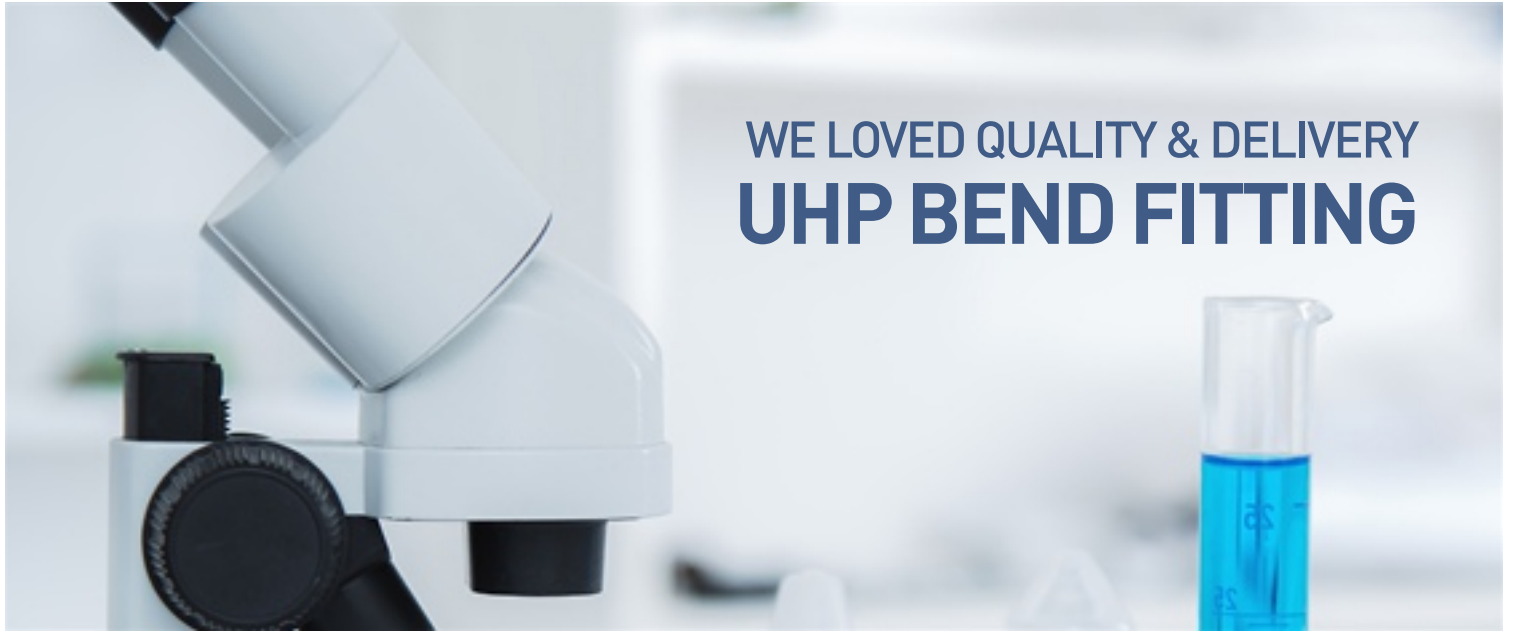




WE LOVED QUALITY & DELIVERY
UHP BEND FITTING





STANDARD FITTINGS



20 90°ELBOW



20 45°ELBOW



21 EQUAL TEE

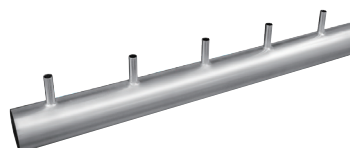


21 CAP



22 REDUCING TEE

23 MULTI-HEADER TEE



23 CON



23 ECC REDUCER



24 CAP RECUDER



JOINT FITTINGS



25 JOINT TEE



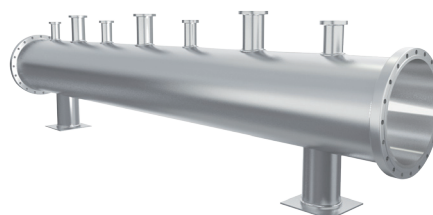
26 JOINT CAP Reducer

25 JOINT MULTI- HEADER TEE



26 JOINT Reducer

27 SPECIAL CLEAN SPOOL HEADER ASSEMBLY





FLANGE CONNECTION



28 RF/BLIND FLANGE



29 TEFLON GASKET



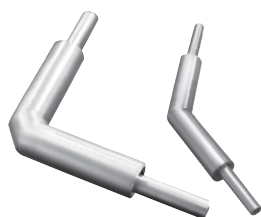
28 LAP JOINT



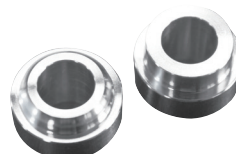
29 PIPE FLANGE



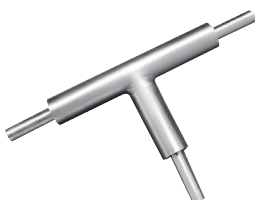
COAXIAL FITTINGS



30 COAXIAL ELBOW



32 STOP SPACER



30 EQUAL TEE

33 COAXIAL HALF TUBE



31 COAXIAL REDUCING TEE



33 COAXIAL OVER TUBE



32 COAXIAL REDUCER



DWC Fitting



HOW TO ORDER BEND FITTINGS

Bend Fittings Part No.

W		4S		P		25A		LE		AP	
TYPE		MATERIAL		TUBE TYPE		SIZE		PRODUCT		AP	AP
S	SEAMLESS	6	316L	T	TUBE	4	1/4"	EB	90° LONG ELBOW	MP	MP
W	WELDED	4S	304	P	PIPE	6	3/8"	SEB	90° SHORT ELBOW	BA	BA
						8	1/2"	HEB	45° LONG ELBOW	EP	EP
						12	3/4"	ET	EQUAL TEE		
						16	1"	ST	SHORT TEE		
						20	1 1/4"	RT	REDUCING TEE		
						24	1 1/2"	RC	CONCENTRIC REDUCER		
						32	2"	RE	ECCENTRIC REDUCER		
						40	2 1/2"	CP	CAP		
						48	3"	RC	CAP REDUCER		
						64	4"	JTM	JOINT TEE (MALE)		
						XXXA	PIPE SIZE	JTF	JOINT TEE (FEMALE)		
								JRM	JOINT CAP REDUCER (MALE)		
								JRF	JOINT CAP REDUCER (FEMALE)		
								JCM	JOINT CAP (MALE)		
								JCF	JOINT CAP (FEMALE)		
								TG	TEFLON GASKET		
								PF	PIPE FLANGE		
								RFF	RF FLANGE		
								BLF	BLIND FLANGE		
								LAJ	LAP JOINT		
								MHT	MULTI-HEADER TEE		
								MJT	MULTI-HEADER JOINT TEE		
								CLE	COAXIAL 90° LEBOW		
								CHE	COAXIAL 45° ELBOW		
								CRC	COAXIAL REDUCER		
								CET	COAXIAL EQUAL TEE		
								CRT	COAXIAL REDUCING TEE		
								SS	STOP SPACER		
								CHT	COAXIAL HALF TUBE		
								COT	COAXIAL OVER TUBE		

Ordering Examples

	S6T4EB-B	W4SP50A25ART-AP	W6P25AHEB-MP
TYPE	SEAMLESS	WELDED	WELDED
MATERIAL	316L	SUS304	SUS316L
TUBE / PIPE	TUBE	PIPE	PIPE
SIZE	1/4"	50A * 25A	25A
PRODUCT	ELBOW	REDUCING TEE	45° ELBOW
INNER SURFACE LEVEL	BA	AP	MP



TUBE SIZE & PIPE SIZE

TUBE SIZE (INCH-SIZE)

(Unit = mm)

Normal Tube	Outside Diameter at End	Wall Thickness at End	Straight End Length	Thinning Length
	OD(OD1, OD2)	T(T1, T2)	L	J
1/8"	3.18	0.7	29	7
1/4"	6.35	1.0(0.89)	29	7
3/8"	9.53	1.0(0.89)	29	7
1/2"	12.70	1.0, 1.24(1.65)	29	7
5/8"	15.88	1.0(1.24)	36	7
3/4"	19.05	1.65(1.24)	36	7
1"	25.40	1.65(1.24)	36	7
1 1/4"	31.80	1.65	36	7
1 1/2"	38.10	1.65	46	7
2"	50.80	1.65	46	7
2 1/2"	63.50	1.65	51	7
3"	76.20	1.65	51	11
4"	101.60	2.11	51	11
5"	127.00	2.77, 3.05	56	11
6"	152.40	2.77, 3.05	56	11

PIPE SIZE (A SIZE)

