COPPER NICKEL ALLOYS FOR SEAWATER CORROSION RESISTANT PIPING SYSTEMS

le bronze industriel

NAVINIC 10®
NAVINIC 30®

Summary

COPPER
NICKEL
ALLOYS
FOR
SEAWATER
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SYSTEMS

le bronze industriel

NAVINIC 10®
NAVINIC 30®

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Portrait of a group

Established in 1934, Le Bronze Industriel is France's leading producer of special copper alloy materials, primarily in the form of :
- *semi-finished products (bars, sections, forged or stamped parts)*
- *corrosion-resistant bars, tubes, fittings and flanges*
- *resistance welding electrodes and wheels*
- *machined parts*

Its headquarters are located in Paris (Bagnolet) and its production site in Suippes (40 000 m²) which is situated in the Champagne-Ardennes region, right in the heart of Europe, employs over 500 personnel.

A RANGE OF PRODUCTS FOR ALL SECTORS OF INDUSTRY :

- Automotive industry : resistance welding equipment
- Shipbuilding, offshore and desalination industries : seawater piping systems
- Aeronautical and aerospace industries : bushings and bearings for landing gears
- Electrical industry : short-circuit rings, rotor bars and wedges for electrical motors, primarily used in the railway industry
- Metallurgy : casting wheels, ingot moulds and dam blocks

CUSTOMER ORIENTED SERVICES FOR INTERNATIONAL DEVELOPMENT

Le Bronze Industriel exports approximately 70 percent of its production to more than forty countries in the five continents, via an extensive network of subsidiaries, agents and distributors.

The Welding, Marine and Special Alloys departments have a team of engineers especially trained in the specific features of the department's activity in order to understand and therefore meet all customers'needs and requirements.

INVESTING IN THE FUTURE

With unique and modern equipement le bronze industriel is eagerly pursuing a policy of continuous investment in innovation and quality. (Le Bronze Industriel has held ISO 9002 certification since 1994).
A clear strategy, a flexible structure, the development of new products at competitive prices, the reliability of its production, its sense of service and its entrepreneurial spirit will be the company's best guarantees of sustained growth throughout the third millenium.

le bronze

A fully integrated factory with equipment on the cutting edge of the highly specialized science of copper alloy metallurgy

industriel Works

Foundry :

Semi-continuous casting 1 2
Continuous casting
Centrifugal casting

Extrusion :

3600 tons press capacity 3

Forging :

Open die forging press 4
Closed die stamping presses 5

Cold drawing :

Fully automated 45 tons triple bench 6
600 tons seamless tube bench 7
25 to 70 tons semi automated drawing benches

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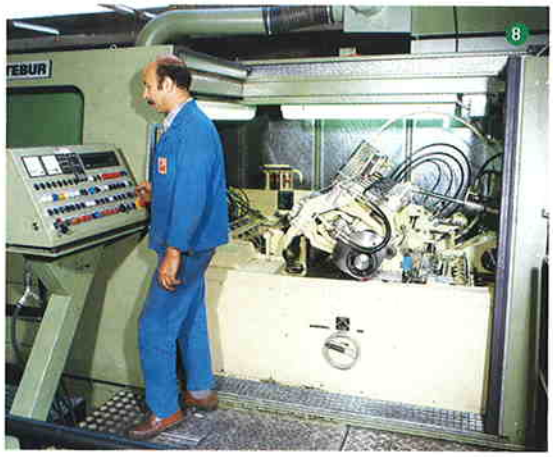


industriel Works

Cold forming :

2 multi-stations punching presses with 5 stations for producing resistance welding caps 8
1 press for hydroforming of fittings
1 press for bending elbows

Machining :

Numerous CNC machines for manufacturing finished parts (electrodes, fittings, flanges, bushings etc..) 9
1 large lathe for turning heavy forged parts

Thermal treatment :

3 furnaces with precise temperature and atmospheric control as well as a quenching device 10 11

Quality control equipment :

1 fully automated Eddy current testing bench 12
2 hydrostatic testing benches 13
Numerous ultra sonic testing devices

Introduction to NAVINIC 10®

Chemical composition

The chemical composition of alloys NAVINIC 10® and NAVINIC 30® have been optimised in collaboration with our customers in order to maximize the behaviour of the metal under the most stringent conditions of seawater corrosion.
Additionally, NAVINIC 10 and NAVINIC 30 meet all requirements of most international standards.

Comparison table of International Standards for NAVINIC 10® and NAVINIC .22®

	Ni%	Fe%	Mn%	C%	Pb%	S%	P%	Zn%	Zr%	Other imp.	Cu%
NAVINIC 10® CuNi10Fe1Mn NAVINIC .22® CuNi10Fe1,6Mn	10,0 - 11,0	1,5 - 1,8	0,5 - 1,0	max. 0,05	max. 0,01	max. 0,005	max. 0,02	max. 0,5	max. 0,03	max. 0,10 Sn+Pb max. 0,03	Balance
NFA 51 - 102	9,0 - 11,0	1,0 - 2,0	0,3 - 1,0	max. 0,05		max. 0,02		max. 0,5		max. 0,10 Sn+Pb max. 0,05	Balance
DIN 17664 2.0872	9,0 - 11,0	1,0 - 2,0	0,5 - 1,0	max. 0,05	max. 0,03	max. 0,02	max. 0,02	max. 0,5		max. 0,30	Balance
DIN 86019 2.1972	9,0 - 11,0	1,5 - 1,8	0,5 - 1,0	max. 0,05	max. 0,03	max. 0,015	max. 0,02	max. 0,15	max. 0,03	max. 0,30	Balance
EEMUA 144 UNS 7060x	10,0 - 11,0	1,5 - 2,0	0,5 - 1,0	max. 0,05	max. 0,01	max. 0,02	max. 0,02	max. 0,20		max. 0,30	Balance
BS 2871 CN 102	10,0 - 11,0	1,0 - 2,0	0,5 - 1,0	max. 0,05	max. 0,01	max. 0,05				max. 0,30	Balance
NES 779	10,0 - 11,0	1,0 - 2,0	0,5 - 1,0	max. 0,05	max. 0,01	max. 0,05				max. 0,30	Balance
MIL-T-16420K C70600	9,0 - 11,0	1,0 - 1,8	max. 1,0	max. 0,05	max. 0,02	max. 0,02	max. 0,02	max. 0,50			mini.86,5
ASTM B466 C70600	9,0 - 11,0	1,0 - 1,8	max. 1,0	max. 0,05	max. 0,02	max. 0,02	max. 0,02	max. 0,50			Balance
JIS H 3300 C7060	9,0 - 11,0	1,0 - 1,8	0,2 - 1,0		max. 0,05			max. 0,50			Cu+Ni +Fe+Mn min. 99,5

French Navy-operated nuclear powered aircraft carrier "CHARLES DE GAULLE" built by DCN Brest.

Comparison table of International Standards for NAVINIC 30®

	Ni%	Fe%	Mn%	C%	Pb%	S%	P%	Zn%	A1%	Bi%	B%	Si%	Other imp.	Cu%
NAVINIC 30® CuNi30Mn1Fe	30,0 - 32,0	0,6 - 0,7	0,5 - 1,0	max. 0,05	max. 0,01	max. 0,005	max. 0,01	max. 0,5	max. 0,03	max. 0,002	max. 0,02	max. 0,05	max. 0,10	Balance
NFA 51-102	29,0 - 32,0	0,4 - 0,7	0,5 - 1,5	max. 0,06		max. 0,02		max. 0,5					max. 0,10 Sn+Pb max. 0,05	Balance
DIN 17664 2.0882	30,0 - 32,0	0,4 - 1,0	0,5 - 1,5	max. 0,05	max. 0,03	max. 0,02	max. 0,02	max. 0,5					max. 0,30	Balance
BS 2871 CN 107	30,0 - 32,0	0,4 - 1,0	0,5 - 1,5	max. 0,06	max. 0,01	max. 0,08							max. 0,30	Balance
DGS 320	30,0 - 32,0	0,4 - 1,0	0,5 - 1,5	max. 0,06	max. 0,01	max. 0,02	max. 0,01			max. 0,002	max. 0,02		max. 0,30	Balance
NES 780	30,0 - 32,0	0,6 - 1,0	0,5 - 1,5	max. 0,06	max. 0,01	max. 0,02	max. 0,01		max. 0,03	max. 0,002	max. 0,02	max. 0,05	max. 0,30	Mini 66,5
MIL-T-16420K C71500	29,0 - 33,0	0,4 - 1,0	max. 1,0	max. 0,05	max. 0,02	max. 0,02	max. 0,02	max. 0,50					max. 0,50	Mini 65,0
ASTM B 466 C71500	29,0 - 33,0	0,4 - 1,0	max. 1,0	max. 0,05	max. 0,02	max. 0,02	max. 0,02	max. 0,50					max. 0,50	Balance
JIS H 3300 C7150	29,0 - 33,0	0,4 - 1,0	0,2 - 1,0		max. 0,05			max. 0,50						Cu+Ni +Fe+Mn min. 99,5

Introduction to NAVINIC 10®

Physical properties

Typical values	Units	NAVINIC 10®	NAVINIC .22®	NAVINIC 30®
Density (20°C)	kg/m³	8900	8900	8900
Electrical resistivity (20°C annealed)	µΩ.cm	19	19	34
Thermal conductivity (20° to 200°C)	W/m.°K	50	50	30
Coefficient of expansion (20° to 200°C)	C x 10^{-6}	17	17	16
Modulus of elasticity (20°C annealed)	MPa	126 000	126 000	126 000
Annealing temperature	°C	760-800	760-800	780-820
Melting interval	°C	1100-1150	1100-1150	1180-1240
Magnetic Permeability (20° annealed)		1.08 - 1.80	1.50 - 2.0	<1.05

Mechanical properties (annealed temper)

Typical values	Units	NAVINIC 10®	NAVINIC .22®	NAVINIC 30®
Tensile strength (UTS), (Rm)	MPa	≥ 310	≥ 320	≥ 350
	ksi	≥ 44	≥ 46	≥ 51
Proof stress (YS 0,2), (Rp 0,2)	MPa	≥ 110	≥ 160	≥ 130
	ksi	≥ 16	≥ 23	≥ 19
Elongation (E 5,65 √S)	%	≥ 35	≥ 35	≥ 30
Hardness (HB10 D^2)		≥ 70	≤ 100	≥ 80

Mechanical properties according to temperature

°C		-200	-150	-100	-50	0	50	100	150	200	250	300	350
	Unit												
NAVINIC 10®													
T.S	MPa	450	390	330	310	300	300	290	280	270	260	250	230
Y.S.	MPa	150	145	140	130	100	100	100	95	90	85	80	65
E (E 5,65 √S)	% >					35	32	28	26	24	23	21	20
NAVINIC 30®													
T.S	MPa	480	420	380	360	350	350	340	320	320	310	300	280
Y.S.	MPa	110	175	150	140	130	130	130	125	120	115	110	100
E (E 5,65 √S)	% >					30	28	24	23	22	20	19	18

Contrary to steels, NAVINIC 10® and NAVINIC 30® do not become fragile at low temperatures

Maximum permissible stress according to service temperature as per ASME code, section III

°C		20	40	75	100	125	150	175	200	225	250
	Unit										
NAVINIC 10®	MPa	70	69	67	66	65	63	62	60	58	57
NAVINIC 30®	Mpa	84	83	77	75	74	72	71	70	70	70

Working pressures as per ASME code, section III

(without safety coefficient)

Tubes	Working pressure bar	
O.D. x W.T.	NAVINIC 10®	NAVINIC 30®
10 x 1,0	152	183
12 x 1,0	125	150
16 x 1,0	92	111
16 x 2,0	194	233
20 x 1,0	73	88
20 x 2,0	152	183
25 x 1,5	88	106
25 x 2,0	120	144
30 x 1,5	73	88
30 x 2,5	125	150
38 x 1,5	57	68
38 x 2,5	97	117
44,5 x 1,5	48	58
44,5 x 2,5	82	99
57 x 1,5	38	45
57 x 2,5	64	76
76,1 x 2,0	38	45
76,1 x 2,5	47	57
88,9 x 2,0	32	38
88,9 x 2,5	40	48
108 x 2,5	33	40
108 x 3,0	40	48
133 x 2,5	27	32
133 x 3,0	32	39
159 x 2,5	22	27
159 x 3,0	27	32
159 x 3,5	31	38
193,7 x 2,5	18	22
193,7 x 3,0	22	26
193,7 x 3,5	26	31
219,1 x 3,0	19	23
219,1 x 3,5	23	27
219,1 x 4,0	26	31
219,1 x 4,5	29	35
267 x 3,0	16	19
267 x 4,0	21	25
267 x 4,5	24	29
267 x 5,5	29	35
323,9 x 4,0	17	21
323,9 x 5,0	22	26
323,9 x 5,5	24	29
323,9 x 7,0	31	37
368 x 4,0	15	18
368 x 5,5	21	25

Tubes	Working pressure bar	
O.D. x W.T.	NAVINIC 10®	NAVINIC 30®
368 x 6,5	25	30
368 x 8,0	31	37
419,1 x 4,0	13	16
419,1 x 6,0	20	24
419,1 x 7,0	24	28
457,2 x 4,0	12	15
457,2 x 6,0	19	22
457,2 x 8,0	25	30
457,2 x 9,5	30	35
508 x 4,5	12	15
508 x 6,5	18	22
508 x 8,5	24	28
508 x 11,0	31	37
610 x 5,0	12	14
610 x 8,0	19	22
610 x 10,5	24	29
610 x 13,0	30	36
711 x 6,0	12	14
711 x 9,0	18	21
711 x 12,0	24	29
711 x 15,0	30	36
813 x 6,0	10	12
813 x 10,0	17	21
813 x 13,5	24	28
813 x 17,0	30	36
914 x 8,0	12	15
914 x 11,0	17	20
914 x 15,5	24	29
914 x 19,0	30	36

Tubes	Breaking pressure bar	
O.D. x W.T.	NAVINIC 10®	NAVINIC 30®
25 x 1,5	410	450
30 x 1,5	380	420
38 x 1,5	320	350
44,5 x 1,5	260	270
57 x 1,5	180	200
76,1 x 2,0	180	200
88,9 x 2,0	175	190
108 x 2,5	165	180
133 x 2,5	145	160
159 x 2,5	125	135

Wall thickness calculation formula as per the ASME code

$$\frac{2e}{Di} = \frac{P}{C-0.6P} \quad \text{or} \quad \frac{P}{C} = \frac{2e}{Di+1.2e}$$

e = tube thickness
Di = tube inside diameter
C = maximum stress at working temperature
P = pressure difference between inside and outside of the tube

Maximum permissible stress (C)
In compliance with international standards and main third party inspection organizations
NAVINIC 10® : 70 N/mm²
NAVINIC 30® : 84 N/mm²

Corrosion behaviour

NAVINIC 10® and NAVINIC 30® have an excellent behaviour when exposed to all forms of marine corrosion. This property is mainly due to the fact that the alloy prevents dissolution by forming a very strong protective surface film.

NAVINIC 10® and NAVINIC 30® possible factors of corrosion

Corrosive environment	*Probable corrosion*	*Behaviour in service*
Clean sea water circulation at a velocity of up to 1 m/s	Uniform or general	0,0025 - 0,025 mm/an
Clean sea water circulation at a velocity of up to 3,5 m/s* : NAVINIC 10® and 4,5 m/s* : NAVINIC 30®	Impact corrosion	Satisfactory
Polluted sea water	General corrosion and accelerated pitting corrosion	Less resistance
Deposits accumulated at the surface	Local attack	Generally good
Corrosion + stress	Stress corrosion	Very resistant

** the local speeds resulting from obstructions can be higher*

Agip Congo-operated top sides "KITINA" built by ROSBOS

Behaviour of NAVINIC 10® and NAVINIC 30® in the presence of sea water, brine and sea atmospheric exposures.

Type of corrosion	Behaviour
General corrosion	Slightly sensitive to this type of corrosion Corrosion rate is less than 25 µ/year
Pitting corrosion	Insensitive to this type of attack Penetration rate less than 25/130 µ/year
Selective corrosion	Insensitive Do not lose the alloying component like brasses and aluminium bronzes
Stress corrosion	Never affected by this type of corrosion
Fouling corrosion	Insensitive Even at a low circulation speed, and although not affected by general corrosion, perfectly resist to the build-up of marine organisms
Corrosion-Erosion (impingement attack)	Very slightly sensitive The addition of an optimum quantity of iron improves the nature of the protective film and makes the alloy very resistant to this type of agression
Galvanic corrosion	Insensitive in the presence of other copper based metals. With a dissolution potential of 200 mv/ECS in sea water, NAVINIC® is compatible with all other copper based metals.

Behaviour of NAVINIC 10® and NAVINIC 30® in other environments

- good resistance in an ammoniacal environment
- the behaviour of copper nickel in the presence of crude petroleum is correct in the vapour phase, with however, the risk of the protective film being destroyed.

Resistance of NAVINIC 10® to fire

Tests of resistance to fire have been made in simulating the service conditions of a pipeline during an offshore fire : piping empty - during 5 minutes - at 700°C, partly in the flame, then 15 minutes on water (with the start of the sprinklers).
They have shown the total reliability of NAVINIC 10® : no rupture of the weld or of the brazing, no leakage, no permanent deformation.
After the end of the fire, the piping in NAVINIC 10® has needed no replacement.

LNG Carrier "MUBARAZ" built by KVAERNER Masa Yards

Worldwide distribution network

Le bronze industriel, Marine Department, has got representative agents or distributors in the following countries :

Belgium	Norway	U.S.A.	Thailand	Taiwan
Holland	Finland	Brazil	Malaysia	
Germany (Subsidiary)	Portugal	Kuwait	Singapore	
Italy	Spain	U.E.A.	China	
United Kingdom	Croatia	India	South Korea	
Greece	Turkey	Indonesia	Japan	

Addresses, telephone and fax numbers as well as contact names are available upon request.

Worldwide references :

Le bronze industriel produces Copper Nickel alloys for seawater piping systems since 1978 and supplies the most demanding international companies in the Marine Industry such as :

DCN International	A and R	BATH IRON WORKS	MOBIL OIL	ROSETTI
Chantiers	KVAERNER	INGALLS	ELF	BOS
de l'Atlantique	BAZAN	NSS	TOTAL	TECHNIP
CMN	AESA	NEWPORT NEWS	ADNOC	FLUOR
Blohm and Voss	UNL	FINCANTIERI	BECHTEL	ETPM
HDW	ROYAL SCHELDE	TEXACO	AGIP	FOSTER WHEELER
TNSW	VDG	CONOCO	ONGC	BROWN AND ROOT
LURSSEN WERFT	AVONDALE	BP	SHELL	PETROBRAS

A complete reference list is available upon request

Management of quality

Le bronze industriel is certified ISO 9002 AFAQ Certificate n° QUAL/1994/2593.

Our Quality Control System complies with the criteria established by NATO's AQAP-120 specifications. Evalutation by DQA (Directorate for Quality Assurance) is made on a regular basis.

Numerous national and international approvals are held as well as frequent technical releases made by organisations such as American Bureau of Shipping, Veritas, Det Norske Veritas, Lloyd's Register of Shipping, Germansicher Lloyd, ...

Shell-operated T.L.P. "URSA" built by BELLELLI / J.R. Mc DERMOTT

NAVINIC 10® and NAVINIC 30®

Providing that certain precautions are taken, NAVINIC 10® and NAVINIC 30® welding does not present major difficulty. Inert shielded arc processes (TIG) are particularly appropriate to the welding of these alloys.
The following procedure has been established for NAVINIC/NAVINIC assemblies in tubes and accessories with a thickness of 1.5 to 10 mm welded by the TIG process.

1. Equipment

To weld under proper working conditions, the welding set should be equipped with a pre-gas, pre-arc and arc fall system.

2. General welding conditions

- Direct current with direct polarity (the electrode is connected to the negative pole).
- Electrode : it is made of thorium tungsten or zirconium tungsten.
Its state of cleanliness is most important, influencing the quality of the weld and the stability of the arc.
The diameter of the electrode is dependent on the welding current :

Diameter mm	Current A
1	25/70
1.6	60/150
2	100/200
3	200/300

To achieve a perfectly stable arc and obtain a maximum heat concentration it is advisable to work the electrode as close as possible to the maximum supportable current.
- Protective gas : neutral argon protection is generally sufficient. Torch flow 8 to 12 l/mn.

3. Filler metal

The filler metal generally has a grade identical to that of the parent metal :
Cu Ni10 Fe (for NAVINIC 10) - Doga UTP A 389 is recommended.
Cu Ni30 Fe (for NAVINIC 30) - Doga UTP A 387 is recommended.
The parent metal filler rods should always be perfectly degreased.

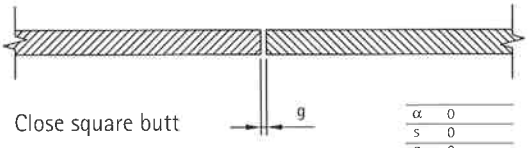
4. Preparation of joints

In general, all types of joints can be used.
For tubes and accessories with a thickness less than or equal to 2 mm, it is not necessary to make a chamfer but it is desirable to break the internal square corner to favour penetration.
For tubes and accessories with a thickness greater than 2 mm, a chamfer of around 30° to 40° is recommended.

Welding instruction

Preparations for butt welded joints on pipes

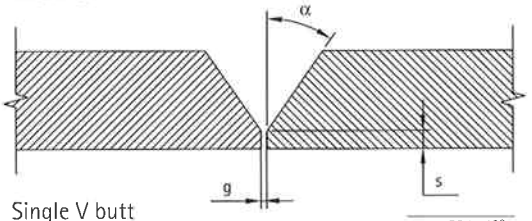
Thickness ≤ 2



Close square butt

α	0
s	0
g	0

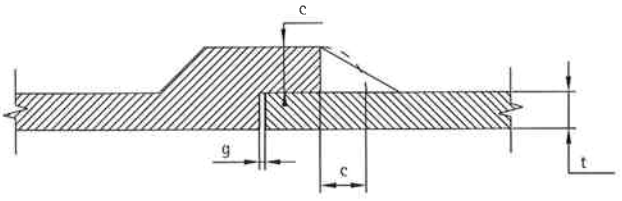
Thickness > 2



Single V butt
Thicknesses
not exceeding 12 mm

α	30 to 40°
s	0 to 1,5mm
g	0

Welded joints on couplings



g = 1,5mm approx. c = 1 1/4 t mini

Not recommended for tubes with diameter exceeding 57 mm

"LAFAYETTE" type fregate built by DCN Lorient

5. Cleaning

This is a most important operation ; welding can only be carried out under correct conditions if the parts to be joined together are perfectly clean and free from grease and oxidation. Cleaning can be carried out by mechanical or chemical means.

6. Internal protection

To avoid oxidation and fluxing on the inside of the joint, it is necessary to ensure internal protection by circulation of neutral gas.

7. Tacking

The parts to be joined together are placed edge to edge and tacked. The spot tacks should be carried out with a lower current than for spot welds. Care should be taken to let the spot tack cool under the jet of argon after breaking of the arc.

Elf Congo-operated concrete platform "N'KOSSA" built by ROSBOS

Welding instruction

8. Welding

- Welding position

NAVINIC can be welded in any position. Welding to a ceiling is the most delicate ; in this case, the pulsed arc gives the best results ; the pulse times remain at the operator's initiative.

- Welding conditions

Thickness mm	Current A	Number of passes *	Rod diameter mm	Argon flow litre/minute
1	70/60	1	1.5	6
1.5	80/65	1	1.5	6
2	90/80	1	1.5	7
2.5	100/90	2	1.5/2	8
3	125/100	2	1.5/2	8
4	150/125	2	1.5/2	8
5	150/125	3	1.5/2.5	8

* The number of passes is important ; it is necessary to follow this data in order to avoid local overheating which risks causing collapse of the bead.

A more detailled welding instruction procedure is available upon request.

Agip Italia-operated platform "DARIA" built by Rosetti

NAVINIC 10® and NAVINIC 30®

The excellent cold properties of these alloys enable them to be formed without difficulty provided that certain elementary precautions inherent in the cold deforming process are taken.
As the achievement of a bend becomes more delicate the thinner the tube and the shorter the radius of bending, it will be necessary to adapt the tooling to the difficulties of bending and to the character of the materials to be formed.
We give hereafter a few general rules regarding the bending of NAVINIC 10® and NAVINIC 30®.

