43	48	58



## Square Plug (SP)

(Dimensions in mm)

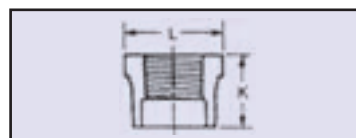
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
U	6	8	10	14	17	19	23	26	32	41	46	58
V	16	19	22	25	28	31	35	36	41	48	53	62



## Reducing Bush (RB)

(Dimensions in mm)

Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/1	1-1/2	2	2-1/2	3	4
L	-	15	19	23	29	36	45	50	62	78	91	116
K	-	15	17	20	24	27	31	33	38	43	48	58

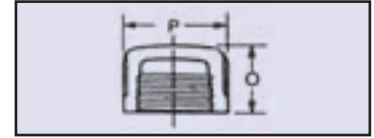


# DIMENSIONS of 150lb 316 BSP SCREWED FITTINGS

## ROUND CAP (RC)

(Dimensions in mm)

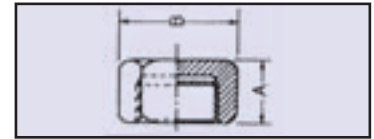
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
P	16	20	24	29	36	43	52	59	72	88	102	128
O	13	15	17	19	22	24	27	27	32	35	38	45



## HEX CAP (HC)

(Dimensions in mm)

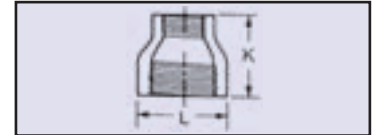
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
B	13	17	21	26	32	40	48	55	69	85	99	125
A	13	15	17	19	22	24	27	27	32	35	38	45



## REDUCING SOCKET (RS)

(Dimensions in mm)

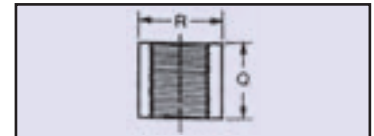
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
K		28	28	35	39	43	49	53	59	67	74	89
L		20	24	29	36	43	52	69	72	89	103	130



## FULL SOCKET (S)

(Dimensions in mm)

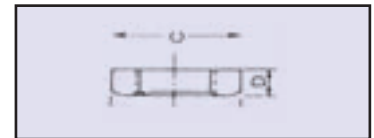
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
Q	17	25	26	27	32	39.5	48.3	54.5	66.3	82	95	122
R	14	19	22	34	36	43	48	48	56	65	71	83



## HEX LOCKNUT (LN)

(Dimensions in mm)

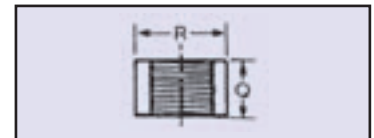
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
C	17	21	26	32	38	46	54	63	77	100	115	145
D	7	8	9	9	10	11	12	13	15	17	18	22



## HALF SOCKET (HS)

(Dimensions in mm)

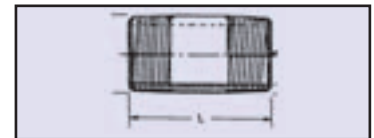
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
R	14	18.5	21.3	26.4	31.8	39.5	48.3	54.5	66.3	82	95	122
Q	7	11	12	15	16	20	22	22	26	30	33	39



## BARREL NIPPLE (BN)

(Dimensions in mm)

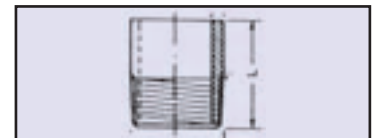
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
L	30	30	40	60	60	60	80	80	100	100	120	120



## WELD NIPPLE (WN)

(Dimensions in mm)

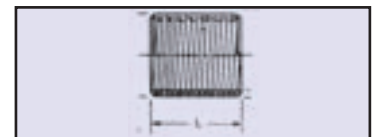
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
L	30	30	30	35	40	40	50	50	50	60	70	80



## PARALLEL NIPPLE (PN)

(Dimensions in mm)

Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
L	16	18	22	25	30	35	38	38	45	55	60	70



## 90° MALE BEND (MB)

(Dimensions in mm)

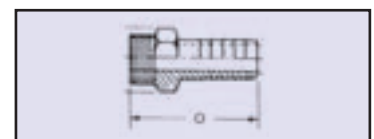
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
L	50	60	78	80	100	120	140	160	190	240	290	375



## HOSE TAILS (HT)

(Dimensions in mm)

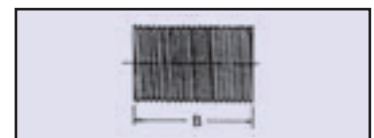
Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
O	30	40	45	50	55	70	80	90	100	-	-	-



## CLOSE TAPER NIPPLE (CTN)

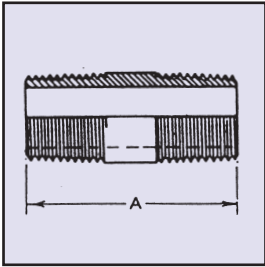
(Dimensions in mm)

Dimension Letter	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
B	13	25	25	29	32	38	38	44	44	57	64	76