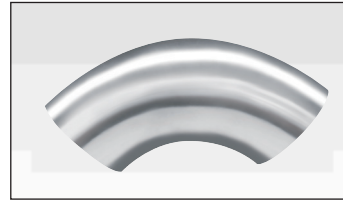
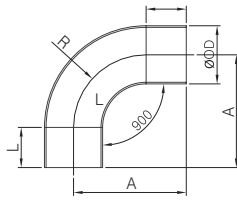
(Unit = mm)

Normal Pipe	Outside Diameter at End	Wall Thickness at End		Straight End Length	Thinning Length	
	OD(OD1, OD2)	T		L	J	
		5S	10S		5S	10S
8A	13.8	1.20	1.65	29	4	7
10A	17.3	1.20	1.65	36	4	7
15A	21.7	1.65	2.10	36	5	7
20A	27.2	1.65	2.10	36	5	7
25A	34	1.65	2.80	36	5	7
32A	42.7	1.65	2.80	46	5	7
40A	48.6	1.65	2.80	46	5	7
50A	60.5	1.65	2.80	46	5	7
65A	76.3	2.10	3.00	51	6	11
80A	89.1	2.10	3.00	51	6	11
100A	114.3	2.10	3.00	51	6	11
125A	139.8	2.80	3.40	-	7	-
150A	165.2	2.80	3.40	-	7	-
200A	216.3	2.80	4.00	-	7	-
250A	267.4	3.40	4.00	-	-	-
300A	318.5	4.00	4.50	-	-	-
350A	355.6	4.00	4.80	-	-	-
400A	406.4	4.20	4.80	-	-	-
450A	457.2	4.20	4.80	-	-	-
500A	508	4.80	5.50	-	-	-
550A	558.8	4.80	5.50	-	-	-
600A	609.6	5.50	6.40	-	-	-

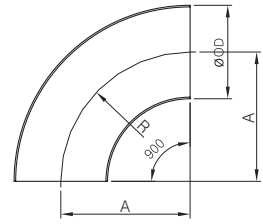
90° ELBOW



AUTO-WELDING 90° ELBOW(8A~100A)



MANUAL-WELDING 90° ELBOW (125A~300A)



- Long Radius

(Unit = mm)

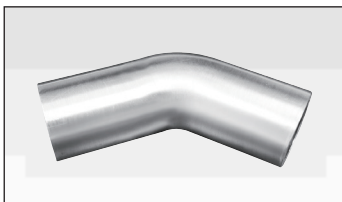
PIPE SIZE (A Size)																
OD	8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
R	25.4	25.4	38.1	38.1	38.1	47.6	57.2	76.2	63.5	76.2	101.6	190.5	228.6	304.8	381.0	457.2
A	55.0	62.0	75.0	75.0	75.0	94.0	104.0	123.0	115.0	128.0	153.0					
L	29.0	36.0	36.0	36.0	36.0	46.0	46.0	46.0	51.0	51.0	51.0	-	-	-	-	-

TUBE SIZE (Inch Size)																
OD	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"		
R	20.0	23.0	25.0	28.0	30.0	33.0	47.6	57.2	76.2	95.3	95.3	133.4	190.5	228.6		
A	49.0	52.0	54.0	64.0	66.0	69.0	84.0	104.0	123.0	147.0	147.0	185.0	250.0	290.0		
L	29.0	29.0	29.0	36.0	36.0	36.0	36.0	46.0	46.0	51.0	51.0	51.0	56.0	56.0		

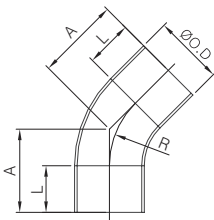
- Short Radius

PIPE SIZE (A Size)																
OD	8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
R	12.7	12.7	12.7	19.1	25.4	31.8	38.1	50.8	63.5	76.2	101.6	127.0	152.4	203.2	254.0	304.8
A	42.0	49.0	49.0	56.0	62.0	78.0	85.0	97.0	115.0	128.0	153.0					
L	29.0	29.0	29.0	36.0	36.0	36.0	36.0	46.0	46.0	51.0	51.0	-	-	-	-	-

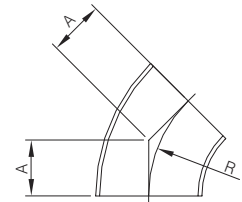
45° ELBOW



AUTO-WELDING 45° ELBOW(8A~100A)



MANUAL-WELDING 45° ELBOW(125A~300A)



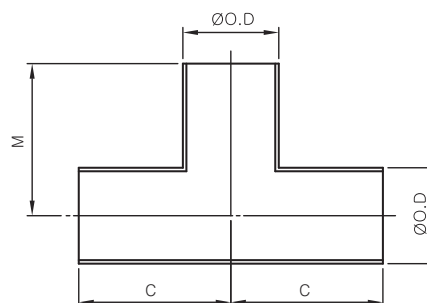
- Long Radius

(Unit = mm)

PIPE SIZE (A Size)																
OD	8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
R	25.4	25.4	38.1	38.1	38.1	47.6	57.2	76.2	95.3	114.3	152.4	190.5	228.6	304.8	381.0	457.2
A	40.0	47.0	52.0	52.0	52.0	66.0	70.0	78.0	91.0	99.0	115.0	78.9	94.7	126.2	157.8	189.4
L	29.0	36.0	36.0	36.0	36.0	46.0	46.0	46.0	51.0	51.0	51.0	-	-	-	-	-

TUBE SIZE (Inch Size)																
OD	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"		
R	20.0	23.0	25.0	28.0	30.0	33.0	47.6	57.2	76.2	95.3	95.3	133.4	190.5	228.6		
A	38.0	39.0	40.0	48.0	49.0	50.0	56.0	70.0	78.0	91.0	91.0	107.0	140.0	155.0		
L	29.0	29.0	29.0	36.0	36.0	36.0	36.0	46.0	46.0	51.0	51.0	51.0	56.0	56.0		

EQUAL TEE



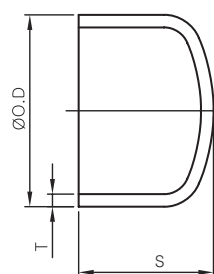
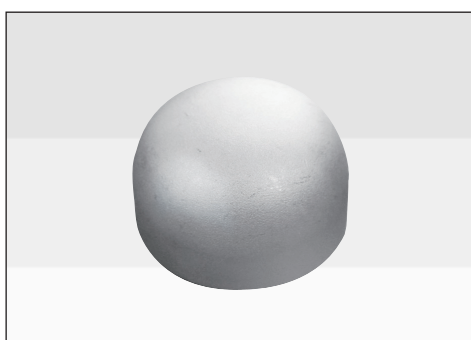
- Standard TEE

(Unit = mm)

PIPE SIZE (A Size)																
OD	8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
C	42	49	59	65	68	88	95	102	121	130	145	123.8	142.9	177.8	215.9	254.0
M	42	49	59	65	68	88	95	102	121	130	145					

TUBE SIZE (Inch Size)														
OD	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"
C	35	37	39	49	52	55	59	74	77	90	97	110	140	160
M	35	37	39	49	52	55	59	74	77	90	97	110	140	160

CAP

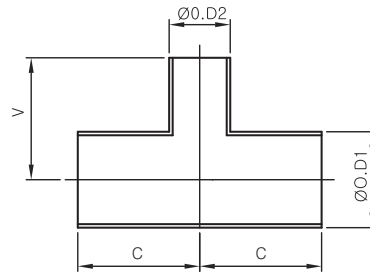


(Unit = mm)

PIPE SIZE (A Size)																
OD	8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
S	12.7	19.1	25.4	25.4	38.1	38.1	38.1	38.1	38.1	50.8	63.5	76.2	88.9	101.6	127.0	152.4
T	1.20	1.20	1.65	1.65	1.65	1.65	1.65	1.65	2.10	2.10	2.10	3.40	3.40	4.00	4.00	4.50

TUBE SIZE (Inch Size)													
OD	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	
S	12.7	12.7	12.7	12.7	19.1	25.4	38.1	38.1	38.1	38.1	38.1	63.5	
T	1.00	1.00	1.24	1.24	1.65	1.65	1.65	1.65	1.65	1.65	1.65	2.11	

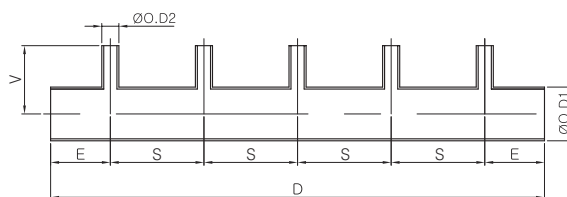
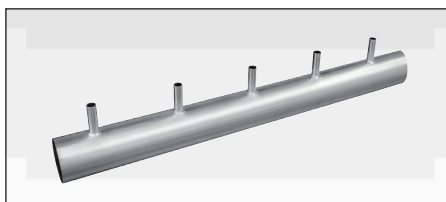
REDUCING TEE



