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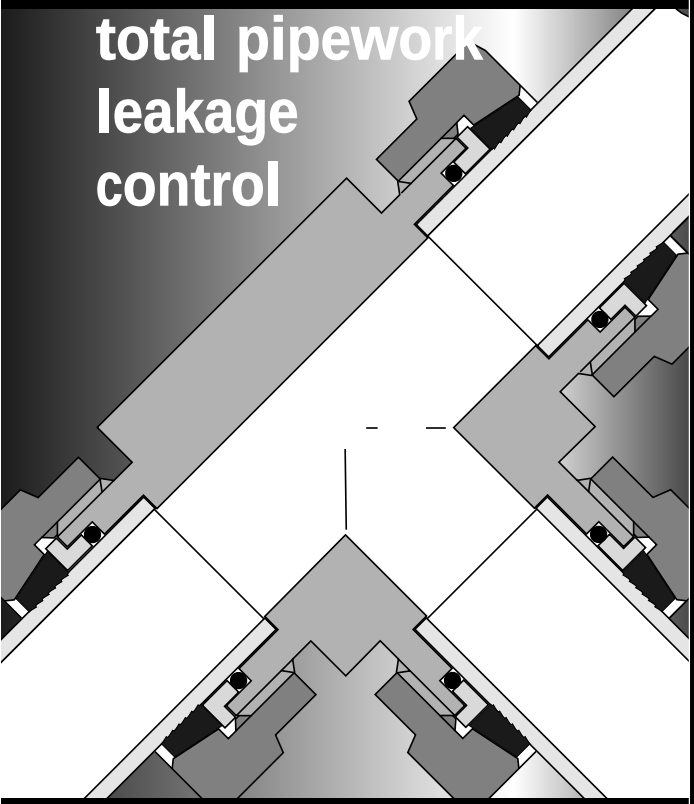
total pipework leakage control



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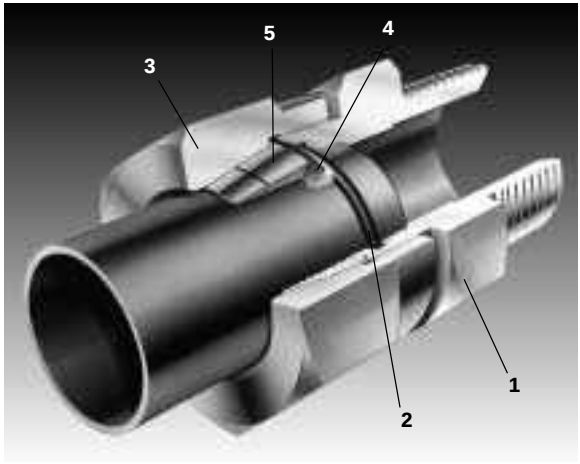
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

Benefits

- Leak free - "O" ring seal
- Safe joint every time – low tightening torque and clamping force rises with the internal pressure.
- Low installed cost – no welding (so inert gas purging, NDT and excessive flushing are not required), minimal tube preparation and no special assembly equipment are required.
- Demountable and reusable. Can be used with most tube materials.



Features

1. Body – mild or stainless steel or cupro-nickel, compatible with most fluids and environments. Locates O ring and tube.
2. O-ring – nitrile, FPM (viton), EP or FEP encapsulated FPM, compatible with most fluids, highly resistant to leakage even under severe vibration, pressure pulsation and temperature cycling. Provides diametric seal between tube O/D and body cavity.
3. Nut – mild or stainless steel or cupro-nickel, compatible with most environments. Closes split collet and retains sealing mechanism.
4. Back-up washer – mild or stainless steel or cupro-nickel. Provides additional support for the tube and locates the O-ring.
5. Split collet – mild or stainless steel or cupro-nickel. Clamping force rises with pressure. Large clamping area ensures minimal deformation of the tube. Retains tube in position.

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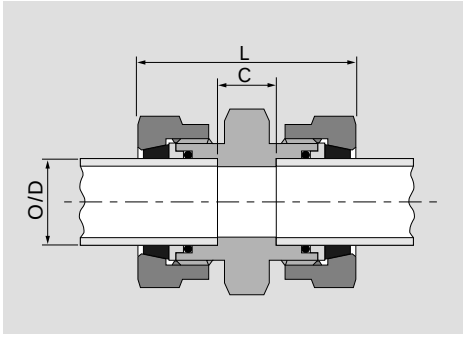

Straight Coupling

O/D mm	Part No	Dimensions - mm C	L	Nut	Body
6	**AM6CR**	**14**	**44**	**16**	**14**
8	**AM8CR**	**14**	**44**	**17**	**17**
10	**AM10CR**	**10**	**54**	**27**	**27**
12	**AM12CR**	**10**	**54**	**27**	**27**
16	**AM16CR**	**11**	**57**	**32**	**27**
20	**AM20CR**	**13**	**73**	**41**	**36**
22	AM22CR	13	73	41	41
25	**AM25CR**	**17**	**76**	**46**	**41**
30	**AM30CR**	**22**	**89**	**50**	**46**
38	**AM38CR**	**29**	**105**	**60**	**55**
50	**AM50CR**	**37**	**137**	**80**	**80**

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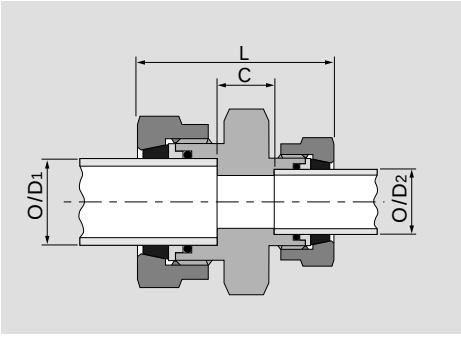

Straight Reducing Coupling

O/D mm		Part No	Dimensions - mm		Nut	Nut	Body
1	2		C	L	1	2	
8	6	AM8-M6RR	14	44	17	16	17
10	8	AM10-M8RR	13	50	27	17	27
10	6	AM10-M6RR	13	50	27	16	27
12	10	AM12-M10RR	10	54	27	27	27
12	8	AM12-M8RR	13	50	27	17	27
16	12	AM16-M12RR	11	57	32	27	27
16	10	AM16-M10RR	11	57	32	27	27
16	8	AM16-M8RR	14	52	32	17	27
20	16	AM20-M16RR	14	67	41	32	36
20	12	AM20-M12RR	14	66	41	27	36
20	10	AM20-M10RR	14	66	41	27	36
25	20	AM25-M20RR	16	77	46	41	41
25	16	AM25-M16RR	16	68	46	32	41
25	12	AM25-M12RR	16	69	46	27	41
30	25	AM30-M25RR	21	84	50	46	46
30	20	AM30-M20RR	19	83	50	41	46
38	30	AM38-M30RR	27	98	60	50	55
38	25	AM38-M25RR	25	93	60	46	55

CARBON STEEL
STAINLESS STEEL
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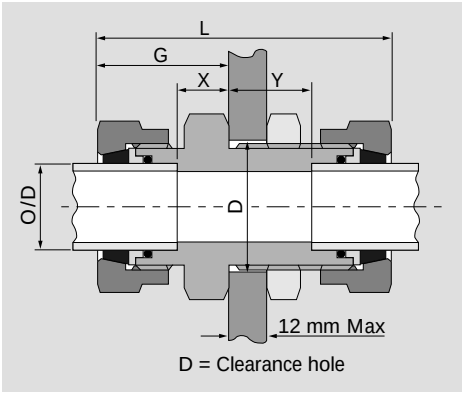

Straight Bulkhead Coupling

O/D mm	Part No	Dimensions - mm D	G	L	X	Y	Nut	Body
6	AM6BPR	14	25	67	10	27	16	17
8	**AM8BPR**	**16**	**25**	**67**	**10**	**27**	**17**	**17**
10	AM10BPR	24	30	76	8	24	27	27
12	**AM12BPR**	**24**	**30**	**76**	**8**	**24**	**27**	**27**
16	**AM16BPR**	**27**	**33**	**82**	**10**	**25**	**32**	**32**
20	**AM20BPR**	**37**	**46**	**101**	**16**	**32**	**41**	**41**
22	AM22BPR	37	43	99	13	25	41	41
25	**AM25BPR**	**40**	**49**	**109**	**18**	**34**	**46**	**41**
30	AM30BPR	46	51	115	18	32	50	50
38	AM38BPR	52	62	134	23	34	60	60
50	AM50BPR	71	79	171	29	42	80	80

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CARBON STEEL
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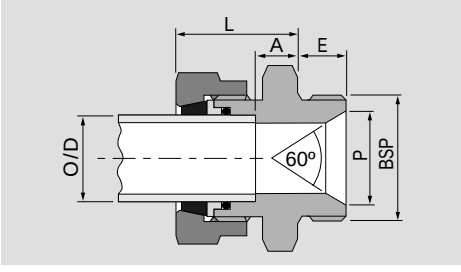

Male Stud Coupling BSP

O/D mm	Stud BSP	Part No	Dimensions - mm A	E	L	P	Nut	Body
6	**¼"**	**AM6-4MSCR**	**11**	**11**	**26**	**11**	**16**	**19**
6	⅜"	AM6-6MSCR	13	13	28	14	16	22
8	**⅛"**	**AM8-2MSCR**	**11**	**10**	**26**	**8**	**17**	**17**
8	**¼"**	**AM8-4MSCR**	**11**	**11**	**26**	**11**	**17**	**19**
8	**⅜"**	**AM8-6MSCR**	**13**	**13**	**28**	**14**	**17**	**22**
10	**¼"**	**AM10-4MSCR**	**10**	**11**	**32**	**11**	**27**	**27**
10	**⅜"**	**AM10-6MSCR**	**10**	**13**	**32**	**14**	**27**	**27**
10	**½"**	**AM10-8MSCR**	**10**	**16**	**32**	**18**	**27**	**27**
12	**⅜"**	**AM12-6MSCR**	**10**	**13**	**32**	**14**	**27**	**27**
12	**½"**	**AM12-8MSCR**	**10**	**16**	**32**	**18**	**27**	**27**
12	¾"	AM12-12MSCR	11	19	33	23	27	33
16	**⅜"**	**AM16-6MSCR**	**11**	**13**	**34**	**14**	**32**	**27**
16	**½"**	**AM16-8MSCR**	**11**	**16**	**34**	**18**	**32**	**27**
16	**¾"**	**AM16-12MSCR**	**13**	**19**	**36**	**23**	**32**	**33**
20	**½"**	**AM20-8MSCR**	**11**	**16**	**41**	**18**	**41**	**36**
20	**¾"**	**AM20-12MSCR**	**11**	**19**	**41**	**23**	**41**	**36**
20	**1"**	**AM20-16MSCR**	**13**	**21**	**44**	**29**	**41**	**41**
22	¾"	AM22-12MSCR	13	19	44	23	41	41
25	**¾"**	**AM25-12MSCR**	**15**	**19**	**46**	**23**	**46**	**41**
25	**1"**	**AM25-16MSCR**	**15**	**21**	**46**	**29**	**46**	**41**
25	1¼"	AM25-20MSCR	18	21	49	37	46	50
30	**1"**	**AM30-16MSCR**	**19**	**21**	**53**	**29**	**50**	**46**
30	**1¼"**	**AM30-20MSCR**	**19**	**21**	**53**	**37**	**50**	**50**
38	**1"**	**AM38-16MSCR**	**24**	**21**	**62**	**29**	**60**	**55**
38	**1¼"**	**AM38-20MSCR**	**24**	**21**	**62**	**37**	**60**	**55**
38	**1½"**	**AM38-24MSCR**	**24**	**25**	**62**	**43**	**60**	**60**
50	1¼"	AM50-20MSCR	30	21	80	37	80	80
50	**1½"**	**AM50-24MSCR**	**30**	**25**	**81**	**43**	**80**	**80**
50	**2"**	**AM50-32MSCR**	**30**	**30**	**81**	**55**	**80**	**80**

CARBON STEEL
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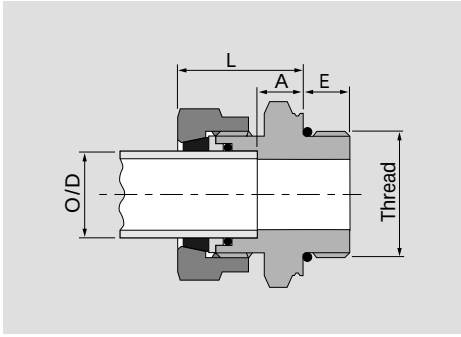

Male Stud Coupling ISO

O/D mm	Stud	Part No	Dimensions - mm A	E	L	Nut	Body
6	M12	AM6-IM12MSCR	10	11.0	26	16	17
8	M14	AM8-IM14MSCR	10	11.0	26	17	19
10	M16	AM10-IM16MSCR	9	12.5	32	27	27
12	M18	AM12-IM18MSCR	9	14.0	32	27	27
16	M22	AM16-IM22MSCR	10	15.0	34	32	27
20	M27	AM20-IM27MSCR	13	18.5	43	41	36
25	M33	AM25-IM33MSCR	15	18.5	46	46	41
30	M42	AM30-IM42MSCR	18	19.0	51	50	50
38	M48	AM38-IM48MSCR	23	21.5	62	60	55
50	M60	AM50-IM60MSCR	29	24.0	79	80	80

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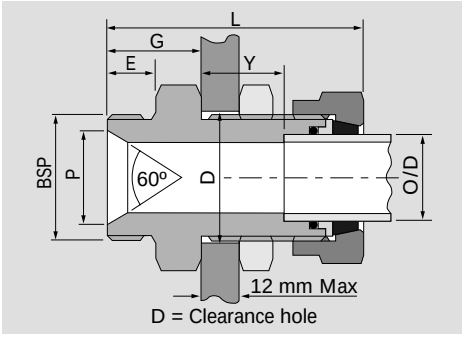
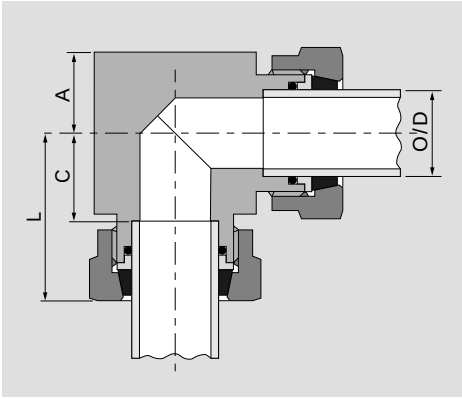


