

IBF

TUBACEX
GROUP



IBF PIPES
SETTING THE STANDARD FOR LARGE DIAMETER
SEAMLESS STAINLESS STEEL & HIGH NICKEL ALLOY PIPES





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IBF
TUBACE
SPLS PIPE 102R4102 N
POS N 122 HEAT 11580
P.O. 770002465
TEST THOMPSON C-1.10
NO. 411019007



1. INTRODUCTION: THE TUBACEX GROUP & IBF

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1. INTRODUCTION

The Tubacex Group: A Global Leader in Seamless Stainless Steel and High Nickel Alloy Fittings and Special Components



The Tubacex Group has become one of the world's leading Seamless Stainless Steel and Nickel Alloy tubular solutions providers.







Founded in 1963, Tubacex brings the experience of a world leader combined with important R&D effort, which is required to meet the future industrial needs.

The Tubacex Group, which exports to over 100 countries worldwide, has a share of around 15% of the world market for

Seamless Stainless Steel tubular solutions, with a total workforce of around 2,400 employees. The headquarters are in Llodio, 25 Km (15 miles) from the Port 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 an extensive network of service centers which provide a wide range of added value operations to the Group's portfolio.

TUBACEX: A GLOBAL INTEGRATED GROUP AT YOUR SERVICE

SOLUTIONS									
	Stainless Steel and High Nickel alloy bars and billets	Seamless Pipe and Tubes up to 8" (extrusion, piercing, cold finishing)			Seamless Pipe up to 72"	Fittings and special connections from 1/2" to 72"	Stock, Service and Trading Value-added operations		
	ACERALAVA TUBACEX GROUP	TTI TUBACEX GROUP	SCHOELLER BLECKMANN TUBACEX GROUP	SALEM TUBE TUBACEX GROUP	TUBACEX INDIA TUBACEX GROUP	IBF TUBACEX GROUP	TTA TUBACEX GROUP	AWAJI STAINLESS TUBACEX GROUP	TSS TUBACEX GROUP

These manufacturing units are part of a fully integrated value chain:

The Group's steel plant, Acerálava, in Spain, provides a customized list of steels and is able to offer exceptions to the standard. Tubacex's metallurgical engineers are devoted to the development of sophisticated steels capable of operating in the demanding environments of the future.

The Seamless Pipes&Tubes Manufacturing Division constitutes the leading worldwide producer of Seamless Stainless Steel tubes

& pipes and supplies hollow bars to the Group's fitting producers.

Fittings and special components are manufactured in IBF (Italy), Tubacex Taylor Accesorios (Spain) and Tubacex Awaji (Thailand).

A worldwide Service Center Network (Tubacex Service Solutions) offers highly competitive distribution and a wide range of additional services to our customers.

Tubacex brings the experience of a world leader in the manufacture of Stainless Steel Tubular Solutions.

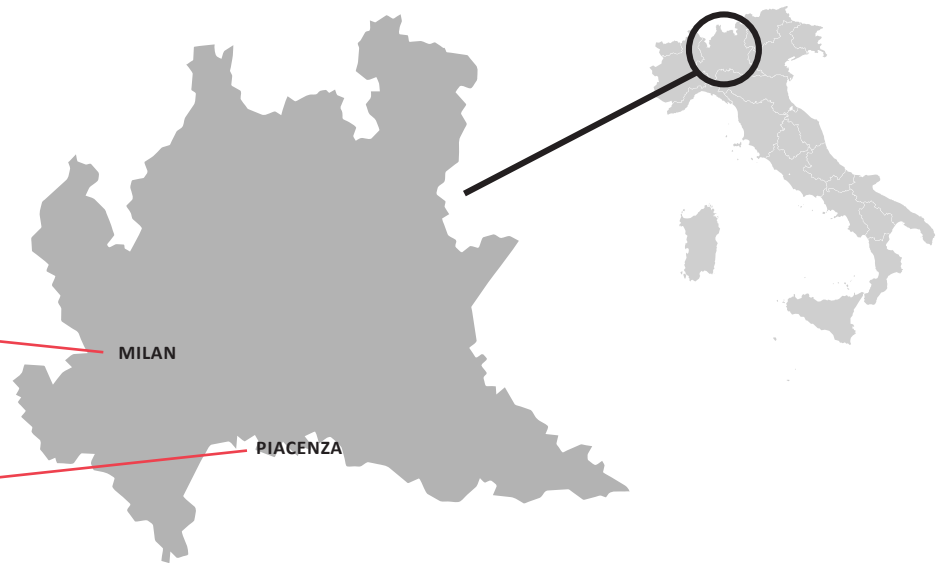
IBF: A specialized producer of value added tubular products

