



EP ELECTROPOLISHED

Applications:

Ultra high purity - electropolished (EP) tubes and butt weld fittings for bulk gases hook-up installations

Material:

SS316L (seamless or welded depends on size)

Dimensions:

According to ASTM A269/ A270/ A632

Size (Inch)	Outside Diameter (mm)	Wall Thickness (mm)
0.25"	6.35	0.89
0.375"	9.53	0.89
0.5"	12.7	1.65
0.75"	19.05	1.65
1"	25.4	1.65
1.5"	38.1	1.65
2"	50.8	1.65
2.5"	63.5	1.65
3"	76.2	1.65
4"	101.6	2.11
6"	152.4	2.77

Surface Finish:

Electropolished (EP)

Surface Roughness (Ra max):

Internal $\leq 10\mu\text{-in}$ (0.25 μm)

External $\leq 32\mu\text{-in}$ (0.8 μm)

Butt Weld End:

Straight end fittings suitable for orbital welding

Quality, Test and Inspection:

- Visual inspection
- Roughness measurement
- Verification of dimensions
- Helium-leak test
- Particle measurement
- Moisture measurement
- Endoscopic inspection (BF tube)
- Conductivity test (DI water)
- TOC (measurement of DI water)
- Metallographic inspection
- Oil inspection

Cleaning:

Cleanroom Federal Class 1000 (ISO Class 6)
Deionized water and nitrogen

Packaging:

Tubes and fittings are purged with nitrogen, closed with PE caps and seal in PE/PE foil with double-bagged

Documentation:

The material test and inspection certificate contains with the following information:

- Certificate serial number
- Delivery order number
- Customer's company name & PO number
- Product specification
- Surface roughness
- Chemical composition
- Mechanical features
- Heat number

Marking & Traceability:

MINOX products engrave with brand name, material, size and traceable heat number. These information and customer's purchase are well record and track in our certificate system.





BA

BRIGHT ANNEALED

Applications:

High purity – bright annealed (BA) or mechanically polished (MP) tubes and butt weld fittings for bulk gases hook-up installations

Material:

SS304L (seamless or welded depends on size)
SS316L (seamless or welded depends on size)

Dimensions:

According to ASTM A269/ A270/ A632

Size (Inch)	Outside Diameter (mm)	Wall Thickness (mm)
0.25"	6.35	0.89
0.375"	9.53	0.89
0.5"	12.7	1.65
0.75"	19.05	1.65
1"	25.4	1.65
1.5"	38.1	1.65
2"	50.8	1.65
2.5"	63.5	1.65
3"	76.2	1.65
4"	101.6	2.11
6"	152.4	2.77

Surface Finish:

Bright annealed (BA) or mechanically polished (MP)

Surface Roughness (Ra max):

Internal ≤20µ-in (0.51µm)
External ≤32µ-in (0.8µm)

Butt Weld End:

Straight end fittings suitable for orbital welding

Quality, Test and Inspection:

- Visual inspection
- Roughness measurement
- Verification of dimensions
- Helium-leak test

Cleaning:

Cleanroom Federal Class 1000 (ISO Class 6)
Deionized water and nitrogen

Packaging:

Tubes and fittings are purged with nitrogen, closed with PE caps and seal in PE/PE foil

Documentation:

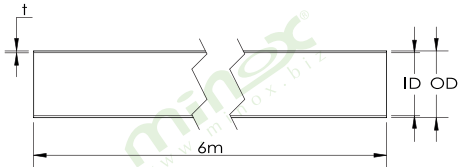
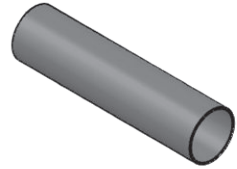
The material test and inspection certificate contains with the following information:

- Certificate serial number
- Delivery order number
- Customer's company name & PO number
- Product specification
- Surface roughness
- Chemical composition
- Mechanical features
- Heat number

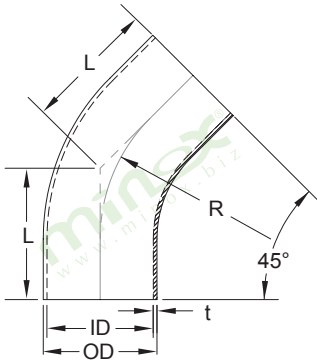
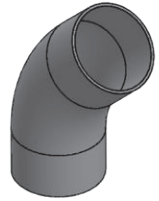
Marking & Traceability:

