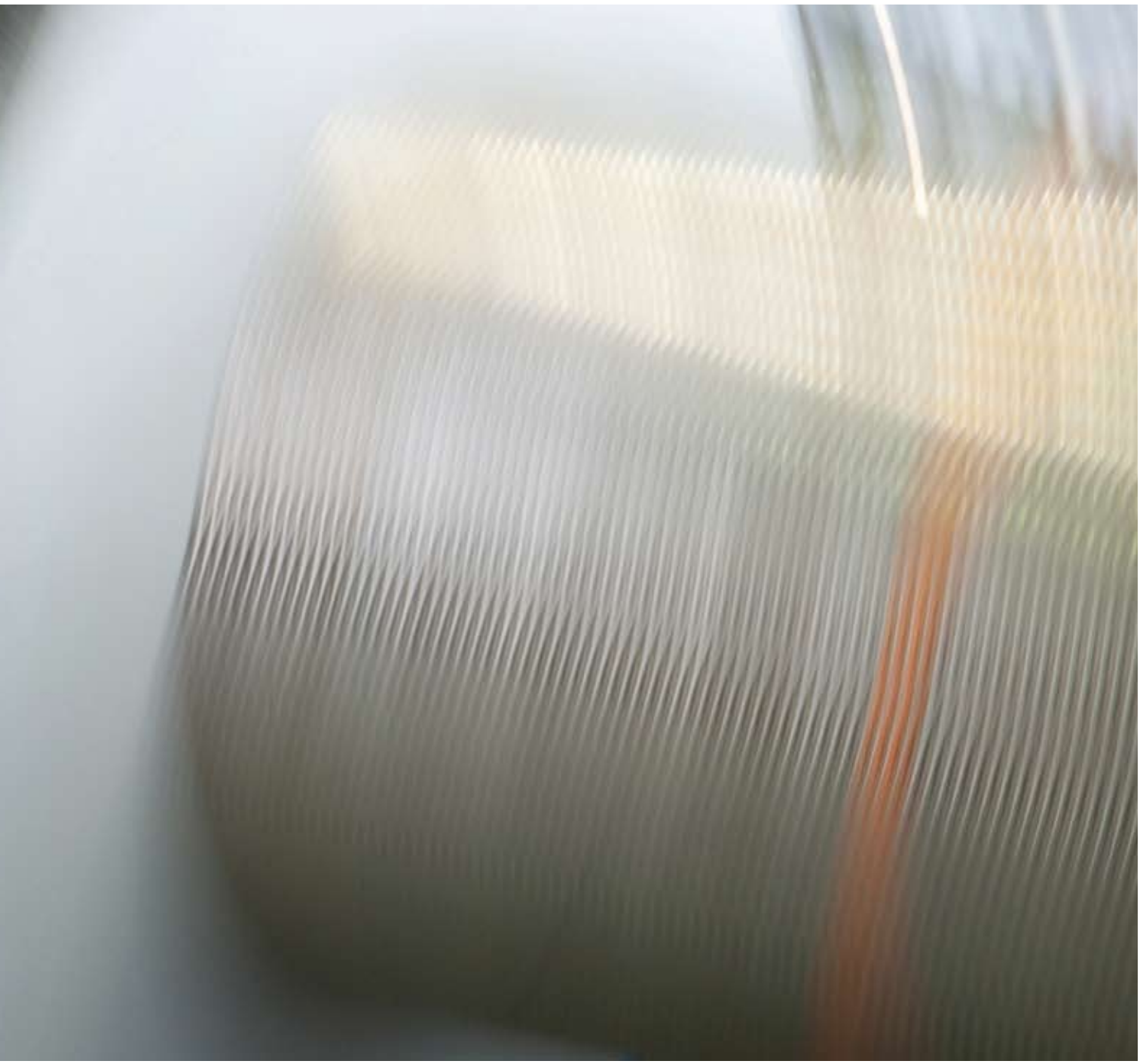
TUBACEX GROUP

SEAMLESS STAINLESS STEEL | PIPES & TUBES

SCHOELLER BLECKMANN EDELSTAHLROHR
SEAMLESS·STAINLESS
NAHTLOS ZUM ERFOLG



CONTENT

TIME CHANGES – QUALITY REMAINS

We offer highest customer benefit. It is our indicator for quality and performance. All our acting is aimed at that. Seamless pipes and tubes made of corrosion-, acid-, and heat-resistant steels of highest quality are our core competence. We achieve adequate profit as basis for the long-term company development.

PIONEERS OF SUCCESS

In Ternitz the processing of iron began as early as 1787. In 1924 Schoeller-Bleckmann Stahlwerke AG was formed by merging the internationally recognized companies founded by Alexander Ritter von Schoeller and Johann Heinrich Bleckmann. Farsightedness and innovation – success factors of all great enterprises – led, just ten years later, to the production of seamless steel pipes.

Schoeller-Bleckmann was nationalized by the Republic of Austria in 1946. In the following years of economic improvement, the company´s production capacity greatly expanded through generous investments.

COMPETENCE IN STAINLESS STEEL

The foundation for the production of seamless stainless steel pipes in Ternitz laid in the early 1960´s. The merger of the high-grade steel producers Schoeller-Bleckmann, Böhler and Styria in 1975 to form the Vereinigte Edelstahlwerke AG (VEW) was dissolved at the end of the 1980´s.

Since Januar the 1st of 1991, Schoeller-Bleckmann Edelstahlrohr GmbH (SBER) has operated independently. Privatization of the company took place at the beginning of 1995.

A "SEAMLESS" PROGRESSION

A clear and successful strategy based on offering customers a high level of flexibility, first-class service, the highest quality standards and absolute responsibility: This was adopted by a team of experienced executives who, in order to ensure the long-term future of SBER, took over the company through a management buyout.

During 1999, as a further milestone in a successful development, SBER became part of TUBACEX S.A., a company quoted at the stock exchange. This strategic position, using synergies within the group, will further strengthen the competitiveness of SBER. Today, in the field of seamless stainless steel pipes and tubes, SBER ranks among the most important manufacturers in the world, continuing the tradition established by the entrepreneurs Schoeller and Bleckmann over 130 years ago.

THE DIMENSION OF QUALITY

With approximately 550 employees in a facility of 200.000m² (60.000m² are under roof), SBER produces about 16.000 tons of tubes and pipes per year and is one of the most important employer in the region of Ternitz. Years of experience in the production of corrosion-, acid-, heat-resistant stainless steel pipes, a modern organizational structure and the success-oriented team have made it possible for SBER to hold a top position within this global industry. SBER can indeed count on its employees, whose commitment and enthusiasm contribute significantly to the success of the company.

