

# Steel & O'Brien Manufacturing

QUALITY BPE FITTINGS, TUBING AND MORE



## BPE BIO-PHARM FITTINGS CATALOG 2019

*From concept, design and prototype, to large scale quantities, let Steel & O'Brien Mfg. turn your vision into reality.*



Member of:



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### About Us

Steel & O'Brien is a domestic manufacturer of sanitary stainless steel fittings for the food processing, pharmaceutical and various other industries, located in Western New York.

Founded in 1990, S&O is family owned and operated specializing in quick turn around, custom fittings and very competitive pricing.

Our new 205,000 square foot facility, maintains over twenty-five million dollars in finished goods inventory as well as over one million dollars in raw materials inventory.

### Introduction

Steel & O'Brien Manufacturing offers a full line of ASME-BPE compliant fittings for the Pharmaceutical and Biotech Industries. Ranging in sizes from 1/2" - 6" with weld and clamp end connections, in 316L material.

**Traceability** - All fittings are marked according to the latest ASME-BPE specifications. Permanently marking each fitting allows for full traceability back to the original stainless steel used to make the part. All Material Test Reports are available upon request or on our website. ([www.steelobrien.com](http://www.steelobrien.com)).

**Quality** - Every BPE fitting is inspected by a highly trained staff to the latest ASME-BPE specifications.

**Packing** - To prevent damage and contamination all BPE fittings are capped and bagged in transparent bags.

**Boroscopying** - Ability to inspect and record welds with an inside diameter of .370 and larger. With a reach of up to 76" from access port. Our high resolution boroscope gives Steel and O'Brien the ability to inspect for ASME-BPE weld discoloration acceptance.



Member of:



## Introduction

Polishing - Polishing is an important component for BPE fittings. Polish offerings are shown below and comply to the latest ASME-BPE requirements

SURFACE FINISH CODE	BPE Designation	Inside Surface			Outside Surface
		Ra Max.		Polish Method	Polish Method
		$\mu$ -in.	$\mu$ m		
PU	SF0			Unpolished	Unpolished
PC	SF1	20	0.51	Mechanical Polish	Unpolished
PL	SF1	20	0.51	Mechanical Polish	Mechanical Polish (32Ra)
PD	SF4	15	0.38	Mechanical Polish & Electropolish	Unpolished
PM	SF4	15	0.38	Mechanical Polish & Electropolish	Mechanical Polish (32Ra)

## Special Fabrications

Steel & O'Brien Mfg. provides custom fabrications in stainless steel as well as other alloys including Hastelloy, AL6XN, Titanium, Monel and Inconel.

Our experienced team of engineers, machinists, welders, and polishers can take your design from drawing to finished product while meeting and often exceeding customer specifications. Industry leading delivery times keeps your project on time.

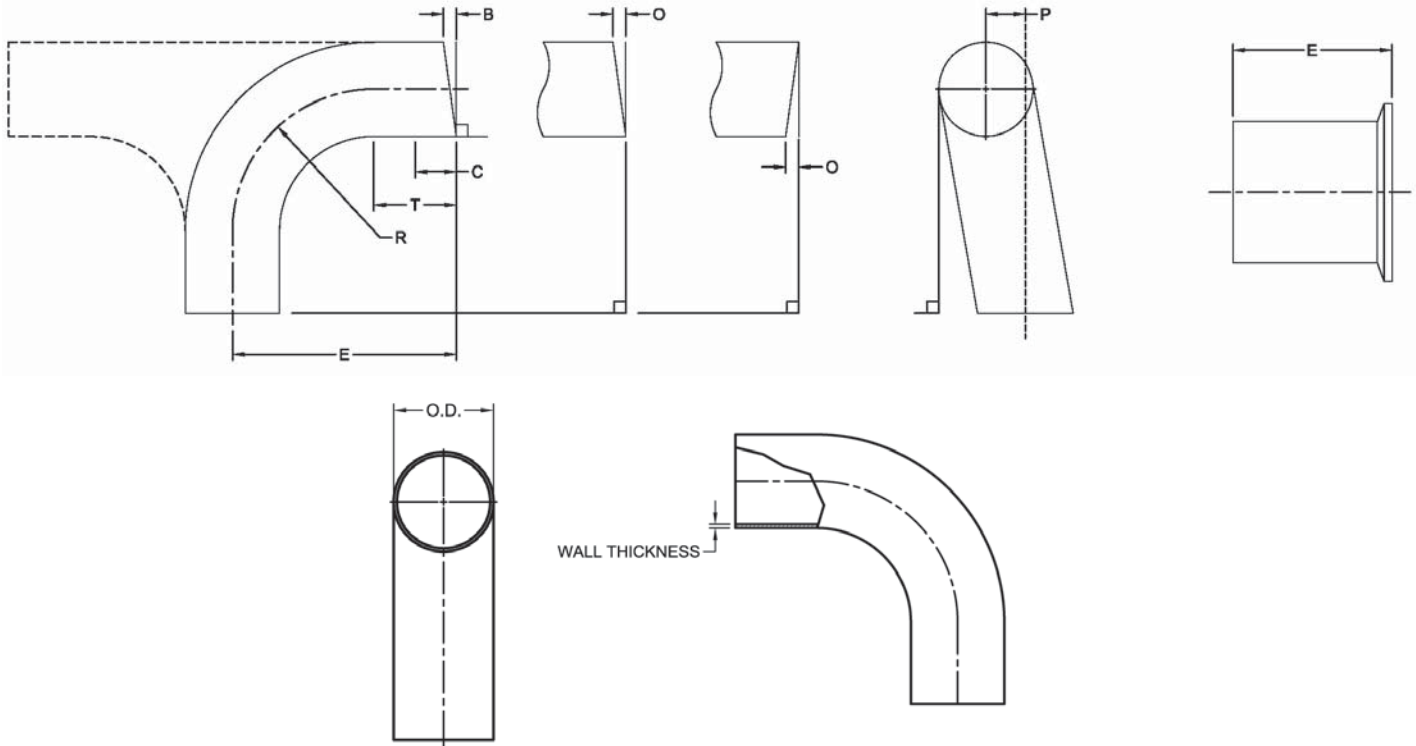
Give us a call for a prompt quote on your custom fabrication needs.



# BPE FITTINGS

## DIMENSIONS & TOLERANCES

As specified in ASME BPE Part DT-3-1

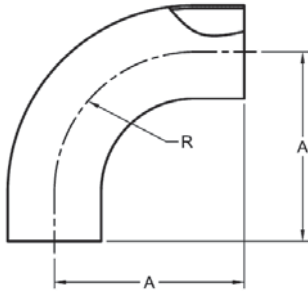


Nominal Size	O.D.		Wall Thickness (Mechanical Polish)		Wall Thickness (Electropolish)		Squareness Face to Tangent, B (max.)		Off Angle O (max.)		Equivalent Angle (O) (max.)	Off Plane, P (max.)		Centerline Radius (CLR), R	
	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.		in.	mm.	in.	mm.
1/4	±0.005	±0.13	+0.003/-0.004	+0.08/-0.10	+0.003/-0.006	+0.08/-0.15	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	+0.003/-0.006	+0.08/-0.15	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/-0.010	+0.13/-0.25	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/-0.010	+0.13/-0.25	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	+0.005/-0.010	+0.13/-0.25	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	+0.005/-0.010	+0.13/-0.25	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	+0.005/-0.010	+0.13/-0.25	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	+0.005/-0.010	+0.13/-0.25	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	+0.005/-0.010	+0.13/-0.25	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	+0.38/-0.38	+0.008/-0.012	+0.20/-0.30	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/-0.20	+0.015/-0.017	+0.38/-0.43	0.030	0.76	0.135	3.43	1.3	0.060	1.52	9.000	228.60

### General Notes:

- 1) Tolerances for "E" end-to-end and center-to-end = .050 in (1.27mm)
- 2) Tolerance for centerline radius (CLR) = ±10% of the nominal O.D. Dimension

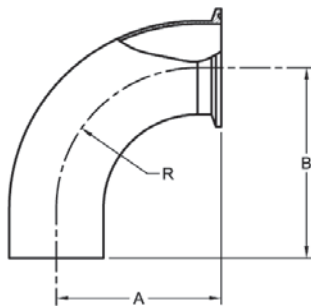
**S2S - 90 DEGREE ELBOW, TANGENT WELD ENDS**



PART NUMBER	SIZE	A	R
S2S-.50	1/2	3.000	1.125
S2S-.75	3/4	3.000	1.125
S2S-1	1	3.000	1.500
S2S-1.5	1-1/2	3.750	2.250
S2S-2	2	4.750	3.000
S2S-2.5	2-1/2	5.500	3.750
S2S-3	3	6.250	4.500
S2S-4	4	8.000	6.000
S2S-6	6	11.500	9.000

BPE TABLE DT-4.1.1-1

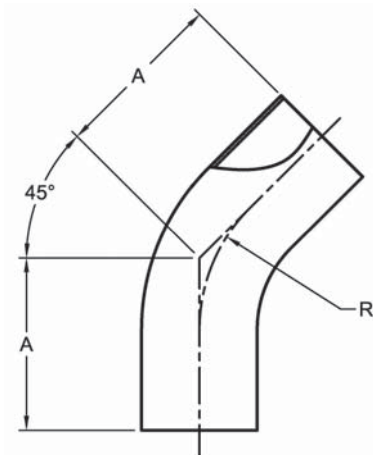
**S2CKW - 90 DEGREE ELBOW, TANGENT WELD END X CLAMP**



PART NUMBER	SIZE	A	B	R
S2CKW-.50	1/2	1.625	3.000	1.125
S2CKW-.75	3/4	1.625	3.000	1.125
S2CKW-1	1	2.000	3.000	1.500
S2CKW-1.5	1-1/2	2.750	3.750	2.250
S2CKW-2	2	3.500	4.750	3.000
S2CKW-2.5	2-1/2	4.250	5.500	3.750
S2CKW-3	3	5.000	6.250	4.500
S2CKW-4	4	6.625	8.000	6.000
S2CKW-6	6	10.500	11.500	9.000

BPE TABLE DT-4.1.1-2

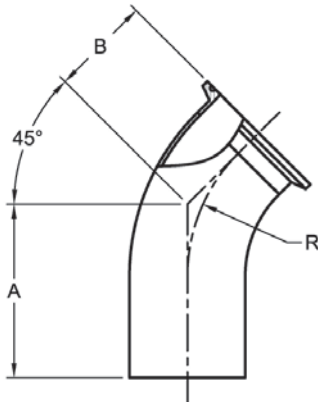
**S2KS - 45 DEGREE ELBOW, TANGENT WELD ENDS**



PART NUMBER	SIZE	A	R
S2KS-.50	1/2	2.250	1.125
S2KS-.75	3/4	2.250	1.125
S2KS-1	1	2.250	1.500
S2KS-1.5	1-1/2	2.500	2.250
S2KS-2	2	3.000	3.000
S2KS-2.5	2-1/2	3.375	3.750
S2KS-3	3	3.625	4.500
S2KS-4	4	4.500	6.000
S2KS-6	6	6.250	9.000

BPE TABLE DT-4.1.1-4

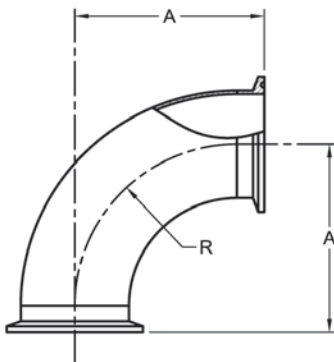
**S2KKW - 45 DEGREE ELBOW, TANGENT WELD END X CLAMP**



PART NUMBER	SIZE	A	B	R
S2KKW-.50	1/2	2.250	1.000	1.125
S2KKW-.75	3/4	2.250	1.000	1.125
S2KKW-1	1	2.250	1.125	1.500
S2KKW-1.5	1-1/2	2.500	1.438	2.250
S2KKW-2	2	3.000	1.750	3.000
S2KKW-2.5	2-1/2	3.375	2.063	3.750
S2KKW-3	3	3.625	2.375	4.500
S2KKW-4	4	4.500	3.125	6.000
S2KKW-6	6	6.250	5.250	9.000

BPE TABLE DT-4.1.1-5

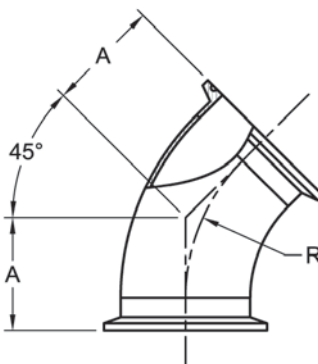
**S2CMP - 90 DEGREE ELBOW, CLAMP ENDS**



PART NUMBER	SIZE	A	R
S2CMP-.50	1/2	1.625	1.125
S2CMP-.75	3/4	1.625	1.125
S2CMP-1	1	2.000	1.500
S2CMP-1.5	1-1/2	2.750	2.250
S2CMP-2	2	3.500	3.000
S2CMP-2.5	2-1/2	4.250	3.750
S2CMP-3	3	5.000	4.500
S2CMP-4	4	6.625	6.000
S2CMP-6	6	10.500	9.000

