

STAINLESS STEEL TUBES

For the Sanitary Industries



Stainless Steel Tube , tube butt weld, Acme threaded and plain bevel-seat, and specialty end connections

- 304 and 316L stainless steel construction
- Polished and unpolished inside- and outside-diameter surface finishes
- Many 3-A compliant configurations

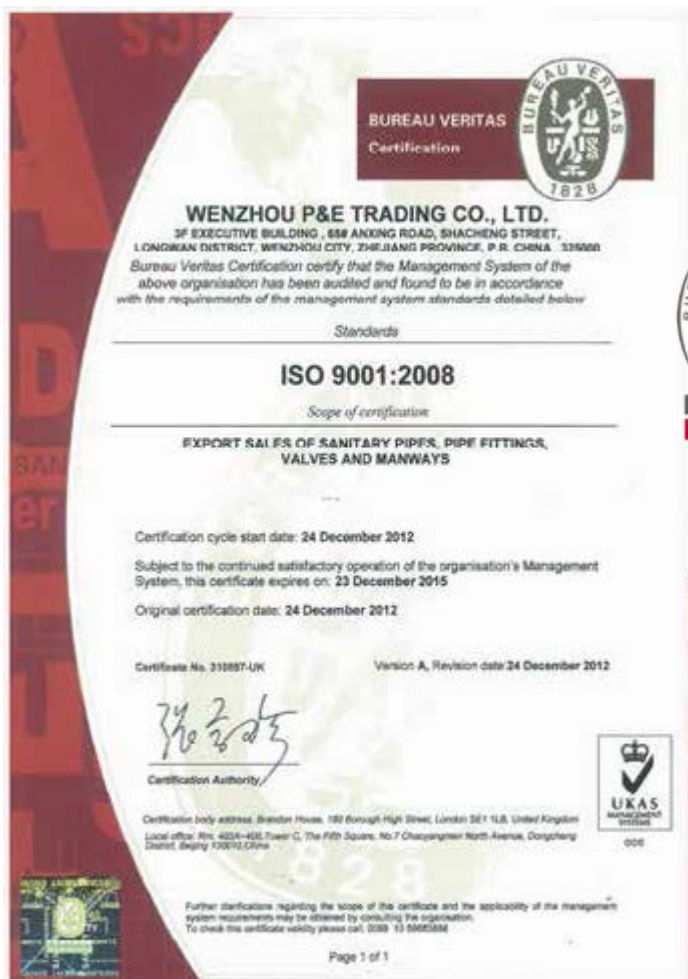


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Bureau Veritas Certificate



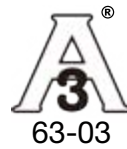
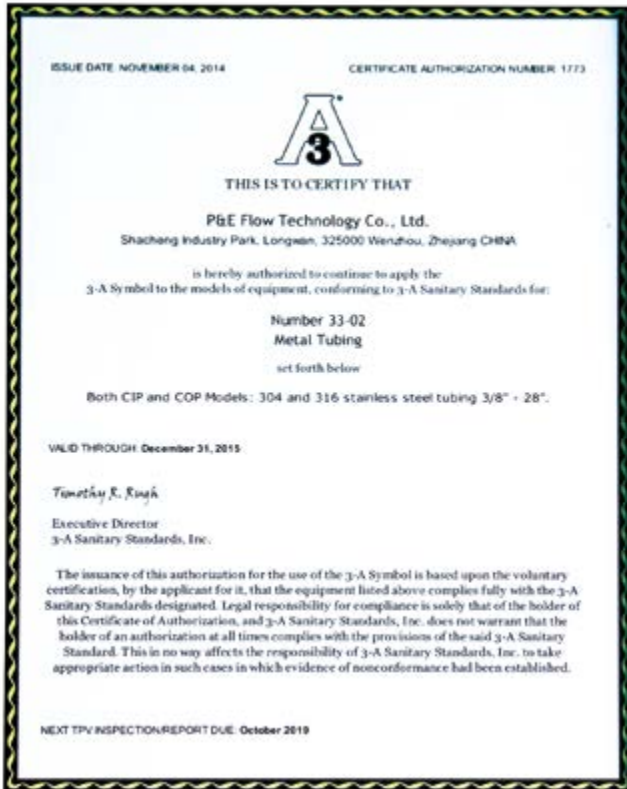
We are certified according to ISO 9001:2008



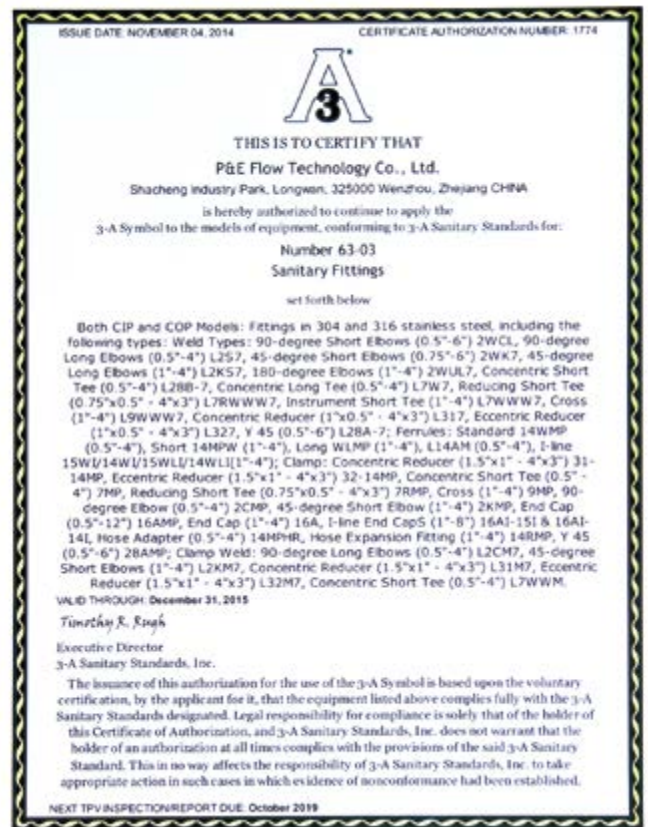
3-A Certificate



We are certified according to 3-A Sanitary Standard 33-02.



We are certified according to 3-A Sanitary Standard 63-03.



Overview

SANITARY CONNECTION SOLUTIONS

The P&E Corp manufactures the Strict implementation of the standards Tubing for industry.

MANAGEMENT

Enterprise Resource Planning(ERP)
 Bureau Veritas ISO9001
 DAS UKAS ISO9001
 Joint Enterprise Resource Planning(ERP)
 Enterprise Asset Management(EAM)

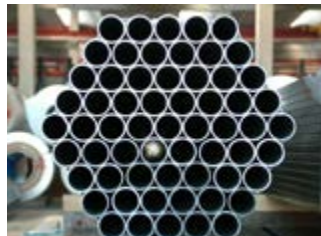
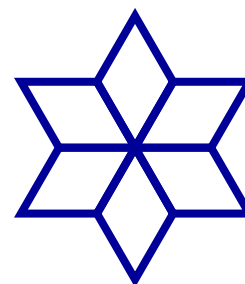
STANDARD DESIGN

GEMO Tubes are available in following standard:

- ASME BPE
- DIN11866
- ASTM A270
- DIN11850
- SMS
- ISO2037
- BS4825
- AS1528
- ASTM A249
- ASTM A269
- ASTM A554

COMPANY PROFILE

Name	P&E Flow Technology Co., Ltd
Export Name	Wenzhou P&E Trading Co., Ltd
Competence	Stainless steel tubing and fittings most standardized connection
Employees	133
Production Plants	2
Production capacity	8000 tons
Quality Assurance	12



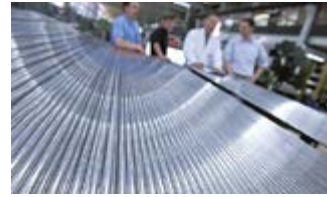
Range Tubes

Bio-Pharm Tubes/Ultracure tubes

ASME BPE

DIN11866

Mechanically polished tubing to 20 μ-in Ra ID for pharmaceutical, semiconductor, biotechnology, and other high purity processes.



Sanitary Tube

ASTM A270

“Specification for seamless & welded austenitic and ferritic/austenitic stainless steel sanitary tubing”.

DIN11850

ISO2037

SMS

BS4825

AS1528

“Specification for tubes (stainless steel) for the food industry”.



Heat Exchanger Solution Tube

ASTM A249

“Specification for welded austenitic steel boiler, super heater, heat exchanger, and condenser tubes”.



General industry Tube

ASTM A269

“Specification for seamless & welded austenitic stainless steel tubing for general service”.



Ornamental Tube

ASTM A554

“Specification for welded stainless steel mechanical tubing”.



