

UHP Tubing & Fittings Product Guide



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Product Code Guide



Unit : ID surface roughness in micro-inch and micro-meter



EP	Seamless	MS8 (5RA 0.127µm)	401	Ultron
		MS6 (10RA 0.254µm)		
	Welded	MS6W (10RA 0.254µm)	301	
BA	Seamless	MS4 (15RA 0.381µm)	201	Finetron
	Welded	MS4W (15RA 0.381µm)		
BEP	Seamless	MS3 (15RA 0.381µm)		TCC1
	Welded	MS3W (15RA 0.381µm)		
CFOS	Seamless	MS2 (20RA 0.508µm)	CFOS	
	Welded	MS2W (20RA 0.508µm)		
AP	Seamless	MS1 (32RA 0.812µm)	101	TCC
	Welded	MS1W (32RA 0.812µm)		
	Welded & Drawn	MS1WD (40RA 1.016µm)		
	As Welded	MS0 (Unspecified)		

Note






1. Our use of term "Welded" in this page means "Welded-as-Seamless" or Weld seam or bead completely removed like a seamless product.
2. "As-Welded" products refer to the welded product with a weld-seam present
3. MS90W is a sleeve or outer tube used for the coaxial products: MS91 or MS92

Product Code Guide



Unit : ID surface roughness in micro-inch and micro-meter



Coaxial	EP Seamless	 MS92 (5RA 0.127µm)	Coaxial
		 MS91 (10RA 0.254µm)	
	Outer Sleeve Welded	MS90W (32RA 0.812µm)	
Coil	EP Seamless	 MS72 (5RA 0.127µm)	
		 MS71 (10RA 0.254µm)	
	BA Seamless	 MS70 (15RA 0.381µm)	

Note

1. Our use of term "Welded" in this page means "Welded-as-Seamless" or Weld seam or bead completely removed like a seamless product.
2. "As-Welded" products refer to the welded product with a weld-seam present
3. MS90W is a sleeve or outer tube used for the coaxial products: MS91 or MS92

WSG Quality Measure of Competitiveness

Superior Pre-Materials enhance the quality of orbital welding

Samsung
Electronics
Approved

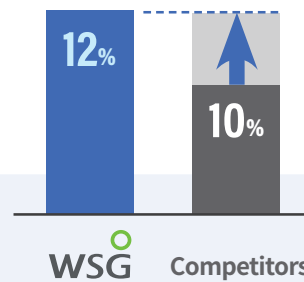
WSG uses **Ni 12** material,
which is higher than the minimum Ni requirement of
10 for TP316/L(S31603) and EN 1.4404 steels.



Ni increase effect

Using Ni 12 material enhances corrosion resistance

Ni^(Nickel) Content



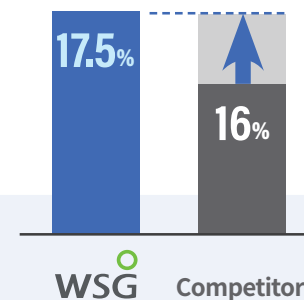
WSG uses **Cr 17.5** material,
which is higher than the minimum Cr requirement of
16 for TP316/L(S31603) and EN 1.4404 steels.



Cr increase effect

Using Cr 17.5 material enhances corrosion resistance

Cr^(Chromium) Content

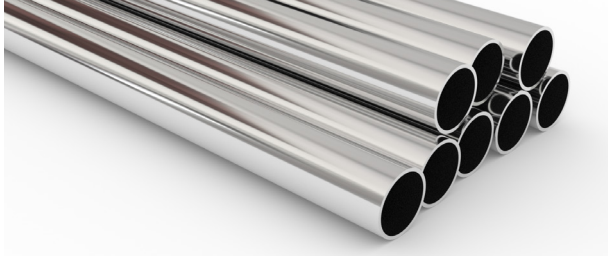


Note It is reported that both **TSMC** and **Samsung Electronics** found that the minimum level of sulfur and manganese reduces the probability of discoloration during the orbital weld procedure.

Suppliers	WSG	WSG	Competitor A	Competitor B
Specifications	JIS	ASTM/EN	ASTM	EN
Nickel (Ni)	12~16	12~14	10~14	10~13
Chromium (Cr)	17.5~18.5	17.5	16~18	16.5~18.5
Sulfur (S)	0.002%	0.005%~0.012%	0.03%	0.015%
Manganese (Mn)	0.8	1.24	2	2

Product Code MS8

EP | Double Melt



Products

- Ultra High Purity (UHP) Seamless Stainless Steel Tubing
- Electropolished (EP)

Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213, A270
- ASME B31.3

Material Grade

- **JIS Specification**
SUS316L Double Melt (VIM/VAR)
- **ASTM Specification**
316L Double Melt (VIM/VAR)
- **EU Specification**
EN1.4404

Surface Treatment

- Electro-Polishing
- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

Surface Finish

ID (Ra) Max μ -inch (μ m)	5 (0.127)
---	-----------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

Product Ends

- Tube**
 - Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding

Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m
3/4"	.750	19.05	.065	1.65	20	4m / 6m / 6.096m
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m
1-1/2"	1.50	38.10	.065	1.65	20	4m / 6m / 6.096m

Tolerances with ASTM: A269, A632, A213 & JIS G3459

Quality Testing & Inspection Environment

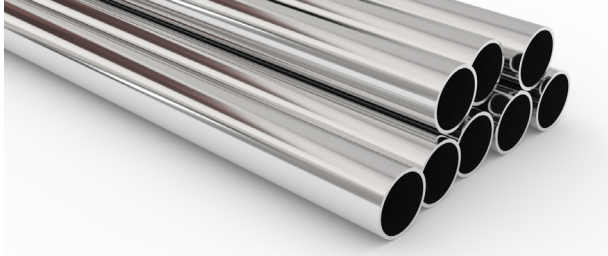
- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS6

EP | Single Melt



○ Products

- Ultra High Purity (UHP) Seamless Stainless Steel Tubing
- Electropolished (EP)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213, A270
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L Single Melt
- **ASTM Specification**
316L single Melt
- **EU Specification**
EN1.4404

○ Surface Treatment

- Electro-Polishing
- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

○ Surface Finish

ID (Ra) Max μ-inch (μm)	10 (0.254)
----------------------------------	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

Tube

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

Pipe

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding
- Bevel-end options available

○ Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m
3/4"	.750	19.05	.065	1.65	20	4m / 6m / 6.096m
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m
1-1/2"	1.50	38.10	.065	1.65	20	4m / 6m / 6.096m

Tolerances with ASTM: A269, A632, A213 & JIS G3459

○ Quality Testing & Inspection Environment

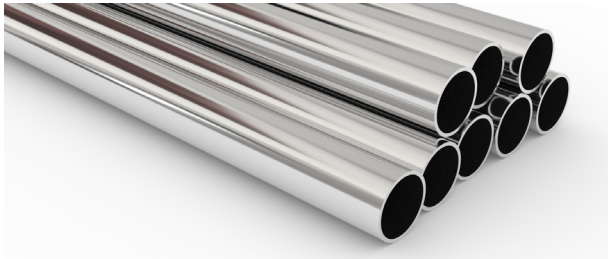
- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

○ Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS6W

EP | Welded



Products

- Ultra High Purity (UHP) Welded Stainless Steel Tubing
- Welded as Seamless (EP)

Specifications

The Product be manufactured as Welded and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A270
- ASME B31.3

Material Grade

- **JIS Specification**
SUS316L
- **ASTM Specification**
TP316L
- **EU Specification**
EN1.4404

Surface Treatment

- Electro-Polishing
- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

Surface Finish

ID (Ra) Max μ-inch (μm)	10 (0.254)
--	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

Product Ends

- Tube**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding
- Pipe**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding
 - Bevel-end options available

Product Dimension

Size	ASTM Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1"	1.00	25.40	.065	1.65	20	6m / 6.096m
1-1/2"	1.50	38.10	.065	1.65	20	6m / 6.096m
2"	2.00	50.80	.065	1.65	20	6m / 6.096m
2-1/2"	2.50	63.50	.065	1.65	20	6m / 6.096m
3"	3.00	76.20	.065	1.65	20	6m / 6.096m
4"	4.00	101.60	.083	2.11	20	6m / 6.096m
6"	6.00	152.40	.109	2.77	20	6m / 6.096m

Size	JIS Dimension			
	OD	WT	Length	
	(mm)	(mm)	(ft)	(m)
150A	165.2	2.8	20	6m / 6.096m
200A	216.3	2.8	20	6m / 6.096m
250A	267.4	3.4	20	6m / 6.096m
300A	318.5	4.0	20	6m / 6.096m
350A	355.6	4.0	20	6m / 6.096m
400A	406.4	4.5	20	6m / 6.096m
450A	457.2	4.5	20	6m / 6.096m
500A	508.0	5.0	20	6m / 6.096m
550A	558.8	5.0	20	6m / 6.096m
600A	609.6	5.5	20	6m / 6.096m

OD 6"~32" pipe sizes are also available Tolerances with ASTM: A269 & JIS G3459

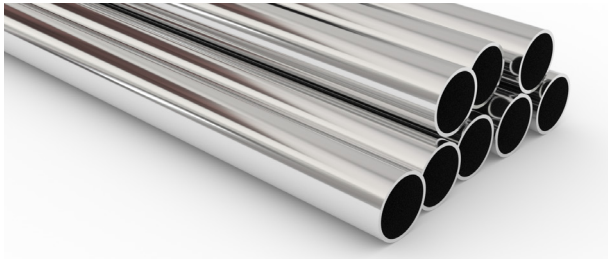
Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flange, Reverse Flattening, Flattening
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS4 BA



○ Products

- Ultra High Purity (UHP) Seamless Stainless Steel Tubing
- Bright Annealed (BA)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213, A270
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L Single Melt
- **ASTM Specification**
316L Single Melt
- **EU Specification**
EN1.4404

○ Surface Treatment

- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

○ Surface Finish

ID (Ra) Max μ-inch (μm)	15 (0.381)
---------------------------	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

- Tube**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding

- Pipe**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding
 - Bevel-end options available

○ Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m
3/4"	.750	19.05	.065	1.65	20	4m / 6m / 6.096m
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m
1-1/2"	1.50	38.10	.065	1.65	20	4m / 6m / 6.096m

Tolerances with ASTM: A269, A632, A213 & JIS G3459

○ Quality Testing & Inspection Environment

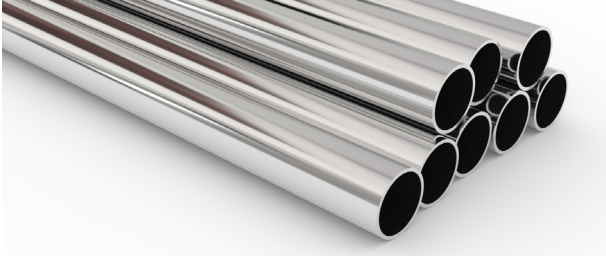
- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

○ Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS4W

BA | Welded



○ Products

- Ultra High Purity (UHP) Welded Stainless Steel Tubing
- Welded as Seamless (MP)

○ Specifications

The Product be manufactured as Welded and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A270
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L
- **ASTM Specification**
TP316L
- **EU Specification**
EN1.4404

○ Surface Treatment

- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

○ Surface Finish

ID (Ra) Max μ-inch (μm)	15 (0.381)
----------------------------------	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

- Tube**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding

- Pipe**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding
 - Bevel-end options available

○ Product Dimension

ASTM Dimension						
Size	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1"	1.00	25.40	.065	1.65	20	6m / 6.096m
1-1/2"	1.50	38.10	.065	1.65	20	6m / 6.096m
2"	2.00	50.80	.065	1.65	20	6m / 6.096m
2-1/2"	2.50	63.50	.065	1.65	20	6m / 6.096m
3"	3.00	76.20	.065	1.65	20	6m / 6.096m
4"	4.00	101.60	.083	2.11	20	6m / 6.096m
6"	6.00	152.40	.109	2.77	20	6m / 6.096m

JIS Dimension				
Size	OD	WT	Length	
	(mm)	(mm)	(ft)	(m)
150A	165.2	2.8	20	6m / 6.096m
200A	216.3	2.8	20	6m / 6.096m
250A	267.4	3.4	20	6m / 6.096m
300A	318.5	4.0	20	6m / 6.096m
350A	355.6	4.0	20	6m / 6.096m
400A	406.4	4.5	20	6m / 6.096m
450A	457.2	4.5	20	6m / 6.096m
500A	508.0	5.0	20	6m / 6.096m
550A	558.8	5.0	20	6m / 6.096m
600A	609.6	5.5	20	6m / 6.096m

OD 6"~32" pipe sizes are also available Tolerances with ASTM: A269 & JIS G3459

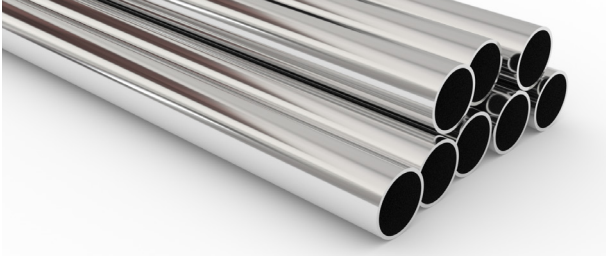
○ Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flange, Reverse Flattening, Flattening
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

○ Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS3 BEP



○ Products

- Ultra High Purity (UHP) Seamless Stainless Steel Tubing
- Bright Annealed (BA)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213, A270
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L
- **ASTM Specification**
TP316L
- **EU Specification**
EN1.4404

○ Surface Treatment

- ACL (Anodical Cleaning) (CGA G4.1 and ASTM G93)

○ Surface Finish

ID (Ra) Max μ-inch (μm)	15 (0.381)
---------------------------	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

Tube

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

Pipe

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding
- Bevel-end options available

○ Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m
3/4"	.750	19.05	.065	1.65	20	4m / 6m / 6.096m
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m

Tolerances with ASTM: A269, A632, A213 & JIS G3459

○ Quality Testing & Inspection Environment

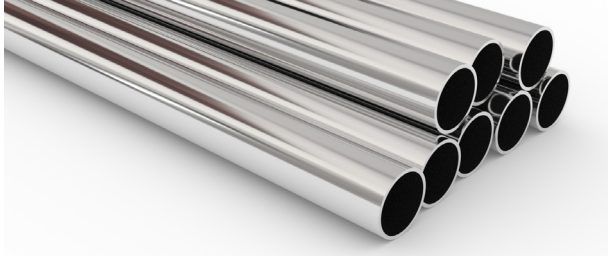
- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

○ Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS3W

BEP | Welded



Products

- Ultra High Purity (UHP) Welded Stainless Steel Tubing
- Welded as Seamless (MP)

Specifications

The Product be manufactured as Welded and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A270
- ASME B31.3

Material Grade

- **JIS Specification**
SUS316L
- **ASTM Specification**
TP316L
- **EU Specification**
EN1.4404

Surface Treatment

- ACL (Anodical Cleaning) (CGA G4.1 and ASTM G93)

Surface Finish

ID (Ra) Max μ -inch (μ m)	32 (0.812)
---	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

Product Ends

- Tube**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding

- Pipe**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding
 - Bevel-end options available

Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m
1-1/2"	1.50	38.10	.065	1.65	20	4m / 6m / 6.096m
2"	2.00	50.80	.065	1.65	20	4m / 6m / 6.096m
2-1/2"	2.50	63.50	.065	1.65	20	4m / 6m / 6.096m
3"	3.00	76.20	.065	1.65	20	4m / 6m / 6.096m
4"	4.00	101.60	.083	2.11	20	4m / 6m / 6.096m
6"	6.00	152.40	.109	2.77	20	4m / 6m / 6.096m

