

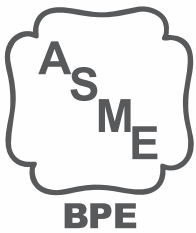


TRUE **BPE**

STAINLESS STEEL

Tube & Fittings





## **TRUE BPE. UNCOMPROMISING QUALITY FROM THE START**

Since introduced in 1997, the ASME BPE standards for bioprocessing equipment have undergone regular upgrades, driving improvements in quality, safety and productivity for the biotech and pharmaceutical industries.

As an industry leader, Valex was one of the first global stainless steel component manufacturers to offer “True BPE”, voluntarily meeting or exceeding all the new BPE design and manufacturing standards. Fast forward to today, the industries are more competitive, processes are more advanced, and the standards are more demanding and tightly regulated. Continuing to provide industry leadership, Valex frequently reinvests in new manufacturing equipment and technologies that enable us to produce the next generation of BPE compliant products at competitive prices - so our clients can do the same.

For over four decades, Valex has been the leading global manufacturer of stainless steel tubes, fittings, valves and assemblies for critical industries with the most stringent tolerances for imperfection. We are responsible for the most important advances in fitting design, electro-polishing, precision cleaning and integrated assemblies. Today, with multiple manufacturing facilities around the world, meeting or exceeding industry guidelines and specifications, Valex consistently delivers the highest quality stainless steel components without compromise.

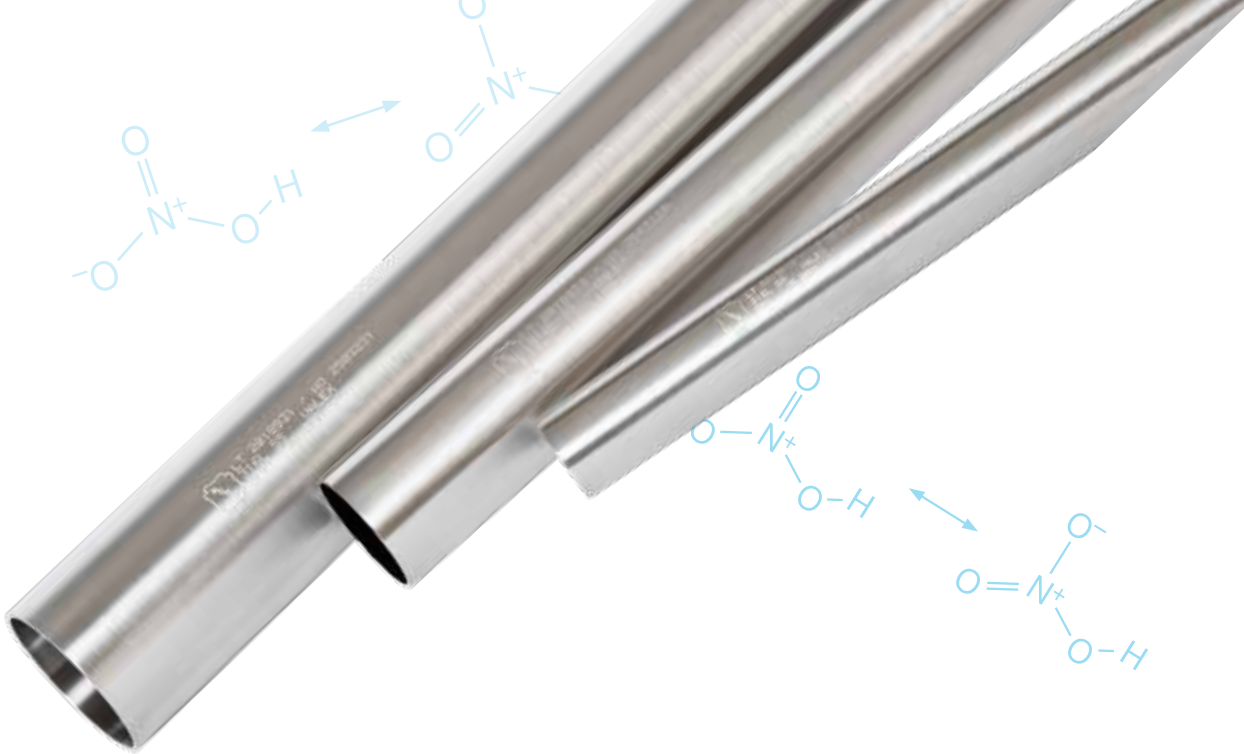
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\* Dimensional charts are subject to change. Please visit [Valex.com](http://Valex.com) or call your local Valex representative for the latest information.



# Passivation

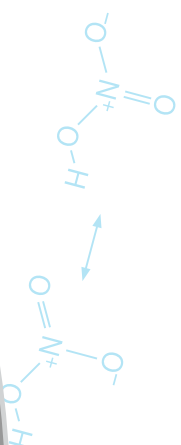


## Good Enough is Not Enough

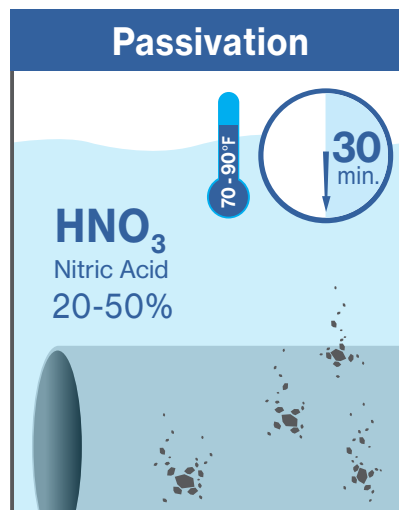
Passivation is a process for assuring the long-term integrity of stainless steel by removing exogenous iron particles and iron compounds left on the surface from the production process. Unremoved, these particles can “activate” over time, initiating galvanic corrosion, and producing rust.

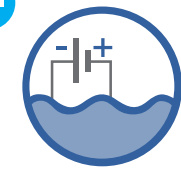
The Valex passivation process is done in-house prior to final cleaning, in accordance with ASTM A967 industry standards. Parts are treated in a nitric acid solution, at spec temperatures and concentrations, for a minimum of 30 minutes. A chemically inert, and highly corrosion-resistant, protective surface oxide layer is formed on inner and outer surfaces when the process is complete.

Left exposed to air, stainless steel naturally will form some degree of passivation as the surface “cures” over time. And some manufacturers consider that good enough.



Passivation  
an  
**Essential**  
STEP  
in the  
**Valex**  
Tube/Fittings  
Production Process





# Electropolishing



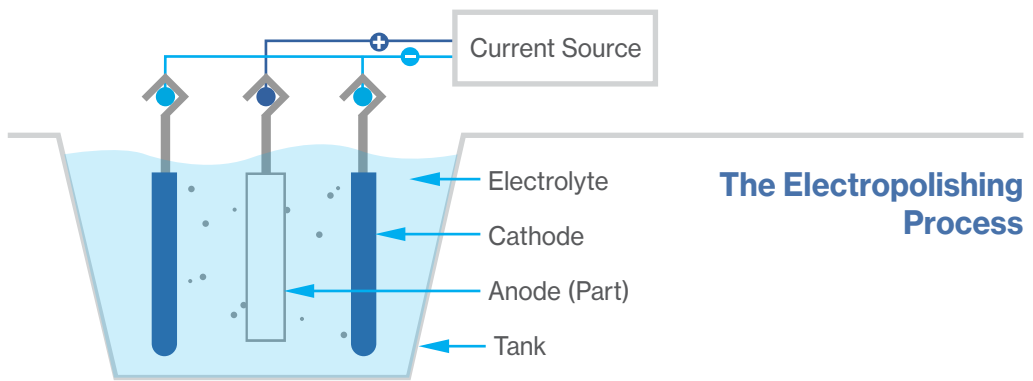
## Smoothing Out the Peaks & Valleys

Finishing tube and fittings to the required surface finish for an application is key to achieving performance and cleanliness goals.

As an established leader in electropolishing, Valex provides electropolished (EP) finishes to complement our mechanically polished offerings. Polishing is performed in-house, where we can assure the highest quality.

Under magnification, raw material surfaces appear rough, and composed of many “peaks” and “valleys”. During the EP process, parts are subjected to a controlled current in an electrolytic bath. Surface metal and contaminants are removed, while the micro-peaks and valleys are dissolved, and the surface is leveled. The result is a degree of smoothness and purity, inside and out, best seen through an electron microscope.

Our EP process has advanced over many years of development in fixturing, electrolytic bath tuning, and refining of process variables to produce the most consistent, repeatable, and uniform surface qualities required for electropolished BPE applications.





# Tolerances

## Dimensions &

- Tube
- Fittings





# Tube



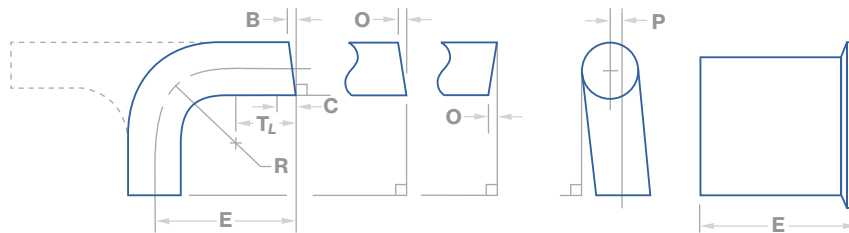
Dimensional Tolerances: ASTM A269/A270-S2

## Dimensions in Inches & Millimeters

Nominal Size		Wall Thickness		O.D. Tolerance*		Wall Thickness Tolerance*
inch	mm	inch	mm	inch	mm	
1/4"	6.35	0.04	0.89	±0.005	±0.127	±10%
3/8"	9.53	0.04	0.89	±0.005	±0.127	±10%
1/2"	12.70	0.07	1.65	±0.005	±0.127	±10%
3/4"	19.05	0.07	1.65	±0.005	±0.127	±10%
1"	25.40	0.07	1.65	±0.005	±0.127	±10%
1-1/2"	38.10	0.07	1.65	±0.008	±0.203	±10%
2"	50.80	0.07	1.65	±0.008	±0.203	±10%
2-1/2"	63.50	0.07	1.65	±0.010	±0.254	±10%
3"	76.20	0.07	1.65	±0.010	±0.254	±10%
4"	101.60	0.08	2.11	±0.015	±0.381	±10%
6"	152.40	0.110	2.77	±0.030	±0.762	±10%

\* Tolerance's are in accordance with ASTM A269/A270-S2 specifications.

ASTM A 270 S2.7.2. The cut length shall not vary over the specified length by more than 2 in. (50 mm) or less than 0 in. (0 mm).



# Fittings

Fittings Specifications: ASME BPE-2019 Part DT-3.1

## Tolerances in Inches

Nominal Size	O.D.	Wall Thickness	Squareness Face to Tangent, <i>B</i>	Length, <i>E</i>	Off Angle, <i>O</i>	Equivalent Angle (for <i>O</i> ) degree	Off Plane, <i>P</i>	Centerline Radius (CLR), <i>R</i>
1/4"	±0.005	+0.003/-0.004	0.005	±0.05	0.009	2.1	0.030	0.563
3/8"	±0.005	+0.003/-0.004	0.005	±0.05	0.012	1.8	0.030	1.125
1/2"	±0.005	+0.005/-0.008	0.005	±0.05	0.014	1.6	0.030	1.125
3/4"	±0.005	+0.005/-0.008	0.005	±0.05	0.018	1.4	0.030	1.125
1"	±0.005	+0.005/-0.008	0.008	±0.05	0.025	1.4	0.030	1.500
1-1/2"	±0.008	+0.005/-0.008	0.008	±0.05	0.034	1.3	0.050	2.250
2"	±0.008	+0.005/-0.008	0.008	±0.05	0.043	1.2	0.050	3.000
2-1/2"	±0.010	+0.005/-0.008	0.010	±0.05	0.054	1.2	0.050	3.750
3"	±0.010	+0.005/-0.008	0.016	±0.05	0.068	1.3	0.050	4.500
4"	±0.015	+0.008/-0.010	0.016	±0.05	0.086	1.2	0.060	6.000
6"	±0.030	+0.015/-0.015	0.030	±0.05	0.135	1.3	0.060	9.000

## Tolerances in Millimeters

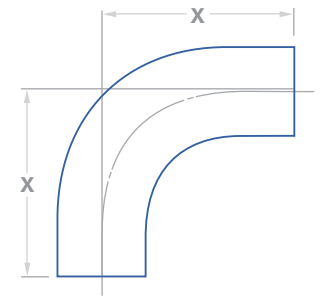
Nominal Size		O.D.	Wall Thickness	Squareness Face to Tangent, <i>B</i>	Length, <i>E</i>	Off Angle, <i>O</i>	Equivalent Angle (for <i>O</i> ) degree	Off Plane, <i>P</i>	Centerline Radius (CLR), <i>R</i>
inch	mm								
1/4"	6.35	±0.13	+0.08/-0.10	0.13	1.27	0.23	2.1	0.76	14.30
3/8"	9.53	±0.13	+0.08/-0.10	0.13	1.27	0.30	1.8	0.76	28.58
1/2"	12.70	±0.13	+0.13/-0.20	0.13	1.27	0.36	1.6	0.76	28.58
3/4"	19.05	±0.13	+0.13/-0.20	0.13	1.27	0.46	1.4	0.76	28.58
1"	25.40	±0.13	+0.13/-0.20	0.20	1.27	0.64	1.4	0.76	38.10
1-1/2"	38.10	±0.20	+0.13/-0.20	0.20	1.27	0.86	1.3	1.27	57.15
2"	50.80	±0.20	+0.13/-0.20	0.20	1.27	1.09	1.2	1.27	76.20
2-1/2"	63.50	±0.25	+0.13/-0.20	0.25	1.27	1.37	1.2	1.27	95.25
3"	76.20	±0.25	+0.13/-0.20	0.41	1.27	1.73	1.3	1.27	114.30
4"	101.60	±0.38	+0.20/-0.25	0.41	1.27	2.18	1.2	1.52	152.40
6"	152.40	±0.76	+0.38/-0.38	0.76	1.27	3.43	1.3	1.52	228.60



