

# STAINLESS STEEL AND HIGH NICKEL ALLOYS TUBULAR SOLUTIONS





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# A Global Leader in Seamless Stainless and High Nickel Alloys Pipes and Tubes



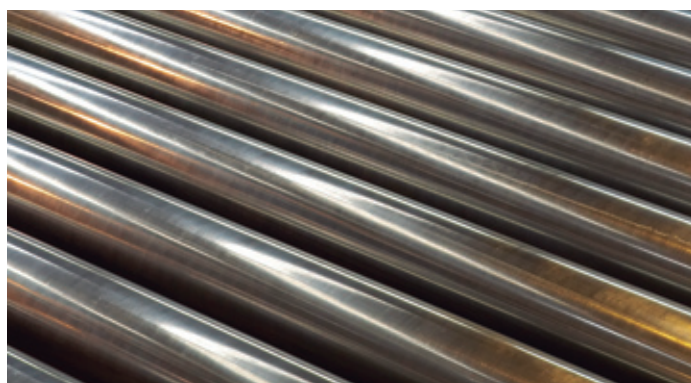
The Tubacex Group has become one of the world's main seamless stainless steel and nickel alloy tubular solutions providers.

Founded in 1963, Tubacex brings the experience of a world leader combined with a strong R&D effort which is needed to fulfill the future needs of the industry.

The Tubacex Group, exporting into more than 100 countries worldwide, has a share of around 15% of the world market of seamless stainless steel tubular solutions, with a total workforce of around 2.400 employees. The headquarters are located in Llodio, 25 Km (15 miles) from the seaport city of Bilbao, in northern Spain.

The Tubacex Group's integrated production process includes a steel making plant, several extrusion and cold finishing mills, trepanning facilities, fitting and special components producers and wide network of service centers which provide a wide range of added value operations to the group's portfolio.

## Tubacex: a global integrated group to your service



### STAINLESS STEEL AND HIGH NICKEL ALLOYS INGOTS, BARS AND BILLETS

Stainless steel and high nickel alloy long products are produced by the group's subsidiary Aceralava, either rolled or forged up to 20":

- Round bar
- Round billet
- Square billet
- Ingot



### SEAMLESS PIPES AND TUBES EXTRUSION/COLD DRAWING

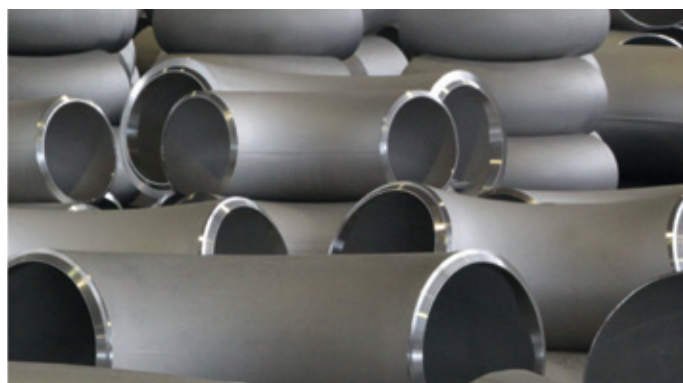
Seamless pipes up to 8" are the bulk of Tubacex portfolio, with focus in Stainless steel and high nickel alloy materials. This includes:

- Pipes and tubes for several applications
  - Straight / U-bended tubes
  - Welded and coiled seamless tubes (for umbilical application)
- Mechanical tubing



### BIG OUTSIDE DIAMETER SEAMLESS PIPES AND TUBES

The Tubacex Group completes its seamless portfolio with trepanning/boring technology that expands manufacturing range to 72" OD, in all materials from carbon steel to titanium – with main focus in Stainless Steel and High Nickel alloys.



### FITTINGS AND SPECIAL COMPONENTS

The Tubacex Group's range includes the design and manufacturing of butt welding fittings, tube bends, elbows, tees, reducers and caps (both seamless and welded), complementing the wide offer of tubular solutions, in a complete manufacturing range that goes up to 72" in any thickness.

## INNOVATION (WITH FOCUS IN NEW SOLUTIONS AND VALUE ADDED OPERATIONS) AND SERVICE AS MAIN GROWTH DRIVERS



### **Worldwide presence**

Through our commercial offices

### **Competitiveness**

Thanks to our lean manufacturing process

### **Service**

Cooperation with our customers

### **Flexibility**

In materials chemical composition & deliveries

### **Reliability**

Of a fully integrated company

Our Customers are the main driver of The Tubacex Group's activity and efforts. Our organization and investments are continuously adapting to fulfill the increasing requirements that companies are facing everyday in high demanding activities in the oil & gas, petrochemical, chemical and power generation industries, amongst others. These new challenging needs are driving us to implement in our mills the most advanced verification equipment and inspection procedures to assure product quality and a high service, guaranteed by a fully integrated company with a worldwide presence.



## **OIL AND GAS EXPLORATION AND PRODUCTION**

New challenging corrosive environments and applications are driving Tubacex product portfolio of corrosion resistant alloys in both on-shore and off-shore E&P, with a particular focus in:

- Oil Country Tubular Goods (OCTG) • Umbilical tubes along with a wide range of seamless stainless and high nickel alloys for subsea application (risers, flowlines, manifolds...)
- Tubes for platforms (piping systems, separators...).



## **REFINING, PETROCHEMICAL AND CHEMICAL**

Tubacex offers an extensive grade and size portfolio to achieve designers expectations regarding several areas and equipments in the Petrochemical and Chemical industry, particularly:

- Regas Facilities • Refineries • Heat exchangers • Reactors • Furnaces, Heaters and Re-Heaters • Other process industries.



## **FERTILIZER PRODUCTION**

Fertilizer production materials need to bear severe corrosion conditions. Tubacex provides pipes & tubes for the equipment involved in the production of Urea, Ammonia, Nitric acid, Sulphuric acid, Phosphoric acid and Melamine.

- Strippers • Condensers • Scrubbers • Reactors • Piping



## **POWER GENERATION**

Tubacex's manufacturing range covers the main stainless steel heat resistant grades used in boiler equipment, in both:

- Critical equipment • Ultra Super Critical (USC) equipment • Industrial power plants
- Nuclear power plants.



## **STOCK FOR DISTRIBUTION AND OTHER INDUSTRIES**

Tubacex's manufacturing range covers the main seamless stainless steel portfolio for distributors worldwide:

- Pipes and Tubes according to all relevant standards • Hollow Bars for metal-mechanic industry through Tubacex Service Solutions • Instrumentation and hydraulic tubing for a wide range of high added value industries, including automotive and aerospace. • Round Bars.

# The Widest Portfolio in Stainless Steel

## A truly global solutions provider at your service

	SOLUTIONS	BUSINESS UNIT
	<p>Stainless Steel and High Nickel alloys bars and billets</p>	<p><b>ACERALAVA</b></p> <hr/> <p><b>TUBACEX GROUP</b></p>
		<p><b>TTI</b></p> <hr/> <p><b>TUBACEX GROUP</b></p>
	<p>Seamless Pipe and Tubes to 8" (extrusion, piercing, cold finishing)</p>	<p><b>SCHOELLER BLECKMANN</b></p> <hr/> <p><b>TUBACEX GROUP</b></p>
	<p>Seamless Pipe and Tubes to 72"</p>	<p><b>TUBACEX INDIA</b></p> <hr/> <p><b>TUBACEX GROUP</b></p>
	<p>Fittings and special connections from 1/2" to 72"</p>	<p><b>IBF</b></p> <hr/> <p><b>TUBACEX GROUP</b></p>
	<p>Stock, Service and Trading Value added operations</p>	<p><b>TTA</b></p> <hr/> <p><b>TUBACEX GROUP</b></p>
		<p><b>TUBACEX SERVICE SOLUTIONS</b></p> <hr/> <p><b>TUBACEX GROUP</b></p>

## RANGE

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### **Round and Square Stainless and Nickel alloy billets**

Rolled from 120 to 280mm (4 ¾" – 11")

Forged from 230 to 508 mm (9" – 20")

Aceralava is the main steel supplier of the Tubacex Group's companies. It also supplies its products to the Stainless Steel Market. Aceralava's manufacturing range covers the main stainless steel grades requested by the industry, with exceptions possible on request.

