



DENNAI CLEAN PIPE

HIGH CLEANLINESS SEAMLESS/ WELDED
STAINLESS STEEL PIPE FOR SEMICONDUCTOR/
LIQUID CRYSTAL PLANTS FOR BIOCHEMICAL/
PHARMACEUTICAL/ FOOD PROCESSING PLANTS

C O N T E N T S

1.Introduction

2.Product Range & Application Field

3.Seamess Stainless Steel Tube/Pipe

3-1.Seamess Stainless Tube Process

3-2.Seamess BA Tube/Pipe Process

3-3.Electropolishing Process

3-4.Specification & Characteristic

4.Welded Tube/Pipe

4-1.Welded & Drawn Tube Product Process

4-2.Welded Tube/Pipe Process

5.Test Item & Characteristic

6. Datasheet & Equipment List

7. Clean Fitting & Coax Clean Fitting

8.Global Marketing





***We will be a partner
in technology***



Introduction

Based on professional technology, DENNAI CLEAN PIPE is one of the few companies that successfully produce seamless stainless steel tubes and pipes worldwide. Due to its high purity, durability and corrosion resistance, DENNAI CLEAN PIPE products are a key component of chemical and gas power systems and semiconductor and LCD production. In order to meet the increasing demand for high precision tube and pipe, the company to save the cost of production method and production technology has made great progress, the goal is to become a world-class technology leader in the overseas markets.

Innovative technology

AP/MP/BA/EP Seamless Stainless Steel Tube & Pipe

Semi-Seamless Stainless Steel Pipe

Laser Welding system with the best manufacturing engineer system

The Development of high-tech tube materials such as VIM/VAR

The Achievement of patent on seamless tube and the manufacturing technology

Product

Seamless Stainless Steel Tube/Pipe

Stainless Steel Laser Welded Tube/Pipe

Welded Stainless Steel Tube/Pipe & Cold Drawn



Seamless Stainless Steel Tube & Pipe



DENNAI CLEAN PIPE has supplied clean and precise seamless tube to semiconductor, medical instrument, biotechnology, aerospace engineering and chemical industries.

Especially, DENNAI CLEAN PIPE has been applied to UHP(Ultra High Purity) piping line that is necessary for pollution control in the semiconductor / LCD field.

■ ■ Product Range & Application Field

Application Field	The quality of material
Semiconductor / LCD plants	VIM/VAR,SUS316(L),304(L)
Sanitary / Biochemical	SUS304(L), 316(L)
Petrochemistry / Electric-power plants	SUS316(L),304(L),310,321
Ship-building	SUS316(L),304(L),310,321
Nuclear power plants	SUS316(L),304(L),310,321
Cylinder & Shaft	SUS304(L)
Precision Machine & Airplane Parts	SUS316(L),304(L)



■ ■ **Seamless Stainless Tube & Pipe**



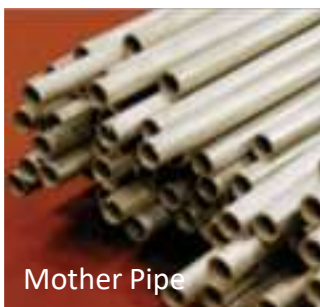
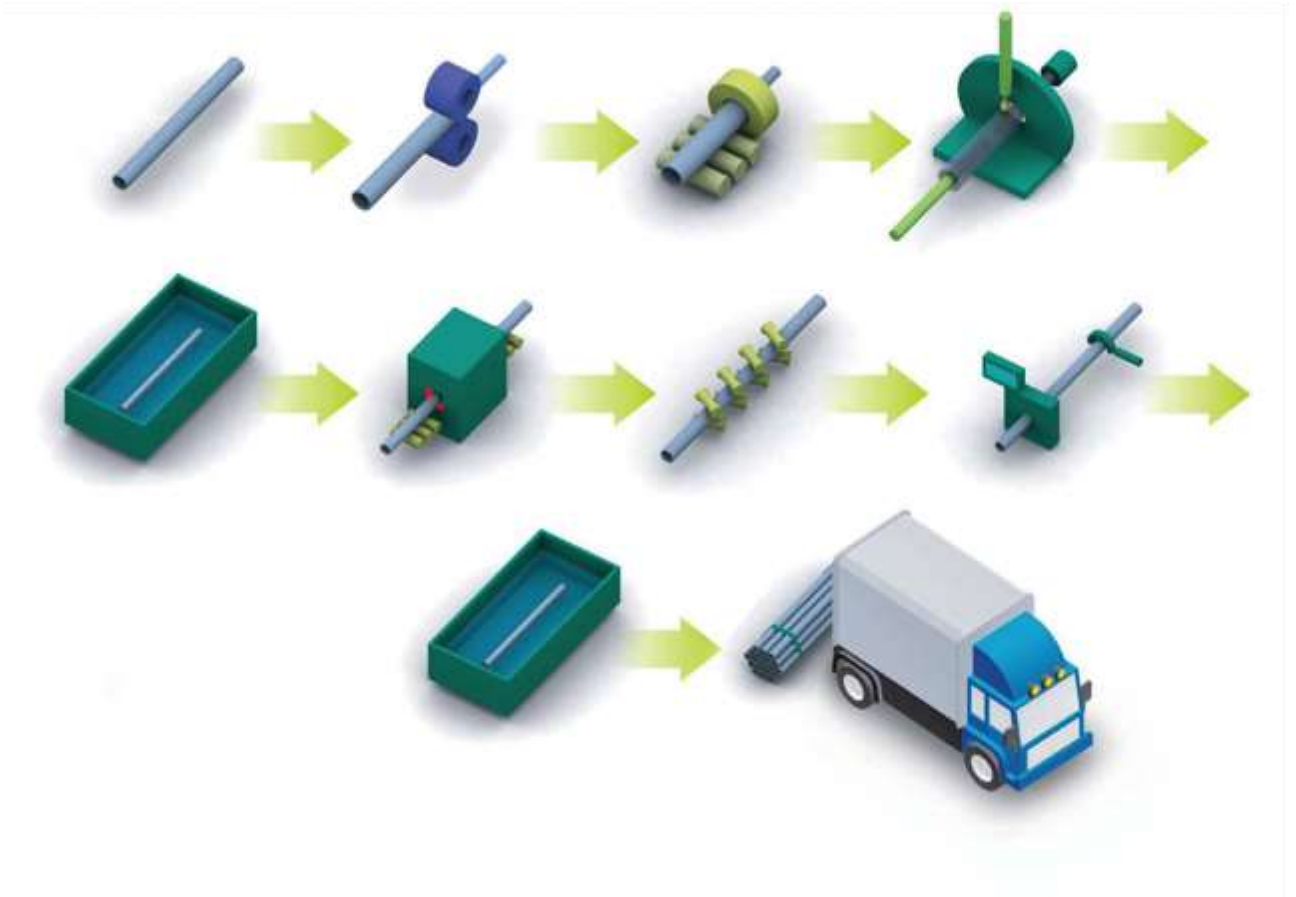


Seamless Stainless Tube & Pipe



Outer Diameter		Wall Thickness (mm)		Tolerance		Type of Pipe	Technology Grade			
inch		mm	mm	Outer diameter	Wall thickness	Seamless	AP	BA	MP	EP
3.18	1/8"	0.51	0.71	±0.06mm	±10%	√	√	√		√
6.35	1/4"	0.89	1.00	±0.1mm	±0.1mm	√	√	√		√
9.53	3/8"	0.89	1.00	±0.1mm	±0.1mm	√	√	√		√
12.7	1/2"	1.00	1.24	±0.1mm	±0.1mm	√	√	√		√
15.88	5/8"	1.00	1.24	±0.1mm	±0.1mm	√	√	√		√
19.05	3/4"	1.24	1.65	±0.1mm	±0.1mm	√	√	√		√
25.4	1"	1.24	1.65	±1%	±0.1mm	√	√	√		√
38.1	1 1/2"	1.65		±1%	±0.1mm	√	√	√		√
50.8	2"	1.65		±1%	±0.1mm	√	√	√		√
63.5	2 1/2"	1.65		±1%	±0.1mm	√	√	√		√
A size		SCH5S	SCH10S				√	√		√
10.5	6A	1.00	1.20	±0.1mm	±0.1mm	√	√	√		√
13.8	8A	1.20	1.65	±0.1mm	±0.1mm	√	√	√		√
17.3	10A	1.20	1.65	±0.1mm	±0.1mm	√	√	√		√
21.7	15A	1.65	2.10	±0.1mm	±10%	√	√	√		√
27.2	20A	1.65	2.10	±0.1mm	±10%	√	√	√		√
34	25A	1.65	2.80	±0.1mm	±10%	√	√	√		√
42.7	32A	1.65	2.80	±0.1mm	±10%	√	√	√		√
48.6	40A	1.65	2.80	±0.1mm	±10%	√	√	√		√
60.5	50A	1.65	2.80	±0.1mm	±10%	√	√	√		√
76.3	65A	2.10	3.00	±0.1mm	±10%	√	√	√		√
89.1	80A	2.10	3.00	±0.1mm	±10%	√	√		√	√
101.6	90A	2.10	3.00	±0.1mm	±10%	√	√		√	√
114.3	100A	2.10	3.00	±0.1mm	±10%	√	√		√	√
139.8	125A	2.80	3.40	±1%	±10%	√	√		√	√
165.2	150A	2.80	3.40	±1%	±10%	√	√		√	√
216.3	200A	2.80	4.00	±1%	±10%	√	√		√	√
267.4	250A	3.40	4.00	±1%	±10%	√	√		√	√
318.5	300A	4.00	4.50	±1%	±10%	√	√		√	√
355.6	350A	4.00	5.00	±1%	±10%	√	√		√	√
406.4	400A	4.50	5.00	±1%	±10%	√	√		√	√
457.2	450A	4.50	5.00	±1%	±10%	√	√		√	√
508	500A	5.00	5.50	±1%	±10%	√	√		√	√
558.8	550A	5.00	5.50	±1%	±10%	√	√		√	√
609.6	600A	5.50	6.50	±1%	±10%	√	√		√	√