Surface Roughness

Surface specification for GEMO® UltraPure range

UltraPure tubes and fittings

GEMO® designation	Surface texture (Ra µm)			Standard designation		According to	Treatment	GEMO® UltraPure ASME-BPE	GEMO® UltraPure Series A and Series B
	Internal	Welded / Bended area	External	Turbular	Machined				
PL	< 0.5	< 0.5	< 0.8	SF1	SF1	ASME BPE	Annealed	X	
PM	< 0.4 EP3)	< 0.4 EP3)	< 0.8	SF4	SF4	ASME BPE	Annealed	X	
H3o/H3	< 0.8	< 0.8	< 1.6	H3o	H3	DIN 11866	Annealed		X
H4o/H4	< 0.4	< 0.4	< 0.8	H4o	H4	DIN 11866	Annealed		X
HE4o/HE4	< 0.4 EP3)	< 0.4 EP3)	< 0.8	HE4o	HE4	DIN 11866	Annealed		X

***Section 12

Surface specification for GEMO® ASTM A270,SMS,ISO2037,BS4825, AS1528 range

Finish code	ID or Product Contact Surface				Polishing Method	OD or Product Non-contact Surface
	Maximum Surface Roughness (Ra)			ASME BPE Finish Code		
	Microinches (µ-inch)	Micrometers (µm)				
#1					Unpolished	Unpolished
#3	32	0.8	----		Mechanical polished	Unpolished
#7	32	0.8	----		Mechanical polished	Polished to Ra, 32 µ-inch/0.8 µm
PC	20	0.5	SFF1		Mechanical polished	Unpolished
PD	15	0.4	SFF4		Mechanical polished and electropolished	Unpolished
PL	20	0.5	SFF1		Mechanical polished	Polished to Ra, 32 µ-inch/0.8 µm
PM	15	0.4	SFF4		Mechanical polished and electropolished	Polished to Ra, 32 µ-inch/0.8 µm

***Section 13

Surface specification for GEMO® DIN11850 and 3A range

GEMO® designation	GEMO designation			Standard designation	According to	Treatment	Dimension ranges			GEMO® Sanitary ASME
	Internal Surface	Welded area	External				DIN 11850	ISO 2037	BS 4825	
BC	< 0.8	< 1.6	pickled	BC	DIN 11850	Annealed	X	X	X	
BD	< 0.8	< 1.6	< 1.0	BD	DIN 11850	Annealed	X	X	X	
CC	< 0.8	< 1.6	pickled	CC	DIN 11850	Not annealed	X			
CD	< 0.8	< 1.6	< 1.0	CD	DIN 11850	Not annealed	X			
GEMO® Sanitary	< 0.8	< 0.8	< 0.8	No. 4 1	3A	Annealed				X

***The Surface Characteristics are distinguished by the inner and outer surfaces and essentially evaluated acc.to DIN EN 10217-7

***Section 14



Surface Roughness

Explanation of surface designation for tubes and fittings

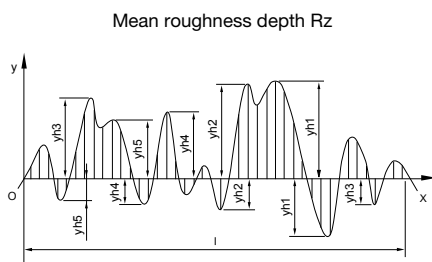
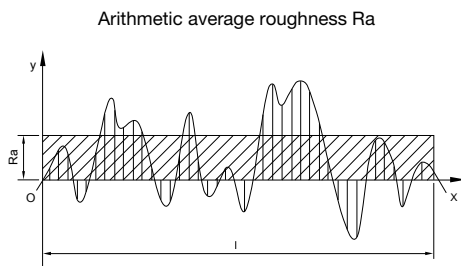
GEMO® designation	Method
Mat	Shot Blasted
Raw	As fabricated or tumbled
Semi bright	As fabricated or tumbled
Polished	Mechanically polished
Mirror	Mechanically polished and buffed for a shiny surface
3A	Mechanically polished or as fabricated

Conversion table - Surface finish

Correlation between Grit and Ra values

Ra (µm)	Ra (µ inch)	US Grit	UK Grit
3	125		120
2	85		180
1.65	70	80	
1.5	50		240
0.75	30		320
0.62	25	180	
0.45	18	240	
0.40	15		500
0.25	10	320	

The Surface Roughness Depends on the Manufacturing Processes



Quality Test

Material test

An analysis of either one length of flat-rolled stock or one tube shall be made for each heat. The chemical composition thus determined shall conform to the requirements .

Dimensional Test

OD/ID test

(3)Inch

(3)mm

Wall Thickness

(2)inch

(2)mm

Straightness, Length

Metallographic Inspection

The microstructure of metallic materials directly affects the performance and service life of mechanical parts, metallurgical analysis is an important way to control the intrinsic quality of the mechanical parts.

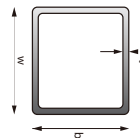
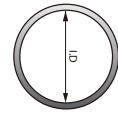
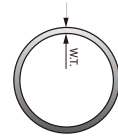
Non-destructive Tests

Non-destructive tests do not damage the material or product being tested. Frequently they are built into production processes, as is the case with pipe tested using eddy current equipment.

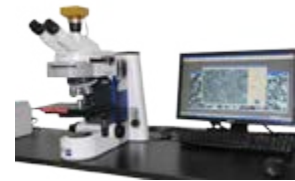
Ultrasonic Testing. This test involves ultrasonic sound waves being aimed, via a coupling medium, at the material to be tested. A proportion are bounced back at the interface but the remainder enter the material and bounce from the internal surface, to the external surface, where a transducer converts them into electrical energy. This is then monitored on a cathode ray tube where results are compared with those from a calibration standard. Any deviations from the standard are visible, thus indicating cracks or internal defects.

Eddy-Current Testing. This involves inducing eddy currents into the material by exciting a coil which surmounts two narrow search coils surrounding the material. Any discontinuities in material are found by comparing the electrical conditions that exist in the two search coils. The fault signals are amplified and can be shown on a cathode ray tube or as an audible signal.

Hydrostatic Testing. This is used to test the manufactured items under a pressure equivalent to or greater than pressure to be encountered in service. It involves filling the tube with water, which cannot be compressed, and increasing the pressure inside the tube to that specified.



Mitutoyo



Quality Test

Pneumatic Test

Each tube will be internally pressurized to 150 psi with air while submerged under water and must be rejected for any leakages.



Tensile Test

This is probably the most revealing of the mechanical tests that can be performed upon a specimen of pipe or tubular product material. A longitudinal specimen of known cross sectional area is taken from the material and gripped at each end, and then pulled apart until fracture occurs.



Flaring Test

This is an alternative to the flange test for certain types of pressure tube. A cone is forced into the end of the tube. The end of the tube is expanded by a specified increase in diameter without splits or cracks.

The included angle of drift is also specified.



Flattening Test

This is usually applied to tube and involves flattening a sample of tube between two parallel faces without the tube showing flaws or cracks.

The length of the test piece and degree to which it is to be flattened (i.e. the distance between the parallel faces) are specified.



Hardness Tests

Brinell Hardness Test. A standard size hardened steel ball is indented into the surface of material by an applied standard load. The diameter of the impression is measured accurately by microscope and converted to a hardness value using tables.

Vickers Diamond Hardness Test. This determines hardness by measuring the impression left in material by a diamond pyramid under a standard load. The impression is accurately measured, and its area calculated.

The Vickers Hardness Number is calculated by dividing the load (kg) by the area of impression (mm²).

Rockwell Hardness Test. This determines hardness by measuring the depth to which a diamond cone or hardened steel ball, under specific load, penetrates the material. Two loads are used, a minor load (10 kgf) and then a major load (100 or 150 kgf), the difference in indentation being used by the machine to determine the Rockwell number.

The number increases with increasing hardness and is displayed or printed by the machine. Two scales are most frequently used, a B scale with a 100 kgf load and 1.588mm steel ball, and a C scale with a 150 kgf load and diamond cone.

A Rockwell superficial hardness machine is used for testing very thin wall thicknesses, the minor load used being 3 kgf and the major load being 15, 30 or 45 kgf. The superficial hardness scales used are then 15T, 30T or 45T with a 1.588mm steel ball, or 15N, 30N or 45N with a diamond cone.



BioPharm/Ultrapure Tubes ASME BPE

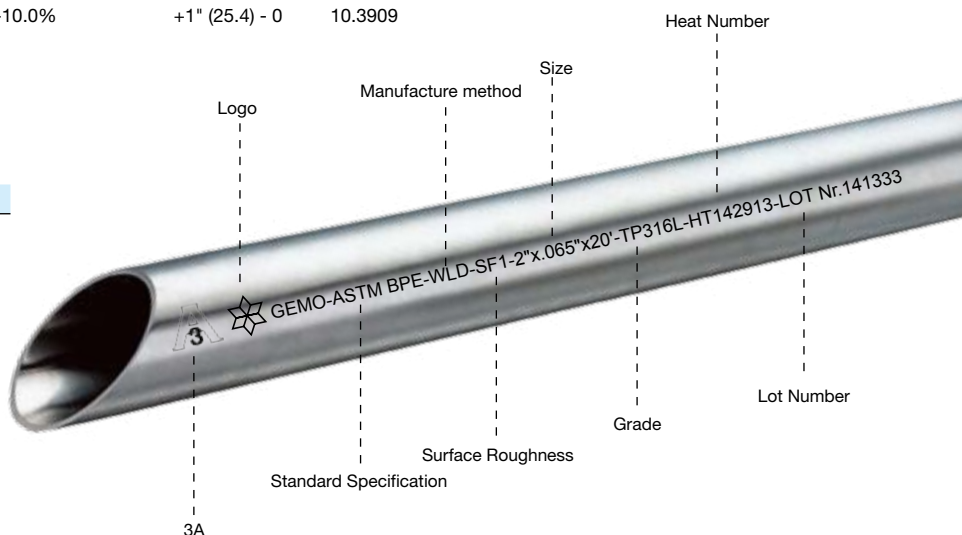
Dimensional Tolerances

all dimensions in inches (mm)

Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness ^{a)}	Tolerances on Length	Weight Kg/M
1/2" (12.7)	+/-0.005" (0.13)	0.065" (1.65)	+/-10.0%	+1/8" (3.18) - 0	0.4571
3/4" (19.1)	+/-0.005" (0.13)	0.065" (1.65)	+/-10.0%	+1/8" (3.18) - 0	0.7218
1" (25.4)	+/-0.005" (0.13)	0.065" (1.65)	+/-10.0%	+1/8" (3.18) - 0	0.9824
1-1/2" (38.1)	+/-0.008" (0.20)	0.065" (1.65)	+/-10.0%	+1/8" (3.18) - 0	1.5078
2" (50.8)	+/-0.008" (0.20)	0.065" (1.65)	+/-10.0%	+1/8" (3.18) - 0	2.0331
2-1/2" (63.5)	+/-0.010" (0.25)	0.065" (1.65)	+/-10.0%	+1/8" (3.18) - 0	2.5585
3" (76.2)	+/-0.010" (0.25)	0.065" (1.65)	+/-10.0%	+1/8" (3.18) - 0	3.0797
4" (101.6)	+/-0.015" (0.38)	0.083" (2.11)	+/-10.0%	+1/8" (3.18) - 0	5.2628
6" (152.4)	+/-0.030" (0.76)	0.109" (2.77)	+/-10.0%	+1" (25.4) - 0	10.3909

