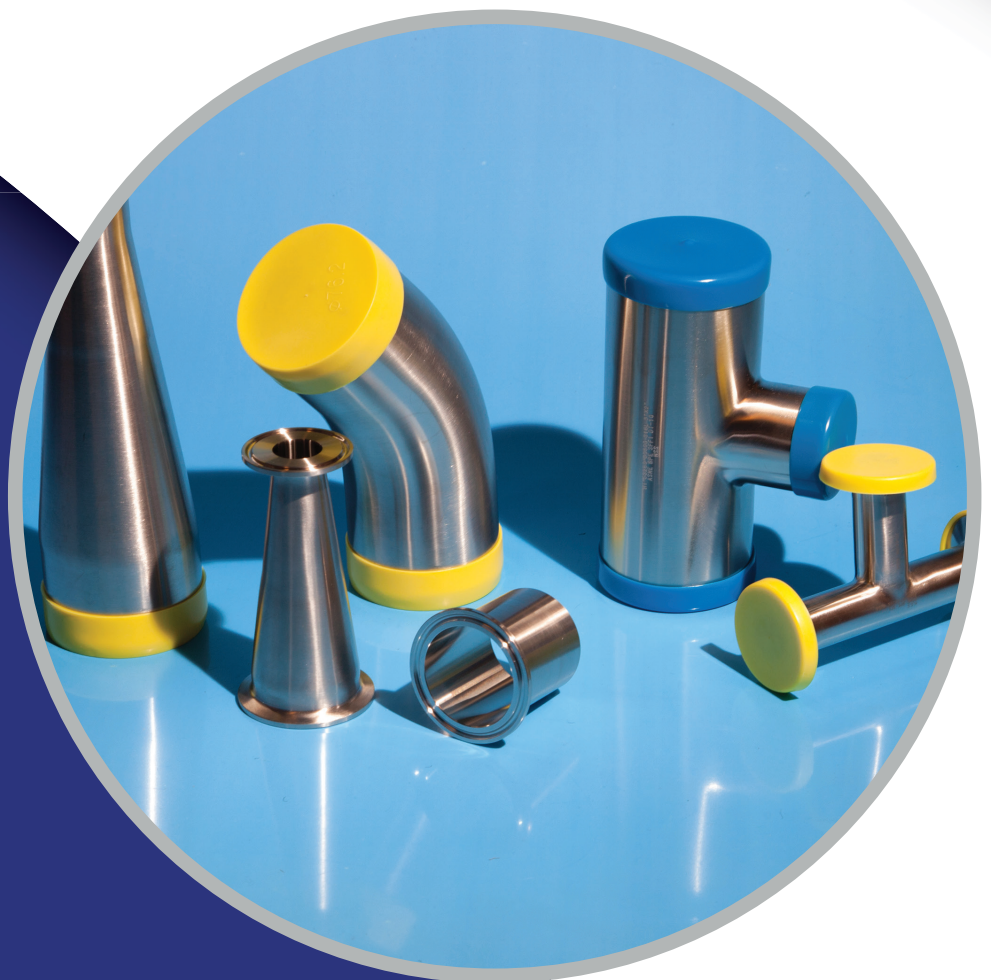




HYGIENIC STAINLESS STEELS LTD.

Bio-Processing Equipment

Serving the Hygienic Fluids
Handling Industries for
over 30 years



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HSS ASME BPE fittings are ideal for Bioprocessing and Pharmaceutical applications requiring mechanically polished surface finishes to 20 Ra Uin (0.5 Ra Um) ID maximum and 32 Ra Uin (0.8Ra Um) OD maximum.

HSS ASME BPE Tubes exceed the requirements of the ASME BPE-2016 specification on dimensions and tolerances and fully meet the ASME BPE-2016 specification for OD and ID surface finishes

HSS ASME BPE Tubes are marked with specification, size, grade and heat number and BPE surface finish designation. Tubes are supplied in 20ft / 6M lengths with ends prepared for orbital welding and capped. HSS ASME BPE tubing is available from stock with ID cleaned for oxygen service.

HSS ASME BPE: Other ID cleaning procedures are available including thermocouple cleaning per ASTM A632 or Nitric Acid & DI Water Rinse. The DI water systems used guarantees 50 PPB with an average of 10 PPB and a resistivity of 17.98 to 18.03. Ultra High Purity 99.9999% pure Nitrogen is also utilized which is filtered to 0.003 micron at the point of use. Cleaning and packaging is performed in a Class 100 clean room.

ASME BPE Part DT-3-1, DT-3-2, DT-4-1 (Table DT – 5)

COMPARISON OF HSS ASME BPE DIMENSIONAL TOLERANCES WITH BPE SPECIFICATIONS													
NOMINAL O.D. TUBE SIZES		NOMINAL WALL THICKNESS		O.D. SPECIFICATION				WALL THICKNESS SPECIFICATION				LENGTH	
				BPE ACTUAL SPEC.		WALL THICKNESS MECHICAL POLISH		WALL THICKNESS ELECTRO POLISH		SQUARENESS FACE TO TANGENT, B		CENTERLINE RADIUS (clr	
In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm
¼"	6.35	0.035	0.89	0.003	0.08	+0.003/-0.004	+0.08/-0.10	+0.003/-0.006	+0.08/-0.15	0.005	0.13	0.563	14.30
¾"	9.53	0.035	0.89	0.003	0.08	+0.003/-0.004	+0.08/-0.10	+0.003/-0.006	+0.08/-0.15	0.005	0.13	1.125	28.58
½"	12.7	0.065	1.65	0.005	0.13	+0.005/-0.008	+0.13/-0.20	+0.005/-0.010	+0.13/-0.25	0.005	0.13	1.125	28.58
¾"	19.05	0.065	1.65	0.005	0.13	+0.005/-0.008	+0.13/-0.20	+0.005/-0.010	+0.13/-0.25	0.005	0.13	1.125	28.58
1"	25.4	0.065	1.65	0.005	0.13	+0.005/-0.008	+0.13/-0.20	+0.005/-0.010	+0.13/-0.25	0.008	0.20	1.500	38.10
1.5"	38.1	0.065	1.65	0.008	0.20	+0.005/-0.008	+0.13/-0.20	+0.005/-0.010	+0.13/-0.25	0.008	0.20	2.250	57.15
2"	50.8	0.065	1.65	0.008	0.20	+0.005/-0.008	+0.13/-0.20	+0.005/-0.010	+0.13/-0.25	0.008	0.20	3.000	76.20
2.5"	63.5	0.065	1.65	0.010	0.25	+0.005/-0.008	+0.13/-0.20	+0.005/-0.010	+0.13/-0.25	0.010	0.25	3.750	95.25
3"	76.2	0.065	1.65	0.010	0.25	+0.005/-0.008	+0.13/-0.20	+0.005/-0.010	+0.13/-0.25	0.016	0.41	4.500	114.30
4"	101.6	0.083	2.11	0.015	0.38	+0.008/-0.010	+0.20/-0.25	+0.008/-0.012	+0.13/-0.25	0.016	0.41	6.000	152.40
6"	152.40	0.109	2.77	0.030	0.76	+0.015/-0.017	+0.20/-0.25	+0.015/-0.017	+0.38/-0.43	0.030	0.76	9.000	228.60

Mechanical Tests: Full mechanical testing is conducted according to ASME SA249 and ASTM A270/ A249/ A450. This includes reverse bends, flattening and flange testing, eddy current (non-destructive) electric testing. All material is 100% bore-scoped inspected prior to mechanical polishing. Hydrostatic and other tests available on request.

HSS ASME BPE tube is available electropolished to 15 Ra Uin max (0.38 Um) ID. The ID of the tube is bright reflective and chromium enriched and receives 100% inspection. Cleaning is accomplished with High Purity Low TOC Deionized water and Electronic grade High Purity Nitrogen.