Mother Pipe



Pilger



Drawing



Heat Treatment



Straightening

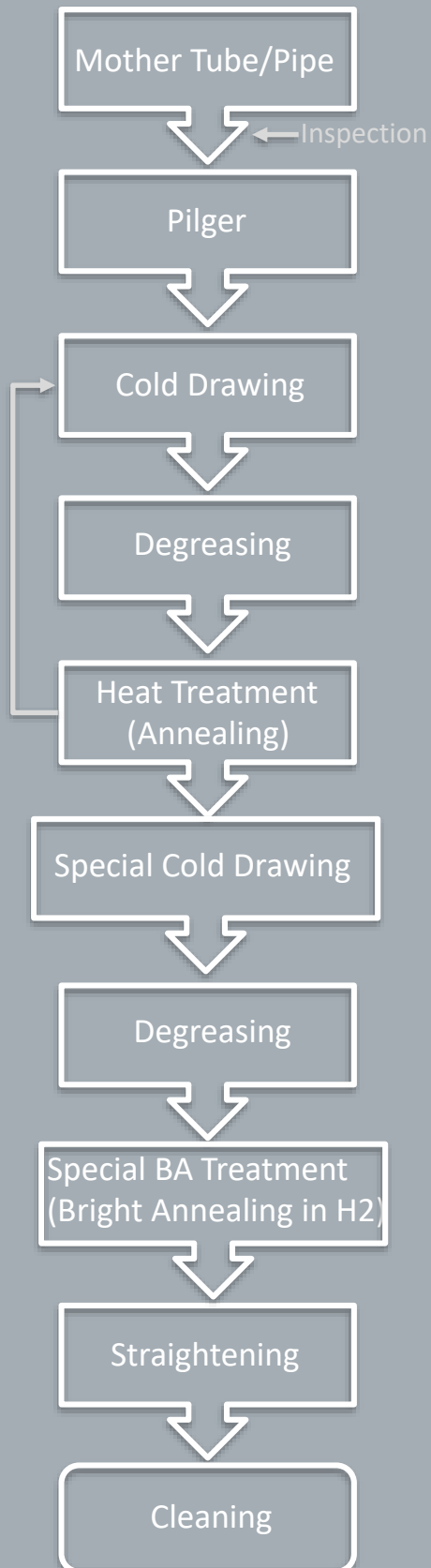


Cleaning

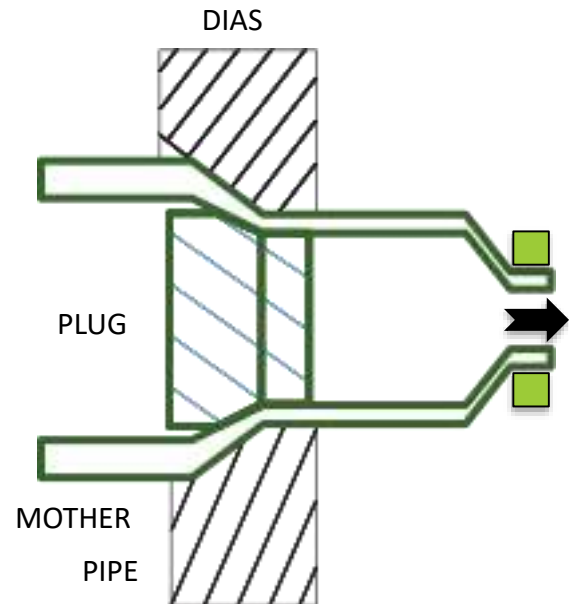


Packing

Seamless BA Tube/Pipe Process



【 Drawing 】



Pilger



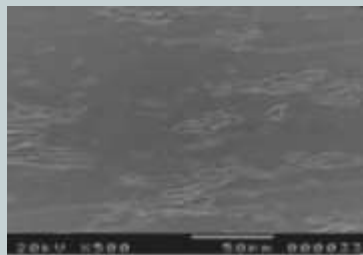
Heat Treatment



Drawing

EP(Electropolishing) Treatment Process

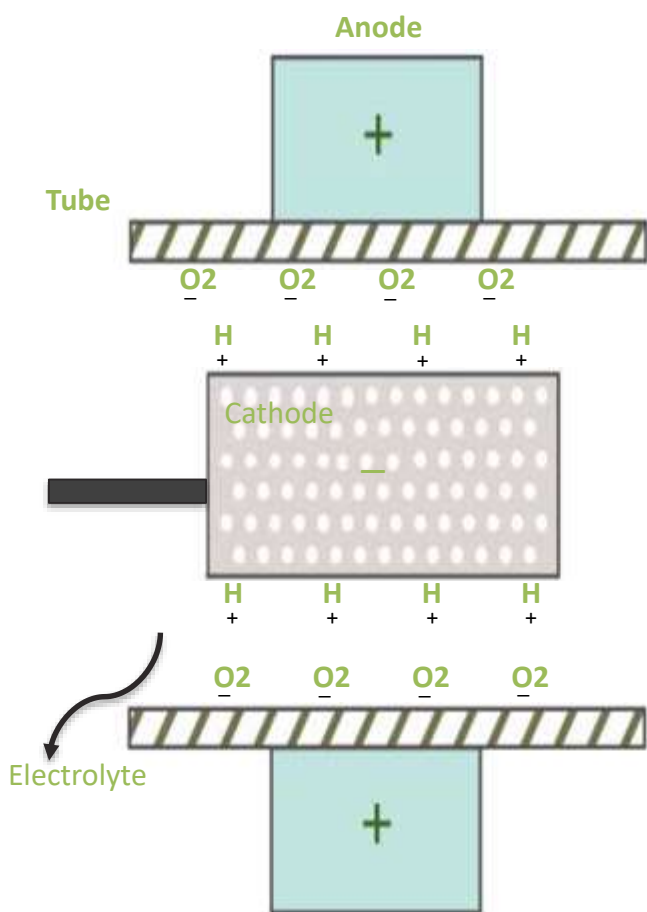
SEM:Scanning Electron Microscope



BA



EP



【 Electropolishing 】

BA Tube/Pipe

Cleaning

Eletropolishing

Passivation

Cleaning/Drying

Face&Square

Inspection

Cleanroom
(Hot Di & Hot N₂, Packing)



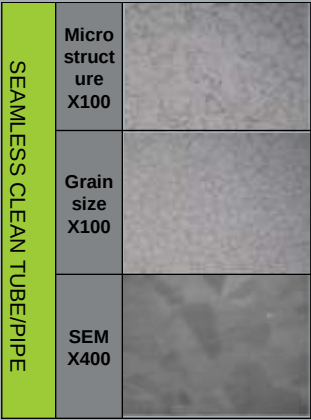
Semiconductor / LCD

MATERIAL/ CHEMICAL COMPOSITI

		C	Si	Mn	P	S	Ni	Cr	Mo	O(ppm)
SUS304TP	SMIC/LCD	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	8.00-11.00	18.00-20.00		
	Typical example	0.02	0.47	1.09	0.028	0.002	9.07	18.25		
SUS316TP	SMIC/LCD	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	10.00-14.00	16.00-18.00	2.00-3.00	
	Typical example	0.02	0.45	0.84	0.026	0.001	11.16	17.28	2.17	
SUS316LTP	SMIC/LCD	max 0.030	max 1.00	max 2.00	max 0.045	max 0.030	12.00-16.00	16.00-18.00	2.00-3.00	
	Typical example	0.019	0.35	0.71	0.027	0.001	12.64	16.68	2.2	
VIM+VAR	SMIC/LCD	max 0.015	max 0.50	max 0.05	max 0.020	max 0.003	14.00-15.00	16.00-17.00	2.00-3.00	max 20
	Typical example	0.006	0.09	0.03	0.004	0.002	14.72	16.37	2.83	8

