

90/10 & 70/30 COPPER NICKEL PIPING PACKAGES



**SITINDUSTRIE MARINE S.A.S.**



FOR THE WORLDWIDE SHIPBUILDING & OFFSHORE INDUSTRIES

# SITINDUSTRIE MARINE S.A.S.

## PRODUCTS, SERVICES & SOLUTIONS

Established in 2003, SITINDUSTRIE MARINE SAS based in Marseille, France, produces and distributes copper nickel pipes, fittings and flanges for the worldwilde shipbuilding and offshore industries, recognized as the best compromise for seawater corrosion resistant line pipe material.

SITINDUSTRIE MARINE SAS offers:

- A single manufacturing source able to offer a complete range of **copper nickel pipes, fittings and flanges** produced within our different factories, in accordance with all international standards.
- A **customized service** with high flexibility, deliveries directly from production plants for large quantity requirements or from stock for fast track projects.
- A **team of specialists** at your service, with more than 30 years experience in the copper nickel industry, who will help you to define the best technical and economical solutions, and will ensure their successful implementation.
- An international network of **agents and distributors** dedicated to customer satisfaction that will provide you with a full project follow-up from budget and inquiry stage to on site deliveries and installation.



TUBE DUSSELDORF 2018 Exhibition



SMM HAMBURG 2018 Exhibition



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5 CORVETTES FOR KINGDOM OF SAUDI ARABIA  
"Photography courtesy of Navantia, Spain"



FPSO LIZA FOR SBM  
"Photography courtesy of Keppel, Singapore"



# SITINDUSTRIE MARINE S.A.S.

## QUALITY ASSURANCE

SITINDUSTRIE MARINE SAS offers piping packages of copper nickel products manufactured by factories which are ISO 9001:2000 certified and approved by the most important international certifying organizations:

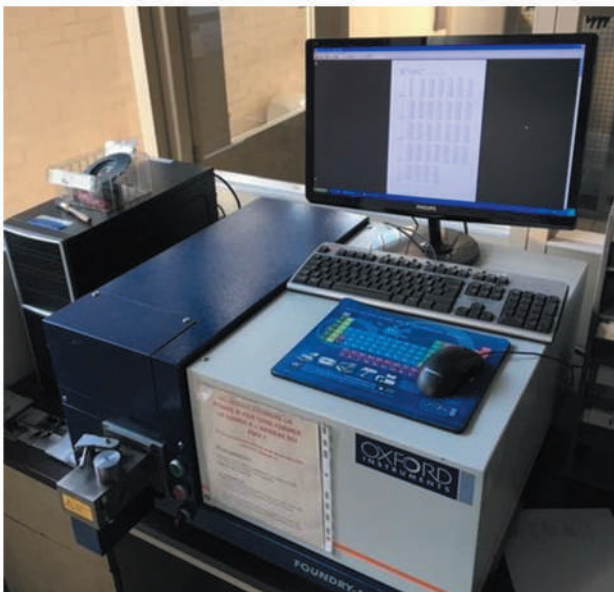
**LLOYDS REGISTER, DNV GL, ABS, TUV, BUREAU VERITAS, RMRS etc...**

SEAMLESS & WELDED PIPES	6.35 mm OD up to 1 524 mm OD according to
BUTT WELDING FITTINGS	
FORGED & MACHINED FITTINGS	EEMUA / DIN / EN / BS / ASTM / MIL / PED / ABS
FLANGES & WELDING COLLARS	
BARS & PLATES	

## VENDOR APPROVALS

SITINDUSTRIE MARINE SAS is approved by the following customers:

**TOTAL PETROBRAS SHELL ARAMCO EXXON  
CHEVRON ADGAS BOROUJE GASCO ADCO  
ZADCO ADMA OPCO TECHNIP QATAR PETROLEUM  
KOC ONGC GOA SHIPYARD etc...**



Chemical composition by spectrometer analysis



Positive Material Identification Test (PMI)



Tensile Test



# SITINDUSTRIE MARINE S.A.S.

■ ■ ■ Soissons – FRANCE



The plant based in Soissons (France) was founded in 1967 and it is worldwide known in the nuclear and oil & gas industries. It manufactures a complete range of stainless steel, Duplex, super Duplex & super alloys tubes, pipes and fittings for any large requirements, especially in the Oil & Gas market and for special applications.

Within the special alloys production range, BSL Pipes & Fittings, **produces welded copper nickel pipes up to 60 inches, as well as the relevant range of seamless & welded but weld fittings.**

On a site **130.000 m<sup>2</sup>** of which **25.000 m<sup>2</sup>** are covered, the plant is organized for large projects but also manufactures a range of out of standard size pipes & fittings for special applications.



4 | All types of Welding Process PAW,SAW,TIG, etc..



3 ROLLS CuNi pipe forming



U-BEND PRESS CuNi pipe forming



Cold forming CuNi elbows from seamless pipes

# SITINDUSTRIE MARINE S.A.S.

■ ■ ■ SOISSONS – FRANCE



2 automatic **welding lines** for diameter up to 20" equipped with heat treatment by induction annealing furnace and eddy current test of welding seam, a **1000 tons press** and a **rolling machine** ensure an annual capacity of **10.000 tons/year**.

