

UPLH



Introduction

G HWA is an internationally-trusted manufacturer of high-quality hygienic stainless steel components for the dairy, food and beverage, cosmetics, pharmaceutical and semiconductor industries.

Since it was established in 2005, G HWA has developed a global reputation as a trusted manufacturer of high-quality hygienic stainless steel process components for the dairy, food and beverage, cosmetics, pharmaceutical and semiconductor industries.

The success of G HWA is built on a synergized collaboration between experts from all aspects of the hygienic stainless steel manufacturing process. Bringing together highly-experienced specialists in product development and design, production management, and quality control, years of hands-on experience in the development, design and manufacture of stainless steel fittings, valves and other equipment has been key to the satisfaction of an ever increasing portfolio of long-term customers around the world.



G HWA Core Values

Integrity

Integrity is at the heart of everything we do and every decision we make. Building long-term relationships with our customers would not be possible if we did not think and act with the utmost integrity. We do not lie. We do not exaggerate. We do not make false promises. When we make a commitment to a customer, we commit ourselves to honoring that commitment. We respect and honor the laws of the countries in which we operate. We embrace competition as an opportunity to drive ourselves forward. We treat suppliers with impartiality and fairness. And we do not tolerate any form of corruption.

Commitment

G HWA is fully committed to serving the best interests of all stakeholders. From suppliers and employees to customers and society, we understand that each of these stakeholders plays a vital role in the success of our company. In order to earn their trust, we foster an environment of mutual commitment to our shared welfare and success.

Trust

Placing the customer at the front of everything we do is part of the G HWA culture. Since our company was founded, we have treated our customers as partners, understanding that their success is our success. By taking the time to find out who they are and what they need, we have cultivated long-lasting relationships with our customers built on trust.

G HWA Business Philosophy

Long-term Vision and Plan

Just as a successful marathon runner makes sacrifices in the short term in order to reach a long-term goal, so building enduring success in a company means setting clear objectives, creating a plan for how to reach them, and then remaining true to your vision. Whether you are chasing success in the world of sport or business, there are no short cuts. At G HWA, we believe that failing to plan for the future means facing inevitable problems in the present. We are confident that we have the best people. By focusing on long-term analysis, planning and execution, many of the obstacles that could slow us down or block our way can be mitigated or avoided altogether.

Building Quality into all Aspects of Our Business

Consistently providing the highest quality products and service throughout the company requires every member of the G HWA team to take pride in their work. At G HWA, quality is not only the responsibility of every employee but also their passion. Each member of our team continuously evaluates and improves the quality of his or her own work and then seeks help, advice and training when necessary. Together we can achieve our greatest goal of providing complete and lasting customer satisfaction.



Keeping Communication Channels Open

Trust is key to the success of our company. We make every effort to earn the trust of our customers, but we also place great importance on trust within our team. Our open management system is designed to keep all lines of communication open. Employees at all levels are encouraged to cooperate closely with one another in relationships built on mutual honesty and sincerity. In such an environment, constructive criticism is accepted by all as part of the improvement process. This management style also ensures that everyone's input is valued, and all opinions are heard before a final decision is made. Once a decision is made and its rationale openly communicated, then everyone works together to achieve the set goal.

OUR MISSION

At G HWA, we believe that success is not measured by sales volumes. Instead, it is gauged from the satisfaction, trust and loyalty of our customers. This is why we never stand still or rest on our laurels but always strive to be better today than we were yesterday. Our customer-centric approach means constantly seeking new ways to improve our technology and management techniques to ensure the standard of our products and the quality of our service. It is a source of immense satisfaction and pride that we are not only a trusted supplier to many industries but also a long-term business partner of all our clients. Our mission, therefore, is to continue producing the high quality products that provide satisfaction and trust for our customers.

Tubes

BPE DT-4-1 (DT-1) Stainless Steel Tube



Nominal Size		Tube Wall Thickness		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	0.035	0.89	2201B014089-##	
3/8	9.53	0.035	0.89	2201B038089-##	
1/2	12.70	0.065	1.65	2201B050165-##	
3/4	19.05	0.065	1.65	2201B075165-##	
1	25.40	0.065	1.65	2201B100165-##	
1 1/2	38.10	0.065	1.65	2201B150165-##	
2	50.80	0.065	1.65	2201B200165-##	
2 1/2	63.50	0.065	1.65	2201B250165-##	
3	76.20	0.065	1.65	2201B300165-##	
4	101.60	0.083	2.11	2201B400211-##	
6	152.40	0.109	2.77	2201B600277-##	

ASTM A249/A269/A270 Stainless Steel Tube

Nominal Size		Tube Wall Thickness		X=ID	Y=OD
Inch	mm	Inch	mm	#=Material Grade	
1/2	12.70	0.065	1.65	2401#050165-XY	
3/4	19.05	0.065	1.65	2401#075165-XY	
1	25.40	0.065	1.65	2401#100165-XY	
1 1/2	38.10	0.065	1.65	2401#150165-XY	
2	50.80	0.065	1.65	2401#200165-XY	
2 1/2	63.50	0.065	1.65	2401#250165-XY	
3	76.20	0.065	1.65	2401#300165-XY	
4	101.60	0.083	2.11	2401#400211-XY	
6	152.40	0.109	2.77	2401#600277-XY	

Material Grades

- A** = 304/ 304L
- B** = 316/ 316L
- C** = 1.4404
- D** = 1.4435
- H** = 904L
- I** = Hastelloy® C-22®
- J** = Hastelloy® C-276
- L** = AL-6XN®
- E** = EPDM
- S** = Silicone/ VMQ or SS Reinforced Teflon®
- T** = PTFE/ Teflon®
- N** = NBR/ Buna-N/ Nitrile
- V** = FKM/ Viton®
- G** = RTFE(Reinforced Teflon®)
- F** = FRN(Fiberglass Reinforced Nylon)

Surface Finishes

- 0** = Unpolished / Mill Finish
- 1** = 0.8 µm R_a Max./ 180 Grit
- 2** = 0.5 µm R_a Max./ 240 Grit
- 3** = 0.4 µm R_a Max./ 320 Grit
- 6** = Sandblasted
- 9** = Tumble Finish
- P** = Pickling / Passivation
- BA** = Bright Annealed

SMS Stainless Steel Tube

Nominal Size		Tube Wall Thickness		ID#320	OD#240
DN	mm	Inch	mm	#=Material Grade	
25	25.4	0.047	1.2	3101#100120-32	
25	25.4	0.059	1.5	3101#100150-32	
38	38.1	0.047	1.2	3101#150120-32	
38	38.1	0.059	1.5	3101#150150-32	
51	50.8	0.047	1.2	3101#200120-32	
51	50.8	0.059	1.5	3101#200150-32	
63.5	63.5	0.059	1.5	3101#250150-32	
76.1	76.2	0.063	1.6	3101#300165-32	
101.6	101.6	0.079	2.0	3101#400210-32	

Comparison Table

ASME-BPE			3-A Inch Size			BS 4825			SMS/ ISO 2037		DIN 11850				
Nominal	OD	T	Nominal	OD	T	Nominal	OD	T	OD	T	Nominal	Series			T
Inch	mm	mm	Inch	mm	mm	Inch	mm	mm	mm	mm	DN	1	2	3	mm
1/4	6.35	0.89	1/2	12.70	1.65	1/2	12.70	1.6	12	1	10	12			1.0
3/8	9.53	0.89	3/4	19.05	1.65	3/4	19.05	1.6	12.7	1			13		1.5
1/2	12.70	1.65	1	25.40	1.65	1	25.40	1.6	17.2	1				14	2.0
3/4	19.05	1.65	1 1/2	38.10	1.65	1 1/2	38.10	1.6	21.3	1	15	18			1.0
1	25.40	1.65	2	50.80	1.65	2	50.80	1.6	25	1.2/1.6			19		1.5
1 1/2	38.10	1.65	2 1/2	63.50	1.65	2 1/2	63.50	1.6	33.7	1.2/1.6				20	2.0
2	50.80	1.65	3	76.20	1.65	3	76.20	1.6	38	1.2/1.6	20	22			1.0
2 1/2	63.50	1.65	4	101.60	2.11	4	101.60	2.0	40	1.2/1.6			23		1.5
3	76.20	1.65	6	152.40	2.77		114.30	2.0	51	1.2/1.6				24	2.0
4	101.60	2.11	8	203.20	2.77		139.70	2.0	63.5	1.6	25	28			1.0
6	152.40	2.77	8	203.20	3.05				70	1.6			29		1.5
									76.1	1.6				30	2.0
									88.9	2	32	34			1.0
									101.6	2			35		1.5
									104	2				36	2.0
									114.3	2	40	40			1.0
									139.7	2			41		1.5
														42	2.0
											50	52			1.0
													53		1.5
														54	2.0
											65	70			2.0
											80	85			2.0
											100	104			2.0
											125	129			2.0
											150	154			2.0

[illegible]



CERTIFICATE OF AUTHORIZATION

The named company is authorized by The American Society of Mechanical Engineers (ASME) for the scope shown below in accordance with the applicable rules of the ASME BPE Standard on Bioprocessing Equipment. The use of the ASME Single Certification Mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any component certified under this authorization shall have been produced, assembled, and tested in accordance with the provisions of the ASME BPE Standard on Bioprocessing Equipment.

COMPANY:

G HWA Industries Co., Ltd.
52 Moo 7 Nongchumpon
Khaoyoi, Phetchaburi 76140
Thailand

SCOPE:

Manufacture of Ferrous Tubing (excluding circumferential welds) and Fittings at the above location only

AUTHORIZED: **January 21, 2021**

EXPIRES: **January 20, 2026**

CERTIFICATE NUMBER: **BPE-107**

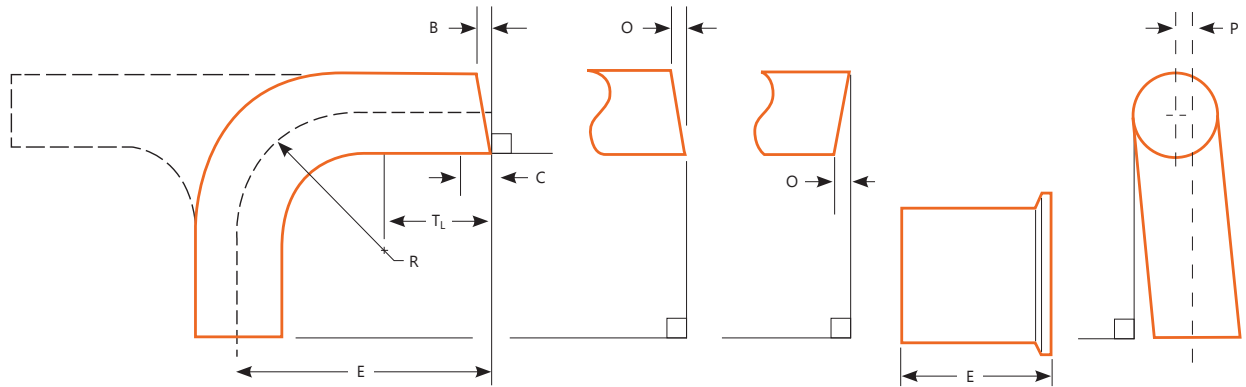
Board Chair, Conformity Assessment

Managing Director, Conformity Assessment



ASME BPE Table DT-3-1

Final Tolerances for Mechanically Polished Fittings and Process Components, Excluding Tube



Nominal Size, in.	O.D.		Wall Thickness		Squareness Face to Tangent, B		Off Angle, O		Equivalent Angle (for O) deg	Off Plane, P		Centerline Radius (CLR), R	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm		Inch	mm	Inch	mm
1/4	±0.005	±0.13	+0.003/-0.004	+0.08/-0.10	0.005	0.13	0.009	0.23	2.1	0.030	0.76	0.563	14.30
3/8	±0.005	±0.13	+0.003/-0.004	+0.08/-0.10	0.005	0.13	0.012	0.30	1.8	0.030	0.76	1.125	28.58
1/2	±0.005	±0.13	+0.005/-0.008	+0.13/-0.20	0.005	0.13	0.014	0.36	1.6	0.030	0.76	1.125	28.58
3/4	±0.005	±0.13	+0.005/-0.008	+0.13/-0.20	0.005	0.13	0.018	0.46	1.4	0.030	0.76	1.125	28.58
1	±0.005	±0.13	+0.005/-0.008	+0.13/-0.20	0.008	0.20	0.025	0.64	1.4	0.030	0.76	1.500	38.10
1 1/2	±0.008	±0.20	+0.005/-0.008	+0.13/-0.20	0.008	0.20	0.034	0.86	1.3	0.050	1.27	2.250	57.15
2	±0.008	±0.20	+0.005/-0.008	+0.13/-0.20	0.008	0.20	0.043	1.09	1.2	0.050	1.27	3.000	76.20
2 1/2	±0.010	±0.25	+0.005/-0.008	+0.13/-0.20	0.010	0.25	0.054	1.37	1.2	0.050	1.27	3.750	95.25
3	±0.010	±0.25	+0.005/-0.008	+0.13/-0.20	0.016	0.41	0.068	1.73	1.3	0.050	1.27	4.500	114.30
4	±0.015	±0.38	+0.008/-0.010	+0.20/-0.25	0.016	0.41	0.086	2.18	1.2	0.060	1.52	6.000	152.40
6	±0.030	±0.76	+0.015/-0.015	+0.38/-0.38	0.030	0.76	0.135	3.43	1.3	0.060	1.52	9.000	228.60

General Notes:

- (a) Tolerance on end-to-end and center-to-end dimension E is ±0.050" (1.27 mm)
 (b) Tolerance for centerline radius (CLR) is ±10% of the nominal dimension (R)
 (c) The length of the control portion C is fixed for all sizes at 0.75" (19 mm)

Weld End Chemical Compositions (wt. %)

	C	Si	Mn	P	S	Ni	Cr	Mo
Min.	-	-	-	-	0.005	10.000	16.000	2.000
Max.	0.035	1.000	2.000	0.045	0.017	14.000	18.000	3.000

R_a Readings for Metallic Process Contact Surfaces Table SF-2.4.1-1

Surface Designation	Mechanically Polished [Note (1)] R _a Max.	
	μin.	μm
SF0	No finish requirement	No finish requirement
SF1	20	0.51
SF2	25	0.64
SF3	30	0.76
Surface Designation	Electropolished R _a Max.	
	μin.	μm
SF4	15	0.38
SF5	20	0.51
SF6	25	0.64

Note:

(1) Or any other finishing method that meets the R_a max.

Acceptance Criteria for Metallic Process Contact Surface Finishes Table SF-2.2-1

Anomaly or Indication	Acceptance Criteria
Pits/porosity	If diameter <0.020 in. (0.51 mm) and bottom is shiny [Notes (1) and (2)]. Pits ≥ 0.003 in. (0.08 mm) diameter are relevant whereas pits <0.003 in. (0.08 mm) diameter are irrelevant and acceptable.
Cluster of pits/porosity	No more than 4 relevant pits per 0.5 in. (12.7 mm) x 0.5 in. (12.7 mm) inspection window. The cumulative total diameter of all relevant pits shall not exceed 0.040 in. (1.02 mm).
Dents	None accepted
Finishing marks	If R _a max. is met
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 R _a requirements of Table SF-2.4.1-1.
Nicks	None accepted
Scratches	For tubing, if cumulative length is <12.0 in. (305 mm) per 20 ft (6.1 m) tube length or prorated and if depth is <0.003 in. (0.08 mm) For fittings, valves, and other process components, if cumulative length is <0.25 in. (6.4 mm), depth <0.003 in. (0.08 mm), and R _a max. is met
Surface cracks	None accepted
Surface inclusions	If R _a max. is met
Surface residuals	None accepted, visual inspection
Surface roughness (R _a)	See Table SF-2.4.1-1
Weld slag	For tubing, up to 3 per 20 ft (6.1 m) length or prorated, if <75% of the width of the weld bead For fittings, valves, vessels, and other process components, none accepted (as welded shall meet the requirements of MJ-8 and Table MJ-8.4-1)
Blistering	None accepted

General note: This table covers surface finishes that are mechanically polished or any other finishing method that meets the R_a max.

Notes:

(1) Black bottom pit of any depth is not acceptable.

(2) Pits in superaustenitic and nickel alloys may exceed this value. Acceptance criteria for pit size should be established by the owner /user. All other pit criteria remain the same.

Additional Acceptance Criteria for Electropolished Metallic Process Contact Surface Finishes

Table SF-2.2-2

Anomaly or Indication	Acceptance Criteria
Cloudiness	Acceptable if R_a max. is met
End grain effect	Acceptable if R_a max. is met
Fixture marks	Acceptable if electropolished
Haze	Acceptable if R_a max. is met
Interrupted electropolish	Acceptable if R_a max. is met
Orange peel	Acceptable if R_a max. is met
Stringer indication	Acceptable if R_a max. is met
Weld whitening	Acceptable if R_a max. is met
Variance in luster	Acceptable if R_a max. is met

Reference

- American Society of Mechanical Engineers 'ASME BPE-2022 Bioprocessing Equipment', Part DT Dimensions and Tolerances for Process Components
- ASTM International 'A270/A270M-15 (2019)', Table 1 Chemical Requirements
- American Society of Mechanical Engineers 'ASME BPE-2022 Bioprocessing Equipment', Part SF Process Contact Surface Finishes

Metallic Fittings: Rated Internal Working Pressure Table DT-2-1

Temperature		<3 in.		3 in.		4 in.		6 in.	
°F	°C	psig	kPa	psig	kPa	psig	kPa	psig	kPa
100	38	200	1379	200	1379	200	1379	150	1034
200	93	200	1379	200	1379	200	1379	150	1034
300	149	188	1293	188	1293	188	1293	141	970
400	204	170	1173	170	1173	170	1173	128	880

General notes:

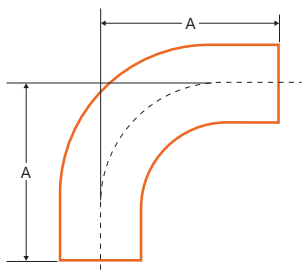
- (a) These pressure ratings apply to metallic fittings, including butt welded or hygienic clamped connections.

BPE Tube Fittings

DT-7

DT-4.1.1-1

90° Elbow WW

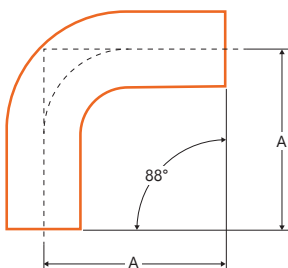


Nominal Size		A		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	2.625	66.68	2207B014-##	
3/8	9.53	2.625	66.68	2207B038-##	
1/2	12.70	3.000	76.20	2207B050-##	
3/4	19.05	3.000	76.20	2207B075-##	
1	25.40	3.000	76.20	2207B100-##	
1 1/2	38.10	3.750	95.25	2207B150-##	
2	50.80	4.750	120.65	2207B200-##	
2 1/2	63.50	5.500	139.70	2207B250-##	
3	76.20	6.250	158.75	2207B300-##	
4	101.60	8.000	203.20	2207B400-##	
6	152.40	11.500	292.10	2207B600-##	

DT-7

DT-4.1.1-9

88° Elbow WW

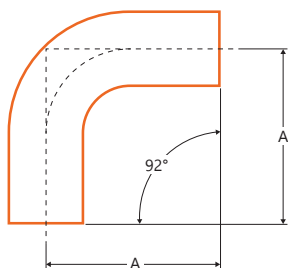


Nominal Size		A		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	2.700	68.58	220788B014-##	
3/8	9.53	2.700	68.58	220788B038-##	
1/2	12.70	3.065	77.85	220788B050-##	
3/4	19.05	3.065	77.85	220788B075-##	
1	25.40	3.050	77.47	220788B100-##	
1 1/2	38.10	3.800	96.52	220788B150-##	
2	50.80	4.810	122.17	220788B200-##	
2 1/2	63.50	5.560	141.22	220788B250-##	
3	76.20	6.310	160.27	220788B300-##	
4	101.60	8.065	204.85	220788B400-##	
6	152.40	11.580	294.13	220788B600-##	

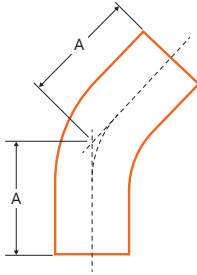
DT-7

DT-4.1.1-10

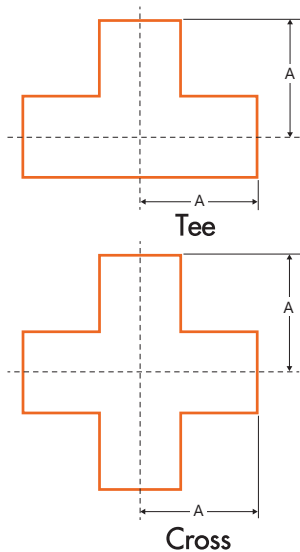
92° Elbow WW



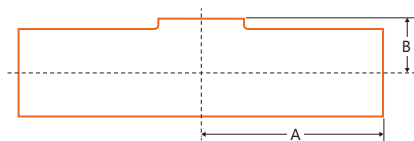
Nominal Size		A		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	2.530	64.26	220792B014-##	
3/8	9.53	2.530	64.26	220792B038-##	
1/2	12.70	2.930	74.42	220792B050-##	
3/4	19.05	2.930	74.42	220792B075-##	
1	25.40	2.950	74.93	220792B100-##	
1 1/2	38.10	3.690	93.73	220792B150-##	
2	50.80	4.690	119.13	220792B200-##	
2 1/2	63.50	5.440	138.18	220792B250-##	
3	76.20	6.190	157.23	220792B300-##	
4	101.60	7.930	201.42	220792B400-##	
6	152.40	11.410	289.81	220792B600-##	

DT-8**DT-4.1.1-4 45° Elbow WW**

Nominal Size		A		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	2.000	50.80	2208B014-##	
3/8	9.53	2.000	50.80	2208B038-##	
1/2	12.70	2.250	57.15	2208B050-##	
3/4	19.05	2.250	57.15	2208B075-##	
1	25.40	2.250	57.15	2208B100-##	
1 1/2	38.10	2.500	63.50	2208B150-##	
2	50.80	3.000	76.20	2208B200-##	
2 1/2	63.50	3.375	85.73	2208B250-##	
3	76.20	3.625	92.08	2208B300-##	
4	101.60	4.500	114.30	2208B400-##	
6	152.40	6.250	158.75	2208B600-##	

DT-9 & DT-9C**DT-4.1.2-1 Equal Tee WWW
Equal Cross WWWW**

Nominal Size		A		Equal Tee		Equal Cross	
				SF1	SF4	SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4	##=F1	##=F4
1/4	6.35	1.750	44.45	2209B014-##		2209CB014-##	
3/8	9.53	1.750	44.45	2209B038-##		2209CB038-##	
1/2	12.70	1.875	47.63	2209B050-##		2209CB050-##	
3/4	19.05	2.000	50.80	2209B075-##		2209CB075-##	
1	25.40	2.125	53.98	2209B100-##		2209CB100-##	
1 1/2	38.10	2.375	60.33	2209B150-##		2209CB150-##	
2	50.80	2.875	73.03	2209B200-##		2209CB200-##	
2 1/2	63.50	3.125	79.38	2209B250-##		2209CB250-##	
3	76.20	3.375	85.73	2209B300-##		2209CB300-##	
4	101.60	4.125	104.78	2209B400-##		2209CB400-##	
6	152.40	5.625	142.88	2209B600-##		2209CB600-##	

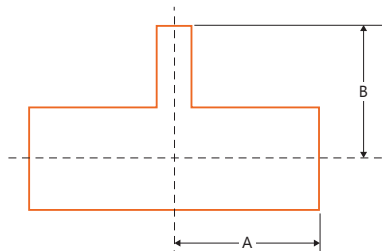
DT-9T**Short Outlet Equal Tee WWW**

Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/2	12.70	1.874	47.60	0.329	8.35	2209TB050-##	
3/4	19.05	2.000	50.80	0.413	10.48	2209TB075-##	
1	25.40	2.126	54.00	0.543	13.80	2209TB100-##	
1 1/2	38.10	2.374	60.30	0.825	20.95	2209TB150-##	
2	50.80	2.874	73.00	1.087	27.60	2209TB200-##	
2 1/2	63.50	3.126	79.40	1.374	34.90	2209TB250-##	
3	76.20	3.374	85.70	1.626	41.30	2209TB300-##	
4	101.60	4.126	104.80	2.126	54.00	2209TB400-##	
6	152.40	5.626	142.90	3.181	80.80	2209TB600-##	

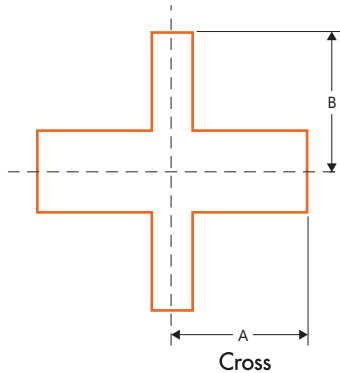
DT-10

DT-4.1.2-6

Reducing Tee WWW



Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
3/8 x 1/4	9.53 x 6.35	1.750	44.45	1.750	44.45	2210B038014-##	
1/2 x 1/4	12.70 x 6.35	1.875	47.63	1.875	47.63	2210B050014-##	
1/2 x 3/8	12.70 x 9.53	1.875	47.63	1.875	47.63	2210B050038-##	
3/4 x 1/4	19.05 x 6.35	2.000	50.80	2.000	50.80	2210B075014-##	
3/4 x 3/8	19.05 x 9.53	2.000	50.80	2.000	50.80	2210B075038-##	
3/4 x 1/2	19.05 x 12.70	2.000	50.80	2.000	50.80	2210B075050-##	
1 x 1/4	25.40 x 6.35	2.125	53.98	2.125	53.98	2210B100014-##	
1 x 3/8	25.40 x 9.53	2.125	53.98	2.125	53.98	2210B100038-##	
1 x 1/2	25.40 x 12.70	2.125	53.98	2.125	53.98	2210B100050-##	
1 x 3/4	25.40 x 19.05	2.125	53.98	2.125	53.98	2210B100075-##	
1 1/2 x 1/2	38.10 x 12.70	2.375	60.33	2.375	60.33	2210B150050-##	
1 1/2 x 3/4	38.10 x 19.05	2.375	60.33	2.375	60.33	2210B150075-##	
1 1/2 x 1	38.10 x 25.40	2.375	60.33	2.375	60.33	2210B150100-##	
2 x 1/2	50.80 x 12.70	2.875	73.03	2.625	66.68	2210B200050-##	
2 x 3/4	50.80 x 19.05	2.875	73.03	2.625	66.68	2210B200075-##	
2 x 1	50.80 x 25.40	2.875	73.03	2.625	66.68	2210B200100-##	
2 x 1 1/2	50.80 x 38.10	2.875	73.03	2.625	66.68	2210B200150-##	
2 1/2 x 1/2	63.50 x 12.70	3.125	79.38	2.875	73.03	2210B250050-##	
2 1/2 x 3/4	63.50 x 19.05	3.125	79.38	2.875	73.03	2210B250075-##	
2 1/2 x 1	63.50 x 25.40	3.125	79.38	2.875	73.03	2210B250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	3.125	79.38	2.875	73.03	2210B250150-##	
2 1/2 x 2	63.50 x 50.80	3.125	79.38	2.875	73.03	2210B250200-##	
3 x 1/2	76.20 x 12.70	3.375	85.73	3.125	79.38	2210B300050-##	
3 x 3/4	76.20 x 19.05	3.375	85.73	3.125	79.38	2210B300075-##	
3 x 1	76.20 x 25.40	3.375	85.73	3.125	79.38	2210B300100-##	
3 x 1 1/2	76.20 x 38.10	3.375	85.73	3.125	79.38	2210B300150-##	
3 x 2	76.20 x 50.80	3.375	85.73	3.125	79.38	2210B300200-##	
3 x 2 1/2	76.20 x 63.50	3.375	85.73	3.125	79.38	2210B300250-##	
4 x 1/2	101.60 x 12.70	4.125	104.78	3.625	92.08	2210B400050-##	
4 x 3/4	101.60 x 19.05	4.125	104.78	3.625	92.08	2210B400075-##	
4 x 1	101.60 x 25.40	4.125	104.78	3.625	92.08	2210B400100-##	
4 x 1 1/2	101.60 x 38.10	4.125	104.78	3.625	92.08	2210B400150-##	
4 x 2	101.60 x 50.80	4.125	104.78	3.875	98.43	2210B400200-##	
4 x 2 1/2	101.60 x 63.50	4.125	104.78	3.875	98.43	2210B400250-##	
4 x 3	101.60 x 76.20	4.125	104.78	3.875	98.43	2210B400300-##	
6 x 1/2	152.40 x 12.70	5.625	142.88	4.625	117.48	2210B600050-##	
6 x 3/4	152.40 x 19.05	5.625	142.88	4.625	117.48	2210B600075-##	
6 x 1	152.40 x 25.40	5.625	142.88	4.625	117.48	2210B600100-##	
6 x 1 1/2	152.40 x 38.10	5.625	142.88	4.625	117.48	2210B600150-##	
6 x 2	152.40 x 50.80	5.625	142.88	4.875	123.83	2210B600200-##	
6 x 2 1/2	152.40 x 63.50	5.625	142.88	4.875	123.83	2210B600250-##	
6 x 3	152.40 x 76.20	5.625	142.88	4.875	123.83	2210B600300-##	
6 x 4	152.40 x 101.60	5.625	142.88	5.125	130.18	2210B600400-##	

DT-10C**Reducing Cross WWWW**

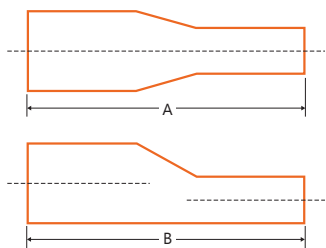
Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
3/8 x 1/4	9.53 x 6.35	1.750	44.45	1.750	44.45	2210CB038014-##	
1/2 x 1/4	12.70 x 6.35	1.875	47.63	1.875	47.63	2210CB050014-##	
1/2 x 3/8	12.70 x 9.53	1.875	47.63	1.875	47.63	2210CB050038-##	
3/4 x 1/4	19.05 x 6.35	2.000	50.80	2.000	50.80	2210CB075014-##	
3/4 x 3/8	19.05 x 9.53	2.000	50.80	2.000	50.80	2210CB075038-##	
3/4 x 1/2	19.05 x 12.70	2.000	50.80	2.000	50.80	2210CB075050-##	
1 x 1/4	25.40 x 6.35	2.125	53.98	2.125	53.98	2210CB100014-##	
1 x 3/8	25.40 x 9.53	2.125	53.98	2.125	53.98	2210CB100038-##	
1 x 1/2	25.40 x 12.70	2.125	53.98	2.125	53.98	2210CB100050-##	
1 x 3/4	25.40 x 19.05	2.125	53.98	2.125	53.98	2210CB100075-##	
1 1/2 x 1/2	38.10 x 12.70	2.375	60.33	2.375	60.33	2210CB150050-##	
1 1/2 x 3/4	38.10 x 19.05	2.375	60.33	2.375	60.33	2210CB150075-##	
1 1/2 x 1	38.10 x 25.40	2.375	60.33	2.375	60.33	2210CB150100-##	
2 x 1/2	50.80 x 12.70	2.875	73.03	2.625	66.68	2210CB200050-##	
2 x 3/4	50.80 x 19.05	2.875	73.03	2.625	66.68	2210CB200075-##	
2 x 1	50.80 x 25.40	2.875	73.03	2.625	66.68	2210CB200100-##	
2 x 1 1/2	50.80 x 38.10	2.875	73.03	2.625	66.68	2210CB200150-##	
2 1/2 x 1/2	63.50 x 12.70	3.125	79.38	2.875	73.03	2210CB250050-##	
2 1/2 x 3/4	63.50 x 19.05	3.125	79.38	2.875	73.03	2210CB250075-##	
2 1/2 x 1	63.50 x 25.40	3.125	79.38	2.875	73.03	2210CB250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	3.125	79.38	2.875	73.03	2210CB250150-##	
2 1/2 x 2	63.50 x 50.80	3.125	79.38	2.875	73.03	2210CB250200-##	
3 x 1/2	76.20 x 12.70	3.375	85.73	3.125	79.38	2210CB300050-##	
3 x 3/4	76.20 x 19.05	3.375	85.73	3.125	79.38	2210CB300075-##	
3 x 1	76.20 x 25.40	3.375	85.73	3.125	79.38	2210CB300100-##	
3 x 1 1/2	76.20 x 38.10	3.375	85.73	3.125	79.38	2210CB300150-##	
3 x 2	76.20 x 50.80	3.375	85.73	3.125	79.38	2210CB300200-##	
3 x 2 1/2	76.20 x 63.50	3.375	85.73	3.125	79.38	2210CB300250-##	
4 x 1/2	101.60 x 12.70	4.125	104.78	3.625	92.08	2210CB400050-##	
4 x 3/4	101.60 x 19.05	4.125	104.78	3.625	92.08	2210CB400075-##	
4 x 1	101.60 x 25.40	4.125	104.78	3.625	92.08	2210CB400100-##	
4 x 1 1/2	101.60 x 38.10	4.125	104.78	3.625	92.08	2210CB400150-##	
4 x 2	101.60 x 50.80	4.125	104.78	3.875	98.43	2210CB400200-##	
4 x 2 1/2	101.60 x 63.50	4.125	104.78	3.875	98.43	2210CB400250-##	
4 x 3	101.60 x 76.20	4.125	104.78	3.875	98.43	2210CB400300-##	
6 x 3	152.40 x 76.20	5.625	142.88	4.875	123.83	2210CB600300-##	
6 x 4	152.40 x 101.60	5.625	142.88	5.125	130.18	2210CB600400-##	

DT-11C(a)

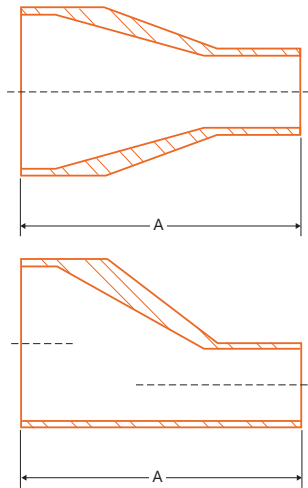
BPE 2012 Concentric Reducer WW

DT-11E(a)

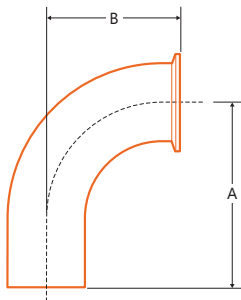
BPE 2012 Eccentric Reducer WW



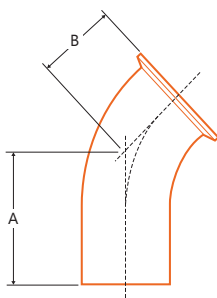
Nominal Size		CR				ER			
		A		SF1	SF4	B		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4	Inch	mm	##=F1	##=F4
1/2 x 3/8	12.70 x 9.53	3.250	82.60	2211CB050038-##		4.000	101.60	2211EB050038-##	
3/4 x 3/8	19.05 x 9.53	3.250	82.60	2211CB075038-##		4.000	101.60	2211EB075038-##	
3/4 x 1/2	19.05 x 12.70	4.000	101.60	2211CB075050-##		4.000	101.60	2211EB075050-##	
1 x 3/8	25.40 x 9.53	4.500	114.30	2211CB100038-##		4.500	114.30	2211EB100038-##	
1 x 1/2	25.40 x 12.70	4.500	114.30	2211CB100050-##		4.500	114.30	2211EB100050-##	
1 x 3/4	25.40 x 19.05	4.000	101.60	2211CB100075-##		4.000	101.60	2211EB100075-##	
1 1/2 x 1/2	38.10 x 12.70	5.500	139.70	2211CB150050-##		5.500	139.70	2211EB150050-##	
1 1/2 x 3/4	38.10 x 19.05	5.000	127.00	2211CB150075-##		5.000	127.00	2211EB150075-##	
1 1/2 x 1	38.10 x 25.40	5.000	127.00	2211CB150100-##		5.000	127.00	2211EB150100-##	
2 x 1/2	50.80 x 12.70	7.750	196.90	2211CB200050-##		7.750	196.90	2211EB200050-##	
2 x 3/4	50.80 x 19.05	7.250	184.20	2211CB200075-##		7.250	184.20	2211EB200075-##	
2 x 1	50.80 x 25.40	7.250	184.20	2211CB200100-##		7.250	184.20	2211EB200100-##	
2 x 1 1/2	50.80 x 38.10	5.250	133.40	2211CB200150-##		5.250	133.40	2211EB200150-##	
2 1/2 x 1/2	63.50 x 12.70	9.750	247.70	2211CB250050-##		9.750	247.70	2211EB250050-##	
2 1/2 x 3/4	63.50 x 19.05	9.250	235.00	2211CB250075-##		9.250	235.00	2211EB250075-##	
2 1/2 x 1	63.50 x 25.40	9.250	235.00	2211CB250100-##		9.250	235.00	2211EB250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	7.250	184.20	2211CB250150-##		7.250	184.20	2211EB250150-##	
2 1/2 x 2	63.50 x 50.80	5.500	139.70	2211CB250200-##		5.500	139.70	2211EB250200-##	
3 x 1	76.20 x 25.40	11.250	285.80	2211CB300100-##		11.250	285.80	2211EB300100-##	
3 x 1 1/2	76.20 x 38.10	9.250	235.00	2211CB300150-##		9.250	235.00	2211EB300150-##	
3 x 2	76.20 x 50.80	7.500	190.50	2211CB300200-##		7.500	190.50	2211EB300200-##	
3 x 2 1/2	76.20 x 63.50	5.500	139.70	2211CB300250-##		5.500	139.70	2211EB300250-##	
4 x 1	101.60 x 25.40	15.500	393.70	2211CB400100-##		15.500	393.70	2211EB400100-##	
4 x 1 1/2	101.60 x 38.10	13.500	342.90	2211CB400150-##		13.500	342.90	2211EB400150-##	
4 x 2	101.60 x 50.80	11.750	298.50	2211CB400200-##		11.750	298.50	2211EB400200-##	
4 x 2 1/2	101.60 x 63.50	9.750	247.70	2211CB400250-##		9.750	247.70	2211EB400250-##	
4 x 3	101.60 x 76.20	7.750	196.90	2211CB400300-##		7.750	196.90	2211EB400300-##	
6 x 3	152.40 x 76.20	10.000	254.00	2211CB600300-##		9.750	247.70	2211EB600300-##	
6 x 4	152.40 x 101.60	10.000	254.00	2211CB600400-##		10.000	254.00	2211EB600400-##	

DT-11C(b)**DT-4.1.3-1 Concentric Reducer WW****DT-11E(b)****DT-4.1.3-1 Eccentric Reducer WW**

Nominal Size		A		CR		ER	
				SF1	SF4	SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4	##=F1	##=F4
3/8 x 1/4	9.53 x 6.35	1.625	41.28	2211CBB038014-##		2211EBB038014-##	
1/2 x 1/4	12.70 x 6.35	1.875	47.63	2211CBB050014-##		2211EBB050014-##	
1/2 x 3/8	12.70 x 9.53	1.875	47.63	2211CBB050038-##		2211EBB050038-##	
3/4 x 3/8	19.05 x 9.53	2.000	50.80	2211CBB075038-##		2211EBB075038-##	
3/4 x 1/2	19.05 x 12.70	2.125	53.98	2211CBB075050-##		2211EBB075050-##	
1 x 1/2	25.40 x 12.70	2.500	63.50	2211CBB100050-##		2211EBB100050-##	
1 x 3/4	25.40 x 19.05	2.125	53.98	2211CBB100075-##		2211EBB100075-##	
1 1/2 x 3/4	38.10 x 19.05	3.000	76.20	2211CBB150075-##		2211EBB150075-##	
1 1/2 x 1	38.10 x 25.40	2.500	63.50	2211CBB150100-##		2211EBB150100-##	
2 x 1	50.80 x 25.40	3.375	85.73	2211CBB200100-##		2211EBB200100-##	
2 x 1 1/2	50.80 x 38.10	2.500	63.50	2211CBB200150-##		2211EBB200150-##	
2 1/2 x 1 1/2	63.50 x 38.10	3.375	85.73	2211CBB250150-##		2211EBB250150-##	
2 1/2 x 2	63.50 x 50.80	2.500	63.50	2211CBB250200-##		2211EBB250200-##	
3 x 1 1/2	76.20 x 38.10	4.250	107.95	2211CBB300150-##		2211EBB300150-##	
3 x 2	76.20 x 50.80	3.375	85.73	2211CBB300200-##		2211EBB300200-##	
3 x 2 1/2	76.20 x 63.50	2.625	66.68	2211CBB300250-##		2211EBB300250-##	
4 x 2	101.60 x 50.80	5.125	130.18	2211CBB400200-##		2211EBB400200-##	
4 x 2 1/2	101.60 x 63.50	4.250	107.95	2211CBB400250-##		2211EBB400250-##	
4 x 3	101.60 x 76.20	3.875	98.43	2211CBB400300-##		2211EBB400300-##	
6 x 3	152.40 x 76.20	7.250	184.15	2211CBB600300-##		2211EBB600300-##	
6 x 4	152.40 x 101.60	5.625	142.88	2211CBB600400-##		2211EBB600400-##	

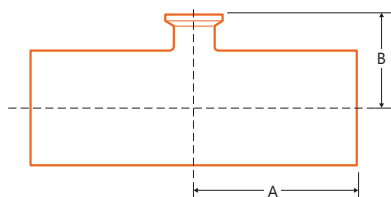
DT-12**DT-4.1.1-2 90° Elbow CW**

Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	2.625	66.68	1.625	41.28	2212B014-##	
3/8	9.53	2.625	66.68	1.625	41.28	2212B038-##	
1/2	12.70	3.000	76.20	1.625	41.28	2212B050-##	
3/4	19.05	3.000	76.20	1.625	41.28	2212B075-##	
1	25.40	3.000	76.20	2.000	50.80	2212B100-##	
1 1/2	38.10	3.750	95.25	2.750	69.85	2212B150-##	
2	50.80	4.750	120.65	3.500	88.90	2212B200-##	
2 1/2	63.50	5.500	139.70	4.250	107.95	2212B250-##	
3	76.20	6.250	158.75	5.000	127.00	2212B300-##	
4	101.60	8.000	203.20	6.625	168.28	2212B400-##	
6	152.40	11.500	292.10	10.500	266.70	2212B600-##	

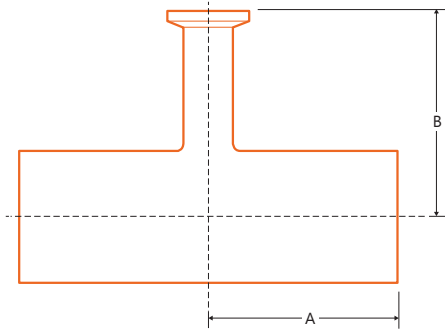
DT-13**DT-4.1.1-5 45° Elbow CW**

Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	2.000	50.80	1.000	25.40	2213B014-##	
3/8	9.53	2.000	50.80	1.000	25.40	2213B038-##	
1/2	12.70	2.250	57.15	1.000	25.40	2213B050-##	
3/4	19.05	2.250	57.15	1.000	25.40	2213B075-##	
1	25.40	2.250	57.15	1.125	28.58	2213B100-##	
1 1/2	38.10	2.500	63.50	1.438	36.53	2213B150-##	
2	50.80	3.000	76.20	1.750	44.45	2213B200-##	
2 1/2	63.50	3.375	85.73	2.063	52.40	2213B250-##	
3	76.20	3.625	92.08	2.375	60.33	2213B300-##	
4	101.60	4.500	114.30	3.125	79.38	2213B400-##	
6	152.40	6.250	158.75	5.250	133.35	2213B600-##	