MECHANICAL PROPERTY

		Tensile strength (N/mm²)	Yield strength (N/mm²)	Elongatio n (%)	Hardness (HRb)
SUS304TP	SMIC/LCD	min 520	min 205	min 35	
	Typical example	619	251	59	162
SUS316TP	SMIC/LCD	min 520	min 205	min 35	
	Typical example	605	278	53	142
SUS316LTP	SMIC/LCD	min 480	min 175	min 35	
	Typical example	587	260	62	138



Bio / Pharmaceutical / Food processing plants

MATERIAL/ CHEMICAL COMPOSITI

		C	Si	Mn	P	S	Ni	Cr	Mo
SUS304TBS	Food / Pharmaceutical	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	8.00-10.50	18.00-20.00	
	Typical example	0.02	0.43	1.04	0.03	0.006	9.09	18.5	
SUS316LTBS	Food / Pharmaceutical	max 0.030	max 1.00	max 2.00	max 0.045	max 0.030	12.00-15.00	16.00-18.00	2.00-3.00
	Typical example	0.019	0.37	0.76	0.025	0.001	12.59	17.37	2.15

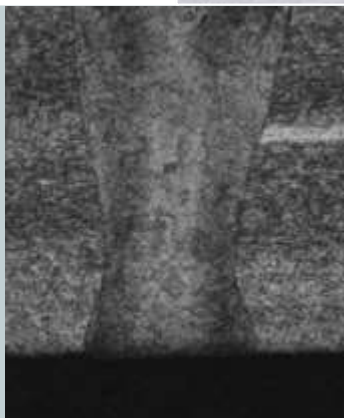
MECHANICAL PROPERTY

		Tensile strength (N/mm²)	Elongation (%)	Hardnes s (HRb)
SUS304TBS	Food / Pharmaceutical	min 520	min 35	
	Typical example	605	55	162
SUS316LTBS	Food / Pharmaceutical	mi n480	min 35	
	Typical example	552	61	138

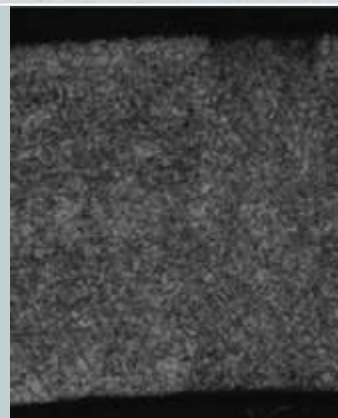
Welded Tube / Pipe



Welding



Welding +
Heat Treatment



Welding+ColdDrawing
+Heat Treatment



Welded & Drawn Tube/Pipe Product Range

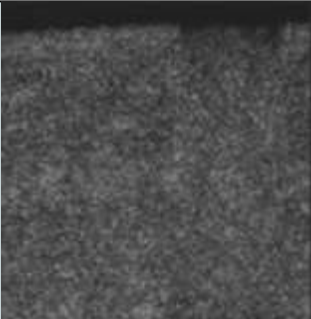
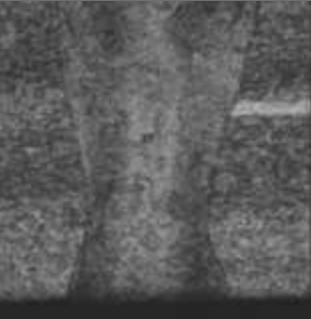


Outer Diameter		Wall Thickness (mm)		Tolerance		Type of Pipe	Technology Grade			
inch		mm	mm	Outer diameter	Wall thickness	Welded	AP	BA	MP	EP
3.18	1/8"	0.51	0.71	±0.06mm	±10%	√	√	√		√
6.35	1/4"	0.89	1.00	±0.1mm	±0.1mm	√	√	√		√
9.53	3/8"	0.89	1.00	±0.1mm	±0.1mm	√	√	√		√
12.7	1/2"	1.00	1.24	±0.1mm	±0.1mm	√	√	√		√
15.88	5/8"	1.00	1.24	±0.1mm	±0.1mm	√	√	√		√
19.05	3/4"	1.24	1.65	±0.1mm	±0.1mm	√	√	√		√
25.4	1"	1.24	1.65	±1%	±0.1mm	√	√	√		√
38.1	1 1/2"	1.65		±1%	±0.1mm	√	√	√		√
50.8	2"	1.65		±1%	±0.1mm	√	√	√		√
63.5	2 1/2"	1.65		±1%	±0.1mm	√	√	√		√
A size		SCH5S	SCH10S				√	√		√
10.5	6A	1.00	1.20	±0.1mm	±0.1mm	√	√	√		√
13.8	8A	1.20	1.65	±0.1mm	±0.1mm	√	√	√		√
17.3	10A	1.20	1.65	±0.1mm	±0.1mm	√	√	√		√
21.7	15A	1.65	2.10	±0.1mm	±10%	√	√	√		√
27.2	20A	1.65	2.10	±0.1mm	±10%	√	√	√		√
34	25A	1.65	2.80	±0.1mm	±10%	√	√	√		√
42.7	32A	1.65	2.80	±0.1mm	±10%	√	√	√		√
48.6	40A	1.65	2.80	±0.1mm	±10%	√	√	√		√
60.5	50A	1.65	2.80	±0.1mm	±10%	√	√	√		√
76.3	65A	2.10	3.00	±0.1mm	±10%	√	√	√		√
89.1	80A	2.10	3.00	±0.1mm	±10%	√	√		√	√
101.6	90A	2.10	3.00	±0.1mm	±10%	√	√		√	√
114.3	100A	2.10	3.00	±0.1mm	±10%	√	√		√	√
139.8	125A	2.80	3.40	±1%	±10%	√	√		√	√
165.2	150A	2.80	3.40	±1%	±10%	√	√		√	√
216.3	200A	2.80	4.00	±1%	±10%	√	√		√	√
267.4	250A	3.40	4.00	±1%	±10%	√	√		√	√
318.5	300A	4.00	4.50	±1%	±10%	√	√		√	√
355.6	350A	4.00	5.00	±1%	±10%	√	√		√	√
406.4	400A	4.50	5.00	±1%	±10%	√	√		√	√
457.2	450A	4.50	5.00	±1%	±10%	√	√		√	√
508	500A	5.00	5.50	±1%	±10%	√	√		√	√
558.8	550A	5.00	5.50	±1%	±10%	√	√		√	√
609.6	600A	5.50	6.50	±1%	±10%	√	√		√	√

