

SEAMLESS STAINLESS STEEL TUBES

for Instrumentation and
Hydraulic Systems



❖ STANDARDS:

ASME SA-213/SA-213M; ASTM A269/A269M; ASME SA-312/SA312M;
ASME SA-789/SA-789M; ASME SB-163; ASME SB-444; E N 10216-5; E N 10305-1

❖ STEEL GRADES:

TP304L (1.4307), TP316L (1.4435), TP317L (1.4438), TP321 (1.4541), TP316TI (1.4571),
S 31254, S 31803 (1.4462), S 32205 (1.4462), N 08904, N 06625, N 08825

❖ BASIC PRODUCT RANGE OF INSTRUMENTATION TUBING:

E N 10216-5

Outside diameter	Wall thickness																			
	0.5	0.6	0.8	1	1.2	1.4	1.6	2	2.3	2.6	2.8	2.9	3.2	3.6	4	4.5	5	5.4	5.6	6.3
mm																				
4																				
5																				
6																				
8																				
10																				
10.2																				
12																				
12.5																				
13.5																				
14																				
16																				
17.2																				
18																				
19																				
19.1																				
20																				
21.3																				
22																				
25																				
25.4																				
26.9																				
30																				
31.8																				
32																				
33.7																				
35																				
38																				
40																				
42.4																				
44.5																				
48.3																				
50																				

Note: other sizes are available upon agreement

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CHROME PLATED BARS - STEEL TUBES - SPECIAL STEELS

ASME SA-213/SA-213M; ASTM A269/A269M; ASME SA-312/SA-312M;
ASME SA-789/SA-789M; ASME SB-163; ASME SB-444

Outside diameter			Wall thickness																				
inch	mm	mm	0.4	0.5	0.6	0.71	0.89-0.91	1	1.2	1.4-1.5	1.6-1.65	1.83-1.9	2.0-2.03	2.11	2.2-2.3	2.4-2.5	2.6-2.64	2.7	3.0-3.05	3.18-3.2	3.5-3.6	4.0	
1/8		6.0																					
1/4	6.35	6.35																					
		7.0																					
5/16	7.94	7.94																					
		9.0																					
3/8	9.53	9.53																					
		10.0																					
		10.2																					
7/16	11.00	11.11																					
		12																					
1/2	12.70	12.7																					
		13																					
		13.5																					
		14-14.3																					
		15																					
5/8	15.88	15.88																					
		16																					
		17.2-17.5																					
		18																					
		19.0-19.05																					
		20																					
		20.6-21.34																					
		22																					
		22.23																					
		23.81																					
		25																					
1	25.40	25.4																					
1 1/4	31.75	31.75																					
		32																					
		33.4																					
		33.7																					
		35																					
		36																					
1 1/2	38.10	38.10																					
		40																					
		42.0-42.4																					
1 3/4	44.45	44.45																					
		48.0-48.3																					
2	50.58	50.8																					

SURFACE CONDITION:
bright annealed

HARDNESS:
max
80HRB

PACKING:
in OSB boxes /
adequately protected

TESTS:
eddy current test;
corrosion test ASTM A 262 Practice E

❖ DIMENSIONAL TOLERANCES FOR

ASME SA-213/SA-213M; ASME SA-312/SA-312M

Outside diameter, mm	Tolerance limits of	
	outside diameter	wall thickness
<25.4	±0.10 mm	±10%
25.4 – 38.1	±0.15 mm	±10%
38.2 – 50.8	±0.20 mm	±10%

Roughness of the outer diameter, $Ra \leq 0.8 \mu\text{m}$

ASTM A269/A269M; ASME SA-789/SA-789M

Outside diameter, mm	Tolerance limits of	
	outside diameter	wall thickness
<12.7	±0.13 mm	±15%
12.7 – 38.1	±0.13 mm	±10%
38.2 – 50.8	±0.25 mm	±10%