Chemical Composition

Elements		316L (wt%)
(C)	Carbon, Max.	0.035
(Mn)	Manganese, Max.	2.00
(P)	Phosphorus, Max.	0.040
(S)	Sulfur	0.005-0.017
(Si)	Silicon, Max.	0.75
(Ni)	Nickel	10.0-15.0
(Cr)	Chromium	16.0-18.0
(Mo)	Molybdenum	2.0-3.0



Flow Information

Tube OD	Tube ID	Wall Thickness	Volume	Weight Dry	Weight with Water	Flow (GPM) at a Mean Velocity		
						5 fps	7 fps	10 fps
Inches	Inches	Inches	Gal/100 ft	Lbs/100 ft	Lbs/100 ft	5 fps	7 fps	10 fps
1/2	0.37	0.065	0.56	30.6	35.3	1.7	2.3	3.4
3/4	0.62	0.065	1.57	48.2	61.3	4.7	6.6	9.4
1	0.87	0.065	3.09	65.8	91.5	9.3	13	19
1 1/2	1.37	0.065	7.66	100.9	164.8	23	32	46
2	1.87	0.065	14.27	136.1	255.1	43	60	86
2 1/2	2.37	0.065	22.92	171.2	362.4	69	96	138
3	2.87	0.065	33.6	206.4	486.7	101	141	202
4	3.834	0.083	59.97	351.8	851.9	180	252	360
6	5.782	0.109	136.39	694.7	1832.2	409	573	818
8	7.782	0.109	247.07	930.6	2991.1	741	1038	1482

***This tubing is available in 1/2" (12.7 mm) to 6" (152.4 mm) OD in stock 20' (6.1 m) lengths.



BioPharm/Ultrapure Tubes DIN 11866

Range A Tube dimension for DIN 11850 range 2

Dimensions (mm)

Dimension DN	6	8	10	15	20	25	32	40	50	65	80	100	125	150	200
Outside dimension	8.00	10.00	13.00	19.00	23.00	29.00	35.00	41.00	53.00	70.00	85.00	104.00	129.00	154.00	204.00
Inside dimension	6.00	8.00	10.00	16.00	20.00	26.00	32.00	38.00	50.00	66.00	81.00	100.00	125.00	150.00	200.00
Tolerances, OD	±0.05	±0.05	±0.05	±0.10	±0.10	±0.12	±0.15	±0.15	±0.25	±0.30	±0.43	±0.52	±0.65	±0.77	±1.02
Wall thickness	1.00	1.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.00	2.00	2.00	2.00	2.00	2.00
Tolerances on wall thickness ^{a)}	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10
Weight Kg/M	0.175	0.226	0.432	0.658	0.808	1.034	1.260	1.485	1.937	3.409	4.162	5.114	6.368	7.621	10.128

Range B Tube dimension for DIN EN ISO 1127

Dimensions (mm)

Dimension DN/OD	10.2	13.5	17.2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1
Outside dimension	10.20	13.50	17.20	21.30	26.90	33.70	42.40	48.30	60.30	76.10	88.90	114.30	139.70	168.30	219.10
Inside dimension	7.00	10.30	14.00	18.10	23.70	29.70	38.40	44.30	56.30	72.10	84.30	109.70	134.50	163.10	213.9
Tolerances, OD	±0.05	±0.05	±0.10	±0.10	±0.12	±0.15	±0.15	±0.20	±0.25	±0.30	±0.44	±0.57	±0.70	±0.84	±1.10
Wall thickness	1.60	1.60	1.60	1.60	1.60	2.00	2.00	2.00	2.00	2.00	2.30	2.30	2.60	2.60	2.60
Tolerances on wall thickness ^{a)}	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.12	±0.12	±0.13	±0.13	±0.15
Weight Kg/M	0.345	0.477	0.626	0.790	1.015	1.589	2.026	2.321	2.923	3.715	4.993	6.458	8.936	10.801	14.112

Range C Tube dimension for ASME-BPE 1997

Dimensions (mm)

Dimension DN/OD (Inch)	1/4"	3/8"	1/2"	3/4"	1"	1½"	2"	2½"	3"	4"	6"
Outside dimension	6.35	9.53	12.70	19.05	25.40	38.10	50.80	63.50	76.20	101.60	152.40
Inside dimension	4.57	7.75	9.40	15.75	22.10	34.80	47.50	60.20	72.90	97.38	146.86
Tolerances, OD	±0.05	±0.05	±0.05	±0.10	±0.12	±0.15	±0.20	±0.25	±0.30	±0.51	±0.76
Wall thickness	0.89	0.89	1.65	1.65	1.65	1.65	1.65	1.65	1.65	2.11	2.77
Tolerances on wall thickness ^{a)}	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.11	±0.14
Weight Kg/M	0.124	0.197	0.457	0.720	0.982	1.508	2.033	2.558	3.084	5.263	10.390

a) = For tubes which have inside treatment (Honen, polished or electropolished) the tolerances of wall thickness may be reduced with 0.05 mm.

Source: DIN11866

Ordering:

All tubes are delivered in lengths of 6 metres or 6.1 metres. Please state the following when ordering:

- Range (A,B or C)
- Material
- Hygiene Class (see *****Section 12**)
- OD/ID dimension



Sanitary Tubes 3A ASTM A270

Dimensional Tolerances

all dimensions in inches (mm)

Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness ^{a)}	Tolerances on Length	Weight Kg/M
1/2" (12.7)	+/-0.005" (0.13)	0.065" (1.65) /0.049" (1.25)	+/-10.0%	+1/8" (3.18)	0.4571
3/4" (19.1)	+/-0.005" (0.13)	0.065" (1.65) /0.049" (1.25)	+/-10.0%	+1/8" (3.18)	0.7218
1" (25.4)	+/-0.005" (0.13)	0.065" (1.65) /0.049" (1.25)	+/-10.0%	+1/8" (3.18)	0.9824
1-1/4" (31.8)	+/-0.008" (0.20)	0.065" (1.65)	+/-10.0%	+1/8" (3.18)	1.2412
1-1/2" (38.1)	+/-0.008" (0.20)	0.065" (1.65) /0.049" (1.25)	+/-10.0%	+1/8" (3.18)	1.5078
2" (50.8)	+/-0.008" (0.20)	0.065" (1.65) /0.049" (1.25)	+/-10.0%	+1/8" (3.18)	2.0331
2-1/2" (63.5)	+/-0.010" (0.25)	0.065" (1.65)	+/-10.0%	+1/8" (3.18)	2.5585
3" (76.2)	+/-0.010" (0.25)	0.065" (1.65)	+/-10.0%	+1/8" (3.18)	3.0797
4" (101.6)	+/-0.015" (0.38)	0.065" (1.65) /0.083" (2.11)	+/-10.0%	+1/8" (3.18)	5.2628
6" (152.4)	+/-0.030" (0.76)	0.083" (2.11)	+/-10.0%	+1" (25.4) - 0	7.9116
6" (152.4)	+/-0.030" (0.76)	0.109" (2.77)	+/-10.0%	+1" (25.4) - 0	10.3909
8" (203.2)	+0.061" (1.55) - 0.031" (0.79)	0.109" (2.77)	+/-10.0%	+1" (25.4) - 0	13.9166

***Uniform wall thickness for 1/2" through 3" size measure.065(16ga).In 4"Size, wall thickness measures .083(14ga),6" and 8" .109(12ga).

Chemical Composition

Elements	304 (wt%)	304L (wt%)	316L (wt%)
(C) Carbon, Max.	0.080	0.035	0.035
(Mn) Manganese, Max.	2.00	2.00	2.00
(P) Phosphorus, Max.	0.040	0.040	0.040
(S) Sulfur, Max.	0.030	0.030	0.030**
(Si) Silicon, Max.	0.75	0.75	0.75
(Ni) Nickel	8.0–11.0	8.0–13.0	10.0–15.0
(Cr) Chromium	18.0–20.0	18.0–20.0	16.0–18.0
(Mo) Molybdenum	N/A	N/A	2.0–3.0
(Fe) Iron	Bal.	Bal.	Bal.
(Cu) Copper	N/A	N/A	N/A
(N) Nitrogen	N/A	N/A	N/A

Product Marking

In addition to the marking prescribed in Specification A 1016/A 1016M and specified in the order, the marking shall include whether the tubing is seamless (SML), welded (WLD), or heavily cold worked (HCW), and the surface finish.