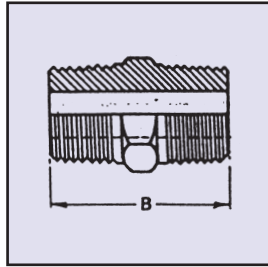


# BS3799 (ANSI B16.11) 3000/6000lb SCREWED FITTINGS

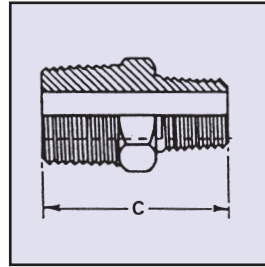
**Round Nipple**



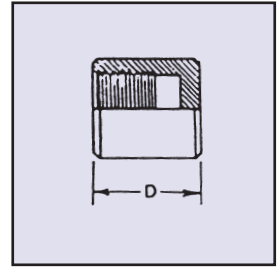
**HEXAGON Nipple**



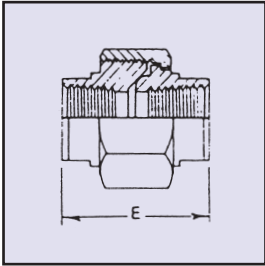
**HEXAGON Reducing Nipple**



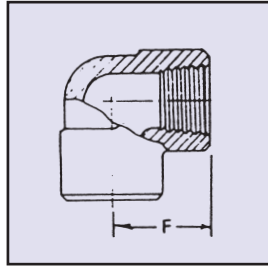
**End Cap**



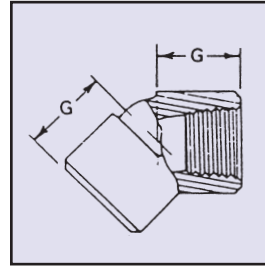
**Union**



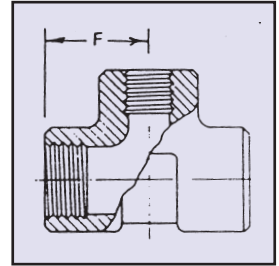
**90° Elbow**



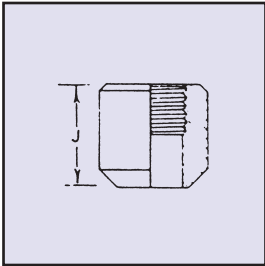
**45° Elbow**



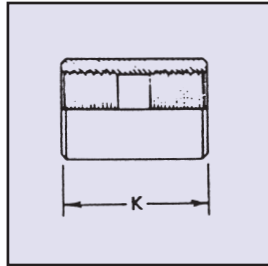
**TEE**



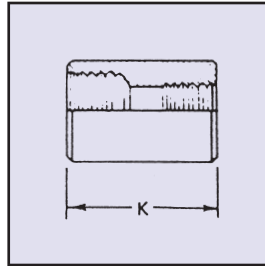
**Welding Boss**



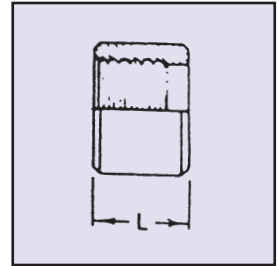
**Coupling**



**Reducing Coupling**



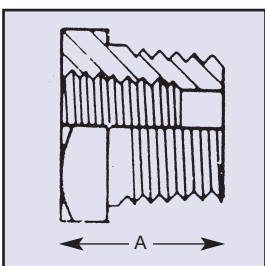
**Half Coupling**



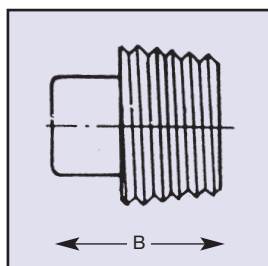
PIPE SIZE INS MM	A	B	C	D		METRIC			G	J	K	L		
				3000	6000	E	F	3000					6000	3000
1/4	8	50	36	31	25	27	43	25	-	19	-	41	35	18
3/8	10	50	40	39	25	27	48	29	-	22	-	45	38	19
1/2	15	75	48	44	32	33	51	33	38	25	29	51	48	24
3/4	20	75	52	50	37	38	57	38	44	29	33	51	51	26
1	25	75	60	56	41	43	64	44	51	33	35	51	60	30
1 1/4	32	-	-	-	45	46	70	51	60	35	43	-	67	34
1 1/2	40	75	68	67	45	48	79	60	64	43	44	51	79	40
2	50	75	71	70	48	51	89	64	83	44	52	51	86	43

PIPE SIZE		METRIC			
INS	MM	A	B	C	D
1/8	6	16	16	16	35
1/4	8	18	17	21	41
3/8	10	21	21	24	41
1/2	15	25	24	28	45
3/4	20	27	27	31	45
1	25	31	32	35	51
1 1/4	32	-	35	40	51
1 1/2	40	34	37	42	51
2	50	36	40	45	64

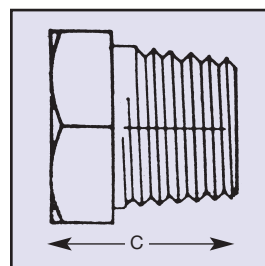
**HEXAGON Bush**



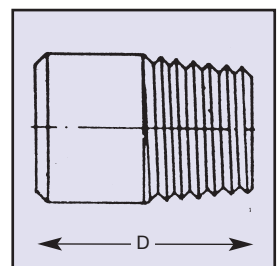
**SQUARE HEAD Plug**



**HEXAGON HEAD Plug**



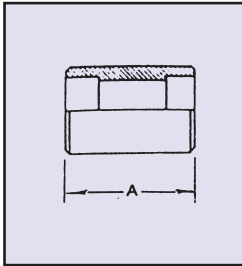
**ROUND HEAD Plug**



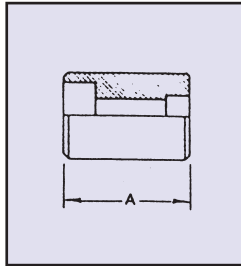
Please state material grade when ordering. Normally threaded NPT but other threads available upon request.

# BS3799 (ANSI B16.11) 3000/6000lb Socket Weld Fittings

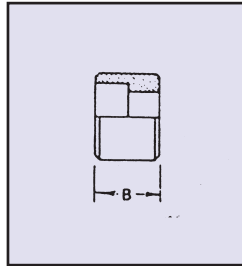
**Coupling**



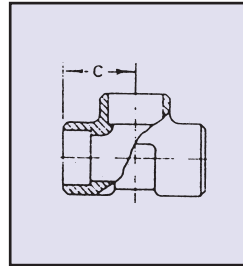
**Reducing Coupling**



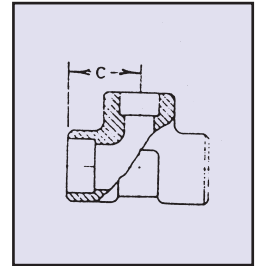
**Half Coupling**



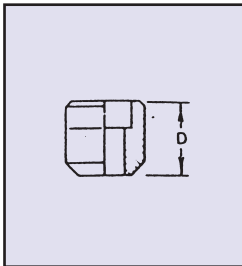
**TEE**



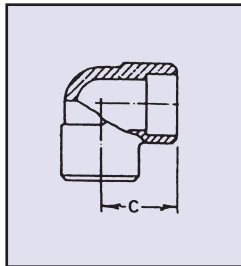
**Reducing Tee**



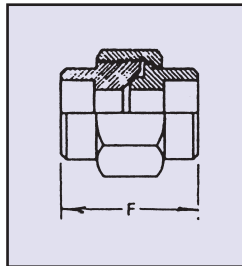
**Welding Boss**



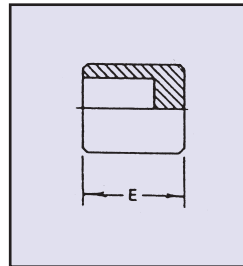
**90° Elbow**



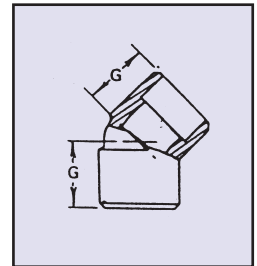
**Union**



**End Cap**



**45° Elbow**

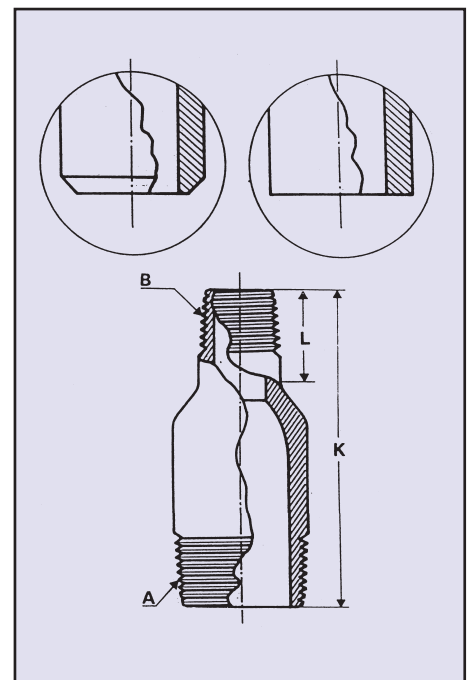


\* Can be machined to suit run pipe

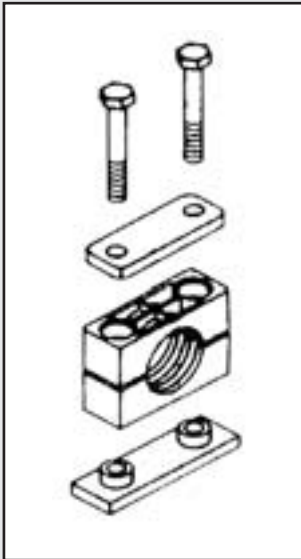
N.B. SIZE		A 3000 6000	B 3000 6000	METRIC		D 3000 6000	E		F 3000	G	
				INS	MM		3000	6000		3000	6000
1/4	8	26	26	21	-	42	17	-	37	18	-
3/8	10	26	27	24	-	45	17	-	37	18	-
1/2	15	30	32	26	29	51	18	21	38	21	23
3/4	20	36	37	32	35	51	23	26	46	26	27
1	25	39	42	35	40	-	24	27	52	28	31
1 1/4	32	39	43	40	45	51	26	31	54	31	34
1 1/2	40	39	45	45	51	51	27	32	56	34	39
2	50	51	57	54	57	51	34	40	68	42	45