HSS ASME BPE tubes are packaged using protective poly-sleeving along with air-tight end caps. Tubing is placed in wooden boxes for maximum protection during shipment. Other packaging is available on request.

'Bpe tube is all fully annealed, 1/2" - 1" is seamless to match with standard requirements'

**ASME BPE - 2016 BIOPROCESSING EQUIPMENT
ACCEPTANCE CRITERIA FOR INTERIOR SURFACE FINISHES OF TUBING
Table SF-2.2-1 (SF – 1)**

ANOMALY OR INDICATION	ACCEPTANCE CRITERIA
Cluster of Pits	No more than 4 pits per 0.5 in. (13 mm) x 0.5 in. (13 mm) inspection window. The cumulative total diameter of all relevant pits shall not exceed 0.040 in. (1.02 mm).
Dents	None accepted
Welds	Welds used in the as-welded condition shall meet the requirements of MJ-8. Welds finished after welding shall be flush with the base metal, and concavity and convexity shall meet the requirements of MJ-8. Such finishing shall meet the Ra requirements of Table SF-2.4-1.
Finishing marks	If Ra is met.
Nicks	None accepted
Pits (per tube length)	If dia. <0.020" and bottom is shiny. (Note 1)
Scratches	For tubing, if cumulative length is 12.0 in. (305mm) per 20ft (6.1m) tube length or prorated and if depth is 0.0003in. (0.08mm) For fittings, valves and other process components, if cumulative length is 0.25 in. (6.4mm), depth 0.003 in. (0.08mm), and Ra max. is met
Star burst	If < 75% of the width of the weld bead.
Surface cracks	None accepted
Surface inclusions	If Ra is met.
Surface residuals	None accepted, visual inspection
Surface roughness (Ra)	See Table SF-2.4-1 (SF-2)
Weld slag (per tube length)	Up to 3, if <75% of the width of the weld bead. (Note-3)
Weld porosity	If no liquid penetrant indication.

Notes:

- (1) Black bottom pit of any depth is not acceptable.
- (2) 12" of cumulative length per tube length.
- (3) Tube length is 20ft.

**Ra READINGS FOR INTERIOR SURFACE OF TUBING
ASME BPE-2016, Part SF, Table SF-2.4-1. (Table SF – 2)**

Surface Designation	As Drawn and / or Mechanically Polished	
	Ra – Max	
	μ-in.	μ-m
SF1	20	0.51
SF1	20	0.51
Surface Designation	Mechanically Polished and Electropolished, or Electropolished	
	Ra – Max	
	μ-in.	μ-m
SF4	15	0.38
SF4	15	0.38

GENERAL NOTE: All Ra reading are taken across the lay, wherever possible.

HSS supplies Bio-Tech and Pharmaceutical Fittings which are designed for use with Automatic Welding Equipment. Long tangents are provided to accommodate all types of Orbital Welding Heads and each Fitting is fabricated to meet the special tolerances required for ovality, wall thickness and squareness.

All HSS BPE Fittings comply with the strict requirements of ASME BPE-2016 BioProcessing Equipment Standard.

MATERIAL IDENTIFICATION & TRACEABILITY: All **HSS BPE Fittings** are permanently marked with the material heat number, size, grade and the surface finish designation, or material identification number, depending on the size of the fitting. These numbers allow complete traceability of all component material back to the original material supplier.

Material Test Reports (MTR) will be supplied on request. Please specify at time of order if **Material Test Reports (MTR)** are required.

PACKAGING: All **HSS BPE Fittings** have colour-coded end caps and are packed in sealed transparent plastic bags with a full part designation label attached.

SURFACE FINISHES:

ASME BPE-2016, Part SF, Table SF-2.4-1

POLISH COMBINATION CODE	INTERNAL (ID) SURFACE			EXTERNAL (OD) SURFACE			ASME BPE SURFACE DESIGNATION
	MAX. SURFACE ROUGHNESS*		SURFACE FINISH	MAX. SURFACE ROUGHNESS*		SURFACE FINISH	
	μ-in.	μ-m.		μ-in.	μ-m.		
PC	20	0.51	Mechanical polish	-	-	Light polish	SF1
PL	20	0.51	Mechanical polish	32	0.8	Mechanical polish	SF1
PD	15	0.38	Mechanical polish & Electropolish	-	-	Light polish	SF1
PM	15	0.38	Mechanical polish & Electropolish	32	0.8	Mechanical polish	SF1

ELECTROPOLISHED FITTINGS: All **HSS BPE Fittings** are available electropolished.

CONVERSION OF SURFACE FINISHES:

CONVERSION CHART				
STANDARD GRIT	Ra		RMS	
	μ-in.	μ-m.	μ-in.	μ-m.
150grit	27-32	0.68-0.80	30-35	0.76-0.89
180grit	18-23	0.46-0.58	20-25	0.51-0.64
240grit	14-18	0.34-0.46	15-20	0.38-0.51
320grit	8-10	0.21-0.25	9-11	0.23-0.28

Grit: Measures the number of scratches per linear inch of abrasive pad. Higher numbers indicate a smoother finish.

RMS: Defined as Root Mean Square roughness, the method measures a sample for peaks and valleys. Lower numbers indicate a smoother finish.

Ra: Known as the Arithmetic Mean, this measurement represents the average value of all peaks and valleys.

Lower numbers indicate a smoother finish.

To convert to RMS multiply by 1.11.

**ASME BPE BIOPROCESSING EQUIPMENT
ACCEPTANCE CRITERIA FOR INTERIOR SURFACE FINISHES OF FITTINGS
Table SF-2.2-1 (Table SF – 3)**

ANOMALY OR INDICATION	ACCEPTANCE CRITERIA
Cluster of Pits	No more than 4 pits per 0.5 in. (13 mm) x 0.5 in. (13 mm) inspection window. The cumulative total diameter of all relevant pits shall not exceed 0.040 in. (1.02 mm).
Dents	None accepted
Welds	Welds used in the as-welded condition shall meet the requirements of MJ-8. Welds finished after welding shall be flush with the base metal, and concavity and convexity shall meet the requirements of MJ-8. Such finishing shall meet the Ra requirements of Table SF-2.4-1.
Finishing marks	If Ra is met.
Nicks	None accepted
Pits (per tube length)	If dia. <0.020" and bottom is shiny. (Note 1)
Scratches	For tubing, if cumulative length is 12.0 in. (305mm) per 20ft (6.1m) tube length or prorated and if depth is 0.0003in. (0.08mm) For fittings, valves and other process components, if cumulative length is 0.25 in. (6.4mm), depth 0.003 in. (0.08mm), and Ra max. is met
Star burst	If < 75% of the width of the weld bead.
Surface cracks	None accepted
Surface inclusions	If Ra is met.
Surface residuals	None accepted, visual inspection
Surface roughness (Ra)	See Table SF-2.4-1 (SF-2)
Weld slag (per tube length)	Up to 3, if <75% of the width of the weld bead. (Note-3)
Weld porosity	If no liquid penetrant indication.

**Ra READINGS FOR INTERIOR SURFACE OF FITTINGS
ASME BPE-2016, Part SF, Table SF-2.4-1. (Table SF – 4)**

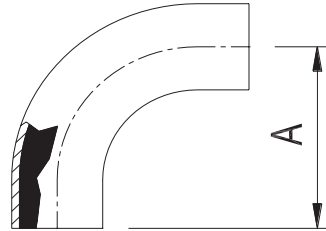
Surface Designation	Mechanically Polished	
	Ra – Max	
	μ-in.	μ-m
SF1	20	0.51
SF1	20	0.51
Surface Designation	Mechanically Polished and Electropolished	
	Ra – Max	
	μ-in.	μ-m
SF4	15	0.38
SF4	15	0.38

GENERAL NOTE: All Ra reading are taken across the lay, wherever possible.