IBF

TUBACEX
GROUP

PIPES DIVISION
• Vittuone (MI)
• 2 workshops

FITTINGS DIVISION
• San Nicolò (PC)
• 3 workshops



Located in Vittuone (Milano) Italy, IBF pipes division manufactures thin & heavy wall seamless pipes from 2" to 72" for a wide range of sectors and applications Oil & Gas, Chemical & Petro-Chemical, Power Generation, Nuclear, Fertilizers, Desalination, Aerospace & Defense. Our Customer base covers six continents and includes many industry leaders and other world class companies, relying on IBF and Tubacex

Group comprehensive approach to quality and service to meet their demands.

Through its well known processes and know how and new equipment IBF Pipes Division is able to cover the widest wall thickness range in big outside diameters (from 6" to 72") in the stainless & high nickel alloys tubular industry:

FORGED HEAVY WALL PIPES



COLD FORMED THIN WALL PIPES



MANUFACTURING RANGE

TECHNOLOGY	OUTSIDE DIAMETER
Forged Heavy wall pipes	From 2" to 72"
Cold formed thin wall pipes	From 6" to 24"





2. IBF PIPES DIVISION

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2.1 HEAVY WALL PIPES

PROCESS

IBF pipe mill entered into production in 1996. IBF factory has a covered area of 18.000 m2 and is fully furnished with all the equipment and machinery for the production of the highest quality **heavy wall seamless pipes** in all grades of Alloy, Stainless, Duplex, Super Duplex, Super Austenitic and High Nickel Alloy Steels.

IBF **traditional production process** starts with a full round forged bar, which is turned and bored using special equipment allowing the recovery of the core. IBF is fully equipped with state of the art treatment furnaces specifically designed for the heat treatment of double random length pipes for which particular emphasis is placed upon the temperature control systems, the reduction of times of movement and immersion and the efficiency of cooling in water.

Quality inspections and controls and all the required laboratory tests are always performed starting from incoming raw materials and during the manufacturing process.



RANGE

Pipes manufactured by IBF go from 2" up to 72" in any wall thickness: from 2" up to 72" in any wall thickness:

MANUFACTURING RANGE	
PIPES	OUTSIDE DIAMETER
Forged Heavy Wall pipes	2"-72" seamless
Standard and special geometries are available	
2"-72" seamless	
Lengths up to 20 meter	
Controlled ID and tight tolerances	
Flexibility in terms of minimum lot requirement	



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	Nickel Alloy (N06625, N06600, N06617...); Nickel Alloy (N08825, N0800H)
Titanium alloys	

* Also exotic steel grades are available.



2.2 COLD FORMED

THIN WALL PIPES

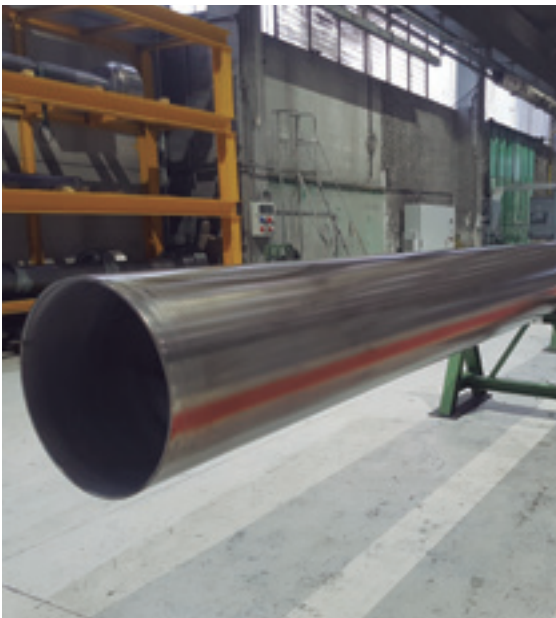
BOTSP PROCESS

Few years ago, IBF has perceived that its customers were starting to request **long seamless pipes** with very **thin walls** and very **tight tolerances** and decided to invest in a new **cold rolling technology** to complement its existing traditional manufacturing cycle.