MINOX products engrave with brand name, material, size and traceable heat number. These information and customer's purchase are well record and track in our certificate system



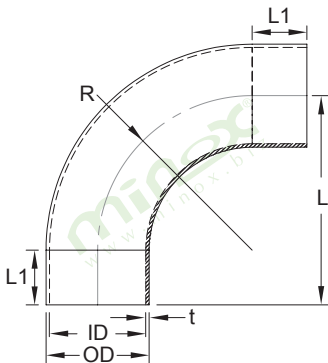
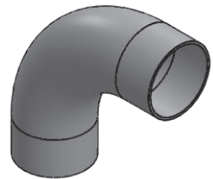


Tube Dimension (mm)			
Size (Inch)	OD	ID	t
0.25"	6.35	4.57	0.89
0.375"	9.53	7.75	0.89
0.50"	12.70	9.40	1.65
0.75"	19.05	15.75	1.65
1.0"	25.40	22.10	1.65
1.5"	38.10	34.80	1.65
2.0"	50.80	47.50	1.65
2.5"	63.50	60.20	1.65
3.0"	76.20	72.90	1.65
4.0"	101.60	97.38	2.11
6.0"	152.40	146.86	2.77



**45 Deg Elbow
Dimension (mm)**

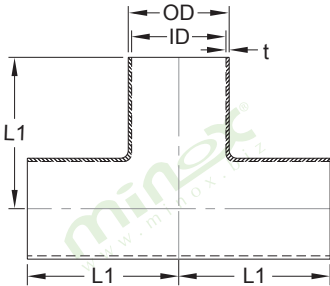
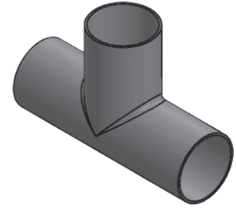
Size (Inch)	OD / ID x t	L	R
0.25"	6.35 / 4.57 x 0.89	50.8	14.3
0.375"	9.53 / 7.75 x 0.89	50.8	28.6
0.5"	12.7 / 9.4 x 1.65	57.2	28.6
0.75"	19.05 / 15.75 x 1.65	57.2	28.6
1.0"	25.4 / 22.1 x 1.65	57.2	38.1
1.5"	38.1 / 34.8 x 1.65	63.5	57.2
2.0"	50.8 / 47.5 x 1.65	76.2	76.2
2.5"	63.5 / 60.2 x 1.65	85.7	95.3
3.0"	76.2 / 72.9 x 1.65	92.1	114.3
4.0"	101.6 / 97.38 x 2.11	114.3	152.4
6.0"	152.4 / 146.86 x 2.77	158.8	228.6



**90 Deg Elbow
Dimension (mm)**

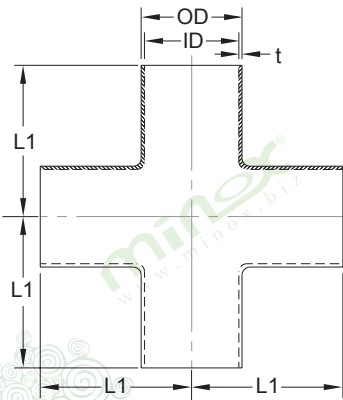
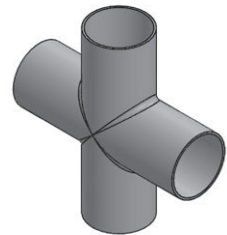
Size (Inch)	OD / ID x t	L	L1	R
0.25"	6.35 / 4.57 x 0.89	66.7	52.4	14.3
0.375"	9.53 / 7.75 x 0.89	66.7	38.1	28.6
0.5"	12.7 / 9.4 x 1.65	76.2	38.1	28.6
0.75"	19.05 / 15.75 x 1.65	76.2	38.1	28.6
1.0"	25.4 / 22.1 x 1.65	76.2	38.1	38.1
1.5"	38.1 / 34.8 x 1.65	95.3	38.1	57.2
2.0"	50.8 / 47.5 x 1.65	120.7	44.5	76.2
2.5"	63.5 / 60.2 x 1.65	139.7	44.5	95.3
3.0"	76.2 / 72.9 x 1.65	158.8	44.5	114.3
4.0"	101.6 / 97.38 x 2.11	203.2	50.8	152.4
6.0"	152.4 / 146.86 x 2.77	292.1	63.5	228.6