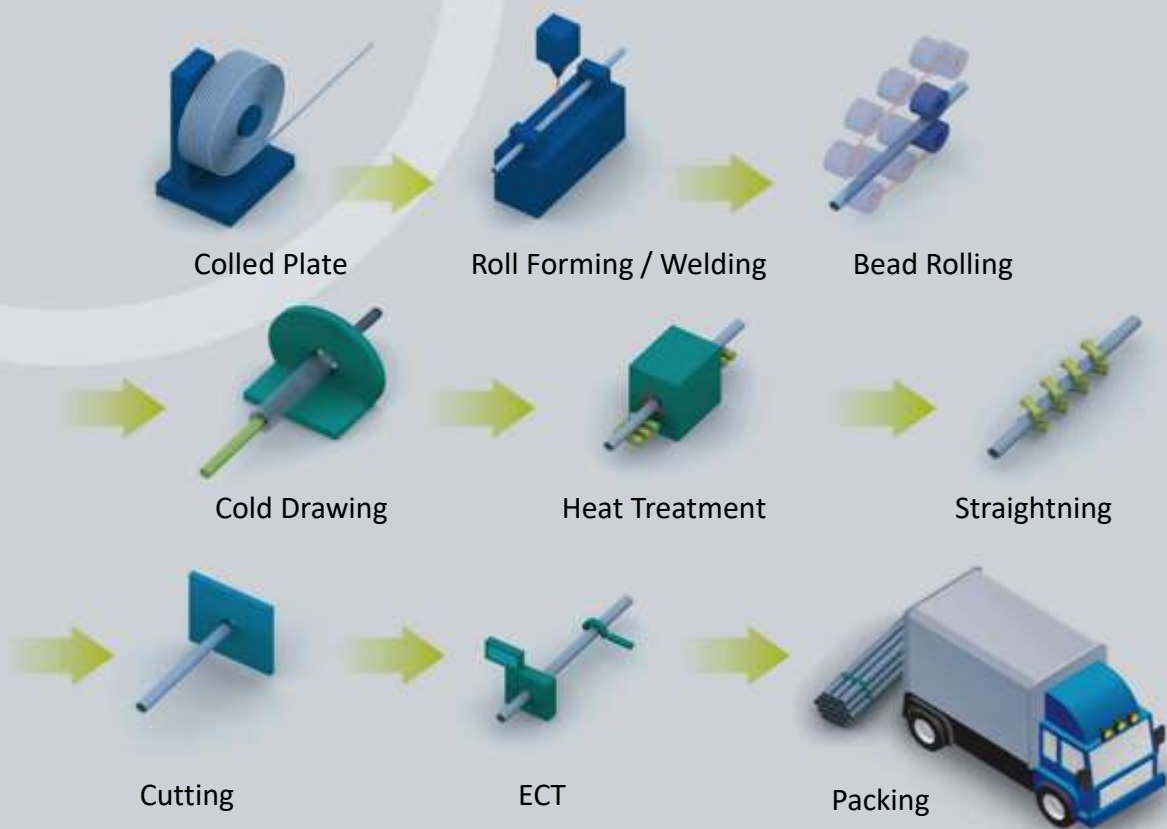
Welding

Welding+Heat
Treatment

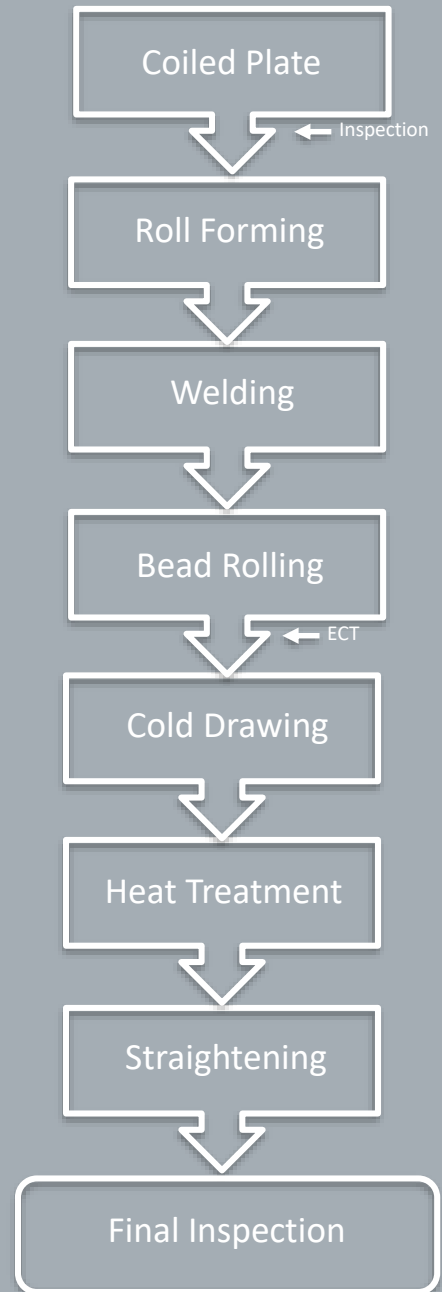
Welding+Cold
Drawing+Heat Treatment



Welded & Drawn Tube



Welded TUBE / PIPE Process





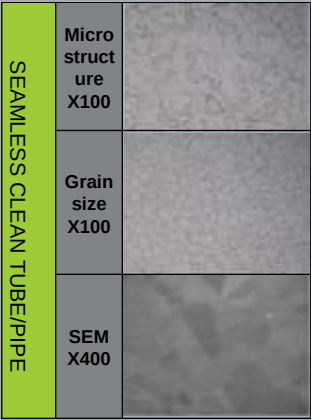
Semiconductor / LCD

MATERIAL/ CHEMICAL COMPOSITI

		C	Si	Mn	P	S	Ni	Cr	Mo	O(ppm)
SUS304TP	SMIC/LCD	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	8.00-11.00	18.00-20.00		
	Typical example	0.02	0.47	1.09	0.028	0.002	9.07	18.25		
SUS316TP	SMIC/LCD	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	10.00-14.00	16.00-18.00	2.00-3.00	
	Typical example	0.02	0.45	0.84	0.026	0.001	11.16	17.28	2.17	
SUS316LTP	SMIC/LCD	max 0.030	max 1.00	max 2.00	max 0.045	max 0.030	12.00-16.00	16.00-18.00	2.00-3.00	
	Typical example	0.019	0.35	0.71	0.027	0.001	12.64	16.68	2.2	
VIM+VAR	SMIC/LCD	max 0.015	max 0.50	max 0.05	max 0.020	max 0.003	14.00-15.00	16.00-17.00	2.00-3.00	max 20
	Typical example	0.006	0.09	0.03	0.004	0.002	14.72	16.37	2.83	8

MECHANICAL PROPERTY

		Tensile strength (N/mm²)	Yield strength (N/mm²)	Elongatio n (%)	Hardness (HRb)
SUS304TP	SMIC/LCD	min 520	min 205	min 35	
	Typical example	619	251	59	162
SUS316TP	SMIC/LCD	min 520	min 205	min 35	
	Typical example	605	278	53	142
SUS316LTP	SMIC/LCD	min 480	min 175	min 35	
	Typical example	587	260	62	138



Bio / Pharmaceutical / Food processing plants

MATERIAL/ CHEMICAL COMPOSITI

		C	Si	Mn	P	S	Ni	Cr	Mo
SUS304TBS	Food / Pharmaceutical	max 0.08	max 1.00	max 2.00	max 0.045	max 0.030	8.00-10.50	18.00-20.00	
	Typical example	0.02	0.43	1.04	0.03	0.006	9.09	18.5	
SUS316LTBS	Food / Pharmaceutical	max 0.030	max 1.00	max 2.00	max 0.045	max 0.030	12.00-15.00	16.00-18.00	2.00-3.00
	Typical example	0.019	0.37	0.76	0.025	0.001	12.59	17.37	2.15

MECHANICAL PROPERTY

		Tensile strength (N/mm²)	Elongation (%)	Hardnes s (HRb)
SUS304TBS	Food / Pharmaceutical	min 520	min 35	
	Typical example	605	55	162
SUS316LTBS	Food / Pharmaceutical	mi n480	min 35	
	Typical example	552	61	138

ITEM	AP	BA	EP	V+V
Measure Tolerance	O	O	O	O
Chemical Composition	Mill Sheet	Mill Sheet	Mill Sheet	Mill Sheet
Welding Test		O	O	O
Tensile Test	O	O	O	O
Surface Microscope		O	O	O
Roughness	O	O	O	O
Hardness	O	O	O	O
Particle Test			O	O
Oil Content			O	O
Eluant ion check			O	O
SEM Test				O
ESCA Test				O

Inner Surface Roughness

Method	Size	Inner surface roughness Assurance values		Hardness
		Rmax(μm)	Ra(μinch)	Hb
AP	OD	≤25	≤100	≥90
BA	1/4"≤OD≤1"	≤3	≤15	
	25A≤OD≤80A	≤4	≤20	
MP	OD≥100A	≤4	≤20	
EP	1/4"OD≤80A	≤0.5	≤10	
	OD≥100A	≤0.7		

※For Semiconductor and Liquid Crystal Plants

Super Mechanical Cleaned Quality Assurance Values

Method	Particle(Number/CFM)		Oil content	Eluant ion Check(Liquid resistivity Measurement)	Eluant ion Check(ion chromatograpty Analysis)	Dew point
	0.1μm	0.3μm				
AP		≤5	≤0.1mg/ft2	—	—	—
BA/MP	≤5	0	≤0.01mg/ft2	≥0.5MΩ·CM	≤10ng/fcm2	≤-75℃
EP	≤1	0	≤0.01mg/ft2	≥0.5MΩ·CM	≤5ng/fcm2	≤-75℃