BPE BIO-TECH & PHARMACEUTICAL FITTINGS AWF BUTT-WELD - BENDS – FERRULES - CAPS

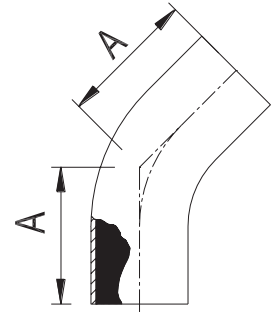
BPE2S-AWF - 90° BEND DT-4.1.1-1 (DT-7)

SIZE TUBE O.D.	A mm	Nom. W.T. mm
½"	76.2	1.65
¾"	76.2	1.65
1"	76.2	1.65
1½"	95.3	1.65
2"	120.7	1.65
2½"	139.7	1.65
3"	158.8	1.65
4"	203.2	2.11
6"	292.1	2.77



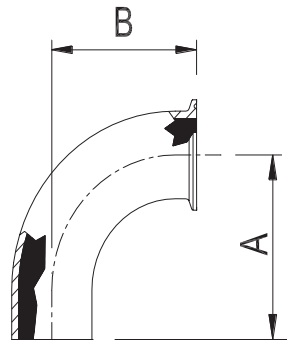
BPE2KS-AWF - 45° BEND DT-4.1.1-4 (DT-8)

SIZE TUBE O.D.	A mm	Nom. W.T. mm
½"	57.2	1.65
¾"	57.2	1.65
1"	57.2	1.65
1½"	63.5	1.65
2"	76.2	1.65
2½"	85.7	1.65
3"	92.1	1.65
4"	114.3	2.11
6"	158.8	2.77



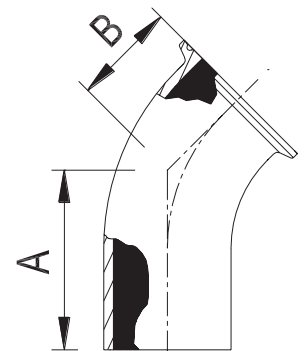
**BPE2CM-AWF- 90° SWEEP ELBOW
DT-4.1.1-2 (DT-12)
(CLAMP END – AWF END)**

SIZE TUBE O.D.	A mm	Nom. W.T. mm
½"	76.2	41.3
¾"	76.2	41.3
1"	76.2	50.8
1½"	95.3	69.9
2"	120.7	88.9
2½"	139.7	108.0
3"	158.8	127.0
4"	203.2	168.3
6"	292.1	266.7



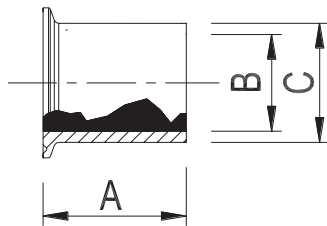
**BPE2KM-AWF- 45° SWEEP ELBOW
DT- 4.1.1-5 (DT-13)
(CLAMP END – AWF END)**

SIZE TUBE O.D.	A mm	Nom. W.T. mm
½"	57.2	25.4
¾"	57.2	25.4
1"	57.2	28.6
1½"	63.5	36.5
2"	76.2	44.5
2½"	85.7	52.4
3"	92.1	60.3
4"	114.3	79.4
6"	158.8	133.4



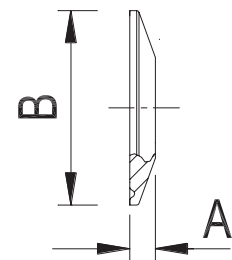
**BPE14AMP-AWF LONG BUTT-WELD FERRULE
DT- 4.1.4-1 (DT-22)**

SIZE TUBE O.D.	A mm	B mm	C mm
½"	44.5	9.40	12.70
¾"	44.5	15.75	19.05
1"	44.5	22.10	25.40
1½"	44.5	34.80	38.10
2"	57.2	47.50	50.80
2½"	57.2	60.20	63.50
3"	57.2	72.90	76.20
4"	57.2	97.38	101.6
6"	76.2	146.86	152.4

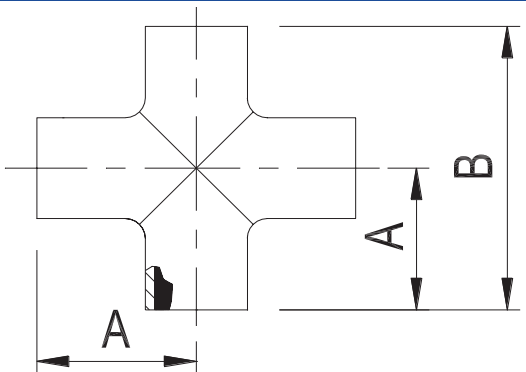


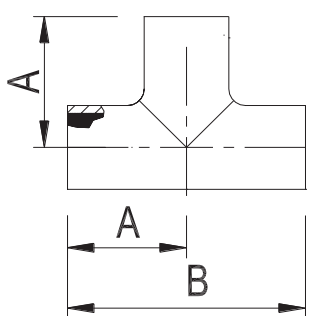
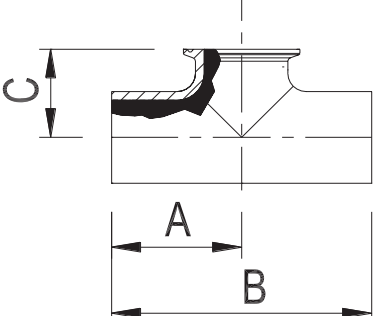
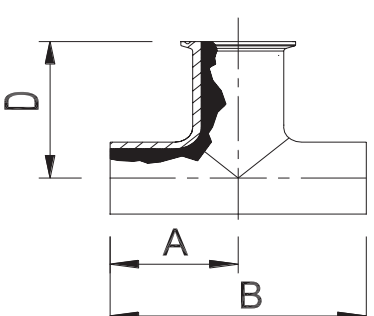
**BPE16AMP SOLID END CAP
DT- 4.1.5- 2 (DT-31)**

SIZE TUBE O.D.	A mm	A mm
½"	5.00	25.40
¾"	5.00	25.40
1"	6.35	50.40
1½"	6.35	50.40
2"	6.35	63.91
2½"	6.35	77.40
3"	6.35	90.91
4"	8.00	118.92
6"	11.12	166.88



BPE BIO-TECH & PHARMACEUTICAL FITTINGS AWF BUTT-WELD – TEES – CROSSES – STUBS - CAPS

BPE9W-AWF CROSS					DT - 4.1.2-1 (DT-9)
SIZE TUBE O.D.	A mm	B mm	C mm	D mm	
½"	47.6	95.3	25.4	57.2	
¾"	50.8	101.6	28.6	60.3	
1"	54.0	108.0	28.6	66.7	
1½"	60.3	120.7	34.9	73.0	
2"	73.0	146.1	41.3	85.7	
2½"	79.4	158.8	47.6	92.1	
3"	85.7	171.5	54.0	98.4	
4"	104.8	209.6	69.9	120.7	
6"	142.9	285.8	117.5	181.0	

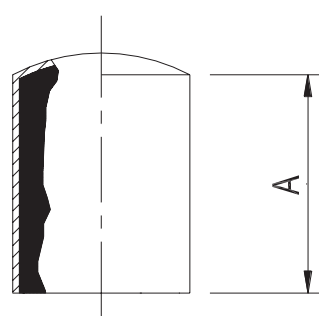
BPE7W-AWF TEE DT – 4.1.2-1 (DT-9)	BPE7WS-AWF-SHORT OUTLET TEE DT - 4.1.2-2 (DT-15)	BPE7WM-AWF CLAMP OUTLET TEE
		