(Unit = mm)

PIPE SIZE (A Size)							
OD1	OD2	C	V	OD1	OD2	C	V
8A	1/2", 3/8", 1/4"	42	42	125A	8A, 1/2", 3/8", 1/4"	80	110
10A	8A, 1/2", 3/8", 1/4"	47	44		25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	100	120
15A	8A, 1/2", 3/8", 1/4"	47	44		50A, 40A, 32A, 2", 1 1/2"	120	130
	10A, 3/4", 5/8"	52	52		100A, 80A, 65A, 4", 3", 2 1/2"	140	140
20A	8A, 1/2", 3/8", 1/4"	47	47	150A	8A, 1/2", 3/8", 1/4"	90	130
	15A, 10A, 1", 3/4", 5/8"	55	55		25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	110	140
25A	8A, 1/2", 3/8", 1/4"	47	50		50A, 40A, 32A, 2", 1 1/2"	130	150
	20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	59	59		100A, 80A, 65A, 4", 3", 2 1/2"	150	160
32A	8A, 1/2", 3/8", 1/4"	57	54	200A	125A, 5"	142.9	136.5
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	68	62		8A, 1/2", 3/8", 1/4"	100	150
40A	8A, 1/2", 3/8", 1/4"	57	57		25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	120	160
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	68	65		50A, 40A, 32A, 2", 1 1/2"	140	170
	32A, 1 1/2"	77	77		100A, 80A, 65A, 4", 3", 2 1/2"	160	180
50A	8A, 1/2", 3/8", 1/4"	57	63		125A, 5"	177.8	161.9
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	68	71	150A, 6"	177.8	168.3	
	40A, 32A, 2", 1 1/2"	83	83	250A	8A, 1/2", 3/8", 1/4"	110	180
65A	8A, 1/2", 3/8", 1/4"	61	71		25A, 20A, 15A, 10A, 1", 3/4"	130	190
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	72	79		50A, 40A, 32A	150	200
	50A, 40A, 32A, 2", 1 1/2"	88	90		100A, 80A, 65A	170	210
	2 1/2"	97	97		125A	215.9	190.5
80A	8A, 1/2", 3/8", 1/4"	61	77		150A	215.9	193.7
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	72	85		200A	215.9	203.2
	50A, 40A, 32A, 2", 1 1/2"	88	96	300A	8A, 1/2", 3/8", 1/4"	120	200
	65A, 3", 2 1/2"	103	103		25A, 20A, 15A, 10A, 1", 3/4"	140	210
100A	8A, 1/2", 3/8", 1/4"	61	90		50A, 40A, 32A	160	220
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"	72	98		100A, 80A, 65A	180	230
	50A, 40A, 32A, 2", 1 1/2"	88	109		125A	254	215.9
	80A, 65A, 4", 3", 2 1/2"	116	116		150A	254	219.1
				200A	254	228.6	
				250A	254	241.3	

MULTI-HEADER TEE

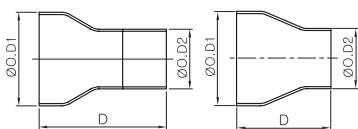


(Unit = mm)

PIPE SIZE (A Size)													
OD		8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	
Length at End		E	60								70		
Pitch		S	100								145		
Total Length (D)	Number of Branches	2	245								285		
		3	370								430		
		4	495								575		
		5	620								720		
Branch Tube Height	Tube-End(V)	42	44	44	47	50	54	57	63	71	77	90	
	Female(V)	35	37	39.5	42.5	46.5	51	54	60	68	74.5	87	

TUBE SIZE (INCH SIZE)													
OD		1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
Length at End		E	76.2										
Pitch		S	152.4										
Total Length (D)	Number of Branches	2	304.8										
		3	457.2										
		4	609.6										
		5	762.0										
Branch Tube Height	Tube-End(V)	35	37	39	44	44	47	50	54	57	63	71	87
	Female(V)	31.5	33.5	35	36.5	38	42	45.5	48	55	61.5	68	81

CONCENTRIC REDUCER



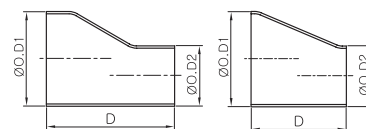
Auto-Welding & Mechanical Working Type
Concentric Reducer [RC] (8A-100A)

Auto Welding Type Concentric Reducer
/Eccentric Reducer

(Unit = mm)

PIPE SIZE (A Size)		
OD1	OD2	D
20A	15A	105
25A	20A, 15A	120
32A	25A, 20A, 15A	125
40A	32A, 25A, 20A	130
50A	40A, 32A, 25A	140
65A	50A, 40A, 32A	165
80A	65A, 50A, 40A	170
100A	80A, 65A, 50A	180

ECCENTRIC REDUCER



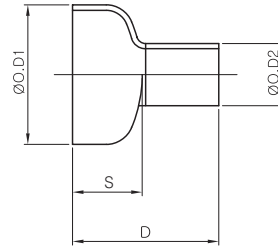
Auto-Welding & Mechanical Working Type
Eccentric Reducer [RE] (8A-100A)

Mechanical Working Type Concentric Reducer
/Eccentric Reducer

(Unit = mm)

PIPE SIZE (A Size)		
OD1	OD2	D
15A	3/4", 1/2"	100
20A	1", 3/4", 1/2"	105
25A	1", 3/4", 1/2", 3/8", 1/4"	120
32A	1 1/2", 1 1/4", 1"	125
40A	1 1/2", 1 1/4", 1", 3/4", 1/2", 3/8"	130
50A	2", 1 1/2", 1 1/4", 1", 3/4"	140

CAP REDUCER



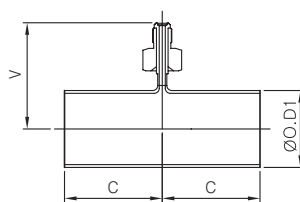
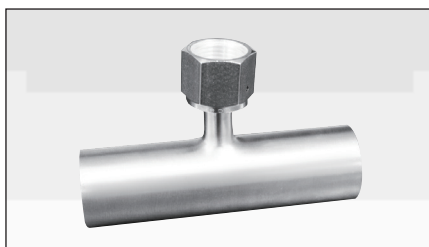
(Unit = mm)

PIPE SIZE (A Size)							
OD1	OD2	S	D	OD1	OD2	S	D
15A	8A, 1/2", 3/8", 1/4"	25.4	60	125A	8A, 1/2", 3/8", 1/4"	76.2	120
	10A, 3/4", 5/8"		(67)		130		
20A	8A, 1/2", 3/8", 1/4"	25.4	60		50A, 40A, 32A, 2", 1 1/2"		140
	15A, 10A, 1", 3/4", 5/8"		67		(150)		
25A	8A, 1/2", 3/8", 1/4"	38.1	73	150A	8A, 1/2", 3/8", 1/4"	88.9	130
	20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"		(80)		140		
32A	8A, 1/2", 3/8", 1/4"	38.1	73		50A, 40A, 32A, 2", 1 1/2"		150
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"		80		160		
40A	8A, 1/2", 3/8", 1/4"	38.1	73	200A	8A, 1/2", 3/8", 1/4"	101.6	140
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"		80		150		
	32A, 1 1/2"		(90)		160		
50A	8A, 1/2", 3/8", 1/4"	38.1	73		100A, 80A, 65A, 4", 3", 2 1/2"		170
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"		80	250A	8A, 1/2", 3/8", 1/4"	127.0	170
	40A, 32A, 2", 1 1/2"		(90)		25A, 20A, 15A, 10A, 1", 3/4"		180
65A	8A, 1/2", 3/8", 1/4"	38.1	73		50A, 40A, 32A		190
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"		80		100A, 80A, 65A		200
	50A, 40A, 32A, 2", 1 1/2"		(90)	300A	8A, 1/2", 3/8", 1/4"	152.4	200
	2 1/2"		(100)		25A, 20A, 15A, 10A, 1", 3/4"		210
80A	8A, 1/2", 3/8", 1/4"	50.8	85		50A, 40A, 32A		220
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"		92		100A, 80A, 65A		230
	50A, 40A, 32A, 2", 1 1/2"		102	* 125A(100A, 80A, 65A, 50A) / 150A(125A, 100A, 80A, [65A])/200A(150A, 125A, 100A) Bevel end at large dia. side.			
	65A, 3", 2 1/2"		(110)				
100A	8A, 1/2", 3/8", 1/4"	63.5	98				
	25A, 20A, 15A, 10A, 1 1/4", 1", 3/4", 5/8"		105				
	50A, 40A, 32A, 2", 1 1/2"		115				
	80A, 65A, 4", 3", 2 1/2"		125				