# Elbows

- 90° Elbows
- 45° Elbows





CONFIGURATION  
**2**

# 90° Elbow

Automatic Tube Weld: 90° Elbow

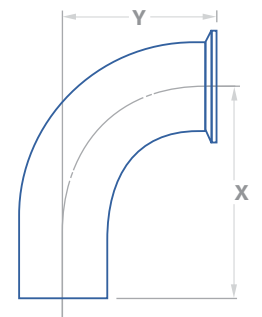
## Dimensions in Inches & Millimeters

Nominal Size		X	
inch	mm	inch	mm
1/4"	6.35	2.625	66.68
3/8"	9.53	2.625	66.68
1/2"	12.70	3.000	76.20
3/4"	19.05	3.000	76.20
1"	25.40	3.000	76.20
1-1/2"	38.10	3.750	95.25
2"	50.80	4.750	120.65
2-1/2"	63.50	5.500	139.70
3"	76.20	6.250	158.75
4"	101.60	8.000	203.20
6"	152.40	11.500	292.10

CONFIGURATION  
**2J**

# 90° Elbow

Automatic Tube Weld: Hygienic Clamp Joint, 90° Elbow

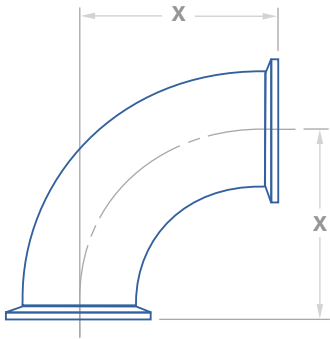


## Ferrules

Type A	Type B
●	
●	
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●	
●	●
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	●
	●
	●

## Dimensions in Inches & Millimeters

Nominal Size		X		Y	
inch	mm	inch	mm	inch	mm
1/4"	6.35	2.625	66.68	1.625	41.28
3/8"	9.53	2.625	66.68	1.625	41.28
1/2"	12.70	3.000	76.20	1.625	41.28
3/4"	19.05	3.000	76.20	1.625	41.28
1"	25.40	3.000	76.20	2.000	50.80
1-1/2"	38.10	3.750	95.25	2.750	69.85
2"	50.80	4.750	120.65	3.500	88.90
2-1/2"	63.50	5.500	139.70	4.250	107.95
3"	76.20	6.250	158.75	5.000	127.00
4"	101.60	8.000	203.20	6.625	168.28
6"	152.40	11.500	292.10	10.500	266.70



# 90° Elbow

Hygienic Clamp Joint: 90° Elbow

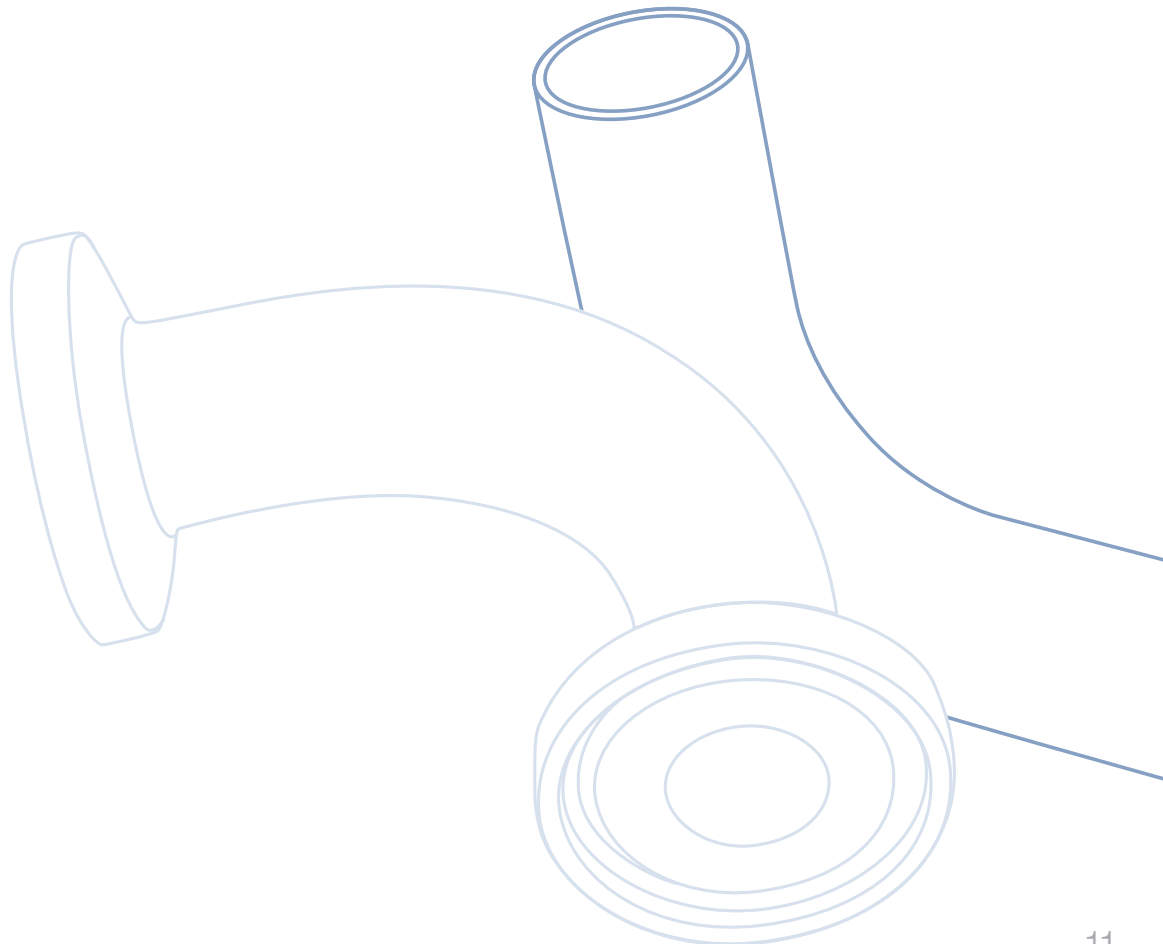


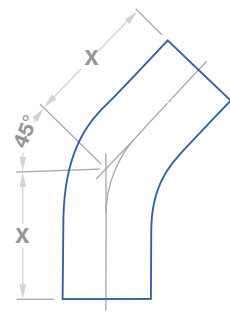
## Ferrules

Type A	Type B
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## Dimensions in Inches & Millimeters

Nominal Size		X	
inch	mm	inch	mm
1/4"	6.35	1.625	41.28
3/8"	9.53	1.625	41.28
1/2"	12.70	1.625	41.28
3/4"	19.05	1.625	41.28
1"	25.40	2.000	50.80
1-1/2"	38.10	2.750	69.85
2"	50.80	3.500	88.90
2-1/2"	63.50	4.250	107.95
3"	76.20	5.000	127.00
4"	101.60	6.625	168.28
6"	152.40	10.500	266.70





CONFIGURATION  
**2K**

# 45° Elbow

Automatic Tube Weld: 45° Elbow

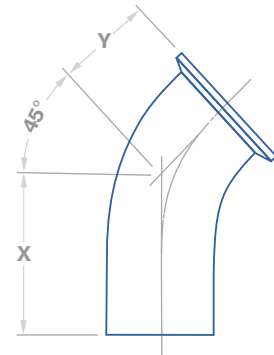
## Dimensions in Inches & Millimeters

Nominal Size		X	
inch	mm	inch	mm
1/4"	6.35	2.000	50.80
3/8"	9.53	2.000	50.80
1/2"	12.70	2.250	57.15
3/4"	19.05	2.250	57.15
1"	25.40	2.500	57.15
1-1/2"	38.10	2.500	63.50
2"	50.80	3.000	76.20
2-1/2"	63.50	3.375	85.73
3"	76.20	3.625	92.08
4"	101.60	4.500	114.30
6"	152.40	6.250	158.75

CONFIGURATION  
**2KJ**

# 45° Elbow

Automatic Tube Weld: Hygienic Clamp Joint, 45° Elbow

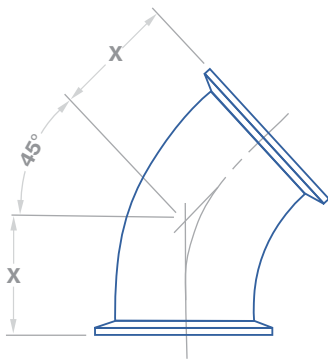


## Ferrules

Type A	Type B
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## Dimensions in Inches & Millimeters

Nominal Size		X		Y	
inch	mm	inch	mm	inch	mm
1/4"	6.35	2.000	50.80	1.000	25.40
3/8"	9.53	2.000	50.80	1.000	25.40
1/2"	12.70	2.250	57.15	1.000	25.40
3/4"	19.05	2.250	57.15	1.000	25.40
1"	25.40	2.250	57.15	1.125	28.58
1-1/2"	38.10	2.500	63.50	1.438	36.53
2"	50.80	3.000	76.20	1.750	44.45
2-1/2"	63.50	3.375	85.73	2.063	52.40
3"	76.20	3.625	92.08	2.375	60.33
4"	101.60	4.500	114.30	3.125	79.38
6"	152.40	6.250	158.75	5.250	133.35



# 45° Elbow

Hygienic Clamp Joint: 45° Elbow



Ferrules	
Type A	Type B
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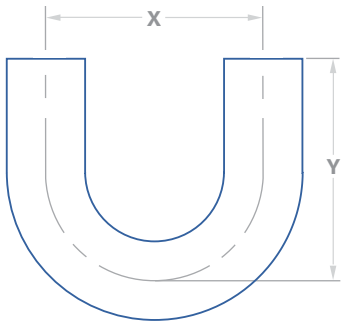
Dimensions in Inches & Millimeters			
Nominal Size		X	
inch	mm	inch	mm
1/4"	6.35	1.000	25.40
3/8"	9.53	1.000	25.40
1/2"	12.70	1.000	25.40
3/4"	19.05	1.000	25.40
1"	25.40	1.125	28.58
1-1/2"	38.10	1.438	36.53
2"	50.80	1.750	44.45
2-1/2"	63.50	2.063	52.40
3"	76.20	2.375	60.33
4"	101.60	3.125	79.38
6"	152.40	5.250	133.35



# Bends

- 180° Bends





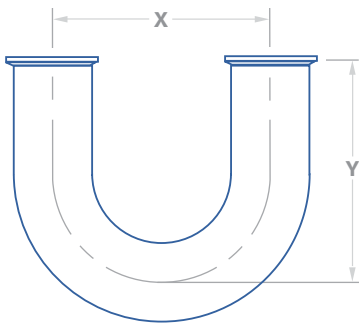
# 180° Return Bend

Automatic Tube Weld: 180° Return Bend



## Dimensions in Inches & Millimeters

Nominal Size		X		Y	
inch	mm	inch	mm	inch	mm
1/4"	6.35	4.500	114.30	2.625	66.68
3/8"	9.53	4.500	114.30	2.625	66.68
1/2"	12.70	4.500	114.30	3.000	76.20
3/4"	19.05	4.500	114.30	3.000	76.20
1"	25.40	3.000	76.20	3.000	76.20
1-1/2"	38.10	4.500	114.30	4.500	114.30
2"	50.80	6.000	152.40	5.000	127.00
2-1/2"	63.50	7.500	190.50	5.750	146.05
3"	76.20	9.000	228.60	6.500	165.10
4"	101.60	12.000	304.80	8.500	215.90
6"	152.40	18.000	457.20	11.500	292.10



# 180° Return Bend

Hygienic Clamp Joint: 180° Return Bend



## Ferrules

Type A	Type B
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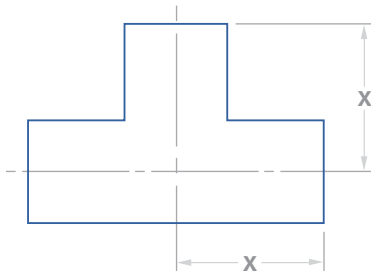
## Dimensions in Inches & Millimeters

Nominal Size		X		Y	
inch	mm	inch	mm	inch	mm
1/4"	6.35	4.500	114.30	3.125	79.38
3/8"	9.53	4.500	114.30	3.125	79.38
1/2"	12.70	4.500	114.30	3.500	88.90
3/4"	19.05	4.500	114.30	3.500	88.90
1"	25.40	3.000	76.20	3.500	88.90
1-1/2"	38.10	4.500	114.30	5.000	127.00
2"	50.80	6.000	152.40	5.500	139.70
2-1/2"	63.50	7.500	190.50	6.250	158.75
3"	76.20	9.000	228.60	7.000	177.80
4"	101.60	12.000	304.80	9.125	231.78
6"	152.40	18.000	457.20	13.000	330.20

# Tees

- Straight Tees
- Reducing Tees
- Instrument Tees





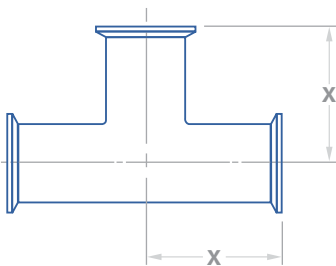
# Straight Tee

Automatic Tube Weld: Straight (Equal) Tee



## Dimensions in Inches & Millimeters

Nominal Size		X	
inch	mm	inch	mm
1/4"	6.35	1.750	44.45
3/8"	9.53	1.750	44.45
1/2"	12.70	1.875	47.63
3/4"	19.05	2.000	50.80
1"	25.40	2.125	53.98
1-1/2"	38.10	2.375	60.33
2"	50.80	2.875	73.03
2-1/2"	63.50	3.125	79.38
3"	76.20	3.375	85.73
4"	101.60	4.125	104.78
6"	152.40	5.625	142.88