DT-14

DT-4.1.2-7
**Short Outlet Reducing Tee
WCW**


Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
3/8 x 1/4	9.53 x 6.35	1.750	44.45	1.000	25.40	2214B038014-##	
1/2 x 1/4	12.70 x 6.35	1.875	47.63	1.000	25.40	2214B050014-##	
1/2 x 3/8	12.70 x 9.53	1.875	47.63	1.000	25.40	2214B050038-##	
3/4 x 1/4	19.05 x 6.35	2.000	50.80	1.000	25.40	2214B075014-##	
3/4 x 3/8	19.05 x 9.53	2.000	50.80	1.000	25.40	2214B075038-##	
3/4 x 1/2	19.05 x 12.70	2.000	50.80	1.000	25.40	2214B075050-##	
1 x 1/4	25.40 x 6.35	2.125	53.98	1.125	28.58	2214B100014-##	
1 x 3/8	25.40 x 9.53	2.125	53.98	1.125	28.58	2214B100038-##	
1 x 1/2	25.40 x 12.70	2.125	53.98	1.125	28.58	2214B100050-##	
1 x 3/4	25.40 x 19.05	2.125	53.98	1.125	28.58	2214B100075-##	
1 1/2 x 1/2	38.10 x 12.70	2.375	60.33	1.375	34.93	2214B150050-##	
1 1/2 x 3/4	38.10 x 19.05	2.375	60.33	1.375	34.93	2214B150075-##	
1 1/2 x 1	38.10 x 25.40	2.375	60.33	1.375	34.93	2214B150100-##	
2 x 1/2	50.80 x 12.70	2.875	73.03	1.625	41.28	2214B200050-##	
2 x 3/4	50.80 x 19.05	2.875	73.03	1.625	41.28	2214B200075-##	
2 x 1	50.80 x 25.40	2.875	73.03	1.625	41.28	2214B200100-##	
2 x 1 1/2	50.80 x 38.10	2.875	73.03	1.625	41.28	2214B200150-##	
2 1/2 x 1/2	63.50 x 12.70	3.125	79.38	1.875	47.63	2214B250050-##	
2 1/2 x 3/4	63.50 x 19.05	3.125	79.38	1.875	47.63	2214B250075-##	
2 1/2 x 1	63.50 x 25.40	3.125	79.38	1.875	47.63	2214B250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	3.125	79.38	1.875	47.63	2214B250150-##	
2 1/2 x 2	63.50 x 50.80	3.125	79.38	1.875	47.63	2214B250200-##	
3 x 1/2	76.20 x 12.70	3.375	85.73	2.125	53.98	2214B300050-##	
3 x 3/4	76.20 x 19.05	3.375	85.73	2.125	53.98	2214B300075-##	
3 x 1	76.20 x 25.40	3.375	85.73	2.125	53.98	2214B300100-##	
3 x 1 1/2	76.20 x 38.10	3.375	85.73	2.125	53.98	2214B300150-##	
3 x 2	76.20 x 50.80	3.375	85.73	2.125	53.98	2214B300200-##	
3 x 2 1/2	76.20 x 63.50	3.375	85.73	2.125	53.98	2214B300250-##	
4 x 1/2	101.60 x 12.70	4.125	104.78	2.625	66.68	2214B400050-##	
4 x 3/4	101.60 x 19.05	4.125	104.78	2.625	66.68	2214B400075-##	
4 x 1	101.60 x 25.40	4.125	104.78	2.625	66.68	2214B400100-##	
4 x 1 1/2	101.60 x 38.10	4.125	104.78	2.625	66.68	2214B400150-##	
4 x 2	101.60 x 50.80	4.125	104.78	2.625	66.68	2214B400200-##	
4 x 2 1/2	101.60 x 63.50	4.125	104.78	2.625	66.68	2214B400250-##	
4 x 3	101.60 x 76.20	4.125	104.78	2.625	66.68	2214B400300-##	
6 x 1/2	152.40 x 12.70	5.625	142.88	3.625	92.08	2214B600050-##	
6 x 3/4	152.40 x 19.05	5.625	142.88	3.625	92.08	2214B600075-##	
6 x 1	152.40 x 25.40	5.625	142.88	3.625	92.08	2214B600100-##	
6 x 1 1/2	152.40 x 38.10	5.625	142.88	3.625	92.08	2214B600150-##	
6 x 2	152.40 x 50.80	5.625	142.88	3.625	92.08	2214B600200-##	
6 x 2 1/2	152.40 x 63.50	5.625	142.88	3.625	92.08	2214B600250-##	
6 x 3	152.40 x 76.20	5.625	142.88	3.625	92.08	2214B600300-##	
6 x 4	152.40 x 101.60	5.625	142.88	3.750	95.25	2214B600400-##	

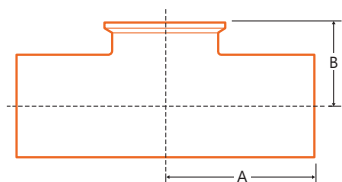
DT-14L**DT-4.1.2-13 Long Outlet Reducing Tee WCW**

Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
3/8 x 1/4	9.53 x 6.35	1.750	44.45	2.250	57.15	2214LB038014-##	
1/2 x 1/4	12.70 x 6.35	1.875	47.63	2.375	60.33	2214LB050014-##	
1/2 x 3/8	12.70 x 9.53	1.875	47.63	2.375	60.33	2214LB050038-##	
3/4 x 1/4	19.05 x 6.35	2.000	50.80	2.500	63.50	2214LB075014-##	
3/4 x 3/8	19.05 x 9.53	2.000	50.80	2.500	63.50	2214LB075038-##	
3/4 x 1/2	19.05 x 12.70	2.000	50.80	2.500	63.50	2214LB075050-##	
1 x 1/4	25.40 x 6.35	2.125	53.98	2.625	66.68	2214LB100014-##	
1 x 3/8	25.40 x 9.53	2.125	53.98	2.625	66.68	2214LB100038-##	
1 x 1/2	25.40 x 12.70	2.125	53.98	2.625	66.68	2214LB100050-##	
1 x 3/4	25.40 x 19.05	2.125	53.98	2.625	66.68	2214LB100075-##	
1 1/2 x 1/2	38.10 x 12.70	2.375	60.33	2.875	73.03	2214LB150050-##	
1 1/2 x 3/4	38.10 x 19.05	2.375	60.33	2.875	73.03	2214LB150075-##	
1 1/2 x 1	38.10 x 25.40	2.375	60.33	2.875	73.03	2214LB150100-##	
2 x 1/2	50.80 x 12.70	2.875	73.03	3.125	79.38	2214LB200050-##	
2 x 3/4	50.80 x 19.05	2.875	73.03	3.125	79.38	2214LB200075-##	
2 x 1	50.80 x 25.40	2.875	73.03	3.125	79.38	2214LB200100-##	
2 x 1 1/2	50.80 x 38.10	2.875	73.03	3.125	79.38	2214LB200150-##	
2 1/2 x 1/2	63.50 x 12.70	3.125	79.38	3.375	85.73	2214LB250050-##	
2 1/2 x 3/4	63.50 x 19.05	3.125	79.38	3.375	85.73	2214LB250075-##	
2 1/2 x 1	63.50 x 25.40	3.125	79.38	3.375	85.73	2214LB250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	3.125	79.38	3.375	85.73	2214LB250150-##	
2 1/2 x 2	63.50 x 50.80	3.125	79.38	3.375	85.73	2214LB250200-##	
3 x 1/2	76.20 x 12.70	3.375	85.73	3.625	92.08	2214LB300050-##	
3 x 3/4	76.20 x 19.05	3.375	85.73	3.625	92.08	2214LB300075-##	
3 x 1	76.20 x 25.40	3.375	85.73	3.625	92.08	2214LB300100-##	
3 x 1 1/2	76.20 x 38.10	3.375	85.73	3.625	92.08	2214LB300150-##	
3 x 2	76.20 x 50.80	3.375	85.73	3.625	92.08	2214LB300200-##	
3 x 2 1/2	76.20 x 63.50	3.375	85.73	3.625	92.08	2214LB300250-##	
4 x 1/2	101.60 x 12.70	4.125	104.78	4.125	104.78	2214LB400050-##	
4 x 3/4	101.60 x 19.05	4.125	104.78	4.125	104.78	2214LB400075-##	
4 x 1	101.60 x 25.40	4.125	104.78	4.125	104.78	2214LB400100-##	
4 x 1 1/2	101.60 x 38.10	4.125	104.78	4.125	104.78	2214LB400150-##	
4 x 2	101.60 x 50.80	4.125	104.78	4.375	111.13	2214LB400200-##	
4 x 2 1/2	101.60 x 63.50	4.125	104.78	4.375	111.13	2214LB400250-##	
4 x 3	101.60 x 76.20	4.125	104.78	4.375	111.13	2214LB400300-##	
6 x 3	152.40 x 76.20	5.625	142.88	5.375	136.53	2214LB600300-##	
6 x 4	152.40 x 101.60	5.625	142.88	5.750	146.05	2214LB600400-##	

DT-15

DT-4.1.2-2

Short Outlet Equal Tee WCW

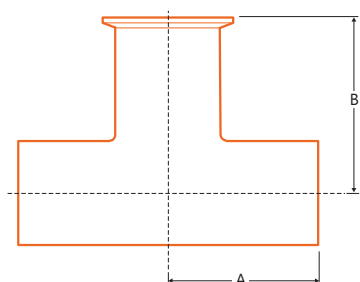


Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	1.750	44.45	1.000	25.40	2215B014-##	
3/8	9.53	1.750	44.45	1.000	25.40	2215B038-##	
1/2	12.70	1.875	47.63	1.000	25.40	2215B050-##	
3/4	19.05	2.000	50.80	1.125	28.58	2215B075-##	
1	25.40	2.125	53.98	1.125	28.58	2215B100-##	
1 1/2	38.10	2.375	60.33	1.375	34.93	2215B150-##	
2	50.80	2.875	73.03	1.625	41.28	2215B200-##	
2 1/2	63.50	3.125	79.38	1.875	47.63	2215B250-##	
3	76.20	3.375	85.73	2.125	53.98	2215B300-##	
4	101.60	4.125	104.78	2.750	69.85	2215B400-##	
6	152.40	5.625	142.88	4.625	117.48	2215B600-##	

DT-15L

DT-4.1.2-12

Long Outlet Equal Tee WCW

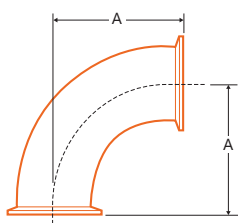


Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	1.750	44.45	2.250	57.15	2215LB014-##	
3/8	9.53	1.750	44.45	2.250	57.15	2215LB038-##	
1/2	12.70	1.875	47.63	2.375	60.33	2215LB050-##	
3/4	19.05	2.000	50.80	2.500	63.50	2215LB075-##	
1	25.40	2.125	53.98	2.625	66.68	2215LB100-##	
1 1/2	38.10	2.375	60.33	2.875	73.03	2215LB150-##	
2	50.80	2.875	73.03	3.375	85.73	2215LB200-##	
2 1/2	63.50	3.125	79.38	3.625	92.08	2215LB250-##	
3	76.20	3.375	85.73	3.875	98.43	2215LB300-##	
4	101.60	4.125	104.78	4.750	120.65	2215LB400-##	
6	152.40	5.625	142.88	7.125	180.98	2215LB600-##	

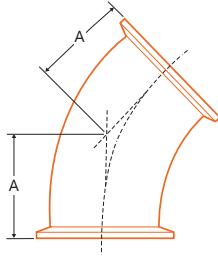
DT-16

DT-4.1.1-3

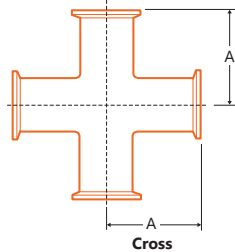
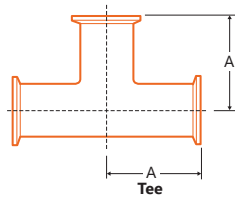
90° Clamp Elbow CC



Nominal Size		A		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	1.625	41.28	2216B014-##	
3/8	9.53	1.625	41.28	2216B038-##	
1/2	12.70	1.625	41.28	2216B050-##	
3/4	19.05	1.625	41.28	2216B075-##	
1	25.40	2.000	50.80	2216B100-##	
1 1/2	38.10	2.750	69.85	2216B150-##	
2	50.80	3.500	88.90	2216B200-##	
2 1/2	63.50	4.250	107.95	2216B250-##	
3	76.20	5.000	127.00	2216B300-##	
4	101.60	6.625	168.28	2216B400-##	
6	152.40	10.500	266.70	2216B600-##	

DT-17**DT-4.1.1-6 45° Clamp Elbow CC**

Nominal Size		A		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	1.000	25.40	2217B014-##	
3/8	9.53	1.000	25.40	2217B038-##	
1/2	12.70	1.000	25.40	2217B050-##	
3/4	19.05	1.000	25.40	2217B075-##	
1	25.40	1.125	28.58	2217B100-##	
1 1/2	38.10	1.438	36.53	2217B150-##	
2	50.80	1.750	44.45	2217B200-##	
2 1/2	63.50	2.063	52.40	2217B250-##	
3	76.20	2.375	60.33	2217B300-##	
4	101.60	3.125	79.38	2217B400-##	
6	152.40	5.250	133.35	2217B600-##	

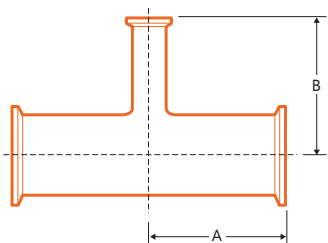
DT-18**DT-4.1.2-4 Clamp Equal Tee CCC****DT-18C****DT-4.1.2-4 Clamp Equal Cross CCCC**

Nominal Size		A		SF1	SF4	SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4	##=F1	##=F4
1/4	6.35	2.250	57.15	2218B014-##		2218CB014-##	
3/8	9.53	2.250	57.15	2218B038-##		2218CB038-##	
1/2	12.70	2.375	60.33	2218B050-##		2218CB050-##	
3/4	19.05	2.500	63.50	2218B075-##		2218CB075-##	
1	25.40	2.625	66.68	2218B100-##		2218CB100-##	
1 1/2	38.10	2.875	73.03	2218B150-##		2218CB150-##	
2	50.80	3.375	85.73	2218B200-##		2218CB200-##	
2 1/2	63.50	3.625	92.08	2218B250-##		2218CB250-##	
3	76.20	3.875	98.43	2218B300-##		2218CB300-##	
4	101.60	4.750	120.65	2218B400-##		2218CB400-##	
6	152.40	7.125	180.98	2218B600-##		2218CB600-##	

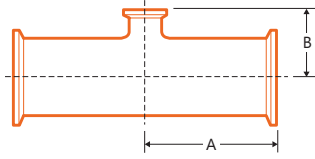
DT-19

DT-4.1.2-8

Clamp Reducing Tee CCC



Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
3/8 x 1/4	9.53 x 6.35	2.250	57.15	2.250	57.15	2219B038014-##	
1/2 x 1/4	12.70 x 6.35	2.375	60.33	2.375	60.33	2219B050014-##	
1/2 x 3/8	12.70 x 9.53	2.375	60.33	2.375	60.33	2219B050038-##	
3/4 x 1/4	19.05 x 6.35	2.500	63.50	2.500	63.50	2219B075014-##	
3/4 x 3/8	19.05 x 9.53	2.500	63.50	2.500	63.50	2219B075038-##	
3/4 x 1/2	19.05 x 12.70	2.500	63.50	2.500	63.50	2219B075050-##	
1 x 1/4	25.40 x 6.35	2.625	66.68	2.625	66.68	2219B100014-##	
1 x 3/8	25.40 x 9.53	2.625	66.68	2.625	66.68	2219B100038-##	
1 x 1/2	25.40 x 12.70	2.625	66.68	2.625	66.68	2219B100050-##	
1 x 3/4	25.40 x 19.05	2.625	66.68	2.625	66.68	2219B100075-##	
1 1/2 x 1/2	38.10 x 12.70	2.875	73.03	2.875	73.03	2219B150050-##	
1 1/2 x 3/4	38.10 x 19.05	2.875	73.03	2.875	73.03	2219B150075-##	
1 1/2 x 1	38.10 x 25.40	2.875	73.03	2.875	73.03	2219B150100-##	
2 x 1/2	50.80 x 12.70	3.375	85.73	3.125	79.38	2219B200050-##	
2 x 3/4	50.80 x 19.05	3.375	85.73	3.125	79.38	2219B200075-##	
2 x 1	50.80 x 25.40	3.375	85.73	3.125	79.38	2219B200100-##	
2 x 1 1/2	50.80 x 38.10	3.375	85.73	3.125	79.38	2219B200150-##	
2 1/2 x 1/2	63.50 x 12.70	3.625	92.08	3.375	85.73	2219B250050-##	
2 1/2 x 3/4	63.50 x 19.05	3.625	92.08	3.375	85.73	2219B250075-##	
2 1/2 x 1	63.50 x 25.40	3.625	92.08	3.375	85.73	2219B250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	3.625	92.08	3.375	85.73	2219B250150-##	
2 1/2 x 2	63.50 x 50.80	3.625	92.08	3.375	85.73	2219B250200-##	
3 x 1/2	76.20 x 12.70	3.875	98.43	3.625	92.08	2219B300050-##	
3 x 3/4	76.20 x 19.05	3.875	98.43	3.625	92.08	2219B300075-##	
3 x 1	76.20 x 25.40	3.875	98.43	3.625	92.08	2219B300100-##	
3 x 1 1/2	76.20 x 38.10	3.875	98.43	3.625	92.08	2219B300150-##	
3 x 2	76.20 x 50.80	3.875	98.43	3.625	92.08	2219B300200-##	
3 x 2 1/2	76.20 x 63.50	3.875	98.43	3.625	92.08	2219B300250-##	
4 x 1/2	101.60 x 12.70	4.750	120.65	4.125	104.78	2219B400050-##	
4 x 3/4	101.60 x 19.05	4.750	120.65	4.125	104.78	2219B400075-##	
4 x 1	101.60 x 25.40	4.750	120.65	4.125	104.78	2219B400100-##	
4 x 1 1/2	101.60 x 38.10	4.750	120.65	4.125	104.78	2219B400150-##	
4 x 2	101.60 x 50.80	4.750	120.65	4.375	111.13	2219B400200-##	
4 x 2 1/2	101.60 x 63.50	4.750	120.65	4.375	111.13	2219B400250-##	
4 x 3	101.60 x 76.20	4.750	120.65	4.375	111.13	2219B400300-##	
6 x 1/2	152.40 x 12.70	7.125	180.98	5.125	130.18	2219B600050-##	
6 x 3/4	152.40 x 19.05	7.125	180.98	5.125	130.18	2219B600075-##	
6 x 1	152.40 x 25.40	7.125	180.98	5.125	130.18	2219B600100-##	
6 x 1 1/2	152.40 x 38.10	7.125	180.98	5.125	130.18	2219B600150-##	
6 x 2	152.40 x 50.80	7.125	180.98	5.375	136.53	2219B600200-##	
6 x 2 1/2	152.40 x 63.50	7.125	180.98	5.375	136.53	2219B600250-##	
6 x 3	152.40 x 76.20	7.125	180.98	5.375	136.53	2219B600300-##	
6 x 4	152.40 x 101.60	7.125	180.98	5.750	146.05	2219B600400-##	

DT-20**DT-4.1.2-9****Short Outlet Reducing Tee
CCC**

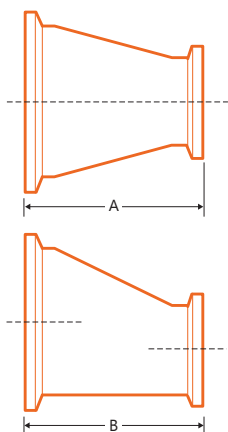
Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
3/8 x 1/4	9.53 x 6.35	2.250	57.15	1.000	25.40	2220B038014-##	
1/2 x 1/4	12.70 x 6.35	2.375	60.33	1.000	25.40	2220B050014-##	
1/2 x 3/8	12.70 x 9.53	2.375	60.33	1.000	25.40	2220B050038-##	
3/4 x 1/4	19.05 x 6.35	2.500	63.50	1.000	25.40	2220B075014-##	
3/4 x 3/8	19.05 x 9.53	2.500	63.50	1.000	25.40	2220B075038-##	
3/4 x 1/2	19.05 x 12.70	2.500	63.50	1.000	25.40	2220B075050-##	
1 x 1/4	25.40 x 6.35	2.625	66.68	1.125	28.58	2220B100014-##	
1 x 3/8	25.40 x 9.53	2.625	66.68	1.125	28.58	2220B100038-##	
1 x 1/2	25.40 x 12.70	2.625	66.68	1.125	28.58	2220B100050-##	
1 x 3/4	25.40 x 19.05	2.625	66.68	1.125	28.58	2220B100075-##	
1 1/2 x 1/2	38.10 x 12.70	2.875	73.03	1.375	34.93	2220B150050-##	
1 1/2 x 3/4	38.10 x 19.05	2.875	73.03	1.375	34.93	2220B150075-##	
1 1/2 x 1	38.10 x 25.40	2.875	73.03	1.375	34.93	2220B150100-##	
2 x 1/2	50.80 x 12.70	3.375	85.73	1.625	41.28	2220B200050-##	
2 x 3/4	50.80 x 19.05	3.375	85.73	1.625	41.28	2220B200075-##	
2 x 1	50.80 x 25.40	3.375	85.73	1.625	41.28	2220B200100-##	
2 x 1 1/2	50.80 x 38.10	3.375	85.73	1.625	41.28	2220B200150-##	
2 1/2 x 1/2	63.50 x 12.70	3.625	92.08	1.875	47.63	2220B250050-##	
2 1/2 x 3/4	63.50 x 19.05	3.625	92.08	1.875	47.63	2220B250075-##	
2 1/2 x 1	63.50 x 25.40	3.625	92.08	1.875	47.63	2220B250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	3.625	92.08	1.875	47.63	2220B250150-##	
2 1/2 x 2	63.50 x 50.80	3.625	92.08	1.875	47.63	2220B250200-##	
3 x 1/2	76.20 x 12.70	3.875	98.43	2.125	53.98	2220B300050-##	
3 x 3/4	76.20 x 19.05	3.875	98.43	2.125	53.98	2220B300075-##	
3 x 1	76.20 x 25.40	3.875	98.43	2.125	53.98	2220B300100-##	
3 x 1 1/2	76.20 x 38.10	3.875	98.43	2.125	53.98	2220B300150-##	
3 x 2	76.20 x 50.80	3.875	98.43	2.125	53.98	2220B300200-##	
3 x 2 1/2	76.20 x 63.50	3.875	98.43	2.125	53.98	2220B300250-##	
4 x 1/2	101.60 x 12.70	4.750	120.65	2.625	66.68	2220B400050-##	
4 x 3/4	101.60 x 19.05	4.750	120.65	2.625	66.68	2220B400075-##	
4 x 1	101.60 x 25.40	4.750	120.65	2.625	66.68	2220B400100-##	
4 x 1 1/2	101.60 x 38.10	4.750	120.65	2.625	66.68	2220B400150-##	
4 x 2	101.60 x 50.80	4.750	120.65	2.625	66.68	2220B400200-##	
4 x 2 1/2	101.60 x 63.50	4.750	120.65	2.625	66.68	2220B400250-##	
4 x 3	101.60 x 76.20	4.750	120.65	2.625	66.68	2220B400300-##	
6 x 1/2	152.40 x 12.70	7.125	180.98	3.625	92.08	2220B600050-##	
6 x 3/4	152.40 x 19.05	7.125	180.98	3.625	92.08	2220B600075-##	
6 x 1	152.40 x 25.40	7.125	180.98	3.625	92.08	2220B600100-##	
6 x 1 1/2	152.40 x 38.10	7.125	180.98	3.625	92.08	2220B600150-##	
6 x 2	152.40 x 50.80	7.125	180.98	3.625	92.08	2220B600200-##	
6 x 2 1/2	152.40 x 63.50	7.125	180.98	3.625	92.08	2220B600250-##	
6 x 3	152.40 x 76.20	7.125	180.98	3.625	92.08	2220B600300-##	
6 x 4	152.40 x 101.60	7.125	180.98	3.750	95.25	2220B600400-##	

DT-21C(a)

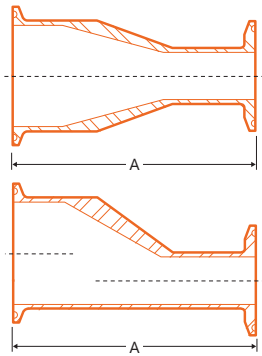
BPE 2012 Concentric Reducer CC

DT-21E(a)

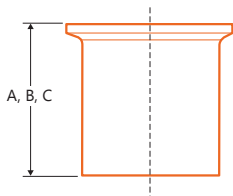
BPE 2012 Eccentric Reducer CC



		CR				ER			
Nominal Size		A		SF1	SF4	B		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4	Inch	mm	##=F1	##=F4
3/4 x 1/2	19.05 x 12.70	2.000	50.80	2221CB075050-##		2.000	50.80	2221EB075050-##	
1 x 1/2	25.40 x 12.70	2.500	63.50	2221CB100050-##		2.500	63.50	2221EB100050-##	
1 x 3/4	25.40 x 19.05	2.000	50.80	2221CB100075-##		2.000	50.80	2221EB100075-##	
1 1/2 x 1/2	38.10 x 12.70	3.500	88.90	2221CB150050-##		3.500	88.90	2221EB150050-##	
1 1/2 x 3/4	38.10 x 19.05	3.000	76.20	2221CB150075-##		3.000	76.20	2221EB150075-##	
1 1/2 x 1	38.10 x 25.40	3.000	76.20	2221CB150100-##		3.000	76.20	2221EB150100-##	
2 x 1/2	50.80 x 12.70	5.500	139.70	2221CB200050-##		5.500	139.70	2221EB200050-##	
2 x 3/4	50.80 x 19.05	5.000	127.00	2221CB200075-##		5.000	127.00	2221EB200075-##	
2 x 1	50.80 x 25.40	5.000	127.00	2221CB200100-##		5.000	127.00	2221EB200100-##	
2 x 1 1/2	50.80 x 38.10	3.000	76.20	2221CB200150-##		3.000	76.20	2221EB200150-##	
2 1/2 x 1/2	63.50 x 12.70	7.500	190.50	2221CB250050-##		7.500	190.50	2221EB250050-##	
2 1/2 x 3/4	63.50 x 19.05	7.000	177.80	2221CB250075-##		7.000	177.80	2221EB250075-##	
2 1/2 x 1	63.50 x 25.40	7.000	177.80	2221CB250100-##		7.000	177.80	2221EB250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	5.000	127.00	2221CB250150-##		5.000	127.00	2221EB250150-##	
2 1/2 x 2	63.50 x 50.80	3.000	76.20	2221CB250200-##		3.000	76.20	2221EB250200-##	
3 x 1	76.20 x 25.40	9.000	228.60	2221CB300100-##		9.000	228.60	2221EB300100-##	
3 x 1 1/2	76.20 x 38.10	7.000	177.80	2221CB300150-##		7.000	177.80	2221EB300150-##	
3 x 2	76.20 x 50.80	5.000	127.00	2221CB300200-##		5.000	127.00	2221EB300200-##	
3 x 2 1/2	76.20 x 63.50	3.000	76.20	2221CB300250-##		3.000	76.20	2221EB300250-##	
4 x 1	101.60 x 25.40	13.125	333.40	2221CB400100-##		13.125	333.40	2221EB400100-##	
4 x 1 1/2	101.60 x 38.10	11.125	282.60	2221CB400150-##		11.125	282.60	2221EB400150-##	
4 x 2	101.60 x 50.80	9.125	231.80	2221CB400200-##		9.125	231.80	2221EB400200-##	
4 x 2 1/2	101.60 x 63.50	7.125	181.00	2221CB400250-##		7.125	181.00	2221EB400250-##	
4 x 3	101.60 x 76.20	5.125	130.20	2221CB400300-##		5.125	130.20	2221EB400300-##	
6 x 3	152.40 x 76.20	7.500	190.50	2221CB600300-##		7.625	193.70	2221EB600300-##	
6 x 4	152.40 x 101.60	7.625	193.70	2221CB600400-##		7.625	193.70	2221EB600400-##	

DT-21C(b)**DT-4.1.3-3 Concentric Reducer CC****DT-21E(b)****DT-4.1.3-3 Eccentric Reducer CC**

Nominal Size		A		CR		ER	
				SF1 ##=F1	SF4 ##=F4	SF1 ##=F1	SF4 ##=F4
Inch	mm	Inch	mm				
3/8 x 1/4	9.53 x 6.35	2.625	66.68	2221CBB038014-##		2221EBB038014-##	
1/2 x 1/4	12.70 x 6.35	2.875	73.03	2221CBB050014-##		2221EBB050014-##	
1/2 x 3/8	12.70 x 9.53	2.875	73.03	2221CBB050038-##		2221EBB050038-##	
3/4 x 3/8	19.05 x 9.53	3.000	76.20	2221CBB075038-##		2221EBB075038-##	
3/4 x 1/2	19.05 x 12.70	3.125	79.38	2221CBB075050-##		2221EBB075050-##	
1 x 1/2	25.40 x 12.70	3.500	88.90	2221CBB100050-##		2221EBB100050-##	
1 x 3/4	25.40 x 19.05	3.125	79.38	2221CBB100075-##		2221EBB100075-##	
1 1/2 x 3/4	38.10 x 19.05	4.000	101.60	2221CBB150075-##		2221EBB150075-##	
1 1/2 x 1	38.10 x 25.40	3.500	88.90	2221CBB150100-##		2221EBB150100-##	
2 x 1	50.80 x 25.40	4.375	111.13	2221CBB200100-##		2221EBB200100-##	
2 x 1 1/2	50.80 x 38.10	3.500	88.90	2221CBB200150-##		2221EBB200150-##	
2 1/2 x 1 1/2	63.50 x 38.10	4.375	111.13	2221CBB250150-##		2221EBB250150-##	
2 1/2 x 2	63.50 x 50.80	3.500	88.90	2221CBB250200-##		2221EBB250200-##	
3 x 1 1/2	76.20 x 38.10	5.250	133.35	2221CBB300150-##		2221EBB300150-##	
3 x 2	76.20 x 50.80	4.375	111.13	2221CBB300200-##		2221EBB300200-##	
3 x 2 1/2	76.20 x 63.50	3.625	92.08	2221CBB300250-##		2221EBB300250-##	
4 x 2	101.60 x 50.80	6.250	158.75	2221CBB400200-##		2221EBB400200-##	
4 x 2 1/2	101.60 x 63.50	5.375	136.53	2221CBB400250-##		2221EBB400250-##	
4 x 3	101.60 x 76.20	5.000	127.00	2221CBB400300-##		2221EBB400300-##	
6 x 3	152.40 x 76.20	8.500	215.90	2221CBB600300-##		2221EBB600300-##	
6 x 4	152.40 x 101.60	7.000	177.80	2221CBB600400-##		2221EBB600400-##	

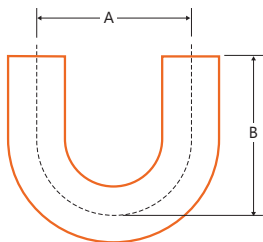
**DT-22A
DT-22B
DT-22C****DT-4.1.4-1****Ferrule**

Nominal Size		A		DT-22A		B		DT-22B		C		DT-22C	
Inch	mm	Inch	mm	SF1 ##=F1	SF4 ##=F4	Inch	mm	SF1 ##=F1	SF4 ##=F4	Inch	mm	SF1 ##=F1	SF4 ##=F4
1/4	6.35	1.750	44.45	2222AB014-##		1.125	28.58	2222BB014-##		0.500	12.70	2222CB014-##	
3/8	9.53	1.750	44.45	2222AB038-##		1.125	28.58	2222BB038-##		0.500	12.70	2222CB038-##	
1/2	12.70	1.750	44.45	2222AB050-##		1.125	28.58	2222BB050-##		0.500	12.70	2222CB050-##	
3/4	19.05	1.750	44.45	2222AB075-##		1.125	28.58	2222BB075-##		0.500	12.70	2222CB075-##	
1	25.40	1.750	44.45	2222AB100-##		1.125	28.58	2222BB100-##		0.500	12.70	2222CB100-##	
1 1/2	38.10	1.750	44.45	2222AB150-##		1.125	28.58	2222BB150-##		0.500	12.70	2222CB150-##	
2	50.80	2.250	57.15	2222AB200-##		1.125	28.58	2222BB200-##		0.500	12.70	2222CB200-##	
2 1/2	63.50	2.250	57.15	2222AB250-##		1.125	28.58	2222BB250-##		0.500	12.70	2222CB250-##	
3	76.20	2.250	57.15	2222AB300-##		1.125	28.58	2222BB300-##		0.500	12.70	2222CB300-##	
4	101.60	2.250	57.15	2222AB400-##		1.125	28.58	2222BB400-##		0.625	15.88	2222CB400-##	
6	152.40	3.000	76.20	2222AB600-##		1.500	38.10	2222BB600-##		0.750	19.05	2222CB600-##	

DT-23

DT-4.1.1-7

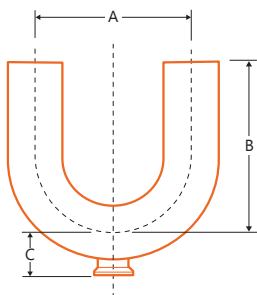
180° Return Bend WW



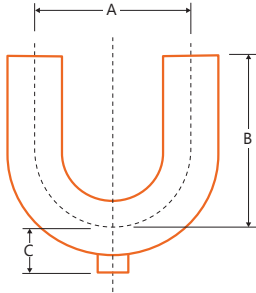
Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	4.500	114.30	2.625	66.68	2223B014-##	
3/8	9.53	4.500	114.30	2.625	66.68	2223B038-##	
1/2	12.70	4.500	114.30	3.000	76.20	2223B050-##	
3/4	19.05	4.500	114.30	3.000	76.20	2223B075-##	
1	25.40	3.000	76.20	3.000	76.20	2223B100-##	
1 1/2	38.10	4.500	114.30	4.500	114.30	2223B150-##	
2	50.80	6.000	152.40	5.000	127.00	2223B200-##	
2 1/2	63.50	7.500	190.50	5.750	146.05	2223B250-##	
3	76.20	9.000	228.60	6.500	165.10	2223B300-##	
4	101.60	12.000	304.80	8.500	215.90	2223B400-##	
6	152.40	18.000	457.20	11.500	292.10	2223B600-##	

DT-23T

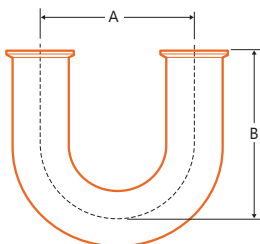
180° Tee Bottom Outlet WCW



Nominal Size		A		B		C		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1 x 1/2	25.40 x 12.70	3.000	76.20	3.000	76.20	1.125	28.58	2223TB100050-##	
1 x 3/4	25.40 x 19.05	3.000	76.20	3.000	76.20	1.125	28.58	2223TB100075-##	
1 x 1	25.40 x 25.40	3.000	76.20	3.000	76.20	1.125	28.58	2223TB100100-##	
1 1/2 x 1/2	38.10 x 12.70	4.500	114.30	4.500	114.30	1.375	34.93	2223TB150050-##	
1 1/2 x 3/4	38.10 x 19.05	4.500	114.30	4.500	114.30	1.375	34.93	2223TB150075-##	
1 1/2 x 1	38.10 x 25.40	4.500	114.30	4.500	114.30	1.375	34.93	2223TB150100-##	
1 1/2 x 1 1/2	38.10 x 38.10	4.500	114.30	4.500	114.30	1.375	34.93	2223TB150150-##	
2 x 1/2	50.80 x 12.70	6.000	152.40	5.000	127.00	1.625	41.28	2223TB200050-##	
2 x 3/4	50.80 x 19.05	6.000	152.40	5.000	127.00	1.625	41.28	2223TB200075-##	
2 x 1	50.80 x 25.40	6.000	152.40	5.000	127.00	1.625	41.28	2223TB200100-##	
2 x 1 1/2	50.80 x 38.10	6.000	152.40	5.000	127.00	1.625	41.28	2223TB200150-##	
2 x 2	50.80 x 50.80	6.000	152.40	5.000	127.00	1.625	41.28	2223TB200200-##	
2 1/2 x 1/2	63.50 x 12.70	7.500	190.50	5.750	146.05	1.875	47.63	2223TB250050-##	
2 1/2 x 3/4	63.50 x 19.05	7.500	190.50	5.750	146.05	1.875	47.63	2223TB250075-##	
2 1/2 x 1	63.50 x 25.40	7.500	190.50	5.750	146.05	1.875	47.63	2223TB250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	7.500	190.50	5.750	146.05	1.875	47.63	2223TB250150-##	
2 1/2 x 2	63.50 x 50.80	7.500	190.50	5.750	146.05	1.875	47.63	2223TB250200-##	
2 1/2 x 2 1/2	63.50 x 63.50	7.500	190.50	5.750	146.05	1.875	47.63	2223TB250250-##	
3 x 1/2	76.20 x 12.70	9.000	228.60	6.500	165.10	2.125	53.98	2223TB300050-##	
3 x 3/4	76.20 x 19.05	9.000	228.60	6.500	165.10	2.125	53.98	2223TB300075-##	
3 x 1	76.20 x 25.40	9.000	228.60	6.500	165.10	2.125	53.98	2223TB300100-##	
3 x 1 1/2	76.20 x 38.10	9.000	228.60	6.500	165.10	2.125	53.98	2223TB300150-##	
3 x 2	76.20 x 50.80	9.000	228.60	6.500	165.10	2.125	53.98	2223TB300200-##	
3 x 2 1/2	76.20 x 63.50	9.000	228.60	6.500	165.10	2.125	53.98	2223TB300250-##	
3 x 3	76.20 x 76.20	9.000	228.60	6.500	165.10	2.125	53.98	2223TB300300-##	
4 x 1/2	101.60 x 12.70	12.000	304.80	8.500	215.90	2.625	66.68	2223TB400050-##	
4 x 3/4	101.60 x 19.05	12.000	304.80	8.500	215.90	2.625	66.68	2223TB400075-##	
4 x 1	101.60 x 25.40	12.000	304.80	8.500	215.90	2.625	66.68	2223TB400100-##	
4 x 1 1/2	101.60 x 38.10	12.000	304.80	8.500	215.90	2.625	66.68	2223TB400150-##	
4 x 2	101.60 x 50.80	12.000	304.80	8.500	215.90	2.625	66.68	2223TB400200-##	
4 x 2 1/2	101.60 x 63.50	12.000	304.80	8.500	215.90	2.625	66.68	2223TB400250-##	
4 x 3	101.60 x 76.20	12.000	304.80	8.500	215.90	2.625	66.68	2223TB400300-##	
4 x 4	101.60 x 101.60	12.000	304.80	8.500	215.90	2.625	66.68	2223TB400400-##	

DT-23TW**180° Tee Bottom Outlet WWW**

Nominal Size		A		B		C		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1 x 1/2	25.40 x 12.70	3.000	76.20	3.000	76.20	2.000	50.80	2223TWB100050-##	
1 x 3/4	25.40 x 19.05	3.000	76.20	3.000	76.20	2.000	50.80	2223TWB100075-##	
1 x 1	25.40 x 25.40	3.000	76.20	3.000	76.20	2.000	50.80	2223TWB100100-##	
1 1/2 x 1/2	38.10 x 12.70	4.500	114.30	4.500	114.30	2.250	57.15	2223TWB150050-##	
1 1/2 x 3/4	38.10 x 19.05	4.500	114.30	4.500	114.30	2.250	57.15	2223TWB150075-##	
1 1/2 x 1	38.10 x 25.40	4.500	114.30	4.500	114.30	2.250	57.15	2223TWB150100-##	
1 1/2 x 1 1/2	38.10 x 38.10	4.500	114.30	4.500	114.30	2.250	57.15	2223TWB150150-##	
2 x 1/2	50.80 x 12.70	6.000	152.40	5.000	127.00	2.500	63.50	2223TWB200050-##	
2 x 3/4	50.80 x 19.05	6.000	152.40	5.000	127.00	2.500	63.50	2223TWB200075-##	
2 x 1	50.80 x 25.40	6.000	152.40	5.000	127.00	2.500	63.50	2223TWB200100-##	
2 x 1 1/2	50.80 x 38.10	6.000	152.40	5.000	127.00	2.500	63.50	2223TWB200150-##	
2 x 2	50.80 x 50.80	6.000	152.40	5.000	127.00	2.500	63.50	2223TWB200200-##	
2 1/2 x 1/2	63.50 x 12.70	7.500	190.50	5.750	146.05	2.750	69.85	2223TWB250050-##	
2 1/2 x 3/4	63.50 x 19.05	7.500	190.50	5.750	146.05	2.750	69.85	2223TWB250075-##	
2 1/2 x 1	63.50 x 25.40	7.500	190.50	5.750	146.05	2.750	69.85	2223TWB250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	7.500	190.50	5.750	146.05	2.750	69.85	2223TWB250150-##	
2 1/2 x 2	63.50 x 50.80	7.500	190.50	5.750	146.05	2.750	69.85	2223TWB250200-##	
2 1/2 x 2 1/2	63.50 x 63.50	7.500	190.50	5.750	146.05	2.750	69.85	2223TWB250250-##	
3 x 1/2	76.20 x 12.70	9.000	228.60	6.500	165.10	3.272	83.10	2223TWB300050-##	
3 x 3/4	76.20 x 19.05	9.000	228.60	6.500	165.10	3.272	83.10	2223TWB300075-##	
3 x 1	76.20 x 25.40	9.000	228.60	6.500	165.10	3.272	83.10	2223TWB300100-##	
3 x 1 1/2	76.20 x 38.10	9.000	228.60	6.500	165.10	3.272	83.10	2223TWB300150-##	
3 x 2	76.20 x 50.80	9.000	228.60	6.500	165.10	3.272	83.10	2223TWB300200-##	
3 x 2 1/2	76.20 x 63.50	9.000	228.60	6.500	165.10	3.272	83.10	2223TWB300250-##	
3 x 3	76.20 x 76.20	9.000	228.60	6.500	165.10	3.272	83.10	2223TWB300300-##	
4 x 1/2	101.60 x 12.70	12.000	304.80	8.500	215.90	4.008	101.80	2223TWB400050-##	
4 x 3/4	101.60 x 19.05	12.000	304.80	8.500	215.90	4.008	101.80	2223TWB400075-##	
4 x 1	101.60 x 25.40	12.000	304.80	8.500	215.90	4.008	101.80	2223TWB400100-##	
4 x 1 1/2	101.60 x 38.10	12.000	304.80	8.500	215.90	4.008	101.80	2223TWB400150-##	
4 x 2	101.60 x 50.80	12.000	304.80	8.500	215.90	4.008	101.80	2223TWB400200-##	
4 x 2 1/2	101.60 x 63.50	12.000	304.80	8.500	215.90	4.008	101.80	2223TWB400250-##	
4 x 3	101.60 x 76.20	12.000	304.80	8.500	215.90	4.008	101.80	2223TWB400300-##	
4 x 4	101.60 x 101.60	12.000	304.80	8.500	215.90	4.008	101.80	2223TWB400400-##	

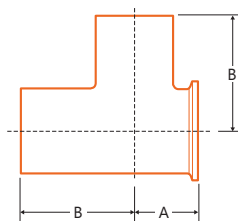
DT-24**DT-4.1.1-8 180° Return Bend CC**

Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	4.500	114.30	3.125	79.38	2224B014-##	
3/8	9.53	4.500	114.30	3.125	79.38	2224B038-##	
1/2	12.70	4.500	114.30	3.500	88.90	2224B050-##	
3/4	19.05	4.500	114.30	3.500	88.90	2224B075-##	
1	25.40	3.000	76.20	3.500	88.90	2224B100-##	
1 1/2	38.10	4.500	114.30	5.000	127.00	2224B150-##	
2	50.80	6.000	152.40	5.500	139.70	2224B200-##	
2 1/2	63.50	7.500	190.50	6.250	158.75	2224B250-##	
3	76.20	9.000	228.60	7.000	177.80	2224B300-##	
4	101.60	12.000	304.80	9.125	231.78	2224B400-##	
6	152.40	18.000	457.20	13.000	330.20	2224B600-##	