The unit has a Quality Assurance System according to NF EN ISO 9001:2000 standard which has been approved by **Lloyd's Register**. Since December 2004, it is also certified under ISO **14001:2004** standard.

The plant is certified by TÜV, Lloyd's Register of shipping, Det NorskeVeritas, R.I.N.A., NORSOK 4, API 5LC and TOTAL and holds the Petroleum Development of Oman Agreement.



CuNi Welded Equal Tees



36" CuNi welded elbows



End preparation before welding half shell CuNi elbows

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U-BEND PRESS forming CuNi plate into pipe



# SITINDUSTRIE MARINE S.A.S.

PIEVE VERGONTE - ITALY



The plant based in Pieve Vergonte (Italy), has a leading position in Europe in the field of copper and copper alloy products for the electromechanical, galvanic and building industry. The first industrial site was established in 1909. At the end of 1992 SITINDUSTRIE entered the non ferrous metal market acquiring from ENI the factory in Pieve Vergonte. Since 2011 the plant is owned by V.C.O. Copper SpA. It occupies a site of 77.000 m<sup>2</sup> of which **27.500 m<sup>2</sup>** covered, with a total capacity of **20.000 tons** per year of copper and copper alloys round square and hexagonal sections and profiles, as well as special products such as large diameter seamless **CuNi pipes** and **CuNi bars & billets** for marine applications.

The production capability, the wide range of products (more than a thousand sections available) and the high quality standards of the range characterise the plant production. The overall strategy of the manufacturing process is further strengthened by the careful integration of techniques for processing raw materials, and by the continuous research and development, the setting and testing of new products and testing methods.

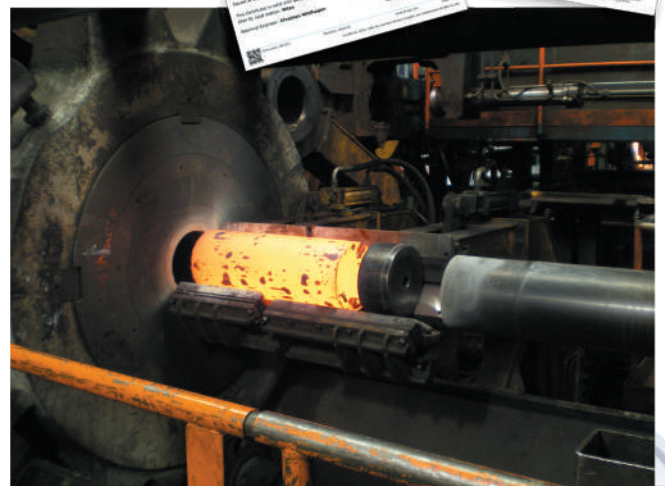
The Pieve Vergonte plant is certified ISO 9001: 2015 and approved by DNV GL.



5500 tons Hot Extrusion press



Semi continuous casting of CuNi billet

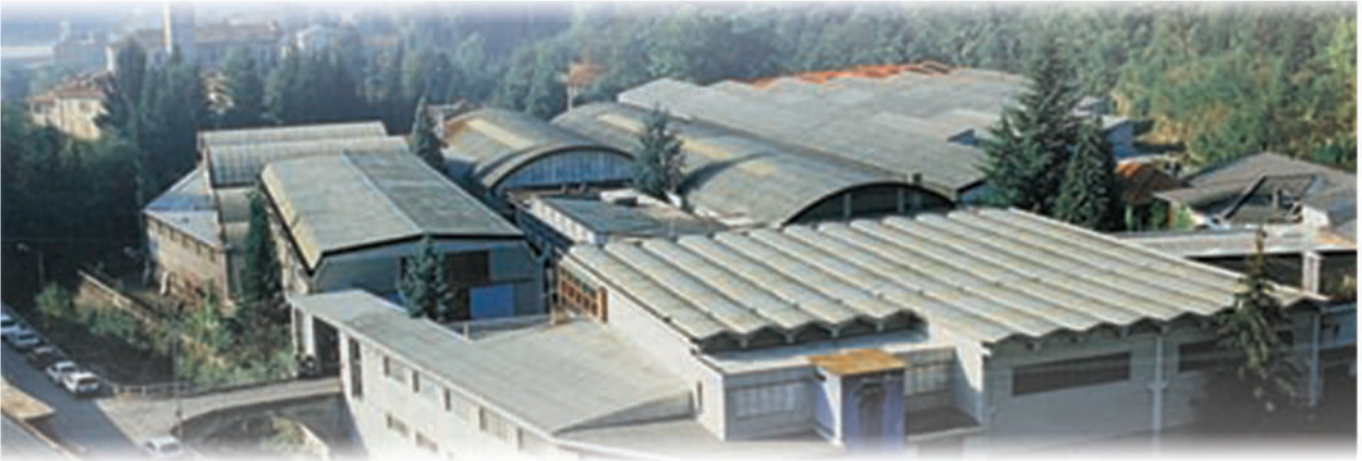


Hot Extrusion of CuNi billet into pipe



# SITINDUSTRIE MARINE S.A.S.

■ ■ ■ VALDUGGIA - ITALY



The plant located in Valduggia (Italy) is dedicated to the machining of mechanical components on a site of 1 642 m<sup>2</sup>.