OD 6"~32" pipe sizes are also available Tolerances with ASTM: A269 & JIS G3459

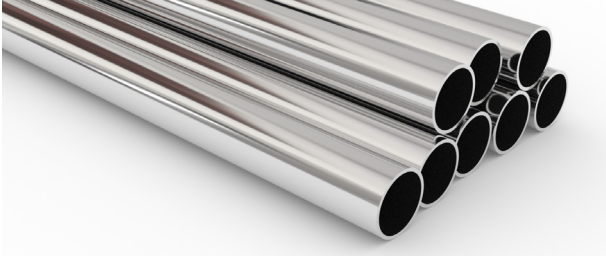
Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flange, Reverse Flattening, Flattening
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code **MS2** CFOS



○ Products

- Ultra High Purity (UHP) Seamless Stainless Steel Tubing
- Bright Annealed (BA)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213, A270
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L
- **ASTM Specification**
TP316L
- **EU Specification**
EN1.4404

○ Surface Treatment

- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

○ Surface Finish

ID (Ra) Max μ -inch (μ m)	20 (0.508)
---	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

Tube

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

Pipe

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding
- Bevel-end options available

○ Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m
3/4"	.750	19.05	.065	1.65	20	4m / 6m / 6.096m
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m

Tolerances with ASTM: A269, A632, A213 & JIS G3459

○ Quality Testing & Inspection Environment

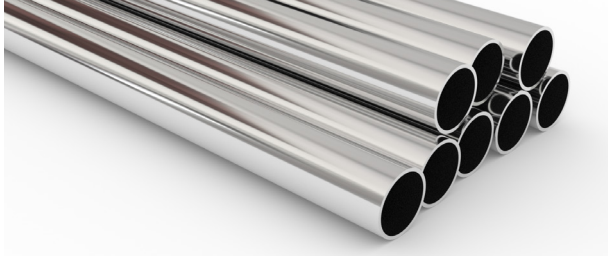
- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)

○ Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS2W

CFOS | Welded



Products

- Ultra High Purity (UHP) Welded Stainless Steel Tubing
- Welded as Seamless (MP)

Specifications

The Product be manufactured as Welded and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A270
- ASME B31.3

Material Grade

- **JIS Specification**
SUS304 / SUS304L / SUS316 / SUS316L
- **ASTM Specification**
TP304 / TP304L / TP316 / TP316L
- **EU Specification**
EN1.4301 / EN1.4307 / EN1.4404

Surface Treatment

- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

Surface Finish

ID (Ra) Max μ -inch (μ m)	20 (0.508)
---	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

Product Ends

- Tube**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding

- Pipe**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding
 - Bevel-end options available

Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m
1-1/2"	1.50	38.10	.065	1.65	20	4m / 6m / 6.096m
2"	2.00	50.80	.065	1.65	20	4m / 6m / 6.096m
2-1/2"	2.50	63.50	.065	1.65	20	4m / 6m / 6.096m
3"	3.00	76.20	.065	1.65	20	4m / 6m / 6.096m
4"	4.00	101.60	.083	2.11	20	4m / 6m / 6.096m
6"	6.00	152.40	.109	2.77	20	4m / 6m / 6.096m

Tolerances with ASTM: A269 & JIS G3459

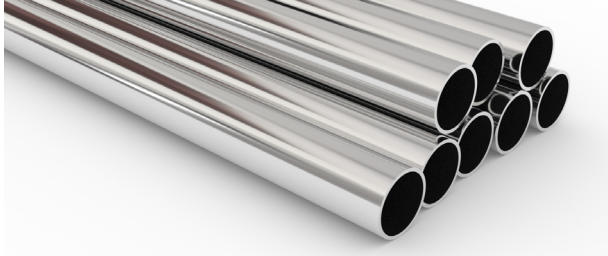
Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flange, Reverse Flattening, Flattening
- Helium-leak testing (Optional*)

Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS1 AP



○ Products

- Ultra High Purity (UHP) Seamless Stainless Steel Tubing
- Bright Annealed (AP)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213, A270
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L
- **ASTM Specification**
TP316L
- **EU Specification**
EN1.4404

○ Surface Treatment

- Cleaning (ASTM A632-S3)

○ Surface Finish

ID (Ra) Max μ-inch (μm)	32 (0.812)
----------------------------------	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

Tube

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

Pipe

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding
- Bevel-end options available

○ Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m
3/4"	.750	19.05	.065	1.65	20	4m / 6m / 6.096m
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m

Tolerances with ASTM: A269, A632, A213 & JIS G3459

○ Quality Testing & Inspection Environment

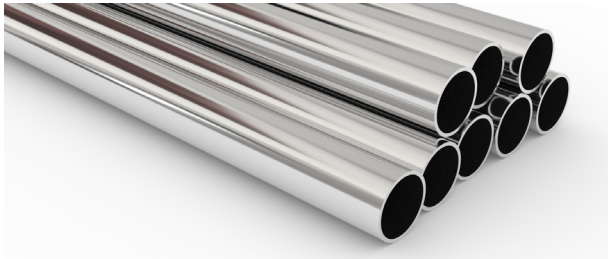
- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)

○ Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS1W

AP | Welded



Products

- Ultra High Purity (UHP) Welded Stainless Steel Tubing
- Welded as Seamless (AP)

Specifications

The Product be manufactured as Welded and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269
- ASME B31.3

Material Grade

- **JIS Specification**
SUS304 / SUS304L / SUS316 / SUS316L
- **ASTM Specification**
TP304 / TP304L / TP316 / TP316L
- **EU Specification**
EN1.4301 / EN1.4307 / EN1.4404

Surface Treatment

- Cleaning (ASTM A632-S3)

Surface Finish

ID (Ra) Max μ -inch (μ m)	32 (0.812)
---	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

Product Ends

- Tube**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding

- Pipe**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding
 - Bevel-end options available

Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m
1-1/2"	1.50	38.10	.065	1.65	20	4m / 6m / 6.096m
2"	2.00	50.80	.065	1.65	20	4m / 6m / 6.096m
2-1/2"	2.50	63.50	.065	1.65	20	4m / 6m / 6.096m
3"	3.00	76.20	.065	1.65	20	4m / 6m / 6.096m
4"	4.00	101.60	.083	2.11	20	4m / 6m / 6.096m
6"	6.00	152.40	.109	2.77	20	4m / 6m / 6.096m

OD 6"~32" pipe sizes are also available Tolerances with ASTM: A269 & JIS G3459

Quality Testing & Inspection Environment

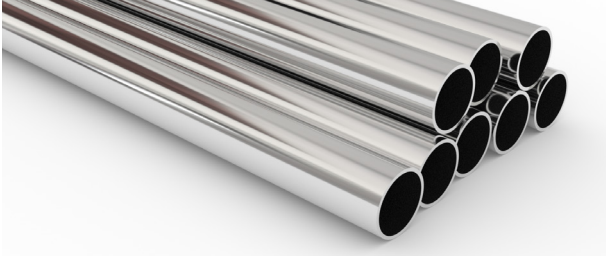
- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flange, Reverse Flattening, Flattening
- Helium-leak testing (Optional*)

Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204-2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS1WD

AP | Welded and Drawn



○ Products

- Ultra High Purity (UHP) Welded Stainless Steel Tubing
- Bright Annealed (AP)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L
- **ASTM Specification**
TP316L
- **EU Specification**
EN1.4404

○ Surface Treatment

- Cleaning (ASTM A632-S3)

○ Surface Finish

ID (Ra) Max μ -inch (μ m)	40 (1.016)
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Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

Tube

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

Pipe

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding
- Bevel-end options available

○ Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m
3/4"	.750	19.05	.065	1.65	20	4m / 6m / 6.096m
1"	1.00	25.40	.065	1.65	20	4m / 6m / 6.096m

Tolerances with ASTM: A269 & JIS G3459

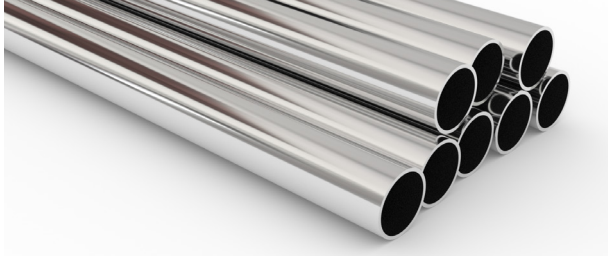
○ Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flange, Reverse Flattening, Flattening
- Helium-leak testing (Optional*)

○ Material Test Report

- Material Test Certificate conforming to EN10204:2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204:2004 (Optional*)
- Lot & heat identification for traceability

Product Code MSO AP



○ Products

- Ultra High Purity (UHP) Welded Stainless Steel Tubing
- Annealed & pickled (A/P)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A312
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS304 / SUS304L / SUS316 / SUS316L
- **ASTM Specification**
TP304 / TP304L / TP316 / TP316L
- **EU Specification**
EN1.4301 / EN1.4307 / EN1.4404

○ Surface Treatment

○ Surface Finish

ID (Ra) Max μ-inch (μm)	Unspecified
---------------------------	-------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

Tube

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

Pipe

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding
- Bevel-end options available

○ Product Dimension

Size	Dimension			
	OD	WT	Length	
	(mm)	(mm)	(ft)	(m)
150A	165.2	2.8	20	4m / 6m / 6.096m
200A	216.3	2.8	20	4m / 6m / 6.096m
250A	267.4	3.4	20	4m / 6m / 6.096m
300A	318.5	4.0	20	4m / 6m / 6.096m
350A	355.6	4.0	20	4m / 6m / 6.096m
400A	406.4	4.5	20	4m / 6m / 6.096m
450A	457.2	4.5	20	4m / 6m / 6.096m
500A	508.0	5.0	20	4m / 6m / 6.096m
550A	558.8	5.0	20	4m / 6m / 6.096m
600A	609.6	5.5	20	4m / 6m / 6.096m

Tolerances with ASTM: A269 & JIS G3459

○ Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flange, Reverse Flattening, Flattening
- Helium-leak testing (Optional*)

○ Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204:2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS92

EP | Inner Tube - Coaxial Double Melt



○ Products

- Ultra High Purity (UHP) Seamless Stainless Steel Tubing
- Electropolished (EP)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L Double Melt
- **ASTM Specification**
316L Double Melt
- **EU Specification**
EN1.4404

○ Surface Treatment

- Electro-Polishing
- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

○ Surface Finish

ID (Ra) Max μ-inch (μm)	5 (0.127)
----------------------------------	-----------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

- Tube**
- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

○ Product Dimension

Size	Dimension							
	Inner Tube				Outer Tube			
	OD1		WT1		OD2		WT2	
	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)
1/4"	.250	6.35	.035	0.89	.500	12.70	.049	1.24
1/4"	.250	6.35	.039	1.00	.500	12.70	.049	1.24
3/8"	.375	9.53	.035	0.89	.625	15.88	.049	1.24
3/8"	.375	9.53	.039	1.00	.625	15.88	.049	1.24
1/2"	.500	12.70	.049	1.24	.750	19.05	.065	1.65
3/4"	.750	19.05	.065	1.65	1.00	25.40	.065	1.65
1"	1.00	25.40	.065	1.65	1.25	31.75	.065	1.65
1-1/2"	1.50	38.10	.065	1.65	2.00	50.80	.065	1.65

Tolerances with ASTM: A269, A632, A213 & JIS G3459

○ Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

○ Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204:2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS91

EP | Inner Tube - Coaxial Single Melt



Products

- Ultra High Purity (UHP) Seamless Stainless Steel Tubing
- Electropolished (EP)

Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213, A270
- ASME B31.3

Material Grade

- **JIS Specification**
SUS316L Single Melt
- **ASTM Specification**
316L Single Melt
- **EU Specification**
EN1.4404

Surface Treatment

- Electro-Polishing
- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

Surface Finish

ID (Ra) Max μ-inch (μm)	10 (0.254)
----------------------------------	------------

Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

Product Ends

- Tube**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding
- Pipe**
- Plain-ended
 - Perpendicular 90° Angle Cut suitable for orbital welding
 - Bevel-end options available

Product Dimension

Size	Dimension							
	Inner Tube				Outer Tube			
	OD1		WT1		OD2		WT2	
	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)
1/4"	.250	6.35	.035	0.89	.500	12.70	.049	1.24
1/4"	.250	6.35	.039	1.00	.500	12.70	.049	1.24
3/8"	.375	9.53	.035	0.89	.625	15.88	.049	1.24
3/8"	.375	9.53	.039	1.00	.625	15.88	.049	1.24
1/2"	.500	12.70	.049	1.24	.750	19.05	.065	1.65
3/4"	.750	19.05	.065	1.65	1.00	25.40	.065	1.65
1"	1.00	25.40	.065	1.65	1.25	31.75	.065	1.65
1-1/2"	1.50	38.10	.065	1.65	2.00	50.80	.065	1.65

Tolerances with ASTM: A269, A632, A213 & JIS G3459

Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204:2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS90W

AP | Coaxial Outer Sleeve



Products

- Ultra High Purity (UHP) Welded Stainless Steel Tubing
- Bright Annealed (BA)

Specifications

The Product be manufactured as Welded and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269
- ASME B31.3

Material Grade

- **JIS Specification**
SUS304 / SUS304L / SUS316 / SUS316L
- **ASTM Specification**
TP304 / TP304L / TP316 / TP316L
- **EU Specification**
EN1.4301 / EN1.4307 / EN1.4404

Surface Treatment

- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

Surface Finish

ID (Ra) Max μ-inch (μm)	32 (0.812)
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Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

Product Ends

Tube

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

Pipe

- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding
- Bevel-end options available

Product Dimension

Size	Dimension							
	Inner Tube				Outer Tube			
	OD1		WT1		OD2		WT2	
	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)
3/8"	.375	9.53	.035	0.89	.625	15.88	.049	1.24
3/8"	.375	9.53	.039	1.00	.625	15.88	.049	1.24
1/2"	.500	12.70	.049	1.24	.750	19.05	.065	1.65
3/4"	.750	19.05	.065	1.65	1.00	25.40	.065	1.65
1"	1.00	25.40	.065	1.65	1.25	31.75	.065	1.65
1-1/2"	1.50	38.10	.065	1.65	2.00	50.80	.065	1.65
2"	2.00	50.80	.065	1.65	2.50	63.50	.065	1.65

Tolerances with ASTM: A269 & JIS G3459

Quality Testing & Inspection Environment

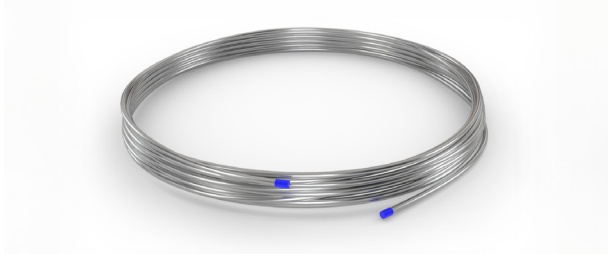
- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flange, Reverse Flattening, Flattening
- Helium-leak testing (Optional*)

Material Test Report

- Material Test Certificate conforming to EN10204:2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204:2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS72

EP | Coil Double Melt



○ Products

- Ultra High Purity (UHP) Seamless Stainless Coil Tubing
- Electropolished (EP)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L Double Melt
- **ASTM Specification**
316L Double Melt
- **EU Specification**
EN1.4404

○ Surface Treatment

- Electro-Polishing
- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

○ Surface Finish

ID (Ra) Max μ-inch (μm)	5 (0.127)
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Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

- Tube**
- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

○ Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m

Tolerances with ASTM: A269, A213& JIS G3459

○ Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

○ Material Test Report

- Material Test Certificate conforming to EN10204:2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204:2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS71

EP | Coil Single Melt



○ Products

- Ultra High Purity (UHP) Seamless Stainless Coil Tubing
- Electropolished (EP)

○ Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213
- ASME B31.3

○ Material Grade

- **JIS Specification**
SUS316L Single Melt
- **ASTM Specification**
316L Single Melt
- **EU Specification**
EN1.4404

○ Surface Treatment

- Electro-Polishing
- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

○ Surface Finish

ID (Ra) Max μ -inch (μ m)	10 (0.254)
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Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

○ Product Ends

- Tube**
- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

○ Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m

Tolerances with ASTM: A269, A632, A213 & JIS G3459

○ Quality Testing & Inspection Environment

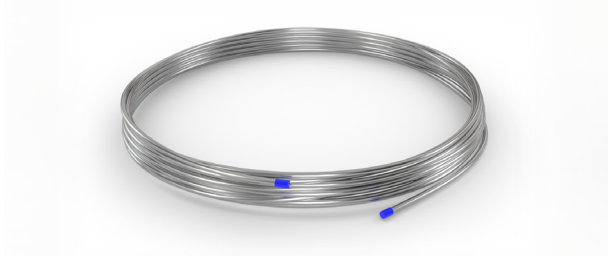
- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

○ Material Test Report

- Material Test Certificate conforming to EN10204:2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204:2004 (Optional*)
- Lot & heat identification for traceability

Product Code MS70

BA | Seamless Single Melt



Products

- Ultra High Purity (UHP) Seamless Stainless Coil Tubing
- Bright Annealed (BA)

Specifications

The Product be manufactured as seamless and bright annealed and certified according to the latest edition of all of the following reference specifications:

- JIS G3459
- ASTM A269, A213
- ASME B31.3

Material Grade

- **JIS Specification**
SUS316L Single Melt
- **ASTM Specification**
316L Single Melt
- **EU Specification**
EN1.4404

Surface Treatment

- Precision Cleaning & Passivation (CGA G4.1 and ASTM G93)

Surface Finish

ID (Ra) Max μ-inch (μm)	15 (0.381)
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Standard outside diameter finish (may exhibit minor surface imperfections) or superior outside diameter finish as directed by customer's purchase order.