## SWAGE Nipples Class 3000lb - 6000lb

Nominal Pipe Sizes A x B	3000 - 6000				Thickness according to ANSI B36-10-1979		
	K(1)		K(1)				
	MM	INS	MM	INS	Sch40	Sch80	Sch160
3/8 x 1/4	60	2.36	20	0.79	Sch40	Sch80	-
1/2 x 3/8	60	2.36	20	0.79	Sch40	Sch80	-
1/2 x 1/4	60	2.36	20	0.79	Sch40	Sch80	-
3/4 x 1/2	70	2.75	21	0.83	Sch40	Sch80	Sch160
3/4 x 3/8	70	2.75	21	0.83	Sch40	Sch80	-
1 x 3/4	90	3.55	22	0.87	Sch40	Sch80	Sch160
1 x 1/2	90	3.55	22	0.87	Sch40	Sch80	Sch160
1 1/4 x 1	90	3.55	25	0.98	Sch40	Sch80	Sch160
1 1/2 x 1 1/4	115	4.53	25	0.98	Sch40	Sch80	Sch160
1 1/2 x 1	115	4.53	25	0.98	Sch40	Sch80	Sch160
1 1/2 x 1 3/4	115	4.53	25	0.98	Sch40	Sch80	Sch160
2 x 1 1/2	165	6.50	30	1.18	Sch40	Sch80	Sch160
2 x 1 1/4	165	6.50	30	1.18	Sch40	Sch80	Sch160
2 x 1	165	6.50	30	1.18	Sch40	Sch80	Sch160
2 1/2 x 2	178	7.01	35	1.38	Sch40	Sch80	Sch160
3 x 2	203	8.00	40	1.57	Sch40	Sch80	Sch160
4 x 3	230	9.06	45	1.77	Sch40	Sch80	Sch160



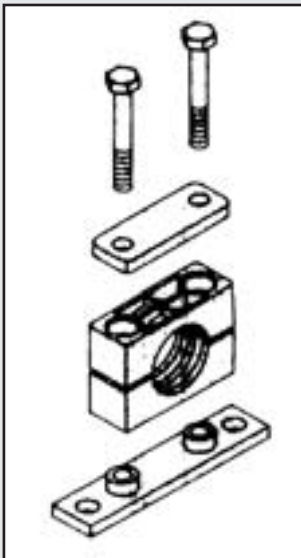
# ASTON Tube Clamps



## Type S STANDARD

- Hexagon head bolts
- Cover Plate
- Clamp body (2 halves)
- Weld plate

**ASTON FITTINGS** Tel:0121 778 6001 Fax: 0121 778 6002 [www.astonfittings.com](http://www.astonfittings.com)



## Type E EXTENDED PLATE

- Hexagon head bolts
- Cover Plate
- Clamp body (2 halves)
- Extended weld plate C/W fixing holes

## MATERIAL AVAILABILITY

Code	Material	Note
1	Polypropelene	Body only
1	Polyamide	Body only
1	Aluminium	Body only
1	Stainless Steel	Body only
1	Steel	Body only

Qty.	Size	Type	Body Material	Plate bolts
12	1/2"	E	3	4

Eg. 12 off 1/2", Tube Clamp, E, 3, 4

Size Availability	
6mm to 42mm	1/2" to 2"

# Aston Tube & Pipe Clamps

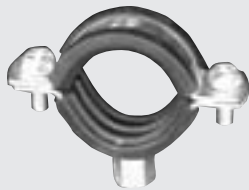
## PRODUCT INFORMATION

- Channel plain or slotted single or double 3m/6m
  - Angle brackets (single or double)
  - Window brackets, 1 or 2 Piece clamps, Munsen rings, Cantilever arms
  - Studding, Nuts, bolts & washers
- All bracketry ancillaries available*



### RUBBER LINED CLIPS M8/M10

- Material (18-90) 2mm x 20 mm
- Material (100-220) 2.5mm x 20mm
- SWL-200Kg Breaking load 600Kg



### STAINLESS STEEL CLAMPS

- SWL-200Kg Breaking load 600Kg
- Material 2mm x 20mm Grade 316

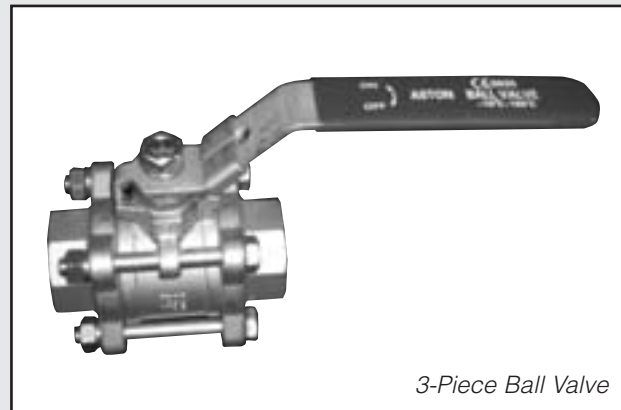
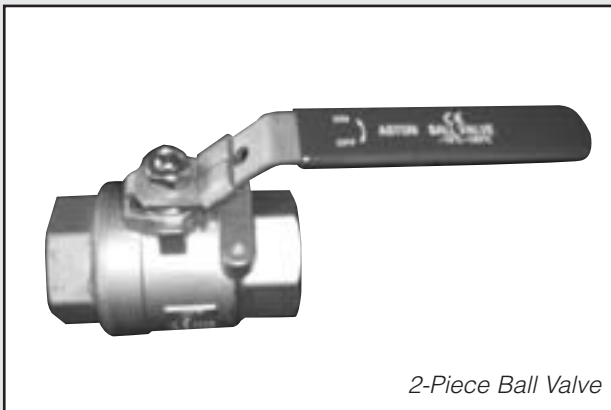
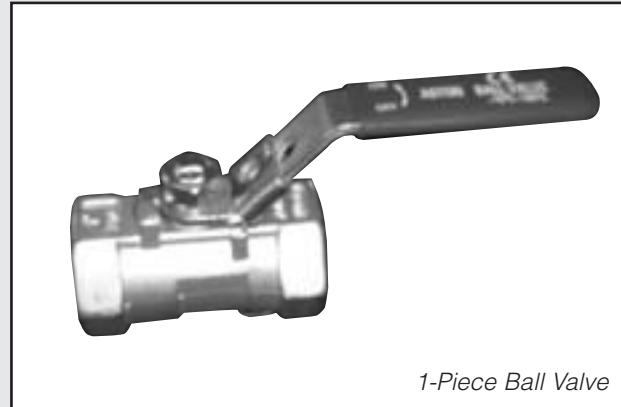


Clip No.	Clip Size	Copper Tube OD	Steel Tube NB	Bag Qty.	Pack Qty.
15	15-19	15	3/8"	50	250
22	20-25	22	1/2"	50	200
28	26-30	28	3/4"	50	200
35	32-36	35	1"	50	200
40	38-43	42	1 1/4"	25	150
48	47-51	-	1 1/2"	25	150
54	53-58	54	-	25	125
60	60-64	-	2"	25	100
70	67-72	67	-	25	100
75	75-80	76	2 1/2"	25	100
83	81-86	-	-	25	100
90	87-92	-	3"	25	75
100	99-105	-	-	25	75

