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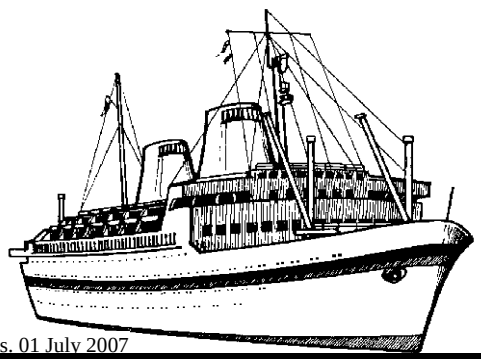
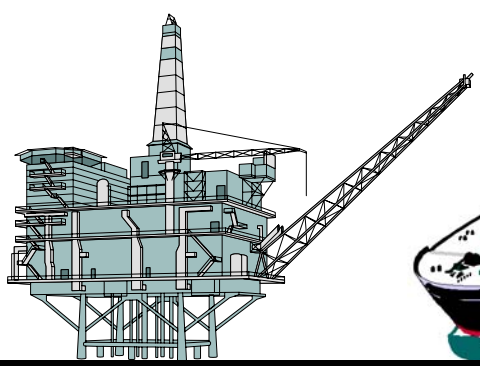
MARINE HEAVY DUTY (MHD)

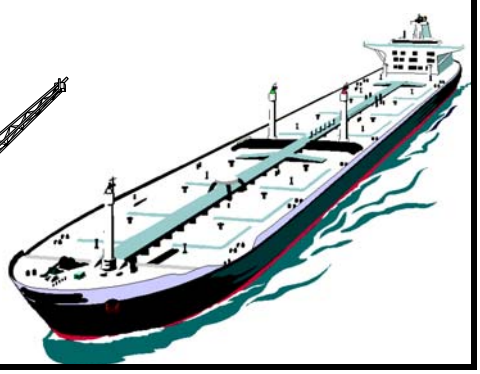
And

GENERAL HEAVY DUTY (GHD)

MANUFACTURED IN GUNMETAL BS1400 LG4 (CC492K GS)







Iss. 01 July 2007

MARINE HEAVY DUTY FITTINGS

Marine Heavy Duty and General Heavy Duty fittings are manufactured from Gunmetal BS EN CC492K GS (BS1400 LG4), a strong, ductile and non-dezinctifiable alloy.

This alloy is equivalent to (but not necessarily identical with)

ASTM B584C3200	(American)
DIN 1705 CuSn7Pb3Zn2	(German)
JIS H—5111 BC7	(Japanese)
U—F 7ZSPb4	(Italian)

The fittings are designed and manufactured for jointing with copper nickel and aluminium brass tubes having an outside diameter in accordance with BS2871 (1972) Pt 2 Table 3 in the following sizes :— 6, 8, 12, 16, 20, 25, 30, 38, 44.5, and 57mm.

Over many years Marine Heavy Duty and General Heavy Duty fittings in conjunction with copper nickel and aluminium brass tubes have provided economic, easy-to-use permanently strong joints unaffected by vibration, temperature or movements of the vessel. Apart from their basic use in steam and sea water lines and in tank heating systems, they have numerous uses with auxiliary plant conveying seawater, steam, lubricating oil and fuel oil.

Our range of fittings use integral silver brazing rings and the principle of “capillary attraction” to ensure an economic, easy-to-make, sound long life joint.
To achieve this it is only necessary to ensure the cleanliness of the fitting and tube, the use of a suitable flux and the careful assembly and application of the heat (see Instructions for making silver brazing joints).

Silver brazed joints are to be regarded as permanent and if it is anticipated that the system will be broken in to in the future then we recommend that a three-part union MEP 11 MHD (GHD) be used at suitable points. This is also an aid to the ease and economy of being able to
prefabricate sections on the bench or floor before fitting into the system.

Our extensive range of Marine Heavy Duty and General Heavy Duty fittings along with stocks of Aluminium Brass, Copper Nickel 90/10 and 70/30 tube, Silver Brazing Kits and Pipe Clips allow us to offer our Customers a complete and responsive service.

GENERAL HEAVY DUTY FITTINGS

We also carry a full range of General Heavy Duty Fittings.

Note: - We operate a program of continual assessment and improvement which means that dimensions can alter without notice. Dimensions will be confirmed, by request, at time of enquiry or order.

General overall dimension shown in this catalogue are for guidance only.

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TECHNICAL DATA

MHD Fittings are manufactured for use in conjunction with Aluminium brass and Copper Nickel Iron tubes to BS2871 (1972) Part 2 Table 3 with Outside Diameters of: -

6, 8, 12, 16, 20, 25, 30, 38, 44.5 and 57mm
The non-standard 10 and 14mm can still be used in conjunction with the MEP 1R MHD adaptor

Imperial tube may also be used in conjunction with MEP 9 MHD adaptor (Nom Bore in inches x Tube Outside Diameter in mm)

1/2"x15.14mm, 3/4"x21.49, 1"x28.25, 1 1/4"x34.60,
1 1/2"x 40.95 and 2"x54.05

The GHD range of fittings are similar to the MHD but for the following tube (Outside Diameters)

6, 8, 12, 15, 22, 28, 35, 42 and 54mm

Chemical composition (%) of:
Gunmetal CC492K GS (BS1400 (1985) LG4)

Cu	Sn	Zn	PB	Ni	Fe	Al	Sb	As	Sb+As	Si	Bi
Balc.	6.0-8.0	1.5-3.0	2.5-3.5	2.0*	0.20	0.01	0.25	0.15	0.40	0.01	0.05

* Tin + 1/2 Nickel content shall be within the range 7.0% to 8.0%.
Unless otherwise stated all chemical values are maximum values.

Mechanical properties of:
Gunmetal CC492K GS (BS1400 (1985) LG4)

Tensile strength (N/mm²)	2% Proof stress (N/mm²)	Elongation (%)
250	130	5 to 16.

Proof stress is for information only.

Chemical composition (%) of:
Silver– Bazing alloy BS1845 (1984) Table 2 - AG14
*Al=0.001, Be=0.0005, Pb=0.025, P=0.008, Si=0.05 and Zr=0.002.

Ag	Cu	Zn	Cd	Sn	Impurities*	Melting point	
54-56	20-22	21-23	20.025	1.7-2.3	0.25	630°C (Solidus)	660°C (Liquidus)

Unless otherwise stated all chemical values are maximum values.
We recommend "Easy-Flo" flux (or direct equivalent).

Silver Brazing alloy equivalents to BS1845 (1984) Type - AG14

DIN 8513 Type L-Ag 55 Sn
ASME SFA-5.8 (AWS) Type BAg-7

Screw threads are NORMALLY BSPP (Parallel)

ALL other screw threads are available including: -
BSPT, NPT, API and Metric
Lengths of fittings may alter for other than BSPP threads

Operating Pressures and Temperatures

Fittings subject to "Class" e.g. Lloyds requirements			
MAX Metal Temperature		MAX Pressure	
°C	°F	bar	psi
50	122	48	700
75	167	47	695
100	212	46	680
125	257	45	660
150	302	43	630
175	347	29	430
200	392	17	250

Test pressure
1.5 x working pressure

Fittings NOT subject to "Class" requirements					
	For metal temperatures not exceeding				
Size	Up to 100°C (212°F)		Up to 177°C (350°F)		Up to 200°C (405°F)	
mm	bar	psi	bar	psi	bar	psi
6	180 - 2610		150 - 2175		61 - 885	
8	170 - 2275		125 - 1815		51 - 740	
12	130 - 1885		98 - 1420		39 - 565	
16	113 - 1635		84 - 1220		33 - 480	
20	102 - 1475		75 - 1085		30 - 435	
25	92 - 1335		68 - 985		27 - 400	
30	86 - 1245		63 - 910		25 - 360	
38	79 - 1145		58 - 840		23 - 335	
44.5	75 - 1085		55 - 800		22 - 320	
57	70 - 1015		52 - 755		20 - 290	

Recommended MAX Velocity of seawater = 3m/s (Based on 100mm N/Bore)