Product Ends

- Tube**
- Plain-ended
- Perpendicular 90° Angle Cut suitable for orbital welding

Product Dimension

Size	Dimension					
	OD		WT		Length	
	(inch)	(mm)	(inch)	(mm)	(ft)	(m)
1/4"	.250	6.35	.035	0.89	20	4m / 6m / 6.096m
1/4"	.250	6.35	.039	1.00	20	4m / 6m / 6.096m
3/8"	.375	9.53	.035	0.89	20	4m / 6m / 6.096m
3/8"	.375	9.53	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.039	1.00	20	4m / 6m / 6.096m
1/2"	.500	12.70	.049	1.24	20	4m / 6m / 6.096m

Tolerances with ASTM: A269, A632, A213 & JIS G3459

Quality Testing & Inspection Environment

- Visual Inspection
- Surface Roughness Measurement
- Oil Content Test
- Moisture Test (Optional*)
- Corrosion Test
- Particle Test
- Hardness
- Tensile Strength
- Flaring
- Helium-leak testing (Optional*)
- Scanning Electron Microscopy (SEM)
- Auger Electron Microscopy (AES)
- Electron Spectroscopy for Chemical Analysis (ESCA or XPS)

Material Test Report

- Material Test Certificate conforming to EN10204-2004 3.1
- Chemical composition
- Applicable specification designation
- Nominal outside diameter size
- Statement of quality assurance testing
- Inspection Certificate type 3.1 per EN 10204:2004 (Optional*)
- Lot & heat identification for traceability

Marking & Packaging



Line-marking Specifications (Tubing)

- Usage: BULK WSG Brand: CREST · Finish Code: EP · Material Grade: SUS316L · Dimension (OD * WT * Length)
- Method of Manufacture: SML · Non-Destructive Tested: NDE · HCN(Heat Code Number) · Production Code

Sample (Continuous in one line)
 BULK WSG EP SUS316L 6.35X1X4000 SML NDE (HCN) (Production Code)

Marking Specifications (Fittings)

- WSG Brand: WSG CREST
- Part No.
- Material Grade: 316L
- Finish Code: EP
- Heat Number: HT# SC12345

Sample
 WSG CREST
 FHP-XXX-XXXX
 TP316L EP
 HT#12345

End Cap Color Differentiation

End caps are color-coordinated according to the different surface finish requirement

MS8	MS6	MS6W	MS4	MS3	MS2	MS0	MS92	MS91	MS72	MS71	MS70
●	●	●	○	○	●	●	●	●	●	●	○
Blue	Blue	Blue	White	White	Blue	Red	Yellow	Yellow	Yellow	Blue	White

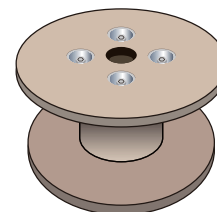
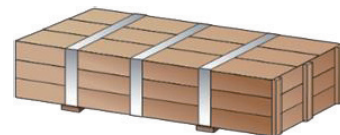
Packaging & Packing

- N2 Purge (Purity of gas : 99.9998%)**
- Sleeve EP :** 0.15mm thickness poly-vinyl double-bagged
- BA/AP :** Sleeve 0.25mm thickness polyvinyl Single -bagged

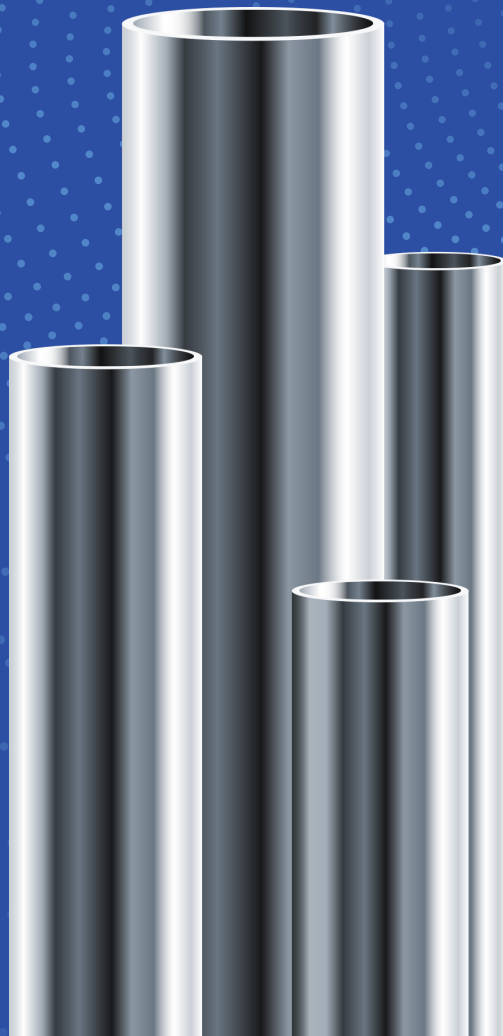
Wooden Box Quantities

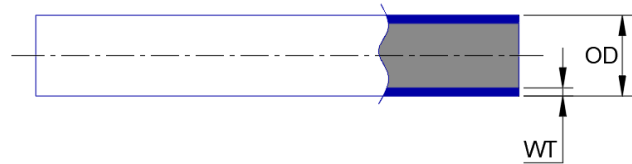
Tube

OD		Length		Quantity		
Inch	mm	ft	m	lengths	ft	m
0.25	6.35	20	6.096	1,000	20,000	6,096
0.375	9.53	20	6.096	600	12,000	3,657
0.5	12.7	20	6.096	500	10,000	3,048
0.75	19.05	20	6.096	300	6,000	1,829
1	25.4	20	6.096	243	4,860	1,481
1.5	38.1	20	6.096	102	2,040	622
2	50.8	20	6.096	59	1,180	360
2.5	63.5	20	6.096	35	700	213
3	76.2	20	6.096	24	480	146
4	101.6	20	6.096	12	240	73
6	152.4	20	6.096	5	100	30



UHP Tubing





UHP Tubing

Part Number	Size	OD	WT		L
	inch	mm	inch	mm	ft/m
xxx-01y-zz013020	1/8	3.175	0.02008	0.510	20ft / 6.096m or 4m, 6m
xxx-01y-zz013028	1/8	3.175	0.02795	0.710	20ft / 6.096m or 4m, 6m
xxx-01y-zz025035	1/4	6.35	0.03504	0.890	20ft / 6.096m or 4m, 6m
xxx-01y-zz025039	1/4	6.35	0.03937	1.000	20ft / 6.096m or 4m, 6m
xxx-01y-zz038035	3/8	9.53	0.03504	0.890	20ft / 6.096m or 4m, 6m
xxx-01y-zz038039	3/8	9.53	0.03937	1.000	20ft / 6.096m or 4m, 6m
xxx-01y-zz050039	1/2	12.70	0.03937	1.000	20ft / 6.096m or 4m, 6m
xxx-01y-zz050049	1/2	12.70	0.04882	1.240	20ft / 6.096m or 4m, 6m
xxx-01y-zz075065	3/4	19.05	0.06496	1.650	20ft / 6.096m or 4m, 6m
xxx-01y-zz100065	1	25.40	0.06496	1.650	20ft / 6.096m or 4m, 6m
xxx-01y-zz150065	1 1/2	38.10	0.06496	1.650	20ft / 6.096m or 4m, 6m
xxx-01y-zz200065	2	50.80	0.06496	1.650	20ft / 6.096m or 4m, 6m
xxx-01y-zz250065	2 1/2	63.50	0.06496	1.650	20ft / 6.096m or 4m, 6m
xxx-01y-zz300065	3	76.20	0.06496	1.650	20ft / 6.096m or 4m, 6m
xxx-01y-zz400083	4	101.60	0.08307	2.110	20ft / 6.096m or 4m, 6m

Code Description

Code XXX	Description
MS8	EP 316L Seamless Double Melt
MS6	EP 316L Seamless Single Melt
MS6W	EP 316L Welded
MS4	BA 316L Seamless Single Melt
MS4W	BA 316L Welded
MS3	BEP 316L Seamless
MS3W	BEP 316L Welded
MS2	CFOS 316L Seamless
MS2W	CFOS 316L Welded
MS1	AP 316L Seamless
MS1W	AP 316L Welded
MS1WD	AP 316L Welded & Drawn
MS0	AP 316L As Welded

Code Y	Description
0	AP (Unpolished)
2	BA (ID Polished/OD Polished)
8	EP (ID Electropolished)

Code ZZ	Description
60	TP316L
62	TP316L S .005-0.012%
66	SUS316L
68	316L VIM/VAR



HVT Tubing

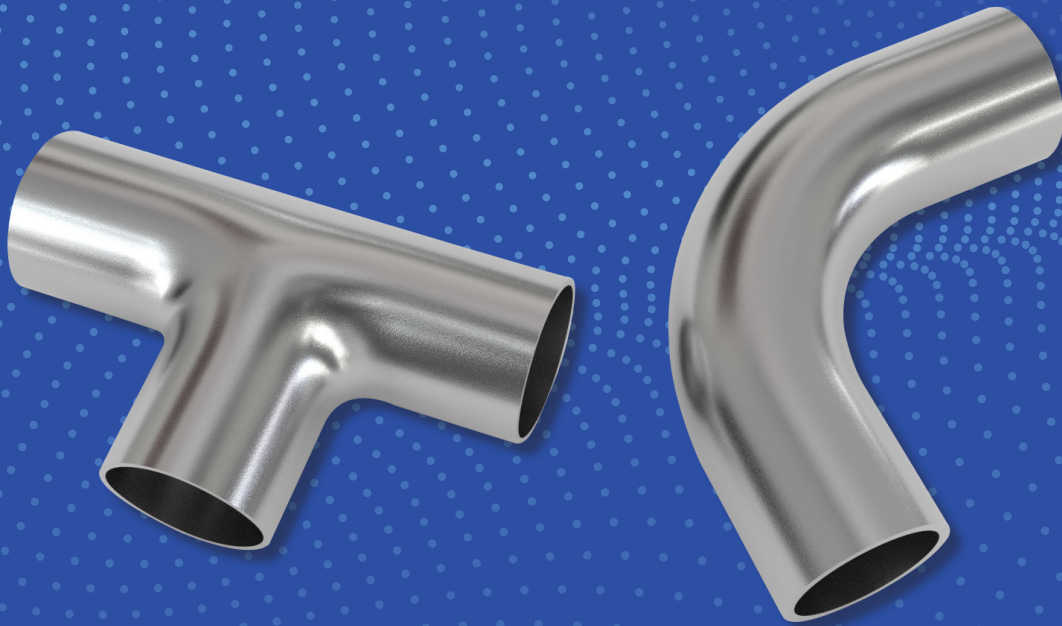
Part Number	Size	OD	WT		L
	inch	mm	inch	mm	ft/m
xxx-01y-zz050049	1/2	12.7	0.049	1.24	20ft or 10ft, 3m, 6m
xxx-01y-zz050065	1/2	12.7	0.065	1.65	20ft or 10ft, 3m, 6m
xxx-01y-zz075065	3/4	19.1	0.065	1.65	20ft or 10ft, 3m, 6m
xxx-01y-zz100065	1	25.4	0.065	1.65	20ft or 10ft, 3m, 6m
xxx-11y-zz100065*	1	25.4	0.065	1.65	20ft or 10ft, 3m, 6m
xxx-11y-zz150065*	1 1/2	38.1	0.065	1.65	20ft or 10ft, 3m, 6m
xxx-11y-zz200065*	2	50.8	0.065	1.65	20ft or 10ft, 3m, 6m
xxx-11y-zz250065*	2 1/2	63.5	0.065	1.65	20ft or 10ft, 3m, 6m
xxx-11y-zz300065*	3	76.2	0.065	1.65	20ft or 10ft, 3m, 6m
xxx-11y-zz400065*	4	101.6	0.065	1.65	20ft or 10ft, 3m, 6m
xxx-11y-zz400083*	4	101.6	0.083	2.11	20ft or 10ft, 3m, 6m
xxx-11y-zz600083*	6	152.4	0.083	2.11	20ft or 10ft, 3m, 6m
xxx-11y-zz600109*	6	152.4	0.109	2.77	20ft or 10ft, 3m, 6m

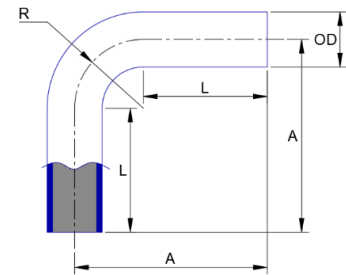
Code Description

Code XXX	Description	Code Y	Description	Code ZZ	Description
HV0	HVT Seamless	0	AP (Unpolished)	30	TP304
HV1	HVT Welded	2	BA (ID Polished/OD Polished)	32	TP304L S .005~0.017%
		8	EP (ID Electropolished)		

UHP Bend Fitting

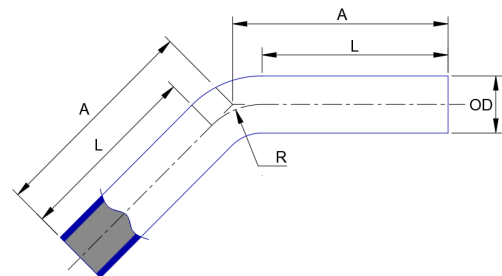
- UHP 90° Elbow / UHP 45° Elbow
- UHP Equal Tee
- UHP Reducing Tee
- UHP Concentric Reducer
- UHP Coaxial Tubing / UHP Coaxial 90° Elbow
- UHP Coaxial 45° Elbow / UHP Coaxial Equal Tee
- UHP Coaxial Reducing Tee
- UHP Coaxial Sleeve / UHP Coaxial Terminator