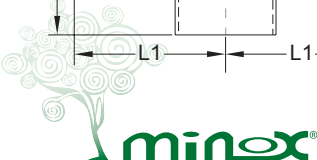
**Equal Tee
Dimension (mm)**

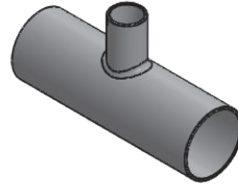
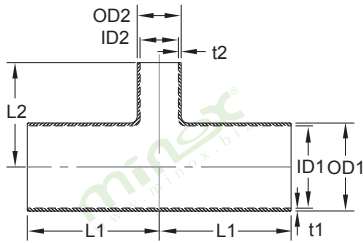
Size (Inch)	OD / ID x t	L1
0.25"	6.35 / 4.57 x 0.89	44.5
0.375"	9.53 / 7.75 x 0.89	44.5
0.5"	12.7 / 9.40 x 1.65	47.6
0.75"	19.05 / 15.75 x 1.65	50.8
1.0"	25.4 / 22.10 x 1.65	54.0
1.5"	38.1 / 34.80 x 1.65	60.3
2.0"	50.8 / 47.50 x 1.65	73.0
2.5"	63.5 / 60.20 x 1.65	79.4
3.0"	76.2 / 72.90 x 1.65	85.7
4.0"	101.6 / 97.38 x 2.11	104.8
6.0"	152.4 / 146.86 x 2.77	142.9



**Cross Tee
Dimension (mm)**

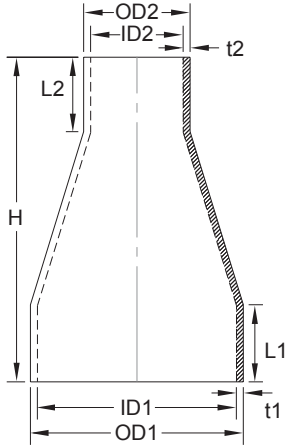
Size (Inch)	OD / ID x t	L1
0.25"	6.35 / 4.57 x 0.89	44.5
0.375"	9.53 / 7.75 x 0.89	44.5
0.5"	12.7 / 9.40 x 1.65	47.6
0.75"	19.05 / 15.75 x 1.65	50.8
1.0"	25.4 / 22.10 x 1.65	54.0
1.5"	38.1 / 34.80 x 1.65	60.3
2.0"	50.8 / 47.50 x 1.65	73.0
2.5"	63.5 / 60.20 x 1.65	79.4
3.0"	76.2 / 72.90 x 1.65	85.7
4.0"	101.6 / 97.38 x 2.11	104.8
6.0"	152.4 / 146.86 x 2.77	142.9





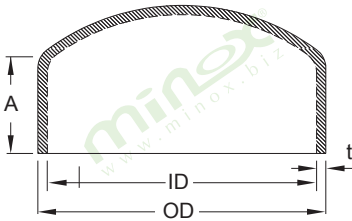
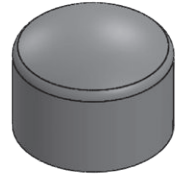
**Reducing Tee
Dimension (mm)**