# Straight Tee

Hygienic Clamp Joint: Straight (Equal) Tee



## Ferrules

Type A	Type B
●	
●	
●	
●	
●	●
	●
	●
	●
	●
	●
	●

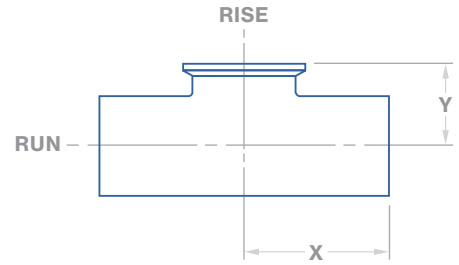
## Dimensions in Inches & Millimeters

Nominal Size		X	
inch	mm	inch	mm
1/4"	6.35	2.250	57.15
3/8"	9.53	2.250	57.15
1/2"	12.70	2.375	60.33
3/4"	19.05	2.500	63.50
1"	25.40	2.625	66.68
1-1/2"	38.10	2.875	73.03
2"	50.80	3.375	85.73
2-1/2"	63.50	3.625	92.08
3"	76.20	3.875	98.43
4"	101.60	4.750	120.65
6"	152.40	7.125	180.98



# Short-Outlet Tee

Automatic Tube Weld:  
Short-Outlet Hygienic Clamp Joint Tee



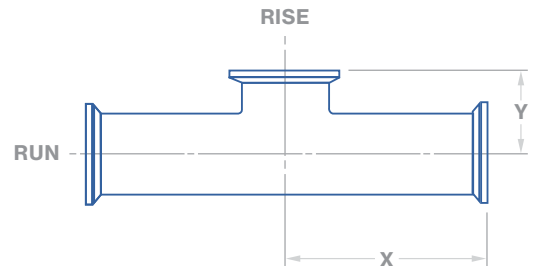
Ferrules	
Type A	Type B
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Dimensions in Inches & Millimeters					
Nominal Size		X		Y	
inch	mm	inch	mm	inch	mm
1/4"	6.35	1.750	44.45	1.000	25.40
3/8"	9.53	1.750	44.45	1.000	25.40
1/2"	12.70	1.875	47.63	1.000	25.40
3/4"	19.05	2.000	50.80	1.125	28.58
1"	25.40	2.125	53.98	1.125	28.58
1-1/2"	38.10	2.375	60.33	1.375	34.93
2"	50.80	2.875	73.03	1.625	41.28
2-1/2"	63.50	3.125	79.38	1.875	47.63
3"	76.20	3.375	85.73	2.125	53.98
4"	101.60	4.125	104.78	2.750	69.85
6"	152.40	5.625	142.88	4.625	117.48



# Short-Outlet Tee

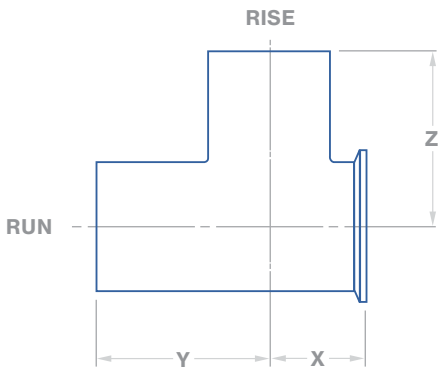
Hygienic Clamp Joint: Short-Outlet Tee



Ferrules	
Type A	Type B
•	
•	
•	•
	•
	•
	•
	•
	•
	•
	•

Dimensions in Inches & Millimeters					
Nominal Size		X		Y	
inch	mm	inch	mm	inch	mm
1/2"	12.70	2.375	60.33	1.000	25.40
3/4"	19.05	2.500	63.50	1.125	28.58
1"	25.40	2.625	66.68	1.125	28.58
1-1/2"	38.10	2.875	73.03	1.375	34.93
2"	50.80	3.375	85.73	1.625	41.28
2-1/2"	63.50	3.625	92.08	1.875	47.63
3"	76.20	3.875	98.43	2.125	53.98
4"	101.60	4.750	120.65	2.750	69.85
6"	152.40	7.125	180.98	4.625	117.48





# Short-Outlet Run Tee

Hygienic Mechanical Joint: Short-Outlet Run Tee

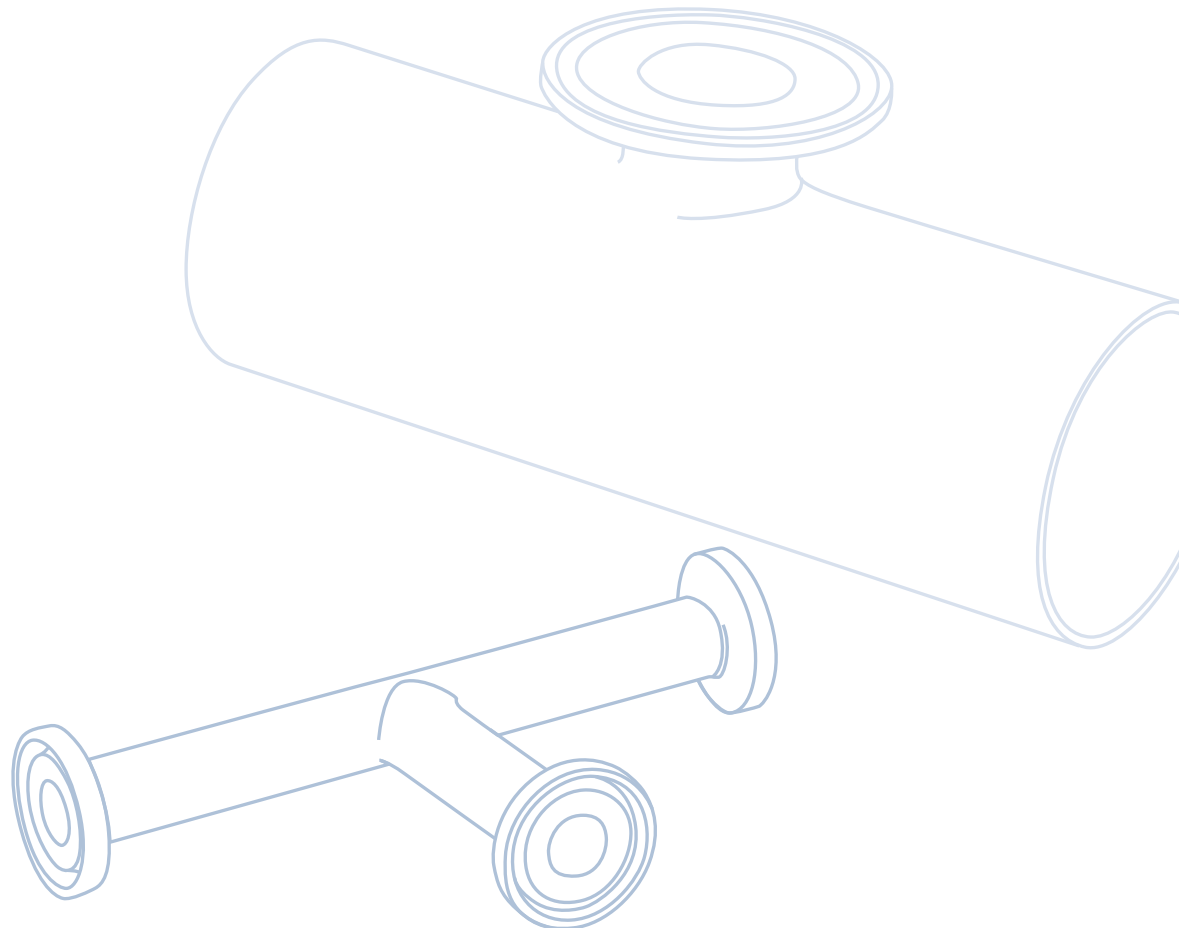
CONFIGURATION  
**8M**

## Ferrules

Type A	Type B
●	
●	
●	
●	
●	●
	●
	●
	●
	●
	●
	●

## Dimensions in Inches & Millimeters

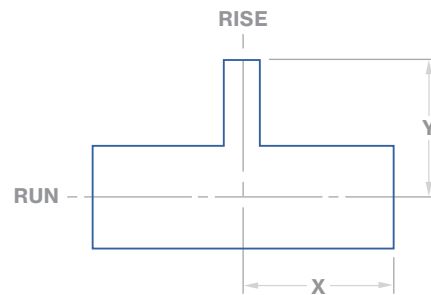
Nominal Size		X		Y		Z	
inch	mm	inch	mm	inch	mm	inch	mm
1/4"	6.35	0.875	22.23	1.750	44.45	1.750	44.45
3/8"	9.53	0.875	22.23	1.750	44.45	1.750	44.45
1/2"	12.70	0.875	22.23	1.875	47.63	1.875	47.63
3/4"	19.05	1.000	25.40	2.000	50.80	2.000	50.80
1"	25.40	1.125	28.58	2.125	53.98	2.125	53.98
1-1/2"	38.10	1.375	34.93	2.375	60.33	2.375	60.33
2"	50.80	1.625	41.28	2.875	73.03	2.875	73.03
2-1/2"	63.50	1.875	47.63	3.125	79.38	3.125	79.38
3"	76.20	2.125	53.98	3.375	85.73	3.375	85.73
4"	101.60	2.750	69.85	4.125	104.78	4.125	104.78
6"	152.40	4.625	117.48	5.625	142.88	5.625	142.88





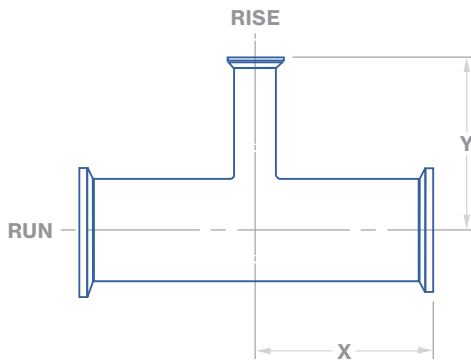
# Reducing Tee

Automatic Tube Weld: Reducing Tee



## Dimensions in Inches & Millimeters

Nominal Size inch		Nominal Size mm		X		Y	
RUN	RISE	RUN	RISE	inch	mm	inch	mm
3/8"	1/4"	9.53	6.35	1.750	44.45	1.750	44.45
1/2"	1/4"	12.70	6.35	1.875	47.63	1.875	47.63
1/2"	3/8"	12.70	9.53	1.875	47.63	1.875	47.63
3/4"	1/4"	19.05	6.35	2.000	50.80	2.000	50.80
3/4"	3/8"	19.05	9.53	2.000	50.80	2.000	50.80
3/4"	1/2"	19.05	12.70	2.000	50.80	2.000	50.80
1"	1/4"	25.40	6.35	2.125	53.98	2.125	53.98
1"	3/8"	25.40	9.53	2.125	53.98	2.125	53.98
1"	1/2"	25.40	12.70	2.125	53.98	2.125	53.98
1"	3/4"	25.40	19.05	2.125	53.98	2.125	53.98
1-1/2"	1/2"	38.10	12.70	2.375	60.33	2.375	60.33
1-1/2"	3/4"	38.10	19.05	2.375	60.33	2.375	60.33
1-1/2"	1"	38.10	25.40	2.375	60.33	2.375	60.33
2"	1/2"	50.80	12.70	2.875	73.03	2.625	66.68
2"	3/4"	50.80	19.05	2.875	73.03	2.625	66.68
2"	1"	50.80	25.40	2.875	73.03	2.625	66.68
2"	1-1/2"	50.80	38.10	2.875	73.03	2.625	66.68
2-1/2"	1/2"	63.50	12.70	3.125	79.38	2.875	73.03
2-1/2"	3/4"	63.50	19.05	3.125	79.38	2.875	73.03
2-1/2"	1"	63.50	25.40	3.125	79.38	2.875	73.03
2-1/2"	1-1/2"	63.50	38.10	3.125	79.38	2.875	73.03
2-1/2"	2"	63.50	50.80	3.125	79.38	2.875	73.03
3"	1/2"	76.20	12.70	3.375	85.73	3.125	79.38
3"	3/4"	76.20	19.05	3.375	85.73	3.125	79.38
3"	1"	76.20	25.40	3.375	85.73	3.125	79.38
3"	1-1/2"	76.20	38.10	3.375	85.73	3.125	79.38
3"	2"	76.20	50.80	3.375	85.73	3.125	79.38
3"	2-1/2"	76.20	63.50	3.375	85.73	3.125	79.38
4"	1/2"	101.60	12.70	4.125	104.78	3.625	92.08
4"	3/4"	101.60	19.05	4.125	104.78	3.625	92.08
4"	1"	101.60	25.40	4.125	104.78	3.625	92.08
4"	1-1/2"	101.60	38.10	4.125	104.78	3.625	92.08
4"	2"	101.60	50.80	4.125	104.78	3.875	98.43
4"	2-1/2"	101.60	63.50	4.125	104.78	3.875	98.43
4"	3"	101.60	76.20	5.625	142.88	3.875	98.43
6"	3"	152.40	76.20	5.625	142.88	4.875	123.83
6"	4"	152.40	101.60	5.625	142.88	5.125	130.18



# Reducing Tee

Hygienic Clamp Joint: Reducing Tee



## Ferrules

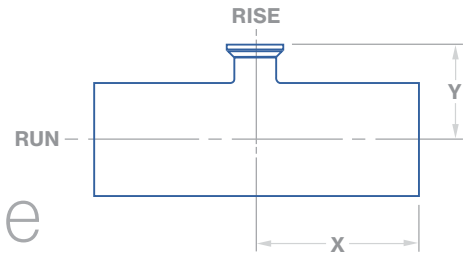
Run		Rise	
Type A	Type B	Type A	Type B
●		●	
●		●	
●		●	
●		●	
●		●	
●	●	●	
●	●	●	
●	●	●	
●	●	●	
	●	●	
	●	●	
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	
	●	●	
	●	●	●
	●	●	●
	●	●	●
	●	●	
	●	●	
	●	●	●
	●	●	●