Male Stud Bulkhead Coupling BSP

O/D mm	Stud BSP	Part No	Dimensions - mm D	E	G	L	Y	P	Nut	Body
6	1/4"	AM6-4BHR	14	11	18	60	27	11	16	17
8	**1/4"**	**AM8-4BHR**	**16**	**11**	**18**	**61**	**27**	**11**	**17**	**17**
10	**3/8"**	**AM10-6BHR**	**24**	**13**	**21**	**67**	**24**	**14**	**27**	**27**
12	**3/8"**	**AM12-6BHR**	**24**	**13**	**21**	**67**	**24**	**14**	**27**	**27**
12	**1/2"**	**AM12-8BHR**	**27**	**16**	**25**	**74**	**25**	**18**	**27**	**27**
16	**1/2"**	**AM16-8BHR**	**27**	**16**	**25**	**74**	**25**	**18**	**32**	**32**
20	**3/4"**	**AM20-12BHR**	**37**	**19**	**31**	**87**	**25**	**23**	**41**	**41**
25	**1"**	**AM25-16BHR**	**40**	**21**	**33**	**92**	**28**	**29**	**46**	**41**
30	**1"**	**AM30-16BHR**	**46**	**21**	**35**	**99**	**32**	**29**	**50**	**50**
30	1 1/4"	AM30-20BHR	46	21	38	102	32	37	50	50
38	1 1/4"	AM38-20BHR	52	21	38	110	34	37	60	60
38	**1 1/2"**	**AM38-24BHR**	**52**	**25**	**48**	**120**	**34**	**43**	**60**	**60**



Equal Elbow

O/D mm	Part No	Dimensions - mm A	C	L	Nut	Body
6	**AM6ER**	**8**	**12**	**27**	**16**	**16**
8	**AM8ER**	**10**	**13**	**29**	**17**	**19**
10	**AM10ER**	**13**	**13**	**35**	**27**	**27**
12	**AM12ER**	**13**	**13**	**35**	**27**	**27**
16	**AM16ER**	**16**	**17**	**41**	**32**	**31**
20	**AM20ER**	**21**	**21**	**51**	**41**	**39**
22	AM22ER	21	21	52	41	39
25	**AM25ER**	**20**	**22**	**53**	**46**	**42**
30	**AM30ER**	**24**	**29**	**63**	**50**	**48**
38	**AM38ER**	**27**	**36**	**74**	**60**	**54**
50	**AM50ER**	**38**	**49**	**99**	**80**	**77**

Swivel Elbows
Use a combination of elbows and Stud Standpipes
see page 37

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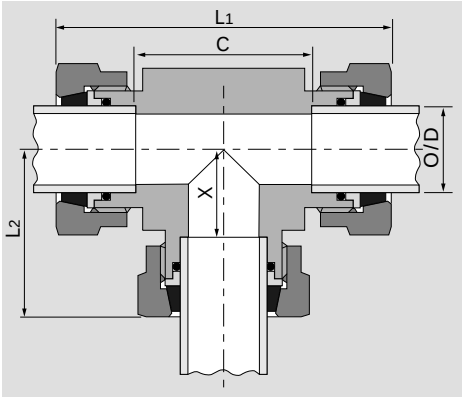

Equal Tee

O/D mm	Part No	Dimensions - mm C	L1	L2	X	Nut	Body
6	**AM6TR**	**24**	**54**	**27**	**12**	**16**	**16**
8	**AM8TR**	**27**	**57**	**29**	**14**	**17**	**19**
10	**AM10TR**	**27**	**71**	**35**	**14**	**27**	**27**
12	**AM12TR**	**27**	**71**	**35**	**14**	**27**	**27**
16	**AM16TR**	**33**	**80**	**40**	**17**	**32**	**30**
20	**AM20TR**	**43**	**103**	**51**	**21**	**41**	**38**
22	AM22TR	43	103	51	21	41	38
25	**AM25TR**	**44**	**104**	**53**	**22**	**46**	**41**
30	**AM30TR**	**59**	**126**	**62**	**29**	**50**	**48**
38	**AM38TR**	**71**	**147**	**74**	**36**	**60**	**54**
50	**AM50TR**	**98**	**199**	**99**	**49**	**80**	**76**

Swivel Tees
Use a combination of Tees and Stud Standpipes
see page 37

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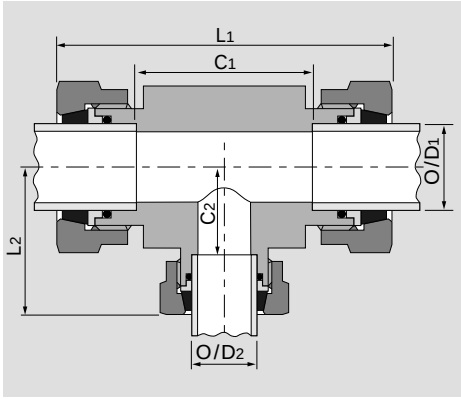

Reducing Outlet Tee

O/D mm		Part No	Dimensions - mm				Nut		Body
1	2		L_1	L_2	C_1	C_2	1	2	
8	6	AM8-M6ROTR	57	29	27	14	17	16	19
10	6	AM10-M6ROTR	71	32	27	17	27	16	27
12	8	AM12-M8ROTR	71	32	27	17	27	17	27
16	8	AM16-M8ROTR	79	39	33	17	32	17	30
20	8	AM20-M8ROTR	103	37	43	22	41	17	38
20	12	AM20-M12ROTR	103	44	43	22	41	27	38
25	12	AM25-M12ROTR	105	44	45	22	46	27	41
25	16	AM25-M16ROTR	105	44	45	22	46	32	41
30	16	AM30-M16ROTR	125	50	57	27	50	32	48
38	8	AM38-M8ROTR	147	48	32	33	60	17	54
38	12	AM38-M12ROTR	147	53	71	31	60	27	54
38	25	AM38-M25ROTR	147	63	71	33	60	46	54

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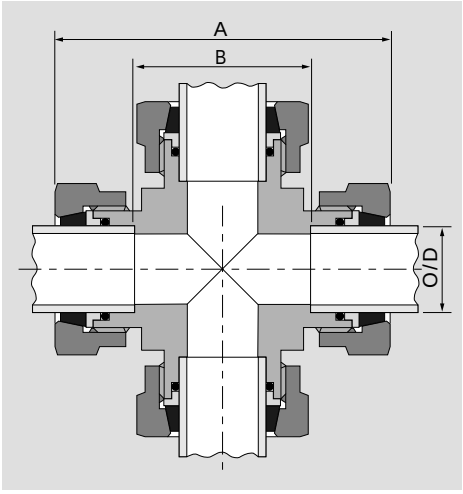

O/D mm	Part No	Dimensions - mm A	B	Nut	Body
6	AM6XR	54	24	16	19
8	AM8XR	57	27	17	19
10	AM10XR	71	27	27	26
12	AM12XR	71	27	27	26
16	AM16XR	79	33	32	32
38	AM38XR	149	72	60	60

CARBON STEEL
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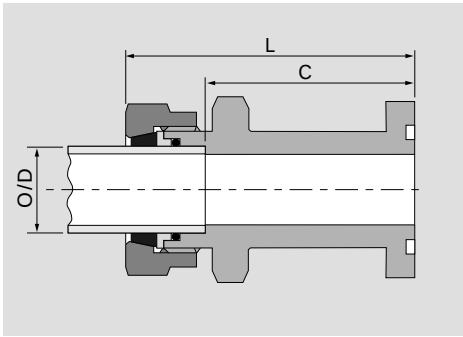

SAE Flange Adaptor (Code 62) Straight

O/D mm	Nom size	Part No	Dimensions - mm C	L	Nut	Body
20	$\frac{3}{4}$"	AM20-12SHR	60	90	41	41
25	$\frac{3}{4}$"	AM25-12SHR	62	92	46	41
25	1"	AM25-16SHR	74	104	46	50
25	$1\frac{1}{4}$"	AM25-20SHR	74	104	46	55
30	1"	AM30-16SHR	75	109	50	50
30	$1\frac{1}{4}$"	AM30-20SHR	75	109	50	55

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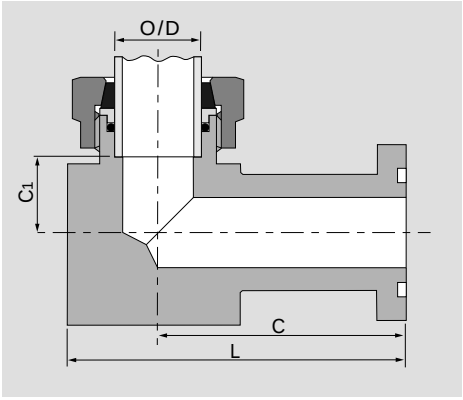

O/D mm	Nom size	Part No	Dimensions - mm C	C1	L	Nut	Body
20	$\frac{3}{4}$"	AM20-12SHER	71	18	90	41	45
25	$\frac{3}{4}$"	AM25-12SHER	73	19	94	46	45
25	1"	AM25-16SHER	83	22	104	46	51
25	$1\frac{1}{4}$"	AM25-20SHER	83	25	104	46	64
30	1"	AM30-16SHER	85	24	109	50	51
30	$1\frac{1}{4}$"	AM30-20SHER	85	27	109	50	64

CARBON STEEL
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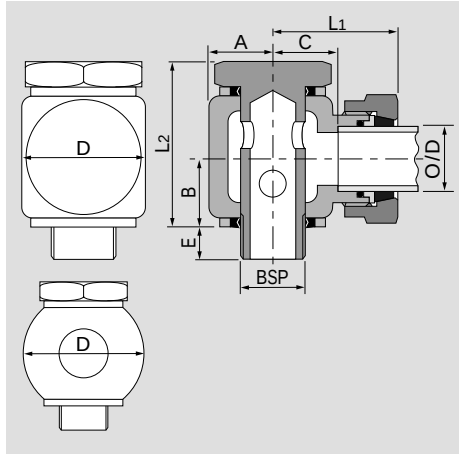
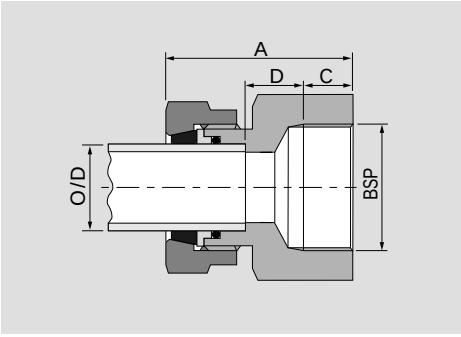


Banjo BSP

O/D mm	Stud BSP	Part No	Dimensions - mm L1	L2	C	A	B	E	D	Nut	Body
6	1/4	**AM6-4BJR**	**32**	**30**	**17**	**13**	**12**	**10**	**Ø 29**	**16**	**19**
8	1/4	**AM8-4BJR**	**32**	**30**	**17**	**13**	**12**	**10**	**Ø 29**	**17**	**19**
10	3/8	**AM10-6BJR**	**40**	**42**	**18**	**18**	**17**	**11**	**Ø 38**	**27**	**22**
12	3/8	**AM12-6BJR**	**40**	**42**	**18**	**18**	**17**	**11**	**Ø 38**	**27**	**22**
16	1/2	**AM16-8BJR**	**45**	**47**	**21**	**21**	**20**	**13**	**Ø 45**	**32**	**27**
20	3/4	**AM20-12BJR**	**56**	**63**	**26**	**25**	**26**	**16**	**Ø 59**	**41**	**33**
22	3/4	AM22-12BJR	56	63	26	25	26	16	Ø 59	41	33
25	**1**	**AM25-16BJR**	**62**	**75**	**31**	**29**	**31**	**17**	**57**	**46**	**41**
30	**1**	**AM30-16BJR**	**69**	**81**	**36**	**32**	**34**	**17**	**64**	**50**	**41**
30	1 1/4	AM30-20BJR	75	89	42	38	38	17	76	50	50
38	**1 1/4**	**AM38-20BJR**	**82**	**96**	**44**	**38**	**41**	**17**	**76**	**60**	**50**
38	1 1/2	AM38-24BJR	86	107	48	43	46	22	86	60	60

We aim to stock all **highlighted** carbon steel items
for standard next day delivery

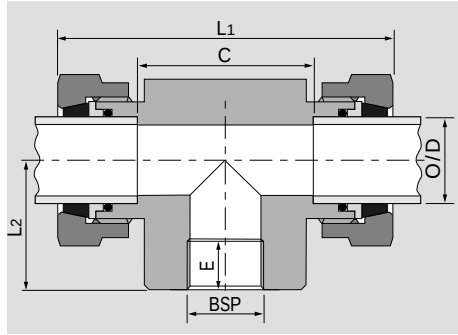
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Female Stud Coupling BSP

O/D mm	Thread BSP	Part No	Dimensions - mm A	C	D	Nut	Body
6	$\frac{1}{4}$	**AM6-4FSCR**	**39**	**11**	**13**	**16**	**22**
8	$\frac{1}{4}$	**AM8-4FSCR**	**40**	**11**	**14**	**17**	**22**
8	$\frac{3}{8}$	AM8-6FSCR	42	13	14	17	24
10	$\frac{3}{8}$	AM10-6FSCR	44	13	9	27	27
12	$\frac{3}{8}$	**AM12-6FSCR**	**44**	**13**	**9**	**27**	**27**
16	$\frac{1}{2}$	**AM16-8FSCR**	**52**	**16**	**12**	**32**	**32**
20	$\frac{3}{4}$	**AM20-12FSCR**	**61**	**19**	**12**	**41**	**41**
22	$\frac{3}{4}$	AM22-12FSCR	61	19	12	41	41
25	**1**	**AM25-16FSCR**	**68**	**21**	**16**	**46**	**46**
30	**1** $\frac{1}{4}$	**AM30-20FSCR**	**75**	**21**	**20**	**50**	**55**
38	**1** $\frac{1}{4}$	**AM38-20FSCR**	**80**	**21**	**21**	**60**	**55**
38	1 $\frac{1}{2}$	AM38-24FSCR	85	25	22	60	60
50	**2**	**AM50-32FSCR**	**107**	**30**	**27**	**80**	**80**