Today IBF is a strong market leader in the Energy sector able to set new standards for large diameter high nickel alloys, Duplex and SuperDuplex seamless pipes for sophisticated projects and demanding applications.

Leveraging on its innovative **BOTSP process** for the production of “**Big OD Thin Wall Seamless Pipes**”, IBF pipes can manufacture in cold-worked condition light high strength pipes. IBF’s cold forming technology consists in an advanced CNC controlled machine, developed for the production of seamless tubular components with excellent dimensional tolerances. Long thin walled pipes up to 14,5 m (46’) and 650mm (24”) can be produced with close tolerances and high straightness, starting from short thick-walled preforms.

Stainless steel, Duplex, Inconel and other difficult to form materials can be formed using different tooling configuration. IBF uses the most advanced cold rolling technology through which it can produce seamless straight with thin wall thickness pipes, with the best tolerances and material properties. Thin walls can be manufactured regardless of the diameters, for the production of large length to diameter ratios. IBF can make long pipes, as consequence, less welding will be needed during installation with obvious savings and less risks.



PREFORM
PREPARATION



MACHINE
SETUP



COLD
ROLLING



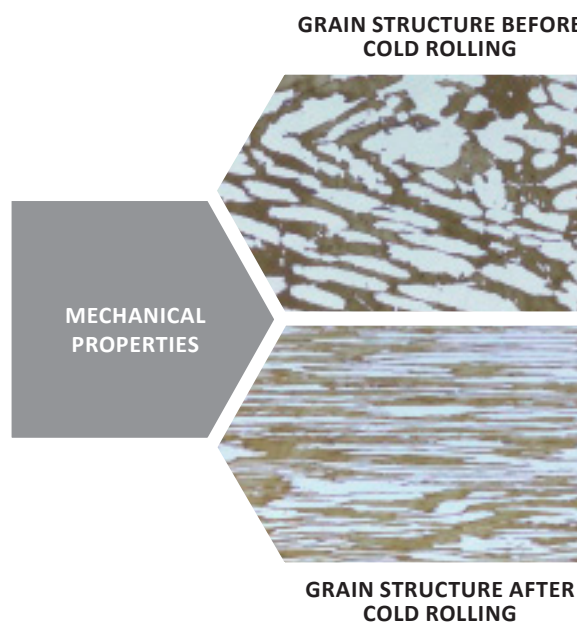
HEAT
TREATMENTS



QUALITY
CONTROL

ADVANTAGES VS. OTHER PROCESSES

- Cold Rolling permanently deforms the metal by plastic deformation below the material recrystallization temperature. The metal undergoes a homogeneous grain refinement and orientation, resulting in better overall mechanical properties such as tensile/yield strength and hardness, that can be further tailored by targeted heat treatments.
- Long seamless pipes up to 14,5 m. As consequence, less welding/connections will be needed during installation with obvious savings and less risks.
- Longer than 14,5 meter can be manufacture on request.
- Excellent dimensional tolerances: (OD +/- 0,8mm ; ID +/- 0,2mm; ID/OD roughness < 1µm).
- Deformation up to the ductility limit of the material and then subsequently annealed or stress relieved to lower strength.
- Finer-grain structure for enhanced corrosion resistance
- Better overall mechanical properties such as tensile/yield strength and hardness, that can be further tailored by targeted heat treatments.