## Dimensions in Inches & Millimeters

Nominal Size inch		Nominal Size mm		X		Y	
RUN	RISE	RUN	RISE	inch	mm	inch	mm
3/8"	1/4"	9.53	6.35	2.250	57.15	2.250	57.15
1/2"	1/4"	12.70	6.35	2.375	60.33	2.375	60.33
1/2"	3/8"	12.70	9.53	2.375	60.33	2.375	60.33
3/4"	1/4"	19.05	6.35	2.500	63.50	2.500	63.50
3/4"	3/8"	19.05	9.53	2.500	63.50	2.500	63.50
3/4"	1/2"	19.05	12.70	2.500	63.50	2.500	63.50
1"	1/4"	25.40	6.35	2.625	66.68	2.625	66.68
1"	3/8"	25.40	9.53	2.625	66.68	2.625	66.68
1"	1/2"	25.40	12.70	2.625	66.68	2.625	66.68
1"	3/4"	25.40	19.05	2.625	66.68	2.625	66.68
1-1/2"	1/2"	38.10	12.70	2.875	73.03	2.875	73.03
1-1/2"	3/4"	38.10	19.05	2.875	73.03	2.875	73.03
1-1/2"	1"	38.10	25.40	2.875	73.03	2.875	73.03
2"	1/2"	50.80	12.70	3.375	85.73	3.125	79.38
2"	3/4"	50.80	19.05	3.375	85.73	3.125	79.38
2"	1"	50.80	25.40	3.375	85.73	3.125	79.38
2"	1-1/2"	50.80	38.10	3.375	85.73	3.125	79.38
2-1/2"	1/2"	63.50	12.70	3.625	92.08	3.375	85.73
2-1/2"	3/4"	63.50	19.05	3.625	92.08	3.375	85.73
2-1/2"	1"	63.50	25.40	3.625	92.08	3.375	85.73
2-1/2"	1-1/2"	63.50	38.10	3.625	92.08	3.375	85.73
2-1/2"	2"	63.50	50.80	3.625	92.08	3.375	85.73
3"	1/2"	76.20	12.70	3.875	98.43	3.625	92.08
3"	3/4"	76.20	19.05	3.875	98.43	3.625	92.08
3"	1"	76.20	25.40	3.875	98.43	3.625	92.08
3"	1-1/2"	76.20	38.10	3.875	98.43	3.625	92.08
3"	2"	76.20	50.80	3.875	98.43	3.625	92.08
3"	2-1/2"	76.20	63.50	3.875	98.43	3.625	92.08
4"	1/2"	101.60	12.70	4.750	120.65	4.125	104.78
4"	3/4"	101.60	19.05	4.750	120.65	4.125	104.78
4"	1"	101.60	25.40	4.750	120.65	4.125	104.78
4"	1-1/2"	101.60	38.10	4.750	120.65	4.125	104.78
4"	2"	101.60	50.80	4.750	120.65	4.375	111.13
4"	2-1/2"	101.60	63.50	4.750	120.65	4.375	111.13
4"	3"	101.60	76.20	4.750	120.65	4.375	111.13
6"	3"	152.40	76.20	7.125	180.98	5.375	136.53
6"	4"	152.40	101.60	7.125	180.98	5.750	146.05

# Short-Outlet Reducing Tee

Automatic Tube Weld: Short-Outlet  
Hygienic Clamp, Joint Reducing Tee

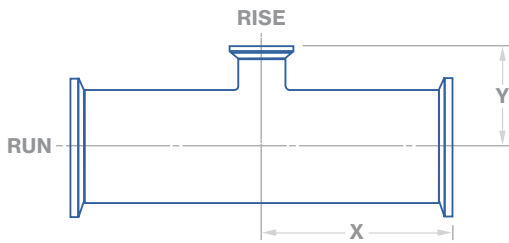


## Ferrules

Rise	
Type A	Type B
●	
●	
●	
●	
●	
●	
●	
●	
●	
●	
●	
●	
●	●
●	
●	●
●	●
●	●
●	●
●	
●	
●	●
●	●
●	●
●	●
●	●
●	●
●	●
●	●
●	●
●	●
●	●
●	●
●	●

## Dimensions in Inches & Millimeters

Nominal Size inch		Nominal Size mm		X		Y	
RUN	RISE	RUN	RISE	inch	mm	inch	mm
3/8"	1/4"	9.53	6.35	1.750	44.45	1.000	25.40
1/2"	1/4"	12.70	6.35	1.875	47.63	1.000	25.40
1/2"	3/8"	12.70	9.53	1.875	47.63	1.000	25.40
3/4"	1/4"	19.05	6.35	2.000	50.80	1.000	25.40
3/4"	3/8"	19.05	9.53	2.000	50.80	1.000	25.40
3/4"	1/2"	19.05	12.70	2.000	50.80	1.000	25.40
1"	1/4"	25.40	6.35	2.125	53.98	1.125	28.58
1"	3/8"	25.40	9.53	2.125	53.98	1.125	28.58
1"	1/2"	25.40	12.70	2.125	53.98	1.125	28.58
1"	3/4"	25.40	19.05	2.125	53.98	1.125	28.58
1-1/2"	1/2"	38.10	12.70	2.375	60.33	1.375	34.93
1-1/2"	3/4"	38.10	19.05	2.375	60.33	1.375	34.93
1-1/2"	1"	38.10	25.40	2.375	60.33	1.375	34.93
2"	1/2"	50.80	12.70	2.875	73.03	1.625	41.28
2"	3/4"	50.80	19.05	2.875	73.03	1.625	41.28
2"	1"	50.80	25.40	2.875	73.03	1.625	41.28
2"	1-1/2"	50.80	38.10	2.875	73.03	1.625	41.28
2-1/2"	1/2"	63.50	12.70	3.125	79.38	1.875	47.63
2-1/2"	3/4"	63.50	19.05	3.125	79.38	1.875	47.63
2-1/2"	1"	63.50	25.40	3.125	79.38	1.875	47.63
2-1/2"	1-1/2"	63.50	38.10	3.125	79.38	1.875	47.63
2-1/2"	2"	63.50	50.80	3.125	79.38	1.875	47.63
3"	1/2"	76.20	12.70	3.375	85.73	2.125	53.98
3"	3/4"	76.20	19.05	3.375	85.73	2.125	53.98
3"	1"	76.20	25.40	3.375	85.73	2.125	53.98
3"	1-1/2"	76.20	38.10	3.375	85.73	2.125	53.98
3"	2"	76.20	50.80	3.375	85.73	2.125	53.98
3"	2-1/2"	76.20	63.50	3.375	85.73	2.125	53.98
4"	1/2"	101.60	12.70	4.125	104.78	2.625	66.68
4"	3/4"	101.60	19.05	4.125	104.78	2.625	66.68
4"	1"	101.60	25.40	4.125	104.78	2.625	66.68
4"	1-1/2"	101.60	38.10	4.125	104.78	2.625	66.68
4"	2"	101.60	50.80	4.125	104.78	2.625	66.68
4"	2-1/2"	101.60	63.50	4.125	104.78	2.625	66.68
4"	3"	101.60	76.20	4.125	104.78	2.625	66.68
6"	1/2"	152.40	12.70	5.625	142.88	3.625	92.08
6"	3/4"	152.40	19.05	5.625	142.88	3.625	92.08
6"	1"	152.40	25.40	5.625	142.88	3.625	92.08
6"	1-1/2"	152.40	38.10	5.625	142.88	3.625	92.08
6"	2"	152.40	50.80	5.625	142.88	3.625	92.08
6"	2-1/2"	152.40	63.50	5.625	142.88	3.625	92.08
6"	3"	152.40	76.20	5.625	142.88	3.625	92.08
6"	4"	152.40	101.60	5.625	142.88	3.750	95.25



# Short-Outlet Reducing Tee

Hygienic Clamp Joint: Short-Outlet Reducing Tee



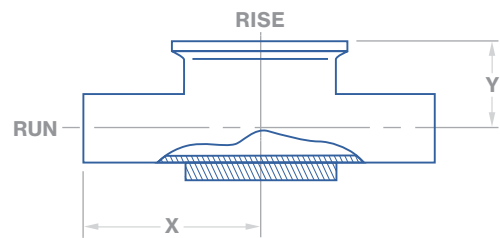
## Ferrules

Run		Rise	
Type A	Type B	Type A	Type B
●		●	
●		●	
●		●	
●		●	
●		●	
●	●	●	
●	●	●	
●	●	●	
●	●	●	
	●	●	
	●	●	
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●

## Dimensions in Inches & Millimeters

Nominal Size inch		Nominal Size mm		X		Y	
RUN	RISE	RUN	RISE	inch	mm	inch	mm
3/8"	1/4"	9.53	6.35	2.250	57.15	1.000	25.40
1/2"	1/4"	12.70	6.35	2.375	60.33	1.000	25.40
1/2"	3/8"	12.70	9.53	2.375	60.33	1.000	25.40
3/4"	1/4"	19.05	6.35	2.500	63.50	1.000	25.40
3/4"	3/8"	19.05	9.53	2.500	63.50	1.000	25.40
3/4"	1/2"	19.05	12.70	2.500	63.50	1.000	25.40
1"	1/4"	25.40	6.35	2.625	66.68	1.125	28.58
1"	3/8"	25.40	9.53	2.625	66.68	1.125	28.58
1"	1/2"	25.40	12.70	2.625	66.68	1.125	28.58
1"	3/4"	25.40	19.05	2.625	66.68	1.125	28.58
1-1/2"	1/2"	38.10	12.70	2.875	73.03	1.375	34.93
1-1/2"	3/4"	38.10	19.05	2.875	73.03	1.375	34.93
1-1/2"	1"	38.10	25.40	2.875	73.03	1.375	34.93
2"	1/2"	50.80	12.70	3.375	85.73	1.625	41.28
2"	3/4"	50.80	19.05	3.375	85.73	1.625	41.28
2"	1"	50.80	25.40	3.375	85.73	1.625	41.28
2"	1-1/2"	50.80	38.10	3.375	85.73	1.625	41.28
2-1/2"	1/2"	63.50	12.70	3.625	92.08	1.875	47.63
2-1/2"	3/4"	63.50	19.05	3.625	92.08	1.875	47.63
2-1/2"	1"	63.50	25.40	3.625	92.08	1.875	47.63
2-1/2"	1-1/2"	63.50	38.10	3.625	92.08	1.875	47.63
2-1/2"	2"	63.50	50.80	3.625	92.08	1.875	47.63
3"	1/2"	76.20	12.70	3.875	98.43	2.125	53.98
3"	3/4"	76.20	19.05	3.875	98.43	2.125	53.98
3"	1"	76.20	25.40	3.875	98.43	2.125	53.98
3"	1-1/2"	76.20	38.10	3.875	98.43	2.125	53.98
3"	2"	76.20	50.80	3.875	98.43	2.125	53.98
3"	2-1/2"	76.20	63.50	3.875	98.43	2.125	53.98
4"	1/2"	101.60	12.70	4.750	120.65	2.625	66.68
4"	3/4"	101.60	19.05	4.750	120.65	2.625	66.68
4"	1"	101.60	25.40	4.750	120.65	2.625	66.68
4"	1-1/2"	101.60	38.10	4.750	120.65	2.625	66.68
4"	2"	101.60	50.80	4.750	120.65	2.625	66.68
4"	2-1/2"	101.60	63.50	4.750	120.65	2.625	66.68
4"	3"	101.60	76.20	4.750	120.65	2.625	66.68
6"	1/2"	152.40	12.70	7.125	180.98	3.625	92.08
6"	3/4"	152.40	19.05	7.125	180.98	3.625	92.08
6"	1"	152.40	25.40	7.125	180.98	3.625	92.08
6"	1-1/2"	152.40	38.10	7.125	180.98	3.625	92.08
6"	2"	152.40	50.80	7.125	180.98	3.625	92.08
6"	2-1/2"	152.40	63.50	7.125	180.98	3.625	92.08
6"	3"	152.40	76.20	7.125	180.98	3.625	92.08
6"	4"	152.40	101.60	7.125	180.98	3.750	95.25



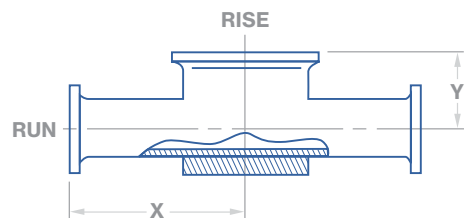


# Instrument Tee

Automatic Tube Weld: Instrument Tee

Ferrules	
Rise	
Type A	Type B
	●
	●
	●
	●
	●
	●
	●

Dimensions in Inches & Millimeters							
Nominal Size inch		Nominal Size mm		X		Y	
RUN	RISE	RUN	RISE	inch	mm	inch	mm
1/2"	1-1/2"	12.70	38.10	2.500	63.50	0.875	22.23
3/4"	1-1/2"	19.05	38.10	2.500	63.50	1.000	25.40
1"	1-1/2"	25.40	38.10	2.500	63.50	1.125	28.58
1/2"	2"	12.70	50.80	2.750	69.85	1.000	25.40
3/4"	2"	19.05	50.80	2.750	69.85	1.125	28.58
1"	2"	25.40	50.80	2.750	69.85	1.250	31.75
1-1/2"	2"	38.10	50.80	2.750	69.85	1.500	38.10



# Instrument Tee

Hygienic Clamp Joint: Instrument Tee

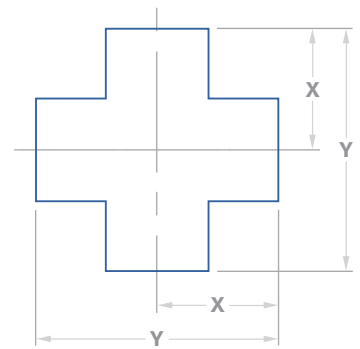
Ferrules			
Run		Rise	
Type A	Type B	Type A	Type B
●			●
●			●
●	●		●
	●		●
	●		●
	●		●
	●		●

Dimensions in Inches & Millimeters							
Nominal Size inch		Nominal Size mm		X		Y	
RUN	RISE	RUN	RISE	inch	mm	inch	mm
1/2"	1-1/2"	12.70	38.10	3.000	76.20	0.875	22.23
3/4"	1-1/2"	19.05	38.10	3.000	76.20	1.000	25.40
1"	1-1/2"	25.40	38.10	3.000	76.20	1.125	28.58
1/2"	2"	12.70	50.80	3.250	82.55	1.000	25.40
3/4"	2"	19.05	50.80	3.250	82.55	1.125	28.58
1"	2"	25.40	50.80	3.250	82.55	1.250	31.75
1-1/2"	2"	38.10	50.80	3.250	82.55	1.500	38.10