Sanitary Tubes Inch ASTM A270

Dimensional Tolerances

all dimensions in inches (mm)

Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness ^{a)}	Tolerances on Length	Weight Kg/M
1/2" (12.7)	+/-0.005" (0.13)	0.059"(1.50)	+/-10.0%	+1/8" (3.18)	0.4185
3/4" (19.1)	+/-0.005" (0.13)	0.059"(1.50)	+/-10.0%	+1/8" (3.18)	0.6576
1" (25.4)	+/-0.005" (0.13)	0.059"(1.50)	+/-10.0%	+1/8" (3.18)	0.8930
1-1/4" (31.8)	+/-0.008" (0.20)	0.059"(1.50)	+/-10.0%	+1/8" (3.18)	1.1322
1-1/2" (38.1)	+/-0.008" (0.20)	0.059"(1.50)	+/-10.0%	+1/8" (3.18)	1.3676
2" (50.8)	+/-0.008" (0.20)	0.059"(1.50)	+/-10.0%	+1/8" (3.18)	1.8421
2-1/2" (63.5)	+/-0.010" (0.25)	0.059"(1.50)	+/-10.0%	+1/8" (3.18)	2.3166
3" (76.2)	+/-0.010" (0.25)	0.059"(1.50)	+/-10.0%	+1/8" (3.18)	2.7912
4" (101.6)	+/-0.015" (0.38)	0.079"(2.00)	+/-10.0%	+1/8" (3.18)	4.9621
6" (152.4)	+/-0.030" (0.76)	0.079"(2.00)	+/-10.0%	+1" (25.4) - 0	7.4929
6" (152.4)	+/-0.030" (0.76)	0.12"(3.05)	+/-10.0%	+1" (25.4) - 0	11.3469
8"(203.2)	+/-0.040" (1.016)	0.12"(3.05)	+/-10.0%	+1" (25.4) - 0	15.2065
10"(254)	+/-0.040" (1.016)	0.12"(3.05)	+/-10.0%	+1" (25.4) - 0	19.0661
10"(254)	+/-0.040" (1.016)	0.134"(3.4)	+/-10.0%	+1" (25.4) - 0	21.2243
12"(304.8)	+/-0.040" (1.016)	0.12"(3.05)	+/-10.0%	+1" (25.4) - 0	22.9256
12"(304.8)	+/-0.040" (1.016)	0,134"(3.4)	+/-10.0%	+1" (25.4) - 0	25.5268

Ordering Information

It is the responsibility of the purchaser to specify all requirements that are necessary for material ordered under this specification. Such requirements may be included, but are not limited to, the following:

- Quantity (feet, meters, or number of lengths).
- Name of material (austenitic steel tube).
- Process seamless (SML), welded (WLD), or heavily cold worked (HCW).
- Size (outside diameter and average wall thickness).
- Length (specific or random).
- Surface finish (see***Section 13).
- Optional requirements (product analysis, hydrostatic or nondestructive electric test).
- Test report required (Certification Section of Specification A 1016/A 1016M).
- Specification designation.
- Special requirements, and any supplementary requirements.



Sanitary Tubes DIN11850

Tubes acc. to DIN 11850 - Series 1 Dimensional Tolerances all dimensions in mm

Nominal diameter DN	Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness	Tolerances on Length	Weight Kg/m
10	12	±0.12	1.0	±10%	+3.00	0.27
15	18	±0.12	1.0	±10%	+3.00	0.42
20	22	±0.12	1.0	±10%	+3.00	0.51
25	28	±0.15	1.0	±10%	+3.00	0.66
32	34	±0.15	1.0	±10%	+3.00	0.82
40	40	±0.2	1.0	±10%	+3.00	0.97
50	52	±0.2	1.0	±10%	+3.00	1.27

Tubes acc. to DIN 11850 - Series 2 Dimensional Tolerances all dimensions in mm

Nominal diameter DN	Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness	Tolerances on Length	Weight Kg/m
10	13	±0.3	1.5	±10%	+3.00	0.43
15	19	±0.3	1.5	±10%	+3.00	0.66
20	23	±0.3	1.5	±10%	+3.00	0.81
25	29	±0.25	1.5	±10%	+3.00	1.03
32	35	±0.3	1.5	±10%	+3.00	1.26
40	41	±0.3	1.5	±10%	+3.00	1.50
50	53	±0.3	1.5	±10%	+3.00	1.944
65	70	±0.3	2.0	±10%	+3.00	3.43
80	85	±0.3	2.0	±10%	+3.00	4.16
100	104	±0.3	2.0	±10%	+3.00	5.03
125	129	±0.4	2.0	±10%	+10.00	6.36
150	154	±0.4	2.0	±10%	+10.00	7.612
200	204	±0.4	2.0	±10%	+10.00	10.116
250	254	±0.4	2.0	±10%	+20.00	12.555
300	304	±0.4	2.0	±10%	+20.00	15.045

Chemical Composition

Werkstoff- Norm nummer		C ≤	Si ≤	Mn ≤	P max.	S ≤	N ≤	Cr	Mo	Ni
1.4301	DIN EN 10217-7	0.07	1.0	2.0	0.045	0.015	0.11	17.0 bis 19.5	—	8.0 bis 10.5
304	ASTM A269 ASTM A 270	0.08	0.75	2.0	0.045	0.030	0.10	18.0 bis 20.0	—	8.0 bis 10.5
1.4307	DIN EN 10217-7	0.03	1.0	2.0	0.045	0.015	0.11	17.5 bis 19.5	—	8.0 bis 10.0
304L	ASTM A269 ASTM A 270	0.03	0.75	2.0	0.045	0.030	0.10	18.0 bis 20.0	—	8.0 bis 12.0
1.4404	DIN EN 10217-7	0.03	1.0	2.0	0.045	0.015	0.11	16.5 bis 18.5	2.0 bis 2.5	10.0 bis 13.0
316L	ASTM A269 ASTM A 270	0.03	0.75	2.0	0.045	0.030	0.10	16.0 bis 18.0	2.0 bis 3.0	10.0 bis 14.0



Sanitary Tubes DIN11850

Tubes DIN11850 Practice based sizes Dimensional Tolerances all dimensions in mm

Nominal diameter DN	Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness	Tolerances on Length	Weight Kg/m
10	12	±0.12	1.5	±10%	+3.00	0.3924
15	18	±0.12	1.5	±10%	+3.00	0.6205
20	22	±0.12	1.5	±10%	+3.00	0.7709
25	28	±0.15	1.5	±10%	+3.00	0.9965
32	34	±0.15	1.5	±10%	+3.00	1.2222
40	40	±0.2	1.5	±10%	+3.00	1.4478
50	52	±0.2	1.5	±10%	+3.00	1.8991

Tubes acc. to DIN 11850 - Series 3 Dimensional Tolerances all dimensions in mm


Nominal diameter DN	Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness	Tolerances on Length	Weight Kg/m
10	14	±0.3	2.0	±10%	+3.00	0.60
15	20	±0.3	2.0	±10%	+3.00	0.90
20	24	±0.3	2.0	±10%	+3.00	1.10
25	30	±0.3	2.0	±10%	+3.00	1.40
32	36	±0.3	2.0	±10%	+3.00	1.70
40	42	±0.3	2.0	±10%	+3.00	2.00
50	54	±0.3	2.0	±10%	+3.00	2.60

Marking

The pipes should be marked according to the provisions of the technical specifications DIN 17456 or DIN 17455 with :

- Manufacture mark
- Standard
- Surface quality mark (see *****Section 14**)
- Dimension(ODxWTxLENGTH)
- Steel grade (material number)
- Heat number
- Lot number

For Examples

 GEMO-DIN11850-CD-52x1.5x6000mm-1.4301-HT145611-LOT Nr.141413

Ordering:

All tubes are delivered in lengths of 6 metres or 6.1 metres. Please state the following

when ordering:

- Range Series
- DIN number of the technical specification (welded pipes DIN17455 , seamless pipes DIN 17456)
- Outside diameter and wall thickness
- Manufactured length
- Material
- Abbreviation for the surface quality (see *****Section 14**)
- Certificates
- Test category accordig to DIN EN 10217-7



Sanitary Tubes SMS 3008

Dimensional Tolerances

all dimensions in mm

Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness	Tolerances on Length	Weight Kg/M
1" (25,00)	+/-0.13	1,20	+/-10.0%	+1/8" (3.18)	0.72
1-1/4"(32,00)	+/-0.20	1,20	+/-10.0%	+1/8" (3.18)	0.92
1-1/2"(38,00)	+/-0.20	1,20	+/-10.0%	+1/8" (3.18)	1.10
2"(51,00)	+/-0.20	1,20	+/-10.0%	+1/8" (3.18)	1.49
2-1/2"(63,50)	+/-0.25	1,60	+/-10.0%	+1/8" (3.18)	2.47
3"(76,10)	+/-0.25	1,60	+/-10.0%	+1/8" (3.18)	2.97
4"(101,60)	+/-0.38	2,00	+/-10.0%	+1/8" (3.18)	4.99

SMS 3008 Practise based sizes

Dimensional Tolerances

all dimensions in mm

Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness	Tolerances on Length	Weight Kg/M
1" (25,00)	+/-0.13	1,00	+/-10.0%	+1/8" (3.18)	0.60
3"(76,00)	+/-0.25	2,00	+/-10.0%	+1/8" (3.18)	3.69
4"(104,00)	+/-0.38	2,00	+/-10.0%	+1/8" (3.18)	5.09

Chemical Composition

Chemical Composition%		
	304	316L
C	0.080	0.030
MN	2.00	2.000
P	0.045	0.045
S	0.030	0.030*
Si	1.000	1.000
Cr	18.0-20.0	16.0-18.0
Ni	8.0-13.0	10.0-14.0
Mo	-	2.0-3.0