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Index of Fittings

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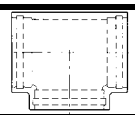
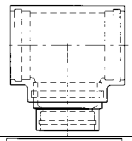
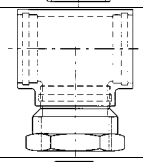
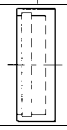
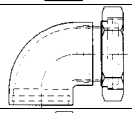
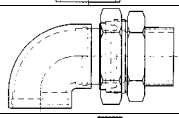
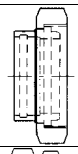
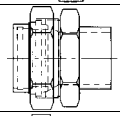
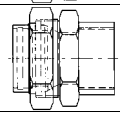
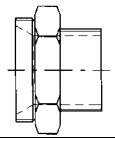
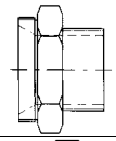
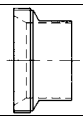
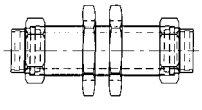
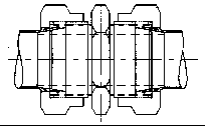
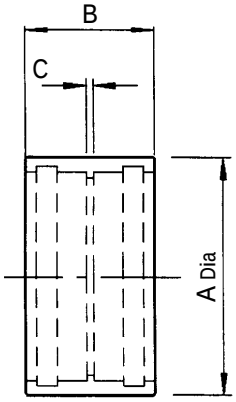
MEP-24 MHD	Teepiece	13	
MEP-25 MHD	Reducing and Un-equal Teepiece	14	
MEP-30 MHD	Teepiece with screwed branch	15	
MEP-61 MHD	Stop end	16	
MEP–64 MHD	Bent union adaptor	16	
MEP–65 MHD	Bent union connector	17	
MEP-68 MHD	Straight union adaptor	17	
MEP-69 MHD	Straight male union connector	18	
MEP-69F MHD	Straight female union connector	18	
MEP-70 MHD	Male nipple	19	
MEP-72 MHD	Female nipple	19	
MEP-75 MHD	Nut and Liner	20	
MEP-77 MHD	Union adaptor	20	
MEP-150 MHD	Straight union bulkhead connector	21	
Silver brazing instructions		22 to 23	
MEP- 11SU 11TU 11FC	Non-Spark union	24	
MEP– Tube manipulation and	Heating coils services	25	

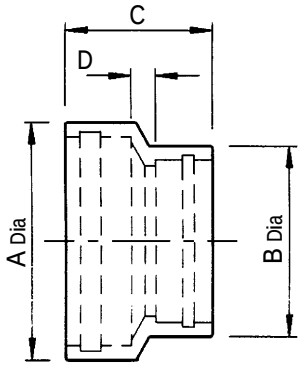
MEP – 1 MHD
Straight Coupling
(Capillary x capillary ends)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)
6	9.5	16.7	2.0
8	11.7	17	2.0
12	15.7	18.6	1.5
16	20	20	1.5
20	24	21	1.5
25	30	23	1.5
30	35	25	1.5
38	44	29	1.5
44.5	51	32	2.0
57	65	38	2.0

Straight couplings in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request..
Sizes in millimetres unless otherwise stated.

MEP – 1R MHD
Reducing Coupling
(Capillary x capillary ends)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
12 x 8	15.5	12	18	3
16 x 8	19.8	12	20	4
16 x 12	19.8	15.5	20	3
20 x 16	24	19.8	21	2.5
25 x 16	29.6	19.8	24	4.5
25 x 20	29.6	24	23.25	3.25
30 x 16	35	19.8	26.5	6
30 x 20	35	24	25.3	4.3
38 x 25	44	29.6	29.75	5.75
38 x 30	44	35	29	4
44.5 x 30	51.2	35	35	8.5
57 x 38	65.2	44	39	7.5
57 x 44.5	65.2	51.2	38.5	5

Reducing couplings in sizes other than above are available.
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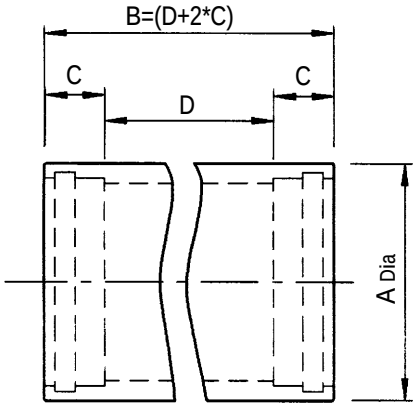
MEP – 1L MHD
Straight Coupling
(Capillary x capillary ends)

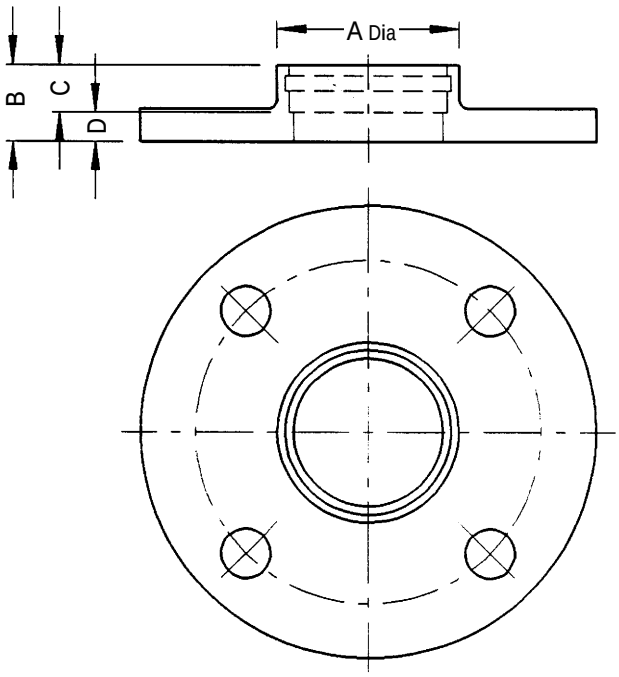
MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
6	9.5		7.35	
8	11.7		7.50	
12	15.7		8.55	
16	20		9.25	
20	24		9.75	
25	30		10.75	
30	35		11.75	
38	44		13.75	
44.5	51		15.00	
57	65		18.00	

Straight couplings in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.



Dimension D to be specified by the customer.

MEP – 1F MHD
Flange Connector
(Capillary ends x Flange)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
8	12	10.5	7.5	3.0
12	16	11.0	8.0	3.0
16	20.5	12.0	9.0	4.0
20	24.7	13.5	9.5	4.0
25	30.2	15.0	10.5	4.5
30	35.7	16.0	11.5	4.5
38	45	17.2	13.2	4.0
44.5	52	20.0	15.0	5.0
57	66	23.0	18.0	5.0

Flange Adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

Flange standards available: -

PN6, 10, 16, 25 and 40 ANSI 150#, 300# (B16.24)

JIS 3, 5, 10, 16, and 20K BST E, F, and H

Special flanges to suit individual requirements

Flanges DRILLED unless otherwise specified

Composite Flanges (GM LG4 Inner x Steel Outer) also available

NOTE: - EXTRA care MUST be taken during the silver brazing process so as NOT to locally OVERHEAT the flange which may cause cracking during cooling.

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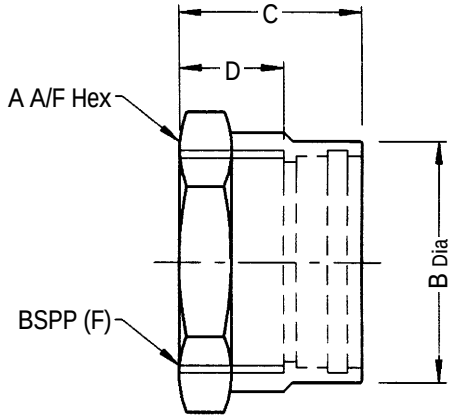
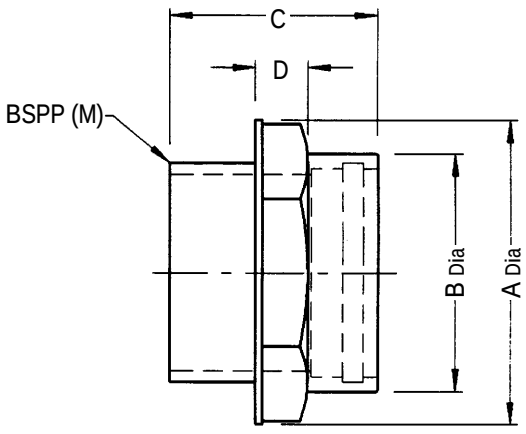
MEP – 2 MHD
Straight Female Connector
(Female thread x capillary ends)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
8 x 1/4”	19	12	24.5	17
12 x 3/8”	22	15.5	26	18
16 x 1/2”	27	19.8	31	22
20 x 3/4”	32	24	32	22
25 x 1”	37.5	29.6	37.5	27
30 x 1 1/4”	47	35	41.5	30

Straight Female Connectors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

MEP – 3 MHD
Straight Male Connector
(Male thread x capillary ends)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
8 x 1/4”	17	11.7	22.25	5.25
12 x 3/8”	22	15.7	22.25	4.75
16 x 1/2”	27	20	24.25	5.75
20 x 3/4”	36	24	29.5	9
25 x 1”	41	30	34	10.5
30 x 1 1/4”	50	35	36.25	10.25
38 x 1 1/2”	55	44	39.5	10
44.5 x 1 1/2”	64	51	42.5	11.5

Straight Male Connectors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

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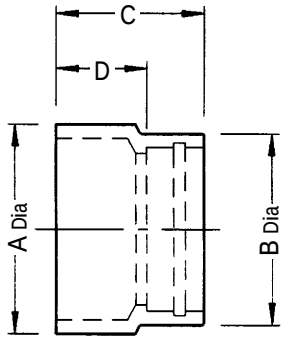
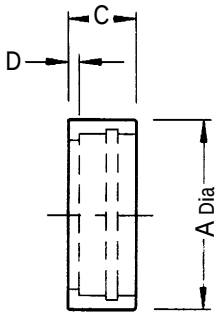
MEP – 6 MHD
Reducing Coupling
(Male x capillary ends)

MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)	Type
8 x 6	8	9.7	12	4.75	1
12 x 8	12	—	10	3	2
16 x 8	16	11.7	17	10	1
16 x 12	16	—	11	3	2
20 x 16	20	—	12.5	3.5	2
25 x 16	25	—	12.5	3.5	2
25 x 20	25	—	12.5	3.5	2
30 x 16	30	20	20.5	11.5	1
30 x 20	30	24	21.5	12	1
30 x 25	30	—	13.5	3.5	2
38 x 16	38	20	23.5	14.5	1
38 x 20	38	24	24.5	15	1
38 x 25	38	30	24.5	14	1
38 x 30	38	—	15.5	3.5	2
44.5 x 16	44.5	20	26	17	1
44.5 x 30	44.5	35	28	16.5	1
44.5 x 38	44.5	—	17	3.5	2
57 x 30	57	35	32.5	21	1
57 x 38	57	44	32.5	19	1
57 x 44.5	57	—	20	5	2

Male end of the reducing coupling is for inserting into the female of the fitting.
Reducing couplings in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.