1. Types of bending

There are 5 types of bending :
- Rotary bending : by winding the tube over a turning former, this involves industrial bending machines such as "Curving", "Bonnamy", "Perfect"...
- Stretch bending : on a bending machine of the "Mingori type" for small diameters.
- Roll extrusion forming : by internal rolling of the tube, "Coupé-Hugot machine".
- Compression bending : using a press.
- Roll bending : using 3 rollers.

2. Bending by means of a rotary bending machine

In general, for this type of machine the tooling is composed of a mandrel, a bending former, a clamping shoe (or jaws), a mobile slide guide and sometimes a wiper die.

- Mandrel : the job of the mandrel is to support the tube internally in the course of deformation so as to avoid flattening of the outer surface and folding of the inner surface by obliging the metal to elongate itself. For the alloys in question, the mandrels are made from treated steel. These parts are carefully machined and are given a final polish to avoid marking of the internal wall of the tubes.
- Bending form and slide guide : made from the same materials as the mandrels, these parts must likewise have an even surface. Here again polishing of the surfaces in contact with the tubes (grooves) is desirable. The "bending form" groove will be sufficiently deep so as to give a slightly protruding lip (1 mm approximately). Sharp edges should be eliminated to avoid pinching of the tube.
- Wiper dies : for short bending radii and thin wall tubes, the use of a wiper die is recommended. It will be made preferably from a friction alloy.
- Tool settings : the clearance between the mandrel and the inside of the tube must be a few tenths of a millimeter (3/10 mm approximately).

Setting of the mandrel lead in relation to the former axis (bending axis) must be performed accurately. It may lie between -15 and +25 mm for tube diameters 38 to 140 mm (fig.1).
It must be established that the clamping shoe (or jaws) axis is parallel to the mandrels axis. If this condition is not met, clamping will be inefficient ; the tube may slip during forming and bring about defects such as flattening of the outer surface or "folding" of the inner surface (fig.2).

In the same way, a check should be made that the longitudinal axis of the slide guide (or the guiding counter-former) is in the same plane as the former axis (fig.3)
Besides these precautions, work should be carried out slowly, avoiding any jolting which may have the effect of marking the tube.
- Lubrication is most important : to avoid seizure, the mandrel and the interior of the tube, and the wiper die must be perfectly lubricated.
- Speed : the speed during bending is not an essential element for making the operation successfull.

Bending instruction

Fig. 1

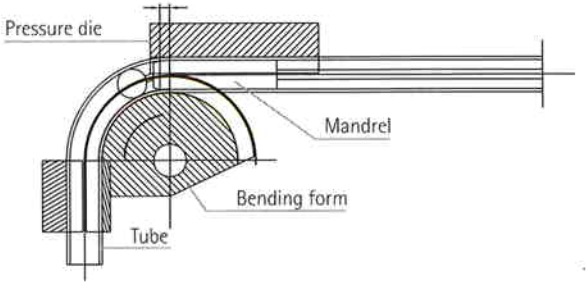


Fig. 2

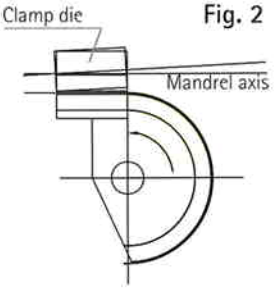
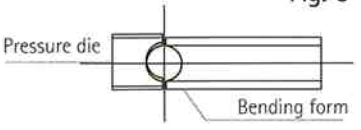


Fig. 3



3. Stretch bending

This process may be called upon when small batches or special bending is involved which does not justify the purchase of tooling required for forming.
In the absence of a mandrel, it is essential to fill the tube with pitch or sand to avoid flattening and ovalization of the tube.

4. Roll extrusion forming

This type of forming is reserved for large diameter tubes necessitating large bending radii.

5. Compression bending

The method is mainly used for limited bendings on large diameter tubes.

6. Roll bending

This process is adopted for making large radii bending on small or medium diameter tubes.

7. Heat treatment after forming

After degreasing the bends, annealing at 600°C is necessary when the parts have to be welded to other components. To avoid pickling, this treatment can be carried out in a protective atmosphere.

Welding rods (filler metal)

Designations and specifications

	Germany	United Kingdom	U.S.A.
CuNi30Fe	2.0837	BS 2901	UNS C71581
	DIN 1733	C18	AWS A 5.7
	Approved by:		Classification
	TÜV, ABS		ERCuNi
CuNi10Fe	2.0873	BS 2901	
	DIN 1733	C16	

Chemical composition (%)

	Ni	Iron	Carbon	Manganese	Silicon	Copper	Titanium	Others
CuNi30Fe	30.0 – 32.0	0.4 – 0.7	max. 0.05	0.5 – 1.0	max. 0.10	Balance	0.2 – 0.5	Pb 0.02
								Zn 0.2
CuNi10Fe	10.0 – 11.0	1.3 – 1.8	max. 0.05	0.5 – 1.0	max. 0.10	Balance	0.2 – 0.5	0.4

Mechanical properties of the weld at room temperature

		CuNi30Fe	CuNi10Fe
0.2 % yield strength	N/mm²	min 180	min 180
	ksi	min 26	min 26
Tensile strength	N/mm²	min 350	min 300
	Ksi	min 51	min 44
Elongation A5	%	min 25	min 20
Impact strength ISO-V	J/cm²	min 80	mini 60

Welding processes

	CuNi30Fe	CuNi10Fe
TIG	+	+
Hot wire	+	+
MIG	+	
Plasma arc	+	+

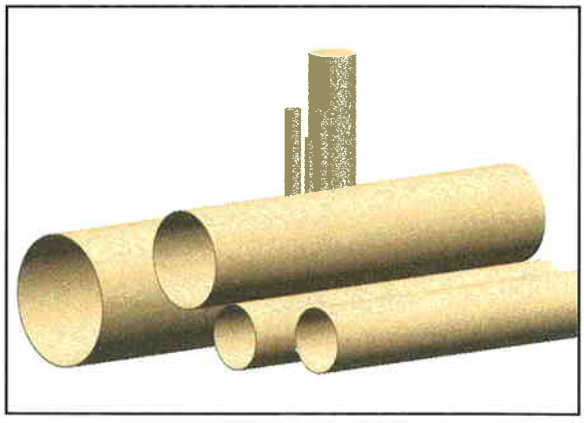
Available diameters (mm) : 1.6 – 2.0 – 2.4 – 3.2 in CuNi30Fe and CuNi10Fe kept on stock.
Welding instructions and procedures are available on request as well as training by one of our welding engineers.

PIPES

Pipes - European Standards

Ref : **LBI-PIP1000**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

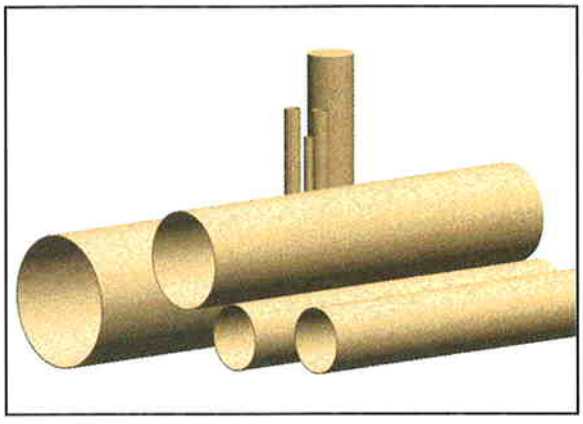


	FRANCE	GERMANY	UNITED KINGDOM
	NAVINIC 10® CuNi10Fe1Mn		
SEAMLESS	NFA 51102 up to OD 50 mm GAM MM11 (French Navy) S.T.F. 22.54. / C.004 (French Navy)	DIN 85004 (German Navy) WL 2.1972.11 or .22 Mechanicals Chemicals DIN 86019 Dimensional DIN 17664 alloy 2.0872 Chemicals DIN 17671 alloy 2.0872.10 Mechanicals DIN 1755 Dimensional	BS 2871 (Part 2) alloy CN 102 EEMUA Pub N° 144 alloy UNS 7060X NES 779 Part 3 (British Navy)
SEAM WELDED		DIN 17664 alloy 2.0872 Chemicals DIN 17670 alloy 2.0872.10 Mechanicals DIN 86018 Dimensional	BS 2875 alloy CN 102 (plates) EEMUA Pub N° 144 alloy UNS 7060X
	NAVINIC 30® CuNi30Mn1Fe		
SEAMLESS	GAM MM 11 (French Navy) S.T.F. 22.54. / C.005 (French Navy)	DIN 17664 alloy 2.0882 Chemicals DIN 17671 alloy 2.0882.10 Mechanicals DIN 1755 Dimensional	BS 2871 Part 2 CN 107 NES 780 Part 3 (British Navy)
SEAM WELDED		DIN 17664 alloy 2.0882 Chemicals DIN 17670 alloy 2.0882.10 Mechanicals DIN 86018 Dimensional	BS 2875 alloy CN 107 (plates)

Pipes - European Standards

Ref : **LBI-PIP1000**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

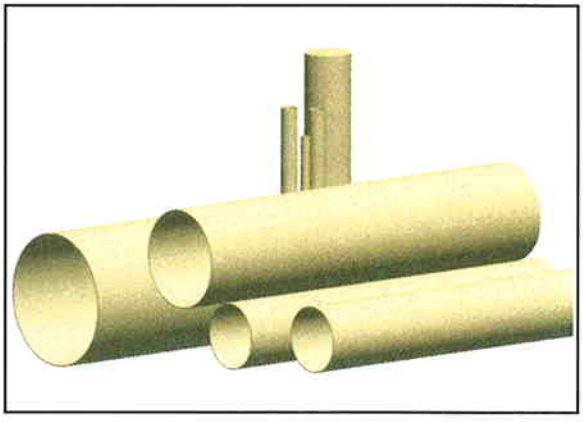


Outside diameter of pipe ØD			10 bar		14 bar		16 bar		20 bar	
			Wall thickness	Theoretical weight	Wall thickness	Theoretical weight	Wall thickness	Theoretical weight	Wall thickness	Theoretical weight
nominal		actual	actual		actual		actual		actual	
inch	ND	mm	mm	Kg/m	mm	Kg/m	mm	Kg/m	mm	Kg/m
SEAMLESS										
1/8		10	1,0	0,26	1,0	0,26	1,0	0,26	1,0	0,26
1/4		12		0,31		0,31		0,31		0,31
3/8	10	16		0,42		0,42	2,0	0,79	2,0	0,79
1/2	15	20		0,53		0,53		1,01		1,01
3/4	20	25	1,5	0,99	1,5	0,99		1,30		1,30
1	25	30		1,20		1,20	2,5	1,93	2,5	1,93
1 1/4	32	38		1,54		1,54		2,50		2,50
1 1/2	40	44,5		1,81		1,81		2,95		2,95
2	50	57		2,34		2,34		3,83		3,83
2 1/2	65	76,1	2,0	4,16	2,0	4,16		5,17		5,17
3	80	88,9		4,88	2,5	6,07		6,07		6,07
4	100	108	2,5	7,41		7,41	3,0	8,85	3,0	8,85
5	125	133		9,16	3,0	10,95		10,95		10,95
6	150	159		10,99		13,14		13,14	3,5	15,29
7	175	193,7		13,43	3,5	18,70		16,07		18,70
8	200	219,1	3,0	18,21		21,19	4,0	24,17	4,5	27,12
10	250	267		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		40,89	5,5	56,00	6,5	65,99	8,0	80,89
16	400	419,1		46,62	6,0	69,60	7,0	81,00	9,0	103,64
SEAMLESS or SEAM WELDED										
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	153,54
SEAM WELDED										
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		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

Other wall thicknesses are also available upon request.

Pipes - U.S. Standards

Ref : **LBI-PIP1100**



Material :

NAVINIC 10® CuNi10Fe1Mn

SEAMLESS	ASTM B 466 alloy UNS C70600
SEAM WELDED	ASTM B 467 alloy UNS C70600

NAVINIC 30® CuNi30Mn1Fe

SEAMLESS	ASTM B 466 alloy UNS C71500
SEAM WELDED	ASTM B 467 alloy UNS C71500

Outside diameter of pipe ØD			Wall thickness		Theoretical weight	
nominal inch	actual inch	actual mm	actual inch	actual mm	Lb/Ft	Kg/m
SEAMLESS						
1/8	0,405	10,29	0,058	1,47	0,24	0,36
1/4	0,540	13,72	0,065	1,65	0,38	0,56
3/8	0,675	17,15			0,48	0,72
1/2	0,840	21,34			0,61	0,91
3/4	1,050	26,67			0,78	1,16
1	1,315	33,40			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			1,60	2,39
2	2,375	60,32	0,083	2,11	2,32	3,45
2 1/2	2,875	73,03			2,82	4,20
3	3,500	88,90	0,095	2,41	3,93	5,85
3 1/2	4,000	101,60			4,51	6,71
4	4,500	114,30	0,109	2,77	5,83	8,68
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
8	8,625	219,10			13,83	20,59
SEAMLESS OR SEAM WELDED						
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
16	16,000	406,40			31,80	47,33
18	18,000	457,20	0,180	4,57	39,03	58,10
20	20,000	508,00			43,41	64,62
SEAM WELDED						
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

Other special wall thicknesses, regular or extra strong as well as relevant flanges, butt weld and machined fittings are also available upon request.

Pipes - U.S. Standards

Ref : **LBI-PIP1200**

Material : **NAVINIC 10®** CuNi10Fe1Mn alloy UNS C70600 **NAVINIC 30®** CuNi30Mn1Fe alloy UNS C71500

Dimension : ANSI / ASME B36.19M

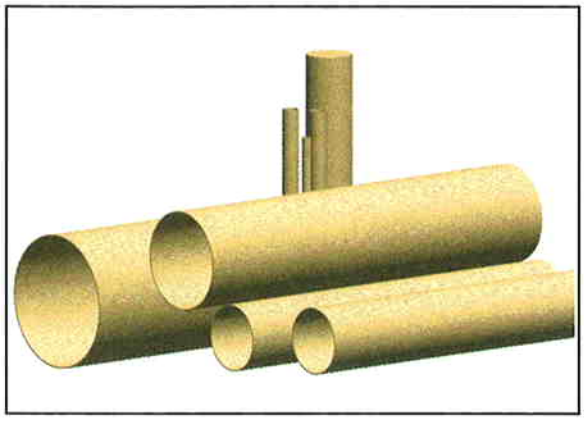
Outside diameter of pipe ØD			Schedule 5S				Schedule 10S			
			Wall thickness		Theoretical weight		Wall thickness		Theoretical weight	
nominal	actual		actual		Lb/Ft	Kg/m	actual		Lb/Ft	Kg/m
inch	inch	mm	inch	mm			inch	mm		
SEAMLESS										
1/8	0,405	10,29					0,049	1,24	0,21	0,32
1/4	0,540	13,72					0,065	1,65	0,37	0,55
3/8	0,675	17,15					0,065	1,65	0,47	0,71
1/2	0,840	21,34	0,065	1,65	0,61	0,90	0,083	2,11	0,76	1,13
3/4	1,050	26,67	0,065	1,65	0,78	1,16	0,083	2,11	0,97	1,45
1	1,315	33,40	0,065	1,65	0,98	1,47	0,109	2,77	1,58	2,36
1 1/4	1,660	42,16	0,065	1,65	1,25	1,86	0,109	2,77	2,05	3,05
1 1/2	1,900	48,27	0,065	1,65	1,45	2,16	0,109	2,77	2,36	3,51
2	2,375	60,32	0,065	1,65	1,82	2,71	0,109	2,77	2,98	4,44
2 1/2	2,875	73,03	0,083	2,11	2,80	4,17	0,120	3,05	3,99	5,94
3	3,500	88,90	0,083	2,11	3,42	5,10	0,120	3,05	4,89	7,29
3 1/2	4,000	101,60	0,083	2,11	3,93	5,85	0,120	3,05	5,62	8,36
4	4,500	114,30	0,083	2,11	4,43	6,60	0,120	3,05	6,34	9,45
5	5,563	141,30	0,109	2,77	7,19	10,70	0,134	3,40	8,78	13,07
6	6,625	168,30	0,109	2,77	8,59	12,79	0,134	3,40	10,50	15,64
8	8,625	219,10	0,109	2,77	11,22	16,71	0,148	3,76	15,14	22,55
10	10,750	273,05	0,134	3,40	17,16	25,57	0,165	4,19	21,07	31,39
12	12,750	323,90	0,156	3,96	23,71	35,31	0,180	4,57	27,31	40,68

Outside diameter of pipe ØD			Schedule 40S				Schedule 80S			
			Wall thickness		Theoretical weight		Wall thickness		Theoretical weight	
nominal	actual		actual		Lb/Ft	Kg/m	actual		Lb/Ft	Kg/m
inch	inch	mm	inch	mm			inch	mm		
SEAMLESS										
1/8	0,405	10,29	0,068	1,73	0,27	0,42	0,095	2,41	0,35	0,53
1/4	0,540	13,72	0,088	2,24	0,47	0,71	0,119	3,02	0,61	0,90
3/8	0,675	17,15	0,091	2,31	0,64	0,95	0,126	3,20	0,84	1,24
1/2	0,840	21,34	0,109	2,77	0,96	1,44	0,147	3,73	1,23	1,83
3/4	1,050	26,67	0,113	2,87	1,28	1,91	0,154	3,91	1,66	2,49
1	1,315	33,40	0,133	3,38	1,90	2,83	0,179	4,55	2,45	3,66
1 1/4	1,660	42,16	0,140	3,56	2,57	3,83	0,191	4,85	3,39	5,05
1 1/2	1,900	48,27	0,145	3,68	3,07	4,58	0,200	5,08	4,10	6,11
2	2,375	60,32	0,154	3,91	4,12	6,15	0,218	5,54	5,67	8,45
2 1/2	2,875	73,03	0,203	5,16	6,54	9,75	0,276	7,01	8,66	12,89
3	3,500	88,90	0,216	5,49	8,57	12,76	0,300	7,62	11,58	17,26
3 1/2	4,000	101,60	0,226	5,74	10,29	15,33	0,318	8,08	14,14	21,05
4	4,500	114,30	0,237	6,02	12,19	18,16	0,337	8,56	16,93	25,22
5	5,563	141,30	0,258	6,55	16,52	24,60	0,375	9,53	23,48	35,00
6	6,625	168,30	0,280	7,11	21,44	31,93	0,432	10,97	32,28	48,09
8	8,625	219,10	0,322	8,18	32,26	48,08	0,500	12,70	49,03	73,04
10	10,750	273,05	0,365	9,27	45,74	68,15	0,500	12,70	61,86	108,49
12	12,750	323,90	0,375	9,53	56,00	83,48	0,500	12,70	73,92	149,25

Others dimensions, wall thicknesses and outside diameters as well as all relevant flanges, butt weld and machined fittings are also available upon request.

Pipes - U.S. Navy Standards

Ref : **LBI-PIP1300**



Material :

NAVINIC 10® CuNi10Fe1Mn MIL - T - 16420K alloy 706 (90/10)
US Navy Specification

NAVINIC 30® CuNi30Mn1Fe MIL - T - 16420K alloy 715 (70/30)
US Navy Specification

Type I Seamless or type II Seam welded

Grade 1 or 2 (without or with heat identification)

Outside diameter of pipe ØD			Class 200				Class 700			
			Minimum Wall thickness		Theoretical weight		Minimum Wall thickness		Theoretical weight	
nominal inch	actual inch	actual mm	actual inch	actual mm	Lb/Ft	Kg/m	actual inch	actual mm	Lb/Ft	Kg/m
SEAMLESS type I										
	0,250	6,35	0,035	0,89	0,09	0,14				
	0,500	12,70			0,20	0,29	0,065	1,65	0,34	0,51
1/4	0,540	13,72	0,065	1,65	0,38	0,56			0,38	0,56
3/8	0,675	17,15			0,48	0,72	0,072	1,83	0,53	0,79
1/2	0,840	21,34			0,61	0,91			0,67	1,00
3/4	1,050	26,67			0,78	1,16	0,083	2,11	0,98	1,45
1	1,315	33,40			0,99	1,47	0,095	2,41	1,41	2,10
1 1/4	1,660	42,16	0,072	1,83	1,39	2,07			1,81	2,69
1 1/2	1,900	48,27			1,60	2,39	0,109	2,77	2,38	3,54
2	2,375	60,32	0,083	2,11	2,32	3,45	0,120	3,05	3,30	4,91
2 1/2	2,875	73,03			2,82	4,20	0,134	3,40	4,47	6,65
3	3,500	88,90	0,095	2,41	3,93	5,85	0,165	4,19	6,70	9,97
3 1/2	4,000	101,60			4,51	6,71	0,180	4,57	8,37	12,45
4	4,500	114,30	0,109	2,77	5,83	8,68	0,203	5,15	10,61	15,78
	5,000	127,00	0,120	3,05	7,14	10,62			11,84	17,62
5	5,563	141,30	0,125	3,18	8,29	12,34	0,220	5,59	14,32	21,30
6	6,625	168,30	0,134	3,40	10,58	15,75	0,259	6,58	20,08	29,89
	7,625	193,70			12,21	18,17	0,284	7,21	25,38	37,76
8	8,625	219,10	0,148	3,76	15,28	22,74	0,340	8,64	34,32	51,07
	9,625	244,48	0,187	4,75	21,49	31,98			38,46	57,23
10	10,750	273,05			24,05	35,79	0,380	9,65	47,96	71,37
12	12,750	323,90	0,250	6,35	38,05	56,63	0,454	11,53	67,97	101,15
SEAMLESS type I or SEAM WELDED type II			Class 50				Class 700			
14	14,000	355,60	0,165	4,19	27,78	41,35	0,473	12,01	77,90	115,87
	15,000	381,00					0,503	12,77	88,80	132,04
16	16,000	406,40	0,165	4,19	31,80	47,32	0,534	13,56	101,00	149,58
18	18,000	457,20	0,180	4,57	39,03	58,10				
20	20,000	508,20			43,41	64,62				
SEAM WELDED type II										
22	22,000	558,80	0,180	4,57	47,80	71,12				
	22,750	577,85			49,50	73,57				
30	30,000	762,00	0,250	6,35	90,54	134,77				
40	40,000	1016,00	0,312	7,92	150,70	224,19				

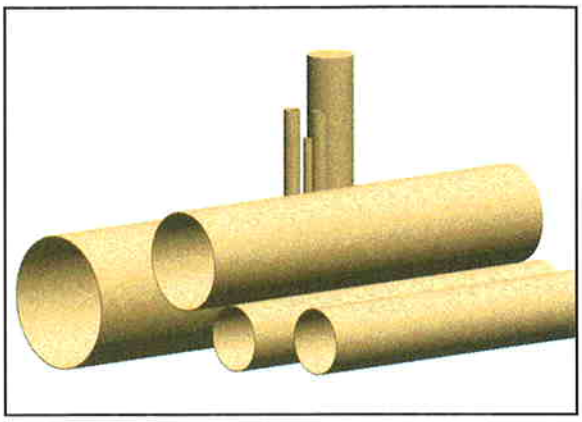
Special classes, class 1650, class 3300 and class 6000 as well as all relevant flanges, butt weld and machined fittings are also available upon request.