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Female Outlet Tee

O/D mm	Stud BSP	Part No	Dimensions - mm L1	L2	C	E	Nut	Body
6	1/4	**AM6-4FOTR**	**63**	**21**	**33**	**11**	**16**	**22**
8	1/4	AM8-4FOTR	63	21	33	11	17	22
10	3/8	**AM10-6FOTR**	**73**	**25**	**29**	**13**	**27**	**27**
12	3/8	AM12-6FOTR	73	25	29	13	27	27
16	1/2	**AM16-8FOTR**	**79**	**30**	**33**	**16**	**32**	**30**
20	3/4	**AM20-12FOTR**	**103**	**37**	**43**	**19**	**41**	**38**
25	1	AM25-16FOTR	116	42	56	21	46	48
30	1 1/4	AM30-20FOTR	134	45	68	21	50	51
38	1 1/4	AM38-20FOTR	144	48	68	21	60	54
38	1 1/2	AM38-24FOTR	149	53	73	25	60	60
50	1 1/2	AM50-24FOTR	198	64	98	25	80	76

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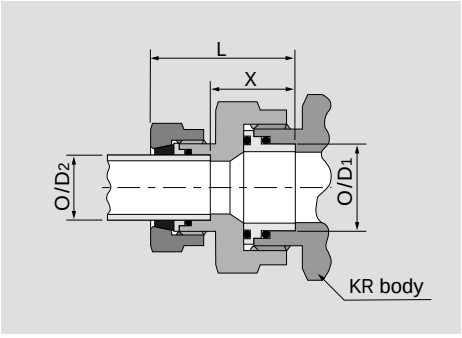
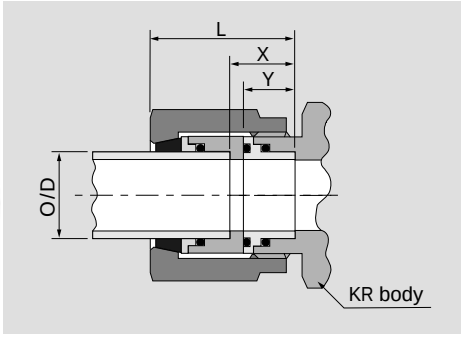


Reducing Nut Adaptor

O/D mm		Part No	Dimensions - mm		Nut	Nut
1	2		L	X	1	2
8	**6**	**AM8-M6RNR**	**35**	**18**	**17**	**16**
10	**8**	**AM10-M8RNR**	**39**	**24**	**17**	**27**
10	**6**	**AM10-M6RNR**	**39**	**24**	**16**	**27**
12	**10**	**AM12-M10RNR**	**43**	**21**	**27**	**27**
12	**8**	**AM12-M8RNR**	**39**	**24**	**17**	**27**
12	**6**	**AM12-M6RNR**	**39**	**24**	**16**	**27**
16	**12**	**AM16-M12RNR**	**43**	**21**	**27**	**32**
16	**10**	**AM16-M10RNR**	**43**	**21**	**27**	**32**
16	**8**	**AM16-M8RNR**	**40**	**25**	**17**	**32**
16	**6**	**AM16-M6RNR**	**40**	**25**	**16**	**32**
20	**16**	**AM20-M16RNR**	**52**	**28**	**32**	**41**
20	**12**	**AM20-M12RNR**	**50**	**28**	**27**	**41**
20	**10**	**AM20-M10RNR**	**50**	**28**	**27**	**41**
25	**20**	**AM25-M20RNR**	**58**	**28**	**41**	**46**
25	**16**	**AM25-M16RNR**	**53**	**29**	**32**	**46**
25	**12**	**AM25-M12RNR**	**51**	**29**	**27**	**46**
30	**25**	**AM30-M25RNR**	**61**	**29**	**46**	**50**
30	**20**	**AM30-M20RNR**	**58**	**28**	**41**	**50**
30	**16**	**AM30-M16RNR**	**53**	**29**	**32**	**50**
38	**30**	**AM38-M30RNR**	**70**	**36**	**50**	**60**
38	**25**	**AM38-M25RNR**	**67**	**36**	**46**	**60**
38	**20**	**AM38-M20RNR**	**66**	**36**	**41**	**60**
50	**38**	**AM50-M38RNR**	**86**	**48**	**60**	**80**
50	**30**	**AM50-M30RNR**	**82**	**49**	**50**	**80**
50	**25**	**AM50-M25RNR**	**79**	**49**	**46**	**80**

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Breakaway Adaptor

The unique KR breakaway adaptor allows easy access to in-line components. Awkward and time consuming dismantling of pipe work normally required to remove components is eliminated. The breakaway adaptor will fit any of the KR Couplings up to 50 mm and 2" O/D. The adaptor replaces the nut, washer and collet of a conventional KR Coupling therefore all the tube couplings shown on pages 4 to 19 can be converted.

O/D mm	Part No	Dimensions - mm L	X	Y	Nut
6	**AM6BCR**	**26**	**12**	**11**	**16**
8	**AM8BCR**	**26**	**12**	**11**	**17**
10	**AM10BCR**	**38**	**17**	**15**	**27**
12	**AM12BCR**	**38**	**17**	**15**	**27**
16	**AM16BCR**	**38**	**17**	**15**	**32**
20	**AM20BCR**	**49**	**21**	**19**	**41**
22	AM22BCR	49	21	19	41
25	**AM25BCR**	**49**	**21**	**19**	**46**
30	**AM30BCR**	**53**	**21**	**19**	**50**
38	**AM38BCR**	**62**	**25**	**22**	**60**
50	**AM50BCR**	**80**	**32**	**29**	**80**

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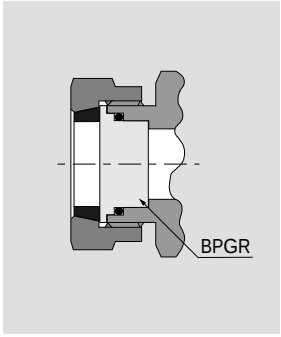
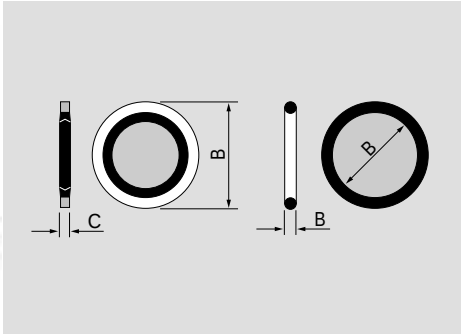


Spare Parts

O/D mm	Part No Blanking Plug	Part No Nut	Part No Collet	Part No Washer
6 mm	**M6BPGR**	**M6NCR**	**M6R**	**M6W**
8 mm	**M8BPGR**	**M8NCR**	**M8R**	**M8W**
10 mm	**M10BPGR**	**M10NCR**	**M10R**	**M10W**
12 mm	**M12BPGR**	**M12NCR**	**M12R**	**M12W**
16 mm	**M16BPGR**	**M16NCR**	**M16R**	**M16W**
20 mm	**M20BPGR**	**M20NCR**	**M20R**	**M20W**
22 mm	**M22BPGR**	**M22NCR**	**M22R**	**M22W**
25 mm	**M25BPGR**	**M25NCR**	**M25R**	**M25W**
30 mm	**M30BPGR**	**M30NCR**	**M30R**	**M30W**
38 mm	**M38BPGR**	**M38NCR**	**M38R**	**M38W**
50 mm	**M50BPGR**	**M50NCR**	**M50R**	**M50W**

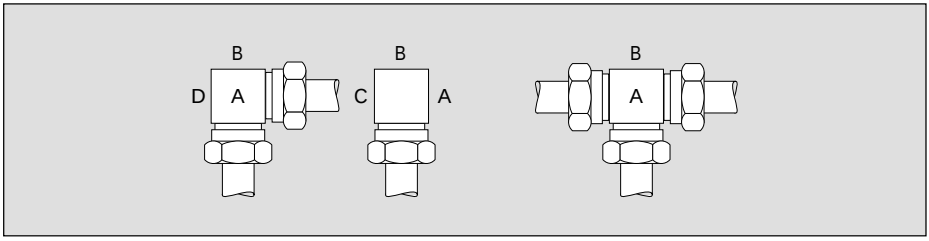


Seals

O Ring for tube coupling O/D				Bonded Washer Self Centering				O Ring for ISO thread			
mm	Part No	A	B	BSP	Part No	B	C	ISO	Part No	A	B
6	200-010-4490	6.1	1.8	1/8	PP45A-SC	15.9	2.03	M12	300-000-4490	9.3	2.2
8	200-011-4490	7.7	1.8	1/4	PP45B-SC	20.6	2.0	M14	300-005-4490	11.3	2.2
10	200-613-4490	9.9	2.6	3/8	PP45C-SC	23.8	2.0	M16	300-010-4490	13.3	2.2
12	200-614-4490	11.9	2.6	1/2	PP45D-SC	28.6	2.3	M18	300-015-4490	15.3	2.2
16	200-114-4490	15.5	2.6	5/8	PP45E-SC	31.8	2.3	M22	300-020-4490	19.3	2.2
20	200-211-4490	20.2	3.5	3/4	PP45F-SC	34.9	2.3	M27	300-025-4490	23.6	2.9
22	200-212-4490	21.8	3.5	7/8	PP45G-SC	38.1	2.3	M33	300-030-4490	29.6	2.9
25	200-214-4490	25.0	3.5	1	PP45H-SC	42.8	3.3	M42	300-035-4490	38.6	2.9
30	200-217-4490	29.8	3.5	1 1/4	PP45J-SC	52.4	3.3	M48	300-040-4490	44.6	2.9
38	200-222-4490	37.7	3.5	1 1/2	PP45K-SC	58.6	3.3	M60	300-045-4490	56.6	2.2
50	207-071-4490	49.5	5.3	2	PP45M-SC	73.0	3.3				

The standard seal material is nitrile, if alternative materials are required please contact our technical department for details.

Tappings in Tee, Elbow & Cross Couplings



Couplings can be supplied with any combination of tappings, subject to the maximum and minimum sizes determined by the body dimensions and pressure rating.

To order, indicate the BSP size in $\frac{1}{16}$'s of an inch (eg. $\frac{3}{8}$ BSP = **6**) and use the appropriate letter code for the face to be tapped. For tapers, add **T** for BSPT, **AT** for NPTF or **AA** for NPT after the thread size code.

For example:

A16ER/B6 = 1" Elbow with $\frac{3}{8}$" BSP tapping in face B

or

A16ER/B6AT = 1" Elbow with $\frac{3}{8}$" NPTF tapping in face B.

For scheduled forward requirements quantities of special couplings can be held in stock.

Part No.	Max thread size
AM10ER/TR/XR	$\frac{3}{8}$ inch
AM12ER/TR/XR	$\frac{3}{8}$ inch
AM16ER/TR/XR	$\frac{3}{8}$ inch
AM20ER/TR	$\frac{1}{2}$ inch
AM22ER/TR	$\frac{1}{2}$ inch
AM25ER/TR	$\frac{7}{8}$ inch
AM30ER/TR	1 inch
AM38ER/TR/XR	1 inch
AM50ER/TR	2 inch

Imperial Range

Straight
A4CR
A5CR
A6CR
A8CR
A10CR
A12CR
A14CR
A16CR
A20CR
A24CR
A32CR
Reducer
A5-4RR
A6-5RR
A6-4RR
A8-6RR
A8-4RR
A10-8RR
A12-10RR
A12-8RR
A12-6RR
A14-12RR
A16-14RR
A16-12RR
A16-8RR
A20-16RR
A20-12RR
A24-20RR
A24-16RR
A32-24RR
Bulkhead
A4BPR
A5BPR
A6BPR
A8BPR
A10BPR
A12BPR
A14BPR
A16BPR
A20BPR
A24BPR
A32BPR
Elbow
A4ER
A5ER
A6ER
A8ER
A10ER
A12ER
A14ER
A16ER
A20ER
A24ER
A32ER
Tee
A4TR
A5TR
A6TR
A8TR
A10TR
A12TR
A14TR
A16TR
A20TR
A24TR
A32TR
Cross
A4XR
A5XR
A6XR
A8XR
A10XR
A12XR
A14XR
A16XR
A20XR
A24XR
Reducing Outlet Tee
A5-4ROTR
A6-4ROTR
A8-4ROTR
A8-5ROTR
A8-6ROTR
A10-8ROTR
A12-6ROTR
A12-8ROTR
A14-12ROTR
A16-6ROTR
A16-8ROTR
A16-12ROTR
A20-12ROTR
A20-16ROTR
A24-16ROTR
A24-20ROTR
Reducing Adaptor
A6-5RNR
A6-4RNR
A8-6RNR
A8-5RNR
A8-4RNR
A10-8RNR
A10-6RNR
A10-5RNR
A12-10RNR
A12-8RNR
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A16-10RNR
A16-8RNR
A20-16RNR
A20-12RNR
A20-10RNR
A20-8RNR
A24-20RNR
A24-16RNR
A32-24RNR
A32-20RNR
A32-16RNR
Breakaway Adaptor
A4BCR
A5BCR
A6BCR
A8BCR
A10BCR
A12BCR
A14BCR
A16BCR
A20BCR
A24BCR
A32BCR
SAE Adaptor Straight
A12-12SHR
A12-16SHR
A16-12SHR
A16-16SHR
A16-20SHR
A20-20SHR
SAE Adaptor Elbow
A12-12SHER
A12-16SHER
A16-12SHER
A16-16SHER
A16-20SHER
A20-20SHER
Male Stud
A4-2MSCR
A4-4MSCR
A4-6MSCR
A4-8MSCR
A5-2MSCR
A5-4MSCR
A5-6MSCR
A6-2MSCR
A6-4MSCR
A6-6MSCR
A6-8MSCR
A8-4MSCR
A8-6MSCR
A8-8MSCR
A8-12MSCR
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A10-8MSCR
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A12-6MSCR
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A20-12MSCR
A20-16MSCR
A20-20MSCR
A24-16MSCR
A24-20MSCR
A24-24MSCR
A32-20MSCR
A32-24MSCR
A32-32MSCR
Stud Bulkhead
A4-4BHR
A5-4BHR
A6-4BHR
A8-6BHR
A10-8BHR
A12-12BHR
A14-12BHR
A16-16BHR
A20-16BHR
A24-20BHR
A32-24BHR
Taper Male Stud
A4-2TMSCR
A4-4TMSCR
A4-6TMSCR
A5-2TMSCR
A5-4TMSCR
A5-6TMSCR
A6-2TMSCR
A6-4TMSCR
A6-6TMSCR
A6-8TMSCR
A8-4TMSCR
A8-6TMSCR
A8-8TMSCR
A8-12TMSCR
A10-6TMSCR
A10-8TMSCR
A10-12TMSCR
A12-8TMSCR
A12-12TMSCR