DT-25

DT-4.1.2-3

Short Outlet Run Tee WWC



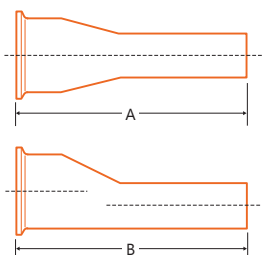
Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/4	6.35	0.875	22.23	1.750	44.45	2225B014-##	
3/8	9.53	0.875	22.23	1.750	44.45	2225B038-##	
1/2	12.70	0.875	22.23	1.875	47.63	2225B050-##	
3/4	19.05	1.000	25.40	2.000	50.80	2225B075-##	
1	25.40	1.125	28.58	2.125	53.98	2225B100-##	
1 1/2	38.10	1.375	34.93	2.375	60.33	2225B150-##	
2	50.80	1.625	41.28	2.875	73.03	2225B200-##	
2 1/2	63.50	1.875	47.63	3.125	79.38	2225B250-##	
3	76.20	2.125	53.98	3.375	85.73	2225B300-##	
4	101.60	2.750	69.85	4.125	104.78	2225B400-##	
6	152.40	4.625	117.48	5.625	142.88	2225B600-##	

DT-26C(a)

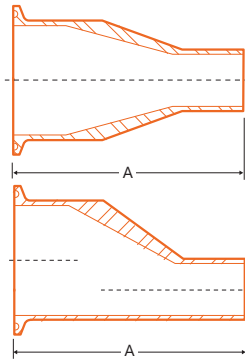
BPE 2012 Concentric Reducer CW

DT-26E(a)

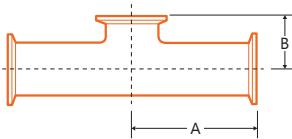
BPE 2012 Eccentric Reducer CW



Nominal Size		CR				ER			
		A		SF1	SF4	B		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4	Inch	mm	##=F1	##=F4
3/4 x 1/2	19.05 x 12.70	3.000	76.20	2226CB075050-##		3.000	76.20	2226EB075050-##	
1 x 1/2	25.40 x 12.70	3.500	88.90	2226CB100050-##		3.500	88.90	2226EB100050-##	
1 x 3/4	25.40 x 19.05	3.000	76.20	2226CB100075-##		3.000	76.20	2226EB100075-##	
1 1/2 x 1/2	38.10 x 12.70	4.500	114.30	2226CB150050-##		4.500	114.30	2226EB150050-##	
1 1/2 x 3/4	38.10 x 19.05	4.000	101.60	2226CB150075-##		4.000	101.60	2226EB150075-##	
1 1/2 x 1	38.10 x 25.40	4.000	101.60	2226CB150100-##		4.000	101.60	2226EB150100-##	
2 x 1/2	50.80 x 12.70	6.500	165.10	2226CB200050-##		6.500	165.10	2226EB200050-##	
2 x 3/4	50.80 x 19.05	6.000	152.40	2226CB200075-##		6.000	152.40	2226EB200075-##	
2 x 1	50.80 x 25.40	6.000	152.40	2226CB200100-##		6.000	152.40	2226EB200100-##	
2 x 1 1/2	50.80 x 38.10	4.000	101.60	2226CB200150-##		4.000	101.60	2226EB200150-##	
2 1/2 x 1/2	63.50 x 12.70	8.500	215.90	2226CB250050-##		8.500	215.90	2226EB250050-##	
2 1/2 x 3/4	63.50 x 19.05	8.000	203.20	2226CB250075-##		8.000	203.20	2226EB250075-##	
2 1/2 x 1	63.50 x 25.40	8.000	203.20	2226CB250100-##		8.000	203.20	2226EB250100-##	
2 1/2 x 1 1/2	63.50 x 38.10	6.000	152.40	2226CB250150-##		6.000	152.40	2226EB250150-##	
2 1/2 x 2	63.50 x 50.80	4.250	108.00	2226CB250200-##		4.250	108.00	2226EB250200-##	
3 x 1	76.20 x 25.40	10.000	254.00	2226CB300100-##		10.000	254.00	2226EB300100-##	
3 x 1 1/2	76.20 x 38.10	8.000	203.20	2226CB300150-##		8.000	203.20	2226EB300150-##	
3 x 2	76.20 x 50.80	6.250	158.80	2226CB300200-##		6.250	158.80	2226EB300200-##	
3 x 2 1/2	76.20 x 63.50	4.250	108.00	2226CB300250-##		4.250	108.00	2226EB300250-##	
4 x 1	101.60 x 25.40	14.125	358.80	2226CB400100-##		14.125	358.80	2226EB400100-##	
4 x 1 1/2	101.60 x 38.10	12.125	308.00	2226CB400150-##		12.125	308.00	2226EB400150-##	
4 x 2	101.60 x 50.80	10.375	263.50	2226CB400200-##		10.375	263.50	2226EB400200-##	
4 x 2 1/2	101.60 x 63.50	8.375	212.70	2226CB400250-##		8.375	212.70	2226EB400250-##	
4 x 3	101.60 x 76.20	6.375	161.90	2226CB400300-##		6.375	161.90	2226EB400300-##	
6 x 3	152.40 x 76.20	9.000	228.60	2226CB600300-##		8.750	222.30	2226EB600300-##	
6 x 4	152.40 x 101.60	9.000	228.60	2226CB600400-##		9.000	228.60	2226EB600400-##	

DT-26C(b)**DT-4.1.3-2 Concentric Reducer CW****DT-26E(b)****DT-4.1.3-2 Eccentric Reducer CW**

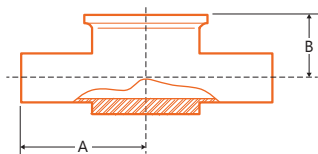
Nominal Size		A		CR		ER	
				SF1	SF4	SF1	SF4
				##=F1	##=F4	##=F1	##=F4
3/8 x 1/4	9.53 x 6.35	2.125	53.98	2226CBB038014-##		2226EBB038014-##	
1/2 x 1/4	12.70 x 6.35	2.375	60.33	2226CBB050014-##		2226EBB050014-##	
1/2 x 3/8	12.70 x 9.53	2.375	60.33	2226CBB050038-##		2226EBB050038-##	
3/4 x 3/8	19.05 x 9.53	2.500	63.50	2226CBB075038-##		2226EBB075038-##	
3/4 x 1/2	19.05 x 12.70	2.625	66.68	2226CBB075050-##		2226EBB075050-##	
1 x 1/2	25.40 x 12.70	3.000	76.20	2226CBB100050-##		2226EBB100050-##	
1 x 3/4	25.40 x 19.05	2.625	66.68	2226CBB100075-##		2226EBB100075-##	
1 1/2 x 3/4	38.10 x 19.05	3.500	88.90	2226CBB150075-##		2226EBB150075-##	
1 1/2 x 1	38.10 x 25.40	3.000	76.20	2226CBB150100-##		2226EBB150100-##	
2 x 1	50.80 x 25.40	3.875	98.43	2226CBB200100-##		2226EBB200100-##	
2 x 1 1/2	50.80 x 38.10	3.000	76.20	2226CBB200150-##		2226EBB200150-##	
2 1/2 x 1 1/2	63.50 x 38.10	3.875	98.43	2226CBB250150-##		2226EBB250150-##	
2 1/2 x 2	63.50 x 50.80	3.000	76.20	2226CBB250200-##		2226EBB250200-##	
3 x 1 1/2	76.20 x 38.10	4.750	120.65	2226CBB300150-##		2226EBB300150-##	
3 x 2	76.20 x 50.80	3.875	98.43	2226CBB300200-##		2226EBB300200-##	
3 x 2 1/2	76.20 x 63.50	3.125	79.38	2226CBB300250-##		2226EBB300250-##	
4 x 2	101.60 x 50.80	5.750	146.05	2226CBB400200-##		2226EBB400200-##	
4 x 2 1/2	101.60 x 63.50	4.875	123.83	2226CBB400250-##		2226EBB400250-##	
4 x 3	101.60 x 76.20	4.500	114.30	2226CBB400300-##		2226EBB400300-##	
6 x 3	152.40 x 76.20	8.000	203.20	2226CBB600300-##		2226EBB600300-##	
6 x 4	152.40 x 101.60	6.375	161.93	2226CBB600400-##		2226EBB600400-##	

DT-27**DT-4.1.2-5 Short Outlet Tee CCC**

Nominal Size		A		B		SF1	SF4
						##=F1	##=F4
Inch	mm	Inch	mm	Inch	mm		
1/2	12.70	2.375	60.33	1.000	25.40	2227B050-##	
3/4	19.05	2.500	63.50	1.125	28.58	2227B075-##	
1	25.40	2.625	66.68	1.125	28.58	2227B100-##	
1 1/2	38.10	2.875	73.03	1.375	34.93	2227B150-##	
2	50.80	3.375	85.73	1.625	41.28	2227B200-##	
2 1/2	63.50	3.625	92.08	1.875	47.63	2227B250-##	
3	76.20	3.875	98.43	2.125	53.98	2227B300-##	
4	101.60	4.750	120.65	2.750	69.85	2227B400-##	
6	152.40	7.125	180.98	4.625	117.48	2227B600-##	

DT-28

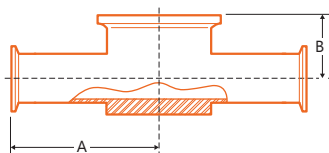
DT-4.1.2-10 Instrument Tee WCW



Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/2 x 1 1/2	12.70 x 38.10	2.500	63.50	0.875	22.23	2228B050150-##	
3/4 x 1 1/2	19.05 x 38.10	2.500	63.50	1.000	25.40	2228B075150-##	
1 x 1 1/2	25.40 x 38.10	2.500	63.50	1.125	28.58	2228B100150-##	
1/2 x 2	12.70 x 50.80	2.750	69.85	1.000	25.40	2228B050200-##	
3/4 x 2	19.05 x 50.80	2.750	69.85	1.125	28.58	2228B075200-##	
1 x 2	25.40 x 50.80	2.750	69.85	1.250	31.75	2228B100200-##	
1 1/2 x 2	38.10 x 50.80	2.750	69.85	1.500	38.10	2228B150200-##	

DT-29

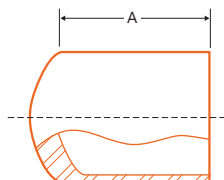
DT-4.1.2-11 Instrument Tee CCC



Nominal Size		A		B		SF1	SF4
Inch	mm	Inch	mm	Inch	mm	##=F1	##=F4
1/2 x 1 1/2	12.70 x 38.10	3.000	76.20	0.875	22.23	2229B050150-##	
3/4 x 1 1/2	19.05 x 38.10	3.000	76.20	1.000	25.40	2229B075150-##	
1 x 1 1/2	25.40 x 38.10	3.000	76.20	1.125	28.58	2229B100150-##	
1/2 x 2	12.70 x 50.80	3.250	82.55	1.000	25.40	2229B050200-##	
3/4 x 2	19.05 x 50.80	3.250	82.55	1.125	28.58	2229B075200-##	
1 x 2	25.40 x 50.80	3.250	82.55	1.250	31.75	2229B100200-##	
1 1/2 x 2	38.10 x 50.80	3.250	82.55	1.500	38.10	2229B150200-##	

DT-30

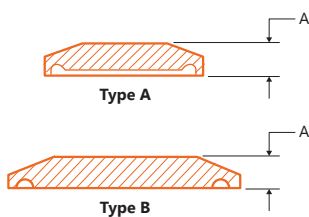
DT-4.1.5-1 Tube Weld End Cap



Nominal Size		A		SF1	SF4
Inch	mm	Inch	mm	##=F1	##=F4
1/2	12.70	1.500	38.10	2230B050-##	
3/4	19.05	1.500	38.10	2230B075-##	
1	25.40	1.500	38.10	2230B100-##	
1 1/2	38.10	1.500	38.10	2230B150-##	
2	50.80	1.500	38.10	2230B200-##	
2 1/2	63.50	1.500	38.10	2230B250-##	
3	76.20	1.750	44.45	2230B300-##	
4	101.60	2.000	50.80	2230B400-##	
6	152.40	2.500	63.50	2230B600-##	

DT-31

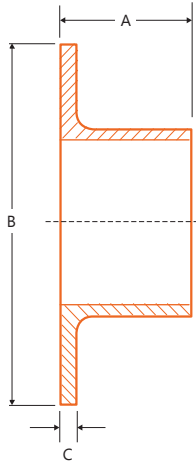
DT-4.1.5-2 Solid End Cap



Nominal Size		Type	A		SF1	SF4
Inch	mm		Inch	mm	##=F1	##=F4
1/4	6.35	A	0.187	4.75	2231B014-##	
3/8	9.53	A	0.187	4.75	2231B038-##	
1/2 & 3/4	12.70, 19.05	A	0.187	4.75	2231B075-##	
1 & 1 1/2	25.40, 38.10	B	0.250	6.35	2231B150-##	
2	50.80	B	0.250	6.35	2231B200-##	
2 1/2	63.50	B	0.250	6.35	2231B250-##	
3	76.20	B	0.250	6.35	2231B300-##	
4	101.60	B	0.312	7.92	2231B400-##	
6	152.40	B	0.437	11.10	2231B600-##	

14VB

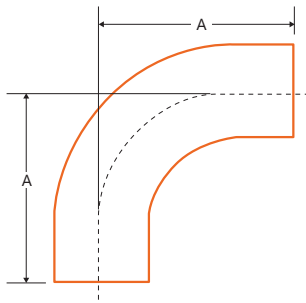
Lap Joint Stub End with Grooves



Nominal Size	A		B		C		Part Number
Inch	Inch	mm	Inch	mm	Inch	mm	316L
1/2	2.00	50.80	1.69	42.92	0.098	2.49	2214VBB050-F1
3/4	2.00	50.80	1.69	42.92	0.098	2.49	2214VBB075-F1
1	2.00	50.80	2.00	50.80	0.130	3.30	2214VBB100-F1
1 1/2	2.00	50.80	2.88	73.15	0.130	3.30	2214VBB150-F1
2	2.50	63.50	3.62	91.94	0.130	3.30	2214VBB200-F1
2 1/2	2.50	63.50	4.12	104.64	0.130	3.30	2214VBB250-F1
3	2.50	63.50	5.00	127.00	0.166	4.21	2214VBB300-F1
4	2.50	63.50	6.19	157.22	0.166	4.21	2214VBB400-F1
6	3.00	76.20	8.50	215.90	0.218	5.53	2214VBB600-F1

2S

90° Long Elbow WW

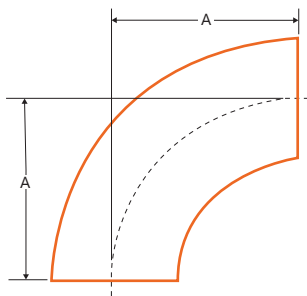


Nominal Size		Nominal Wall	A		Part Number	
Inch	mm	mm	Inch	mm	304	316L
1/2	12.70	1.65	3.000	76.20	242SA050-11	242SB050-11
3/4	19.05	1.65	3.000	76.20	242SA075-11	242SB075-11
1	25.40	1.65	2.063	52.40	242SA100-11	242SB100-11
1 1/2	38.10	1.65	2.938	74.60	242SA150-11	242SB150-11
2	50.80	1.65	4.063	103.20	242SA200-11	242SB200-11
2 1/2	63.50	1.65	5.188	131.80	242SA250-11	242SB250-11
3	76.20	1.65	6.312	160.30	242SA300-11	242SB300-11
4	101.60	2.11	8.313	211.20	242SA400-11	242SB400-11
6	152.40	2.77	12.460	316.50	242SA600-11	242SB600-11

Different dimensions available upon request

2WCL

90° Short Elbow WW

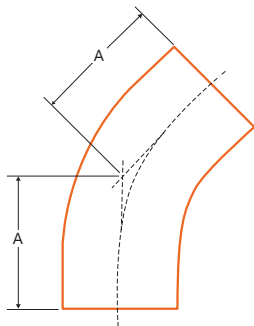


Nominal Size		Nominal Wall	A		Part Number	
Inch	mm	mm	Inch	mm	304	316L
1/2	12.70	1.65	1.125	28.60	242WCLA050-11	242WCLB050-11
3/4	19.05	1.65	1.125	28.60	242WCLA075-11	242WCLB075-11
1	25.40	1.65	1.500	38.10	242WCLA100-11	242WCLB100-11
1 1/2	38.10	1.65	2.250	57.20	242WCLA150-11	242WCLB150-11
2	50.80	1.65	3.000	76.20	242WCLA200-11	242WCLB200-11
2 1/2	63.50	1.65	3.750	95.25	242WCLA250-11	242WCLB250-11
3	76.20	1.65	4.500	114.30	242WCLA300-11	242WCLB300-11
4	101.60	2.11	6.000	152.40	242WCLA400-11	242WCLB400-11
6 x 2.11	152.40	2.11	9.000	228.60	242WCLA600211-99	242WCLB600211-99
6	152.40	2.77	9.000	228.60	242WCLA600-11	242WCLB600-11
8	203.20	2.77	12.000	304.80	242WCLA800-11	242WCLB800-11
10	254.00	2.77	15.000	381.00	242WCLA1000-11	242WCLB1000-11
12	304.80	3.00	18.000	457.20	242WCLA1200-11	242WCLB1200-11

Different dimensions available upon request

2KS

45° Long Elbow WW

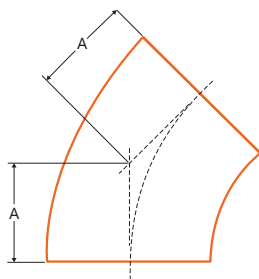


Nominal Size		Nominal Wall	A		Part Number	
Inch	mm	mm	Inch	mm	304	316L
1/2	12.70	1.65	2.250	57.20	242KSA050-11	242KSB050-11
3/4	19.05	1.65	2.250	57.20	242KSA075-11	242KSB075-11
1	25.40	1.65	1.188	30.20	242KSA100-11	242KSB100-11
1 1/2	38.10	1.65	1.625	41.30	242KSA150-11	242KSB150-11
2	50.80	1.65	2.312	58.70	242KSA200-11	242KSB200-11
2 1/2	63.50	1.65	3.000	76.20	242KSA250-11	242KSB250-11
3	76.20	1.65	3.688	93.70	242KSA300-11	242KSB300-11
4	101.60	2.11	4.812	122.20	242KSA400-11	242KSB400-11
6 x 2.11	152.40	2.11	7.330	186.18	242KSA600186-99	242KSB600186-99
6	152.40	2.77	6.252	158.80	242KSA600-11	242KSB600-11

Different dimensions available upon request

2WK

45° Short Elbow WW

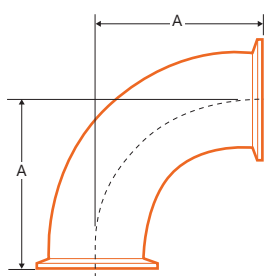


Nominal Size		Nominal Wall	A		Part Number	
Inch	mm	mm	Inch	mm	304	316L
1/2	12.70	1.65	0.466	11.90	242WKA050-11	242WKB050-11
3/4	19.05	1.65	0.466	11.90	242WKA075-11	242WKB075-11
1	25.40	1.65	0.625	15.80	242WKA100-11	242WKB100-11
1 1/2	38.10	1.65	0.937	23.80	242WKA150-11	242WKB150-11
2	50.80	1.65	1.250	31.75	242WKA200-11	242WKB200-11
2 1/2	63.50	1.65	1.562	39.60	242WKA250-11	242WKB250-11
3	76.20	1.65	1.875	47.60	242WKA300-11	242WKB300-11
4	101.60	2.11	2.500	63.50	242WKA400-11	242WKB400-11
6 x 2.11	152.40	2.11	3.750	95.30	242WKA600211-99	242WKB600211-99
6	152.40	2.77	3.750	95.30	242WKA600-11	242WKB600-11
8	203.20	2.77	5.000	127.00	242WKA800-11	242WKB800-11
10	254.00	2.77	6.250	158.75	242WKA1000-11	242WKB1000-11
12	304.80	3.00	7.500	190.50	242WKA1200-11	242WKB1200-11

Different dimensions available upon request

2CMP

90° Clamp Short Elbow CC

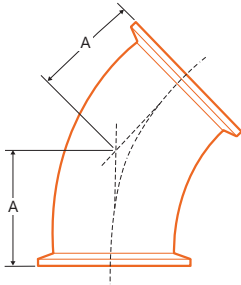


Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
1/2	12.70	1.625	41.30	242CMPA050-11	242CMPB050-11
3/4	19.05	1.625	41.30	242CMPA075-11	242CMPB075-11
1	25.40	2.000	50.80	242CMPA100-11	242CMPB100-11
1 1/2	38.10	2.750	69.90	242CMPA150-11	242CMPB150-11
2	50.80	3.500	88.90	242CMPA200-11	242CMPB200-11
2 1/2	63.50	4.250	107.95	242CMPA250-11	242CMPB250-11
3	76.20	5.000	127.00	242CMPA300-11	242CMPB300-11
4	101.60	6.625	168.20	242CMPA400-11	242CMPB400-11
6	152.40	9.875	250.83	242CMPA600-11	242CMPB600-11
8	203.20	12.875	327.00	242CMPA800-11	242CMPB800-11
10	254.00	15.875	403.20	242CMPA1000-11	242CMPB1000-11
12	304.80	18.875	479.40	242CMPA1200-11	242CMPB1200-11

Different dimensions available upon request

2KMP

45° Clamp Short Elbow CC

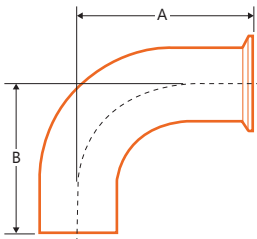


Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
1/2	12.70	0.966	24.60	242KMPA050-11	242KMPB050-11
3/4	19.05	0.966	24.60	242KMPA075-11	242KMPB075-11
1	25.40	1.125	28.50	242KMPA100-11	242KMPB100-11
1 1/2	38.10	1.437	36.50	242KMPA150-11	242KMPB150-11
2	50.80	1.750	44.45	242KMPA200-11	242KMPB200-11
2 1/2	63.50	2.062	52.30	242KMPA250-11	242KMPB250-11
3	76.20	2.375	60.30	242KMPA300-11	242KMPB300-11
4	101.60	3.125	79.30	242KMPA400-11	242KMPB400-11
6	152.40	4.625	117.50	242KMPA600-11	242KMPB600-11
8	203.20	5.875	149.20	242KMPA800-11	242KMPB800-11
10	254.00	7.125	181.00	242KMPA1000-11	242KMPB1000-11
12	304.80	8.375	212.70	242KMPA1200-11	242KMPB1200-11

Different dimensions available upon request

2CM

90° Clamp X Weld Long Elbow CW

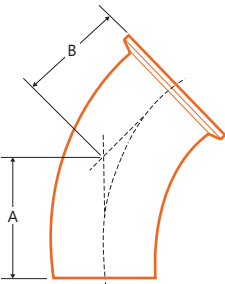


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1/2	12.70	3.500	88.90	3.000	76.20	242CMA050-11	242CMB050-11
3/4	19.05	3.500	88.90	3.000	76.20	242CMA075-11	242CMB075-11
1	25.40	2.562	65.10	2.063	52.40	242CMA100-11	242CMB100-11
1 1/2	38.10	3.438	87.30	2.938	74.60	242CMA150-11	242CMB150-11
2	50.80	4.562	115.90	4.063	103.20	242CMA200-11	242CMB200-11
2 1/2	63.50	5.688	144.50	5.188	131.80	242CMA250-11	242CMB250-11
3	76.20	6.812	173.00	6.312	160.30	242CMA300-11	242CMB300-11
4	101.60	8.937	226.90	8.313	211.10	242CMA400-11	242CMB400-11

Different dimensions available upon request

2KM

45° Clamp X Weld Long Elbow CW

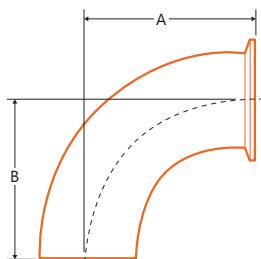


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	1.188	30.2	1.688	42.88	242KMA100-11	242KMB100-11
1 1/2	38.10	1.625	41.3	2.125	53.98	242KMA150-11	242KMB150-11
2	50.80	2.312	58.7	2.812	71.42	242KMA200-11	242KMB200-11
2 1/2	63.50	3.000	76.2	3.500	88.90	242KMA250-11	242KMB250-11
3	76.20	3.688	93.7	4.188	106.38	242KMA300-11	242KMB300-11
4	101.60	4.812	122.2	5.437	138.10	242KMA400-11	242KMB400-11

Different dimensions available upon request

2CMS

90° Clamp X Weld Short Elbow CW

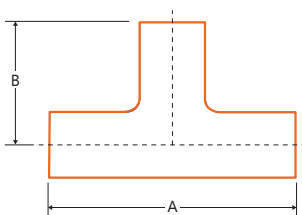


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1/2	12.70	1.625	41.30	1.125	28.60	242CMSA050-11	242CMSB050-11
3/4	19.05	1.625	41.30	1.125	28.60	242CMSA075-11	242CMSB075-11
1	25.40	2.000	50.80	1.500	38.10	242CMSA100-11	242CMSB100-11
1 1/2	38.10	2.750	69.90	2.250	57.20	242CMSA150-11	242CMSB150-11
2	50.80	3.500	88.90	3.000	76.20	242CMSA200-11	242CMSB200-11
2 1/2	63.50	4.250	107.95	3.750	95.25	242CMSA250-11	242CMSB250-11
3	76.20	5.000	127.00	4.500	114.30	242CMSA300-11	242CMSB300-11
4	101.60	6.625	168.28	6.000	152.40	242CMSA400-11	242CMSB400-11
6	152.40	9.875	250.80	9.000	228.60	242CMSA600-11	242CMSB600-11

Different dimensions available upon request

7W

Long Equal Tee

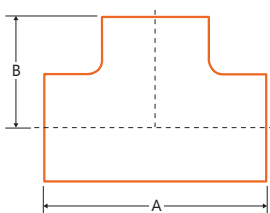


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1/2	12.70	3.750	95.25	1.875	47.63	247WA050-11	247WB050-11
3/4	19.05	4.000	101.60	2.000	50.80	247WA075-11	247WB075-11
1	25.40	3.750	95.25	1.875	47.63	247WA100-11	247WB100-11
1 1/2	38.10	4.500	114.30	2.250	57.20	247WA150-11	247WB150-11
2	50.80	6.000	152.40	3.000	76.20	247WA200-11	247WB200-11
2 1/2	63.50	6.000	152.40	3.000	76.20	247WA250-11	247WB250-11
3	76.20	6.500	165.20	3.250	82.60	247WA300-11	247WB300-11
4	101.60	7.750	196.80	3.875	98.40	247WA400-11	247WB400-11
6	152.40	11.250	285.75	5.625	142.88	247WA600-11	247WB600-11
8	203.20	14.000	355.60	7.000	177.80	247WA800-11	247WB800-11
10	254.00	17.000	431.80	8.500	215.90	247WA1000-11	247WB1000-11
12	304.80	20.000	508.00	10.000	254.00	247WA1200-11	247WB1200-11

Different dimensions available upon request

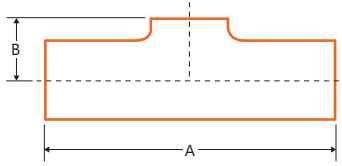
7WWW

Short Equal Tee



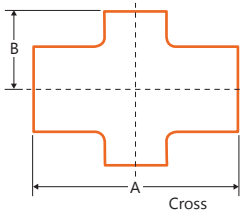
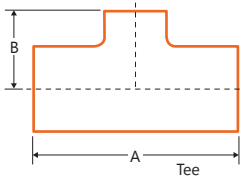
Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	2.250	57.20	1.125	28.60	247WWWA100-11	247WWWB100-11
1 1/2	38.10	3.312	84.20	1.656	42.10	247WWWA150-11	247WWWB150-11
2	50.80	4.124	104.80	2.062	52.40	247WWWA200-11	247WWWB200-11
2 1/2	63.50	4.688	119.00	2.344	59.50	247WWWA250-11	247WWWB250-11
3	76.20	5.188	131.80	2.594	65.90	247WWWA300-11	247WWWB300-11
4	101.60	6.876	174.60	3.438	87.30	247WWWA400-11	247WWWB400-11

Different dimensions available upon request

7WT**Long Equal Tee w/o**

Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1/2	12.70	3.75	95.25	0.33	8.35	247WTA050-11	247WTB050-11
3/4	19.05	4.00	101.60	0.49	12.53	247WTA075-11	247WTB075-11
1	25.40	3.75	95.20	0.56	14.30	247WTA100-11	247WTB100-11
1 1/2	38.10	4.50	114.40	0.86	21.95	247WTA150-11	247WTB150-11
2	50.80	6.00	152.40	1.14	29.00	247WTA200-11	247WTB200-11
2 1/2	63.50	6.00	152.40	1.38	35.00	247WTA250-11	247WTB250-11
3	76.20	6.50	165.20	1.69	43.00	247WTA300-11	247WTB300-11
4	101.60	7.75	196.80	2.13	54.00	247WTA400-11	247WTB400-11
6	152.40	11.25	285.75	3.18	80.80	247WTA600-11	247WTB600-11

Different dimensions available upon request

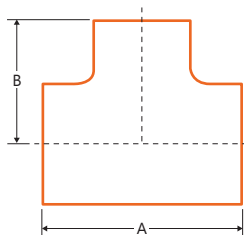
7RW & 9RW**Long Reducing Tee
Long Reducing Cross**

Nominal Size		A		B		Reducing Tee Part Number		Reducing Cross Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L	304	316L
3/4 x 1/2	19.05 x 12.70	4.000	101.60	2.000	50.80	247RWA075050-11	247RWB075050-11	249RWA075050-11	249RWB075050-11
1 x 1/2	25.40 x 12.70	4.250	107.96	2.125	53.98	247RWA100050-11	247RWB100050-11	249RWA100050-11	249RWB100050-11
1 x 3/4	25.40 x 19.05	4.250	107.96	2.125	53.98	247RWA100075-11	247RWB100075-11	249RWA100075-11	249RWB100075-11
1 1/2 x 1/2	38.10 x 12.70	4.750	120.66	2.375	60.33	247RWA150050-11	247RWB150050-11	249RWA150050-11	249RWB150050-11
1 1/2 x 3/4	38.10 x 19.05	4.750	120.66	2.375	60.33	247RWA150075-11	247RWB150075-11	249RWA150075-11	249RWB150075-11
1 1/2 x 1	38.10 x 25.40	4.500	114.30	2.125	53.98	247RWA150100-11	247RWB150100-11	249RWA150100-11	249RWB150100-11
2 x 1/2	50.80 x 12.70	5.750	146.06	2.625	66.68	247RWA200050-11	247RWB200050-11	249RWA200050-11	249RWB200050-11
2 x 3/4	50.80 x 19.05	5.750	146.06	2.625	66.68	247RWA200075-11	247RWB200075-11	249RWA200075-11	249RWB200075-11
2 x 1	50.80 x 25.40	6.000	152.40	2.375	60.33	247RWA200100-11	247RWB200100-11	249RWA200100-11	249RWB200100-11
2 x 1 1/2	50.80 x 38.10	6.000	152.40	2.500	63.50	247RWA200150-11	247RWB200150-11	249RWA200150-11	249RWB200150-11
2 1/2 x 1	63.50 x 25.40	6.000	152.40	2.625	66.68	247RWA250100-11	247RWB250100-11	249RWA250100-11	249RWB250100-11
2 1/2 x 1 1/2	63.50 x 38.10	6.000	152.40	2.750	69.85	247RWA250150-11	247RWB250150-11	249RWA250150-11	249RWB250150-11
2 1/2 x 2	63.50 x 50.80	6.000	152.40	3.250	82.55	247RWA250200-11	247RWB250200-11	249RWA250200-11	249RWB250200-11
3 x 1	76.20 x 25.40	6.500	165.10	2.874	73.00	247RWA300100-11	247RWB300100-11	249RWA300100-11	249RWB300100-11
3 x 1 1/2	76.20 x 38.10	6.500	165.10	3.000	76.20	247RWA300150-11	247RWB300150-11	249RWA300150-11	249RWB300150-11
3 x 2	76.20 x 50.80	6.500	165.10	3.500	88.90	247RWA300200-11	247RWB300200-11	249RWA300200-11	249RWB300200-11
3 x 2 1/2	76.20 x 63.50	6.500	165.10	3.250	82.55	247RWA300250-11	247RWB300250-11	249RWA300250-11	249RWB300250-11
4 x 1	101.60 x 25.40	7.750	196.86	3.374	85.70	247RWA400100-11	247RWB400100-11	249RWA400100-11	249RWB400100-11
4 x 1 1/2	101.60 x 38.10	7.750	196.86	3.500	88.90	247RWA400150-11	247RWB400150-11	249RWA400150-11	249RWB400150-11
4 x 2	101.60 x 50.80	7.750	196.86	4.000	101.60	247RWA400200-11	247RWB400200-11	249RWA400200-11	249RWB400200-11
4 x 2 1/2	101.60 x 63.50	7.750	196.86	3.750	95.25	247RWA400250-11	247RWB400250-11	249RWA400250-11	249RWB400250-11
4 x 3	101.60 x 76.20	7.750	196.86	3.750	95.25	247RWA400300-11	247RWB400300-11	249RWA400300-11	249RWB400300-11
6 x 1 1/2	152.40 x 38.10	11.250	285.76	4.500	114.30	247RWA600150-11	247RWB600150-11	249RWA600150-11	249RWB600150-11
6 x 2	152.40 x 50.80	11.250	285.76	4.500	114.30	247RWA600200-11	247RWB600200-11	249RWA600200-11	249RWB600200-11
6 x 3	152.40 x 76.20	11.250	285.76	4.875	123.83	247RWA600300-11	247RWB600300-11	249RWA600300-11	249RWB600300-11
6 x 4	152.40 x 101.60	11.250	285.76	5.125	130.18	247RWA600400-11	247RWB600400-11	249RWA600400-11	249RWB600400-11

Different dimensions available upon request

7RWWW

Short Reducing Tee

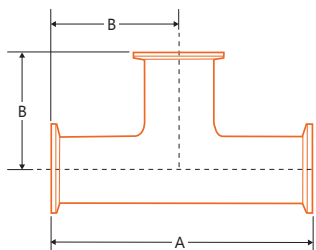


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
3/4 x 1/2	19.05 x 12.70	3.750	95.25	1.000	25.40	247RWWWA075050-11	247RWWWB075050-11
1 x 1/2	25.40 x 12.70	3.750	95.25	1.500	38.10	247RWWWA100050-11	247RWWWB100050-11
1 x 3/4	25.40 x 19.05	3.750	95.25	2.000	50.80	247RWWWA100075-11	247RWWWB100075-11
1 1/2 x 1/2	38.10 x 12.70	4.500	114.30	2.250	57.15	247RWWWA150050-11	247RWWWB150050-11
1 1/2 x 3/4	38.10 x 19.05	4.500	114.30	2.250	57.15	247RWWWA150075-11	247RWWWB150075-11
1 1/2 x 1	38.10 x 25.40	3.312	84.12	1.375	34.93	247RWWWA150100-11	247RWWWB150100-11
2 x 1/2	50.80 x 12.70	4.124	104.76	1.625	41.28	247RWWWA200050-11	247RWWWB200050-11
2 x 3/4	50.80 x 19.05	4.124	104.76	1.625	41.28	247RWWWA200075-11	247RWWWB200075-11
2 x 1	50.80 x 25.40	4.124	104.76	1.625	41.28	247RWWWA200100-11	247RWWWB200100-11
2 x 1 1/2	50.80 x 38.10	4.124	104.76	1.906	48.41	247RWWWA200150-11	247RWWWB200150-11
2 1/2 x 1	63.50 x 25.40	4.688	119.08	1.875	47.63	247RWWWA250100-11	247RWWWB250100-11
2 1/2 x 1 1/2	63.50 x 38.10	4.688	119.08	2.156	54.76	247RWWWA250150-11	247RWWWB250150-11
2 1/2 x 2	63.50 x 50.80	4.688	119.08	2.312	58.72	247RWWWA250200-11	247RWWWB250200-11
3 x 1	76.20 x 25.40	5.188	131.78	2.126	54.00	247RWWWA300100-11	247RWWWB300100-11
3 x 1 1/2	76.20 x 38.10	5.188	131.78	2.406	61.11	247RWWWA300150-11	247RWWWB300150-11
3 x 2	76.20 x 50.80	5.188	131.78	2.562	65.07	247RWWWA300200-11	247RWWWB300200-11
3 x 2 1/2	76.20 x 63.50	5.188	131.78	2.594	65.89	247RWWWA300250-11	247RWWWB300250-11
4 x 1	101.60 x 25.40	6.876	174.66	2.626	66.70	247RWWWA400100-11	247RWWWB400100-11
4 x 1 1/2	101.60 x 38.10	6.876	174.66	2.906	73.81	247RWWWA400150-11	247RWWWB400150-11
4 x 2	101.60 x 50.80	6.876	174.66	3.062	77.77	247RWWWA400200-11	247RWWWB400200-11
4 x 2 1/2	101.60 x 63.50	6.876	174.66	3.094	78.59	247RWWWA400250-11	247RWWWB400250-11
4 x 3	101.60 x 76.20	6.876	174.66	3.094	78.59	247RWWWA400300-11	247RWWWB400300-11
6 x 1 1/2	152.40 x 38.10	10.000	254.00	4.750	120.65	247RWWWA600150-11	247RWWWB600150-11
6 x 2	152.40 x 50.80	10.000	254.00	4.750	120.65	247RWWWA600200-11	247RWWWB600200-11
6 x 3	152.40 x 76.20	10.000	254.00	4.875	123.83	247RWWWA600300-11	247RWWWB600300-11
6 x 4	152.40 x 101.60	10.000	254.00	4.750	120.65	247RWWWA600400-11	247RWWWB600400-11

Different dimensions available upon request

7MP

Clamp Long Equal Tee

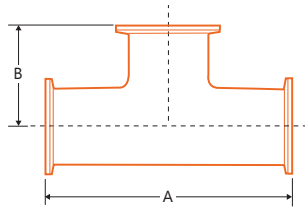


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1/2	12.70	4.750	120.65	2.375	60.33	247MPA050-11	247MPB050-11
3/4	19.05	5.000	127.00	2.500	63.50	247MPA075-11	247MPB075-11
1	25.40	4.750	120.60	2.375	60.30	247MPA100-11	247MPB100-11
1 1/2	38.10	5.500	139.80	2.750	69.90	247MPA150-11	247MPB150-11
2	50.80	7.000	177.80	3.500	88.90	247MPA200-11	247MPB200-11
2 1/2	63.50	7.000	177.80	3.500	88.90	247MPA250-11	247MPB250-11
3	76.20	7.500	190.60	3.750	95.30	247MPA300-11	247MPB300-11
4	101.60	9.000	228.40	4.500	114.20	247MPA400-11	247MPB400-11
6	152.40	13.000	330.20	6.500	165.10	247MPA600-11	247MPB600-11
8	203.20	15.750	400.05	7.875	200.03	247MPA800-11	247MPB800-11
10	254.00	18.750	476.25	9.735	247.27	247MPA1000-11	247MPB1000-11
12	304.80	21.750	552.45	10.735	272.67	247MPA1200-11	247MPB1200-11

Different dimensions available upon request

7MPS

Clamp Short Equal Tee

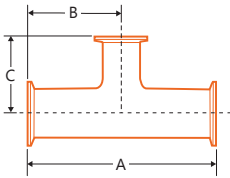


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	3.250	82.60	1.625	41.30	247MPSA100-11	247MPSB100-11
1 1/2	38.10	4.315	109.60	2.157	54.80	247MPSA150-11	247MPSB150-11
2	50.80	5.125	130.20	2.562	65.10	247MPSA200-11	247MPSB200-11
2 1/2	63.50	5.685	144.40	2.842	72.20	247MPSA250-11	247MPSB250-11
3	76.20	6.188	157.20	3.094	78.60	247MPSA300-11	247MPSB300-11
4	101.60	8.118	206.20	4.059	103.10	247MPSA400-11	247MPSB400-11

Different dimensions available upon request

7RMP

Clamp Long Reducing Tee

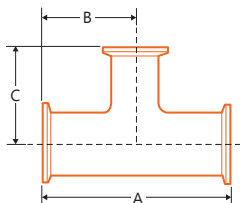


Nominal Size		A		B		C		Part Number	
Inch	mm	Inch	mm	Inch	mm	Inch	mm	304	316L
3/4 x 1/2	19.05 x 12.70	5.000	127.00	2.500	63.50	2.500	63.50	247RMPA075050-11	247RMPB075050-11
1 x 1/2	25.40 x 12.70	5.250	133.35	2.625	66.68	2.625	66.68	247RMPA100050-11	247RMPB100050-11
1 x 3/4	25.40 x 19.05	5.250	133.35	2.625	66.68	2.625	66.68	247RMPA100075-11	247RMPB100075-11
1 1/2 x 1/2	38.10 x 12.70	5.750	146.05	2.875	73.03	2.875	73.03	247RMPA150050-11	247RMPB150050-11
1 1/2 x 3/4	38.10 x 19.05	5.750	146.05	2.875	73.03	2.875	73.03	247RMPA150075-11	247RMPB150075-11
1 1/2 x 1	38.10 x 25.40	5.500	139.70	2.750	69.85	2.625	66.68	247RMPA150100-11	247RMPB150100-11
2 x 1/2	50.80 x 12.70	6.750	171.45	3.375	85.73	3.125	79.38	247RMPA200050-11	247RMPB200050-11
2 x 3/4	50.80 x 19.05	6.750	171.45	3.375	85.73	3.125	79.38	247RMPA200075-11	247RMPB200075-11
2 x 1	50.80 x 25.40	7.000	177.80	3.500	88.90	2.875	73.00	247RMPA200100-11	247RMPB200100-11
2 x 1 1/2	50.80 x 38.10	7.000	177.80	3.500	88.90	3.000	76.20	247RMPA200150-11	247RMPB200150-11
2 1/2 x 1 1/2	63.50 x 38.10	7.000	177.80	3.500	88.90	3.250	82.55	247RMPA250150-11	247RMPB250150-11
2 1/2 x 2	63.50 x 50.80	7.000	177.80	3.500	88.90	3.750	95.25	247RMPA250200-11	247RMPB250200-11
3 x 1	76.20 x 25.40	7.500	190.50	3.750	95.25	3.374	85.70	247RMPA300100-11	247RMPB300100-11
3 x 1 1/2	76.20 x 38.10	7.500	190.50	3.750	95.25	3.500	88.90	247RMPA300150-11	247RMPB300150-11
3 x 2	76.20 x 50.80	7.500	190.50	3.750	95.25	4.000	101.60	247RMPA300200-11	247RMPB300200-11
3 x 2 1/2	76.20 x 63.50	7.500	190.50	3.750	95.25	3.750	95.25	247RMPA300250-11	247RMPB300250-11
4 x 1	101.60 x 25.40	8.994	228.46	4.497	114.23	3.874	98.40	247RMPA400100-11	247RMPB400100-11
4 x 1 1/2	101.60 x 38.10	8.994	228.46	4.497	114.23	4.000	101.60	247RMPA400150-11	247RMPB400150-11
4 x 2	101.60 x 50.80	8.994	228.46	4.497	114.23	4.500	114.30	247RMPA400200-11	247RMPB400200-11
4 x 2 1/2	101.60 x 63.50	8.994	228.46	4.497	114.23	4.250	107.95	247RMPA400250-11	247RMPB400250-11
4 x 3	101.60 x 76.20	8.994	228.46	4.497	114.23	4.250	107.95	247RMPA400300-11	247RMPB400300-11
6 x 1 1/2	152.40 x 38.10	13.000	330.20	6.500	165.10	5.000	127.00	247RMPA600150-11	247RMPB600150-11
6 x 2	152.40 x 50.80	13.000	330.20	6.500	165.10	5.000	127.00	247RMPA600200-11	247RMPB600200-11
6 x 3	152.40 x 76.20	13.000	330.20	6.500	165.10	5.375	136.53	247RMPA600300-11	247RMPB600300-11
6 x 4	152.40 x 101.60	13.000	330.20	6.500	165.10	5.747	145.98	247RMPA600400-11	247RMPB600400-11