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### **Seamless Stainless Steel and Nickel Alloy tubes and pipes**

The size manufactured through the extrusion press and the 11 cold rolling machines, goes from ½" up to 8" NPS, or 19 – 250 mm OD, at manufacturing facilities located at Llodio and Amurrio (Spain).

A specific line is fully devoted to OCTG (oil country tubular goods) manufacturing, in a range that goes to 9 5/8" (currently in trial).

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### **Seamless Stainless Steel pipes and tubes**

Schoeller Bleckmann Edelstahlrohr, located in Ternitz, Austria, manufactures Seamless Stainless Steel in dimensions between 1/8" and 8" NPS, or 6 – 250 mm OD.

A specific plant is devoted to special tube manufacturing, with focus in straight and welded tubes for umbilical application and other high demanding applications (Nuclear, Fertilizer).

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### **Welded and Seamless Stainless Steel and Nickel Alloy tubes.**

Located in Greenville, PA (USA) Salem tube's manufacturing range goes from 1/8" to 2" OD.

The company is highly specialized in precision tubing for the most demanding industries such as military and aerospace, with a heavy concentration of high nickel alloy in their product portfolio.

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### **Seamless Stainless Steel tubes and pipes**

Located in Umbergaon (Gujarat- India), Tubacex India manufactures cold finished tubes and pipes from 6 mm OD to 273.1 mm OD

The company is able to deliver tubes up to 28 m (length), straight and U-Shape, to a wide range of customers. The company is ISO 9000 and ISO 14000 certified

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### **Mechanically bored tubes**

Located in Vittuone, Italy, IBF pipes division manufactures mechanically bored tubes up to 72" in any wall thickness.

### **Fittings**

Located in San Niccolo, Italy, IBF fittings and special parts division manufactures fittings, elbows, and special components in a manufacturing range that goes from ½" to 72" NPS.

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### **Stainless steel (also carbon and alloy) butt welding fittings**

Size range goes from 1 ½" up to 14" NPS, in short and long radius as well as in special radii.

Located in Artziniega, Spain, Tubacex Taylor Accesorios (TTA) manufactures fittings (elbows and return bends) mainly for the Petrochemical industry, perfectly complementing the portfolio of the rest of The Group.

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### **Global Network of Service Centers (Cotubes, MIS, Tubacex America and Tubos Mecánicos )**

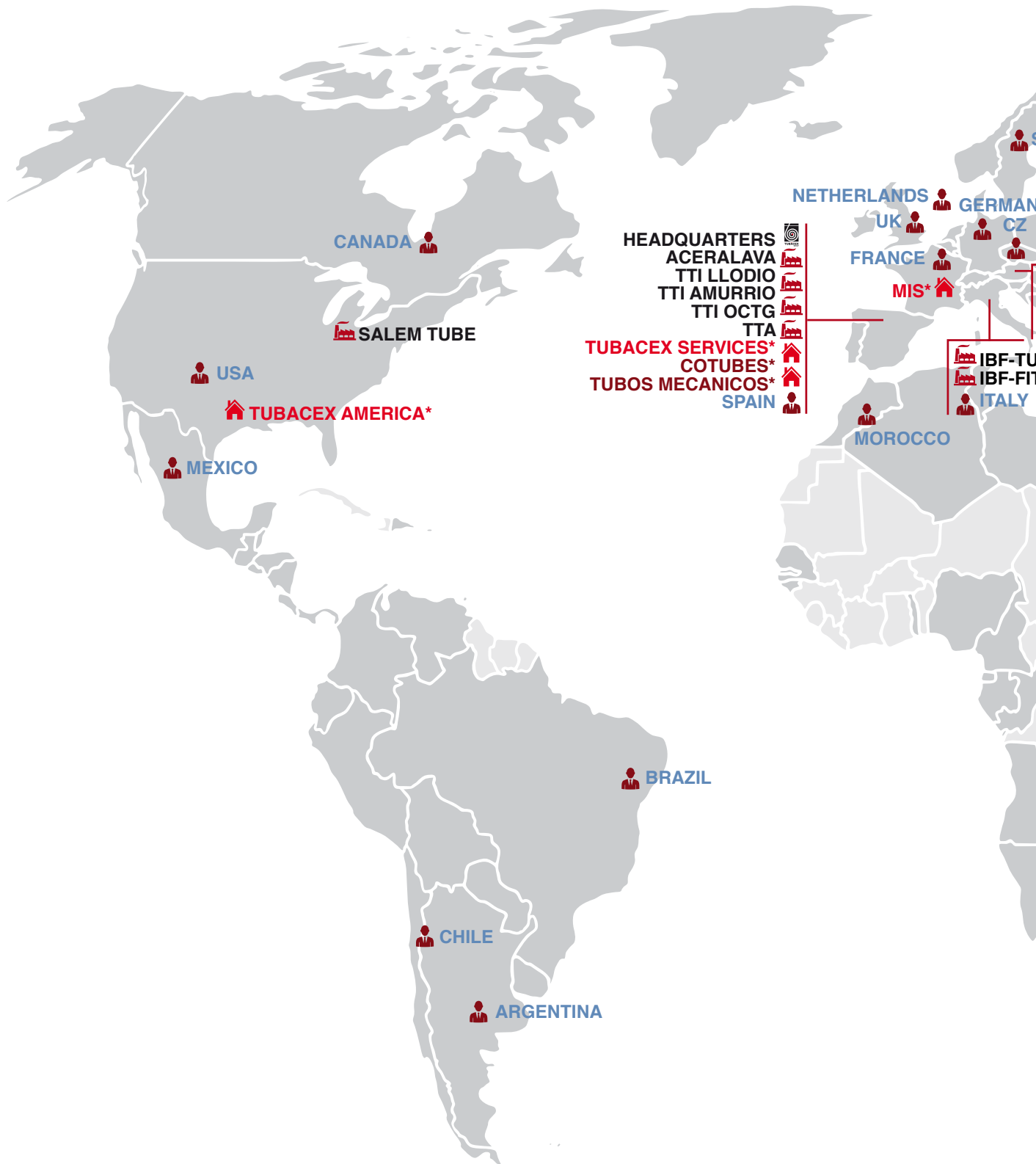
Service centers located in Spain, France, Brazil, China and the United States.

Special added value operations in **Tubacex Services**.

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# TUBACEX: Worldwide Presence