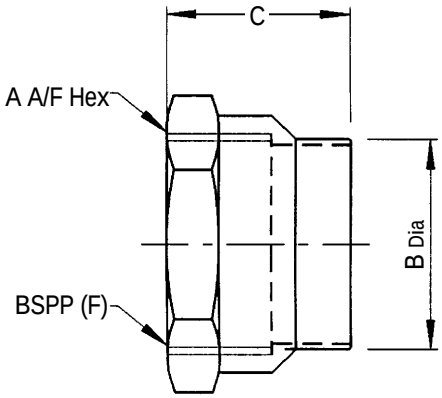


Type 1



Type 2

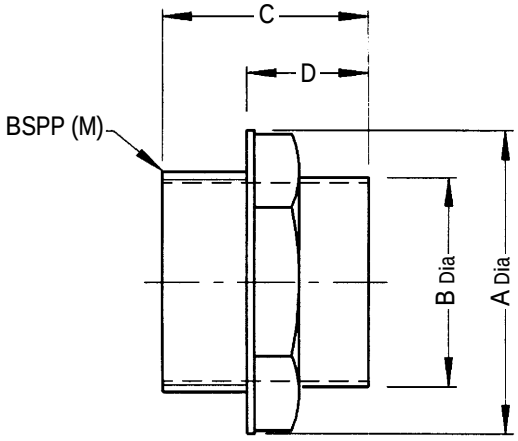
MEP – 7 MHD
Female Adaptor
(Female thread imperial x Male end metric)



MHD Size O/D (mm x ins)	A (mm)	B (mm)	C (mm)
16 x 1/2”	27	16	34.5
20 x 3/4”	32	20	37
30 x 1”	41	30	39
38 x 1 1/2”	55	38	50
44.5 x 1 1/2”	55	44.5	47
57 x 2”	70	57	51

Female Adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

MEP – 8 MHD
Male Adaptor
(Male thread imperial x Male end metric)



MHD Size O/D (mm x ins)	A (mm)	B (mm)	C (mm)	D (mm)
16 x 1/2”	27	16	32	21
20 x 3/4”	34	20	36	24
25 x 1”	42	25	39	26
30 x 1 1/4”	51	30	43	28
38 x 1 1/2”	55	38	50	30
44.5 x 1 1/2”	55	44.5	50	30
57 x 2”	70	57	51	32

Male Adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

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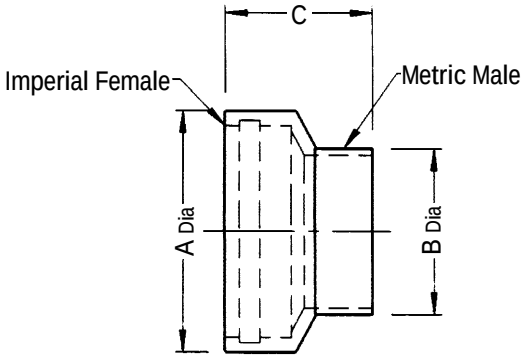
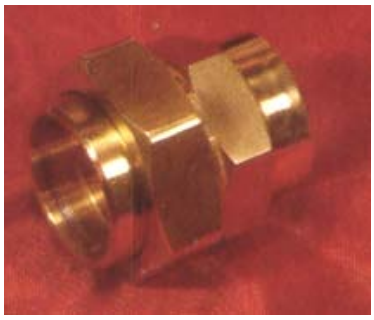
MEP – 9 MHD
Imperial / Metric Adaptor
(Female capillary imperial x Male end metric)

MHD Size (mm x ins)	A (mm)	B (mm)	C (mm)
12 x 3/8”	16	12	21
16 x 1/2”	20	16	24
20 x 3/4”	27	20	25
25 x 1”	34	25	28
30 x 1 1/4”	41	30	33
38 x 1 1/2”	48	38	38
44.5 x 1 1/2”	48	44.5	34
57 x 2”	61	57	43

Imperial / Metric Adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.

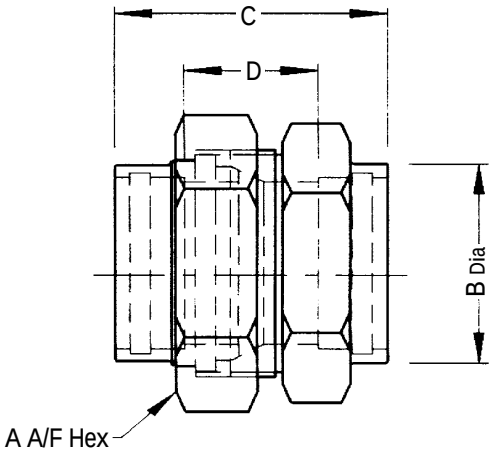


MEP – 11 MHD
Union Connector
(Female capillary x Female capillary)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
8	22.2	12	40	23
12	27	16	49	27
16	32	20.5	42	23.5
20	41	24.7	50	32
25	47	30.2	52	31
30	47	35.7	52	28.5
38	66	45	60	32
44.5	66	52	65	33.5
57	85	66	71	34

Union connectors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.



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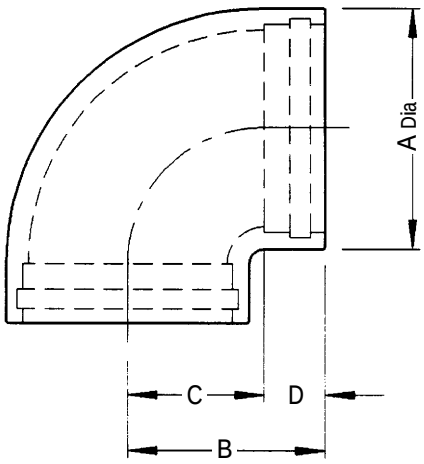
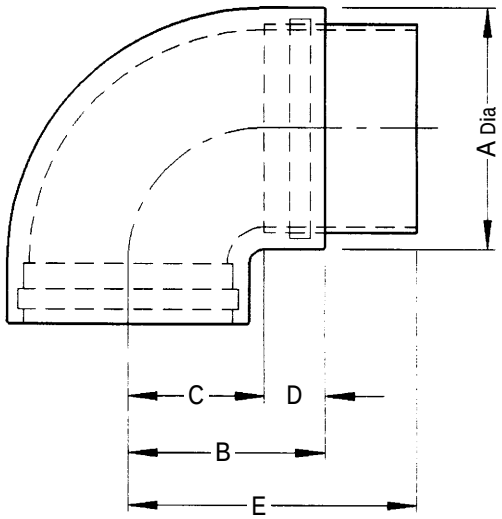
MEP – 12 MHD
Elbow 90°
(Female capillary x Female capillary)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
8	12	15	7.5	7.5
12	16	18.5	10	8.5
16	20.5	21.5	12	9.5
20	24.7	24.5	14.5	10.0
25	30.2	28.5	17.5	11.0
30	35.7	33.5	21.5	12.0
38	45	38.5	24.5	14.0
44.5	52	43.5	28	15.5
57	66	54	36	18.0

90° Elbows in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.

MEP – 12s MHD
Street Elbow 90°
(Female capillary x Male end)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
8	12	15	7.5	7.5	28.5
12	16	18.5	10	8.5	33
16	20.5	21.5	12	9.5	36
20	24.7	24.5	14.5	10.0	40.5
25	30.2	28.5	17.5	11.0	47.5
30	35.7	33.5	21.5	12.0	53.5
38	45	38.5	24.5	14.0	62.5
44.5	52	43.5	28	15.5	69
57	66	54	36	18.0	82

90° Street Elbows in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.