Japanese maritime specification

Ref : **LBI-PIP1400**

Material : **NAVINIC 10®** CuNi10Fe1Mn
JIS H 3300 alloy C7060 T or TS

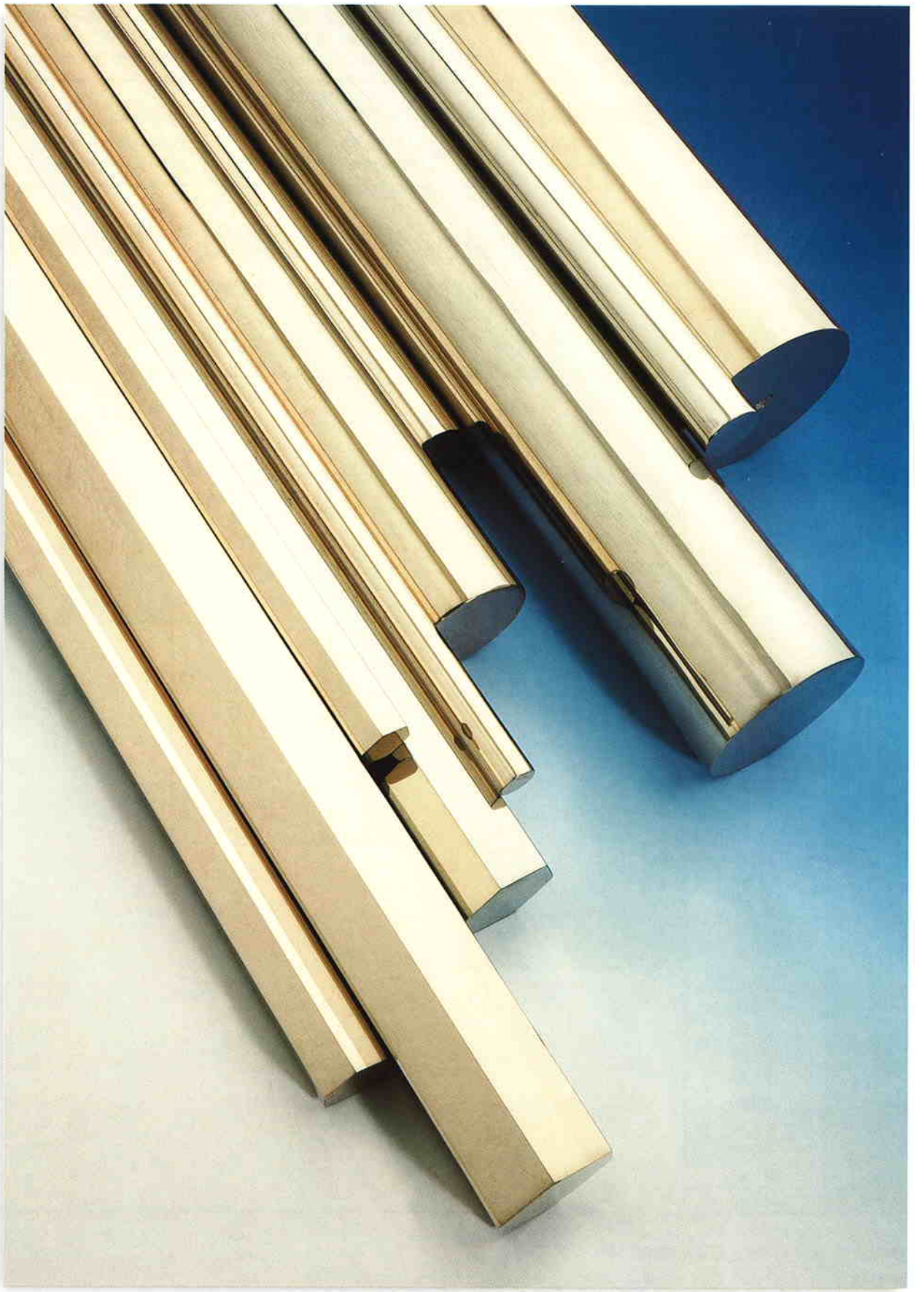
NAVINIC 30® CuNi30Mn1Fe
JIS H 3300 alloy C7150 T or TS



NOMINAL DIAMETER		METRIC SIZE			NAVY DIMENSION inch Size						M.M. (NDS) Size		
					5 K			10 K					
M/M	inch	outside Diam. mm	Wall thick. mm	Theore. weight Kg/m	outside Diam. mm	Wall thick. mm	Theore. weight Kg/m	outside Diam. mm	Wall thick. mm	Theore. weight Kg/m	outside Diam. mm	Wall thick. mm	Theore. weight Kg/m
SEAMLESS													
6 A	1/8							6,35	0,89	0,14			
10 A	3/8	16	1,0	0,42				12,71	0,89	0,29	15		0,57
15 A	1/2	20		0,53	15,14	1,21	0,47	15,14		0,62	20	1,50	0,78
20 A	3/4	25		0,99	21,49		0,69	21,49	1,65	0,92	25		0,99
25 A	1	30		1,20	28,25		1,07	28,25		1,23	30		1,20
32 A	1 1/4	38	1,5	1,54	34,60	1,42	1,32	34,60		1,53	38		2,02
40 A	1 1/2	44,5		1,81	40,95		1,58	40,95	1,83	2,01	45	2	2,41
50 A	2	57		2,34	54,05	1,62	2,39	54,05	2,11	3,08	55		2,98
65 A	2 1/2	76,1	2,0	4,16	66,75		2,96	66,75	2,41	4,35	70		3,82
80 A	3	88,9	2,5	6,07	79,86	1,82	3,99	79,86		5,24	85	3	6,91
90 A	3 1/2										95		7,75
100 A	4	108		7,41	106,27	2,33	6,80	106,27	2,77	8,05	110		9,02
125 A	5	133	2,5	9,16	131,67		8,46	131,67	3,18	11,47	130		10,70
150 A	6	159		10,99	157,68	2,64	11,49	157,68	3,40	14,73	160		17,52
175 A	7										180	4	19,77
200 A	8	219,1	3,0	18,21	208,48	2,64	15,26	208,48	3,76	21,61	210		23,14
225 A											230		25,39
250 A	10	267	3,0	22,24	260,50	3,25	23,48	260,50	4,75	34,11	260	4,5	32,29
300 A	12	323,9		35,94	312,11	3,68	31,87	312,11	6,35	54,52	310	5,5	47,03
350 A	14	368	4,0	40,89									
400 A	16	419,1		46,62									
SEAMLESS OR SEAM WELDED													
450 A	18	457,2	4,0	50,91									
500 A	20	508	4,5	63,63									
SEAM WELDED													
600 A	24	610	5,0	84,96									
700 A	28	711	6,0	118,80									

Other diameters and wall thicknesses are also available upon request.

BARS



Bars - metric sizes

FRANCE	GERMANY	UNITED KINGDOM	U.S.A.
	NAVINIC 10®	CuNi10Fe1Mn	
GAM MM11 (French Navy) GAM MM13 (French Navy)	DIN 17664 alloy 2.0872 Chemicals DIN 17672 alloy 2.0872.10 Mechanicals	BS 2872 alloy CN 102-O BS 2874 alloy CN 102-O Mechanicals Chemicals	ASTM B 151 alloy C70600 Mechanicals Chemicals ASTM B249 Dimensional
	NAVINIC 30®	CuNi30Mn1Fe	
	DIN 17664 alloy 2.0882 Chemicals DIN 17672 alloy 2.0882.10 Mechanicals	BS 2872 alloy CN 107-O BS 2874 alloy CN 107-O Mechanicals Chemicals	ASTM B 151 alloy C71500 Mechanicals Chemicals ASTM B249 Dimensional

Ref : **LBI-RON2000** **LBI-POL2200** **LBI-MEP2600** **LBI-MEP2400**

Rounds		Hexagonals		Flats		Squares	
D mm	Theoretical weight Kg/m	H mm	Theoretical weight Kg/m	L x l mm	Theoretical weight Kg/m	C mm	Theoretical weight Kg/m
10	0,70	12	1,11	20 x 10	1,70	10 x 10	0,90
■ 15	1,58	14	1,51	30 x 10	2,67	20 x 20	3,57
■ 20	2,80	17	2,27	40 x 10	3,57	30 x 30	8,05
■ 25	4,39	■ 19	2,78	40 x 20	7,13	40 x 40	14,26
■ 30	6,32	■ 22	3,73	45 x 30	12,05	50 x 50	22,35
■ 35	8,60	■ 24	4,43	50 x 20	8,90	60 x 60	32,25
■ 40	11,20	■ 27	5,64	60 x 20	10,75	70 x 70	43,80
■ 45	14,20	■ 30	6,97	60 x 30	16,13	80 x 80	57,16
■ 50	17,55	■ 32	7,92	60 x 40	21,90	90 x 90	72,44
■ 55	21,20	■ 36	9,96	80 x 20	14,30	100 x 100	89,50
■ 60	25,30	37	10,77	80 x 40	28,57		
■ 65	29,70	■ 38	11,13	90 x 30	24,15		
■ 70	34,40	■ 40	12,35	90 x 60	48,30		
■ 75	39,40	■ 41	12,98	100 x 50	44,75		
■ 80	44,90	■ 42	13,59	100 x 70	62,45		
■ 85	50,70	■ 46	16,30	120 x 30	32,12		
■ 90	56,90	■ 50	19,36	120 x 40	42,82		
■ 95	63,10	■ 55	23,40	120 x 60	64,23		
■ 100	69,87	■ 60	27,90	120 x 80	85,65		
■ 105	77,03	■ 65	32,60				
■ 110	84,54	70	38,55				
115	92,40	75	44,25				
■ 120	100,61	■ 80	49,53				
■ 125	109,00	■ 85	55,93				
■ 130	118,00						
140	136,00						
■ 150	157,00						
160	179,00						
170	206,00						
180	228,00						
190	257,50						
■ 200	280,00						
250	445,80						
■ 285	570,50						

■ Dimensions kept on stock alloy **NAVINIC 10®**

Please inquire for other dimensions as well as for forgings such as plates, discs, rings and blocks.

Bars - imperial sizes

UNITED KINGDOM	U.S.A.
NAVINIC 10®	CuNi10Fe1Mn
BS 2872 alloy CN 102-O Mechanicals Chemicals BS 2874 alloy CN 102-O Mechanicals Chemicals	ASTM B 151 alloy C70600 Mechanicals Chemicals MIL-C-15726 alloy C70600 Mechanicals Chemicals
NAVINIC 30®	CuNi30Mn1Fe
BS 2872 alloy CN 107-O Mechanicals Chemicals BS 2874 alloy CN 107-O Mechanicals Chemicals NES 780 PART 2 Mechanicals Chemicals	ASTM B 151 alloy C71500 Mechanicals Chemicals MIL-C-15726 alloy C71500 Mechanicals Chemicals

Ref : **LBI-RON2100** **LBI-POL2300**

Rounds				Hexagonals			
D		Theoretical weight		H		Theoretical weight	
inch	mm	Kg/m	Lb/Ft	inch	mm	Kg/m	Lb/Ft
1/4"	6,35	0,29	0,19	1 3/8"	34,93	9,60	6,45
3/8"	9,53	0,65	0,43	1 5/8"	41,27	13,40	9,00
1/2"	12,70	1,15	0,77	2"	50,80	20,30	13,64
5/8"	■ 15,87	1,79	1,21	2 1/4"	57,15	25,69	17,26
3/4"	19,05	2,59	1,74	2 9/16"	65,08	33,32	22,38
7/8"	■ 22,22	3,52	2,36	3"	76,20	45,68	30,69
1"	■ 25,40	4,60	3,09	3 1/2"	88,90	62,18	41,77
1 1/8"	28,58	5,83	3,91				
1 1/4"	31,75	7,19	4,83				
1 3/8"	34,93	8,70	5,85				
1 1/2"	■ 38,10	10,35	6,96				
1 3/4"	44,45	14,09	9,47				
2"	■ 50,80	18,41	12,37				
2 1/4"	57,15	23,30	15,65				
2 3/8"	60,32	25,95	17,43				
2 1/2"	■ 63,50	28,76	19,32				
2 3/4"	69,85	34,80	23,38				
3"	■ 76,20	41,42	27,82				
3 1/2"	■ 88,90	56,37	37,87				
4"	101,60	73,63	49,46				
4 1/2"	114,30	93,18	62,60				
5"	127,00	115,05	77,29				
5 1/2"	139,70	139,21	93,52				
6"	■ 152,40	165,67	111,29				
7"	■ 177,80	225,49	151,49				
8"	203,20	294,52	197,86				
9"	■ 228,60	372,76	250,42				
10"	254,00	460,19	309,16				
11"	279,40	556,83	374,08				
12"	304,80	662,68	445,19				

■ Dimensions kept on stock alloy **NAVINIC 10®**

Please inquire for other dimensions as well as for forgings such as plates, discs, rings and blocks.

BUTT WELD FITTINGS

Elbows R~1D-45°
Seamless, seam welded
LBI-ELB3111

Page : 38

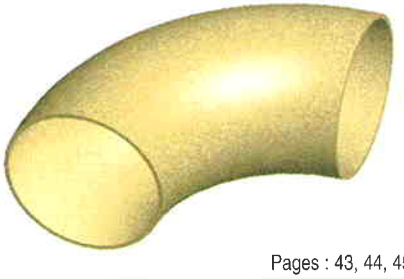
Elbows R~1D-90°
Seamless, seam welded
LBI-ELB3112

Page : 39

Elbows R~1,5D-45°
Seamless, seam welded
LBI-ELB3113 • LBI-ELB3114 • LBI-ELB3115

Pages : 40, 41, 42

Elbows R~1,5D-90°
Seamless, seam welded
LBI-ELB3116 • LBI-ELB3117 • LBI-ELB3118



Pages : 43, 44, 45

Elbows R~1,5D-180°
Seamless, seam welded
LBI-ELB3119

Page : 46

Concentric reducers
Seamless
LBO-RCO3211 • LBI-RCO3213 • LBI-RCO3214
LBI-RCO3215 • LBI-RCO3216

Pages : 47, 48, 49, 50, 52, 53, 54, 55

Concentric reducers
Seamless, seam welded
LBI-RCO3211 • LBI-RCO3212
LBI-RCO3214 • LBI-RCO3216

Pages : 50, 51, 53, 55

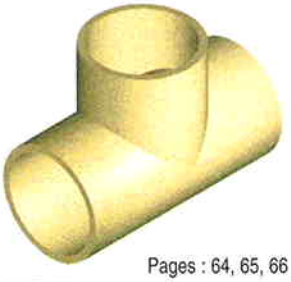
Eccentric reducers
Seamless
LBI-REX3311 • LBI-REX3313 • LBI-REX3315

Pages : 56, 57, 60, 62

Eccentric reducers
Seam welded
LBI-REX3312 • LBI-REX3314 • LBI-REX3316

Pages : 58, 59, 61, 63

Equal tees
Seamless, seam welded
LBI-TEE3411 • LBI-TEE3412
LBI-TEE3413



Pages : 64, 65, 66

Reducing tees
Seamless, seam welded
LBI-TEE3511 • LBI-TEE3512 • LBI-TEE3513
LBI-TEE3514 • LBI-TEE3515 • LBI-TEE3516

Pages : 67, 68, 69, 70, 71, 72, 73, 74

Saddles
Seamless, seam welded
LBI-SAD3611 • LBI-SAD3612 • LBI-SAD3613
LBI-SAD3614 • LBI-SAD3615 • LBI-SAD3616

Pages : 75, 76, 77, 78,
79, 80, 81, 82, 83, 84, 85, 86

Caps
Seamless
LBI-CAP3711 • LBI-CAP3712 • LBI-CAP3713

Pages : 87, 88, 89

Elbows short radius

10 Bar

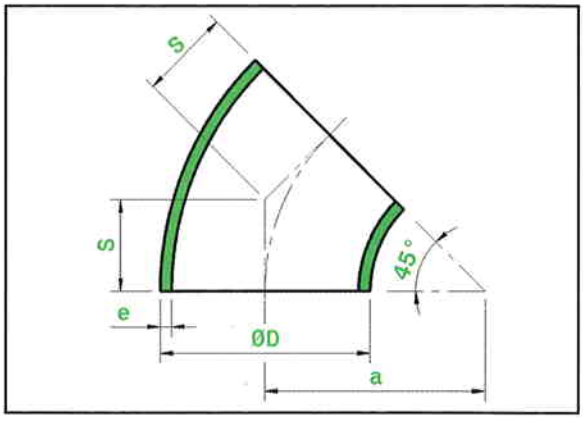
R~1D-45°

■ and 14 Bar

Ref : **LBI-ELB3111**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : Extrapolated from DIN 86090



Outside diameter of pipe ØD		Wall thickness e	Radius a	s	Theoretical weight
nominal inch	actual mm	mm	mm	mm	Kg/piece
SEAMLESS					
1	30	1,5	30	12	0,02
1 1/4	38		32,5	14	0,04
1 1/2	44,5		40	17	0,06
2	57		52,5	22	0,10
2 1/2	76,1	2	70	29	0,22
3	88,9		82,5	34	0,32
		■ 2,5			0,40
4	108	2,5	100	41	0,58
5	133		125	52	0,90
		■ 3			1,08
6	159	2,5	150	62	1,30
		■ 3			1,56
7	193,7	2,5	180	75	1,90
		■ 3,5			2,66
8	219,1	3	210	87	3,00
		■ 3,5			3,50
SEAMLESS or SEAM WELDED					
10	267	3	255	106	4,40
		■ 4			5,87
12	323,9	4	305	126	8,60
		■ 5			10,75
14	368	4	352,5	146	11,30
		■ 5,5			15,54
SEAM WELDED					
16	419,1	4	400	166	16,40
		■ 6			21,87
18	457,2	4	455	188	20,40
		■ 6			30,60
20	508	4,5	505	209	28,10
		■ 6,5			42,15
24	610	5	610	253	40,90
		■ 8			65,45

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

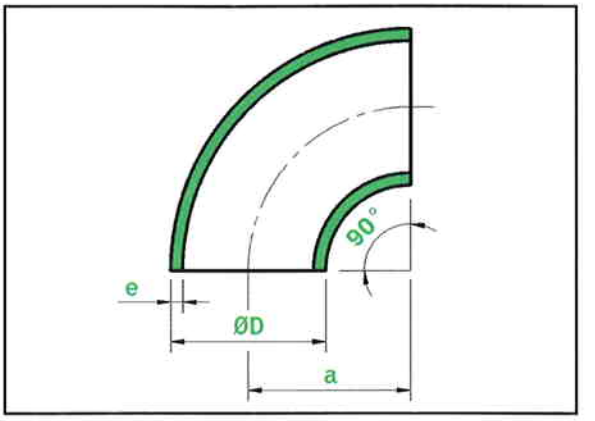
Elbows short radius — 10 Bar

R~1D-90° — ■ and 14 Bar

Ref : **LBI-ELB3112**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : Extrapolated from DIN 86090



Outside diameter of pipe ØD		Wall thickness e	Radius a	Theoretical weight
nominal inch	actual mm	mm	mm	Kg/piece
SEAMLESS				
1	30	1,5	30	0,04
1 1/4	38		32,5	0,08
1 1/2	44,5		40	0,12
2	57		52,5	0,20
2 1/2	76,1	2	70	0,44
3	88,9		82,5	0,64
		■ 2,5		0,80
4	108	2,5	100	1,16
5	133		125	1,80
		■ 3		2,16
6	159	2,5	150	2,60
		■ 3		3,12
7	193,7	2,5	180	3,80
		■ 3,5		5,32
8	219,1	3	210	6,00
		■ 3,5		7,00
SEAMLESS or SEAM WELDED				
10	267	3	255	8,80
		■ 4		11,74
12	323,9	4	305	17,20
		■ 5		21,50
14	368	4	352,5	22,60
		■ 5,5		31,08
SEAM WELDED				
16	419,1	4	400	32,80
		■ 6		43,74
18	457,2	4	455	40,80
		■ 6		61,20
20	508	4,5	505	56,20
		■ 6,5		84,30
24	610	5	610	81;80
		■ 8		130,90

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Elbows long radius

10 Bar

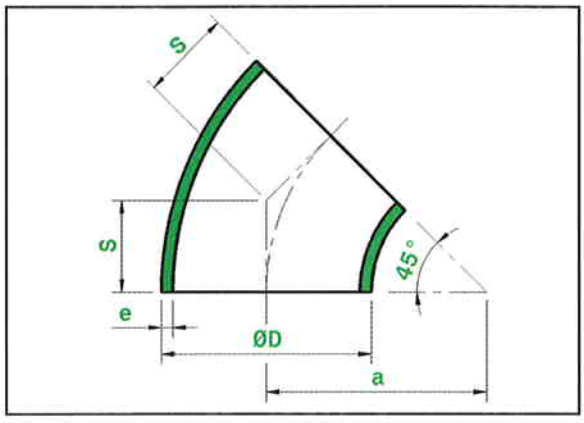
R~1,5D-45°

■ and 14 Bar

Ref : **LBI-ELB3113**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86090



Outside diameter of pipe ØD		Wall thickness e	Radius a	s	Theoretical weight
nominal inch	actual mm	mm	mm	mm	Kg/piece
SEAMLESS					
1/2	20	1	25	10,4	0,01
3/4	25	1,5	27,5	11,4	0,02
1	30		33,5	14	0,03
1 1/4	38		45	19	0,05
1 1/2	44,5		51	21	0,07
2	57		72	30	0,13
2 1/2	76,1	2	95	39	0,30
3	88,9	2	114,5	47	0,43
		■ 2,5			0,54
4	108	2,5	142,5	59	0,82
5	133	2,5	181	75	1,29
		■ 3			1,55
6	159	2,5	216	89	1,85
		■ 3			2,22
7	193,7	2,5	270	112	2,82
		■ 3,5			3,94
8	219,1	3	305	126	4,33
		■ 3,5			5,04
SEAMLESS or SEAM WELDED					
10	267	3	378	157	6,55
		■ 4			8,73
12	323,9	4	457	189	12,80
		■ 5			16,00
14	368	4	533,5	221	17,00
		■ 5,5			23,37
16	419,1	4	609,5	252	29,90
		■ 6			33,20
SEAM WELDED					
18	457,2	4	686	284	30,70
		■ 6			46,05
20	508	4,5	762	316	41,90
		■ 6,5			62,85
24	610	5	915	379	60,62
		■ 8			97,00

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

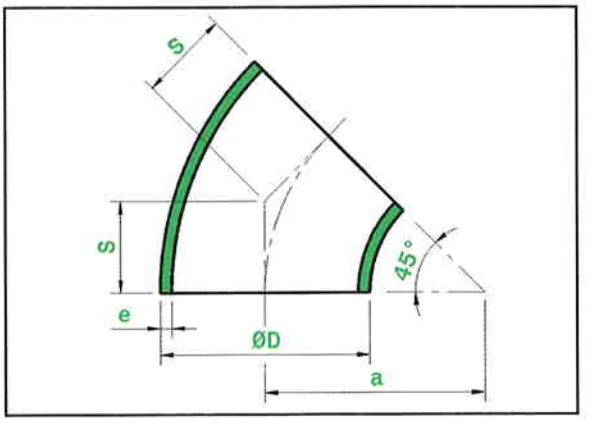
Elbows long radius — 16 Bar

R~1,5D-45°

Ref : **LBI-ELB3114**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD		Wall thickness e	Radius a	s	Theoretical weight
nominal inch	actual mm	mm	mm	mm	Kg/piece
SEAMLESS					
1	30	2,5	38	22	0,06
1 1/4	38		48	25	0,09
1 1/2	44,5		57	29	0,13
2	57		76	35	0,23
2 1/2	76,1		95	44	0,38
3	88,9		114	51	0,54
4	108	3	152	64	1,05
6	159		229	95	2,35
SEAMLESS or SEAM WELDED					
8	219,1	4	305	127	5,75
10	267	4,5	381	159	9,85
12	323,9	5,5	457	190	17,53
SEAM WELDED					
14	368	6,5	533	222	27,46
16	419,1	7	610	254	38,50
18	457,2	8	686	286	54,10
20	508	8,5	762	318	70,93
24	610	10,5	914	381	126,42
28	711	12	1067	438	196,30
32	813	13,5	1219	502	288,00
36	914	15,5	1372	565	418,60

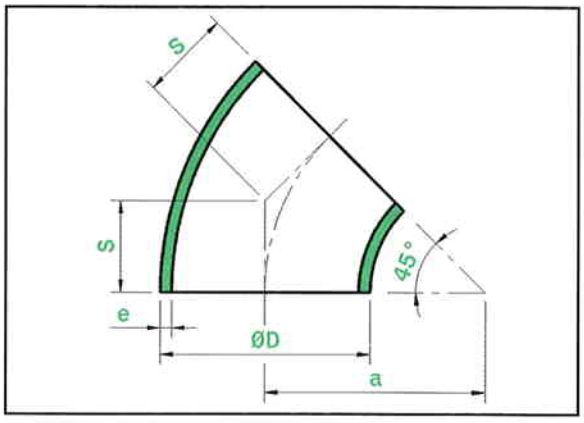
Elbows long radius — 20 Bar

R~1,5D-45°

Ref : **LBI-ELB3115**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD		Wall thickness	Radius		Theoretical weight
nominal inch	actual mm	e mm	a mm	s mm	Kg/piece
SEAMLESS					
1	30	2,5	38	22	0,06
1 1/4	38		48	25	0,09
1 1/2	44,5		57	29	0,13
2	57		76	35	0,23
2 1/2	76,1		95	44	0,38
3	88,9		114	51	0,54
4	108	3	152	64	1,05
6	159	3,5	229	95	2,74
SEAMLESS or SEAM WELDED					
8	219,1	4,5	305	127	6,47
10	267	5,5	381	159	12,04
12	323,9	7	457	190	22,30
SEAM WELDED					
14	368	8	533	222	33,80
16	419,1	9	610	254	49,50
18	457,2	9,5	686	286	64,25
20	508	11	762	318	91,80
24	610	13	914	381	156,60
28	711	15	1067	438	245,40
32	813	17	1219	502	363,85
36	914	19	1372	565	513,13