Imperial Range

A12-16TMSCR
A14-8TMSCR
A14-12TMSCR
A14-16TMSCR
A16-12TMSCR
A16-16TMSCR
A16-20TMSCR
A20-16TMSCR
A20-20TMSCR
A20-24TMSCR
A24-16TMSCR
A24-20TMSCR
A24-24TMSCR
A32-24TMSCR

Taper Male Stud NPT

A4-4AAMSCR
A5-4AAMSCR
A6-6AAMSCR
A8-8AAMSCR
A10-8AAMSCR
A12-12AAMSCR
A14-12AAMSCR
A16-16AAMSCR
A20-20AAMSCR
A24-24AAMSCR
A32-24AAMSCR

Banjo

A4-2BJR
A4-4BJR
A5-4BJR
A5-6BJR
A6-4BJR
A6-6BJR
A8-6BJR
A8-8BJR
A10-8BJR
A12-8BJR
A12-12BJR
A14-12BJR
A16-12BJR
A16-16BJR
A20-16BJR
A20-20BJR
A24-20BJR
A24-24BJR

Male Elbow

A4-2MER
A4-4MER
A5-4MER
A6-4MER
A6-6MER
A8-4MER
A8-6MER
A8-8MER
A10-8MER
A12-8MER
A12-12MER
A14-12MER
A16-12MER
A16-16MER
A20-16MER
A20-20MER
A24-16MER
A24-20MER
A24-24MER

Taper Male Elbow

A4-2TMER
A4-4TMER
A5-4TMER
A6-4TMER
A6-6TMER
A8-4TMER
A8-6TMER
A8-8TMER
A10-8TMER
A12-8TMER
A12-12TMER
A14-12TMER
A16-12TMER
A16-16TMER
A20-16TMER
A20-20TMER
A24-20TMER
A24-24TMER

Male Outlet Tee

A4-4MOTR
A5-4MOTR
A6-4MOTR
A6-6MOTR
A8-6MOTR
A8-8MOTR
A10-8MOTR
A12-8MOTR
A12-12MOTR
A16-12MOTR

Female Stud

A4-2FSCR
A4-4FSCR
A4-6FSCR
A5-4FSCR
A5-6FSCR
A6-4FSCR
A6-6FSCR
A8-4FSCR
A8-6FSCR
A8-8FSCR
A10-8FSCR
A12-8FSCR
A12-12FSCR
A12-16FSCR
A14-12FSCR
A16-12FSCR
A16-16FSCR
A20-16FSCR
A20-20FSCR
A24-20FSCR
A24-24FSCR
A32-24FSCR
A32-32FSCR

Female Outlet Tee

A4-4FOTR
A6-4FOTR
A6-6FOTR
A6-8FOTR
A8-6FOTR
A8-8FOTR
A10-8FOTR
A12-8FOTR
A12-12FOTR
A16-12FOTR
A16-16FOTR
A20-16FOTR
A24-20FOTR
A24-24FOTR
A32-16FOTR

Plug

4BPGR
5BPGR
6BPGR
8BPGR
10BPGR
12BPGR
14BPGR
16BPGR
20BPGR
24BPGR
32BPGR

Stud Standpipe

4-2SSAR
4-4SSAR
5-2SSAR
5-4SSAR
5-6SSAR
6-4SSAR
6-6SSAR
8-4SSAR
8-6SSAR
8-8SSAR
10-6SSAR
10-8SSAR
10-12SSAR
12-8SSAR
12-12SSAR
14-8SSAR
14-12SSAR
14-16SSAR
16-12SSAR
16-16SSAR
20-12SSAR
20-16SSAR
20-20SSAR
32-24SSAR
32-32SSAR

Gauge Adaptors

A4-6GAR-JET
A6-4GAR
No. 1 JET
No. 2 JET

Spare Parts

Nut

4NCR
5NCR
6NCR
8NCR
10NCR
12NCR
14NCR
16NCR
20NCR
24NCR
32NCR

Collet

4R
5R
6R
8R
10R
12R
14R
16R
20R
24R
32R

Washer

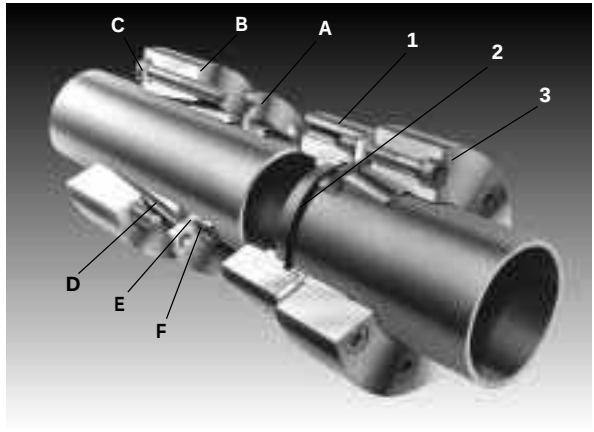
4W
5W
6W
8W
10W
12W
14W
16W
20W
24W
32W

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

KR Couplings 50 to 125 mm & 2 to 5 inch

Benefits

- Leak free - "O" ring seal
- Safe joint every time – low tightening torque and clamping force rises with the internal pressure.
- Low installed cost – no welding (so inert gas purging, NDT and excessive flushing are not required), minimal tube preparation and no special assembly equipment are required. Demountable and reusable. Can be used with most tube materials.



Features

1. Body – mild or stainless steel or cupro-nickel, compatible with most fluids and environments. Locates O ring and tube.
2. O-ring – nitrile, FPM (viton), EP or FEP encapsulated FPM, compatible with most fluids, highly resistant to leakage even under severe vibration, pressure pulsation and temperature cycling. Provides diametric seal between tube O/D and body cavity.
3. Flange Sub-assembly – mild or stainless steel or cupro-nickel, compatible with most environments. Secures the tube and retains sealing mechanism.

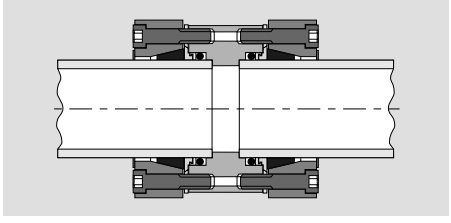
Comprising of:- –

A. Retaining Plate – holds the following components in one secure sub-assembly so easing assembly.
B. Flange – Closes the split collet and retains sealing mechanism.
C. Bolts – high tensile, cap head, give high compressive force at low tightening torque.
D. Split collet – Clamping force rises with pressure. Large clamping area ensures minimal deformation of the tube. Retains tube in position.
E. Back-up washer– Provides additional support for the tube and locates the O-ring
F. Anti-extrusion ring – acetal, provides additional support for the O-ring, giving larger acceptable tolerances on tube O/D found on larger sizes.

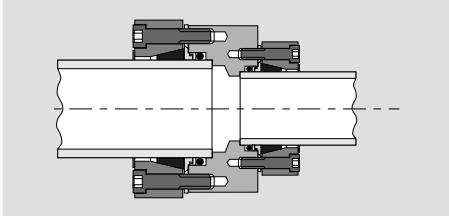
Product Approvals

- Tested to BS4368 Part 4
- Lloyds Register of Shipping
- American Bureau of Shipping
- MOD(N)

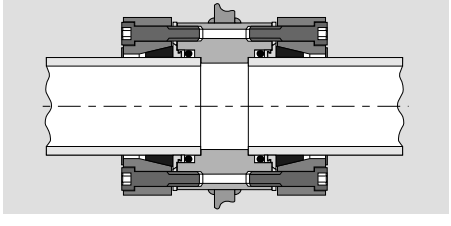
Designed & Manufactured to suit Your System Requirements - Please Phone for Details



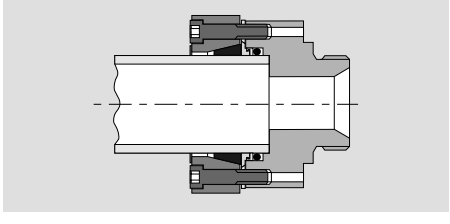
Straight



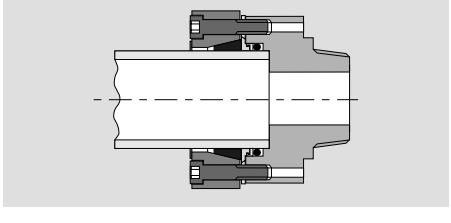
Straight Reducer



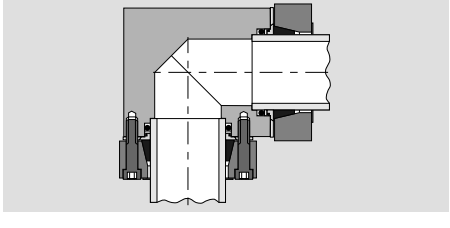
Welded Bulkhead Straight



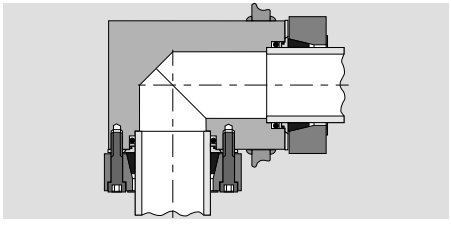
Male Stud BSP



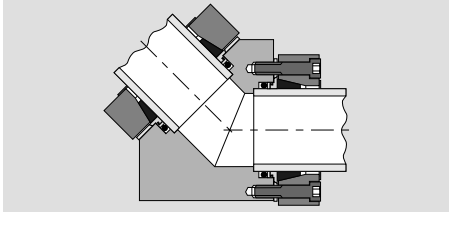
Male Stud BSPT



Elbow



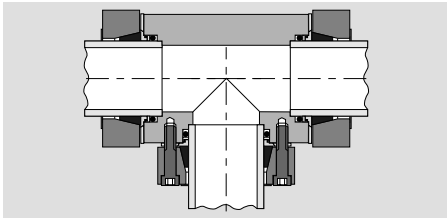
Welded Bulkhead Elbow



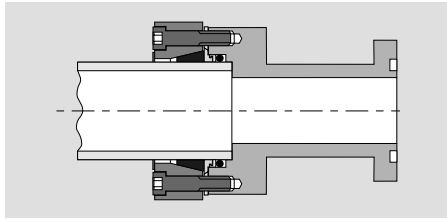
45° Elbow

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

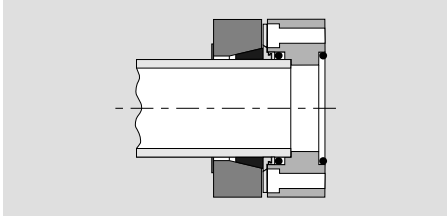
KR Couplings 50 to 125 mm & 2 to 5 inch



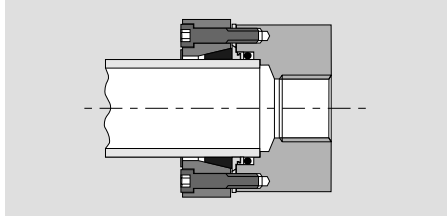
Tee



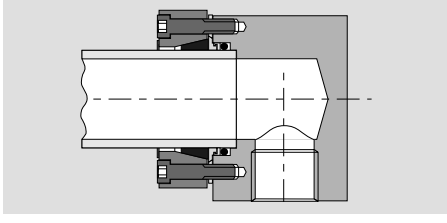
SAE Flange Adaptor, Code 61 & 62



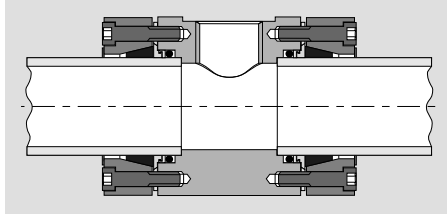
SAE Port Adaptor, Code 61 & 62



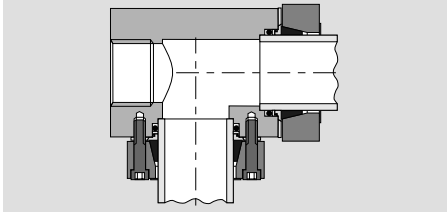
Female Stud



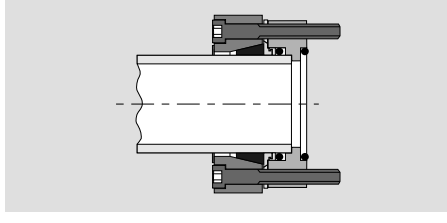
Female Elbow



Female Outlet Tee, Single & double

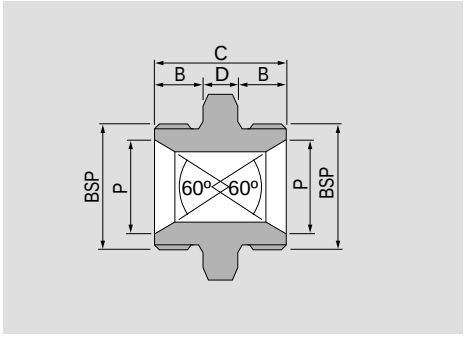


Female Run Tee



Breakaway Adaptor

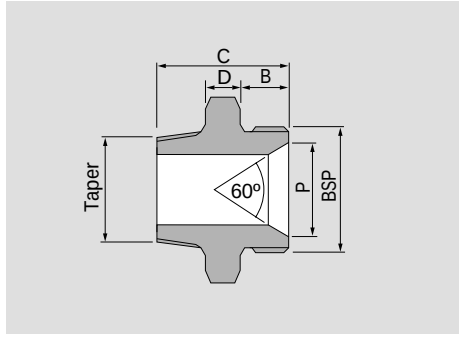
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Equal Union