SUPPLIED AS TWO-PART FITTING

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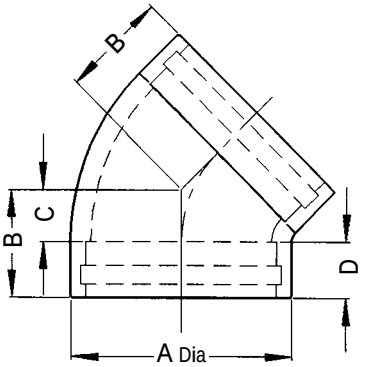
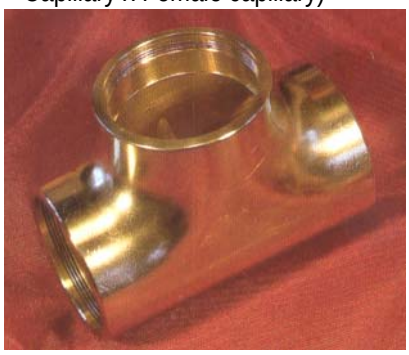
MEP – 21 MHD
Obtuse Elbow 45°
(Female capillary x Female capillary)

MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
16	21	14.70	5.20	9.5
20	26	16.25	6.25	10.0
25	30	19.10	8.10	11.0
30	36	20.25	8.25	12.0
38	45	24.50	10.50	14.0
44.5	52	27.10	11.60	15.5
57	66	33	15.00	18.0

45° Elbows in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.

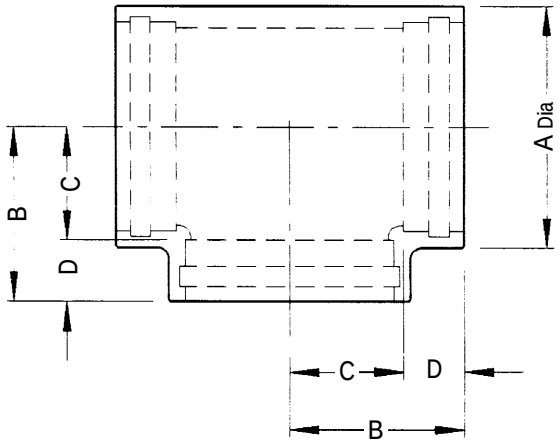


MEP – 24 MHD
Equal Teepiece
(Female capillary x Female Capillary x Female capillary)

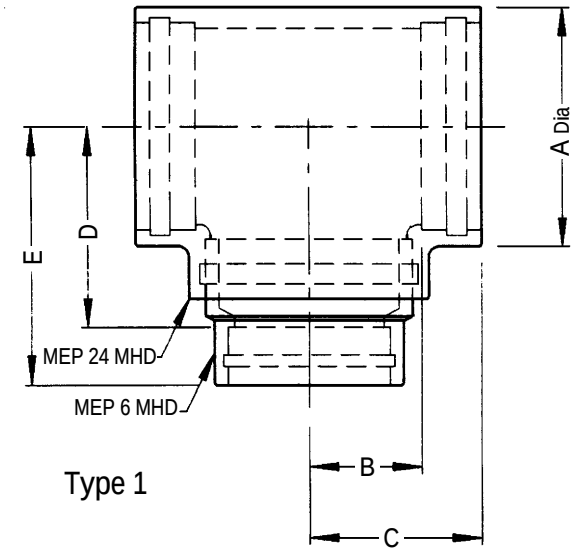


MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
8	12	15	7.5	7.5
12	16	18	10	8.0
16	20.5	21.2	12.2	9.0
20	24.7	24.3	14.8	9.5
25	30.2	28.3	17.8	10.5
30	35.7	33.3	21.8	11.5
38	45	38.2	25	13.2
44.5	52	43.2	28.2	15.0
57	66	54.7	36.7	18.0

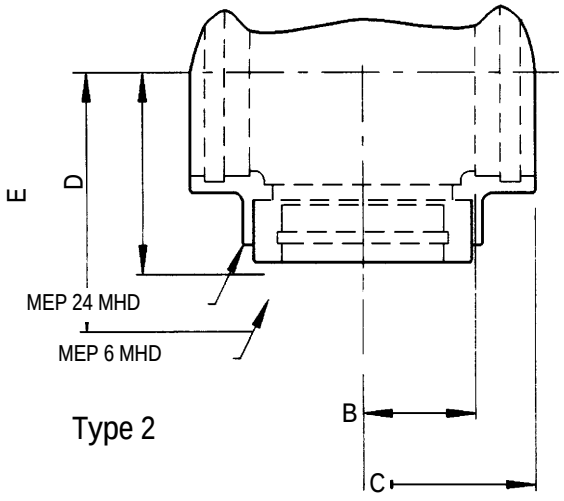
Equal teepieces in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.



MEP – 25 MHD
Reducing AND Un-equal Teepiece
(Female capillary x Female
Capillary x Female capillary)



Type 1

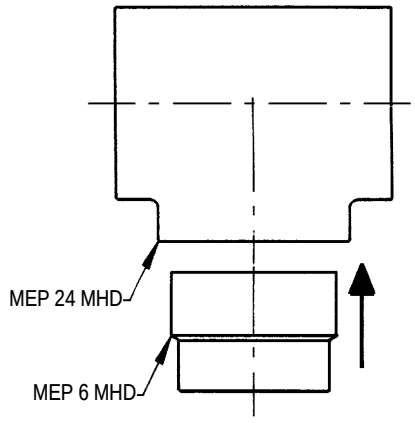


Type 2

MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Type
16 x 16 x 8	20.5	12.2	21.2	21.5	29.0	1
16 x 16 x 12	20.5	12.2	21.2	14.0	22.5	2
20 x 20 x 16	24.7	14.8	24.3	17.1	26.5	2
25 x 25 x 16	30.2	17.8	28.3	20.1	29.5	2
25 x 25 x 20	30.2	17.8	28.3	19.6	29.5	2
30 x 30 x 20	35.7	21.8	33.3	32.6	42.5	1
30 x 30 x 25	35.7	21.8	33.3	23.6	34.5	2
38 x 38 x 16	45.0	25.0	38.2	38.0	47.5	1
38 x 38 x 20	45.0	25.0	38.2	38.5	48.5	1
38 x 38 x 25	45.0	24.0	38.2	38.5	50.0	1
38 x 38 x 30	45.0	25.0	38.2	27.5	39.5	2
44.5 x 44.5 x 16	52.0	28.2	43.2	44.0	53.5	1
44.5 x 44.5 x 30	52.0	28.2	43.2	43.5	55.5	1
57 x 57 x 38	66.0	36.7	54.7	54.5	68.5	1
57 x 57 x 44.5	66.0	36.7	54.7	40.5	55.5	2

Reducing and Un-equal teepieces in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.

SUPPLIED AS TWO (OR MORE) FITTINGS



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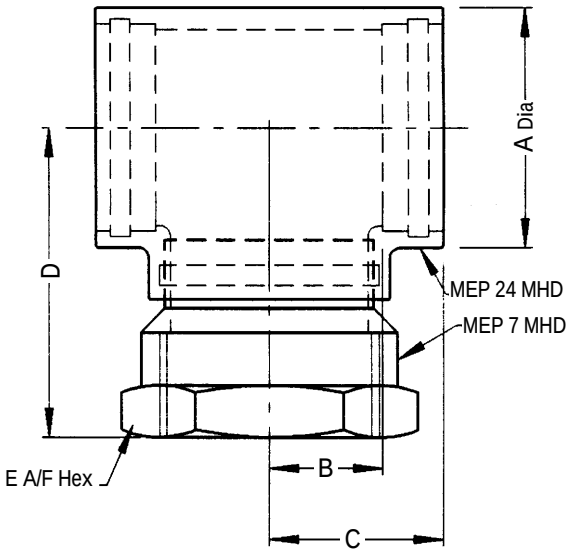
MEP – 30 MHD
Teepiece with Screwed branch
(Female capillary x Female
Capillary x Female parallel thread)

MHD Size (mm x mm x ins)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
16 x 16 x 1/2”	20.5	12.2	21.2	45	27
20 x 20 x 3/4”	24.7	14.8	24.3	50	32
30 x 30 x 1”	35.7	21.8	33.3	55	41
38 x 38 x 1 1/2”	45.0	25.0	38.2	65	55
44.5 x 44.5 x 1 1/2”	52.0	28.2	43.2	70	55
57 x 57 x 2”	66.0	36.7	54.7	85	70

Female adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.

BSPT, API, NPT and METRIC threads are available.