Size (Inch)	OD1 / ID1 x t1	OD2 / ID2 x t2	L1	L2
0.375" x 0.25"	9.53 / 7.75 x 0.89	6.35 / 4.57 x 0.89	44.5	44.5
0.5" x 0.25"	12.7 / 9.4 x 1.65	6.35 / 4.57 x 0.89	47.6	47.6
0.5" x 0.375"	12.7 / 9.4 x 1.65	9.53 / 7.75 x 0.89	47.6	47.6
0.75" x 0.25"	19.05 / 15.75 x 1.65	6.35 / 4.57 x 0.89	50.8	50.8
0.75" x 0.375"	19.05 / 15.75 x 1.65	9.53 / 7.75 x 0.89	50.8	50.8
0.75" x 0.5"	19.05 / 15.75 x 1.65	12.7 / 9.4 x 1.65	50.8	50.8
1" x 0.25"	25.4 / 22.1 x 1.65	6.35 / 4.57 x 0.89	54.0	54.0
1" x 0.375"	25.4 / 22.1 x 1.65	9.53 / 7.75 x 0.89	54.0	54.0
1" x 0.5"	25.4 / 22.1 x 1.65	12.7 / 9.4 x 1.65	54.0	54.0
1" x 0.75"	25.4 / 22.1 x 1.65	19.05 / 15.75 x 1.65	54.0	54.0
1.5" x 0.5"	38.1 / 34.8 x 1.65	12.7 / 9.4 x 1.65	60.3	60.3
1.5" x 0.75"	38.1 / 34.8 x 1.65	19.05 / 15.75 x 1.65	60.3	60.3
1.5" x 1.0"	38.1 / 34.8 x 1.65	25.4 / 22.1 x 1.65	60.3	60.3
2.0" x 0.5"	50.8 / 47.5 x 1.65	12.7 / 9.4 x 1.65	73.0	66.7
2.0" x 0.75"	50.8 / 47.5 x 1.65	19.05 / 15.75 x 1.65	73.0	66.7
2.0" x 1.0"	50.8 / 47.5 x 1.65	25.4 / 22.1 x 1.65	73.0	66.7
2.0" x 1.5"	50.8 / 47.5 x 1.65	38.1 / 34.8 x 1.65	73.0	66.7
2.5" x 0.5"	63.5 / 60.2 x 1.65	12.7 / 9.4 x 1.65	73.0	66.7
2.5" x 0.75"	63.5 / 60.2 x 1.65	19.05 / 15.75 x 1.65	73.0	66.7
2.5" x 1.0"	63.5 / 60.2 x 1.65	25.4 / 22.1 x 1.65	79.4	73.0
2.5" x 1.5"	63.5 / 60.2 x 1.65	38.1 / 34.8 x 1.65	79.4	73.0
2.5" x 2.0"	63.5 / 60.2 x 1.65	50.8 / 47.5 x 1.65	79.4	73.0
3.0" x 0.5"	76.2 / 72.9 x 1.65	12.7 / 9.4 x 1.65	85.7	79.4
3.0" x 0.75"	76.2 / 72.9 x 1.65	19.05 / 15.75 x 1.65	85.7	79.4
3.0" x 1.0"	76.2 / 72.9 x 1.65	25.4 / 22.1 x 1.65	85.7	79.4
3.0" x 1.5"	76.2 / 72.9 x 1.65	38.1 / 34.8 x 1.65	85.7	79.4
3.0" x 2.0"	76.2 / 72.9 x 1.65	50.8 / 47.5 x 1.65	85.7	79.4
3.0" x 2.5"	76.2 / 72.9 x 1.65	63.5 / 60.2 x 1.65	85.7	79.4
4.0" x 0.5"	101.6 / 97.38 x 2.11	12.7 / 9.4 x 1.65	104.8	92.1
4.0" x 0.75"	101.6 / 97.38 x 2.11	19.05 / 15.75 x 1.65	104.8	92.1
4.0" x 1.0"	101.6 / 97.38 x 2.11	25.4 / 22.1 x 1.65	104.8	92.1
4.0" x 1.5"	101.6 / 97.38 x 2.11	38.1 / 34.8 x 1.65	104.8	92.1
4.0" x 2.0"	101.6 / 97.38 x 2.11	50.8 / 47.5 x 1.65	104.8	92.1
4.0" x 2.5"	101.6 / 97.38 x 2.11	63.5 / 60.2 x 1.65	104.8	92.1
4.0" x 3.0"	101.6 / 97.38 x 2.11	76.2 / 72.9 x 1.65	104.8	92.1
6.0" x 0.5"	152.4 / 146.86 x 2.77	12.7 / 9.4 x 1.65	142.9	117.5
6.0" x 0.75"	152.4 / 146.86 x 2.77	19.05 / 15.75 x 1.65	142.9	117.5
6.0" x 1.0"	152.4 / 146.86 x 2.77	25.4 / 22.1 x 1.65	142.9	117.5
6.0" x 1.5"	152.4 / 146.86 x 2.77	38.1 / 34.8 x 1.65	142.9	117.5
6.0" x 2.0"	152.4 / 146.86 x 2.77	50.8 / 47.5 x 1.65	142.9	123.8
6.0" x 2.5"	152.4 / 146.86 x 2.77	63.5 / 60.2 x 1.65	142.9	123.8
6.0" x 3.0"	152.4 / 146.86 x 2.77	76.2 / 72.9 x 1.65	142.9	123.8
6.0" x 4.0"	152.4 / 146.86 x 2.77	101.6 / 97.38 x 2.11	142.9	130.2