It started in 1955 by manufacturing industrial valves and within few years became a reliable supplier of cast steel gate, globe and check valves, in bolted bonnet and pressure seal execution. Conduit valves and ball valves have subsequently been added to the range addressed mainly to critical application in the petrochemical, oil & gas, power generation, shipping, food and dairy industries.



Different types of CNC machines

Since 2011, the copper nickel flanges and fittings manufacturing activity has been taken over by T.F. Snc. The plant has accreditations for ISO 9001 :2015 and is approved by Lloyds Register. It is equipped with new CNC machines for the production of more than 2.000 tons/year of composite & solid **CuNi flanges with diameter up to 60" (1524 mm)**, and **forged & machined CuNi fittings with a diameter up to 4" (108 mm)**.



Hot forging of CuNi bar



Hot ring rolling of CuNi flange



CuNi hot forged & machined capillary elbows



Hot forging of 20" CuNi stub ends



CuNi Inner flanges final inspection



# SITINDUSTRIE MARINE S.A.S.

## COPPER NICKEL PIPES: EUROPEAN STANDARDS

			Shipbuilding industry				Offshore industry			
			10 Bar System		14 Bar System		16 Bar System		20 Bar System	
ND inch	ND mm	Actual mm	WT mm	weight KG/M	WT mm	weight KG/M	WT mm	weight KG/M	WT mm	weight KG/M
1/8		10	1,0	0,26	1,0	0,26				
1/4		12	1,0	0,31	1,0	0,31				
3/8	10	16	1,0	0,42	1,0	0,42				
1/2	15	20/16*	1,0	0,53	1,0	0,53	2,0	1,01	2,0	1,01
3/4	20	25	1,5	0,99	1,5	0,99	2,0	1,30	2,0	1,30
1	25	30	1,5	1,20	1,5	1,20	2,5	1,93	2,5	1,93
1 1/4	32	38	1,5	1,54	1,5	1,54	2,5	2,50	2,5	2,50
1 1/2	40	44,5	1,5	1,81	1,5	1,81	2,5	2,95	2,5	2,95
2	50	57	1,5	2,34	1,5	2,34	2,5	3,83	2,5	3,83
2 1/2	65	76,1	2,0	4,16	2,0	4,16	2,5	5,17	2,5	5,17
3	80	88,9	2,0	4,88	2,5	6,07	2,5	6,07	2,5	6,07
4	100	108	2,5	7,41	2,5	7,41	3,0	8,85	3,0	8,85
5	125	133	2,5	9,16	3,0	10,95				
6	150	159	2,5	10,99	3,0	13,14	3,0	13,14	3,5	15,29
7	175	194	2,5	13,43	3,5	18,70				
8	200	219,1	3,0	18,21	3,5	21,19	4,0	24,17	4,5	27,12
10	250	267	3,0	22,24	4,0	29,55	4,5	33,18	5,5	40,39
12	300	323,9	4,0	35,94	5,0	44,78	5,5	49,18	7,0	62,30
14	350	368	4,0	40,89	5,5	56,00	6,5	65,99	8,0	80,89
16	400	419	4,0	46,62	6,0	69,60	7,0	81,00	9,0	103,64
18	450	457,2	4,0	50,91	6,0	76,03	8,0	100,93	9,5	119,45
20	500	508	4,5	63,63	6,5	91,55	8,5	119,24	11,0	153,54
24	600	610	5,0	84,96	8,0	135,26	10,5	176,79	13,0	217,97
28	700	711	6,0	118,80	9,0	177,45	12,0	235,58	15,0	293,22
32	800	813	6,0	135,99	10,0	225,53	13,5	303,14	17,0	380,06
36	900	914	8,0	203,57	11,0	278,98	15,5	391,14	19,0	477,60

\* EEMUA 234

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ZADCO UZ750 Oil Field  
"Photography courtesy of Technip FMC, Emirates"

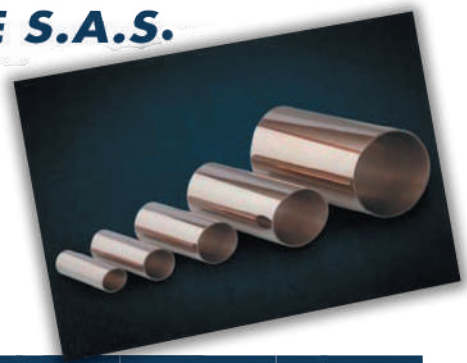


KANDO 110 Super Yachts  
"Photography courtesy of Ava Yachts, Turkey"