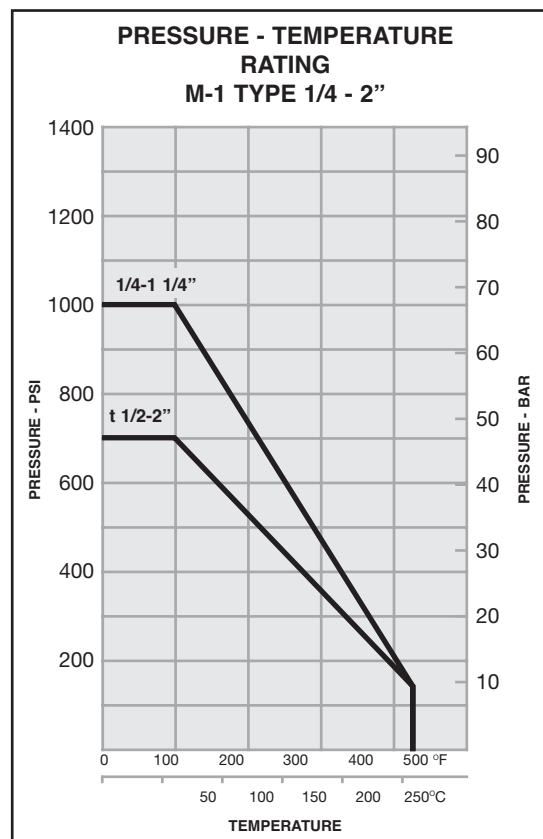
Clip No.	Clip Size	Tube OD	NB	Boss Tapping	Weight Kg/100	Pack Qty.
18	15-18	15	3/8"	M10/M8	5.0	50
22	20-24	22	1/2"	M10/M8	5.5	50
28	26-30	28	3/4"	M10/M8	6.1	50
35	32-36	35	1"	M10/M8	6.5	50
40	38-42	42	1 1/4"	M10/M8	7.8	25
48	47-50	48	1 1/2"	M10/M8	8.3	25
54	51-55	54	-	M10/M8	9.	25
60	60-64	60	2"	M10/M8	10.0	25
70	67-73	67	-	M10/M8	11.6	25
75	75-80	76	2 1/2"	M10/M8	11.4	25
90	82-90	90	3"	M10/M8	12.3	25

# ASTON BALL VALVES

- Stainless Steel 304/316 Ball Valve
- W/15% Glassfibre reinforced Teflon Seat
- Screwed ends, 1000WOG 800WOG
- Pipe threads: in accordance with ANSI B21, BS21 1973 or DIN 259



No.	Part	Qty.	Material
1	Body	1	AISI-316
2	Cap	1	AISI-316
3	Ball	1	AISI-316
4	Seat	2	PTFE
5	Thrust washer	1	PTFE
6	Stem Packing	1	PTFE
7	Handle	1	AISI-304
8	Plastic Cover	1	Plastic
9	Stem	1	AISI-316
10	Gland	1	AISI-304
11	Stem Washer	1	AISI-304
12	Stem Nut	1	AISI-304

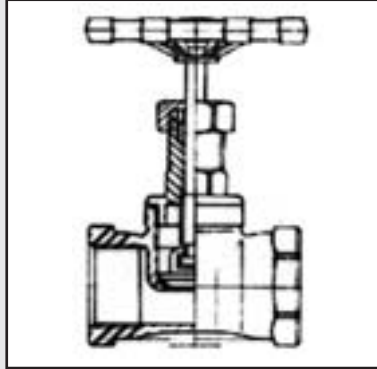




# ASTON VALVES

## Globe Valve

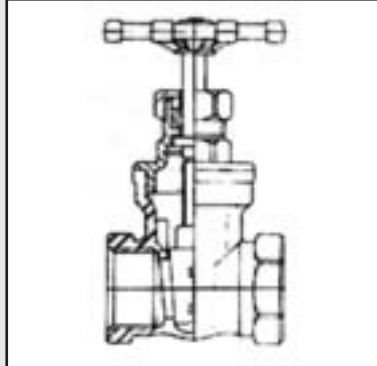
Investment casting ASTM-A351, CF8M, Class 200, screwed bonnet, beveled disc, integral seat, rising stem and handwheel



Parts Name	Material
Body	CF8M
Bonnet	CF8M
Stem	316
Gasket	Teflon
Disc	CF8M
Packing	Teflon
Gland	316
Cap Nut	CF8M
Handle	ZDC2: ADC12
Spin Washer	304
Stem Nut	304

## GATE VALVE

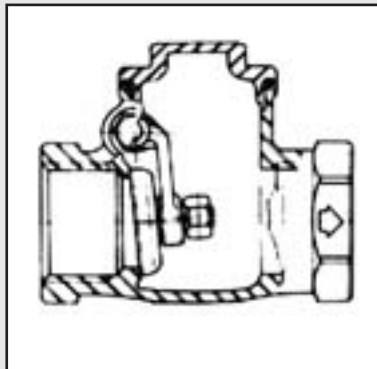
Investment casting ASTM-A351, CF8M, Class 200, inside screw and screwed bonnet, wedge disc, integral seat, non-rising stem and handwheel



Parts Name	Material
Body	CF8M
Bonnet	CF8M
Disc	CF8M
Stem	316
Gasket	Teflon
Snap Ring	316
Washer	316
Packing	Teflon
Cap Nut	CF8M
Gland	304
Handle	ZDC2: ADC12
Spin Washer	304
Stem Nut	304

## SWING CHECK VALVE CLASS 200

Investment casting ASTM-A351, CF8M, Class 200, screwed cap, swing type disc, integral seat.



Parts Name	Material
Body	CF8M
Cap	CF8M
Disc	CF8M
Connecting Rod	CF8M
Disc Nut	316
Pin	304
Bolt Washer	Teflon
Gasket	Teflon
Bolt	304

**Instrumentation Valves & Non-Return Valves also available!**

# Pipe Dimensions ANSI B36.10 & ANSI B36.19

Wall Thickness (mm), Wall Thickness (inches), Weight (Kg/m)  
Available in various grades - seamless and welded