Stud BSP	Part No	Dimensions - mm B	C	D	P	A/F	A/C
1/8	EU2	10	27	8	8	14	16.1
1/4	EU4	11	30	8	11	19	22.0
3/8	EU6	13	35	10	14	22	25.4
1/2	EU8	16	41	10	18	27	31.2
5/8	EU10	16	41	10	19	32	36.9
4/3	EU12	19	49	11	23	32	36.9
1	EU16	21	54	13	29	41	47.2
1 1/4	EU20	21	56	14	37	50	57.5
1 1/2	EU24	25	67	16	43	55	63.3
2	EU32	30	78	18	55	70	80.8

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

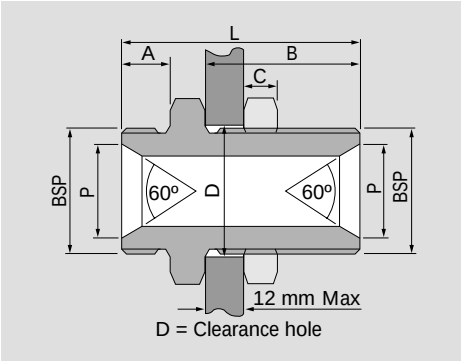


Equal Union, Parallel/Taper

Stud BSP	BSPT	Part No	Dimensions - mm B	C	D	P	A/F	A/C
1/8	1/8	EUPT2	10	25	6	8	14	16.2
1/4	1/4	EUPT4	11	29	6	11	19	21.9
3/8	3/8	EUPT6	13	33	8	14	22	25.4
1/2	1/2	EUPT8	16	40	8	18	27	31.2
3/4	3/4	EUPT12	19	48	10	23	33	38.1
1	1	EUPT16	21	54	11	29	41	47.4
1 1/4	1 1/4	EUPT20	21	59	13	37	50	57.8
1 1/2	1 1/2	EUPT24	25	65	14	43	55	63.5
2	2	EUPT32	30	76	16	55	70	80.8
BSP	NPTF							
1/8	1/8	EUPAT2	10	25	6	8	14	16.2
1/4	1/4	EUPAT4	11	32	6	11	19	21.9
3/8	3/8	EUPAT6	13	35	8	14	22	25.4
	1/2	EUPAT8	16	43	8	18	27	31.2
3/4	3/4	EUPAT12	19	48	10	23	33	38.1
1	1	EUPAT16	21	56	11	29	41	47.4
1 1/4	1 1/4	EUPAT20	21	58	13	37	50	57.5

We aim to stock all carbon steel items for standard next day delivery

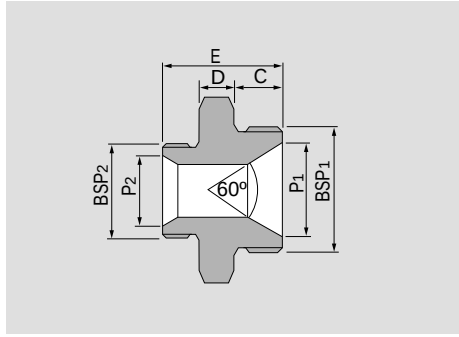
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Equal Union Bulkhead

Stud BSP	Part No	Dimensions - mm A	B	L	C	D	P	Body A/F	Body A/C	Nut A/F
1/4	EUBH4	11.1	28.6	47.6	6	15	10.5	19	21.9	19
3/8	EUBH6	12.7	31.7	53.9	7	18	14.0	22	25.4	22
1/2	EUBH8	15.9	34.9	60.3	8	23	17.6	27	31.1	27
5/8	EUBH10	15.9	34.9	60.3	8	24	19.4	33	38.1	33
3/4	EUBH12	19.1	38.1	68.2	9	28	22.9	33	38.1	32
1	EUBH16	20.6	41.3	74.6	10	35	28.8	41	47.4	41
1 1/4	EUBH20	20.6	44.5	79.4	14	43	36.9	50	57.8	50
1 1/2	EUBH24	25.4	47.6	88.9	15	49	42.8	55	63.0	55

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Unequal Union

Stud BSP 1	Stud BSP 2	Part No	Dimensions - mm C	D	E	P1	P2	A/F
1/4	1/8	UU4-2	11	8	29	11	8	19
3/8	1/4	UU6-4	13	10	33	14	11	22
1/2	1/4	UU8-4	16	10	37	18	11	27
1/2	3/8	UU8-6	16	10	38	18	14	27
5/8	1/4	UU10-4	16	10	37	19	11	32
5/8	3/8	UU10-6	16	10	38	19	14	32
5/8	1/2	UU10-8	16	10	41	19	18	32
3/4	3/8	UU12-6	19	11	43	23	14	33
3/4	1/2	UU12-8	19	11	46	23	18	33
3/4	5/8	UU12-10	19	11	46	23	19	33
7/8	3/4	UU14-12	19	13	51	26	23	36
1	1/2	UU16-8	21	13	49	29	18	41
1	5/8	UU16-10	21	14	51	29	19	41
1	3/4	UU16-12	21	13	52	29	23	41
1	7/8	UU16-14	21	13	52	29	26	41
1 1/4	1	UU20-16	21	14	56	37	29	50
1 1/2	1	UU24-16	25	16	62	43	29	55
1 1/2	1 1/4	UU24-20	25	16	62	43	37	55
2	1	UU32-16	30	18	68	55	29	70
2	1 1/4	UU32-20	30	18	68	55	37	70
2	1 1/2	UU32-24	30	18	73	55	43	70

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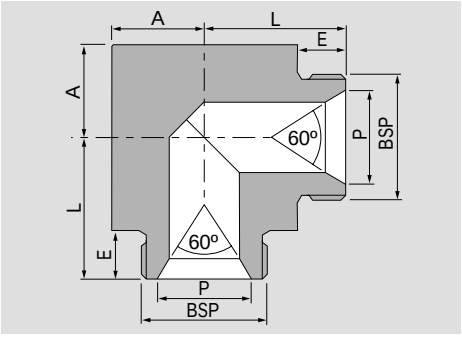
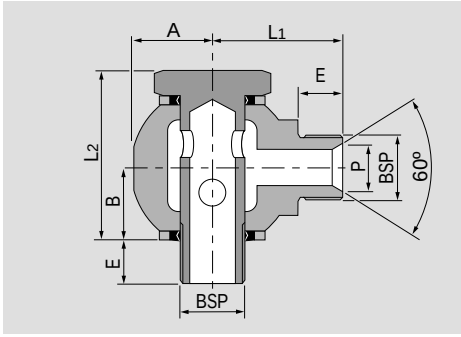
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Equal Male Elbow

Stud BSP	Part No	Dimensions - mm L	E	A	P	A/F
1/8	EME2	20	10	8	8	16
1/4	EME4	27	11	10	11	22
3/8	EME6	29	13	13	14	27
1/2	EME8	33	16	16	18	32
3/4	EME12	41	19	18	23	41
1	EME16	45	21	23	29	48
1 1/4	EME20	52	21	27	37	54
1 1/2	EME24	60	25	30	43	60
2	EME32	75	30	37	55	76

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Banjo

Stud BSP 1	2	Part No	Dimensions - mm L1	L2	A	B	E	P	A/F	A/C
1/4	1/4	A4-4BJ	25	34	14	14	11	11	19	21.9
3/8	3/8	A6-6BJ	29	42	17	17	13	14	22	25.4
1/2	1/2	A8-8BJ	37	47	21	20	16	18	27	31.2
3/4	3/4	A12-12BJ	45	63	25	26	19	23	34	38.1

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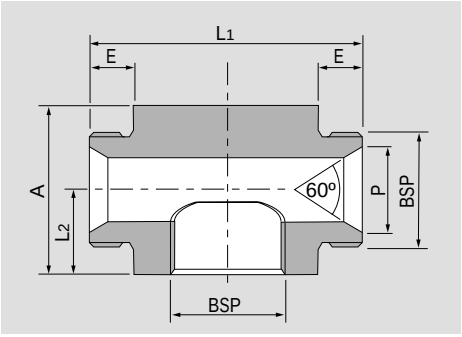
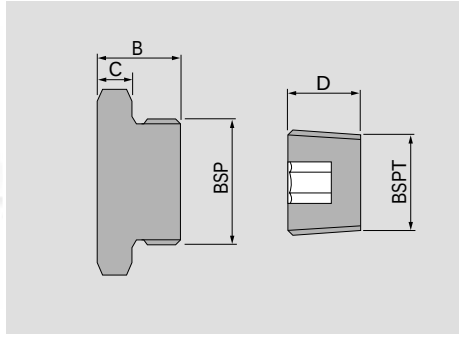
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Female Outlet Male Tee

Thread BSP	Part No	Dimensions - mm L1	L2	E	A	P	A/F
$\frac{1}{4}$	FOMT 4	50.8	12.7	11.1	24.8	10.5	25
$\frac{3}{8}$	FOMT 6	57.2	14.3	12.7	28.6	14.1	30
$\frac{1}{2}$	FOMT 8	70.0	17.5	15.9	34.9	17.7	35
$\frac{3}{4}$	FOMT 12	82.6	23.8	19.1	39.8	23.0	40
1	FOMT 16	95.3	27.0	20.6	47.6	28.3	50
$1\frac{1}{4}$	FOMT 20	108.0	30.2	20.6	57.2	37.0	60
$1\frac{1}{2}$	FOMT 24	121.0	34.9	25.4	63.5	42.8	65

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Plug, Parallel & taper

Stud BSP	Part No	Dimensions - mm B	C	D	A/F	A/C
1/8	P2	17	7		14	16.2
1/4	P4	18	7		19	21.9
3/8	P6	21	8		22	25.4
1/2	P8	25	9		27	31.2
5/8	P10	26	10		32	36.9
4/3	P12	29	10		33	38.1
7/8	P14	31	12		36	41.6
1	P16	33	12		41	47.4
1 1/4	P20	34	14		50	57.8
1 1/2	P24	41	15		55	63.5
2	P32	47	17		70	80.8
BSPT						
1/8	PT2			9.5	3/16 "	
1/4	PT4			12.7	1/4 "	
3/8	PT6			14.3	5/16 "	
1/2	PT8			17.5	3/8 "	
4/3	PT12			20.6	1/2 "	
1	PT16			25.4	9/16 "	

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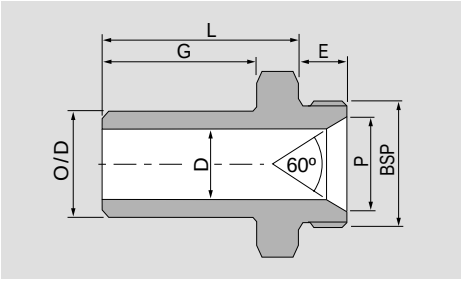
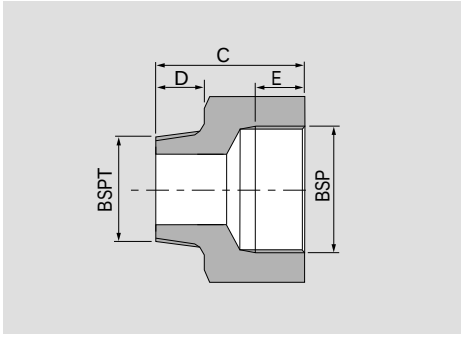
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Stud Standpipe

O/D mm	Stud BSP	Part No	Dimensions - mm E	G	L	D	P	A/F
6	1/8	M6-2SSAR	10	29	35	4	8	14
6	1/4	M6-4SSAR	11	29	35	4	11	19
8	1/8	M8-2SSAR	10	29	35	6	8	14
8	1/4	M8-4SSAR	11	29	35	6	11	19
8	3/8	M8-6SSAR	13	29	35	6	14	22
10	1/4	M10-4SSAR	11	37	43	6	11	19
10	3/8	M10-6SSAR	13	37	43	6	14	22
12	1/4	M12-4SSAR	11	37	43	6	11	19
12	3/8	M12-6SSAR	13	37	43	8	14	22
12	1/2	M12-8SSAR	16	37	45	8	18	29
16	3/8	M16-6SSAR	13	37	44	10	14	22
16	1/2	M16-8SSAR	16	37	45	10	18	29
16	3/4	M16-12SSAR	19	37	48	10	23	33
20	1/2	M20-8SSAR	16	48	56	11	18	29
20	3/4	M20-12SSAR	19	48	60	14	23	33
22	1/2	M22-8SSAR	11	48	56	11	18	29
22	3/4	M22-12SSAR	19	48	60	16	23	33
22	1	M22-16SSAR	21	48	60	16	29	41
25	3/4	M25-12SSAR	19	48	60	18	23	33
25	1	M25-16SSAR	21	48	60	18	29	41
30	3/4	M30-12SSAR	19	55	67	18	23	33
30	1	M30-16SSAR	21	55	67	22	29	41
30	1 1/4	M30-20SSAR	21	55	69	22	37	50
38	1	M38-16SSAR	21	64	76	26	29	41
38	1 1/4	M38-20SSAR	21	64	79	26	37	50
38	1 1/2	M38-24SSAR	25	64	79	26	43	55
50	1 1/2	M50-24SSAR	25	83	98	35	43	55
50	2	M50-32SSAR	30	83	106	35	55	70

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Adaptor Bush

BSPT	BSP	Part No	Dimensions - mm				
1	2		C	D	E	A/F	A/C
$\frac{1}{4}$	$\frac{1}{4}$	AB4T-4	30	11	11	19	21.9
$\frac{3}{8}$	$\frac{1}{4}$	AB6T-4	30	13	11	19	21.9
$\frac{3}{8}$	$\frac{3}{8}$	AB6T-6	35	13	13	24	27.7
$\frac{1}{2}$	$\frac{1}{2}$	AB8T-8	43	16	16	29	33.5
$\frac{3}{4}$	$\frac{3}{4}$	AB12T-12	49	19	19	36	41.6
1	1	AB16T-16	57	22	21	46	53.1
$1\frac{1}{4}$	$1\frac{1}{4}$	AB20T-20	61	25	21	55	63.5
$1\frac{1}{2}$	$1\frac{1}{2}$	AB24T-24	68	25	25	60	69.3
2	2	AB32T-32	79	30	30	80	92.4