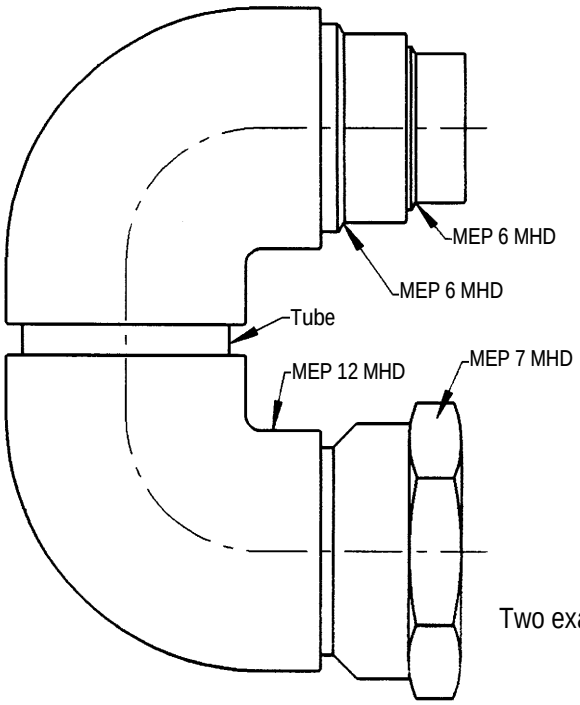
SUPPLIED AS TWO (OR MORE) FITTINGS

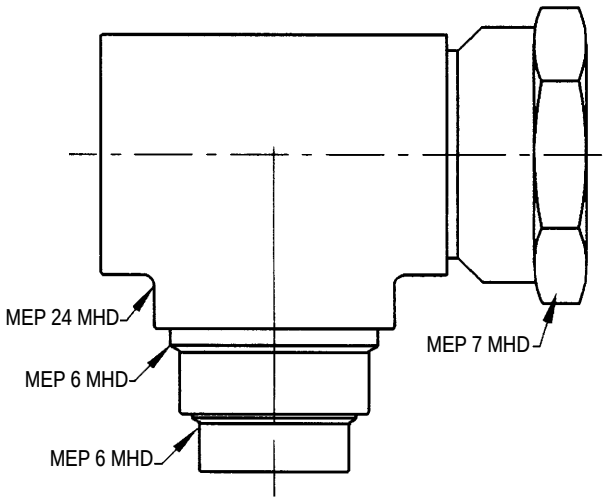


By adding to a standard Marine High Duty (and General High Duty) fittings a vast range of “NEW” products can be generated by the Designer and Pipe Engineer to successfully meet all eventualities.

For example the an equal tee piece MEP 24 MHD (GHD) can be altered by using one, or more, reducing couplings MEP 6 MHD (GHD) to give a smaller tube entry or an adaptor MEP 7 MHD (GHD) to give a female screwed connection.

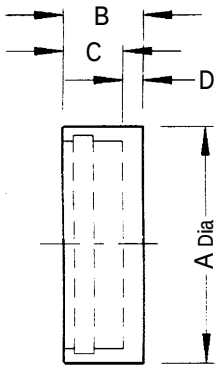
The range is only limited by the requirements of the user.





Two examples of assemblies showing the inherent versatility of the fittings

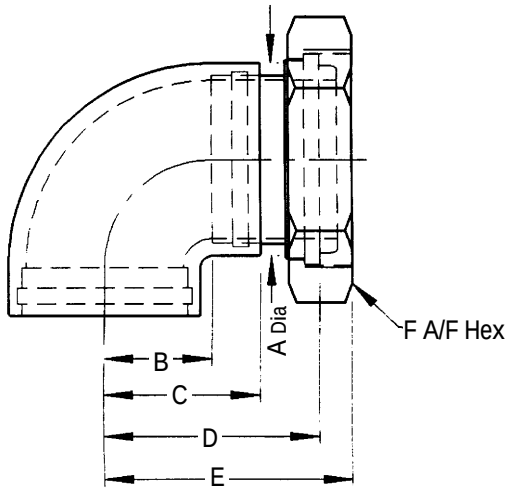
MEP – 61 MHD
Stop End
(Female capillary x Blind)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
8	12.5	12.5	7.5	5
12	15.7	13	8.0	5
16	20.0	14	9.0	5
20	24.0	15	9.5	5.5
25	30.0	16	10.5	5.5
30	35.0	17	11.5	6
38	44.0	20	13.2	6.8
44.5	51.0	23.5	15.0	8.5
57	65.0	28	18.0	10

Stop ends in sizes other than above are available.
Sizes in millimetres unless otherwise stated.

MEP – 64 MHD
Bent Union Adaptor
(Female capillary x Union nut)



MHD Size O/D (mm x ins)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Type
8 x 3/8"	12.0	7.5	15	23.0	31.5	22.2	1
12 x 1/2"	16.0	10	18.5	29.0	40.0	27.0	1
16 x 3/4"	20.5	12	21.5	41.5	51.0	32.0	2
20 x 1"	24.7	14.5	24.5	44.5	55.5	41.0	2
25 x 1 1/4"	30.2	17.5	28.5	51.0	62.5	48.0	2
30 x 1 1/4"	35.7	21.5	33.5	55.0	66.5	48.0	2
38 x 1 3/4"	45.0	24.5	38.5	61.0	72.5	60.0	2

Bent Union Adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

Type 1 supplied as two fittings (TWO PARTS)
Type 2 supplied as two fittings (THREE PARTS)

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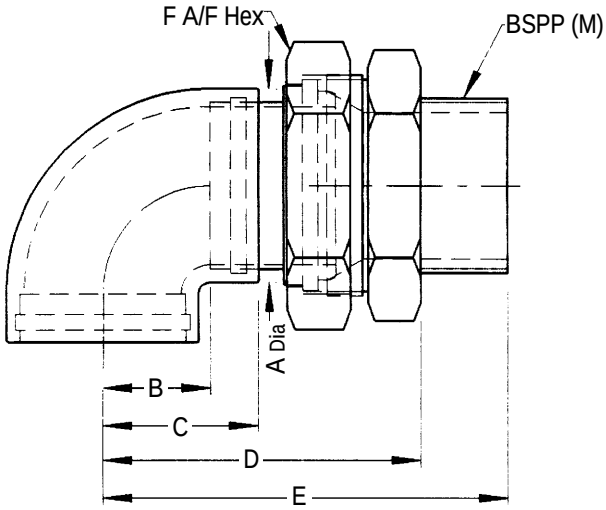
MEP – 65 MHD
Bent Union Connector
(Female capillary x Male parallel thread)

MHD Size O/D (mm x ins)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Type
8 x 1/4"	12.0	7.5	15	40.5	49.0	22.2	1
12 x 3/8"	16.0	10	18.5	51.5	61.5	27.0	1
16 x 1/2"	20.5	12	21.5	65.0	73.5	32.0	2
20 x 3/4"	24.7	14.5	24.5	74.0	84.5	41.0	2
25 x 1"	30.2	17.5	28.5	81.5	93.0	48.0	2
30 x 1 1/4"	35.7	21.5	33.5	85.5	99.0	48.0	2
38 x 1 1/2"	45.0	24.5	38.5	96.0	111.0	60.0	2

Bent Union Connectors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

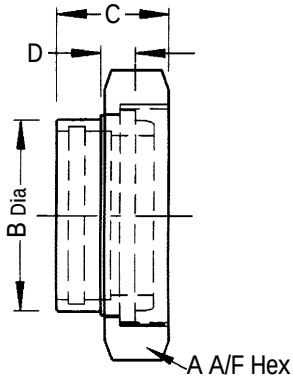
Type 1 supplied as three fittings (THREE PARTS)
Type 2 supplied as three fittings (FOUR PARTS)



MEP – 68 MHD
Straight Union Adaptor
(Female capillary x Union nut)

MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
6 x 1/4"	19.0	9.5	19.0	4.0
8 x 3/8"	22.2	11.7	19.5	4.0
12 x 1/2"	27.0	15.7	22.5	4.0
16 x 3/4"	32.0	20.0	23.0	4.0
20 x 1"	41.0	24.0	27.0	6.5
25 x 1 1/4"	48.0	30.0	29.0	6.5
30 x 1 1/4"	48.0	35.0	29.0	6.0
38 x 1 3/4"	60.0	44.0	34.0	8.5
44.5 x 2"	66.0	51.0	35.0	8.0
57 x 2 1/2"	85.0	65.0	38.0	8.0

Straight Union Adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.



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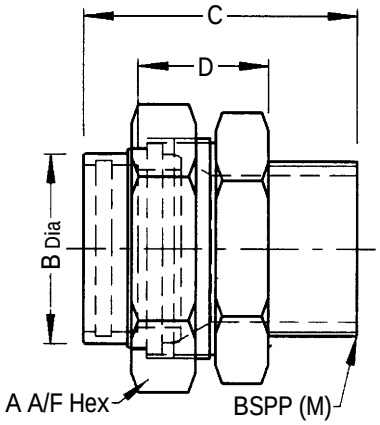
MEP – 69 MHD
Straight Male Union Connector

(Female capillary x Male parallel thread)

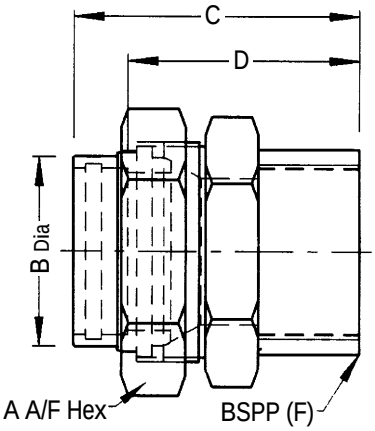


MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
6 x 1/8”	19.0	9.5	34.0	20.0
8 x 1/4”	22.2	11.7	39.5	23.5
12 x 3/8”	27.0	15.7	46.0	27.5
16 x 1/2”	32.0	20.0	46.5	27.0
20 x 3/4”	41.0	24.0	56.5	35.0
25 x 1”	48.0	30.0	59.5	36.5
30 x 1 1/4”	48.0	35.0	62.5	35.5
38 x 1 1/2”	60.0	44.0	72.0	41.5
44.5 x 1 1/2”	66.0	51.0	76.0	44.0
57 x 2”	85.0	65.0	79.5	43.0