SBER, ALWAYS AND EVERYWHERE

New standards are being set by SBER with regard to quality, perfect workmanship and punctuality. The wide range of products fulfills all recognized norms and specifications and SBER is known throughout the world for its high standard of quality. SBER stainless steel tubes and pipes are found in chemical and petrochemical industries, in powerplants, industrial furnaces and in mechanical engineering. The possible areas of use are practically limitless; even certain exclusive watches are framed in rings, airplanes are equipped with special parts and oil drilling is supported by special housings which are produced from pipes made by SBER.

STRESS RESISTANCE IS KEY

This feature is essential because the tubes and pipes are constantly put to use where extreme conditions prevail and where safety of people and the trouble-free operation of plant and equipment must be ensured. SBER stainless steel tubes and pipes are made to withstand the greatest heat and the highest pressure; they are unaffected by acids and don´t give corrosion a chance!

100 STEPS TO PERFECTION

The manufacturing methods employed at SBER reflect state-of-the-art technology and production is carried out according to international standards. A seamless stainless steel pipe or tube can pass through as many as 100 production steps before taking its final form and quality.

FULL-SPEED INTO THE FUTURE

SBER is a company with a proud tradition and a strong orientation toward the future. Many years of experience in the production of seamless stainless steel tubes and pipes form the basis of its strength and the dynamism of its innovative leadership is its driving force.

WORLDWIDE LEADERSHIP

Our most important concern is the satisfaction of our customers. The worldwide presence of the company enables us to fulfill customer requirements quickly and reliably.

This customer orientation, excellent product quality as well as great flexibility has made SBER a worldwide leader in the manufacture of seamless stainless steel tubes and pipes and will remain a guiding principle for the future of Schoeller Bleckmann Edelstahlrohr.

ASME

DET NORSKE VERITAS

GOST

KOREAN REGISTER OF SHIPPING

KTA 1401

ISO 9001

ISO 14001

OHSAS 18001

QUALITY ASSURANCE

New standards are being set by Schoeller Bleckmann Edelstahlrohr GmbH with regard to quality, perfect workmanship and punctuality. The wide range of products fulfills all recognized norms and specifications and SBER is known throughout the world for its high standard of quality.

Quality Assurance – we make it double sure. Our Quality Assurance System meets the requirements of the "ASME CODE" which are among the most stringent in existence. We have been granted the Quality System Certificate (materials) for nuclear material manufacturers.

QUALITY VALUED AROUND THE WORLD

High-grade seamless stainless steel tubes and pipes are becoming increasingly important. Higher quality requirements for materials and components in almost all industries help create new areas of application for seamless stainless steel tubes and pipes. The number of companies throughout the world who depend on the efficient and professional cooperation of SBER is growing steadily.

ISO 9001

ISO 9001 – in addition we hold the ISO 9001 approval, authorized and supervised by Lloyd's Register Quality Assurance.

ISO 14001

This is the standard for our integrated environmental management system.

OHSAS 18001

Ohsas 18001 is in addition our standard for integrated occupational health and safety management system.

ADDITIONAL APPROVALS:

ASME SECT. III NCA 3800
American Nuclear certification

KTA 1401 UND AVS D 100/50
German regulation for Nuclear applications

HAF 604
Official Chinese Nuclear Registration

GOST
Approval according GOST standards which cover industrial applications of the Commonwealth of Independent States (CIS)

NORSOK M650
The most important certification for Offshore

AD 2000-MERKBLATT W0

PRESSURE EQUIPMENT DIRECTIVE 97/23/EC

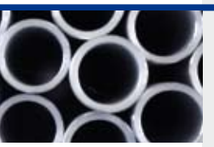
GERMANISCHER LLOYD FÜR METALLISCHE WERKSTOFFE, KAPITEL 2, ABSCHNITT 2.E

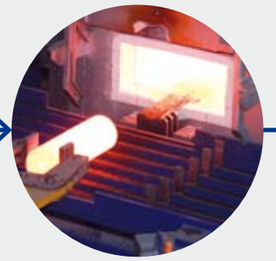
RINA
Rules for the approval of manufactures of materials

COMPLETE LIST OF APPROVALS IS AVAILABLE ON REQUEST

FLOW CHART OF TUBE FORMING

100 steps to perfection. A seamless stainless steel pipe can pass through as many as 100 production steps before taking on its final form and quality.



INSPECTION OF STARTING MATERIAL → STORAGE OF STARTING MATERIAL → CUTTING → BORING → CHAMFERING → DEGREASING → 

PREHEATING → 

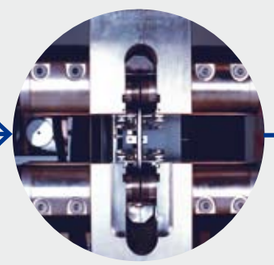
EXPANDING → REHEATING → 

EXTRUSION → HEAT TREATMENT → PICKLING → HOT FINISHED TUBES

HOT FINISHED TUBES → COLD FINISHED TUBES → 

COLD PILGER ROLLING → DEGREASING → 

BRIGHT ANNEALING → HEAT TREATMENT → PICKLING → STRAIGHTENING → HYDRO PRESSURE TEST / EDDY CURRENT TEST → 

ULTRA SONIC TEST → CUTTING → 

MECHANICAL TESTING → INSPECTION / SPECTROSCOPY / MARKING → 

PACKING → SHIPPING

DRAWING → COLD FINISHED TUBES

SIZE RANGE OF SEAMLESS HOT FINISHED TUBES

SBER is producer of seamless stainless steel pipes and tubes

OUTSIDE DIAMETER				WALL THICKNESS																																					
ASTM A 312 ASME B36.10			inch	0,109	0,120	0,126	0,133	0,134	0,140	0,145	0,147	0,154	0,179	0,191	0,200	0,203	0,216	0,218	0,226	0,237	0,250	0,258	0,276	0,280	0,281	0,300	0,318	0,322	0,337	0,344	0,375	0,406	0,432	0,438	0,500	0,531	0,562	0,625	0,719	0,906	
			mm	2,77	3,05	3,20	3,38	3,40	3,56	3,68	3,73	3,91	4,55	4,85	5,08	5,16	5,49	5,54	5,74	6,02	6,35	6,55	7,01	7,11	7,14	7,62	8,08	8,18	8,56	8,74	9,52	10,31	10,97	11,13	12,70	13,49	14,27	15,88	18,26	23,01	
NPS	inch	mm	DIN mm	2,9		3,2				3,6		4,0	4,5		5,0				5,6		6,3			7,1			8,0			8,8		10,0	11,0		12,5					25,0	DIN mm
1,0	1,315	33,40	33,7																																						33,7
	1,496		38,0																																						38,0
	1,575		40,0																																						40,0
1 1/4	1,660	42,16	42,4						40					80							160																				42,4
	1,752		44,5																																						44,5
1 1/2	1,900	48,26	48,3							40					80										160																48,3
	2,008		51,0																																						51,0
	2,126		54,0																																						54,0
	2,244		57,0																																						57,0
2,0	2,375	60,33	60,3									40						80												160											60,3
	2,500		63,5																																						63,5
	2,756		70,0																																						70,0
2 1/2	2,875	73,03	76,1													40							80								160										76,1
3,0	3,500	88,90	88,9														40									80								160							88,9
3 1/2	4,000	101,60	101,6																40								80														101,6
	4,252		108,0																																						108,0
4,0	4,500	114,30	114,3																	40									80					120		160					114,3
	5,236		133,0																																						133,0
	5,500		139,7																																						139,7
5,0	5,563	141,30	141,3					10														40									80				120			160			141,3
	6,260		159,0																																						159,0
6,0	6,625	168,28	168,3					10																40									80				120		160		168,3
	7,626		193,7																																						193,7
8,0	8,625	219,08	219,1																									40				60			80				120	160	219,1
	9,000		228,6																																						228,6
	9,626		244,5																																						244,5