***The sulfur content 316L ASME BPE is 0.005-0.017% for all weld ends.



Sanitary Tubes ISO2037

Dimensional Tolerances

all dimensions in mm

Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness	Tolerances on Length	Weight Kg/M
12,00	+/-0.13	1,00	+/-10.0%	+3.18 - 0	0.274
17,20	+/-0.13	1,00	+/-10.0%	+3.18 - 0	0.404
21,30	+/-0.13	1,00	+/-10.0%	+3.18 - 0	0.506
25,00	+/-0.13	1,20	+/-10.0%	+3.18 - 0	0.712
25,00	+/-0.13	1,60	+/-10.0%	+3.18 - 0	0.933
33,70	+/-0.20	1,20	+/-10.0%	+3.18 - 0	0.972
33,70	+/-0.20	1,60	+/-10.0%	+3.18 - 0	1.280
38,00	+/-0.20	1,20	+/-10.0%	+3.18 - 0	1.100
38,00	+/-0.20	1,60	+/-10.0%	+3.18 - 0	1.451
40,00	+/-0.20	1,20	+/-10.0%	+3.18 - 0	1.160
40,00	+/-0.20	1,60	+/-10.0%	+3.18 - 0	1.531
51,00	+/-0.20	1,20	+/-10.0%	+3.18 - 0	1.490
51,00	+/-0.20	1,60	+/-10.0%	+3.18 - 0	1.970
63,50	+/-0.25	1,60	+/-10.0%	+3.18 - 0	2.467
70,00	+/-0.25	1,60	+/-10.0%	+3.18 - 0	2.730
76,10	+/-0.25	1,60	+/-10.0%	+3.18 - 0	2.970
88,90	+/-0.25	2,00	+/-10.0%	+3.18 - 0	4.330
101,60	+/-0.38	2,00	+/-10.0%	+3.18 - 0	4.983
114,30	+/-0.38	2,00	+/-10.0%	+3.18 - 0	5.600
139,70	+/-0.38	2,00	+/-10.0%	+3.18 - 0	6.860
168,30	+/-0.76	2,60	+/-10.0%	+3.18 - 0	10.732
219,10	+/-1.55	2,60	+/-10.0%	+25.4 - 0	14.022
273	+/-1.60	2,60	+/-10.0%	+25.4 - 0	17.513
323.9	+/-1.60	2,60	+/-10.0%	+25.4 - 0	20.810
355.6	+/-1.60	2,60	+/-10.0%	+25.4 - 0	22.863
406.4	+/-1.60	3,20	+/-10.0%	+25.4 - 0	32.140

Chemical Composition

Chemical Composition%		
	304	316L
C	0.080	0.030
MN	2.00	2.000
P	0.045	0.045
S	0.030	0.030*
Si	1.000	1.000
Cr	18.0-20.0	16.0-18.0
Ni	8.0-13.0	10.0-14.0
Mo	-	2.0-3.0

***The sulfur content 316L ASME BPE is 0.005-0.017% for all weld ends.



Sanitary Tubes BS4825-1 / AS1528.1

Dimensional Tolerances

all dimensions in mm

Size OD	Tolerances, OD	Wall thickness	Tolerances on wall thickness	Tolerances on Length	Weight Kg/M
12,70	+/-0.1	1,20	+/-10.0%	+3, - 0	0.344
15,88	+/-0.1	1,20	+/-10.0%	+3, - 0	0.439
19,05	+/-0.1	1,20	+/-10.0%	+3, - 0	0.534
25,40	+/-0.1	1,20	+/-10.0%	+3, - 0	0.723
25,40	+/-0.1	1,60	+/-10.0%	+3, - 0	0.949
38,10	+/-0.1	1,20	+/-10.0%	+3, - 0	1.103
38,10	+/-0.1	1,60	+/-10.0%	+3, - 0	1.455
50,80	+/-0.1	1,20	+/-10.0%	+3, - 0	1.483
50,80	+/-0.1	1,60	+/-10.0%	+3, - 0	1.961
63,50	+/-0.1	1,60	+/-10.0%	+3, - 0	2.467
76,20	+/-0.1	1,60	+/-10.0%	+3, - 0	2.973
101,60	+/-0.1	2,00	+/-10.0%	+3, - 0	4.962
114,30	+/-0.38	2,00	+/-10.0%	+3, - 0	5.595
139,70	+/-0.38	2,00	+/-10.0%	+3, - 0	6.860
168,30	+/-0.76	2,60	+/-10.0%	+3, - 0	10.732
219,10	+/-1.55	2,60	+/-10.0%	+3, - 0	14.022

Material grades

Grade	Maximum carbon content%	Description
304S11	0.03	Seamless
304S31	0.07	Seamless
316S11	0.03	Seamless
316S13	0.03	Seamless
316S31	0.07	Seamless
316S33	0.07	Seamless
304S22	0.03	Welded
304S25	0.06	Welded
316S22	0.03	Welded
316S26	0.07	Welded

Marking

Each tube shall be legibly and indelibly marked, either on the tube or on a label or wrapping which shall be securely attached with the following information:

- the manufacturer's name or identification mark;
- the number of this British Standard, i.e. BS 4825-12);
- the outside diameter and thickness;
- material grade;
- cast or batch reference to identify the source of the material.

Example

XYZ BS 4825/1 25.4 1.6 304S14 A1234

***NOTE The purchaser should specify in his enquiry and/or order whether permanent continuous marking is required

Ordering:

Information to be supplied by the purchaser

- Materials and manufacture
- Dimensions
- Tolerances
- Surface finish
- Manufacturer's certificate
- Marking



General Industry Tube ASTM A269

Standard Dimension

Outside Diameter		Wall Thickness(mm)								
ASTM A-269		1.00	1.20	1.50	1.65	2.00	2.11	2.77	3.05	3.4
in	mm									
0.315	8.00	○								
0.354	9.00	●								
0.472	12.00	○								
0.500	12.70	●	○							
0.630	16.00	●	●							
0.709	18.00	○	○							
0.748	19.00	●	●							
0.750	19.05	●	●		●					
0.874	22.20	○	○	○						
1.000	25.40	●	●	●	●	●				
1.252	31.80	●	●	●	●	●				
1.378	35.00		●	●		●				
1.500	38.10		●	●	●	●				
2.000	50.80		●	●	●	●				
2.50	63.50		●	●	●	●				
3.00	76.20		●	●	●	●				
4.00	101.60			●	●	●				
6.00	152.4					●	●	●	●	
8.00	203.2					●	●	●	●	●
10.00	254					●	●	●	●	●
12.00	304.8							●	●	●

○ =Made to order ● =Usual production Note:Other sizes required upon request

Permissible Variations in Dimensions

Group	Size, Outside Diameter, in.	Permissible Variations in Outside Diameter, in. (mm)	Permissible Variations in Wall Thickness, ⁴ %	Permissible Variations in Cut Length, in. (mm) ⁵		Thin Walled Tubes ^C
				Over	Under	
1	Up to 1/2	±0.005 (0.13)	±15	1/8 (3.2)	0	...
2	1/2 to 1 1/2 , excl	±0.005 (0.13)	±10	1/8 (3.2)	0	less than 0.065 in. (1.65 mm) nominal
3	1 1/2 to 3 1/2 , excl	±0.010 (0.25)	±10	3/16 (4.8)	0	less than 0.095 in. (2.41 mm) nominal
4	3 1/2 to 5 1/2 , excl	±0.015 (0.38)	±10	3/16 (4.8)	0	less than 0.150 in. (3.81 mm) nominal
5	5 1/2 to 8, excl	±0.030 (0.76)	±10	3/16 (4.8)	0	less than 0.150 in. (3.81 mm) nominal
6	8 to 12, excl	±0.040 (1.01)	±10	3/16 (4.8)	0	less than 0.200 in. (5.08 mm) nominal
7	12 to 14, excl	±0.050 (1.26)	±10	3/16 (4.8)	0	less than 0.220 in. (5.59 mm) nominal

Ordering Information

Orders for material under this specification should include the following, as required, to describe the desired material adequately:

- Quantity (feet, metres, or number of lengths)
- Name of material (seamless or welded tubes)
- Grade
- Size (outside diameter and nominal wall thickness)
- Length (specific or random)
- Optional requirements (heat treatment, hydrostatic or nondestructive electric test)
- Test report required (Inspection of Specification A 1016/A 1016M)
- Specification designation

Surface Condition

The tubes shall be pickled free of scale. When bright annealing is used, pickling is not necessary.



Heat Exchanger Service Tube(ASTM A-249)

Standard Dimension

Outside Diameter		Wall Thickness(mm)				
NF A 49-249	ASTM A-249	1.2	1.50	1.60	1.65	2.0
25	19.05	●	●		⊙	
25.40	25.40	●	●		⊙	
28	31.80	●	●		⊙	
38	35	●	●			
40	36	●	●			
51	38.10	●	●		⊙	
52	41.30	●	●			
53	44.45	●	●			
63.50	50.80		●	●	●	
70	63.50		●	●	●	●
76.10	76.20		●	●	●	●
85			●	●	●	●
101.60	101.60		●	●	●	●
104			●	●	●	●
4.00	101.60		●	●	●	●

⊙ =Made to order ● =Usual production
 Note:Other sizes required upon request

Chemical Composition

Elements	304 (wt%)	304L (wt%)	316L (wt%)
(C) Carbon, Max.	0.080	0.035	0.035
(Mn) Manganese, Max.	2.00	2.00	2.00
(P) Phosphorus, Max.	0.040	0.040	0.040
(S) Sulfur, Max.	0.030	0.030	0.030**
(Si) Silicon, Max.	0.75	0.75	0.75
(Ni) Nickel	8.0-11.0	8.0-13.0	10.0-15.0
(Cr) Chromium	18.0-20.0	18.0-20.0	16.0-18.0
(Mo) Molybdenum	N/A	N/A	2.0-3.0
(Fe) Iron	Bal.	Bal.	Bal.
(Cu) Copper	N/A	N/A	N/A
(N) Nitrogen	N/A	N/A	N/A

Surface Condition

The tubes, after final heat treatment, shall be chemically descaled or pickled free of scale. When bright annealing is used, pickling or chemical descaling is not necessary.

Product Marking

In addition to the marking prescribed in Specification A 1016/ A 1016M, the marking for Grades TP304H, TP309H, TP309HCb, TP310H, TP310HCb, TP316H, TP321H, TP347H, and TP348H shall also include the heat number and the heat-treatment lot identification.