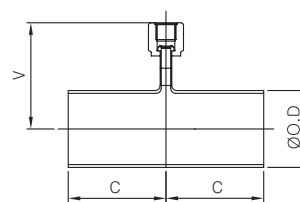
(Unit = mm)

TUBE SIZE (Inch Size)							
OD1	OD2	S	D	OD1	OD2	S	D
3/4"	1/2", 3/8", 1/4", 8A	19.1	54	2 1/2"	1/2", 3/8", 1/4", 8A	38.1	73
	5/8", 10A		60		1 1/4", 1", 3/4", 5/8", 25A, 20A, 15A, 10A		80
1"	1/2", 3/8", 1/4", 8A	25.4	60		2", 1 1/2", 50A, 40A, 32A		(90)
	3/4", 5/8", 15A, 10A		67	3"	1/2", 3/8", 1/4", 8A	38.1	73
1 1/4"	1/2", 3/8", 1/4", 8A	38.1	73		1 1/4", 1", 3/4", 5/8", 25A, 20A, 15A, 10A		80
	1", 3/4", 5/8", 20A, 15A, 10A		80		2", 1 1/2", 50A, 40A, 32A		(90)
1 1/2"	1/2", 3/8", 1/4", 8A	38.1	73		2 1/2"		(95)
	1 1/4", 1", 3/4", 5/8", 25A, 20A, 15A, 10A		80	4"	1/2", 3/8", 1/4", 8A	63.5	98
2"	1/2", 3/8", 1/4", 8A	38.1	73		1 1/4", 1", 3/4", 5/8", 25A, 20A, 15A, 10A		105
	1 1/4", 1", 3/4", 5/8", 25A, 20A, 15A, 10A		80		2", 1 1/2", 50A, 40A, 32A		115
	1 1/2", 40A, 32A		(90)		3", 2 1/2", 80A, 65A		(125)

JOINT TEE



Male Type



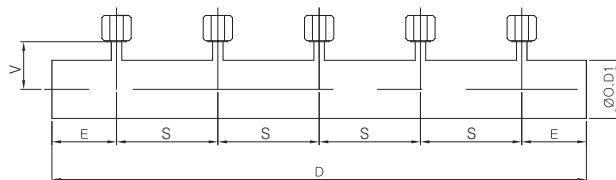
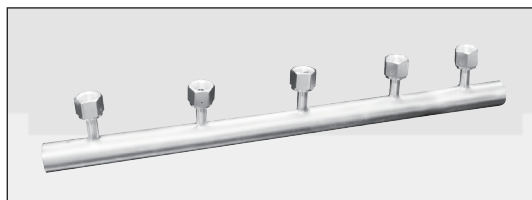
Female Type

(Unit = mm)

PIPE SIZE (A Size)															
OD		8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A
C		45	52	52	55	59	68	68	68	72	72	72	100	110	120
Female	V	35	37	39.5	42.5	46.5	51	54	60	68	74.5	87	100	113	138.5
Male	V	45	47	49.5	52.5	56.5	61	64	70	78	84.5	97	110	123	148.5

TUBE SIZE (Inch Size)															
OD		1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"
C		43	45	45	52	52	55	59	68	68	72	72	72	90	100
Female	V	31.5	33.5	35	36.5	38	42	45.5	48	55	61.5	68	81	94	107
Male	V	41.5	43.5	45	46.5	48	52	55.5	58	65	72.5	78	91	104	117

JOINT MULTI-HEADER TEE

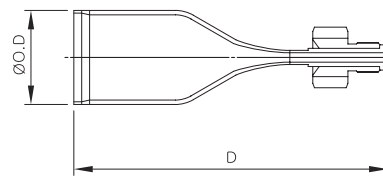
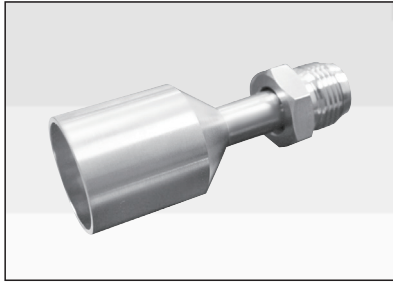


(Unit = mm)

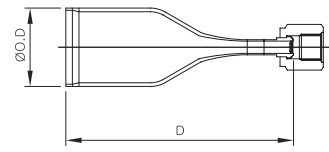
PIPE SIZE (A Size)												
OD		8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A
Length at End	E	23	29	31	34	42	46	49	60	68	74.5	87
Pitch	S	125									145	
Total Length (D)	Number of Branches	2	245									285
		3	370									430
		4	495									575
		5	620									720
Branch Tube Height	Tube-End(V)	42	44	44	47	50	54	57	63	71	77	90
	Female(V)	35	37	39.5	42.5	46.5	51	54	60	68	74.5	87

TUBE SIZE (Inch Size)														
OD		1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	
Length at End		E	21	21	21	27	30	33	40	45	50	65	68	86
Pitch		S	152.4											
Total Length (D)	Number of Branches	2	304.8											
		3	457.2											
		4	609.6											
		5	762.0											
Branch Tube Height	Tube-End(V)	35	37	39	44	44	47	50	54	57	63	71	87	
	Female(V)	31.5	33.5	35	36.5	38	42	45.5	48	55	61.5	68	81	

JOINT REDUCER



Male Type



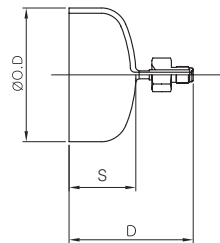
Female Type

(Unit = mm)

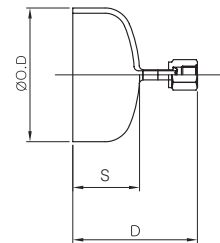
PIPE SIZE (A Size)						
OD		8A	10A	15A	20A	25A
Female	D	90	100	110	115	130
Male	D	100	110	120	125	140

TUBE SIZE (Inch Size)						
OD		3/8"	1/2"	5/8"	3/4"	1"
Female	D	80	85	100	110	115
Male	D	90	95	110	120	125

JOINT CAP REDUCER



Male Type



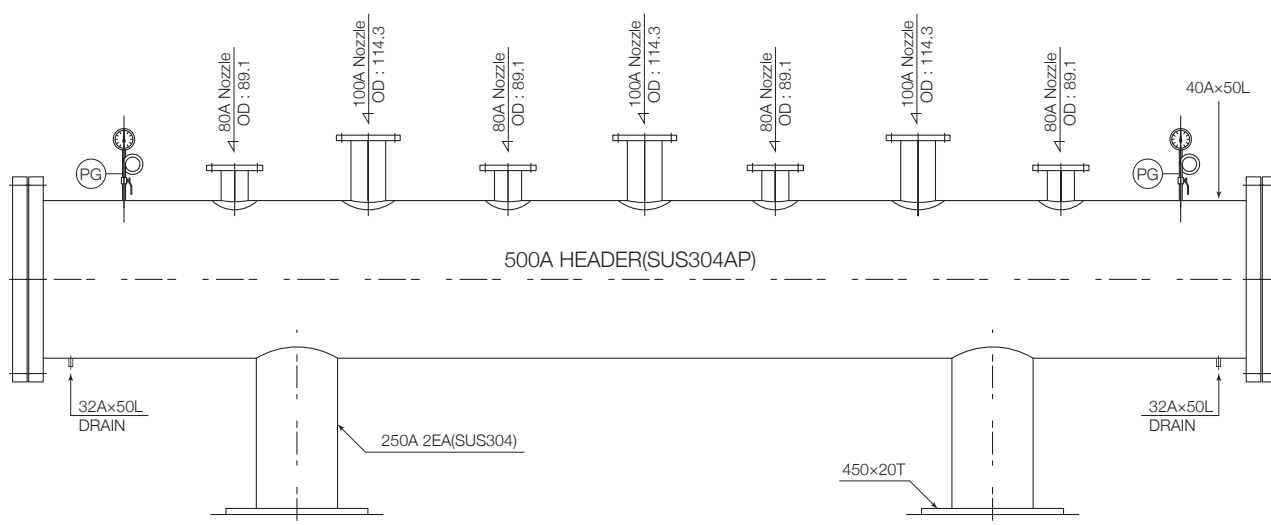
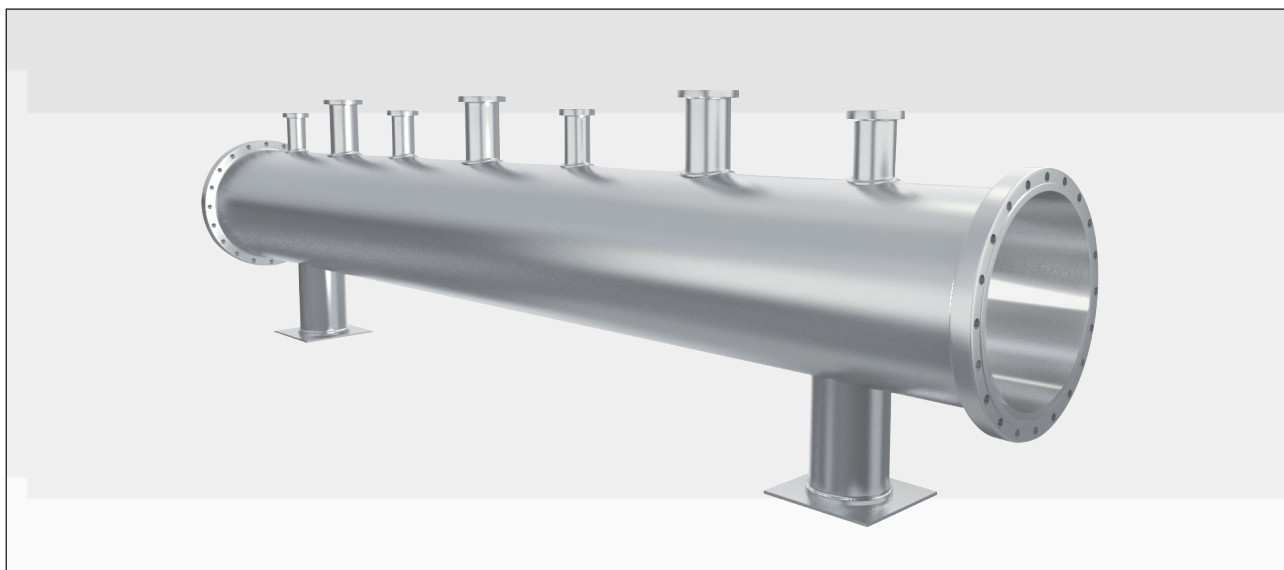
Female Type