Reference figures - additional or intermediate sizes on request

restricted grade program

SCHOELLER BLECKMANN EDELSTAHLROHR
SEAMLESS·STAINLESS
NAHTLOS ZUM ERFOLG

TUBACEX GROUP

SIZE RANGE OF SEAMLESS COLD FINISHED TUBES

SBER is producer of seamless stainless steel pipes and tubes

OUTSIDE DIAMETER — WALL THICKNESS

ASTM A 312 ASME B 36.10			inch	0,032	0,035	0,039	0,049	0,059	0,065	0,068	0,083	0,088	0,091	0,095	0,102	0,109	0,113	0,120	0,126	0,133	0,134	0,140	0,145	0,147	0,148	0,154	0,179	0,188	0,191	0,200	0,203	0,216	0,218	0,219	0,226	0,237	0,250	0,258	0,276	0,280	0,281	0,300	0,318	0,322	0,337	0,344	0,375	0,406	0,432	0,438	0,500	0,559	
			mm	0,81	0,90		1,24		1,65	1,73	2,11	2,24	2,31	2,41		2,77	2,87	3,05	3,20	3,38	3,40	3,56	3,68	3,73	3,76	3,91	4,55	4,78	4,85	5,08	5,16	5,49	5,54	5,56	5,74	6,02	6,35	6,55	7,01	7,11	7,14	7,62	8,08	8,18	8,56	8,74	9,53	10,31	10,97	11,13	12,70		
NPS	inch	mm	DIN mm	0,8		1,0	1,2	1,5	1,6		2,0		2,3		2,6		2,9		3,2				3,6			4,0	4,5			5,0				5,6			6,3			7,1			8,0			8,8		10,0	11,0		12,5	14,2	DIN mm
	0,236		6,0																																																		6,0
	0,315		8,0																																																		8,0
	0,394		10,0																																																		10,0
1/8	0,405	10,29	10,2				10			40				80																																							10,2
	0,472		12,0																																																		12,0
1/4	0,540	13,72	13,5						10			40																																									13,5
	0,551		14,0																																																		14,0
	0,630		16,0																																																		16,0
3/8	0,675	17,15	17,2						10				40						80																																		17,2
	0,709		18,0																																																		18,0
	0,748		19,0																																																		19,0
	0,787		20,0																																																		20,0
1/2	0,840	21,34	21,3						5		10					40								80				160																									21,3
	0,866		22,0																																																		22,0
	0,984		25,0																																																		25,0
3/4	1,050	26,67	26,9						5		10						40									80								160																			26,9
	1,181		30,0																																																		30,0
	1,240		31,5																																																		31,5
	1,260		32,0																																																		32,0
1,0	1,315	33,4	33,7						5							10				40							80										160																33,7
	1,378		35,0																																																		35,0
	1,496		38,0																																																		38,0
	1,575		40,0																																																		40,0
1 1/4	1,660	42,16	42,4						5							10						40							80								160																42,4
	1,752		44,5																																																		44,5
1 1/2	1,900	48,26	48,3						5							10							40							80										160														48,3
	2,008		51,0																																																		51,0
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	2,244		57,0																																																		57,0
2,0	2,375	60,33	60,3													10										40							80													160							60,3
	2,500		63,5																																																		63,5
	2,756		70,0																																																		70,0
2 1/2	2,875	73,03	76,1								5							10													40								80								160						76,1
3,0	3,500	88,90	88,9								5							10														40									80												88,9
3 1/2	4,000	101,6	101,6															10																	40							80											101,6
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	6,260		159,0																																																		159,0
6,0	6,625	168,28	168,3																		10																			40									80				168,3
	7,626		193,7																																																		193,7
8,0	8,625	219,08	219,1																					10											20						40				60			80		219,1

Reference figures – other sizes on request

FINISHES & SURFACE CONDITION OF SEAMLESS STAINLESS TUBES

according to EN 10216 - 5

TYPE OF DELIVERY CONDITION	SYMBOL	SURFACE CONDITION (DESCRIPTION ACC. TO STANDARD)	REMARK
Hot finished heat treated, descaled	HFD	Metallically clean	Scale free, minor surface imperfections are allowed
Cold finished heat treated, descaled	CFD	Metallically clean	Scale free, smoother than HFD, with a minimum of surface imperfections
Cold finished, bright annealed	CFA	Metallically bright	Bright and smoother than CFA; SBER standard on any tube with ID ≤ 12mm possible on OD's up to 60mm; We supply every CFA tube up to 25,4mm OD in industrial polished condition
Cold finished, heat treated, ground	CFG	Metallically bright – ground, the type and degree of roughness shall be agreed at the time of enquiry and order	Grinding details to be agreed. The following standard finishes are available: outside grit 240 or grit 400 When the enqiury or order calls for tubes without specifying the gritfi-nish, we take grit 240.
Cold finished heat treated, polished	CFP	Metallically bright-polished, the type and degree of roughness shall be agreed at the time of enquiry and order	upon customer request; no polishig on Ti stabilized grades possible

SURFACE ROUGHNESS ACCORDING COMMON ROUGHNESS INDICATORS

for more details and definitions refer to ISO 4287

Ra (CLA)

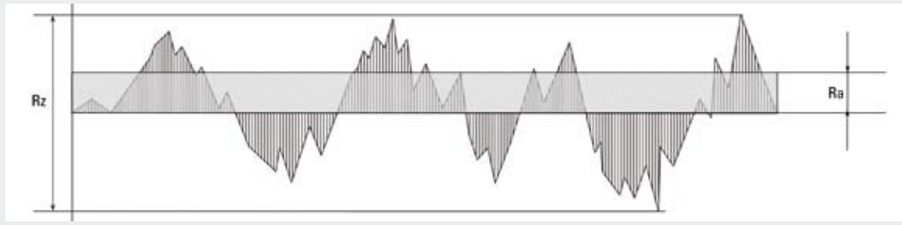
Arithmetic Average Roughness
(Center Line Average)

It is equal to a rectangle which is as long as the measuring length and in area equal to the total area between the mean value and the area below the peaks and valleys of the profile.