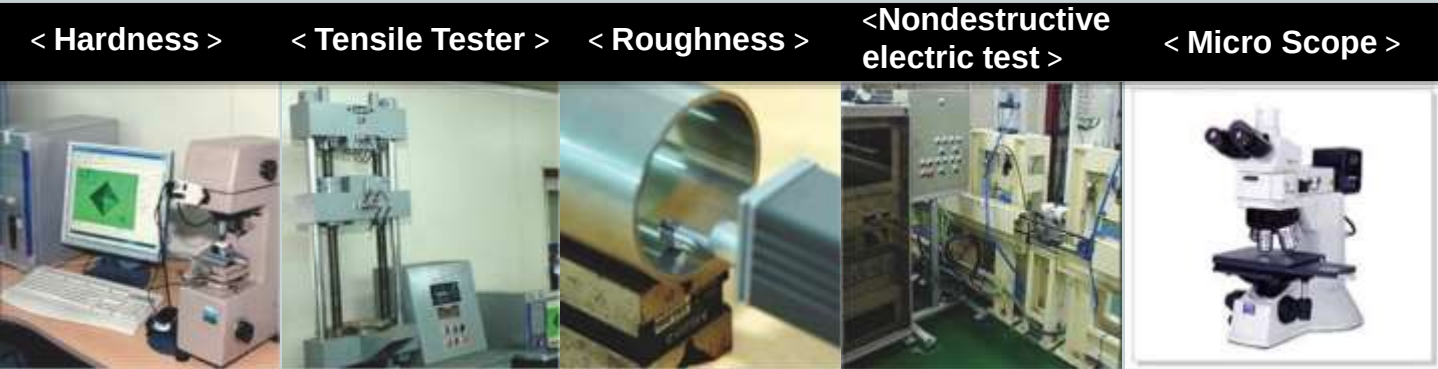
※For Semiconductor and Liquid Crystal Plants

Facility Equipment

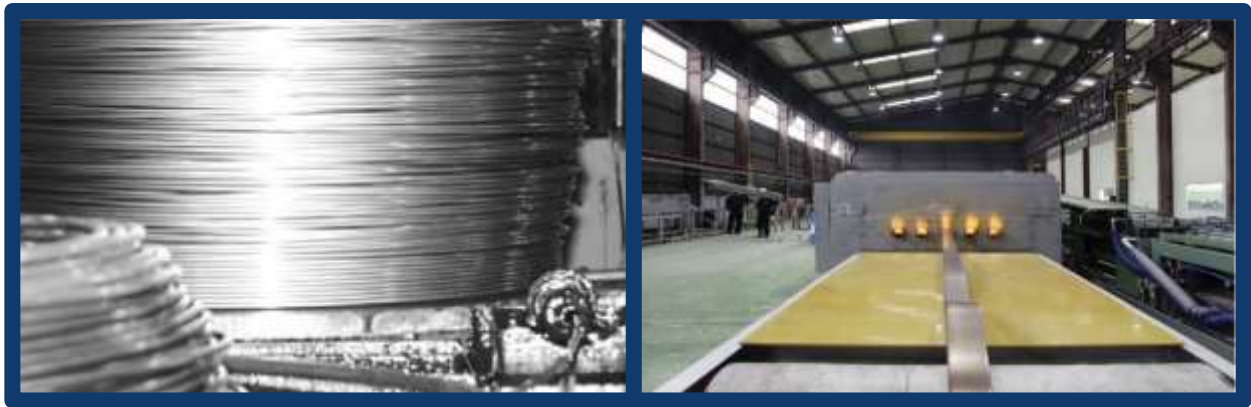
Classification	Q'ty	Etc.
RO/DI system	1	18MΩ 10TON/DAY
Clean room	1	100/1000CLASS
Gas equipment	1	N2, H2, CDA
Auto cutting/chamering	1	WITH AUTO CLEANING
Dew point tester	1	-90<DEW POINT<+90

Inspection Equipment

Classification	Q'ty	Etc.
Surface roughness Measuring instruments	1	
Pin gauge	5	
Microscope for steel	1	X500
Hardness tester	1	H.V. tester 1Kg
Flattnf tester	1	
Eddy current examination equipment	2	
Versatile tester	1	
		Max 1000kN



Seamless Coiled Tube



Product Range

Material	SIZE	OD(mm)	T(mm)	Length(M)
				Max
SUS 316L	1/8"	3.175	0.71	500
	1/4"	6.35	0.71	220
	1/4"	6.35	0.89	200
	1/4"	6.35	1.24	140
	3/8"	9.53	0.89	115
	3/8"	9.53	1.00	105
	3/8"	9.53	1.24	85
	1/2"	12.7	0.89	85
	1/2"	12.7	1.00	80
	1/2"	12.7	1.24	65
	6mm	6	1.00	175
	8mm	8	1.00	125
	8mm	8	1.30	100
	10mm	10	1.00	100
	10mm	10	1.30	80
	12mm	12	1.00	85
	12mm	12	1.30	65

Clean Fitting & Coax Clean Fitting

The pre-fabricated and assembled pipe or tube package with valve and fitting.



The Advantages of MSP(Manifold Spool Package)

- (1). Cost Reduction: Approximately 20~25% saving compared from typical way (Max 30~35%)
- (2). Shortening Delivery :
Removing of on site work such as Inspection, Cutting, Facing, Welding, Installation, Purging
- (3). Assurance for Better Quality :
It is possible through testing MSP itself by pre-fabricator such as Helium leak test, Pressure test in better treatment with prompt DI water cleaning after welding.
- (4). Removing of welding Point

MSP Application Field

- (1). PCW (Process Cooling Water) : TP304 GP Pipe & Ball Valve Spool
- Other options also available
- (2). General Purity Gas (CDA, Gn2) : TP304 HP pipe & Ball Valve Spool
- Other options also available (Bellows V/V, TP316L Pipe)
- (3). High Purity Gas (PN2, PAr, PHe) : TP316L UHP Pipe & Diaphragm, Bellows Valve Spool)
- (4). Other Piping Line : Chemical, Vacuum, Exhaust, Drain Piping spool also available



►►BE90 - ELBOW 90°



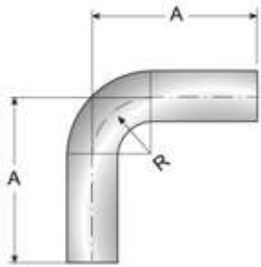
ASTM Standard

O.D. Size Inch	Dimensions				Shape - Size*
	A inch	A mm	R inch	R mm	
1/4"	2.63	66.80	0.62	15.75	DLE90-1/4-*
3/8"	2.63	66.80	1.00	25.40	DLE90-3/8-*
1/2"	3.00	76.20	1.13	28.70	DLE90-1/2-*
5/8"	3.00	76.20	1.13	28.70	DLE90-5/8-*
3/4"	3.00	76.20	1.13	28.70	DLE90-3/4-*
1"	3.00	76.20	1.50	38.10	DLE90-1-*
1 1/2"	3.75	95.25	2.25	57.15	DLE90-1 1/2-*
2"	4.75	120.65	3.00	76.20	DLE90-2-*
2 1/2"	5.50	139.70	3.75	95.25	DLE90-2 1/2-*
3"	6.25	158.75	4.50	114.30	DLE90-3-*
4"	8.00	203.20	6.00	152.40	DLE90-4-*
6"	11.50	292.10	9.00	228.60	DLE90-6-*



JIS Standard

O.D. Size Inch	Dimensions		Shape - Size*
	A mm	R mm	
15A	38.10	75.00	DLE90-15A-*
20A	38.10	75.00	DLE90-20A-*
25A	38.10	75.00	DLE90-25A-*
32A	47.60	94.00	DLE90-32A-*
40A	57.20	104.00	DLE90-40A-*
50A	76.20	123.00	DLE90-50A-*
65A	95.30	147.00	DLE90-65A-*
80A	114.30	166.00	DLE90-80A-*
100A	152.40	204.00	DLE90-100A-*
125A	190.50	250.00	DLE90-125A-*
150A	228.60	290.00	DLE90-150A-*
200A	304.80	375.00	DLE90-200A-*



►►BE45 – ELBOW 45°



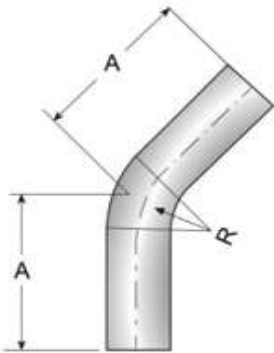
ASTM Standard

O.D. Size Inch	Dimensions				Shape - Size*
	A inch	A mm	R inch	R mm	
1/4"	2.00	50.80	0.62	15.75	DLE45-1/4-*
3/8"	2.00	50.80	1.00	25.40	DLE45-3/8-*
1/2"	2.25	57.15	1.13	28.70	DLE45-1/2-*
5/8"	2.25	57.15	1.13	28.70	DLE45-5/8-*
3/4"	2.25	57.15	1.13	28.70	DLE45-3/4-*
1"	2.25	57.15	1.50	38.10	DLE45-1-*
1 1/2"	2.25	57.15	2.25	57.15	DLE45-1 1/2-*
2"	3.00	76.20	3.00	76.20	DLE45-2-*
2 1/2"	3.37	85.60	3.75	95.25	DLE45-2 1/2-*
3"	3.62	91.95	4.50	114.30	DLE45-3-*
4"	4.50	114.30	6.00	152.40	DLE45-4-*
6"	6.25	158.75	9.00	228.60	DLE45-6-*