BPE TABLE DT-4.1.1-3

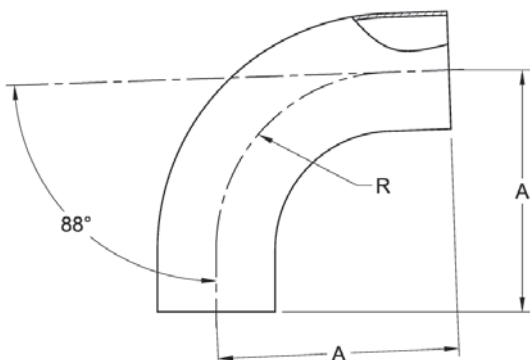
**S2KMP - 45 DEGREE ELBOW, CLAMP ENDS**



PART NUMBER	SIZE	A	R
S2KMP-.50	1/2	1.000	1.125
S2KMP-.75	3/4	1.000	1.125
S2KMP-1	1	1.125	1.500
S2KMP-1.5	1-1/2	1.438	2.250
S2KMP-2	2	1.750	3.000
S2KMP-2.5	2-1/2	2.063	3.750
S2KMP-3	3	2.375	4.500
S2KMP-4	4	3.125	6.000
S2KMP-6	6	5.250	9.000

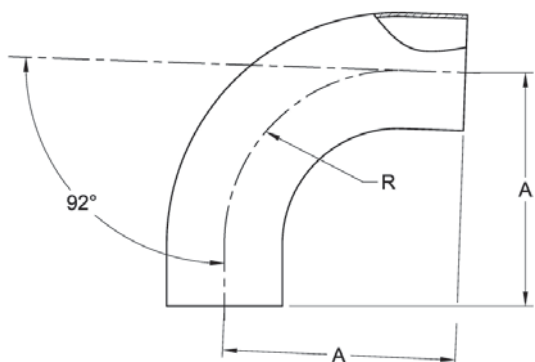
BPE TABLE DT-4.1.1-6

**S2S88 - 88 DEGREE ELBOW TANGENT WELD ENDS**



PART NUMBER	SIZE	A	R
S2S88-.50	1/2	3.065	1.125
S2S88-.75	3/4	3.065	1.125
S2S88-1	1	3.051	1.500
S2S88-1.5	1-1/2	3.801	2.250
S2S88-2	2	4.809	3.000
S2S88-2.5	2-1/2	5.559	3.750
S2S88-3	3	6.308	4.500
S2S88-4	4	8.066	6.000

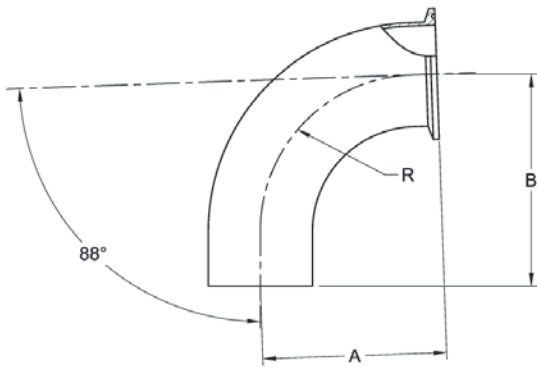
**S2S92 - 92 DEGREE ELBOW TANGENT WELD ENDS**



PART NUMBER	SIZE	A	R
S2S92-.50	1/2	2.921	1.125
S2S92-.75	3/4	2.934	1.125
S2S92-1	1	2.947	1.500
S2S92-1.5	1-1/2	3.696	2.250
S2S92-2	2	4.687	3.000
S2S92-2.5	2-1/2	5.432	3.750
S2S92-3	3	6.181	4.500
S2S92-4	4	7.919	6.000

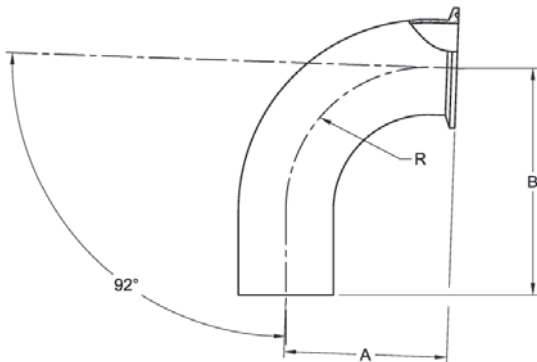


**S2CKW88 - 88 DEGREE ELBOW, TANGENT WELD END X CLAMP END**



PART NUMBER	SIZE	A	B	R
S2CKW88-.50	1/2	1.690	3.017	1.125
S2CKW88-.75	3/4	1.725	3.015	1.125
S2CKW88-1	1	2.051	3.017	1.500
S2CKW88-1.5	1-1/2	2.806	3.764	2.250
S2CKW88-2	2	3.559	4.766	3.000
S2CKW88-2.5	2-1/2	4.309	5.515	3.750
S2CKW88-3	3	5.058	6.265	4.500
S2CKW88-4	4	6.691	8.018	6.000

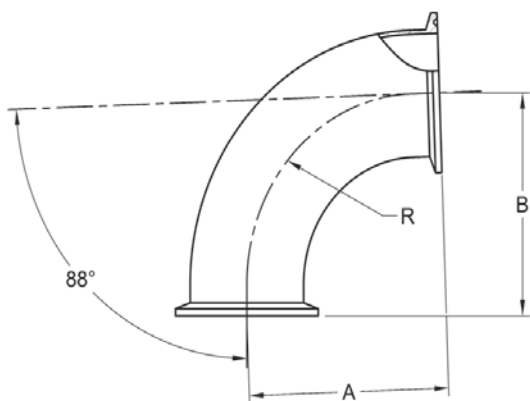
**S2CKW92 - 92 DEGREE ELBOW, TANGENT WELD END X CLAMP END**



PART NUMBER	SIZE	A	B	R
S2CKW92-.50	1/2	1.511	2.983	1.125
S2CKW92-.75	3/4	1.564	2.982	1.125
S2CKW92-1	1	1.877	2.983	1.500
S2CKW92-1.5	1-1/2	2.696	3.731	2.250
S2CKW92-2	2	3.298	4.734	3.000
S2CKW92-2.5	2-1/2	4.012	5.486	3.750
S2CKW92-3	3	4.727	6.250	4.500
S2CKW92-4	4	6.272	7.981	6.000

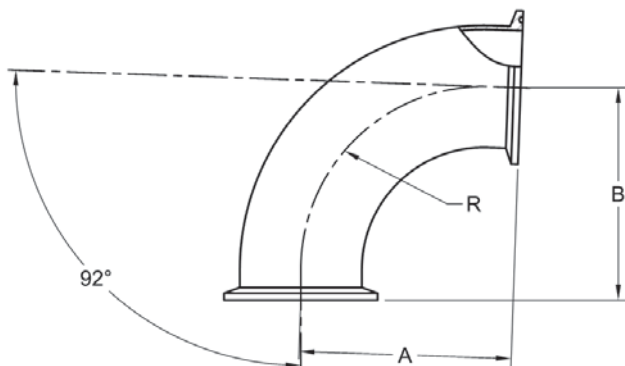


S2CMP88 - 88 DEGREE ELBOW CLAMP ENDS



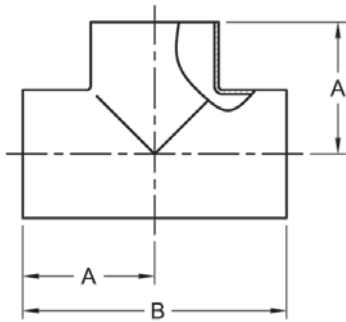
PART NUMBER	SIZE	A	B	R
S2CMP88-.50	1/2	1.642	1.642	1.125
S2CMP88-.75	3/4	1.647	1.647	1.125
S2CMP88-1	1	2.017	2.017	1.500
S2CMP88-1.5	1-1/2	2.771	2.771	2.250
S2CMP88-2	2	3.516	3.516	3.000
S2CMP88-2.5	2-1/2	4.265	4.265	3.750
S2CMP88-3	3	5.015	5.015	4.500
S2CMP88-4	4	6.644	6.644	6.000

S2CMP92 - 92 DEGREE ELBOW CLAMP ENDS



PART NUMBER	SIZE	A	B	R
S2CMP92-.50	1/2	1.559	1.608	1.125
S2CMP92-.75	3/4	1.667	1.607	1.125
S2CMP92-1	1	1.912	1.983	1.500
S2CMP92-1.5	1-1/2	2.724	2.733	2.250
S2CMP92-2	2	3.341	3.481	3.000
S2CMP92-2.5	2-1/2	4.056	4.233	3.750
S2CMP92-3	3	4.770	4.983	4.500
S2CMP92-4	4	6.320	6.606	6.000

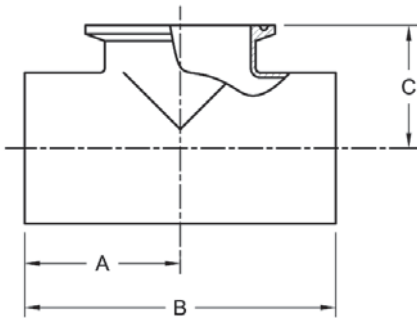
**S7WWW - TEE, TANGENT WELD ENDS**



PART NUMBER	SIZE	A	B
S7WWW-.50	1/2	1.875	3.750
S7WWW-.75	3/4	2.000	4.000
S7WWW-1	1	2.125	4.250
S7WWW-1.5	1-1/2	2.375	4.750
S7WWW-2	2	2.875	5.750
S7WWW-2.5	2-1/2	3.125	6.250
S7WWW-3	3	3.375	6.750
S7WWW-4	4	4.125	8.250
S7WWW-6	6	5.625	11.250

BPE TABLE DT-4.1.2-1

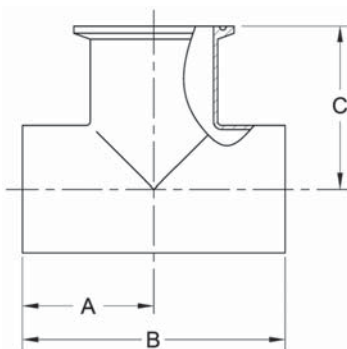
**S7SWWK - TEE, TANGENT WELD ENDS x SHORT CLAMP OUTLET**



PART NUMBER	SIZE	A	B	C
S7SWWK-.50	1/2	1.875	3.750	1.000
S7SWWK-.75	3/4	2.000	4.000	1.125
S7SWWK-1	1	2.125	4.250	1.125
S7SWWK-1.5	1-1/2	2.375	4.750	1.375
S7SWWK-2	2	2.875	5.750	1.625
S7SWWK-2.5	2-1/2	3.125	6.250	1.875
S7SWWK-3	3	3.375	6.750	2.125
S7SWWK-4	4	4.125	8.250	2.750
S7SWWK-6	6	5.625	11.250	4.625

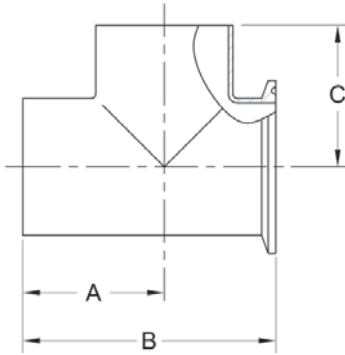
BPE TABLE DT-4.1.2-2

**S7WWK - TEE, TANGENT WELD ENDS x CLAMP OUTLET**



PART NUMBER	SIZE	A	B	C
S7WWK-.50	1/2	1.875	3.750	2.375
S7WWK-.75	3/4	2.000	4.000	2.500
S7WWK-1	1	2.125	4.250	2.625
S7WWK-1.5	1-1/2	2.375	4.750	2.875
S7WWK-2	2	2.875	5.750	3.375
S7WWK-2.5	2-1/2	3.125	6.250	3.625
S7WWK-3	3	3.375	6.750	3.875
S7WWK-4	4	4.125	8.250	4.750
S7WWK-6	6	5.625	11.250	6.375

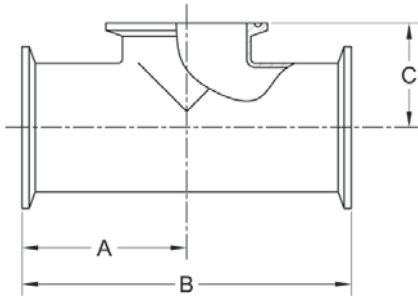
## S7WSKW - TEE, TANGENT WELD ENDS x CLAMP SHORT RUN



PART NUMBER	SIZE	A	B	C
S7WSKW-.50	1/2	1.875	2.750	1.875
S7WSKW-.75	3/4	2.000	3.000	2.000
S7WSKW-1	1	2.125	3.250	2.125
S7WSKW-1.5	1-1/2	2.375	3.750	2.375
S7WSKW-2	2	2.875	4.500	2.875
S7WSKW-2.5	2-1/2	3.125	5.000	3.125
S7WSKW-3	3	3.375	5.500	3.375
S7WSKW-4	4	4.125	6.875	4.125
S7WSKW-6	6	5.625	10.250	5.625

BPE TABLE DT-4.1.2-3

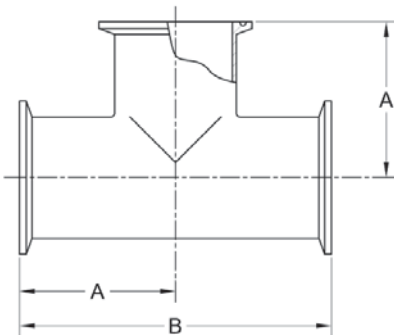
## S7MPS - TEE, CLAMP ENDS x SHORT CLAMP OUTLET



PART NUMBER	SIZE	A	B	C
S7MPS-.50	1/2	2.375	4.750	1.000
S7MPS-.75	3/4	2.500	5.000	1.125
S7MPS-1	1	2.625	5.250	1.125
S7MPS-1.5	1-1/2	2.875	5.750	1.375
S7MPS-2	2	3.375	6.750	1.625
S7MPS-2.5	2-1/2	3.625	7.250	1.875
S7MPS-3	3	3.875	7.750	2.125
S7MPS-4	4	4.750	9.500	2.750
S7MPS-6	6	7.125	14.250	4.625