BPE16W-AWF CAP

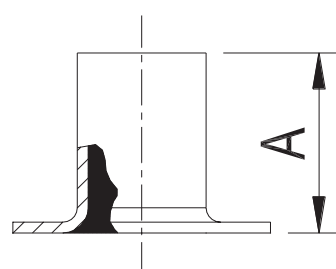
DT – 4.1.5-1 (DT-30)

14W-AWF LAB JOINT FERRULE
(NOT TO BPE dimensions)

SIZE TUBE O.D.	A mm
½"	38.1
¾"	38.1
1"	38.1
1½"	38.1
2"	38.1
2½"	38.1
3"	44.5
4"	50.8
6"	63.5



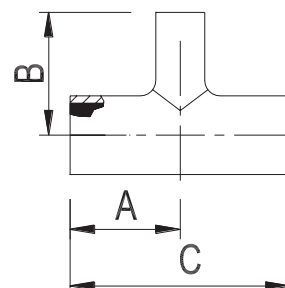
SIZE TUBE O.D.	A mm
½"	50.8
¾"	50.8
1"	50.8
1½"	50.8
2"	50.8
2½"	63.5
3"	63.5
4"	76.2



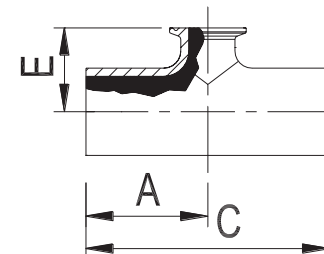
BPE BIO-TECH & PHARMACEUTICAL FITTINGS AWF BUTT-WELD REDUCING TEES

**BPE7RW-AWF-REDUCING TEE
DT-4.1.2-6 (DT-10)**

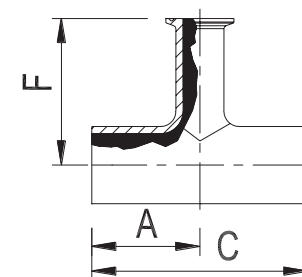
SIZE TUBE O.D.	A mm	B mm	C mm	D mm	E mm	F mm
¾" x ½"	50.8	50.8	101.6	101.6	25.4	63.5
1" x ½"	54.0	54.0	108.0	108.0	28.6	66.7
1" x ¾"	54.0	54.0	108.0	108.0	28.6	66.7
1½" x ½"	60.3	60.3	120.7	120.7	34.9	73.0
1½" x ¾"	60.3	60.3	120.7	120.7	34.9	73.0
1½" x 1"	60.3	60.3	120.7	120.7	34.9	73.0
2" x ½"	73.0	66.7	146.1	133.4	41.3	79.4
2" x ¾"	73.0	66.7	146.1	133.4	41.3	79.4
2" x 1"	73.0	66.7	146.1	133.4	41.3	79.4
2" x 1½"	73.0	66.7	146.1	133.4	41.3	79.4
2½" x ½"	79.4	73.0	158.8	146.1	47.6	85.7
2½" x ¾"	79.4	73.0	158.8	146.1	47.6	85.7
2½" x 1"	79.4	73.0	158.8	146.1	47.6	85.7
2½" x 1½"	79.4	73.0	158.8	146.1	47.6	85.7
2½" x 2"	79.4	73.0	158.8	146.1	47.6	85.7
3" x ½"	85.7	79.4	171.5	158.8	54.0	92.1
3" x ¾"	85.7	79.4	171.5	158.8	54.0	92.1
3" x 1"	85.7	79.4	171.5	158.8	54.0	92.1
3" x 1½"	85.7	79.4	171.5	158.8	54.0	92.1
3" x 2"	85.7	79.4	171.5	158.8	54.0	98.4
3" x 2½"	85.7	79.4	171.5	158.8	54.0	98.4
4" x ½"	104.8	92.1	209.6	184.2	66.7	104.8
4" x ¾"	104.8	92.1	209.6	184.2	66.7	104.8
4" x 1"	104.8	92.1	209.6	184.2	66.7	104.8
4" x 1½"	104.8	92.1	209.6	184.2	66.7	104.8
4" x 2"	104.8	98.4	209.6	196.9	66.7	111.1
4" x 2½"	104.8	98.4	209.6	196.9	66.7	111.1
4" x 3"	104.8	98.4	209.6	196.9	66.7	111.1
6" x 4"	142.9	130.2	285.8	260.4	95.3	146.1



**BPE7RW-AWF-REDUCING TEE
DT-4.1.2-6 (DT-10)**

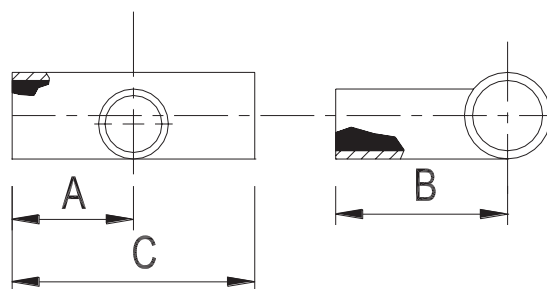
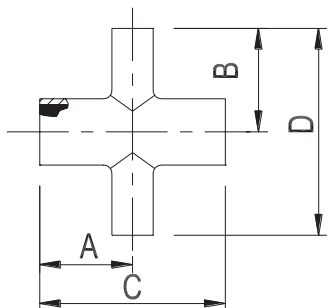


**BPE7RW-AWF-REDUCING TEE
DT-4.1.2-6 (DT-10)**



BPE9RW-AWF REDUCING CROSS

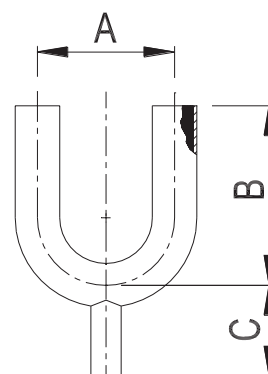
**BPE7ERW-AWF-ECCENTRIC REDUCING
TEE
(designed for easy drainage of lines)**



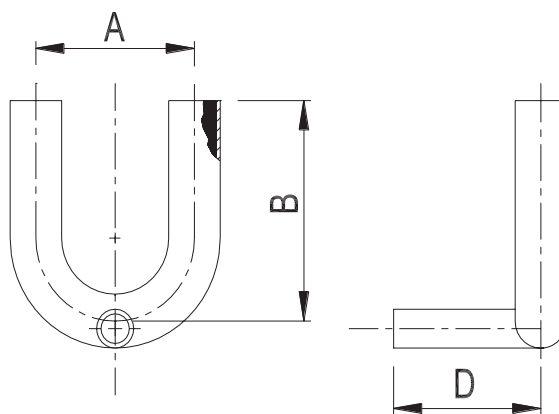
BPE BIO-TECH & PHARMACEUTICAL FITTINGS AWF 180° RETURN BENDS WITH WELD END OUTLETS

BPEL29RBW-REDUCING, BOTTOM-OUTLET USE-POINT (bottom outlet is reducing size)