Straight Male Union Adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

MEP – 69F MHD
Straight Female Union Connector

(Female capillary x Female parallel thread)



MHD Size O/D (mm)	A (mm)	B (mm)	C (mm)	D (mm)
6 x 1/8”	19.0	9.5	41	33.5
8 x 1/4”	22.2	11.7	41	33.0
12 x 3/8”	27.0	15.7	45	36.0
16 x 1/2”	32.0	20.0	50	40.0
20 x 3/4”	41.0	24.0	53	43.0
25 x 1”	48.0	30.0	58	47.0
30 x 1 1/4”	48.0	35.0	61	49.0
38 x 1 1/2”	60.0	44.0	68	54.0
44.5 x 1 1/2”	66.0	51.0	70	54.5
57 x 2”	85.0	65.0	79	61.0

Straight Female Union Adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

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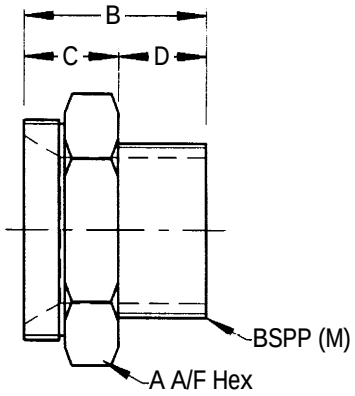
MEP – 70 MHD
Male Nipple
(Union thread 60° Cone x Male parallel thread)

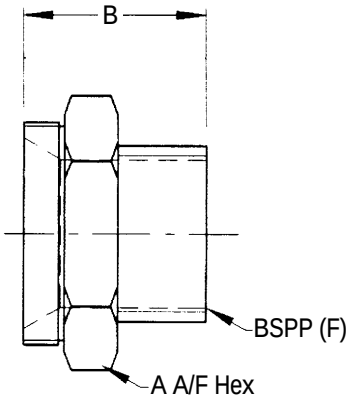
MHD 60° Cone x Male thread	A (mm)	B (mm)	C (mm)	D (mm)
1/4" x 1/8"	17.0	21.0	14.0	7.0
3/8" x 1/4"	19.0	23.0	14.5	8.5
1/2" x 3/8"	22.0	29.0	19.0	10.0
3/4" x 1/2"	27.0	30.0	20.0	10.0
1" x 3/4"	36.0	37.0	25.5	11.5
1 1/4" x 1"	46.0	40.0	26.8	13.2
1 1/4" x 1 1/4"	46.0	41.0	27.0	14.0
1 3/4" x 1 1/4"	50.0	42.0	27.0	15.0
1 3/4" x 1 1/2"	55.0	47.5	31.0	16.5
2" x 1 1/2"	60.0	50.0	33.5	16.5
2 1/2" x 2"	70.0	50.5	32.5	18.0



Male Nipples in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

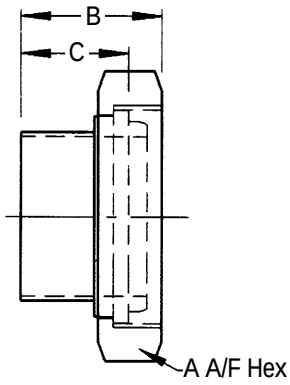
MEP – 72 MHD
Female Nipple
(Union thread 60° Cone x Female parallel thread)

MHD 60° Cone x Male thread	A (mm)	B (mm)
3/8" x 1/4"	17.0	25.0
1/2" x 3/8"	22.0	27.5
3/4" x 1/2"	27.0	33.0
1" x 3/4"	36.0	44.0
1 1/4" x 1"	41.0	52.0
1 1/2" x 1 1/4"	48.0	60.0



Female Nipples in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

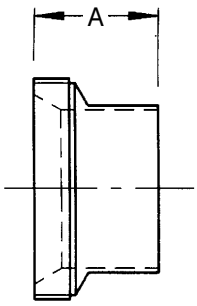
MEP – 75 MHD
Nut and Liner
(Male end (Liner) x Union nut)



MHD O/D (mm) x Female thread	A (mm)	B (mm)	C (mm)
8 x 3/8”	22.2	30	22.0
12 x 1/2”	27.0	32	21.5
16 x 3/4”	32.0	40	30.0
20 x 1”	41.0	42	30.5
25 x 1 1/4”	48.0	46	34.0
30” x 1 1/4”	48.0	46	34.0
38 x 1 3/4”	60.0	49	37.0

Nuts and Liners in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

MEP – 77 MHD
Union Adaptor
(Union thread 60° Cone x Male end)



MHD 60° Cone x Male thread	A (mm)
12 x 1/2”	22.0
16 x 3/4”	23.0
20 x 1”	26
25 x 1 1/4”	28.5
30 x 1 1/4”	28.0
30 x 1 1/2”	28.0

Union Adaptors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.
BSPT, API, NPT and METRIC threads are available.

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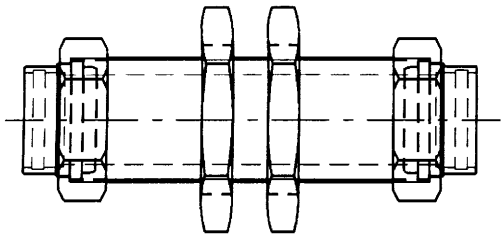
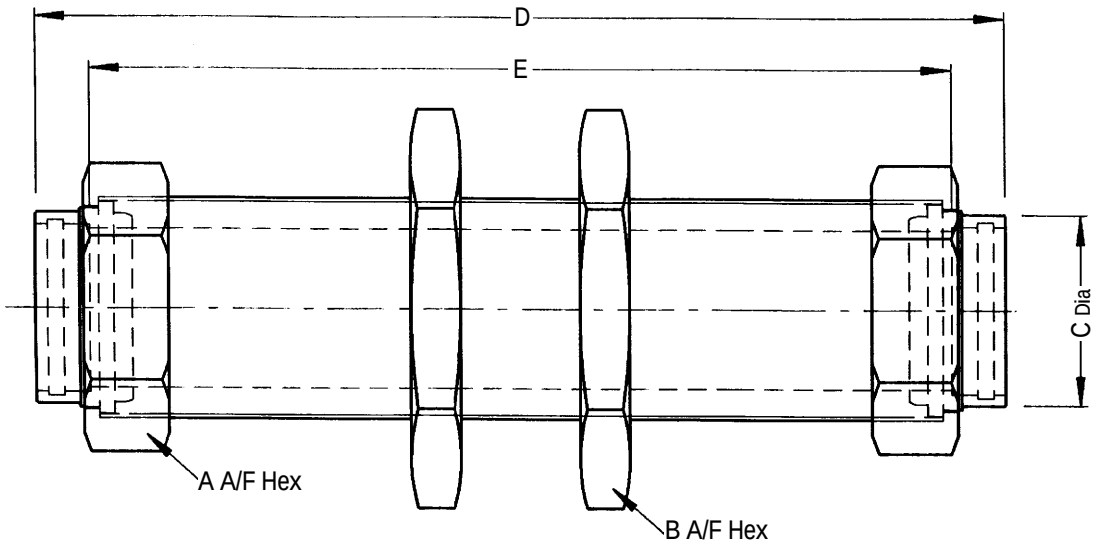
MEP – 150 MHD
Straight Union Connector
(Capillary end x Capillary end)



MHD O/D (mm) x I/D (ins)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
12 x 1/2”	27	36	16.0	105.8	88.8
16 x 3/4”	32	41	20.5	110.3	91.3
20 x 1”	41	50	24.7	117.8	97.8
25 x 1 1/4”	48	60	30.2	124.3	102.3
30 x 1 1/4”	48	60	35.7	124.3	102.3

Straight Union Connectors in sizes other than above are available.
Imperial/Imperial and Imperial/Metric combinations are available on request.
Sizes in millimetres unless otherwise stated.



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Instructions for making silver brazing joints between Nickel copper iron and Gunmetal, Aluminium brass and Gunmetal. (Using internal silver brazing rings)

SAFETY

ALL work will be carried out using CORRECT and SERVICABLE protective equipment and with due regard to safe working practises.

EQUIPMENT

Easy-Flo flux, a small brush for application and a container for mixing)
Fine toothed hacksaw)
Smooth file) ALL the listed equipment can
Deburing tool)be supplied as a “Starter” or “Consumer”
Grade "0 sand paper (or alumina based paper or cloth)) KITS of parts.
Wire brush)
Silver brazing alloy to BS1845 AG14)

PROCEEDURE

FLUX

MIX Only the amount of flux required for immediate use with clean water into a creamy paste.
NOTE: - To preserve the flux in a dry condition use only the amount required and reseal the container immediately.

METAL PARTS

Select the fitting and tube to be used, inspect all parts to ensure that they are clean and have all their silver brazing rings in place.
Ensure that the tube is of the correct size.
Ensure that the insertion length is allowed in the overall length of the tube and that the ends are square and de-burred inside and out.
should the tube require cutting use a fine toothed hacksaw and NOT a rotary cutter which will effect the end diameter of the tube.
Clean the outside of the male and the inside and end face of the female part using the grade "0" sand paper.