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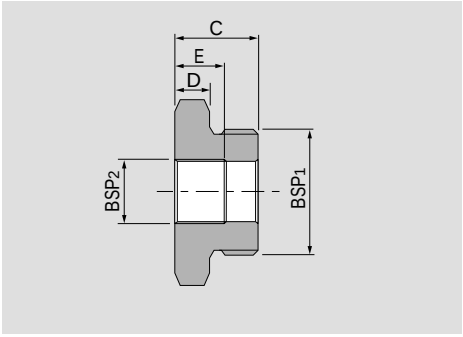
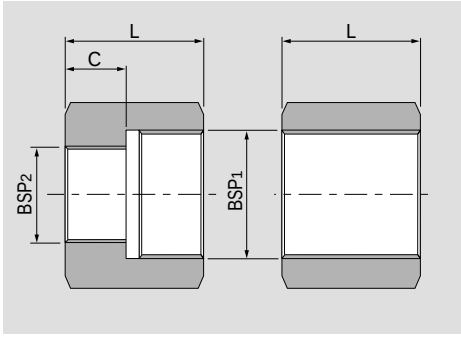
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Reducing Bush

BSP 1	BSP 2	Part No	Dimensions - mm C	D	E	A/F
1/4	1/8	RB4-2	29	8	10	19
3/8	1/8	RB6-2	29	16	10	22
3/8	1/4	RB6-4	32	19	11	22
1/2	1/8	RB8-2	30	14	10	27
1/2	1/4	RB8-4	32	16	11	27
1/2	3/8	RB8-6	35	19	13	27
5/8	1/2	RB10-8	43	27	16	32
3/4	1/4	RB12-4	29	10	11	32
3/4	3/8	RB12-6	35	16	13	32
3/4	1/2	RB12-8	41	22	16	32
1	1/4	RB16-4	33	12	11	41
1	3/8	RB16-6	33	12	13	41
1	1/2	RB16-8	33	12	16	41
1	3/4	RB16-12	45	24	19	41
1 1/4	3/8	RB20-6	34	14	13	50
1 1/4	1/2	RB20-8	34	14	16	50
1 1/4	3/4	RB20-12	34	14	19	50
1 1/4	1	RB20-16	51	30	20	50
1 1/2	1/2	RB24-8	41	15	16	55
1 1/2	3/4	RB24-12	41	15	19	55
1 1/2	1	RB24-16	41	15	20	55
1 1/2	1 1/4	RB24-20	59	33	20	55
2	1	RB32-16	47	17	20	70
2	1 1/4	RB32-20	47	17	20	70
2	1 1/2	RB32-24	47	17	25	70

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

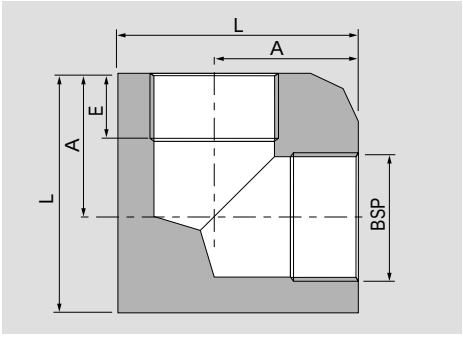


Female Union

BSP 1	BSP 2	Part No	Dimensions - mm L	C	A/F
1/8	1/8	FA2-2	22	-	17
1/4	1/8	FA4-2	25	12	22
1/4	1/4	FA4-4	25	-	22
3/8	1/8	FA6-2	27	13	27
3/8	1/4	FA6-4	27	13	27
3/8	3/8	FA6-6	29	-	27
1/2	1/8	FA8-2	30	12	32
1/2	1/4	FA8-4	30	12	32
1/2	3/8	FA8-6	32	14	32
1/2	1/2	FA8-8	35	-	32
3/4	3/4	FA12-12	41	-	41
1	1	FA16-16	45	-	50
1 1/4	1 1/4	FA20-20	45	-	60

We aim to stock all carbon steel items for standard next day delivery

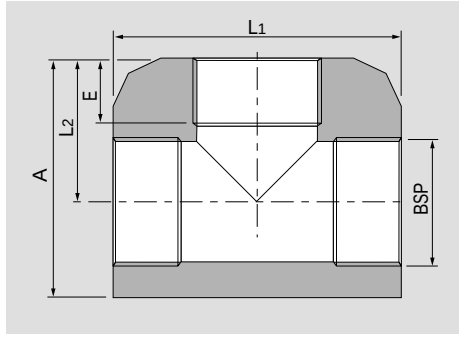
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Equal Female Elbow

BSP	Part No	Dimensions - mm A	L	E	Body
1/8	EFE2	17	27	10	19
1/4	EFE4	21	33	11	25
3/8	EFE6	24	37	13	25
1/2	EFE8	29	44	16	32
3/4	EFE12	35	56	19	41
1	EFE16	41	67	21	51
1 1/4	EFE20	44	73	21	57
1 1/2	EFE24	52	83	25	60
2	EFE32	64	102	30	76

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

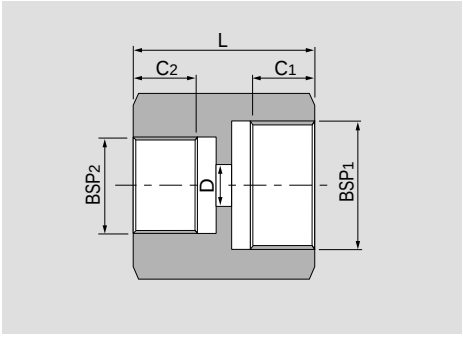


Equal Female Tee

BSP	Part No	Dimensions - mm L1	L2	E	A	Body
1/8	EFT2	35	17	10	27	19
1/4	EFT4	41	21	11	33	25
3/8	EFT6	48	24	13	37	25
1/2	EFT8	57	29	16	44	32
3/4	EFT12	70	35	19	56	41
1	EFT16	83	41	21	67	51
1 1/4	EFT20	89	44	21	73	64
1 1/2	EFT24	105	52	25	83	64
2	EFT32	127	64	30	102	76

We aim to stock all carbon steel items for standard next day delivery

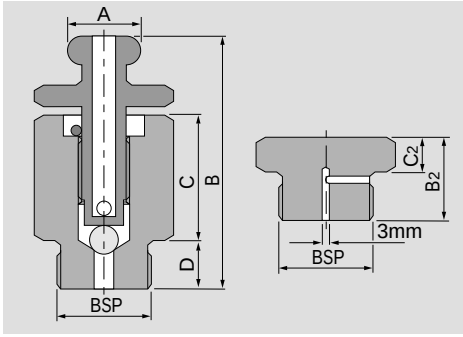
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Gauge Adaptor

BSP 1	BSP 2	Part No	Dimensions - mm L	C_1	C_2	D	A/F	A/C
1/4	1/4	GA4-4	30	13	13	6	22	25.4
3/8	1/4	GA6-4	33	16	13	6	24	27.7
1/2	1/4	GA8-4	37	19	13	6	29	33.5

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Bleed Valve

BSP	Part No	Dimensions - mm A	B	B_2	C	C_2	D	Nut	Body
$\frac{1}{8}$	BV2	8	40		18		10	14	16
$\frac{1}{8}$	P2AB			17		7			14

We aim to stock all carbon steel items for standard next day delivery

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

Hydraulic Tube

Berendsen PMC recommends and supplies cold finished tubing. This method of manufacture ensures very accurate sizing, particularly on outside diameter. This means maximum grip and zero leakage when used with O/D high pressure couplings.The cold drawing process ensures remarkably good surface finish both internally and externally. This gives reduced pressure drop of the transmitted fluid and enables compression couplings to be fitted quickly and efficiently with minimum risk of damage to such items as rubber seals.

All tubing up to and including 2"/50 mm O/D is scaleless annealed, enabling simple cold manipulation for installations whilst retaining surface finish. Tube over 50 mm can be supplied in either a stress relieved or normalised condition dependent upon application. Stress relieved tubes are not suitable for cold bending but a full range of angle joints are available. Tube suffix ST354 and ST524 being fully annealed are suitable for cold bending.

All working pressures are for guidance only. Several formulae can be used for calculating the dimensions of tubes to withstand internal pressures at normal temperatures. All figures given are based upon UTS and a factor of safety of 3:1 neglecting bending. All tube is generally supplied in random lengths (4 to 6.5m). Carbon steel tube is either oil dipped or phosphated and the ends plugged. Mill certificates can be supplied if requested at the time of placing an order. Imperial, Stainless steel and cupro-nickel tube are also available on request.

Material Specification:

Part Number Suffix

Blank (standard)	=	CDMS to BS3602 CFS360/DIN 2391C ST35.4 with minimum UTS of 360 N/mm^2
DOM	=	DOM 1026 to ASTMA513 with minimum UTS of 585 N/mm^2
ST524	=	CDMS to DIN 2391C/DIN2445 ST52.4 with minimum UTS of 520 N/mm^2

A full range of imperial tube also available - Please Phone for Details

Hydraulic Tube

O/D mm	I/D mm	Max Pressure bar	Part No	Min bend radius mm	Kg/m
6 x 1	4	390	STM6 x 1	20	0.123
6 x 1.5	3	600	STM6 x 15	20	0.166
8 x 1	6	300	STM8 x 1	25	0.173
8 x 1.5	5	440	STM8 x 15	25	0.240
10 x 1.5	7	350	STM10 x 15	25	0.314
10 x 2	6	470	STM10 x 2	25	0.395
12 x 1.5	9	300	STM12 x 15	30	0.388
12 x 2	8	390	STM12 x 2	30	0.493
16 x 2	12	300	STM16 x 2	40	0.691
16 x 3	10	440	STM16 x 3	40	0.962
20 x 2	16	230	STM20 x 2	55	0.888
20 x 3	14	350	STM20 x 3	55	1.26
22 x 2	18	210	STM22 x 2	60	1.2
22 x 3	16	320	STM22 x 3	60	1.41
25 x 3	19	280	STM25 x 3	70	1.63
25 x 4	17	380	STM25 x 4	70	2.07
30 x 3	24	230	STM30 x 3	90	2.0
30 x 4	22	310	STM30 x 4	90	2.57
30 x 5	20	390	STM30 x 5	90	3.08
38 x 3	32	180	STM38 x 3	125	2.59
38 x 5	28	310	STM38 x 5	125	4.07
42 x 3	36	170	STM42 x 3	130	2.89
50 x 3.5	43	160	STM50 x 35	160	4.012
50 x 6	38	285	STM50 x 6	160	6.51
50 x 8	34	380	STM50 x 8	60	8.282
60 x 5	50	300	STM60 x 5 DOM		6.904
60 x 5	50	275	STM60 x 5 ST524		6.904
70 x 5	60	270	STM70 x 5 DOM		8.205
75 x 7.5	60	326	STM75 x 75 ST524		12.405
80 x 5	70	240	STM80 x 5 DOM		9.419
80 x 8	64	326	STM50 x 8 ST524		14.114
90 x 5	80	200	STM90 x 5 DOM		10.728
97 x 10	77	336	STM97 x 10 ST524		21.318
100 x 10	80	350	STM100 x 10 DOM		22.379

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

KR Coupling Specifications

Tube O/D		Working Pressure ❣ Std **Tube to Tube** Couplings @ 3:1 Safety factor	Tube O/D tolerance inc ovality	Tube spec † fully annealed	Max Surface Hardness - VPN With Mild Steel Collet	With Stainless Steel Collet	With Cupro-Nickel Collet
mm	inch	Bar	mm				
6	$\frac{1}{4}$	680	± 0.1				
8	$\frac{5}{16}$	680	± 0.1	Mild steel -			
10	$\frac{3}{8}$	680	± 0.1	BS3602 with O/D			
12	$\frac{1}{2}$	680	± 0.1	tolerance to			
16	$\frac{5}{8}$	680	± 0.1	BS3602 & DIN2391C			
20	$\frac{3}{4}$	680	± 0.1	Stainless steel -	180	180	140
22	$\frac{7}{8}$	680	± 0.1	ASTM A 269			
25	1	500	± 0.1	grade 316 or 304			
30	$1\frac{1}{4}$	500	± 0.1	Cupro-nickel -			
38	$1\frac{1}{2}$	500	± 0.15	90-10 or 70-30			
50	2	500	± 0.2	Alumium Silicon Brass			
50	2	500	± 0.2				
	$2\frac{1}{4}$	333	± 0.2				
60	$2\frac{3}{8}$	300	± 0.2				
	$2\frac{1}{2}$	300	± 0.2				
70		350	± 0.25	Mild steel -			
75	3	300	± 0.25	DOM 1026	180	180	140
80		250	± 0.25	ASTM A513			
90	$3\frac{1}{2}$	250	± 0.25				
100	4	207	± 0.25				
	$4\frac{1}{2}$	207	± 0.25				
125	5	207	± 0.25				

❣ Derate by 50% for high pressure gas systems.
† All tube must be of good outside surface finish and within the tolerance quoted.

Coupling Materials

Standard Couplings
Body, nut/flange, washer - Metric: mild steel-zinc plated and treated, clear finish
Imperial; mild steel-zinc plated and golden passivated
Collet - carbon steel - heat treated, phosphated with dry oil finish

Stainless Steel Couplings
Body, flange - AISI 316
Nut, washer - AISI 303
Collet - carbon steel or treated stainless steel or Cupro-Nickel

Cupro-Nickel Couplings
Body, nut/flange, collet, washer - Cupro-Nickel, NES 835

O Ring Data

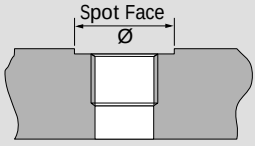
Berendsen Fluid Power stocks four different grades of 'O' rings which cover most applications encountered.

Elastomer Type	Temperature Ranges	General Fluid Compatibility*
Medium Nitrile 90 Shore Hardness	-40°C to + 100°C	Mineral Oil Water in Oil Emulsion Water Glycol Air Nitrogen Carbon Dioxide Water
FPM (Viton) 90 Shore Hardness	-20°C to +150°C	Phosphate Ester (not Skydrol) Oxygen
EP (Ethylene Propylene)	-40°C to +100°C	Skydrol 500B Hot Water Castor Based Brake Fluid
FEP encapsulated FPM	-20°C to +150°C	Very good chemical resistance to most liquids and chemicals, with the exception of liquid alkaline metals and some fluorine compounds

*For specific fluid compatability and other applications e.g. paint lines, underseal, food processing, petro-chemical etc., please consult our Sales Office.