JIS Standard

O.D. Size Inch	Dimensions		Shape - Size*
	A mm	R mm	
15A	38.10	75.00	DLE90-15A-*
20A	38.10	75.00	DLE90-20A-*
25A	38.10	75.00	DLE90-25A-*
32A	47.60	94.00	DLE90-32A-*
40A	57.20	104.00	DLE90-40A-*
50A	76.20	123.00	DLE90-50A-*
65A	95.30	147.00	DLE90-65A-*
80A	114.30	166.00	DLE90-80A-*
100A	152.40	204.00	DLE90-100A-*
125A	190.50	250.00	DLE90-125A-*
150A	228.60	290.00	DLE90-150A-*
200A	304.80	375.00	DLE90-200A-*

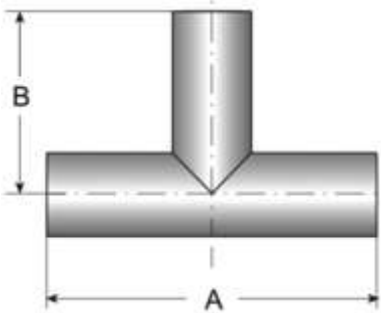


►► BT - EQUAL TEE



ASTM Standard

O.D. Size Inch	Dimensions				Shape - Size*
	A inch	A mm	B inch	B mm	
1/4"	3.50	88.90	1.75	44.45	DET-1/4-*
3/8"	3.50	88.90	1.75	44.45	DET-3/8-*
1/2"	3.75	95.25	1.88	47.75	DET-1/2-*
5/8"	4.00	101.60	2.00	50.80	DET-5/8-*
3/4"	4.00	101.60	2.00	50.80	DET-3/4-*
1"	4.25	107.95	2.13	54.10	DET-1-*
1 1/2"	4.75	120.65	2.38	60.45	DET-1 1/2-*
2"	5.75	146.05	2.88	73.15	DET-2-*
2 1/2"	6.25	158.75	3.12	79.25	DET-2 1/2-*
3"	6.75	171.45	3.37	85.60	DET-3-*
4"	8.25	209.55	4.12	104.65	DET-4-*
6"	11.25	285.75	5.62	142.75	DET-6-*



JIS Standard

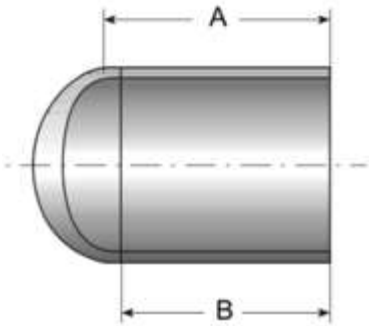
O.D. Size Inch	Dimensions		Shape - Size*
	A mm	B mm	
15A	118.00	59.00	DET-15A-*
20A	130.00	65.00	DET-20A-*
25A	136.00	68.00	DET-25A-*
32A	176.00	88.00	DET-32A-*
40A	190.00	95.00	DET-40A-*
50A	204.00	102.00	DET-50A-*
65A	242.00	121.00	DET-65A-*
80A	260.00	130.00	DET-80A-*
100A	290.00	145.00	DET-100A-*
125A	320.00	160.00	DET-125A-*
150A	340.00	170.00	DET-150A-*
200A	380.00	190.00	DET-200A-*

►► BCP - END CAP



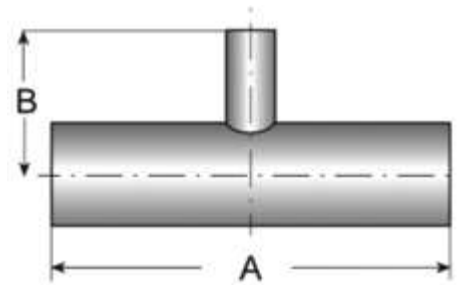
ASTM Standard

O.D. Size Inch	Dimensions		Shape - Size*
	A inch	A mm	
1/4"	1.00	25.40	DCP-1/4-*
3/8"	1.00	25.40	DCP-3/8-*
1/2"	1.50	38.10	DCP-1/2-*
5/8"	1.50	38.10	DCP-5/8-*
3/4"	1.50	38.10	DCP-3/4-*
1"	1.50	38.10	DCP-1-*
1 1/2"	1.50	38.10	DCP-1 1/2-*
2"	1.50	38.10	DCP-2-*
2 1/2"	1.50	38.10	DCP-2 1/2-*
3"	1.75	44.45	DCP-3-*
4"	2.00	50.80	DCP-4-*
6"	2.50	63.50	DCP-6-*



JIS Standard

O.D. Size Inch	Dimensions	Shape - Size*
	A mm	
15A	25.40	DCP-15A-*
20A	25.40	DCP-20A-*
25A	38.10	DCP-25A-*
32A	38.10	DCP-32A-*
40A	38.10	DCP-40A-*
50A	38.10	DCP-50A-*
65A	38.10	DCP-65A-*
80A	50.80	DCP-80A-*
100A	63.50	DCP-100A-*
125A	76.20	DCP-125A-*
150A	88.90	DCP-150A-*
200A	101.60	DCP-200A-*



ASTM Standard

O.D. Size Inch		Dimensions				Shape - Size*
		A inch	A mm	B inch	B mm	
3/8"	1/4"	3.50	88.90	1.75	44.45	DRT-3/8-1/4-*
1/2"	1/4", 3/8"	3.75	95.25	1.88	47.75	DRT-1/2-*
5/8"	1/4", 3/8", 1/2"	4.00	101.60	2.00	50.80	DRT-5/8-*
3/4"	1/4", 3/8", 1/2", 5/8"	4.00	101.60	2.00	50.80	DRT-3/4-*
1"	1/4", 3/8", 1/2", 5/8", 3/4"	4.25	107.95	2.13	54.10	DBRT-1-*
1 1/2"	1/4", 3/8", 1/2", 5/8", 3/4", 1"	4.75	120.65	2.38	60.45	DRT-1 1/2-*
2"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2"	5.75	146.05	2.63	66.80	DRT-2-*
2 1/2"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2", 2"	6.25	158.75	2.88	73.15	DRT-2 1/2-*
3"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2", 2", 2 1/2"	6.75	171.45	3.12	79.25	DRT-3-*
4"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2", 2", 2 1/2", 3"	8.25	209.55	3.88	98.55	DRT-4-*
6"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2", 2", 2 1/2", 3", 4"	11.25	285.75	5.62	142.75	DRT-6-*



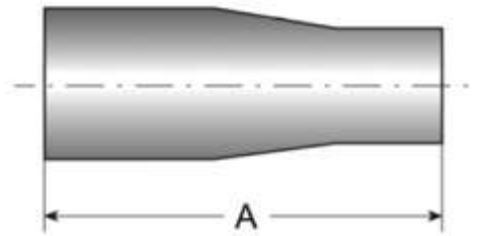
JIS Standard

O.D. Size Inch		Dimensions		Shape - Size*
		A mm	B mm	
15A	1/4", 3/8", 1/2"	94	44	DRT-15A-*
	3/4"	104	52	
20A	1/4", 3/8", 1/2"	94	47	DRT-20A-*
	3/4", 1", 15A	110	55	
25A	1/4", 3/8", 1/2"	94	50	DRT-25A-*
	3/4", 1", 15A, 20A	118	59	
32A	1/4", 3/8", 1/2"	114	54	DRT-32A-*
	3/4", 1", 15A, 20A, 25A	136	62	
40A	1/4", 3/8", 1/2", 3/4 1", 15A, 20A, 25A	114	57	DRT-40A-*
	11/2", 32A	136	65	
		154	77	
50A	1/4", 3/8", 1/2", 3/4 1", 15A, 20A, 25A	114	63	DRT-50A-*
	11/2", 32A, 40A, 2"	136	71	
		166	83	
65A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A	122	71	DRT-65A-*
	11/2", 32A, 40A, 2", 50A	144	79	
	2 1/2"	176	90	
		194	97	
80A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A	122	77	DRT-80A-*
	11/2", 32A, 40A, 2", 50A	144	85	
	2 1/2", 3", 65A	176	96	
		206	103	
100A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A	122	90	DRT-100A-*
	11/2", 32A, 40A, 2", 50A	144	98	
	2 1/2", 3", 65A, 80A, 4"	176	109	
		232	116	
125A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A	160	110	DRT-125A-*
	11/2", 32A, 40A, 2", 50A	200	120	
	2 1/2", 3", 65A, 80A, 4", 100A	240	130	
		280	140	
150A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A	180	130	DRT-150A-*
	11/2", 32A, 40A, 2", 50A	220	140	
	2 1/2", 3", 65A, 80A, 4", 100A	260	150	
	125A	300	160	
		340	170	
200A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A	200	150	DRT-200A-*
	11/2", 32A, 40A, 2", 50A	240	160	
	2 1/2", 3", 65A, 80A, 4", 100A	280	170	
	125A, 6", 150A	320	180	
		360	190	