Rz

Maximum profile height

It is the maximum value between the highest positive and negative peak in the measuring length.



example for surface profile in measured length

Roughness indicators

N class		1	2	3	4	5	6	7	8	9	10	11	12
Ra (CLA)	µm	0,025	0,05	0,1	0,2	0,4	0,8	1,6	3,2	6,3	12,5	25	50
	µ"	1	2	4	8	16	32	63	125	250	500	1000	2000

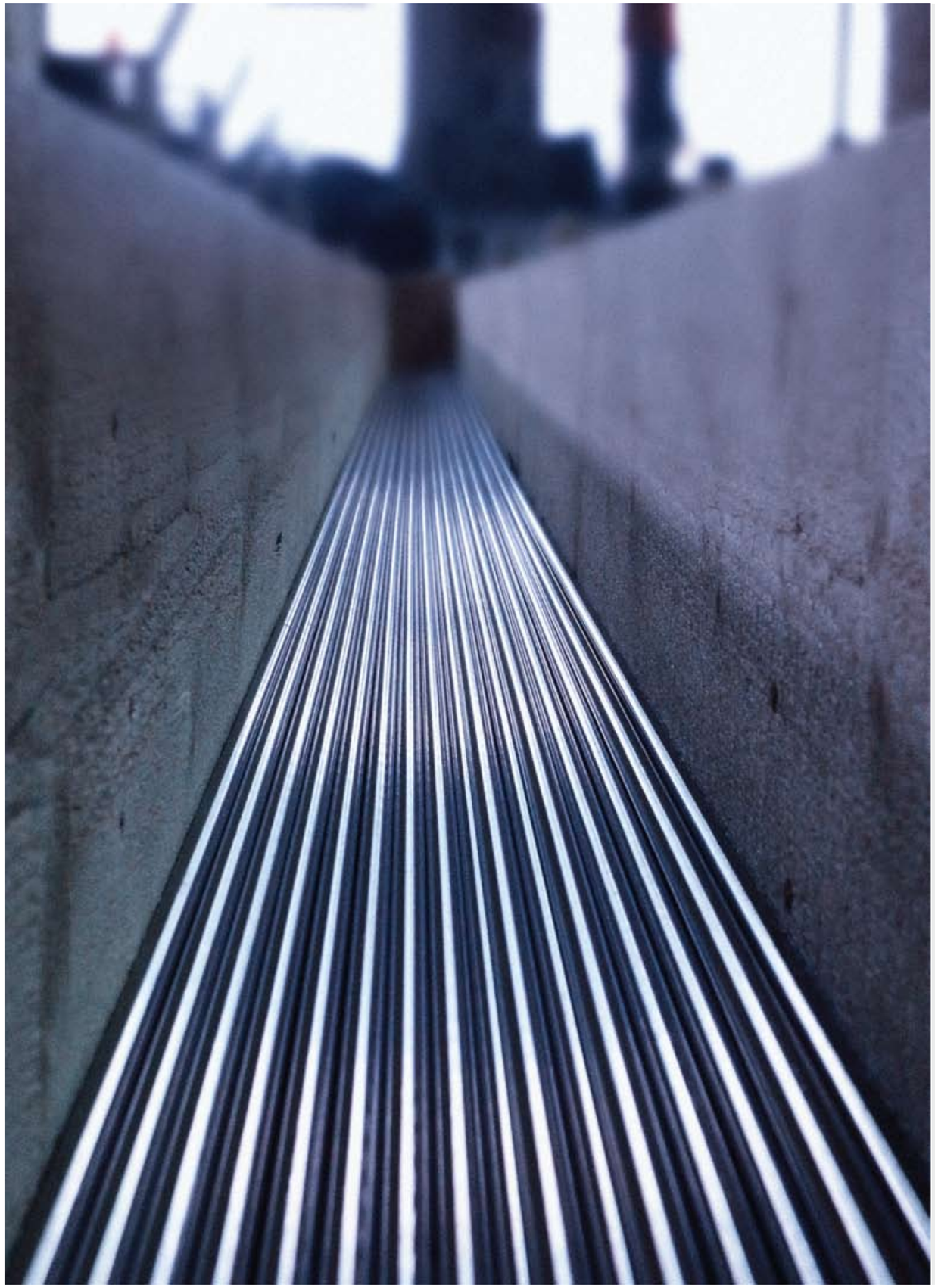
OD grinding

grit	Ra max*		Rz max*	
240	1,0 µm	39,4 µin	7,0 µm	275,6 µin
400	0,6 µm	23,6 µin	5,0 µm	196,9 µin

* on 80% of the measures taken

OD grinding possibility on tubes from 10 to 88,9 mm OD

Ra in µm x 39,37 = value in µinch



STANDARDS FOR SEAMLESS STAINLESS STEEL PIPES & TUBES

The manufacturing methods employed at SBER reflect state-of-the-art technology. Production of seamless stainless steel pipes and tubes is carried out according to all common international delivery and tolerance standards.

AMERICAN STANDARDS

ASTM A213: Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes

ASTM A269: Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

ASTM A312: Standard Specification for Seamless, Welded and Heavily Cold Worked Austenitic Stainless Steel Pipes

ASTM A450: Standard Specification for General Requirements for Carbon and Low Alloy Steel Tubes

ASTM A511: Standard Specification for Seamless Steel Mechanical Tubing

ASTM A530: Standard Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe

ASTM A789: Standard Specification for Seamless and Welded Ferritic/Austenitic Stainless Steel Tubing for General Service

ASTM A790: Standard Specification for Seamless and Welded Ferritic/Austenitic and Stainless Steel Pipe

ASTM A999: Standard Specification for General Requirements for Alloy and Stainless Steel Pipe

ASTM A1016: Standard Specification for General Requirements for Ferritic Alloy Steel, Austenitic Alloy Steel, and Stainless Steel Tubes

ASTM B163: Standard Specification for Seamless Nickel and Nickel Alloy Condenser and Heat-Exchanger Tubes

ASTM B829: Standard Specification for General Requirements for Nickel and Nickel Alloys Seamless Pipe and Tube

ANSI B16.25: Buttwelding Ends

EUROPEAN-STANDARDS

EN ISO 1127: Stainless steel tubes – Dimensions, tolerances and conventional masses per unit length