## COPPER NICKEL PIPES: EUROPEAN & US STANDARDS



	MAIN STANDARDS	BS	EEMUA	DEFSTAN	DIN	EN	ASTM	MIL
NITON 10	Seamless Pipes CuNi10 Fe1 Mn	2871 CN 102	234 UNS 7060X	779 part 3	86019 2.1972 17664/17664 2.0872	12449 CW352 H	B 466 C 70600	MIL-T-1640K C70600
	Seamwelded Pipes CuNi10 Fe1 Mn	2875 CN 102	234 UNS 7060X		86018 2.1972 17664/17664 2.0872		B 467 C 70600	MIL-T-1640K C70600
	Bars CuNi10 Fe1 Mn	2872 CN 102 2874 CN 102		779 part 2	17664 2.0872 17672 2.0872.10		B 151 C 70600 B 249	MIL-C-24679 C70600
	Plates CuNi10 Fe1 Mn	2870 CN 102 2875 CN 102		779 part 1			B 171 C 70600 B 402	MIL-C-15726F C70600
NITON 30	Seamless Pipes CuNi30 Mn1 Fe	BS 2871 CN 107		780 part 3	17664 2.0882 17671/1755	12449 CW354 H	B 466 C 71500	MIL-T-1640K C71500
	Welded Pipes CuNi30 Mn 1 Fe	BS 2875 CN 107			17664 2.0882 17670 2.0882/86018		B 467 C 71500	MIL-T-1640K C71500
	Bars CuNi30 Mn1 Fe	BS 2872 CN 107 BS 2874 CN 107		780 part 2	17664 2.0872 17672 2.0872.10		B 151 C 71500 B 249	MIL-C-24679 C71500
	Plates CuNi30 Mn 1 Fe	BS 2875 CN 107		780 part 1			B 171 C 71500 B 402	MIL-C-15726F C71500

### CHEMICAL COMPOSITION

		Ni %	Fe%	Mn %	C%	Pb%	S%	P%	Zn%	Zr%	Others %	Cu
NITON 10	Minimum	10,00	1,50	0,500								
	Maximum	11,00	1,80	1,000	0,05	0,010	0,005	0,020	0,05	0,030	0,10	Balance
NITON 30	Minimum	30	0,6	0,5								
	Maximum	32	0,7	1	0,05	0,01	0,005	0,01	0,05		0,1	Balance

### MECHANICAL CHARACTERISTICS

	90/10 CuNi	70/30 CuNi	
Tensile strength UTS, Rm (Mpa):	310	350	mini
Yield strength YS 0.2, Rp 0.2 (Mpa):	110	130	mini
Elongation (E 5.65 √S) %	35	30	mini
Hardness (HB10 D2)	70	80	mini

### MECHANICAL CHARACTERISTICS

	Typical values 20°C	Units	90/10 CuNi	70/30 CuNi
Density (20°C)		Kg/m <sup>3</sup>	8900	8900
Electrical resistivity (20°C annealed)		μΩ.cm	19	34
Thermal conductivity (20°C to 200°C)		W/m. °K	50	30
Coefficient of expansion (20°C to 200°C)		Cx10 <sup>-6</sup>	17	16
Modulus of elasticity (20°C annealed)		MPa	126.000	126.000
Annealing temperature		°C	760-800	780-820
Melting interval		°C	1100-1150	1180-1240
Magnetic Permeability (20°C annealed)			below 1,08 on special request	below 1,05



# SITINDUSTRIE MARINE S.A.S.

## COPPER NICKEL PIPES: U.S. STANDARDS

ND inch	Actual inch	Actual mm	MIL T 16420 K Class 50				MIL T 16420 K Class 200				MIL T 16420 K Class 700			
			WT inch	WT mm	weight Lb/Ft	weight Kg/m	WT inch	WT mm	weight Lb/Ft	weight Kg/m	WT inch	WT mm	weight Lb/Ft	weight Kg/m
	0,250	6,35												
1/8	0,405	10,29												
	0,500	12,70					0,035	0,89	0,22	0,33	0,065	1,65	0,38	0,57
1/4	0,540	13,72					0,065	1,65	0,42	0,62	0,065	1,65	0,42	0,62
3/8	0,675	17,15					0,065	1,65	0,53	0,79	0,072	1,83	0,58	0,87
1/2	0,840	21,34					0,065	1,65	0,68	1,01	0,072	1,83	0,75	1,11
3/4	1,050	26,67					0,065	1,65	0,86	1,28	0,083	2,11	1,08	1,61
1	1,315	33,40					0,065	1,65	1,09	1,62	0,095	2,41	1,55	2,31
1 1/4	1,660	42,16					0,072	1,83	1,53	2,28	0,095	2,41	1,99	2,96
1 1/2	1,900	48,27					0,072	1,83	1,77	2,63	0,109	2,77	2,62	3,90
2	2,375	60,32					0,083	2,11	2,55	3,80	0,120	3,05	3,63	5,40
2 1/2	2,875	73,03					0,083	2,11	3,11	4,63	0,134	3,40	4,92	7,32
3	3,500	88,90					0,095	2,41	4,33	6,44	0,165	4,19	7,37	10,97
3 1/2	4,000	101,60					0,095	2,41	4,97	7,39	0,180	4,57	9,21	13,70
4	4,500	114,30					0,109	2,77	6,42	9,55	0,203	5,16	11,69	17,40
	5,000	127,00					0,120	3,05	7,85	11,68	0,203	5,16	13,05	19,42
5	5,563	141,30					0,125	3,18	9,12	13,57	0,220	5,59	15,75	23,44
6	6,625	168,30					0,134	3,40	11,64	17,32	0,259	6,58	22,09	32,87
	7,625	193,70					0,140	3,56	14,05	20,91	0,284	7,21	27,91	41,54
8	8,625	219,10					0,148	3,76	16,81	25,01	0,340	8,64	37,75	56,17
	9,625	244,48					0,187	4,75	23,64	35,18	0,340	8,64	42,30	62,94
10	10,750	273,05					0,187	4,75	26,46	39,37	0,380	9,65	52,77	78,52
12	12,750	323,90					0,250	6,35	41,86	62,29	0,454	11,53	74,76	111,25
14	14,000	355,60	0,165	4,19	27,78	41,35	0,250	6,35	46,04	68,51	0,473	12,01	85,65	127,46
	15,000	381,00									0,503	12,78	97,68	145,36
16	16,000	406,40	0,165	4,19	31,80	47,32	0,250	6,35	52,73	78,47	0,534	13,56	110,57	164,54
18	18,000	457,20	0,180	4,57	39,03	58,10	0,250	6,35	59,42	88,43				
20	20,000	508,00	0,180	4,57	43,41	64,62	0,250	6,35	66,12	98,40				
22	22,000	558,80	0,180	4,57	47,80	71,12	0,250	6,35	72,82	108,36				
24	24,000	609,60	0,180	4,57	49,50	73,57	0,250	6,35	79,52	118,33				
30	30,000	762,00	0,250	6,35	90,54	134,77								
40	40,000	1.016,00	0,312	7,92	150,70	224,19								