►► BRD - REDUCERS



ASTM Standard



O.D. Size Inch		Dimensions		Shape - Size*
		A inch	A mm	
3/8"	1/4"	1.62	41.15	DRD-3/8-1/4-*
1/2"	1/4", 3/8"	1.87	47.50	DRD-1/2-*
5/8"	1/4", 3/8", 1/2"	1.87	47.50	DRD-5/8-*
3/4"	1/4", 3/8", 1/2", 5/8"	2.10	53.34	DRD-3/4-*
1"	1/4", 3/8", 1/2", 5/8", 3/4"	2.10	53.34	DRD-1-*
1 1/2"	1/4", 3/8", 1/2", 5/8", 3/4", 1"	2.25	57.15	DRD-1 1/2-*
2"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2"	2.75	69.85	DRD-2-*
2 1/2"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2", 2"	3.25	82.55	DRD-2 1/2-*
3"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2", 2", 2 1/2"	4.50	114.30	DRD-3-*
4"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2", 2", 2 1/2", 3"	5.00	127.00	DRD-4-*
6"	1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/2", 2", 2 1/2", 3", 4"	10.00	254.00	DRD-6-*



JIS Standard

O.D. Size Inch		Dimensions	Shape - Size*
		A mm	
15A	1/4", 3/8", 1/2", 3/4"	100	DRD-15A-*
20A	1/4", 3/8", 1/2", 3/4", 1", 15A	105	DRD-20A-*
25A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A	120	DRD-25A-*
32A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A	125	DRD-32A-*
40A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A, 1 1/2", 32A	130	DRD-40A-*
50A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A, 1 1/2", 32A, 40A, 2"	140	DRD-50A-*
65A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A, 1 1/2", 32A, 40A, 2", 50A, 2 1/2"	165	DRD-65A-*
80A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A, 1 1/2", 32A, 40A, 2", 50A, 2 1/2", 3", 65A	170	DRD-80A-*
100A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A, 1 1/2", 32A, 40A, 2", 50A, 2 1/2", 3", 65A, 4"	180	DRD-100A-*
125A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A, 1 1/2", 32A, 40A, 2", 50A, 2 1/2", 3", 65A, 4"	250	DRD-125A-*
150A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A, 1 1/2", 32A, 40A, 2", 50A, 2 1/2", 3", 65A, 4", 125A	260	DRD-150A-*
200A	1/4", 3/8", 1/2", 3/4", 1", 15A, 20A, 25A, 1 1/2", 32A, 40A, 2", 50A, 2 1/2", 3", 65A, 4", 125A, 6", 150A	280	DRD-200A-*

Coax Clean Fitting



Coax-Tubes

Inner Tube	Outer Tube	Wall Thickness	Wall Thickness
		t1	t2
1/4"	1/2"	0.89	1.24
3/8"	5/8"	0.89	1.24
1/2"	3/4"	1.24	1.65
3/4"	1"	1.65	1.65
1"	1 1/4"	1.65	1.65

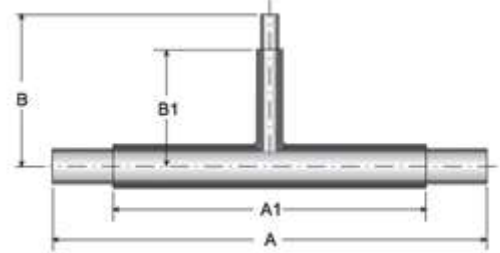
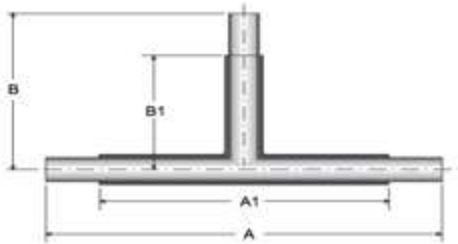
The special twin wall tube system consists of an inner electrochemically polished process tube and an outer safety tube.

Both are prepared for orbital welding and manufactured from high quality stainless steel AISI 316L (the tube is also available in other alloys on demand).

Spacers centre the process tube and safeguard the gas flow between the outer and the inner tube. In case of a leak in the process tube the escaping medium flows into the safety space and can be neutralised and harmlessly discharged from the system.

The twin wall tube system is easy to install by orbital welding and can also be integrated into existing systems and plants.

Coax Clean Fitting



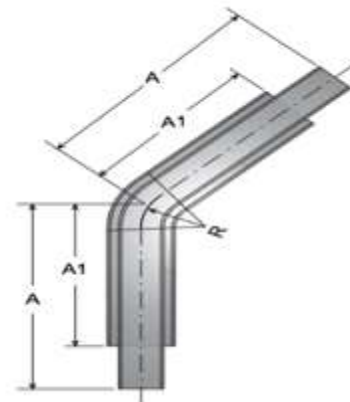
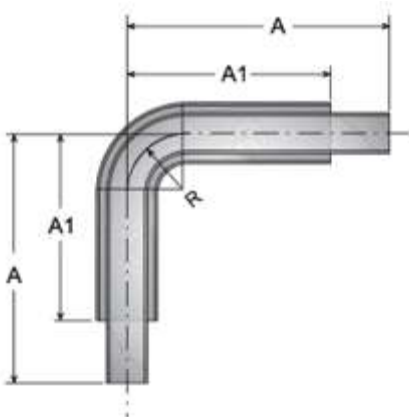
Coax-Tee

O.D. Size		Dimensions				Shape - Size*
Inner	Outer	A	A 1	B	B 1	
1/4"	1/2"	146.10	95.30	73.20	47.80	DCT-1/4-1/2-*
3/8"	5/8"	146.10	95.30	73.20	47.80	DCT-3/8-5/8-*
1/2"	3/4"	152.40	101.60	76.20	50.80	DCT-1/2-3/4-*
3/4"	1"	158.80	108.00	79.50	54.10	DCT-3/4-1-*
1"	1 1/4"	158.80	108.00	79.50	54.10	DCT-1-1 1/4-*



Coax-Reducing

O.D. Size		Dimensions				Shape - Size*
Inner	Outer	A	A 1	B	B 1	
1/4"*3/8"	1/2"*5/8"	146.1	95.3	73.2	47.8	DCT-1/4-3/8-*
1/4"*1/2"	1/2"*3/4"	152.4	101.6	76.2	50.8	DCT-1/4-1/2-*
3/8"*1/2"	5/8"*3/4"	152.4	101.6	76.2	50.8	DCT-3/8-1/2-*
1/4"*3/4"	1/2"*1"	158.8	108	79.5	54.1	DCT-1/4-3/4-*
3/8"*3/4"	5/8"*1"	158.8	108	79.5	54.1	DCT-3/8-3/4-*
1/2"*3/4"	3/4"*1"	158.8	108	79.5	54.1	DCT-1/2-3/4-*
1/4"*1"	1/2"*1 1/4"	158.8	108	79.5	54.1	DCT-1/4-1-*
3/8"*1"	5/8"*1 1/4"	158.8	108	79.5	54.1	DCT-3/8-1-*
1/2"*1"	3/4"*1 1/4"	158.8	108	79.5	54.1	DCT-1/2-1-*
3/4"*1"	1"*1 1/4"	158.8	108	79.5	54.1	DCT-3/4-1-*



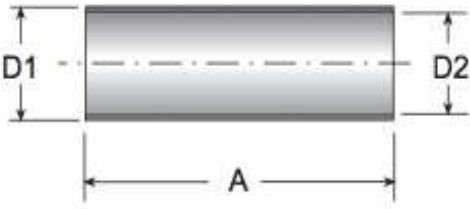
Coax-Elbow 90

O.D. Size		Dimensions			Shape - Size*
Inner	Outer	A	A 1	R	
1/4"	1/2"	101.6	28.6	28.6	DC90E-1/4-1/2-*
3/8"	5/8"	101.6	28.6	28.6	DC90E-3/8-5/8-*
1/2"	3/4"	101.6	28.6	28.6	DC90E-1/2-3/4-*
3/4"	1"	101.6	28.6	38.1	DC90E-3/4-1-*
1"	1 1/4"	101.6	28.6	38.1	DC90E-1-1 1/4-*