Ordering Information

It is the responsibility of the purchaser to specify all requirements that are necessary for material ordered under this specification. Such requirements may include, but are not limited to, the following:

- Quantity (feet, metres, or number of lengths)
- Name of material welded tubes (WLD) or heavily cold worked tubes (HCW)
- Grade
- Size (outside diameter and nominal wall thickness)
- Length (specific or random)
- Optional requirements
- Test report required (Specification A 1016/A 1016M)
- Specification designation
- Special requirements and any supplementary requirements selected



Ornamental Tube ASTM A554

Standard Dimension

Outside Diameter		Wall Thickness(mm)		
ASTMA-554		1.00	1.20	1.50
in	mm			
0.500	12.70	●	○	
0.630	16.00	●	●	
0.748	19.00	●	●	
0.874	22.20	○	○	○
1.000	25.40	●	●	●
1.252	31.80	●	●	●
1.500	38.10		●	●
1.750	44.45		●	●
2.000	50.80		●	●
2.50	63.50		●	●
3.00	76.20		●	●
4.00	101.60			●

○ =Made to order ● =Usual production
 Note:Other sizes required upon request

Diameter, Wall,⁴ and Ovality Tolerances for Tubing with Bead Removed

OD Size, in. (mm)	OD, ±		ID, ±	
	in	mm	in	mm
Up to 3/32 (2.4), excl	0.001	0.03	0.001	0.03
3/32 to 3/16 (2.4 to 4.8), excl	0.0015	0.038	0.0015	0.038
3/16 to 1/2 (4.8 to 12.7), excl	0.003	0.08	0.005	0.13
1/2 to 1 (12.7 to 25.4), excl	0.004	0.10	0.006	0.15
1 to 1 1/2 (25.4 to 38.1),excl	0.005	0.13	0.007	0.18
1 1/2 to 2 (38.1 to 50.8),excl	0.006	0.15	0.008	0.20
2 to 2 1/2 (50.8 to 63.5),excl	0.007	0.18	0.010	0.25
2 1/2 to 3 1/2 (63.5 to 88.9),excl	0.010	0.25	0.014	0.36
3 1/2 to 5 (88.9 to 127.0),incl	0.015	0.38	0.020	0.51
Over 5 to 16 (127.0 to 406.4), incl	0.00125 in./in. or mm/mm of circumference		0.0013 in./in. or mm/mm of circumference	

A Wall tolerance is 610 % of specified wall thickness.

Diameter, Wall,⁴ and Ovality Tolerances (All Conditions Except Tubing with Bead Removed)

OD Size, in. (mm)	Wall Thickness		OD, ±	
	in	mm	in	mm
Under 1/2 (12.7)	0.020 to 0.049	0.51 to 1.24	0.004	0.10
1/2 to 1 (12.7 to 25.4)	0.020 to 0.065	0.51 to 1.65	0.005	0.13
1/2 to 1 (12.7 to 25.4)	over 0.065 to 0.134	over 1.65 to 3.40	0.010	0.25
Over 1 to 1 1/2 (25.4 to 38.1), incl	0.025 to 0.065	0.64 to 1.65	0.008	0.20
Over 1 to 1 1/2 (25.4 to 38.1), incl	over 0.065 to 0.134	over 1.65 to 3.40	0.010	0.25
Over 1 1/2 to 2 (38.1 to 50.8), incl	0.025 to 0.049	0.64 to 1.24	0.010	0.25
Over 1 1/2 to 2 (38.1 to 50.8), incl	over 0.049 to 0.083	over 1.24 to 2.11	0.011	0.28
Over 1 1/2 to 2 (38.1 to 50.8), incl	over 0.083 to 0.149	over 2.11 to 3.78	0.012	0.30
Over 2 to 2 1/2 (50.8 to 63.5), incl	0.032 to 0.065	0.81 to 1.65	0.012	0.30
Over 2 to 2 1/2 (50.8 to 63.5), incl	over 0.065 to 0.109	over 1.65 to 2.77	0.013	0.33
Over 2 to 2 1/2 (50.8 to 63.5), incl	over 0.109 to 0.165	over 2.77 to 4.19	0.014	0.36
Over 2 1/2 to 3 1/2 (63.5 to 88.9), incl	0.032 to 0.165	0.81 to 4.19	0.014	0.36
Over 2 1/2 to 3 1/2 (63.5 to 88.9), incl	over 0.165	over 4.19	0.020	0.51
Over 3 1/2 to 5 (88.9 to 127.0), incl	0.035 to 0.165	0.89 to 4.19	0.020	0.51
Over 3 1/2 to 5 (88.9 to 127.0), incl	over 0.165	over 4.19	0.025	0.64
Over 5 to 7 1/2 (127.0 to 190.5), incl	0.049 to 0.250	1.24 to 6.35	0.025	0.64
Over 5 to 7 1/2 (127.0 to 190.5), incl	over 0.250	over 6.35	0.030	0.76
Over 7 1/2 to 16 (190.5 to 406.4), incl	all	all	0.00125 in./in. or mm/mm of circumference	

Product Marking

Civilian Procurement—Each box, bundle or lift, and piece (when individual pieces are shipped) shall be identified by a tag or stencil with the manufacturer's name or brand, specified size, purchaser's order number, this specification number, and grade. Bar coding is acceptable as a supplementary identification method. Bar coding should be consistent with the Automotive Industry Action Group (AIAG) standard prepared by the Primary Metals Subcommittee of the AIAG Bar Code Project Team.

Surface Finish

- Tubes shall be free of scale.
- If special surface conditioning is required, they shall be stated in the order.



Square Tube

Square Tube

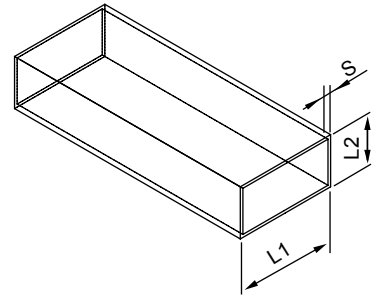
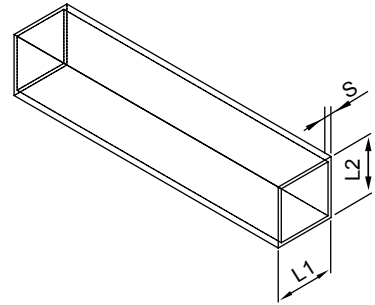
L1	L2	S	weight[kg/m]
15	15	1,00	0,468
15	15	1,50	0,702
20	20	1,00	0,624
20	20	1,50	0,936
20	20	2,00	1,248
25	25	1,00	0,780
25	25	1,25	0,938
25	25	1,50	1,145
25	25	2,00	1,502
30	30	1,50	1,404
30	30	2,00	1,803
30	30	3,00	2,720
35	35	1,00	2,148
35	35	2,00	1,638
35	35	1,00	2,117
40	40	1,50	1,872
40	40	2,00	2,454
40	40	3,00	3,744
50	50	1,50	2,340
50	50	2,00	3,038
50	50	3,00	4,542
60	60	2,00	3,709
60	60	3,00	5,616
60	60	4,00	7,217
80	80	2,00	4,992
80	80	3,00	7,430
80	80	4,00	9,770
100	100	2,00	6,332
100	100	3,00	9,422
100	100	4,00	12,460
120	120	2,00	7,457
120	120	3,00	11,184
120	120	4,00	15,030

*** Other dimension upon request

Rectangular Tube

L1	L2	S	Wright[kg/m]
30	20	1,50	1,170
30	20	2,00	1,560
40	20	1,25	1,140
40	20	1,50	1,404
40	20	2,00	1,802
40	30	1,50	1,638
40	30	2,00	2,184
50	25	1,50	1,755
50	25	2,00	2,340
50	30	1,50	1,872
50	30	2,00	2,451
50	30	3,00	3,507
60	30	1,50	2,106
60	30	2,00	2,753
60	30	3,00	2,808
60	40	2,00	3,078
60	40	3,00	4,680
80	40	2,00	3,709
80	40	3,00	5,616
80	40	4,00	7,078
80	60	2,00	4,354
80	60	3,00	6,384
80	60	4,00	8,509
100	40	2,00	4,680
100	40	3,00	7,020
100	50	2,00	4,670
100	50	3,00	6,950
100	50	4,00	9,129
100	60	3,00	7,403
100	60	4,00	9,770
120	60	2,00	5,621
120	60	3,00	8,354
120	60	4,00	11,318

*** Other dimension upon request



Flat Steel/Angular steel

Flat steel

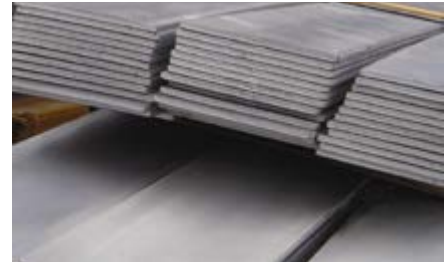
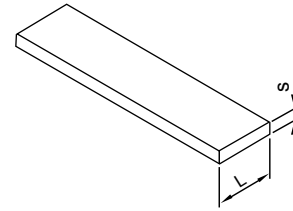
L	S	Weight[kg/m]
20	3	0.471
20	4	0.628
20	5	0.785
20	6	0.942
20	8	1.260
20	10	1.570
25	3	0.589
25	4	0.785
25	5	0.981
25	6	1.180
25	8	1.570
30	3	0.707
30	4	0.942
30	5	1.180
30	6	1.410
30	8	1.880
30	10	2.360
35	5	1.370
40	3	0.942
40	4	1.260
40	5	1.570
40	6	1.880
40	8	2.510
40	10	3.140

*** Other dimension upon request

Flat steel

L	S	Weight[kg/m]
50	3	1.180
50	4	1.570
50	5	1.960
50	6	0.360
50	8	3.140
50	10	3.930
60	3	1.413
60	4	1.880
60	5	2.360
60	6	2.830
60	8	3.770
60	10	4.710
80	5	3.140
80	6	3.770
80	8	5.020
80	10	6.280
100	5	3.930
100	6	4.710
100	8	6.280
100	10	7.850
120	6	5.650
120	8	7.540
120	10	9.420
150	6	7.070
150	8	9.420
150	10	11.770