Bonded Seal Installation Data

BSP	Torque (Nm) Single Seal	Min Spot Face Ø
1/8	22	17.0 mm
1/4	40	21.0 mm
3/8	75	26.0 mm
1/2	80	29.0 mm
5/8	150	33.0 mm
3/4	160	36.0 mm
1	190	44.0 mm
1 1/4	205	53.0 mm
1 1/2	210	59.0 mm
2	215	74.0 mm



Surface to be machined to 1.6µm circular lay and normal to thread within 0.08 mm per 25 mm run.

General Tube Preparation

1. Ensure that tube is right for the application. It should be clean and supplied plugged and oiled with no scoring or surface deformation. It must be the correct size for the coupling, to the correct specification and within the tolerances given for the coupling to be used.
2. Berendsen Fluid Power supply 'O' rings, boom rings and fire safe seals separately, ie. not installed in the coupling. Ensure seals are the correct size for the coupling. For KR couplings use only seals supplied by Berendsen Fluid Power as these are of specific quality and specification to suit KR couplings. Nitrile, FPM (viton), E.P. and FEP encapsulated FPM 'O' rings are available. Please consult our technical department for the correct material selection.
3. All metallic tubes should be cut using a hacksaw or similar tool, preferably with a guide to ensure a 90º cut. Both the inside and outside edges should be deburred and the tube pulled through to ensure no debris is left inside. Note, if roller cutters are used on metal tube there is a danger of swaging the outside diameter and leaving a burr on the inside diameter
4. Ensure tube runs are correctly aligned. Do not attempt to use tube couplings to pull misaligned tubes together.

KR Assembly Couplings up to 50 mm & 2”

Assembly of KR couplings is very simple and requires no special tools . To ensure speedy and safe assembly every time the following instructions should be followed.

1. Before installing KR couplings follow the guidelines given for general tube preparation.
2. Unscrew the nut from the body (1). Slide nut (5), collet (4) and backup washer (3) over the tube as in fig.1. Lubricate the 'O' ring (2) and the outer surface of the collet with system fluid (for air or gas systems use silicon grease) and slide the 'O' ring over the tube taking particular care not to damage it. When used in extremely hostile environments, such as offshore, lubricate the couplings threads and the collet with grease.
3. Locate the tube end against the tube abutment in the body (1). Slide the 'O' ring and the backup washer along the tube until they are correctly located in the body's counter bore. It is important that the 'O' ring and the backup washer are fully located in the body, as fig. 2.
4. Slide the collet against the washer.
5. Screw the nut onto the body and tighten holding the body with a second spanner. The completed assembly should be as fig. 3. An indication of correct assembly is given by the gap between the nut and body shoulder being approximately 3mm. The final position of the nut in relation to the body will vary with the O/D tolerance of the tube.

Note:
If a number of couplings are assembled in a straight line, ensure the previous joint is not slackened when tightening a coupling.

6. Pressurise the system, switch off and check all nuts for tightness, retighten as necessary. It is quite common for collets to 'bed in' during initial pressurisation. Torque wrenches need not be used in normal assembly work but recommendations for the guidance of quality assurance personnel are available from our technical department.

IMPORTANT:
When refitting a used coupling always use new seals and ensure that the old seals have been removed from the body.

Additional instructions for the assembly of cupro-nickel and fire safe couplings.

Fire safe couplings are fitted with an additional seal. This secondary seal takes over when the 'O' ring is destroyed by the heat of a fire. Assembly is as for our standard couplings except that the fire safe seal is placed between the 'O' ring and the backup washer, see fig. 4. Components for the fire safe coupling are NOT interchangeable with those for our other couplings.

Cupro-nickel couplings can be specified with or without a boom ring. For couplings without a boom ring assemble as above. For couplings with a boom ring, place the boom ring between the 'O' ring and the backup washer with its concave side facing the 'O' ring, see fig. 5.

Hint:
To help push the 'O' ring into the counter bore on large sizes, lightly tap the backup washer with the flats of a spanner or slide the collet against the backup washer and gently screw the nut by hand onto the body. If this method is used the nut must be removed to check the 'O' ring and washer are fully located.

Figure 1.

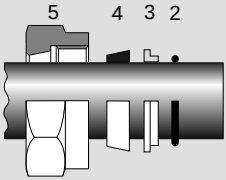


Figure 2.

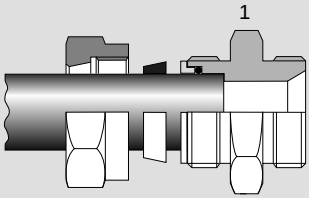


Figure 3.

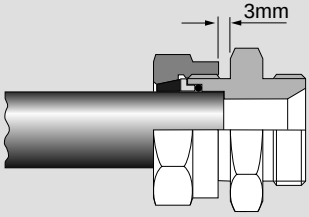


Figure 4.

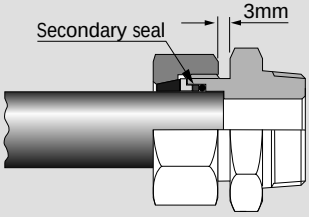
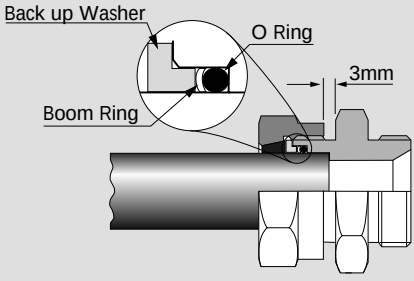


Figure 5.



KR Flange Assembly Couplings over 50 mm & 2”

Assembly of KR flange couplings is very simple and requires no special tools (other than that provided with the coupling). To ensure speedy and safe assembly every time the following instructions should be followed.

1. Before installing KR flange couplings follow the guidelines given on page 49 for tube preparation.
2. Remove the flange sub-assembly (A) from the coupling body (F). Do not unscrew the bolts past the retaining plate (B). Slide sub-assembly over the tube (fig. 1). Lubricate the 'O' ring (E) with system fluid (for air or gas systems use silicon grease) and slide it over the tube taking particular care not to damage it. When used in extremely hostile environments, such as offshore, lubricate the couplings threads and the collet with grease.
3. Locate the tube end against the tube abutment in the body (F). Slide the 'O' ring along the tube until it is correctly located in the chamfer to the counter bore of the body.
4. Slide the flange sub-assembly up to the 'O' ring, enter the tapered end of the assembly tool (provided with the coupling) as far as possible into the collet gap. Locate bolts 1 and 2 and tighten evenly until the backup washer is in its correct position (indicated by the gap between the retaining plate and the body being about 2 mm), fig 2.
5. Unscrew bolts 1 and 2 three turns and withdraw the assembly tool.
6. Fully tighten all bolts evenly in the order given, fig 3, to the correct torque, see ask our technical department for correct torque figures quoting part number, pressure rating and safety factor.

   The final position of the flange in relation to the body will vary according to the O/D tolerance of the tube.
7. Pressurise the system, switch off and check all joints.

If in doubt please consult our technical department.

Note:
Do not weld a bulkhead coupling in place without first removing its flange sub-assemblies and 'O' rings.

IMPORTANT:
When refitting a used coupling always use new seals and ensure that the old seals have been removed from the body of the coupling.

Trouble shooting
In the unlikely event of a correctly assembled KR coupling leaking check for a damaged 'O' ring, malformed or misaligned tube. Simply tightening a leaking coupling cannot cure the leak; something is wrong and the tube and 'O' ring must be checked.

Fig 1

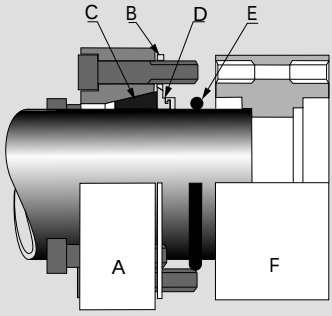


Fig 2

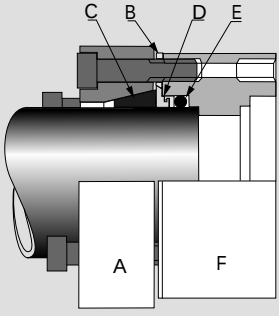
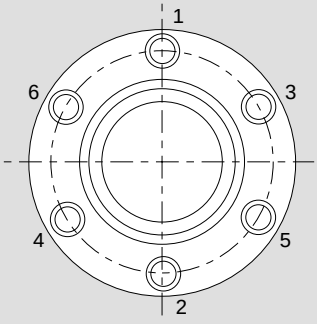


Fig 3



Pipework Installation

Obviously pipe installations are vitally important and must not be left as an afterthought to the system in which they serve a critical function.

Pipework should be laid out and should be considered early in the system design in order that the best results are achieved.

The basic operating parameters must be known to the designer to enable the correct selection of components. To help in this selection process the following hints will act as a guide.

Tube

1. Material should be compatible with the fluid or gas to be carried and the external environment. Due consideration should be given to the life expectancy. e.g. A carbon steel tube on an open deck of a ship would corrode through within 2 years without suitable protection. The use of stainless steel, copper nickel or aluminium silicon bronze tubes could well be more cost effective in the longer term.

2. Pressure rating should be capable of meeting system demand for both steady state and shock loading.

3. Outside diameter should conform to the size requirements including ovality and have a suitable surface finish.

4. Inside diameter must be clean and free from scale; this is essential in hydraulic systems. Hot finished tube will not generally provide adequate cleanliness.

5. All tube should be plugged to prevent ingress of dirt and carbon steel tube should be oiled.

Pipework Layout

1. Good appearance of pipe installation is not always easy to attain but good installation will be rewarded by reliability and can be seen by good vertical and horizontal layout.

2. Where space permits, pipe forming on the tube sizes up to 50 mm O/D is preferable to using couplings. Cold forming should always be used on annealed tubing as applying heat for bending often causes scaling in the bore of carbon steel tube and can damage the properties of copper based tubes.

3. Accessibility of couplings and inline mounted equipment is very important. Couplings in long runs should be staggered to allow for maintenance.

It is also worth considering the use of breakaway couplings to allow for the removal of inline components, should the need arise.

4. Wherever possible flexible hoses should be used to mount between rigid pipework and pumps, motors or any flexibly mounted unit. This will reduce transmitted vibration to the pipework.

Clamping

1. External vibration is difficult to predict in the early design stages but vibration and shock have an adverse effect on reliability. Firmly anchored clamping is necessary to restrain pipes from excessive movement. Clamps should be well positioned and arranged to avoid strain on pipework. A reliable system will only remain so as long as it has an equally reliable piping installation.

Couplings

1. Material must be compatible with the fluid or gas to be carried and compatible with the tube to be joined. The same comments with regard to life of the tube apply to the couplings. It is possible to use a proprietary mastic tape to protect carbon steel couplings when used with non-ferrous tubing.

2. Pressure rating should be capable of meeting system demand for both steady state and shock loading.

3. The coupling seal must be compatible with the fluid or gas in the system.

4. The coupling design must be capable of withstanding any external vibration or shock loading and where necessary must comply to the necessary certification requirements.

5. Pipes should be arranged so that they enter the coupling freely and in line. Straining pipe into couplings at an angle could cause premature failure. Bends adjacent to couplings should have a minimum of 25 mm straight pipe before the start of the radius to the back of the coupling nut. Bends in pipes close to couplings can effect the diameter and hence the gripping and sealing mechanism of the coupling.

Pipe Sizing

The accepted flow velocity for pressure lines is between 2.2 and 4.6 m/sec and for suction & return lines between 0.6 and 1.4 m/sec.

Table 1 shows the relationship between flow, tube bore and flow velocity. Lining up the appropriate flow rate on the left hand column and the desired flow velocity on the right hand column gives the approximate bore size in the centre.

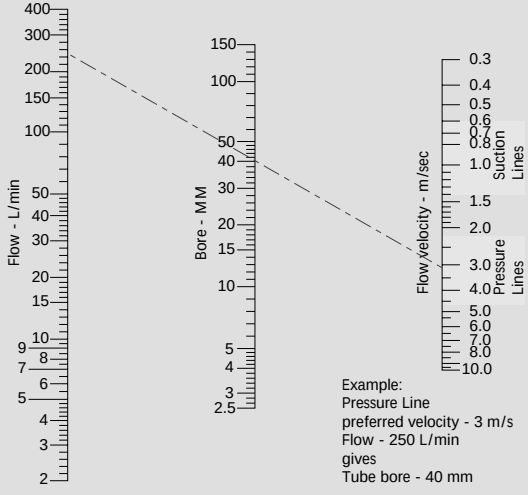


Table 1

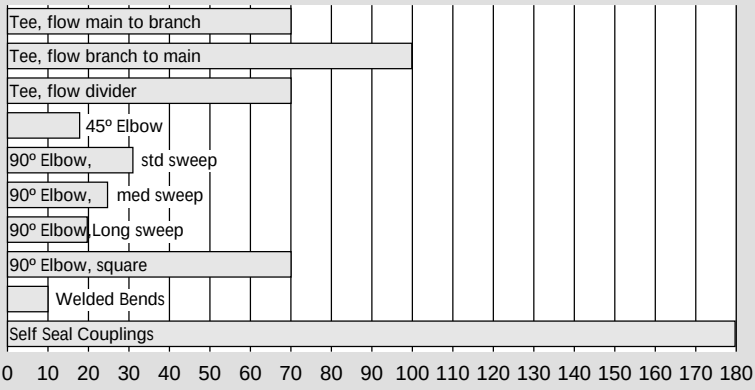


Table 2

Equivalent straight lengths of tube in tube bores to be added to the pipe run when calculating pressure drop. Example - using 40mm I/D tube, each 90º square elbow will add a pressure drop the equivalent to 2800 mm (40 x 70) of straight pipe.

Pressure Drop Calculations

Pressure Losses in Pipework

The calculation below will give the pressure drop within the pipework, the pressure at the pump and/or bore of the tube can be adjusted accordingly

Fluid flow in pipework system will result in an energy loss due to surface friction, changes in flow area and direction. Pressure loss is dependent amongst other factors on density and viscosity which will vary with temperature. The pressure loss will also vary according to whether the flow is laminar or turbulent.