BPE TABLE DT-4.1.2-5

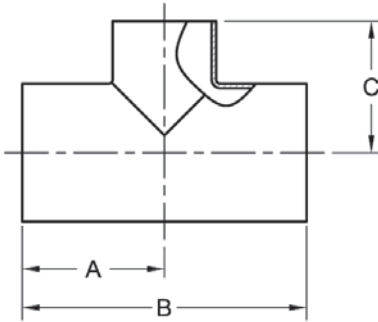
## S7MP - TEE, CLAMP ENDS



PART NUMBER	SIZE	A	B
S7MP-.50	1/2	2.375	4.750
S7MP-.75	3/4	2.500	5.000
S7MP-1	1	2.625	5.250
S7MP-1.5	1-1/2	2.875	5.750
S7MP-2	2	3.375	6.750
S7MP-2.5	2-1/2	3.625	7.250
S7MP-3	3	3.875	7.750
S7MP-4	4	4.750	9.500
S7MP-6	6	7.125	14.250

BPE TABLE DT-4.1.2-4

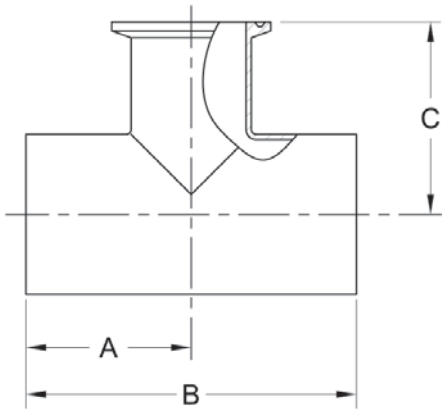
S7RWWW - REDUCING TEE, TANGENT WELD ENDS



PART NUMBER	SIZE	A	B	C
S7RWWW-.75X.50	3/4 X 1/2	2.000	4.000	2.000
S7RWWW-1X.50	1 X 1/2	2.125	4.250	2.125
S7RWWW-1X.75	1 X 3/4	2.125	4.250	2.125
S7RWWW-1.5X.50	1-1/2 X 1/2	2.375	4.750	2.375
S7RWWW-1.5X.75	1-1/2 X 3/4	2.375	4.750	2.375
S7RWWW-1.5X1	1-1/2 X 1	2.375	4.750	2.375
S7RWWW-2X.50	2 X 1/2	2.875	5.750	2.625
S7RWWW-2X.75	2 X 3/4	2.875	5.750	2.625
S7RWWW-2X1	2 X 1	2.875	5.750	2.625
S7RWWW-2X1.5	2 X 1-1/2	2.875	5.750	2.625
S7RWWW-2.5X.50	2-1/2 X 1/2	3.125	6.250	2.875
S7RWWW-2.5X.75	2-1/2 X 3/4	3.125	6.250	2.875
S7RWWW-2.5X1	2-1/2 X 1	3.125	6.250	2.875
S7RWWW-2.5X1.5	2-1/2 X 1-1/2	3.125	6.250	2.875
S7RWWW-2.5X2	2-1/2 X 2	3.125	6.250	2.875
S7RWWW-3X.50	3 X 1/2	3.375	6.750	3.125
S7RWWW-3X.75	3 X 3/4	3.375	6.750	3.125
S7RWWW-3X1	3 X 1	3.375	6.750	3.125
S7RWWW-3X1.5	3 X 1-1/2	3.375	6.750	3.125
S7RWWW-3X2	3 X 2	3.375	6.750	3.125
S7RWWW-3X2.5	3 X 2-1/2	3.375	6.750	3.125
S7RWWW-4X.50	4 X 1/2	4.125	8.250	3.625
S7RWWW-4X.75	4 X 3/4	4.125	8.250	3.625
S7RWWW-4X1	4 X 1	4.125	8.250	3.625
S7RWWW-4X1.5	4 X 1-1/2	4.125	8.250	3.625
S7RWWW-4X2	4 X 2	4.125	8.250	3.875
S7RWWW-4X2.5	4 X 2-1/2	4.125	8.250	3.875
S7RWWW-4X3	4 X 3	4.125	8.250	3.875
S7RWWW-6X3	6 X 3	5.625	11.250	4.875
S7RWWW-6X4	6 X 4	5.625	11.250	5.125

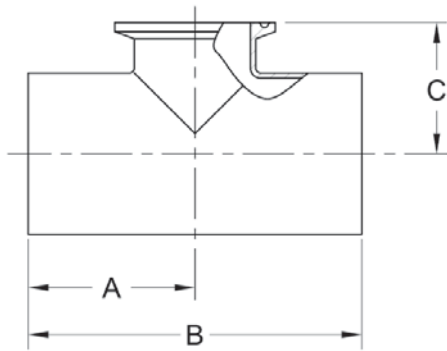
BPE TABLE DT-4.1.2-6

S7RWWK - REDUCING TEE, TANGENT WELD ENDS x CLAMP END BRANCH



PART NUMBER	SIZE	A	B	C
S7RWWK-.75X.50	3/4 X 1/2	2.000	4.000	2.500
S7RWWK-1X.50	1 X 1/2	2.125	4.250	2.625
S7RWWK-1X.75	1 X 3/4	2.125	4.250	2.625
S7RWWK-1.5X.50	1-1/2 X 1/2	2.375	4.750	2.875
S7RWWK-1.5X.75	1-1/2 X 3/4	2.375	4.750	2.875
S7RWWK-1.5X1	1-1/2 X 1	2.375	4.750	2.875
S7RWWK-2X.50	2 X 1/2	2.875	5.750	3.125
S7RWWK-2X.75	2 X 3/4	2.875	5.750	3.125
S7RWWK-2X1	2 X 1	2.875	5.750	3.125
S7RWWK-2X1.5	2 X 1-1/2	2.875	5.750	3.125
S7RWWK-2.5X.50	2-1/2 X 1/2	3.125	6.250	3.375
S7RWWK-2.5X.75	2-1/2 X 3/4	3.125	6.250	3.375
S7RWWK-2.5X1	2-1/2 X 1	3.125	6.250	3.375
S7RWWK-2.5X1.5	2-1/2 X 1-1/2	3.125	6.250	3.375
S7RWWK-2.5X2	2-1/2 X 2	3.125	6.250	3.375
S7RWWK-3X.50	3 X 1/2	3.375	6.750	3.625
S7RWWK-3X.75	3 X 3/4	3.375	6.750	3.625
S7RWWK-3X1	3 X 1	3.375	6.750	3.625
S7RWWK-3X1.5	3 X 1-1/2	3.375	6.750	3.625
S7RWWK-3X2	3 X 2	3.375	6.750	3.625
S7RWWK-3X2.5	3 X 2-1/2	3.375	6.750	3.625
S7RWWK-4X.50	4 X 1/2	4.125	8.250	4.125
S7RWWK-4X.75	4 X 3/4	4.125	8.250	4.125
S7RWWK-4X1	4 X 1	4.125	8.250	4.125
S7RWWK-4X1.5	4 X 1-1/2	4.125	8.250	4.125
S7RWWK-4X2	4 X 2	4.125	8.250	4.375
S7RWWK-4X2.5	4 X 2-1/2	4.125	8.250	4.375
S7RWWK-4X3	4 X 3	4.125	8.250	4.375
S7RWWK-6X3	6 X 3	5.625	11.250	5.375
S7RWWK-6X4	6 X 4	5.625	11.250	5.750

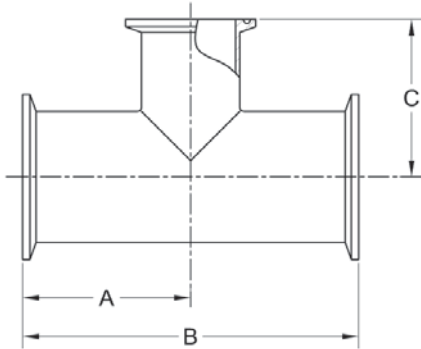
S7RSWWK - REDUCING TEE, TANGENT WELD ENDS x SHORT CLAMP BRANCH



PART NUMBER	SIZE	A	B	C
S7RSWWK-.75X.50	3/4 X 1/2	2.000	4.000	1.000
S7RSWWK-1X.50	1 X 1/2	2.125	4.250	1.125
S7RSWWK-1X.75	1 X 3/4	2.125	4.250	1.125
S7RSWWK-1.5X.50	1-1/2 X 1/2	2.375	4.750	1.375
S7RSWWK-1.5X.75	1-1/2 X 3/4	2.375	4.750	1.375
S7RSWWK-1.5X1	1-1/2 X 1	2.375	4.750	1.375
S7RSWWK-2X.50	2 X 1/2	2.875	5.750	1.625
S7RSWWK-2X.75	2 X 3/4	2.875	5.750	1.625
S7RSWWK-2X1	2 X 1	2.875	5.750	1.625
S7RSWWK-2X1.5	2 X 1-1/2	2.875	5.750	1.625
S7RSWWK-2.5X.50	2-1/2 X 1/2	3.125	6.250	1.875
S7RSWWK-2.5X.75	2-1/2 X 3/4	3.125	6.250	1.875
S7RSWWK-2.5X1	2-1/2 X 1	3.125	6.250	1.875
S7RSWWK-2.5X1.5	2-1/2 X 1-1/2	3.125	6.250	1.875
S7RSWWK-2.5X2	2-1/2 X 2	3.125	6.250	1.875
S7RSWWK-3X.50	3 X 1/2	3.375	6.750	2.125
S7RSWWK-3X.75	3 X 3/4	3.375	6.750	2.125
S7RSWWK-3X1	3 X 1	3.375	6.750	2.125
S7RSWWK-3X1.5	3 X 1-1/2	3.375	6.750	2.125
S7RSWWK-3X2	3 X 2	3.375	6.750	2.125
S7RSWWK-3X2.5	3 X 2-1/2	3.375	6.750	2.125
S7RSWWK-4X.50	4 X 1/2	4.125	8.250	2.625
S7RSWWK-4X.75	4 X 3/4	4.125	8.250	2.625
S7RSWWK-4X1	4 X 1	4.125	8.250	2.625
S7RSWWK-4X1.5	4 X 1-1/2	4.125	8.250	2.625
S7RSWWK-4X2	4 X 2	4.125	8.250	2.625
S7RSWWK-4X2.5	4 X 2-1/2	4.125	8.250	2.625
S7RSWWK-4X3	4 X 3	4.125	8.250	2.625
S7RSWWK-6X3	6 X 3	5.625	11.250	3.625
S7RSWWK-6X4	6 X 4	5.625	11.250	3.750

BPE TABLE DT-4.1.2-7

S7RMP - REDUCING TEE, CLAMP ENDS

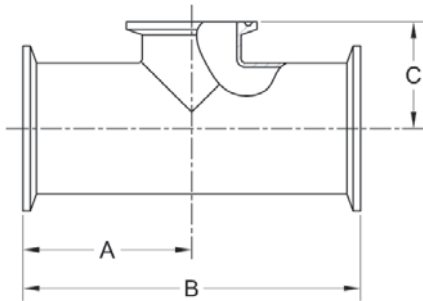


PART NUMBER	SIZE	A	B	C
S7RMP-.75X.50	3/4 X 1/2	2.500	5.000	2.500
S7RMP-1X.50	1 X 1/2	2.625	5.250	2.625
S7RMP-1X.75	1 X 3/4	2.625	5.250	2.625
S7RMP-1.5X.50	1-1/2 X 1/2	2.875	5.750	2.875
S7RMP-1.5X.75	1-1/2 X 3/4	2.875	5.750	2.875
S7RMP-1.5X1	1-1/2 X 1	2.875	5.750	2.875
S7RMP-2X.50	2 X 1/2	3.375	6.750	3.125
S7RMP-2X.75	2 X 3/4	3.375	6.750	3.125
S7RMP-2X1	2 X 1	3.375	6.750	3.125
S7RMP-2X1.5	2 X 1-1/2	3.375	6.750	3.125
S7RMP-2.5X.50	2-1/2 X 1/2	3.625	7.250	3.375
S7RMP-2.5X.75	2-1/2 X 3/4	3.625	7.250	3.375
S7RMP-2.5X1	2-1/2 X 1	3.625	7.250	3.375
S7RMP-2.5X1.5	2-1/2 X 1-1/2	3.625	7.250	3.375
S7RMP-2.5X2	2-1/2 X 2	3.625	7.250	3.375
S7RMP-3X.50	3 X 1/2	3.875	7.750	3.625
S7RMP-3X.75	3 X 3/4	3.875	7.750	3.625
S7RMP-3X1	3 X 1	3.875	7.750	3.625
S7RMP-3X1.5	3 X 1-1/2	3.875	7.750	3.625
S7RMP-3X2	3 X 2	3.875	7.750	3.625
S7RMP-3X2.5	3 X 2-1/2	3.875	7.750	3.625
S7RMP-4X.50	4 X 1/2	4.750	9.500	4.125
S7RMP-4X.75	4 X 3/4	4.750	9.500	4.125
S7RMP-4X1	4 X 1	4.750	9.500	4.125
S7RMP-4X1.5	4 X 1-1/2	4.750	9.500	4.125
S7RMP-4X2	4 X 2	4.750	9.500	4.375
S7RMP-4X2.5	4 X 2-1/2	4.750	9.500	4.375
S7RMP-4X3	4 X 3	4.750	9.500	4.375
S7RMP-6X3	6 X 3	7.125	14.250	5.375
S7RMP-6X4	6 X 4	7.125	14.250	5.750