Different dimensions available upon request

7RMPS

Clamp Short
Reducing Tee

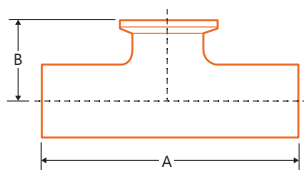


Nominal Size		A		B		C		Part Number	
Inch	mm	Inch	mm	Inch	mm	Inch	mm	304	316L
3/4 x 1/2	19.05 x 12.70	4.750	120.66	2.375	60.33	1.500	38.10	247RMPSA075050-11	247RMPSB075050-11
1 x 1/2	25.40 x 12.70	4.750	120.66	2.375	60.33	2.000	50.80	247RMPSA100050-11	247RMPSB100050-11
1 x 3/4	25.40 x 19.05	4.750	120.66	2.375	60.33	2.500	63.50	247RMPSA100075-11	247RMPSB100075-11
1 1/2 x 3/4	38.10 x 19.05	5.500	139.70	2.750	69.85	2.750	69.85	247RMPSA150075-11	247RMPSB150075-11
1 1/2 x 1	38.10 x 25.40	4.312	109.52	2.156	54.76	1.880	47.63	247RMPSA150100-11	247RMPSB150100-11
2 x 1	50.80 x 25.40	5.124	130.16	2.562	65.08	2.130	53.98	247RMPSA200100-11	247RMPSB200100-11
2 x 1 1/2	50.80 x 38.10	5.124	130.16	2.562	65.08	2.410	61.11	247RMPSA200150-11	247RMPSB200150-11
2 1/2 x 1 1/2	63.50 x 38.10	5.688	144.48	2.844	72.24	2.660	67.46	247RMPSA250150-11	247RMPSB250150-11
2 1/2 x 2	63.50 x 50.80	5.688	144.48	2.844	72.24	2.810	71.42	247RMPSA250200-11	247RMPSB250200-11
3 x 1	76.20 x 25.40	6.188	157.18	3.094	78.59	2.630	66.70	247RMPSA300100-11	247RMPSB300100-11
3 x 1 1/2	76.20 x 38.10	6.188	157.18	3.094	78.59	2.910	73.81	247RMPSA300150-11	247RMPSB300150-11
3 x 2	76.20 x 50.80	6.188	157.18	3.094	78.59	3.060	77.77	247RMPSA300200-11	247RMPSB300200-11
3 x 2 1/2	76.20 x 63.50	6.188	157.18	3.094	78.59	3.090	78.59	247RMPSA300250-11	247RMPSB300250-11
4 x 1	101.60 x 25.40	8.120	206.26	4.060	103.13	3.130	79.40	247RMPSA400100-11	247RMPSB400100-11
4 x 1 1/2	101.60 x 38.10	8.120	206.26	4.060	103.13	3.410	86.51	247RMPSA400150-11	247RMPSB400150-11
4 x 2	101.60 x 50.80	8.120	206.26	4.060	103.13	3.560	90.47	247RMPSA400200-11	247RMPSB400200-11
4 x 2 1/2	101.60 x 63.50	8.120	206.26	4.060	103.13	3.590	91.29	247RMPSA400250-11	247RMPSB400250-11
4 x 3	101.60 x 76.20	8.120	206.26	4.060	103.13	3.590	91.29	247RMPSA400300-11	247RMPSB400300-11
6 x 2	152.40 x 50.80	11.750	298.44	5.875	149.22	5.250	133.35	247RMPSA600200-11	247RMPSB600200-11
6 x 3	152.40 x 76.20	11.750	298.44	5.875	149.22	5.380	136.53	247RMPSA600300-11	247RMPSB600300-11
6 x 4	152.40 x 101.60	11.750	298.44	5.875	149.22	5.370	136.45	247RMPSA600400-11	247RMPSB600400-11

Different dimensions available upon request

7WMS

Long Equal Tee w/o WCW

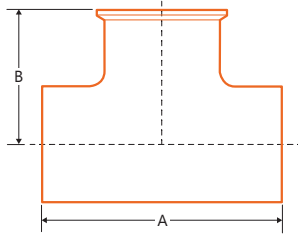


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1/2	12.70	3.75	95.25	0.83	21.05	247WMSA050-11	247WMSB050-11
3/4	19.05	4.00	101.60	0.99	25.23	247WMSA075-11	247WMSB075-11
1	25.40	3.75	95.20	1.06	27.00	247WMSA100-11	247WMSB100-11
1 1/2	38.10	4.50	114.40	1.36	34.65	247WMSA150-11	247WMSB150-11
2	50.80	6.00	152.40	1.64	41.70	247WMSA200-11	247WMSB200-11
2 1/2	63.50	6.00	152.40	1.88	47.70	247WMSA250-11	247WMSB250-11
3	76.20	6.50	165.20	2.19	55.70	247WMSA300-11	247WMSB300-11
4	101.60	7.75	196.80	2.75	69.80	247WMSA400-11	247WMSB400-11
6	152.40	11.25	285.75	4.06	103.00	247WMSA600-11	247WMSB600-11

Different dimensions available upon request

7WWM

Short Equal Tee WCW

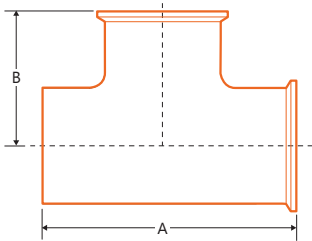


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	2.250	57.20	1.625	41.30	247WWMA100-11	247WWMB100-11
1 1/2	38.10	3.312	84.20	2.156	54.80	247WWMA150-11	247WWMB150-11
2	50.80	4.124	104.80	2.562	65.10	247WWMA200-11	247WWMB200-11
2 1/2	63.50	4.688	119.00	2.844	72.20	247WWMA250-11	247WWMB250-11
3	76.20	5.188	131.80	3.094	78.60	247WWMA300-11	247WWMB300-11
4	101.60	6.876	174.60	4.063	103.10	247WWMA400-11	247WWMB400-11

Different dimensions available upon request

7WMM

Short Equal Tee WCC

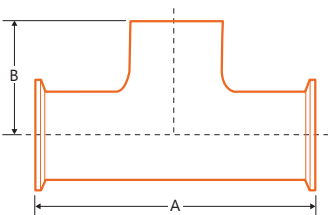


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	2.750	69.90	1.625	41.30	247WMMA100-11	247WMMB100-11
1 1/2	38.10	3.812	96.90	2.156	54.80	247WMMA150-11	247WMMB150-11
2	50.80	4.624	117.50	2.562	65.10	247WMMA200-11	247WMMB200-11
2 1/2	63.50	5.188	131.70	2.844	72.20	247WMMA250-11	247WMMB250-11
3	76.20	5.688	144.50	3.094	78.60	247WMMA300-11	247WMMB300-11
4	101.60	7.500	190.40	4.063	103.10	247WMMA400-11	247WMMB400-11

Different dimensions available upon request

7MMW

Short Equal Tee CWC

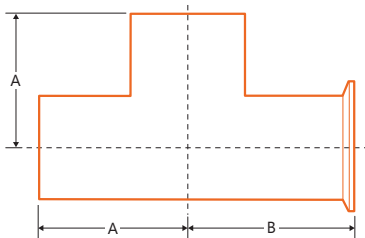


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	3.250	82.60	1.125	28.60	247MMWA100-11	247MMWB100-11
1 1/2	38.10	4.312	109.60	1.656	42.10	247MMWA150-11	247MMWB150-11
2	50.80	5.124	130.20	2.062	52.40	247MMWA200-11	247MMWB200-11
2 1/2	63.50	5.688	144.40	2.342	59.50	247MMWA250-11	247MMWB250-11
3	76.20	6.188	157.20	2.594	65.90	247MMWA300-11	247MMWB300-11
4	101.60	8.124	206.20	3.438	87.30	247MMWA400-11	247MMWB400-11

Different dimensions available upon request

7WMW

Short Equal Tee WWC

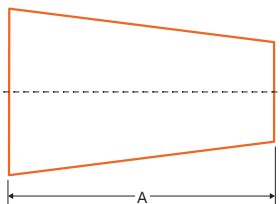


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	1.125	28.6	1.625	41.30	247WMWA100-11	247WMWB100-11
1 1/2	38.10	1.656	42.1	2.156	54.80	247WMWA150-11	247WMWB150-11
2	50.80	2.062	52.4	2.562	65.10	247WMWA200-11	247WMWB200-11
2 1/2	63.50	2.342	59.5	2.844	72.20	247WMWA250-11	247WMWB250-11
3	76.20	2.594	65.9	3.094	78.60	247WMWA300-11	247WMWB300-11
4	101.60	3.438	87.3	4.063	103.10	247WMWA400-11	247WMWB400-11

Different dimensions available upon request

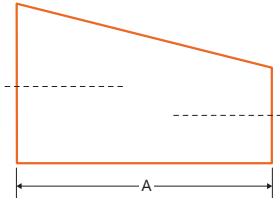
31W

Concentric Reducer WW



Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
3/4 x 1/2	19.05 x 12.70	1.000	25.40	2431WA075050-11	2431WB075050-11
1 x 1/2	25.40 x 12.70	1.000	25.40	2431WA100050-11	2431WB100050-11
1 x 1/2	25.40 x 12.70	2.000	50.80	2431WA100050508-11	2431WB100050508-11
1 x 3/4	25.40 x 19.05	1.000	25.40	2431WA100075-11	2431WB100075-11
1 1/2 x 1/2	38.10 x 12.70	2.500	63.50	2431WA150050-11	2431WB150050-11
1 1/2 x 3/4	38.10 x 19.05	2.000	50.80	2431WA150075-11	2431WB150075-11
1 1/2 x 1	38.10 x 25.40	2.000	50.80	2431WA150100-11	2431WB150100-11
2 x 1/2	50.80 x 12.70	6.000	152.40	2431WA200050-11	2431WB200050-11
2 x 3/4	50.80 x 19.05	5.000	127.00	2431WA200075-11	2431WB200075-11
2 x 1	50.80 x 25.40	4.000	101.60	2431WA200100-11	2431WB200100-11
2 x 1 1/2	50.80 x 38.10	2.000	50.80	2431WA200150-11	2431WB200150-11
2 1/2 x 1 1/2	63.50 x 38.10	4.000	101.60	2431WA250150-11	2431WB250150-11
2 1/2 x 2	63.50 x 50.80	2.000	50.80	2431WA250200-11	2431WB250200-11
3 x 1	76.20 x 25.40	8.000	203.20	2431WA300100-11	2431WB300100-11
3 x 1 1/2	76.20 x 38.10	6.000	152.40	2431WA300150-11	2431WB300150-11
3 x 2	76.20 x 50.80	4.000	101.60	2431WA300200-11	2431WB300200-11
3 x 2 1/2	76.20 x 63.50	2.000	50.80	2431WA300250-11	2431WB300250-11
4 x 1	101.60 x 25.40	12.000	304.80	2431WA400100-11	2431WB400100-11
4 x 1 1/2	101.60 x 38.10	10.000	254.00	2431WA400150-11	2431WB400150-11
4 x 2	101.60 x 50.80	8.000	203.20	2431WA400200-11	2431WB400200-11
4 x 2 1/2	101.60 x 63.50	6.000	152.40	2431WA400250-11	2431WB400250-11
4 x 3	101.60 x 76.20	4.000	101.60	2431WA400300-11	2431WB400300-11
6 x 2	152.40 x 50.80	5.500	139.70	2431WA600200-11	2431WB600200-11
6 x 3	152.40 x 76.20	5.500	139.70	2431WA600300-11	2431WB600300-11
6 x 3	152.40 x 76.20	6.000	152.40	2431WA600300152-11	2431WB600300152-11
6 x 4	152.40 x 101.60	5.500	139.70	2431WA600400-11	2431WB600400-11
6 x 4	152.40 x 101.60	6.000	152.40	2431WA600400152-11	2431WB600400152-11
8 x 3	203.20 x 76.20	6.000	152.40	2431WA800300-11	2431WB800300-11
8 x 4	203.20 x 101.60	6.000	152.40	2431WA800400-11	2431WB800400-11
8 x 6	203.20 x 152.40	6.000	152.40	2431WA800600-11	2431WB800600-11

Different dimensions available upon request

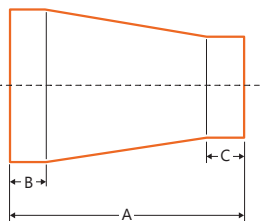
32W**Eccentric Reducer WW**

Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
3/4 x 1/2	19.05 x 12.70	1.000	25.40	2432WA075050-11	2432WB075050-11
1 x 1/2	25.40 x 12.70	1.000	25.40	2432WA100050-11	2432WB100050-11
1 x 1/2	25.40 x 12.70	2.000	50.80	2432WA100050508-11	2432WB100050508-11
1 x 3/4	25.40 x 19.05	1.000	25.40	2432WA100075-11	2432WB100075-11
1 1/2 x 1/2	38.10 x 12.70	2.500	63.50	2432WA150050-11	2432WB150050-11
1 1/2 x 1/2	38.10 x 12.70	4.000	101.60	2432WA150050101-11	2432WB150050101-11
1 1/2 x 3/4	38.10 x 19.05	2.000	50.80	2432WA150075-11	2432WB150075-11
1 1/2 x 3/4	38.10 x 19.05	3.000	76.20	2432WA150075762-11	2432WB150075762-11
1 1/2 x 1	38.10 x 25.40	2.000	50.80	2432WA150100-11	2432WB150100-11
2 x 1/2	50.80 x 12.70	6.000	152.40	2432WA200050-11	2432WB200050-11
2 x 3/4	50.80 x 19.05	5.000	127.00	2432WA200075-11	2432WB200075-11
2 x 1	50.80 x 25.40	4.000	101.60	2432WA200100-11	2432WB200100-11
2 x 1 1/2	50.80 x 38.10	2.000	50.80	2432WA200150-11	2432WB200150-11
2 1/2 x 1 1/2	63.50 x 38.10	4.000	101.60	2432WA250150-11	2432WB250150-11
2 1/2 x 2	63.50 x 50.80	2.000	50.80	2432WA250200-11	2432WB250200-11
3 x 1	76.20 x 25.40	8.000	203.20	2432WA300100-11	2432WB300100-11
3 x 1 1/2	76.20 x 38.10	6.000	152.40	2432WA300150-11	2432WB300150-11
3 x 2	76.20 x 50.80	4.000	101.60	2432WA300200-11	2432WB300200-11
3 x 2 1/2	76.20 x 63.50	2.000	50.80	2432WA300250-11	2432WB300250-11
4 x 1 1/2	101.60 x 38.10	10.000	254.00	2432WA400150-11	2432WB400150-11
4 x 2	101.60 x 50.80	8.000	203.20	2432WA400200-11	2432WB400200-11
4 x 2 1/2	101.60 x 63.50	6.000	152.40	2432WA400250-11	2432WB400250-11
4 x 3	101.60 x 76.20	4.000	101.60	2432WA400300-11	2432WB400300-11
6 x 3	152.40 x 76.20	5.500	139.70	2432WA600300-11	2432WB600300-11
6 x 4	152.40 x 101.60	5.500	139.70	2432WA600400-11	2432WB600400-11
8 x 4	203.20 x 101.60	6.000	152.40	2432WA800400-11	2432WB800400-11
8 x 6	203.20 x 152.40	6.000	152.40	2432WA800600-11	2432WB800600-11

Different dimensions available upon request

31

Concentric Reducer with Tangents

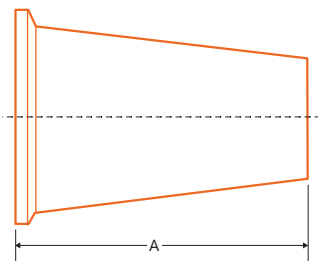


Nominal Size		A		B		C		Part Number	
Inch	mm	Inch	mm	Inch	mm	Inch	mm	304	316L
1 x 3/4	25.40 x 19.05	2.375	60.33	0.375	9.53	0.375	9.53	2431A100075-11	2431B100075-11
1 1/2 x 3/4	38.10 x 19.05	2.375	60.33	0.375	9.53	0.375	9.53	2431A150075-11	2431B150075-11
1 1/2 x 1	38.10 x 25.40	2.375	60.33	0.375	9.53	0.375	9.53	2431A150100-11	2431B150100-11
2 x 1/2	50.80 x 12.70	4.969	126.20	1.000	25.40	1.000	25.40	2431A200050-11	2431B200050-11
2 x 3/4	50.80 x 19.05	7.000	177.80	1.000	25.40	1.000	25.40	2431A200075-11	2431B200075-11
2 x 1	50.80 x 25.40	2.375	60.33	0.375	9.53	0.375	9.53	2431A200100-11	2431B200100-11
2 x 1 1/2	50.80 x 38.10	2.375	60.33	0.375	9.53	0.375	9.53	2431A200150-11	2431B200150-11
2 1/2 x 1 1/2	63.50 x 38.10	2.375	60.33	0.375	9.53	0.375	9.53	2431A250150-11	2431B250150-11
2 1/2 x 2	63.50 x 50.80	2.375	60.33	0.375	9.53	0.375	9.53	2431A250200-11	2431B250200-11
3 x 1 1/2	76.20 x 38.10	3.625	92.08	0.375	9.53	0.375	9.53	2431A300150-11	2431B300150-11
3 x 2	76.20 x 50.80	3.625	92.08	0.375	9.53	0.375	9.53	2431A300200-11	2431B300200-11
3 x 2 1/2	76.20 x 63.50	3.625	92.08	0.375	9.53	0.375	9.53	2431A300250-11	2431B300250-11
4 x 1 1/2	101.60 x 38.10	5.500	139.70	0.375	9.53	0.375	9.53	2431A400150-11	2431B400150-11
4 x 2	101.60 x 50.80	3.625	92.08	0.375	9.53	0.375	9.53	2431A400200-11	2431B400200-11
4 x 2 1/2	101.60 x 63.50	3.625	92.08	0.375	9.53	0.375	9.53	2431A400250-11	2431B400250-11
4 x 3	101.60 x 76.20	3.625	92.08	0.375	9.53	0.375	9.53	2431A400300-11	2431B400300-11
6 x 3	152.40 x 76.20	5.500	139.70	0.375	9.53	0.375	9.53	2431A600300211-11	2431B600300211-11
6 x 3	152.40 x 76.20	9.000	228.60	1.500	38.10	1.500	38.10	2431A600300381-11	2431B600300381-11
6 x 3	152.40 x 76.20	9.000	228.60	1.750	44.45	1.750	44.45	2431A600300-11	2431B600300-11
6 x 4	152.40 x 101.60	5.500	139.70	0.375	9.53	0.375	9.53	2431A600400211-11	2431B600400211-11
6 x 4	152.40 x 101.60	9.000	228.60	1.500	38.10	1.500	38.10	2431A600400381-11	2431B600400381-11
6 x 4	152.40 x 101.60	9.000	228.60	1.750	44.45	1.750	44.45	2431A600400-11	2431B600400-11

Different dimensions available upon request

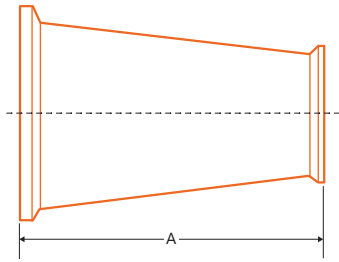
31M

Concentric Reducer CW



Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
3/4 x 1/2	19.05 x 12.70	1.500	38.10	2431MA075050-11	2431MB075050-11
1 x 1/2	25.40 x 12.70	1.500	38.10	2431MA100050-11	2431MB100050-11
1 x 3/4	25.40 x 19.05	1.500	38.10	2431MA100075-11	2431MB100075-11
1 1/2 x 1	38.10 x 25.40	2.500	63.50	2431MA150100-11	2431MB150100-11
2 x 1	50.80 x 25.40	4.500	114.30	2431MA200100-11	2431MB200100-11
2 x 1 1/2	50.80 x 38.10	2.500	63.50	2431MA200150-11	2431MB200150-11
2 1/2 x 1 1/2	63.50 x 38.10	4.500	114.30	2431MA250150-11	2431MB250150-11
2 1/2 x 2	63.50 x 50.80	2.500	63.50	2431MA250200-11	2431MB250200-11
3 x 1 1/2	76.20 x 38.10	6.500	165.10	2431MA300150-11	2431MB300150-11
3 x 2	76.20 x 50.80	4.500	114.30	2431MA300200-11	2431MB300200-11
3 x 2 1/2	76.20 x 63.50	2.500	63.50	2431MA300250-11	2431MB300250-11
4 x 2	101.60 x 50.80	8.625	219.08	2431MA400200-11	2431MB400200-11
4 x 2 1/2	101.60 x 63.50	6.625	168.28	2431MA400250-11	2431MB400250-11
4 x 3	101.60 x 76.20	4.625	117.48	2431MA400300-11	2431MB400300-11

Different dimensions available upon request

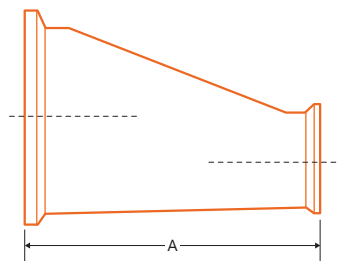
31MP**Concentric Reducer CC**

Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
3/4 x 1/2	19.05 x 12.70	2.000	50.80	2431MPA075050-11	2431MPB075050-11
1 x 1/2	25.40 x 12.70	2.000	50.80	2431MPA100050-11	2431MPB100050-11
1 x 3/4	25.40 x 19.05	2.000	50.80	2431MPA100075-11	2431MPB100075-11
1 1/2 x 1/2	38.10 x 12.70	3.500	88.90	2431MPA150050-11	2431MPB150050-11
1 1/2 x 3/4	38.10 x 19.05	3.000	76.20	2431MPA150075-11	2431MPB150075-11
1 1/2 x 1	38.10 x 25.40	3.000	76.20	2431MPA150100-11	2431MPB150100-11
2 x 1/2	50.80 x 12.70	7.000	177.80	2431MPA200050-11	2431MPB200050-11
2 x 3/4	50.80 x 19.05	6.000	152.40	2431MPA200075-11	2431MPB200075-11
2 x 1	50.80 x 25.40	5.000	127.00	2431MPA200100-11	2431MPB200100-11
2 x 1 1/2	50.80 x 38.10	3.000	76.20	2431MPA200150-11	2431MPB200150-11
2 1/2 x 1 1/2	63.50 x 38.10	5.000	127.00	2431MPA250150-11	2431MPB250150-11
2 1/2 x 2	63.50 x 50.80	3.000	76.20	2431MPA250200-11	2431MPB250200-11
3 x 1	76.20 x 25.40	9.000	228.60	2431MPA300100-11	2431MPB300100-11
3 x 1 1/2	76.20 x 38.10	7.000	177.80	2431MPA300150-11	2431MPB300150-11
3 x 2	76.20 x 50.80	5.000	127.00	2431MPA300200-11	2431MPB300200-11
3 x 2 1/2	76.20 x 63.50	3.000	76.20	2431MPA300250-11	2431MPB300250-11
4 x 1 1/2	101.60 x 38.10	11.125	282.50	2431MPA400150-11	2431MPB400150-11
4 x 2	101.60 x 50.80	9.125	231.70	2431MPA400200-11	2431MPB400200-11
4 x 2 1/2	101.60 x 63.50	7.125	180.90	2431MPA400250-11	2431MPB400250-11
4 x 3	101.60 x 76.20	5.125	130.10	2431MPA400300-11	2431MPB400300-11
6 x 2	152.40 x 50.80	6.875	174.63	2431MPA600200-11	2431MPB600200-11
6 x 3	152.40 x 76.20	6.875	174.63	2431MPA600300-11	2431MPB600300-11
6 x 4	152.40 x 101.60	7.000	177.80	2431MPA600400-11	2431MPB600400-11
8 x 4	203.20 x 101.60	7.500	190.50	2431MPA800400-11	2431MPB800400-11
8 x 6	203.20 x 152.40	7.750	196.85	2431MPA800600-11	2431MPB800600-11

Different dimensions available upon request

32MP

Eccentric Reducer CC

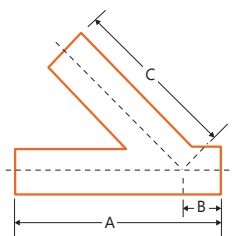


Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
3/4 x 1/2	19.05 x 12.70	2.000	50.800	2432MPA075050-11	2432MPB075050-11
1 x 1/2	25.40 x 12.70	2.000	50.800	2432MPA100050-11	2432MPB100050-11
1 x 3/4	25.40 x 19.05	2.000	50.800	2432MPA100075-11	2432MPB100075-11
1 1/2 x 1/2	38.10 x 12.70	3.500	88.900	2432MPA150050-11	2432MPB150050-11
1 1/2 x 3/4	38.10 x 19.05	3.000	76.200	2432MPA150075-11	2432MPB150075-11
1 1/2 x 1	38.10 x 25.40	3.000	76.200	2432MPA150100-11	2432MPB150100-11
2 x 1/2	50.80 x 12.70	7.000	177.800	2432MPA200050-11	2432MPB200050-11
2 x 3/4	50.80 x 19.05	6.000	152.400	2432MPA200075-11	2432MPB200075-11
2 x 1	50.80 x 25.40	5.000	127.000	2432MPA200100-11	2432MPB200100-11
2 x 1 1/2	50.80 x 38.10	3.000	76.200	2432MPA200150-11	2432MPB200150-11
2 1/2 x 1 1/2	63.50 x 38.10	5.000	127.000	2432MPA250150-11	2432MPB250150-11
2 1/2 x 2	63.50 x 50.80	3.000	76.200	2432MPA250200-11	2432MPB250200-11
3 x 1	76.20 x 25.40	9.000	228.600	2432MPA300100-11	2432MPB300100-11
3 x 1 1/2	76.20 x 38.10	7.000	177.800	2432MPA300150-11	2432MPB300150-11
3 x 2	76.20 x 50.80	5.000	127.000	2432MPA300200-11	2432MPB300200-11
3 x 2 1/2	76.20 x 63.50	3.000	76.200	2432MPA300250-11	2432MPB300250-11
4 x 1 1/2	101.60 x 38.10	11.125	282.500	2432MPA400150-11	2432MPB400150-11
4 x 2	101.60 x 50.80	9.125	231.700	2432MPA400200-11	2432MPB400200-11
4 x 2 1/2	101.60 x 63.50	7.125	180.900	2432MPA400250-11	2432MPB400250-11
4 x 3	101.60 x 76.20	5.125	130.100	2432MPA400300-11	2432MPB400300-11
6 x 3	152.40 x 76.20	6.875	174.630	2432MPA600300-11	2432MPB600300-11
6 x 4	152.40 x 101.60	7.000	177.800	2432MPA600400-11	2432MPB600400-11
8 x 4	203.20 x 101.60	7.500	190.500	2432MPA800400-11	2432MPB800400-11
8 x 6	203.20 x 152.40	7.750	196.850	2432MPA800600-11	2432MPB800600-11

Different dimensions available upon request

28WA

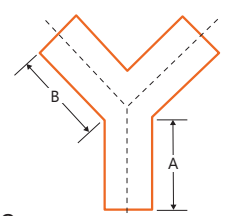
Lateral WWW



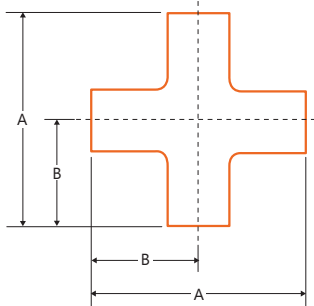
Nominal Size		A		B		C		Part Number	
Inch	mm	Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	6.000	152.40	1.000	25.40	5.000	127.00	2428WAA100-11	2428WAB100-11
1 1/2	38.10	7.375	187.33	1.188	30.18	6.188	157.18	2428WAA150-11	2428WAB150-11
2	50.80	8.750	222.25	1.625	41.28	7.125	180.98	2428WAA200-11	2428WAB200-11
2 1/2	63.50	10.000	254.00	1.500	38.10	8.500	215.90	2428WAA250-11	2428WAB250-11
3	76.20	10.750	273.05	1.875	47.63	8.875	225.43	2428WAA300-11	2428WAB300-11
4	101.60	12.812	325.42	2.015	51.18	10.750	273.05	2428WAA400-11	2428WAB400-11

28W

True Y WWW

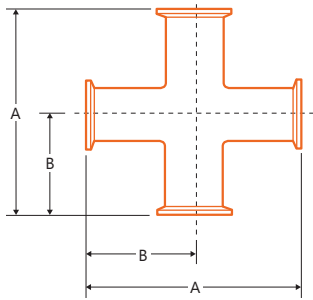


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	2.000	50.80	2.438	61.93	2428WA100-11	2428WB100-11
1 1/2	38.10	2.000	50.80	2.438	61.93	2428WA150-11	2428WB150-11
2	50.80	2.625	66.68	3.250	82.55	2428WA200-11	2428WB200-11
2 1/2	63.50	3.370	85.60	4.125	104.78	2428WA250-11	2428WB250-11
3	76.20	4.000	101.60	4.875	123.83	2428WA300-11	2428WB300-11
4	101.60	5.375	136.53	5.375	136.53	2428WA400-11	2428WB400-11

9W**Long Equal 4-Way Cross**

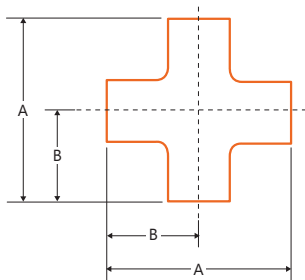
Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	3.75	95.20	1.87	47.60	249WA100-11	249WB100-11
1 1/2	38.10	4.50	114.40	2.25	57.20	249WA150-11	249WB150-11
2	50.80	6.00	152.40	3.00	76.20	249WA200-11	249WB200-11
2 1/2	63.50	6.00	152.40	3.00	76.20	249WA250-11	249WB250-11
3	76.20	6.50	165.20	3.25	82.60	249WA300-11	249WB300-11
4	101.60	7.75	196.80	3.87	98.40	249WA400-11	249WB400-11

Different dimensions available upon request

9MP**Clamp Long Equal 4-Way Cross**

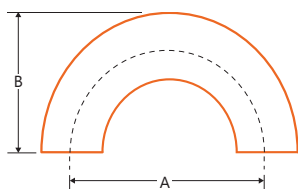
Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	4.750	120.60	2.375	60.30	249MPA100-11	249MPB100-11
1 1/2	38.10	5.500	139.80	2.750	69.90	249MPA150-11	249MPB150-11
2	50.80	7.000	177.80	3.500	88.90	249MPA200-11	249MPB200-11
2 1/2	63.50	7.000	177.80	3.500	88.90	249MPA250-11	249MPB250-11
3	76.20	7.500	190.60	3.750	95.30	249MPA300-11	249MPB300-11
4	101.60	9.000	228.40	4.500	114.20	249MPA400-11	249MPB400-11

Different dimensions available upon request

9WWWW**Short Equal 4-Way Cross**

Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	2.250	57.20	1.125	28.60	249WWWWA100-11	249WWWWB100-11
1 1/2	38.10	3.312	84.20	1.656	42.10	249WWWWA150-11	249WWWWB150-11
2	50.80	4.125	104.80	2.062	52.40	249WWWWA200-11	249WWWWB200-11
2 1/2	63.50	4.687	119.00	2.343	59.50	249WWWWA250-11	249WWWWB250-11
3	76.20	5.187	131.80	2.593	65.90	249WWWWA300-11	249WWWWB300-11
4	101.60	6.875	174.60	3.437	87.30	249WWWWA400-11	249WWWWB400-11

Different dimensions available upon request

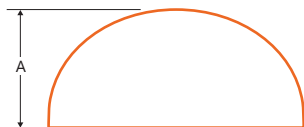
2WUL**180° Short U Bend WW**

Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	3.000	76.20	2.000	50.80	242WULA100-11	242WULB100-11
1 1/2	38.10	4.500	114.30	3.000	76.20	242WULA150-11	242WULB150-11
2	50.80	6.000	152.40	4.000	101.60	242WULA200-11	242WULB200-11
2 1/2	63.50	7.500	190.50	5.000	127.00	242WULA250-11	242WULB250-11
3	76.20	9.000	228.60	6.000	152.40	242WULA300-11	242WULB300-11
4	101.60	12.000	304.80	8.000	203.20	242WULA400-11	242WULB400-11

Different dimensions available upon request

16W

Tube Weld End Cap

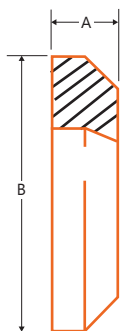


Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
1/2	12.70	0.250	6.400	2416WA050-11	2416WB050-11
3/4	19.05	0.312	7.900	2416WA075-11	2416WB075-11
1	25.40	0.375	9.500	2416WA100-11	2416WB100-11
1 1/2	38.10	0.562	14.300	2416WA150-11	2416WB150-11
2	50.80	0.750	19.100	2416WA200-11	2416WB200-11
2 1/2	63.50	1.000	25.400	2416WA250-11	2416WB250-11
3	76.20	1.250	31.800	2416WA300-11	2416WB300-11
4	101.60	1.500	38.100	2416WA400-11	2416WB400-11
6	152.40	2.000	50.800	2416WA600-11	2416WB600-11
8	203.20	2.500	63.500	2416WA800-11	2416WB800-11

Different dimensions available upon request

16AMP

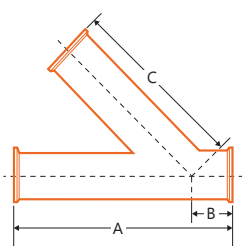
Solid End Cap



Nominal Size	A	B	Part Number	
Inch	mm	mm	304	316L
1/2 - 3/4	4.75	25.20	2416AMPA07511	2416AMPB07511
1 - 1 1/2	6.40	50.40	2416AMPA15011	2416AMPB15011
2	6.40	63.90	2416AMPA20011	2416AMPB20011
2 1/2	6.40	77.40	2416AMPA25011	2416AMPB25011
3	6.40	90.90	2416AMPA30011	2416AMPB30011
4	7.90	118.90	2416AMPA40011	2416AMPB40011
5	7.90	144.50	2416AMPA50011	2416AMPB50011
6	11.10	166.90	2416AMPA60011	2416AMPB60011
8	11.10	217.70	2416AMPA80011	2416AMPB80011
10	11.10	268.50	2416AMPA100011	2416AMPB100011
12	11.10	319.30	2416AMPA120011	2416AMPB120011

28AMP

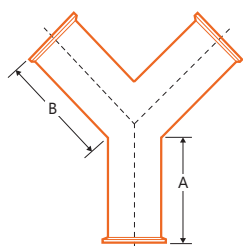
Clamp End Lateral CCC



Nominal Size		A		B		C		Part Number	
Inch	mm	Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	7.000	177.80	1.500	38.10	5.500	139.70	2428AMPA100-11	2428AMPB100-11
1 1/2	38.10	8.375	212.73	1.688	42.88	6.688	169.88	2428AMPA150-11	2428AMPB150-11
2	50.80	9.750	247.65	2.125	53.98	7.625	193.68	2428AMPA200-11	2428AMPB200-11
2 1/2	63.50	11.000	279.40	2.000	50.80	9.000	228.60	2428AMPA250-11	2428AMPB250-11
3	76.20	11.750	298.45	2.375	60.33	9.375	238.13	2428AMPA300-11	2428AMPB300-11
4	101.60	14.062	357.17	2.640	67.06	11.312	287.32	2428AMPA400-11	2428AMPB400-11

28BMP

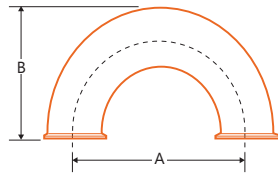
Clamp End True Y CCC



Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	2.500	63.50	2.938	74.63	2428BMIPA100-11	2428BMPB100-11
1 1/2	38.10	2.500	63.50	2.938	74.63	2428BMIPA150-11	2428BMPB150-11
2	50.80	3.125	79.38	3.750	95.25	2428BMIPA200-11	2428BMPB200-11
2 1/2	63.50	3.875	98.43	4.625	117.48	2428BMIPA250-11	2428BMPB250-11
3	76.20	4.500	114.30	5.375	136.53	2428BMIPA300-11	2428BMPB300-11
4	101.60	6.000	152.40	6.000	152.40	2428BMIPA400-11	2428BMPB400-11

2WUMP

180° Clamp U Bend CC

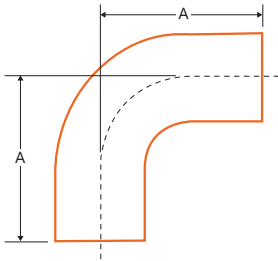


Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1	25.40	3.000	76.20	2.500	63.50	242WUMPA100-11	242WUMPB100-11
1 1/2	38.10	4.500	114.30	3.500	88.90	242WUMPA150-11	242WUMPB150-11
2	50.80	6.000	152.40	4.500	114.30	242WUMPA200-11	242WUMPB200-11
2 1/2	63.50	7.500	190.50	5.500	139.70	242WUMPA250-11	242WUMPB250-11
3	76.20	9.000	228.60	6.500	165.10	242WUMPA300-11	242WUMPB300-11
4	101.60	12.000	304.80	8.625	219.08	242WUMPA400-11	242WUMPB400-11

Different dimensions available upon request

BS

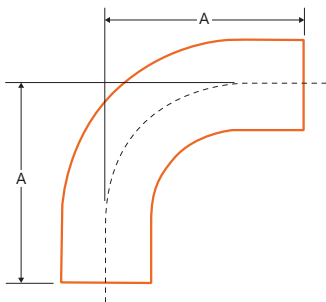
90° Long Tube Bend 1D



Nominal Size		Nominal Wall	A	Part Number	
Inch	mm	mm	mm	304	316L
1	25.4	1.60	55	2507L1DA100-11	2507L1DB100-11
1 1/2	38.1	1.60	70	2507L1DA150-11	2507L1DB150-11
2	50.8	1.60	82	2507L1DA200-11	2507L1DB200-11
2 1/2	63.5	1.60	105	2507L1DA250-11	2507L1DB250-11
3	76.2	1.60	110	2507L1DA300-11	2507L1DB300-11
4	101.6	2.10	150	2507L1DA400-11	2507L1DB400-11

BS

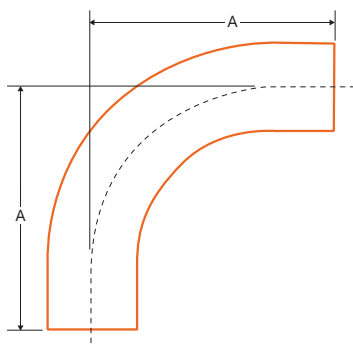
90° Long Tube Bend 1.5D



Nominal Size		Nominal Wall	A	Part Number	
Inch	mm	mm	mm	304	316L
1/2	12.70	1.60	62	2507LA050-11	2507LB050-11
3/4	19.05	1.60	62	2507LA075-11	2507LB075-11
1	25.40	1.60	65	2507LA100-11	2507LB100-11
1 1/2	38.10	1.60	85	2507LA150-11	2507LB150-11
2	50.80	1.60	110	2507LA200-11	2507LB200-11
2 1/2	63.50	1.60	135	2507LA250-11	2507LB250-11
3	76.20	1.60	155	2507LA300-11	2507LB300-11
4	101.60	2.10	195	2507LA400-11	2507LB400-11

BS

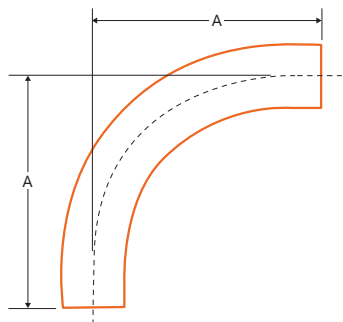
90° Long Tube Bend 2D



Nominal Size		Nominal Wall	A	Part Number	
Inch	mm	mm	mm	304	316L
1	25.4	1.60	80.0	2507L2DA100-11	2507L2DB100-11
1 1/2	38.1	1.60	105.0	2507L2DA150-11	2507L2DB150-11
2	50.8	1.60	130.0	2507L2DA200-11	2507L2DB200-11
2 1/2	63.5	1.60	160.0	2507L2DA250-11	2507L2DB250-11
3	76.2	1.60	215.0	2507L2DA300-11	2507L2DB300-11
4	101.6	2.10	213.2	2507L2DA400-11	2507L2DB400-11

BS

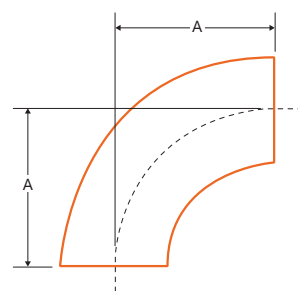
90° Long Tube Bend 3D



Nominal Size		Nominal Wall	A	Part Number	
Inch	mm	mm	mm	304	316L
1	25.4	1.60	115.0	2507L3DA100-11	2507L3DB100-11
1 1/2	38.1	1.60	140.0	2507L3DA150-11	2507L3DB150-11
2	50.8	1.60	225.0	2507L3DA200-11	2507L3DB200-11
2 1/2	63.5	1.60	230.0	2507L3DA250-11	2507L3DB250-11
3	76.2	1.60	240.0	2507L3DA300-11	2507L3DB300-11
4	101.6	2.10	365.6	2507L3DA400-11	2507L3DB400-11

BS

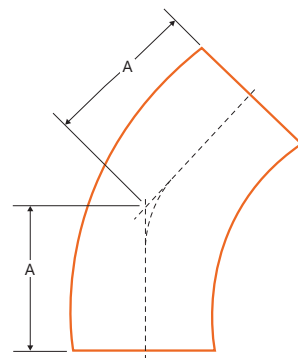
90° Short Tube Bend 1.5D



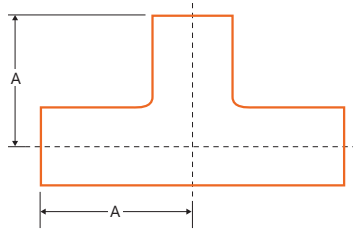
Nominal Size		Nominal Wall	A	Part Number	
Inch	mm	mm	mm	304	316L
1	25.4	1.60	43.5	2507SA100-11	2507SB100-11
1 1/2	38.1	1.60	63.5	2507SA150-11	2507SB150-11
2	50.8	1.60	88.5	2507SA200-11	2507SB200-11
2 1/2	63.5	1.60	113.5	2507SA250-11	2507SB250-11
3	76.2	1.60	133.5	2507SA300-11	2507SB300-11
4	101.6	2.10	173.5	2507SA400-11	2507SB400-11