COLD ROLLING-MANUFACTURING RANGE

NPS	OD (mm)	WALL THICKNESS (mm)													
		SCH 10s	SCH 10	SCH 20	SCH 30	STD	XS	SCH 40	SCH 60	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
6"	168,3	3,4				7,1	11,0	7,1		11,0		14,3		18,3	21,9
8"	219,1	3,8	6,4	6,4	7,0	8,2	12,7	8,2	10,3	12,7	15,1	18,3	20,6	23,0	22,2
10"	273,1	4,2	4,2	6,4	7,8	9,3	12,7	9,3	12,7	15,1	18,2	21,4	25,4	28,6	
12"	323,9	4,6	4,6	6,4	8,4	9,5	12,7	10,3	14,3	17,5	21,4	25,4	28,6		
14"	355,6	4,8	6,4	7,9	9,5	9,5	12,7	11,1	15,1	19,1	23,8	27,8			
16"	406,4	4,8	6,4	7,9	9,5	9,5	12,7	12,7	16,7	21,4	26,2				
18"	457,2	4,8	6,4	7,9	11,1	9,5	12,7	14,3	19,1	23,8	29,4				
20"	508,0	5,5	6,4	9,5	12,7	9,5	12,7	15,1	20,6	26,2					
22"	558,8	5,5	6,4	9,5	12,7	9,5	12,7		22,2	28,6					
24"	609,6	6,4	6,4	9,5	14,3	9,5	12,7	17,5	24,6						





3. USERS & APPLICATIONS

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3. USERS &

APPLICATIONS

Range of applications

Our Customers are the main driver of IBF and 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&GAS: EXPLORATION AND PRODUCTION

- Oil Country Tubular Goods (OCTG): Plain end OCTG tubes for tubing and casing, as well as of coupling stock mother tubes and mechanical tubing for accessories. These are in corrosion resistant alloys (CRA), from duplex stainless steels (DSS) up to sophisticated nickel alloys, with high mechanical properties suitable for the use in corrosive environments and demanding conditions (aggressive H₂S/CO₂ environments, HP/HT, sour wells,...)
- Wide range of seamless stainless and high nickel alloys for subsea applications (risers, flowlines, manifolds).
- Tubes for platforms (piping systems, separation...).



REFINING, PETROCHEMICAL AND CHEMICAL

- Extensive range of products and services for topsides of offshore oil platforms (including processing, storage and living platforms), for natural gas pipelines/O&G gathering systems and for the developments of liquefied natural gas processing and transport (LNG Trains, FLNG, regasification plants).



POWER GENERATION - FOSSIL FUEL THERMAL PLANTS

- IBF supplies all the main grades demanded by manufacturers for the construction of supercritical or ultra-supercritical thermal power plants including **Carbon alloys, stainless steel and ni-based materials**.
- In addition, Tubacex Group is developing new solutions with its customers for the next generation of advanced supercritical thermal power plants, which will operate at even higher pressures and temperatures (350 bars and 700°C respectively).
- IBF is capable to offer ID controlled and OD Pipes and fittings for a wide range of applications within a power plants: Main steam, hot reheat and feed water systems, Boiler headers and piping, Forgings and fittings.



POWER GENERATION - NUCLEAR

- As of today, IBF has accumulated an extensive experience working with all the existent nuclear plant designers in the world like Areva, Westinghouse, Rosatom, Candu, Kopec, CNNC, CGN.
- IBF supplies Pipes, fittings and special components for a wide range of applications within a nuclear power plant: Reactor Coolant Loop (RCL) such as Hot Legs, Cold legs, Cross overs, Surge lines, Outlet Nozzle Forgings, Flued head Penetrators, Specially Machined Components, Main Steam & Feedwater piping system, High pressure steam & water lines.



FERTILIZER PRODUCTION

- IBF can produce all the range of materials in the Urea (especially those used in the HP synthesis section), such as 316L UG (1.4335), 25.22.2 (1.4466) or S32906 (Uremium29) as well as grades used in the ammonia, nitric acid, sulfuric acid, phosphoric acid or melamine industry.
- IBF production range, together with the rest of Tubacex facilities' extensive manufacturing program, makes the Tubacex Group capable of offering the widest range of sizes worldwide. Tubacex IBF can produce piping systems in accordance with all main licensors' specifications in the Urea Industry.