Roughness of the outer diameter, $Ra \leq 0.8 \mu\text{m}$

ASME SB-163; ASME SB-444

Outside diameter, mm	Tolerance limits of	
	outside diameter	wall thickness
<16.0	±0.13 mm	±15%
16.0 – 38.0	±0.13 mm	±10%
38.1 – 50.8	±0.25 mm	±10%

Roughness of the outer diameter, $Ra \leq 0.8 \mu\text{m}$

EN 10305-1

Outside diameter, mm	Tolerance limits of	
	outside diameter	wall thickness
<30.0	±0.08 mm	±10.0% with min ±0.1 mm
30.0 – 40.0	±0.15 mm	±10.0% with min ±0.1 mm
40.1 – 50.8	±0.20 mm	±10.0% with min ±0.1 mm

Roughness of the outer diameter, $Ra \leq 0.8 \mu\text{m}$

❖ DIMENSIONAL TOLERANCES FOR

EN 10216-5

Outside diameter, mm	Tolerance limits of			
	outside diameter		wall thickness	
	tolerance class		tolerance class	
	D3	D4	T3	T4
4.0–50.8	±0.75% with min ±0.30 mm	±0.50% with min ±0.10 mm	±10.0% with min ±0.20 mm	±7.5% with min ±0.15 mm

Roughness of the outer diameter, Ra ≤ 0.8 μm

❖ TESTING OF FINISHED TUBES & PIPES

Standard	Chemical composition	Relative elongation	Hardness	Flattening	Flaring	IC resistance	Hydrostatic non-destructive testing
ASTM A213	B	B	B	B	B	– ¹⁾	K ²⁾
ASTM A269	B	–	B	–	B	– ¹⁾	K ²⁾
ASTM B163	B	B	–	–	B	– ¹⁾	K ²⁾
ASTM B444	B	B	–	–	–	– ¹⁾	K ²⁾
EN 10216-5	B	B	–	–	B	– ¹⁾	K ²⁾

B – random testing
K – testing of each tube

1) Tubes shall be subjected to intergranular corrosion testing conducted by the Manufacturer in accordance with ASTM A262, Method E, unless otherwise specified

2) Each tube shall be non-destructive or hydrostatic testing.
The Manufacturer shall specify the type of testing to be conducted, unless otherwise specified in the Order.

An advanced heat treatment technology has been developed at producer for cold finished tubes that allows for UNS S 31803/S 32205 material to meet the mechanical properties of UNS S32750 and S 32760 without the loss of ductility and corrosion properties (offered as an option).