BPE TABLE DT-4.1.2-8



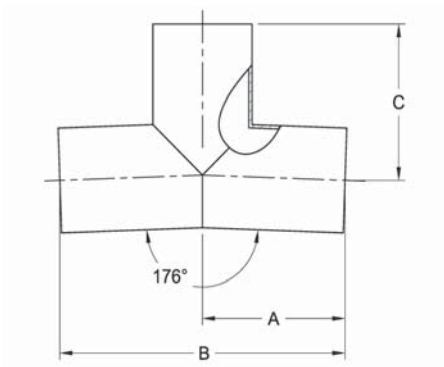
**S7RMPS - REDUCING TEE, SHORT OUTLET CLAMP ENDS**



PART NUMBER	SIZE	A	B	C
S7RMPS-.75X.50	3/4 X 1/2	2.500	5.000	1.000
S7RMPS-1X.50	1 X 1/2	2.625	5.250	1.125
S7RMPS-1X.75	1 X 3/4	2.625	5.250	1.125
S7RMPS-1.5X.50	1-1/2 X 1/2	2.875	5.750	1.375
S7RMPS-1.5X.75	1-1/2 X 3/4	2.875	5.750	1.375
S7RMPS-1.5X1	1-1/2 X 1	2.875	5.750	1.375
S7RMPS-2X.50	2 X 1/2	3.375	6.750	1.625
S7RMPS-2X.75	2 X 3/4	3.375	6.750	1.625
S7RMPS-2X1	2 X 1	3.375	6.750	1.625
S7RMPS-2X1.5	2 X 1-1/2	3.375	6.750	1.625
S7RMPS-2.5X.50	2-1/2 X 1/2	3.625	7.250	1.875
S7RMPS-2.5X.75	2-1/2 X 3/4	3.625	7.250	1.875
S7RMPS-2.5X1	2-1/2 X 1	3.625	7.250	1.875
S7RMPS-2.5X1.5	2-1/2 X 1-1/2	3.625	7.250	1.875
S7RMPS-2.5X2	2-1/2 X 2	3.625	7.250	1.875
S7RMPS-3X.50	3 X 1/2	3.875	7.750	2.125
S7RMPS-3X.75	3 X 3/4	3.875	7.750	2.125
S7RMPS-3X1	3 X 1	3.875	7.750	2.125
S7RMPS-3X1.5	3 X 1-1/2	3.875	7.750	2.125
S7RMPS-3X2	3 X 2	3.875	7.750	2.125
S7RMPS-3X2.5	3 X 2-1/2	3.875	7.750	2.125
S7RMPS-4X.50	4 X 1/2	4.750	9.500	2.625
S7RMPS-4X.75	4 X 3/4	4.750	9.500	2.625
S7RMPS-4X1	4 X 1	4.750	9.500	2.625
S7RMPS-4X1.5	4 X 1-1/2	4.750	9.500	2.625
S7RMPS-4X2	4 X 2	4.750	9.500	2.625
S7RMPS-4X2.5	4 X 2-1/2	4.750	9.500	2.625
S7RMPS-4X3	4 X 3	4.750	9.500	2.625
S7RMPS-6X3	6 X 3	7.125	14.250	3.625
S7RMPS-6X4	6 X 4	7.125	14.250	3.750

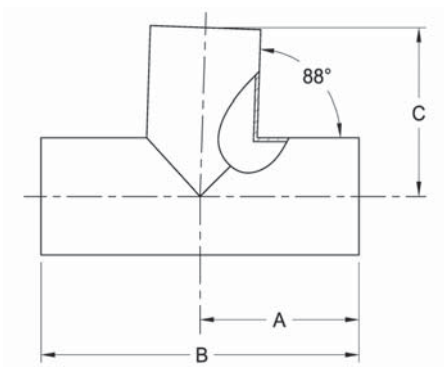
BPE TABLE DT-4.1.2-9

**S7WWW176 - 176 DEGREE TEE, TANGENT WELD ENDS**



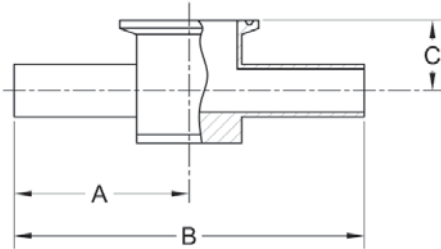
PART NUMBER	SIZE	A	B	C
S7WWW176-.50	1/2	1.874	3.748	1.940
S7WWW176-.75	3/4	1.999	3.998	2.070
S7WWW176-1	1	2.124	4.247	2.199
S7WWW176-1.5	1-1/2	2.374	4.747	2.458
S7WWW176-2	2	2.873	5.746	2.967
S7WWW176-2.5	2-1/2	3.123	6.246	3.234
S7WWW176-3	3	3.373	6.746	3.493
S7WWW176-4	4	4.123	8.245	4.269

**S7WWW88 - 88 DEGREE TEE, TANGENT WELD ENDS**



PART NUMBER	SIZE	A	B	C
S7WWW88-.50	1/2	1.875	3.750	1.874
S7WWW88-.75	3/4	2.000	4.000	1.999
S7WWW88-1	1	2.125	4.250	2.124
S7WWW88-1.5	1-1/2	2.375	4.750	2.374
S7WWW88-2	2	2.875	5.750	2.873
S7WWW88-2.5	2-1/2	3.125	6.250	3.123
S7WWW88-3	3	3.375	6.750	3.373
S7WWW88-4	4	4.125	8.250	4.122

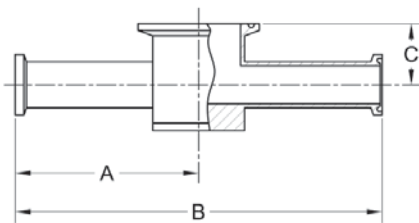
**S7IWWKS - INSTRUMENT TEE, WELD ENDS x CLAMP END**



PART NUMBER	SIZE	A	B	C
S7IWWKS-.50X1.5	1/2 x 1-1/2	2.500	5.000	.875
S7IWWKS-.75X1.5	3/4 x 1-1/2	2.500	5.000	1.000
S7IWWKS-1X1.5	1 x 1-1/2	2.500	5.000	1.125
S7IWWKS-.50X2	1/2 x 2	2.750	5.500	1.000
S7IWWKS-.75X2	3/4 x 2	2.750	5.500	1.125
S7IWWKS-1X2	1 x 2	2.750	5.500	1.250
S7IWWKS-1.5X2	1-1/2 x 2	2.750	5.500	1.500

BPE TABLE DT-4.1.2-10

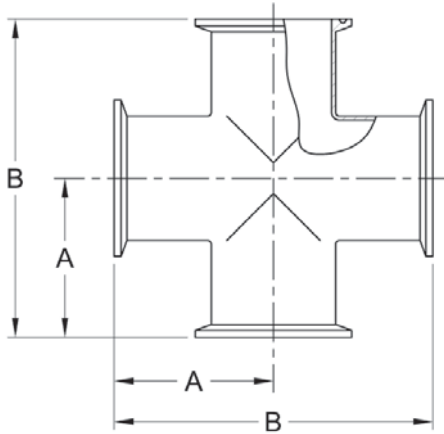
**S7IMPS - INSTRUMENT TEE, CLAMP ENDS**



PART NUMBER	SIZE	A	B	C
S7IMPS-.50X1.5	1/2 x 1-1/2	3.000	6.000	.875
S7IMPS-.75X1.5	3/4 x 1-1/2	3.000	6.000	1.000
S7IMPS-1X1.5	1 x 1-1/2	3.000	6.000	1.125
S7IMPS-.50X2	1/2 x 2	3.250	6.500	1.000
S7IMPS-.75X2	3/4 x 2	3.250	6.500	1.125
S7IMPS-1X2	1 x 2	3.250	6.500	1.250
S7IMPS-1.5X2	1-1/2 x 2	3.250	6.500	1.500

BPE TABLE DT-4.1.2-11

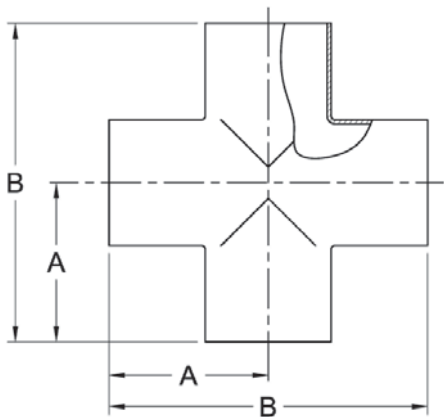
S9MP - CROSS, CLAMP ENDS



PART NUMBER	SIZE	A	B
S9MP-.50	1/2	2.375	4.750
S9MP-.75	3/4	2.500	5.000
S9MP-1	1	2.625	5.250
S9MP-1.5	1-1/2	2.875	5.750
S9MP-2	2	3.375	6.750
S9MP-2.5	2-1/2	3.625	7.250
S9MP-3	3	3.875	7.750
S9MP-4	4	4.750	9.500

BPE TABLE DT-4.1.2-4

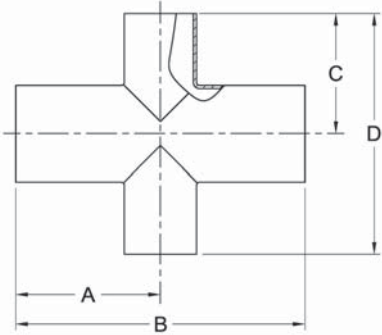
S9WWW - CROSS, TANGENT WELD ENDS



PART NUMBER	SIZE	A	B
S9WWW-.50	1/2	1.875	3.750
S9WWW-.75	3/4	2.000	4.000
S9WWW-1	1	2.125	4.250
S9WWW-1.5	1-1/2	2.375	4.750
S9WWW-2	2	2.875	5.750
S9WWW-2.5	2-1/2	3.125	6.250
S9WWW-3	3	3.375	6.750
S9WWW-4	4	4.125	8.250

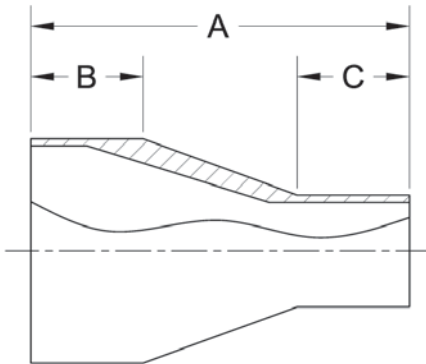
BPE TABLE DT-4.1.2-1

S9RWWW - REDUCING CROSS, TANGENT WELD ENDS



PART NUMBER	SIZE	A	B	C	D
S9RWWW-75X.50	3/4 X 1/2	2.000	4.000	2.000	4.000
S9RWWW-1X.50	1 X 1/2	2.125	4.250	2.125	4.250
S9RWWW-1X.75	1 X 3/4	2.125	4.250	2.125	4.250
S9RWWW-1.5X.50	1-1/2 X 1/2	2.375	4.750	2.375	4.750
S9RWWW-1.5X.75	1-1/2 X 3/4	2.375	4.750	2.375	4.750
S9RWWW-1.5X1	1-1/2 X 1	2.375	4.750	2.375	4.750
S9RWWW-2X.50	2 X 1/2	2.875	5.750	2.625	5.250
S9RWWW-2X.75	2 X 3/4	2.875	5.750	2.625	5.250
S9RWWW-2X1	2 X 1	2.875	5.750	2.625	5.250
S9RWWW-2X1.5	2 X 1-1/2	2.875	5.750	2.625	5.250
S9RWWW-2.5X1	2-1/2 X 1	3.125	6.250	2.875	5.750
S9RWWW-2.5X1.5	2-1/2 X 1-1/2	3.125	6.250	2.875	5.750
S9RWWW-2.5X2	2-1/2 X 2	3.125	6.250	2.875	5.750
S9RWWW-3X1	3 X 1	3.375	6.750	3.125	6.250
S9RWWW-3X1.5	3 X 1-1/2	3.375	6.750	3.125	6.250
S9RWWW-3X2	3 X 2	3.375	6.750	3.125	6.250
S9RWWW-3X2.5	3 X 2-1/2	3.375	6.750	3.125	6.250
S9RWWW-4X1	4 X 1	4.125	8.250	3.625	7.250
S9RWWW-4X1.5	4 X 1-1/2	4.125	8.250	3.625	7.250
S9RWWW-4X2	4 X 2	4.125	8.250	3.875	7.750
S9RWWW-4X2.5	4 X 2-1/2	4.125	8.250	3.875	7.750
S9RWWW-4X3	4 X 3	4.125	8.250	3.875	7.750
S9RWWW-6X3	6 X 3	5.625	11.250	4.875	9.750
S9RWWW-6X4	6 X 4	5.625	11.250	5.125	10.250

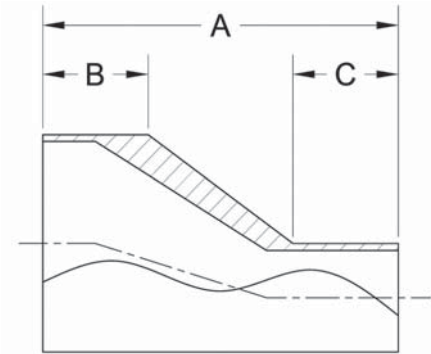
S31S - SHORT CONCENTRIC REDUCER, WELD ENDS