(Unit = mm)

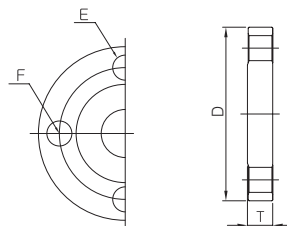
PIPE SIZE (A Size)														
OD		10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A
Cap Length	S	19.1	25.4	25.4	38.1	38.1	38.1	38.1	38.1	50.8	63.5	76.2	88.9	101.6
Female	D	48	55	55	68	68	68	68	68	81	94	107	120	133
Male	D	58	65	65	78	78	78	78	78	91	104	117	130	143

TUBE SIZE (Inch Size)									
OD		3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
Cap Length	S	19.1	25.4	38.1	38.1	38.1	38.1	38.1	63.5
Female	D	48	55	68	68	68	68	68	94
Male	D	58	65	78	78	78	78	78	104

SPECIAL CLEAN SPOOL HEADER ASSEMBLY



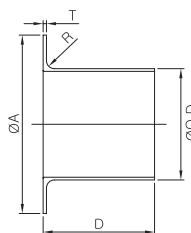
RF/BLIND FLANGE



(Unit = mm)

PIPE SIZE (A Size)															
JIS 10K															
OD	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
D	90	95	100	125	135	140	155	175	185	210	250	280	330	400	445
T	12	12	14	14	16	16	16	18	18	18	20	22	22	24	24
E	4	4	4	4	4	4	4	4	8	8	8	8	12	12	16
F	F12	F12	F12	F16	F16	F16	F16	F16	F16	F16	F20	F20	F20	F22	F22
JIS 5K															
OD	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
D	75	80	85	95	115	120	130	155	180	200	235	265	320	385	430
T	9	9	10	10	12	12	14	14	14	16	16	18	20	22	22
E	4	4	4	4	4	4	4	4	4	8	8	8	8	12	12
F	F10	F10	F10	F10	F12	F12	F12	F12	F16	F16	F16	F16	F20	F20	F20
TUBE SIZE (INCH SIZE)															
OD	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"					
D	95	100	125	135	140	155	175	195	250	280					
T	12	14	14	16	16	16	18	18	20	22					
E	4	4	4	4	4	4	4	8	8	8					
F	F12	F12	F16	F16	F16	F16	F16	F16	F20	F20					

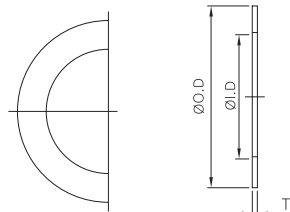
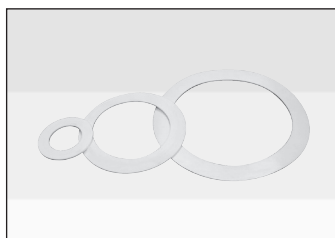
LAP JOINTE



(Unit = mm)

PIPE SIZE (A SIZE)															
OD	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
D	55	55	55	55	70	70	70	75	75	75	50	50	65	65	65
A	JIS 10K	46	51	56	67	76	81	96	116	126	151	182	212	262	368
	JIS 5K	39	44	49	59	70	75	85	110	121	141	182	212	262	368
R	3	3	3	3	3	3	4	4	5	5	5	5	5	5	5
T	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5	5	7	7	9
TUBE SIZE (INCH SIZE)															
OD	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"					
D	55	55	55	70	70	70	75	75	85	90					
A	51	56	67	76	81	96	116	136	182	212					
R	3	3	3	3	3	4	4	5	5	5					
T	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3					

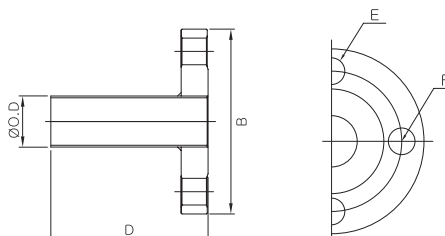
TEFLON GASKET



(Thickness T=2mm, Unit = mm)

PIPE SIZE (A Size)															
JIS 10K															
D	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
OD	53	58	63	74	84	89	104	124	134	159	190	220	270	333	378
ID	18	22	28	35	43	49	61	77	90	115	141	167	218	270	321
JIS 5K															
D	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
OD	45	50	55	65	78	83	93	118	129	149	184	214	260	325	370
ID	18	22	28	35	43	49	61	77	90	115	141	167	218	270	321
TUBE SIZE (INCH SIZE)															
D	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"					
OD	58	63	74	84	89	104	124	144	190	220					
ID	19.5	26	32.5	38.5	51.5	64	77	102.5	128	153.5					

PIPE FLANGE



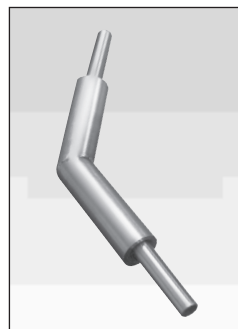
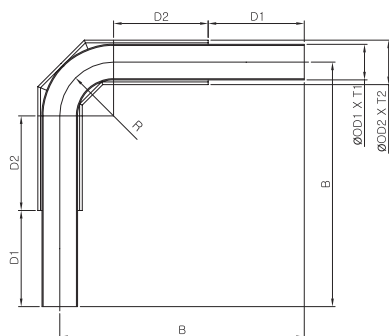
(Unit = mm)

PIPE SIZE (A Size)															
OD	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
D	100	100	100	100	100	100	100	100	100	100	200	200	200	200	200
B	90	95	100	125	135	140	155	175	185	210	250	280	330	400	445
E	4	4	4	4	4	4	4	4	8	8	8	8	12	12	16
F	F12	F12	F12	F16	F16	F16	F16	F16	F16	F16	F20	F20	F20	F22	F22
TUBE SIZE (INCH SIZE)															
OD	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"					
D	100	100	100	100	100	100	100	100	200	200					
B	95	100	125	135	140	155	175	195	250	280					
E	4	4	4	4	4	4	4	8	8	8					
F	F12	F12	F16	F16	F16	F16	F16	F16	F20	F20					