SIZE TUBE O.D.	A mm	B mm	C mm	D mm
3/4" x 1/2"	114.3	76.2	50.8	50.8
1" x 1/2"	114.3	76.2	54.0	54.0
1" x 3/4"	114.3	76.2	54.0	54.0
1 1/2" x 1/2"	152.4	114.3	60.3	60.3
1 1/2" x 3/4"	152.4	114.3	60.3	60.3
1 1/2" x 1"	152.4	114.3	60.3	60.3
2" x 1/2"	152.4	127.0	66.6	66.6
2" x 3/4"	152.4	127.0	66.6	66.6
2" x 1"	152.4	127.0	66.6	66.6
2" x 1 1/2"	152.4	127.0	66.6	66.6
2 1/2" x 1/2"	190.5	146.1	73.0	73.0
2 1/2" x 3/4"	190.5	146.1	73.0	73.0
2 1/2" x 1"	190.5	146.1	73.0	73.0
2 1/2" x 1 1/2"	190.5	146.1	73.0	73.0
2 1/2" x 2"	190.5	146.1	73.0	73.0
3" x 1/2"	228.6	165.1	79.4	79.4
3" x 3/4"	228.6	165.1	79.4	79.4
3" x 1"	228.6	165.1	79.4	79.4
3" x 1 1/2"	228.6	165.1	79.4	79.4
3" x 2"	228.6	165.1	79.4	79.4
3" x 2 1/2"	228.6	165.1	79.4	79.4
4" x 1/2"	304.8	215.9	92.1	92.1
4" x 3/4"	304.8	215.9	92.1	92.1
4" x 1"	304.8	215.9	92.1	92.1
4" x 1 1/2"	304.8	215.9	92.1	92.1
4" x 2"	304.8	215.9	98.4	98.4
4" x 2 1/2"	304.8	215.9	98.4	98.4
4" x 3"	304.8	215.9	98.4	98.4
6" x 4"	457.2	292.1	101.6	101.6



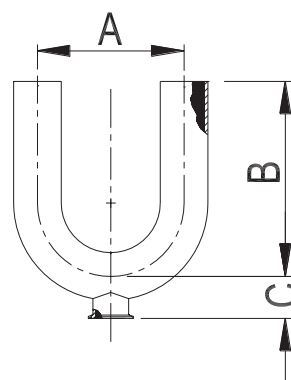
BPEL29RSW-REDUCING, SIDE-OUTLET USE-POINT (side outlet is reducing size)



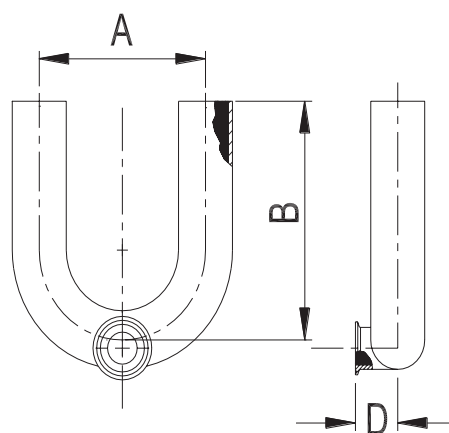
BPE BIO-TECH & PHARMACEUTICAL FITTINGS AWF 180° RETURN BENDS WITH CLAMP END OUTLETS

BPEL29RBMS-REDUCING, SHORT, BOTTOM-OUTLET USE-POINT (bottom outlet is reducing size)

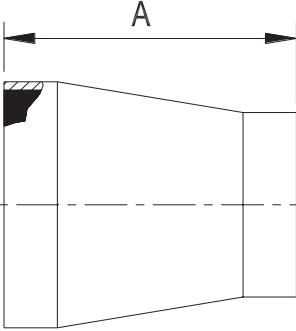
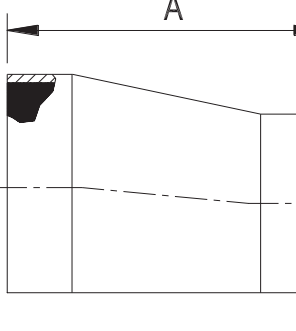
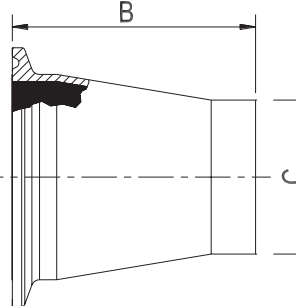
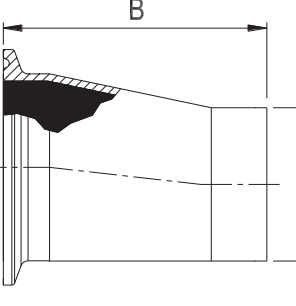
SIZE TUBE O.D.	A mm	B mm	C mm	D mm
¾" x ½"	114.3	76.2	25.4	28.6
1" x ½"	114.3	76.2	28.6	28.6
1" x ¾"	114.3	76.2	28.6	31.8
1½" x ½"	152.4	114.3	34.9	31.8
1½" x ¾"	152.4	114.3	34.9	31.8
1½" x 1"	152.4	114.3	34.9	31.8
2" x ½"	152.4	127.0	41.3	44.5
2" x ¾"	152.4	127.0	41.3	44.5
2" x 1"	152.4	127.0	41.3	44.5
2" x 1½"	152.4	127.0	41.3	44.5
2½" x ½"	190.5	146.1	47.6	50.8
2½" x ¾"	190.5	146.1	47.6	50.8
2½" x 1"	190.5	146.1	47.6	50.8
2½" x 1½"	190.5	146.1	47.6	50.8
2½" x 2"	190.5	146.1	47.6	50.8
3" x ½"	228.6	165.1	54.0	57.2
3" x ¾"	228.6	165.1	54.0	57.2
3" x 1"	228.6	165.1	54.0	57.2
3" x 1½"	228.6	165.1	54.0	57.2
3" x 2"	228.6	165.1	54.0	57.2
3" x 2½"	228.6	165.1	54.0	57.2
4" x ½"	304.8	215.9	66.7	69.9
4" x ¾"	304.8	215.9	66.7	69.9
4" x 1"	304.8	215.9	66.7	69.9
4" x 1½"	304.8	215.9	66.7	69.9
4" x 2"	304.8	215.9	66.7	69.9
4" x 2½"	304.8	215.9	66.7	69.9
4" x 3"	304.8	215.9	66.7	69.9
6" x 4"	457.2	292.1	95.3	98.5



BPEL29RSMS-REDUCING, SHORT, SIDE-OUTLET USE-POINT (side outlet is reducing size)



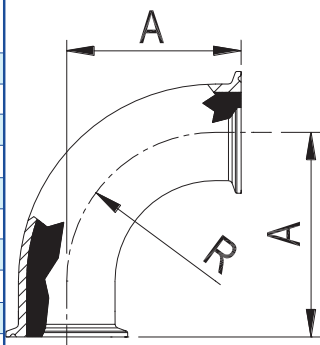
BPE BIO-TECH & PHARMACEUTICAL FITTINGS AWF BUTT-WELD - REDUCERS

				BPE31-AWF CONCENTRIC REDUCER DT-4.1.3-1 (DT – 11) (for automatic welding)	BPE32-AWF ECCENTRIC REDUCER DT-4.1.3-1 (DT – 11) (for automatic welding)
SIZE TUBE O.D.	A mm	B mm	C mm		
3/4" x 1/2"	101.6	76.2	12.7		
1" x 1/2"	114.3	88.9	12.7		
1" x 3/4"	101.6	76.2	19.0		
1 1/2" x 1/2"	139.7	114.3	12.7		
1 1/2" x 3/4"	127.0	101.6	19.0		
1 1/2" x 1"	127.0	101.6	25.4		
2" x 1/2"	196.9	165.1	12.7		
2" x 3/4"	184.2	152.4	19.0		
2" x 1"	184.2	152.4	25.4		
2" x 1 1/2"	133.4	101.6	38.1		
2 1/2" x 1/2"	247.7	215.9	12.7		
2 1/2" x 3/4"	235.0	203.2	19.0		
2 1/2" x 1"	235.0	203.2	25.4		
2 1/2" x 1 1/2"	184.2	152.4	38.1		
				BPE31M-AWF CONCENTRIC REDUCER DT-4.1.3-2 (DT-26) (clamp end – weld end)	PBE32M-AWF ECCENTRIC REDUCER DT-4.1.3-2 (DT-26) (clamp end – weld end)
					