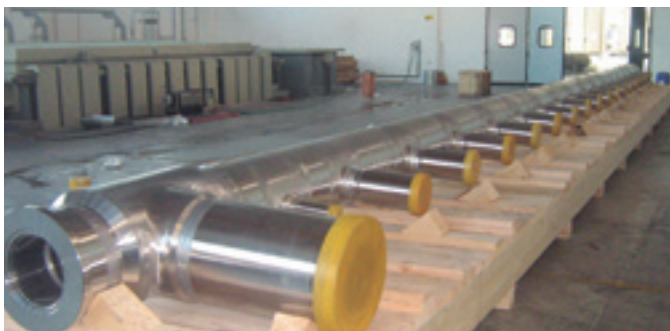
Special Components



Hang off Flange



56 inches cladded manifold



Duplex seamless Subsea



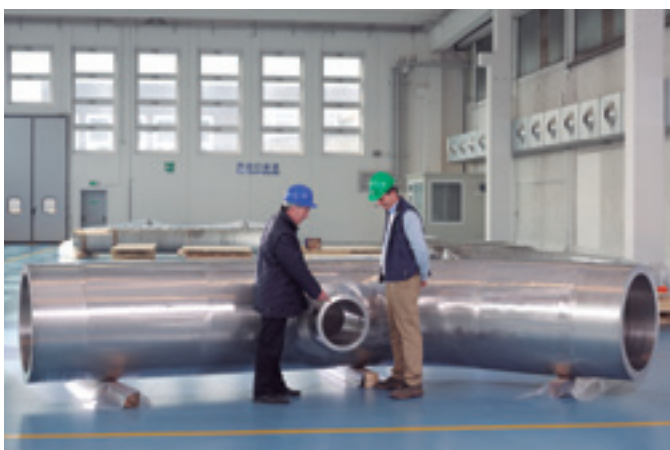
Forged riser stress joint (with conector)