# Crosses

- Straight Crosses





CONFIGURATION  
**9**

# Straight Cross

Automatic Tube Weld: Straight Cross

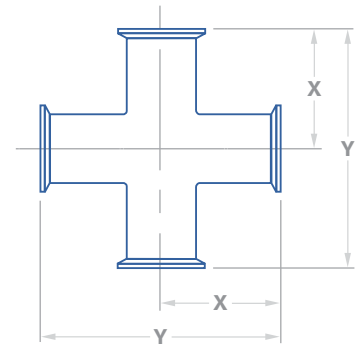
## Dimensions in Inches & Millimeters

Nominal Size		X		Y	
inch	mm	inch	mm	inch	mm
1/4"	6.35	1.750	44.45	3.500	88.90
3/8"	9.53	1.750	44.45	3.500	88.90
1/2"	12.70	1.875	47.63	3.750	95.25
3/4"	19.05	2.000	50.80	4.000	101.60
1"	25.40	2.125	53.98	4.250	107.95
1-1/2"	38.10	2.375	60.33	4.750	120.65
2"	50.80	2.875	73.03	5.750	146.05
2-1/2"	63.50	3.125	79.38	6.250	158.75
3"	76.20	3.375	85.73	6.750	171.45
4"	101.60	4.125	104.78	8.250	209.55
6"	152.40	5.625	142.88	11.250	285.75

CONFIGURATION  
**9H**

# Straight Cross

Hygienic Clamp Joint: Straight Cross



## Ferrules

Type A	Type B
●	
●	
●	
●	
●	●
	●
	●
	●
	●
	●
	●

## Dimensions in Inches & Millimeters

Nominal Size		X		Y	
inch	mm	inch	mm	inch	mm
1/4"	6.35	2.250	57.15	4.500	114.30
3/8"	9.53	2.250	57.15	4.500	114.30
1/2"	12.70	2.375	60.33	4.750	120.65
3/4"	19.05	2.500	63.50	5.000	127.00
1"	25.40	2.625	66.68	5.250	133.35
1-1/2"	38.10	2.875	73.03	5.750	146.05
2"	50.80	3.375	85.73	6.750	171.45
2-1/2"	63.50	3.625	92.08	7.250	184.15
3"	76.20	3.875	98.43	7.750	196.85
4"	101.60	4.750	120.65	9.500	241.30
6"	152.40	7.125	180.98	14.250	361.95

# Reducers

- Concentric Reducers
- Cap Reducers

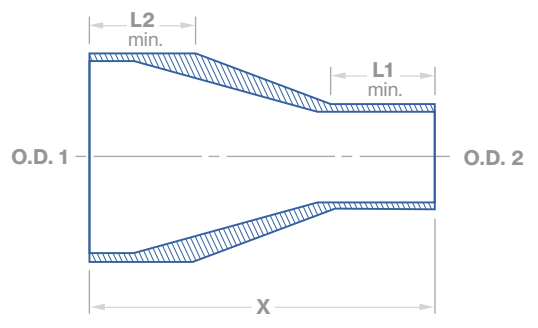




CONFIGURATION  
**31**

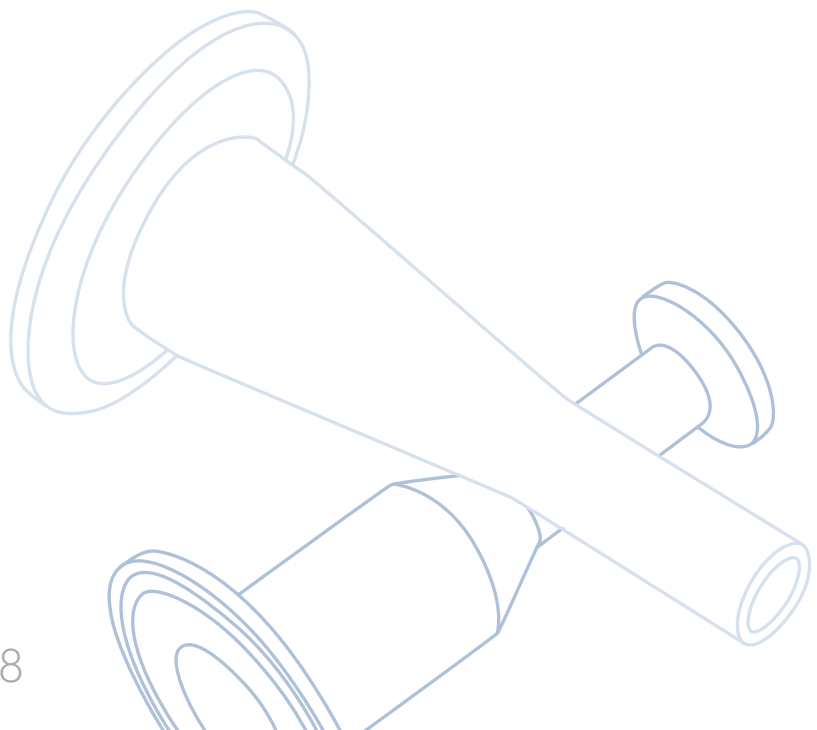
# Concentric Reducer

Automatic Tube Weld: Concentric Reducer

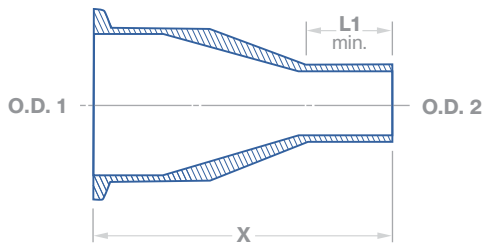


## Dimensions in Inches & Millimeters

Nominal Size inch		Nominal Size mm		Overall Length, X		O.D., Small End, L1		O.D., Large End, L2	
O.D. 1	O.D. 2	O.D. 1	O.D. 2	inch	mm	inch	mm	inch	mm
3/8"	1/4"	9.53	6.35	1.625	41.28	0.750	19.05	0.750	19.05
1/2"	1/4"	12.70	6.35	1.875	47.63	0.750	19.05	1.000	25.40
1/2"	3/8"	12.70	9.53	1.875	47.63	0.750	19.05	1.000	25.40
3/4"	3/8"	19.05	9.53	2.000	50.80	0.750	19.05	1.000	25.40
3/4"	1/2"	19.05	12.70	2.125	53.98	1.000	25.40	1.000	25.40
1"	1/2"	25.40	12.70	2.500	63.50	1.000	25.40	1.000	25.40
1"	3/4"	25.40	19.05	2.125	53.98	1.000	25.40	1.000	25.40
1-1/2"	3/4"	38.10	19.05	3.000	76.20	1.000	25.40	1.000	25.40
1-1/2"	1"	38.10	25.40	2.500	63.50	1.000	25.40	1.000	25.40
2"	1"	50.80	25.40	3.375	85.73	1.000	25.40	1.000	25.40
2"	1-1/2"	50.80	38.10	2.500	63.50	1.000	25.40	1.000	25.40
2-1/2"	1-1/2"	63.50	38.10	3.375	85.73	1.000	25.40	1.000	25.40
2-1/2"	2"	63.50	50.80	2.500	63.50	1.000	25.40	1.000	25.40
3"	1-1/2"	76.20	38.10	4.250	107.95	1.000	25.40	1.500	38.10
3"	2"	76.20	50.80	3.375	85.73	1.000	25.40	1.500	38.10
3"	2-1/2"	76.20	63.50	2.625	66.68	1.000	25.40	1.500	38.10
4"	2"	101.60	50.80	5.125	130.18	1.000	25.40	1.500	38.10
4"	2-1/2"	101.60	63.50	4.250	107.95	1.000	25.40	1.500	38.10
4"	3"	101.60	76.20	3.875	98.43	1.500	38.10	1.500	38.10
6"	3"	152.40	76.20	7.250	184.15	1.500	38.10	2.000	50.80
6"	4"	152.40	101.60	5.625	142.88	1.500	38.10	2.000	50.80







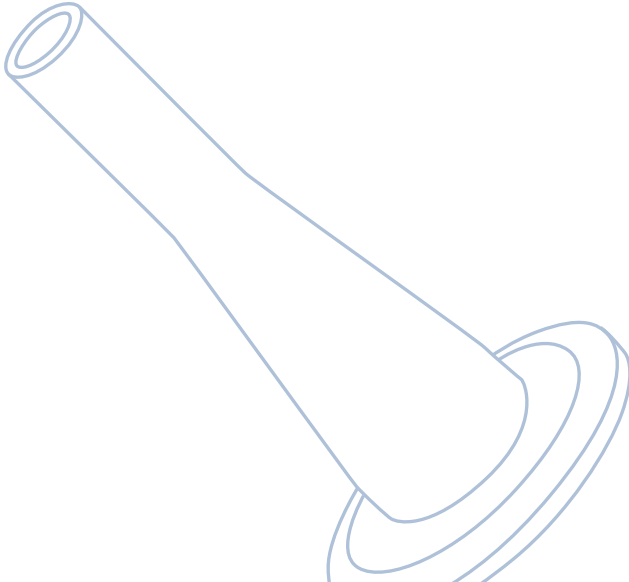
# Concentric Reducer

Hygienic Clamp Joint: Tube Weld Concentric Reducer



Ferrules	
O.D. 1	
Type A	Type B
●	
●	
●	
●	
●	●
●	●
	●
	●
	●
	●
	●
	●
	●
	●
	●
	●
	●
	●
	●
	●
	●

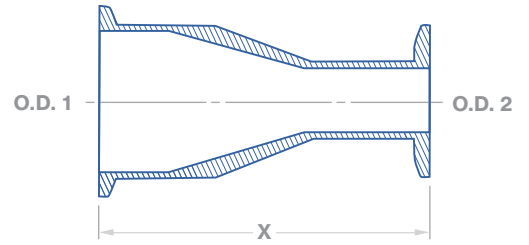
Dimensions in Inches & Millimeters							
Nominal Size inch		Nominal Size mm		X		L1	
O.D. 1	O.D. 2	O.D. 1	O.D. 2	inch	mm	inch	mm
3/8"	1/4"	9.53	6.35	2.125	53.98	0.750	19.05
1/2"	1/4"	12.70	6.35	2.375	60.33	0.750	19.05
1/2"	3/8"	12.70	9.53	2.375	60.33	0.750	19.05
3/4"	3/8"	19.05	9.53	2.500	63.50	0.750	19.05
3/4"	1/2"	19.05	12.70	2.625	66.68	1.000	25.40
1"	1/2"	25.40	12.70	3.000	76.20	1.000	25.40
1"	3/4"	25.40	19.05	2.625	66.68	1.000	25.40
1-1/2"	3/4"	38.10	19.05	3.500	88.90	1.000	25.40
1-1/2"	1"	38.10	25.40	3.000	76.20	1.000	25.40
2"	1"	50.80	25.40	3.875	98.43	1.000	25.40
2"	1-1/2"	50.80	38.10	3.000	76.20	1.000	25.40
2-1/2"	1-1/2"	63.50	38.10	3.875	98.43	1.000	25.40
2-1/2"	2"	63.50	50.80	3.000	76.20	1.000	25.40
3"	1-1/2"	76.20	38.10	4.750	120.65	1.000	25.40
3"	2"	76.20	50.80	3.875	98.43	1.000	25.40
3"	2-1/2"	76.20	63.50	3.125	79.38	1.000	25.40
4"	2"	101.60	50.80	5.750	146.05	1.000	25.40
4"	2-1/2"	101.60	63.50	4.875	123.83	1.000	25.40
4"	3"	101.60	76.20	4.500	114.30	1.500	38.10
6"	3"	152.40	76.20	8.000	203.20	1.500	38.10
6"	4"	152.40	101.60	6.375	161.93	1.500	38.10





# Concentric Reducer

Hygienic Clamp Joint: Concentric Reducer

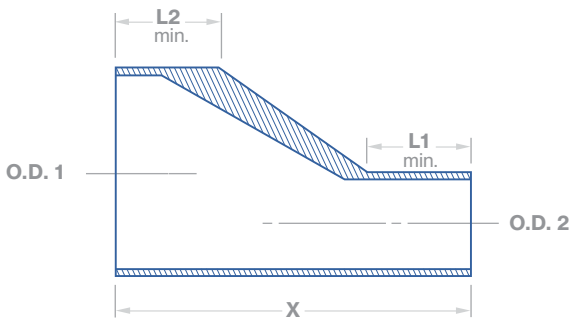


### Ferrules

O.D. 1		O.D. 2	
Type A	Type B	Type A	Type B
•		•	
•		•	
•		•	
•		•	
•		•	
•	•	•	
•	•	•	
	•	•	•
	•	•	•
	•	•	•
	•		•
	•		•
	•		•
	•		•
	•		•
	•		•
	•		•
	•		•
	•		•
	•		•
	•		•
	•		•
	•		•

### Dimensions in Inches & Millimeters

Nominal Size inch		Nominal Size mm		X	
O.D. 1	O.D. 2	O.D. 1	O.D. 2	inch	mm
3/8"	1/4"	9.53	6.35	2.625	66.68
1/2"	1/4"	12.70	6.35	2.875	73.03
1/2"	3/8"	12.70	9.53	2.875	73.03
3/4"	3/8"	19.05	9.53	3.000	76.20
3/4"	1/2"	19.05	12.70	3.125	79.38
1"	1/2"	25.40	12.70	3.500	88.90
1"	3/4"	25.40	19.05	3.125	79.38
1-1/2"	3/4"	38.10	19.05	4.000	101.60
1-1/2"	1"	38.10	25.40	3.500	88.90
2"	1"	50.80	25.40	4.375	111.13
2"	1-1/2"	50.80	38.10	3.500	88.90
2-1/2"	1-1/2"	63.50	38.10	4.375	111.13
2-1/2"	2"	63.50	50.80	3.500	88.90
3"	1-1/2"	76.20	38.10	5.250	133.35
3"	2"	76.20	50.80	4.375	111.13
3"	2-1/2"	76.20	63.50	3.625	92.08
4"	2"	101.60	50.80	6.250	158.75
4"	2-1/2"	101.60	63.50	5.375	136.53
4"	3"	101.60	76.20	5.000	127.00
6"	3"	152.40	76.20	8.500	215.90
6"	4"	152.40	101.60	7.000	177.80