2 1/2" x 2"	139.7	108.0	50.8		
3" x 1/2"	298.5	266.7	12.7		
3" x 3/4"	285.8	254.0	19.0		
3" x 1"	285.8	254.0	25.4		
3" x 1 1/2"	235.0	203.2	38.1		
3" x 2"	190.5	158.8	50.8		
3" x 2 1/2"	139.7	108.0	63.5		
4" x 1/2"	406.4	371.5	12.7		
4" x 3/4"	393.7	358.8	19.0		
4" x 1"	393.7	358.8	25.4		
4" x 1 1/2"	342.9	308.0	38.1		
4" x 2"	298.5	263.5	50.8		
4" x 2 1/2"	247.7	212.7	63.5		
4" x 3"	196.9	161.9	76.2		
6" x 3"	247.7	222.3	76.2		
6" x 4"	254.0	228.6	101.6		

BPE BIO-TECH & PHARMACEUTICAL FITTINGS CLAMP END ELBOWS – TEES - CROSSES

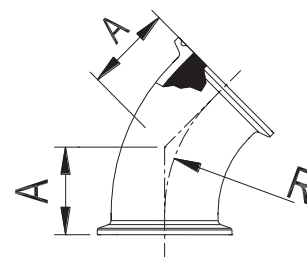
BPE2CMP - 90° ELBOW DT - 4.1.1- 3 (DT-16)

SIZE TUBE O.D.	A mm	R mm
½"	41.3	19.0
¾"	41.3	28.6
1"	50.8	38.1
1½"	69.9	57.2
2"	88.9	76.2
2½"	108.0	95.3
3"	127.0	114.3
4"	168.3	152.4
6"	266.7	228.6
8"	327.0	304.8
10"	403.2	381.0



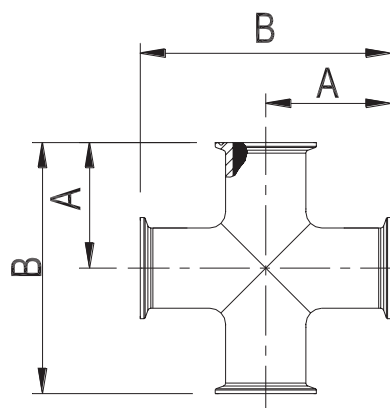
BPE2KMP - 45° ELBOW DT- 4.1.1-6 (DT-17)

SIZE TUBE O.D.	A mm	R mm
½"	25.4	19.0
¾"	25.4	28.6
1"	28.6	38.1
1½"	36.5	57.2
2"	44.5	76.2
2½"	52.4	95.3
3"	60.3	114.3
4"	79.4	152.4
6"	133.4	228.6
8"	139.7	304.8
10"	168.3	381.0



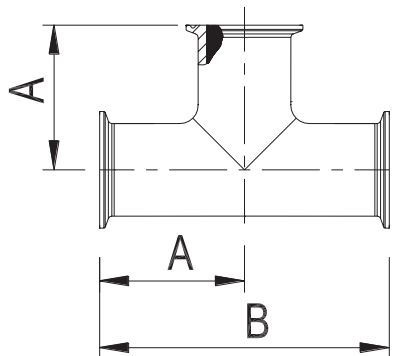
BPE9MP – CROSS DT- 4.1.2 - 4 (DT-18)

SIZE TUBE O.D.	A mm	B mm	C mm
½"	57.2	114.3	25.4
¾"	60.3	120.6	28.6
1"	66.7	133.4	28.66
1½"	73.0	146.0	34.9
2"	85.7	171.5	41.3
2½"	92.1	184.2	47.6
3"	98.4	196.9	54.0
4"	120.7	241.3	69.9
6"	181.0	362.0	117.5
8"	174.6	349.3	127.0
10"	212.7	425.5	152.4

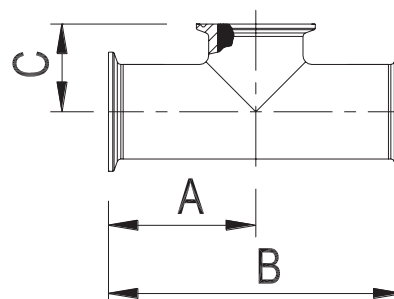


BPE7MP – TEE

DT- 4.1.2- 4 (DT-18)



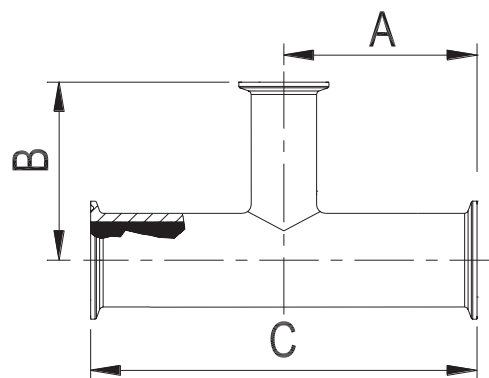
**BPE7SMP – SHORT OUTLET TEE
DT- 4.1.2-5 (DT-27)**



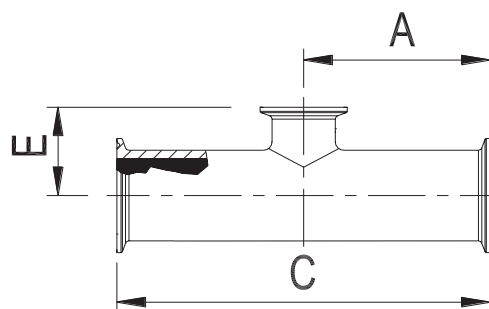
BPE BIO-TECH & PHARMACEUTICAL FITTINGS CLAMP END REDUCING TEES & CROSSES

BPE7RMP-REDUCING TEE
(reducing size on branch) DT-4.1.2-8 (DT-19)

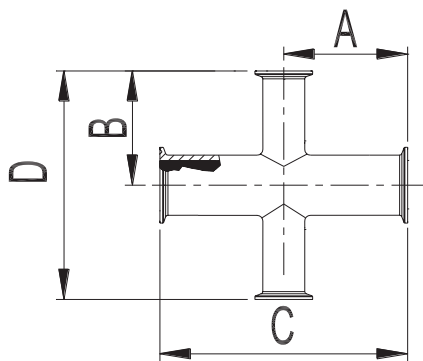
SIZE TUBE O.D.	A mm	B mm	C mm	D mm	E mm
¾" x ½"	63.5	63.5	127.0	127.0	25.4
1" x ½"	66.7	66.7	133.4	133.4	28.6
1" x ¾"	66.7	66.7	133.4	133.4	28.6
1½" x ½"	73.0	73.0	146.1	146.1	34.9
1½" x ¾"	73.0	73.0	146.1	146.1	34.9
1½" x 1"	73.0	73.0	146.1	146.1	34.9
2" x ½"	85.7	79.4	171.4	158.8	41.3
2" x ¾"	85.7	79.4	171.4	158.8	41.3
2" x 1"	85.7	79.4	171.4	158.8	41.3
2" x 1½"	85.7	79.4	171.4	158.8	41.3
2½" x ½"	92.1	85.7	184.2	171.4	47.6
2½" x ¾"	92.1	85.7	184.2	171.4	47.6
2½" x 1"	92.1	85.7	184.2	171.4	47.6
2½" x 2"	92.1	85.7	184.2	171.4	47.6
3" x ½"	98.4	92.1	196.9	184.2	54.0
3" x ¾"	98.4	92.1	196.9	184.2	54.0
3" x 1"	98.4	92.1	196.9	184.2	54.0
3" x 1½"	98.4	92.1	196.9	184.2	54.0
3" x 2"	98.4	98.4	196.9	196.9	54.0
3" x 2½"	98.4	98.4	196.9	196.9	54.0
4" x ½"	120.7	104.8	241.3	209.6	66.7
4" x ¾"	120.7	104.8	241.3	209.6	66.7
4" x 1"	120.7	104.8	241.3	209.6	66.7
4" x 1½"	120.7	104.8	241.3	209.6	66.7
4" x 2"	120.7	111.1	241.3	222.2	66.7
4" x 2½"	120.7	111.1	241.3	222.2	66.7
4" x 3"	120.7	111.1	241.3	222.2	66.7
6" x 4"	181.0	146.1	362.0	292.2	95.3