Power Generation (fossil fuel): P91/P92 Big OD pipes



Special hot formed elbow for power gen application

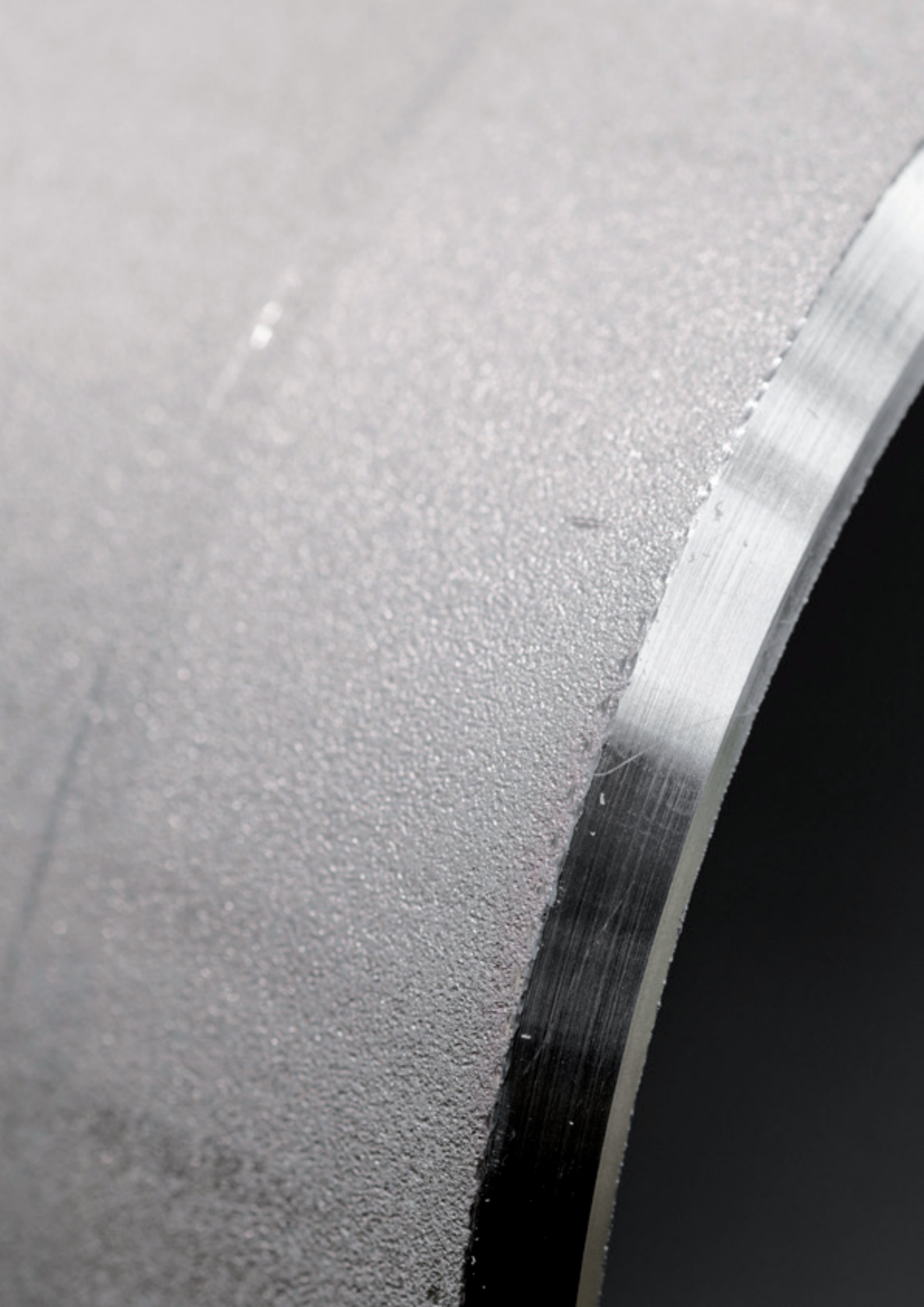


Special component for nuclear application



Engineered special Y piece

In addition: Water Injection riser manifolds, Flued head Penetrators and several special pieces, including associated testing and special packing for airfreight transportation.





4. WHY IBF



4. WHY IBF

Experience, quality & service

IBF is part of Tubacex Group which is the largest worldwide producer of seamless tubes in stainless steel and high-nickel alloys, and one of the few companies to have an integrated production: steel manufacturing, hot extrusion and cold-rolling facilities.

IBF can leverage on Tubacex strong engineering and R&D capabilities.

- IBF's products are made by means of very high technology equipped plants. Pipes Division manufactures thin & heavy wall seamless pipes, Fittings Division manufactures a complete dimensional range of fittings welded or seamless. IBF is able to supply pipes and fittings in carbon alloys, ferritic, austenitic and nickel based grades from ¼" – 72".
- The synergy between the two divisions allows the production of special tailor-made components. Using specially designed equipment and tools IBF can guarantee the highest level of manufacturing feasibility.
- Cooperation with the best suppliers, continuous investments in tools and constant research of new processes and materials, allows IBF in looking to the future with the aim of achieving continuous improvement.
- As a matter of fact, IBF constantly seeks the excellence of its own products through TUBACEX Group own production system, TxPS.



MATERIAL EXPERIENCE

- Austenitic Stainless Steel
ASTM A312/376 – 300 Series.
- Duplex Stainless Steel
ASTM A790 – 2205, 2507.
- Ferritic Alloys
ASTM A335 – P9, P11 P22, P91, P92.
- Nickel Alloys – Series
200, 400, 600, 617, 625, 700, 718, 800,
825, 945, 945X, A028, G3, 20, 22, C276,
2550.
- Zirconium, Titanium, Aluminum.

MANUFACTURING CAPABILITIES

- Mechanical testing laboratory in house.
- Pickling and passivation area.
- Sandblasting machine.
- OD grinding machines.
- ID lapping machines.
- Straightening and calibrating machine.
- Milling machine for special and big pieces.
- Heavy wall Big OD pipes manufacturing machines.
- Precision Cold Rolling pipes.
- Bevelling machines.
- Hydro Testing.
- Heat Treating furnaces 15mtr. Long.
- Expanding/Sizing.
- Automatic UT, PT.
- MIG/TIG Welding.
- Cladding machine



LABORATORY

IBF laboratory performs, in accordance with the applicable Standards/Codes and client's specifications requirements, the following product analysis and testing:

- Chemical analysis.
- Mechanical testing.
- Tensile (hot and room temperature).
- Impact (until minus 196 degree Celsius).
- Hardness (Rockwell, Vickers, Brinell).
- Metallographic tests (Grain size evaluation, etc.).
- Corrosion tests.



QUALITY/ APPROVALS

IBF goals are to provide customers with the highest quality products level, assuring that our employees work without any health and safety risks and our manufacturing activities have any environmental impact. The results of this commitment are the Quality Management Systems Certifications in compliance with main Standards/Codes and other important approvals from main customers.