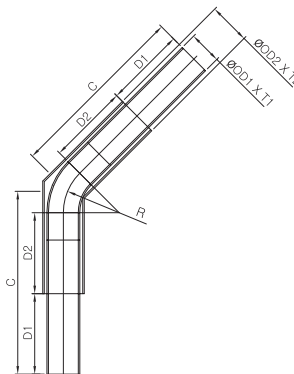
COAXIAL ELBOW



Coaxial 90° Elbow



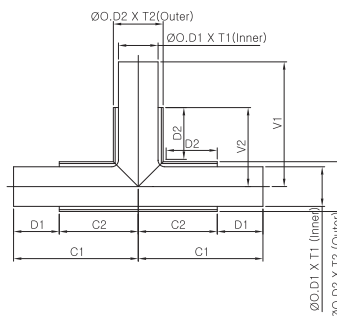
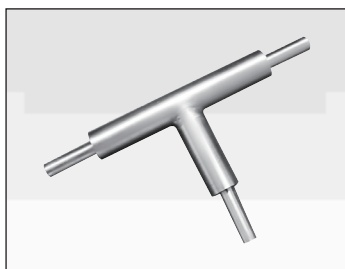
Coaxial 45° Elbow



(Unit = mm)

TUBE SIZE / PIPE SIZE															
INNER TUBE	1/4" X 1T		3/8"X1T		1/2" X 1T		3/4" X1.24T	1"X1.24T	1 1/2"X1.65T	2" X 1.65T	10A X 5S	15A X 5S	20A X 5S	25A X 5S	32A X 5S
	1/2" X 1T	8A X 5S	5/8" X 1T	10A X 5S	3/4" X 1.24T	15A X 5S	3/4" X1.65T	1"X1.65T							
OUTER TUBE	1/2" X 1.24T	8A X 5S	5/8" X 1.24T	10A X 5S	3/4" X 1.24T	15A X 5S	20A X 5S	25A X 5S	2" X 1.65T	2 1/2" X 1.65T	20A X 5S	25A X 5S	32A X 5S	40A X 5S	50A X 5S
D1	40	40	40	40	40	40	40	40	46	46	40	40	40	40	46
D2	29	29	36	36	36	36	36	36	46	51	36	36	46	46	46
R	25	26	28	30	35	38	47.6	57.2	95.3	120	47.6	57.2	76.2	95.3	114.3
B	94	95	104	106	111	114	124	134	188	217	124	134	163	182	207
C	80	80	88	89	91	92	96	100	132	147	96	100	118	126	140

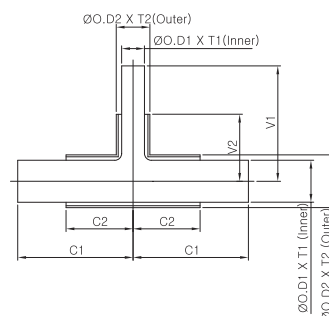
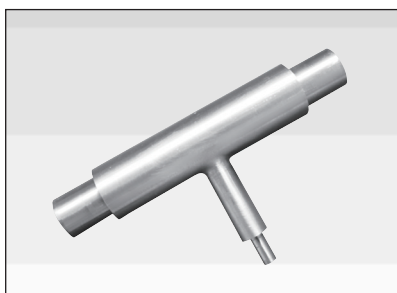
COAXIAL EQUAL TEE



(Unit = mm)

TUBE SIZE / PIPE SIZE															
INNER TUBE	1/4" X 1T		3/8"X1T		1/2" X 1T		3/4" X1.24T	1"X1.24T	1 1/2"X1.65T	2" X 1.65T	10A X 5S	15A X 5S	20A X 5S	25A X 5S	32A X 5S
	1/2" X 1T	8A X 5S	5/8" X 1T	10A X 5S	3/4" X 1.24T	15A X 5S	3/4" X1.65T	1"X1.65T							
OUTER TUBE	1/2" X 1.24T	8A X 5S	5/8" X 1.24T	10A X 5S	3/4" X 1.24T	15A X 5S	20A X 5S	25A X 5S	2" X 1.65T	2 1/2" X 1.65T	20A X 5S	25A X 5S	32A X 5S	40A X 5S	50A X 5S
D1	40	40	40	40	40	40	40	40	46	46	40	40	40	40	46
D2	29	29	36	36	36	36	36	36	46	51	36	36	46	46	46
C1, V1	82	82	89	89	92	92	105	108	123	136	95	99	114	117	129
C2, V2	42	42	49	49	52	52	65	68	77	90	55	59	74	77	83

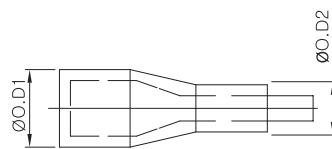
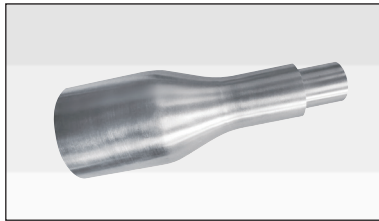
COAXIAL REDUCING TEE



(Unit = mm)

TUBE SIZE / PIPE SIZE							
Normal Tube Size				Inner Tube		Outer Tube	
INNER TUBE		OUTER TUBE					
Normal Tube Size	Branch Tube Size	Normal Tube Size	Branch Tube Size	C1	V1	C2	V2
3/8"	1/4"	5/8", 10A	8A, 1/2"	87	84	47	44
1/2"	1/4"	3/4", 15A	8A, 1/2"	87	84	47	44
	3/8"		10A, 5/8"	92	92	52	52
3/4"	1/4"	1", 20A	8A, 1/2"	87	87	47	47
	3/8", 1/2"		10A, 5/8", 15A, 3/4"	95	95	55	55
1"	1/4"	1 1/4", 25A	8A, 1/2"	87	90	47	50
	3/8", 1/2", 10A, 3/4", 15A		10A, 5/8", 15A, 3/4", 20A, 1", 25A	99	99	59	59
1 1/2"	1/4"	2"	8A, 1/2"	103	97	57	57
	3/8", 1/2", 10A, 3/4", 15A, 1"		10A, 5/8", 15A, 3/4", 20A, 1", 25A, 1 1/4"	114	105	68	65
	20A, 25A		32A, 40A	123	117	77	77
2"	1/4"	2 1/2"	8A, 1/2"	107	103	61	63
	3/8", 1/2", 10A, 3/4", 15A, 1"		10A, 5/8", 15A, 3/4", 20A, 1", 25A, 1 1/4"	118	111	72	71
	20A, 25A		32A, 40A, 2", 50A	136	123	90	83
	1 1/2", 32A		32A, 40A, 2", 50A	136	129	90	83
10A	1/4"	20A	8A, 1/2"	87	87	47	47
	3/8", 1/2"		10A, 5/8", 15A, 3/4"	95	95	55	55
15A	1/4"	25A	8A, 1/2"	87	90	47	50
	3/8", 1/2", 10A, 3/4"		10A, 5/8", 15A, 3/4", 20A, 1"	99	99	59	59
20A	1/4"	32A	8A, 1/2"	97	94	57	54
	3/8", 1/2", 10A, 3/4", 15A, 1"		10A, 5/8", 15A, 3/4", 20A, 1", 25A, 1 1/4"	108	102	68	62
25A	1/4"	40A	8A, 1/2"	97	97	57	57
	3/8", 1/2", 10A, 3/4", 15A, 1"		10A, 5/8", 15A, 3/4", 20A, 1", 25A, 1 1/4"	108	105	68	65
	20A		32A	117	117	77	77
32A	1/4"	50A	8A, 1/2"	103	103	57	63
	3/8", 1/2", 10A, 3/4", 15A, 1"		10A, 5/8", 15A, 3/4", 20A, 1", 25A, 1 1/4"	114	111	68	71
	20A, 25A		32A, 40A	129	123	83	83

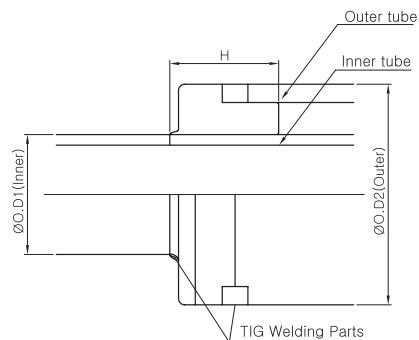
COAXIAL REDUCER



(Unit = mm)