BS

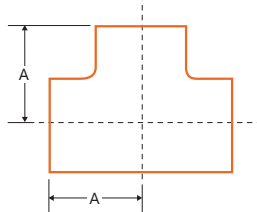
45° Long Tube Bend 1.5D



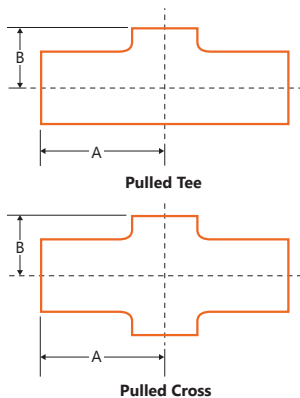
Nominal Size		Nominal Wall	A	Part Number	
Inch	mm	mm	mm	304	316L
1	25.4	1.60	30.2	2508LA100-11	2508LB100-11
1 1/2	38.1	1.60	41.3	2508LA150-11	2508LB150-11
2	50.8	1.60	58.7	2508LA200-11	2508LB200-11
2 1/2	63.5	1.60	76.2	2508LA250-11	2508LB250-11
3	76.2	1.60	93.7	2508LA300-11	2508LB300-11
4	101.6	2.10	122.2	2508LA400-11	2508LB400-11

BS**Long Equal Tee**

Nominal Size		Nominal Wall	A	Part Number	
Inch	mm	mm	mm	304	316L
1	25.4	1.60	130	2509LA100-11	2509LB100-11
1 1/2	38.1	1.60	170	2509LA150-11	2509LB150-11
2	50.8	1.60	220	2509LA200-11	2509LB200-11
2 1/2	63.5	1.60	270	2509LA250-11	2509LB250-11
3	76.2	1.60	310	2509LA300-11	2509LB300-11
4	101.6	2.10	390	2509LA400-11	2509LB400-11

BS**Short Equal Tee**

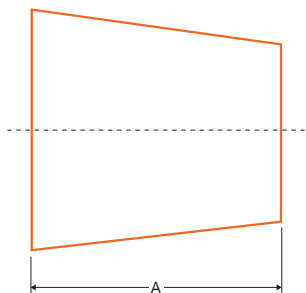
Nominal Size		Nominal Wall	A	Part Number	
Inch	mm	mm	mm	304	316L
1	25.4	1.60	44	2509SA100-11	2509SB100-11
1 1/2	38.1	1.60	64	2509SA150-11	2509SB150-11
2	50.8	1.60	89	2509SA200-11	2509SB200-11
2 1/2	63.5	1.60	114	2509SA250-11	2509SB250-11
3	76.2	1.60	134	2509SA300-11	2509SB300-11
4	101.6	2.10	174	2509SA400-11	2509SB400-11

BS**Pulled Tee / Pulled Cross**

Nominal Size		A	B	Part Number	
Inch	mm	mm	mm	Pulled Tee	Pulled Cross
1	25.4	44	14	2515SB100-11	2515SCB100-11
1 1/2	38.1	64	22	2515SB150-11	2515SCB150-11
2	50.8	89	29	2515SB200-11	2515SCB200-11
2 1/2	63.5	114	35	2515SB250-11	2515SCB250-11
3	76.2	134	41	2515SB300-11	2515SCB300-11
4	101.6	174	54	2515SB400-11	2515SCB400-11

BS

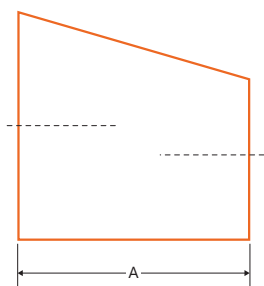
Concentric Reducer



Nominal Size		A	Part Number	
Inch	mm	mm	304	316L
3/4 x 1/2	19.05 x 12.70	25.4	2511CA075050-11	2511CB075050-11
1 x 1/2	25.40 x 12.70	43.0	2511CA100050-11	2511CB100050-11
1 x 3/4	25.40 x 19.05	30.0	2511CA100075-11	2511CB100075-11
1 1/2 x 3/4	38.10 x 19.05	50.8	2511CA150075-11	2511CB150075-11
1 1/2 x 1	38.10 x 25.40	48.0	2511CA150100-11	2511CB150100-11
2 x 1	50.80 x 25.40	50.0	2511CA200100-11	2511CB200100-11
2 x 1 1/2	50.80 x 38.10	66.0	2511CA200150-11	2511CB200150-11
2 1/2 x 1	63.50 x 25.40	68.0	2511CA250100-11	2511CB250100-11
2 1/2 x 1 1/2	63.50 x 38.10	48.0	2511CA250150-11	2511CB250150-11
2 1/2 x 2	63.50 x 50.80	66.0	2511CA250200-11	2511CB250200-11
3 x 1	76.20 x 25.40	98.0	2511CA300100-11	2511CB300100-11
3 x 1 1/2	76.20 x 38.10	75.0	2511CA300150-11	2511CB300150-11
3 x 2	76.20 x 50.80	70.0	2511CA300200-11	2511CB300200-11
3 x 2 1/2	76.20 x 63.50	72.0	2511CA300250-11	2511CB300250-11
4 x 1	101.60 x 25.40	304.8	2511CA400100-11	2511CB400100-11
4 x 1 1/2	101.60 x 38.10	60.0	2511CA400150-11	2511CB400150-11
4 x 2	101.60 x 50.80	101.0	2511CA400200-11	2511CB400200-11
4 x 2 1/2	101.60 x 63.50	76.0	2511CA400250-11	2511CB400250-11
4 x 3	101.60 x 76.20	50.0	2511CA400300-11	2511CB400300-11

BS

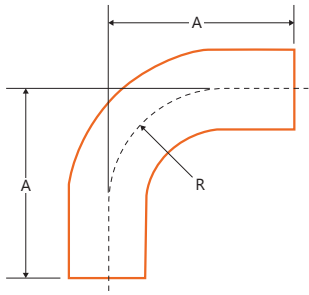
Eccentric Reducer



Nominal Size		A	Part Number	
Inch	mm	mm	304	316L
3/4 x 1/2	19.05 x 12.70	25.4	2511EA075050-11	2511EB075050-11
1 x 1/2	25.40 x 12.70	38.1	2511EA100050-11	2511EB100050-11
1 x 3/4	25.40 x 19.05	25.4	2511EA100075-11	2511EB100075-11
1 1/2 x 1	38.10 x 25.40	33.0	2511EA150100-11	2511EB150100-11
2 x 1	50.80 x 25.40	66.0	2511EA200100-11	2511EB200100-11
2 x 1 1/2	50.80 x 38.10	33.0	2511EA200150-11	2511EB200150-11
2 1/2 x 1	63.50 x 25.40	73.0	2511EA250100-11	2511EB250100-11
2 1/2 x 1 1/2	63.50 x 38.10	68.0	2511EA250150-11	2511EB250150-11
2 1/2 x 2	63.50 x 50.80	39.0	2511EA250200-11	2511EB250200-11
3 x 1	76.20 x 25.40	95.0	2511EA300100-11	2511EB300100-11
3 x 1 1/2	76.20 x 38.10	70.0	2511EA300150-11	2511EB300150-11
3 x 2	76.20 x 50.80	48.0	2511EA300200-11	2511EB300200-11
3 x 2 1/2	76.20 x 63.50	40.0	2511EA300250-11	2511EB300250-11
4 x 2	101.60 x 50.80	70.0	2511EA400200-11	2511EB400200-11
4 x 2 1/2	101.60 x 63.50	77.0	2511EA400250-11	2511EB400250-11
4 x 3	101.60 x 76.20	152.4	2511EA400300-11	2511EB400300-11

SMS

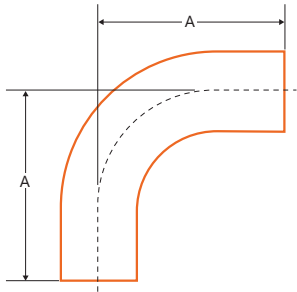
90° Long Tube Bend 1D



Nominal Size	Nominal Wall	A	R	Part Number	
DN	mm	mm	mm	304	316L
25	1.25	55	32	2307L1DA025-11	2307L1DB025-11
38	1.25	70	45	2307L1DA038-11	2307L1DB038-11
51	1.25	82	58	2307L1DA051-11	2307L1DB051-11
63.5	1.50	105	70	2307L1DA635-11	2307L1DB635-11
76.1	1.60	110	76	2307L1DA761-11	2307L1DB761-11
101.6	2.00	150	110	2307L1DA101-11	2307L1DB101-11
104	2.00	150	110	2307L1DA104-11	2307L1DB104-11

SMS

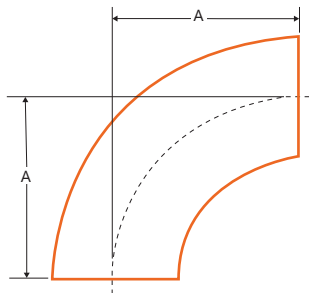
90° Long Tube Bend 1.5D



Nominal Size	Nominal Wall	A	Part Number	
DN	mm	mm	304	316L
25	1.25	60.10	2307LA025-11	2307LB025-11
38	1.25	79.20	2307LA038-11	2307LB038-11
51	1.25	101.20	2307LA051-11	2307LB051-11
63.5	1.50	125.25	2307LA635-11	2307LB635-11
76.1	1.60	144.30	2307LA761-11	2307LB761-11
104	2.00	187.40	2307LA104-11	2307LB104-11

SMS

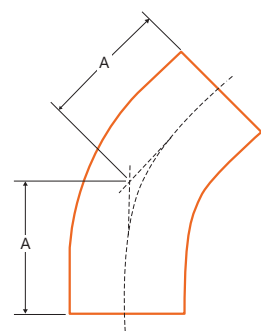
90° Short Tube Bend 1.5D



Nominal Size	Nominal Wall	A	Part Number	
DN	mm	mm	304	316L
25	1.25	38	2307SA025-11	2307SB025-11
38	1.25	57	2307SA038-11	2307SB038-11
51	1.25	77	2307SA051-11	2307SB051-11
63.5	1.50	95	2307SA635-11	2307SB635-11
76.1	1.60	114	2307SA761-11	2307SB761-11
101.6	2.10	152	2307SA101-11	2307SB101-11
104	2.00	152	2307SA104-11	2307SB104-11

SMS

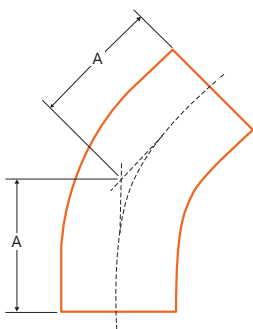
45° Long Tube Bend 1D



Nominal Size	Nominal Wall	A	Part Number	
DN	mm	mm	304	316L
25	1.25	42	2308L1DA025-11	2308L1DB025-11
38	1.25	49	2308L1DA038-11	2308L1DB038-11
51	1.25	58	2308L1DA051-11	2308L1DB051-11
63.5	1.50	75	2308L1DA635-11	2308L1DB635-11
76.1	1.60	79	2308L1DA761-11	2308L1DB761-11
101.6	2.00	86	2308L1DA101-11	2308L1DB101-11
104	2.00	86	2308L1DA104-11	2308L1DB104-11

SMS

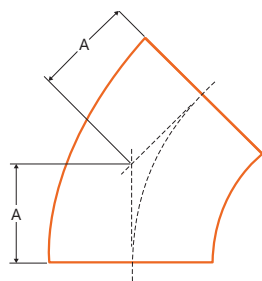
45° Long Tube Bend 1.5D



Nominal Size	Nominal Wall	A	Part Number	
DN	mm	mm	304	316L
25	1.25	37.80	2308LA025-11	2308LB025-11
38	1.25	45.70	2308LA038-11	2308LB038-11
51	1.25	51.00	2308LA051-11	2308LB051-11
63.5	1.50	69.50	2308LA635-11	2308LB635-11
76.1	1.60	77.00	2308LA761-11	2308LB761-11
104	2.00	98.20	2308LA104-11	2308LB104-11

SMS

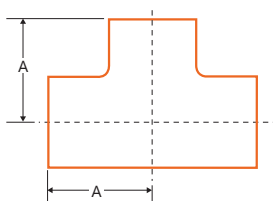
45° Short Tube Bend 1.5D



Nominal Size	Nominal Wall	A	Part Number	
DN	mm	mm	304	316L
25	1.25	16	2308SA025-11	2308SB025-11
38	1.25	24	2308SA038-11	2308SB038-11
51	1.25	32	2308SA051-11	2308SB051-11
63.5	1.50	39	2308SA635-11	2308SB635-11
76.1	1.60	47	2308SA761-11	2308SB761-11
101.6	2.10	64	2308SA101-11	2308SB101-11
104	2.00	63	2308SA104-11	2308SB104-11

SMS

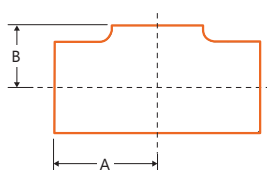
Equal Tee



Nominal Size	Nominal Wall	A	Part Number	
DN	mm	mm	304	316L
25	1.25	55	2309A025-11	2309B025-11
38	1.25	70	2309A038-11	2309B038-11
51	1.25	82	2309A051-11	2309B051-11
63.5	1.50	105	2309A635-11	2309B635-11
76.1	1.60	110	2309A761-11	2309B761-11
101.6	2.10	98	2309A101-11	2309B101-11
104	2.00	150	2309A104-11	2309B104-11

SMS

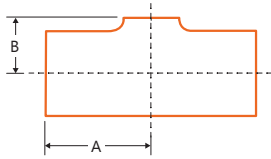
Short Outlet Equal Tee



Nominal Size	Nominal Wall	A	B	Part Number	
DN	mm	mm	mm	304	316L
25	1.25	55	15	2315A025-11	2315B025-11
38	1.25	70	22	2315A038-11	2315B038-11
51	1.25	82	28	2315A051-11	2315B051-11
63.5	1.50	105	36	2315A635-11	2315B635-11
76.1	1.60	110	43	2315A761-11	2315B761-11
101.6	2.10	98	54	2315A101-11	2315B101-11
104	2.00	150	58	2315A104-11	2315B104-11

SMS

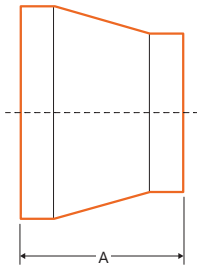
Short Outlet Reducing Tee



Nominal Size	Nominal Wall	A	B	Part Number	
DN	mm	mm	mm	304	316L
38 x 25	1.25 x 1.25	70	22	2314A038025-11	2314B038025-11
51 x 25	1.25 x 1.25	82	29	2314A051025-11	2314B051025-11
51 x 38	1.25 x 1.25	82	29	2314A051038-11	2314B051038-11
63.5 x 25	1.50 x 1.25	105	35	2314A635025-11	2314B635025-11
63.5 x 38	1.50 x 1.25	105	35	2314A635038-11	2314B635038-11
63.5 x 51	1.50 x 1.25	105	36	2314A635051-11	2314B635051-11
76.1 x 25	1.60 x 1.25	110	42	2314A761025-11	2314B761025-11
76.1 x 38	1.60 x 1.25	110	43	2314A761038-11	2314B761038-11
76.1 x 51	1.60 x 1.25	110	43	2314A761051-11	2314B761051-11
76.1 x 63.5	1.60 x 1.50	110	43	2314A761635-11	2314B761635-11
104 x 25	2.00 x 1.25	150	55	2314A104025-11	2314B104025-11
104 x 38	2.00 x 1.25	150	55	2314A104038-11	2314B104038-11
104 x 51	2.00 x 1.25	150	57	2314A104051-11	2314B104051-11
104 x 63.5	2.00 x 1.50	150	58	2314A104635-11	2314B104635-11
104 x 76.1	2.00 x 1.60	150	58	2314A104761-11	2314B104761-11

SMS

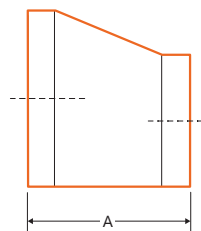
Concentric Reducer with Straight End



Nominal Size	Nominal Wall	A	Part Number	
DN	mm	mm	304	316L
38 x 25	1.25 x 1.25	39	2311CA038025-11	2311CB038025-11
51 x 25	1.25 x 1.25	57	2311CA051025-11	2311CB051025-11
51 x 38	1.25 x 1.25	39	2311CA051038-11	2311CB051038-11
63.5 x 25	1.50 x 1.25	74	2311CA635025-11	2311CB635025-11
63.5 x 38	1.50 x 1.25	57	2311CA635038-11	2311CB635038-11
63.5 x 51	1.50 x 1.25	39	2311CA635051-11	2311CB635051-11
76.1 x 25	1.60 x 1.25	92	2311CA761025-11	2311CB761025-11
76.1 x 38	1.60 x 1.25	74	2311CA761038-11	2311CB761038-11
76.1 x 51	1.60 x 1.25	57	2311CA761051-11	2311CB761051-11
76.1 x 63.5	1.60 x 1.50	39	2311CA761635-11	2311CB761635-11
101.6 x 51	2.10 x 1.25	91	2311CA101051-11	2311CB101051-11
101.6 x 63.5	2.10 x 1.50	74	2311CA101635-11	2311CB101635-11
101.6 x 76.1	2.10 x 1.60	56	2311CA101761-11	2311CB101761-11
104 x 51	2.00 x 1.25	95	2311CA104051-11	2311CB104051-11
104 x 63.5	2.00 x 1.50	78	2311CA104635-11	2311CB104635-11
104 x 76.1	2.00 x 1.60	60	2311CA104761-11	2311CB104761-11

SMS

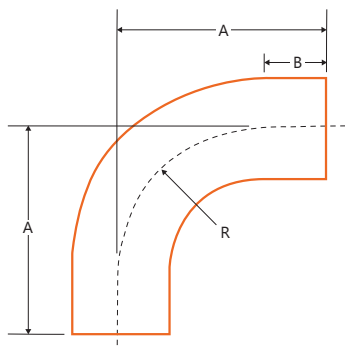
Eccentric Reducer with Straight End



Nominal Size	Nominal Wall	A	Part Number	
DN	mm	mm	304	316L
38 x 25	1.25 x 1.25	46	2311EA038025-11	2311EB038025-11
51 x 25	1.25 x 1.25	68	2311EA051025-11	2311EB051025-11
51 x 38	1.25 x 1.25	47	2311EA051038-11	2311EB051038-11
63.5 x 25	1.50 x 1.25	92	2311EA635025-11	2311EB635025-11
63.5 x 38	1.50 x 1.25	70	2311EA635038-11	2311EB635038-11
63.5 x 51	1.50 x 1.25	44	2311EA635051-11	2311EB635051-11
76.1 x 38	1.60 x 1.25	92	2311EA761038-11	2311EB761038-11
76.1 x 51	1.60 x 1.25	68	2311EA761051-11	2311EB761051-11
76.1 x 63.5	1.60 x 1.25	47	2311EA761635-11	2311EB761635-11
104 x 51	2.00 x 1.25	117	2311EA104051-11	2311EB104051-11
104 x 63.5	2.00 x 1.50	94	2311EA104635-11	2311EB104635-11
104 x 76.1	2.00 x 1.60	74	2311EA104761-11	2311EB104761-11

DIN 11865

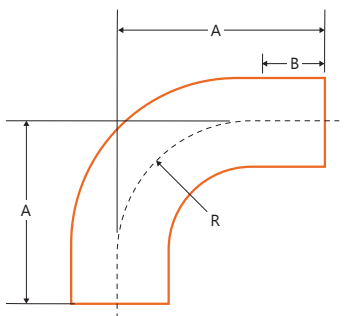
Series A 90° Long Elbow



Nominal Size		Nominal Wall	A	B	R	Part Number
DN	mm	mm	mm	mm	mm	316L
10	12	1.0	51	25	26	2707LB012-11
10	13	1.5	51	25	26	2707AB013-11
15	18	1.5	51	25	26	2707LB018-11
15	19	1.5	60	25	35	2707AB019-11
20	23	1.5	65	25	40	2707AB023-11
25	28	1.5	90	40	50	2707LB028-11
25	29	1.5	90	40	50	2707AB029-11
32	35	1.5	95	40	55	2707AB035-11
40	41	1.5	100	40	60	2707AB041-11
50	53	1.5	110	40	70	2707AB053-11
65	70	2.0	120	40	80	2707AB070-11
80	85	2.0	145	55	90	2707AB085-11
100	104	2.0	155	55	100	2707AB104-11

DIN 11852

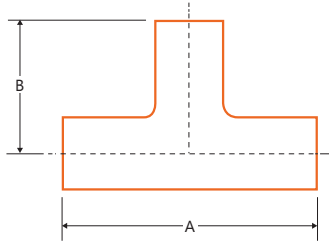
Series 2 90° Long Elbow



Nominal Size		Nominal Wall	A	B	R	Part Number
DN	mm	mm	mm	mm	mm	316L
10	13	1.5	51	25	26	272SC013-11
15	19	1.5	60	25	35	272SC019-11
20	23	1.5	65	25	40	272SC023-11
25	29	1.5	90	40	50	272SC029-11
32	35	1.5	95	40	55	272SC035-11
40	41	1.5	100	40	60	272SC041-11
50	53	1.5	110	40	70	272SC053-11
65	70	2.0	120	40	80	272SC070-11
80	85	2.0	145	55	90	272SC085-11

DIN 11852

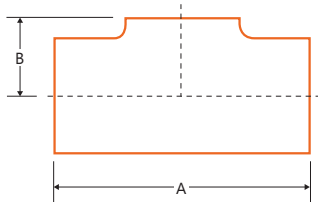
Series 2 Equal Tee



Nominal Size		Nominal Wall	A	B	Part Number
DN	mm	mm	mm	mm	316L
15	19	1.5	35	35	277WC019-11
20	23	1.5	40	40	277WC023-11
25	29	1.5	50	50	277WC029-11
32	35	1.5	55	55	277WC035-11
40	41	1.5	60	60	277WC041-11
50	53	1.5	70	70	277WC053-11
65	70	2.0	80	80	277WC070-11
80	85	2.0	90	90	277WC085-11
100	104	2.0	100	100	277WC104-11

DIN 11852

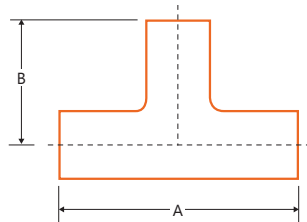
Series 2 Short Outlet Equal Tee



Nominal Size		Nominal Wall	A	B	Part Number
DN	mm	mm	mm	mm	316L
15	19	1.5	35	11.0	277WTC019-11
20	23	1.5	40	13.0	277WTC023-11
25	29	1.5	50	16.5	277WTC029-11
32	35	1.5	55	19.0	277WTC035-11
40	41	1.5	60	22.5	277WTC041-11
50	53	1.5	70	29.5	277WTC053-11
65	70	2.0	80	40.0	277WTC070-11
80	85	2.0	90	47.5	277WTC085-11
100	104	2.0	100	58.0	277WTC104-11

AS

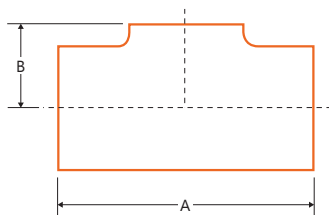
Short Equal Tee



Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1/2	12.70	1.500	38.100	0.75	19.050	2909SA050-11	2909SB050-11
3/4	19.05	2.250	57.200	1.13	28.625	2909SA075-11	2909SB075-11
1	25.40	3.000	76.200	1.50	38.100	2909SA100-11	2909SB100-11
1 1/4	31.80	3.750	95.400	1.88	47.700	2909SA125-11	2909SB125-11
1 1/2	38.10	4.500	114.300	2.25	57.150	2909SA150-11	2909SB150-11
2	50.80	6.000	152.400	3.00	76.200	2909SA200-11	2909SB200-11
2 1/2	63.50	7.500	190.500	3.75	95.250	2909SA250-11	2909SB250-11
3	76.20	9.000	228.600	4.50	114.300	2909SA300-11	2909SB300-11
4	101.60	12.000	304.800	6.00	152.400	2909SA400-11	2909SB400-11

AS

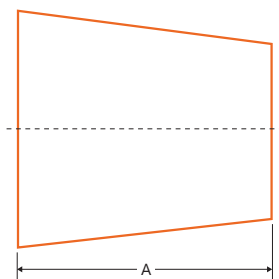
Short Outlet Equal Tee



Nominal Size		A		B		Part Number	
Inch	mm	Inch	mm	Inch	mm	304	316L
1/2	12.70	1.500	38.100	0.37	9.350	2909STA050-11	2909STB050-11
3/4	19.05	2.250	57.200	0.49	12.525	2909STA075-11	2909STB075-11
1	25.40	3.000	76.200	0.62	15.700	2909STA100-11	2909STB100-11
1 1/4	31.80	3.750	95.400	0.74	18.900	2909STA125-11	2909STB125-11
1 1/2	38.10	4.500	114.300	0.87	22.050	2909STA150-11	2909STB150-11
2	50.80	6.000	152.400	1.12	28.400	2909STA200-11	2909STB200-11
2 1/2	63.50	7.500	190.500	1.37	34.750	2909STA250-11	2909STB250-11
3	76.20	9.000	228.600	1.62	41.100	2909STA300-11	2909STB300-11
4	101.60	12.000	304.800	2.20	55.800	2909STA400-11	2909STB400-11

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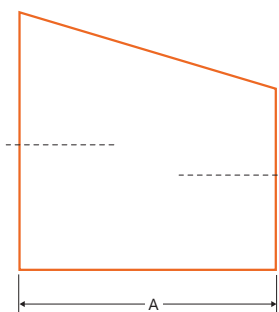
Concentric Reducer WW



Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
1 x 1/2	25.40 x 12.70	1.000	25.40	2931A100050-11	2931B100050-11
1 x 3/4	25.40 x 19.05	1.000	25.40	2931A100075-11	2931B100075-11
1 1/2 x 1	38.10 x 25.40	1.500	38.10	2931A150100-11	2931B150100-11
1 1/2 x 1 1/4	38.10 x 31.80	1.500	38.10	2931A150125-11	2931B150125-11
2 x 1	50.80 x 25.40	2.000	50.80	2931A200100-11	2931B200100-11
2 x 1 1/4	50.80 x 31.80	2.000	50.80	2931A200125-11	2931B200125-11
2 x 1 1/2	50.80 x 38.10	2.000	50.80	2931A200150-11	2931B200150-11
2 1/2 x 1	63.50 x 25.40	2.500	63.50	2931A250100-11	2931B250100-11
2 1/2 x 1 1/4	63.50 x 31.80	2.500	63.50	2931A250125-11	2931B250125-11
2 1/2 x 1 1/2	63.50 x 38.10	2.500	63.50	2931A250150-11	2931B250150-11
2 1/2 x 2	63.50 x 50.80	2.500	63.50	2931A250200-11	2931B250200-11
3 x 1	76.20 x 25.40	3.000	76.20	2931A300100-11	2931B300100-11
3 x 1 1/2	76.20 x 38.10	3.000	76.20	2931A300150-11	2931B300150-11
3 x 2	76.20 x 50.80	3.000	76.20	2931A300200-11	2931B300200-11
3 x 2 1/2	76.20 x 63.50	3.000	76.20	2931A300250-11	2931B300250-11
4 x 1 1/2	101.60 x 38.10	4.000	101.60	2931A400150-11	2931B400150-11
4 x 2	101.60 x 50.80	4.000	101.60	2931A400200-11	2931B400200-11
4 x 2 1/2	101.60 x 63.50	4.000	101.60	2931A400250-11	2931B400250-11
4 x 3	101.60 x 76.20	4.000	101.60	2931A400300-11	2931B400300-11
6 x 2	152.40 x 50.80	6.000	152.40	2931A600200-11	2931B600200-11
6 x 3	152.40 x 76.20	6.000	152.40	2931A600300-11	2931B600300-11
6 x 4	152.40 x 101.60	6.000	152.40	2931A600400-11	2931B600400-11

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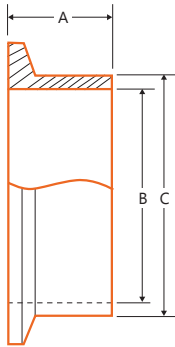
Eccentric Reducer WW



Nominal Size		A		Part Number	
Inch	mm	Inch	mm	304	316L
1 1/2 x 1	38.10 x 25.40	1.500	38.10	2932A150100-11	2932B150100-11
1 1/2 x 1 1/4	38.10 x 31.80	1.500	38.10	2932A150125-11	2932B150125-11
2 x 1	50.80 x 25.40	2.000	50.80	2932A200100-11	2932B200100-11
2 x 1 1/2	50.80 x 38.10	2.000	50.80	2932A200150-11	2932B200150-11
2 1/2 x 1 1/4	63.50 x 31.80	2.500	63.50	2932A250125-11	2932B250125-11
2 1/2 x 1 1/2	63.50 x 38.10	2.500	63.50	2932A250150-11	2932B250150-11
2 1/2 x 2	63.50 x 50.80	2.500	63.50	2932A250200-11	2932B250200-11
3 x 1 1/2	76.20 x 38.10	3.000	76.20	2932A300150-11	2932B300150-11
3 x 2	76.20 x 50.80	3.000	76.20	2932A300200-11	2932B300200-11
3 x 2 1/2	76.20 x 63.50	3.000	76.20	2932A300250-11	2932B300250-11
4 x 1 1/2	101.60 x 38.10	4.000	101.60	2932A400150-11	2932B400150-11
4 x 2	101.60 x 50.80	4.000	101.60	2932A400200-11	2932B400200-11
4 x 2 1/2	101.60 x 63.50	4.000	101.60	2932A400250-11	2932B400250-11
4 x 3	101.60 x 76.20	4.000	101.60	2932A400300-11	2932B400300-11
6 x 3	152.40 x 76.20	6.000	152.40	2932A600300-11	2932B600300-11
6 x 4	152.40 x 101.60	6.000	152.40	2932A600400-11	2932B600400-11

14WMP

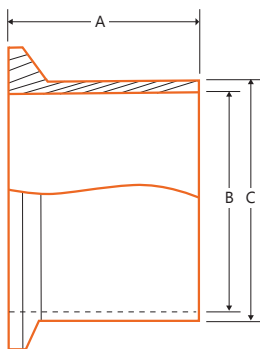
Short Welding Ferrule



Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	304	316L
1/2	12.70	9.40	12.70	2414WMPA05011	2414WMPB05011
3/4	12.70	15.75	19.05	2414WMPA07511	2414WMPB07511
1	12.70	22.10	25.40	2414WMPA10011	2414WMPB10011
1 1/2	12.70	34.80	38.10	2414WMPA15011	2414WMPB15011
2	12.70	47.50	50.80	2414WMPA20011	2414WMPB20011
2 1/2	12.70	60.20	63.50	2414WMPA25011	2414WMPB25011
3	12.70	72.90	76.20	2414WMPA30011	2414WMPB30011
4	15.88	97.38	101.60	2414WMPA40011	2414WMPB40011
6	22.20	146.86	152.40	2414WMPA60011	2414WMPB60011
8	22.20	197.66	203.20	2414WMPA80027711	2414WMPB80027711
8	22.20	197.10	203.20	2414WMPA80011	2414WMPB80011
10	22.20	248.46	254.00	2414WMPA100011	2414WMPB100011
12	22.20	298.70	304.80	2414WMPA120011	2414WMPB120011

14MMP

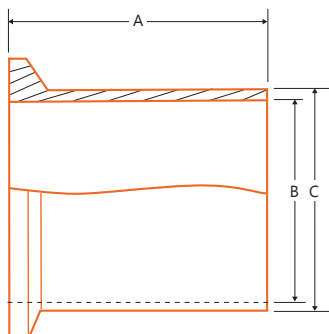
Medium Welding Ferrule



Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	304	316L
1/2	21.50	9.40	12.70	2414MMPA05011	2414MMPB05011
3/4	21.50	15.75	19.05	2414MMPA07511	2414MMPB07511
1	21.50	22.10	25.40	2414MMPA10011	2414MMPB10011
1 1/2	21.50	34.80	38.10	2414MMPA15011	2414MMPB15011
2	21.50	47.50	50.80	2414MMPA20011	2414MMPB20011
2 1/2	21.50	60.20	63.50	2414MMPA25011	2414MMPB25011
3	21.50	72.90	76.20	2414MMPA30011	2414MMPB30011
4	21.50	97.38	101.60	2414MMPA40011	2414MMPB40011
6	21.50	146.86	152.40	2414MMPA60011	2414MMPB60011
8	21.50	197.10	203.20	2414MMPA80011	2414MMPB80011
10	21.50	248.46	254.00	2414MMPA100011	2414MMPB100011
12	21.50	298.70	304.80	2414MMPA120011	2414MMPB120011

14AMP

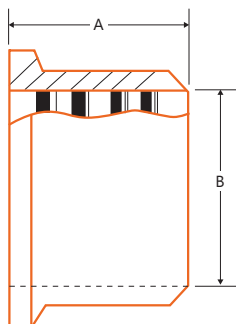
Long Welding Ferrule



Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	304	316L
1/2	28.60	9.40	12.70	2414AMPA05011	2414AMPB05011
3/4	28.60	15.75	19.05	2414AMPA07511	2414AMPB07511
1	28.60	22.10	25.40	2414AMPA10011	2414AMPB10011
1 1/2	28.60	34.80	38.10	2414AMPA15011	2414AMPB15011
2	28.60	47.50	50.80	2414AMPA20011	2414AMPB20011
2 1/2	28.60	60.20	63.50	2414AMPA25011	2414AMPB25011
3	28.60	72.90	76.20	2414AMPA30011	2414AMPB30011
4	28.60	97.38	101.60	2414AMPA40011	2414AMPB40011
6	28.60	146.86	152.40	2414AMPA60028611	2414AMPB60028611
8	28.60	197.10	203.20	2414AMPA80028611	2414AMPB80028611
10	28.60	248.46	254.00	2414AMPA100028611	2414AMPB100028611
12	28.60	298.70	304.80	2414AMPA120028611	2414AMPB120028611
6	38.10	146.86	152.40	2414AMPA60011	2414AMPB60011
8	38.10	197.10	203.20	2414AMPA80011	2414AMPB80011
10	38.10	248.46	254.00	2414AMPA100011	2414AMPB100011
12	38.10	298.70	304.80	2414AMPA120011	2414AMPB120011

14RMP

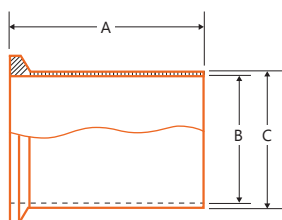
Roll-On Ferrule



Nominal Size	A	B	Part Number	
Inch	mm	mm	304	316L
1	19.05	25.53	2414RMPA100	2414RMPB100
1 1/2	28.58	38.23	2414RMPA150	2414RMPB150
2	33.32	50.93	2414RMPA200	2414RMPB200
2 1/2	34.93	63.63	2414RMPA250	2414RMPB250
3	36.50	76.33	2414RMPA300	2414RMPB300
4	38.10	101.73	2414RMPA400	2414RMPB400
6	50.80	152.53	2414RMPA600	2414RMPB600

14WLMP

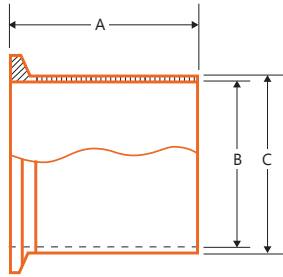
Light Tank Welding Ferrule



Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	304	316L
1	76.20	22.10	25.40	2414WLMPA100-11	2414WLMPB100-11
1 1/2	76.20	34.80	38.10	2414WLMPA150-11	2414WLMPB150-11
2	76.20	47.50	50.80	2414WLMPA200-11	2414WLMPB200-11
2 1/2	76.20	60.20	63.50	2414WLMPA250-11	2414WLMPB250-11
3	101.60	72.90	76.20	2414WLMPA300-11	2414WLMPB300-11
4	101.60	97.38	101.60	2414WLMPA400-11	2414WLMPB400-11
6	152.40	146.86	152.40	2414WLMPA600-11	2414WLMPB600-11
8	152.40	197.10	203.20	2414WLMPA800-11	2414WLMPB800-11
10	152.40	248.46	254.00	2414WLMPA1000-11	2414WLMPB1000-11
12	152.40	298.70	304.80	2414WLMPA1200-11	2414WLMPB1200-11

14MPW

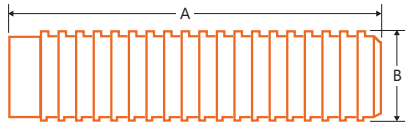
Heavy Tank Welding Ferrule



Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	304	316L
1/2	41.28	8.15	12.75	2414MPWA050	2414MPWB050
3/4	41.28	14.58	19.05	2414MPWA075	2414MPWB075
1	41.28	22.10	29.46	2414MPWA100	2414MPWB100
1 1/2	41.28	34.80	42.57	2414MPWA150	2414MPWB150
2	44.45	47.50	55.68	2414MPWA200	2414MPWB200
2 1/2	44.45	60.20	68.78	2414MPWA250	2414MPWB250
3	46.05	72.90	81.89	2414MPWA300	2414MPWB300
4	53.98	97.38	108.10	2414MPWA400	2414MPWB400
6	63.50	146.25	157.28	2414MPWA600	2414MPWB600
8	63.50	197.05	208.08	2414MPWA800	2414MPWB800

14WHRL

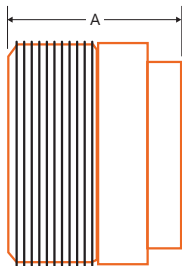
Long Weld Hose Adapter



Nominal Size	Nominal Wall	A	B	Part Number
Inch	mm	mm	mm	316L
1	2.95	76.20	26.16	2414WHRLB10011
1 1/2	2.95	114.30	38.86	2414WHRLB15011
2	2.95	114.30	51.56	2414WHRLB20011
2 1/2	2.95	127.00	64.26	2414WHRLB25011
3	2.95	127.00	76.96	2414WHRLB30011
4	2.95	123.83	102.36	2414WHRLB40011

19WB

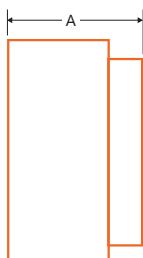
Male NPT x Weld Adapter



Nominal Size	Nominal Wall	A	Part Number	
Inch	mm	mm	304	316L
1/2	1.65	41.28	2419WBA050	2419WBB050
3/4	1.65	41.28	2419WBA075	2419WBB075
1	1.65	44.45	2419WBA100	2419WBB100
1 1/2	1.65	44.45	2419WBA150	2419WBB150
2	1.65	46.02	2419WBA200	2419WBB200
2 1/2	1.65	58.72	2419WBA250	2419WBB250
3	1.65	63.50	2419WBA300	2419WBB300
4	2.11	65.07	2419WBA400	2419WBB400

22WB

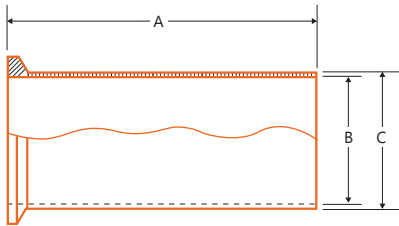
Female NPT x Weld Adapter



Nominal Size	Nominal Wall	A	Part Number	
Inch	mm	mm	304	316L
1/2	1.65	31.75	2422WBA050	2422WBB050
3/4	1.65	41.28	2422WBA075	2422WBB075
1	1.65	44.45	2422WBA100	2422WBB100
1 1/2	1.65	44.45	2422WBA150	2422WBB150
2	1.65	46.02	2422WBA200	2422WBB200
2 1/2	1.65	58.72	2422WBA250	2422WBB250
3	1.65	63.50	2422WBA300	2422WBB300
4	2.11	63.50	2422WBA400	2422WBB400

14MPHT

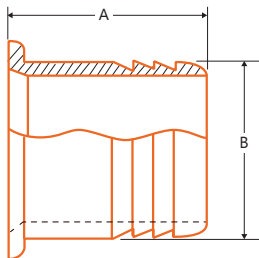
Tygon Hose Adapter



Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	304	316L
1/2	101.60	9.40	12.70	2414MPHTA050	2414MPHTB050
3/4	101.60	15.75	19.05	2414MPHTA075	2414MPHTB075
1	114.30	22.10	25.40	2414MPHTA100	2414MPHTB100
1 1/2	114.30	34.80	38.10	2414MPHTA150	2414MPHTB150
2	114.30	47.50	50.80	2414MPHTA200	2414MPHTB200
2 1/2	114.30	60.20	63.50	2414MPHTA250	2414MPHTB250
3	114.30	72.90	76.20	2414MPHTA300	2414MPHTB300
4	117.48	97.38	101.60	2414MPHTA400	2414MPHTB400
6	152.40	146.86	152.40	2414MPHTA600	2414MPHTB600

14MPHR

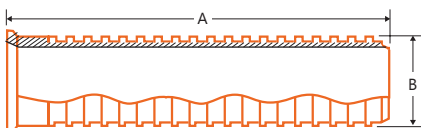
Rubber Hose Adapter



Tube OD	Hose Size	A	B	Part Number	
Inch	Inch	mm	mm	304	316L
1/2	3/8	38.10	10.29	2414MPHRA050038	2414MPHRB050038
1/2	1/2	38.10	12.70	2414MPHRA050	2414MPHRB050
3/4	1/4	38.10	7.92	2414MPHRA075014	2414MPHRB075014
3/4	3/8	38.10	10.29	2414MPHRA075038	2414MPHRB075038
3/4	1/2	38.10	12.70	2414MPHRA075050	2414MPHRB075050
3/4	3/4	38.10	19.05	2414MPHRA075	2414MPHRB075
1	3/8	38.10	10.29	2414MPHRA100038	2414MPHRB100038
1	1/2	38.10	12.70	2414MPHRA100050	2414MPHRB100050
1	3/4	42.88	19.05	2414MPHRA100075	2414MPHRB100075
1	1	42.88	25.40	2414MPHRA100	2414MPHRB100
1 1/2	1/2	38.10	12.70	2414MPHRA150050	2414MPHRB150050
1 1/2	3/4	38.10	19.05	2414MPHRA150075	2414MPHRB150075
1 1/2	1	42.85	25.40	2414MPHRA150100	2414MPHRB150100
1 1/2	1 1/2	42.85	38.10	2414MPHRA150	2414MPHRB150
2	1 1/2	58.72	38.10	2414MPHRA200150	2414MPHRB200150
2	2	58.72	50.80	2414MPHRA200	2414MPHRB200
2 1/2	2 1/2	59.54	63.50	2414MPHRA250	2414MPHRB250
3	3	78.59	76.20	2414MPHRA300	2414MPHRB300
4	4	86.51	101.60	2414MPHRA400	2414MPHRB400
6	6	86.51	152.40	2414MPHRA600	2414MPHRB600
8	8	86.51	203.20	2414MPHRA800	2414MPHRB800

14MPHRL

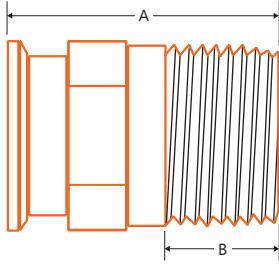
Brewery Rubber Hose Adapter



Tube OD	A	B	Part Number	
Inch	mm	mm	304	316L
1	88.90	26.54	2414MPHRLA100100	2414MPHRLB100100
1 1/2	127.00	39.24	2414MPHRLA150150	2414MPHRLB150150
2	127.00	51.94	2414MPHRLA200200	2414MPHRLB200200
2 1/2	139.70	64.64	2414MPHRLA250250	2414MPHRLB250250
3	139.70	77.34	2414MPHRLA300300	2414MPHRLB300300
4	139.70	102.74	2414MPHRLA400400	2414MPHRLB400400