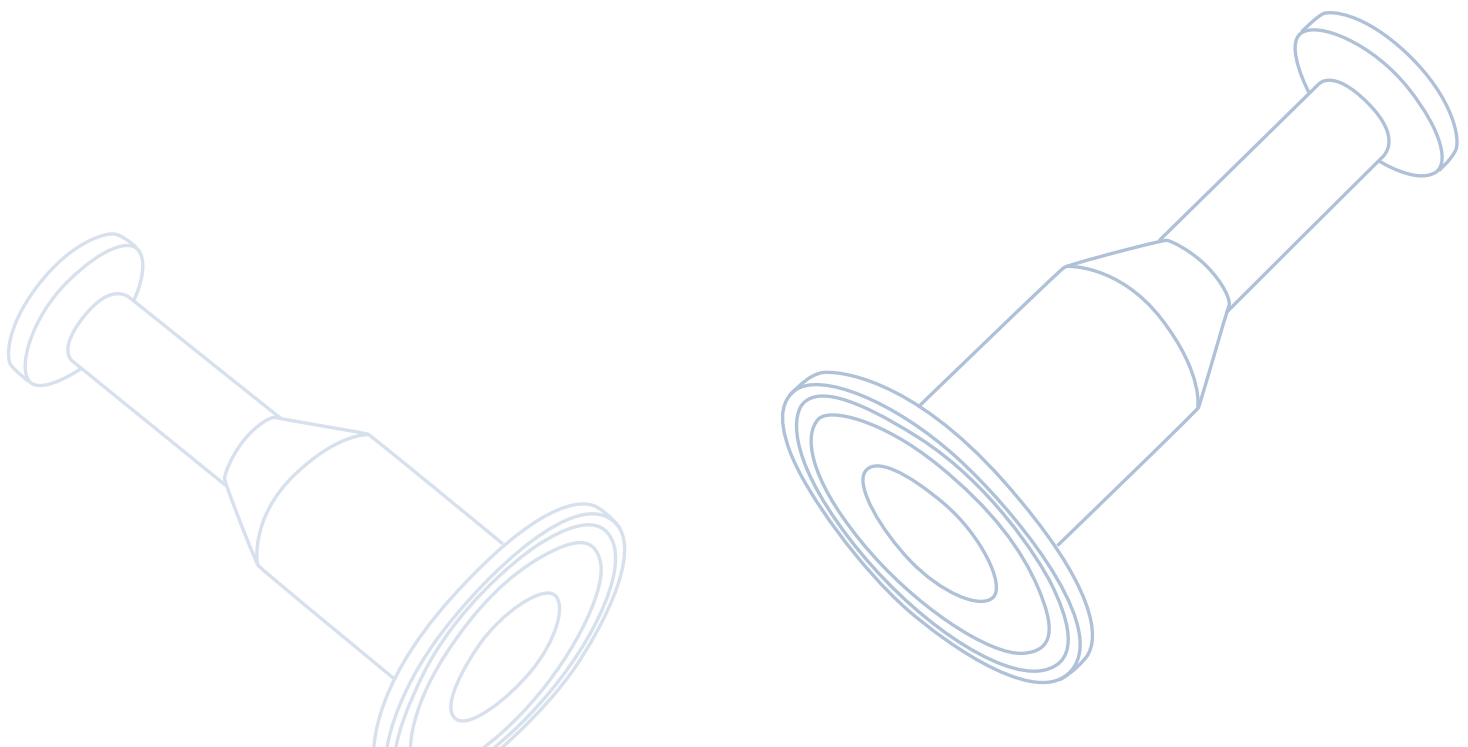
# Eccentric Reducer

Automatic Tube Weld: Eccentric Reducer

CONFIGURATION  
**32**

## Dimensions in Inches & Millimeters

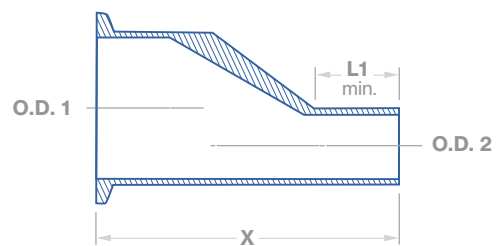
Nominal Size inch		Nominal Size mm		Overall Length, X		O.D., Small End, L1		O.D., Large End, L2	
O.D. 1	O.D. 2	O.D. 1	O.D. 2	inch	mm	inch	mm	inch	mm
3/8"	1/4"	9.53	6.35	1.625	41.28	0.750	19.05	0.750	19.05
1/2"	1/4"	12.70	6.35	1.875	47.63	0.750	19.05	1.000	25.40
1/2"	3/8"	12.70	9.53	1.875	47.63	0.750	19.05	1.000	25.40
3/4"	3/8"	19.05	9.53	2.000	50.80	0.750	19.05	1.000	25.40
3/4"	1/2"	19.05	12.70	2.125	53.98	1.000	25.40	1.000	25.40
1"	1/2"	25.40	12.70	2.500	63.50	1.000	25.40	1.000	25.40
1"	3/4"	25.40	19.05	2.125	53.98	1.000	25.40	1.000	25.40
1-1/2"	3/4"	38.10	19.05	3.000	76.20	1.000	25.40	1.000	25.40
1-1/2"	1"	38.10	25.40	2.500	63.50	1.000	25.40	1.000	25.40
2"	1"	50.80	25.40	3.375	85.73	1.000	25.40	1.000	25.40
2"	1-1/2"	50.80	38.10	2.500	63.50	1.000	25.40	1.000	25.40
2-1/2"	1-1/2"	63.50	38.10	3.375	85.73	1.000	25.40	1.000	25.40
2-1/2"	2"	63.50	50.80	2.500	63.50	1.000	25.40	1.000	25.40
3"	1-1/2"	76.20	38.10	4.250	107.95	1.000	25.40	1.500	38.10
3"	2"	76.20	50.80	3.375	85.73	1.000	25.40	1.500	38.10
3"	2-1/2"	76.20	63.50	2.625	66.68	1.000	25.40	1.500	38.10
4"	2"	101.60	50.80	5.125	130.18	1.000	25.40	1.500	38.10
4"	2-1/2"	101.60	63.50	4.250	107.95	1.000	25.40	1.500	38.10
4"	3"	101.60	76.20	3.875	98.43	1.500	38.10	1.500	38.10
6"	3"	152.40	76.20	7.250	184.15	1.500	38.10	2.000	50.80
6"	4"	152.40	101.60	5.625	142.88	1.500	38.10	2.000	50.80



CONFIGURATION  
**32J**

# Eccentric Reducer

Hygienic Clamp Joint: Tube Weld Eccentric Reducer

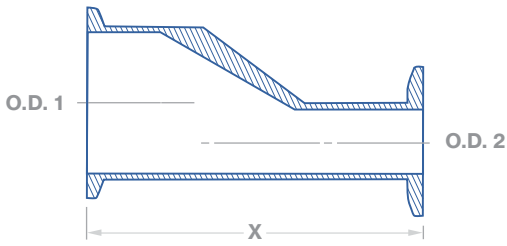


### Ferrules

O.D. 1	
Type A	Type B
•	
•	
•	
•	
•	
•	•
•	•
	•
	•
	•
	•
	•
	•
	•
	•
	•
	•
	•
	•
	•
	•

### Dimensions in Inches & Millimeters

Nominal Size inch		Nominal Size mm		X		L1	
O.D. 1	O.D. 2	O.D. 1	O.D. 2	inch	mm	inch	mm
3/8"	1/4"	9.53	6.35	2.125	53.98	0.750	19.05
1/2"	1/4"	12.70	6.35	2.375	60.33	0.750	19.05
1/2"	3/8"	12.70	9.53	2.375	60.33	0.750	19.05
3/4"	3/8"	19.05	9.53	2.500	63.50	0.750	19.05
3/4"	1/2"	19.05	12.70	2.625	66.68	1.000	25.40
1"	1/2"	25.40	12.70	3.000	76.20	1.000	25.40
1"	3/4"	25.40	19.05	2.625	66.68	1.000	25.40
1-1/2"	3/4"	38.10	19.05	3.500	88.90	1.000	25.40
1-1/2"	1"	38.10	25.40	3.000	76.20	1.000	25.40
2"	1"	50.80	25.40	3.875	98.43	1.000	25.40
2"	1-1/2"	50.80	38.10	3.000	76.20	1.000	25.40
2-1/2"	1-1/2"	63.50	38.10	3.875	98.43	1.000	25.40
2-1/2"	2"	63.50	50.80	3.000	76.20	1.000	25.40
3"	1-1/2"	76.20	38.10	4.750	120.65	1.000	25.40
3"	2"	76.20	50.80	3.875	98.43	1.000	25.40
3"	2-1/2"	76.20	63.50	3.125	79.38	1.000	25.40
4"	2"	101.60	50.80	5.750	146.05	1.000	25.40
4"	2-1/2"	101.60	63.50	4.875	123.83	1.000	25.40
4"	3"	101.60	76.20	4.500	114.30	1.500	38.10
6"	3"	152.40	76.20	8.000	203.20	1.500	38.10
6"	4"	152.40	101.60	6.375	161.93	1.500	38.10



# Eccentric Reducer

## Hygienic Clamp Joint: Eccentric Reducer

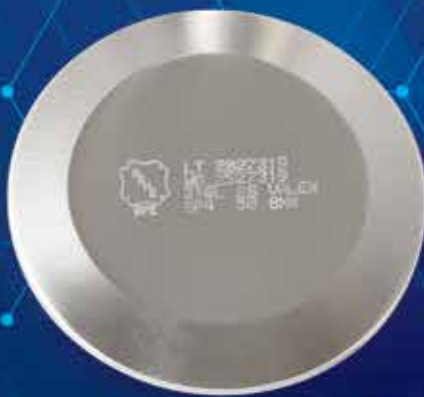
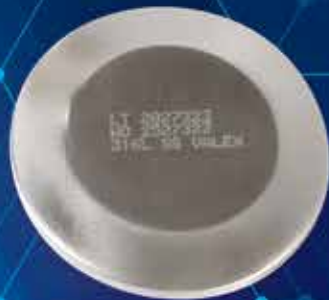
 CONFIGURATION  
**32J**

Ferrules			
O.D. 1		O.D. 2	
Type A	Type B	Type A	Type B
●		●	
●		●	
●		●	
●		●	
●		●	
●	●	●	
●	●	●	
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●
	●	●	●

Dimensions in Inches & Millimeters					
Nominal Size inch		Nominal Size mm		X	
O.D. 1	O.D. 2	O.D. 1	O.D. 2	inch	mm
3/8"	1/4"	9.53	6.35	2.625	66.68
1/2"	1/4"	12.70	6.35	2.875	73.03
1/2"	3/8"	12.70	9.53	2.875	73.03
3/4"	3/8"	19.05	9.53	3.000	76.20
3/4"	1/2"	19.05	12.70	3.125	79.38
1"	1/2"	25.40	12.70	3.500	88.90
1"	3/4"	25.40	19.05	3.125	79.38
1-1/2"	3/4"	38.10	19.05	4.000	101.60
1-1/2"	1"	38.10	25.40	3.500	88.90
2"	1"	50.80	25.40	4.375	111.13
2"	1-1/2"	50.80	38.10	3.500	88.90
2-1/2"	1-1/2"	63.50	38.10	4.375	111.13
2-1/2"	2"	63.50	50.80	3.500	88.90
3"	1-1/2"	76.20	38.10	5.250	133.35
3"	2"	76.20	50.80	4.375	111.13
3"	2-1/2"	76.20	63.50	3.625	92.08
4"	2"	101.60	50.80	6.250	158.75
4"	2-1/2"	101.60	63.50	5.375	136.53
4"	3"	101.60	76.20	5.000	127.00
6"	3"	152.40	76.20	8.500	215.90
6"	4"	152.40	101.60	7.000	177.80

# Caps

- Cap
- End Cap, Solid

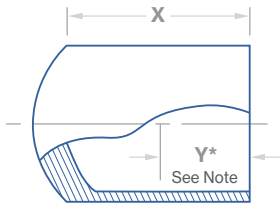




# Cap

Automatic Tube Weld: Cap

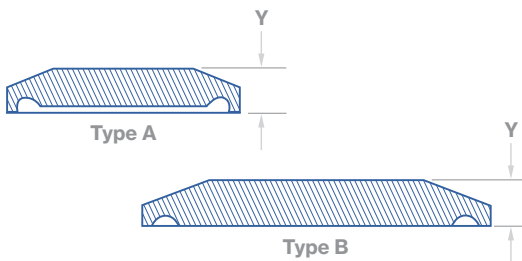
CONFIGURATION  
**16**



## Dimensions in Inches & Millimeters

Nominal Size		Overall Length, X	
inch	mm	inch	mm
1/2"	12.70	1.500	38.10
3/4"	19.05	1.500	38.10
1"	25.40	1.500	38.10
1-1/2"	38.10	1.500	38.10
2"	50.80	1.500	38.10
2-1/2"	63.50	1.500	38.10
3"	76.20	1.750	44.45
4"	101.60	2.000	50.80
6"	152.40	2.500	63.50

\* Minimum I.D. control portion length, Y, is 0.375 in. (9.53 mm) for all sizes.