ND inch	Actual inch	Actual mm	ASTM B 466/B 467			
			WT inch	WT mm	weight Lb/Ft	weight Kg/m
	0,250	6,35				
1/8	0,405	10,29	0,058	1,47	0,24	0,36
	0,500	12,70				
1/4	0,540	13,72	0,065	1,65	0,38	0,56
3/8	0,675	17,15	0,065	1,65	0,48	0,72
1/2	0,840	21,34	0,065	1,65	0,61	0,91
3/4	1,050	26,67	0,065	1,65	0,78	1,16
1	1,315	33,40	0,065	1,65	0,99	1,47
1 1/4	1,660	42,16	0,072	1,83	1,39	2,07
1 1/2	1,900	48,27	0,072	1,83	1,60	2,39
2	2,375	60,32	0,083	2,11	2,32	3,45
2 1/2	2,875	73,03	0,083	2,11	2,82	4,20
3	3,500	88,90	0,095	2,41	3,93	5,85
3 1/2	4,000	101,60	0,095	2,41	4,51	6,71
4	4,500	114,30	0,109	2,77	5,83	8,68
	5,000	127,00				
5	5,563	141,30	0,125	3,18	8,29	12,34
6	6,625	168,30	0,134	3,40	10,58	15,75
	7,625	193,70				
8	8,625	219,10	0,134	3,40	13,83	20,59
	9,625	244,48				
10	10,750	273,05	0,134	3,40	17,29	25,74
12	12,750	323,90	0,156	3,96	23,90	35,58
14	14,000	355,60	0,165	4,19	27,78	41,35
	15,000	381,00				
16	16,000	406,40	0,165	4,19	31,80	47,33
18	18,000	457,20	0,180	4,57	39,03	58,10
20	20,000	508,00	0,180	4,57	43,41	64,62
22	22,000	558,80				
24	24,000	609,60	0,180	4,57	52,17	77,66
30	30,000	762,00	0,250	6,35	90,54	134,77
40	40,000	1.016,00				



BAE DREADNOUGHT SUBMARINE  
"Photography courtesy of BAE system"



# SITINDUSTRIE MARINE S.A.S.

## COPPER NICKEL PIPES: U.S. STANDARDS

ND inch	Actual inch	Actual mm	MIL T 16420 K Class 1650				MIL T 16420 K Class 3300				MIL T 16420 K Class 6000			
			WT inch	WT mm	weight Lb/Ft	weight Kg/m	WT inch	WT mm	weight Lb/Ft	weight Kg/m	WT inch	WT mm	weight Lb/Ft	weight Kg/m
	0,250	6,35					0,035	0,89	0,101	0,15	0,058	1,47	0,150	0,22
1/8	0,405	10,29					0,058	1,47	0,27	0,40	0,095	2,41	0,395	0,58
	0,500	12,70	0,035	0,89	0,218	0,33	0,072	1,83	0,413	0,62	0,120	3,05	0,611	0,91
1/4	0,540	13,72	0,042	1,07	0,281	0,42	0,072	1,83	0,451	0,67	0,120	3,05	0,675	1,00
3/8	0,675	17,15	0,049	1,24	0,410	0,61	0,095	2,41	0,738	1,10	0,148	3,76	1,045	1,55
1/2	0,840	21,34	0,058	1,47	0,607	0,90	0,120	3,05	1,16	1,73	0,203	5,16	1,727	2,57
3/4	1,050	26,67	0,083	2,11	1,075	1,61	0,148	3,76	1,79	2,66	0,238	6,05	2,585	3,85
1	1,315	33,40	0,095	2,41	1,55	2,31	0,180	4,57	2,74	4,07	0,300	7,62	4,08	6,07
1 1/4	1,660	42,16	0,120	3,05	2,48	3,69	0,220	5,59	4,25	6,31	0,380	9,65	6,51	9,69
1 1/2	1,900	48,27	0,134	3,40	3,17	4,71	0,250	6,35	5,52	8,22	0,425	10,80	8,39	12,50
2	2,375	60,32	0,165	4,19	4,88	7,26	0,340	8,64	9,27	13,79	0,520	13,21	12,87	19,22
2 1/2	2,875	73,03	0,203	5,16	7,26	10,81	0,380	9,65	12,65	18,89				
3	3,500	88,90	0,250	6,35	10,88	16,19	0,458	11,63	18,70	27,75				
3 1/2	4,000	101,60	0,284	7,21	14,08	21,02								
4	4,500	114,30	0,340	8,64	18,92	28,19								
	5,000	127,00	0,380	9,65	23,54	34,89								
5	5,563	141,30	0,425	10,80	29,26	43,54								