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CHROME PLATED BARS - STEEL TUBES - SPECIAL STEELS

❖ MAXIMUM WORKING PRESSURE AT AMBIENT TEMPERATURE

OD		WT		TP304L, TP316L, TP317L, 1.4307, 1.4435, 1.4438	S31254, 1.4547	N08904, 1.4539	S31803, S32205, 1.4462	N08825, 2.4858	N06625, 2.4856						
inch	mm	inch	mm	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar		
0.236	6.00	0.039	1.00	4105	283	7498	517	5192	358	10878	750	7005	483	10008	690
		0.059	1.50	6164	425	11240	775	7803	538	16317	1125	10501	724	15011	1035
0.250	6.35	0.028	0.71	2756	190	5033	347	3481	240	7295	503	4699	324	6715	463
		0.035	0.89	3452	238	6295	434	4366	301	9152	631	5888	406	8412	580
		0.036	0.91	3539	244	6440	444	4467	308	9355	645	6019	415	8601	593
		0.048	1.22	4743	327	8644	596	5990	413	12546	865	8064	556	11545	796
		0.049	1.24	4815	332	8775	605	6092	420	12749	879	8209	566	11719	808
		0.059	1.50	5830	402	10617	732	7368	508	15417	1063	9921	684	14185	978
		0.063	1.60	6208	428	11327	781	7861	542	16447	1134	10588	730	15127	1043
		0.064	1.63	6324	436	11545	796	8006	552	16752	1155	10791	744	15403	1062
		0.065	1.65	6411	442	11690	806	8108	559	16955	1169	10921	753	15606	1076
		0.313	7.94	0.035	0.89	2770	191	5033	347	3495	241	7310	504	4714	325
0.036	0.91			2828	195	5149	355	3568	246	7484	516	4815	332	6875	474
0.315	8.00	0.039	1.00	3089	213	5627	388	3901	269	8166	563	5250	362	7513	518
		0.059	1.50	4627	319	8427	581	5845	403	12241	844	7890	544	11255	776
		0.079	2.00	6164	425	11240	775	7803	538	16317	1125	10501	724	15011	1035
0.375	9.53	0.035	0.89	2306	159	4206	290	2915	201	6092	420	3916	270	5613	387
		0.036	0.91	2350	162	4293	296	2973	205	6237	430	4018	277	5729	395
		0.048	1.22	3162	218	5758	397	3989	275	8354	576	5366	370	7687	530
		0.049	1.24	3205	221	5845	403	4061	280	8499	586	5453	376	7803	538
		0.064	1.63	4221	291	7687	530	5337	368	11168	770	7194	496	10269	708
		0.065	1.65	4264	294	7788	537	5395	372	11298	779	7266	501	10399	717
		0.080	2.03	5250	362	9572	660	6643	458	13909	959	8949	617	12792	882
		0.083	2.11	5453	376	9950	686	6904	476	14446	996	9297	641	13300	917
0.394	10.00	0.039	1.00	2466	170	4496	310	3118	215	6527	450	4206	290	6005	414
		0.059	1.50	3698	255	6744	465	4685	323	9790	675	6295	434	9007	621
		0.063	1.60	3945	272	7194	496	4989	344	10443	720	6715	463	9601	662
		0.079	2.00	4931	340	8992	620	6237	430	13053	900	8398	579	12009	828

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CHROME PLATED BARS - STEEL TUBES - SPECIAL STEELS

❖ MAXIMUM WORKING PRESSURE AT AMBIENT TEMPERATURE

OD		WT		TP304L, TP316L, TP317L, 1.4307, 1.4435, 1.4438	S31254, 1.4547		N08904, 1.4539		S31803, S32205, 1.4462		N08825, 2.4858		N06625, 2.4856		
inch	mm	inch	mm	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
0.472	12.00	0.039	1.00	2060	142	3742	258	2596	179	5439	375	3495	241	5004	345
		0.059	1.50	3089	213	5627	388	3901	269	8166	563	5250	362	7513	518
		0.079	2.00	4105	283	7498	517	5192	358	10878	750	7005	483	10008	690
0.500	12.70	0.035	0.89	1726	119	3147	217	2190	151	4569	315	2944	203	4206	290
		0.036	0.91	1769	122	3220	222	2234	154	4670	322	3017	208	4308	297
		0.048	1.22	2364	163	4322	298	3002	207	6266	432	4032	278	5772	398
		0.049	1.24	2408	166	4395	303	3046	210	6367	439	4090	282	5859	404
		0.064	1.63	3162	218	5772	398	4003	276	8383	578	5395	372	7716	532
		0.065	1.65	3205	221	5845	403	4047	279	8485	585	5453	376	7803	538
		0.080	2.03	3945	272	7194	496	4989	344	10428	719	6715	463	9601	662
		0.083	2.11	4090	282	7469	515	5178	357	10849	748	6976	481	9979	688
0.551	14.00	0.039	1.00	1755	121	3205	221	2234	154	4656	321	3002	207	4293	296
		0.059	1.50	2640	182	4815	332	3336	230	6991	482	4496	310	6440	444
		0.079	2.00	3524	243	6425	443	4453	307	9326	643	6005	414	8572	591
0.591	15.00	0.039	1.00	1639	113	3002	207	2074	143	4351	300	2799	193	4003	276
		0.059	1.50	2466	170	4496	310	3118	215	6527	450	4206	290	6005	414
		0.079	2.00	3292	227	5990	413	4163	287	8702	600	5598	386	8006	552
0.625	15.88	0.048	1.22	1900	131	3452	238	2393	165	5018	346	3220	222	4612	318
		0.049	1.24	1929	133	3510	242	2437	168	5091	351	3278	226	4699	324
		0.064	1.63	2524	174	4612	318	3205	221	6701	462	4322	298	6150	424
		0.065	1.65	2567	177	4670	322	3234	223	6788	468	4366	301	6237	430
0.623	16.00	0.039	1.00	1537	106	2814	194	1943	134	4076	281	2625	181	3756	259
		0.059	1.50	2306	159	4221	291	2930	202	6121	422	3945	272	5627	388
		0.079	2.00	3089	213	5627	388	3901	269	8166	563	5250	362	7513	518
		0.098	2.50	3858	266	7020	484	4873	336	10196	703	6570	453	9384	647
		0.118	3.00	4627	319	8427	581	5845	403	12241	844	7890	544	11255	776