PART NUMBER	SIZE	A	B (min.)	C (min.)
S31S-.75X.50	3/4 X 1/2	2.125	1.000	1.000
S31S-1X.50	1 X 1/2	2.500	1.000	1.000
S31S-1X.75	1 X 3/4	2.125	1.000	1.000
S31S-1.5X.75	1-1/2 X 3/4	3.000	1.000	1.000
S31S-1.5X1	1-1/2 X 1	2.500	1.000	1.000
S31S-2X1	2 X 1	3.375	1.000	1.000
S31S-2X1.5	2 X 1-1/2	2.500	1.000	1.000
S31S-2.5X1.5	2-1/2 X 1-1/2	3.375	1.000	1.000
S31S-2.5X2	2-1/2 X 2	2.500	1.000	1.000
S31S-3X1.5	3 X 1-1/2	4.250	1.500	1.000
S31S-3X2	3 X 2	3.375	1.500	1.000
S31S-3X2.5	3 X 2-1/2	2.625	1.500	1.000
S31S-4X2	4 X 2	5.125	1.500	1.000
S31S-4X2.5	4 X 2-1/2	4.250	1.500	1.000
S31S-4X3	4 X 3	3.875	1.500	1.500
S31S-6X3	6 X 3	7.250	2.000	1.500
S31S-6X4	6 X 4	5.625	2.000	1.500

BPE TABLE DT-4.1.3-1

S32S - SHORT ECCENTRIC REDUCER, WELD ENDS

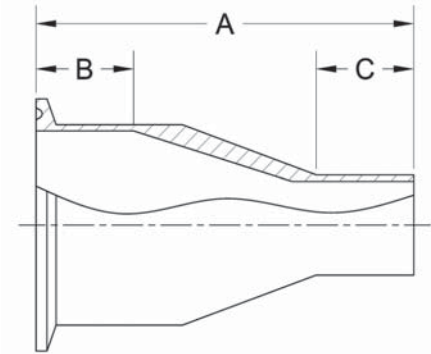


PART NUMBER	SIZE	A	B (min.)	C (min.)
S32S-.75X.50	3/4 X 1/2	2.125	1.000	1.000
S32S-1X.50	1 X 1/2	2.500	1.000	1.000
S32S-1X.75	1 X 3/4	2.125	1.000	1.000
S32S-1.5X.75	1-1/2 X 3/4	3.000	1.000	1.000
S32S-1.5X1	1-1/2 X 1	2.500	1.000	1.000
S32S-2X1	2 X 1	3.375	1.000	1.000
S32S-2X1.5	2 X 1-1/2	2.500	1.000	1.000
S32S-2.5X1.5	2-1/2 X 1-1/2	3.375	1.000	1.000
S32S-2.5X2	2-1/2 X 2	2.500	1.000	1.000
S32S-3X1.5	3 X 1-1/2	4.250	1.500	1.000
S32S-3X2	3 X 2	3.375	1.500	1.000
S32S-3X2.5	3 X 2-1/2	2.625	1.500	1.000
S32S-4X2	4 X 2	5.125	1.500	1.000
S32S-4X2.5	4 X 2-1/2	4.250	1.500	1.000
S32S-4X3	4 X 3	3.875	1.500	1.500
S32S-6X3	6 X 3	7.250	2.000	1.500
S32S-6X4	6 X 4	5.625	2.000	1.500

BPE TABLE DT-4.1.3-1



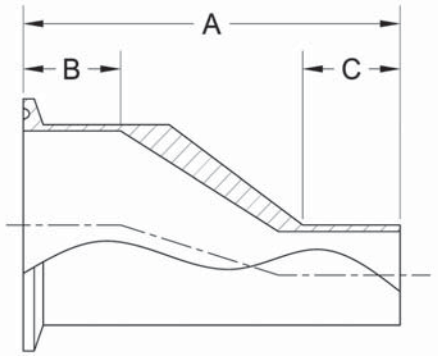
S31SK - SHORT CONCENTRIC REDUCER, CLAMP x WELD END



PART NUMBER	SIZE	A	B (I.D.) (min.)	C (min.)
S31SK-.75X.50	3/4 X 1/2	2.625	.375	1.000
S31SK-1X.50	1 X 1/2	3.000	.375	1.000
S31SK-1X.75	1 X 3/4	2.625	.375	1.000
S31SK-1.5X.75	1-1/2 X 3/4	3.500	.375	1.000
S31SK-1.5X1	1-1/2 X 1	3.000	.375	1.000
S31SK-2X1	2 X 1	3.875	.375	1.000
S31SK-2X1.5	2 X 1-1/2	3.000	.375	1.000
S31SK-2.5X1.5	2-1/2 X 1-1/2	3.875	.375	1.000
S31SK-2.5X2	2-1/2 X 2	3.000	.375	1.000
S31SK-3X1.5	3 X 1-1/2	4.750	.375	1.000
S31SK-3X2	3 X 2	3.875	.375	1.000
S31SK-3X2.5	3 X 2-1/2	3.125	.375	1.000
S31SK-4X2	4 X 2	5.750	.375	1.000
S31SK-4X2.5	4 X 2-1/2	4.875	.375	1.000
S31SK-4X3	4 X 3	4.500	.375	1.500
S31SK-6X3	6 X 3	8.000	.375	1.500
S31SK-6X4	6 X 4	6.375	.375	1.500

BPE TABLE DT-4.1.3-2

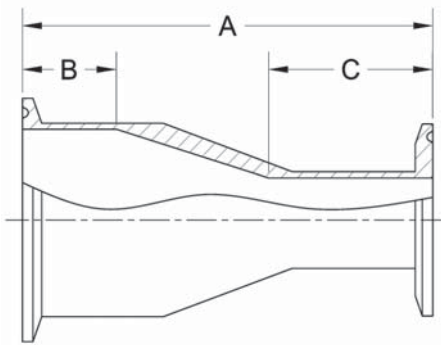
S32SK - SHORT ECCENTRIC REDUCER, CLAMP x WELD END



PART NUMBER	SIZE	A	B (I.D.) (min.)	C (min.)
S32SK-.75X.50	3/4 X 1/2	2.625	.375	1.000
S32SK-1X.50	1 X 1/2	3.000	.375	1.000
S32SK-1X.75	1 X 3/4	2.625	.375	1.000
S32SK-1.5X.75	1-1/2 X 3/4	3.500	.375	1.000
S32SK-1.5X1	1-1/2 X 1	3.000	.375	1.000
S32SK-2X1	2 X 1	3.875	.375	1.000
S32SK-2X1.5	2 X 1-1/2	3.000	.375	1.000
S32SK-2.5X1.5	2-1/2 X 1-1/2	3.875	.375	1.000
S32SK-2.5X2	2-1/2 X 2	3.000	.375	1.000
S32SK-3X1.5	3 X 1-1/2	4.750	.375	1.000
S32SK-3X2	3 X 2	3.875	.375	1.000
S32SK-3X2.5	3 X 2-1/2	3.125	.375	1.000
S32SK-4X2	4 X 2	5.750	.375	1.000
S32SK-4X2.5	4 X 2-1/2	4.875	.375	1.000
S32SK-4X3	4 X 3	4.500	.375	1.500
S32SK-6X3	6 X 3	8.000	.375	1.500
S32SK-6X4	6 X 4	6.375	.375	1.500

BPE TABLE DT-4.1.3-2

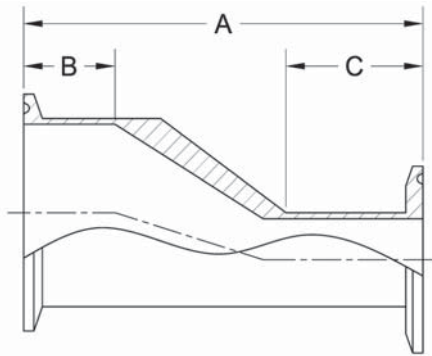
S31S-14MP - SHORT CONCENTRIC REDUCER, CLAMP x CLAMP



PART NUMBER	SIZE	A	B (I.D.) (min.)	C (I.D.) (min.)
S31S-14MP-.75X.50	3/4 X 1/2	3.125	.375	1.125
S31S-14MP-1X.50	1 X 1/2	3.500	.375	1.125
S31S-14MP-1X.75	1 X 3/4	3.125	.375	1.125
S31S-14MP-1.5X.75	1-1/2 X 3/4	4.000	.375	1.125
S31S-14MP-1.5X1	1-1/2 X 1	3.500	.375	1.125
S31S-14MP-2X1	2 X 1	4.375	.375	1.125
S31S-14MP-2X1.5	2 X 1-1/2	3.500	.375	1.125
S31S-14MP-2.5X1.5	2-1/2 X 1-1/2	4.375	.375	1.125
S31S-14MP-2.5X2	2-1/2 X 2	3.500	.375	1.125
S31S-14MP-3X1.5	3 X 1-1/2	5.250	.375	1.125
S31S-14MP-3X2	3 X 2	4.375	.375	1.125
S31S-14MP-3X2.5	3 X 2-1/2	3.625	.375	1.125
S31S-14MP-4X2	4 X 2	6.250	.375	1.125
S31S-14MP-4X2.5	4 X 2-1/2	5.375	.375	1.125
S31S-14MP-4X3	4 X 3	5.000	.375	1.625
S31S-14MP-6X3	6 X 3	8.500	.375	1.625
S31S-14MP-6X4	6 X 4	7.000	.375	1.625

BPE TABLE DT-4.1.3-3

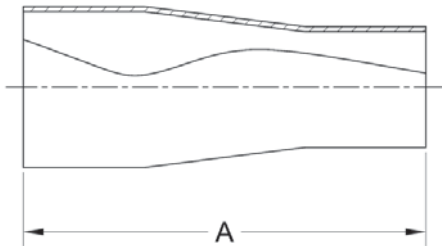
**S32S-14MP - SHORT ECCENTRIC REDUCER, CLAMP x CLAMP**



PART NUMBER	SIZE	A	B (I.D.) (min.)	C (I.D.) (min.)
S32S-14MP-.75X.50	3/4 X 1/2	3.125	.375	1.125
S32S-14MP-1X.50	1 X 1/2	3.500	.375	1.125
S32S-14MP-1X.75	1 X 3/4	3.125	.375	1.125
S32S-14MP-1.5X.75	1-1/2 X 3/4	4.000	.375	1.125
S32S-14MP-1.5X1	1-1/2 X 1	3.500	.375	1.125
S32S-14MP-2X1	2 X 1	4.375	.375	1.125
S32S-14MP-2X1.5	2 X 1-1/2	3.500	.375	1.125
S32S-14MP-2.5X1.5	2-1/2 X 1-1/2	4.375	.375	1.125
S32S-14MP-2.5X2	2-1/2 X 2	3.500	.375	1.125
S32S-14MP-3X1.5	3 X 1-1/2	5.250	.375	1.125
S32S-14MP-3X2	3 X 2	4.375	.375	1.125
S32S-14MP-3X2.5	3 X 2-1/2	3.625	.375	1.125
S32S-14MP-4X2	4 X 2	6.250	.375	1.125
S32S-14MP-4X2.5	4 X 2-1/2	5.375	.375	1.125
S32S-14MP-4X3	4 X 3	5.000	.375	1.625
S32S-14MP-6X3	6 X 3	8.500	.375	1.625
S32S-14MP-6X4	6 X 4	7.000	.375	1.625

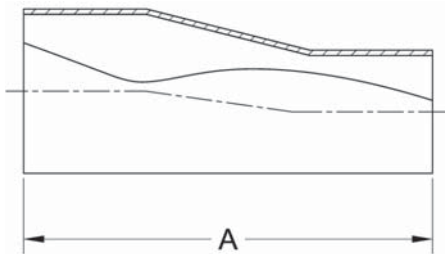
BPE TABLE DT-4.1.3-3

## S31 - CONCENTRIC REDUCER, TANGENT WELD ENDS



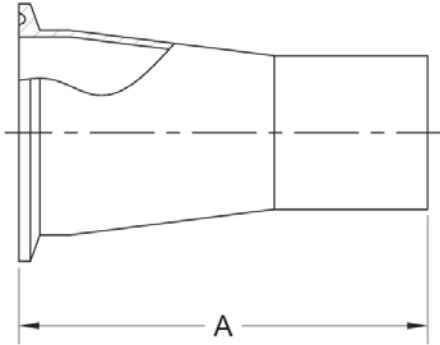
PART NUMBER	SIZE	A
S31-.75X.50	3/4 X 1/2	4.000
S31-1X.50	1 X 1/2	4.500
S31-1X.75	1 X 3/4	4.000
S31-1.5X.50	1-1/2 X 1/2	5.500
S31-1.5X.75	1-1/2 X 3/4	5.000
S31-1.5X1	1-1/2 X 1	5.000
S31-2X.50	2 X 1/2	7.750
S31-2X.75	2 X 3/4	7.250
S31-2X1	2 X 1	7.250
S31-2X1.5	2 X 1-1/2	5.250
S31-2.5X.50	2-1/2 X 1/2	9.750
S31-2.5X.75	2-1/2 X 3/4	9.250
S31-2.5X1	2-1/2 X 1	9.250
S31-2.5X1.5	2-1/2 X 1-1/2	7.250
S31-2.5X2	2-1/2 X 2	5.500
S31-3X.50	3 X 1/2	12.750
S31-3X.75	3 X 3/4	11.250
S31-3X1	3 X 1	11.250
S31-3X1.5	3 X 1-1/2	9.250
S31-3X2	3 X 2	7.500
S31-3X2.5	3 X 2-1/2	5.500
S31-4X1	4 X 1	15.500
S31-4X1.5	4 X 1-1/2	13.500
S31-4X2	4 X 2	11.750
S31-4X2.5	4 X 2-1/2	9.750
S31-4X3	4 X 3	7.750
S31-6X3	6 X 3	10.000
S31-6X4	6 X 4	10.000