ND inch	Actual inch	Actual mm	ANSI B 36.19 5 S				ANSI B 36.19 10 S				ANSI B 36.19 40 S				ANSI B 36.19 80 S			
			WT inch	WT mm	weight Lb/Ft	weight Kg/m	WT inch	WT mm	weight Lb/Ft	weight Kg/m	WT inch	WT mm	weight Lb/Ft	weight Kg/m	WT inch	WT mm	weight Lb/Ft	weight Kg/m
1/8	0,405	10,29					0,049	1,24	0,21	0,32	0,068	1,73	0,28	0,42	0,095	2,41	0,36	0,53
1/4	0,54	13,72					0,065	1,65	0,38	0,56	0,088	2,24	0,48	0,72	0,119	3,02	0,61	0,91
3/8	0,675	17,15					0,065	1,65	0,48	0,72	0,091	2,31	0,64	0,96	0,126	3,20	0,84	1,25
1/2	0,84	21,34	0,065	1,65	0,61	0,91	0,083	2,11	0,77	1,14	0,109	2,77	0,97	1,44	0,147	3,73	1,24	1,84
3/4	1,05	26,67	0,065	1,65	0,78	1,16	0,083	2,11	0,98	1,46	0,113	2,87	1,29	1,92	0,154	3,91	1,68	2,50
1	1,315	33,40	0,065	1,65	0,99	1,47	0,109	2,77	1,60	2,38	0,133	3,38	1,91	2,85	0,179	4,55	2,48	3,69
1 1/4	1,66	42,16	0,065	1,65	1,26	1,88	0,109	2,77	2,05	3,06	0,140	3,56	2,59	3,86	0,191	4,85	3,41	5,08
1 1/2	1,9	48,27	0,065	1,65	1,45	2,16	0,109	2,77	2,38	3,54	0,145	3,68	3,09	4,61	0,200	5,08	4,14	6,16
2	2,375	60,32	0,065	1,65	1,83	2,72	0,109	2,77	3,01	4,48	0,154	3,91	4,16	6,19	0,218	5,54	5,72	8,52
2 1/2	2,875	73,03	0,083	2,11	2,82	4,20	0,120	3,05	4,02	5,99	0,203	5,16	6,60	9,83	0,276	7,01	8,73	13,00
3	3,5	88,90	0,083	2,11	3,45	5,14	0,120	3,05	4,93	7,35	0,216	5,49	8,63	12,86	0,300	7,62	11,68	17,39
3 1/2	4	101,60	0,083	2,11	3,95	5,89	0,120	3,05	5,67	8,44	0,226	5,74	10,37	15,45	0,318	8,08	14,25	21,22
4	4,5	114,30	0,083	2,11	4,46	6,65	0,120	3,05	6,40	9,53	0,237	6,02	12,29	18,30	0,337	8,56	17,07	25,42
5	5,563	141,30	0,109	2,77	7,24	10,78	0,134	3,40	8,84	13,17	0,258	6,55	16,64	24,78	0,375	9,53	23,67	35,26
6	6,625	168,30	0,109	2,77	8,65	12,88	0,134	3,40	10,57	15,74	0,280	7,11	21,60	32,18	0,432	10,97	32,53	48,46
8	8,625	219,10	0,109	2,77	11,30	16,83	0,148	3,76	15,27	22,74	0,322	8,18	32,53	48,45	0,500	12,70	49,42	73,61
10	10,75	273,05	0,134	3,40	17,28	25,74	0,165	4,19	21,24	31,63	0,365	9,27	46,10	68,66	0,500	12,70	62,33	92,84
12	12,75	323,90	0,156	3,96	23,89	35,58	0,180	4,57	27,51	40,98	0,375	9,53	56,48	84,13	0,500	12,70	74,51	110,98
14	14	355,60	0,156	3,96	26,25	39,10	0,188	4,78	31,61	47,09								
16	16	406,40	0,165	4,19	31,77	47,32	0,188	4,78	36,19	53,91								
18	18	457,20	0,165	4,19	35,78	53,30	0,188	4,78	40,77	60,72								
20	20	508,00	0,188	4,78	45,34	67,54	0,218	5,54	52,47	78,16								
22	22	558,80	0,188	4,78	49,92	74,36	0,218	5,54	57,78	86,07								
24	24	609,60	0,218	5,54	63,09	93,97	0,250	6,35	72,21	107,56								
30	30	762,00	0,250	6,35	90,46	134,74	0,312	7,92	112,59	167,70								



LITTORAL COMBAT SHIP  
"Photography courtesy of AUSTAL Shipbuilding"



LPD 30  
"Photography courtesy of INGALLS Shipbuilding"



