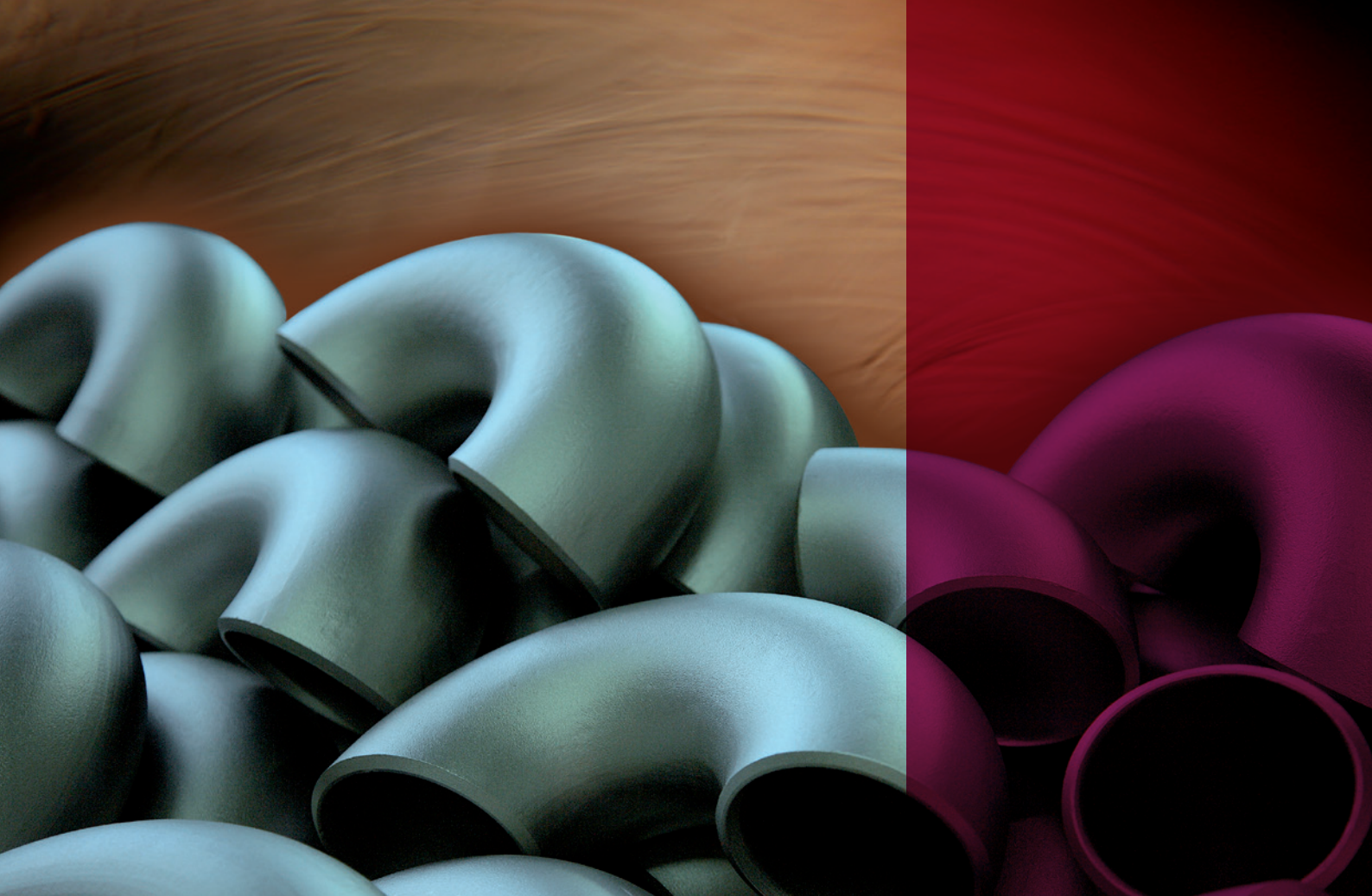


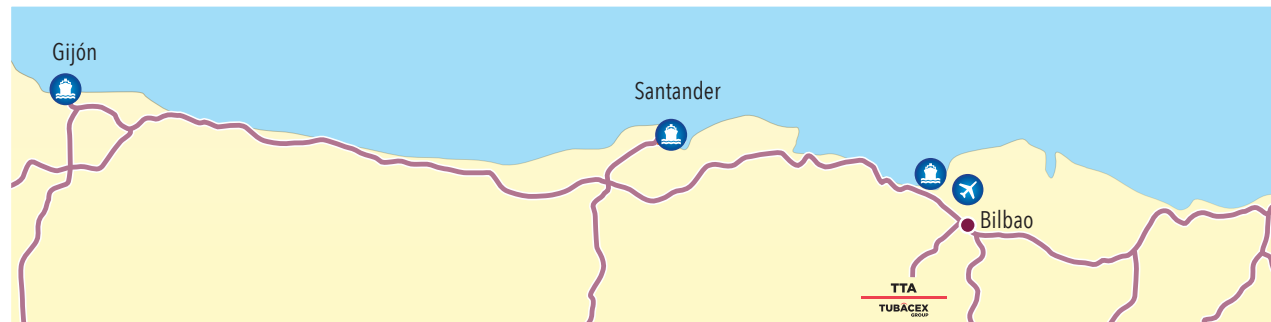


SEAMLESS CARBON, ALLOY AND STAINLESS STEEL

BUTT WELDING FITTINGS

TTA

TUBACEX
GROUP



THE COMPANY

Tubacex Taylor Accesorios, is an independent private company which was founded in 1972 as a Joint Venture between Taylor Forge and the Tubacex Group. This relation finished in 1977 and, since then, T.T.A is fully integrated in the Tubacex Group. T.T.A's manufacturing capabilities in addition to the range of pipe of the Group enables our customers to achieve higher efficiency in their purchasing decisions.

Located 30 Km from the seaport of Bilbao, in the north of Spain, we provide our fittings to almost all markets around the world.

These Companies, among others, have already relied on our products and expertise: Foster Wheeler, Repsol, Total, Técnicas Reunidas, Fluor, ABB Lummus, Petrochem Development Co., KTI Corporation, BP Oil, ExxonMobil, Stone & Webster, Heurtey Petrochem, Boustead International Heaters, HCL, IKT Brazil, Linde Impianti, Kirchner Italia, Selas Linde, Technip, Shell, Tioga Pipe Supply Co., Suncor, Schmidt & Clemens, Conoco Phillips and Toyo Engineering. Through them, we have taken part in many of the most important projects for new refineries or revamps in the Petrochemical sector (our major market).



THE PRODUCT

- Butt Welding Fittings made of Carbon Steel, Alloy Steel, Stainless Steel (austenitic, austenoferritic and martensitic) and Nickel-based Alloys.
- Tube Bends: SR, LR and Special Radius.
- Concentric and Eccentric Reducers in various sizes (from 2" X 1" up to 12" X 10").
- Fittings with Special Sizes.
- We complement our production range with other type of fittings like Tees and Caps from our sister Companies (Tubacex Awaji Thailand / IBF) and other European Partners.



APPLICATIONS

- Furnaces and Reactors for Oil and Petrochemical Ind.
- Chemical Ind.; Oil & Gas Refineries.
- Generation: Boilers (Industrial and Generation types).
- Manufacturing Equipment.
- Heat Exchangers.