TUBE SIZE / PIPE SIZE			
INNER TUBE		OUTER TUBE	
Large End(ØOD1)	Small End(ØOD2)	Large End(ØOD1)	Small End(ØOD2)
1/4"	[1/8"]	1/2"	3/8", [1/4"]
		8A	1/2", 3/8", 1/4"
3/8"	[1/4"]	5/8"	1/2", 8A
		10A	1/2", 8A
1/2"	3/8" [1/4"]	3/4"	5/8", 1/2" 10A, [8A]
		15A	5/8", 1/2" 10A, [8A]
3/4"	1/2" [3/8", 1/4" 10A]	20A	15A, 10A, 8A, 3/4", 1/2", 20A
		1"	3/4", [5/8"], 1/2", 15A, [10A-8A]
1"	3/4", 1/2", [3/8", 1/4", 15A][10A]	1 1/4"	1", [3/4", 20A], [5/8"-1/2", 15A-8A]
		25A	25A, 20A, 15A, 10A, 8A, 1", 3/4", 1/2"
1 1/2"	1", [3/4", 25A][1/2"-1/4", 20A, 10A]	2"	[1 1/4"], 1", [40A], [3/4"-1/2", 32A-8A]
2"	1 1/2", 1", [3/4"-1/4", 32A-10A]	2 1/2"	2", 1 1/4", 50A, [1"-1/2", 40A-8A]
10A	[1/2", 3/8", 1/4"]	20A	15A, [10A, 8A, 3/4", 1/2"]
15A	[10A, 3/4", 1/2", 3/8", 1/4"]	25A	20A, 15A, [10A, 8A, 3/4", 1/2"]
20A	15A, [10A, 1", 3/4" 1/2", 3/8", 1/4"]	32A	25A, 20A, 15A, [1 1/4"] [10A-8A, 1"-1/2"]
25A	20A, 15A, [10A, 1", 3/4" 1/2", 3/8", 1/4"]	40A	32A, 25A, 20A, 15A, [10A-8A, 1 1/4"-1/2"]
32A	25A, 20A, 15A, [1 1/2"] [10A, 1", 3/4", 1/2" 3/8" 1/4"]	50A	40A, 32A, 25A, 20A, [2"] [15A-8A, 1 1/4"-1/2"]

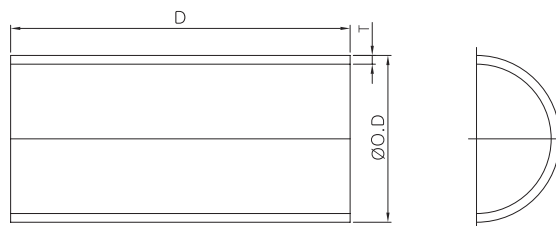
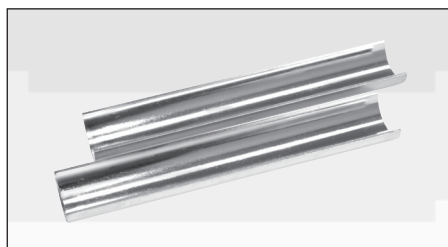
STOP SPACER



(Unit = mm)

TUBE SIZE / PIPE SIZE															
INNER TUBE	1/4" X 1T		3/8"X1T		1/2" X 1T		3/4" X1.24T	1"X1.24T	1 1/2"X1.65T	2" X 1.65T	10A X 5S	15A X 5S	20A X 5S	25A X 5S	32A X 5S
					1/2" X 1.24T		3/4" X1 .65T	1"X1.65T							
OUTER TUBE	1/2" X 1T	8A X 5S	5/8" X 1T	10A X 5S	3/4" X 1.24T	15A X 5S	20A X 5S	25A X 5S	2" X 1.65T	2 1/2" X 1.65T	20A X 5S	25A X 5S	32A X 5S	40A X 5S	50A X 5S
	1/2" X 1.24T		5/8" X 1.24T												
H	9	9	9	9	9	9	12	12	12	12	12	12	12	12	12

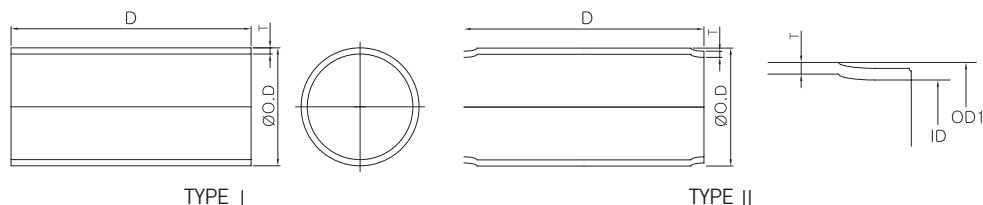
COAXIAL HALF TUBE



(Unit = mm)

TUBE SIZE/PIPE SIZE															
INNER TUBE	1/4" X 1T		3/8"X1T		1/2" X 1T		3/4" X1.24T	1"X1.24T	1 1/2"X1.65T	2" X 1.65T	10A X 5S	15A X 5S	20A X 5S	25A X 5S	32A X 5S
					1/2" X 1.24T		3/4" X1 .65T	1"X1.65T							
OUTER TUBE	1/2" X 1T	8A X 5S	5/8" X 1T	10A X 5S	3/4" X 1.24T	15A X 5S	20A X 5S	25A X 5S	2" X 1.65T	2 1/2" X 1.65T	20A X 5S	25A X 5S	32A X 5S	40A X 5S	50A X 5S
	1/2" X 1.24T		5/8" X 1.24T		19.05 X 1.24	21.7 X 1.65	27.2 X 1.65	34.0 X 1.65							
OD X T	12.7 X 1.00	13.8 X 1.20	15.88 X 1.00	17.3 X 1.20	19.05 X 1.24	21.7 X 1.65	27.2 X 1.65	34.0 X 1.65	50.8 X 1.65	63.5 X 1.65	27.2 X 1.65	34.0 X 1.65	42.7 X 1.65	48.6 X 1.65	60.5 X 1.65
	12.7 X 1.24		15.88 X 1.24		19.05 X 1.24	21.7 X 1.65	27.2 X 1.65	34.0 X 1.65							

COAXIAL OVER TUBE



- TYPE I

(Unit = mm)

TUBE SIZE/PIPE SIZE															
INNER TUBE	1/4" X 1T		3/8"X1T		1/2" X 1T		3/4" X1.24T	1"X1.24T	1 1/2"X1.65T	2" X 1.65T	10A X 5S	15A X 5S	20A X 5S	25A X 5S	32A X 5S
					1/2" X 1.24T		3/4" X1 .65T	1"X1.65T							
OUTER TUBE	1/2" X 1T	8A X 5S	5/8" X 1T	10A X 5S	3/4" X 1.24T	15A X 5S	20A X 5S	25A X 5S	2" X 1.65T	2 1/2" X 1.65T	20A X 5S	25A X 5S	32A X 5S	40A X 5S	50A X 5S
	1/2" X 1.24T		5/8" X 1.24T												
OD X T	15.0 X 1.05	165. X 1.25	18.5 X 1.20	20.0 X 1.25	22.0 X 1.35	25.4 X 1.70	Over Tube TYPE II								