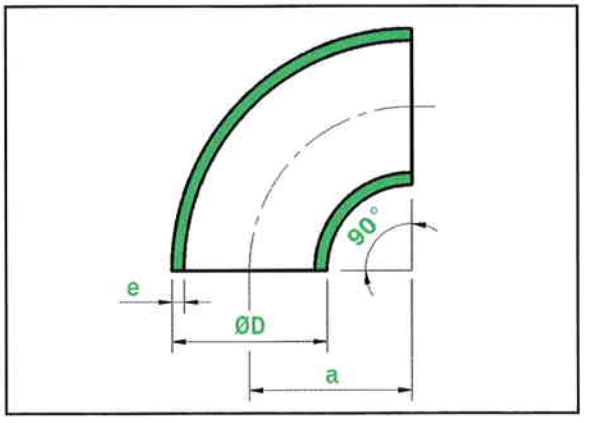
Elbows long radius — 10 Bar

R~1,5D-90° — ■ and 14 Bar

Ref : **LBI-ELB3116**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86090



Outside diameter of pipe ØD		Wall thickness e	Radius a	Theoretical weight
nominal inch	actual mm	mm	mm	Kg/piece
SEAMLESS				
1/2	20	1	25	0,02
3/4	25	1,5	27,5	0,04
1	30		33,5	0,06
1 1/4	38		45	0,10
1 1/2	44,5		51	0,14
2	57		72	0,26
2 1/2	76,1	2	95	0,61
3	88,9		114,5	0,87
		■ 2,5		1,08
4	108	2,5	142,5	1,64
5	133		181	2,58
		■ 3		3,10
6	159	2,5	216	3,70
		■ 3		4,44
7	193,7	2,5	270	5,65
		■ 3,5		7,88
8	219,1	3	305	8,66
		■ 3,5		10,08
SEAMLESS or SEAM WELDED				
10	267	3	378	13,10
		■ 4		17,46
12	323,9	4	457	25,61
		■ 5		32,00
14	368	4	533,5	34,00
		■ 5,5		46,74
SEAM WELDED				
16	419,1	4	609,5	39,40
		■ 6		66,40
18	457,2	4	686	48,40
		■ 6		72,63
20	508	4,5	762	75,62
		■ 6,5		125,70
24	610	5	915	121,24
		■ 8		194,00

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

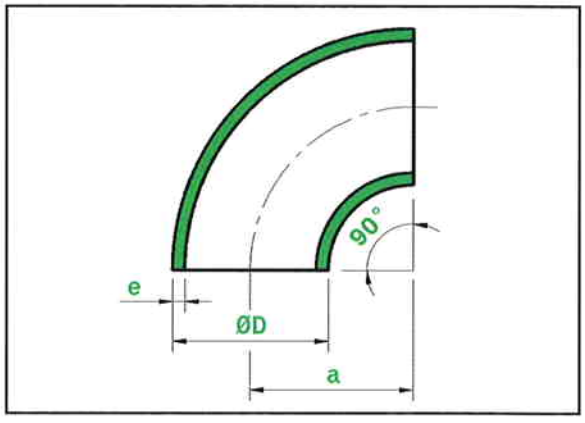
Elbows long radius — 16 Bar

R~1,5D-90°

Ref : **LBI-ELB3117**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD		Wall thickness e	Radius a	Theoretical weight
nominal inch	actual mm	mm	mm	Kg/piece
SEAMLESS				
1	30	2,5	38	0,12
1 1/4	38		48	0,18
1 1/2	44,5		57	0,26
2	57		76	0,46
2 1/2	76,1		95	0,76
3	88,9		114	1,08
4	108	3	152	2,10
6	159		229	4,70
SEAMLESS or SEAM WELDED				
8	219,1	4	305	11,50
10	267	4,5	381	19,70
12	323,9	5,5	457	35,06
SEAM WELDED				
14	368	6,5	533	54,92
16	419,1	7	610	77,00
18	457,2	8	686	108,20
20	508	8,5	762	141,86
24	610	10,5	914	252,94
28	711	12	1067	392,60
32	813	13,5	1219	577,90
36	914	15,5	1372	837,20

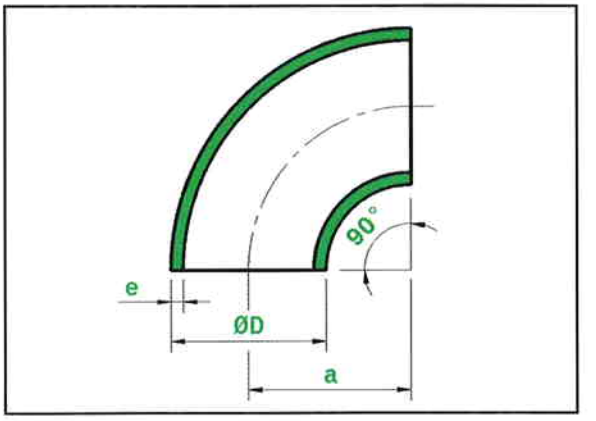
Elbows long radius 20 Bar

R~1,5D-90°

Ref : **LBI-ELB3118**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD		Wall thickness e	Radius a	Theoretical weight
nominal inch	actual mm	mm	mm	Kg/piece
SEAMLESS				
1	30	2,5	38	0,12
1 1/4	38		48	0,18
1 1/2	44,5		57	0,26
2	57		76	0,46
2 1/2	76,1		95	0,76
3	88,9		114	1,08
4	108	3	152	2,10
6	159	3,5	229	5,48
SEAMLESS or SEAM WELDED				
8	219,1	4,5	305	12,94
10	267	5,5	381	24,08
12	323,9	7	457	44,60
SEAM WELDED				
14	368	8	533	67,60
16	419,1	9	610	99,00
18	457,2	9,5	686	128,50
20	508	11	762	183,60
24	610	13	914	313,30
28	711	15	1067	490,80
32	813	17	1219	727,70
36	914	19	1372	1026,26

Elbows long radius

10 Bar

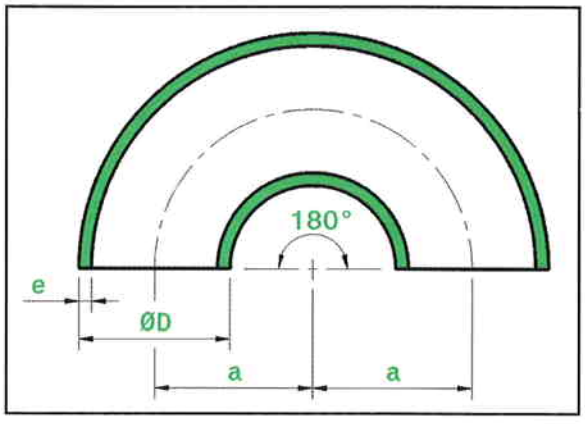
R~1,5D-180°

■ and 14 Bar

Ref : **LBI-ELB3119**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86090



Outside diameter of pipe ØD		Wall thickness e	Radius a	Theoretical weight
nominal inch	actual mm	mm	mm	Kg/piece
SEAMLESS				
1/2	20	1	25	0,04
3/4	25	1,5	27,5	0,08
1	30		33,5	0,12
1 1/4	38		45	0,20
1 1/2	44,5		51	0,28
2	57		72	0,52
2 1/2	76,1	2	95	1,22
3	88,9		114,5	1,74
		■ 2,5		2,10
4	108	2,5	142,5	3,28
5	133		181	5,16
		■ 3		6,20
6	159	2,5	216	7,40
		■ 3		8,88
7	193,7	2,5	270	11,30
		■ 3,5		15,70
8	219,1	3	305	17,32
		■ 3,5		20,70
SEAMLESS or SEAM WELDED				
10	267	3	378	26,20
		■ 4		34,90
12	323,9	4	457	51,22
		■ 5		64,00
14	368	4	533,5	68,00
		■ 5,5		93,40
SEAM WELDED				
16	419,1	4	609,5	88,64
		■ 6		132,80
18	457,2	4	686	108,94
		■ 6		145,26
20	508	4,5	762	151,24
		■ 6,5		251,00
24	610	5	915	242,48
		■ 8		388

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Concentric reducers

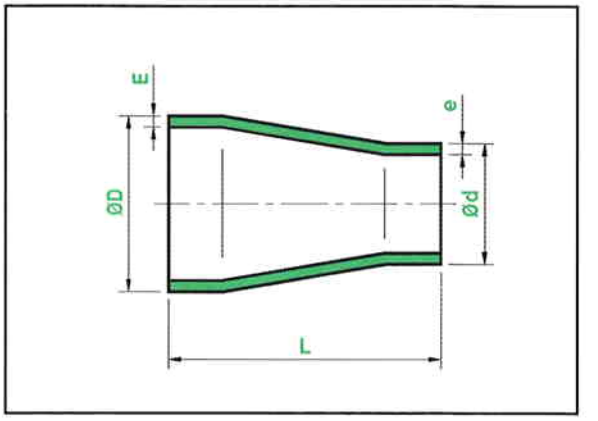
10 Bar

■ and 14 Bar

Ref : **LBI-RCO3211**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86089



Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS									
1/2	x	3/8	20	x	16	1	1	30	0,01
3/4	x	3/8	25	x	16	1,5	1	30	0,02
	x	1/2		x	20		1		0,03
1	x	3/8	30	x	16	1,5	1	35	0,03
	x	1/2		x	20		1		0,04
	x	3/4		x	25		1,5		0,05
1 1/4	x	3/8	38	x	16	1,5	1	50	0,05
	x	1/2		x	20		1		0,06
	x	3/4		x	25		1,5		0,07
	x	1		x	30		1,5		0,08
1 1/2	x	1/2	44,5	x	20	1,5	1	80	0,09
	x	3/4		x	25		1,5		0,11
	x	1		x	30		1,5		0,12
	x	1 1/4		x	38		1,5		0,13
2	x	3/4	57	x	25	1,5	1,5	80	0,13
	x	1		x	30		1,5		0,14
	x	1 1/4		x	38		1,5		0,15
	x	1 1/2		x	44,5		1,5		0,16
2 1/2	x	1	76,1	x	30	2	1,5	90	0,24
	x	1 1/4		x	38		1,5		0,25
	x	1 1/2		x	44,5		1,5		0,26
	x	2		x	57		1,5		0,29
3	x	1 1/4	88,9	x	38	2	1,5	90	0,29
	x	1 1/2		x	44,5		1,5		0,30
	x	2		x	57		1,5		0,32
	x	2 1/2		x	76,1		2		0,40
3	x	1 1/4	88,9	x	38	■ 2,5	1,5	90	0,33
	x	1 1/2		x	44,5		1,5		0,35
	x	2		x	57		1,5		0,38
	x	2 1/2		x	76,1		2		0,48
4	x	1 1/2	108	x	44,5	2,5	1,5	100	0,46
	x	2		x	57		1,5		0,48
	x	2 1/2		x	76,1		2		0,57
	x	3		x	88,9		2		0,61
	x	3		x	88,9		■ 2,5		0,61

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Concentric reducers

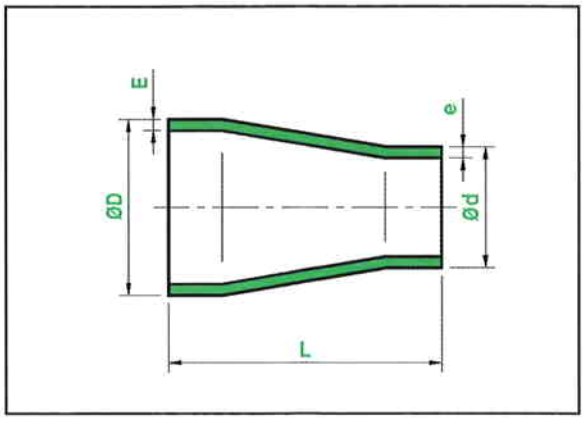
10 Bar

■ and 14 Bar

Ref : **LBI-RCO32111**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86089



Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS									
5	x	2	133	x	57	2,5	1,5	140	0,80
	x	2 1/2		x	76,1		2		0,93
	x	3		x	88,9		2		0,98
	x	4		x	108		2,5		1,16
5	x	2	133	x	57	■ 3	1,5	140	0,86
	x	2 1/2		x	76,1		2		1,06
	x	3		x	88,9		■ 2,5		1,13
	x	4		x	108		2,5		1,34
6	x	2 1/2	159	x	76,1	2,5	2	150	1,13
	x	3		x	88,9		2		1,19
	x	4		x	108		2,5		1,38
	x	5		x	133		2,5		1,51
6	x	2 1/2	159	x	76,1	■ 3	2	150	1,35
	x	3		x	88,9		■ 2,5		1,42
	x	4		x	108		2,5		1,65
	x	5		x	133		■ 3		1,81
7	x	3	193,7	x	88,9	2,5	2	155	1,39
	x	4		x	108		2,5		1,58
	x	5		x	133		2,5		1,71
	x	6		x	159		2,5		1,86
7	x	3	193,7	x	88,9	■ 3,5	■ 2,5	155	1,94
	x	4		x	108		2,5		2,21
	x	5		x	133		■ 3		2,39
	x	6		x	159		■ 3		2,60
8	x	4	219,1	x	108	3	2,5	155	2,47
	x	5		x	133		2,5		2,60
	x	6		x	159		2,5		2,74
	x	7		x	193,7		2,5		2,93
8	x	4	219,1	x	108	■ 3,5	2,5	155	2,88
	x	5		x	133		■ 3		3,03
	x	6		x	159		■ 3		3,20
	x	7		x	193,7		■ 3,5		3,42

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

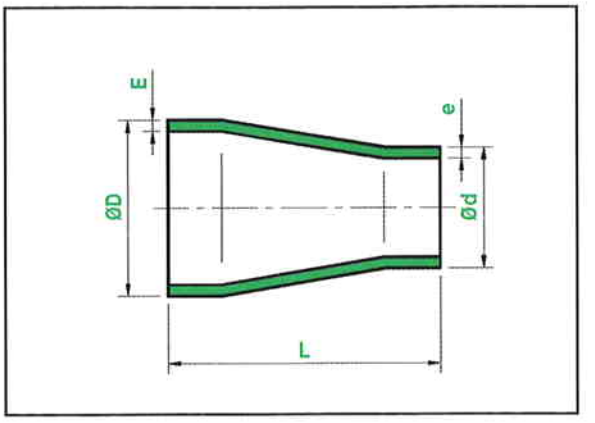
Concentric reducers — 10 Bar

■ and 14 Bar

Ref : **LBI-RCO3211**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86089



Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS									
10	x	5	267	x	133	3	2,5	210	3,30
	x	6		x	159		2,5		3,49
	x	7		x	193,7		2,5		3,75
	x	8		x	219,1		3		4,25
10	x	5	267	x	133	■ 4	■ 3	210	4,40
	x	6		x	159		■ 3		4,65
	x	7		x	193,7		■ 3,5		5,00
	x	8		x	219,1		■ 3,5		5,65
12	x	7	323,9	x	193,7	4	2,5	210	6,02
	x	8		x	219,1		3		6,30
	x	10		x	267		3		6,88
14	x	8	368	x	219,1	4	3	300	9,76
	x	10		x	267		3		10,57
	x	12		x	323,9		4		11,53
16	x	10	419,1	x	267	4	3	300	12,38
	x	12		x	323,9		4		13,42
	x	14		x	368		4		14,22

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Concentric reducers

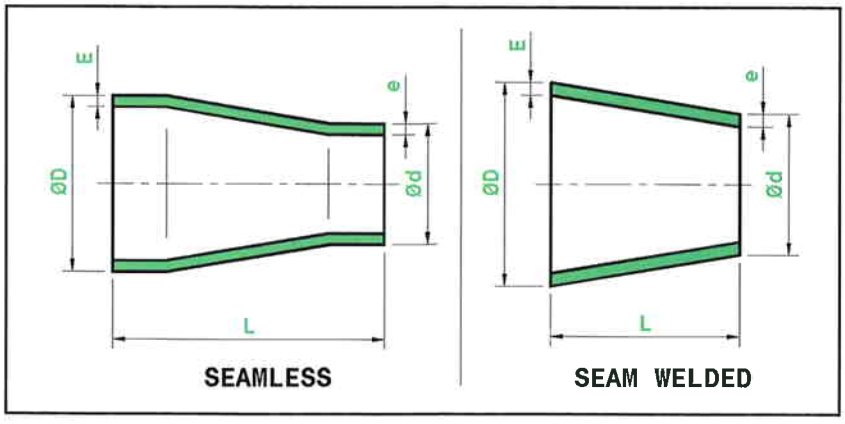
10 Bar

■ and 14 Bar

Ref : **LBI-RCO3211**

Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86089



Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS or SEAM WELDED									
12	x	5	323,9	x	133	4	2,5	210	5,30
	x	6		x	159		2,5		5,60
12	x	5	323,9	x	133	■ 5	■ 3	210	6,62
	x	6		x	159		■ 3		7,00
	x	7		x	193,7		■ 3,5		7,52
	x	8		x	219,1		■ 3,5		7,90
	x	10		x	267		■ 4		8,60
14	x	6	368	x	159	4	2,5	300	8,75
	x	7		x	193,7		2,5		9,34
14	x	6	368	x	159	■ 5,5	■ 3	300	12,03
	x	7		x	193,7		■ 3		12,84
	x	8		x	219,1		■ 3,5		13,42
	x	10		x	267		■ 4		14,53
	x	12		x	323,9		■ 5		15,85
16	x	7	419,1	x	193,7	4	2,5	325	11,04
	x	8		x	219,1		3		11,50
16	x	7	419,1	x	193,7	■ 6	■ 3,5	325	16,56
	x	8		x	219,1		■ 3,5		17,25
	x	10		x	267		■ 4		18,57
	x	12		x	323,9		■ 5		20,13
	x	14		x	368		■ 5,5		21,33

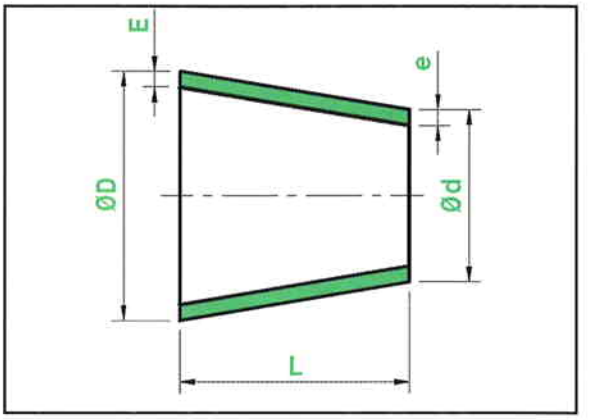
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Concentric reducers — 10 Bar

■ and 14 Bar

Ref : **LBI-RCO3212**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



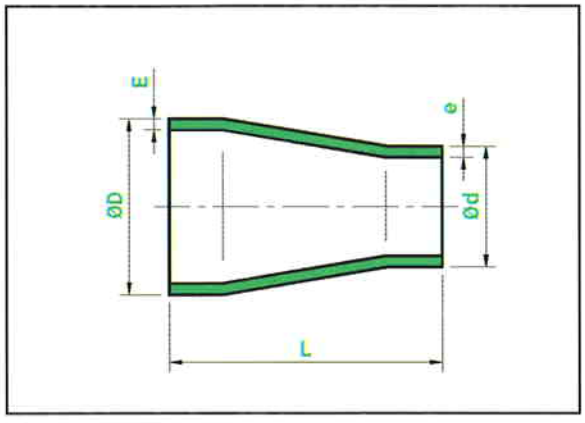
Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAM WELDED									
18	x	8	457,2	x	219,1	4	3	350	13,14
	x	10		x	267		3		14,08
	x	12		x	323,9		4		15,20
	x	14		x	368		4		16,06
	x	16		x	419,1		4		17,07
18	x	8	457,2	x	219,1	■ 6	■ 3,5	350	19,70
	x	10		x	267		■ 4		21,10
	x	12		x	323,9		■ 5		22,80
	x	14		x	368		■ 5,5		24,10
	x	16		x	419,1		■ 6		25,80
20	x	10	508	x	267	4,5	3	375	18,07
	x	12		x	323,9		4		19,42
	x	14		x	368		4		20,47
	x	16		x	419,1		4		21,68
	x	18		x	457,2		4		22,57
20	x	10	508	x	267	■ 6,5	■ 4	375	26,10
	x	12		x	323,9		■ 5		28,05
	x	14		x	368		■ 5,5		29,60
	x	16		x	419,1		■ 6		31,30
	x	18		x	457,2		■ 6		32,60
24	x	14	610	x	368	5	4	400	27,19
	x	16		x	419,1		4		28,62
	x	18		x	457,2		4		29,69
	x	20		x	508		4,5		31,12
24	x	14	610	x	368	■ 8	■ 5,5	400	43,50
	x	16		x	419,1		■ 6		45,80
	x	18		x	457,2		■ 6		47,50
	x	20		x	508		■ 6,5		49,80

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Ref : **LBI-RCO3213**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



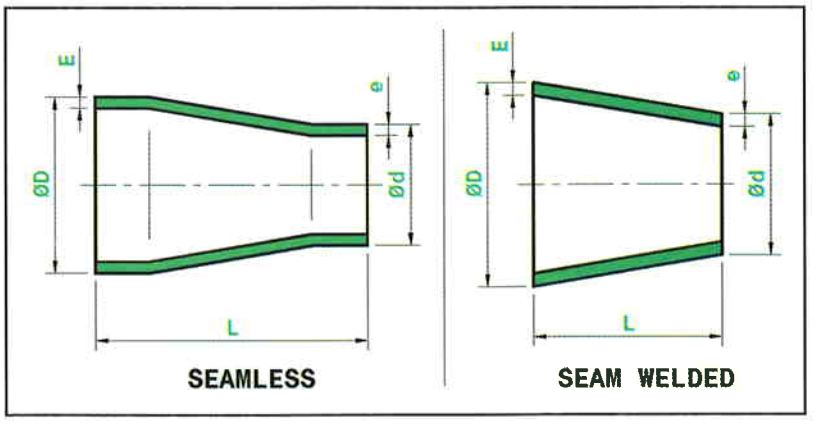
Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS									
1	x	3/4	30	x	25	2,5	2	51	0,09
1 1/4	x	3/4	38	x	25	2,5	2	51	0,10
	x	1		x	30		2,5		0,11
1 1/2	x	3/4	44,5	x	25	2,5	2	64	0,14
	x	1		x	30		2,5		0,15
	x	1 1/4		x	38		2,5		0,17
2	x	1	57	x	30	2,5	2,5	76	0,21
	x	1 1/4		x	38		2,5		0,23
	x	1 1/2		x	44,5		2,5		0,25
2 1/2	x	1 1/4	76,1	x	38	2,5	2,5	89	0,34
	x	1 1/2		x	44,5		2,5		0,36
	x	2		x	57		2,5		0,40
3	x	1 1/2	88,9	x	44,5	2,5	2,5	89	0,40
	x	2		x	57		2,5		0,44
	x	2 1/2		x	76,1		2,5		0,50
4	x	2	108	x	57	3	2,5	102	0,68
	x	2 1/2		x	76,1		2,5		0,76
	x	3		x	88,9		2,5		0,82
6	x	2	159	x	57	3	2,5	140	1,30
	x	2 1/2		x	76,1		2,5		1,35
	x	3		x	88,9		2,5		1,42
	x	4		x	108		3		1,54