		DIN / EN			ASTM		APROXIMATE CHEMICAL COMPOSITION RANGE								
		NORM CODE	STEEL GRADE	STANDARD	STEEL GRADE		STANDARD	%Ni	%Cr	%Mo	%C	%Mn	%Nb	%Fe	%Others
					UNS										
SEAMLESS STAINLESS STEEL	AUSTENITICS	1.4301	X5 CrNi 18 10	DIN 17458 EN 10253-4	S 30400	WP 304	ASTM A 403	8-11	18-20	---	< 0,08	< 2,00			
		---	---	---	S 30409	WP 304 H	ASTM A 403	8-11	18-20	---	0,04-0,10	< 2,00			
		1.4306	X2CrNi 19 11	DIN 17458 EN 10253-4	S 30403	WP 304 L	ASTM A 403	8-13	18-20	---	< 0,035	< 2,00			
		1,4828	X15CrNiSi 20 12	SEW 470											
		1.4541	X6CrNiTi 18 10	DIN 17458 EN 10253-4	S 32100	WP 321	ASTM A 403	9-13	17-20	---	0,04-0,10	< 2,00			5(C + N) < Ti < 0,70
		1,4878	X12CrNiTi 18 9	SEW 470	S 32109	WP 321 H	ASTM A 403								4 (C+N) < Ti
		1.4550	X6CrNiNb 18 10	DIN 17458 EN 10253-4	S 34700 S 34709	WP 347 WP 347 H	ASTM A 403 ASTM A 403	9-13	17-20	---	0,04-0,10	< 2,00	10C- 1,00 8C-1,00		
		1.4401	X5 CrNiMo 17 12 2	DIN 17458 EN 10253-4	S 31600	WP 316	ASTM A 403	10-14	16-18 (16,5-18,5)	2,0-3,0 (2,0-2,5)		< 2,00			
		1.4404 1.4435 1.4571	X2CrNiMo 17 13 2 X2CrNiMo 18 14 3 X6CrNiMoTi 17 12 2	DIN 17458 EN 10253-4	S 31603 S 31635	WP 316 L WP316Ti	ASTM A 403 ASTM A 213	11-16 10-14	16-18 (16,5-18,5) 16-18 (17-18,5) 16-18	2,0-3,0 (2,0-2,5) 2,0-3,0 (2,5-3,0) 2,0-2,5	< 0,030	< 2,00			5 (C+N)< Ti < 0,80
		1,4941	X6CrNiTiB1810	DIN 17459 EN 10216-5		WP316Ti						< 2,00 < 2,00			
		1,4910	X3CrNiMoNB17-13-3	EN 10216-5	S 31609	WP 316 H	ASTM A 403	10-14	16-18	2,0-3,0	0,04-0,10	< 2,00			
		1.4580 1.4833 1.4845 1.4438	X6CrNiMoNb 17 12 2 X7CrNi2314 X15 CrNiSi 25 20 X2CrNiMo 18 15 4	DIN 17458 SEW 470 EN 10253-4	S 30940 S 31008 S 31703 S 31700	WP 316H Nb WP 309 WP 310 WP 317 L WP 317	ASTM A 213 ASTM A 403	10,5-13,5 12-15 19-22 11,0-14,0	16,5-18,5 22,24 24-26 18-20	2,0-2,5 3,0-4,0	< 0,08 < 0,03				
		1,4547	X1CrNiMoCuN20-18-7	EN 10253-4	S31254	"6Mo" SUPER AUSTENITIC	ASTM A403	17,5-18,5	19,5-20,5	6,0-6,5					0,50 < Cu < 1,00
				SEW 400											
		SEW 400	X1NiCrMoCuN 25 20 5	Vd TÜV 421 EN 10253-4	N 08904	WP 904 L	ASTM B 366	24-26	19-21	4,0-5,0					N: 0,04-0,15
	NICKEL ALLOYS				N 08800	WPNIC		30-35	19-23	---					Cu < 0,75 Al: 0,15-0,60 (0,15-0,45)
		1,4876	X10NiCrAlTi 32 20	SEW 470 Vd TÜV 412											Cu < 0,75
					N 08810	WPNIC 10		30-35 (30-34)	19-23	---		< 2,00			(Al + Ti)≤ 0,7 Co< 1,00 Cu < 0,75
							ASTM B 366								(Al + Ti) >0,85 (Al + Ti< 0,7)
		1.4876H	X10NiCrAlTi 32 20 H	Vd TÜV 434	N 08811	WPNIC 11		30-35 (30-34)	19-23	---		< 1,50			Co< 1,00
													8C-1,00		
		2.4660 2,4858	NiCr20CuMo NiCr 22Mo 9Nb	Vd TÜV 432/2	N 08020 N 08825	WP20CB "Alloy 20" WPNICMC		32-38 38-46	19-21 19,5-23,5	2,0-3,0 2,5-3,5	< 0,07 < 0,05	< 2,00 < 1,00		>22	Co< 1,00
	AUSTENITIC- FERRITIC	1,4410 1.4501	X2CrNiMoN25-7-4 X1CrNiMoCuWN 25 7 4	EN 10253-4 EN 10253-4	S 32750 S 32760	"Superduplex" Duplex 25Cr	ASTM A 815 ASTM A 815	6-8 6,0-8,0	24-26 24-26	3-May 3,0-4,0					Cu < 0,50 Cu: 0,50 - 1,00
				SEW 400	S 31803				21-23	2,5-3,5					N: 0,08 - 0,20
		1,4462	X2CrNiMoN 22 5 3	EN 10253-4 Vd TÜV 418	S32205	Duplex 22Cr	ASTM A 815	4,5-6,5	22-23	3,0-3,5					N: 0,14 - 0,20
		CARBON STEEL					WPB		< 0,40	< 0,40	< 0,15	< 0,30	< 1,35	< 0,02	
ALLOY STEEL		13 Cr Mo 4-4	DIN 17175		WP1 WP11		---	---	0,44-0,65 0,44-0,65	< 0,28 0,05-0,15	0,30-0,90 0,30-0,60				
	1.7335 1.7380	13 Cr Mo 4-5 10 Cr Mo 9 10	E10253-2		WP12 WP22		---	0,80-1,25 1,90-2,60	0,44-0,65 0,87-1,13	0,05-0,15	0,30-0,60				
	1.7362	X11CrMo5	Vd TÜV 007/3 E10253-2		WP5	ASTM A234	---	4,0-6,0	0,44-0,65	< 0,15	0,30-0,60				
	1.7386	X11CrMo9,1	Vd TÜV 109 E10253-2		WP9		---	8,0-10,0	0,90-1,10	< 0,15	0,30-0,60				
	1.4903	X 10 Cr Mo VNb 9-1	Vd TÜV 511/2 E10253-2		WP91		< 0,40	8,0-9,5	0,85-1,05	0,08-0,12	0,30-0,60	0,06-0,10		Vn	
	1,5415	16Mo3	E10253-2	---	---			< 0,30	0,25-0,35	0,12-0,20	0,40-0,90				