**TUBACEX**  
GROUP



**MANUFACTURING**      **SERVICE CENTER**      **SALES REPRESENTATION**

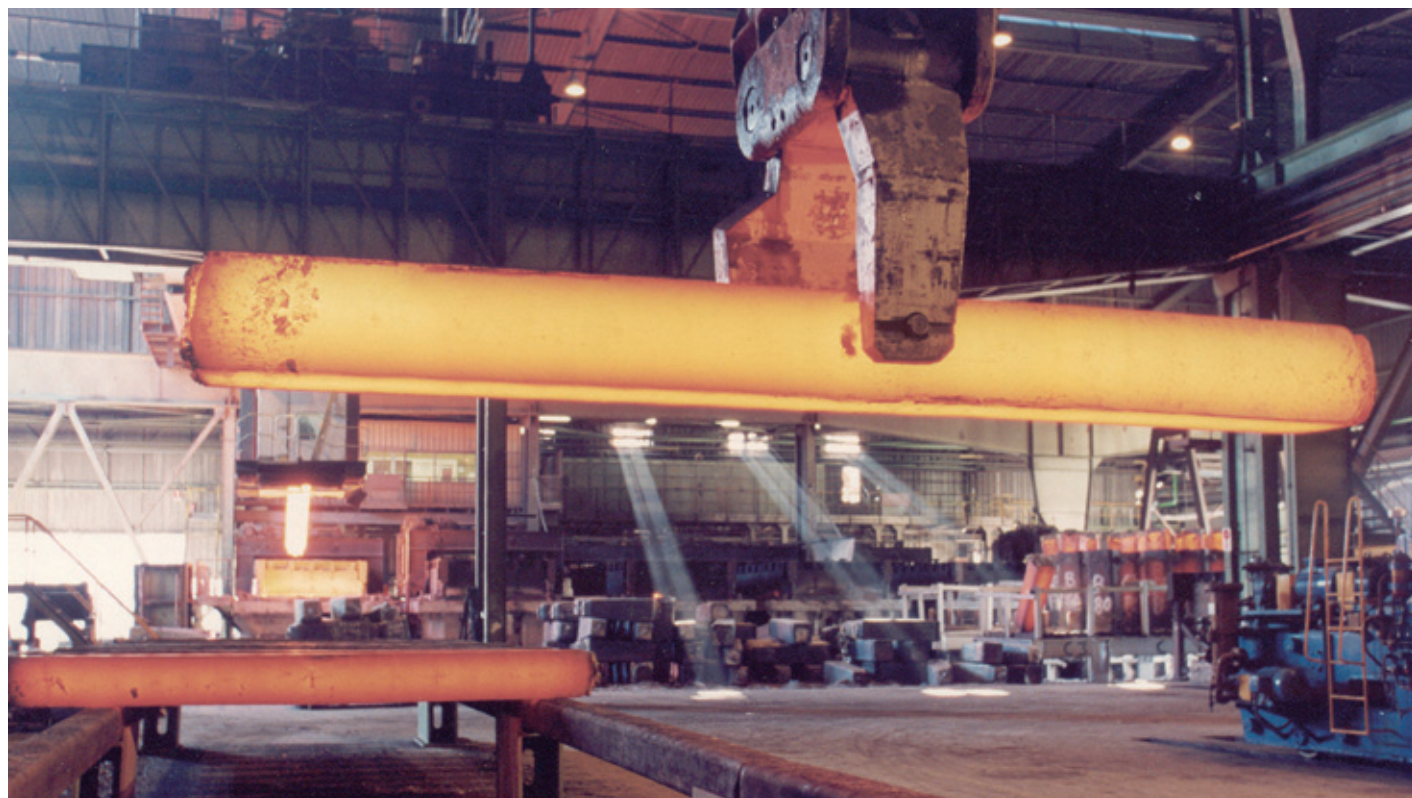
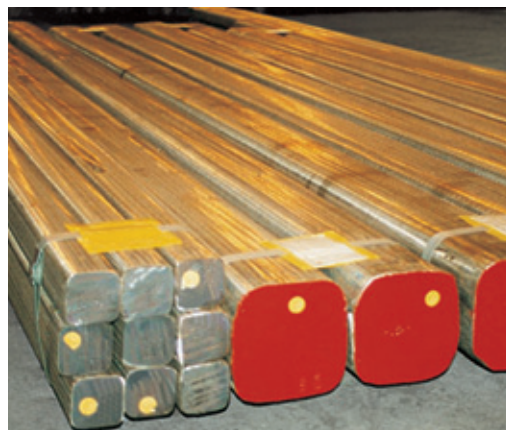
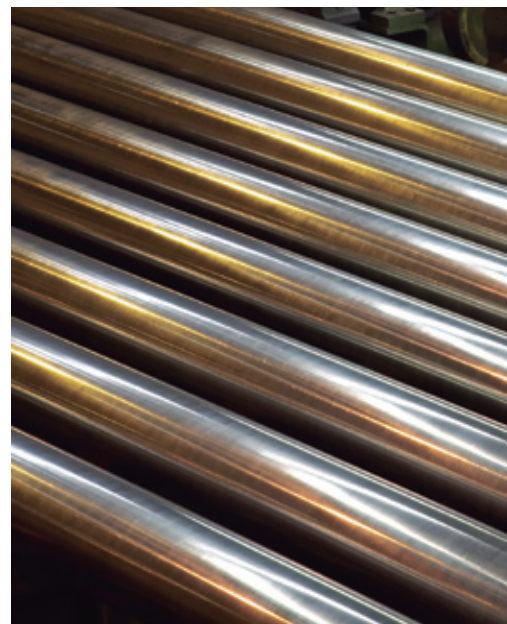
**\*TUBACEX SERVICES SOLUTIONS**

# Stainless Steel Bars and Billets

Aceralava is The Tubacex Group's steel melting shop, which provides the bulk of raw material supply for the rest of the Group's manufacturing units. In addition, Aceralava offers a wide stainless steel portfolio to our customers.

Aceralava's product range includes stainless steel long products such as square and round bars, billets and ingots, rolled and forged. Our standard portfolio can be defined as follows:

ROUNDS BARS & BILLETS			
Products	Size range	Condition	Grades
●	165 mm. up to 230 mm. (6 1/2" - 9")	Rolled	Martensitics Austenitics Ferritic - Austenitics High Nickel Alloys
●	230 mm. up to 500 mm. (9" - 19 3/4")	Forged	
SQUARE BILLETS			
Products	Size range	Condition	Grades
■	120 mm. up to 280 mm. (4 3/4" - 11")	Rolled	Martensitics Austenitics Ferritic - Austenitics High Nickel Alloys
■	280 mm. up to 508 mm. (11" - 20")	Forged	





# Stainless Steel Bars and Billets

Aceralava's manufacturing range covers the main stainless steel grades requested by the industry and a tailor made list of steels. Our metallurgical engineers are devoted to the development of sophisticated steels capable of operating in the demanding environments of the future. Exceptions over the standard steel grades can be met upon request.



## STAINLESS STEEL GRADES

	ASTM	Wnr	AFNOR	C max*	Cr	Ni	Mo	Other	
AUSTENITIC	304	1.4301	TU Z 6 CN 18-09	0,08	17/20	8/11			
	304 L	1.4306	TU Z 2 CN 18-10	0,03	18/20	10/12			
	304 L	1.4307	TU Z 3 CN 19-09	0,03	17,5/19,5	8/10,5			
	304 H		TU Z 6 CN 19-10	0,04/0,10	18/20	8/11			
	TX304HB**	1.4907		0,07	17/19	7,5/10,5		Nb 0,3/0,6 Cu 2,5/3,5	
	321	1.4541	TU Z 6 CNT 18-10	0,08	17/19	9/12		5 C < Ti ≤ 0,60	
	321 H		TU Z 6 CNT 18-12 B	0,04/0,10	17/20	9/13		4 C < Ti ≤ 0,60	
	347	1.4550	TU Z 6 CNNb 18-10	0,08	17/19	9/12		10 C < Nb ≤ 1,0	
	347 H		TU Z 6 CNNb 18-12 B	0,04/0,08	17/20	9/13		8 C < Nb ≤ 1,0	
	347 H FG	1.4908		0,07	17/19	9/13		8 C < Nb ≤ 1,1	
	316	1.4401	TU Z 6 CND 17-11	0,08	16/18	11/14	2/3		
	316 L	1.4404	TU Z 2 CND 17-12	0,03	16/18	11/14	2/3		
	316 Ti	1.4571	TU Z 6 CNDT 17-12	0,08	16,5/18,5	10,5/13,5	2/2,5	5 C < Ti ≤ 0,80	
	(316 L)	1.4435	TU Z 2 CND 17-13	0,03	17/18,5	12,5/15	2,5/3		
	(316)	1.4436	TU Z 6 CND 17-12	0,07	16,5/18,5	11/14	2,5/3		
	316 Nb	1.4580		0,08	16/18	11/13	2/2,5	10 C < Nb < 1,0	
	316 N/316 LN			0,03	16/18	11/14	2/3	N 0,10/0,16	
	316 L urea			0,03	17/18	13/15	2/3		
	317			TU Z 2 CND 19-15	0,08	18/20	11/15	3/4	
	317 L	1.4438		TU Z 2 CND 19-15	0,03	18/20	11/15	3/4	
309 S/309 H	1.4833		TU Z 12 CN 24-12	0,08	22/24	12/15	≤ 0,75		
310 S/310 H	1.4845		TU Z 12 CN 25-20	0,08	24/26	19/22	≤ 0,75		
310 HCbN	1.4952			0,07	24/26	19/22		0,2 < Nb ≤ 0,6	
310 MoLN	1.4466			0,02	24/26	21/23	2/2,5	N=0,1/0,15 Si<0,4 P<0,02	
	1.4828		TU Z 17 CNS 20-12	0,20	19/21	11/13		Si 1,5/2,5	
314	1.4841		TU Z 15 CNS 25-20	0,15	24/26	19/21		Si 1,5/2,5	
UNS S31254	1.4547			0,02	19,5/20,5	17,5/18,5	6,0/6,5	Cu 0,50/1,00 N 0,18/0,22	
FERRITIC AUSTENITIC	UNS S31803	1.4462	TU Z 2 CND 22-05-03	0,03	21/23	4,5/6,5	2,5/3,5	N 0,12/0,20	
	UNS S32750	1.4410			24,0/26,0	6,0/8,0	3,0/5,0		
	UNS S32760	1.4501	TU Z 3 CND 25-06-Az	0,03	24/26	6/8	3/5	N 0,2/0,3 Cu & W 0,5/1,0	
HIGH NICKEL	904 L	1.4539	TU Z 1 CNDU 25-20	0,02	19/21	24/26	4/5	Cu 1,20/2,00 N 0,04/0,10	
	800-H-HT	1.4876	(TU Z10 NC 32-21)	0,6/0,10	19/23	30/35		Al & Ti 0,15/0,60	
	UNS N08020	2.4660		0,07	19/21	32/38	2/3	Cu 3/4 Nb 8xC-1,0 Fe Balance	
	UNS N08825	2.4858		0,05	19,5/23,5	38/46	2,5/3,5	Cu 1,5/3,0 Al 0,2 max Ti 0,6/1,2 Fe Balance	
	UNS N08028	1.4563	TU Z2 CNDU 31-27	0,03	26/28	30/32	3/4	Cu=0,8/1,4 N=0,04/0,15 Fe Balance	
G-3 N06985					21,0/23,5	44,0/52,0	6,5/8,0	Fe: 18,0/21,0	