S32 - ECCENTRIC REDUCER, TANGENT WELD ENDS



PART NUMBER	SIZE	A
S32-.75X.50	3/4 X 1/2	4.000
S32-1X.50	1 X 1/2	4.500
S32-1X.75	1 X 3/4	4.000
S32-1.5X.50	1-1/2 X 1/2	5.500
S32-1.5X.75	1-1/2 X 3/4	5.000
S32-1.5X1	1-1/2 X 1	5.000
S32-2X.50	2 X 1/2	7.750
S32-2X.75	2 X 3/4	7.250
S32-2X1	2 X 1	7.250
S32-2X1.5	2 X 1-1/2	5.250
S32-2.5X.50	2-1/2 X 1/2	9.750
S32-2.5X.75	2-1/2 X 3/4	9.250
S32-2.5X1	2-1/2 X 1	9.250
S32-2.5X1.5	2-1/2 X 1-1/2	7.250
S32-2.5X2	2-1/2 X 2	5.500
S32-3X.50	3 X 1/2	11.750
S32-3X.75	3 X 3/4	11.250
S32-3X1	3 X 1	11.250
S32-3X1.5	3 X 1-1/2	9.250
S32-3X2	3 X 2	7.500
S32-3X2.5	3 X 2-1/2	5.500
S32-4X1	4 X 1	15.500
S32-4X1.5	4 X 1-1/2	13.500
S32-4X2	4 X 2	11.750
S32-4X2.5	4 X 2-1/2	9.750
S32-4X3	4 X 3	7.750
S32-6X3	6 X 3	9.750
S32-6X4	6 X 4	10.000

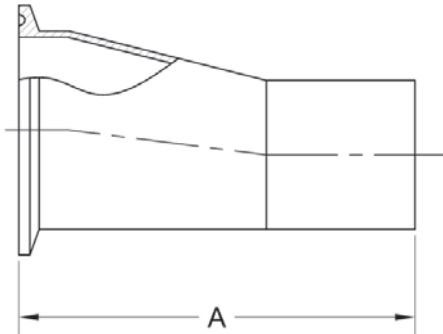
S31K - CONCENTRIC REDUCER, CLAMP x TANGENT WELD END



PART NUMBER	SIZE	A
S31K-.75X.50	3/4 X 1/2	3.000
S31K-1X.50	1 X 1/2	3.500
S31K-1X.75	1 X 3/4	3.000
S31K-1.5X.50	1-1/2 X 1/2	4.500
S31K-1.5X.75	1-1/2 X 3/4	4.000
S31K-1.5X1	1-1/2 X 1	4.000
S31K-2X.50	2 X 1/2	6.500
S31K-2X.75	2 X 3/4	6.000
S31K-2X1	2 X 1	6.000
S31K-2X1.5	2 X 1-1/2	4.000
S31K-2.5X.50	2-1/2 X 1/2	8.500
S31K-2.5X.75	2-1/2 X 3/4	9.000
S31K-2.5X1	2-1/2 X 1	8.000
S31K-2.5X1.5	2-1/2 X 1-1/2	6.000
S31K-2.5X2	2-1/2 X 2	4.250
S31K-3X.50	3 X 1/2	12.000
S31K-3X.75	3 X 3/4	11.000
S31K-3X1	3 X 1	10.000
S31K-3X1.5	3 X 1-1/2	8.000
S31K-3X2	3 X 2	6.250
S31K-3X2.5	3 X 2-1/2	4.250
S31K-4X1	4 X 1	14.125
S31K-4X1.5	4 X 1-1/2	12.125
S31K-4X2	4 X 2	10.375
S31K-4X2.5	4 X 2-1/2	8.375
S31K-4X3	4 X 3	6.375
S31K-6X3	6 X 3	9.000
S31K-6X4	6 X 4	9.000

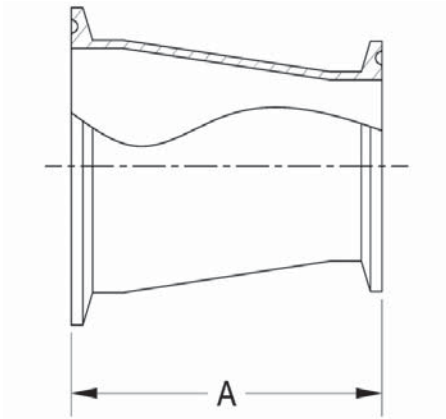


S32K - ECCENTRIC REDUCER, CLAMP x TANGENT WELD END



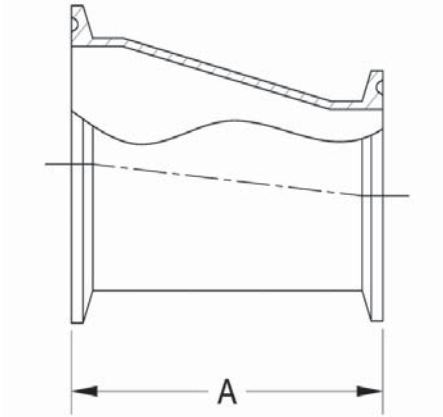
PART NUMBER	SIZE	A
S32K-.75X.50	3/4 X 1/2	3.000
S32K-1X.50	1 X 1/2	3.500
S32K-1X.75	1 X 3/4	3.000
S32K-1.5X.50	1-1/2 X 1/2	4.500
S32K-1.5X.75	1-1/2 X 3/4	4.000
S32K-1.5X1	1-1/2 X 1	4.000
S32K-2X.50	2 X 1/2	6.500
S32K-2X.75	2 X 3/4	6.000
S32K-2X1	2 X 1	6.000
S32K-2X1.5	2 X 1-1/2	4.000
S32K-2.5X.50	2-1/2 X 1/2	9.500
S32K-2.5X.75	2-1/2 X 3/4	9.000
S32K-2.5X1	2-1/2 X 1	8.000
S32K-2.5X1.5	2-1/2 X 1-1/2	6.000
S32K-2.5X2	2-1/2 X 2	4.250
S32K-3X.50	3 X 1/2	12.000
S32K-3X.75	3 X 3/4	11.000
S32K-3X1	3 X 1	10.000
S32K-3X1.5	3 X 1-1/2	8.000
S32K-3X2	3 X 2	6.250
S32K-3X2.5	3 X 2-1/2	4.250
S32K-4X1	4 X 1	14.125
S32K-4X1.5	4 X 1-1/2	12.125
S32K-4X2	4 X 2	10.375
S32K-4X2.5	4 X 2-1/2	8.375
S32K-4X3	4 X 3	6.375
S32K-6X3	6 X 3	8.750
S32K-6X4	6 X 4	9.000

## S31-14MP - CONCENTRIC REDUCER, CLAMP ENDS



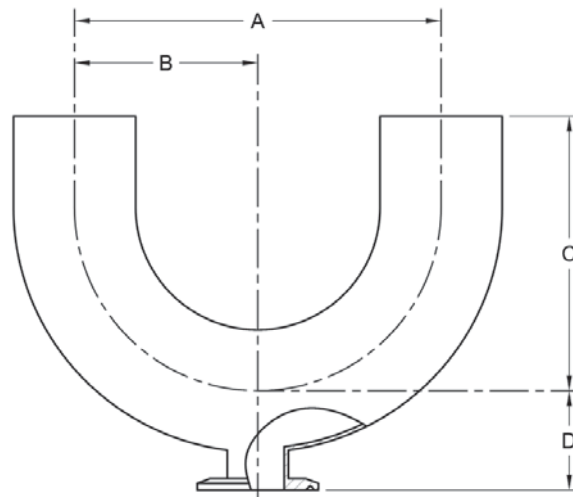
PART NUMBER	SIZE	A
S31-14MP-.75X.50	3/4 X 1/2	2.000
S31-14MP-1X.50	1 X 1/2	2.500
S31-14MP-1X.75	1 X 3/4	2.000
S31-14MP-1.5X.50	1-1/2 X 1/2	3.500
S31-14MP-1.5X.75	1-1/2 X 3/4	3.000
S31-14MP-1.5X1	1-1/2 X 1	3.000
S31-14MP-2X.50	2 X 1/2	7.000
S31-14MP-2X.75	2 X 3/4	6.000
S31-14MP-2X1	2 X 1	5.000
S31-14MP-2X1.5	2 X 1-1/2	3.000
S31-14MP-2.5X.50	2-1/2 X 1/2	9.000
S31-14MP-2.5X.75	2-1/2 X 3/4	8.000
S31-14MP-2.5X1	2-1/2 X 1	7.000
S31-14MP-2.5X1.5	2-1/2 X 1-1/2	5.000
S31-14MP-2.5X2	2-1/2 X 2	3.000
S31-14MP-3X.50	3 X 1/2	11.000
S31-14MP-3X.75	3 X 3/4	10.000
S31-14MP-3X1	3 X 1	9.000
S31-14MP-3X1.5	3 X 1-1/2	7.000
S31-14MP-3X2	3 X 2	5.000
S31-14MP-3X2.5	3 X 2-1/2	3.000
S31-14MP-4X1	4 X 1	13.125
S31-14MP-4X1.5	4 X 1-1/2	11.125
S31-14MP-4X2	4 X 2	9.125
S31-14MP-4X2.5	4 X 2-1/2	7.125
S31-14MP-4X3	4 X 3	5.125
S31-14MP-6X3	6 X 3	7.625
S31-14MP-6X4	6 X 4	7.625

S32-14MP - ECCENTRIC REDUCER, CLAMP ENDS



PART NUMBER	SIZE	A
S32-14MP-.75X.50	3/4 X 1/2	2.000
S32-14MP-1X.50	1 X 1/2	2.500
S32-14MP-1X.75	1 X 3/4	2.000
S32-14MP-1.5X.50	1-1/2 X 1/2	3.500
S32-14MP-1.5X.75	1-1/2 X 3/4	3.000
S32-14MP-1.5X1	1-1/2 X 1	3.000
S32-14MP-2X.50	2 X 1/2	7.000
S32-14MP-2X.75	2 X 3/4	6.000
S32-14MP-2X1	2 X 1	5.000
S32-14MP-2X1.5	2 X 1-1/2	3.000
S32-14MP-2.5X.50	2-1/2 X 1/2	9.000
S32-14MP-2.5X.75	2-1/2 X 3/4	8.000
S32-14MP-2.5X1	2-1/2 X 1	7.000
S32-14MP-2.5X1.5	2-1/2 X 1-1/2	5.000
S32-14MP-2.5X2	2-1/2 X 2	3.000
S32-14MP-3X.50	3 X 1/2	11.000
S32-14MP-3X.75	3 X 3/4	10.000
S32-14MP-3X1	3 X 1	9.000
S32-14MP-3X1.5	3 X 1-1/2	7.000
S32-14MP-3X2	3 X 2	5.000
S32-14MP-3X2.5	3 X 2-1/2	3.000
S32-14MP-4X1	4 X 1	13.125
S32-14MP-4X1.5	4 X 1-1/2	11.125
S32-14MP-4X2	4 X 2	9.125
S32-14MP-4X2.5	4 X 2-1/2	7.125
S32-14MP-4X3	4 X 3	5.125
S32-14MP-6X3	6 X 3	7.500
S32-14MP-6X4	6 X 4	7.625

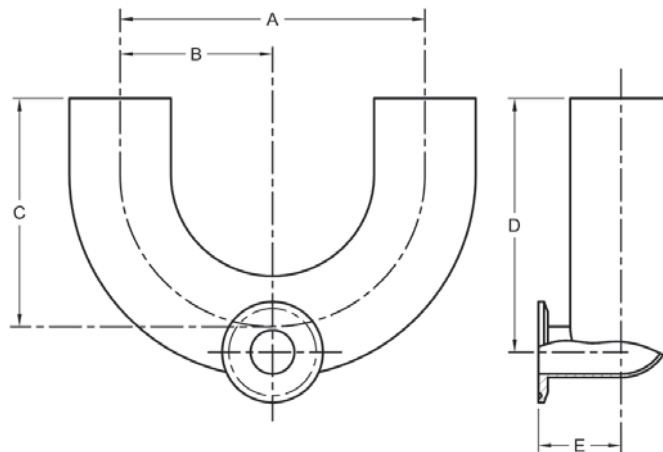
**S2UBWWK - BOTTOM OUTLET USE POINT**



PART NUMBER	SIZE	A	B	C	D
S2UBWWK-.75X.50	3/4 X 1/2	4.500	2.250	3.750	.875
S2UBWWK-1X.50	1 X 1/2	3.000	1.500	3.000	1.125
S2UBWWK-1X.75	1 X 3/4	3.000	1.500	3.000	1.125
S2UBWWK-1.5X.50	1-1/2 X 1/2	4.500	2.250	4.500	1.375
S2UBWWK-1.5X.75	1-1/2 X 3/4	4.500	2.250	4.500	1.375
S2UBWWK-1.5X1	1-1/2 X 1	4.500	2.250	4.500	1.375
S2UBWWK-2X.50	2 X 1/2	6.000	3.000	5.000	1.625
S2UBWWK-2X.75	2 X 3/4	6.000	3.000	5.000	1.625
S2UBWWK-2X1	2 X 1	6.000	3.000	5.000	1.625
S2UBWWK-2X1.5	2 X 1-1/2	6.000	3.000	5.000	1.625
S2UBWWK-2.5X.50	2-1/2 X 1/2	7.500	3.750	5.750	1.875
S2UBWWK-2.5X.75	2-1/2 X 3/4	7.500	3.750	5.750	1.875
S2UBWWK-2.5X1	2-1/2 X 1	7.500	3.750	5.750	1.875
S2UBWWK-2.5X1.5	2-1/2 X 1-1/2	7.500	3.750	5.750	1.875
S2UBWWK-2.5X2	2-1/2 X 2	7.500	3.750	5.750	1.875
S2UBWWK-3X.50	3 X 1/2	9.000	4.500	6.500	2.125
S2UBWWK-3X.75	3 X 3/4	9.000	4.500	6.500	2.125
S2UBWWK-3X1	3 X 1	9.000	4.500	6.500	2.125
S2UBWWK-3X1.5	3 X 1-1/2	9.000	4.500	6.500	2.125
S2UBWWK-3X2	3 X 2	9.000	4.500	6.500	2.125
S2UBWWK-3X2.5	3 X 2-1/2	9.000	4.500	6.500	2.125
S2UBWWK-4X.50	4 X 1/2	12.000	6.000	8.500	2.625
S2UBWWK-4X.75	4 X 3/4	12.000	6.000	8.500	2.625
S2UBWWK-4X1	4 X 1	12.000	6.000	8.500	2.625
S2UBWWK-4X1.5	4 X 1-1/2	12.000	6.000	8.500	2.625
S2UBWWK-4X2	4 X 2	12.000	6.000	8.500	2.625
S2UBWWK-4X2.5	4 X 2-1/2	12.000	6.000	8.500	2.625
S2UBWWK-4X3	4 X 3	12.000	6.000	8.500	2.625