Concentric reducers — 16 Bar

Ref : **LBI-RCO3214**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146

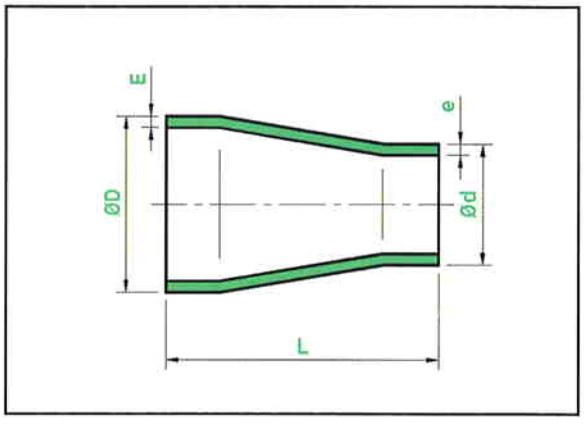


Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS or SEAM WELDED									
8	x	2 1/2	219,1	x	76,1	4	2,5	152	2,45
	x	3		x	88,9		2,5		2,55
	x	4		x	108		3		2,72
	x	6		x	159		3		3,16
10	x	4	267	x	108	4,5	3	178	4,11
	x	6		x	159		3		4,69
	x	8		x	219,1		4		5,36
12	x	6	323,9	x	159	5,5	3	203	7,39
	x	8		x	219,1		4		8,33
	x	10		x	267		4,5		9,09
14	x	8	368	x	219,1	6,5	4	330	17,28
	x	10		x	267		4,5		18,73
	x	12		x	323,9		5,5		20,44
16	x	10	419,1	x	267	7	4,5	356	23,51
	x	12		x	323,9		5,5		25,51
	x	14		x	368		6,5		27,04
SEAM WELDED									
18	x	12	457,2	x	323,9	8	5,5	381	32,72
	x	14		x	368		6,5		34,61
	x	16		x	419,1		7		36,80
20	x	14	508	x	368	8,5	6,5	508	52,07
	x	16		x	419,1		7		55,17
	x	18		x	457,2		8		57,48
24	x	16	610	x	419,1	10,5	7	508	75,49
	x	18		x	457,2		8		78,34
	x	20		x	508		8,5		82,15
28	x	18	711	x	457,2	12	8	610	117,58
	x	20		x	508		8,5		122,82
	x	24		x	610		10,5		133,30
32	x	24	813	x	610	13,5	10,5	610	161,42
	x	28		x	711		12		173,09
36	x	24	914	x	610	15,5	10,5	610	274,48
	x	28		x	711		12		287,89
	x	32		x	813		13,5		301,43

Ref : **LBI-RCO3215**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146

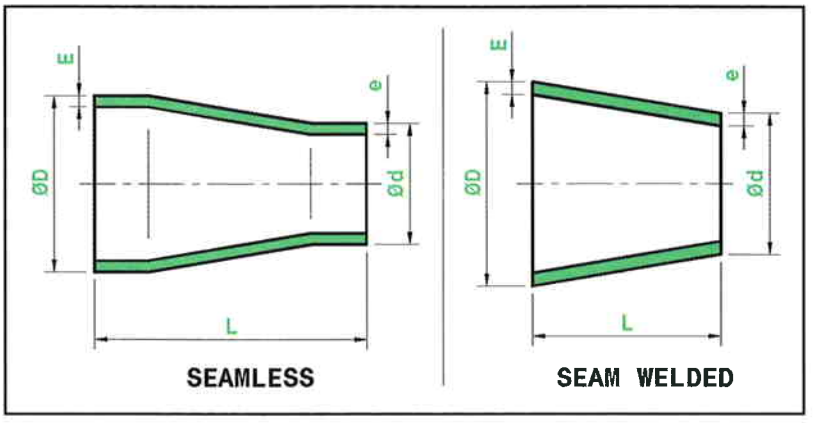


Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS									
1	x	3/4	30	x	25	2,5	2	51	0,09
1 1/4	x	3/4	38	x	25	2,5	2	51	0,10
	x	1		x	30		2,5		0,11
1 1/2	x	3/4	44,5	x	25	2,5	2	64	0,14
	x	1		x	30		2,5		0,15
	x	1 1/4		x	38		2,5		0,17
2	x	1	57	x	30	2,5	2,5	76	0,21
	x	1 1/4		x	38		2,5		0,23
	x	1 1/2		x	44,5		2,5		0,25
2 1/2	x	1 1/4	76,1	x	38	2,5	2,5	89	0,34
	x	1 1/2		x	44,5		2,5		0,36
	x	2		x	57		2,5		0,40
3	x	1 1/2	88,9	x	44,5	2,5	2,5	89	0,40
	x	2		x	57		2,5		0,44
	x	2 1/2		x	76,1		2,5		0,50
4	x	2	108	x	57	3	2,5	102	0,68
	x	2 1/2		x	76,1		2,5		0,76
	x	3		x	88,9		2,5		0,82
6	x	2	159	x	57	3,5	2,5	140	1,50
	x	2 1/2		x	76,1		2,5		1,56
	x	3		x	88,9		2,5		1,65
	x	4		x	108		3		1,78

Ref : **LBI-RCO3216**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS or SEAM WELDED									
8	x	2 1/2	219,1	x	76,1	4,5	2,5	152	2,74
	x	3		x	88,9		2,5		2,87
	x	4		x	108		3		3,05
	x	6		x	159		3,5		3,54
10	x	4	267	x	108	5,5	3	178	5,00
	x	6		x	159		3,5		5,70
	x	8		x	219,1		4,5		6,53
12	x	6	323,9	x	159	7	3,5	203	9,35
	x	8		x	219,1		4,5		10,55
	x	10		x	267		5,5		11,52
14	x	8	368	x	219,1	8	4,5	330	21,16
	x	10		x	267		5,5		22,95
	x	12		x	323,9		7		25,06
16	x	10	419,1	x	267	9	5,5	356	30,05
	x	12		x	323,9		7		32,62
	x	14		x	368		8		34,60
SEAM WELDED									
18	x	12	457,2	x	323,9	9,5	7	381	38,85
	x	14		x	368		8		41,10
	x	16		x	419,1		9		43,70
20	x	14	508	x	368	11	8	508	67,38
	x	16		x	419,1		9		71,39
	x	18		x	457,2		9,5		74,38
24	x	16	610	x	419,1	13	9	508	93,46
	x	18		x	457,2		9,5		96,99
	x	20		x	508		11		101,70
28	x	18	711	x	457,2	15	9,5	610	146,97
	x	20		x	508		11		153,52
	x	24		x	610		13		166,62
32	x	24	813	x	610	17	13	610	203,26
	x	28		x	711		15		217,96
36	x	24	914	x	610	19	13	610	336,45
	x	28		x	711		15		352,89
	x	32		x	813		17		369,49

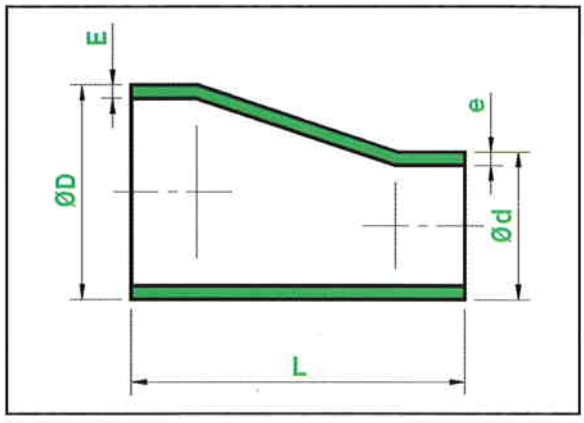
Eccentric reducers

10 Bar

■ and 14 Bar

Ref : **LBI-REX3311**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



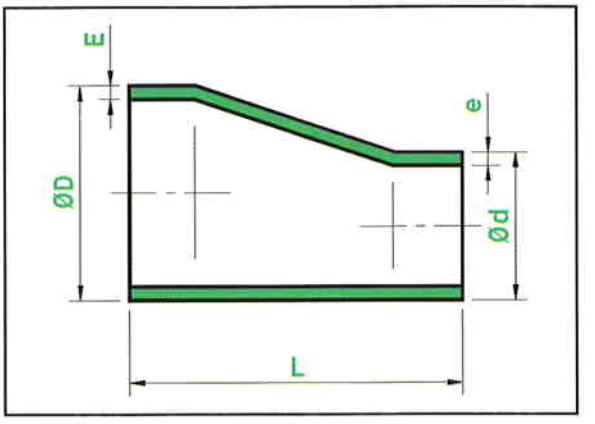
Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS									
1/2	x	3/8	20	x	16	1	1	30	0,01
3/4	x	3/8	25	x	16	1,5	1	30	0,02
	x	1/2		x	20		1		0,03
1	x	3/8	30	x	16	1,5	1	35	0,03
	x	1/2		x	20		1		0,04
	x	3/4		x	25		1,5		0,05
1 1/4	x	3/8	38	x	16	1,5	1	50	0,05
	x	1/2		x	20		1		0,06
	x	3/4		x	25		1,5		0,07
	x	1		x	30		1,5		0,08
1 1/2	x	1/2	44,5	x	20	1,5	1	80	0,09
	x	3/4		x	25		1,5		0,11
	x	1		x	30		1,5		0,12
	x	1 1/4		x	38		1,5		0,13
2	x	3/4	57	x	25	1,5	1,5	80	0,13
	x	1		x	30		1,5		0,14
	x	1 1/4		x	38		1,5		0,15
	x	1 1/2		x	44,5		1,5		0,16
2 1/2	x	1	76,1	x	30	2	1,5	90	0,24
	x	1 1/4		x	38		1,5		0,25
	x	1 1/2		x	44,5		1,5		0,26
	x	2		x	57		1,5		0,29
3	x	1 1/4	88,9	x	38	2	1,5	90	0,29
	x	1 1/2		x	44,5		1,5		0,30
	x	2		x	57		1,5		0,32
	x	2 1/2		x	76		2		0,40
3	x	1 1/4	88,9	x	38	■ 2,5	1,5	90	0,29
	x	1 1/2		x	44,5		1,5		0,30
	x	2		x	57		1,5		0,32
	x	2 1/2		x	76,1		2		0,40
4	x	1 1/2	108	x	44,5	2,5	1,5	100	0,46
	x	2		x	57		1,5		0,48
	x	2 1/2		x	76,1		2		0,57
	x	3		x	88,9		2		0,61
	x	3		x	88,9		■ 2,5		0,61

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Eccentric reducers — 10 Bar ■ and 14 Bar

Ref : **LBI-REX3311**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS									
5	x	2	133	x	57	2,5	1,5	140	0,80
	x	2 1/2		x	76,1		2		0,93
	x	3		x	88,9		2		0,98
	x	4		x	108		2,5		1,16
5	x	2	133	x	57	■ 3	1,5	140	0,86
	x	2 1/2		x	76,1		2		1,06
	x	3		x	88,9		■ 2,5		1,13
	x	4		x	108		2,5		1,34
6	x	2 1/2	159	x	76,1	2,5	2	150	1,13
	x	3		x	88,9		2		1,19
	x	4		x	108		2,5		1,38
	x	5		x	133		2,5		1,51
6	x	2 1/2	159	x	76,1	■ 3	2	150	1,35
	x	3		x	88,9		■ 2,5		1,42
	x	4		x	108		2,5		1,65
	x	5		x	133		■ 3		1,81
7	x	3	193,7	x	88,9	2,5	2	155	1,39
	x	4		x	108		2,5		1,58
	x	5		x	133		2,5		1,71
	x	6		x	159		2,5		1,85
7	x	3	193,7	x	88,9	■ 3,5	■ 2,5	155	1,94
	x	4		x	108		2,5		2,21
	x	5		x	133		■ 3		2,39
	x	6		x	159		■ 3		2,60
8	x	4	219,1	x	108	3	2,5	155	2,47
	x	5		x	133		2,5		2,60
	x	6		x	159		2,5		2,74
	x	7		x	193,7		2,5		2,93
8	x	4	219,1	x	108	■ 3,5	2	155	2,88
	x	5		x	133		■ 3		3,03
	x	6		x	159		■ 3		3,20
	x	7		x	193,7		■ 3		3,42

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

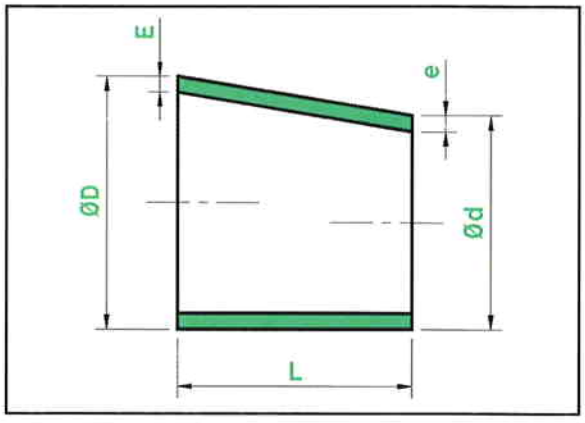
Eccentric reducers

10 Bar

■ and 14 Bar

Ref : **LBI-REX3312**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAM WELDED									
10	x	5	267	x	133	3	2,5	210	3,30
	x	6		x	159		2,5		3,49
	x	7		x	193,7		2,5		3,75
	x	8		x	219,1		3		4,25
10	x	5	267	x	133	■ 4	■ 3	210	4,40
	x	6		x	159		■ 3		4,65
	x	7		x	193,7		■ 3,5		5,00
	x	8		x	219,1		■ 3,5		5,65
12	x	5	323,9	x	133	4	2,5	210	5,30
	x	6		x	159		2,5		5,60
	x	7		x	193,7		2,5		6,02
	x	8		x	219,1		3		6,30
	x	10		x	267		3		6,88
12	x	5	323,9	x	133	■ 5	■ 3	210	6,62
	x	6		x	159		■ 3		7,00
	x	7		x	193,7		■ 3,5		7,52
	x	8		x	219,1		■ 3,5		7,90
	x	10		x	267		■ 4		8,60
14	x	6	368	x	159	4	2,5	300	8,75
	x	7		x	193,7		2,5		9,34
	x	8		x	219,1		3		9,76
	x	10		x	267		3		10,57
	x	12		x	323,3		4		11,53
14	x	6	368	x	159	■ 5,5	■ 3	300	12,03
	x	7		x	193,7		■ 3		12,84
	x	8		x	219,1		■ 3,5		13,42
	x	10		x	267		■ 4		14,53
	x	12		x	323,3		■ 5		15,85
16	x	7	419,1	x	193,7	4	2,5	325	11,04
	x	8		x	219,1		3		11,50
	x	10		x	267		3		12,38
	x	12		x	323,9		4		13,42
	x	14		x	368		4		14,22

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

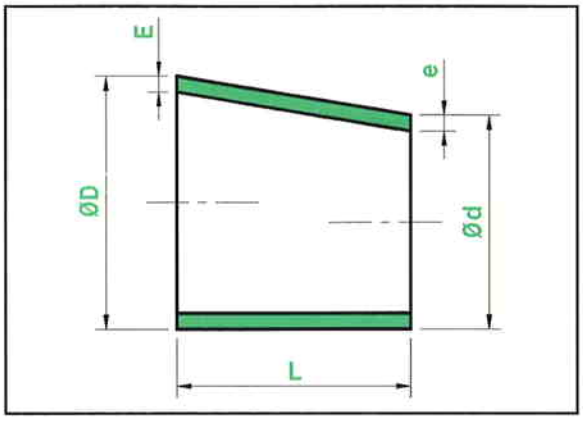
Eccentric reducers

10 Bar

■ and 14 Bar

Ref : **LBI-REX3312**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



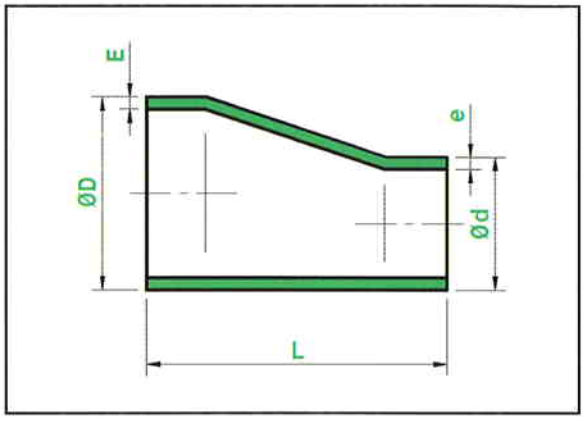
Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAM WELDED									
16	x	7	419,1	x	193,7	■ 6	■ 3,5	325	16,56
	x	8		x	219,1		■ 3,5		17,25
	x	10		x	267		■ 4		18,57
	x	12		x	323,9		■ 5		20,13
	x	14		x	368		■ 5,5		21,33
18	x	8	457,2	x	219,1	4	3	350	13,14
	x	10		x	267		3		14,08
	x	12		x	323,9		4		15,20
	x	14		x	368		4		16,06
	x	16		x	419,1		4		17,07
18	x	8	457,2	x	219,1	■ 6	■ 3,5	350	19,70
	x	10		x	267		■ 4		21,10
	x	12		x	323,9		■ 5		22,80
	x	14		x	368		■ 5,5		24,10
	x	16		x	419,1		■ 6		25,60
20	x	10	508	x	267	4,5	3	375	18,07
	x	12		x	323,9		4		19,42
	x	14		x	368		4		20,47
	x	16		x	419,1		4		21,68
	x	18		x	457,2		4		22,57
20	x	10	508	x	267	■ 6,5	■ 4	375	26,10
	x	12		x	323,9		■ 5		28,05
	x	14		x	368		■ 5,5		29,60
	x	16		x	419,1		■ 6		31,30
	x	18		x	457,2		■ 6		32,60
24	x	14	610	x	368	5	4	400	27,19
	x	16		x	419,1		4		28,62
	x	18		x	457,2		4		29,69
	x	20		x	508		4,5		31,12
24	x	14	610	x	368	■ 8	■ 5,5	400	43,50
	x	16		x	419,1		■ 6		45,80
	x	18		x	457,2		■ 6		47,50
	x	20		x	508		■ 6,5		49,80

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Ref : **LBI-REX3313**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



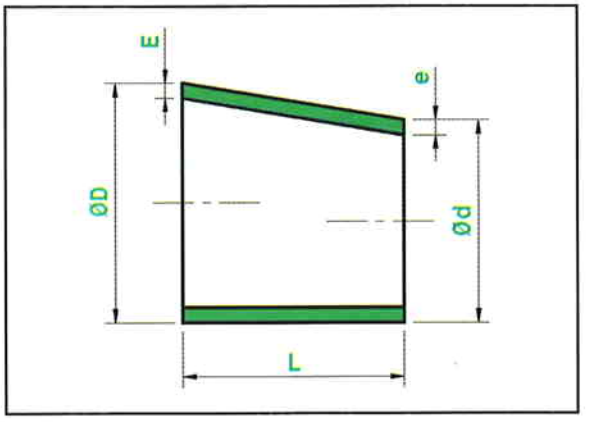
Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS									
1	x	3/4	30	x	25	2,5	2	51	0,09
1 1/4	x	3/4	38	x	25	2,5	2	51	0,10
	x	1		x	30		2,5		0,11
1 1/2	x	3/4	44,5	x	25	2,5	2	64	0,14
	x	1		x	30		2,5		0,15
	x	1 1/4		x	38		2,5		0,17
2	x	1	57	x	30	2,5	2,5	76	0,21
	x	1 1/4		x	38		2,5		0,23
	x	1 1/2		x	44,5		2,5		0,25
2 1/2	x	1 1/4	76,1	x	38	2,5	2,5	89	0,34
	x	1 1/2		x	44,5		2,5		0,36
	x	2		x	57		2,5		0,40
3	x	1 1/2	88,9	x	44,5	2,5	2,5	89	0,40
	x	2		x	57		2,5		0,44
	x	2 1/2		x	76,1		2,5		0,50
4	x	2	108	x	57	3	2,5	102	0,68
	x	2 1/2		x	76,1		2,5		0,76
	x	3		x	88,9		2,5		0,82
6	x	2	159	x	57	3	2,5	140	1,30
	x	2 1/2		x	76,1		2,5		1,35
	x	3		x	88,9		2,5		1,42
	x	4		x	108		3		1,54

Eccentric reducers — 16 Bar

Ref : **LBI-REX3314**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146

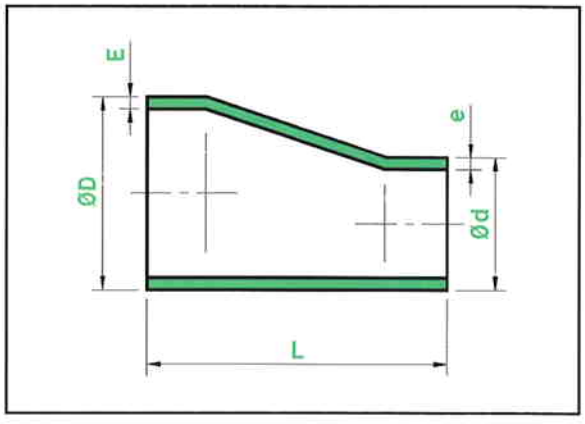


Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAM WELDED									
8	x	2 1/2	219,1	x	76,1	4	2,5	152	2,45
	x	3		x	88,9		2,5		2,55
	x	4		x	108		3		2,72
	x	6		x	159		3		3,16
10	x	4	267	x	108	4,5	3	178	4,11
	x	6		x	159		3		4,69
	x	8		x	219,1		4		5,36
12	x	6	323,9	x	159	5,5	3	203	7,39
	x	8		x	219,1		4		8,33
	x	10		x	267		4,5		9,09
14	x	8	368	x	219,1	6,5	4	330	17,28
	x	10		x	267		4,5		18,73
	x	12		x	323,9		5,5		20,44
16	x	10	419,1	x	267	7	4,5	356	23,51
	x	12		x	323,9		5,5		25,51
	x	14		x	368		6,5		27,04
18	x	12	457,2	x	323,9	8	5,5	381	32,72
	x	14		x	368		6,5		34,61
	x	16		x	419,1		7		36,80
20	x	14	508	x	368	8,5	6,5	508	52,07
	x	16		x	419,1		7		55,17
	x	18		x	457,2		8		57,48
24	x	16	610	x	419,1	10,5	7	508	75,49
	x	18		x	457,2		8		78,34
	x	20		x	508		8,5		82,15
28	x	18	711	x	457,2	12	8	610	117,58
	x	20		x	508		8,5		122,82
	x	24		x	610		10,5		133,30
32	x	24	813	x	610	13,5	10,5	610	161,42
	x	28		x	711		12		173,09
36	x	24	914	x	610	15,5	10,5	610	274,48
	x	28		x	711		12		287,89
	x	32		x	813		13,5		301,43

Ref : **LBI-REX3315**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



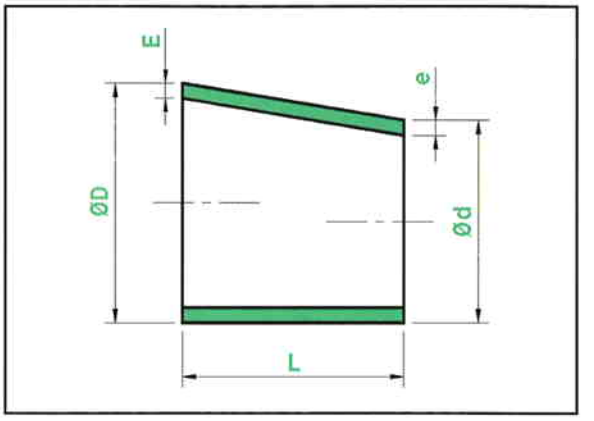
Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAMLESS									
1	x	3/4	30	x	25	2,5	2	51	0,09
1 1/4	x	3/4	38	x	25	2,5	2	51	0,10
	x	1		x	30		2,5		0,11
1 1/2	x	3/4	44,5	x	25	2,5	2	64	0,14
	x	1		x	30		2,5		0,15
	x	1 1/4		x	38		2,5		0,17
2	x	1	57	x	30	2,5	2,5	76	0,21
	x	1 1/4		x	38		2,5		0,23
	x	1 1/2		x	44,5		2,5		0,25
2 1/2	x	1 1/4	76,1	x	38	2,5	2,5	89	0,34
	x	1 1/2		x	44,5		2,5		0,36
	x	2		x	57		2,5		0,40
3	x	1 1/2	88,9	x	44,5	2,5	2,5	89	0,40
	x	2		x	57		2,5		0,44
	x	2 1/2		x	76,1		2,5		0,50
4	x	2	108	x	57	3	2,5	102	0,68
	x	2 1/2		x	76,1		2,5		0,76
	x	3		x	88,9		2,5		0,82
6	x	2	159	x	57	3,5	2,5	140	1,50
	x	2 1/2		x	76,1		2,5		1,56
	x	3		x	88,9		2,5		1,65
	x	4		x	108		3		1,78