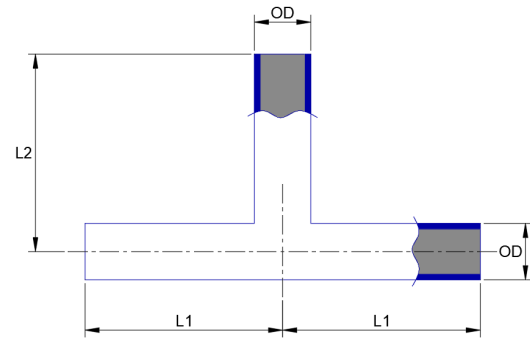
UHP 90° Elbow

Part Number	Size	OD	WT	A	L	R
	inch	mm	mm	mm	mm	mm
FHP-xxx-9Ey-zz025035	1/4	6.35	0.89	66.70	52.4	14.30
FHP-xxx-9Ey-zz038035	3/8	9.53	0.89	66.70	38.1	28.60
FHP-xxx-9Ey-zz050039	1/2	12.70	1.24	76.20	49.2	27.00
FHP-xxx-9Ey-zz075065	3/4	19.05	1.65	76.20	47.6	28.60
FHP-xxx-9Ey-zz100065	1	25.40	1.65	76.20	38.1	38.10
FHP-xxx-9Ey-zz150065	1 1/2	38.10	1.65	95.30	38.1	57.20
FHP-xxx-9Ey-zz200065	2	50.80	1.65	120.70	44.5	76.20
FHP-xxx-9Ey-zz250065	2 1/2	63.50	1.65	139.70	44.5	95.30
FHP-xxx-9Ey-zz300065	3	76.20	1.65	158.50	44.5	114.30
FHP-xxx-9Ey-zz400083	4	101.60	2.11	203.20	50.8	152.40



UHP 45° Elbow

Part Number	Size	OD	WT	A	L	R
	inch	mm	mm	mm	mm	mm
FHP-xxx-4Ey-zz025035	1/4	6.35	0.89	50.80	44.88	14.3
FHP-xxx-4Ey-zz038035	3/8	9.53	0.89	50.80	38.95	28.6
FHP-xxx-4Ey-zz050039	1/2	12.70	1.24	57.20	46.02	27
FHP-xxx-4Ey-zz075065	3/4	19.05	1.65	57.20	45.35	28.6
FHP-xxx-4Ey-zz100065	1	25.40	1.65	57.20	41.42	38.1
FHP-xxx-4Ey-zz150065	1 1/2	38.10	1.65	63.50	39.81	57.2
FHP-xxx-4Ey-zz200065	2	50.80	1.65	76.20	44.64	76.2
FHP-xxx-4Ey-zz250065	2 1/2	63.50	1.65	85.70	46.23	95.3
FHP-xxx-4Ey-zz300065	3	76.20	1.65	92.10	44.76	114.3
FHP-xxx-4Ey-zz400083	4	101.60	2.11	114.30	51.17	152.40

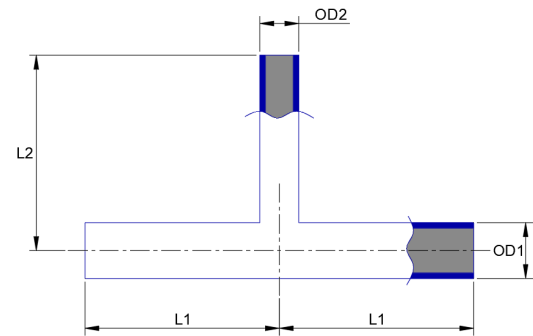


UHP Equal Tee

Part Number	Size	OD	WT	L1	L2
	inch	mm	mm	mm	mm
FHP-xxx-8Ty-zz025035	1/4	6.35	0.89	44.50	44.5
FHP-xxx-8Ty-zz038035	3/8	9.53	0.89	44.50	44.5
FHP-xxx-8Ty-zz050039	1/2	12.70	1.24	47.60	47.6
FHP-xxx-8Ty-zz075065	3/4	19.05	1.65	50.80	50.8
FHP-xxx-8Ty-zz100065	1	25.40	1.65	54.00	54
FHP-xxx-8Ty-zz150065	1 1/2	38.10	1.65	60.30	60.3
FHP-xxx-8Ty-zz200065	2	50.80	1.65	73.00	73
FHP-xxx-8Ty-zz250065	2 1/2	63.50	1.65	79.40	79.4
FHP-xxx-8Ty-zz300065	3	76.20	1.65	85.75	85.75
FHP-xxx-8Ty-zz400083	4	101.60	2.11	104.80	104.80

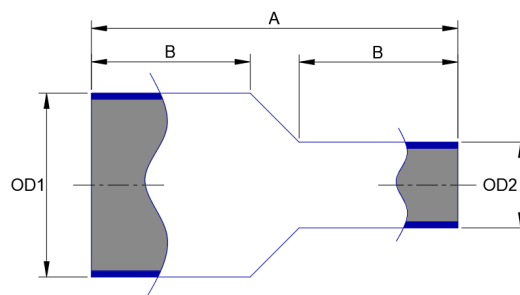
Code Description

Code XXX	Description	Code Y	Description	Code ZZ	Description
MS8	EP 316L Seamless Double Melt	0	AP (Unpolished)	60	TP316L
MS6	EP 316L Seamless Single Melt	2	BA (ID Polished/OD Polished)	62	TP316L S.005~0.012%
MS6W	EP 316L Welded	8	EP (ID Electropolished)	66	SUS316L
MS4	BA 316L Seamless Single Melt			68	316L VIM/VAR
MS4W	BA 316L Welded				
MS3	BEP 316L Seamless				
MS3W	BEP 316L Welded				
MS2	CFOS 316L Seamless				
MS2W	CFOS 316L Welded				
MS1	AP 316L Seamless				
MS1W	AP 316L Welded				
MS1WD	AP 316L Welded & Drawn				
MS0	AP 316L As Welded				



UHP Reducing Tee

Part Number	Size	OD1	OD2	WT1	WT2	L1	L2
	inch	mm	mm	mm	mm	mm	mm
FHP-xxx-9Ty-zz038025	3/8x1/4	9.53	6.35	0.89	0.89	44.50	44.5
FHP-xxx-9Ty-zz050025	1/2x1/4	12.70	6.35	0.89	0.89	47.60	47.6
FHP-xxx-9Ty-zz050038	1/2x3/8	12.70	9.53	0.89	0.89	47.60	47.6
FHP-xxx-9Ty-zz075025	3/4x1/4	19.05	6.35	0.89	0.89	50.80	50.8
FHP-xxx-9Ty-zz075038	3/4x3/8	19.05	9.53	0.89	0.89	50.80	50.8
FHP-xxx-9Ty-zz075050	3/4x1/2	19.05	12.7	1.24	1.24	50.80	50.8
FHP-xxx-9Ty-zz100025	1x1/4	25.40	6.35	1.65	1.65	54.00	54
FHP-xxx-9Ty-zz100038	1x3/8	25.40	9.53	1.65	1.65	54.00	54
FHP-xxx-9Ty-zz100050	1x1/2	25.40	12.7	1.65	1.65	54.00	54
FHP-xxx-9Ty-zz100075	1x3/4	25.40	19.05	1.65	1.65	54.00	54
FHP-xxx-9Ty-zz150050	1 1/2x 1/2	38.10	12.7	1.65	1.65	60.30	60.3
FHP-xxx-9Ty-zz150075	1 1/2x 3/4	38.10	19.05	1.65	1.65	60.30	60.3
FHP-xxx-9Ty-zz150100	1 1/2x 1	38.10	25.4	2.11	2.11	60.30	60.3
FHP-xxx-9Ty-zz200050	2x1/2	50.80	12.7	1.65	1.65	73.00	66.7
FHP-xxx-9Ty-zz200075	2x3/4	50.80	19.05	1.65	1.65	73.00	66.7
FHP-xxx-9Ty-zz200100	2x1	50.80	25.4	1.65	1.65	73.00	66.7
FHP-xxx-9Ty-zz200150	2x1 1/2	50.80	38.1	1.65	1.65	73.00	66.7
FHP-xxx-9Ty-zz250050	2 1/2x1/2	63.50	12.7	1.65	1.65	79.40	73
FHP-xxx-9Ty-zz250075	2 1/2x3/4	63.50	19.05	1.65	1.65	79.40	73
FHP-xxx-9Ty-zz250100	2 1/2x1	63.50	25.4	1.65	1.65	79.40	73
FHP-xxx-9Ty-zz250150	2 1/2x1 1/2	63.50	38.1	1.65	1.65	79.40	73
FHP-xxx-9Ty-zz250200	2 1/2x2	63.50	50.8	1.65	1.65	79.40	73
FHP-xxx-9Ty-zz300050	3x1/2	76.20	12.7	1.65	1.65	85.75	79.4
FHP-xxx-9Ty-zz300075	3x3/4	76.20	19.05	1.65	1.65	85.75	79.4
FHP-xxx-9Ty-zz300100	3x1	76.20	25.4	1.65	1.65	85.75	79.4
FHP-xxx-9Ty-zz300150	3x1 1/2	76.20	38.1	1.65	1.65	85.75	79.4
FHP-xxx-9Ty-zz300200	3x2	76.20	50.8	1.65	1.65	85.75	79.4
FHP-xxx-9Ty-zz300250	3x2 1/2	76.20	63.5	1.65	1.65	85.75	79.4
FHP-xxx-9Ty-zz400050	4x1/2	101.60	12.7	2.11	1.65	104.80	92.1
FHP-xxx-9Ty-zz400075	4x3/4	101.60	19.05	2.11	1.65	104.80	92.1
FHP-xxx-9Ty-zz400100	4x1	101.60	25.4	2.11	1.65	104.80	92.1
FHP-xxx-9Ty-zz400150	4x1 1/2	101.60	38.1	2.11	1.65	104.80	92.1
FHP-xxx-9Ty-zz400200	4x2	101.60	50.8	2.11	1.65	104.80	98.4
FHP-xxx-9Ty-zz400250	4x2 1/2	101.60	63.5	2.11	1.65	104.80	98.4
FHP-xxx-9Ty-zz400300	4x3	101.60	76.2	2.11	1.65	104.80	98.4



UHP Concentric Reducer

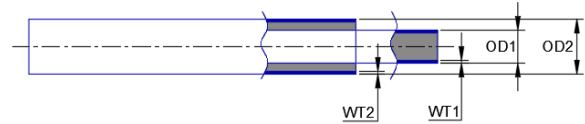
Part Number	Size	OD1	OD2	WT1	WT2	A	B	C
	inch	mm	mm	mm	mm	mm	mm	mm
FHP-xxx-8Ry-zz038025	3/8x1/4	9.53	6.35	0.89	0.89	41.28	19.05	19.05
FHP-xxx-8Ry-zz050025	1/2x1/4	12.70	6.35	0.89	0.89	38.00	19.00	19
FHP-xxx-8Ry-zz050038	1/2x3/8	12.70	9.53	0.89	0.89	38.00	19.00	19
FHP-xxx-8Ry-zz075038	3/4x3/8	19.05	9.53	0.89	0.89	50.80	25.40	19.05
FHP-xxx-8Ry-zz075050	3/4x1/2	19.05	12.7	1.24	1.24	53.98	25.40	25.4
FHP-xxx-8Ry-zz100050	1x1/2	25.40	12.7	1.65	1.65	63.50	39.80	20
FHP-xxx-8Ry-zz100075	1x3/4	25.40	19.05	1.65	1.65	53.98	25.40	25.4
FHP-xxx-8Ry-zz150050	1 1/2x 1/2	38.10	12.7	1.65	1.65	80.00	30.00	25
FHP-xxx-8Ry-zz150075	1 1/2x 3/4	38.10	19.05	1.65	1.65	76.20	25.40	25.4
FHP-xxx-8Ry-zz150100	1 1/2x 1	38.10	25.4	2.11	2.11	63.50	25.40	25.4
FHP-xxx-8Ry-zz200100	2x1	50.80	25.4	1.65	1.65	85.73	25.40	25.4
FHP-xxx-8Ry-zz200150	2x1 1/2	50.80	38.1	1.65	1.65	63.50	25.40	25.4
FHP-xxx-8Ry-zz250100	2 1/2x1	63.50	25.4	1.65	1.65	100.00	30.00	25
FHP-xxx-8Ry-zz250150	2 1/2x1 1/2	63.50	38.1	1.65	1.65	85.73	25.40	25.4
FHP-xxx-8Ry-zz250200	2 1/2x2	63.50	50.8	1.65	1.65	63.50	25.40	25.4
FHP-xxx-8Ry-zz300150	3x1 1/2	76.20	38.1	1.65	1.65	107.95	38.10	25.4
FHP-xxx-8Ry-zz300200	3x2	76.20	50.8	1.65	1.65	85.73	38.10	25.4
FHP-xxx-8Ry-zz300250	3x2 1/2	76.20	63.5	1.65	1.65	66.68	38.10	25.4
FHP-xxx-8Ry-zz400200	4x2	101.60	50.8	2.11	1.65	130.18	38.10	25.4
FHP-xxx-8Ry-zz400250	4x2 1/2	101.60	63.5	2.11	1.65	107.95	38.10	25.4
FHP-xxx-8Ry-zz400300	4x3	101.60	76.2	2.11	1.65	98.43	38.10	38.1

Code Description

Code XXX	Description
MS8	EP 316L Seamless Double Melt
MS6	EP 316L Seamless Single Melt
MS6W	EP 316L Welded
MS4	BA 316L Seamless Single Melt
MS4W	BA 316L Welded
MS3	BEP 316L Seamless
MS3W	BEP 316L Welded
MS2	CFOS 316L Seamless
MS2W	CFOS 316L Welded
MS1	AP 316L Seamless
MS1W	AP 316L Welded
MS1WD	AP 316L Welded & Drawn
MS0	AP 316L As Welded

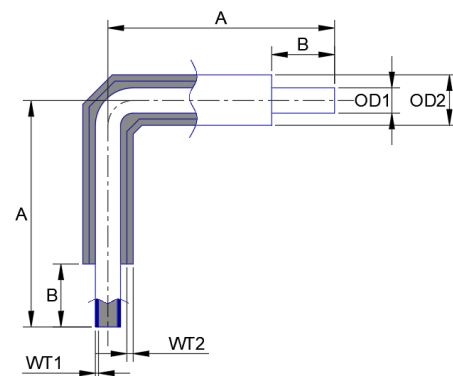
Code Y	Description
0	BA (Unpolished)
2	MP (ID Polished/OD Polished)
8	EP (ID Electropolished)

Code ZZ	Description
60	TP316L
62	TP316L S .005-0.012%
66	SUS316L
68	316L VIM/VAR



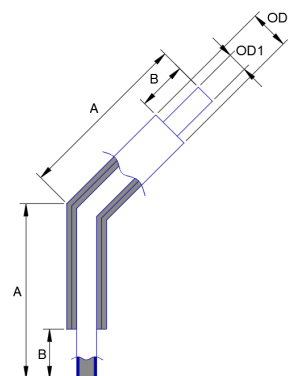
UHP Coaxial Tubing

Part Number	Size	OD1	WT1	OD2	WT2	Inner	Inner
	inch	mm	mm	mm	mm	m	m
UHP-xxx-01y-zz025035	1/4	6.35	0.89	12.7	1.24	5.95	5.95
UHP-xxx-01y-zz038035	3/8	9.53	0.89	15.88	1.24	5.95	5.95
UHP-xxx-01y-zz050049	1/2	12.70	1.24	19.05	1.65	5.95	5.95
UHP-xxx-01y-zz075065	3/4	19.05	1.65	25.4	1.65	5.95	5.95
UHP-xxx-01y-zz100065	1	25.40	1.65	38.1	1.65	5.95	5.95