Nom Bore inch	O.D. mm	O.D. inch	5s	10s	10	20	30	STD 40s	40	60	XS 80s	80	100	120	140	160	XXS
1/8"	10.29	0.405		1.25 0.049 0.28				1.73 0.068 0.37			2.41 0.095 0.47						
1/4"	13.72	0.540		1.65 0.065 0.48				2.24 0.088 0.64			3.02 0.119 0.82						
3/8"	17.15	0.675		1.65 0.065 0.64				2.31 0.091 0.87			3.20 0.126 1.12						
1/2"	21.34	0.840	1.65 0.065 0.81	2.11 0.083 1.02	2.11 0.083 1.02			2.77 1.090 1.29			3.73 0.147 1.64					4.75 0.187 1.97	7.47 0.294 2.59
3/4"	26.67	1.050	1.65 0.065 1.03	2.11 0.083 1.30	2.11 0.083 1.30			2.87 0.113 1.71			3.91 0.154 2.23					5.54 0.218 2.93	7.82 0.308 3.69
1"	33.40	1.315	1.65 0.065 1.31	2.77 0.109 2.13	2.77 0.109 2.13			3.38 0.133 2.54			4.55 0.179 3.29					6.35 0.250 4.30	9.09 0.358 5.53
1-1/4"	42.16	1.660	1.65 0.065 1.67	2.77 0.109 2.73	2.77 0.109 2.73			3.56 0.140 3.44			4.85 0.191 4.53					6.35 0.250 5.69	9.70 0.362 7.88
1-1/2"	48.26	1.900	1.65 0.065 1.93	2.77 0.109 3.16	2.77 0.109 3.16			3.68 0.145 4.11			5.08 0.200 5.49					7.14 0.281 7.35	10.15 0.400 9.69
2"	60.33	2.375	1.65 0.065 2.42	2.77 0.109 3.99	2.77 0.109 3.99			3.91 0.154 5.52			5.54 0.218 7.60					8.71 0.343 11.26	11.07 0.436 13.65
2-1/2"	73.03	2.875	2.11 0.083 3.75	3.05 0.120 5.34	3.05 0.120 5.34			5.16 0.203 8.77			7.01 0.276 11.59					9.53 0.375 15.15	14.02 0.552 20.72
3"	88.90	3.500	2.11 0.083 4.59	3.05 0.120 6.56	3.05 0.120 6.56			5.49 0.216 11.47			7.62 0.300 15.51					11.13 0.438 21.67	15.24 0.600 28.11
3-1/2"	101.60	4.000	2.11 0.083 5.25	3.05 0.120 7.53	3.05 0.120 7.53			5.74 0.226 13.78			8.08 0.318 18.92						16.15 0.636 34.56
4"	114.30	4.500	2.11 0.083 5.93	3.05 0.120 8.50	3.05 0.120 8.50			6.02 0.237 16.32			8.56 0.337 22.66			11.13 0.438 28.75		12.49 0.531 34.05	17.12 0.674 41.66
5"	141.30	5.563	2.77 0.109 9.61	3.40 0.134 11.74	3.40 0.134 11.74			6.55 0.258 22.10			9.53 0.375 31.44			12.70 0.500 10.90		15.88 0.625 49.87	19.05 0.750 58.31
6"	168.28	6.625	2.77 0.109 11.47	3.40 0.134 14.04	3.40 0.134 14.04			7.11 0.280 28.69			10.97 0.432 43.21			14.27 0.562 55.03		18.24 0.718 68.53	21.95 0.864 80.43
8"	219.08	8.625	2.77 0.109 15.00	3.76 0.148 20.27	3.76 0.148 20.27	6.35 0.250 33.82	7.04 0.277 37.38	8.18 0.322 43.20		10.81 0.406 53.90	12.70 0.500 65.63		15.06 0.593 76.93	18.24 0.718 91.73	20.62 0.812 102.47	23.01 0.906 112.97	22.23 0.875 109.57
10"	273.05	10.75	3.40 0.134 22.95	4.19 0.165 28.20	4.19 0.165 28.20	6.35 0.250 42.41	7.80 0.307 51.81	9.27 0.365 61.22		12.70 0.500 82.80	12.70 0.500 82.80	15.06 0.593 97.27	18.24 0.712 116.38	21.41 0.843 134.90	25.40 1.000 157.51	28.58 1.125 174.95	25.40 1.000 157.51
12"	323.85	12.75	3.96 0.156 31.72	4.57 0.180 36.54	4.57 0.180 36.54	6.35 0.250 50.48	8.38 0.330 66.20	9.53 0.375 75.01	10.31 0.406 80.94	14.27 0.562 110.62	12.70 0.500 98.95	17.45 0.687 133.88	21.41 0.843 162.14	25.40 1.000 189.82	28.58 1.125 211.31	33.32 1.312 242.40	25.40 1.000 189.82

To calculate the maximum working pressure for a given tube size and quality:

$$P = 2 \times S \times T / D$$

Where P = Pressure PSI, S = Allowable Stress PSI, T = Wall Thickness in mm, D = Outside Diameter in mm

Allowable stress 304, 316, 321, and 347 = 18,700 PSI

Weight Calculation for Austenitic Stainless Steel Tube

Weight in kg/metre = (D-T) x T X 0.02504

N.B. Calculations are for guidance only

# Stainless Steel Tubing for use with **ASTON** stainless fittings

Annealed 304, 316 stainless tubing to ASTM A269, A213 or equivalent. Based on ultimate tensile strength 75,000 psi. For metal temperature not to exceed -30°C to 37°C. Allowable working pressure loads calculated from an allowable stress value of 18,750 psi to provide a safety factor of 4:1.

We recommend a hardness Rb 80 or less. Tubing to be free of scratches. Suitable for bending and flaring.

Tube O.D (inch)	Tube Wall Thickness (inches)										
	,028"	,035"	,049"	,065"	,083"	,095"	,109"	,120"	,134"	,156"	,188"
1/8"	9993	12675									
3/16"	6356	8175	11775								
1/4"	4575	5906	8700	11718							
5/16"		4593	6712	9225							
3/8"		3768	5456	7532							
1/2"		2775	3974	5437	7162						
5/8"				3131	4237	5550	6487				
3/4"			2568	3487	4537	5268	6150				
7/8"			2193	2943	3843	4443	5175				
1"				2568	3318	3843	4462	4968			

Working Pressure (PSI)

Tube O.D (inch)	Tube Wall Thickness (inches)									
	0,7	0,9	1,0	1,2	1,5	2,0	2,5	2,7	3,0	
4mm	7650	10315	11748							
6mm	4837	6408	7229	8951	11748					
8mm		4647	5221	6408	8292					
10mm			4086	4990	6408					
12mm			3357	4086	5221	7229				
16mm				3000	3810	5221	6713			
18mm				2647	3357	4585	5874	6408		
20mm				2369	3000	4086	5221	5689		
25mm					2369	3213	4086	4444	4990	

Working Pressure (PSI)

## Tubing Data

NOTE - For higher temperature the working pressure should be decreased as follows:-

Temperature (°F)	100	400	500	600	700	800	900	1000
Stainless Steel Decrease	-	3%	10%	15%	18%	20%	22%	23%

**ASTON** fittings are not recommended for use with tubing outside the above size ranges - please consult **ASTON** Technical Department before trying other sizes or grades.

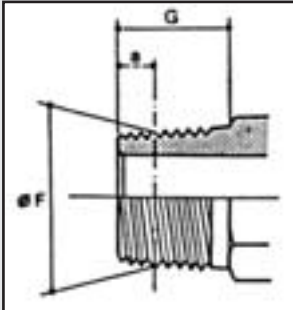
WHILST EVERY EFFORT HAS BEEN MADE TO ENSURE THE ACCURACY OF ALL INFORMATION CONTAINED IN THIS CATALOGUE, THE COMPANY WILL NOT ACCEPT RESPONSIBILITY FOR ANY CLAIMS ARISING FROM ERRORS OR OMISSIONS. IN THE INTERESTS OF TECHNICAL IMPROVEMENT AND/OR CUSTOMER SERVICE, THE COMPANY RESERVES THE RIGHT TO INTRODUCE MODIFICATION TO ANY OF THE PRODUCTS ILLUSTRATED OR DESCRIBED IN THE CATALOGUE.