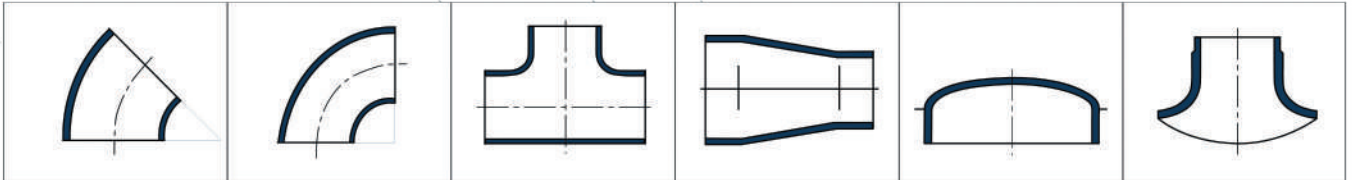
## COPPER NICKEL FITTINGS

All drawings are available online

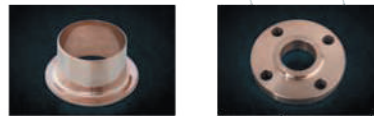
### BUTT WELD FITTINGS



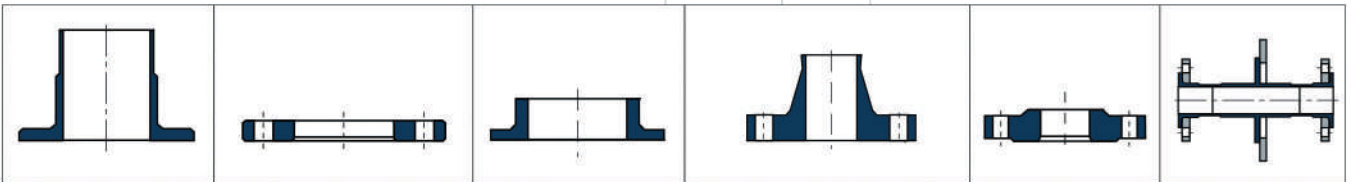
- 45° ELBOWS**  
LONG AND SHORT RADIUS  
DIN 86090/ EEMUA 234  
ASME B 16.9
- 90° ELBOWS**  
LONG AND SHORT RADIUS  
DIN 86090/ EEMUA 234  
ASME B 16.9
- TEES**  
EQUAL AND REDUCING  
DIN 86088/ EEMUA 234  
ASME B 16.9
- REDUCERS**  
CONCENTRIC AND ECCENTRIC  
DIN 86089/ EEMUA 234  
ASME B 16.9
- END CAPS**  
DIN 28011/ EEMUA 234  
ASME B 16.9
- SADDLES**  
EQUAL AND REDUCING  
DIN 86087/ EEMUA 234



### FLANGES



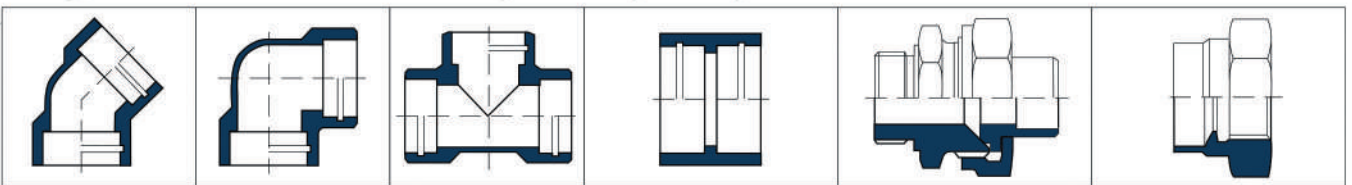
- COLLARS/INNER FLANGE**  
LONG TYPE/SHORT TYPE  
DIN 86037/ EEMUA 234  
ASME B 16.9
- CARBON STEEL**  
OUTER FLANGE  
DIN 86037/ EEMUA 234/ ASME B16.5
- COMPOSITE SLIP ON**  
FLANGE  
DIN 86036  
EEMUA 234/ ISO NP 10
- SOLID WELDING NECK**  
DIN 2632/2633  
EEMUA 234/ ISO NP 10
- SOLID SLIP**  
ON & SOCKET WELDING  
EEMUA 234/ ASME B16.5  
NAVSEA 810.4715319
- BULKHEAD**  
DIN 86068



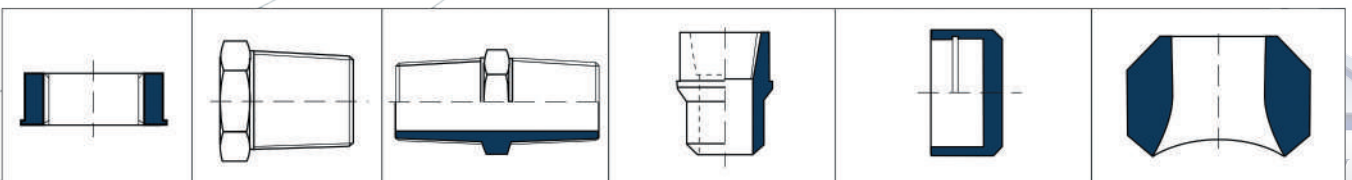
### FORGED AND MACHINED FITTINGS



- ELBOWS 45°**  
SOCKET WELD/  
CAPILLARY  
EEMUA 234
- ELBOWS 90°**  
SOCKET WELD/  
CAPILLARY  
EEMUA 234
- EQUAL AND REDUCING**  
TEES  
SOCKET WELD/CAPILLARY  
EEMUA 234
- STRAIGHT/HALF/REDUCING**  
COUPLING  
SOCKET WELD/CAPILLARY/  
THREADED EEMUA 234
- MALE/FEMALE UNION**  
CONNECTORS  
SOCKET WELD/CAPILLARY/  
BUTT WELD
- ADAPTORS**  
BUTT WELD/MALE OR FEMALE  
THREADED