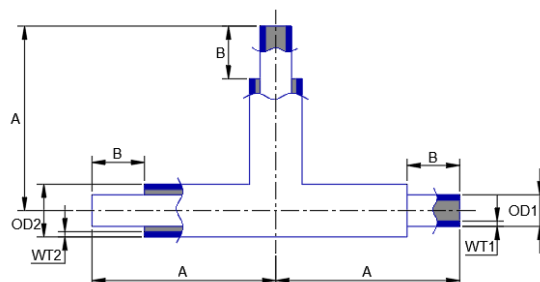
UHP Coaxial 90° Elbow

Part Number	Size	OD1	WT1	OD2	WT2	A	B
	inch	mm	mm	mm	mm	m	m
FHP-COX-9Ey-zz025035	1/4	6.35	0.89	12.7	1.24	120.70	19.05
FHP-COX-9Ey-zz038035	3/8	9.53	0.89	15.88	1.24	130.70	19.05
FHP-COX-9Ey-zz050049	1/2	12.70	1.24	19.05	1.65	184.40	19.05
FHP-COX-9Ey-zz075065	3/4	19.05	1.65	25.4	1.65	190.75	25.4
FHP-COX-9Ey-zz100065	1	25.40	1.65	38.1	1.65	107.97	25.4



UHP Coaxial 45° Elbow

Part Number	Size	OD1	WT1	OD2	WT2	A	B
	inch	mm	mm	mm	mm	m	m
FHP-xxx-4Ey-zz025035	1/4	6	0.89	12.7	1.24	98.45	19.05
FHP-xxx-4Ey-zz038035	3/8	10	0.89	15.88	1.24	98.45	19.05
FHP-xxx-4Ey-zz050049	1/2	13	1.24	19.05	1.65	109.26	19.05
FHP-xxx-4Ey-zz075065	3/4	19	1.65	25.4	1.65	135.61	25.4
FHP-xxx-4Ey-zz100065	1	25	1.65	38.1	1.65	88.90	25.4



UHP Coaxial Equal Tee

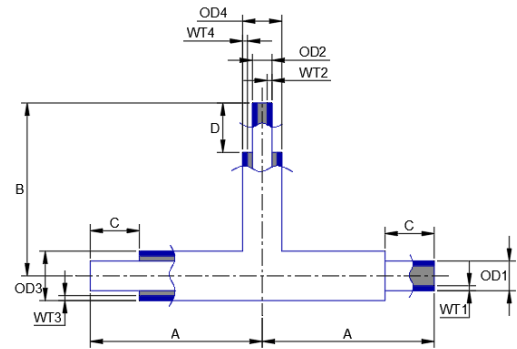
Part Number	Size	OD1	WT1	OD2	WT2	A	B
	inch	mm	mm	mm	mm	m	m
FHP-COX-4Ey-zz025035	1/4	6.35	0.89	12.7	1.24	98.45	19.05
FHP-COX-4Ey-zz038035	3/8	9.53	0.89	15.88	1.24	98.45	19.05
FHP-COX-4Ey-zz050049	1/2	12.70	1.24	19.05	1.65	109.26	19.05
FHP-COX-4Ey-zz075065	3/4	19.05	1.65	25.4	1.65	135.61	25.4
FHP-COX-4Ey-zz100065	1	25.40	1.65	38.1	1.65	88.90	25.4

Code Description

Code XXX	Description
MS92	EP 316L Seamless Double Melt
MS91	EP 316L Seamless Single Melt

Code Y	Description
0	BA (ID Polished/OD Polished)
8	EP (ID Electropolished)

Code ZZ	Description
60	TP316L
62	TP316L S .005~0.012%
66	SUS316L
68	316L VIM/VAR



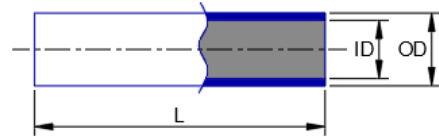
UHP Coaxial Reducing Tee

Part Number	Size	OD1	OD2	OD3	OD4	WT1	WT2	WT3	WT4
	inch	mm	mm	mm	mm	mm	mm	mm	mm
FHP-COX-9Ty-zz038025	3/8x1/4	9.53	6.35	15.88	12.70	0.89	0.89	1.24	1.24
FHP-COX-9Ty-zz050025	1/2x1/4	12.70	6.35	19.05	12.70	0.89	0.89	1.65	1.24
FHP-COX-9Ty-zz050038	1/2x3/8	12.70	9.53	19.05	15.88	0.89	0.89	1.65	1.24
FHP-COX-9Ty-zz075025	3/4x1/4	19.05	6.35	25.40	12.70	0.89	0.89	1.65	1.24
FHP-COX-9Ty-zz075038	3/4x3/8	19.05	9.53	25.40	15.88	0.89	0.89	1.65	1.24
FHP-COX-9Ty-zz075050	3/4x1/2	19.05	12.7	25.40	19.05	1.24	1.24	1.65	1.65
FHP-COX-9Ty-zz100025	1x1/4	25.40	6.35	38.10	12.70	1.65	1.65	1.65	1.24
FHP-COX-9Ty-zz100038	1x3/8	25.40	9.53	38.10	15.88	1.65	1.65	1.65	1.24
FHP-COX-9Ty-zz100050	1x1/2	25.40	12.7	38.10	19.05	1.65	1.65	1.65	1.65
FHP-COX-9Ty-zz100075	1x3/4	25.40	19.05	38.10	25.40	1.65	1.65	1.65	1.65

Part Number	Size	A	B	C	D
	inch	mm	mm	mm	mm
FHP-COX-9Ty-zz038025	3/8x1/4	63.50	63.50	19.05	19.05
FHP-COX-9Ty-zz050025	1/2x1/4	66.68	66.68	19.05	19.05
FHP-COX-9Ty-zz050038	1/2x3/8	66.68	66.68	19.05	19.05
FHP-COX-9Ty-zz075025	3/4x1/4	66.68	66.68	19.05	19.05
FHP-COX-9Ty-zz075038	3/4x3/8	66.68	66.68	19.05	19.05
FHP-COX-9Ty-zz075050	3/4x1/2	66.68	66.68	19.05	19.05
FHP-COX-9Ty-zz100025	1x1/4	79.38	79.38	19.05	25.4
FHP-COX-9Ty-zz100038	1x3/8	79.38	79.38	19.05	25.4
FHP-COX-9Ty-zz100050	1x1/2	79.38	79.38	19.05	25.4
FHP-COX-9Ty-zz100075	1x3/4	79.38	79.38	19.05	25.4

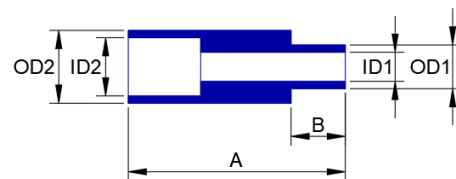
Code Description

Code XXX	Description	Code Y	Description	Code ZZ	Description
MS92	EP 316L Seamless Double Melt	0	BA (ID Polished/OD Polished)	60	TP316L
MS91	EP 316L Seamless Single Melt	8	EP (ID Electropolished)	62	TP316L S .005~0.012%
				66	SUS316L
				68	316L VIM/VAR



UHP Coaxial Sleeve

Part Number	Size	OD	ID
	inch	mm	mm
FHP-COX-SL0-zz02500	1/4	15.88	12.90
FHP-COX-SL0-zz03800	3/8	19.05	16.11
FHP-COX-SL0-zz05000	1/2	22.23	19.30
FHP-COX-SL0-zz07500	3/4	30.00	25.60
FHP-COX-SL0-zz10000	1	42.40	38.40



UHP Coaxial Terminator

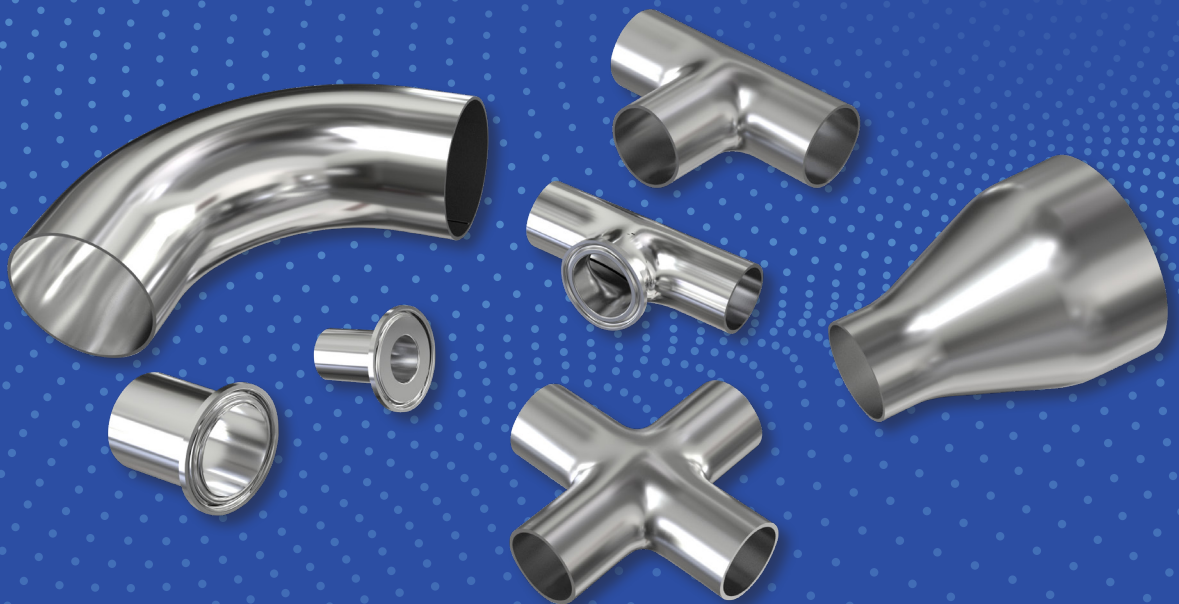
Part Number	Size	OD1	ID1	OD2	ID2	A	B
	inch	mm	mm	mm	mm	mm	mm
FHP-COX-TM0-zz02500	1/4	8.26	6.48	12.70	10.21	31.75	6.35
FHP-COX-TM0-zz03800	3/8	11.43	9.65	15.88	13.39	31.75	6.35
FHP-COX-TM0-zz05000	1/2	15.32	12.85	19.05	15.75	31.75	6.35
FHP-COX-TM0-zz07500	3/4	22.48	19.2	25.40	22.10	50.8	6.35
FHP-COX-TM0-zz10000	1	28.83	25.55	38.10	34.80	50.8	6.35

Code Description

Code ZZ	Description
30	TP304
32	TP304L S .005~0.017%

Micro Fitting and Accessories

- Product Code Guide
- Micro Weld Fittings
- Forged Weld Fittings
- Glands
- Gaskets
- Nuts, Caps and Plugs
- High Flow Connection



Product Code Guide

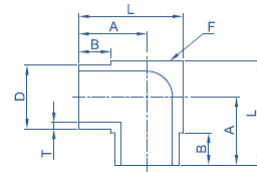


Material		Size				Type	
Code	Details	Code	OD		WT (mm)	Code	Type
			(inch)	(mm)			
SM	SUS316L	2	1/8	3.175	0.70	E	90° Elbow
DM	SUS316L VIM/VAR	4	1/4	6.35	1.00	HE	45° Elbow
		6	3/8	9.53	1.00	T	Equal Tee
		8	1/2	12.7	1.24	CR	Cross
		12	3/4	19.05	1.65	TB	Tribow
		16	1	25.4	1.65	R	Reducer
						FG	Female Gland
						MG	Male Gland
						SSG	Socket Weld Short Gland
						SLG	Socket Weld Long Gland
						RSLG	Reducing Socket Weld Gland
						BG	Blind Gland
						MWG	Male Weld Gland
						TA	Tube Adapter
						MU	Double Male Union
						MRU	Double Male Reducing Union
						BHU	Bulkhead Union
						TC	TBW Connector
						TBHC	TBW Bulkhead Connector
						CG	Coupling
						FRU	Double Female Reducing Union
						RA	Reducing Adapter
						RB	Reducing Bushing
						ME	Male Elbow
						UE	Union Elbow
						UT	Union Tee
						UC	Union Cross
						SC	Tube Fitting Connector
						BHSC	Tube Fitting Bulkhead Connector
						BHMC	Bulkhead Male Connector
						MC	Male Connector
						FC	Female Connector
						GR	Gasket Retainer Assembly
						GT	Gasket
						BGT	Blind Gasket
						FN	Female Nut
						MN	Male Nut
						PG	Plug
						CP	Cap
						PGC	Plug (Cable Type)
						HFN	High Flow Female Nut
						HMV	High Flow Male Nut
						HLG	High Flow Long Gland
						HTC	High Flow TBW Connector
						HBHC	High Flow TBW Bulkhead Connector
						WMC	Welded Male Connector
						WFC	Welded Female Connector
						WSC	Welded Lok Connector
						WFU	Welded Female Union

Thread Type (Option)		Length (Option)		Surface Finish	
Code	Thread Type	Code	Length (mm)	Code	Surface Finish
N	NPT ※ National Pipe Thread	6	6.35		BA (Non-Electropolished)
		10	10		
R	PT ※ Pipe Thread	19	19.05	P	EP (Electropolished)
		22	22.5		
U	SAE ※ Society of Automotive Engineers/ Straight Thread	23	22.3	SP	Silver Plated

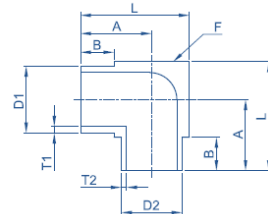
* Produce Code Examples

Produce Code	SM6X4R6-P	SM12MEN-P
Material	SUS316L	SUS316L
Size	3/8" X 1/4" (9.53 mm X 6.35 mm)	3/4" (19.05mm)
Type	Micro Reducer	Male Elbow
Thread Type	N/A	NPT (National Pipe Thread)
Length	6.35mm	N/A
Surface Finish	Electropolished	Electropolished



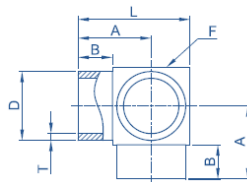
Micro 90° Elbow

Part No.	OD		WT	A	B	F Body	L
	D1		T				
	(inch)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
SM2E6	1/8	3.175	0.70	10.32	6.35	7.94	14.29
SM4E6	1/4	6.35	1.00	10.32	6.35	7.94	14.29
SM6E6	3/8	9.53	1.00	11.91	6.35	11.11	17.46
SM8E6	1/2	12.70	1.24	13.50	6.35	14.29	20.64
SM12E6	3/4	19.05	1.65	16.68	6.35	20.65	27.00



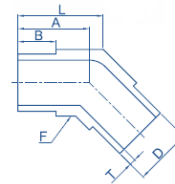
Micro Reducing 90° Elbow

Part No.	OD				WT		A	B	F Body	L
	D1		D2		T1	T2				
	(inch)	(mm)	(inch)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
SM4X2E6	1/4	6.35	1/8	3.175	1.00	0.70	10.32	6.35	7.94	14.29
SM6X4E6	3/8	9.53	1/4	6.35	1.00	1.00	11.91	6.35	11.11	17.46
SM8X4E6	1/2	12.70	1/4	6.35	1.24	1.00	13.50	6.35	14.29	20.64
SM8X6E6	1/2	12.70	3/8	9.53	1.24	1.00	13.50	6.35	14.29	20.64
SM12X4E6	3/4	19.05	1/4	6.35	1.65	1.00	16.68	6.35	20.65	27.00
SM12X6E6	3/4	19.05	3/8	9.53	1.65	1.00	16.68	6.35	20.65	27.00
SM12X8E6	3/4	19.05	1/2	12.70	1.65	1.24	16.68	6.35	20.65	27.00