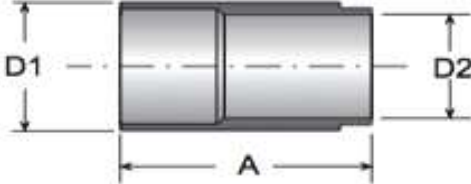
Coax-Elbow 45

O.D. Size		Dimensions			Shape - Size*
Inner	Outer	A	A 1	R	
1/4"	1/2"	82.6	76.2	28.6	DC45E-1/4-1/2-*
3/8"	5/8"	82.6	76.2	28.6	DC45E-3/8-5/8-*
1/2"	3/4"	82.6	76.2	28.6	DC45E-1/2-3/4-*
3/4"	1"	82.6	76.2	38.1	DC45E-3/4-1-*
1"	1 1/4"	82.6	76.2	38.1	DC45E-1-1 1/4-*



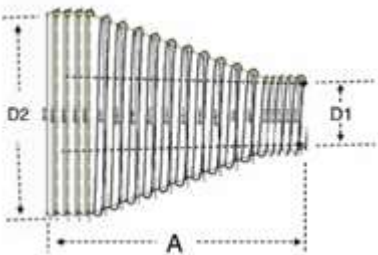
Coax-Sleeve

Outer Tube	Dimensions			Shape - Size*
	D1	D2	A	
1/2"	15.3	12.85	100	DCSEL-1/4-1/2-*
5/8"	18.5	16.03	100	DCSEL-3/8-5/8-*
3/4"	22.5	19.18	100	DCSEL-1/2-3/4-*
1"	29	25.65	100	DCSEL-3/4-1-*
1 1/4"	35.3	32	100	DCSEL-1-11/4-*



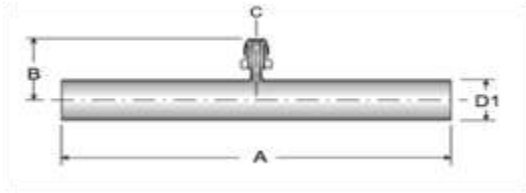
Coax-Terminator

Inner Tube	Outer Tube	Dimensions			Shape - Size*
		D1	D2	A	
1/4"	1/2"	12.7	6.45	31.75	DCTR-1/4-1/2-*
3/8"	5/8"	15.9	9.63	31.75	DCTR-3/8-5/8-*
1/2"	3/4"	19.1	12.8	31.75	DCTR-1/2-3/4-*
3/4"	1"	25.4	19.15	50.8	DCTR-3/4-1-*
1"	1 1/4"	31.8	25.5	50.8	DCTR-1-11/4-*



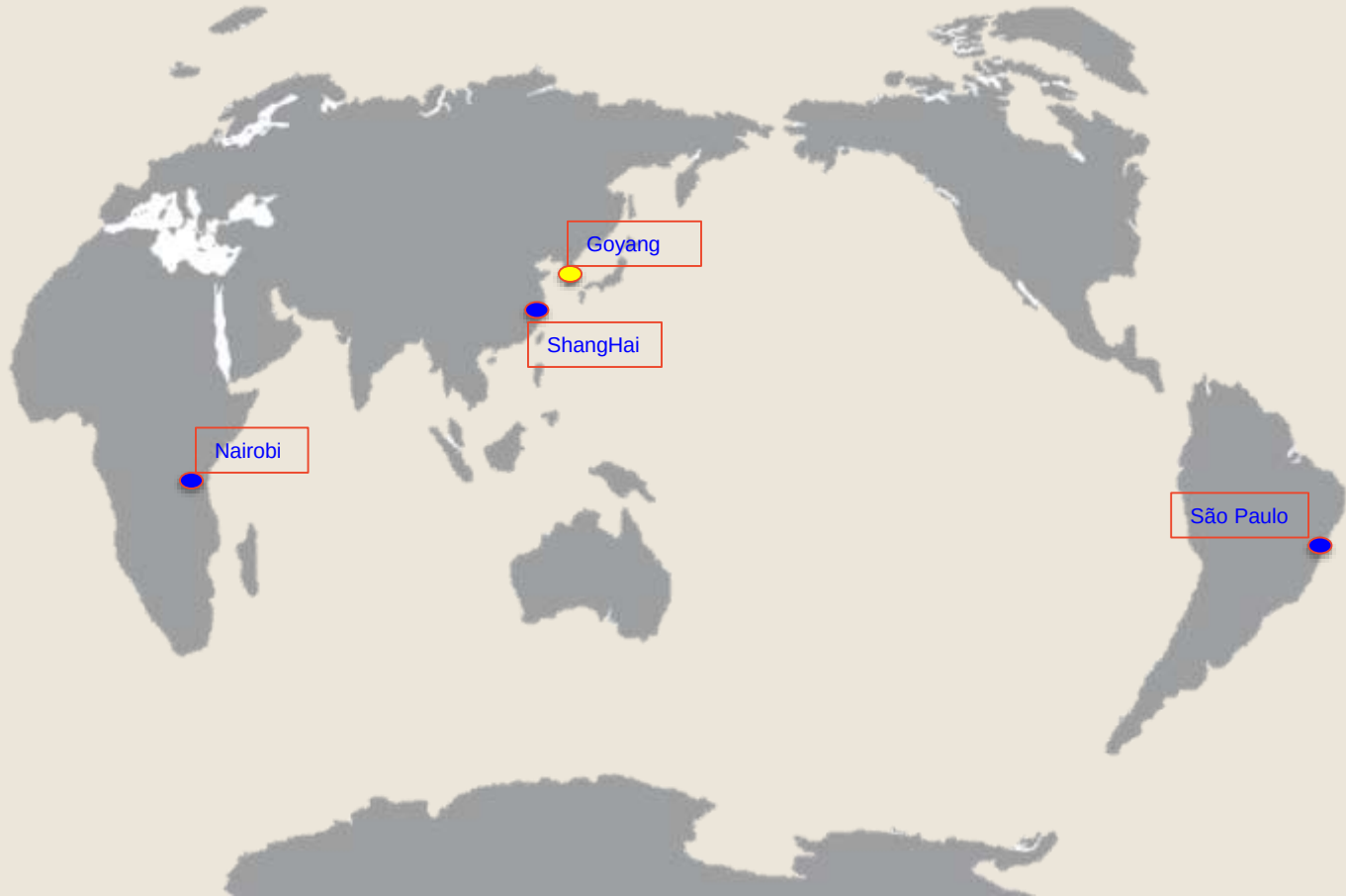
Coax-Spring

D1	D2	A	Shape - Size*
1/4"	10.22	15	DCSG-1/4-1/2-*
3/8"	13.4	15	DCSG-3/8-5/8-*
1/2"	15.75	15	DCSG-1/2-3/4-*
3/4"	22.1	20	DCSG-3/4-1-*
1"	28.45	20	DCSG-1-11/4-*



Coax-Purge Tee

Inner & Outer	Dimensions				Shape - Size*
	D1	A	B	C	
1/4"x1/2"	1/2"	95.3	127	1/4"VCR	DCPT-1/4-1/2-*
3/8"x5/8"	5/8"	95.3	152.4	1/4"VCR	DCPT-3/8-5/8-*
1/2"x3/4"	3/4"	101.6	152.4	1/4"VCR	DCPT-1/2-3/4-*
3/4"x1"	1"	108	235	1/4"VCR	DCPT-3/4-1-*
1"x1 1/4"	1 1/4"	108	241.3	1/4"VCR	DCPT-1-11/4-*



DENNAI GROUP GLOBAL LOCATIONS



DENNAI KOREA

Tel: +82-31-901-0082

Fax: +82-31-901-0016

E-Mail: austin.kr@dennai.com www.dennai.com

Rm Ro.1034, Rubenscounty, 19. Jangback-Ro,
Ilsandong-Gu, Goyang - City, Kyounggi, Korea [Zip Code 10449]



DENNAI CHINA

Tel: +86 (21)64790210

Fax: +86 (21)64790211

E-Mail: tonyliu.cn@dennai.com www.dennai.com



DENNAI BRASIL

Tel: +55-11977862666

Fax: +55-1132272638

E-Mail: linsheng.br@dennai.com www.dennai.com



DENNAI KENYA

Tel: +254-718940300

Fax: +254-718940300

E-Mail: xiaobing.ke@dennai.com www.dennai.com