EN ISO 9692-1: Welding and allied processes Recommendations for joint preparation Part 1: Manual metalarc welding, gasshielded metalarc welding, gas welding, TIG welding and beam welding of steels

EN 10204: Metallic products – Types of inspection documents

EN 10216-5: Seamless steel tubes for pressure purposes – Technical delivery conditions – Part 5: Stainless steel tubes

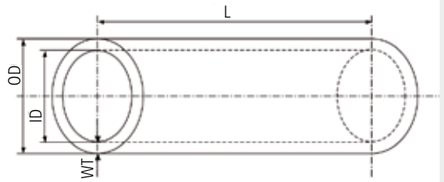
EN 10297-2: Seamless steel tubes for mechanical and general engineering purposes – Technical delivery conditions – Part 2: Stainless steel

EN 10305-1: Steel tubes for precision applications – Technical delivery conditions – Part 1: Seamless cold drawn tubes

GEOMETRIES

some definitions

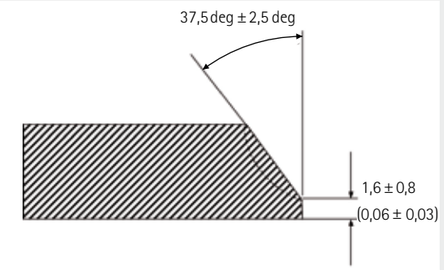
DIMENSION



OD ... Outside Diameter
ID ... Inside Diameter
WT... Wall Thickness
L ... Length

If minimum wall thickness is required variations are allowed on the plus side only!

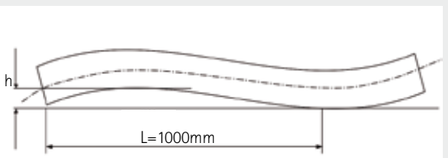
BUTTWELDING ENDS



ANSI / ASME B16.25-2007
Fig. 4 Weld Bevel Details for GTAW Root Pass
[WT > 3mm (0,12 in.) to 10mm (0,38 in.), Inclusive]

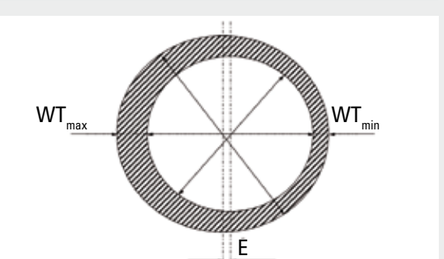
GENERAL NOTES:
a) This detail applies for gas tungsten arc welding (GTAW) of the root pass where nominal thickness is over 3mm
b) Linear dimensions are in millimeters with inch values in parentheses.

STRAIGHTNESS



Standard pipes and tubes are supplied straightened to the eye: for special applications the permissible deviation from the straight line may be agreed between purchaser and tube manufacturer; the maximum permissible deviation from the straight line related to the length of measurement L is to be indicated, e.g. 1mm/1000mm.

ECCENTRICITY



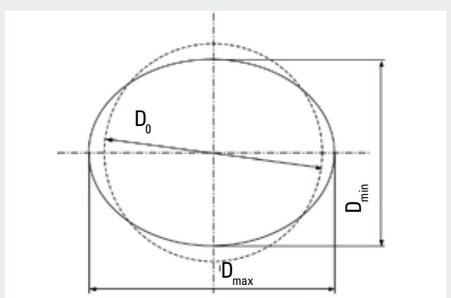
E is half of the difference between biggest and smallest wall thickness (WT) values in one cross section.

In terms of mm: $E(mm)= \frac{WT_{max} - WT_{min}}{2}$

However, eccentricity is expressed as a percentage of the mean wall thickness of this cross section

$$E(\%)= \frac{WT_{max} - WT_{min}}{WT_{max} + WT_{min}} \cdot 100$$

MEAN DIAMETER OUTSIDE OR INSIDE



D_0 is the arithmetic mean between the smallest and biggest tube diameter on any one tube circumference. If minimum wall thickness is required variations are allowed on the plus side only!

OVALITY

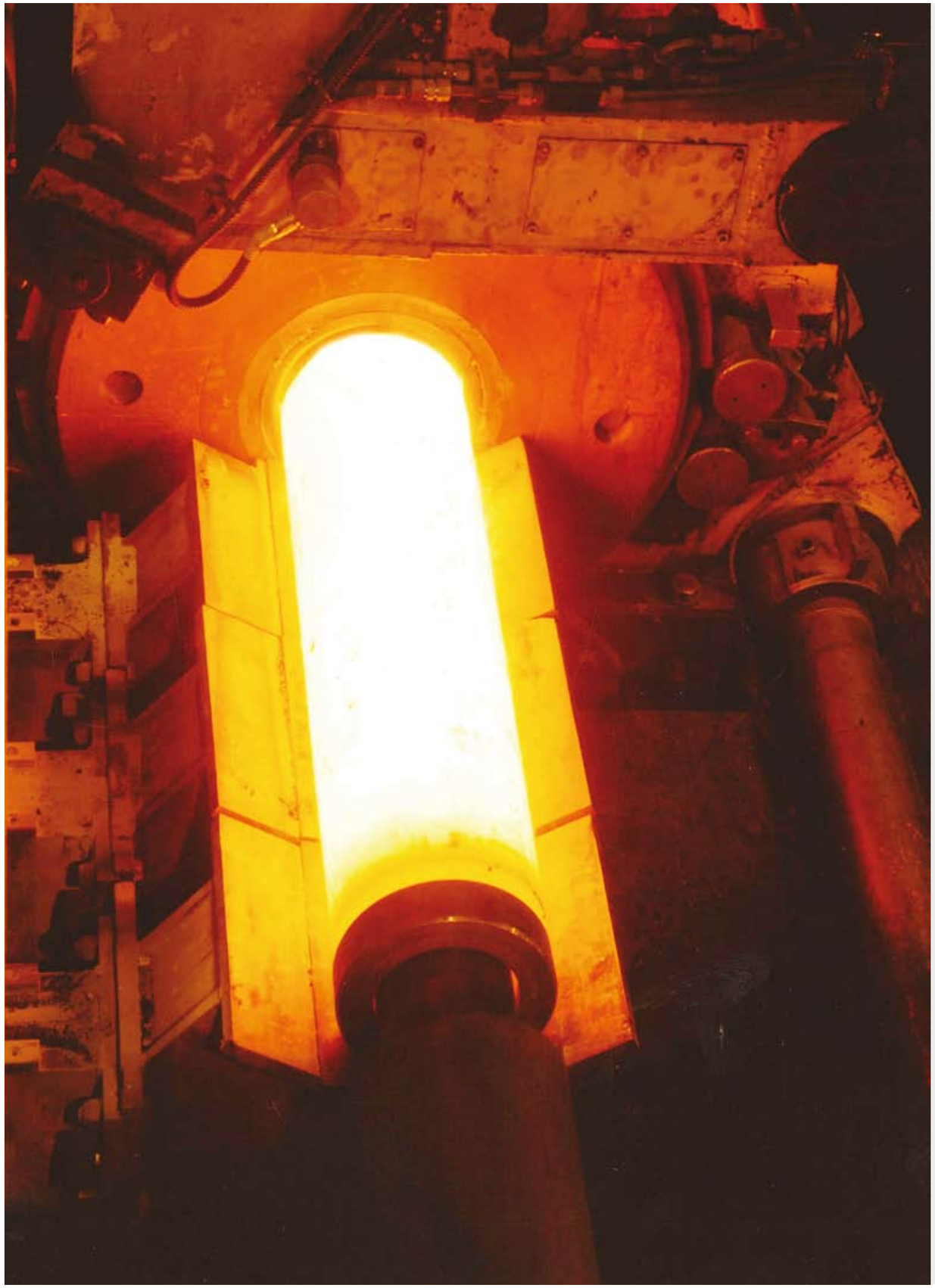
O is the difference between biggest and smallest diameter on any one tube circumference.