# End Cap, Solid

Hygienic Clamp Joint: End Cap, Solid

CONFIGURATION  
**16H**

## Ferrules

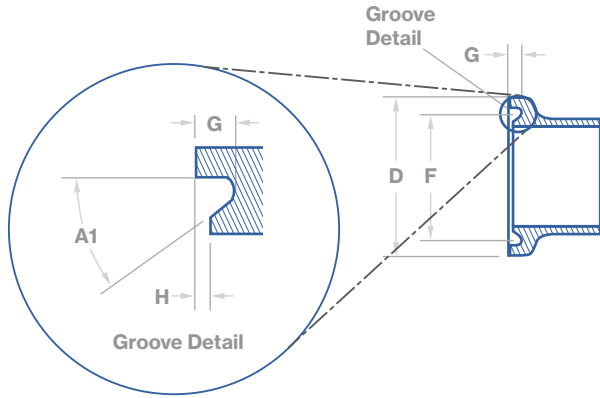
Type A	Type B
●	
●	
●	
●	
●	●
	●
	●
	●
	●
	●

## Dimensions in Inches & Millimeters

Nominal Size		Y	
inch	mm	inch	mm
1/4"	6.35	0.187	4.75
3/8"	9.53	0.187	4.75
1/2"	12.70	0.187	4.75
3/4"	19.05	0.187	4.75
1"	25.40	0.250	6.35
1-1/2"	38.10	0.250	6.35
2"	50.80	0.250	6.35
2-1/2"	63.50	0.250	6.35
3"	76.20	0.250	6.35
4"	101.60	0.312	7.92
6"	152.40	0.437	11.10

# Ferrules





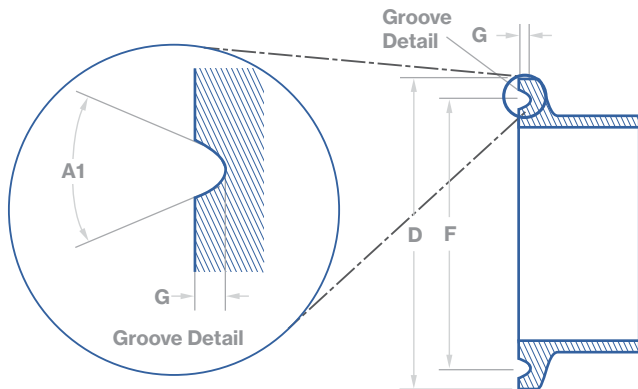
# Hygienic Clamp Ferrule

Standard Dimensions & Tolerance: Type A

## Dimensions in Inches & Millimeters

Nominal Size		Flange Diameter, D		Groove Diameter, F		Groove Depth, G		Face Offset, H		Groove Detail, A1
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	
1/4"	6.35	0.984	25.0	0.800	20.32	0.085	2.16	0.031	0.79	35
3/8"	9.53	0.984	25.0	0.800	20.32	0.085	2.16	0.031	0.79	35
1/2"	12.70	0.984	25.0	0.800	20.32	0.085	2.16	0.031	0.79	35
3/4"	19.05	0.984	25.0	0.800	20.32	0.085	2.16	0.031	0.79	35
1"	25.40	1.339	34.0	1.160	29.46	0.085	2.16	0.031	0.79	35

For more dimensional information please refer to ASME BPE standard table DT-7-1.



# Hygienic Clamp Ferrule

Standard Dimensions & Tolerance: Type B

## Dimensions in Inches & Millimeters

Nominal Size		Flange Diameter, D		Groove Diameter, F		Groove Depth, G		Groove Detail, A1
inch	mm	inch	mm	inch	mm	inch	mm	
1	25.40	1.984	50.39	1.718	43.64	0.063	1.60	46
1-1/2	38.10	1.984	50.39	1.718	43.64	0.063	1.60	46
2	50.80	2.516	63.91	2.218	56.34	0.063	1.60	46
2-1/2	63.50	3.047	77.39	2.781	70.64	0.063	1.60	46
3	76.20	3.579	90.91	3.281	83.34	0.063	1.60	46
4	101.60	4.682	118.92	4.344	110.34	0.063	1.60	46
6	152.40	6.570	166.88	6.176	156.87	0.063	1.60	46

For more dimensional information please refer to ASME BPE standard table DT-7-1.

CONFIGURATION  
**14S**

# Clamp Ferrule Short

Automatic Tube Weld: Ferrule



## Ferrules

Type A	Type B
●	
●	
●	
●	
●	●
	●
	●
	●
	●
	●
	●

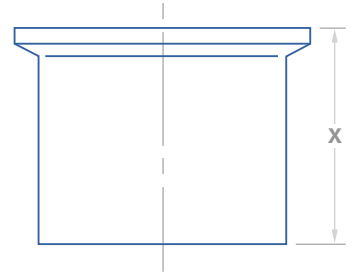
## Dimensions in Inches & Millimeters

Nominal Size		X	
inch	mm	inch	mm
1/4"	6.35	0.500	12.70
3/8"	9.53	0.500	12.70
1/2"	12.70	0.500	12.70
3/4"	19.05	0.500	12.70
1"	25.40	0.500	12.70
1-1/2"	38.10	0.500	12.70
2"	50.80	0.500	12.70
2-1/2"	63.50	0.500	12.70
3"	76.20	0.500	12.70
4"	101.60	0.625	15.88
6"	152.40	0.750	19.05

CONFIGURATION  
**14M**

# Clamp Ferrule Medium

Automatic Tube Weld: Ferrule

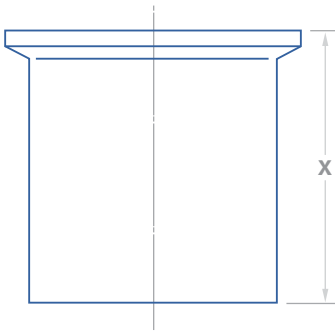


## Ferrules

Type A	Type B
●	
●	
●	
●	
●	●
	●
	●
	●
	●
	●
	●

## Dimensions in Inches & Millimeters

Nominal Size		X	
inch	mm	inch	mm
1/4"	6.35	1.125	28.58
3/8"	9.53	1.125	28.58
1/2"	12.70	1.125	28.58
3/4"	19.05	1.125	28.58
1"	25.40	1.125	28.58
1-1/2"	38.10	1.125	28.58
2"	50.80	1.125	28.58
2-1/2"	63.50	1.125	28.58
3"	76.20	1.125	28.58
4"	101.60	1.125	28.58
6"	152.40	1.500	38.10



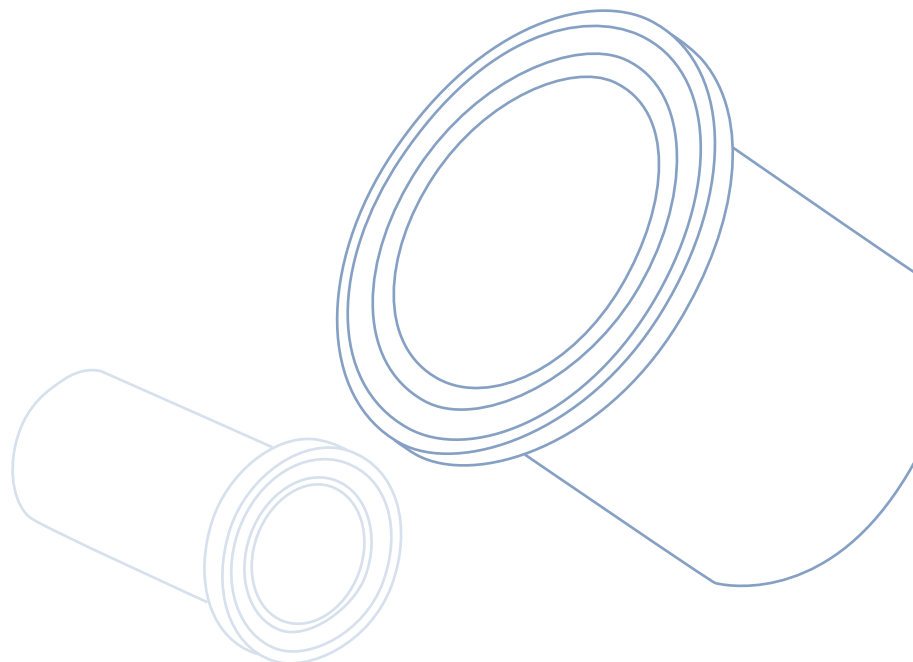
# Clamp Ferrule Long

Automatic Tube Weld: Ferrule

CONFIGURATION  
**14L**

Ferrules	
Type A	Type B
●	
●	
●	
●	
●	●
	●
	●
	●
	●
	●

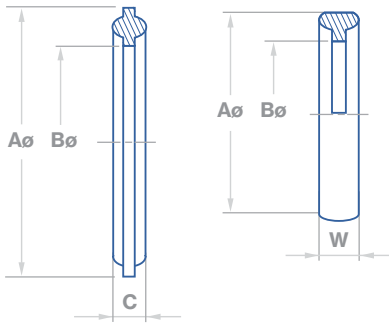
Dimensions in Inches & Millimeters			
Nominal Size		X	
inch	mm	inch	mm
1/4"	6.35	1.750	44.45
3/8"	9.53	1.750	44.45
1/2"	12.70	1.750	44.45
3/4"	19.05	1.750	44.45
1"	25.40	1.750	44.45
1-1/2"	38.10	1.750	44.45
2"	50.80	2.250	57.15
2-1/2"	63.50	2.250	57.15
3"	76.20	2.250	57.15
4"	101.60	2.250	57.15
6"	152.40	3.000	76.20





# Gaskets





Dimensions



Gasket  
Hygienic Gasket



**Dimensions in Inches & Millimeters**

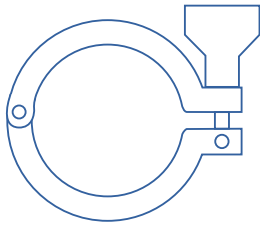
Nominal Size		A		B		C		W	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
1/2"	12.70	1.000	25.40	0.370	9.40	N/A	N/A	0.22	5.50
3/4"	19.05	1.000	25.40	0.618	15.70	N/A	N/A	0.22	5.50
1"	25.40	1.975	50.17	0.900	22.86	0.20	5.08	N/A	N/A
1-1/2"	38.10	1.975	50.17	0.900	35.56	0.20	5.08	N/A	N/A
2"	50.80	2.500	63.50	1.900	48.26	0.20	5.08	N/A	N/A
2-1/2"	63.50	3.000	76.20	2.400	60.96	0.20	5.08	N/A	N/A
3"	76.20	3.575	90.81	2.900	73.66	0.20	5.08	N/A	N/A
4"	101.60	4.690	119.13	3.875	98.43	0.20	5.08	N/A	N/A
6"	152.40	6.600	167.64	5.840	148.34	0.20	5.08	N/A	N/A

\* Gasket materials include: PTFE®, VITON®, Envelope type-TEFLON® with EPDM Filler, TEFLON with VITON Filler, Silicon, BUNA, EPDM & TEF-STEEL®



# Clampos





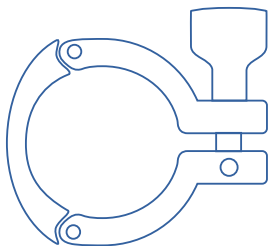
# Hygienic Clamp

Heavy Duty

CONFIGURATION  
**13C**

Ferrule Size & Type		
Nominal Size		Type
inch	mm	
1/4"	6.35	A
3/8"	9.53	A
1/2"	12.70	A
3/4"	19.05	A
1"	25.40	A
1"	25.40	B
1-1/2"	38.10	B
2"	50.80	B
2-1/2"	63.50	B
3"	76.20	B
4"	101.60	B
6"	152.40	B

Corrospounding Hygienic Clamp	
Nominal Size	
inch	mm
3/4"	19.05
3/4"	19.05
3/4"	19.05
3/4"	19.05
ISO DN15	ISO DN15
1-1/2"	38.10
1-1/2"	38.10
2"	50.80
2-1/2"	63.50
3	76.20
4	101.60
6	152.40



# Hygienic Clamp

Heavy Duty, 3-Piece

CONFIGURATION  
**13C**

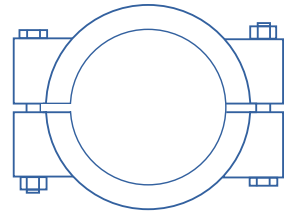
Ferrule Size & Type		
Nominal Size		Type
inch	mm	
1/4"	6.35	A
3/8"	9.53	A
1/2"	12.70	A
3/4"	19.05	A
1"	25.40	A
1"	25.40	B
1-1/2"	38.10	B
2"	50.80	B
2-1/2"	63.50	B
3"	76.20	B
4"	101.60	B
6"	152.40	B

Corrospounding Hygienic Clamp	
Nominal Size	
inch	mm
3/4"	19.05
3/4"	19.05
3/4"	19.05
3/4"	19.05
ISO DN15	ISO DN15
1-1/2"	38.10
1-1/2"	38.10
2"	50.80
2-1/2"	63.50
3	76.20
4	101.60
6	152.40

CONFIGURATION  
**13C**

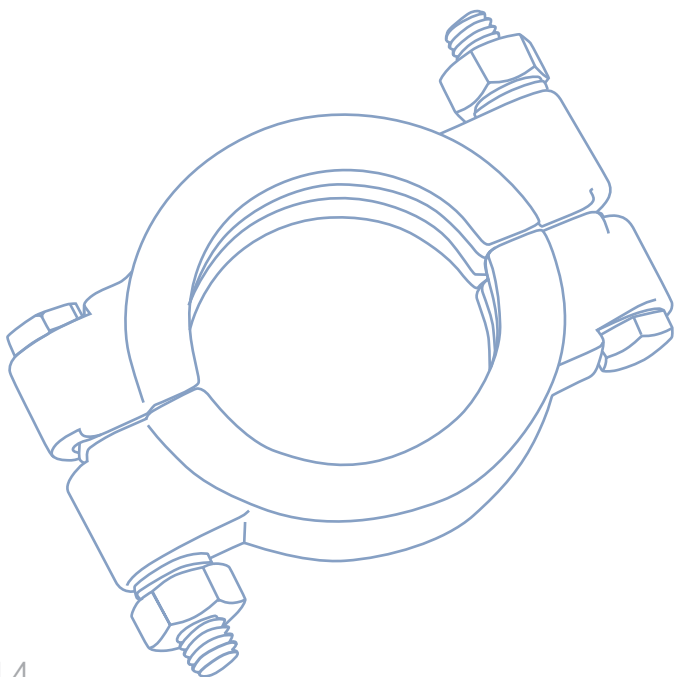
# Hygienic Clamp

High Pressure, 2-Bolt



Ferrule Size & Type		
Nominal Size		Type
inch	mm	
1/4"	6.35	A
3/8"	9.53	A
1/2"	12.70	A
3/4"	19.05	A
1"	25.40	A
1"	25.40	B
1-1/2"	38.10	B
2"	50.80	B
2-1/2"	63.50	B
3"	76.20	B
4"	101.60	B
6"	152.40	B

Corresponding Hygienic Clamp		
Nominal Size		
inch	mm	
3/4"	19.05	
3/4"	19.05	
3/4"	19.05	
3/4"	19.05	
ISO DN15	ISO DN15	
1-1/2"	38.10	
1-1/2"	38.10	
2"	50.80	
2-1/2"	63.50	
3	76.20	
4	101.60	
6	152.40	