21MP

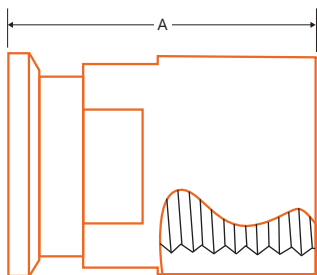
Male NPT x Clamp Adapter



Tube OD Inch	NPT Size Inch	A mm	B mm	Part Number	
				304	316L
1/2	3/8	50.80	15.24	2421MPA050038	2421MPB050038
1/2	1/2	41.28	19.86	2421MPA050050	2421MPB050050
1/2	3/4	50.80	20.17	2421MPA050075	2421MPB050075
3/4	1/2	50.80	19.86	2421MPA075050	2421MPB075050
3/4	3/4	45.39	20.17	2421MPA075075	2421MPB075075
3/4	1	57.15	25.02	2421MPA075100	2421MPB075100
1	1/2	55.55	19.86	2421MPA100050	2421MPB100050
1	3/4	55.55	20.17	2421MPA100075	2421MPB100075
1	1	57.15	25.02	2421MPA100100	2421MPB100100
1	1 1/2	61.93	26.04	2421MPA100150	2421MPB100150
1	2	66.68	26.87	2421MPA100200	2421MPB100200
1 1/2	1/2	55.55	19.86	2421MPA150050	2421MPB150050
1 1/2	3/4	55.55	20.17	2421MPA150075	2421MPB150075
1 1/2	1	61.90	25.02	2421MPA150100	2421MPB150100
1 1/2	1 1/4	61.93	25.63	2421MPA150125	2421MPB150125
1 1/2	1 1/2	57.15	26.04	2421MPA150150	2421MPB150150
1 1/2	2	66.68	26.87	2421MPA150200	2421MPB150200
1 1/2	2 1/2	83.34	39.90	2421MPA150250	2421MPB150250
2	1/2	55.58	19.86	2421MPA200050	2421MPB200050
2	3/4	55.58	20.17	2421MPA200075	2421MPB200075
2	1	62.71	25.02	2421MPA200100	2421MPB200100
2	1 1/2	66.68	25.63	2421MPA200150	2421MPB200150
2	2	67.01	26.87	2421MPA200200	2421MPB200200
2	2 1/2	79.38	39.90	2421MPA200250	2421MPB200250
2	3	88.90	41.50	2421MPA200300	2421MPB200300
2	4	88.90	44.04	2421MPA200400	2421MPB200400
2 1/2	1/2	70.64	19.86	2421MPA250050	2421MPB250050
2 1/2	1	70.64	19.86	2421MPA250100	2421MPB250100
2 1/2	1 1/2	70.64	26.04	2421MPA250150	2421MPB250150
2 1/2	2	70.64	26.87	2421MPA250200	2421MPB250200
2 1/2	2 1/2	73.03	39.90	2421MPA250250	2421MPB250250
2 1/2	3	93.73	41.50	2421MPA250300	2421MPB250300
3	1	76.20	25.02	2421MPA300100	2421MPB300100
3	1 1/2	76.20	25.63	2421MPA300150	2421MPB300150
3	2	76.20	26.87	2421MPA300200	2421MPB300200
3	2 1/2	76.20	39.90	2421MPA300250	2421MPB300250
3	3	77.98	41.50	2421MPA300300	2421MPB300300
3	4	88.90	44.04	2421MPA300400	2421MPB300400
4	3	96.85	41.50	2421MPA400300	2421MPB400300
4	4	80.14	44.04	2421MPA400400	2421MPB400400

22MP

Female NPT x Clamp Adapter

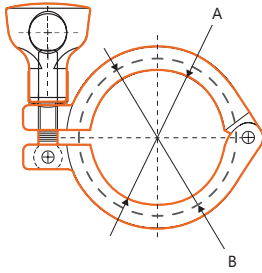


Tube OD	NPT Size	A	Part Number	
Inch	Inch	mm	304	316L
1/2	3/8	38.10	2422MPA050038	2422MPB050038
1/2	1/2	38.10	2422MPA050050	2422MPB050050
1/2	3/4	38.10	2422MPA050075	2422MPB050075
3/4	1/2	41.28	2422MPA075050	2422MPB075050
3/4	3/4	41.28	2422MPA075075	2422MPB075075
3/4	1	41.28	2422MPA075100	2422MPB075100
1	1/2	41.28	2422MPA100050	2422MPB100050
1	3/4	41.28	2422MPA100075	2422MPB100075
1	1	41.28	2422MPA100100	2422MPB100100
1	1 1/2	41.28	2422MPA100150	2422MPB100150
1	2	63.50	2422MPA100200	2422MPB100200
1 1/2	1/2	41.28	2422MPA150050	2422MPB150050
1 1/2	3/4	41.28	2422MPA150075	2422MPB150075
1 1/2	1	57.15	2422MPA150100	2422MPB150100
1 1/2	1 1/4	57.15	2422MPA150125	2422MPB150125
1 1/2	1 1/2	57.15	2422MPA150150	2422MPB150150
1 1/2	2	63.50	2422MPA150200	2422MPB150200
1 1/2	2 1/2	63.50	2422MPA150250	2422MPB150250
1 1/2	3	63.50	2422MPA150300	2422MPB150300
2	1/2	42.85	2422MPA200050	2422MPB200050
2	3/4	42.85	2422MPA200075	2422MPB200075
2	1	42.85	2422MPA200100	2422MPB200100
2	1 1/2	59.54	2422MPA200150	2422MPB200150
2	2	61.11	2422MPA200200	2422MPB200200
2	2 1/2	61.11	2422MPA200250	2422MPB200250
2	3	61.11	2422MPA200300	2422MPB200300
2	4	61.11	2422MPA200400	2422MPB200400
2 1/2	3/4	33.35	2422MPA250075	2422MPB250075
2 1/2	1	33.35	2422MPA250100	2422MPB250100
2 1/2	1 1/2	42.06	2422MPA250150	2422MPB250150
2 1/2	2	53.16	2422MPA250200	2422MPB250200
2 1/2	2 1/2	55.55	2422MPA250250	2422MPB250250
2 1/2	3	55.55	2422MPA250300	2422MPB250300
3	1	55.55	2422MPA300100	2422MPB300100
3	1 1/2	55.55	2422MPA300150	2422MPB300150
3	2	55.55	2422MPA300200	2422MPB300200
3	2 1/2	55.55	2422MPA300250	2422MPB300250
3	3	55.55	2422MPA300300	2422MPB300300
4	3	55.55	2422MPA400300	2422MPB400300
4	4	92.76	2422MPA400400	2422MPB400400

13GH

Single Pin Heavy
Duty Clamp

#14 Wing Nut



Nominal Size	A	B	Part Number
Inch	mm	mm	304
1/2 - 3/4	20.00	28.20	2433GHA075W4-99
1 - 1 1/2	44.40	53.60	2433GHA150W4-99
2	57.80	67.00	2433GHA200W4-99
2 1/2	71.40	80.60	2433GHA250W4-99
3	84.00	94.20	2433GHA300W4-99
4	110.00	122.20	2433GHA400W4-99
6	155.40	170.40	2433GHA600W4-99
8	205.00	220.00	2433GHA800W4-99
10	286.00	271.00	2433GHA1000W4-99
12	337.00	322.00	2433GHA1200W4-99

Wing-Nut

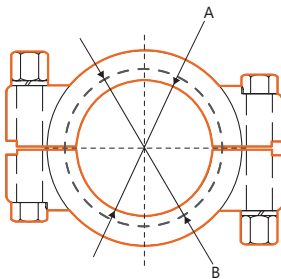
For Clamp



Part Number	#11 W1	#12 W2	#13 W3	#14 W4	#15 W5
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13MHP

High Pressure Clamp

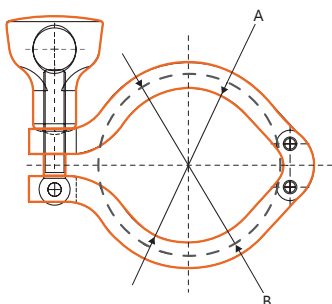


Nominal Size	A	B	Part Number
Inch	mm	mm	304
1/2 - 3/4	20.00	28.00	2433MHHPA075-99
1 - 1 1/2	43.32	52.00	2433MHHPA150-99
2	56.44	65.50	2433MHHPA200-99
2 1/2	69.54	79.00	2433MHHPA250-99
3	77.56	92.50	2433MHHPA300-99
4	108.86	120.50	2433MHHPA400-99
6	158.00	170.00	2433MHHPA600-99
8	222.50	237.50	2433MHHPA800-99
10	258.20	272.80	2433MHHPA1000-99
12	309.00	327.60	2433MHHPA1200-99

13MHHM

Double Pin Heavy
Duty Clamp

#14 Wing Nut

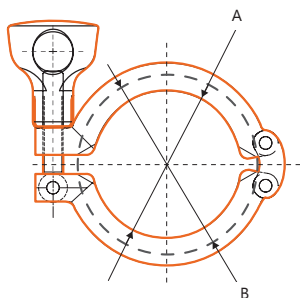


Nominal Size	A	B	Part Number
Inch	mm	mm	304
1/2 - 3/4	20.00	28.00	2433DPA075W4-99
1 - 1 1/2	43.60	53.60	2433DPA150W4-99
2	57.00	67.00	2433DPA200W4-99
2 1/2	70.60	80.60	2433DPA250W4-99
3	84.00	94.00	2433DPA300W4-99
4	112.00	122.00	2433DPA400W4-99
6	155.00	170.00	2433DPA600W4-99
8	205.00	220.80	2433DPA800W4-99

13SF

Double Pin Heavy
Duty Clamp

#14 Wing Nut

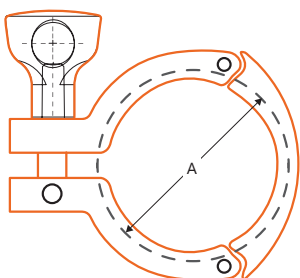


Nominal Size	A	B	Part Number
Inch	mm	mm	304
1/2 - 3/4	20.00	28.00	2433SFA075W4-99
1 - 1 1/2	45.00	58.60	2433SFA150W4-99
2	59.00	72.00	2433SFA200W4-99
2 1/2	67.00	84.00	2433SFA250W4-99
3	85.00	98.00	2433SFA300W4-99
4	114.00	127.00	2433SFA400W4-99

13MHHS

Three Segment
Clamp

#14 Wing Nut



Nominal Size	A	Part Number
Inch	mm	304
1 - 1 1/2	54.00	2433TSA150W4-99
2	67.50	2433TSA200W4-99
2 1/2	80.90	2433TSA250W4-99
3	84.40	2433TSA300W4-99
4	122.40	2433TSA400W4-99

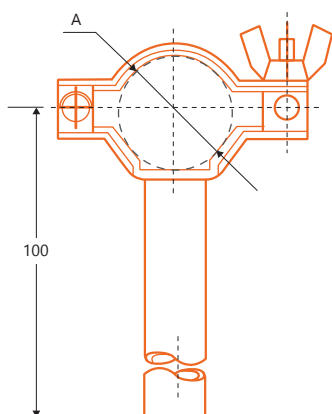
Recommended Max. PSI Service Ratings for Clamps

Nominal Size	13GH		13MHM		13MHHS		13MHP	
Inch	@20°C	@120°C	@20°C	@120°C	@20°C	@120°C	@20°C	@120°C
1/2- 3/4	1500	1200					1500	1200
1- 1 1/2	500	300	500	250	600	300	1500	1200
2	450	250	450	250	550	275	1000	800
2 1/2	400	200	400	200	450	225	1000	800
3	350	175	350	150	350	160	1000	800
4	200	125	200	125	250	150	800	600
6	150	75					300	200
8	100	50						
10	40	30						
12	30	25						

* All ratings are dependent upon related components in the system and proper installation.

TH-1

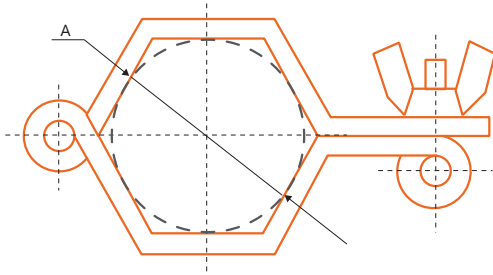
Tube Hanger w/ Leg



Nominal Size	A	Part Number
Inch	mm	304
1	25.4	24TH1A100
1 1/2	38.1	24TH1A150
2	50.8	24TH1A200
2 1/2	63.5	24TH1A250
3	76.2	24TH1A300
4	101.6	24TH1A400

TH-3

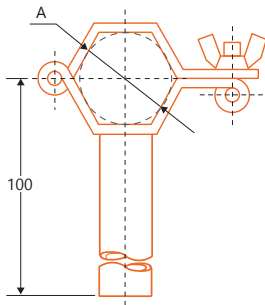
Type A Hex Hanger w/o Leg



Nominal Size	A	Part Number
Inch	mm	304
1/2	12.5	24TH3A050
3/4	19.0	24TH3A075
1	25.0	24TH3A100
1 1/2	38.0	24TH3A150
2	51.0	24TH3A200
2 1/2	63.5	24TH3A250
3	76.0	24TH3A300
4	101.6	24TH3A400

TH-3

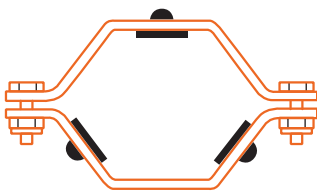
Type D Hex Hanger w/ Leg



Nominal Size	A	Part Number
Inch	mm	304
1/2	12.5	24TH3DA050
3/4	19.0	24TH3DA075
1	25.0	24TH3DA100
1 1/2	38.0	24TH3DA150
2	51.0	24TH3DA200
2 1/2	63.5	24TH3DA250
3	76.0	24TH3DA300
4	101.6	24TH3DA400

TH-4

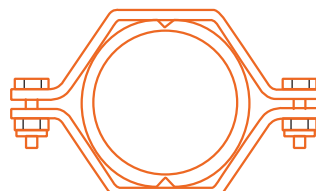
Hex Tube Hanger w/ Grommets



Nominal Size	Part Number
Inch	304
1/2	24TH4A050G
3/4	24TH4A075G
1	24TH4A100G
1 1/2	24TH4A150G
2	24TH4A200G
2 1/2	24TH4A250G
3	24TH4A300G
4	24TH4A400G
6	24TH4A600G
8	24TH4A800G
10	24TH4A1000G

TH-4

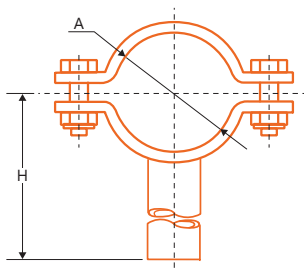
Hex Tube Hanger w/ PVC Sleeve



Nominal Size	Part Number
Inch	304
1/2	24TH4A050P
3/4	24TH4A075P
1	24TH4A100P
1 1/2	24TH4A150P
2	24TH4A200P
2 1/2	24TH4A250P
3	24TH4A300P
4	24TH4A400P
6	24TH4A600P

TH-5

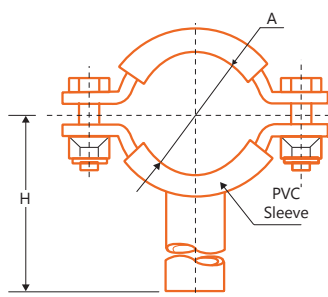
Type A Round Hanger w/ Leg



Nominal Size	A	H	Part Number
Inch	mm	mm	304
1/2	12.5	90	24TH5GHA050
3/4	19.0	90	24TH5GHA075
1	25.4	90	24TH5GHA100
1 1/2	38.1	90	24TH5GHA150
2	50.8	90	24TH5GHA200
2 1/2	63.5	90	24TH5GHA250
3	76.2	90	24TH5GHA300
4	101.6	90	24TH5GHA400
6	152.4	130	24TH5A600

TH-6B

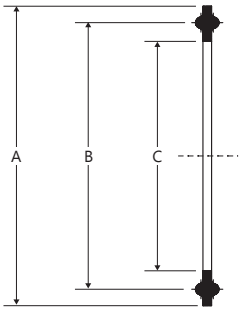
Round Hanger w/ PVC Sleeve and Leg



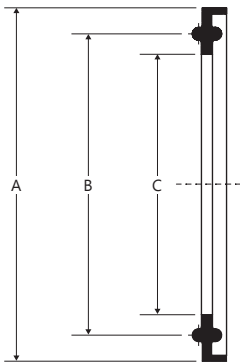
Nominal Size	A	H	Part Number
Inch	mm	mm	304
1	25.4	90	24TH6BA100P
1 1/2	38.1	90	24TH6BA150P
2	50.8	90	24TH6BA200P
2 1/2	63.5	90	24TH6BA250P
3	76.2	90	24TH6BA300P
4	101.6	90	24TH6BA400P
6	152.4	130	24TH6A600P

Material	Average Temperature Range*	
	Min. °C	Max. °C
PTFE/ FKM TEFLON®/ VITON®	-60	180
PTFE TEFLON®	-15	200
VMQ SILICONE	-40	190
FKM VITON®	-20	200
EPDM	-30	120

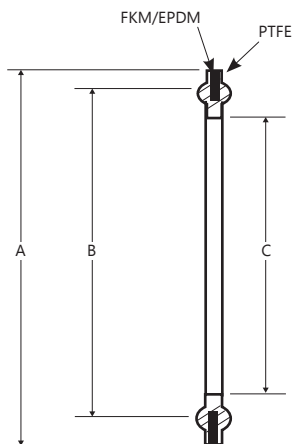
*Each material has many different grades and variants this is a general overview of the average temperature ranges of each material type.

13PG**Ferrule Gasket Plain Type**

Nominal Size	A	B	C	Part Number				
Inch	mm	mm	mm	EPDM (Black/White)	SILICONE (Platinum-Cured)	PTFE/TEFLON	FKM/VITON®	NBR/BUNA-N
1/2	21.80	-	9.65	2413PGE050Q	2413PGSPT050Q	2413PGT050Q	2413PGV050QW	2413PGN050Q
3/4	21.80	-	15.75	2413PGE075Q	2413PGSPT075Q	2413PGT075Q	2413PGV075QW	2413PGN075Q
1	50.39	43.64	22.70	2413PGE100Q	2413PGSPT100Q	2413PGT100Q	2413PGV100QW	2413PGN100Q
1 1/2	50.39	43.64	35.56	2413PGE150Q	2413PGSPT150Q	2413PGT150Q	2413PGV150QW	2413PGN150Q
2	63.88	56.34	48.26	2413PGE200Q	2413PGSPT200Q	2413PGT200Q	2413PGV200QW	2413PGN200Q
2 1/2	77.47	70.64	60.96	2413PGE250Q	2413PGSPT250Q	2413PGT250Q	2413PGV250QW	2413PGN250Q
3	90.91	83.34	73.66	2413PGE300Q	2413PGSPT300Q	2413PGT300Q	2413PGV300QW	2413PGN300Q
4	118.92	110.34	98.27	2413PGE400Q	2413PGSPT400Q	2413PGT400Q	2413PGV400QW	2413PGN400Q
6	165.28	156.40	147.75	2413PGE600Q	2413PGSPT600Q	2413PGT600Q	2413PGV600QW	2413PGN600Q
8	216.00	207.20	198.60	2413PGE800Q	2413PGSPT800Q	2413PGT800Q	2413PGV800QW	2413PGN800Q

13FG**Ferrule Gasket Flanged Type**

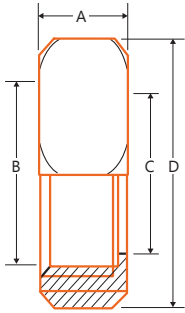
Nominal Size	A	B	C	Part Number		
Inch	mm	mm	mm	EPDM (Black/White)	SILICONE (Platinum-Cured)	FKM/VITON®
1	52.70	43.50	22.80	2413FGE100Q	2413FGSPT100Q	2413FGV100QW
1 1/2	52.70	43.50	35.80	2413FGE150Q	2413FGSPT150Q	2413FGV150QW
2	66.20	56.50	48.80	2413FGE200Q	2413FGSPT200Q	2413FGV200QW
2 1/2	79.70	70.50	60.50	2413FGE250Q	2413FGSPT250Q	2413FGV250QW
3	93.20	83.50	73.10	2413FGE300Q	2413FGSPT300Q	2413FGV300QW
4	121.20	110.00	97.80	2413FGE400Q	2413FGSPT400Q	2413FGV400QW
6	169.10	156.40	148.00	2413FGE600Q	2413FGSPT600Q	2413FGV600QW
8	220.10	207.00	198.40	2413FGE800Q	2413FGSPT800Q	2413FGV800QW
10	270.70	258.00	249.00	2413FGE1000Q	2413FGSPT1000Q	2413FGV1000QW
12	321.50	308.80	300.00	2413FGE1200Q	2413FGSPT1200Q	2413FGV1200QW

13PGTE**13PGTV****Envelope Ferrule Gasket Plain Type**

Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	PTFE/EPDM	PTFE/FKM
1/2	21.80	-	9.65	2413PGTE050W	2413PGTV050W
3/4	21.80	-	15.75	2413PGTE075W	2413PGTV075W
1	50.42	43.64	22.86	2413PGTE100W	2413PGTV100W
1 1/2	50.42	43.64	35.56	2413PGTE150W	2413PGTV150W
2	63.50	56.34	48.26	2413PGTE200W	2413PGTV200W
2 1/2	76.84	70.64	60.96	2413PGTE250W	2413PGTV250W
3	90.17	83.34	73.66	2413PGTE300W	2413PGTV300W
4	118.75	110.34	98.27	2413PGTE400W	2413PGTV400W
6	169.37	156.36	147.75	2413PGTE600W	2413PGTV600W
8	220.19	207.26	197.49	2413PGTE800W	2413PGTV800W
10	270.87	257.56	248.18	2413PGTE1000W	2413PGTV1000W
12	321.54	308.48	297.82	2413PGTE1200W	2413PGTV1200W

13H

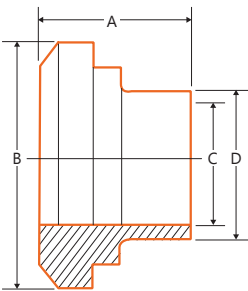
Hexagonal Nut



Nominal Size	A	B	C	D	Part Number
Inch	mm	ACME	mm	mm	304
1	23.0	34.34*8T	30.3	46.0	2434HA100
1 1/2	24.6	47.86*8T	43.4	61.1	2434HA150
2	27.0	61.37*8T	56.5	76.2	2434HA200
2 1/2	30.2	74.88*8T	69.6	91.3	2434HA250
3	32.5	88.40*8T	82.7	106.4	2434HA300
4	38.1	115.42*6T	108.9	137.6	2434HA400

14A

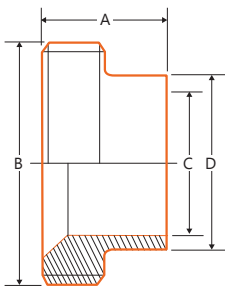
Long Welding Liner



Nominal Size	A	B	C	D	Part Number	
Inch	mm	mm	mm	mm	304	316L
1	34.9	33.3	22.2	25.7	2414AA100	2414AB100
1 1/2	38.1	46.8	34.9	38.4	2414AA150	2414AB150
2	38.1	60.3	47.5	51.1	2414AA200	2414AB200
2 1/2	44.5	73.8	60.2	63.8	2414AA250	2414AB250
3	44.5	87.3	72.9	76.5	2414AA300	2414AB300
4	44.5	114.3	97.4	101.9	2414AA400	2414AB400

15A

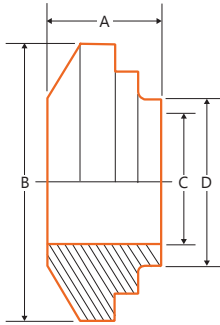
Long Welding Male



Nominal Size	A	B	C	D	Part Number	
Inch	mm	ACME	mm	mm	304	316L
1	34.9	37.13*8T	22.2	25.7	2415AA100	2415AB100
1 1/2	38.1	50.65*8T	34.9	38.4	2415AA150	2415AB150
2	38.1	64.16*8T	47.5	51.1	2415AA200	2415AB200
2 1/2	44.5	77.67*8T	60.2	63.8	2415AA250	2415AB250
3	44.5	91.19*8T	72.9	76.5	2415AA300	2415AB300
4	44.5	119.25*6T	97.4	101.9	2415AA400	2415AB400

14PRF

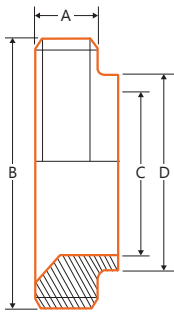
Short Welding Liner



Nominal Size	A	B	C	D	Part Number	
Inch	mm	mm	mm	mm	304	316L
1	18.3	33.3	22.2	25.7	2414PRFA100	2414PRFB100
1 1/2	18.3	46.8	34.9	38.4	2414PRFA150	2414PRFB150
2	19.1	60.3	47.5	51.1	2414PRFA200	2414PRFB200
2 1/2	22.3	73.8	60.2	63.8	2414PRFA250	2414PRFB250
3	23.1	87.3	72.9	76.5	2414PRFA300	2414PRFB300
4	26.2	114.3	97.4	101.9	2414PRFA400	2414PRFB400

15TRF

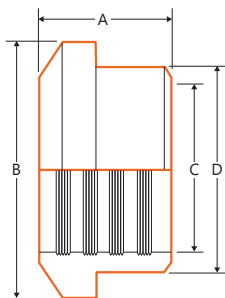
Short Welding Male



Nominal Size	A	B	C	D	Part Number	
Inch	mm	ACME	mm	mm	304	316L
1	18.3	37.13*8T	22.2	25.7	2415TRFA100	2415TRFB100
1 1/2	18.3	50.65*8T	34.9	38.4	2415TRFA150	2415TRFB150
2	19.1	64.16*8T	47.5	51.1	2415TRFA200	2415TRFB200
2 1/2	22.3	77.67*8T	60.2	63.8	2415TRFA250	2415TRFB250
3	23.1	91.19*8T	72.9	76.5	2415TRFA300	2415TRFB300
4	26.2	119.25*6T	97.4	101.9	2415TRFA400	2415TRFB400

14R

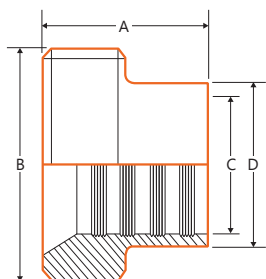
Expanding Liner



Nominal Size	A	B	C	D	Part Number	
Inch	mm	mm	mm	mm	304	316L
1	19.1	33.3	25.5	29.5	2414RA100	2414RB100
1 1/2	28.6	46.8	38.2	42.6	2414RA150	2414RB150
2	33.3	60.3	50.9	55.7	2414RA200	2414RB200
2 1/2	34.9	73.8	63.6	68.8	2414RA250	2414RB250
3	36.5	87.3	76.3	81.9	2414RA300	2414RB300
4	38.1	114.3	101.7	108.1	2414RA400	2414RB400

15R

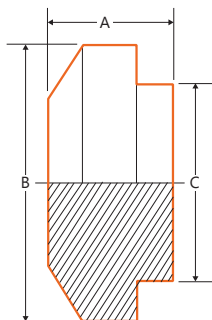
Expanding Male



Nominal Size	A	B	C	D	Part Number	
Inch	mm	ACME	mm	mm	304	316L
1	20.6	37.13*8T	25.5	29.5	2415RA100	2415RB100
1 1/2	28.6	50.65*8T	38.2	42.6	2415RA150	2415RB150
2	34.9	64.16*8T	50.9	55.7	2415RA200	2415RB200
2 1/2	38.1	77.67*8T	63.6	68.8	2415RA250	2415RB250
3	41.3	91.19*8T	76.3	81.9	2415RA300	2415RB300
4	41.3	119.25*6T	101.7	108.1	2415RA400	2415RB400

16A

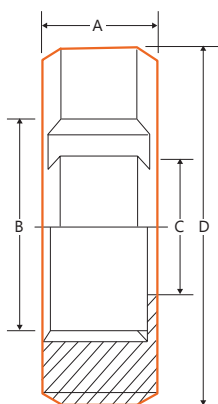
Blank Cap



Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	304	316L
1	11.9	33.3	29.5	2416AA100	2416AB100
1 1/2	14.3	46.8	42.6	2416AA150	2416AB150
2	15.9	60.3	55.7	2416AA200	2416AB200
2 1/2	16.7	73.8	68.8	2416AA250	2416AB250
3	18.3	87.3	81.9	2416AA300	2416AB300
4	20.6	114.3	108.1	2416AA400	2416AB400

DIN-13R

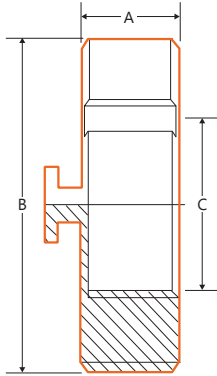
Round Nut (4 Slots)



Nominal Size		A	B	C	D	Part Number
Imperial	DN	mm	RD	mm	mm	304
	10	18	Rd28*1/8	19	38	2734RA010
	15	18	Rd34*1/8	25	44	2734RA015
	20	21	Rd44*1/6	31	54	2734RA020
1	25	21	Rd52*1/6	36	63	2734RA025
	32	21	Rd58*1/6	42	70	2734RA032
1 1/2	40	21	Rd65*1/6	49	78	2734RA040
2	50	22	Rd78*1/6	62	92	2734RA050
2 1/2	65	25	Rd95*1/6	80	112	2734RA065
3	80	30	Rd110*1/4	94	127	2734RA080
	90	30	Rd120*1/4	104	138	2734RA090
4	100	31	Rd130*1/4	115	148	2734RA100
	125	35	Rd160*1/4	138	178	2734RA125
	150	40	Rd190*1/4	164	210	2734RA150

DIN-13RB

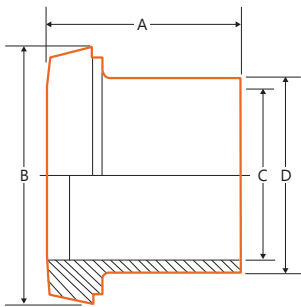
Blank Round Nut (4 Slots)



Nominal Size		A	B	C	Part Number
Imperial	DN	mm	mm	RD	304
	10	18	38	Rd28*1/8	2734RBA010
	15	18	44	Rd34*1/8	2734RBA015
	20	21	54	Rd44*1/6	2734RBA020
1	25	21	63	Rd52*1/6	2734RBA025
	32	21	70	Rd58*1/6	2734RBA032
1 1/2	40	21	78	Rd65*1/6	2734RBA040
2	50	22	92	Rd78*1/6	2734RBA050
2 1/2	65	25	112	Rd95*1/6	2734RBA065
3	80	30	127	Rd110*1/4	2734RBA080
	90	30	138	Rd120*1/4	2734RBA090
4	100	31	148	Rd130*1/4	2734RBA100
	125	35	178	Rd160*1/4	2734RBA125
	150	40	210	Rd190*1/4	2734RBA150

DIN-14

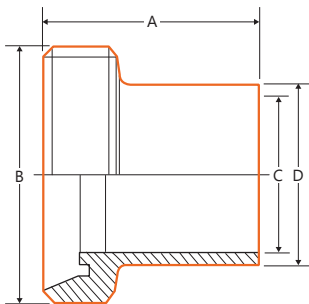
Welding Liner (Imperial)



Nominal Size		A	B	C	D	Part Number	
Inch	DN	mm	mm	mm	mm	304	316L
1	25	22	44	22.2	25.4	2734LA100I	2734LB100I
1 1/2	40	26	56	34.9	38.1	2734LA150I	2734LB150I
2	50	28	68	47.6	51.0	2734LA200I	2734LB200I
2 1/2	65	32	86	60.3	63.5	2734LA250I	2734LB250I
3	80	37	100	73.0	76.2	2734LA300I	2734LB300I
4	100	44	121	97.6	101.6	2734LA400I	2734LB400I

DIN-15

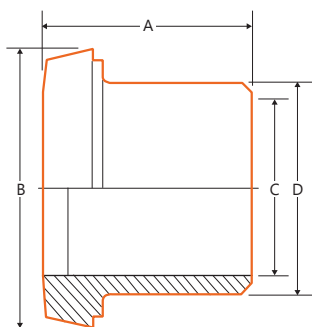
Welding Male (Imperial)



Nominal Size		A	B	C	D	Part Number	
Inch	DN	mm	RD	mm	mm	304	316L
1	25	29	Rd52*1/6	22.2	25.4	2734MA100I	2734MB100I
1 1/2	40	33	Rd65*1/6	34.9	38.1	2734MA150I	2734MB150I
2	50	35	Rd78*1/6	47.6	51.0	2734MA200I	2734MB200I
2 1/2	65	40	Rd95*1/6	60.3	63.5	2734MA250I	2734MB250I
3	80	45	Rd110*1/4	73.0	76.2	2734MA300I	2734MB300I
4	100	54	Rd130*1/4	97.6	101.6	2734MA400I	2734MB400I

DIN-14

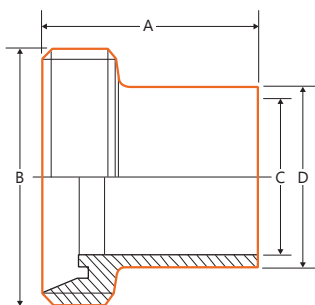
Welding Liner



Nominal Size	A	B	C	D	Part Number	
DN	mm	mm	mm	mm	304	316L
10	17	22	10	15	2734LA010	2734LB010
15	17	28	16	21	2734LA015	2734LB015
20	18	36	20	25	2734LA020	2734LB020
25	22	44	26	31	2734LA025	2734LB025
32	25	50	32	37	2734LA032	2734LB032
40	26	56	38	43	2734LA040	2734LB040
50	28	68	50	55	2734LA050	2734LB050
65	32	86	66	72	2734LA065	2734LB065
80	37	100	81	87	2734LA080	2734LB080
90	35	111	89	95	2734LA090	2734LB090
100	44	120	100	106	2734LA100	2734LB100
125	34	149	125	132	2734LA125	2734LB125
150	37	175	150	157	2734LA150	2734LB150

DIN-15

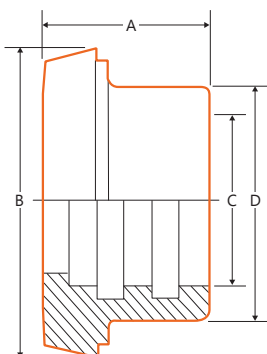
Welding Male



Nominal Size	A	B	C	D	Part Number	
DN	mm	RD	mm	mm	304	316L
10	21	Rd28*1/8	10	15	2734MA010	2734MB010
15	21	Rd34*1/8	16	21	2734MA015	2734MB015
20	24	Rd44*1/6	20	25	2734MA020	2734MB020
25	29	Rd52*1/6	26	31	2734MA025	2734MB025
32	32	Rd58*1/6	32	37	2734MA032	2734MB032
40	33	Rd65*1/6	38	43	2734MA040	2734MB040
50	35	Rd78*1/6	50	55	2734MA050	2734MB050
65	40	Rd95*1/6	66	72	2734MA065	2734MB065
80	45	Rd110*1/4	81	87	2734MA080	2734MB080
90	45	Rd120*1/4	89	95	2734MA090	2734MB090
100	54	Rd130*1/4	100	106	2734MA100	2734MB100
125	46	Rd160*1/4	125	132	2734MA125	2734MB125
150	50	Rd190*1/4	150	157	2734MA150	2734MB150

DIN-14R

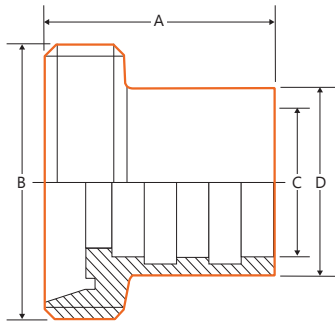
Expanding Liner



Nominal Size	A	B	C	D	Part Number	
DN	mm	mm	mm	mm	304	316L
10	17	22	12.2	18	2714RA010	2714RB010
15	17	28	18.2	24	2714RA015	2714RB015
20	18	36	22.2	30	2714RA020	2714RB020
25	22	44	28.2	35	2714RA025	2714RB025
32	25	50	34.2	41	2714RA032	2714RB032
40	26	56	40.2	48	2714RA040	2714RB040
50	28	68	52.2	61	2714RA050	2714RB050
65	32	86	70.3	79	2714RA065	2714RB065
80	37	100	85.3	93	2714RA080	2714RB080
100	44	120	104.3	114	2714RA100	2714RB100
125	34	149	129.3	137	2714RA125	2714RB125
150	37	175	154.3	163	2714RA150	2714RB150

DIN-15R

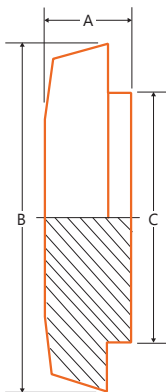
Expanding Male



Nominal Size		A	B	C	D	Part Number	
DN	mm	mm	RD	mm	mm	304	316L
10	21		Rd28*1/8	12.2	18	2715RA010	2715RB010
15	21		Rd34*1/8	18.2	24	2715RA015	2715RB015
20	24		Rd44*1/6	22.2	30	2715RA020	2715RB020
25	29		Rd52*1/6	28.2	35	2715RA025	2715RB025
32	32		Rd58*1/6	34.2	41	2715RA032	2715RB032
40	33		Rd65*1/6	40.2	48	2715RA040	2715RB040
50	35		Rd78*1/6	52.2	61	2715RA050	2715RB050
65	40		Rd95*1/6	70.3	79	2715RA065	2715RB065
80	45		Rd110*1/4	85.3	93	2715RA080	2715RB080
100	54		Rd130*1/4	104.3	114	2715RA100	2715RB100
125	46		Rd160*1/4	129.3	137	2715RA125	2715RB125
150	50		Rd190*1/4	154.3	163	2715RA150	2715RB150

DIN-14B

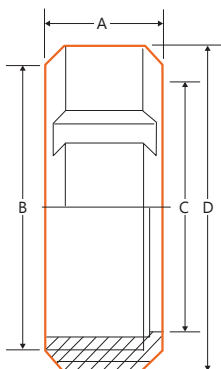
Blank Cap



Nominal Size		A	B	C	Part Number	
Imperial	DN	mm	mm	mm	304	316L
	10	11	22	18	2734BA010	2734BB010
	15	17	28	24	2734BA015	2734BB015
	20	21	36	30	2734BA020	2734BB020
1	25	27	44	35	2734BA025	2734BB025
	32	33	50	41	2734BA032	2734BB032
1 1/2	40	39	56	48	2734BA040	2734BB040
2	50	51	68	61	2734BA050	2734BB050
2 1/2	65	67	86	79	2734BA065	2734BB065
3	80	82	100	93	2734BA080	2734BB080
4	100	101	120	114	2734BA100	2734BB100
	125	126	149	137	2734BA125	2734BB125
	150	151	175	163	2734BA150	2734BB150

SMS-13R

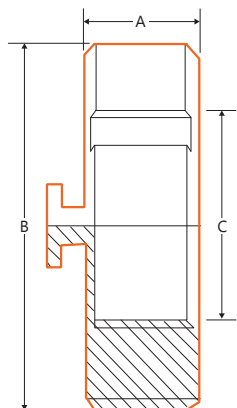
Round Nut (6 Slots)



Nominal Size		A	B	C	D	Part Number
Inch	DN	mm	RD	mm	mm	304
1	25	19	Rd40*1/6	32.5	51	2334RA025
1 1/2	38	23	Rd60*1/6	48.5	74	2334RA038
2	51	24	Rd70*1/6	61.0	84	2334RA051
2 1/2	63.5	28	Rd85*1/6	74.0	100	2334RA063
3	76	30	Rd98*1/6	87.0	114	2334RA076
4	101.6	31	Rd125*1/4	113.0	138	2334RA101

SMS-13RB

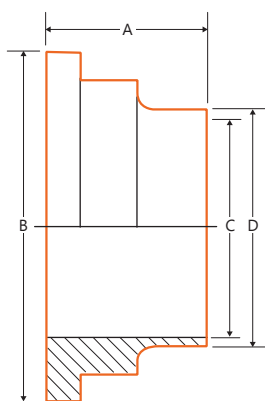
Blank Round Nut (6 Slots)



Nominal Size		A	B	C	Part Number
Inch	DN	mm	mm	RD	304
1	25	19	51	Rd40*1/6	2334RBA025
1 1/2	38	23	74	Rd60*1/6	2334RBA038
2	51	24	84	Rd70*1/6	2334RBA051
2 1/2	63.5	28	100	Rd85*1/6	2334RBA063
3	76	30	114	Rd98*1/6	2334RBA076
4	101.6	31	138	Rd125*1/4	2334RBA101

SMS-14

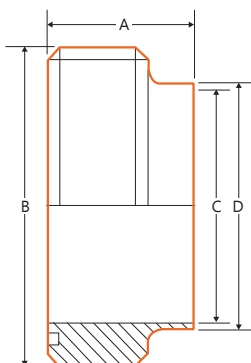
Welding Liner



Nominal Size		A	B	C	D	Part Number	
Inch	DN	mm	mm	mm	mm	304	316L
1	25	15.5	35.5	22.5	25.0	2334LA025	2334LB025
1 1/2	38	16.0	55.0	35.5	38.0	2334LA038	2334LB038
2	51	17.0	65.0	48.5	51.0	2334LA051	2334LB051
2 1/2	63.5	17.0	80.0	60.5	63.5	2334LA063	2334LB063
3	76	19.0	93.0	72.9	76.1	2334LA076	2334LB076
4	101.6	19.0	118.0	97.6	101.6	2334LA101	2334LB101
	104	19.0	118.0	100.0	104.0	2334LA104	2334LB104

SMS-15

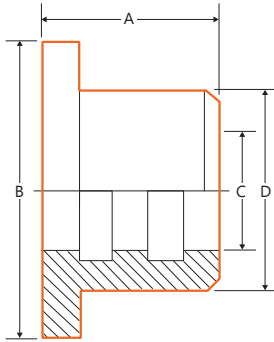
Welding Male



Nominal Size		A	B	C	D	Part Number	
Inch	DN	mm	RD	mm	mm	304	316L
1	25	19	Rd40*1/6	22.5	25.0	2334MA025	2334MB025
1 1/2	38	23	Rd60*1/6	35.5	38.0	2334MA038	2334MB038
2	51	23	Rd70*1/6	48.5	51.0	2334MA051	2334MB051
2 1/2	63.5	27	Rd85*1/6	60.5	63.5	2334MA063	2334MB063
3	76	27	Rd98*1/6	72.9	76.1	2334MA076	2334MB076
4	101.6	30	Rd125*1/4	97.6	101.6	2334MA101	2334MB101
	104	30	Rd125*1/4	100.0	104.0	2334MA104	2334MB104

SMS-14R

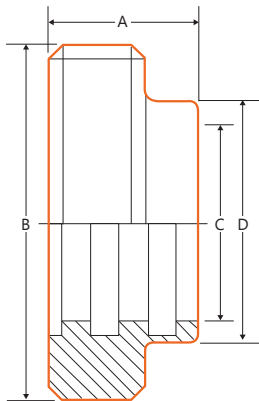
Expanding Liner



Nominal Size		A	B	C	D	Part Number	
Inch	DN	mm	mm	mm	mm	304	316L
1	25	17	35.5	25.8	32.0	2314RA025	2314RB025
1 1/2	38	20	55.0	38.8	48.0	2314RA038	2314RB038
2	51	20	65.0	51.8	60.4	2314RA051	2314RB051
2 1/2	63.5	25	80.0	64.3	73.5	2314RA635	2314RB635
3	76	30	93.0	77.0	86.5	2314RA761	2314RB761
4	101.6	27	118.0	102.6	112.5	2314RA101	2314RB101

SMS-15R

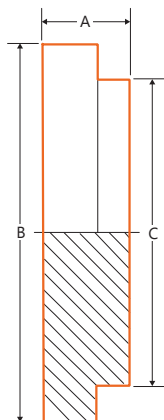
Expanding Male



Nominal Size		A	B	C	D	Part Number	
Inch	DN	mm	RD	mm	mm	304	316L
1	25	20	Rd40*1/6	25.8	32.0	2315RA025	2315RB025
1 1/2	38	23	Rd60*1/6	38.8	47.9	2315RA038	2315RB038
2	51	25	Rd70*1/6	51.8	50.4	2315RA051	2315RB051
2 1/2	63.5	30	Rd85*1/6	64.3	73.5	2315RA635	2315RB635
3	76	30	Rd98*1/6	77.0	86.5	2315RA761	2315RB761
4	101.6	30	Rd125*1/4	102.6	112.5	2315RA101	2315RB101