$O(mm)= D_{max} - D_{min}$

As a percentage of the mean diameter this is:

$$O(mm)= \frac{D_{max} - D_{min}}{D_{max} + D_{min}} \cdot 200$$

Ovality must not be confused with eccentricity.



TOLERANCES OF SEAMLESS STAINLESS STEEL PIPES & TUBES

TOLERANCES ACCORDING EN ISO 1127		
Cold formed	**Outside Diameter**	**Wall Thickness**
D4 / T4	±0,5% however, min. ±0,1mm	±7,5% however, min. ±0,15mm
D3 / T3	±0,75% however, min. ±0,3mm	±10% however, min. ±0,2mm
Hot formed	**Outside Diameter**	**Wall Thickness**
D2 / T2	±1,0% however, min. ±0,5mm	±12,5% however, min. ±0,4mm
D1 / T1	±1,5% however, min. ±0,75mm	±15% however, min. ±0,6mm

TOLERANCES ACCORDING ASTM A312 / A999 (OD RANGE MM)			
Cold formed		**Outside Diameter mm**	**Wall Thickness %**
> 10,3	≤ 48,3	+0,4 / -0,8	-12,5 / --*
Cold or hot formed		**Outside Diameter mm**	**Wall Thickness %**
> 48,3	≤ 114,3	+0,8 / -0,8	-12,5 / --*
> 114,3	≤ 219,1	+1,6 / -0,8	-12,5 / --*
Hot formed		**Outside Diameter mm**	**Wall Thickness %**
> 219,1	(≤ 250)	+2,4 / -0,8	-12,5 / --*

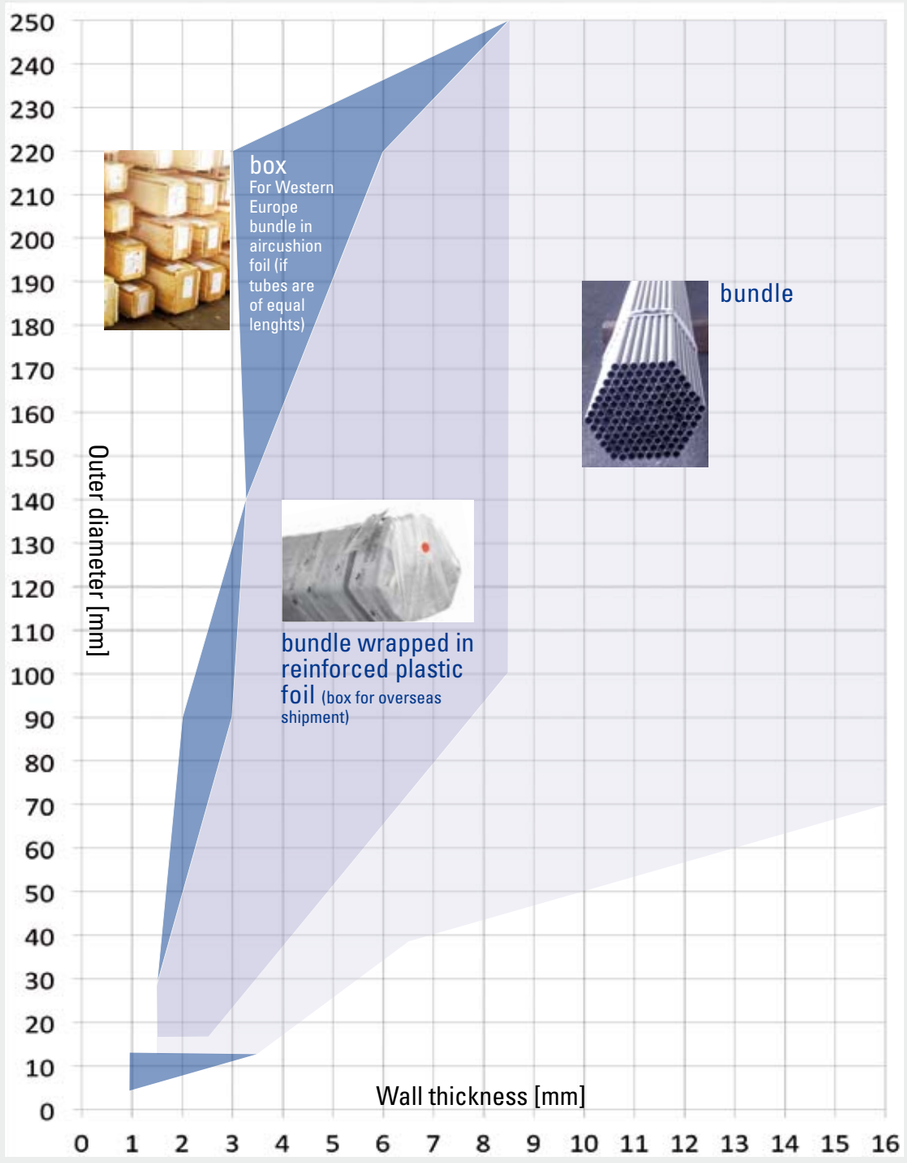
* not specified

TOLERANCES ACCORDING ASTM A213 / A1016 (OD RANGE MM)			
Cold formed		**Outside Diameter mm**	**Wall Thickness %**
> 25,4	≤ 38,1	+0,15 / -0,15	0 / +20
> 38,1	≤ 50,8	+0,20 / -0,20	0 / +22
> 50,8	≤ 63,5	+0,25 / -0,25	0 / +22
> 63,5	≤ 76,2	+0,30 / -0,30	0 / +22
> 76,2	≤ 101,6	+0,38 / -0,38	0 / +22
> 101,6	≤ 190,5	+0,38 / -0,64	0 / +22
> 190,5	≤ 219,1	+0,38 / -1,14	0 / +22
Hot formed		**Outside Diameter mm**	
OD Range mm	≤ 101,6	+0,4 / -0,8	
> 101,6	≤ 190,5	+0,4 / -1,2	
> 190,5	≤ 228,6	+0,4 / -1,6	
Hot formed			**Wall Thickness %**
WT Range mm	≤ 2,4**		+40 / 0
> 2,4	≤ 3,8		+35 / 0
> 3,8	≤ 4,6		+33 / 0
> 4,6			+28 / 0

** only for OD < 101,6mm

PACKING DIAGRAM

Common packing method at SBER



Special packing on request e.g. endcaps, PE-hose, ...