- SPRINKLER**  
BUSHES
- PLUGS**  
MALE  
EEMUA 234
- NIPPLES**  
HEXAGONAL/PIPES  
THREADED
- WELDING BOSSES**  
THREADED  
EEMUA 234
- CAPS**  
SOCKET WELD/CAPILLARY/  
THREADED EEMUA 234
- OLETS**  
SOCKOLET/THREDOLET/  
WEDOLET EEMUA 234



# SITINDUSTRIE MARINE S.A.S.

## APPLICATION

### COPPER NICKEL ALLOYS ARE THE MOST RELIABLE AND ECONOMICAL MATERIAL FOR SEAWATER PIPING SYSTEMS

90/10 and 70/30 Copper nickel alloys have an exceptional resistance to all kinds of seawater corrosion such as: crevice, pitting, selective, stress, galvanic, erosion, fouling.

In contact with seawater, these alloys develop a very strong protective surface film that will prevent dissolution and maintain a general corrosion rate less than 0,025 mm per year, if velocity of seawater is maintained between 1 m/s and 3,5 m/s.

Main advantages are:

- 30 years life time guaranteed without maintenance (within proper design and use)..
- High resistance to fire and explosion: highest safety level for fire protection piping systems.
- Easiness of installation (TIG / MIG welding or silver brazing, cold bending allowed on site)
- Natural antifouling: chemical injection and internal pipe cleaning are not necessary
- Weight saving: thanks to extremely low corrosion rate light wall thickness design is allowed



P68 FPSO PROJECT, Brazil  
"Photography courtesy of Jurong Shipyard"



"Photography courtesy of U.S COAST GUARD"



ONGC India, BASSEIN DEVELOPMENT 3 WELL platform  
"Photography courtesy of LARSEN & TOUBRO, India"



FLNG GOLAR HILLI  
"Photography courtesy of Keppel Shipyard, Singapore"



# SITINDUSTRIE MARINE S.A.S.

## PROJECT MANAGEMENT & CUSTOMER SERVICE



- SITINDUSTRIE MARINE SAS is supported by its commercial network with a presence in more than 35 countries.
- SITINDUSTRIE MARINE SAS main stock of semi finished and finished products is located in Soissons, 1 hour drive from Paris, 2.5 hours drive from Antwerp, crossroads of the European logistics network.
- Thanks to our SAP computer system, SITINDUSTRIE MARINE SAS is able to maximize efficiency in your supply chain management and can provide a fully integrated service from the technical definition of the customer needs, up to the complete piping package delivery on site.

- Through our website [www.sitindustriemarine.com](http://www.sitindustriemarine.com), SITINDUSTRIE MARINE SAS customers will find the following services:

**Catalog on line - Request for quotation on line.**



Welding CuNi piping spools

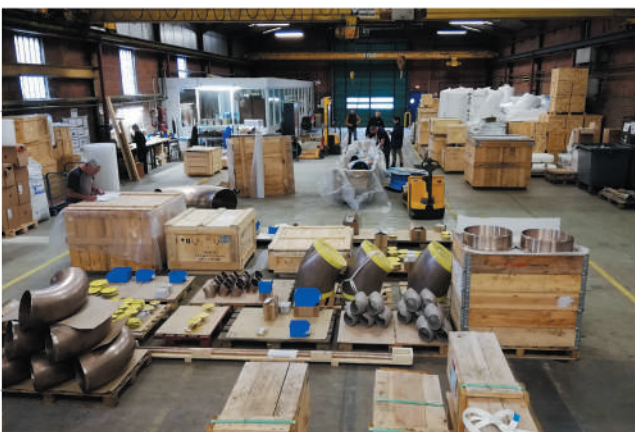


Fire Fighting piping skid 90/10 CuNi



90/10 CuNi piping spools

14



Third party quality inspection



500 tons of finished products in stock

# SITINDUSTRIE MARINE S.A.S.

## MAIN CUSTOMERS REFERENCE LIST:

### MILITARY SHIPBUILDING



### CIVIL SHIPBUILDING



### ENGINEERING & CONTRACTORS



### OIL & GAS END USERS





**SITINDUSTRIE  
MARINE S.A.S.**

## **COPPER NICKEL PIPES, FITTINGS AND FLANGES**

# **APPLICATIONS**

*Copper nickel alloys are the best compromise  
for piping systems resistant to seawater corrosion*

**Alloys: CuNi10Fe1Mn - C70600; CuNi30MnFe - C71500**

### **OFF SHORE PLATFORM**



### **F. P. S. O.**



### **CIVIL SHIPBUILDING**



### **AIRCRAFT CARRIER**



### **DESALINATION PLANT**



### **MILITARY SHIPBUILDING**



**[www.sitindustriemarine.com](http://www.sitindustriemarine.com)**

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