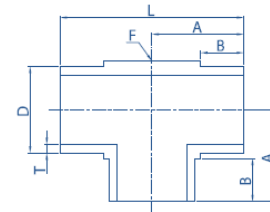
Micro Tribow

Part No.	OD		WT	A	B	F Body	L
	D1		T				
	(inch)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
SM2TB6	1/8	3.175	0.70	10.32	6.35	7.94	14.29
SM4TB6	1/4	6.35	1.00	10.32	6.35	7.94	14.29
SM6TB6	3/8	9.53	1.00	11.91	6.35	11.11	17.46
SM8TB6	1/2	12.70	1.24	13.50	6.35	14.29	20.64
SM12TB6	3/4	19.05	1.65	16.68	6.35	20.65	27.00



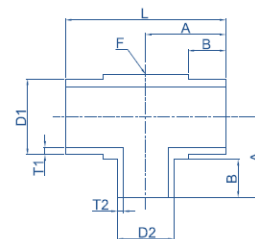
Micro 45° Elbow

Part No.	OD		WT	A	B	F Body	L
	D1		T				
	(inch)	(mm)	(mm)				
SM2HE6	1/8	3.175	0.70	10.32	6.35	7.94	11.96
SM4HE6	1/4	6.35	1.00	10.32	6.35	7.94	11.96
SM6HE6	3/8	9.53	1.00	11.91	6.35	11.11	14.21
SM8HE6	1/2	12.70	1.24	13.50	6.35	14.29	16.46
SM12HE6	3/4	19.05	1.65	16.68	6.35	20.65	20.95



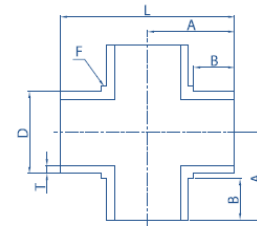
Micro Tee

Part No.	OD		WT	A	B	F Body	L
	D1		T				
	(inch)	(mm)	(mm)				
SM2T6	1/8	3.175	0.70	10.32	6.35	7.94	20.64
SM4T6	1/4	6.35	1.00	10.32	6.35	7.94	20.64
SM6T6	3/8	9.53	1.00	11.91	6.35	11.11	23.81
SM8T6	1/2	12.70	1.24	13.50	6.35	14.29	26.99
SM12T6	3/4	19.05	1.65	16.68	6.35	20.65	33.35



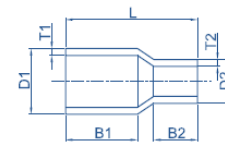
Micro Reducing Tee

Part No.	OD				WT		A	B	F Body	L
	D1		D2		T1	T2				
	(inch)	(mm)	(inch)	(mm)	(mm)	(mm)				
SM4X2T6	1/4	6.35	1/8	3.175	1.00	0.70	10.35	6.35	7.94	20.64
SM6X4T6	3/8	9.53	1/4	6.35	1.00	1.00	11.91	6.35	11.11	23.81
SM8X4T6	1/2	12.70	1/4	6.35	1.24	1.00	13.50	6.35	14.29	27.00
SM8X6T6	1/2	12.70	3/8	9.53	1.24	1.00	13.50	6.35	14.29	27.00
SM12X4T6	3/4	19.05	1/4	6.35	1.65	1.00	16.68	6.35	20.65	27.00
SM12X6T6	3/4	19.05	3/8	9.53	1.65	1.00	16.68	6.35	20.65	27.00
SM12X8T6	3/4	19.05	1/2	12.7	1.65	1.24	16.68	6.35	20.65	27.00



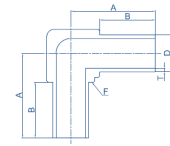
Micro Cross

Part No.	OD		WT	A	B	F Body	L
	D1		T				
	(inch)	(mm)	(mm)				
SM2CR6	1/8	3.175	0.70	10.32	6.35	7.94	14.29
SM4CR6	1/4	6.35	1.00	10.32	6.35	7.94	14.29
SM6CR6	3/8	9.53	1.00	11.91	6.35	11.11	17.46
SM8CR6	1/2	12.70	1.24	13.50	6.35	14.29	20.64
SM12CR6	3/4	19.05	1.65	16.68	6.35	20.65	27.00



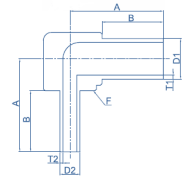
Micro Reducer

Part No.	OD				WT		B1	B2	L
	D1		D2		T1	T2			
	(inch)	(mm)	(inch)	(mm)	(mm)	(mm)			
SM4X2R6	1/4	6.35	1/8	3.175	1.00	0.70	10.40	6.35	19.10
SM6X4R6	3/8	9.53	1/4	6.35	1.00	1.00	10.40	6.35	19.10
SM8X4R6	1/2	12.70	1/4	6.35	1.24	1.00	10.40	6.35	19.10
SM8X6R6	1/2	12.70	3/8	9.53	1.24	1.00	10.40	6.35	19.10
SM12X4R6	3/4	19.05	1/4	6.35	1.65	1.00	10.40	6.35	19.10
SM12X6R6	3/4	19.05	3/8	9.53	1.65	1.00	10.40	6.35	19.10
SM12X8R6	3/4	19.05	1/2	12.70	1.65	1.24	10.40	6.35	19.10



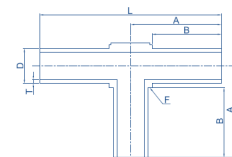
90° Elbow

Part No.	OD		WT T	A	B	F Body
	D1					
	(inch)	(mm)	(mm)	(mm)	(mm)	(mm)
SM4E19	1/4	6.35	1.00	25.00	19.05	11.10
SM6E19	3/8	9.53	1.00	25.00	19.05	12.40
SM8E19	1/2	12.70	1.24	29.00	19.05	17.00
SM12E22	3/4	19.05	1.65	33.50	22.50	25.00
SM16E23	1	25.40	1.65	38.30	23.30	30.00
SM4E10	1/4	6.35	1.00	15.90	10.00	11.10
SM6E10	3/8	9.53	1.00	15.90	10.00	12.40
SM8E10	1/2	12.70	1.24	19.90	10.00	17.00
SM12E10	3/4	19.05	1.65	22.40	10.00	25.00
SM16E10	1	25.40	1.65	24.95	10.00	30.00



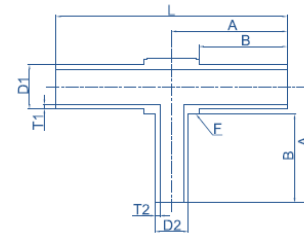
Reducing 90° Elbow

Part No.	OD				WT		A	B	L
	D1		D2		T1	T2			
	(inch)	(mm)	(inch)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
SM6X4E19	3/8	9.53	1/4	6.35	1.00	1.00	25.00	19.05	12.40
SM8X4E19	1/2	12.70	1/4	6.35	1.24	1.00	29.00	19.05	17.00
SM8X6E19	1/2	12.70	3/8	9.53	1.24	1.00	29.00	19.05	17.00
SM12X4E22	3/4	19.05	1/4	6.35	1.65	1.00	33.50	22.50	25.00
SM12X6E22	3/4	19.05	3/8	9.53	1.65	1.00	33.50	22.50	25.00
SM12X8E22	3/4	19.05	1/2	12.70	1.65	1.24	33.50	22.50	25.00
SM16X4E23	3/4	19.05	1/2	12.70	1.65	1.24	38.30	23.30	30.00
SM16X8E23	3/4	19.05	1/2	12.70	1.65	1.24	38.30	23.30	30.00
SM16X12E23	3/4	19.05	1/2	12.70	1.65	1.24	38.30	23.30	30.00



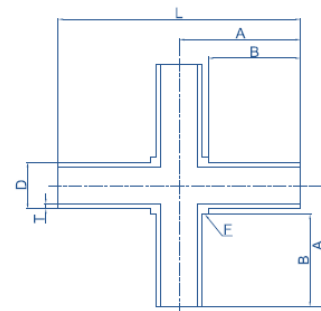
Equal Tee

Part No.	OD		WT T	A	B	F Body	L
	D1						
	(inch)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
SM4T19	1/4	6.35	1.00	25.00	19.05	11.10	50.00
SM6T19	3/8	9.53	1.00	25.00	19.05	12.40	50.00
SM8T19	1/2	12.70	1.24	29.00	19.05	17.00	58.00
SM12T22	3/4	19.05	1.65	33.50	22.50	25.00	67.00
SM16T23	1	25.40	1.65	38.30	23.30	30.00	76.60
SM4T10	1/4	6.35	1.00	15.90	10.00	11.10	31.80
SM6T10	3/8	9.53	1.00	15.90	10.00	12.40	31.80
SM8T10	1/2	12.70	1.24	19.90	10.00	17.00	39.80
SM12T10	3/4	19.05	1.65	22.40	10.00	25.00	44.80
SM16T10	1	25.40	1.65	24.95	10.00	30.00	49.90



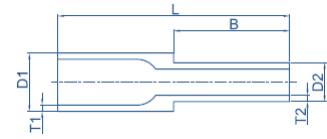
Reducing Tee

Part No.	OD				WT		A (mm)	B (mm)	F Body (mm)	L (mm)
	D1		D2		T1	T2				
	(inch)	(mm)	(inch)	(mm)	(mm)	(mm)				
SM6X4T19	3/8	9.53	1/4	6.35	1.00	1.00	25.00	19.05	12.40	50.00
SM8X4T19	1/2	12.70	1/4	6.35	1.24	1.00	29.00	19.05	17.00	58.00
SM8X6T19	1/2	12.70	3/8	9.53	1.24	1.00	29.00	19.05	17.00	58.00
SM12X4T22	3/4	19.05	1/4	6.35	1.65	1.00	33.50	22.50	25.00	67.00
SM12X6T22	3/4	19.05	3/8	9.53	1.65	1.00	33.50	22.50	25.00	67.00
SM12X8T22	3/4	19.05	1/2	12.70	1.65	1.24	33.50	22.50	25.00	67.00
SM16X4T23	1	25.40	1/4	6.35	1.65	1.00	38.30	23.30	30.00	76.60
SM16X8T23	1	25.40	1/2	12.70	1.65	1.24	38.30	23.30	30.00	76.60
SM16X12T23	1	25.40	3/4	19.05	1.65	1.65	38.30	23.30	30.00	76.60
SM6X4T10	3/8	9.53	1/4	6.35	1.00	1.00	15.90	10.00	12.40	31.80
SM8X4T10	1/2	12.70	1/4	6.35	1.24	1.00	19.90	10.00	17.00	39.80
SM8X6T10	1/2	12.70	3/8	9.53	1.24	1.00	19.90	10.00	17.00	39.80
SM12X4T10	3/4	19.05	1/4	6.35	1.65	1.00	22.40	10.00	25.00	44.80
SM12X6T10	3/4	19.05	3/8	9.53	1.65	1.00	22.40	10.00	25.00	44.80



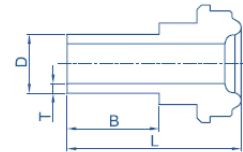
Equal Cross

Part No.	OD		WT	A (mm)	B (mm)	F Body (mm)	L (mm)
	D1		T				
	(inch)	(mm)	(mm)				
SM4CR19	1/4	6.35	1.00	25.00	19.05	11.10	50.00
SM6CR19	3/8	9.53	1.00	25.00	19.05	12.40	50.00
SM8CR19	1/2	12.70	1.24	29.00	19.05	17.00	58.00
SM12CR22	3/4	19.05	1.65	33.50	22.50	25.00	67.00
SM16CR23	1	25.40	1.65	38.30	23.30	30.00	76.60
SM4CR10	1/4	6.35	1.00	15.90	10.00	11.10	31.80
SM6CR10	3/8	9.53	1.00	15.90	10.00	12.40	31.80
SM8CR10	1/2	12.70	1.24	19.90	10.00	17.00	39.80
SM12CR10	3/4	19.05	1.65	22.40	10.00	25.00	44.80
SM16CR10	1	25.40	1.65	24.95	10.00	30.00	49.90



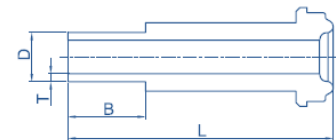
Reducer

Part No.	OD				WT		B	L
	D1		D2		T1	T2		
	(inch)	(mm)	(inch)	(mm)	(mm)	(mm)		
SM6X4R19	3/8	9.53	1/4	6.35	1.00	1.00	19.05	38.10
SM8X4R19	1/2	12.70	1/4	6.35	1.24	1.00	19.05	38.10
SM8X6R19	1/2	12.70	3/8	9.53	1.24	1.00	19.05	38.10
SM12X4R19	3/4	19.05	1/4	6.35	1.65	1.00	19.05	42.90
SM12X6R19	3/4	19.05	3/8	9.53	1.65	1.00	19.05	42.90
SM12X8R19	3/4	19.05	1/2	12.70	1.65	1.24	19.05	42.90
SM16X4R19	1	25.40	1/4	6.35	1.65	1.00	19.05	42.90
SM16X6R19	1	25.40	3/8	9.53	1.65	1.00	19.05	42.90
SM16X8R19	1	25.40	1/2	12.70	1.65	1.24	19.05	42.90
SM16X12R19	1	25.40	3/4	19.05	1.65	1.65	19.05	42.90
SM6X4R10	3/8	9.53	1/4	6.35	1.00	1.00	10.00	20.00
SM8X4R10	1/2	12.70	1/4	6.35	1.24	1.00	10.00	20.00
SM8X6R10	1/2	12.70	3/8	9.53	1.24	1.00	10.00	20.00
SM12X4R10	3/4	19.05	1/4	6.35	1.65	1.00	10.00	20.00
SM12X6R10	3/4	19.05	3/8	9.53	1.65	1.00	10.00	20.00
SM12X8R10	3/4	19.05	1/2	12.70	1.65	1.24	10.00	20.00



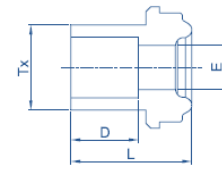
Female Gland (FG)

Part No.	Head Size		Tube OD		WT	B	L
	(inch)	(mm)	(inch)	(mm)	T1		
SM2FG19	1/8	3.175	1/8	3.175	0.70	19.05	27.40
SM4FG6	1/4	6.35	1/4	6.35	1.00	6.35	15.24
SM4FG10	1/4	6.35	1/4	6.35	1.00	10.00	18.89
SM4FG19	1/4	6.35	1/4	6.35	1.00	19.05	27.94
SM8X4FG6	1/2	12.70	1/4	6.35	1.00	6.35	15.75
SM8X4FG10	1/2	12.70	1/4	6.35	1.00	10.00	19.40
SM8X4FG19	1/2	12.70	1/4	6.35	1.00	19.05	28.45
SM6FG6	1/2	12.70	3/8	9.53	1.00	6.35	15.75
SM6FG10	1/2	12.70	3/8	9.53	1.00	10.00	19.40
SM6FG19	1/2	12.70	3/8	9.53	1.00	19.05	28.45
SM8FG6	1/2	12.70	1/2	12.70	1.24	6.35	15.75
SM8FG10	1/2	12.70	1/2	12.70	1.24	10.00	19.40
SM8FG19	1/2	12.70	1/2	12.70	1.24	19.05	28.45
SM12FG19	3/4	19.05	3/4	19.05	1.65	19.05	34.50
SM16FG19	1	25.40	1	25.40	1.65	19.05	38.60



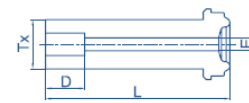
Male Gland (MG)