# MATERIAL SPECIFICATIONS ASTM

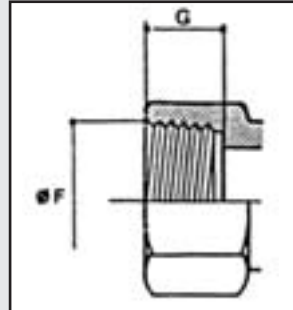
Astm	Grade	Classification	Chemistry													
			C %	Mn %	P MAX %	S MAX %	Si %	Ni %	Cr %	Mo %	T.S. Min psi (kg/mm2)	Y.S. Min psi (kg/mm2)	EL. Min %	Red. Min %	HB MAX	
A-105		Carbon Steel	MAX 0.35	0.60~1.05	0.040	0.050	MAX 0.35					70,000 (49.2)	36,000 (25.3)	22	30	187
A-181	I	Carbon Steel	MAX 0.35	MAX 0.90	0.050	0.050	MAX (0.35)					60,000 (42.2)	30,000 (21.1)	22	35	
A-181	II	Carbon Steel	MAX 0.35	MAX 0.90	0.050	0.050	MAX (0.35)					70,000 (49.2)	36,000 (25.3)	18	24	
A-182	F1	1/2 Mo	MAX 0.28	0.6~0.90	0.045	0.045	0.15~0.35				0.44~0.65	70,000 (49.2)	40,000 (28.1)	25	35	192
A-182	F5	5cr 1/2 Mo	MAX 0.15	0.30~0.60	0.030	0.030	MAX 0.50	MAX 0.50	4.0~6.0		0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	35	192
A-182	F5a	5cr-1/2 Mo	MAX 0.25	MAX 0.6	0.040	0.030	MAX 0.50	MAX 0.50	4.0~6.0		0.44~0.65	90,000 (63.3)	65,000 (45.7)	22	50	235
A-182	F6	13-cr	MAX 0.12	MAX 1.00	0.040	0.030	MAX 1.00	MAX 0.50	11.5~13.5			85,000 (59.8)	55,000 (38.7)	25	50	223
A-182	F7	7cr-1/2 Mo	MAX 0.15	0.30~0.60	0.030	0.030	0.5~1.00		6.0~8.0		0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	35	192
A-182	F9	9cr-1 Mo	MAX 0.15	0.30~0.60	0.030	0.030	0.5~1.00		8.0~10.0		0.90~1.10	85,000 (59.8)	55,000 (38.7)	20	40	223
A-182	F11	11/4cr-1/2 Mo	0.10~0.20	0.30~0.60	0.040	0.040	0.5~1.00		1.00~1.50		0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	30	192
A-182	F12	1cr 1/2 Mo	0.10~0.20	0.30~0.80	0.040	0.040	0.1~0.6		0.8~1.25		0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	30	192
A-182	F22	21/4cr-1 Mo	MAX 0.15	0.30~0.60	0.040	0.040	MAX 0.50		2.00~2.50		0.87~1.13	75,000 (52.7)	45,000 (31.6)	20	30	192
A-182	F304	18cr - 8 Ni	MAX 0.08	MAX 2.00	0.040	0.030	MAX 1.00	8.00~11.00	18.00~20.00			75,000 (52.7)	30,000 (21.1)	45	50	
A-182	F304L	18cr - 8 Ni Low	MAX 0.035	MAX 2.00	0.040	0.030	MAX 1.00	8.00~13.00	18.00~20.00			65,000 (45.7)	25,000 (17.6)	30	50	
A-182	F316	18cr - 8 Ni Mo	MAX 0.08	MAX 2.00	0.040	0.030	MAX 1.00	10.00~14.00	16.00~18.00	2.00~3.00		75,000 (52.7)	30,000 (21.1)	45	50	
A-182	F316L	18cr - 8 Ni Mo-Low	MAX 0.035	MAX 2.00	0.040	0.030	MAX 1.00	10.00~15.00	16.00~18.00	2.00~3.00		65,000 (45.7)	25,000 (17.6)	30	50	
A-182	F321	18cr - 8 Ni Ti	MAX 0.08	MAX 2.00	0.030	0.030	MAX 1.00	9.00~12.00	Min 17.00			75,000 (52.7)	30,000 (21.1)	45	50	
A-182	F347	18cr - 8 Ni Cb	MAX 0.08	MAX 2.00	0.030	0.030	MAX 1.00	9.00~13.00	17.00~20.00			75,000 (52.7)	30,000 (21.1)	45	50	
A-350	LF1	Carbon Steel	MAX 0.30	0.75~1.05	0.035	0.040	0.15~0.30					60,000~85,000 (42.2)	30,000 (21.1)	25	38	
A-350	LF2	Carbon Steel	MAX 0.30	MAX 1.35	0.035	0.040	0.15~0.30					70,000~95,000 (49.2)	36,000 (25.3)	22	30	
A-350	LF3	3 1/2 Ni	MAX 0.20	MAX 0.90	0.035	0.040	0.20~0.35	3.25~3.75				70,000~95,000 (49.2)	37,500 (26.4)	22	35	

# STANDARD THREAD SIZES

## NPT - ANSI B2.1

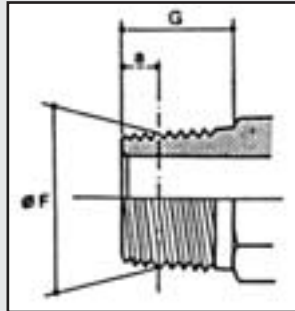


Inches	Ø F	No. of threads to inch	a	G
1/8"	10.2	27	4.5	9.5
1/4"	13.5	18	5	14.3
3/8"	17	18	6	14.3
1/2"	21.2	14	8.1	19.1
3/4"	26.5	14	8.6	19.1
1"	33.2	11 1/2	10.1	23.8
1 1/4"	41.9	11 1/2	10.6	23.8
1 1/2"	48	11 1/2	10.6	26.2



Inches	Ø F	No. of threads to inch	G
1/8"	10.2	27	9.5
1/4"	13.5	18	14.3
3/8"	17	18	14.3
1/2"	21.2	14	19.1

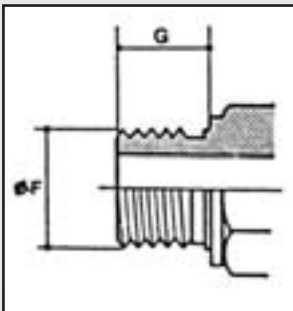
## BSP TAPER B.S.21 - 1985



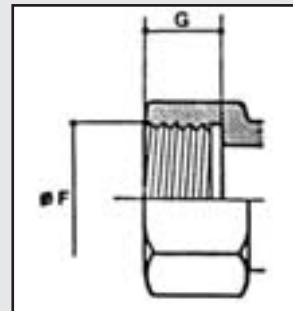
Inches	mm	Ø F	No. of threads to inch	a	G
1/8"	5.10	9.7	28	4	9.5
1/4"	8.13	13.1	19	6	14.3
3/8"	12.17	16.6	19	6.4	14.3
1/2"	15.21	20.9	14	8.2	19.1
3/4"	21.27	26.4	14	9.5	19.1
1"	26.34	33.2	11	10.4	23.8
1 1/4"	33.42	41.9	11	12.7	23.8
1 1/2"	40.49	47.8	11	12.7	26.2
2"	59.60	59.6	11	15.9	27.0

**ASTON FITTINGS** Tel:0121 778 6001 Fax: 0121 778 6002 [www.astonfittings.com](http://www.astonfittings.com)

## BSP PARALLEL B.S.2779 - 1973

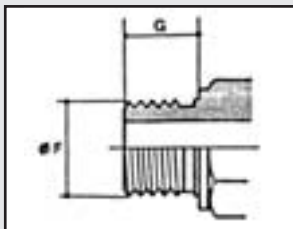


Inches	mm	Ø F	No. of threads to inch	G
1/8"	5.10	9.7	28	8
1/4"	8.13	13.1	19	10
3/8"	12.17	16.6	19	10
1/2"	15.21	20.9	14	12
3/4"	21.27	26.4	14	16
1"	26.34	33.2	11	16
1 1/4"	33.42	41.9	11	18
1 1/2"	40.49	47.8	11	18
2"	50.60	59.6	11	20