SMS-14B

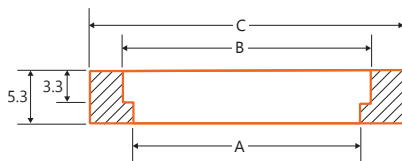
Blank Cap



Nominal Size		A	B	C	Part Number	
Inch	DN	mm	mm	mm	304	316L
1	25	7.5	35.5	32.0	2334BA025	2334BB025
1 1/2	38	8.0	55.0	47.9	2334BA038	2334BB038
2	51	9.0	65.0	60.4	2334BA051	2334BB051
2 1/2	63.5	9.0	80.0	73.5	2334BA635	2334BB635
3	76	11.0	93.0	86.5	2334BA761	2334BB076
4	101.6	11.0	118.0	112.5	2334BA101	2334BB101

SMS

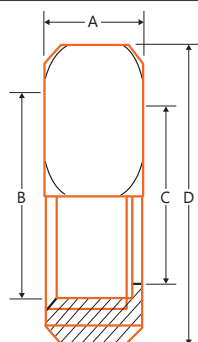
Union Seal



Size	A	B	C	Part Number		
DN	mm	mm	mm	EPDM	SILICONE (Platinum-Cured)	PTFE
25	22.8	25.1	31.8	2334E025	2334SPT025	2334T025
38	35.8	38.1	47.8	2334E038	2334SPT038	2334T038
51	48.8	51.1	60.8	2334E051	2334SPT051	2334T051
63.5	61.0	63.6	73.3	2334E635	2334SPT635	2334T635
76.1	73.4	76.1	85.8	2334E076	2334SPT076	2334T761
101.6	100.5	104.0	115.7	2334E101	2334SPT101	2334T101

RJT-13H

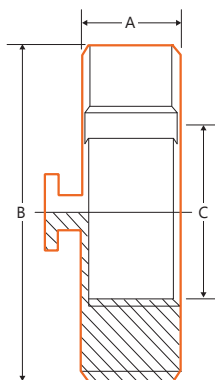
Hexagonal Nut



Nominal Size	A	B	C	D	Part Number
Inch	mm	WHIT.	mm	mm	304
1	22.2	42.6*1/8	33.3	50.8	3034HA100
1 1/2	22.2	55.3*1/8	46.0	65.0	3034HA150
2	22.2	68.3*1/6	58.7	79.3	3034HA200
2 1/2	22.2	80.9*1/6	71.4	92.0	3034HA250
3	22.2	93.6*1/6	84.1	104.7	3034HA300
4	22.2	119.1*1/6	109.5	130.0	3034HA400

RJT-13HB

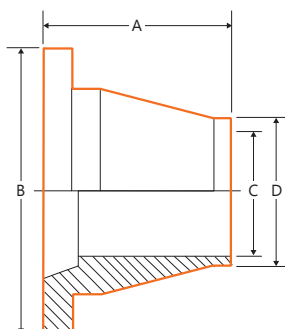
Blank Hexagonal Nut



Nominal Size	A	B	C	Part Number
Inch	mm	mm	WHIT.	304
1	24	50.8	42.6*1/8	3034HBA100
1 1/2	24	65.0	55.3*1/8	3034HBA150
2	25	79.3	68.3*1/6	3034HBA200
2 1/2	26	92.0	80.9*1/6	3034HBA250
3	26	104.7	93.6*1/6	3034HBA300
4	25	130.0	119.1*1/6	3034HBA400

RJT-14

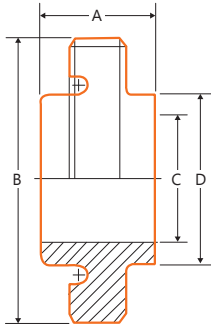
Welding Liner



Nominal Size	A	B	C	D	Part Number	
Inch	mm	mm	mm	mm	304	316L
1	19.5	41.3	22.2	25.65	3034LA100	3034LB100
1 1/2	19.5	54.0	34.9	38.35	3034LA150	3034LB150
2	19.5	66.7	47.6	51.05	3034LA200	3034LB200
2 1/2	19.5	79.4	60.3	63.75	3034LA250	3034LB250
3	19.5	92.1	73.0	76.45	3034LA300	3034LB300
4	19.5	117.5	97.6	101.85	3034LA400	3034LB400

RJT-15

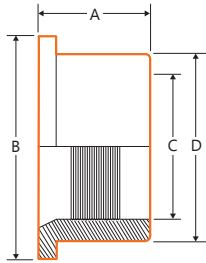
Welding Male



Nominal Size	A	B	C	D	Part Number	
Inch	mm	WHIT.	mm	mm	304	316L
1	27	45.72*1/8	22.2	25.65	3034MA100	3034MB100
1 1/2	27	58.42*1/8	34.9	38.35	3034MA150	3034MB150
2	27	72.72*1/6	47.6	51.05	3034MA200	3034MB200
2 1/2	27	85.42*1/6	60.3	63.75	3034MA250	3034MB250
3	27	98.12*1/6	73.0	76.45	3034MA300	3034MB300
4	27	123.52*1/6	97.6	101.85	3034MA400	3034MB400

RJT-14R

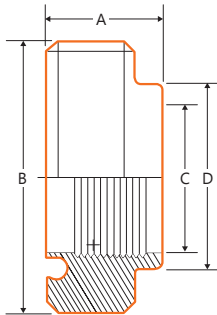
Expanding Liner



Nominal Size	A	B	C	D	Part Number	
Inch	mm	mm	mm	mm	304	316L
1	20	41.3	25.5	32.5	3014RA100	3014RB100
1 1/2	24	54.0	38.2	45.2	3014RA150	3014RB150
2	28	66.7	50.9	57.9	3014RA200	3014RB200
2 1/2	32	79.4	63.6	70.6	3014RA250	3014RB250
3	32	92.1	76.3	83.3	3014RA300	3014RB300
4	32	117.5	101.7	108.7	3014RA400	3014RB400

RJT-15R

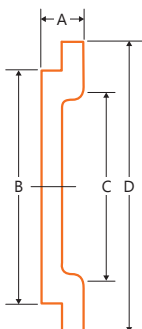
Expanding Male



Nominal Size	A	B	C	D	Part Number	
Inch	mm	WHIT.	mm	mm	304	316L
1	20	45.72*1/8	25.5	32.5	3015RA100	3015RB100
1 1/2	24	58.42*1/8	38.2	45.2	3015RA150	3015RB150
2	28	72.72*1/6	50.9	57.9	3015RA200	3015RB200
2 1/2	32	85.42*1/6	63.6	70.6	3015RA250	3015RB250
3	32	98.12*1/6	76.3	83.3	3015RA300	3015RB300
4	32	123.52*1/6	101.7	108.7	3015RA400	3015RB400

RJT-14B

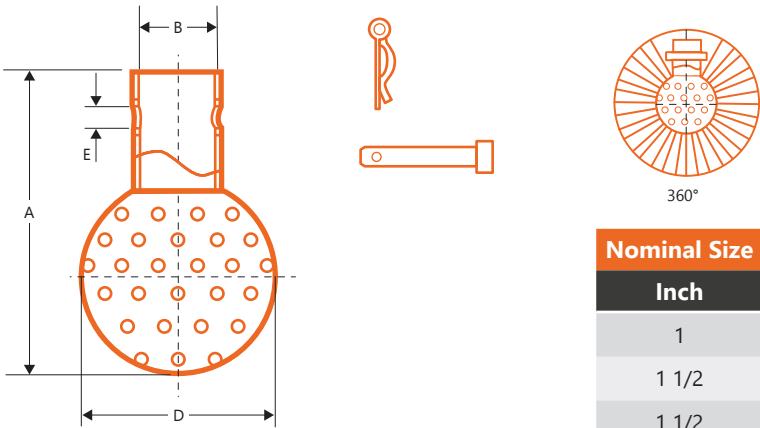
Blank Cap



Nominal Size	A	B	C	D	Part Number	
Inch	mm	mm	mm	mm	304	316L
1	8.2	32.4	27.8	41.3	3034BA100	3034BB100
1 1/2	8.2	45.1	40.5	54.0	3034BA150	3034BB150
2	8.2	57.8	53.2	66.7	3034BA200	3034BB200
2 1/2	8.2	70.5	65.9	79.4	3034BA250	3034BB250
3	8.2	83.1	78.6	92.1	3034BA300	3034BB300
4	8.2	108.6	104.0	117.5	3034BA400	3034BB400

Spray Balls

Fixed 360° Weld End



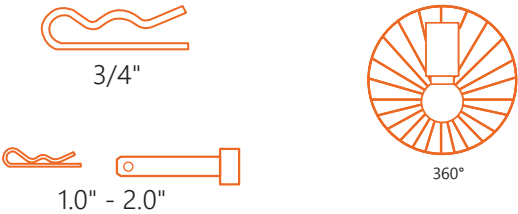
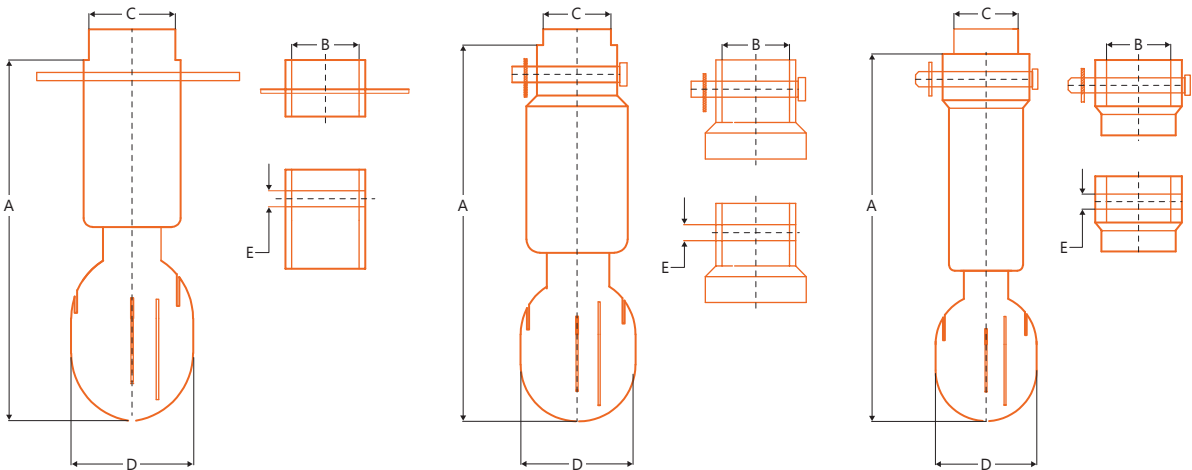
Nominal Size	A	B	D	E	Holes	Holes	Part Number
Inch	mm	mm	mm	mm	mm	Qty	316
1	90	25.7	64	6.5	2.4	79	2449B100-11
1 1/2	87	38.4	64	6.5	2.4	79	2449B15064-11
1 1/2	116	38.4	91	6.5	2.9	79	2449B15091-11
2	120	51.3	91	6.5	2.9	79	2449B20091-11

Rotary 360° Clip-on Locking Pin

3/4"

1.0"

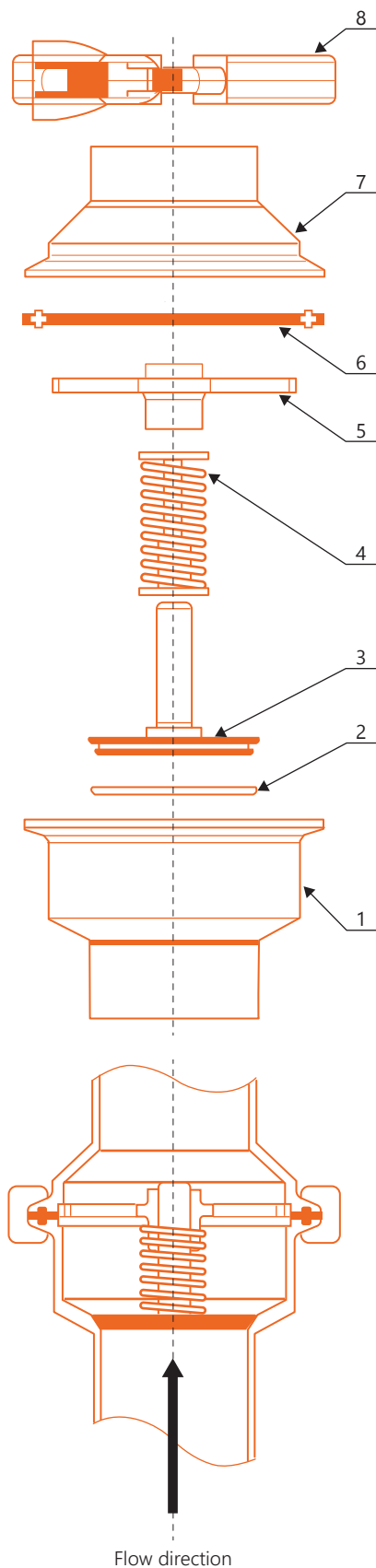
1.5" - 2.0"



Nominal Size	A	B	C	D	E	Part Number
Inch	mm	mm	mm	mm	mm	316
3/4	77	19.3	19.05	25	2.8	2449RC2B07525-11
1	148	26.0	25.40	45	6.0	2449RC2B10045-11
1 1/2	148	38.6	38.10	45	6.0	2449RC2B15045-11
2	183	51.0	50.80	65	6.0	2449RC2B20065-11

Check Valve

Non-return Valve



Technical data

Max. product pressure
Min. product pressure
Working temperature

: 10 bar
: 0.06 bar
: -10°C~120°C (EPDM)
-40°C~190°C (Silicone)
-20°C~200°C (VITON®)

Material

Product wetted stainless steel parts
Finish
Other stainless steel parts
Seal
Clamp

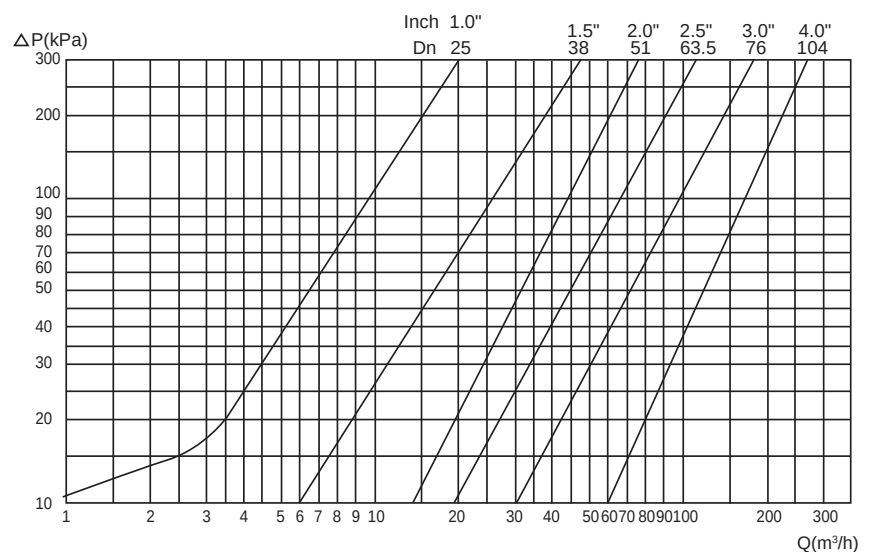
: SS304 or SS316L
: Semi-bright
: SS304
: Silicone, EPDM or VITON®
: SS304

Ordering information

Size
Connection type
Material grade
Gasket and O-Ring material

Item	Parts	Material	Qty
1	Lower Body	SS304/SS316L	1
2	O-Ring	Silicone/EPDM/VITON®	1
3	Disc	SS304/SS316L	1
4	Spring	SS304/SS316L	1
5	Plate	SS304/SS316L	1
6	Gasket	Silicone/EPDM/VITON®	1
7	Upper Body	SS304/SS316L	1
8	Clamp	SS304	1

Pressure drop/capacity diagram

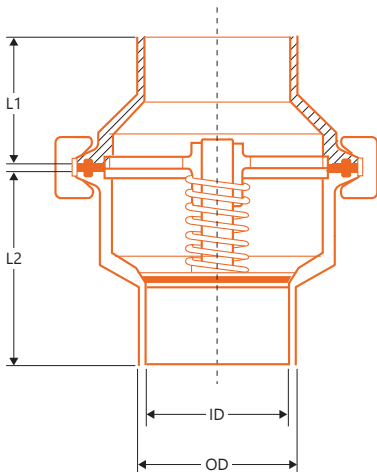


Medium: Water(20°C)

Measurement: In accordance with VDI 2173

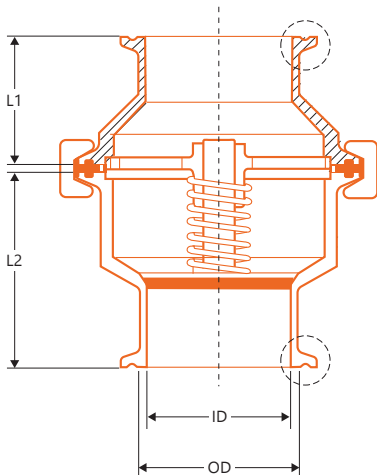
Check Valve

Weld Type

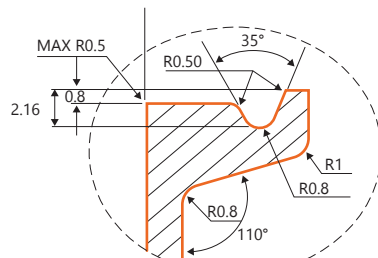


Nominal Size	ID	OD	L1	L2	Part Number
Inch	mm	mm	mm	mm	316L/Silicone
1/2	9.40	12.70	25.0	46	2442WB050GS
3/4	15.75	19.05	30.0	48	2442WB075GS
1	22.10	25.40	30.0	48	2442WB100GS
1 1/2	34.80	38.10	27.5	50	2442WB150GS
2	47.50	50.80	33.0	57	2442WB200GS
2 1/2	60.20	63.50	35.0	62	2442WB250GS
3	72.90	76.20	35.0	62	2442WB300GS
4	97.38	101.60	36.0	65	2442WB400GS

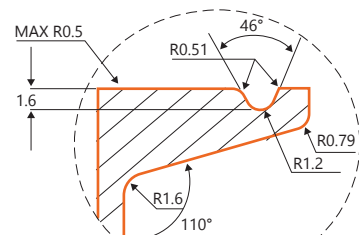
Clamp Type



Nominal Size	ID	OD	L1	L2	Part Number
Inch	mm	mm	mm	mm	316L/Silicone
1/2	9.40	12.70	25.0	46.0	2442CB050GS
3/4	15.75	19.05	42.5	60.5	2442CB075GS
1	22.10	25.40	42.5	60.5	2442CB100GS
1 1/2	34.80	38.10	40.0	62.5	2442CB150GS
2	47.50	50.80	45.5	69.5	2442CB200GS
2 1/2	60.20	63.50	47.5	74.5	2442CB250GS
3	72.90	76.20	47.5	74.5	2442CB300GS
4	97.38	101.60	51.7	80.7	2442CB400GS

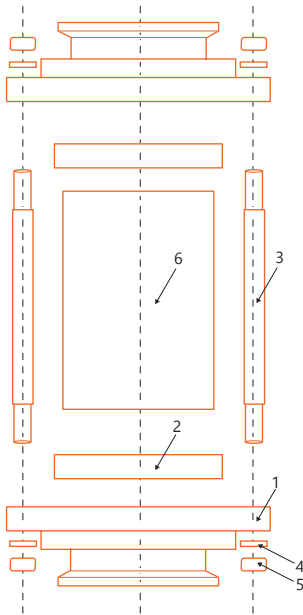


1/2" - 3/4"



1.0" - 4.0"

Sight Glass



Material

Product wetted stainless steel parts	: SS304 or SS316L
Finish	: Semi-bright
Seal	: Silicone, EPDM or VITON®

Ordering information

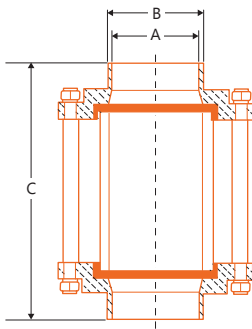
Size
Connection type
Material grade
Gasket and O-Ring material

Internal pressure strength of PYREX® borosilicate glass tube

Size	1"	1.5"	2"	2.5"	3"	4"
Max. Pressure (Bar)	13	10	12	9	8	6

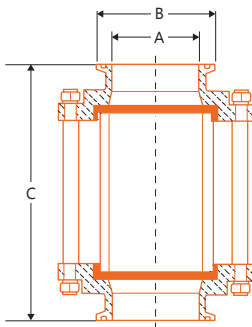
Item	Parts	Material	Qty
1	Body	SS304/SS316L	2
2	Seal	Silicone/EPDM/VITON®	2
3	Screw Bolt	SS304	1"-3"=4pcs/ 4"=6pcs
4	Spring Washer	SS304	1"-3"=8pcs/ 4"=12pcs
5	M6 Nut	SS304	1"-3"=8pcs/ 4"=12pcs
6	Clear Tempered Glass	PYREX® Borosilicate Glass	1

Weld Type



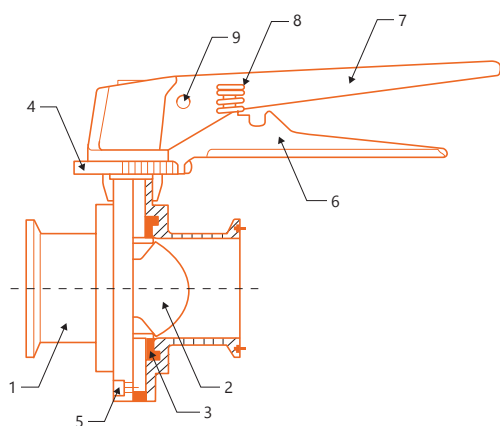
Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	304/EPDM	316L/EPDM
1	22.1	25.4	129	2447WA100QE	2447WB100QE
1 1/2	34.8	38.1	129	2447WA150QE	2447WB150QE
2	47.5	50.8	136.5	2447WA200QE	2447WB200QE
2 1/2	60.2	63.5	136.5	2447WA250QE	2447WB250QE
3	72.9	76.2	136.5	2447WA300QE	2447WB300QE
4	97.4	101.6	148.5	2447WA400QE	2447WB400QE

Clamp Type



Nominal Size	A	B	C	Part Number	
Inch	mm	mm	mm	304/EPDM	316L/EPDM
1	22.1	50.4	153.9	2447CA100QE	2447CB100QE
1 1/2	34.8	50.4	153.9	2447CA150QE	2447CB150QE
2	47.5	63.9	161.9	2447CA200QE	2447CB200QE
2 1/2	60.2	77.4	161.9	2447CA250QE	2447CB250QE
3	72.9	90.9	161.9	2447CA300QE	2447CB300QE
4	97.4	118.9	180.3	2447CA400QE	2447CB400QE

Butterfly Valve



Technical data

Max. product pressure : 10 bar
Working temperature : -10°C~140°C (EPDM)

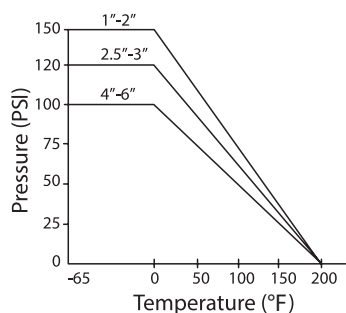
Material

Product wetted stainless steel parts : SS304 or SS316L
Finish : Semi-bright
Other stainless steel parts : SS304
Seal : Silicone, EPDM or VITON®

Ordering information

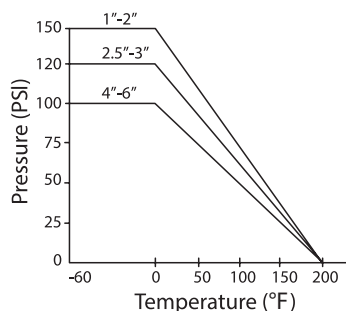
Valve type
Valve size
Connection type
Material grade
Seal material
Handle type
Actuation type

EPDM SEAT TEMPERATURE CHART



Item	Parts	Material	Qty
1	Body	SS304/SS316L	1
2	Disc	SS304/SS316L	1
3	Seal	Silicone/EPDM/VITON®	1
4	Notch plate	SS304	2
5	Screw (M6x12)	SS304	1
6	Trigger	SS304	1
7	Handle	Nylon/SS304	1
8	Spring	SS304	1
9	Pin	SS304	4

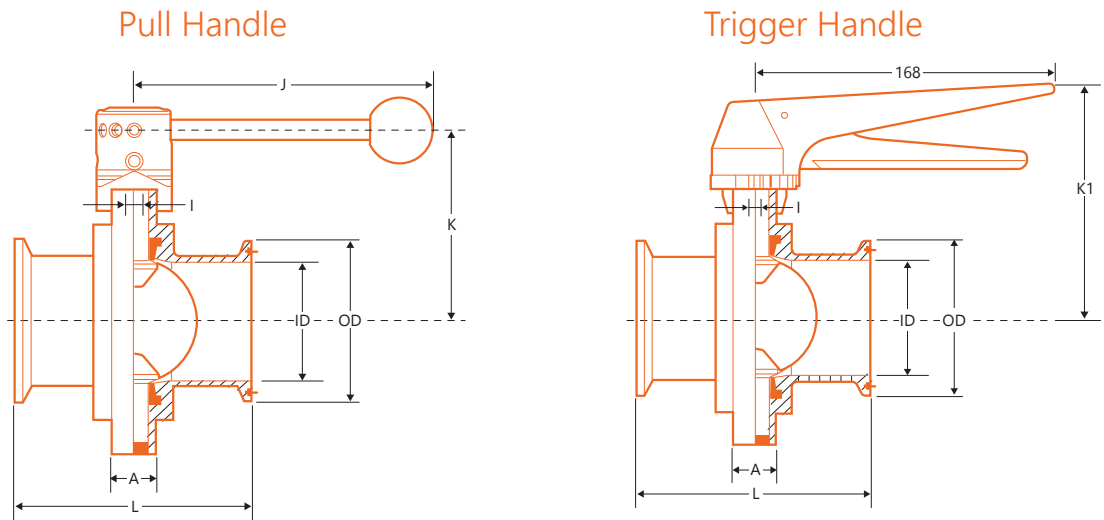
SILICONE SEAT TEMPERATURE CHART



Open/Shut Torque

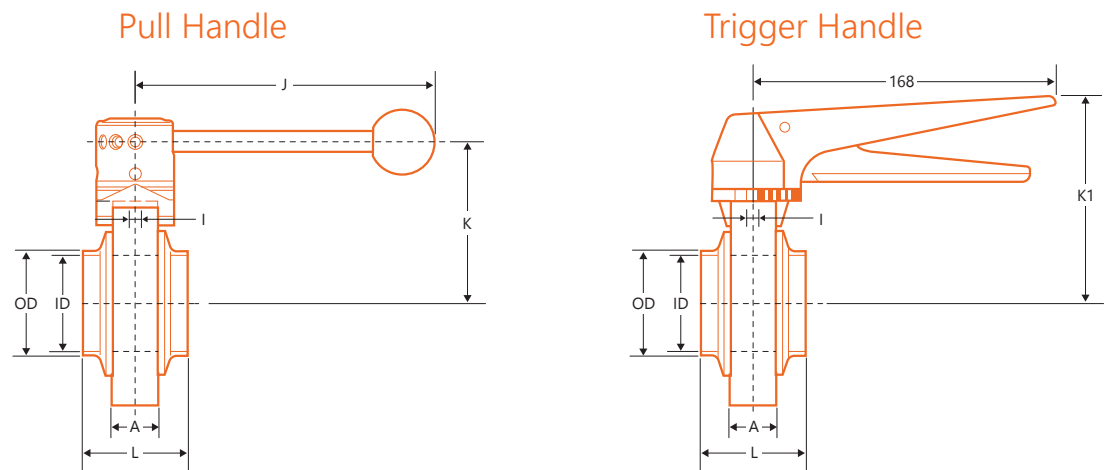
Nominal Size	Max. Torque
Inch	Nm
1	15
1 1/2	15
2	20
2 1/2	25
3	30
4	35

Clamp Type



Nominal Size	ID	OD	L	A	I	K	K1	J	Part Number	
Inch	mm	mm	mm	mm	mm	mm	mm	mm	Pull (4 Pos) Handle	Trigger (12 Pos) Handle
1	22.1	50.5	77.4	18	8 X 10	66.0	92	127	2444CX100G164Y	2444CX100G1612FY
1 1/2	34.8	50.5	77.4	18	8 X 10	68.5	95	127	2444CX150G164Y	2444CX150G1612FY
2	47.5	64.0	77.4	18	8 X 10	76.5	102	135	2444CX200G164Y	2444CX200G1612FY
2 1/2	60.2	77.4	81.4	18	8 X 10	84.5	111	135	2444CX250G164Y	2444CX250G1612FY
3	72.9	91.0	85.4	18	8 X 10	91.0	117	160	2444CX300G164Y	2444CX300G1612FY
4	97.4	119.0	103.8	22	10 X 10	113.0	136	160	2444CX400G164Y	2444CX400G1612FY

Weld Type



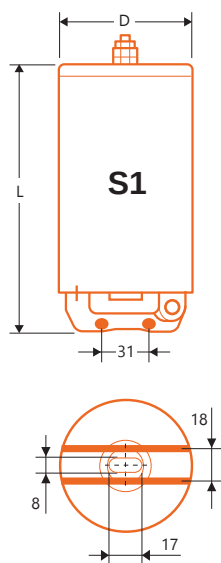
Nominal Size	ID	OD	L	A	I	K	K1	J	Part Number*	
Inch	mm	mm	mm	mm	mm	mm	mm	mm	Pull (4 Pos) Handle	Trigger (12 Pos) Handle
1	22.1	25.4	52	18	8 X 10	66.0	92	127	2444WX100G164Y	2444WX100G1612FY
1 1/2	34.8	38.1	52	18	8 X 10	68.5	95	127	2444WX150G164Y	2444WX150G1612FY
2	47.5	50.8	52	18	8 X 10	76.5	102	135	2444WX200G164Y	2444WX200G1612FY
2 1/2	60.2	63.5	56	18	8 X 10	84.5	111	135	2444WX250G164Y	2444WX250G1612FY
3	72.9	76.2	60	18	8 X 10	91.0	117	160	2444WX300G164Y	2444WX300G1612FY
4	97.4	101.6	72	22	10 X 10	113.0	136	160	2444WX400G164Y	2444WX400G1612FY

* Part number

X Can be replaced by A=SS304 or B=SS316L

Y Can be replaced by E=EPDM or S=Silicone

Butterfly Valve Actuator



S1 Technical data:

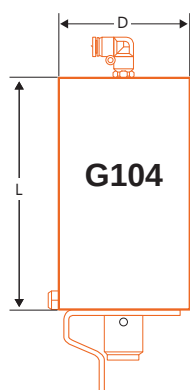
Shut-off time : 1.5 seconds
 Can be connected with M12 screw proximity switch (PNP or NPN)
 Min. air pressure for NC and NO : 5 bar
 Working temperature : -25°C~90°C

G104 Technical data:

Shut-off time : 2 seconds
 Can be connected with M12 screw proximity switch (PNP or NPN)
 Min. air pressure for NC and NO : 6 bar
 Working temperature : -25°C~90°C

Material

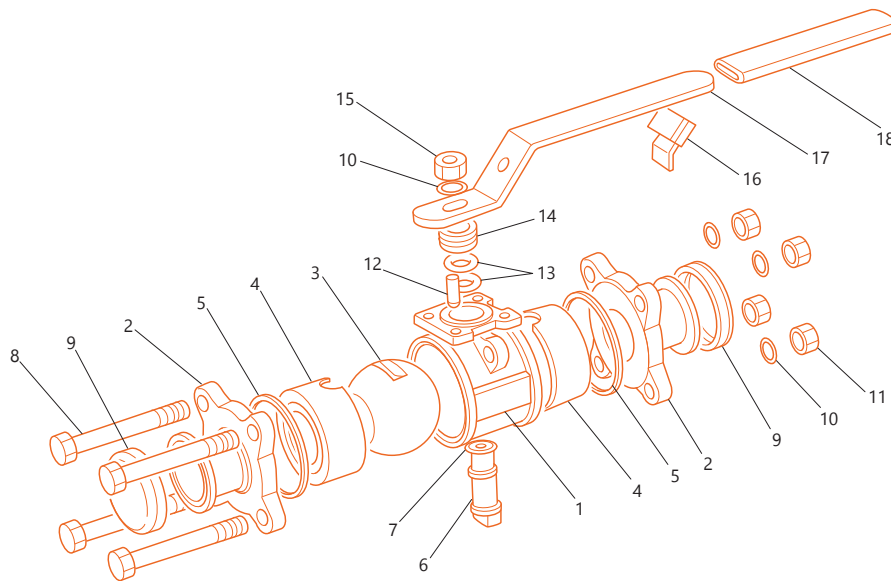
Actuator body : SS304
 Piston : POM
 Seal : NBR



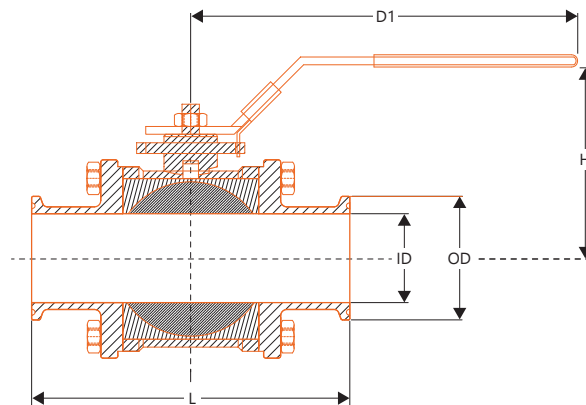
Model	For Butterfly Valve	D	L	Part Number
No.	Size	mm	mm	
S1	1"-3"	85	205	2445A100Q
G104	4"	108	178	2445A400G

Ball Valve

V2C Clamp 2-Way 3PC Manual Ball Valve (ISO Mount Pad, PTFE Encapsulated)



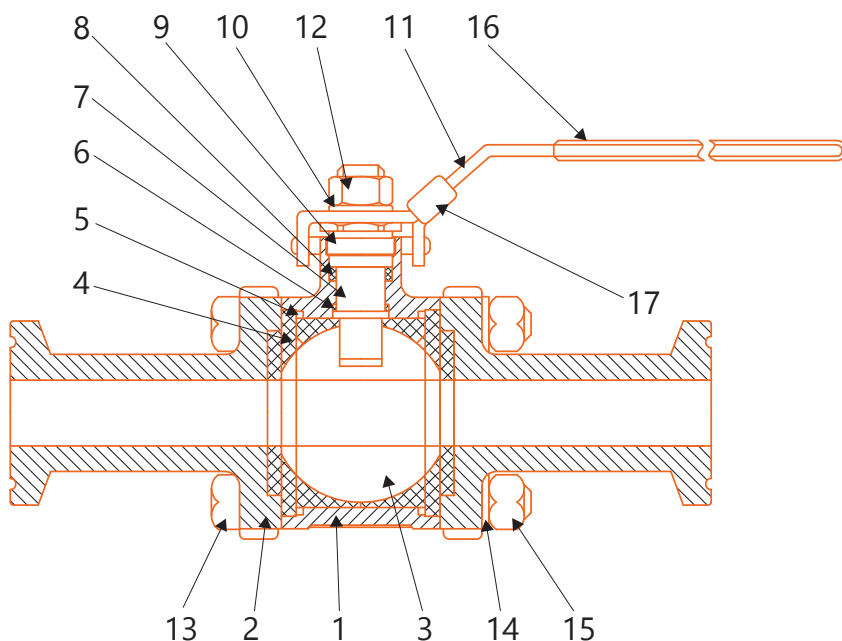
Item	Parts	Material	Qty
1	Body	A351-CF8M	1
2	Cap	AISI 316/316L	2
3	Ball	A351-CF8M	1
4	Seat	PTFE	2
5	Gasket	PTFE	2
6	Stem	SUS 316L	1
7	Thrust washer	PTFE	1
8	Bolt	SUS 304	4
9	Cover cap	Plastic	2
10	Spring washer	SUS 304	5
11	Hex nut	SUS 304	4
12	Stop pin	SUS 304	1
13	Stem packing	PTFE	1
14	Gland	SUS 304	1
15	Nut	SUS 304	1
16	Lock device	SUS 304	1
17	Handle	SUS 304	1
18	Plastic cover	Plastic	1



Nominal Size		D1		H		L		ID	OD	Part Number
Inch	mm	Inch	mm	Inch	mm	Inch	mm	mm	mm	316
1/2	12.70	5.12	130.0	2.30	58.30	3.50	89.0	9.40	25.2	24V2CCB050GT
3/4	19.05	5.12	130.0	2.48	62.90	3.98	101.0	15.75	25.2	24V2CCB075GT
1	25.40	6.56	166.7	2.68	68.00	4.49	114.0	22.10	50.5	24V2CCB100GT
1 1/2	38.10	7.65	194.3	3.43	87.00	5.51	140.0	34.80	50.5	24V2CCB150GT
2	50.80	7.65	194.3	3.74	95.00	6.14	156.0	47.50	64.0	24V2CCB200GT
2 1/2	63.50	9.92	252.0	4.97	126.25	7.76	197.0	60.30	77.5	24V2CCB250GT
3	76.20	9.92	252.0	5.30	134.50	9.02	229.0	72.90	91.0	24V2CCB300GT
4	101.60	13.11	333.0	6.20	157.50	9.59	243.5	97.40	119.0	24V2CCB400GT

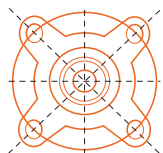
Ball Valve

V2G Clamp 2-Way 3PC Manual Ball Valve (RTFE Non-Encap)



Item	Parts	Material
1	Body	A351-CF8M
2	Cap	AISI 316/316L
3	Ball	A351-CF8M
4	Stem	PTFE
5	Gasket	PTFE
6	Thrust washer	PTFE
7	Stem	ASTM A276 Gr.316
8	Packing	PTFE
9	Gland	SS304
10	Bevel washer	AISI 301
11	Handle	SS304
12	Spring washer	SS304
13	Bolts	AISI 304
14	Bolt washer	AISI 304
15	Bolt nut	AISI 304
16	Handle sleeve	VINYL GRIP
17	Locking plate	SS304

1/2" - 3/4" FULL PORT



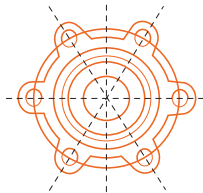
Materials:

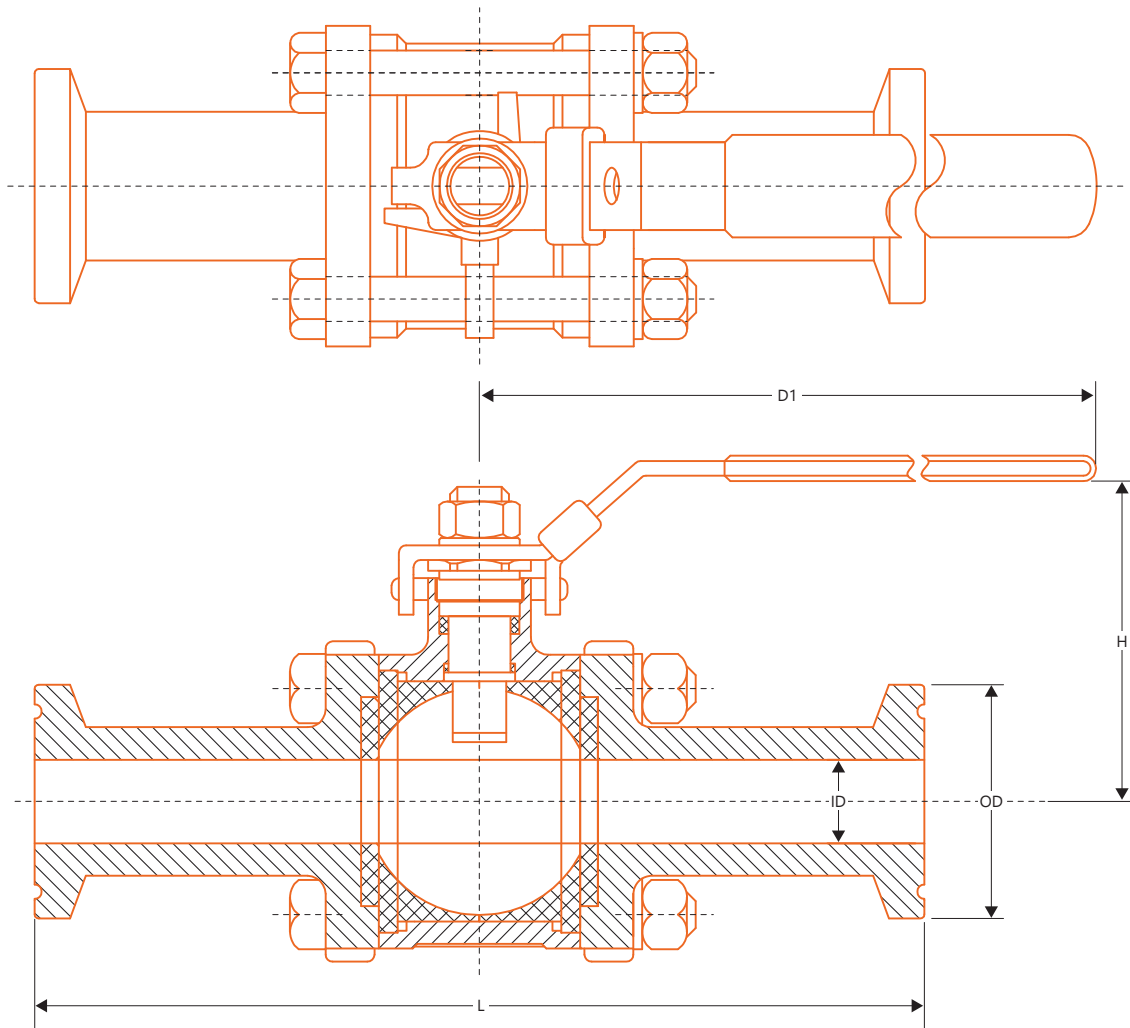
- Body, ends and ball : CF8M stainless
- Seats : 15% glass reinforced RTFE

Features:

- Live-loaded stem packing
- Precision stainless steel balls reduce torque and friction losses while extending seat life
- Integral ISO 5211 mounting pad
- ID polish is Ra 32 minimum
- Lockable handle can prevent accidental actuation
- Standard internal entry blow out proof stem design
- Full port design matches ball and seat ports to tube ID for lower pressure drop and less turbulent flow
- Compact design for areas with tight space restrictions
- Maximum pressure rating : 1/2" - 2" 1000 PSI WOG, 2 1/2" - 4" 800 PSI WOG