FLUX APPLICATION

Apply the flux evenly, using the brush, to the inside diameter of the female part and the outside diameter of the male part (to a length in excess of the socket depth).

ASSEMBLY

Insert the male part into the female part, up to the stop, using a twisting action to ensure even distribution of the flux. Ensure all parts correctly aligned and supported to prevent stresses being created during the silver brazing, which may lead to distortion and/or cracking while cooling.

HEAT SOURCE

The heat source MUST be adequate to heat the parts gently and evenly to the temperature required using a large soft, neutral or slightly reducing flame.
For joints under 25mm the preferred heating method is a large blow lamp, air/propane, oxy propane or air/gas touch.
For joints of 25mm and over the preferred method is an air/propane. oxy/propane or air / gas touch.

MAKING THE JOINT

Make the joint by GENTLY heating the tube and fitting with torch movements to prevent local overheating. Continue to apply the heat (up to approximately 670 deg C, red-heat in poor daylight) until a complete ring of molten silver braze appears around the end of the female part. continue heating for a few seconds and then remove the heat source and allow to cool naturally without interference.

Do NOT quench.

If for any reason a complete ring of silver braze is not obtained. Continue with the heat source and end feed the joint with silver braze until the ring is complete.

CLEANING

After cooling any remaining flux MUST be removed. This may be accomplished by using a steel wire brush, an abrasive or hot water. Oxide films may be removed by abrasive or chemical methods.

INSPECTION

Inspect the joint to ensure a complete, smooth ring of silver braze. If any fault is found reflux, carefully reheat and end feed into the effected area.

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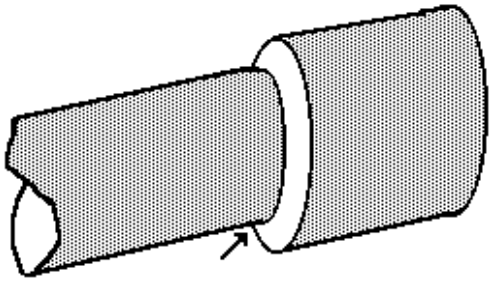
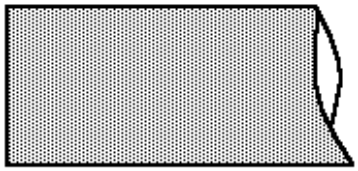
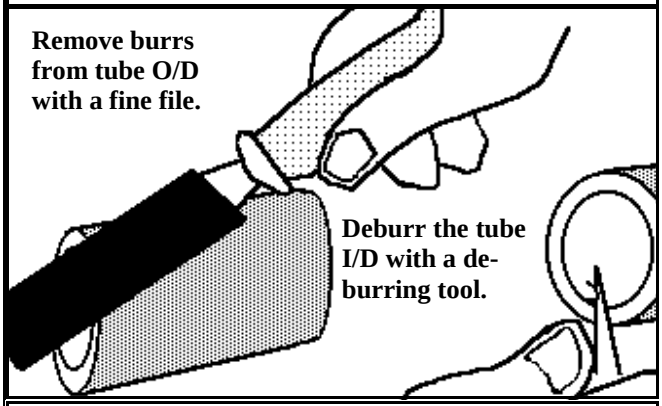


Ensure that the tube is of the correct fit.

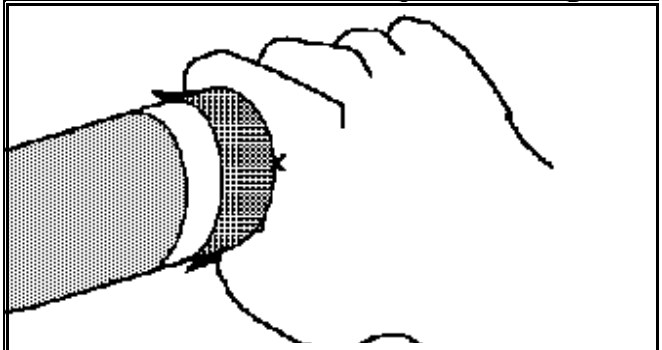


Ensure that the tube is cut square.

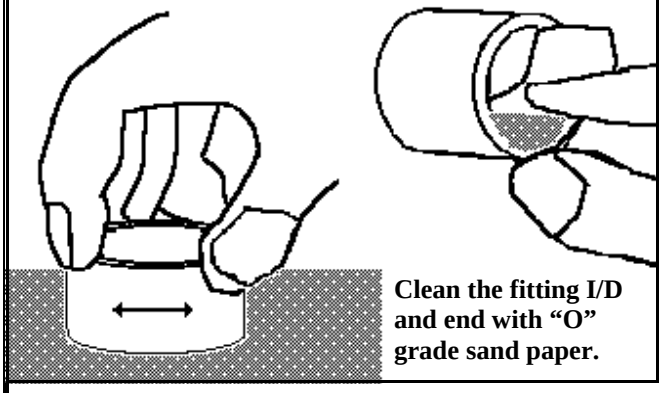
Remove burrs from tube O/D with a fine file.



Deburr the tube I/D with a de-burring tool.

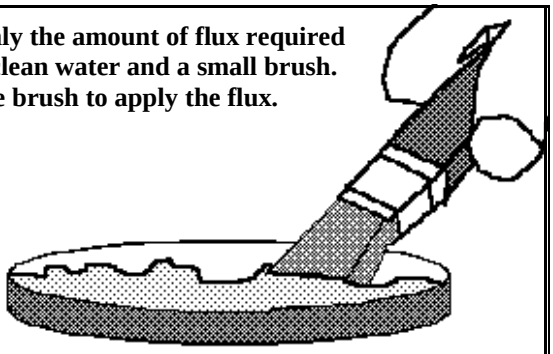


Clean the tube O/D with "O" grade sand paper.

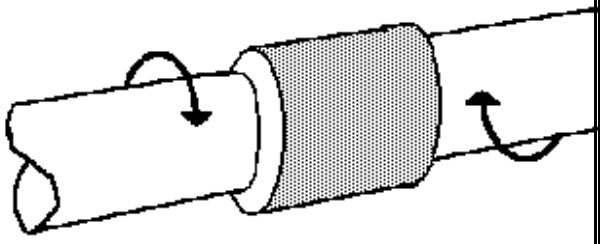


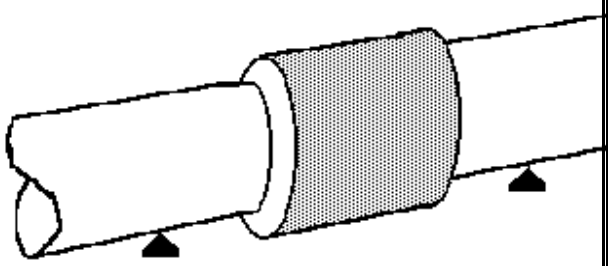
Clean the fitting I/D and end with "O" grade sand paper.

Mix only the amount of flux required using clean water and a small brush. Use the brush to apply the flux.



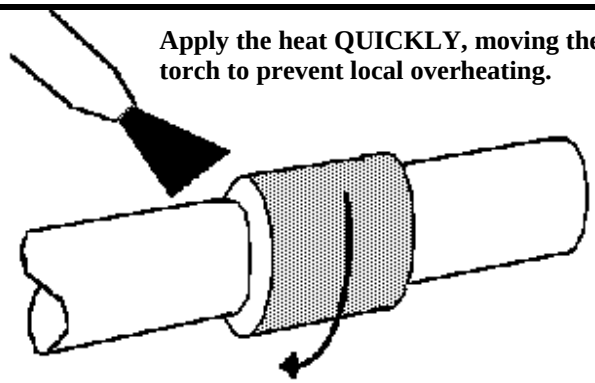
Assemble male and female parts with rotary action to evenly spread the flux.



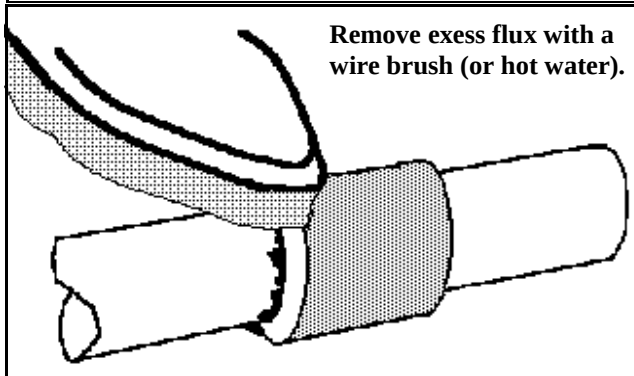


Adequately support the assembly during silver brazing and cooling.

Apply the heat QUICKLY, moving the torch to prevent local overheating.



Remove exess flux with a wire brush (or hot water).