Inches	mm	Ø F	No. of threads to inch	G
1/8"	5.10	9.7	28	8
1/4"	8.13	13.1	19	11
3/8"	12.17	16.6	19	11.4
1/2"	15.21	20.9	14	15
3/4"	21.27	26.4	14	16.3
1"	26.34	33.2	11	19.1
1 1/4"	33.42	41.9	11	21.4
1 1/2"	40.49	47.8	11	21.4

## ISO METRIC



Ø F	G
8 x 100	8
10 x 100	8
12 x 100	8
12 x 150	10
12 x 125	8

Ø F	G
14 x 125	10
14 x 150	10
16 x 150	10
18 x 150	12
20 x 150	12

Ø F	G
24 x 150	14
26 x 150	16
27 x 150	16
30 x 200	16
33 x 150	16

Ø F	G
33 x 200	16
39 x 200	18
42 x 200	18
45 x 200	18
48 x 200	18

**We specialise in batch manufacture of precision engineered components for various branches of engineering ranging from Instrumentation, Nuclear and Pharmaceutical Manufacturers to the Power, Fire-Fighting, Hydraulic and Process Industries.**



*Our Sub-Contract machining facilities are detailed below and include a number of high precision CNC's. These are in addition to our Autos, Emi-Mecs and conventional machinery, allowing us to offer a complete Sub-Contract service.*

<b>PLANT CAPACITY</b>	
<b>5 Axis CNC's</b>	<b>Conventional (2nd ops)</b>
<b>CNC's 65mm bar / Machining Centers</b>	<b>Capstans (Herberts/Wards/Taylor's)</b>
<b>EMI-MEC's 2" diameter</b>	<b>Drillers (including CNC controlled) Tappers</b>
<b>Single spindle autos 2" diameter</b>	<b>Cri-Dan Threading-single point</b>

Full certification to DIN50049 31B | Traceability where required | Assembly/pressure test facility | Machine to most internationally recognised standards eg. DIN 2353, BS 2051 pt2, BS4368 pt2 & 3, BS 2799, BS21, ISO, API, ANSI B16.11 etc.



## Ball Valves

Available in most materials including 316 Stainless, Alloy 400, Carbon Steel, Bronze Alloy and Brass.

Full and reduced bore.

Working pressures to 10,000 Psi.

One Piece, two piece or three piece construction.

Female, male, compression, flanged, socket weld and butt ends available.

Available to full fire safe specification.

Sizes 1/8" to 4" NPT, BSPT and BSPP.

## FORGED & WROUGHT FITTINGS

3000lb and 6000lb ratings.

Socket weld and screwed.

Dimensions to ANSI B16.11/BS3799.

Threads to ANSI B2.1 - NPT and BS21 - BSPT or BSPP.

Carbon steel to ASTM A105/ASTM A350 LF2.

Stainless steel all grades.

Malleable iron to ASTM A197 - 150lb and 300lb NPT and BSP.

Wrought steel to BS EN 10241 (BS1740)



## BUTT WELD FITTINGS

Dimensions to ANSI B16.9/ANSI B16.28.

Carbon steel to ASTM A234 GR.WPB.

Low temp carbon steel to ASTM A420.

Stainless steel, steel, all grades

Seamless and welded.

## FORGED & PLATE FLANGES

Dimensions to ANSI B16.5/BS1560.

Ratings 150lb to 2500lb.

Carbon steel to ASTM A105N.

Low Temp carbon steel to ASTM A350 LF2.

Stainless steel all grades.

Plate flanges also supplied.

EN 1092-1(BS4504)



## HYDRAULIC ADAPTORS

Machined in our extensive manufacturing facility to exacting tolerances.

The adaptors conform to

BS 5200 and are readily available in steel and stainless steel.

BSP Male & BSP Male 60 coned adaptors

BSP Male (60° Coned) & BSP Male Taper Adaptors

BSP Male Coned Plugs

BSP (Flat Face) Plugs

Adaptors in other materials or grades of stainless Steel can be produced to order.

**ASTON FITTINGS MANUFACTURING LTD  
T/A ASTON FITTINGS & FLANGES MANUFACTURING LTD**

**CONDITIONS OF SALE OF ASTON FITTINGS MANUFACTURING LTD  
T/A ASTON FITTINGS & FLANGES MANUFACTURING LTD**

**GENERAL**

Unless otherwise agreed in writing these conditions of sale shall be deemed to be incorporated as conditions of any contract for sale entered into by Aston Fittings Manufacturing Ltd T/A Aston Fittings & Flanges Manufacturing Ltd (hereinafter called "the company").

**1. "THE CUSTOMER"**

1.1 The customer is any person, persons or company entering into a contract with the company for the provision of goods and/or services by the company.

**2. ACCOUNTS AND PAYMENT THEREOF**

2.1 Accounts shall be opened at the discretion of the company.

2.2 The customer shall pay for the goods by the last day of the month following that in which the goods supplied. Payments by this date shall be Next Monthly Account, unless otherwise agreed in writing by the parties.

2.3 A maximum amount of credit allowance shall be set upon each account and the Company reserves the right to withdraw credit facilities upon any amount exceeding the said limit.

2.4 The company reserves the right to withdraw credit facilities on all overdue accounts.

2.5 All goods or materials supplied by the company are to remain the company's property until payment is received in full for all amounts owing to the company by the customer. All such goods and materials are at the sole risk of the customer and in the event of the same being damaged, destroyed or lost after delivery, the company is entitled to receive payment in full for the said goods.

**3. PRICES AND QUOTATIONS**

3.1 Typing and clerical errors are subject to correction.

3.2 All prices quoted are valid for a period of 30 days from its date or the price ruling at the date of supply, unless otherwise stated in writing.

3.3 Any revision in price quotes shall be made and be effective without prior notice to the customer.

3.4 The company reserved the right to charge the customer for any additional costs incurred in obtaining or supplying the goods where these occur either as a direct result of the customers instructions or where they could not reasonably have been foreseen at the time that the quotation was given.

**CONTINUAL IMPROVEMENT**

4. The company is continually updating its designs from both a material and manufacturing aspect and it reserves the right to change specifications without prior notice.

**5. ORDERS AND DELIVERY**

5.1 The company reserves the right to charge the customer with all costs incurred on cancelled orders.

5.2 The time and date of delivery shall not be of the essence unless otherwise agreed in writing by the parties.

5.3 In absence of written information to the contrary the customers' directions will be the sole basis for manufacture.

5.4 The company shall not be liable for any loss or damage of any kind attributable to any delay in performance of the contract on behalf of the company for whatever reason and the customer will keep the company indemnified against any action, claim or demand arising from any such loss or damage.

5.5 When delivery takes place at the customers premises the company or carrier, as the case may be, shall not be under any obligation to provide any plant, power or labour which in addition to the company's or carriers person is required for loading or unloading at such premises. Any assistance given beyond the usual place of collection or delivery shall be at the sole risk and expense of the customer who will keep the company or carrier indemnified against any such action, claim or demand which could not have been made if such assistance had not been given.

5.6 If the company, its agents or employees shall seek clarification of any order placed by the customer, the response to such clarification shall be substituted for the original order placed, the response sought shall be in writing and shall constitute the agreed contract between the parties in place of the original order in its entirety and the company shall be entitled to reply upon the contents of such response as representing the entirety of the contract in substitution for the order originally sent and any specifications attached thereto.

**6. GOODS RETURNED FOR CREDIT**

6.1 If the customer decides to return the goods to the company, the returned goods will only be accepted by the company after agreement and subject to minimum handling charge of 25% of the sale price on standard re-saleable items. If such agreement is reached the company will accept returned goods which are clean and in a re-saleable condition subject to the goods being returned to the company at the customer's expense. The returned goods will be inspected upon receipt and a credit note will be issued depending upon the condition as received, such credit being entirely at the company's discretion.