# Ordering Info.

- Tube
- Fittings

TV

0S  
0W  
2S  
2W

Size

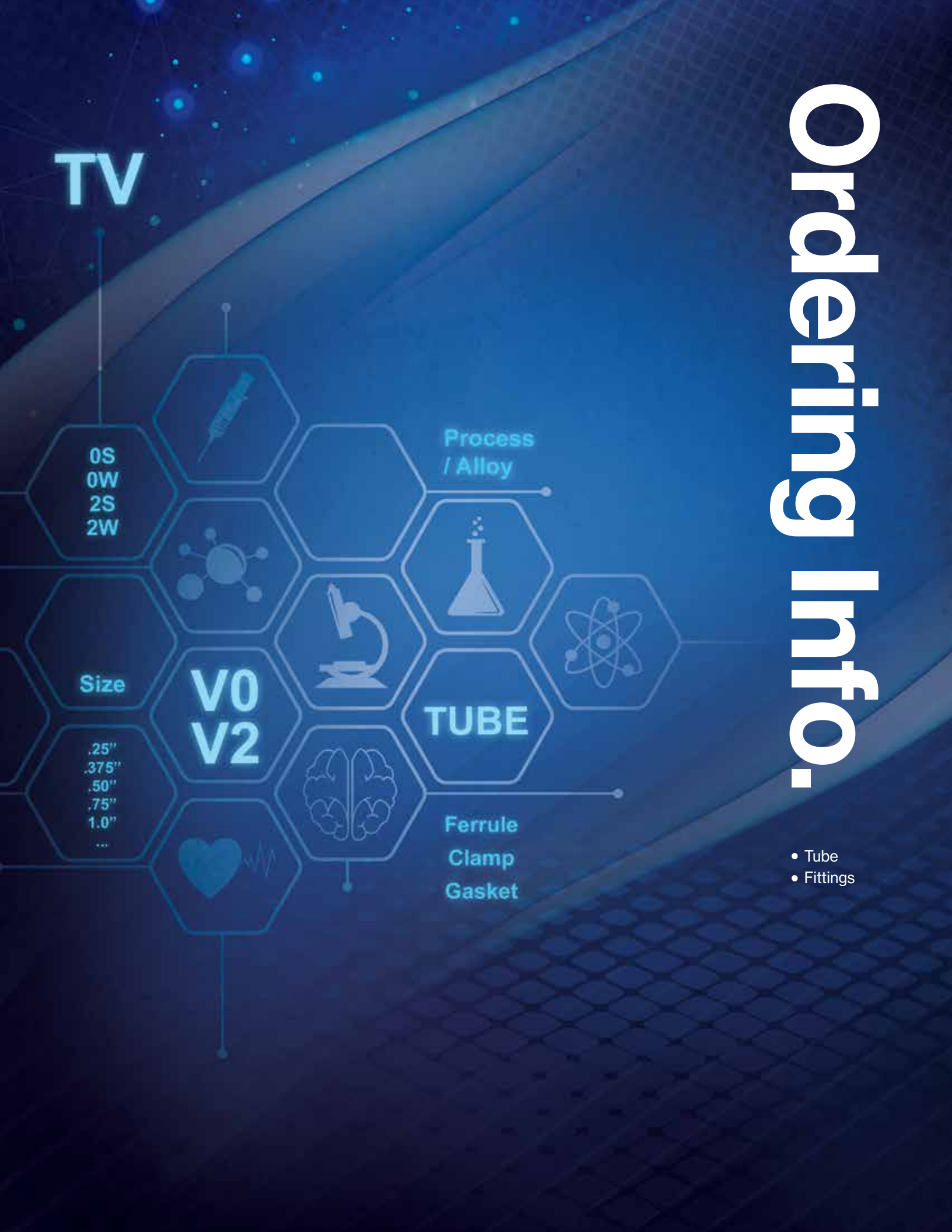
.25"  
.375"  
.50"  
.75"  
1.0"  
...

V0  
V2

Process  
/ Alloy

TUBE

Ferrule  
Clamp  
Gasket



# Tube

Per Valex Specification SP-9225 (BPE)

Example 1:

**T V - 0 S - 0 5 0 0 D - 6 M - S 4**

**T | V**

**Process**

TV = Per SP-9225 (BPE)

**0 | S**

**Alloy**

- 0S = 316L Seamless
- 0W = 316L Welded
- 2S = 304L Seamless
- 2W = 304L Welded

**0 | 5 | 0 | 0**

**Size**

- 0250 = .25" Diameter
- 0375 = .375" Diameter
- 0500 = .5" Diameter
- 0750 = .75" Diameter
- 1000 = 1" Diameter
- 1500 = 1.5" Diameter
- 2000 = 2" Diameter
- 2500 = 2.5" Diameter
- 3000 = 3" Diameter
- 4000 = 4" Diameter
- 6000 = 6" Diameter

**D**

**Wall**

- B = .035" Wall
- D = .049" Wall
- F = .065" Wall
- G = .083" Wall
- J = .109" Wall

**6 | M**

**Length**

- 4M = 4 Meter
- 6M = 6 Meter

**S | 4**

**I.D. Surface Finish**

(See Note 1)

- S0 = No Finish Requirement
- S1 = 20µin Ra Max, Mechanically Polished
- S2 = 25µin Ra Max, Mechanically Polished
- S3 = 30µin Ra Max, Mechanically Polished
- S4 = 15µin Ra Max, Electropolished
- S5 = 20µin Ra Max, Electropolished
- S6 = 25µin Ra Max, Electropolished

**Notes:**

1. For finish codes S1, S2 & S3 (mechanical polish), any surface finish method is acceptable that meets the Ra max.



# Fittings

Per Vallex Specification SP-9225 (BPE)

Example:

**V 2 7 R J - 2 4 F W ( 0 8 D A ) - 1**

Used Only for Reducing Fittings & Instrument Tees

## V | 2

### Process / Alloy

- V0 = SP-9225 (BPE) 0S/0W (316L)
- V2 = SP-9225 (BPE) 2S/2W (304L)

## 7 | R | J

### Configuration

- 2 = 90° Elbow, Tube Weld
- 2J = 90° Elbow, Tube Weld x Hygienic Joint
- 2H = 90° Elbow, Hygienic Joint
- 2K = 45° Elbow, Tube Weld
- 2KJ = 45° Elbow, Tube Weld x Hygienic Joint
- 2KH = 45° Elbow, Hygienic Joint
- 2U = 180° Return Bend, Tube Weld
- 2UH = 180° Return Bend, Hygienic Joint
- 7 = Straight Tee, Tube Weld
- 7H = Straight Tee, Hygienic Joint
- 7N = Instrument Tee, Tube Weld
- 7NH = Instrument Tee, Hygienic Joint
- 7R = Reducing Tee, Tube Weld
- 7RH = Reducing Tee, Hygienic Joint
- 8J = Short-Outlet Tee, Tube Weld x Hygienic Joint
- 8H = Short-Outlet Tee, Hygienic Joint
- 8M = Short-Outlet Run Tee, Hygienic Mechanical Joint
- 8RJ = Short-Outlet Reducing Tee, Tube Weld x Hygienic Joint
- 8RH = Short-Outlet Reducing Tee, Hygienic Joint
- 9 = Straight Cross, Tube Weld
- 9H = Straight Cross, Hygienic Joint
- 31 = Conc. Reducer, Tube Weld
- 31J = Conc. Reducer, Hygienic Joint x Tube Weld
- 31H = Conc. Reducer, Hygienic Joint
- 32 = Eccentric Reducer, Tube Weld
- 32J = Eccentric Reducer, Hygienic Joint x Tube Weld
- 32H = Eccentric Reducer, Hygienic Joint
- 16 = Cap, Tube Weld
- 16H = End Cap Solid, Hygienic Joint
- 14S = Ferrule, Tube Weld, Short
- 14M = Ferrule, Tube Weld, Medium
- 14L = Ferrule, Tube Weld, Long
- 13C = Hygienic Clamp
- 13G = Hygienic Gasket

## 2 | 4

### Size

- 04 = .25" Diameter
- 06 = .375" Diameter
- 08 = .5" Diameter
- 12 = .75" Diameter
- 16 = 1" Diameter
- 24 = 1.5" Diameter
- 32 = 2" Diameter
- 40 = 2.5" Diameter
- 48 = 3" Diameter
- 64 = 4" Diameter
- 96 = 6" Diameter

## F

### Wall

- X = N/A
- B = .035" Wall
- D = .049" Wall
- F = .065" Wall
- G = .083" Wall
- J = .109" Wall

## W

### Type:

#### Tube

- S = Seamless
- W = Welded

#### Ferrule

- A = Type A Ferrule
- T = Type B Ferrule

#### Clamp

- 0 = ISO DN 15 (1" DIA, TYPE A)
- 1 = Heavy Duty
- 2 = Heavy Duty, 3-Piece
- 3 = High Pressure, 2-Bolt

#### Gasket

(See Note 2)

- C = PTFE (I.E. "Teflon®", etc.)
- D = FKM (I.E. "Viton®", etc.)
- E = NBR (I.E. "Buna®", etc.)
- F = EPDM

## ( 0 8 D A )

### Used Only for Reducing Fittings & Instrument Tees

Refer to size, wall & type codes if applicable

## 1

### I.D. Surface Finish

(See Note 1)

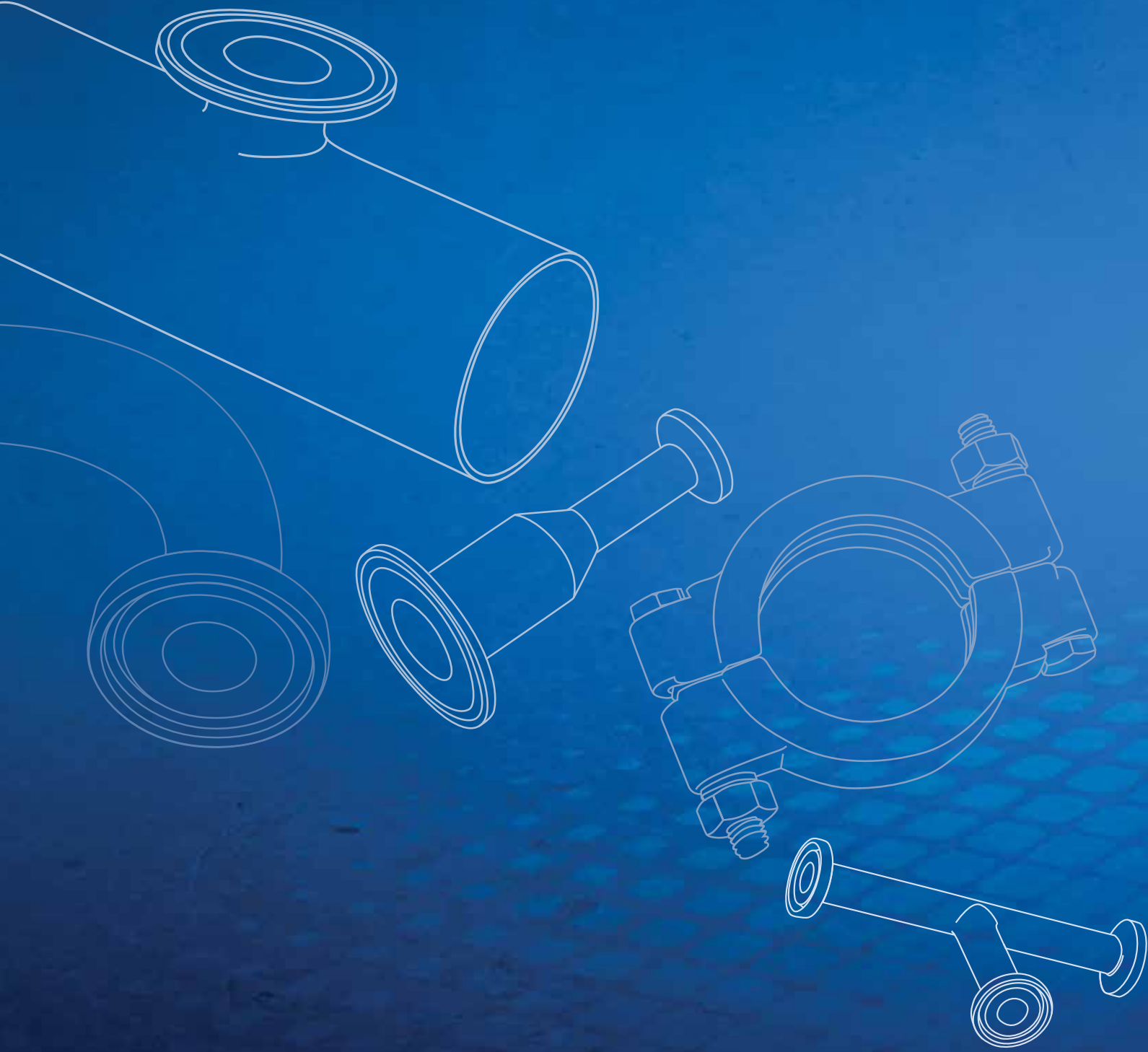
- 0 = Surface Finish Requirement -OR- N/A
- 1 = 20µin Ra Max, Mechanically Polished
- 2 = 25µin Ra Max, Mechanically Polished
- 3 = 30µin Ra Max, Mechanically Polished
- 4 = 15µin Ra Max, Electropolished
- 5 = 20µin Ra Max, Electropolished
- 6 = 25µin Ra Max, Electropolished

#### Notes:

1. For finish codes 1, 2 & 3 (Mechanical Polish), any surface finish method is acceptable that meets the Ra max.
2. "Teflon®" and "Viton®" are registered trademarks of Chemours company.



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#### **Valex Corporate Offices & Manufacturing**

6080 Leland Street  
Ventura, CA 93003  
United States of America  
Phone: 805-658-0944

32 Hansan-gil  
Cheongbuk-eup  
Pyeongtaek-si, Gyeonggi-do  
Republic of Korea  
Phone: 82-31-683-0119

No. 358 Zhonggang Road  
Xitangqiao Street  
Haiyan Economic Development Zone  
Zhejiang Province, P.R. China 314305  
Phone: 86-573-86868221