NOMINAL PIPE SIZE METRIC SYSTEM

Weight for austenitic stainless steel tubes according ANSI/ASME B36.19 and ASME B36.10 dimensions / For min wall acc. ASTM A 213 add 10%

NOMINAL WALL THICKNESS - PIPE SCHEDULES												
Pipe size	Outside diameter in mm	5S	10S	20	STD 40S	60	80S XS	100	120	140	160	XXS
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
1/8	10,3	0,89	1,24		1,73		2,41					
		0,21	0,28		0,37		0,48					
1/4	13,7	1,24	1,65		2,24		3,02					
		0,39	0,50		0,64		0,81					
3/8	17,2	1,24	1,65		2,31		3,20					
		0,49	0,64		0,86		1,12					
1/2	21,3	1,65	2,11		2,77		3,73				4,78	7,47
		0,81	1,02		1,29		1,64				1,98	2,59
3/4	26,7	1,65	2,11		2,87		3,91				5,56	7,82
		1,03	1,30		1,71		2,23				2,94	3,69
1	33,4	1,65	2,77		3,38		4,55				6,35	9,09
		1,31	2,12		2,54		3,29				4,30	5,53
1 1/4	42,2	1,65	2,77		3,56		4,85				6,35	9,70
		1,67	2,73		3,44		4,53				5,69	7,88
1 1/2	48,3	1,65	2,77		3,68		5,08				7,14	10,16
		1,93	3,16		4,11		5,49				7,35	9,69
2	60,3	1,65	2,77		3,91		5,54				8,74	11,07
		2,42	3,99		5,52		7,60				11,29	13,65
2 1/2	73,0	2,11	3,05		5,16		7,01				9,53	14,02
		3,75	5,34		8,77		11,59				15,15	20,72
3	88,9	2,11	3,05		5,49		7,62				11,13	15,24
		4,59	6,56		11,47		15,51				21,67	28,11
3 1/2	101,6	2,11	3,05		5,74		8,08					
		5,26	7,53		13,78		18,92					
4	114,3	2,11	3,05		6,02		8,56		11,13		13,49	17,12
		5,93	8,50		16,32		22,66		28,75		34,05	41,66
5	141,3	2,77	3,40		6,55		9,53		12,70		15,88	19,05
		9,61	11,74		22,10		31,44		40,90		49,87	58,31
6	168,3	2,77	3,40		7,11		10,97		14,27		18,26	21,95
		11,48	14,04		28,69		43,21		55,03		68,59	80,43
8	219,1	2,77	3,76	6,35	8,18	10,31	12,70	15,09	18,26	20,62	23,01	22,23
		15,00	20,27	33,82	43,20	53,90	65,63	77,08	91,82	102,47	112,97	109,57

NOMINAL PIPE SIZE IMPERIAL SYSTEM

Weight for austenitic stainless steel tubes according ANSI/ASME B36.19 and ASME B36.10 dimensions / For min wall acc. ASTM A 213 add 10%

NOMINAL WALL THICKNESS - PIPE SCHEDULES												
Pipe size	Outside diameter in mm	5S	10S	20	STD 40S	60	80S XS	100	120	140	160	XXS
		inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch
		lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft
1/8	10,3	0,035	0,049		0,068		0,095					
		0,141	0,189		0,249		0,319					
1/4	13,7	0,049	0,065		0,088		0,119					
		0,260	0,335		0,432		0,543					
3/8	17,2	0,049	0,065		0,091		0,126					
		0,332	0,430		0,576		0,750					
1/2	21,3	0,065	0,083		0,109		0,147				0,188	0,294
		0,546	0,682		0,865		1,104				1,331	1,742
3/4	26,7	0,065	0,083		0,113		0,154				0,219	0,308
		0,694	0,871		1,148		1,496				1,973	2,478
1	33,4	0,065	0,109		0,133		0,179				0,250	0,358
		0,881	1,426		1,706		2,207				2,888	3,715
1 1/4	42,2	0,065	0,109		0,140		0,191				0,250	0,382
		1,124	1,834		2,310		3,042				3,823	5,293
1 1/2	48,3	0,065	0,109		0,145		0,200				0,281	0,400
		1,293	2,118		2,758		3,688				4,936	6,507
2	60,3	0,065	0,109		0,154		0,218				0,344	0,436
		1,628	2,680		3,709		5,103				7,580	9,167
2 1/2	73,0	0,083	0,120		0,203		0,276				0,375	0,552
		2,516	3,588		5,887		7,780				10,173	13,908
3	88,9	0,083	0,120		0,216		0,300				0,438	0,600
		3,079	4,402		7,698		10,412				14,551	18,872
3 1/2	101,6	0,083	0,120		0,226		0,318					
		3,529	5,053		9,250		12,703					
4	114,3	0,083	0,120		0,237		0,337		0,438		0,531	0,674
		3,980	5,704		10,958		15,216		19,304		22,862	27,969
5	141,3	0,109	0,134		0,258		0,375		0,500		0,625	0,750
		6,451	7,882		14,838		21,111		27,456		33,482	39,151
6	168,3	0,109	0,134		0,280		0,432		0,562		0,718	0,864
		7,707	9,424		19,264		29,011		36,946		45,985	53,996
8	219,1	0,109	0,148	0,250	0,322	0,406	0,500	0,593	0,719	0,812	0,906	0,875
		10,073	13,610	22,709	29,002	36,184	44,062	51,653	61,646	68,795	75,844	73,565

SEAMLESS STAINLESS STEEL TUBES ACCORDING SWG

Weight for austenitic stainless steel according Imperial Standard Wire Gauge - SWG
For min wall acc. ASTM A 213 add 10%