Eccentric reducers 20 Bar

Ref : **LBI-REX3316**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter ØD x Ød nominal inch			Outside diameter ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Length L mm	Theoretical weight Kg/piece
SEAM WELDED									
8	x	2 1/2	219,1	x	76,1	4,5	2,5	152	2,74
	x	3		x	88,9		2,5		2,87
	x	4		x	108		3		3,05
	x	6		x	159		3,5		3,54
10	x	4	267	x	108	5,5	3	178	5,00
	x	6		x	159		3,5		5,70
	x	8		x	219,1		4,5		6,53
12	x	6	323,9	x	159	7	3,5	203	9,35
	x	8		x	219,1		4,5		10,55
	x	10		x	267		5,5		11,52
14	x	8	368	x	219,1	8	4,5	330	21,16
	x	10		x	267		5,5		22,95
	x	12		x	323,9		7		25,06
16	x	10	419,1	x	267	9	5,5	356	30,05
	x	12		x	323,9		7		32,62
	x	14		x	368		8		35,60
18	x	12	457,2	x	323,9	9,5	7	381	38,85
	x	14		x	368		8		41,10
	x	16		x	419,1		9		43,70
20	x	14	508	x	368	11	8	508	67,38
	x	16		x	419,1		9		71,39
	x	18		x	457,2		9,5		74,38
24	x	16	610	x	419,1	13	9	508	93,46
	x	18		x	457,2		9,5		96,99
	x	20		x	508		11		101,70
28	x	18	711	x	457,2	15	9,5	610	146,97
	x	20		x	508		11		153,52
	x	24		x	610		13		166,62
32	x	24	813	x	610	17	13	610	203,26
	x	28		x	711		15		217,96
36	x	24	914	x	610	19	13	610	336,45
	x	28		x	711		15		352,89
	x	32		x	813		17		369,49

Equal tees

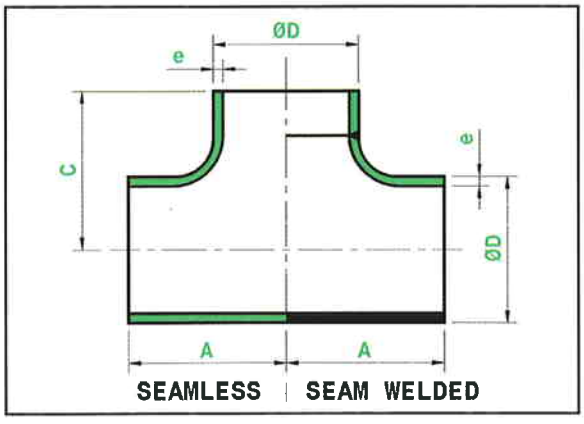
10 Bar

■ and 14 Bar

Ref : **LBI-TEE3411**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86088



Outside diameter of pipe ØD		Wall thickness e	A	C	Theoretical weight
nominal inch	actual mm	mm	mm	mm	Kg/piece
SEAMLESS					
1/2	20	1	25	25	0,05
3/4	25	1,5	29	29	0,07
1	30	1,5	38	38	0,10
1 1/4	38	1,5	48	48	0,13
1 1/2	44,5	1,5	57	57	0,19
2	57	1,5	64	64	0,29
2 1/2	76,1	2	76	76	0,65
3	88,9	2	86	86	0,82
		■ 2,5	86	86	1,03
4	108	2,5	105	105	1,60
5	133	■ 2,5	124	124	2,80
		■ 3	124	124	3,36
6	159	2,5	143	143	4,40
		■ 3	143	143	5,28
7	193,7	2,5	157	157	4,70
		■ 3	157	157	6,60
8	219,1	3	178	178	12,80
		■ 3,5	178	178	14,95
SEAM WELDED					
10	267	3	216	216	16,60
		■ 4	216	216	22,10
12	323,9	4	254	254	31,50
		■ 5	254	254	39,40
14	368	4	279	279	39,40
		■ 5,5	279	279	54,20
16	419,1	4	305	305	55,10
		■ 6	305	305	82,65
18	457,2	4	343	343	67,65
		■ 6	343	343	101,50
20	508	4,5	381	381	92,80
		■ 6,5	381	381	134,10
24	610	5	432	432	126,60
		■ 8	432	432	202,60

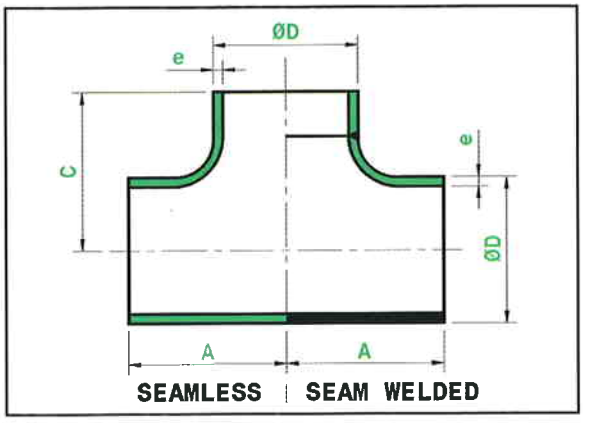
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Equal tees — 16 Bar

Ref : **LBI-TEE3412**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146

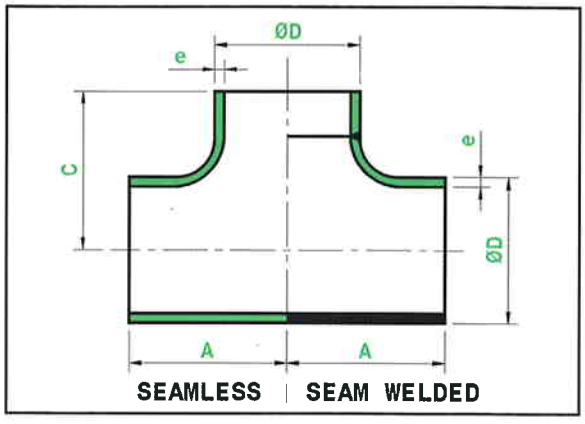


Outside diameter of pipe ØD		Wall thickness e	A	C	Theoretical weight
nominal inch	actual mm	mm	mm	mm	Kg/piece
SEAMLESS					
1	30	2,5	38	38	0,18
1 1/4	38		48	48	0,29
1 1/2	44,5		57	57	0,43
2	57		64	64	0,57
2 1/2	76,1		76	76	0,88
3	88,9		86	86	1,16
4	108	3	105	105	2,09
6	159		143	143	4,07
8	219,1	4	178	178	17,00
WELDED					
10	267	4,5	216	216	24,90
12	323,9	5,5	254	254	43,30
14	368	6,5	279	279	64,05
16	419,1	7	305	305	96,40
18	457,2	8	343	343	135,30
20	508	8,5	381	381	175,30
24	610	10,5	432	432	265,90
28	711	12,0	521	521	427,00
32	813	13,5	597	597	546,10
36	914	15,5	673	673	794,10

Ref : **LBI-TEE3413**

Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD		Wall thickness e	A	C	Theoretical weight
nominal inch	actual mm	mm	mm	mm	Kg/piece
SEAMLESS					
1	30	2,5	38	38	0,18
1 1/4	38		48	48	0,29
1 1/2	44,5		57	57	0,43
2	57		64	64	0,57
2 1/2	76		76	76	0,88
3	89		86	86	1,16
4	108	3	105	105	2,09
6	159	3,5	143	143	4,74
8	219	4,5	178	178	19,10
SEAM WELDED					
10	267	5,5	216	216	30,40
12	324	7	254	254	55,10
14	368	8	279	279	78,80
16	419	9	305	305	124,00
18	457	9,5	343	343	160,65
20	508	11	381	381	226,90
24	610	13	432	432	329,20
28	711	15	521	521	533,75
32	813	17	597	597	687,70
36	914	19	673	673	973,40

Reducing tees

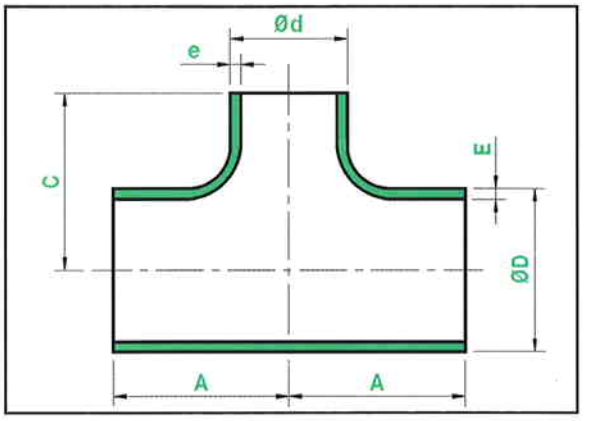
10 Bar

■ and 14 Bar

Ref : **LBI-TEE3511**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86088



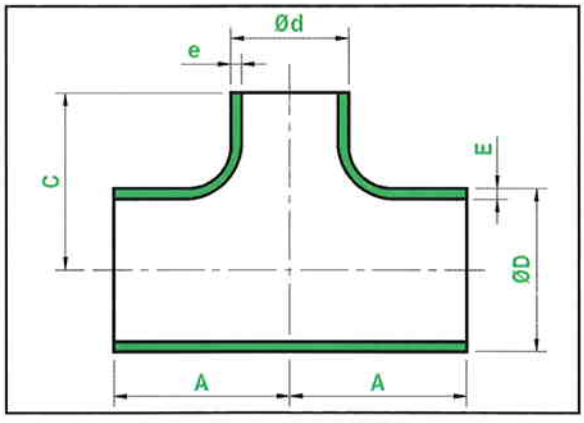
Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face A mm	Centre to face C mm	Theoretical weight Kg/piece
SEAMLESS										
1 1/4	x	1	38	x	30	1,5	1,5	48	42	0,10
1 1/2	x	1	44,5	x	30	1,5	1,5	57	45	0,21
	x	1 1/4		x	38		1,5		51	0,21
2	x	1	57	x	30	1,5	1,5	64	51	0,32
	x	1 1/4		x	38		1,5		57	0,32
	x	1 1/2		x	44,5		1,5		63	0,32
2 1/2	x	1	76,1	x	30	2	1,5	76	56	0,65
	x	1 1/4		x	38		1,5		62	0,65
	x	1 1/2		x	44,5		1,5		71	0,67
	x	2		x	57		1,5		73	0,67
3	x	1 1/4	88,9	x	38	2	1,5	86	73	0,87
	x	1 1/2		x	44,5		1,5		76	0,87
	x	2		x	57		1,5		80	0,89
	x	2 1/2		x	76,1		2		83	0,92
3	x	1 1/4	88,9	x	38	■ 2,5	1,5	86	73	1,08
	x	1 1/2		x	44,5		1,5		76	1,08
	x	2		x	57		1,5		80	1,10
	x	2 1/2		x	76,1		2		83	1,15
4	x	1 1/2	108	x	44,5	2,5	1,5	105	89	1,60
	x	2		x	57		1,5		90	1,60
	x	2 1/2		x	76,1		2		92	1,65
	x	3		x	88,9		2		96	1,65
	x	3		x	88,9		■ 2,5		96	1,65
5	x	2	133	x	57	2,5	1,5	124	98	3,00
	x	2 1/2		x	76,1		2		105	3,10
	x	3		x	88,9		2		108	3,25
	x	4		x	108		2,5		117	3,30
5	x	2	133	x	57	■ 3	1,5	124	98	3,60
	x	2 1/2		x	76,1		2		105	3,70
	x	3		x	88,9		■ 2,5		108	3,90
	x	4		x	108		2,5		117	3,95

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Ref : **LBI-TEE3511**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86088



Outside diameter of pipe ØD x Ød (nominal inch)			Outside diameter of pipe ØD x Ød (actual mm)			Wall thickness E mm	Wall thickness e mm	Centre to face A mm	Centre to face C mm	Theoretical weight Kg/piece
SEAMLESS										
6	x	2 1/2	159	x	76,1	2,5	2	143	118	4,40
	x	3		x	88,9		2		121	4,50
	x	4		x	108		2,5		130	4,60
	x	5		x	133		2,5		136	4,60
6	x	2 1/2	159	x	76,1	■ 3	2	143	118	5,25
	x	3		x	88,9		■ 2,5		121	5,40
	x	4		x	108		2,5		130	5,50
	x	5		x	133		■ 3		136	5,50
8	x	4	219,1	x	108	3	2,5	178	156	12,60
	x	5		x	133		2,5		162	12,70
	x	6		x	159		2,5		168	12,80
8	x	4	219,1	x	108	■ 3,5	2,5	178	156	14,75
	x	5		x	133		■ 3		162	14,85
	x	6		x	159		■ 3		168	14,95

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

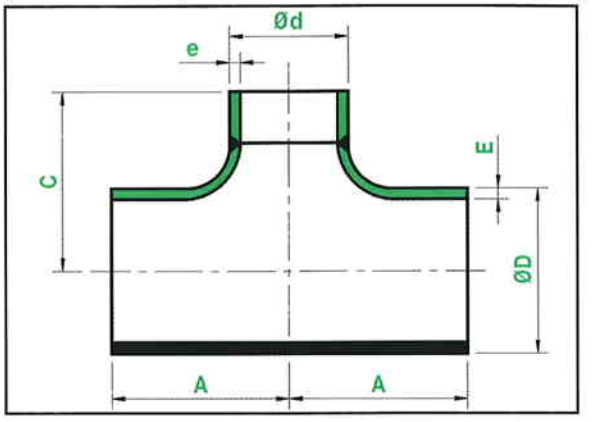
Reducing tees

10 Bar

■ and 14 Bar

Ref : **LBI-TEE3512**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face A mm	Centre to face C mm	Theoretical weight Kg/piece
SEAM WELDED										
	x	4		x	108		2,5	194	209	12,50
	x	5		x	133		2,5	217	219	13,50
10	x	6	267	x	159	3	2,5	240	229	14,80
	x	7		x	193,7		2,5	267	243	15,20
	x	8		x	219,1		3	290	259	16,60
	x	4		x	108		2,5	194	209	16,70
	x	5		x	133		■ 3	217	219	18,00
10	x	6	267	x	159	■ 4	■ 3	240	229	19,75
	x	7		x	193,7		■ 3,5	267	243	20,25
	x	8		x	219,1		■ 3,5	290	259	22,10
	x	5		x	133		2,5	217	247	28,60
	x	6		x	159		2,5	240	257	30,45
12	x	7	323,9	x	193,7	4	2,5	267	272	32,60
	x	8		x	219,1		3	290	287	34,60
	x	10		x	267		3	324	317	37,80
	x	5		x	133		■ 3	217	247	35,75
	x	6		x	159		■ 3	240	257	38,00
12	x	7	323,9	x	193,7	■ 5	■ 3,5	267	272	40,75
	x	8		x	219,1		■ 3,5	290	287	43,25
	x	10		x	267		■ 4	324	317	47,25
	x	6		x	159		2,5	240	279	37,40
	x	7		x	193,7		2,5	267	294	39,85
14	x	8	368	x	219,1	4	3	290	309	42,10
	x	10		x	267		3	324	339	45,55
	x	12		x	323,9		4	380	369	52,00
	x	6		x	159		■ 3	240	279	51,40
	x	7		x	193,7		■ 3,5	267	294	54,20
14	x	8	368	x	219,1	■ 5,5	■ 3,5	290	309	57,90
	x	10		x	267		■ 4	324	339	62,65
	x	12		x	323,9		■ 5	380	369	71,50

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

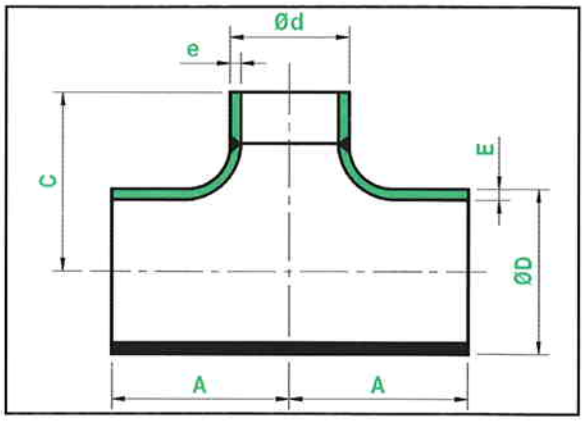
Reducing tees

10 Bar

■ and 14 Bar

Ref : **LBI-TEE3512**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face A mm	Centre to face C mm	Theoretical weight Kg/piece
SEAM WELDED										
16	x	7	419,1	x	193,7	4	2,5	267	319	49,10
	x	8		x	219,1		3	290	335	52,10
	x	10		x	267		3	324	365	56,40
	x	12		x	323,9		4	380	395	64,80
	x	14		x	368		4	407	410	68,90
16	x	7	419,1	x	193,7	■ 6	■ 3,5	267	319	73,65
	x	8		x	219,1		■ 3,5	290	335	78,15
	x	10		x	267		■ 4	324	365	84,60
	x	12		x	323,9		■ 5	380	395	97,20
	x	14		x	368		■ 5,5	407	410	103,35
18	x	10	457,2	x	267	4	3	324	383	55,70
	x	12		x	323,9		4	380	413	64,60
	x	14		x	368		4	407	428	68,90
	x	16		x	419,1		4	440	453	74,60
18	x	10	457,2	x	267	■ 6	■ 4	324	383	83,55
	x	12		x	323,9		■ 5	380	413	96,90
	x	14		x	368		■ 5,5	407	428	103,35
	x	16		x	419,1		■ 6	440	453	111,90
20	x	12	508	x	323,9	4,5	4	380	439	72,50
	x	14		x	368		4	407	454	77,40
	x	16		x	419,1		4	440	479	83,90
	x	18		x	457,2		4	500	509	94,10
20	x	12	508	x	323,9	■ 6,5	■ 5	380	439	104,70
	x	14		x	368		■ 5,5	407	454	111,80
	x	16		x	419,1		■ 6	440	479	121,20
	x	18		x	457,2		■ 6	500	509	135,90
24	x	14	610	x	368	5	4	407	505	109,95
	x	16		x	419,1		4	440	530	117,85
	x	18		x	457,2		4	500	555	130,35
	x	20		x	508		4,5	540	580	141,85
24	x	14	610	x	368	■ 8	■ 5,5	407	505	175,90
	x	16		x	419,1		■ 6	440	530	188,55
	x	18		x	457,2		■ 6	500	555	208,60
	x	20		x	508		■ 6,5	540	580	226,95

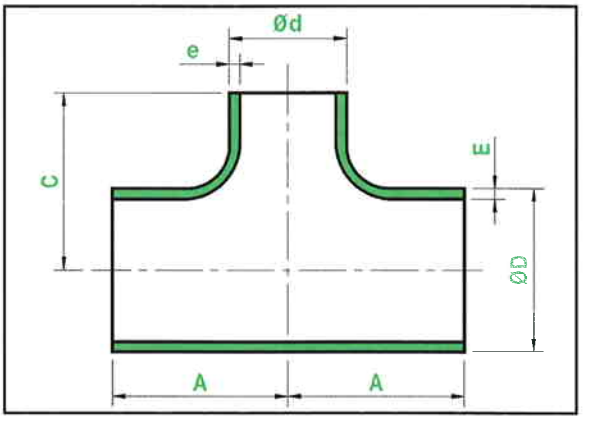
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Reducing tees — 16 Bar

Ref : **LBI-TEE3513**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146

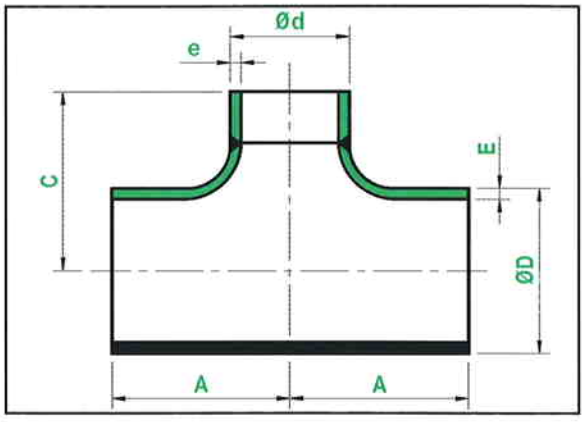


Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face A mm	Centre to face C mm	Theoretical weight Kg/piece
SEAMLESS										
1	x	3/4	30	x	25	2,5	2	38	38	0,17
1 1/4	x	3/4	38	x	25	2,5	2	48	48	0,28
	x	1		x	30		2,5			0,28
1 1/2	x	3/4	44,5	x	25	2,5	2	57	57	0,37
	x	1		x	30		2,5			0,40
	x	1 1/4		x	38		2,5			0,41
2	x	1	57	x	30	2,5	2,5	64	51	0,51
	x	1 1/4		x	38		2,5		57	0,54
	x	1 1/2		x	44,5		2,5		60	0,55
2 1/2	x	1 1/4	76,1	x	38	2,5	2,5	76	64	0,83
	x	1 1/2		x	44,5		2,5		67	0,84
	x	2		x	57		2,5		70	0,85
3	x	1 1/2	88,9	x	44,5	2,5	2,5	86	73	1,10
	x	2		x	57		2,5		76	1,12
	x	2 1/2		x	76,1		2,5		83	1,15
4	x	2	108	x	57	3	2,5	105	89	1,90
	x	2 1/2		x	76,1		2,5		95	1,92
	x	3		x	88,9		2,5		98	1,95
6	x	2 1/2	159	x	76,1	3	2,5	143	121	3,95
	x	3		x	88,9		2,5		124	4,00
	x	4		x	108		3		130	4,05
8	x	3	219,1	x	88,9	4	2,5	178	152	16,60
	x	4		x	108		3		156	16,90
	x	6		x	159		3		168	17,00

Ref : **LBI-TEE3514**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



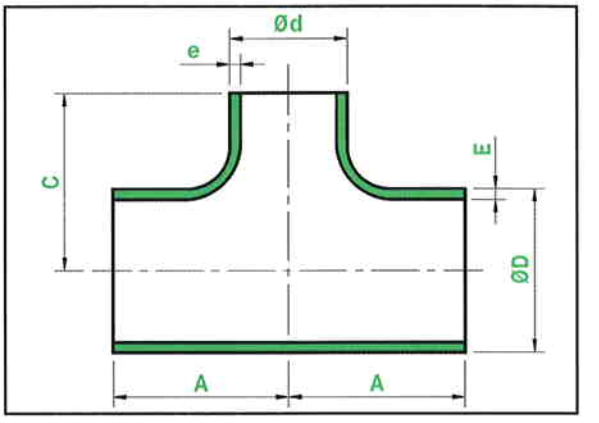
Outside diameter of pipe ØD x Ød (nominal inch)			Outside diameter of pipe ØD x Ød (actual mm)			Wall thickness E mm	Wall thickness e mm	Centre to face A mm	Centre to face C mm	Theoretical weight Kg/piece
SEAM WELDED										
10	x	4	267	x	108	4,5	3	216	184	21,60
	x	6		x	159		3		194	21,75
	x	8		x	219,1		4		203	21,90
12	x	6	323,9	x	159	5,5	3	254	219	38,50
	x	8		x	219,1		4		229	39,60
	x	10		x	267		4,5		241	40,70
14	x	8	368	x	219,1	6,5	4	279	248	58,80
	x	10		x	267		4,5		257	59,70
	x	12		x	323,9		5,5		270	61,50
16	x	10	419,1	x	267	7	4,5	305	283	89,60
	x	12		x	323,9		5,5		295	91,40
	x	14		x	368		6,5		305	93,50
18	x	12	457,2	x	323,9	8	5,5	343	321	126,30
	x	14		x	368		6,5		330	128,30
	x	16		x	419,1		7		330	129,90
20	x	14	508	x	368	8,5	6,5	381	356	162,00
	x	16		x	419,1		7		356	164,20
	x	18		x	457,2		8		368	168,30
24	x	16	610	x	419,1	10,5	7	432	406	248,30
	x	18		x	457,2		8		419	251,70
	x	20		x	508		8,5		432	255,30
29	x	18	711	x	457,2	12	8	521	470	394,60
	x	20		x	508		8,5		483	398,20
	x	24		x	610		10,5		508	409,90
32	x	20	813	x	508	13,5	8,5	597	533	495,00
	x	24		x	610		10,5		559	506,80
	x	28		x	711		12		572	518,80
36	x	24	914	x	610	15,5	10,5	673	610	723,60
	x	28		x	711		12		622	735,40
	x	32		x	813		13,5		648	754,40