\* Maximum unless otherwise indicated. \*\* Tubacex name.

In addition to these standards, Tubacex's capabilities include a wide range of stainless steel and high nickel alloy grades depending on our customers' requirements.

# Seamless Pipes and Tubes Extrusion / Cold drawing

The Tubacex Group has an extensive manufacturing program for stainless steel and nickel alloys seamless pipes and tubes covering most dimensions and grades required by the industry. Seamless Stainless Steel Tubing can be hot or cold finished, covering the following range:

## MANUFACTURING RANGE

OUTSIDE DIAMETER		HOT MANUFACTURING DIMENSIONS																																							
		WALL THICKNESS																																							
ASTM A 312 ASME B.36.10		Inch	0,120	0,126	0,133	0,134	0,140	0,145	0,148	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	1,000	Inch	
		mm	3,05	3,20	3,38	3,40	3,56	3,68	3,76	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	12,5	12,7	13,49	14,27	15,88	18,26	23,10	25,40	mm
NPS	Inch	mm	DIN mm																													DIN mm									
	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	88,9	88,9	40				80				160																								88,9					
3 1/2	4,000	101,60	101,6	40				80				160																								101,6					
	4,252		108,0																													108,0									
4,0	4,500	114,30	114,3	40				80				160																								114,3					
	5,236		133,0																													133,0									
	5,500		139,7																													139,7									
5,0	5,563	141,3	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	10				40				80				120				160																219,1					
	9,000		228,6																													228,6									
	9,626		244,5																													244,5									

Range of Tubacex Tubos Inoxidables and Schoeller Bleckmann Edelstahlrohr for austenitic hot manufactured tubes and pipes. Production according to main manufacturing standards (ASTM/ASME, EN and other international manufacturing standards). Non standard articles available upon request.

OUTSIDE DIAMETER		COLD MANUFACTURING DIMENSIONS																																										
		WALL THICKNESS																																										
ASTM A 312 ASME B.36.10		Inch	0,020	0,035	0,049	0,065	0,083	0,091	0,102	0,109	0,113	0,120	0,126	0,133	0,134	0,140	0,145	0,148	0,154	0,179	0,191	0,200	0,203	0,216	0,219	0,226	0,237	0,250	0,258	0,276	0,280	0,300	0,318	0,322	0,337	0,375	0,432	0,500	0,559	Inch				
		mm	0,50	0,89	1,24	1,65	2,11	2,31	2,59	2,77	2,87	3,05	3,20	3,38	3,40	3,56	3,68	3,76	3,91	4,55	4,85	5,08	5,16	5,49	5,56	5,74	6,02	6,35	6,55	7,01	7,11	7,62	8,08	8,18	8,56	9,53	10,97	12,70	14,20	mm				
NPS	Inch	mm	DIN mm																													DIN mm												
	0,125	3,17	3,2																													3,0												
	0,236		6,0																													6,0												
	0,315		8,0																													8,0												
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				80																								13,5								
	0,630		16,0																													16,0												
3/8	0,675	17,15	17,2	10				40				80																								17,2								
	0,748		19,0																													19,0												
	0,787		20,0																													20,0												
1/2	0,840	21,34	21,3	5				10				40																								21,3								
	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												
	1,260		32,0																													32,0												
1,0	1,315	33,40	33,7	5				10				40				80				160				200																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																								48,3				
	2,008		51,0																													51,0												
	2,244		57,0																													57,0												
2,0	2,375	60,33	60,3	5				10				40																								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				160																								88,9
3 1/2	4,000	101,60	101,6	5				10				40				80																								101,6				
	4,252		108,0																													108,0												
4,0	4,500	114,30	114,3	5				10				40				80																								114,3				
	5,236		133,0																													133,0												
5,0	5,563	141,30	141,3	5				10				40				80				120																141,3								
	6,260		159,0																													159,0												
6,0	6,625	168,28	168,3	5				10				40				80																								168,3				
	7,626		193,7																													193,7												
8,0	8,625	219,08	219,1	5				10				40				80																								219,1				

Range of Tubacex Tubos Inoxidables, Schoeller Bleckmann Edelstahlrohr, Salem Tube and Tubacex India for Austenitic cold manufactured tubes and pipes. Production according to main manufacturing standards (ASTM/ASME, EN and other international manufacturing standards). Non standard articles available on request.





# Stainless Steel Mechanical Tubes

Tubacex Group covers the Mechanical Tube market mainly through Tubacex Service Solutions (Cotubes, MIS and Tubacex America). Cotubes in particular, is specialized in the commercialization of Hollow Bar manufactured in both T.T.I. Tubacex Tubos Inoxidables and Schoeller Bleckmann Edelstahlrohr. Cotubes offers excellent availability supported by a global distribution network. In addition, the company operates one of the world's most relevant seamless stainless steel tubes and pipes stocks.

SEAMLESS STAINLESS MECHANICAL TUBES MANUFACTURING RANGE																																									
Wall thickness: Average																																									
OD	INSIDE DIAMETER																																								
OUTSIDE DIAMETER	16	20	25	28	32	36	40	45	50	55	56	60	61	63	67	69	71	75	80	85	90	95	98	100	106	110	112	118	122	125	130	132	140	150	160	170	180	186	190	200	
32	8	6																																							
36	10	8	5,5																																						
40		10	7,5	6																																					
45			12,5		8,5	6,5																																			
50				12,5		9	7																																		
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63						15,5	13,5	11,5	9	6,5																															
71							17,5	15,5	13	10,5	7,5																														
75								17,5	15	12,5	9,5	7,5																													
80									20	17,5	15	12		8,5																											
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95													22,5	19,5			16	13		10																					
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236																																									
240																																									
250																																							32	25	

**WALL THICKNESS**



The Tubacex Group offers the main dimensions of mechanical tubes according to EN 10294-2, in a wide range of combinations of OD/ID.

In the manufacture of cylindrical tools or hollow stainless steel parts, the cost of machining the bore is greatly reduced when hollow bar is used as basic material. Chip loss is substantially lower than if solid bar is used. A wide range of hollow parts can be processed from hollow bar, as liners, feed bushes, shearing cylinders, cutting rings, fittings, pumps, flange rings and hollow axles.



The Tubacex Group supplies mechanically bored tubes through IBF. Located in Vittuone, Italy, IBF pipes division manufactures mechanically bored tubes up to 72" in any wall thickness.