STANDARD WIRE GAUGE WALL-THICKNESS SWG

Outside diameter			20		18		16		14		12		11		10	
			inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
inch		mm	0,036	0,914	0,048	1,219	0,064	1,626	0,080	2,032	0,104	2,642	0,116	2,946	0,128	3,251
			lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m
1/4	0,250	6,35	0,08	0,12	0,11	0,16	0,13	0,19								
5/16	0,313	7,95	0,11	0,16	0,14	0,21	0,17	0,26								
3/8	0,375	9,53	0,13	0,20	0,17	0,25	0,22	0,32	0,26	0,38						
1/2	0,500	12,70	0,18	0,27	0,24	0,35	0,30	0,45	0,36	0,54	0,45	0,67	0,48	0,72		
5/8	0,625	15,88	0,23	0,34	0,30	0,45	0,39	0,58	0,47	0,70	0,59	0,88	0,64	0,95		
3/4	0,750	19,05	0,28	0,42	0,37	0,54	0,48	0,71	0,58	0,87	0,73	1,09	0,80	1,19	0,86	1,29
7/8	0,875	22,23			0,43	0,64	0,56	0,84	0,69	1,03	0,87	1,30	0,96	1,42	1,04	1,54
1	1,000	25,40			0,50	0,74	0,65	0,97	0,80	1,19	1,01	1,51	1,11	1,66	1,21	1,80
1 1/4	1,250	31,75			0,63	0,93	0,82	1,23	1,02	1,51	1,29	1,93	1,43	2,13	1,56	2,32
1 1/2	1,500	38,10			0,76	1,13	1,00	1,48	1,23	1,84	1,58	2,35	1,74	2,59	1,91	2,84
1 3/4	1,750	44,45			0,89	1,32	1,17	1,74	1,45	2,16	1,86	2,77	2,06	3,06	2,25	3,35
2	2,000	50,80			1,02	1,51	1,35	2,00	1,67	2,48	2,14	3,19	2,37	3,53	2,60	3,87
3	3,000	76,20					2,04	3,04	2,54	3,77	3,27	4,87	3,63	5,40	3,99	5,94
3 1/2	3,500	88,90					2,39	3,55	2,97	4,42	3,83	5,71	4,26	6,34	4,69	6,97
4	4,000	101,60					2,73	4,07	3,40	5,07	4,40	6,55	4,89	7,28	5,38	8,01

SEAMLESS STAINLESS STEEL TUBES ACCORDING BWG

Weight for austenitic stainless steel according Birmingham Wire Gauge - BWG
For min wall acc. ASTM A 213 add 10%

BIRMINGHAM WIRE GAUGE WALL-THICKNESS BWG

Outside diameter			20		18		16		15		14		13		12		11		10	
			inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
inch		mm	0,035	0,889	0,049	1,245	0,065	1,651	0,072	1,829	0,083	2,108	0,095	2,413	0,109	2,769	0,120	3,048	0,134	3,404
			lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m	lb/ft	kg/m
1/4	0,250	6,35	0,08	0,12	0,11	0,16	0,13	0,19												
31/99	0,313	7,95	0,11	0,16	0,14	0,21	0,17	0,26												
3/8	0,375	9,53	0,13	0,19	0,17	0,26	0,22	0,33	0,24	0,35	0,26	0,39								
1/2	0,500	12,70	0,18	0,26	0,24	0,36	0,31	0,46	0,33	0,50	0,38	0,56	0,42	0,62	0,46	0,69	0,50	0,74		
5/8	0,625	15,88	0,22	0,33	0,31	0,46	0,40	0,59	0,43	0,64	0,49	0,73	0,55	0,81	0,61	0,91	0,66	0,98		
3/4	0,750	19,05	0,27	0,40	0,37	0,55	0,48	0,72	0,53	0,79	0,60	0,89	0,68	1,01	0,76	1,13	0,82	1,22	0,90	1,33
7/8	0,875	22,23			0,44	0,65	0,57	0,85	0,63	0,93	0,71	1,06	0,80	1,20	0,91	1,35	0,98	1,46	1,08	1,60
1	1,000	25,40			0,51	0,75	0,66	0,98	0,73	1,08	0,83	1,23	0,93	1,39	1,05	1,57	1,15	1,71	1,26	1,87
1 1/8	1,125	28,58			0,57	0,85	0,75	1,11	0,82	1,22	0,94	1,40	1,06	1,58	1,20	1,79	1,31	1,95	1,44	2,15
1 1/4	1,250	31,75			0,64	0,95	0,84	1,24	0,92	1,37	1,05	1,56	1,19	1,77	1,35	2,01	1,47	2,19	1,62	2,42
1 3/4	1,375	34,93			0,71	1,05	0,92	1,38	1,02	1,52	1,16	1,73	1,32	1,96	1,50	2,23	1,63	2,43	1,81	2,69
1 1/2	1,500	38,10			0,77	1,15	1,01	1,51	1,12	1,66	1,28	1,90	1,45	2,16	1,65	2,45	1,80	2,68	1,99	2,96
1 3/4	1,750	44,45			0,90	1,35	1,19	1,77	1,31	1,95	1,50	2,24	1,71	2,54	1,94	2,89	2,12	3,16	2,35	3,50
2	2,000	50,80			1,04	1,54	1,37	2,03	1,51	2,24	1,73	2,57	1,96	2,92	2,24	3,33	2,45	3,64	2,71	4,04
2 1/4	2,250	57,15			1,17	1,74	1,54	2,29	1,70	2,53	1,95	2,91	2,22	3,31	2,53	3,77	2,77	4,13	3,08	4,58
2 3/8	2,375	60,33			1,24	1,84	1,63	2,43	1,80	2,68	2,07	3,07	2,35	3,50	2,68	3,99	2,94	4,37	3,26	4,85
2 1/2	2,500	63,50			1,30	1,94	1,72	2,56	1,90	2,82	2,18	3,24	2,48	3,69	2,83	4,21	3,10	4,61	3,44	5,12
2 7/8	2,875	73,03			1,50	2,24	1,98	2,95	2,19	3,26	2,52	3,74	2,87	4,27	3,27	4,87	3,59	5,34	3,99	5,93
3	3,000	76,20					2,07	3,08	2,29	3,41	2,63	3,91	3,00	4,46	3,42	5,09	3,75	5,58	4,17	6,20
3 1/2	3,500	88,90					2,42	3,61	2,68	3,99	3,08	4,58	3,51	5,23	4,01	5,97	4,40	6,55	4,90	7,29
4	4,000	101,60					2,78	4,13	3,07	4,57	3,53	5,25	4,03	5,99	4,60	6,85	5,05	7,52	5,62	8,37

TUBACEX GROUP

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TUBACEX, S.A. is dedicated to the manufacture and sale of special seamless stainless steel tubes, exporting to over 60 countries all over the world. Total sales have converted TUBACEX into the the second producer worldwide, a leadership where total integration of the production processes has demonstrated being a key factor in success.

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