Reducing tees — 20 Bar

Ref : **LBI-TEE3515**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146

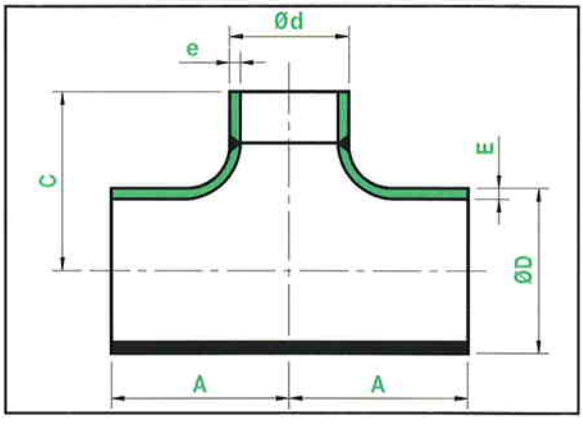


Outside diameter of pipe ØD x Ød (nominal inch)			Outside diameter of pipe ØD x Ød (actual mm)			Wall thickness E mm	Wall thickness e mm	Centre to face A mm	Centre to face C mm	Theoretical weight Kg/piece
SEAMLESS										
1	x	3/4	30	x	25	2,5	2	38	38	0,17
1 1/4	x	3/4	38	x	25	2,5	2	48	48	0,28
	x	1		x	30		2,5			0,28
1 1/2	x	3/4	44,5	x	25	2,5	2	57	57	0,37
	x	1		x	30		2,5			0,40
	x	1 1/4		x	38		2,5			0,41
2	x	1	57	x	30	2,5	2,5	64	51	0,51
	x	1 1/4		x	38		2,5		57	0,54
	x	1 1/2		x	44,5		2,5		60	0,55
2 1/2	x	1 1/4	76,1	x	38	2,5	2,5	76	64	0,83
	x	1 1/2		x	44,5		2,5		67	0,84
	x	2		x	57		2,5		70	0,85
3	x	1 1/2	88,9	x	44,5	2,5	2,5	86	73	1,10
	x	2		x	57		2,5		76	1,12
	x	2 1/2		x	76,1		2,5		83	1,15
4	x	2	108	x	57	3	2,5	105	89	1,90
	x	2 1/2		x	76,1		2,5		95	1,92
	x	3		x	88,9		2,5		98	1,95
6	x	2 1/2	159	x	76,1	3,5	2,5	143	121	4,60
	x	3		x	88,9		2,5		124	4,65
	x	4		x	108		3		130	4,72
8	x	3	219,1	x	88,9	4,5	2,5	178	152	18,70
	x	4		x	108		3		156	19,00
	x	6		x	159		3,5		168	19,10

Ref : **LBI-TEE3516**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face A mm	Centre to face C mm	Theoretical weight Kg/piece
SEAM WELDED										
10	x	4	267	x	108	5,5	3	216	184	26,40
	x	6		x	159		3,5		194	26,60
	x	8		x	219,1		4,5		203	26,75
12	x	6	323,9	x	159	7	3,5	254	219	49,00
	x	8		x	219,1		4,5		229	50,40
	x	10		x	267		5,5		241	51,80
14	x	8	368	x	219,1	8	4,5	279	248	72,35
	x	10		x	267		5,5		257	73,50
	x	12		x	323,9		7		270	75,70
16	x	10	419,1	x	267	9	5,5	305	283	115,20
	x	12		x	323,9		7		295	117,50
	x	14		x	368		8		305	120,20
18	x	12	457,2	x	323,9	9,5	7	343	321	150,00
	x	14		x	368		8		330	152,35
	x	16		x	419,1		9		330	154,25
20	x	14	508	x	368	11	8	381	356	209,65
	x	16		x	419,1		9		356	212,50
	x	18		x	457,2		9,5		368	217,80
24	x	16	610	x	419,1	13	9	432	406	307,40
	x	18		x	457,2		9,5		419	311,60
	x	20		x	508		11		432	310,10
28	x	18	711	x	457,2	15	9,5	521	470	493,25
	x	20		x	508		11		483	497,75
	x	24		x	610		13		508	512,40
32	x	20	813	x	508	17	11	597	533	623,30
	x	24		x	610		13		559	638,20
	x	28		x	711		15		572	653,30
36	x	24	914	x	610	19	13	673	610	887,00
	x	28		x	711		15		622	901,45
	x	32		x	813		17		648	924,75

Saddles

10 Bar

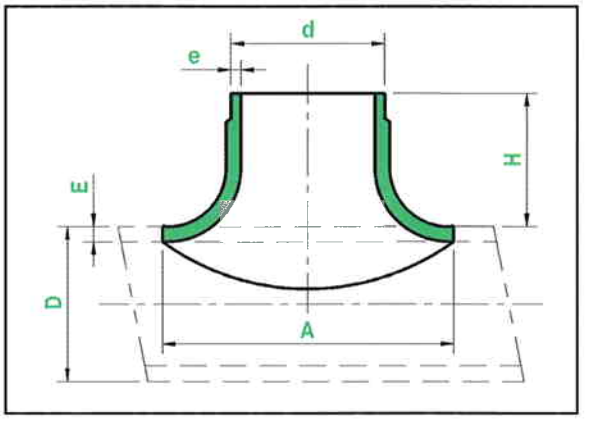
With equal or reduced branch

■ and 14 Bar

Ref : **LBI-SAD3611**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86087



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAMLESS										
1/2	x	1/2	20	x	20	1	1	20	32	0,05
3/4	x	1/2	25	x	20	1,5	1	20	40	0,05
	x	3/4		x	25		1,5	22		0,06
1	x	3/4	30	x	25	1,5	1,5	22	40	0,06
	x	1		x	30		1,5	30	50	0,10
1 1/4	x	1	38	x	30	1,5	1,5	30	50	0,10
	x	1 1/4		x	38		1,5	35	64	0,11
1 1/2	x	1 1/4	44,5	x	38	1,5	1,5	35	64	0,14
	x	1 1/2		x	44,5		1,5		74	0,15
2	x	1 1/4	57	x	38	1,5	1,5	35	64	0,15
	x	1 1/2		x	44,5		1,5		74	0,17
	x	2		x	57		1,5	40	97	0,25
2 1/2	x	1 1/4	76,1	x	38	2	1,5	35	64	0,30
	x	1 1/2		x	44,5		1,5		74	0,34
	x	2		x	57		1,5	40	97	0,48
	x	2 1/2		x	76,1		2	50	126	0,52
3	x	1 1/4	88,9	x	38	2	1,5	35	64	0,36
	x	1 1/2		x	44,5		1,5		74	0,44
	x	2		x	57		1,5	40	97	0,50
	x	2 1/2		x	76,1		2	50	126	0,56
	x	3		x	88,9		2	55	149	0,76
3	x	1 1/4	88,9	x	38	■ 2,5	1,5	35	64	0,45
	x	1 1/2		x	44,5		1,5		74	0,55
	x	2		x	57		1,5	40	97	0,62
	x	2 1/2		x	76,1		2	50	126	0,70
	x	3		x	88,9		■ 2,5	55	149	0,95
4	x	1 1/2	108	x	44,5	2,5	1,5	35	74	0,32
	x	2		x	57		1,5	40	97	0,40
	x	2 1/2		x	76,1		2	50	126	0,65
	x	3		x	88,9		2	55	149	0,79
	x	4		x	108		2,5	75	188	1,30

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Saddles

10 Bar

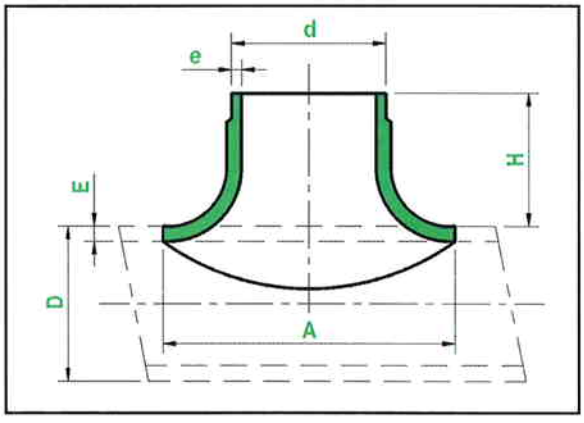
With equal or reduced branch

■ and 14 Bar

Ref : **LBI-SAD3611**

Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86087



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAMLESS										
	x	2		x	57		1,5	40	97	0,40
	x	2 1/2		x	76,1		2	50	126	0,80
5	x	3	133	x	88,9	2,5	2	55	149	1,00
	x	4		x	108		2,5	75	188	1,20
	x	5		x	133		2,5	85	233	1,70
	x	2		x	57		1,5	40	97	0,48
	x	2 1/2		x	76,1		2	50	126	0,96
5	x	3	133	x	88,9	■ 3	■ 2,5	55	149	1,20
	x	4		x	108		2,5	75	188	1,44
	x	5		x	133		■ 3	85	233	2,04
	x	2 1/2		x	76,1		2	50	126	0,65
	x	3		x	88,9		2	55	149	1,00
6	x	4	159	x	108	2,5	2,5	75	188	1,20
	x	5		x	133		2,5	85	233	2,00
	x	6		x	159		2,5	95	279	2,60
	x	2 1/2		x	76,1		2	50	126	0,78
	x	3		x	88,9		■ 2,5	55	149	1,20
6	x	4	159	x	108	■ 3	2,5	75	188	1,44
	x	5		x	133		■ 3	85	233	2,40
	x	6		x	159		■ 3	95	279	3,12
	x	2 1/2		x	76,1		2	50	126	0,95
	x	3		x	88,9		2	55	149	1,30
7	x	4	193,7	x	108	2,5	2,5	75	188	1,40
	x	5		x	133		2,5	85	233	1,90
	x	6		x	159		2,5	95	279	2,50
	x	7		x	193,7		2,5	110	334	3,20
	x	2 1/2		x	76,1		2,5	50	126	1,33
	x	3		x	88,9		■ 2,5	55	149	1,82
7	x	4	193,7	x	108	■ 3,5	2,5	75	188	1,96
	x	5		x	133		■ 3	85	233	2,66
	x	6		x	159		■ 3	95	279	3,50
	x	7		x	193,7		■ 3,5	110	334	4,48

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Saddles

10 Bar

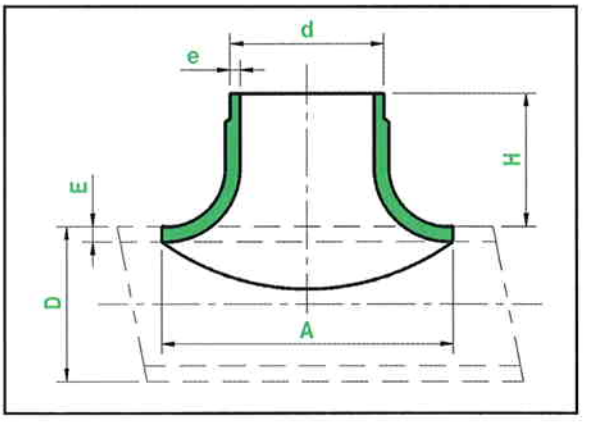
With equal or reduced branch

■ and 14 Bar

Ref : **LBI-SAD3611**

Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86087



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAMLESS										
8	x	3	219,1	x	88,9	3	2	55	149	1,30
	x	4		x	108		2,5	75	188	1,80
	x	5		x	133		2,5	85	233	2,70
	x	6		x	159		2,5	95	279	3,80
	x	7		x	193,7		2,5	110	334	4,50
	x	8		x	219,1		3	125	379	5,70
8	x	3	219,1	x	88,9	■ 3,5	■ 2,5	55	149	1,52
	x	4		x	108		2,5	75	188	2,10
	x	5		x	133		■ 3	85	233	3,15
	x	6		x	159		■ 3	95	279	4,43
	x	7		x	193,7		■ 3,5	110	334	5,25
	x	8		x	219,1		■ 3,5	125	379	6,65
10	x	4	267	x	108	3	2,5	75	188	1,80
	x	5		x	133		2,5	85	233	2,30
	x	6		x	159		2,5	95	279	3,70
	x	7		x	193,7		2,5	110	334	4,70
	x	8		x	219,1		3	125	379	6,10
	x	10		x	267		3	155	447	8,70
10	x	4	267	x	108	■ 4	2,5	75	188	2,40
	x	5		x	133		■ 3	85	233	3,06
	x	6		x	159		■ 3	95	279	4,93
	x	7		x	193,7		■ 3,5	110	334	6,27
	x	8		x	219,1		■ 3,5	125	379	8,13
	x	10		x	267		■ 4	155	447	11,60
12	x	5	323,9	x	133	4	2,5	85	233	2,60
	x	6		x	159		2,5	95	279	3,80
	x	7		x	193,7		2,5	110	334	4,90
	x	8		x	219,1		3	125	379	7,70
	x	10		x	267		3	155	447	10,00
	x	12		x	323,9		4	185	560	13,00

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Saddles

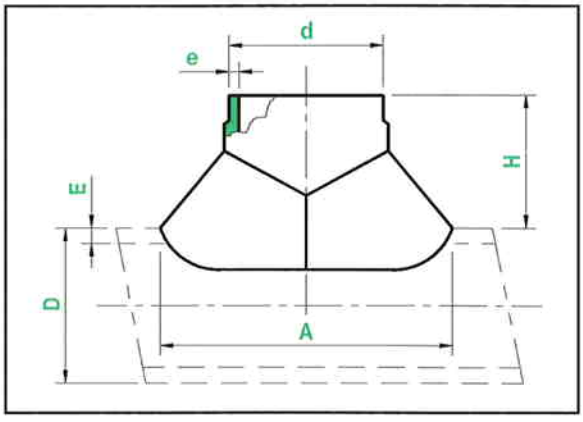
10 Bar

With equal or reduced branch

■ and 14 Bar

Ref : **LBI-SAD3612**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAM WELDED										
12	x	5	323,9	x	133	■ 5	■ 3	85	233	3,25
	x	6		x	159		■ 3	95	279	4,75
	x	7		x	193,7		■ 3,5	110	334	6,20
	x	8		x	219,1		■ 3,5	125	379	9,60
	x	10		x	267		■ 4	155	447	12,50
	x	12		x	323,9		■ 5	185	560	16,25
14	x	6	368	x	159	4	2,5	95	279	3,85
	x	7		x	193,7		2,5	110	334	4,20
	x	8		x	219,1		3	125	379	4,35
	x	10		x	267		3	155	447	7,30
	x	12		x	323,9		4	185	560	9,45
	x	14		x	368		4	200	613	12,35
14	x	6	368	x	159	■ 5,5	■ 3	95	279	5,30
	x	7		x	193,7		■ 3,5	110	334	5,80
	x	8		x	219,1		■ 3,5	125	379	6,00
	x	10		x	267		■ 4	155	447	10,00
	x	12		x	323,9		■ 5	185	560	13,00
	x	14		x	368		■ 5,5	200	613	17,00
16	x	8	419,1	x	219,1	4	3	125	379	4,35
	x	10		x	267		3	155	447	6,65
	x	12		x	323,9		4	185	560	9,35
	x	14		x	368		4	200	613	12,00
	x	16		x	419,1		4	225	680	17,35
16	x	8	419,1	x	219,1	■ 6	■ 3,5	125	379	6,50
	x	10		x	267		■ 4	155	447	10,00
	x	12		x	323,9		■ 5	185	560	14,00
	x	14		x	368		■ 5,5	200	613	18,00
	x	16		x	419,1		■ 6	225	680	26,00
18	x	10	457,2	x	267	4	3	155	447	6,30
	x	12		x	323,9		4	185	560	8,00
	x	14		x	368		4	200	613	9,70
	x	16		x	419,1		4	225	680	14,85
	x	18		x	457,2		4	250	800	21,70

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Saddles

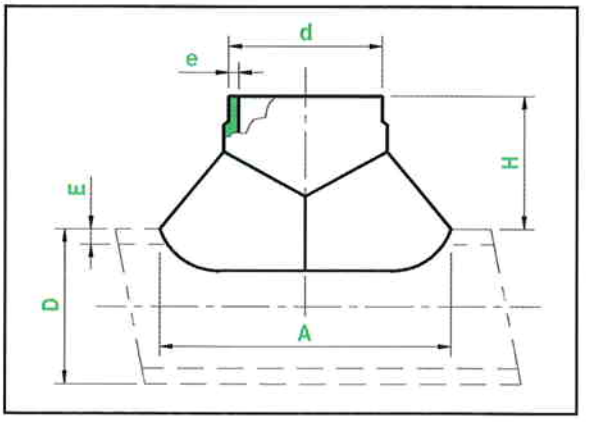
10 Bar

With equal or reduced branch

■ and 14 Bar

Ref : **LBI-SAD3612**

Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAM WELDED										
	x	10		x	267		■ 4	155	447	9,45
	x	12		x	323,9		■ 5	185	560	12,00
18	x	14	457,2	x	368	■ 6	■ 5,5	200	613	14,60
	x	16		x	419,1		■ 6	225	680	22,30
	x	18		x	457,2		■ 6	250	800	32,60
	x	12		x	323,9		4	185	560	9,00
	x	14		x	368		4	200	613	10,80
20	x	16	508	x	419,1	4,5	4	225	680	16,80
	x	18		x	457,2		4	250	800	22,80
	x	20		x	508		4,5	275	880	28,80
	x	12		x	323,9		■ 5	185	560	13,00
	x	14		x	368		■ 5,5	200	613	15,60
20	x	16	508	x	419,1	■ 6,5	■ 6	225	680	24,30
	x	18		x	457,2		■ 6	250	800	32,95
	x	20		x	508		■ 6,5	275	880	41,60
	x	14		x	368		4	200	613	11,10
	x	16		x	419,1		4	225	680	17,25
24	x	18	610	x	457,2	5	4	250	800	22,80
	x	20		x	508		4,5	275	880	26,70
	x	24		x	610		5	300	1020	47,20
	x	14		x	368		■ 5,5	200	613	17,77
	x	16		x	419,1		■ 6	225	680	27,55
24	x	18	610	x	457,2	■ 8	■ 6	250	800	36,45
	x	20		x	508		■ 6,5	275	880	42,65
	x	24		x	610		■ 8	300	1020	75,50

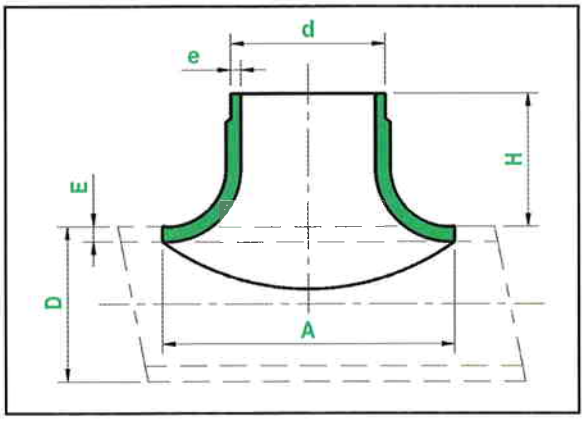
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

With equal or reduced branch

Ref : **LBI-SAD3613**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAMLESS										
1 1/4	x	1 1/4	38	x	38	2,5	2,5	35	64	0,18
1 1/2	x	1 1/4	44,5	x	38	2,5	2,5	35	64	0,23
	x	1 1/2		x	44,5		2,5		74	0,25
2	x	1 1/4	57	x	38	2,5	2,5	35	64	0,25
	x	1 1/2		x	44,5		2,5		74	0,28
	x	2		x	57		2,5	40	97	0,40
2 1/2	x	1 1/4	76,1	x	38	2,5	2,5	35	64	0,37
	x	1 1/2		x	44,5		2,5		74	0,42
	x	2		x	57		2,5	40	97	0,60
	x	2 1/2		x	76,1		2,5	50	126	0,65
3	x	1 1/4	88,9	x	38	2,5	2,5	35	64	0,45
	x	1 1/2		x	44,5		2,5		74	0,55
	x	2		x	57		2,5	40	97	0,62
	x	2 1/2		x	76,1		2,5	50	126	0,70
	x	3		x	88,9		2,5	55	149	0,95
4	x	1 1/2	108	x	44,5	3	2,5	35	74	0,38
	x	2		x	57		2,5	40	97	0,48
	x	2 1/2		x	76,1		2,5	50	126	0,78
	x	3		x	88,9		2,5	55	149	0,94
	x	4		x	108		3	75	188	1,56
6	x	2 1/2	159	x	76,1	3	2,5	50	126	0,78
	x	3		x	88,9		2,5	55	149	1,20
	x	4		x	108		3	75	188	1,44
	x	6		x	159		3	95	279	3,12
SEAMLESS or SEAM WELDED										
8	x	3	219,1	x	88,9	4	2,5	55	149	1,73
	x	4		x	108		3	75	188	2,40
	x	6		x	159		3	95	279	5,06
	x	8		x	219,1		4	125	379	7,60

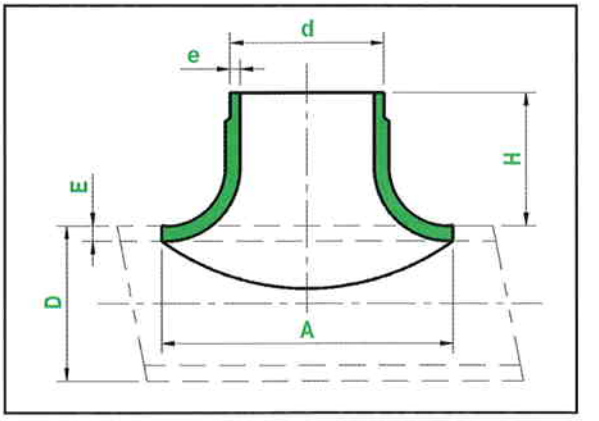
Saddles 16 Bar

With equal or reduced branch

Ref : **LBI-SAD3613**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



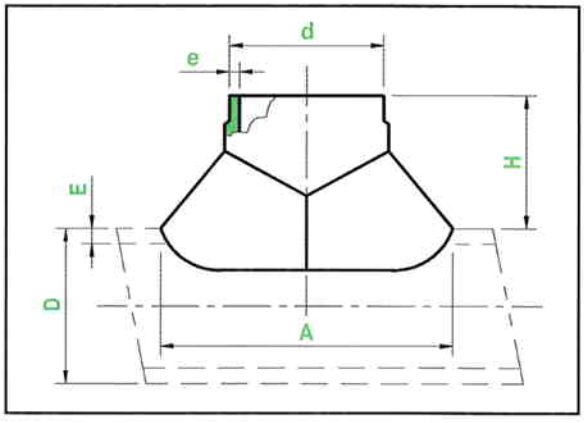
Outside diameter of pipe ØD x Ød (nominal inch)			Outside diameter of pipe ØD x Ød (actual mm)			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAMLESS or SEAM WELDED										
10	x	4	267	x	108	4,5	3	75	188	2,70
	x	6		x	159		3	95	279	5,54
	x	8		x	219,1		4	125	379	9,14
	x	10		x	267		4,5	155	447	13,05
12	x	6	323,9	x	159	5,5	3	95	279	5,22
	x	8		x	219,1		4	125	379	10,58
	x	10		x	267		4,5	155	447	13,75
	x	12		x	323,9		5,5	185	560	17,87