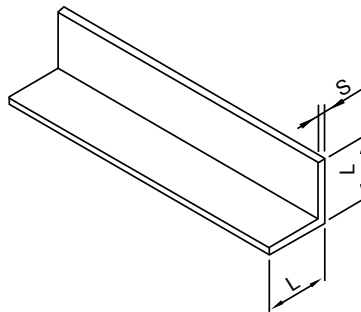
*** Other dimension upon request



Angular steel

L	S	Weight[kg/m]
20	3	0.88
25	3	1.12
30	3	1.36
30	4	1.78
35	4	2.10
40	3	
40	4	2.42
40	5	2.97
50	5	3.77
50	6	4.47
60	6	5.42
80	8	9.66
100	10	15.10

*** Other dimension upon request



GENERAL LIST

304 - 304L - 316L

Outside Diameter (mm)	Wall-Thickness (mm)	Nominal Outside Diameter	Nominal Wall Thickness	Dimensional Standard	Use
6.00	1.00			ISO 1127 serie 2	industrial
6.00	1.00			Seamless Precision Tubing	industrial
6.35	0.89	1/4"	0,035"	ASME BPE - SF 1	pharma
6.35	0.89	1/4"	0,035"	ASME BPE - SF 4	pharma
6.35	0.89	DN 8	Range C	DIN 11866 Reihe C	pharma
8.00	1.00	DN 6	Range A	DIN 11866 Reihe A	pharma
8.00	1.00			ISO 1127 serie 2	industrial
8.00	1.00			Seamless Precision Tubing	industrial
9.53	0.89	3/8"	0,035"	ASME BPE - SF 1	pharma
9.53	0.89	3/8"	0,035"	ASME BPE - SF 4	pharma
9.53	0.89	DN 10	Range C	DIN 11866 Reihe C	pharma
10.00	1.00	DN 8	Range A	DIN 11866 Reihe A	pharma
10.00	1.00			ISO 1127 serie 2	industrial
10.00	1.50			METRIC	industrial
10.00	1.50			Seamless Precision Tubing	industrial
10.20	1.60	DN 6	Range B	ISO 1127 serie 1	pharma
10.20	2.00	1/8"	gas	DIN 11866 Reihe B	industrial
10.29	1.24	1/8"	SCH 10S	ASTM A312	industrial
10.29	1.73	1/8"	SCH 40S	ASTM A312	industrial
12.00	1.00	DN 10	Range 1	DIN 11850 Reihe 1	food
12.00	1.00			ISO 2037	food
12.00	1.50	DN 10		BS4825-1	food
12.00	1.50			DIN11850 Practise based size	industrial
12.70	1.20	1/2"		Seamless Precision Tubing	food
12.70	1.65	1/2"	0,065"	3A	food
12.70	1.65	1/2"	0,065"	ASME BPE - SF 1	pharma
12.70	1.65	1/2"	0,065"	ASME BPE - SF 4	pharma
12.70	1.65	DN 15	Range C	DIN 11866 Reihe C	pharma
13.00	1.50	DN 10	Range 2	DIN 11850 Reihe 2	food
13.00	1.50	DN 10	Range A	DIN 11866 Reihe A	pharma
13.50	1.60	DN 8	Range B	DIN 11866 Reihe B	pharma
13.50	1.60	1/4"		ISO 1127 serie 1	industrial
13.50	2.00	1/4"		ISO 1127 serie 1	industrial
13.50	2.30	1/4"	gas	ISO 1127 serie 1	industrial
13.72	1.65	1/4"	SCH 10S	10SASTM A312	industrial
13.72	2.24	1/4"	SCH 40S	40SASTM A312	industrial
14.00	1.50			METRIC	industrial
15.00	1.50			METRIC	industrial
15.00	2.00			METRIC	industrial
15.00	2.00			BS4825-1	industrial
15.88	1.20	5/8"		ISO 1127 serie 2	food
16.00	1.00			METRIC	industrial
16.00	1.50			Seamless Precision Tubing	industrial
17.15	1.65	3/8"	SCH 10S	ASTM A312	industrial
17.15	2.35	3/8"	SCH 40S	ASTM A312	industrial
17.20	1.00			ISO 2037	food
17.20	1.60	DN 10	Range B	ISO 1127 serie 1	pharma
17.20	1.60	3/8"		ISO 1127 serie 1	industrial
17.20	2.00	3/8"		ISO 1127 serie 1	industrial
17.20	2.30	3/8"	gas	DIN 11866 Reihe B	industrial
18.00	1.00	DN 15	Range 1	DIN 11850 Reihe 1	food



GENERAL LIST

304 - 304L - 316L					
Outside Diameter (mm)	Wall-Thickness (mm)	Nominal Outside Diameter	Nominal Wall Thickness	Dimensional Standard	Use
18.00	1.50	DN 15		BS4825-1	food
19.00	1.50	DN 15	Range 2	3A	food
19.00	1.50	DN 15	Range A	ASME BPE - SF 1	pharma
19.05	1.20	3/4"		ASME BPE - SF 4	food
19.05	1.65	3/4"	0,065"	METRIC	food
19.05	1.65	3/4"	0,065"	ISO 2037	pharma
19.05	1.65	3/4"	0,065"	DIN11850 Practise based size	pharma
19.05	1.65	DN 20	Range C	DIN 11850 Reihe 2	pharma
20.00	1.50			DIN 11866 Reihe A	industrial
21.30	1.00			DIN 11866 Reihe C	food
21.30	1.60	DN 15	Range B	DIN 11866 Reihe B	pharma
21.30	1.60	1/2"		ISO 1127 serie 1	industrial
21.30	2.00	1/2"		ISO 1127 serie 1	industrial
21.30	2.60	1/2"	gas	ISO 1127 serie 1	industrial
21.34	1.65	1/2"	SCH 5S	ASTM A312	industrial
21.34	2.11	1/2"	SCH 10S	ASTM A312	industrial
21.34	2.77	1/2"	SCH 40S	ASTM A312	industrial
22.00	1.00	DN 20	Range 1	DIN 11850 Reihe 1	food
22.00	1.50	DN 20		DIN11850 Practise based size	food
23.00	1.50	DN 20	Range 2	SMS3008	food
23.00	1.50	DN 20	Range A	ISO 2037	pharma
25.00	1.00	1"		METRIC	food
25.00	1.20	1"		ISO 2037	food
25.00	1.20			METRIC	food
25.00	1.50			BS4825-1	industrial
25.00	1.60			Nederlandse zuivel	food
25.00	2.00			Nederlandse zuivel	industrial
25.40	1.20	1"		BS4825-1	food
25.40	1.25			DIN 11850 Reihe 2	food
25.40	1.50			DIN 11866 Reihe A	food
25.40	1.60	1"		SMS3008 Practise based size	food
25.40	1.65	1"	0,065"	3A	food
25.40	1.65	1"	0,065"	ASME BPE - SF 1	pharma
25.40	1.65	1"	0,065"	ASME BPE - SF 4	pharma
25.40	1.65	DN 25	Range C	ASTM A312	pharma
26.67	1.65	3/4"	SCH 5S	DIN 11866 Reihe C	industrial
26.67	2.11	3/4"	SCH 10S	ASTM A312	industrial
26.67	2.87	3/4"	SCH 40S	ASTM A312	industrial
26.90	1.60	DN 20	Range B	ISO 1127 serie 1	pharma
26.90	1.60	3/4"		ISO 1127 serie 1	industrial
26.90	2.00	3/4"		ISO 1127 serie 1	industrial
26.90	2.60	3/4"	gas	DIN 11866 Reihe B	industrial
28.00	1.00	DN 25	Range 1	DIN 11850 Reihe 1	food
28.00	1.50	DN 25		METRIC	food
28.00	2.00			ISO 1127 serie 3	industrial
29.00	1.50	DN 25	Range 2	Nederlandse zuivel	food
29.00	1.50	DN 25	Range A	SMS3008	pharma
30.00	2.00			ASTM A312	industrial
31.80	1.50			DIN11850 Practise based size	food
32.00	1.20	1 1/4"		DIN 11850 Reihe 2	food
33.40	1.65	1"	SCH 5S	DIN 11866 Reihe A	industrial
33.40	2.77	1"	SCH 10S	ASTM A312	industrial
33.40	3.38	1"	SCH 40S	ASTM A312	industrial