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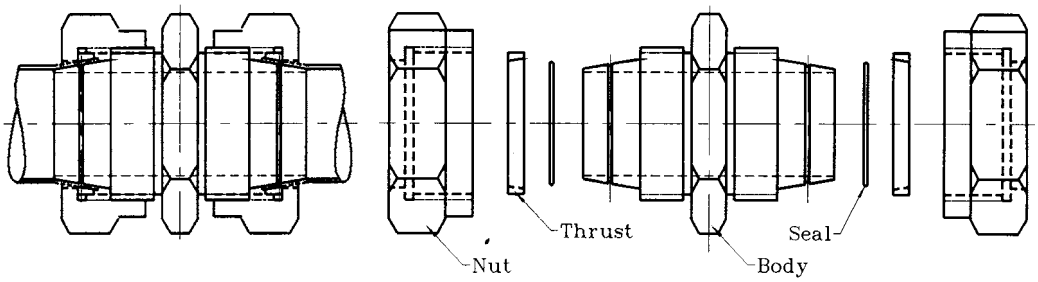
MEP - Non- Spark Unions

For ue in areas and tanks that are NOT gas free - FLAMELESS REPAIRS

MEP 11 SU (STRAIGHT TAPER UNION)

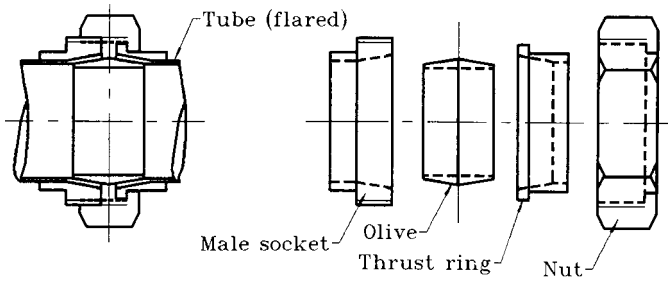


Method of use: -
After sliding the Nut and Thrust washer over each tube, the tube is flared. Flaring tools are available from stock.
The Body with it's two high temperature, Teflon (PTFE) "O" rings are inserted into the end of each tube and the Nuts tightened against the centre hexagon.

The tubes seals against the two tapers with the "O" ring giving extra security

Please inform the tube size (O/D and WT) when ordering
(Size range to suit 16 to 57 O/D Tube)

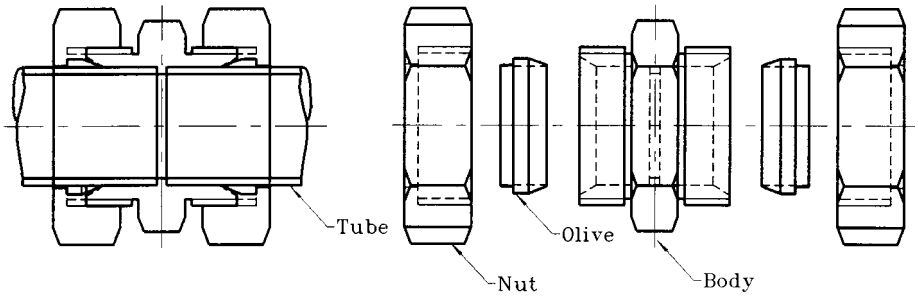
MEP 11 TU TANKER UNION



Method of use: -
After sliding the Nut over one tube and the Thrust ring over the other, both tubes are flared. Flaring tools are available from stock.
Paint the outside of the Olive with a proprietary jointing compound (e.g. Stag).
Introduce the Olive into both tubes and tighten the Nut to the Thrust ring.

Please inform the tube size (O/D and WT) when ordering
(Size range to suit 16 to 57 O/D Tube)

MEP 11 FC (FULL COMPRESSION UNION - external seal)



Method of use: -
Ensure that the tube's outer surface is in good condition and free from pitting. The MEP - 11FC fitting uses two Olives and is sealed by the force exerted on the pipe by the two Olives. Due to the differential tapers of the Body and the Olives, which "bite" into the tube to form the seal.
The fitting acts, and is used in the same way as an ordinary compression fitting. NO flaring is required.

Please inform the tube size (O/D and WT) when ordering
(Size range to suit 16 to 57 O/D Tube)

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MEP – Tube manipulation and services: -

We have a vast knowledge and experience in the Design, Supply and Installation of Cargo/Product heating and pipe systems through our involvement with major Oil and Chemical companies world-wide, on Ships, Oil rigs and Land installations. We stock the necessary tube, flanges, fittings, valves and ancillary items to allow us to manufacture, quickly and efficiently, in all materials to our clients needs.

Our experienced personnel, fully comprehensive workshops, outside contracting facilities and the availability of stock materials make us the leader in our field.

Our experienced personnel will visit the Site or Vessel and obtain all the necessary information and dimensions to prepare, either on—board or in our own Technical Department, drawings, sketches and data to the requirements of the owner and with due regard for the "Class" approval.

On completion of the drawings we will quote an exact Bill of Materials with ALL manufacturing and installation costs along with a time schedule.

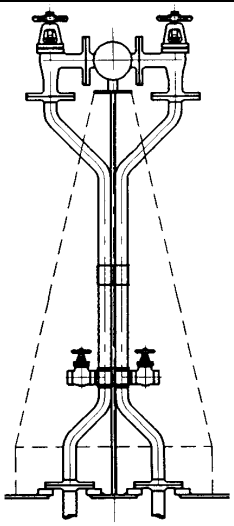
Our Technicians, using Computer Aided Design facilities, and Craftsmen will manufacture all parts in our modern, well equipped, workshops to the highest standards ensuring that the installation will be complete with ALL necessary Pipe Supports, Valves and where required Expansion joints. (three types are shown below)

MEP Deck Control Unit for Cargo and Product Heating Systems

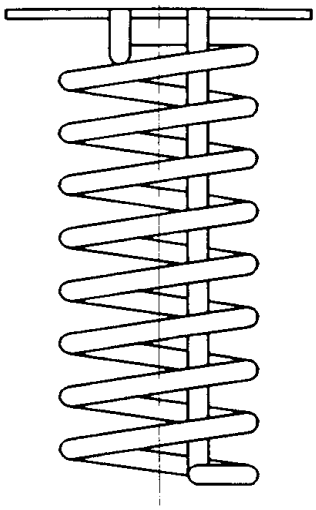
The deck control units are manufactured in a variety of materials and configurations to suit individual requirements. Designs allow the units to have from two (2) to ten (10) isolating valves in both the Steam side and the Return side. Normally the Steam side is fitted with a master control valve to isolate the whole deck unit and the tank heating associated with it (isolating valves can also be fitted to the Return side, if required).
Each leg of the Return side is fitted with a test valve to allow observations to be made if it is suspected that an individual heating unit is damaged.

Conventional Cargo/Product heating is achieved by the insulation of grids and trace lines with all of the associated fittings. Installations, normally are fitted with condensate lift fittings to clear water from the systems. All necessary pipe clips are supplied and fitted, as appropriate. The pipe clips can be supplied with insulated bases, if required.

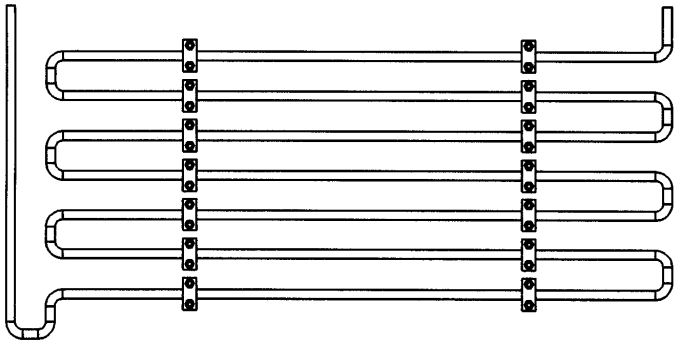
All work is carried out to "Class" approvals.



Deck Control Unit

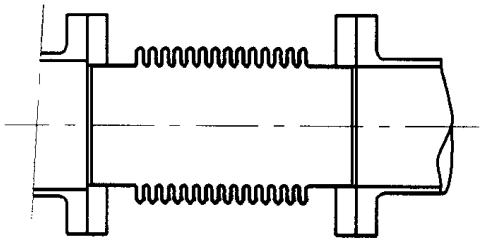


Tank Heating Coil

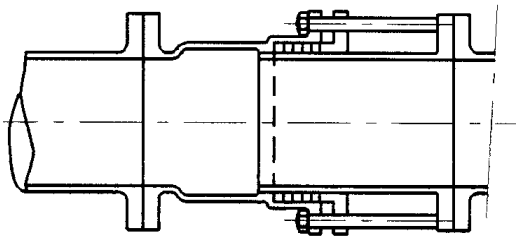


Conventional Heating Grid

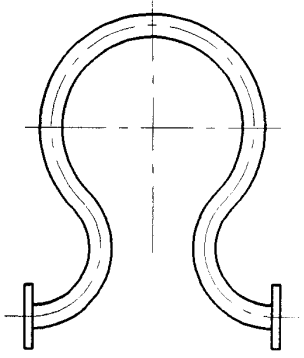
MEP – Expansion Joints. Manufactured in ALL materials and ALL sizes.



Bellows (with or without inner sleeve)



Sliding Sleeve (Single or Double)



Omega Loop