There are several methods available to calculate the theoretical loss in a straight piece of pipe, one of which is shown below. To be added to this are the additional losses caused by changes in section or direction. These can be established using the equivalent length method. Table 2, page 55, gives the additional lengths of pipe to be added to the overall length for each fitting, etc

Nomenclature

- Q = Flow Rate, m^3/s
- A = Pipe Area, m^2
- P = Density of Oil, kg/m^3
- V = Velocity of Oil, m/s
- $\sqrt{}$ = Kinematic Viscosity of Oil, m^2/s
- μ = Absolute or dynamic viscosity, Ns/m^2
- F = Friction Factor for Tube
- L = Total Length of Pipe including additions for Joints, m
- d = Pipe Bore, m
- ΔP = Pressure drop, N/m^2

Conversion Factors

Flow

$1\ L/min = \frac{10^{-3}}{60}\ m^3/s$

Kinematic Viscosity

$1\ cst = 10^{-6}\ m^2/s$

Pressure

$1\ bar = 10^5\ N/m^2$

Dynamic viscosity

$1\ Poise = 0.1\ Ns/m^2$

Calculation

1) Velocity of Oil in Pipe

$$V = \frac{Q}{A} \quad m/s$$

2) Reynolds number

$$Re = \frac{Vd}{\sqrt{}} \quad \text{or} \quad Re = \frac{Vdp}{\mu}$$

For Reynolds numbers up to 1800 flow is laminar. For Reynolds numbers from 2200 flow is turbulent. For Reynolds numbers in region 1800-2200 flow is transient and both conditions should be calculated.

For Laminar Flow

3) Darcy formula

$$F = \frac{16}{Re}$$

For Turbulent Flow

4) Blasuis Formula

$$F = \frac{0.079}{Re^{1/4}}$$

5) Total Pressure Drop for Laminar or Turbulent flow

$$\Delta P = \frac{2FLPV^2}{d} \quad N/m^2$$

6) Total Pressure Drop for Laminar flow

$$\Delta P = \frac{128\mu LQ}{\pi d^4} \quad N/m^2$$

These calculations assume the use of smooth bore tube, cold drawn tube being recommended.

Fluid Viscosities & Densities

Fluid	Approximate Kinematic Viscosity @40º C	Density @ 15º C
Mineral Oil		
Grade 32	32 cSt	873 kg/m^3
Grade 46	46 cSt	878 kg/m^3
HFB Water in oil emulsion 60/40		
Light Grade	46 cSt	935 kg/m^3
Heavy Grade	90 cSt	950 kg/m^3
HFA 5/95	1.0 cSt	1000 kg/m^3
HFC Water Glycol	42 cSt	1060 kg/m^3
HFD Phosphate Ester	30 - 45 cSt	1130 - 1170 kg/m^3

Note: These figure are typical values only, sepcific values must be obtained from the oil manufacturer.

Wall Thickness Calculations

Calculation of Pipework Wall Thickness

Calculation for wall thickness is given below or if standard sizes of tube are required the table on page 46 gives the working pressure with a safety factor of 3:1 neglecting the effects of bending.

A number of formulae can be employed for calculating the wall thickness of tubes to withstand internal pressure. The two most often used are:

1) Barlows Formula

$$P = \frac{2St}{D} \quad \text{or} \quad t = \frac{PD}{2S} \quad \text{mm}$$

2) Lame's Formula

$$P = \frac{10S(R^2 - r^2)}{(R^2 + r^2)} \quad \text{mm}$$

Or

$$t = r\left(\sqrt{\left(\frac{S + P}{S - P}\right)} - 1\right) \quad \text{mm}$$

Lame's formulae is considered more accurate for thick wall tubes where high pressures are used.

P = Internal Pressure, N/m^2
S = Permissible Stress, N/m^2
t = Wall Thickness, mm
D = Outside Diameter, mm
d = Inside Diameter, mm
R = Outside Radius, mm
r = Inside Radius, mm

Note:
A reduction of 12.5% in the permissible stress (S) should be made if the tube is to be bent.

Tube Material Stress

Tube Material	UTS (min) N/mm^2	Yield Stress N/mm^2	0.2% Proof stress N/mm^2
Mild Steel			
BS 3602, CFS 360	360	215	207
BS 3602, CFS 410	410	245	237
BS 3602, CFS 460	460	280	264
BS 3603, CFS 410	410	235	-
DOM 1026 to ASTM A513			
Stress relieved	585	518	-
Normalised	493	355	-
Stainless Steel			
ASTM A269 Grade 316	517	207	206
Aluminium Silicon Bronze			
DGS 1182 D	450	-	210
Copper Nickel			
90/10	270	68.6**	108*
70/30	360	79.4**	123*

* As quoted in BS 1306 - 1975. ** Permissible stress for metal temperatures up to 75º C

Note: These figures are for guidance only. Please consult the tube manufacturer for the latest specification.

Conversion Tables

Multiply	by	to obtain
Acceleration		
cm/s/s	0.03281	ft/s/s
ft/s/s	30.48	cm/s/s
ft/s/s	0.3048	m/s/s
inch/s/s	0.0254	m/s/s
m/s/s	3.28084	ft/s/s
m/s/s	39.37008	in/s/s
Area		
cm^2	0.1550003	in^2
cm^2	0.001076391	ft^2
ft^2	0.09290304	m^2
ft^2	929.0304	cm^2
ft^2	92903.04	mm^2
in^2	645.16	mm^2
in^2	6.4516	cm^2
in^2	0.00064516	m^2
m^2	1550.003	in^2
m^2	10.76391	ft^2
m^2	1.19599	yd^2
mm^2	0.0000107639	ft^2
mm^2	0.001550003	in^2
yd^2	0.8361274	m^2
Density		
g/cm^3	0.03612730	lb/in^3
kg/m^3	0.06242797	lb/ft^3
kg/m^3	0.01002242	lb/Imp gal
kg/m^3	0.000036046	lb/in^3
lb/ft^3	16.01846	kg/m^3
lb/in^3	27.67990	g/cm^3
lb/Imp gal	99.77633	kg/m^3
Flow		
ft^3/min	28.31685	l/min
ft^3/min	0.0004719474	m^3/s
l/min	0.03531466	ft^3/min
l/min	0.0005886	ft^3/s
l/min	0.22	Imp gal/min
l/min	0.264172	Us gal/min
m^3/s	2118.88	ft^3/min
m^3/s	35.31	ft^3/s
m^3/s	13198.15	Imp gal/min
Imp gal/min	4.546	l/min
Imp gal/min	0.004546092	m^3/min
Imp gal/min	0.0000757682	m^3/s
Imp gal/min	1.20095	US gal/min
US gal/min	0.83267	Imp gal/min
US gal/min	3.785412	l/min
Force		
kg f	2.2046	lb f
kg f	9.80665	N
kg f	0.0009842	ton f
lb f	0.4536	kg f
lb f	4.448	N
N	0.1019716	kg f
N	0.2248089	lb f
N	0.0001004	ton f
ton f	1016.0	kg f
ton f	9964.0	N
Kinematic viscosity		
cSt	1.0	mm^2/s
cSt	0.00001076	ft^2/s
cSt	0.00155	in^2/s
cSt	0.000001	m^2/s
ft^2/s	92903.0	cSt
ft^2/s	144.0	in^2/s
ft^2/s	0.0929	m^2/s
in^2/s	645.2	cSt
in^2/s	0.006944	ft^2/s
in^2/s	0.0006452	m^2/s
m^2/s	1000000.0	cSt
m^2/s	10.76	ft^2/s
m^2/s	1550.0	in^2/s
Length		
cm	0.0328084	ft
cm	0.3937008	in
ft	0.3048	m
ft	30.48	cm
ft	304.8	mm
in	0.0254	m
in	2.54	cm
in	25.4	mm
m	39.37008	in
m	3.28084	ft
m	1.093613	yd
mm	0.00328084	ft
mm	0.03937008	in
yd	0.9144	m
Power		
ft lbf/s	0.00818	hp
ft lbf/s	0.001356	kW
ft lbf/s	1.3558	W
hp	550.0	ft lbf/s
hp	0.7457	kW
hp	745.7	W
kW	737.6	ft lbf/s
kW	1.341	hp
kW	1000.0	W
W	0.7376	ft lbf/s
W	0.001341	hp
W	0.001	kW
Pressure		
atm	1.013	bar
atm	29.92	in Hg
atm	1.013	kgf/cm^2
atm	14.6959	lbf/in^2
atm	760.0	mm Hg
atm	101325.0	N/m^2
bar	29.53	in Hg
bar	1.02	kgf/cm^2
bar	14.50377	lbf/in^2
bar	750.1	mm Hg
bar	100000.0	N/m^2
in Hg	0.03342	atm
in Hg	0.03386	bar
in Hg	0.03453	kgf/cm^2
in Hg	0.4911	lbf/in^2
in Hg	25.4	mm Hg
in Hg	3386.0	N/m^2
kgf/cm^2	0.9807	bar
kgf/cm^2	28.96	in Hg
kgf/cm^2	14.22	lbf/in^2
kgf/cm^2	735.6	mm Hg
kgf/cm^2	98066.5	N/m^2
lbf/in^2	0.06894757	bar
lbf/in^2	2.036	in Hg
lbf/in^2	0.07030697	kgf/cm^2
lbf/in^2	51.71	mm Hg
lbf/in^2	6894.757	N/m^2

Multiply	by	to obtain
mm Hg	0.001316	atm
mm Hg	0.001333	bar
mm Hg	0.03937	in Hg
mm Hg	0.00136	kgf/cm^2
mm Hg	133.3	N/m^2
N/m^2	0.00001	bar
N/m^2	0.0002953	in Hg
N/m^2	0.0000101972	kgf/cm^2
N/m^2	0.000145	lbf/in^2
N/m^2	0.007501	mm Hg
Stress		
kgf cm^2	2048.0	lbf/ft^2
kgf cm^2	14.22	lbf/in^2
kgf cm^2	98070.0	N/m^2
kgf cm^2	0.00635	tonf/in^2
lbf/ft^2	0.0004882	kgf cm^2
lbf/ft^2	0.006944	lbf/in^2
lbf/ft^2	47.88	N/m^2
lbf/ft^2	0.0000031	tonf/in^2
lbf/in^2	0.07031	kgf cm^2
lbf/in^2	144.0	lbf/ft^2
lbf/in^2	6895.0	N/m^2
lbf/in^2	0.0004464	tonf/in^2
tonf/in^2	157.5	kgf cm^2
tonf/in^2	322600.0	lbf/ft^2
tonf/in^2	2240.0	lbf/in^2
tonf/in^2	15440000.0	N/m^2
N/m^2	0.0000102	kgf cm^2
N/m^2	0.02089	lbf/ft^2
N/m^2	0.000145	lbf/in^2
N/m^2	0.0000000648	tonf/in^2
Torque		
kgf m	7.233	lbf ft
kgf m	86.8	lbf in
kgf m	9.80665	N.m
lbf ft	0.1383	kgf m
lbf ft	12.0	lbf in
lbf ft	1.355818	N.m
lbf in	0.01152	kgf m
lbf in	0.08333	lbf ft
lbf in	0.113	N.m
N.m	0.1019716	kgf m
N.m	0.7375621	lbf ft

Multiply	by	to obtain
N.m	8.851	lbf in
Velocity		
cm/s	1.968504	ft/min
cm/s	0.0328084	ft/s
ft/min	0.508	cm/s
ft/min	0.00508	m/s
ft/min	5.08	mm/s
ft/s	30.48	cm/s
ft/s	0.3048	m/s
ft/s	304.8	mm/s
m/s	11811.02	ft/hour
m/s	196.8504	ft/min
m/s	3.28084	ft/s
mm/s	0.19685	ft/min
mm/s	0.003281	ft/s
Volume		
cm^3	0.06102376	in^3
ft^3	0.02831685	m^3
ft^3	28.31685	litre
Imp gal	0.004546092	m^3
Imp gal	4.546092	litre
in^3	16387.06	mm^3
in^3	16.38706	cm^3
in^3	0.00001638706	m^3
litre	0.001	m^3
litre	0.2199692	Imp gal
litre	0.03531466	ft^3
m^3	219.9692	Imp gal
m^3	35.31466	ft^3
m^3	1000.0	litre
m^3	61023.76	in^3
mm^3	0.0000610238	in^3
Weight		
g	0.0022046	lb
kg	2.20462	lb
lb	453.592	g
lb	0.453592	kg
ton	1.01605	tonne
tonne	0.984207	ton

NOTE: whilst every effort has been made to ensure the accuracy of these tables Berendsen PMC Limited cannot accept any responsibilities of any inaccuracies.

Hydraulic &
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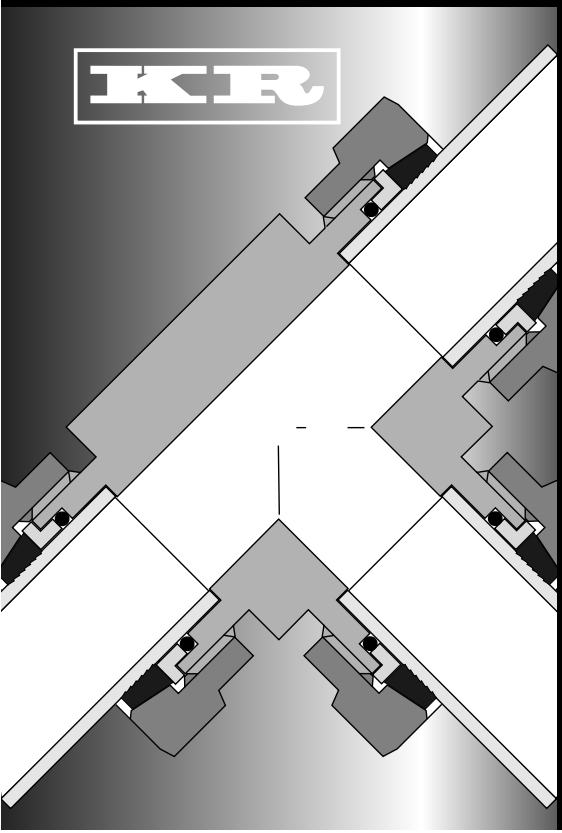

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