ALSO AVAILABLE WITH BUTT-WELDED OUTLET

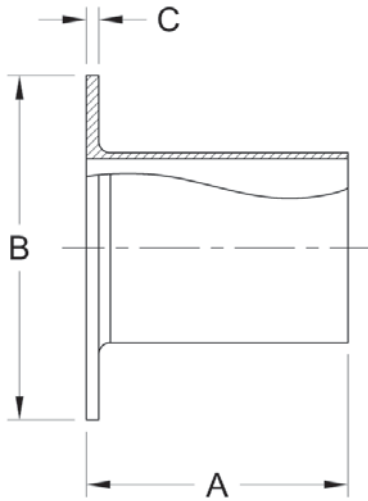
S2USWWK - SIDE OUTLET USE POINT



PART NUMBER	SIZE	A	B	C	D	E
S2USWWK-.75X.50	3/4 X 1/2	4.500	2.250	3.750	3.875	.875
S2USWWK-1X.50	1 X 1/2	3.000	1.500	3.000	3.250	1.125
S2USWWK-1X.75	1 X 3/4	3.000	1.500	3.000	3.125	1.125
S2USWWK-1.5X.50	1-1/2 X 1/2	4.500	2.250	4.500	5.000	1.375
S2USWWK-1.5X.75	1-1/2 X 3/4	4.500	2.250	4.500	4.875	1.375
S2USWWK-1.5X1	1-1/2 X 1	4.500	2.250	4.500	4.750	1.375
S2USWWK-2X.50	2 X 1/2	6.000	3.000	5.000	5.750	1.625
S2USWWK-2X.75	2 X 3/4	6.000	3.000	5.000	5.625	1.625
S2USWWK-2X1	2 X 1	6.000	3.000	5.000	5.500	1.625
S2USWWK-2X1.5	2 X 1-1/2	6.000	3.000	5.000	5.250	1.625
S2USWWK-2.5X.50	2-1/2 X 1/2	7.500	3.750	5.750	6.750	1.875
S2USWWK-2.5X.75	2-1/2 X 3/4	7.500	3.750	5.750	6.625	1.875
S2USWWK-2.5X1	2-1/2 X 1	7.500	3.750	5.750	6.500	1.875
S2USWWK-2.5X1.5	2-1/2 X 1-1/2	7.500	3.750	5.750	6.250	1.875
S2USWWK-2.5X2	2-1/2 X 2	7.500	3.750	5.750	6.000	1.875
S2USWWK-3X.50	3 X 1/2	9.000	4.500	6.500	7.750	2.125
S2USWWK-3X.75	3 X 3/4	9.000	4.500	6.500	7.625	2.125
S2USWWK-3X1	3 X 1	9.000	4.500	6.500	7.500	2.125
S2USWWK-3X1.5	3 X 1-1/2	9.000	4.500	6.500	7.250	2.125
S2USWWK-3X2	3 X 2	9.000	4.500	6.500	7.000	2.125
S2USWWK-3X2.5	3 X 2-1/2	9.000	4.500	6.500	6.750	2.125
S2USWWK-4X.50	4 X 1/2	12.000	6.000	8.500	10.250	2.625
S2USWWK-4X.75	4 X 3/4	12.000	6.000	8.500	10.125	2.625
S2USWWK-4X1	4 X 1	12.000	6.000	8.500	10.000	2.625
S2USWWK-4X1.5	4 X 1-1/2	12.000	6.000	8.500	9.750	2.625
S2USWWK-4X2	4 X 2	12.000	6.000	8.500	9.500	2.625
S2USWWK-4X2.5	4 X 2-1/2	12.000	6.000	8.500	9.250	2.625
S2USWWK-4X3	4 X 3	12.000	6.000	8.500	9.000	2.625

ALSO AVAILABLE WITH BUTT-WELD OUTLET

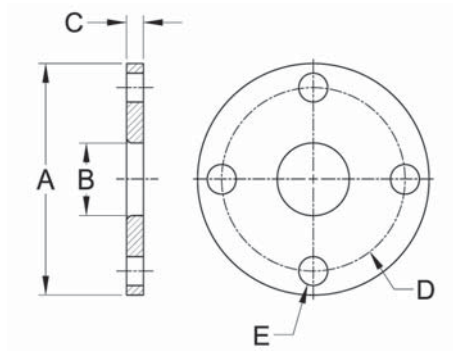
S14WA - STUB END - TYPE A



PART NUMBER	SIZE	A	B	C
S14WA-.50	1/2	2.750	1.500	.130
S14WA-.75	3/4	2.750	1.500	.130
S14WA-1	1	2.750	2.000	.130
S14WA-1.5	1-1/2	2.750	2.875	.130
S14WA-2	2	2.750	3.625	.130
S14WA-2.5	2-1/2	2.750	4.125	.130
S14WA-3	3	2.750	5.000	.166
S14WA-4	4	2.750	6.187	.166
S14WA-6	6	3.000	8.500	.218

STUB END FACE IS SERRATED

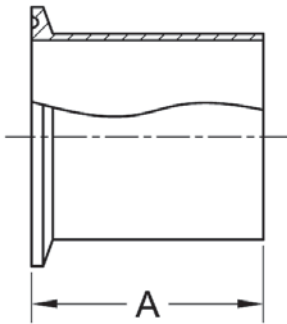
38SL - SLIP ON FLANGE



PART NUMBER	SIZE	A	B	C	D	E
38SL-.50	1/2	3.500	.570	.375	2.375	(4) - .625
38SL-.75	3/4	3.875	.813	.375	2.750	(4) - .625
38SL-1	1	4.250	1.063	.375	3.125	(4) - .625
38SL-1.5	1-1/2	5.000	1.563	.375	3.875	(4) - .625
38SL-2	2	6.000	2.063	.438	4.750	(4) - .750
38SL-2.5	2-1/2	7.000	2.563	.438	5.500	(4) - .750
38SL-3	3	7.500	3.063	.500	6.000	(4) - .750
38SL-4	4	9.000	4.063	.500	7.500	(8) - .750
38SL-6	6	11.000	6.062	.562	9.500	(8) - .875

Flange Gasket Kit Available, 150lb. Bolt Hole Pattern on All Flanges

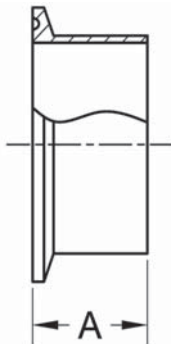
**STL14AM7 - LONG WELD FERRULE**



PART NUMBER	SIZE	A
STL14AM7-.50	1/2	1.750
STL14AM7-.75	3/4	1.750
STL14AM7-1A	1 (TYPE A)	1.750
STL14AM7-1	1	1.750
STL14AM7-1.5	1-1/2	1.750
STL14AM7-2	2	2.250
STL14AM7-2.5	2-1/2	2.250
STL14AM7-3	3	2.250
STL14AM7-4	4	2.250
STL14AM7-6	6	3.000

BPE TABLE DT-4.1.4-1

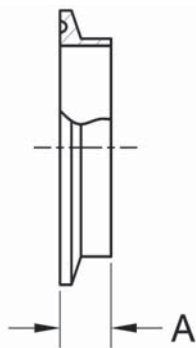
**SL14AM7 - MEDIUM WELD FERRULE**



PART NUMBER	SIZE	A
SL14AM7-.50	1/2	1.125
SL14AM7-.75	3/4	1.125
SL14AM7-1	1	1.125
S14AM7-1.5	1-1/2	1.125
S14AM7-2	2	1.125
S14AM7-2.5	2-1/2	1.125
S14AM7-3	3	1.125
S14AM7-4	4	1.125

BPE TABLE DT-4.1.4-1

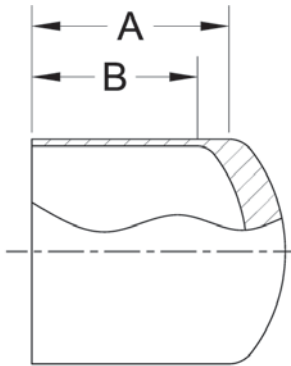
**S14WMP - SHORT WELD FERRULE**



PART NUMBER	SIZE	A
S14WMP-.50	1/2"	.500
S14WMP-.75	3/4"	.500
S14WMP-1	1"	.500
S14WMP-1.5	1-1/2	.500
S14WMP-2	2	.500
S14WMP-2.5	2-1/2	.500
S14WMP-3	3	.500
S14WMP-4	4	.625

BPE TABLE DT-4.1.4-1

## S16W - LONG TANGENT WELD CAP



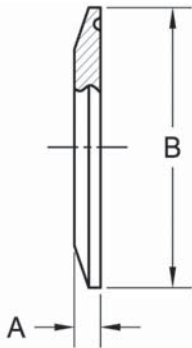
PART NUMBER	SIZE	A
S16W-.50	1/2	1.500
S16W-.75	3/4	1.500
S16W-1	1	1.629
S16W-1.5	1-1/2	1.660
S16W-2	2	1.762
S16W-2.5	2-1/2	1.505
S16W-3	3	1.750
S16W-4	4	2.000
S16W-6	6	2.500

BPE TABLE DT-4.1.5-1

"A" DIMENSION IS STRAIGHT TANGENT LENGTH

"B" MINIMUM I.D. STRAIGHT LENGTH = .375 ALL SIZES

## S16AMP - CLAMP CAP

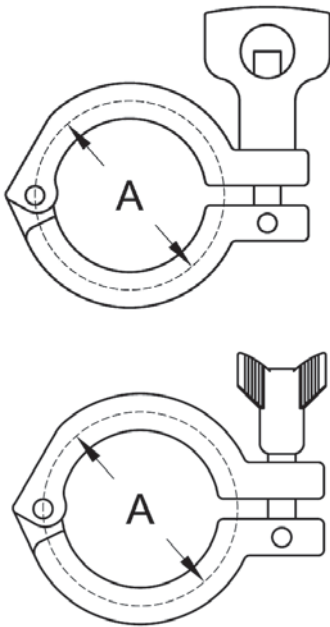


PART NUMBER	SIZE	A	B
S16AMP-.50	1/2" & 3/4"	.187	.984
S16AMP-1	1" & 1-1/2"	.250	1.984
S16AMP-2	2"	.250	2.516
S16AMP-2.5	2-1/2"	.250	3.047
S16AMP-3	3"	.250	3.579
S16AMP-4	4"	.312	4.682
S16AMP-6	6"	.437	6.570

BPE TABLE DT-4.1.5-2



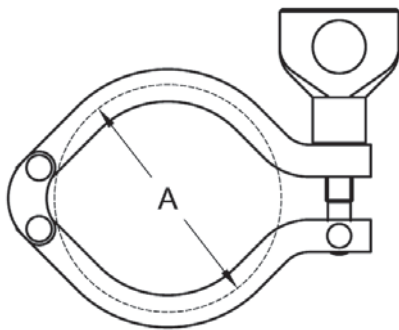
13MHHM - SINGLE PIN CLAMP



PART NUMBER	SIZE	A	PSI RATING @ 70° F	PSI RATING @ 250° F
13MHHM-.50	1/2 & 3/4	1.125	1500	1200
13MHHM-1	1 & 1-1/2	2.122	500	300
13MHHM-2	2	2.654	450	300
13MHHM-2.5	2-1/2	3.185	400	200
13MHHM-3	3	3.717	350	195
13MHHM-4	4	4.820	300	150
13MHHM-5	5	5.625	150	75
13MHHM-6	6	6.695	150	75
13MHHM-8	8	8.695	100	50
13MHHM-10	10	10.695	75	40
13MHHM-12	12	12.695	50	25

NOTES: ALSO AVAILABLE WITH ROCKET WING NUT  
 AVAILABLE IN 304 OR 316 MATERIAL  
 PRESSURE RATINGS ARE MAXIMUM WORKING PRESSURE ONLY  
 PRESSURE RATINGS PERTAIN TO THE CLAMP "UNION"