GENERAL LIST

304 - 304L - 316L

Outside Diameter (mm)	Wall-Thickness (mm)	Nominal Outside Diameter	Nominal Wall Thickness	Dimensional Standard	Use
33.70	1.20			ISO 2037	food
33.70	1.60			ISO 2037	food
33.70	1.60	1"		ISO 1127 serie 1	industrial
33.70	2.00	DN 25	Range B	DIN 11866 Reihe B	pharma
33.70	2.00	1"		ISO 1127 serie 1	industrial
33.70	3.20	1"	gas	ISO 1127 serie 1	industrial
34.00	1.00	DN 32	Range 1	DIN 11850 Reihe 1	food
34.00	1.50	DN 32		DIN11850 Practise based size	food
35.00	1.50	DN 32	Range 2	DIN 11850 Reihe 2	food
35.00	1.50	DN 32	Range A	DIN 11866 Reihe A	pharma
38.00	1.20	1 1/2"		SMS3008	food
38.00	1.20			ISO 2037	food
38.00	1.60			ISO 2037	food
38.10	1.20	1 1/2"		BS4825-1	food
38.10	1.50			Nederlandse zuivel	food
38.10	1.60	1 1/2"		BS4825-1	food
38.10	1.65	1 1/2"	0,065"	3A	food
38.10	1.65	1 1/2"	0,065"	ASME BPE - SF 1	pharma
38.10	1.65	1 1/2"	0,065"	ASME BPE - SF 4	pharma
38.10	1.65	DN 40	Range C	DIN 11866 Reihe C	pharma
40.00	1.00	DN 40	Range 1	DIN 11850 Reihe 1	food
40.00	1.20			ISO 2037	food
40.00	1.50	DN 40		DIN11850 Practise based size	food
40.00	1.60			ISO 2037	food
40.00	2.00			METRIC	industrial
41.00	1.50	DN 40	Range 2	DIN 11850 Reihe 2	food
41.00	1.50	DN 40	Range A	DIN 11866 Reihe A	pharma
42.16	1.65	1 1/4"	SCH 5S	ASTM A312	industrial
42.16	2.77	1 1/4"	SCH 10S	ASTM A312	industrial
42.16	3.56	1 1/4"	SCH 40S	ASTM A312	industrial
42.40	1.60	1 1/4"		ISO 1127 serie 1	industrial
42.40	2.00	DN 32	Range B	DIN 11866 Reihe B	pharma
42.40	2.00	1 1/4"		ISO 1127 serie 1	industrial
42.40	3.20	1 1/4"	gas	ISO 1127 serie 1	industrial
43.00	1.50			METRIC	industrial
44.50	2.00			ISO 1127 serie 3	industrial
48.26	1.65	1 1/2"	SCH 5S	ASTM A312	industrial
48.26	2.77	1 1/2"	SCH 10S	ASTM A312	industrial
48.26	3.68	1 1/2"	SCH 40S	ASTM A312	industrial
48.30	1.60	1 1/2"		ISO 1127 serie 1	industrial
48.30	2.00	DN 40	Range B	DIN 11866 Reihe B	pharma
48.30	2.00	1 1/2"		ISO 1127 serie 1	industrial
48.30	3.20	1 1/2"	gas	ISO 1127 serie 1	industrial
50.80	1.20	2"		BS4825-1	food
50.80	1.50			Nederlandse zuivel	food
50.80	1.60	2"		BS4825-1	food
50.80	1.65	2"	0,065"	3A	food
50.80	1.65	2"	0,065"	ASME BPE - SF 1	pharma
50.80	1.65	2"	0,065"	ASME BPE - SF 4	pharma
50.80	1.65	DN 50	Range C	DIN 11866 Reihe C	pharma
51.00	1.20			ISO 2037	food
51.00	1.20	2"		SMS3008	food
51.00	1.60			ISO 2037	food



GENERAL LIST

304 - 304L - 316L					
Outside Diameter (mm)	Wall-Thickness (mm)	Nominal Outside Diameter	Nominal Wall Thickness	Dimensional Standard	Use
52.00	1.00	DN 50	Range 1	DIN 11850 Reihe 1	food
52.00	1.50	DN 50		DIN11850 Practise based size	food
53.00	1.50	DN 50	Range 2	ISO 1127 serie 3	food
53.00	1.50	DN 50	Range A	ISO 1127 serie 2	pharma
54.00	2.00			ISO 1127 serie 1	industrial
57.00	2.00			DIN 11850 Reihe 2	industrial
60.30	1.60	2"		DIN 11866 Reihe A	industrial
60.30	2.00	DN 50	Range B	DIN 11866 Reihe B	pharma
60.30	2.00	2"		ISO 1127 serie 1	industrial
60.30	3.60	2"	gas	ISO 1127 serie 1	industrial
60.33	1.65	2"	SCH 5S	ASTM A312	industrial
60.33	2.77	2"	SCH 10S	ASTM A312	industrial
60.33	3.91	2"	SCH 40S	ASTM A312	industrial
63.50	1.50			Nederlandse zuivel	food
63.50	1.60	2 1/2"		BS4825-1	food
63.50	1.60	2 1/2"		SMS3008	food
63.50	1.60			ISO 2037	food
63.50	1.65	2 1/2"	0,065"	3A	food
63.50	1.65	2 1/2"	0,065"	ASME BPE - SF 1	pharma
63.50	1.65	2 1/2"	0,065"	ASME BPE - SF 4	pharma
63.50	1.65	DN 65	Range C	DIN 11866 Reihe C	pharma
70.00	1.60			ISO 2037	food
70.00	2.00	DN 65	Range 2	DIN 11850 Reihe 2	food
70.00	2.00	DN 65	Range A	DIN 11866 Reihe A	pharma
70.00	2.00			ISO 1127 serie 2	industrial
73.03	2.11	2 1/2"	SCH 5S	ASTM A312	industrial
73.03	3.05	2 1/2"	SCH 10S	ASTM A312	industrial
73.03	5.16	2 1/2"	SCH 40S	ASTM A312	industrial
76.00	2.00	3"		SMS3008 Practise based size	food
76.10	1.50			Nederlandse zuivel	food
76.10	1.60	3"		SMS3008	food
76.10	1.60			ISO 2037	food
76.10	1.60	2 1/2"		ISO 1127 serie 1	industrial
76.10	2.00	DN 65	Range B	DIN 11866 Reihe B	pharma
76.10	2.00	2 1/2"		ISO 1127 serie 1	industrial
76.10	3.60	2 1/2"	gas	ISO 1127 serie 1	industrial
76.20	1.60	3"		BS4825-1	food
76.20	1.65	3"	0,065"	3A	food
76.20	1.65	3"	0,065"	ASME BPE - SF 1	pharma
76.20	1.65	3"	0,065"	ASME BPE - SF 4	pharma
76.20	1.65	DN 80	Range C	DIN 11866 Reihe C	pharma
84.00	2.00			METRIC	industrial
85.00	2.00	DN 80	Range 2	DIN 11850 Reihe 2	food
85.00	2.00	DN 80	Range A	DIN 11866 Reihe A	pharma
88.90	1.60	3"		ISO 1127 serie 1	industrial
88.90	2.00	3"		ISO 1127 serie 1	industrial
88.90	2.00			ISO 2037	food
88.90	2.11	3"	SCH 5S	ASTM A312	industrial
88.90	2.30	DN 80	Range B	DIN 11866 Reihe B	pharma
88.90	3.05	3"	SCH 10S	ASTM A312	industrial
88.90	4.00	3"	gas	ISO 1127 serie 1	industrial
88.90	5.49	3"	SCH 40S	ASTM A312	industrial
101.60	2.00			Nederlandse zuivel	food



GENERAL LIST

304 - 304L - 316L					
Outside Diameter (mm)	Wall-Thickness (mm)	Nominal Outside Diameter	Nominal Wall Thickness	Dimensional Standard	Use
101.60	2.00	4"		SMS3008	food
101.60	2.00	4"		BS4825-1	food
101.60	2.00			ISO 2037	food
101.60	2.11	4"	0,083"	3A	food
101.60	2.11	4"	0,083"	ASME BPE - SF 1	pharma
101.60	2.11	4"	0,083"	ASME BPE - SF 4	pharma
101.60	2.11	DN 100	Range C	DIN 11866 Reihe C	pharma
104.00	2.00	DN 100	Range 2	DIN 11850 Reihe 2	food
104.00	2.00	DN 100	Range A	DIN 11866 Reihe A	pharma
104.00	2.00			METRIC	industrial
104.00	2.00	4"		SMS3008 Practise based size	food
114.30	2.00	4"		ISO 1127 serie 1	industrial
114.30	2.00	4 1/2"		BS4825-1	food
114.30	2.00			ISO 2037	food
114.30	2.11	4"	SCH 5S	ASTM A312	industrial
114.30	2.30	DN 100	Range B	DIN 11866 Reihe B	pharma
114.30	3.05	4"	SCH 10S	ASTM A312	industrial
114.30	6.02	4"	SCH 40S	ASTM A312	industrial
129.00	2.00	DN 125	Range 2	DIN 11850 Reihe 2	food
129.00	2.00	DN 125	Range A	DIN 11866 Reihe A	pharma
139.70	2.00	5 1/2"		BS4825-1	food
139.70	2.00			ISO 2037	food
139.70	2.00	5"		ISO 1127 serie 1	industrial
139.70	2.60	DN 125	Range B	DIN 11866 Reihe B	pharma
141.30	2.77	5"	SCH 5S	ASTM A312	industrial
141.30	3.40	5"	SCH 10S	ASTM A312	industrial
141.30	6.55	5"	SCH 40S	ASTM A312	industrial
152.40	2.77	6"	0,109"	3A	food
152.40	2.77	6"	0,109"	ASME BPE - SF 1	pharma
152.40	2.77	6"	0,109"	ASME BPE - SF 4	pharma
152.40	2.77	DN 150	Range C	DIN 11866 Reihe C	pharma
154.00	2.00	DN 150	Range 2	DIN 11850 Reihe 2	food
154.00	2.00	DN 150	Range A	DIN 11866 Reihe A	pharma
168.28	2.77	6"	SCH 5S	ASTM A312	industrial
168.28	3.40	6"	SCH 10S	ASTM A312	industrial
168.28	7.11	6"	SCH 40S	ASTM A312	industrial
168.30	2.00	6"		ISO 1127 serie 1	industrial
168.30	2.60	6 5/8"		BS4825-1	food
168.30	2.60			ISO 2037	food
168.30	2.60	DN 150	Range B	DIN 11866 Reihe B	pharma
204.00	2.00	DN 200	Range 2	DIN 11850 Reihe 2	food
204.00	2.00	DN 200	Range A	DIN 11866 Reihe A	pharma
219.08	2.77	8"	SCH 5S	ASTM A312	industrial
219.08	3.76	8"	SCH 10S	ASTM A312	industrial
219.08	8.18	8"	SCH 40S	ASTM A312	industrial
219.10	2.00	8"		ISO 1127 serie 1	industrial
219.10	2.60	8 5/8"		BS4825-1	food
219.10	2.60			ISO 2037	food
219.10	2.60	DN 200	Range B	DIN 11866 Reihe B	pharma
254.00	2.00	DN 250	Range 2	DIN 11850 Reihe 2	food
254.00	3.05	10"	0,12"	3A	food
304.00	3.05	12"	0,12"	3A	food
304.00	3.40	12"	0,14"	3A	food





P&E Flow Technology Co.,Ltd

ADD:Shacheng industry park,Logwan District.Wenzhou.Zhejiang.China

TEL:+86-577-85827696 +86-577-86826961

FAX:+86-577-85826961

ZIP:325000

EMAIL:info@pestainless.com

EMAIL:info@gemoindustries.com