Part No.	Head Size		Tube OD		WT	B	L
	(inch)	(mm)	(inch)	(mm)	T1		
SM2MG19	1/8	3.175	1/8	3.175	0.70	19.05	36.00
SM4MG6	1/4	6.35	1/4	6.35	1.00	6.35	30.48
SM4MG10	1/4	6.35	1/4	6.35	1.00	10.00	34.13
SM4MG19	1/4	6.35	1/4	6.35	1.00	19.05	43.18
SM8X4MG6	1/2	12.70	1/4	6.35	1.00	6.35	32.77
SM8X4MG10	1/2	12.70	1/4	6.35	1.00	10.00	36.42
SM8X4MG19	1/2	12.70	1/4	6.35	1.00	19.05	45.47
SM6MG6	1/2	12.70	3/8	9.53	1.00	6.35	32.77
SM6MG10	1/2	12.70	3/8	9.53	1.00	10.00	36.42
SM6MG19	1/2	12.70	3/8	9.53	1.00	19.05	45.47
SM8MG6	1/2	12.70	1/2	12.70	1.24	6.35	32.77
SM8MG10	1/2	12.70	1/2	12.70	1.24	10.00	36.42
SM8MG19	1/2	12.70	1/2	12.70	1.24	19.05	45.47
SM12MG19	3/4	19.05	3/4	19.05	1.65	19.05	51.56
SM16MG19	1	25.40	1	25.40	1.65	19.05	58.93



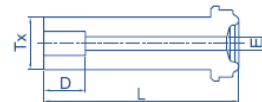
Socket Weld Short Gland (SSG)

Part No.	Head Size		Socket Size		D	E	L	Tx
	(inch)	(mm)	(inch)	(mm)				
SM4SSG	1/4	6.35	1/4	6.35	7.10	4.60	12.70	8.90



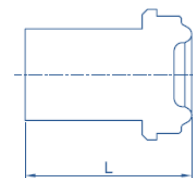
Socket Weld Long Gland (SLG)

Part No.	Head Size		Socket Size		D	E	L	Tx
	(inch)	(mm)	(inch)	(mm)				
SM2SLG	1/8	3.175	1/8	3.175	2.50	2.30	17.80	5.10
SM4SLG	1/4	6.35	1/4	6.35	7.10	4.60	33.30	8.90
SM6SLG	1/2	12.70	1/2	9.53	7.90	7.10	38.10	15.20
SM8SLG	1/2	12.70	1/2	12.70	9.60	10.22	38.10	15.20
SM12SLG	3/4	19.05	3/4	19.05	11.20	15.75	50.80	22.40
SM16SLG	1	25.40	1	25.40	15.70	22.10	56.40	30.20



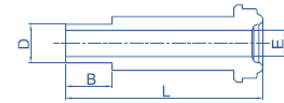
Reducing Socket Weld Long Gland (RSLG)

Part No.	Head Size		Socket Size		D	E	L	Tx
	(inch)	(mm)	(inch)	(mm)				
SM4X2RSLG	1/4	6.35	1/8	3.175	2.50	2.30	33.30	8.90
SM8X4RSLG	1/2	12.70	1/4	6.35	7.10	4.60	38.10	15.20



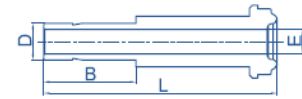
Blind Gland (BG)

Part No.	Head Size		L
	(inch)	(mm)	
SM2BG	1/8	3.175	17.80
SM4BG	1/4	6.35	33.30
SM8BG	1/2	12.70	39.10
SM12BG	3/4	19.05	50.80
SM16BG	1	25.40	56.40



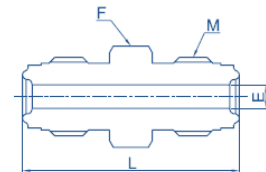
Male Weld Gland (MWG)

Part No.	Head Size		Socket Size		E	B	L
	(inch)	(mm)	(inch)	(mm)			
SM2MWG	1/8	3.175	1/8	3.175	1.50	7.10	17.80
SM4MWG	1/4	6.35	1/4	6.35	3.00	10.40	33.30
SM6MWG	1/2	12.70	3/8	9.53	7.10	10.40	38.10
SM8MWG	1/2	12.70	1/2	12.70	10.20	12.70	38.10



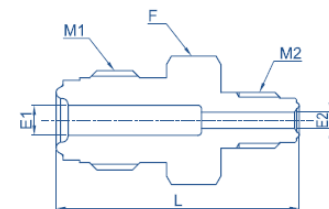
Tube Adapter (TA)

Part No.	Head Size		Socket Size		E	B	L
	(inch)	(mm)	(inch)	(mm)			
SM4TA	1/4	6.35	1/4	6.35	4.30	16.20	41.00
SM6TA	1/2	6.35	3/8	9.53	6.80	17.80	46.00
SM8TA	1/2	12.70	1/2	12.70	9.40	24.40	49.30



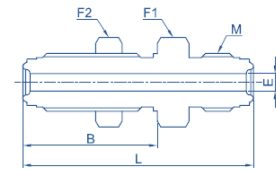
Double Male Union (MU)

Part No.	Head Size		E	L	F HEX.	M
	(inch)	(mm)				
SM2MU	1/8	3.175	2.30	28.70	9.52	5/16-24UNF
SM4MU	1/4	6.35	4.35	39.37	15.88	9/16-18UNF
SM8MU	1/2	12.70	10.22	46.74	23.81	7/8-14UNF
SM12MU	3/4	19.05	15.75	61.98	33.34	1 1/4-18UNEF
SM16MU	1	25.40	22.10	65.79	41.28	1 1/2-20UN



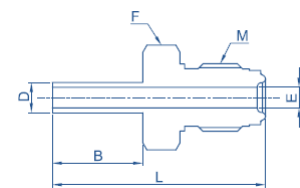
Double Male Reducing Union (MRU)

Part No.	Head Size1		Head Size2		E1	E2	F HEX.	L	M1	M2
	(inch)	(mm)	(inch)	(mm)						
SM4X2MRU	1/8	6.35	1/8	3.175	2.30	4.35	15.88	34.80	9/16-18UNF	5/16-24UNF
SM8X4MRU	1/4	12.70	1/4	6.35	4.35	10.22	23.81	43.40	7/8-14UNF	9/16-18UNF



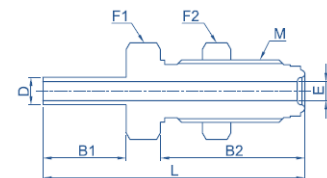
Bulkhead Union (BHU)

Part No.	Head Size		E (mm)	B (mm)	L (mm)	F1 HEX. (mm)	F2 HEX. (mm)	M
	(inch)	(mm)						
SM4BHU	1/4	6.35	4.35	33.00	56.60	19.05	19.05	9/16-18UNF
SM8BHU	1/2	12.70	10.22	37.60	65.25	26.90	26.90	7/8-14UNF
SM12BHU	3/4	19.05	15.75	43.40	79.00	38.10	38.10	1 1/4-18UNEF
SM16BHU	1	25.40	22.10	47.10	86.00	44.40	44.40	1 1/2-20UN



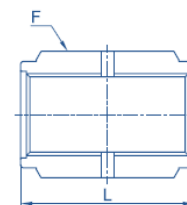
Tube Butt Weld Connector (TC)

Part No.	Head Size		Tube OD D		B (mm)	E (mm)	L (mm)	F HEX. (mm)	M
	(inch)	(mm)	(inch)	(mm)					
SM4TC	1/4	6.35	1/4	6.35	19.05	4.35	42.65	15.88	9/16-18UNF
SM6TC	1/2	12.70	3/8	9.53	19.05	10.22	46.70	23.81	7/8-14UNF
SM8TC	1/2	12.70	1/2	12.70	19.05	10.22	46.70	23.81	7/8-14UNF
SM12TC	3/4	19.05	3/4	19.05	19.05	15.75	55.55	33.34	1 1/4-18UNEF



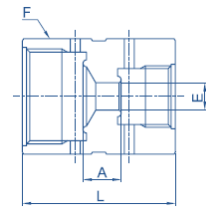
Tube Butt Weld Bulkhead Connector (TBHC)

Part No.	Head Size		Tube OD D		E (mm)	B1 (mm)	B2 (mm)	L (mm)	F1 HEX. F2 HEX. (mm)	M
	(inch)	(mm)	(inch)	(mm)						
SM4TBHC	1/4	6.35	1/4	6.35	4.35	19.05	33.00	59.85	19.05	9/16-18UNF
SM8TBHC	1/2	12.70	1/2	12.70	10.22	19.05	37.60	65.25	26.90	7/8-14UNF
SM12TBHC	3/4	19.05	3/4	19.05	15.75	19.05	43.25	71.30	38.10	1 1/4-18UNEF



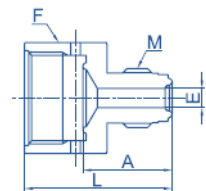
Coupling (CG)

Part No.	Head Size		F HEX (mm)	L (mm)
	(inch)	(mm)		
SM2CG	1/8	3.175	11.11	16.80
SM4CG	1/4	6.35	19.05	30.20
SM8CG	1/2	12.70	26.98	33.30
SM12CG	3/4	19.05	38.10	42.70
SM16CG	1	25.40	44.45	51.80



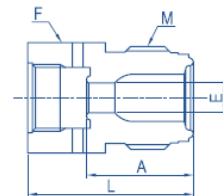
Double Female Reducing Union (FRU)

Part No.	Head Size		Tube OD D		E (mm)	F HEX. (mm)	A (mm)	L (mm)
	(inch)	(mm)	(inch)	(mm)				
SM8X4FRU	1/2	12.70	1/4	6.35	6.40	26.98	8.90	35.80



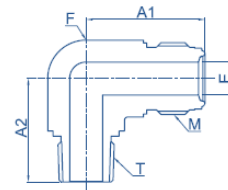
Reducing Adapter (RA)

Part No.	Head Size 1		Head Size 2		E (mm)	F HEX. (mm)	A (mm)	L (mm)	M
	(inch)	(mm)	(inch)	(mm)					
SM2X4RA	1/8	3.175	1/4	6.35	2.30	19.05	17.50	30.20	5/16-24UNF
SM4X8RA	1/4	6.35	1/2	12.70	4.60	26.98	21.60	35.80	9/16-18UNF



Reducing Bushing (RB)

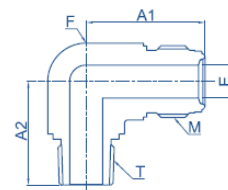
Part No.	Head Size 1		Head Size 2		E (mm)	F HEX. (mm)	A (mm)	L (mm)	M
	(inch)	(mm)	(inch)	(mm)					
SM4X2RA	1/4	6.35	1/8	3.175	3.30	15.88	19.30	26.90	9/16-18UNF
SM8X4RA	1/2	12.70	1/4	6.35	6.40	23.81	23.10	35.80	7/8-14UNF



Male Elbow (NPT)

Part No.	Head Size		T (NPT)	E (mm)	A1 (mm)	A2 (mm)	F Body (mm)	M
	(inch)	(mm)						
SM4MEN	1/4	6.35	1/4	4.35	27.18	27.18	17.00	9/16-18UNF
SM8MEN	1/2	12.70	1/2	10.22	36.83	36.83	25.00	7/8-14UNF
SM12MEN	3/4	19.05	3/4	15.75	48.80	43.50	33.30	1 1/4-18UNEF

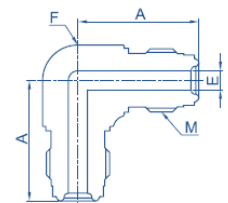
※ NPT: National Pipe Thread Tapered



Male Elbow (PT)

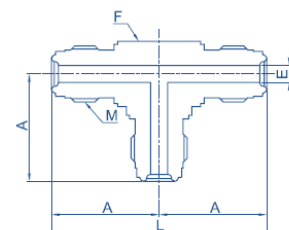
Part No.	Head Size		T (NPT)	E (mm)	A1 (mm)	A2 (mm)	F Body (mm)	M
	(inch)	(mm)						
SM4MER	1/4	6.35	1/4	4.35	27.18	27.18	17.00	9/16-18UNF
SM8MER	1/2	12.70	1/2	10.22	36.83	36.83	25.00	7/8-14UNF
SM12MER	3/4	19.05	3/4	15.75	48.80	43.50	33.30	1 1/4-18UNEF

※ PT: Pipe Thread Tapered



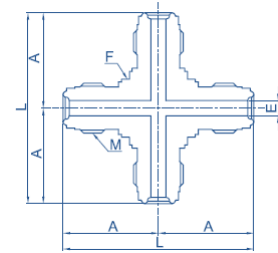
Union Elbow

Part No.	Head Size		E (mm)	A (mm)	F Body (mm)	M
	(inch)	(mm)				
SM4UE	1/4	6.35	4.35	27.18	17.00	9/16-18UNF
SM8UE	1/2	12.70	10.22	36.83	25.00	7/8-14UNF
SM12UE	3/4	19.05	15.75	48.77	33.30	1 1/4-18UNEF
SM16UE	1	25.40	22.10	50.80	42.80	1 1/2-20UN



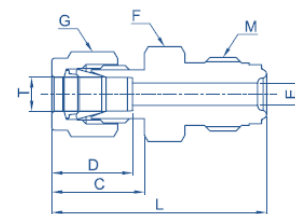
Union Tee

Part No.	Head Size		E (mm)	A (mm)	L (mm)	F Body (mm)	M
	(inch)	(mm)					
SM4UT	1/4	6.35	4.35	27.18	54.36	17.00	9/16-18UNF
SM8UT	1/2	12.70	10.22	36.83	73.66	25.00	7/8-14UNF
SM12UT	3/4	19.05	15.75	48.77	97.54	33.30	1 1/4-18UNEF
SM16UT	1	25.40	22.10	50.80	101.60	42.80	1 1/2-20UN



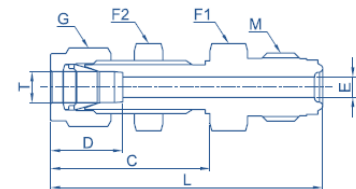
Union Cross

Part No.	Head Size		E (mm)	A (mm)	L (mm)	F Body (mm)	M
	(inch)	(mm)					
SM4UC	1/4	6.35	4.35	27.18	54.36	17.00	9/16-18UNF
SM8UC	1/2	12.70	10.22	36.83	73.66	25.00	7/8-14UNF
SM12UC	3/4	19.05	15.75	48.77	97.54	33.30	1 1/4-18UNEF
SM16UC	1	25.40	22.10	50.80	101.60	42.80	1 1/2-20UN



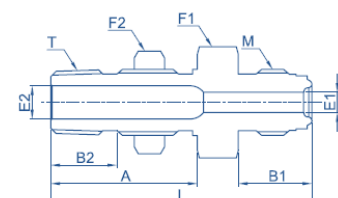
Tube Fitting Connector

Part No.	Head Size		Tube Size T (mm)	C (mm)	D (mm)	E (mm)	F HEX. (mm)	G HEX. (mm)	L (mm)	M
	(inch)	(mm)								
SM4SC	1/4	6.35	6.35	17.80	15.20	4.35	15.90	14.29	41.10	9/16-18UNF
SM8SC	1/2	12.70	12.70	21.80	22.90	10.22	23.81	22.23	49.50	7/8-14UNF



Tube Fitting Bulkhead Connector

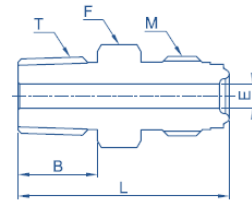
Part No.	Head Size		Tube Size T (mm)	C (mm)	D (mm)	E (mm)	F1 HEX. F2 HEX. (mm)	G HEX. (mm)	L (mm)	M
	(inch)	(mm)								
SM4BHSC	1/4	6.35	6.35	33.50	15.20	4.60	15.87	14.28	57.20	9/16-18UNF
SM8BHSC	1/2	12.70	12.70	41.90	22.90	10.22	23.81	22.22	69.50	7/8-14UNF



Bulkhead Male Connector (NPT)