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CHROME PLATED BARS - STEEL TUBES - SPECIAL STEELS

❖ MAXIMUM WORKING PRESSURE AT AMBIENT TEMPERATURE

OD		WT		TP304L, TP316L, TP317L, 1.4307, 1.4435, 1.4438		S31254, 1.4547		N08904, 1.4539		S31803, S32205, 1.4462		N08825, 2.4858		N06625, 2.4856	
inch	mm	inch	mm	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
0.709	18.00	0.039	1.00	1363	94	2495	172	1726	119	3626	250	2335	161	3336	230
		0.059	1.50	2060	142	3742	258	2596	179	5439	375	3495	241	5004	345
		0.079	2.00	2741	189	4989	344	3466	239	7252	500	4670	322	6672	460
		0.098	2.50	3423	236	6251	431	4337	299	9065	625	5830	402	8340	575
		0.118	3.00	4105	283	7498	517	5192	358	10878	750	6991	482	10008	690
0.750	19.05	0.048	1.22	1581	109	2886	199	2002	138	4177	288	2698	186	3858	266
		0.049	1.24	1610	111	2930	202	2031	140	4250	293	2727	188	3916	270
		0.064	1.63	2103	145	3843	265	2669	184	5584	385	3597	248	5134	354
		0.065	1.65	2132	147	3901	269	2698	186	5656	390	3640	251	5207	359
		0.083	2.11	2727	188	4975	343	3452	238	7223	498	4656	321	6657	459
		0.094	2.40	3104	214	5671	391	3930	271	8224	567	5294	365	7571	522
		0.109	2.77	3582	247	6541	451	4540	313	9485	654	6121	422	8731	602
0.787	20.00	0.059	1.50	1856	128	3379	233	2335	161	4902	338	3147	217	4511	311
		0.079	2.00	2466	170	4496	310	3118	215	6527	450	4206	290	6005	414
		0.098	2.50	3089	213	5627	388	3901	269	8166	563	5250	362	7513	518
		0.118	3.00	3698	255	6744	465	4685	323	9790	675	6295	434	9021	622
		0.157	4.00	4931	340	8992	620	6237	430	13053	900	8412	580	12009	828
0.866	22.00	0.059	1.50	1682	116	3060	211	2132	147	4453	307	2857	197	4090	282
		0.079	2.00	2248	155	4090	282	2828	195	5932	409	3814	263	5453	376
0.984	25.00	0.059	1.50	1479	102	2698	186	1871	129	3916	270	2524	174	3597	248
		0.079	2.00	1973	136	3597	248	2495	172	5221	360	3365	232	4801	331
		0.098	2.50	2466	170	4496	310	3118	215	6527	450	4206	290	6005	414
		0.118	3.00	2959	204	5395	372	3742	258	7832	540	5047	348	7194	496
1.000	25.40	0.048	1.22	1189	82	2161	149	1494	103	3133	216	2031	140	2872	198
		0.049	1.24	1204	83	2190	151	1523	105	3191	220	2060	142	2930	202
		0.065	1.65	1595	110	2915	201	2031	140	4235	292	2727	188	3901	269
		0.083	2.11	2045	141	3742	258	2596	179	5424	374	3495	241	4989	344
		0.094	2.40	2335	161	4250	293	2944	203	6164	425	3974	274	5671	391
		0.126	3.20	3104	214	5671	391	3930	271	8224	567	5279	364	7571	522