**Concentric Reducer
Dimension (mm)**

Size (Inch)	OD1 / ID1 x t1	OD2 / ID2 x t2	H	L1	L2
0.375" x 0.25"	9.53 / 7.75 x 0.89	6.35 / 4.57 x 0.89	82.6	38.10	38.10
0.5" x 0.25"	12.7 / 9.4 x 1.65	6.35 / 4.57 x 0.89	82.6	38.10	38.10
0.5" x 0.375"	12.7 / 9.4 x 1.65	9.53 / 7.75 x 0.89	82.6	38.10	38.10
0.75" x 0.375"	19.05 / 15.75 x 1.65	9.53 / 7.75 x 0.89	82.6	38.10	38.10
0.75" x 0.5"	19.05 / 15.75 x 1.65	12.7 / 9.4 x 1.65	101.6	38.10	38.10
1.0" x 0.5"	25.4 / 22.1 x 1.65	12.7 / 9.4 x 1.65	114.3	38.10	38.10
1.0" x 0.75"	25.4 / 22.1 x 1.65	19.05 / 15.75 x 1.65	101.6	38.10	38.10
1.5" x 0.5"	38.1 / 34.8 x 1.65	12.7 / 9.4 x 1.65	139.7	38.10	38.10
1.5" x 0.75"	38.1 / 34.8 x 1.65	19.05 / 15.75 x 1.65	127.0	38.10	38.10
1.5" x 1.0"	38.1 / 34.8 x 1.65	25.4 / 22.1 x 1.65	127.0	38.10	38.10
2.0" x 0.5"	50.8 / 47.5 x 1.65	12.7 / 9.4 x 1.65	196.9	41.30	41.30
2.0" x 0.75"	50.8 / 47.5 x 1.65	19.05 / 15.75 x 1.65	184.2	44.45	38.10
2.0" x 1.0"	50.8 / 47.5 x 1.65	25.4 / 22.1 x 1.65	184.2	44.45	38.10
2.0" x 1.5"	50.8 / 47.5 x 1.65	38.1 / 34.8 x 1.65	133.4	44.45	38.10
2.5" x 1.0"	63.5 / 60.2 x 1.65	25.4 / 22.1 x 1.65	235.0	44.45	38.10
2.5" x 1.5"	63.5 / 60.2 x 1.65	38.1 / 34.8 x 1.65	184.2	44.45	41.30
2.5" x 2.0"	63.5 / 60.2 x 1.65	50.8 / 47.5 x 1.65	139.7	44.45	44.45
3.0" x 1.0"	76.2 / 72.9 x 1.65	25.4 / 22.1 x 1.65	285.8	44.45	38.10
3.0" x 1.5"	76.2 / 72.9 x 1.65	38.1 / 34.8 x 1.65	235.0	44.45	38.10
3.0" x 2.0"	76.2 / 72.9 x 1.65	50.8 / 47.5 x 1.65	190.5	44.45	44.45
3.0" x 2.5"	76.2 / 72.9 x 1.65	63.5 / 60.2 x 1.65	139.7	44.45	44.45
4.0" x 1.0"	101.6 / 97.38 x 2.11	25.4 / 22.1 x 1.65	393.7	50.80	38.10
4.0" x 1.5"	101.6 / 97.38 x 2.11	38.1 / 34.8 x 1.65	342.9	50.80	38.10
4.0" x 2.0"	101.6 / 97.38 x 2.11	50.8 / 47.5 x 1.65	298.5	57.15	38.10
4.0" x 2.5"	101.6 / 97.38 x 2.11	63.5 / 60.2 x 1.65	247.7	57.15	38.10
4.0" x 3.0"	101.6 / 97.38 x 2.11	76.2 / 72.9 x 1.65	196.9	57.15	44.45
6.0" x 3.0"	152.4 / 146.86 x 2.77	76.2 / 72.9 x 1.65	254.0	57.15	44.45
6.0" x 4.0"	152.4 / 146.86 x 2.77	101.6 / 97.38 x 2.11	254.0	57.15	50.80



Tube End Cap Dimension (mm)		
Size (Inch)	OD / ID x t	A
0.25"	6.35 / 4.57 x 0.89	38.1
0.375"	9.53 / 7.75 x 0.89	38.1
0.5"	12.7 / 9.40 x 1.65	38.1
0.75"	19.05 / 15.75 x 1.65	38.1
1.0"	25.4 / 22.10 x 1.65	38.1
1.5"	38.1 / 34.80 x 1.65	38.1
2.0"	50.8 / 47.50 x 1.65	38.1
2.5"	63.5 / 60.20 x 1.65	38.1
3.0"	76.2 / 72.90 x 1.65	44.5
4.0"	101.6 / 97.38 x 2.11	50.8
6.0"	152.4 / 146.86 x 2.77	63.5