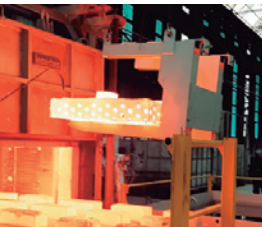
WALL THICKNESS (SHORT RADIUS AND LONG RADIUS)

n.d. (inches)	o.d. (mm)	Sch. 10	Sch. 20	Sch. 30	Std	Sch. 40	Sch. 60	XS	Sch. 80	Sch. 100	Sch. 120	Sch. 140	Sch. 160	Sch. XXS
1/2"	21,3				2,77			3,73						
3/4"	26,6	2,1			2,87			3,91						
1"	33,4	2,76			3,38			4,55					6,35	9,09
1 1/4"	42,16	2,76			3,56			4,85					6,35	9,7
1 1/2"	48,30	2,76			3,68	3,68		5,08	5,08				7,14	10,15
2"	60,30	2,76			3,91	3,91		5,54	5,54				8,71	11,07
2 1/2"	73,00	3,05			5,16	5,16		7,01	7,01				9,53	14,02
3"	88,90	3,05			5,49	5,49		7,62	7,62				11,13	15,24
3 1/2"	101,60	3,05			5,74	5,74		8,08	8,08					16,15
4"	114,30	3,05			6,02	6,02		8,56	8,56		11,13		13,49	17,12
5"	141,30	3,40			6,55	6,55		9,53	9,53		12,70		15,88	19,05
6"	168,30	3,40			7,11	7,11		10,97	10,97		14,27		18,24	21,95
8"	219,10	3,76	6,35	7,04	8,18	8,18	10,31	12,70	12,70	15,06	18,24	20,62	23,01	22,23
10"	273,00	4,19	6,35	7,80	9,27	9,27	12,70	12,70	15,09	18,24	21,41	25,40	28,58	25,40
12"	323,90	4,57	6,35	8,38	9,53	10,31	14,27	12,70	17,48	21,44	25,40	28,58	33,32	25,40
14"	355,6	6,35	7,92	9,53	9,53	11,12	15,06	12,70	19,05				35,71	
16"	406,4	6,35	7,92	9,53	9,53	12,70	16,66	12,70	21,41				40,46	

Note: our range in SR starts from 2".

THE MANUFACTURING PROCESSES

- **Hot Drawing "Hamburg" Process:** this process is suitable for both bends, in short or long radius (SR or LR as per ASME B16.9) or even for pieces with not standarized bending radius. The diameter of the starting pipe is smaller than the one of the formed elbow and the thickness quite thicker.
- **"Bending" Process:** this is a valid method when the thickness/diameter ratio is greater than 10%. The starting tube for this process has to be slightly bigger in diameter than the formed elbow.



FACILITIES FOR THE MANUFACTURING

- 5 hydraulic draw presses. (From 30tn. to 200tn.)
- 9 vertical hydraulic presses. (From 200tn. to 600tn.)
- 3 heat treatment furnaces.
- Sawing and bevelling machines.
- 2 Shot-blasting cabins.
- Pickling and Passivation automatic installation for Stainless Steel.
- Automatic painting line for rust protection coating for Carbon and Low Alloy Steel fittings.
- Equipment for measurement, testing and PMI (Positive Material Identification).
- Low Stress stamping marking machines.
- Laser marking machines.



QUALITY ASSURANCE

T.T.A. takes special care of the quality of the processes, equipment and products. Our Quality Management Manual, summarizes the general requirements of our Quality Management System, which is based on the UNE-EN-ISO 9001, ed.2015 standards. This Manual ensures that the products full comply with the specified requirements and its application is obligatory in all areas of the Company.

The yearly statement of Quality Goals and improvement proposals resulting from the Management Review, create the basis for a continuous improvement.



FACILITIES FOR INSPECTION AND TESTING:

- 2 Krautkramer DM 43 Ultrasonic Thickness Gauges.
- Roughness Meter (CV Instrumen).
- 4 Hardness Testers (Time and Centaur).
- 3 Optical Spectrographic PMI Machines (Spectro Hispania S.L.).
- Ferrite Measurement Machine (Fischer).
- 2 Optical Pyrometers (Hartman & Braun and Keller Optix).
- Destructive Tests: Integranular Corrosion Test, Resiliencie Test, Hot Yield Test, ...
- NDE: Liquid Penetrant Test, Magnetic Particle Test, Ultrasonic Test, ...
- Equipment for measurement, testing and PMI (Positive Material Identification).





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