Standards / Codes Certification

The main goals of the Tubacex Group are to provide customers with the highest quality product, ensuring that all employees work in conditions that are free of health and safety risks and the manufacturing activities do not have an impact on the environment. The result of this commitment is the Certification of the Quality Management Systems in compliance with the leading Standards/Codes and other important approvals by leading customers.

The Tubacex Group manufactures products in accordance with the main international Standards/Codes (e.g.: ISO, ASME, ASTM, NACE, EN, DIN, API, BS, SIS, GOST, JIS, PED, etc.) and customer requirements (e.g.: SHELL MESC, etc), and all its Quality Management Systems are approved by leading external bodies (e.g.: ASME, Lloyd's Register, TÜV, DNV, BV, etc.).

QUALITY MANAGEMENT SYSTEM CERTIFICATES

AREA	STANDARDS & CODES	EXTERNAL BODIES
Quality	ISO 9001	LLOYD'S REGISTER AENOR UDT
	ISO 3834-2	BUREAU VERITAS
	PED 2014/68/EU	TUV NORD / SUD
	AD 2000 MERKBLATT-W0 / TRD 100	TUV NORD / SUD
	ASME III NCA-4000 (NPT Certificate)	ASME
	ASME III NCA-3800 (QSC Certificate)	ASME
Health & Safety	APIQ1	
	OHSAS 18001	ONDOAN / ICIM
Environment	ISO 14001	AENOR / ICIM

OTHER APPROVED MANUFACTURER CERTIFICATIONS

- Norsok M-650
- API Spec. Q1 and API 5-CRA
- KTA 1401 and AVS D 100 / 50
- Achilles Qualif. Certificate
- JIS Mark scheme
- Lloyd's Register of Shipping (rules for the manufacture, testing and certification of materials) DNV Rules for Classification Part 2
- Austenitic Stainless Steel Pipes and Tubes According to En 10216-5 or Equivalent Standards

Complete list of approvals and certifications is available on request.



5. TUBACEX AROUND

THE WORLD



IBF PIPES DIVISION

Located in Vittuone (Milano) Italy, IBF pipes division manufactures thin & heavy wall seamless pipes from 2" to 72" for a wide range of sectors and applications Oil & Gas, Chemical & Petro-Chemical, Power Generation, Nuclear, Fertilizers, Desalination, Aerospace & Defense. Our customer base covers six continents and includes many of the respective industry leaders and other world class companies, relying on IBF and Tubacex Group comprehensive approach to quality and service to meet their demands.

Currently the Tubacex Group exports to over 100 countries worldwide from its manufacturing sites and warehouses. The company has 15 sales offices and an extensive network of agents in diverse countries, giving it a global presence.

MANUFACTURING COMPANIES

IBF, S.p.a.
PIPES DIVISION
Vittuone - Milano. ITALY

IBF, S.p.a.
BUTT WELDING FITTINGS
SPECIAL COMPONENTS
San Nicolò - Piacenza. ITALY

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

Tubacex Taylor Accesorios, S.A.U.
BUTT WELDING FITTINGS
Artzeniega. SPAIN

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

Tubacex Awaji
BUTT WELDING FITTINGS
Amphur Muang-Samutprakarn.
THAILAND

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

Tubacex Prakash
COLD FINISHING PLANT
Umbergaon. INDIA

SERVICE & DISTRIBUTION COMPANIES

Tubacex Service Solutions, S.A.
STAINLESS STEEL LONG PRODUCTS
DISTRIBUTION
Amurrio. SPAIN

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

**Metaux Inox Services, S.A.S. /
TSS France**
STAINLESS STEEL LONG PRODUCTS
DISTRIBUTION
Satolas & Bonce. FRANCE

TSS Brasil
STAINLESS STEEL LONG PRODUCTS
DISTRIBUTION
Sao Paulo. BRAZIL

TSS Central Europe
STAINLESS STEEL LONG PRODUCTS
DISTRIBUTION
Ternitz. AUSTRIA

TSS India
STAINLESS STEEL LONG PRODUCTS
DISTRIBUTION
Gandhidham. INDIA

TSS Middle East
STAINLESS STEEL LONG PRODUCTS
DISTRIBUTION
Dubai. UAE

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

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



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