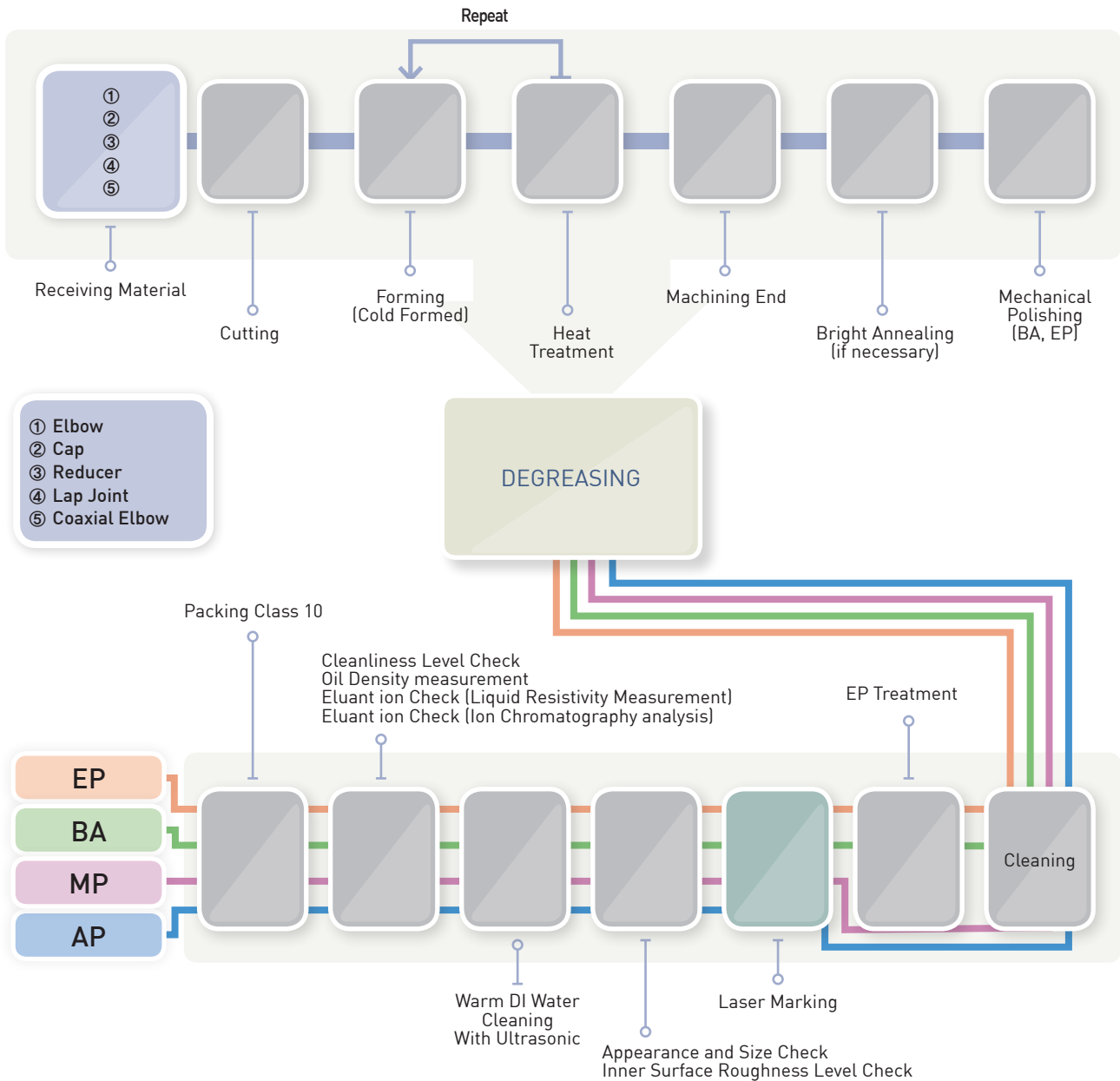
- TYPE II

TUBE SIZE/PIPE SIZE																
Normal Tube Size	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	8A	10A	15A	20A	25A	32A	40A	50A
OD1	15.88	19.05	25.4	31.8	38.1	42.7	60.5	76.2	17.3	21.7	25.4	31.8	38.1	48.6	60.5	76.3
ID	13.0	16.2	19.3	25.7	32.1	38.4	51.1	63.8	14.1	17.6	22	27.5	34.3	43	48.9	60.8
D	100	100	100	100	100	112	112	122	100	100	100	100	100	112	112	112
T	1.0	1.24	1.65	1.65	1.24	1.65	1.65	1.65	1.0	1.24	1.24	1.65	1.65	1.65	1.65	1.65



DWC MANUFACTURING PROCESS

PROCESS I





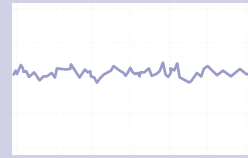
TECHNICAL DATA

● Example of Inner Surface Roughness

DWC-EP 90° ELBOW SUS 316L 25A×5S

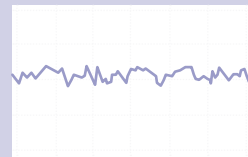


① Straight End



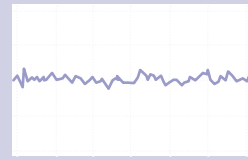
Roughness	
Cut Off	= 0.25mm
Tilt Cor	= CURVE-ML
Length	= 1.25mm
V-Mag	= 20000
H-Mag	= 50
T-Speed	= 0.3mm/s
Polarity	= Positive
Ra	= 1.2μinch
Ry	= 8.3μinch

② Inside of Bend



Roughness	
Cut Off	= 0.25mm
Tilt Cor	= CURVE-ML
Length	= 1.25mm
V-Mag	= 20000
H-Mag	= 50
T-Speed	= 0.3mm/s
Polarity	= Positive
Ra	= 1.6μinch
Ry	= 8.7μinch

③ Outside of Bend

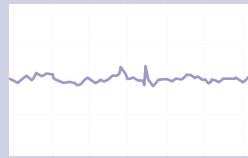


Roughness	
Cut Off	= 0.25mm
Tilt Cor	= CURVE-ML
Length	= 1.25mm
V-Mag	= 20000
H-Mag	= 50
T-Speed	= 0.3mm/s
Polarity	= Positive
Ra	= 1.6μinch
Ry	= 9.1μinch

DWC-EP EQUAL TEE SUS 316L 25A×5S

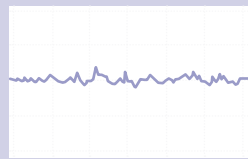


① Corner Radius



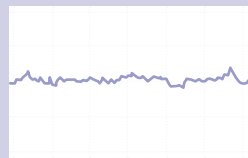
Roughness	
Cut Off	= 0.25mm
Tilt Cor	= CURVE-ML
Length	= 1.25mm
V-Mag	= 20000
H-Mag	= 50
T-Speed	= 0.3mm/s
Polarity	= Positive
Ra	= 1.6μinch
Ry	= 10.6μinch

② Welded Section



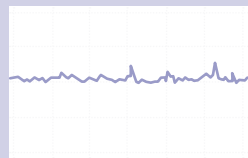
Roughness	
Cut Off	= 0.25mm
Tilt Cor	= CURVE-ML
Length	= 1.25mm
V-Mag	= 20000
H-Mag	= 50
T-Speed	= 0.3mm/s
Polarity	= Positive
Ra	= 2.0μinch
Ry	= 9.8μinch

③ Straight part in Pipe



Roughness	
Cut Off	= 0.25mm
Tilt Cor	= CURVE-ML
Length	= 1.25mm
V-Mag	= 20000
H-Mag	= 50
T-Speed	= 0.3mm/s
Polarity	= Positive
Ra	= 1.6μinch
Ry	= 9.8μinch

④ Straight part in Branch pipe



Roughness	
Cut Off	= 0.25mm
Tilt Cor	= CURVE-ML
Length	= 1.25mm
V-Mag	= 20000
H-Mag	= 50
T-Speed	= 0.3mm/s
Polarity	= Positive
Ra	= 2.0μinch
Ry	= 9.4μinch

INSPECTION

1. SURFACE ROUGHNESS

ITEM	Internal				External(Ra)	Length : 4~16mm Cutoff : 0.8mm 0.05~0.5
	Ra		Ry			
	EP	BA	EP	BA		
PIPE & TUBE FITTINGS	≤10pinch	≤20pinch	≤0.7μm	≤2.5μm	≤30pinch	

2. SEM



BA Tube Surface × 300



EP Tube × 300



BA Tube Surface × 1000



EP Tube × 1000

3. AES

Element	Oxide Thickness	Carbon Layer Thickness	Cr/Fe Ratio at 10 Ang	Carbon	sulfur	Phosphorus	Silicon	Nitrogen
Atomic Percentage	≥20A	≤10A	≤1	≤30	≤1	≤2	≤1.5	≤2

4. XPS

Element	Cr/Fe Ratio	CrO/FeO Ratio
Result	≥2	≥3

5. INSPECTION EQUIPMENT



► He Leak Tester



► Moisture Tester



► Oil Contents Tester



► Partical Contour Tester



► Pressure Leak Tester



► Roughness Tester



DIMENSIONAL TOLERANCE

Products	Item	Normal Size				
		1/4"~1/2'	8A~10A	15A~65A	80A~200A	250A~300A
			1/2"~3/4"	1"~3"	4"~6"	
Pipe & Tube Fitting Multi Tees (J-Tee)	Outside Diameter at End	±0.1mm	±1%			
	Wall Thickness at End	Either Bigger ± 0.2mm or ± 10%				
	Straight End Length	+ Not Specified				
	Thinning Length	+ Not Specified				
Elbows	Bend Radius	±0.8mm		±1.6mm		±3.2mm
Elbows, Tee, J-Tee Multi-Tee (J-Tee) Reducer	Center to End	±0.8mm		±1.6mm		±3.2mm
Clean Lap Pipe Flange Blind	Length	±0.8mm		±1.6mm		±3.2mm
Cap	Back to End	±0.8mm		±3.2mm		
Reducer Cap Reducer Pipe size(joint)	Over all Length	±0.8mm		±1.6mm		±3.2mm
Clean Lap Lap Joint	Thickness of Lap		±5mm -0			
	Diameter of Lap		±1.6mm			+0 -1.6mm
Multi-Tee (J-Tee)	Length of End	±1.6mm				
	Branch Pitch	±1.6mm			±3.2mm	
	Total Length	+5mm -0				

● He Detector Leak Test

(Applied to Clean Fittings and Joints)

Measuring instrument : ALCATEL

Detection sensitivity : 1×10^{-11} Torr:1/s

● Pressure / Airtightness Test

(Application for Welded Products)

Pressure Test : 1MPa[10kg/cm²]

Airtightness Test : 0.7MPa[7kg/cm²]

● Particle Counter Test

(Customer Requirements)

Measuring instrument : MET ONE

Detection sensitivity : 0.01μm