# Big Outside Diameter Seamless Pipes and Tubes

Growing sizes in both outside diameter and wall thickness are a clear trend in almost all seamless pipe demanding industries (oil and gas, refining and petrochemical, power generation). Starting either from forged round bars (rough or machined) or from hollow forging (heat treated or as forged) Tubacex offers a wide manufacturing range through trepanning technology:

MANUFACTURING RANGE	
Trepanned Pipes	Outside Diameter
From round bar	1/2" - 26"
From hollow bar	22" - 72"
Seamless heavy wall pipes	
Any thickness	
Lengths up to 20 meter	



Materials covered include a wide range of grades, from carbon steel to titanium, with focus in stainless steel and high nickel alloys:

GRADE RANGE - BIG OUTSIDE DIAMETER SEAMLESS PIPES AND TUBES	
Carbon steels	ASTM A105, A106, A333...
Carbon steels with high yield limit	X52- X60-X65 in conformity with the standards A864, A860, MSS-SP-75, API 5L...
Low alloy steels	ASTM A182, A234, A335 grade F/WP/P1, 5, 11,12, 22, 91, 92, 122...
Austenitic stainless steels	Standard austenitic (304,316,321, 347 series...) and superaustenitic steels (UNS S31254,UNS S34565...)
Martensitic and ferritic stainless steels	400 Series: 410...
Ferritic-austenitic stainless steels	22% Cr Duplex ( UNS S31803, S32205); 25% Cr Super Duplex (UNS S32760, S32750, S32550)
Nickel and nickel alloys	Inconel (N06625, N06600...); Incoloy (N08825, N0800H)
Titanium alloys	



# Fittings and Special Components



The Tubacex range includes the design and manufacturing of butt welding fittings, tube bends, elbows, tees, reducers and caps (both seamless and welded), complementing the wide offer of tubular solutions, by IBF and TTA companies. In addition IBF offers a wide range of special parts (manifolds, laterals, special reducers...)

- TTA size range goes from 1 ½" up to 14" NPS, in short and long radius as well as special radii. Located in Artziniega, Spain, Tubacex Taylor Accesorios (TTA) manufactures fittings (elbows and return bends) mainly for the petrochemical industry, perfectly complementing the portfolio of the rest of the Group and particularly the seamless tubes for furnace applications, heaters and re-heaters.
- Located in San Niccolo, Italy, IBF fittings and special parts division manufactures fittings, elbows, and special components in a manufacturing range that goes from ½ "to 72" NPS for a wide range of end users (Oil and Gas, Power Gen, Nuclear...). Specialized in special and big size pieces, cold drawn dimensions are mainly sourced from its participated company CFF.

The Tubacex Group's fitting and special components extensive production program is suitable for all kinds of projects. The range offered is one of the widest in the industry:

## MANUFACTURING RANGE - FITTINGS AND SPECIAL PARTS

Seamless	1/2" ton 44"
Welded	1/2" ton 72"

Hot drawing, bending and cold drawing processes  
Any thickness  
Lengths from 0,5 to 20 meter

Materials covered include a wide range of grades, from carbon steel to titanium, with focus in stainless steel and high nickel alloys – same as described regarding trepanned pipes. The Tubacex Group maintains a very high stock level in finished and semifinished products, as well as base materials, to provide full flexibility and a extremely competitive lead time.





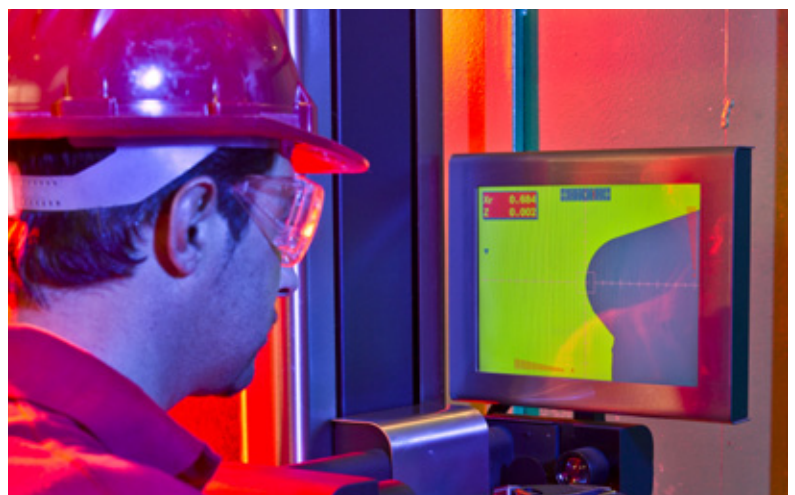
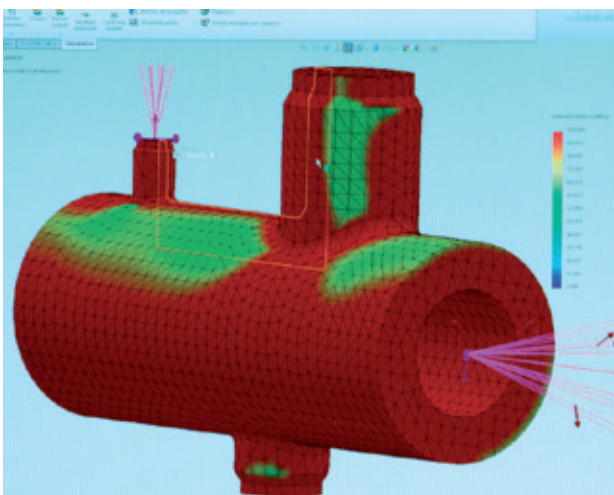
## Product portfolio

- The Tubacex Group's Fittings program covers all kind of fittings (Butt welding fittings & elbows, tees, reducers, caps) from standard to special products, manufactured by hot drawing, bending or cold drawing.
- In addition to fittings, special components such as laterals, manifolds, tees, stress joints, weldolets are manufactured at IBF fittings and special parts division, with a clear trend to a more particularized design.

FITTINGS	SPECIAL PARTS
Butt Welding fittings & elbows	Special components
Tees	Manifolds
Reducers	Laterals
Caps	Special Reducers



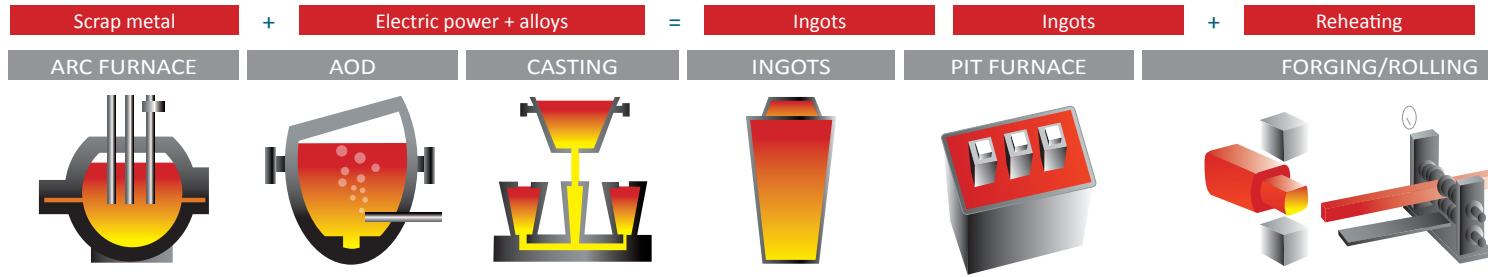
- Flexible production processes allow The Tubacex Group's products to be manufactured by a variety of production methods, to reach a wide range in a specialized market, where particularized designs are growingly demanded – designs defined and calculated by our engineering departments.
- IBF has a technical department equipped with CAD systems for design and calculation. This department designs fittings and special items in compliance with all applicable standards and specifications and in conjunction with the client's specific requirements. In addition, the department offers support to the development of all necessary production equipment, machinery and technical processes.



# Integrated process

Tubacex is a fully integrated company with one melting shop (in Spain), two extrusion facilities (in Spain and Austria) and three cold finishing facilities (in Spain, Austria and the USA). The Group is capable of producing seamless steel tubes in hot and cold finishing.

## STEEL PRODUCTION



General description of the process. Additional specialized equipment not included in the graphic above.