13MHHM-DP - DOUBLE PIN CLAMP

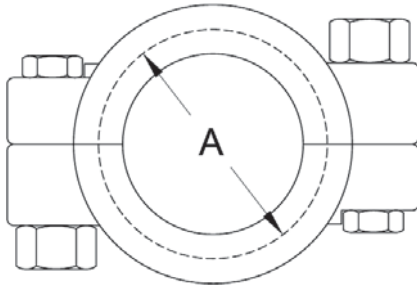


AVAILABLE IN 304 MATERIAL ONLY

PART NUMBER	SIZE	A	PSI RATING @ 70° F	PSI RATING @ 250° F
13MHHM-DP-.50	1/2 & 3/4	1.125	1500	1200
13MHHM-DP-1	1 & 1-1/2	2.122	500	300
13MHHM-DP-2	2	2.654	450	300
13MHHM-DP-2.5	2-1/2	3.185	400	200
13MHHM-DP-3	3	3.717	350	195
13MHHM-DP-4	4	4.820	300	150
13MHHM-DP-6	6	6.695	150	75
13MHHM-DP-8	8	8.695	100	50
13MHHM-DP-10	10	10.695	75	40

NOTES: ROCKET WING NUTS ALSO AVAILABLE  
 PRESSURE RATINGS ARE MAXIMUM WORKING PRESSURE ONLY  
 PRESSURE RATINGS PERTAIN TO THE CLAMP "UNION"

**13MHP - HIGH PRESSURE CLAMP**

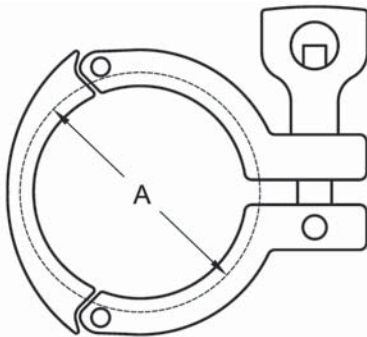


AVAILABLE IN 304 AND 316 MATERIAL

PART NUMBER	SIZE	A	PSI RATING @ 70° F	PSI RATING @ 250° F
13MHP-.50	1/2 & 3/4	1.125	1500	1200
13MHP-1	1 & 1-1/2	2.046	1000	800
13MHP-2	2	2.596	1000	800
13MHP-2.5	2-1/2	3.127	1000	800
13MHP-3	3	3.659	1000	800
13MHP-4	4	4.762	800	600
13MHP-5	5	5.762	300	200
13MHP-6	6	6.695	300	200
13MHP-8	8	8.695	250	150
13MHP-10	10	10.695	200	125
13MHP-12	12	12.695	150	100

NOTES: PRESSURE RATINGS ARE MAXIMUM WORKING PRESSURE ONLY  
PRESSURE RATINGS PERTAIN TO THE CLAMP "UNION"  
SUPPLIED WITH BRASS HEX NUTS

**13MHHS - THREE SEGMENT CLAMP**

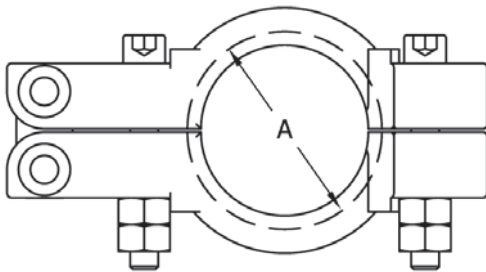


AVAILABLE IN 304 MATERIAL ONLY

PART NUMBER	SIZE	A	PSI RATING @ 70° F	PSI RATING @ 250° F
13MHHS-1	1 & 1-1/2	2.122	600	300
13MHHS-2	2	2.654	550	275
13MHHS-2.5	2-1/2	3.185	450	225
13MHHS-3	3	3.717	350	175
13MHHS-4	4	4.820	300	150

NOTES: ROCKET WING NUTS ALSO AVAILABLE  
PRESSURE RATINGS ARE MAXIMUM WORKING PRESSURE ONLY  
PRESSURE RATINGS PERTAIN TO THE CLAMP "UNION"

**13ASME - ASME DOUBLE BOLT CLAMP**



AVAILABLE IN 316 MATERIAL ONLY

PART NUMBER	SIZE	A	PSI RATING @ 70° F	PSI RATING @ 250° F
13ASME-1	1 & 1-1/2	2.046	1485	1337
13ASME-2	2	2.578	1370	1233
13AMSE-3	3	3.640	1000	900
13ASME-4	4	4.744	874	787
13ASME-6	6	6.632	415	374
13ASME-8	8	8.632	299	269
13ASME-10	10	10.632	161	145
13ASME-12	12	12.632	102	92

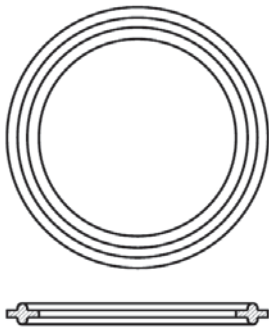
NOTE: TO MEET THE PSI RATINGS ABOVE THE FERRULE (HUB) USED SHALL BE DESIGNED IN ACCORDANCE WITH ASME SECTION 8 DIVISION 1 MANDATORY APPENDIX 24  
STANDARD FERRULES AND FULL FACE GASKET CAN BE USED HOWEVER PERFORMANCE MAY NOT MEET THE ABOVE RATINGS

## CLAMP GASKET PERFORMANCE CHART

PROPERTY	BUNA-N	EPDM	TEFLON	VITON	SILICONE
TENSILE STRENGTH	GOOD	GOOD - EXCELLENT	EXCELLENT	EXCELLENT	GOOD
ELECTRICAL PROPERTIES	POOR	EXCELLENT	EXCELLENT	GOOD	EXCELLENT
WEATHER RESISTANCE	GOOD	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT
OZONE RESISTANCE	POOR	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT
HEAT RESISTANCE	GOOD (250° F)	EXCELLENT (300° F)	EXCELLENT (500° F)	EXCELLENT (400° F)	EXCELLENT (450° F)
COLD RESISTANCE	GOOD (-30° F)	GOOD - EXCELLENT (-20° F)	EXCELLENT (-100° F)	GOOD (-30° F)	EXCELLENT (-40° F)
STEAM RESISTANCE	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	GOOD
TEAR RESISTANCE	GOOD	GOOD	EXCELLENT	GOOD	GOOD
ABRASION RESISTANCE	GOOD	GOOD	EXCELLENT	GOOD	GOOD
ACID RESISTANCE	POOR - GOOD	GOOD - EXCELLENT	EXCELLENT	GOOD	GOOD
PETROLEUM OIL	EXCELLENT	POOR	EXCELLENT	EXCELLENT	POOR - GOOD
FLAME RESISTANCE	POOR	POOR	EXCELLENT	GOOD	POOR
VEGETABLE OIL	EXCELLENT	GOOD	EXCELLENT	EXCELLENT	GOOD (INTERMITTENT)
USP CLASS VI	NO	YES	YES	YES	YES
ANIMAL OILS & FATS	EXCELLENT	POOR	EXCELLENT	EXCELLENT	GOOD
ALCOHOL, GLYCOLS	EXCELLENT	EXCELLENT	EXCELLENT	GOOD	EXCELLENT
SOAPS, BLEACHES, DETERGENTS	POOR	EXCELLENT	EXCELLENT	GOOD	POOR

THE ABOVE CHART IS INTENDED AS A GUIDELINE, ACUTAL PERFORMANCE MAY VARY WITH EACH APPLICATION.

## 40MP - CLAMP GASKET



AVAILABLE IN THE FOLLOWING MATERIALS:  
 BUNA-N, EPDM, TEFLON, VITON, SILICONE  
 TUF-STEEL & STAINLESS  
 OTHER MATERIALS AVAILABLE UPON REQUEST

PART NUMBER	SIZE
40MP-.50	1/2
40MP-.75	3/4
40MP-1	1
40MP-1.5	1-1/2
40MP-2	2
40MP-2.5	2-1/2
40MP-3	3
40MP-4	4
40MP-5	5
40MP-6	6
40MP-8	8
40MP-10	10
40MP-12	12



### **ASTM-A270 BPE TUBING**

- Tubing is made from 316L material and is 100% boroscoped.
- Mechanically polished on both I.D. and O.D. (20Ra I.D., 32Ra O.D.)  
Also Available with 15Ra EP I.D., 32Ra O.D. finish  
Surface finish measured per ASME/ANSI B46.1
- Tubing is tested beyond the requirements of ASTM A269 and A270 by mechanically testing to ASME SA249 specifications.
- Tubing is bright annealed in line to 1900°F
- High purity tubing is also available which can include cleaned for gas/oxygen service, thermocouple cleaning or nitric acid cleaning with a deionized water rinse.
- High purity tubing is cleaned and packaged in a Class 100 Cleanroom.

### **Tubing Tolerances**

PART NUMBER	OD SIZE (IN.)	WALL (IN.)	OD TOLERANCE	WALL TOLERANCE	LENGTH TOLERANCE	BOX QTY. (FT.)
SAN00507	.500	.065	+ .005 / - .005	.065 ± 10%	+ .125 / - .000	300
SAN00757	.750	.065	+ .005 / - .005	.065 ± 10%	+ .125 / - .000	300
SAN01007	1.000	.065	+ .005 / - .005	.065 ± 10%	+ .125 / - .000	300
SAN01507	1.500	.065	+ .008 / - .008	.065 ± 10%	+ .125 / - .000	300
SAN02007	2.000	.065	+ .008 / - .008	.065 ± 10%	+ .125 / - .000	300
SAN02507	2.500	.065	+ .010 / - .010	.065 ± 10%	+ .125 / - .000	200
SAN03007	3.000	.065	+ .010 / - .010	.065 ± 10%	+ .125 / - .000	200
SAN04007	4.000	.083	+ .015 / - .015	.083 ± 10%	+ .125 / - .000	100
SAN06007	6.000	.109	+ .030 / - .030	.109 ± 10%	+ .188 / - .000	20

- Tubing available in numerous sizes and wall thicknesses not listed including rectangular shapes, call for details and pricing.
- Surcharges apply at time of shipment.

### **Chemical Composition - 316L (%)**

(C) Carbon, max	(Mn) Manganese, max	(N) Nitrogen, max	(S) Sulfur	(Ni) Nickel	(Cr) Chromium	(Mo) Molybdenum
.030	2.00	.10	.005 - .017	10.0 - 14.0	16.0 - 18.0	2.0 - 3.0

STEEL & O'BRIEN	ALFA-LAVAL	SPX	VNE	DIXON
S2S	B2S	S2S	TE2S	T2S
S2CKW	B2CMW	S2CKW	TE2C	T2CM
S2KS	B2KS	S2KS	TE2KS	T2KS
S2KKW	B2KMW	S2KKW	TE2KC	T2KM
S2CMP	B2CMP	S2CMP	TEG2C	T2CMP
S2KMP	B2KMP	S2KMP	TEG2K	T2KMP
S7WWW	B7WWW	S7WWW	TE7WWW	T7WWW
S7SWWK	B7WWMS	S7SWWK	TE7WWCS	T7WWMS
S7WWK	B7WWM	S7WWK	TE7WWC	T7WWM
S7WSKW	B7WMSW	S7WSKW	TE7WCSW	
S7MPS	B7MPS	S7MPS	TEG7S	T7MPS
S7MP	B7MP	S7MP	TEG7	T7MP
S7RWWW	B7RWWW	S7RWWW	TE7RWWW	T7RWWW
S7RWK	B7RWM	S7RWK	TE7RWC	T7WWM
S7RSWWK	B7RWMS	S7RSWWK	TE7RWCS	T7RWMS
S7RMP	B7RMP	S7RMP	TEG7R	T7RMP
S7RMPS	B7RMPS	S7RMPS	TEG7RS	T7RMPS
S7IWWKS	B7IWWMS	S7RSGT	TE7IWWCS	T7IWWMS
S7IMPS	B7IMPS	S7RSGTMP	TEG7IS	T7IMPS
S9MP	B9MP	S9MP	TEG9	
S9WWW	B9WWW	S9WWW	TE9WWW	
S9RWWW	B9RWWW	S9RWWW	TE9RWWW	
S31S			TE31SWW	
S32S			TE32SWW	
S31SK			TE31SCW	
S32SK			TE32SCW	
S31S-14MP			TEG31SCC	
S32S-14MP			TEG32SCC	
S31	B31	S31	TE31WW	T31W
S32	B32	S32	TE32WW	T32W
S31K	B31M	S31K	TE31CW	T31M
S32K	B32M	S32K	TE32CW	T32M
S31-14MP	B31-14MP	S31-14MP	TEG31CC	T3114MP
S32-14MP	B32-14MP	S32-14MP	TEG32CC	T3214MP
S2UBWWK	B2UMPBOA	S2UBWWK	TE2UBWWW	
S2USWWK	B2UMPSOA	S2USWWK	TE2USWWC	
STL14AM7	BS14AM	S14AWF	TEG14AM7	TL14AM7
S16W	B16W	S16AWF	TE16W	T16W
S16AMP	16AMP	S16AMP	TEG16A	T16AMP
S14WA		S14WA	TE14WA	T14VB



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## Our Quality Policy

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Steel & O'Brien Manufacturing is committed to understanding the needs of our customers and meeting or exceeding those requirements through careful attention to detail and through the continuous improvement of our processes.

We are dedicated to delivering defect-free products on-time at the most competitive cost possible through an effective Quality Management System based on sound Quality Objectives while complying with all relevant national and international requirements.

**PLEASE NOTE:**

Reasonable care has been taken in preparing this catalog. Steel & O'Brien Manufacturing, Inc. reserves the right to make changes or corrections to any of the product information, including dimensions, listed herein without notice.

# Proudly Serving Our Customers For Over 25 Years



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