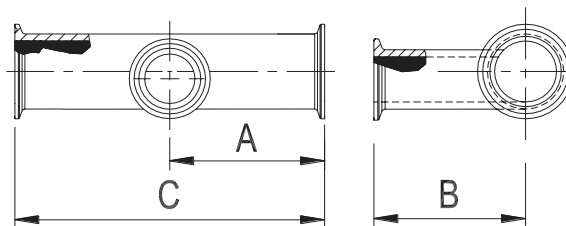
**BPE7SMP-SHORT OUTLET
REDUCING TEE** (reducing size on
branch) DT-4.1.2-9 (DT – 20)



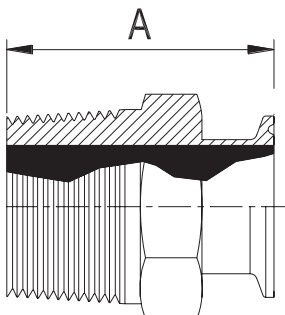
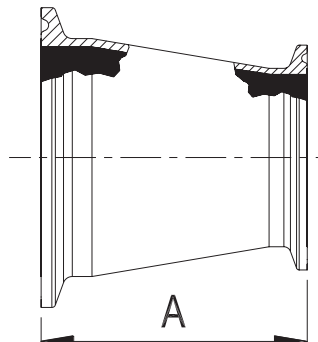
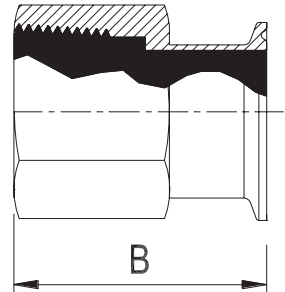
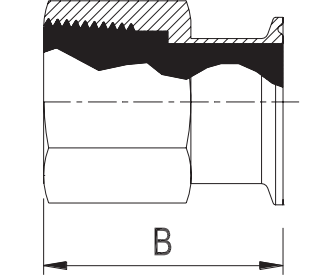
BPE9RMP REDUCING CROSS



BPE7REMP- ECCENTRIC REDUCING TEE
(reducing size on branch)



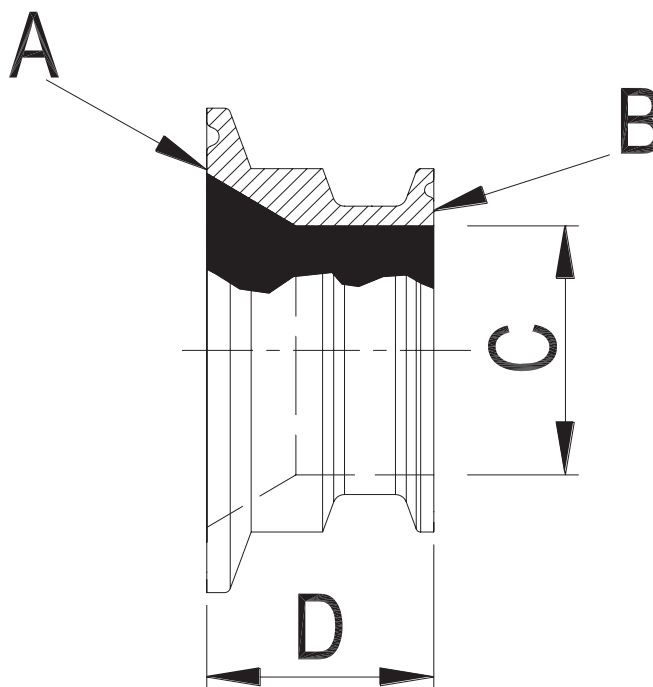
BPE BIO-TECH & PHARMACEUTICAL FITTINGS CLAMP END REDUCERS CLAMP END ADAPTERS

CLAMP END REDUCERS BPE31-14MP CONCENTRIC REDUCER DT-4.1.3-3 (DT-21)			BPE21 RMP & BPE22RMP REDUCING ADAPTERS BPE21RMP			
SIZE TUBE O.D.	A mm		SIZE TUBE O.D.	A mm	B mm	
3/4" x 1/2"	50.80	BPE32-14MP ECCENTRIC REDUCER DT-4.1.3-3 (DT - 21)	1/2" x 1/2"	50.8	50.8	BPE22RMP
1" x 1/2"	63.50		1/2" x 3/4"	50.8	41.3	
1" x 3/4"	50.80		1/2" x 1"	50.8	41.3	
1 1/2" x 1/2"	88.90		3/4" x 3/4"	50.8	54.0	
1 1/2" x 3/4"	76.20		3/4" x 1"	50.8	46.0	
1 1/2" x 1"	76.20		1" x 1/2"	55.6	41.3	
2" x 1/2"	139.7		1" x 3/4"	55.6	41.3	
2" x 3/4"	127.00		1" x 1"	57.2	41.3	
2" x 1"	127.00		1" x 1 1/2"	50.8	54.0	
2" x 1 1/2"	76.2		1" x 2"	66.7	57.2	
2 1/2" x 1/2"	190.5		1 1/2" x 1/2"	55.6	41.3	
2 1/2" x 3/4"	177.8		1 1/2" x 3/4"	55.6	41.3	
2 1/2" x 1"	177.8		1 1/2" x 1"	57.2	41.3	
2 1/2" x 1 1/2"	127.0		1 1/2" x 1 1/4"	62.0	57.2	
2 1/2" x 2"	76.2	1 1/2" x 1 1/2"	62.0	57.2		
3" x 1"	228.6	1 1/2" x 2"	66.7	57.2		
3" x 2"	127.0	2" x 1/2"	55.6	50.8		
3" x 1 1/2"	177.8	2" x 3/4"	55.6	54.0		
3" x 2 1/2"	76.2	2" x 1"	57.2	54.0		
4" x 1"	333.4		2" x 1 1/4"	62.7	54.0	
4" x 1 1/2"	282.6		2" x 1 1/2"	62.7	57.2	
4" x 2"	231.8		2" x 2"	67.6	59.5	
4" x 2 1/2"	181.0		2" x 2 1/2"	79.4	61.1	
4" x 3"	130.2		2 1/2" x 1 1/2"	70.6	57.2	
6" x 4"	193.7		2 1/2" x 2"	70.6	59.5	
8" x 6"	181.0		2 1/2" x 2 1/2"	83.3	66.7	
10" x 6"	222.3		2 1/2" x 3"	88.9	53.2	
10" x 8"	222.3		3" x 2"	88.9	59.5	
			3" x 3"	88.9	73.0	
			4" x 3"	96.8	55.6	
			4" x 4"	96.8	76.2	
			6" x 6"	127.0	98.4	
OTHER SIZES AVAILABLE ON REQUEST						