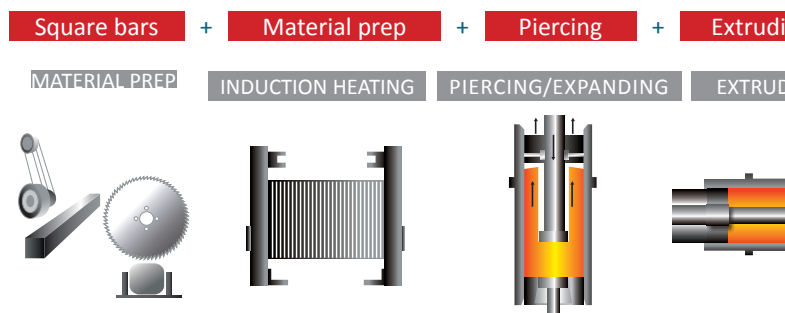
## HOT FINISHED PRODUCTION

**Tubacex Tubos Inoxidables  
HOT EXTRUSION PLANT  
Llodio. SPAIN**

- 80-250 mm OD
- Horizontal induction furnaces
- Expanding press (hydraulic. 1.600 ton)
- Vertical induction furnaces
- Extrusion press (hydraulic. 4.100 ton)
- Soaking furnace (walking beams)
- Stretching - reducing mill
- Heat treatment
- N.D. testing (ultrasonic. hydrostatic)
- Finishing lines

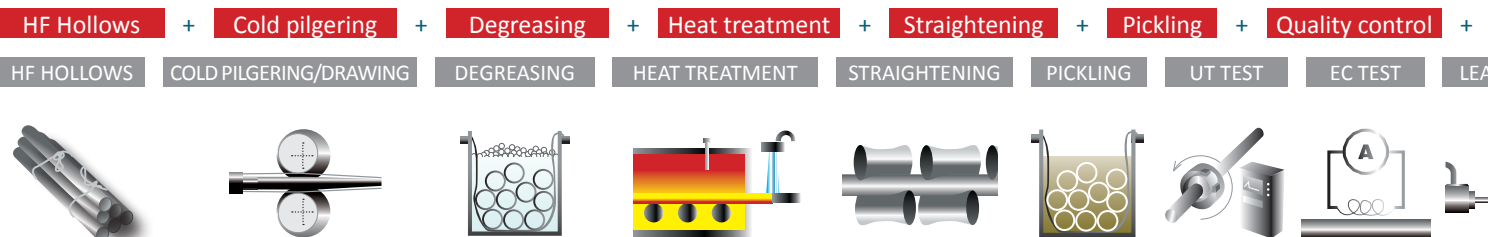
**Schoeller Bleckmann Edelstahlrohr  
HOT EXTRUSION PLANT  
Ternitz. AUSTRIA**

- 38-250 mm OD
- Horizontal induction furnaces
- Expanding press (hydraulic. 1.600 ton)
- Vertical induction furnaces
- 2 Extrusion presses (hydraulic, 2.000 and 3.300 tons)
- Soaking furnace (walking beams)
- Stretching - reducing mill
- Heat treatment/bright annealing furnace
- N.D. testing (ultrasonic. hydrostatic)
- Finishing lines



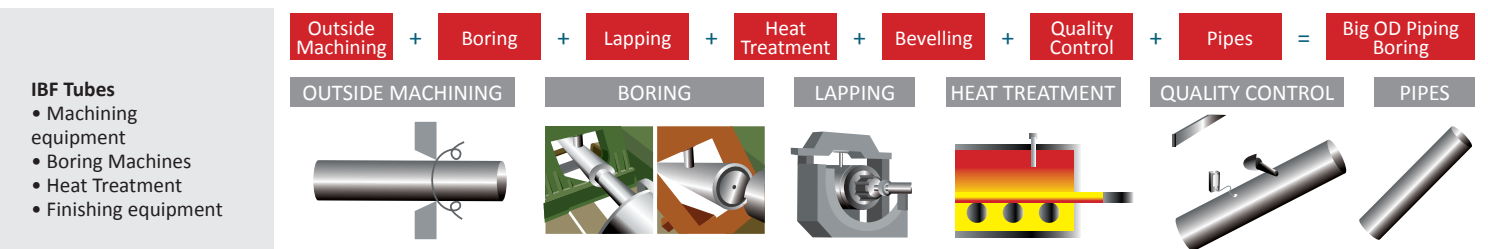
General description of the process. Additional specialized equipment not included in the graphic above.

## COLD FINISHED PRODUCTION



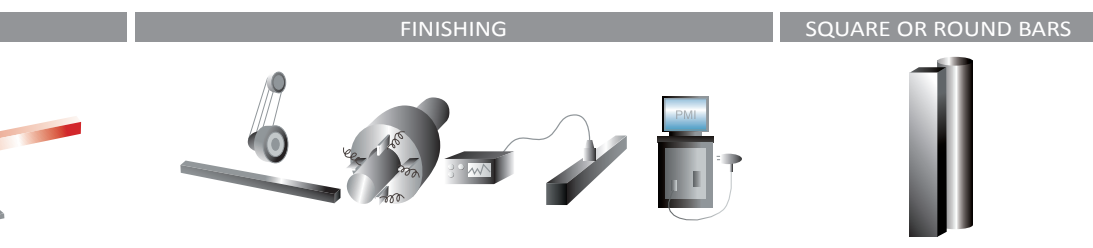
General description of the process. Additional specialized equipment (Drawing bench, coiling & welding facilities, U-bending equipment...) not included in the graphic above.

## BIG OD PIPING



General description of the process. Additional specialized equipment not included in the graphic above.

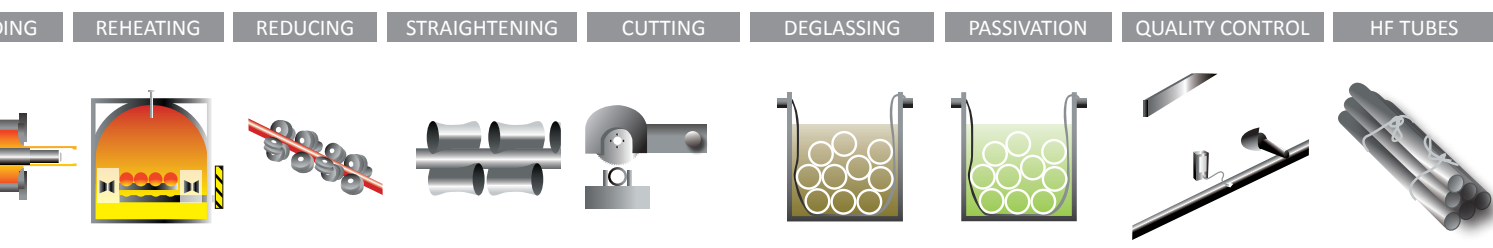
+ Forging, rolling, or both + Finishing (straightening, cutting, peeling, UT, PMI...) = Bars



**Acería de Álava**  
**STEEL MELTING SHOP**  
**Amurrio. SPAIN**

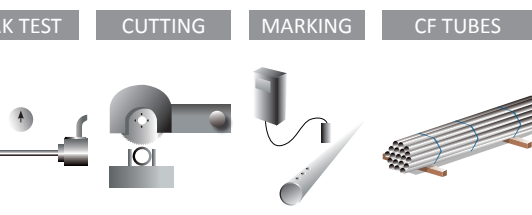
- Acería Electric Arc Furnace (100 tons)
- AOD converter (60 tonnes)
- 8 soaking pit furnaces (gas heated)
- Forging press
- Blooming rolling mill
- Heat treatment
- Peeling and polishing
- Non destructive tests

ng + Reducing + Straightening + Cutting + Pickling + Quality control = Hot finished tubes



graphic above.