Non standard items as defined by the company will not be accepted for credit.

**7. WARRANTY**

7.1 Subject to clause 7.2 below, any goods which are, or which become defective within 12 months of delivery by reason of provable faulty materials or workmanship may either be replaced or repaired by the company in a reasonable time or the price paid for the goods credited, at the sole discretion of the company. In all cases the goods shall be returned to the company at the customer's expense for inspection before any replacement or credit note is issued. If the goods are identified as faulty in the reasonable opinion of the company, the company will pay for its own inspection costs. If the goods are deemed not to be faulty then the customer shall be liable for all costs of inspection. Any goods returned to the company shall belong to the company and any repaired or replaced goods shall be warranted on these terms for the unexpired portion of the 12 month period.

7.1.1 Subject, in every case, to the remaining provisions of this condition 7 provided that the liability of the Company under this condition 7 shall in no event exceed the purchase price of such goods or services and performance of any one of the above options shall constitute an entire discharge of the Company's liability under this warranty.

7.2 Clause 7.1 above shall only apply if:

7.2.1 The customer has notified the company in writing of the defect within one month of the occurrence of the defect;



- 7.2.2 The customer makes no further use of the goods after giving such notice;
- 7.2.3 The defect does not arise because the customer failed to follow the company's instructions as to storage, installation, commissioning, use or maintenance of the goods; or
- 7.2.4 The customer does not alter or repair such goods without the written consent of the company.
- 7.3 The customer shall be responsible for ensuring that goods are fit for the purpose for which he wishes to use them and the company gives no warranty (and none shall be implied) that the goods are fit for any particular purpose; and
- 7.3.1 The defects in question shall have appeared within 12 months after the customer shall have taken possession of the goods or performance of services completed and shall have been thereupon promptly notified in writing to the company, and
- 7.3.2 Any goods alleged to be defective shall be stored in a safe place by the customer until such time as the company authorises their disposal in writing; and
- 7.3.3 Any goods alleged to be defective shall, if so required by the company, be promptly returned at the customer's risk and expense to the company's works for inspection, and the company shall in its reasonable opinion consider them to be defective solely by reason of faulty design or materials and/or workmanship; and
- 7.3.4 No attempt shall have been made by the customer or by any third party to remedy any defect before, if so required by the company, the goods in question shall have been returned to the company for inspection; and
- 7.3.5 The goods in question shall have been serviced and maintained properly and in accordance with the company's recommendations and shall not have been fitted with any parts, components and/or accessories other than those manufactured or recommended by the company.
- 7.4 The company shall be under no liability under the warranty at condition 7.2 above:
- 7.4.1 In respect of any defect arising from fair wear and tear, wilful damage, negligence, abnormal working conditions, failure to follow the Company's instructions (whether oral or in writing). Misuse or alteration or repair of the goods without the Company's approval of or by any other party;
- 7.4.2 Until the total price for the goods or services has been paid;
- 7.4.3 Where the defect arises as a result of the Supplier following any drawing, design or specification by the Customer; or
- 7.4.4 In respect of any type of defect, damage or wear specifically excluded by the Company by notice in writing:
- The warranties set out in this document are the only warranties which shall be given by the Company and all warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the contract.
- 7.5 The liability of the company arising from all and any claims relating to any single contract shall be limited to a maximum sum of £200 in total or such amount (less the costs of recovery incurred by the company) as the company receives from the manufacturer or suppliers of the goods giving rise to the claim from the customer. The company shall not be liable for any claim or claims relating to any breach of warranty express or implied, brought after twelve months of the date contract was made. The liability of the company is also subject to compliance by the customer with all the terms contained in this clause 7. Apart from such reimbursement, replacement or repair, the company, its employees and agents shall be under no liability to the customer, or any third party for any injury, loss or damage of any kind whatsoever, howsoever and wheresoever arising or arisen, and whether direct or indirect, including without limitation any injury, loss or damage, arising out of and/or incidental to:
- 7.5.1 Any negligence of the company and/or of any of its employees and/or (except insofar as such negligence may result in death or personal injury); and/or
- 7.5.2 The company's performance of and/or failure to perform and/or breach of any of its obligations, whether express or implied under the contract and/or otherwise; and/or
- 7.5.3 The supply, installation, repair and/or maintenance of any of the goods; and/or
- 7.5.4 Any defect in any of the goods; and/or
- 7.5.5 Any advice given and/or representation made by the company or on its behalf in relation to the nature, quality, specification, design, performance, use and/or installation of any of the goods.
- 7.5.6 Any performance of any services.
- 7.6 The terms of this condition replaces all conditions, warranties, representations, statements, liabilities and other terms whatsoever implied by the common law, statute and/or otherwise all of which shall accordingly be excluded to the extent allowed by law, and the company shall in relation to the goods and services have no obligation to the customer, either arising by statute, or in tort or in contract and whether arising out of any negligence of the company and/or any other its employees and/or agents (and whether under the contract or under any other contract) other than the express obligations contained in these conditions or in any other document expressly incorporated in writing into contract. Accordingly, it shall be for the customer to insure against any liability arising from the performance of the services and from its use of the goods.
- 7.7 Test certificates for goods can be provided upon request against specific orders and may be charged for the Certificates by Lloyds or other independent authority will be charged for at cost.
- 7.8 Health and Safety at Work Act, October 1974. The customer must inform the company of any special requirements with which it considers necessary that the goods and/or the services should comply, otherwise the company will assume responsibility for the goods and/or services being sufficient and suitable for the buyer's purpose.
8. **THIRD PARTY CLAIMS**
- 8.1 The company shall only accept liability for any claims by third parties to the extent of the provisions of clause 7, hereof resulting in loss caused by the company or its employees and shall not accept liability for any other such claims or losses and the customer shall indemnify the company to the extent that the customer is in any way responsible either through itself, himself, herself or it, is or her employees or agents.
9. **FORCE MAJEURE**
- The company shall have no liability whatsoever for any failure to perform or for any delay in the performance of any of its obligation under the contract arising wholly or in part by reason of any factor beyond its direct control.
10. **NOTICES**
- Any notices required to be given in writing under the contract shall be given either by telex or facsimile transmission or by first class post addressed to the registered office of the party for which it is intended.
11. **GOVERNING LAW**
- The contract shall be governed by English Law.

# Quality Policy

It is the policy of Aston Fittings Manufacturing Limited to operate and maintain a Quality Management System which conforms to the minimum requirements of BS EN ISO 9001: 2000

The main objectives are to provide products and services which:

Are equal to, or exceed, purchase order requirements.

Are fit for purpose  
Are delivered on time  
Are safe and reliable

The Quality Management System is fully endorsed by the Company, who recognise that the Quality Systems outlined form only the base on which more comprehensive quality aims can be built upon.

It is conditional that each individual employee understands the importance of their quality input, and are personally committed to ensure that in carrying out their tasks they are Right-First-Time, Everytime.

Our Quality manual outlines and defines our quality policies, systems and related procedures which have the unqualified support of the Directors. It is a living document in daily use and shall be updated as appropriate to reflect any changes which may subsequently occur.

Signed: Richard Brown  
Mr Richard Brown  
Managing Director

## ASTON FITTINGS MANUFACTURING LTD.

Units 1-3 Eagle Works	Telephone	0121 778 6001
2 Springcroft Road	Int Tel No.	(44) 121 778 6001
Tyseley	Facsimile	0121 778 6002
Birmingham B11 3EL	Website	<a href="http://www.astonfittings.com">www.astonfittings.com</a>
England	E-Mail	<a href="mailto:sales@astonfittings.com">sales@astonfittings.com</a>