BPE BIO-TECH & PHARMACEUTICAL FITTINGS SPECIAL CONICAL ADAPTOR

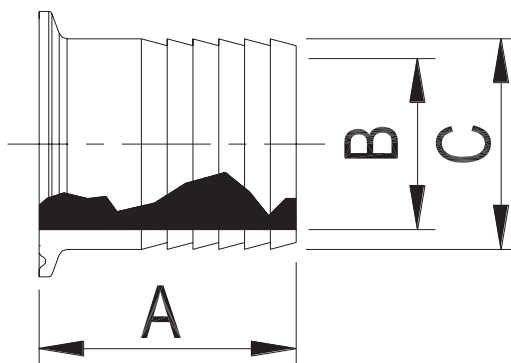
SPECIAL CONICAL ADAPTOR

CLAMP SIZE A	CLAMP SIZE B	INSIDE DIA C	LENGTH D
¾"	½"	9.4	31.8
1"	½"	9.4	31.8
1½"	½"	9.4	31.8
2"	½"	9.4	31.8
2½"	½"	9.4	31.8
3"	½"	9.4	31.8
4"	½"	9.4	31.8
1"	¾"	15.8	31.8
1½"	¾"	15.8	31.8
2"	¾"	15.8	31.8
2½"	¾"	15.8	31.8
3"	¾"	15.8	31.8
4"	¾"	15.8	31.8
1½"	1"	22.1	31.8
2"	1"	22.1	31.8
2½"	1"	22.1	31.8
3"	1"	22.1	31.8
4"	1"	22.1	31.8
2"	1½"	34.8	31.8
2½"	1½"	34.8	31.8
3"	1½"	34.8	31.8
4"	1½"	34.8	31.8
2½"	2"	47.5	31.8
3"	2"	47.5	31.8
4"	2"	47.5	31.8
3"	2½"	60.2	31.8
4"	2½"	60.2	31.8
4"	3"	72.9	31.8
4"	4"	98.3	31.8

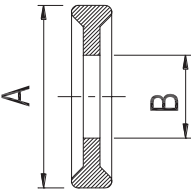
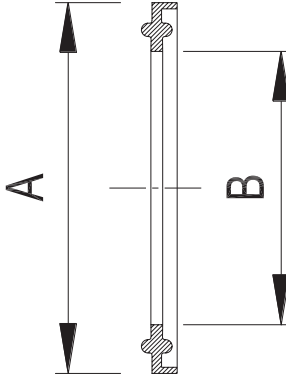
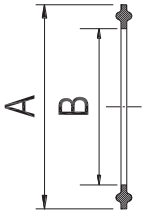


BPE14MPHR RUBBER HOSE ADAPTER

SIZE TUBE O.D.	CLAMP SIZE B	CLAMP SIZE C	CLAMP SIZE D
½"	38.1	9.4	12.7
¾"	38.1	15.8	19.1
1"	42.9	21.2	25.4
1½"	42.9	33.9	38.1
2"	58.7	46.6	50.8
2½"	50.8	59.3	63.5
3"	78.4	72.0	76.2
4"	86.5	97.4	101.6
6"	101.6	146.9	152.4



BPE BIO-TECH & PHARMACEUTICAL FITTINGS BPE GASKETS FOR CLAMP END FITTINGS

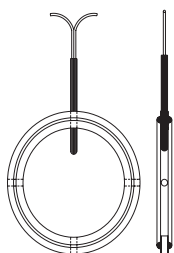
BPE GASKETS – TYPE 1 STANDARD 1/2" & 3/4"				BPE GASKETS – TYPE 2 FLANGED 1" – 12"			
SIZE TUBE O.D.	A mm	B mm		SIZE TUBE O.D.	A mm	B mm	
1/2"	21.8	9.9		1"	52.7	22.8	
3/4"	21.8	16.3		1 1/2"	52.7	35.8	
				2"	66.2	48.8	
				2 1/2"	79.7	60.5	
				3"	93.2	73.1	
				4"	121.2	97.8	
BPE GASKETS – TYPE 1 STANDARD 1" – 8"							
1"	50.0	22.7		6"	169.1	148.0	
1 1/2"	50.0	35.9		8"	220.0	199.0	
2"	63.5	48.6		10"	270.7	249.0	
2 1/2"	76.2	61.3		12"	321.5	300.0	
3"	88.9	74.0					
4"	118.0	98.6					
6"	165.0	147.8					
8"	216.0	196.6					

GASKET MATERIAL PROPERTIES

PROPERTY	EPDM 40MP-E	TEFLON 40MP-G	BUNA-N 40MP-U	VITON 40MP-V	SILICONE 40MP-X
Temperature range	-65°F to 325°F	-40°F to 450°F	-40°F to 225°F	-20°F to 400°F	-80°F to 400°F
Acid Resistance	Good-Excellent	Excellent	Good	Good	Good
Alkali Resistance	Good-Excellent	Excellent	Fair-Good	Poor-Good	Poor-Fair
Petroleum Oil Resistance	Poor	Excellent	Excellent	Excellent	Good
Vegetable Oil Resistance	Good	Excellent	Good	Excellent	Good
Abrasion Resistance	Good-Excellent	Excellent	Good	Good	Good-Excellent
Compression Set	Fair	Cold Flows	Good	Good-Excellent	Good-Excellent

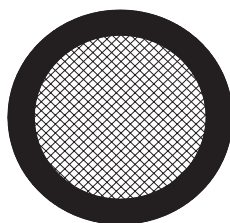
SMART GASKETS

We also offer the Smart Gasket line of specialty gaskets for use with Smart Clamps. These Gaskets install between two standard sanitary flanges and allow the use of sensors (thermocouples) and spore traps (details on application).



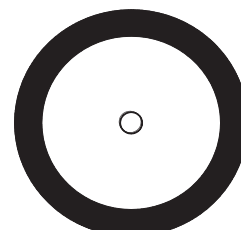
SMART GASKETS

Fluid conditioning gaskets are available in a wide variety of meshes and materials (reference chart available on application)



ORIFICE PLATES

Orifice gaskets are available in many materials (details on application)



Buna-N (Black or White)

- Least expensive elastomer gasket
- Nitrile compound is very elastic making for a leak proof connection
- Good chemical resistance for use with petroleum solvents, alcohol etc.
- 3A qualified
- Meets 21CFR 177.2600
- Useful temperature range from -40°F to 225°F (-40°C to 107°C)

Teflon (PTFE)

- Commonly used for food and pharmaceutical applications
- Excellent chemical resistance
- Not suitable for great temperature fluctuations, Teflon tends to cold flow and will not return to its original shape.
- 3A qualified
- Meets 21CFR 177.2600
- Passes cytotoxicity testing
- Pharmaceutical Class VI approved
- Useful temperature range from -40°F to 450°F (-40°C to 232°C)

Silicone (Platinum cured)

- 3A qualified
- Meets 21CFR 177.2600
- Passes cytotoxicity testing
- Pharmaceutical Class VI approved
- Useful temperature range from -80°F to 400°F (-62°C to 204°C)

Silicone (Peroxide cured)

- 3A qualified
- Meets 21CFR 177.2600
- Passes cytotoxicity testing
- Pharmaceutical Class VI approved
- Useful temperature range from -80°F to 400°F (-62°C to 204°C)

Viton (Flourel)

- 3A qualified
- Meets 21CFR 177.2600
- Passes cytotoxicity testing
- Pharmaceutical Class VI approved
- Useful temperature range from -20°F to 400°F (-29°C to 204°C)

EPDM

- 3A qualified
- Meets 21CFR 177.2600
- Passes cytotoxicity testing
- Pharmaceutical Class VI approved
- Useful temperature range from -65°F to 325°F (-54°C to 163°C)

Tef Steel

- Does not cold flow (creep), retains shape and seal properties
- Excellent chemical resistance
- Steam resistance
- Minimal thermal expansion
- Teflon & PM316L
- 3A qualified
- Meets 21CFR 177.2600
- Passes cytotoxicity testing
- Pharmaceutical Class VI approved
- Useful temperature range from -110°F to 400°F (-79°C to 204°C)

Best Service ■ Top Quality ■ Nationwide Delivery



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