Part No.	Head Size	T	B1 (mm)	B2 (mm)	E1 (mm)	E2 (mm)	F1 HEX. F2 HEX. (mm)	A (mm)	L (mm)	M
	(inch)	(NPT)								
SM4BHMCN	1/4	1/4	15.70	14.20	4.60	7.10	20.63	31.50	56.10	9/16-18UNF

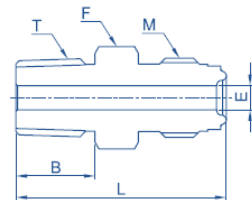
※ NPT: National Pipe Thread Tapered



Male Connector (PT)

Part No.	Head Size		T (PT)	E (mm)	B (mm)	L (mm)	F HEX. (mm)	M
	(inch)	(mm)						
SM2MCR	1/8	3.175	1/8	2.30	9.60	27.20	11.11	5/16-24UNF
SM4MCR	1/4	6.35	1/4	4.35	14.22	37.84	15.90	9/16-18UNF
SM8MCR	1/2	12.70	1/2	10.22	19.05	46.74	23.80	7/8-14UNF
SM12MCR	3/4	19.05	3/4	15.75	19.05	55.63	33.30	1 1/4-18UNEF
SM16MCR	1	25.40	1	22.10	23.88	62.74	41.28	1 1/2-20UN

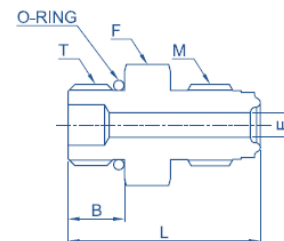
※ PT: Pipe Thread Tapered



Male Connector (NPT)

Part No.	Head Size		T (PT)	E (mm)	B (mm)	L (mm)	F HEX. (mm)	M
	(inch)	(mm)						
SM2MCN	1/8	3.175	1/8	2.30	9.60	27.20	11.11	5/16-24UNF
SM4MCN	1/4	6.35	1/4	4.35	14.22	37.84	15.90	9/16-18UNF
SM8MCN	1/2	12.70	1/2	10.22	19.05	46.74	23.80	7/8-14UNF
SM12MCN	3/4	19.05	3/4	15.75	19.05	55.63	33.30	1 1/4-18UNEF
SM16MCN	1	25.40	1	22.10	23.88	62.74	41.28	1 1/2-20UN

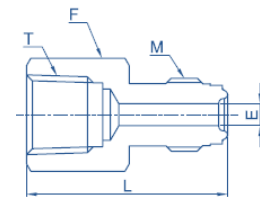
※ NPT: National Pipe Thread Tapered



Male Connector (SAE)

Part No.	Head Size		T (PT)	E (mm)	B (mm)	L (mm)	F HEX. (mm)	M
	(inch)	(mm)						
SM4X6MCU	1/4	6.35	5/16-24UNF	4.35	9.90	33.80	19.05	9/16-18UNF
SM8X10MCU	1/2	12.70	9/16-18UNF	10.22	12.70	42.20	25.40	7/8-14UNF
SM8X6MCU	1/2	12.70	7/8-14UNF	10.22	9.90	37.60	23.80	7/8-14UNF
SM12X14MCU	3/4	19.05	1 1/4-18UNEF	15.75	15.00	51.50	34.90	1 1/4-18UNEF

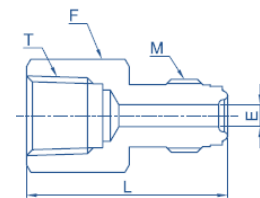
※ SAE: Society of Automotive Engineers/ Straight Thread



Female Connector (PT)

Part No.	Head Size		T (PT)	E (mm)	L (mm)	F HEX. (mm)	M
	(inch)	(mm)					
SM2FCR	1/8	3.175	1/8	2.30	30.20	14.28	5/16-24UNF
SM4FCR	1/4	6.35	1/4	4.35	39.10	19.05	9/16-18UNF
SM8FCR	1/2	12.70	1/2	10.22	50.50	26.98	7/8-14UNF
SM12FCR	3/4	19.05	3/4	15.75	59.90	33.33	1 1/4-18UNEF
SM16FCR	1	25.40	1	22.10	63.80	41.27	1 1/2-20UN

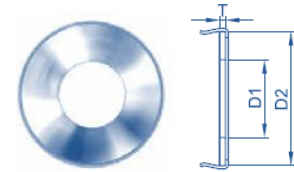
※ PT: Pipe Thread Tapered



Female Connector (NPT)

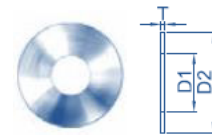
Part No.	Head Size		T (PT)	E (mm)	L (mm)	F HEX. (mm)	M
	(inch)	(mm)					
SM2FCN	1/8	3.175	1/8	2.30	30.20	14.28	5/16-24UNF
SM4FCN	1/4	6.35	1/4	4.35	39.10	19.05	9/16-18UNF
SM8FCN	1/2	12.70	1/2	10.22	50.50	26.98	7/8-14UNF
SM12FCN	3/4	19.05	3/4	15.75	59.90	33.33	1 1/4-18UNEF
SM16FCN	1	25.40	1	22.10	63.80	41.27	1 1/2-20UN

※ NPT: National Pipe Thread Tapered



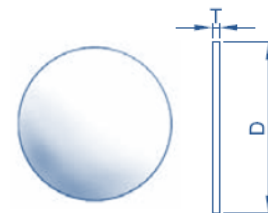
Gasket Retainer Assembly

Part No.	Head Size		T (mm)	D1 (mm)	D2 (mm)
	(inch)	(mm)			
SM4GR	1/4	6.35	0.80	5.60	11.85
SM8GR	1/2	12.70	0.80	11.20	19.27
SM12GR	3/4	19.05	0.80	16.70	27.90
SM16GR	1	25.40	0.80	22.60	34.20



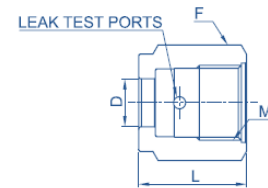
Gasket

Part No.	Head Size		T (mm)	D1 (mm)	D2 (mm)
	(inch)	(mm)			
SM2GT	1/8	3.175	0.80	2.30	6.60
SM4GT	1/4	6.35	0.80	5.60	12.70
SM8GT	1/2	12.70	0.80	11.20	19.80
SM12GT	3/4	19.05	0.80	16.70	29.00
SM16GT	1	25.40	0.80	22.60	35.80



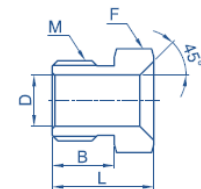
Blind Gasket

Part No.	Head Size		T (mm)	D (mm)
	(inch)	(mm)		
SM4GT	1/4	6.35	0.80	11.90
SM8GT	1/2	12.70	0.80	19.80
SM12GT	3/4	19.05	0.80	28.90
SM16GT	1	25.40	0.80	35.50



Female Nut

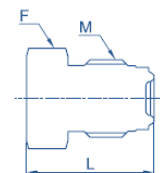
Part No.	Head Size		L (mm)	D (mm)	F HEX. (mm)	M
	(inch)	(mm)				
SM2FN	1/8	3.175	13.50	5.30	11.11	5/16-24UNF
SM4FN	1/4	6.35	20.50	9.10	19.05	9/16-18UNF
SM8FN	1/2	12.70	22.30	15.50	26.99	7/8-14UNF
SM12FN	3/4	19.05	28.40	22.60	38.10	1 1/4-18UNEF
SM16FN	1	25.40	34.00	30.50	44.45	1 1/2-20UN



Male Nut

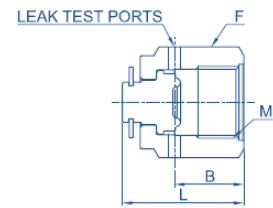
Part No.	Head Size		L (mm)	B (mm)	D (mm)	F HEX. (mm)	M
	(inch)	(mm)					
SM2MN	1/8	3.175	12.70	8.20	5.30	9.52	5/16-24UNF
SM4MN	1/4	6.35	18.00	11.10	9.10	15.88	9/16-18UNF
SM4MNS*	1/4	6.35	13.70	11.10	9.10	15.88	9/16-18UNF
SM8MN	1/2	12.70	20.50	12.70	15.50	23.81	7/8-14UNF
SM12MN	3/4	19.05	25.40	16.00	22.60	33.34	1 1/4-18UNEF
SM16MN	1	25.40	30.20	20.00	30.50	41.28	1 1/2-20UN

※ SM4MNS: Short Male Nut



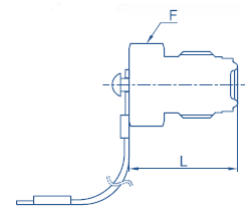
Plug

Part No.	Head Size		L (mm)	F HEX. (mm)	M
	(inch)	(mm)			
SM2PG	1/8	3.175	17.30	9.52	5/16-24UNF
SM4PG	1/4	6.35	23.37	15.88	9/16-18UNF
SM8PG	1/2	12.70	27.43	23.81	7/8-14UNF
SM12PG	3/4	19.05	36.32	33.34	1 1/4-18UNEF
SM16PG	1	25.40	38.61	41.28	1 1/2-20UN



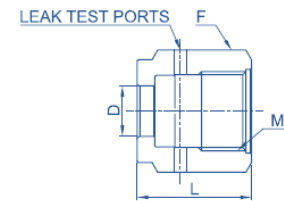
Cap

Part No.	Head Size		L (mm)	B (mm)	F HEX. (mm)	M
	(inch)	(mm)				
SM2CP	1/8	3.175	16.00	7.60	11.11	5/16-24UNF
SM4CP	1/4	6.35	24.20	11.18	19.05	9/16-18UNF
SM8CP	1/2	12.70	25.50	11.43	26.99	7/8-14UNF
SM12CP	3/4	19.05	32.77	13.72	38.10	1 1/4-18UNEF
SM16CP	1	25.40	39.12	16.00	44.45	1 1/2-20UN



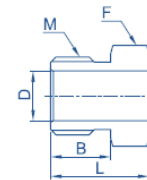
Plug (Cable Type)

Part No.	Head Size		L (mm)	F HEX. (mm)	Cable Length (mm)
	(inch)	(mm)			
SM4PGC	1/4	6.35	23.37	15.88	260
SM8PGC	1/2	12.70	27.43	23.81	260



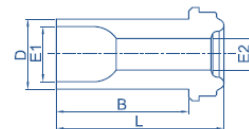
High Flow Female Nut

Part No.	Head Size		L (mm)	D (mm)	F HEX. (mm)	M
	(inch)	(mm)				
SM4HFN	1/4	6.35	20.57	9.90	19.05	9/16-18UNF



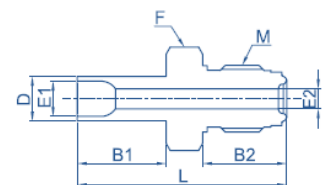
High Flow Male Nut

Part No.	Head Size		B (mm)	L (mm)	D (mm)	F HEX. (mm)	M
	(inch)	(mm)					
SM4HMN	1/4	6.35	11.00	18.03	9.90	15.88	9/16-18UNF



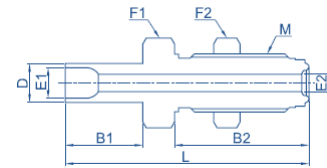
High Flow Long Gland

Part No.	Head Size		Tube OD		B (mm)	L (mm)	E1 (mm)	E2 (mm)
			D					
	(inch)	(mm)	(inch)	(mm)	(mm)	(mm)	(mm)	(mm)
SM4X6HLG	1/4	6.35	3/8	9.53	28.40	33.20	7.50	6.28



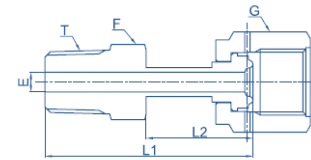
High Flow Tube Butt Weld Connector

Part No.	Head Size		Tube OD D (inch)	E1 (mm)	E2 (mm)	B1 (mm)	B2 (mm)	L (mm)	F HEX. (mm)	M
	(inch)	(mm)								
SM4X6HLC	1/4	6.35	3/8	7.5	6.35	19.05	15.80	42.75	15.88	9/16-18UNF



High Flow Tube Butt Weld Bulkhead Connector

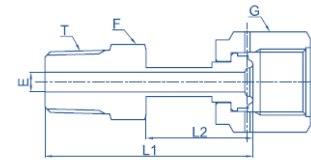
Part No.	Head Size		Tube OD	E1	E2	B1	B2	L	F1 HEX. F2 HEX.	M
	(inch)	(mm)	D (inch)							
SM4X6HBLC	1/4	6.35	3/8	7.5	6.35	19.05	33.00	59.85	19.05	9/16-18UNF



Welded Male Connector (PT)

Part No.	Head Size		T	E	L1	L2	F HEX.	G HEX.
	(inch)	(mm)	(PT)					
SM4WMCR	1/4	6.35	1/4	4.35	4.35	23.40	14.29	19.05
SM8WMCR	1/2	12.70	1/2	10.22	10.22	53.10	22.23	26.66

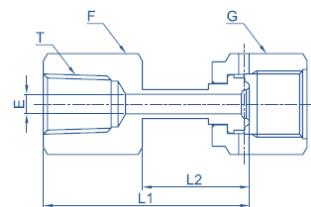
※ PT: Pipe Thread Tapered



Welded Male Connector (NPT)

Part No.	Head Size		T	E	L1	L2	F HEX.	G HEX.
	(inch)	(mm)	(NPT)					
SM4WMCN	1/4	6.35	1/4	4.35	4.35	23.40	14.29	19.05
SM8WMCN	1/2	12.70	1/2	10.22	10.22	53.10	22.23	26.66

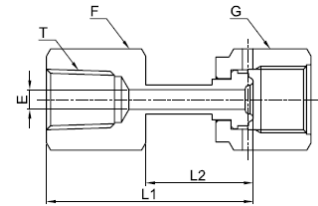
※ NPT: National Pipe Thread Tapered



Welded Female Connector (PT)

Part No.	Head Size		T	E	L1	L2	F HEX.	G HEX.
	(inch)	(mm)	(PT)					
SM4WFCR	1/4	6.35	1/4	4.35	45.00	23.40	19.05	19.05
SM8WFCR	1/2	12.70	1/2	10.22	55.40	26.40	26.99	26.99

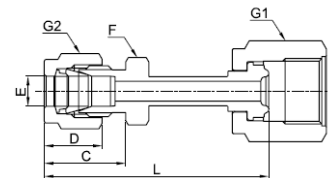
※ PT: Pipe Thread Tapered



Welded Male Connector (NPT)

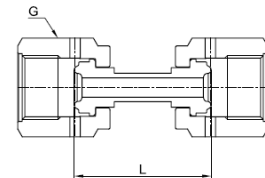
Part No.	Head Size		T (NPT)	E (mm)	L1 (mm)	L2 (mm)	F HEX. (mm)	G HEX. (mm)
	(inch)	(mm)						
SM4WFCR	1/4	6.35	1/4	4.35	45.00	23.40	19.05	19.05
SM8WFCR	1/2	12.70	1/2	10.22	55.40	26.40	26.99	26.99

※ NPT: National Pipe Thread Tapered



Welded Lok Connector

Part No.	Head Size		Tube Size (mm)	C (mm)	D (mm)	E (mm)	L (mm)	F HEX. (mm)	G1 HEX. (mm)	G2 HEX. (mm)
	(inch)	(mm)								
SM4WSC	1/4	6.35	6.35	17.78	15.24	4.35	49.28	12.70	19.00	14.29
SM8WSC	1/2	12.70	12.70	21.84	22.86	10.22	56.64	20.64	26.99	22.22



Welded Female Union

Part No.	Head Size		L (mm)	G HEX. (mm)
	(inch)	(mm)		
SM4WFO	1/4	6.35	43.40	19.05
SM8WFO	1/2	12.70	46.70	26.99



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