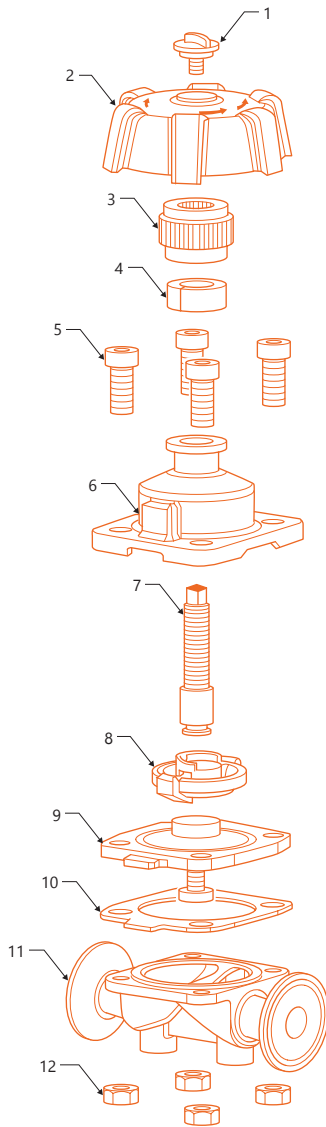
4" FULL PORT





Nominal Size		D1		H		L		ID	OD	Break Torque	
Inch	mm	Inch	mm	Inch	mm	Inch	mm	mm	mm	(in-lbs.)	316
1/2	12.70	4.13	105	2.33	59.10	4.57	116	9.5	25.0	55	24V2CCB050GT
3/4	19.05	4.13	105	2.46	62.55	4.69	119	15.9	25.0	71	24V2CCB075GT
1	25.40	5.04	128	2.78	70.70	4.88	124	22.2	50.4	101	24V2CCB100GT
1 1/2	38.10	6.06	154	3.51	89.10	5.55	141	35.0	50.4	221	24V2CCB150GT
2	50.80	7.64	194	3.86	98.15	6.38	162	47.6	63.9	345	24V2CCB200GT
2 1/2	63.50	7.64	194	4.35	110.60	7.76	197	60.3	77.4	883	24V2CCB250GT
3	76.20	10.87	276	4.88	124.00	9.02	229	73.0	90.9	830	24V2CCB300GT
4	101.60	13.19	335	6.63	168.50	9.57	243	97.4	118.9	1323	24V2CCB400GT

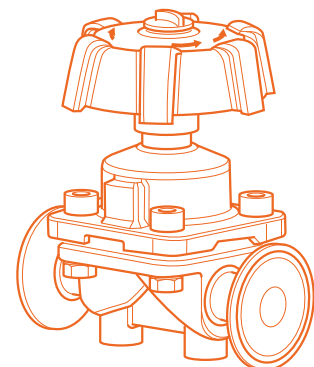
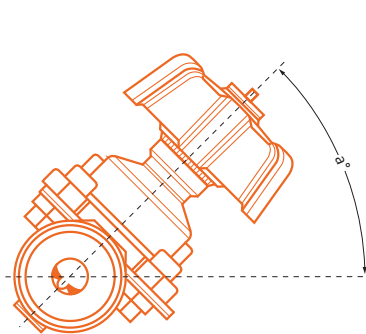
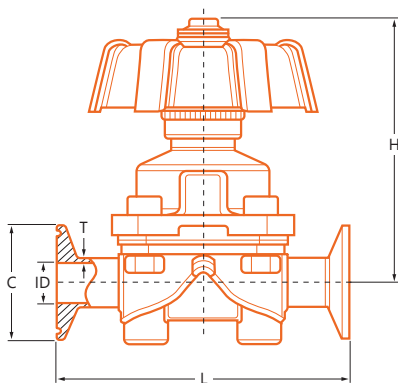
Manual Diaphragm Valve (PTFE+EPDM)



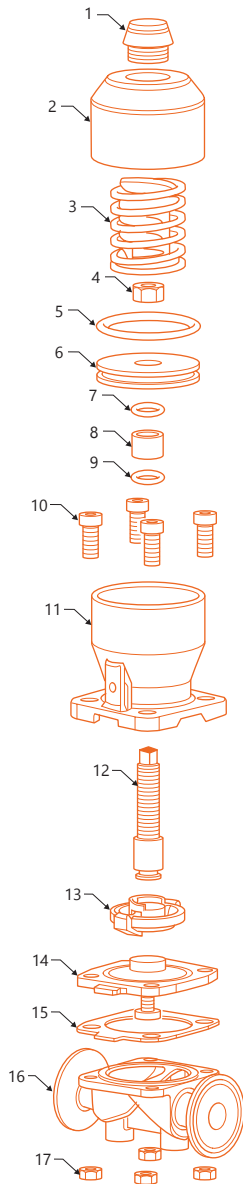
Item	Parts	Material	Qty
1	Cover	PC+SS304	1
2	Handle Wheel	PC	1
3	Positioning Ring	PC	1
4	Sleeve	PE	1
5	Screw	SS304	4
6	Bonnet	SS304	1
7	Shaft	SS304	1
8	Seat	SS304	1
9	Seal	EPDM	1
10	Seal	PTFE	1
11	Body	SS316L	1
12	Nut	SS304	4

Max. product pressure : 10 bar
 Working temperature : -10°C~95°C
 Operating air pressure : 4 bar
 Casting Material

Nominal Size	ID	T	C	H	L	a°	Part Number
Inch	mm	mm	mm	mm	mm		Clamp End
3/4	15.8	1.65	25.0	113	116	33°	2250CMB075GTE
1	22.1	1.65	50.5	116	126	25°	2250CMB100GTE
1 1/2	34.8	1.65	50.5	138	159	24°	2250CMB150GTE
2	47.5	1.65	64.0	166	190	30°	2250CMB200GTE
2 1/2	60.2	1.65	77.5	178	215	30°	2250CMB250GTE



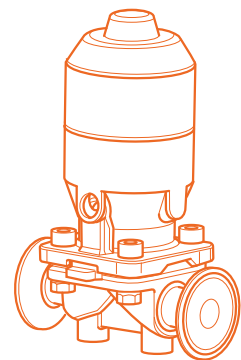
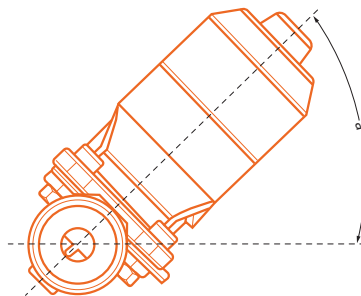
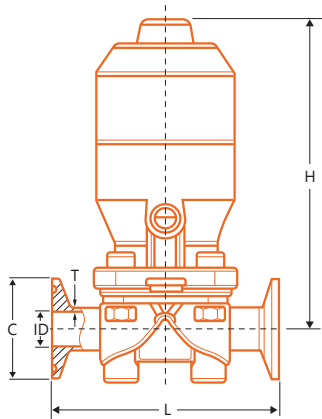
Pneumatic Diaphragm Valve (PTFE+EPDM)



Item	Parts	Material	Qty
1	Top Cover	PC	1
2	Cover	SS304	1
3	Spring	65Mn	1
4	Nut	SS304	1
5	O-ring Piston Seal	NBR	1
6	Piston	Aluminum	1
7	O Ring	NBR	1
8	Sleeve	Copper	1
9	O Ring	NBR	1
10	Screw	SS304	4
11	Bonnet	SS304	1
12	Piston Rod	SS304	1
13	Seat	SS304	1
14	Seal	EPDM	1
15	Seal	PTFE	1
16	Body	SS316L	1
17	Nut	SS304	4

Max. product pressure : 10 bar
 Working temperature : -10°C~95°C
 Operating air pressure : 4 bar
 Casting Material

Nominal Size	ID	T	C	H	L	a°	Part Number
Inch	mm	mm	mm	mm	mm		Clamp End
3/4	15.8	1.65	25.0	166	116	33°	2250CPB075GTE
1	22.1	1.65	50.5	166	126	25°	2250CPB100GTE
1 1/2	34.8	1.65	50.5	183	159	24°	2250CPB150GTE
2	47.5	1.65	64.0	261	190	30°	2250CPB200GTE





THIS IS TO CERTIFY THAT

GHWA Industries Co. Ltd

SV City Tower 1, 20th Floor, 896/34 Rama 3 Road, Bangpongpan, Bangkok 10120 , Thailand

is hereby authorized to continue to apply the
3-A Symbol to the models of equipment, conforming to 3-A Sanitary Standards for:

Number 33-03
33-03 (Metal Tubing)

set forth below

Clean-in-Place Model Number(s): 2401A or Bxxxyyy-z1, where z is: 1, 2, 3, 4, or 5; 2201Bxxxyyy-F1 or 4, in 304, 304L, 316 and 316L

VALID THROUGH: **December 31, 2024**

The issuance of this authorization for the use of the 3-A Symbol is based upon the voluntary certification, by the applicant for it, that the equipment listed above complies fully with the 3-A Sanitary Standard(s) designated. Legal responsibility for compliance is solely that of the holder of this Certificate of Authorization, and 3-A Sanitary Standards, Inc. does not warrant that the holder of an authorization at all times complies with the provisions of the said 3-A Sanitary Standards. This in no way affects the responsibility of 3-A Sanitary Standards, Inc. to take appropriate action in such cases in which evidence of nonconformance has been established.

NEXT TPV INSPECTION/REPORT DUE: **January 2027**



THIS IS TO CERTIFY THAT

GHWA Industries Co. Ltd

SV City Tower 1, 20th Floor, 896/34 Rama 3 Road, Bangpongpan, Bangkok 10120 , Thailand

is hereby authorized to continue to apply the
3-A Symbol to the models of equipment, conforming to 3-A Sanitary Standards for:

**Number 63-04
63-04 (Sanitary Fittings)**

set forth below

CIP Models: 242SA,B,C or Dxxx-yz; 242WCLA,B,C or Dxxx-yz; 242KSA,B,C or Dxxx-yz; 242WKA,B,C or Dxxx-yz; 242WULA,B,C or Dxxx-yz; 247WA,B,C or Dxxx-yz; 247WWWA,B,C or Dxxx-yz; 249WA,B,C or Dxxx-yz; 249WWWWA,B,C or Dxxx-yz; 247WTA,B,C or Dxxx-yz; 247WWWTA,B,C or Dxxx-yz; 247RWA,B,C or Dxxx-yz; 247RWWWA,B,C or Dxxx-yz; 247RWTB,B,C or Dxxx-yz; 247RWWWTB,B,C or Dxxx-yz; 2431WA,B,C or Dxxx-yz; 2432WA,B,C or Dxxx-yz; 2431A,B,C or Dxxx-yz; 2432A,B,C or Dxxx-yz; 242CMPLA,B,C or Dxxx-yz; 242CMPA,B,C or Dxxx-yz; 242KMPLA,B,C or Dxxx-yz; 242KMPA,B,C or Dxxx-yz; 247MPA,B,C or Dxxx-yz; 247MPSA,B,C or Dxxx-yz; 249MPA,B,C or Dxxx-yz; 247RMPA,B,C or Dxxx-yz; 247RMPSA,B,C or Dxxx-yz; 2431MPA,B,C or Dxxx-yz; 2432MPA,B,C or Dxxx-yz; 2414AMPA,B,C or Dxxx-yz; 2414WMPA,B,C or Dxxx-yz; 2414MMPA,B,C or Dxxx-yz; 2416WA,B,C or Dxxx-yz; 2416AMPA,B,C or Dxxx-yz; 2414PRFA,B,C or Dxxx-yz; 2414AA,B,C or Dxxx-yz; 2414WLA,B,C or Dxxx-yz; 2414WA,B,C or Dxxx-yz; 2415TRFA,B,C or Dxxx-yz; 2415AA,B,C or Dxxx-yz; 2415WLA,B,C or Dxxx-yz; 2415WA,B,C or Dxxx-yz; 2416AA,B,C or Dxxx-yz; 247WWTA,B,C or Dxxx-yz; 247WTTA,B,C or Dxxx-yz; 247WTWA,B,C or Dxxx-yz; 247TTWA,B,C or Dxxx-yz; 242TA,B,C or Dxxx-yz; 242KTA,B,C or Dxxx-yz; 242FPA,B,C or Dxxx-yz; 242KPA,B,C or Dxxx-yz; 242FMP14A,B,C or Dxxx-yz; 2417MP14A,B,C or Dxxx-yz; 2417MP15A,B,C or Dxxx-yz; 243115FA,B,C or Dxxx-yz; 2431TTA,B,C or Dxxx-yz; 2431TPA,B,C or Dxxx-yz; 2414C31A,B,C or Dxxx-yz; 2428WAA,B,C or Dxxx-yz; 2428WA,B,C or Dxxx-yz; 2428AMPA,B,C or Dxxx-yz; 2428BMPA,B,C or Dxxx-yz; 2207A,B,C or Dxxx-yz; 2208A,B,C or Dxxx-yz; 2209A,B,C or Dxxx-yz; 2210A,B,C or Dxxx-yz; 2211CA,B,C or Dxxx-yz; 2211EA,B,C or Dxxx-yz; 2222AA,B,C or Dxxx-yz; 2222BA,B,C or Dxxx-yz; 2222CA,B,C or Dxxx-yz; Where y and z are: 1, 2, 3, 4, or 5. Materials 304/304L and 316/316L

VALID THROUGH: December 31, 2024

The issuance of this authorization for the use of the 3-A Symbol is based upon the voluntary certification, by the applicant for it, that the equipment listed above complies fully with the 3-A Sanitary Standard(s) designated. Legal responsibility for compliance is solely that of the holder of this Certificate of Authorization, and 3-A Sanitary Standards, Inc. does not warrant that the holder of an authorization at all times complies with the provisions of the said 3-A Sanitary Standards. This in no way affects the responsibility of 3-A Sanitary Standards, Inc. to take appropriate action in such cases in which evidence of nonconformance has been established.

NEXT TPV INSPECTION/REPORT DUE: January 2027

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

Ghwa Industries Co.,Ltd.
52 Moo 7 Nongchumpon,
Khaoyoi,
Petchaburi
76140
Thailand

Holds Certificate Number:

FM 655607

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

Manufacturing of Ferrous Fitting and Tubing.

Previous certificate expired on 07/12/2022
Recertification audit end 27/10/2022



For and on behalf of BSI:

Michael Lam - Managing Director Assurance, APAC

Original Registration Date: 2016-12-08

Latest Revision Date: 2022-12-09

Effective Date: 2022-12-09

Expiry Date: 2025-12-07

Page: 1 of 1



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An electronic certificate can be authenticated [online](https://www.bsi-global.com/ClientDirectory).

Printed copies can be validated at www.bsi-global.com/ClientDirectory or telephone +66(2) 2944889-92.

Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2015 requirements may be obtained by consulting the organization.
This certificate is valid only if provided original copies are in complete set.

Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 345 080 9000
BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A Member of the BSI Group of Companies.

Certificate of Registration

ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2015

This is to certify that:

Ghwa Industries Co.,Ltd.
52 Moo 7 Nongchumpon,
Khaoyoi,
Petchaburi
76140
Thailand

Holds Certificate Number:

EMS 778766

and operates an Environmental Management System which complies with the requirements of ISO 14001:2015 for the following scope:

Manufacturing of Ferrous Fitting and Tubing.



For and on behalf of BSI:

Michael Lam - Managing Director Assurance, APAC

Original Registration Date: 2022-12-16

Effective Date: 2022-12-16

Latest Revision Date: 2022-12-16

Expiry Date: 2025-12-15

Page: 1 of 1



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Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 345 080 9000
BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A Member of the BSI Group of Companies.



EU CERTIFICATE OF QUALITY SYSTEM APPROVAL

In accordance with the requirements of the Pressure Equipment Directive
2014/68/EU.

This is to certify that the Quality Management System of:

GHWA Industries Co., Ltd.

52 Moo 7, Nongchumpon, Khaoyoi,

Phetchaburi 76140, Thailand

has been assessed against the requirements of Annex I, Paragraph 4.3 of the
above Directive and EN 764-5: 2014, Section 4.2 and conforms to the
requirements for the products shown below:

Manufacture of Ferrous Fittings and Tubings

Approval is subject to the continued maintenance of the quality system in
accordance with the requirements of the above Directive and EN764-5: 2014,
Section 4.2 and on-going surveillance. The products are as detailed on the
attached schedule.

Certificate No.: 0343/PED/MUM/PRJ11100416888/1

Original Approval: 22 November 2023

Current Issue: 22 November 2023

Certificate Expiry: 21 November 2026

Notified Body No. 0343

Keval Nikam on behalf of LRQA Nederland B.V.

LRQA Nederland B.V. (Reg. no. 24247948) is a private limited company registered in the Netherlands with registered office at George Hintzenweg 77, 3068 AX Rotterdam. A subsidiary of LRQA Group Limited.

LRQA Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'LRQA'. LRQA assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant LRQA entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Industry Terms and Definitions

animal-derived ingredients (ADI): products or ingredients derived from tissues or secretions of animals susceptible to transmissible spongiform encephalopathies (TSEs), primarily cattle's bovine spongiform encephalopathy (BSE).

animal-derived products (ADP): products made from animal-derived ingredients (ADI).

annealing: a treatment process for steel for reducing hardness, improving machinability, facilitating cold working, or producing a desired mechanical, physical, or other property.

anomaly: a localized surface area that is out of specifications to the surrounding area, and is classified as abnormal.

arc gap: for orbital GTAW, the nominal distance, measured prior to welding, from the tip of the electrode to the surface of the weld joint or insert.

arc strike: a discontinuity consisting of any localized remelted metal, heat-affected metal, or change in the surface profile of any part of a weld or base metal resulting from an arc, generated by the passage of electrical current between the surface of the weld or base material and a current source, such as a welding electrode, magnetic particle prod, or electropolishing electrode.

aseptic: free of pathogenic (causing or capable of causing disease) microorganisms.

autogenous fillet weld: a fillet weld that is produced without the addition of filler metal. (See also seal weld.)

autogenous weld: a weld made by fusion of the base material without the addition of filler. [See also gas tungsten-arc welding (GTAW).]

automatic welding: welding with equipment that performs the welding operation without adjustment of the controls by a welding operator. The equipment may or may not perform the loading and unloading of the work. (See also machine welding.)

barrier fluid: a fluid used to separate environment from product such as water or condensate in a dual mechanical seal.

bioburden: the number of viable contaminating organisms per product unit.

biofilm: a film of microorganisms or cell components adhering to surfaces submerged in or subjected to fluid environments.

biologics: therapeutic or diagnostic products generated and purified from natural sources.

biopharmaceuticals: pharmaceuticals manufactured by biotechnology methods, with the products having biological sources, usually involving live organisms or their active components. Biopharmaceuticals generally include recombinant proteins, (monoclonal) antibodies, vaccines, blood/plasma-derived products, nonrecombinant culture-derived proteins, and cultured cells and tissues.

bioprocess: technique or operation used in the manufacture and/or purification of biopharmaceuticals or other biological materials, such as products derived from microbial fermentation (e.g., yeast, mold, bacteria), cell culture (e.g., insect, mammalian, plant), tissue culture, blood, or milk fractionation.

bioprocessing equipment: equipment, systems, or facilities used in the creation of products utilizing living organisms.

blind weld: a weld joint by design that cannot feasibly be visually examined internally.

blister (polymeric): a localized imperfection on a polymer surface, containing a pocket of fluid.

blistering (metallic): a localized delamination within the metal that has an appearance of chipped or flaked-off areas. Per SEMI F019-0304, section 4.2.1.

borescope: generic term for a group of optical instruments for visual examinations. This includes rigid borescopes and flexible borescopes (fiberscopes). Often a camera chip is mounted to the borescope. (See also videoscope.)

break: a discontinuity in the face of a fitting.

buffing: a metal finishing process for smoothing the surface using a grease-suspended abrasive.

burn-through: excessive melt-through or a hole through the root bead of a weld.

burr: excess material protruding from the edge typically resulting from operations such as cutting or facing.

butt joint: a joint between two members lying approximately in the same plane.

cartridge seal: a self-contained seal assembly.

cavitation: a condition of liquid flow where, after vaporization of the liquid, the subsequent collapse of vapor bubbles can produce surface damage.

cGMPs: current Good Manufacturing Practices. Current design and operating practices developed by the pharmaceutical industry to meet FDA requirements as published in the Code of Federal Regulations, Chapter 1, Title 21, Parts 210 and 211.

chromatography: the purification of substances based on the chemical, physical, and biological properties of the molecules involved.

clean: a condition achieved by removal of dirt, residues, detergents, or other surface contaminants.

cleaning: operations by which dirt, residues, detergents, or other surface contaminants are removed to achieve predetermined surface attributes.

clean-in-place (CIP): cleaning of process contact surfaces of a system or component without disassembly beyond the removal of single-use components.

closed head: for orbital GTAW, a welding head that encapsulates the entire circumference of the tube/pipe during welding and that contains the shielding gas.

cloudiness: the appearance of a milky white hue across some portion of a surface resulting from the electropolish process.

cluster of pits: two or more pits, the closest distance between each being less than the diameter of any one pit.

cluster porosity: porosity that occurs in clumps or clusters.

compendial water: purported to conform to USP and/or any other acknowledged body of work related to the quality, manufacture, or distribution of high-purity water.

concavity: a condition in which the surface of a welded joint is depressed relative to the surface of the tube or pipe. Concavity is measured as a maximum distance from the outside or inside diameter surface of a welded joint along a line perpendicular to a line joining the weld toes.

consumable insert: a ring of metal placed between the two elements to be welded that provides filler for the weld, when performed with fusion welding equipment. A consumable insert can also be used for the root pass in a multiple-pass weld with the addition of filler wire (also called insert ring).

convexity: a condition in which the surface of a welded joint is extended relative to the surface of the tube or pipe. Convexity is measured as a maximum distance from the outside or inside diameter surface of a welded joint along a line perpendicular to a line joining the weld toes.

corrosion: a chemical or electrochemical interaction between a metal and its environment, which results in changes in the property of the metal. This may lead to impairment of the function of the metal, the environment, and/or the technical system involved.

cracks: fracture-type discontinuities characterized by a sharp tip and high ratio of length and width to opening displacement. A crack may not be detected with a stylus. A linear crack will produce a liquid penetrant indication during liquid penetration inspection, X-ray, or ultrasound.

crater: a depression at the termination of a weld bead.

crater cracks: cracks that form in the crater, or end, of the weld bead.

creep: a time-dependent permanent deformation that occurs under stress levels below the yield stress.

dead leg: a space where system design and operating conditions result in insufficient process fluid flow, presenting a risk for particulate, chemical, or biological contamination.

defects: discontinuities that by nature or accumulated effect (e.g., total crack length) render a part or product unable to meet minimum applicable acceptable standards or specifications. This term designates rejectability. (See also discontinuity.)

deionized water: a grade of purified water produced by the exchange of cations for hydrogen ions and anions for hydroxyl ions.

delamination: separation into constituent layers.

demarcation: a localized area that is dissimilar to the surrounding areas with a defined boundary.

dent: a large, smooth-bottomed depression whose diameter or width is greater than its depth and that will not produce an indication.

descaling: the removal of heavy, tightly adherent oxide films resulting from hot-forming, heat-treatment, welding, and other high-temperature operations such as in steam systems.

direct visual examination: a visual examination where there is an uninterrupted optical path from the observer's eye to the area to be examined. This can be either unaided or aided via mirrors, lenses, etc.

dirty: a relative term indicating the condition of being contaminated.

discoloration: any change in surface color from that of the base metal. Usually associated with oxidation occurring on the weld and heat-affected zone on the outside diameter and inside diameter of the weld joint as a result of heating the metal during welding. Colors may range from pale bluish-gray to deep blue, and from pale straw color to a black crusty coating.

discontinuity: interruption of the typical structure of a weldment, such as a lack of homogeneity in the mechanical, metallurgical, or physical characteristics of the material or weldment. A discontinuity is not necessarily a defect.

distribution system: centralized system for the delivery of fluids from point of generation or supply to point of use.

downslope: that part of an automatic orbital weld sequence during which the welding current is gradually reduced prior to extinguishing of the welding arc. The downslope portion of a welded joint is seen as a tapering of the end of the weld bead with a reduction of penetration from the beginning to the end of the downslope so that the final weld bead is small with minimal penetration.

drainable: a designed characteristic of a component, equipment, or system that enables the removal of water by means of gravity except for that which remains due to surface adherence. Drain paths that become blocked due to surface-adhered water are not considered drainable.

duplex stainless steel: a group of stainless steels whose chemical composition is designed to produce a room temperature microstructure that is a mixture of austenite and ferrite.

durometer: measurement of hardness related to the resistance to penetration of an indenter point in to a material as typically determined by ASTM D2240.

dynamic seal: seal with a component that is in motion relative to a second surface.

dynamic spray device: a moving device, designed to produce a nonstationary spray pattern.

elastomer: rubber or rubberlike material possessing elasticity. (See also elastomeric material.)

elastomeric material: a material that can be stretched or compressed repeatedly and, upon immediate release of stress, will return to its approximate original size.

electropolishing: a controlled electrochemical process utilizing acid electrolyte, direct current, anode, and cathode to smooth the surface by removal of metal.

end grain effect: a surface discontinuity of small diameter (or linear) cavities located perpendicular to the rolling direction of the material and appearing after electropolishing.

etching: the process of removing a layer of metal from its surface using a chemical and/or electrolytic process.

ethical pharmaceutical: a controlled substance for the diagnosis or treatment of disease.

excessive penetration: weld penetration that exceeds the acceptance limit for inside diameter convexity. (See also convexity.)

finishing marks: any surface texture or pattern resulting from cutting, machining, forming, grinding, polishing, and/or other finishing methods.

fixture marks: an area on an electropolished component where the electrical connection was made for the processing of the component.

flash electropolish: an electrochemical process done for a very short duration of time with a low current density, which neither significantly alters the surface of the material nor meets the acceptance criteria as set forth in ASME-BPE Nonmandatory Appendix H, Table H-3.3-1.

flushing (rinsing): the flowing of water over the process contact surfaces of system components for the removal of articulates or water-soluble contaminants.

full penetration: a weld joint is said to be fully penetrated when the depth of the weld extends from its face into the weld joint so that the joint is fully fused. For a tube-to-tube weld, no unfused portions of the weld joint shall be visible on the inside diameter of a fully penetrated weld.

fusion: the melting together of filler metal and base metal, or of base metal only, that results in coalescence.

fusion welding: welding in which the base material is fused together without the addition of filler material to the weld. [See also gas tungsten-arc welding (GTAW).]

gasket: static seal made from deformable material compressed between two mating surfaces.

gas tungsten-arc welding (GTAW): an arc welding process that produces coalescence of metals by heating them with an arc between a tungsten (nonconsumable) electrode and the work. Shielding is obtained from a gas or gas mixture. (This process is sometimes called TIG welding, a nonpreferred term.) GTAW may be performed by adding filler material to the weld, or by a fusion process in which no filler is added.

grain boundary: an interface separating two grains, where the orientation of the lattice structure changes from that of one grain to that of the other. Per SEMI F019-0304, section 4.8.2.

harvesting: the separation of cells from growth media. This can be accomplished by filtration, precipitation, or centrifugation.

haze: a localized diminished surface brightness, commonly produced by gassing or variations of the essential variables during electropolishing.

heat-affected zone: that portion of the base metal or polymer that has not been melted, but whose microstructure or mechanical properties have been altered by the heat of welding or cutting.

heat number: an alphanumeric identification of a stated tonnage of metal obtained from a continuous melting in a furnace.

heat tint: coloration of a metal surface through oxidation by heating. (See also discoloration.)

High Efficiency Particulate Air (HEPA) filter: a type of air filter that removes 99.97% of particles 0.3 μ and larger in diameter.

higher alloy: a metal containing various alloying constituents formulated to provide enhanced corrosion resistance and possibly improved mechanical properties beyond those that are typically observed in UNS S31603 stainless steel.

holdup volume: the volume of liquid remaining in a vessel or piping system after it has been allowed to drain.

hydrotest: a pressure test of piping, pressure vessels, or pressure-containing parts, usually performed by pressurizing the internal volume with water at a pressure determined by the applicable code.

hygienic: of or pertaining to equipment and piping systems that by design, materials of construction, and operation provide for the maintenance of cleanliness so that products produced by these systems will not adversely affect human or animal health.

hygienic clamp joint: a tube outside diameter union consisting of two neuted ferrules having flat faces with a concentric groove and mating gasket that is secured with a clamp, providing a nonprotruding, recessless process contact surface.

hygienic joint: a tube outside diameter union providing a nonprotruding, recessless process contact surface.

icicles: localized regions of excessive penetration, which usually appear as long, narrow portions of weld metal on the weld underbead. (See also convexity and excessive penetration.)

inclusions: particles of foreign material in a metallic or polymer matrix.

incomplete fusion (or lack of fusion): a weld discontinuity in which fusion did not occur between weld metal and faces or between adjoining weld beads. Also, in welding of tubing, when the weld fully penetrates the wall thickness but misses the joint, leaving some portion of the inner (inside diameter) weld joint with unfused edges.

incomplete penetration (or lack of penetration): a groove weld in which the weld metal does not extend completely through the joint thickness.

indication: a condition or an anomaly of a localized area that has not been classified as being accepted or rejected.

inspection (as it relates to process piping, tubing, and process contact surfaces): functions performed by the owner's Inspector to verify that all required examinations and testing have been completed and to evaluate the physical attributes of the piping to the extent necessary to be satisfied that it conforms to all applicable requirements.

interrupted electropolish: a break in the continuity of the electropolished surface appearance, due to a change of electropolishing conditions at the overlapping boundaries, which may occur when surfaces are electropolished by zones. It may be visible as haze, cloudiness, or variance in luster across these overlapping boundaries.

ISO class 1–9: clean room classifications based on air particulate concentration as defined by the International Organization for Standardization in ISO 14644-1.

joint penetration: the depth that a weld extends from its face into a joint, exclusive of reinforcement.

lack of fusion after reflow: a discontinuity in welding of tubing where, after a reflow or second weld pass has been made, the original joint has still not been consumed, leaving the weld joint with unfused edges on the inner surface.

lamellar tears: terrace-like fractures in the base metal with a basic orientation parallel to the wrought surface; caused by the high stress in the thickness direction that results from welding.

laminations: elongated defects in a finished metal product, resulting from the rolling of a welded or other part containing a blowhole. Actually, the blowhole is stretched out in the direction of rolling.

leachables (polymeric): typically a subset of extractables, these chemicals migrate from polymeric articles into the product or process fluid.

linear porosity: porosity that occurs in a linear pattern. Linear porosity generally occurs in the root pass from inadequate joint penetration.

liquid penetrant indication: refer to ASME BPVC, Section V, T-600, for testing an anomaly or an indication.

looped header: a piping ring with multiple branches for inlet or outlet. The branches on the ring can be closed by valves, caps, or other means of flow isolation.

luster: the state or quality of shining by reflecting light. (See also variance in luster.)

machine welding: welding with equipment that performs the welding operation under the constant observation and control of a welding operator. The equipment may or may not perform the loading and unloading of the works. (See also automatic welding.)

manual welding: welding in which the entire welding operation is performed and controlled by hand.

material manufacturer: an organization responsible for the production of products meeting the requirements of the material specification(s).

Material Test Report (mill test report or MTR): a document in which the results of tests, examinations, repairs, or treatments required by the material specification to be reported are recorded. This document includes those of any supplementary requirements or other requirements stated in the order for the material. This document may be combined with a Certificate of Conformance as a single document.

material type: a commercial designation for a given chemistry range.

maximum working pressure: the pressure at which the system is capable of operating for a sustained period of time.

maximum working temperature: the temperature at which the system must operate for a sustained period of time. The maximum working temperature should relate to the maximum working pressure and the fluids involved.

meandering: of or pertaining to a weld bead that deviates from side to side across the weld joint rather than tracking the joint precisely.

mechanical polishing: a process by which abrasive media is applied to a surface until the specified surface roughness (Ra) is achieved.

mechanical seal: a device used for sealing fluids with rotating shafts. A mechanical seal is a prefabricated or packaged assembly that forms a running seal between flat surfaces.

micron (1 μ) or micrometer (1 μm): one-millionth of a meter.

misalignment (mismatch): axial offset of the joint members.

miter: two or more straight sections of tube matched and joined in a plane bisecting the angle of junction so as to produce a change of direction.

molded seal: a seal that is manufactured by forming in a mating cavity.

mold flash: excess material that is greater than the designed geometry of a part that is formed in the molding process.

multiuse: a term describing process contact components, equipment, and systems that are designed to be cleaned, sanitized, or sterilized and used multiple times (also referred to as repeated use).

nick: a surface void anomaly caused by material removal or compression from the surface, whose bottom surface is usually irregular.

nominal outside diameter: a numerical identification of outside diameter to which tolerances apply.

nominal wall thickness: a numerical identification of wall thickness to which tolerances apply.

nonsliding seal: a seal that does not have transverse or rotational movement between the seal and mating surface(s).

nonuniform mechanical polishing marks: a localized surface polishing pattern that is dissimilar to the surrounding area.

off angle: a measurement of face-to-face squareness.

off plane: a measurement of the offset between part centerlines or two planes.

open head: for orbital GTAW, a welding head that is open to the atmosphere external to the tube/pipe being welded and that does not enclose the shielding gas, which is still provided through the torch.

orange peel: large-featured, roughened type of surface visible to the unaided eye whose surface appearance pattern is like that of an orange peel.

orbital welding: automatic or machine welding of tubes or pipe in-place with the electrode rotating (or orbiting) around the work. Orbital welding can be done with the addition of filler material or as a fusion process without the addition of filler.

O-ring: ring seal of circular cross section.

outboard seal: a seal that is outside the product area in the outermost part of a mechanical seal assembly.

overlap: the protrusion of weld metal beyond the weld toes or weld root. Also, in an orbital weld, that amount by which the end of the weld bead overlaps the beginning of the weld bead (not including the downslope) on a singlepass weld.

oxidation: a common form of electrochemical reaction that is the combining of oxygen with various elements and compounds.

oxide island: a concentration of nonmetallic impurities (often oxides or nitrides) that may form in the weld pool and solidify on the underbead or weld top surface.

oxide layer: an area usually located in the heat-affected zone of the weldment where an oxidation reaction has taken place.

packing: a type of shaft seal formed into coils, spirals, or rings that is compressed into the seal cavity.

particulates (single-use): small, solid, and mobile matter.

passivation: removal of exogenous iron or iron from the surface of stainless steels and higher alloys by means of a chemical dissolution, most typically by a treatment with an acid solution that will remove the surface contamination and enhance the formation of the passive layer.

passive layer: a chromium-enriched oxide layer on a stainless steel surface that improves the corrosion resistance of the base metal.

passivity: the state in which a stainless steel exhibits a very low corrosion rate; the loss (or minimizing) of chemical reactivity exhibited by certain metals and alloys under special environmental conditions.

PE: polyethylene, polymer material composed of carbon and hydrogen.

penetration: see full penetration, incomplete penetration, and joint penetration.

personal care products: products used for personal hygiene or cosmetic care.

pickling: a chemical process for cleaning and descaling stainless steel and other alloy parts, equipment, and systems.

pipe: pipe size is determined by diameter and schedule, series, or SDR. For bioprocessing equipment, pipe does not include tube.

pit: a small surface void resulting from a localized loss of base material.

pitch: to cause to be set at a particular angle or slope; degree of slope or elevation.

polypropylene (PP): polymer material composed of carbon and hydrogen.

porosity: cavity-type discontinuities formed by gas entrapment during solidification.

pressure rating: pressure at which a system is designed to operate, allowing for applicable safety factors.

process component: a constituent part of equipment or a system that contacts the product or process fluid. Examples of process components include, but are not limited to, tube, fittings, gaskets, valves, and instruments.

process contact surface: a surface under design operating conditions that is in contact with, or has the potential to be in contact with, raw materials, in-process materials, APIs, clean utilities (e.g., WFI, CIP, pure steam, process gases), or components (e.g., stoppers) and where there is a potential for the surface to affect product safety, quality, identity, strength, or purity.

process equipment: an assembly of components that, when combined, provides the platform for one or more process operations including, but not limited to, storage, momentum transfer, heat transfer, mass transfer, and separation. Examples of process equipment include, but are not limited to, pumps, vessels, heat exchangers, chromatography columns, centrifuges, and filter housings.

process system: an assembly of components, equipment, and subsystems that, when integrated, provides a platform for one or more process operations to produce an output within predefined specifications. Examples of process systems include, but are not limited to, bioreactor, chromatography, CIP, and purified water systems.

product contact surface: a process contact surface that is in contact with, or has the potential to be in contact with, a product where product is defined by the owner/user. Examples of product contact surfaces may include the interior surfaces of bioreactors, transfer tubing, chromatography columns, vessels, and recirculating segments of CIP systems.

profilometer: an instrument for the measurement of the degree of surface roughness.

progressive polishing: a mechanical grinding procedure where a coarse grit material is used first and the successive operations use a finer and finer grit until the desired surface roughness is achieved.

PTFE: polytetrafluoroethylene, homopolymer material of tetrafluoroethylene.

pure steam: also known as clean steam, steam that is produced by a steam generator that, when condensed, meets requirements for water-for-injection (WFI).

purified water (PW): a classification of water according to compendial standards.

pyrogen: a fever-producing substance.

Ra: log of the arithmetic mean of the surface profile.

Ra max.: the highest value of a series of Ra readings.

reflow: a second weld pass made to correct a lack of fusion or missed joint.

remote visual examination: a visual examination where there is an interrupted optical path from the observer's eye to the area to be examined. This covers the use of photography, video systems, videoscopes, and borescopes.

rouge: a general term used to describe a variety of discolorations in high-purity stainless steel biopharmaceutical systems. It is composed of metallic (primarily iron) oxides and/or hydroxides. Three types of rouge have been categorized.

Class I rouge: a rouge that is predominantly particulate in nature that tends to migrate downstream from its origination point and can deposit on process contact surfaces. It is generally orange to red-orange in color. These particles can be wiped off a surface and are evident on a wipe. Surface composition under the rouge remains unchanged.

Class II rouge: a localized form of active corrosion. It occurs in a spectrum of colors (orange, red, blue, purple, gray, black). It can be the result of chloride or other halide attack on the surface of the stainless steel.

Class III rouge: a surface oxidation condition occurring in high-temperature environments such as pure steam systems. The system's color transitions to gold, to blue, to various shades of black, as the layer thickens. This surface oxidation initiates as a stable layer and is rarely particulate in nature. It is an extremely stable form of magnetite (iron sesquioxide, Fe_3O_4).

sanitary (hygienic) weld: generally considered to be a groove weld in a square butt joint made by the GTAW (or plasma) process as a fusion weld without the addition of filler material. A sanitary weld must be completely penetrated on the weld inside diameter (I.D.), with little or no discoloration due to oxidation, and be otherwise without defects that would interfere with maintenance in a clean and sterile condition.

scratch: an elongated mark or groove cut in the surface by mechanical means, not associated with the predominant surface texture pattern.

seal face: surface point on which a seal is achieved.

seal point: location of process boundary created by components in contact (seal), having sufficient contact stress/ load to create media or environmental isolation.

seal weld: a weld used to obtain fluid tightness as opposed to mechanical strength. (See also autogenous fillet weld.)

seat leakage: a quantity of test fluid passing through an assembled valve in the closed position under the defined test conditions.

SEM: scanning electron microscope.

semi-automatic arc welding: arc welding with equipment that controls only the filler metal feed. The advance of the welding is manually controlled.

service life: the life expectancy or number of cycles for which the unit will maintain its performance.

shelf life: the duration, under specified storage conditions, from the date of manufacture to the last date the product can be placed in service without having an unacceptable effect on performance.

shell leakage: a quantity of test fluid passing from the inside of a component externally to atmosphere under the defined test conditions.

single-use: a term describing process contact components, assemblies, and systems that are designed to be used once, and not to be cleaned or sterilized for reuse.

size classification: the size of surface deficits is classified in two groups as follows: (a) macro: referring to indications that can be seen in adequate lighting without magnification. (b) micro: referring to indications that can be seen only with the aid of magnification.

slag: a nonmetallic product resulting from the mutual dissolution of flux and nonmetallic impurities in some welding and brazing operations.

slope: an incline or deviation from the horizontal. A tube or pipe installed in the horizontal plane is said to slope if one end is positioned higher than the other.

splatter: the metal particles expelled during welding that do not form part of a weld.

spot electropolishing: a localized electrochemical process that is capable of producing the correct Cr to Fe ratios on the surface of a material and meeting the requirements of ASME-BPE Nonmandatory Appendix H, Table H-3.3-1.

square cut: a tube end cut perpendicular to the tangent plane.

squareness: face-to-face perpendicularity.

static seal: a stationary sealing device.

steam-in-place (SIP): the use of steam to sanitize or sterilize a piece of equipment without the use of an autoclave.

strainer: a component that mechanically separates and retains suspended solid particulates from a process fluid. (See also strainer body and strainer element.)

strainer body: the subcomponent of a strainer that holds or houses the strainer element. A strainer body can be part of the process piping in which the strainer is installed (e.g., gasket strainer).

strainer element: the subcomponent of a strainer with openings (e.g., perforations, slots). This subcomponent provides the straining of suspended solid particulates.

stringer indication: a linear void resulting from the removal of an elongated nonmetallic inclusion or secondary phase.

stuffing box: in shaft seals, the casing containing the sealing material; seal chamber for shaft seals. (See also packing.)

superaustenitic stainless steel: a subgroup of austenitic stainless steels having elevated levels of nickel, chromium, and molybdenum compared with standard austenitic stainless steels (e.g., UNS S31603) and that may have other additions (e.g., nitrogen and/or copper) to increase strength and resistance to pitting corrosion and stress corrosion cracking in the presence of chlorides.

super duplex stainless steel: those duplex stainless steels whose chemical composition is designed to result in a pitting resistance equivalent number (PREN) of at least 40.

surface inclusion: particles of foreign material in a metallic matrix. The particles are usually compounds such as oxides, sulfides, or silicates, but may be a substance foreign to and essentially insoluble in the matrix.

surface residual: a foreign substance that adheres to a surface by chemical reaction, adhesion, adsorption, or ionic bonding (e.g., corrosion, rouging, and staining).

swing elbow: a movable elbow used to connect and reconfigure flow paths.

tack weld: a weld made to hold parts of a weldment in proper alignment until the final welds are made.

thermoplastic: long-chain polymers that are usually not connected by crosslinks. Once formed, these materials can be reshaped.

thermoset: long-chain polymers that are usually connected by crosslinks. Once formed, these materials cannot be reshaped.

transfer panel: a panel to which process and/or utilities are piped that mechanically precludes erroneous cross-connections.

tube: tube is sized by its nominal outside diameter. For bioprocessing equipment, tube does not include pipe.

tungsten inclusions: tungsten particles transferred into the weld deposit by occasional touching of the tungsten electrode used in the gas tungsten-arc process to the work or to the molten weld metal. These inclusions are often considered defects that must be removed and the weld repaired prior to final acceptance. Tungsten inclusions may be invisible to the unaided eye, but are readily identified in a radiograph.

Ultra-Low Particulate Air (ULPA) filter: a type of air filter that removes 99.999% of particles 0.1 μ and larger in diameter.

undercut: a groove melted into the base metal adjacent to the weld toe or weld root and left unfilled by weld metal.

underfill: a depression on the weld face or root surface extending below the adjacent surface of the base metal. (See also concavity.)

uniformly scattered porosity: porosity that is distributed in a weldment in a uniform pattern.

validation: establishing documented evidence that the system does what it purports to do.

variance in luster: the appearance of a different shine or reflectivity resulting from the examination or inspection technique or from the preconditioning or conditioning of the electropolished surface.

videoscope: a type of borescope with a camera chip mounted to the instrument for taking photos or videos of the area of examination.

waviness: undulations or rippling of the surfaces.

welding operator: one who operates machine or automatic welding equipment.

weld joint design: the shape, dimensions, and configuration of the weld joint.

weld whitening: a difference in appearance of grain structure between weld metal and base metal after electropolishing.

WFI: water-for-injection, a classification of water according to compendial standards.

Limited Warranty

G HWA Industries Co., Ltd. warrants that the products will be free from defects in materials and workmanship as per purchase specifications and under normal use and service for a period of (1) one year from the date of shipment. Any product that proves to be defective shall be repaired, replaced or credited with original purchase price of such defective products at G HWA's discretion, providing it has been used in an approved installation and maintained in strict accordance WITH recognized standard industry practice, and that has not been subject to extraordinary service, such as encountered under severe corrosive or abrasive conditions. G HWA shall not be liable for any consequential, indirect, incidental or contingent damages. G HWA makes no warranties, expressed or implied, other than those listed above.

The information contained herein are correct at the time of issuance, but may be subject to change without prior notice.





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