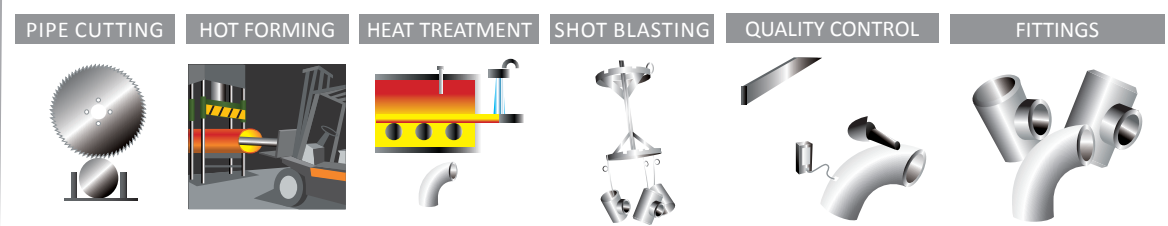
Cutting + Packing = Cold finished tubes



<p><b>Tubacex Tubos Inoxidables</b>  <b>Amurrio. SPAIN</b>  <b>COLD FINISHING PLANT</b></p> <ul style="list-style-type: none"> <li>• 19 – 193 mm O</li> <li>• Pilger cold rolling mills</li> <li>• Heat treatment furnaces</li> <li>• N.D. testing (eddy current, ultrasonic, hydrostatic)</li> <li>• Finishing lines</li> </ul>	<p><b>Schoeller Bleckmann Edelstahlrohr</b>  <b>Ternitz. AUSTRIA</b>  <b>COLD FINISHING PLANT</b></p> <ul style="list-style-type: none"> <li>• 6 – 250 mm OD</li> <li>• Pilger cold rolling mills</li> <li>• Drawing benches</li> <li>• Heat treatment furnaces</li> <li>• N.D. testing</li> <li>• Finishing lines</li> </ul>	<p><b>Salem Tube Greenville.</b>  <b>PA. USA</b>  <b>COLD FINISHING PLANT</b></p> <ul style="list-style-type: none"> <li>• 3-57 mm OD</li> <li>• Drawing benches</li> <li>• Heat treatment furnaces</li> <li>• N.D. testing (eddy current, ultrasonic, hydrostatic)</li> </ul>
<p><b>OCTG FINISHING LINE</b></p> <ul style="list-style-type: none"> <li>• Pilger cold Rolling Mills</li> <li>• Fully automated finishing line for big outside diameter tubes.</li> <li>• Specific N.D. testing (ultrasonic, hydrostatic)</li> </ul>	<p><b>SPECIAL TUBE PLANT</b></p> <ul style="list-style-type: none"> <li>• 4 Pilger mills LC 50 with integrated cleaning</li> <li>• Bright annealing furnace (1t/h). Straightener</li> <li>• Finishing line + US/Eddy Current/PMI</li> <li>• Welding units + X-ray radiosopes + coilers</li> <li>• Hydropressure testing device</li> </ul>	<p><b>TUBACEX PRAKASH</b></p> <ul style="list-style-type: none"> <li>• 6 - 273,1 mm OD</li> <li>• Piercing</li> <li>• Pilgering</li> <li>• Drawing Benches</li> <li>• U-bending</li> </ul>

## FITTINGS HOT & COLD FORMING

Pipes Cutting + Heating + Hot Forming + Heat Treatment + Extra Lengths cuttings + Bevelling + Shot blasting fitting + Pickling + Quality Control & testing + Fittings = Fittings Hot & Cold Forming



**IBF Fittings**

- Vertical presses
- Heat treatment
- Cold finishing equipment through CFF

**TTA**

- 5 Hydraulic draw presses
- 9 Vertical hydraulic presses
- 3 Heat Treatment furnaces
- Finishing equipment

General description of the process. Additional specialized equipment not included in the graphic above.



The Tubacex Group's Vision remarks the aspiration of becoming a global supplier, benchmark in the development of innovative tubular solutions in advanced materials. Creativity and Innovation, along with customer satisfaction, are the values behind this vision.

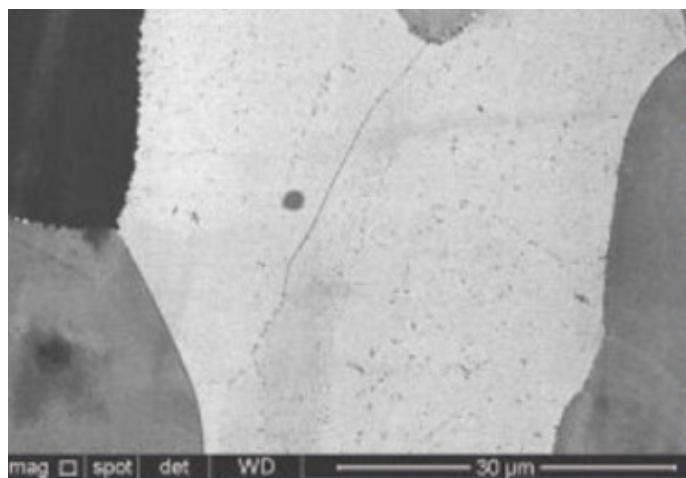
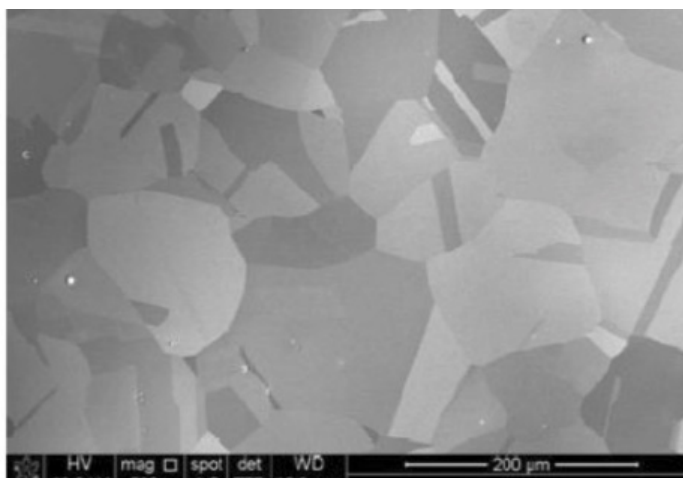


The Tubacex Group has made a significant effort in innovation in recent years, which is constantly being reflected in results and in the sales figure.

The Group has a corporate innovation unit called Tubacex Innovación, with human and technical resources devoted exclusively to Innovation activities, consisting of product R&D projects and development projects for the different industrial plans of the Group's companies, in which technological development is required.

## Tubacex Innovation

- Steel Portfolio Management
- R&D Projects Management
- New Products Development
- Known grades. Performance Improvement. New requirements
- Participation in Industrialization Projects
- Participation in Continuous Improvement Projects
- Investigation and analysis of Metallurgical claims
- Heat treatments design
- Group Laboratories Standarization
- Technical support to Sales and Engineering
- Customers Assistance



Important approvals with potential customers have also been obtained, which will enable sales of high value-added products to increase in the future. Since 2008, and more notably in the past two years, we have entered all of the strategic sectors that were defined as targets, namely: OCTG, umbilical offshore tubes, ultra supercritical boilers and recently, fertilizers. This has been possible thanks not only to R&D activities, but also to significant investment in recent years, in excess of €150M, and the improved processes in all of the Group's plants.

A milestone in 2014 was the opening of a new laboratory specifically devoted to R&D, which is located in the Zamudio Scientific and Technology Park (Bizkaia). This new laboratory will accelerate the development of the R&D unit, in skills such as metallurgical and metallographic knowledge, which is key for the development of new materials and processes. The creation of the new laboratory will act as a base for the future growth of the R&D capacities of the Tubacex Group, enabling closer collaboration with customers in the development of new solutions for the energy sector.

Service is the other main driver of the Tubacex Group's vision. This means excellent service in the existing portfolio, along with the development of new value added services that can complement and enrich the Tubacex Group's product portfolio.

# Service

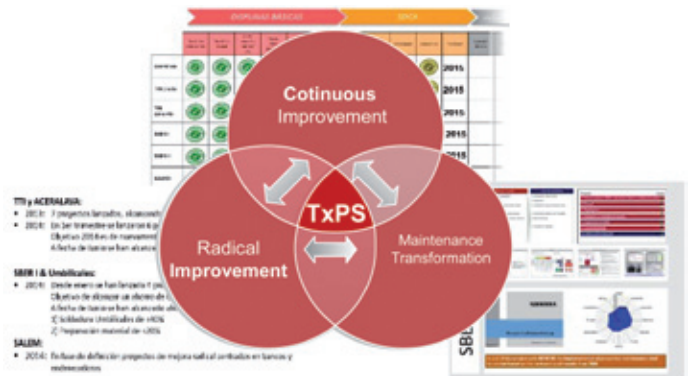


## Excellent service in the existing portfolio - Tubacex Production System

TxPS, the acronym of Tubacex Production System, is the standard Management System for the entire Tubacex Group focused on:

- Implementing a continuous improvement system in all areas
- Involving all personnel from all areas
- Ensuring that the improvements are sustained over time

TxPS is based on action on three levels: yearly management plan, daily management and specific action for radical improvement.



## New Services to develop and complete our offer - Tubacex Services

To further increase our service capabilities we are developing final added value operations for small niches:

- Final treatments
- Special packages
- Others

The Group has developed a new unit called Tubacex Services, with resources devoted exclusively to the development of those added value operations to the Group's portfolio. This unit is already developing specialized process as Shot peening in a new mill in Santander (north of Spain).



## Global Service Center Network - Tubacex Service Solutions

In addition, the group network of service centers in Europe, America and Asia offers availability and proximity service to our customers through companies such as Cotubes, Tubos Mecánicos, MIS and Tubacex America.