❖ MAXIMUM WORKING PRESSURE AT AMBIENT TEMPERATURE

OD		WT		TP304L, TP316L, TP317L, 1.4307, 1.4435, 1.4438	S31254, 1.4547	N08904, 1.4539	S31803, S32205, 1.4462	N08825, 2.4858	N06625, 2.4856						
inch	mm	inch	mm	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
1.181	30.00	0.063	1.60	1320	91	2393	165	1668	115	3481	240	2234	154	3205	221
		0.098	2.50	2060	142	3742	258	2596	179	5439	375	3510	242	5018	346
		0.118	3.00	2466	170	4496	310	3118	215	6527	450	4206	290	6005	414
		0.157	4.00	3292	227	5990	413	4163	287	8702	600	5598	386	8006	552
1.250	31.75	0.126	3.20	2480	171	4525	312	3147	217	6585	454	4235	292	6063	418
1.378	35.00	0.079	2.00	1407	97	2567	177	1784	123	3727	257	2393	165	3437	237
		0.098	2.50	1755	121	3205	221	2234	154	4656	321	2988	206	4293	296
		0.118	3.00	2118	146	3858	266	2669	184	5598	386	3597	248	5134	354
1.496	38.00	0.079	2.00	1291	89	2364	163	1639	113	3437	237	2205	152	3162	218
		0.118	3.00	1943	134	3553	245	2466	170	5149	355	3307	228	4728	326
		0.157	4.00	2596	179	4728	326	3278	226	6875	474	4424	305	6324	436
		0.197	5.00	3249	224	5918	408	4105	283	8586	592	5526	381	7905	545
1.654	42.00	0.079	2.00	1175	81	2147	148	1479	102	3104	214	2002	138	2857	197
		0.118	3.00	1755	121	3205	221	2234	154	4656	321	2988	206	4293	296
1.968	50.00	0.157	4.00	1973	136	3597	248	2495	172	5221	360	3365	232	4801	331
		0.197	5.00	2466	170	4496	310	3118	215	6527	450	4206	290	6005	414

Pressure is calculated by the formula below according to ASME B31.3:
$$P = S \times \ln \left[\frac{D - 2c_0}{D - 2(T - c)} \right]$$

D – outside diameter of pipe. For design calculations in accordance with this Chapter, the outside diameter of the pipe is the maximum value allowable under the specifications.

P – internal design gage pressure.

S – allowable stress.

T – pipe wall thickness (measured or minimum in accordance with the purchase specification).

❖ WINTRADE VALUE PROPOSITION

Hardness of HRB 80 for 304L/316L and HRB 90 for other austenitic grades	>	Ensuring quality of joints (tube material must be softer than the fitting material)
Surface roughness up to 0,8 Ra. Electropolishing upon customer request	>	Ensuring optimal flow characteristics
100% EC and UT inline	>	Ultimate quality assurance along the whole length of the tube
100% bright annealed	>	Smooth shiny surface, increased resistance to pitting corrosion
Electronic MTR service	>	Online access to MTR's at any time
Ability to deliver in flexible lengths. Wide range of lengths available	>	Customized lengths to meet customer specifications
Both ends plugged	>	Ensuring tube cleanliness
ISO 9001, 14001, 16949, 17025, OHSAS 18001 certifications	>	Integrated QMS approved according to ISO standards
Approved by Shell, Exxon-Mobil, Saudi Aramco, Norsok M-650, ADCO, ADMA-OPCO, ZADCO	>	Approved by key industry end-users



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