# Quality and Approvals

The Tubacex Group holds several approvals as a manufacturer of seamless tube and pipe, and can deliver tubular products in accordance with most international standards.

## MANUFACTURING STANDARDS

Apart from standards mentioned in the catalogue we also manufacture according to UNE, BS, SIS, GOST, JIS and other international standards and steel grades.

## MANAGEMENT SYSTEM CERTIFICATES

ISO 9001.

API Q1.

## ENVIRONMENTAL RESPONSABILITY

The Tubacex Group is highly engaged with the environment and it is ISO 14001 certified.

## SAFETY

Occupational Health and Safety is also a key element of our culture. The company is OHSAS 18.001 certified.

## APPROVALS

Tubacex is approved to manufacture according to TÜV, Lloyd's register, DNV, Germanischer Lloyd's, BV, Norsok etc. Complete list of approvals is available upon request.

## OTHER CERTIFICATIONS

Tüv Süddeutschland (Ad - Merkblatt Wo / Trd 100)

Lloyd's Register of Shipping (rules for the manufacture, testing and certification of materials)

Qualification as Manufacturer of Special Materials to Norsok M-650

ASME Quality System Certificate as Material Organization for Ferrous and Nonferrous Material

Tüv Süddeutschland (Pressure Equipment Directive 97/23Ec)

Det Norske Veritas (Dnv's Rules for Classification Pt.2)

Germanischer Lloyd (Austenitic Stainless Steel Pipes and Tubes According to En 10216-5 or Equivalent Standards)

PED 97/23/EC.

AD2000, werkblatt W0.

JIS Mark scheme

Complete list of approvals and certifications is available on request.



## MANAGEMENT SYSTEM CERTIFICATES

UNE - EN - ISO 9001:2000  
ER-0006/1991



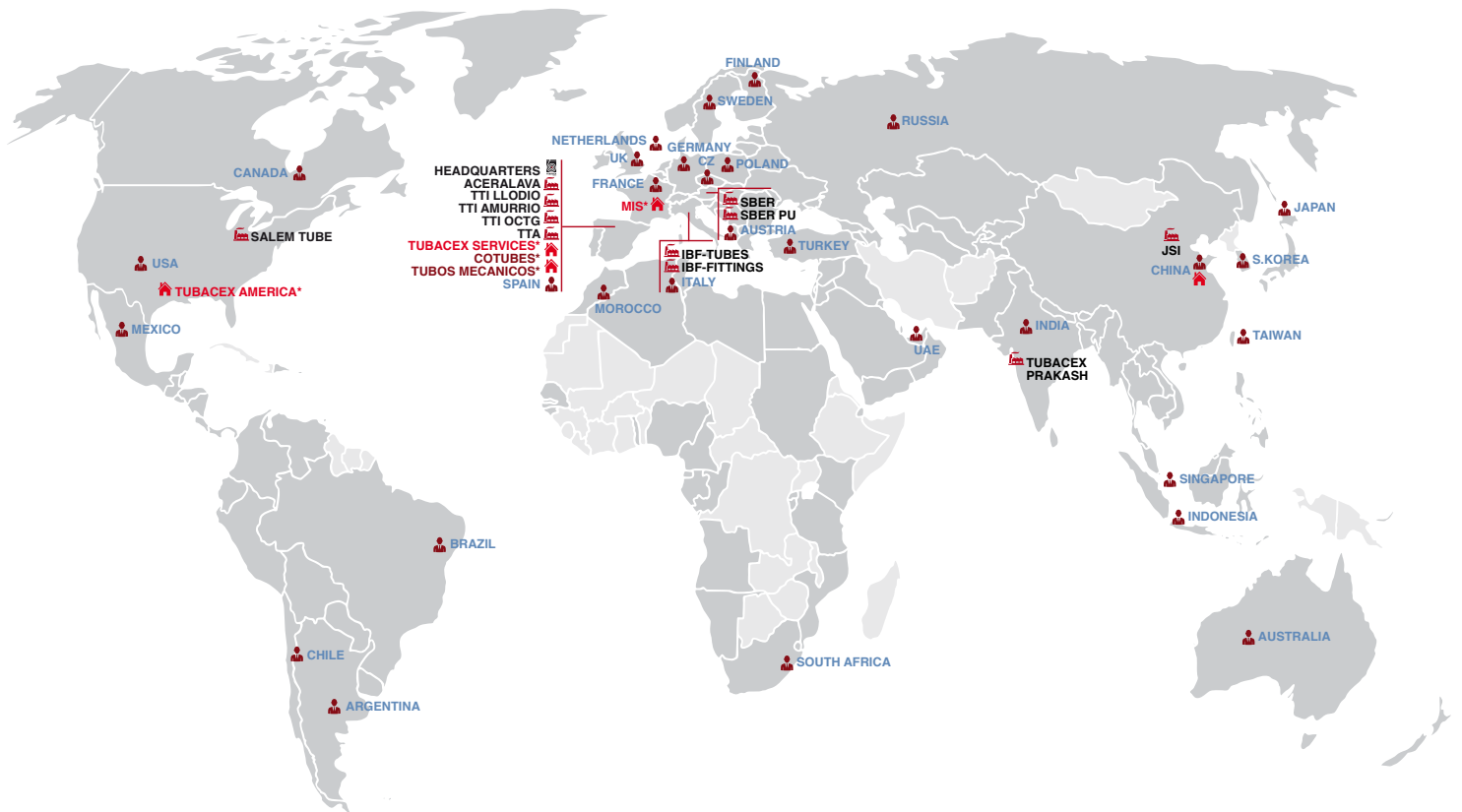
OHSAS 18001:1999



UNE - EN - ISO  
14001:1996  
GA-2001/0127







MANUFACTURING    SERVICE CENTER    SALES REPRESENTATION

\*TUBACEX SERVICES SOLUTIONS

Currently the Tubacex Group is exporting into more than 100 countries worldwide from its manufacturing sites and warehouses. The company has 15 commercial offices and a wide network of agents in several countries that lead to a global presence.

## MANUFACTURING COMPANIES

**Acería de Álava, S.A.**  
STEEL MELTING SHOP  
Amurrio. SPAIN

**Tubacex Tubos Inoxidables, S.A.**  
HOT EXTRUSION PLANT  
Llodio. SPAIN  
  
COLD FINISHING PLANT  
OCTG FINISHING PLANT  
Amurrio. SPAIN

**Schoeller Bleckmann Edelmetallrohr, GmbH**  
COLD FINISHING PLANT  
HOT EXTRUSION PLANT  
SPECIAL TUBE PLANT  
Ternitz. AUSTRIA

**Salem Tube, Inc.**  
COLD FINISHING PLANT  
Greenville. PA. USA

**IBF, S.p.a.**  
TUBES DIVISION  
Vituone - Milano ITALY  
FITTINGS DIVISION  
San Nicolò - Piacenza ITALY  
JSI CO. LTD.  
FITTINGS AND SPECIAL  
COMPONENTS FOR NUCLEAR  
Jilin City - China

**TUBACEX PRAKASH**  
COLD FINISHING PLANT  
Umbergaon - Gujarat. INDIA

**Tubacex Taylor Accesorios, S.A.**  
BUTT WELDING FITTINGS  
Arzeniega. SPAIN

**Tubacex Services, S.L.**  
TUBE FINISHING SERVICES  
Santander. SPAIN

## SERVICE & DISTRIBUTION COMPANIES

**Comercial de Tubos y Accesorios, S.A.**  
STAINLESS STEEL LONG PRODUCTS  
DISTRIBUTION  
Amurrio. SPAIN

**Metaux Inox Services, S.A.S.**  
STAINLESS STEEL LONG PRODUCTS  
DISTRIBUTION  
Sotolas & Bonce. FRANCE

**Tubacex America, Inc.**  
STAINLESS STEEL LONG PRODUCTS  
DISTRIBUTION  
Houston. UNITED STATES

**Tubos Mecánicos, S.A.**  
CARBON & ALLOYED MECHANICAL  
TUBING DISTRIBUTION  
Barcelona. SPAIN





**HEAD OFFICE:  
TUBACEX GROUP.**

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e-mail: frederic.bouvier@sbtfr.fr

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e-mail: paul.knobling@sber.de

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e-mail: jbilbao@cotubes.es

**ITALY:**

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Fax: + (43) 2630 369 47  
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