With equal or reduced branch

Ref : **LBI-SAD3614**

Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



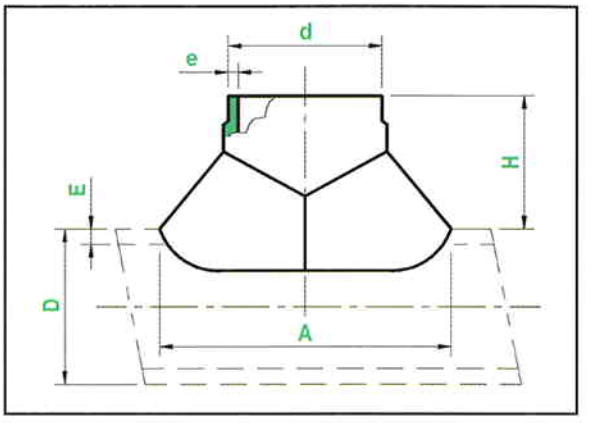
Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAM WELDED										
8	x	8	219,1	x	219,1	4	4	125	379	5,70
10	x	8	267	x	219,1	4,5	4	125	379	6,75
	x	10		x	267		4,5	155	447	12,40
12	x	8	323,9	x	219,1	5,5	4	125	379	6,60
	x	10		x	267		4,5	155	447	12,10
	x	12		x	323,9		5,5	185	560	15,40
14	x	8	368	x	219,1	6,5	4	125	379	7,10
	x	10		x	267		4,5	155	447	11,80
	x	12		x	323,9		5,5	185	560	15,40
	x	14		x	368		6,5	200	613	20,10
16	x	10	419,1	x	267	7	4,5	155	447	11,65
	x	12		x	323,9		5,5	185	560	16,35
	x	14		x	368		6,5	200	613	19,50
	x	16		x	419,1		7	225	680	28,20
18	x	12	457,2	x	323,9	8	5,5	185	560	16,00
	x	14		x	368		6,5	200	613	19,45
	x	16		x	419,1		7	225	680	29,70
	x	18		x	457,2		8	250	800	43,40
20	x	14	508	x	368	8,5	6,5	200	613	20,40
	x	16		x	419,1		7	225	680	31,75
	x	18		x	457,2		8	250	800	43,10
	x	20		x	508		8,5	275	880	54,40

With equal or reduced branch

Ref : **LBI-SAD3614**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAM WELDED										
24	x	16	610	x	419,1	10,5	7	225	680	36,15
	x	18		x	457,2		8	250	800	47,85
	x	20		x	508		8,5	275	880	56,00
	x	24		x	610		10,5	300	1020	99,20
28	x	18	711	x	457,2	12	8	250	800	77,70
	x	20		x	508		8,5	275	880	105,10
	x	24		x	610		10,5	300	1020	137,15
	x	28		x	711		12	360	1225	182,85
32	x	20	813	x	508	13,5	8,5	275	880	118,10
	x	24		x	610		10,5	300	1020	163,15
	x	28		x	711		12,5	360	1225	208,15
	x	32		x	813		13,5	410	1400	225,00
36	x	24	914	x	610	15,5	10,5	300	1020	206,70
	x	28		x	711		12,5	360	1225	246,85
	x	32		x	813		13,5	410	1400	294,45
	x	36		x	914		15,5	460	1550	357,00

Saddles

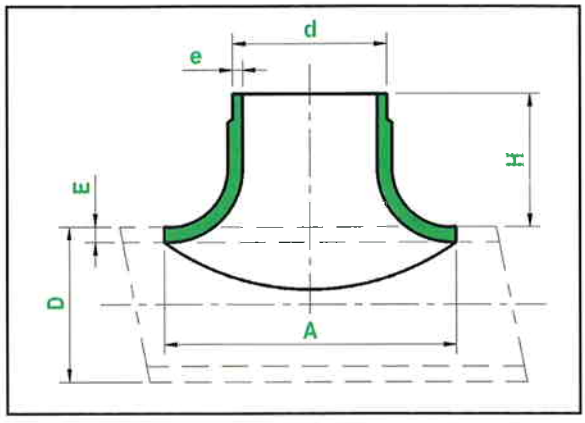
20 Bar

With equal or reduced branch

Ref : **LBI-SAD3615**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



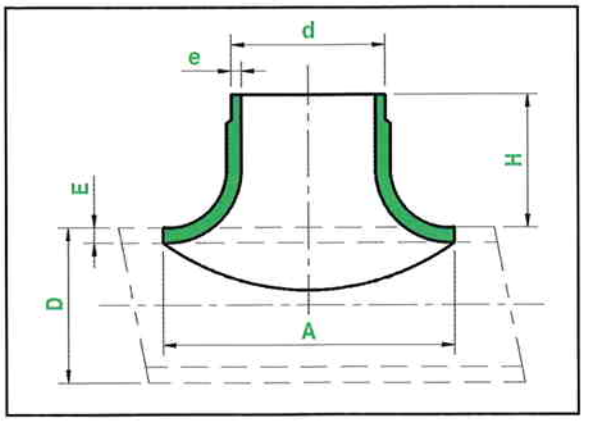
Outside diameter of pipe ØD x Ød (nominal inch)			Outside diameter of pipe ØD x Ød (actual mm)			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAMLESS										
1 1/4	x	1 1/4	38	x	38	2,5	2,5	35	64	0,18
1 1/2	x	1 1/4	44,5	x	38	2,5	2,5	35	64	0,23
	x	1 1/2		x	44,5		2,5		74	0,25
2	x	1 1/4	57	x	38	2,5	2,5	35	64	0,25
	x	1 1/2		x	44,5		2,5		74	0,28
	x	2		x	57		2,5	40	97	0,40
2 1/2	x	1 1/4	76,1	x	38	2,5	2,5	35	64	0,37
	x	1 1/2		x	44,5		2,5		74	0,42
	x	2		x	57		2,5	40	97	0,60
	x	2 1/2		x	76,1		2,5	50	126	0,65
3	x	1 1/4	88,9	x	38	2,5	2,5	35	64	0,45
	x	1 1/2		x	44,5		2,5		74	0,55
	x	2		x	57		2,5	40	97	0,62
	x	2 1/2		x	76,1		2,5	50	126	0,70
	x	3		x	88,9		2,5	55	149	0,95
4	x	1 1/2	108	x	44,5	3	2,5	35	74	0,38
	x	2		x	57		2,5	40	97	0,48
	x	2 1/2		x	76,1		2,5	50	126	0,78
	x	3		x	88,9		2,5	55	149	0,94
	x	4		x	108		3	75	188	1,56
6	x	2 1/2	159	x	76,1	3,5	2,5	50	126	0,91
	x	3		x	88,9		2,5	55	149	1,40
	x	4		x	108		3	75	188	1,68
	x	6		x	159		3,5	95	279	3,64
SEAMLESS or SEAM WELDED										
8	x	3	219,1	x	88,9	4,5	2,5	55	149	1,94
	x	4		x	108		3	75	188	2,70
	x	6		x	159		3,5	95	279	5,69
	x	8		x	219,1		4,5	125	379	8,55

With equal or reduced branch

Ref : **LBI-SAD3615**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



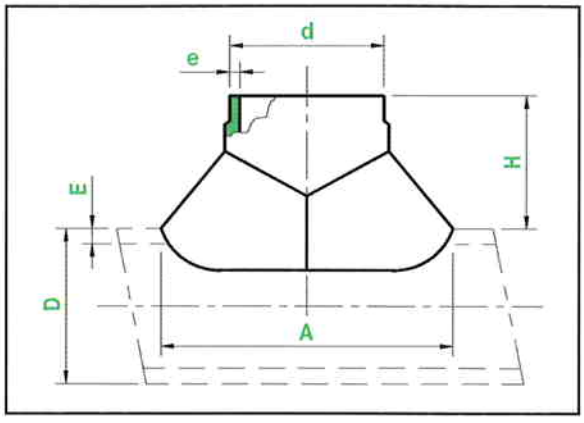
Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAMLESS or SEAM WELDED										
10	x	4	267	x	108	5,5	3	75	188	3,30
	x	6		x	159		3,5	95	279	6,77
	x	8		x	219,1		4,5	125	379	11,17
	x	10		x	267		5,5	155	447	15,95
12	x	6	323,9	x	159	7	3,5	95	279	6,64
	x	8		x	219,1		4,5	125	379	13,46
	x	10		x	267		5,5	155	447	17,50
	x	12		x	323,9		7	185	560	22,74

With equal or reduced branch

Ref : **LBI-SAD3616**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD x Ød nominal inch			Outside diameter of pipe ØD x Ød actual mm			Wall thickness E mm	Wall thickness e mm	Centre to face H mm	Centre to face A mm	Theoretical weight Kg/piece
SEAM WELDED										
8	x	8	219,1	x	219,1	4,5	4,5	125	379	6,40
10	x	8	267	x	219,1	5,5	4,5	125	379	8,25
	x	10		x	267		5,5	155	447	15,15
12	x	8	323,9	x	219,1	7	4,5	125	379	8,40
	x	10		x	267		5,5	155	447	15,40
	x	12		x	323,9		7	185	560	19,60
14	x	8	368	x	219,1	8	4,5	125	379	8,75
	x	10		x	267		5,5	155	447	14,55
	x	12		x	323,9		7	185	560	18,95
	x	14		x	368		8	200	613	24,75
16	x	10	419,1	x	267	9	5,5	155	447	15,00
	x	12		x	323,9		7	185	560	21,00
	x	14		x	368		8	200	613	25,10
	x	16		x	419,1		9	225	680	36,25
18	x	12	457,2	x	323,9	9,5	7	185	560	19,00
	x	14		x	368		8	200	613	23,10
	x	16		x	419,1		9	225	680	35,25
	x	18		x	457,2		9,5	250	800	51,55
20	x	14	508	x	368	11	8	200	613	26,40
	x	16		x	419,1		9	225	680	41,10
	x	18		x	457,2		9,5	250	800	55,80
	x	20		x	508		11	275	880	70,40
24	x	16	610	x	419,1	13	9	225	680	44,75
	x	18		x	457,2		9,5	250	800	59,25
	x	20		x	508		11	275	880	69,30
	x	24		x	610		13	300	1020	122,80

End caps

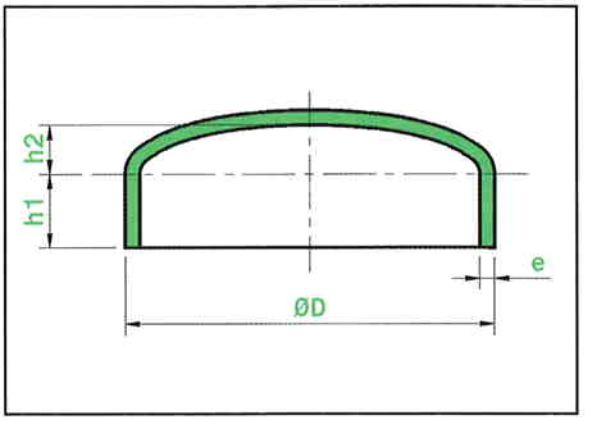
10 Bar

■ and 14 Bar

Ref.: **LBI-CAP3711**

Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 28011



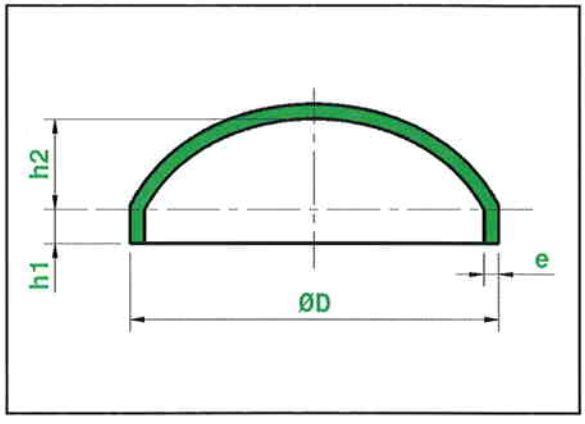
Outside diameter of pipe ØD		Wall thickness e	Heigh		Theoretical weight
nominal inch	actual mm	mm	h1 mm	h2 mm	Kg/piece
SEAMLESS					
1	30	1,5	14	5	0,07
1 1/4	38	1,5		6,5	0,10
1 1/2	44,5	1,5		8	0,12
2	57	1,5	18	10	0,18
2 1/2	76,1	2		14	0,31
3	88,9	2	20	16	0,39
3	88,9	■ 2,5			0,53
4	108	2,5		20	0,75
5	133	2,5		24	0,95
5	133	■ 3			1,20
6	159	2,5		29	1,35
6	159	■ 3			1,60
7	193,7	2,5		36	1,95
7	193,7	■ 3,5			2,40
8	219,1	3		41	2,60
8	219,1	■ 3,5			3,10
10	267	3		50	3,85
10	267	■ 4			4,85
12	323,9	4		61	6,60
12	323,9	■ 5			8,20
14	368	4		69	8,80
14	368	■ 5,5			12,60
16	419,1	4		79	12,20
16	419,1	■ 6	25		17,40
18	457,2	4	20	87	12,55
18	457,2	■ 6	25		17,90
20	508	4,5	20	96	18,80
20	508	■ 6,5	25		26,35
24	610	5	20	115	26,70
24	610	■ 8	35		49,60

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Ref.: **LBI-CAP3712**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146

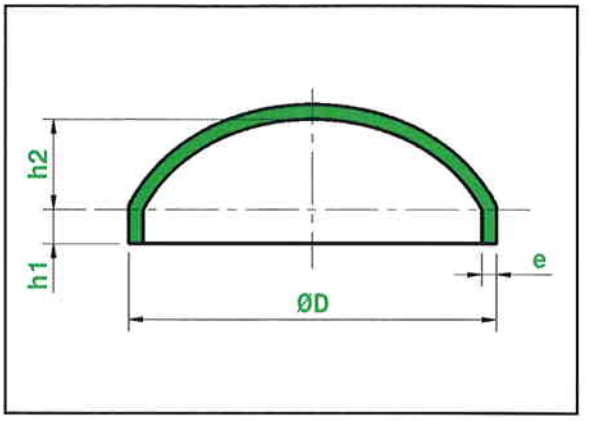


Outside diameter of pipe ØD		Wall thickness	Heigh			Theoretical weight
nominal inch	actual mm	e mm	h1	+ mm	h2	Kg/piece
SEAMLESS						
1 1/2	44,5	2,5	19,6			0,13
2	57		22			0,19
2 1/2	76,1		25,7			0,31
3	88,9		28,2			0,40
4	108	3	31,7			0,75
6	159		41			1,50
8	219,1	4	55			2,75
10	267	4,5	69			4,90
12	323,9	5,5	80			9,17
14	368	6,5	93			14,05
16	419,1	7	102			18,60
18	457,2	8	119			22,75
20	508	8,5	129			31,70
24	610	10,5	148			56,16
28	711	12	176			85,55
32	813	13,5	200			125,40
36	914	15,5	221			175,40

Ref.: **LBI-CAP3713**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146



Outside diameter of pipe ØD		Wall thickness	Heigh			Theoretical weight
nominal inch	actual mm	e mm	h1	+ mm	h2	Kg/piece
SEAMLESS						
1 1/2	44,5	2,5	19,6			0,13
2	57		22			0,19
2 1/2	76,1		25,7			0,31
3	88,9		28,2			0,40
4	108	3	31,7			0,75
6	159	3,5	44			1,75
8	219,1	4,5	60			3,10
10	267	5,5	69			5,96
12	323,9	7	85			11,68
14	368	8	103			17,30
16	419,1	9	112			23,90
18	457,2	9,5	119			27,00
20	508	11	139			41,00
24	610	13	163			68,30
28	711	15	191			106,90
32	813	17	210			157,90
36	914	19	231			215,00

FLANGES

Composite weld neck flanges
Inner flanges (DIN)
LBI-INR4111

Page : 94

Composite weld neck flanges
Inner flanges (Short type EEMUA)
LBI-INR4112 • LBI-INR4113

Pages : 95, 96

Composite weld neck flanges
Inner flanges (Long type EEMUA)
LBI-INR4114 • LBI-INR4115

Pages : 97, 98

Composite weld neck flanges
Outer flanges (ISO)
LBI-FLG4211

Page : 99

Composite weld neck flanges
Outer flanges (EEMUA)
LBI-FLG4212

Page : 100

Composite weld neck flanges
Outer flanges (ANSI)
LBI-FLG4213 • LBI-FLG4214

Pages : 101, 102

Composite slip on flanges
Inner flanges (DIN)
LBI-FLG4311

Page : 103

Composite slip on flanges
Outer flanges (ISO)
LBI-FLG4312

Page : 103

Composite slip on flanges
Inner flanges (EEMUA)
LBI-FLG4313

Page : 104

Composite slip on flanges
Outer flanges (EEMUA)
LBI-FLG4314

Page : 104

Composite blind flanges
(ISO, ANSI)
LBI-FLG4411 • LBI-FLG4412 • LBI-FLG4413

Pages : 105, 106, 107

Solid welding neck flanges
(DIN)
LBI-FLG4511 • LBI-FLG4512

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Solid weld neck flanges
(EEMUA, ANSI)
LBI-FLG4513 • LBI-FLG4514 • LBI-FLG4515 • LBI-FLG4516

Pages : 109, 110, 111, 112

Solid slip on flanges
(DIN, ANSI)
LBI-FLG4611 • LBI-FLG4613 • LBI-FLG4614

Pages : 113, 115, 116

Solid slip on flanges
(EEMUA)
LBI-FLG4612

Page : 114

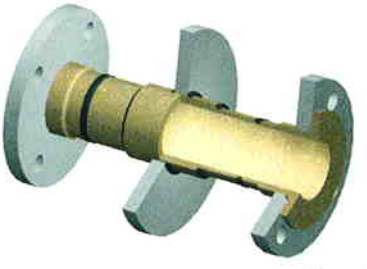
Solid socket welding flanges
(ANSI)
LBI-FLG4711 • LBI-FLG4712

Page : 117

Solid blind flanges
(ISO, ANSI)
LBI-FLG4811 • LBI-FLG4812 • LBI-FLG4813

Pages : 118, 119, 120

Bulkhead pieces
type 1
LBI-FLG4911



Page : 121

Bulkhead pieces
type 2
LBI-FLG4912

Page : 122

Bulkhead fittings
LBI-FLG4913

Page : 123

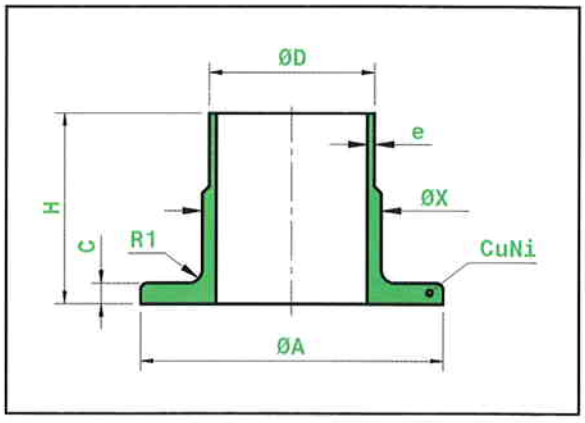
Composite weld neck flanges 10 Bar

Inner flanges ■ and 14 Bar

Ref : **LBI-INR4111**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86037



Outside diameter of pipe ØD		Wall thickness e	ØA	H	C	ØX	R1	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	Kg/piece
3/4	25	1,5	58	40	5	27	3	0,17
1	30	1,5	68	40	5	32	4	0,24
1 1/4	38	1,5	78	40	5	40	4	0,26
1 1/2	44,5	1,5	88	45	6	46,5	4	0,42
2	57	1,5	102	45	6	59	5	0,53
2 1/2	76,1	2	122	45	6	78	5	0,64
3	88,9	2	138	50	7	91	5	0,86
		■ 2,5		50	7	91	5	0,90
4	108	2,5	158	50	7	110	5	1,10
5	133	2,5	188	50	7	135,5	5	1,50
		■ 3	188	50	7	135,5	5	1,55
6	159	2,5	212	50	9	161,5	5	2,00
		■ 3	212	50	9	161,5	5	2,10
7	193,7	2,5	242	50	9	197	5	2,30
		■ 3,5	242	50	9	197	5	2,55
8	219,1	3	268	50	9	222	5	2,70
		■ 3,5	268	50	9	222	5	2,90
10	267	3	320	50	9	270	5	3,40
		■ 4	320	50	9	270	5	3,80
12	323,9	4	370	50	11	327	7	4,60
		■ 5	370	50	11	327	7	5,40
14	368	4	430	50	11	371	7	6,20
		■ 5,5	430	50	11	371	7	6,95
16	419,1	4	482	50	12	422	7	7,50
		■ 6	482	50	12	422	7	8,65
18	457,2	4	530	50	12	460	7	9,00
		■ 6	530	50	12	460	7	10,15
20	508	4,5	585	50	12	511	7	10,65
		■ 6,5	585	50	12	511	7	11,90
24	610	5	685	60	14	613	9	14,90
		■ 8	685	60	14	613	9	17,65

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

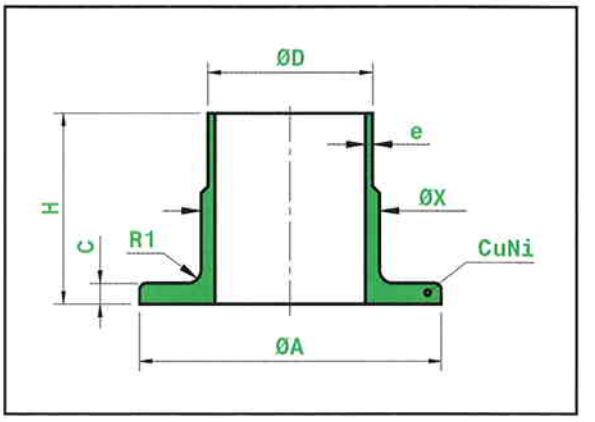
Composite weld neck flanges 16 Bar

Short inner flanges type EEMUA

Ref : **LBI-INR4112**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 145



Outside diameter of pipe ØD		Wall thickness e	ØA	H	C	ØX	R1	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	Kg/piece
1/2	16	2	40	35	4	18	2	0,07
3/4	25		50	40	5	27	3	0,16
1	30	2,5	60			32	4	0,20
1 1/4	38		70			40		0,25
1 1/2	44,5		80	45	6	46,5		0,42
2	57		99			59	5	0,50
2 1/2	76,1		120			78		0,67
3	88,9		130	50	7	91		0,86
4	108	3	158			110		1,18
6	159		212		9	161,5		2,20
8	219,1	4	270			222		3,20
10	267	4,5	320			270		3,90
12	323,9	5,5	370		11	327	7	6,50
14	368	6,5	430			371		7,45
16	419,1	7	482		12	422		9,20
18	457,2	8	530			460		11,45
20	508	8,5	585			511		13,40
24	610	10,5	685	60	14	613	9	20,75
28	711	12	800		19	719		33,35
32	813	13,5	905		20,5	821		42,25
36	914	15,5	1000		22	922		49,35

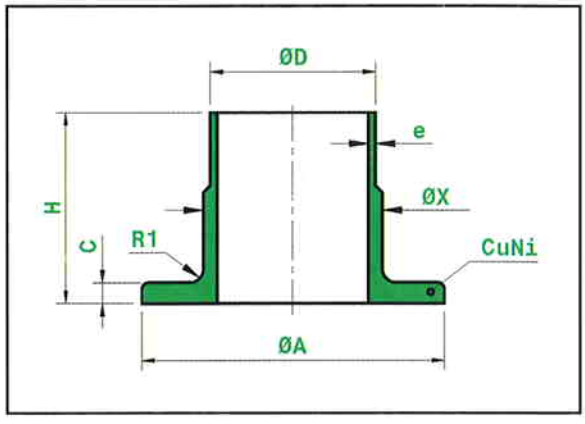
Composite weld neck flanges 20 Bar

Short inner flanges type EEMUA

Ref : **LBI-INR4113**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 145



Outside diameter of pipe ØD		Wall thickness e	ØA	H	C	ØX	R1	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	Kg/piece
1/2	16	2	40	35	4	18	2	0,07
3/4	25		50	40	5	27	3	0,16
1	30	2,5	60			32	4	0,20
1 1/4	38		70			40		0,25
1 1/2	44,5		80	45	6	46,5		0,42
2	57		99			59	5	0,50
2 1/2	76,1		120			78		0,67
3	88,9		130	50	7	91		0,86
4	108	3	158			110		1,20
6	159	3,5	212		9	161,5		2,20
8	219,1	4,5	270			222		3,30
10	267	5,5	320			270		4,20
12	323,9	7	370		11	327	7	6,80
14	368	8	430			371		8,20
16	419,1	9	482		12	422		10,35
18	457,2	9,5	530			460		12,40
20	508	11	585			511		15,10
24	610	13	685	60	14	613	9	23,25
28	711	15	800		19	719		36,80
32	813	17	905		20,5	821		46,85
36	914	19	1000		22	922		54,55

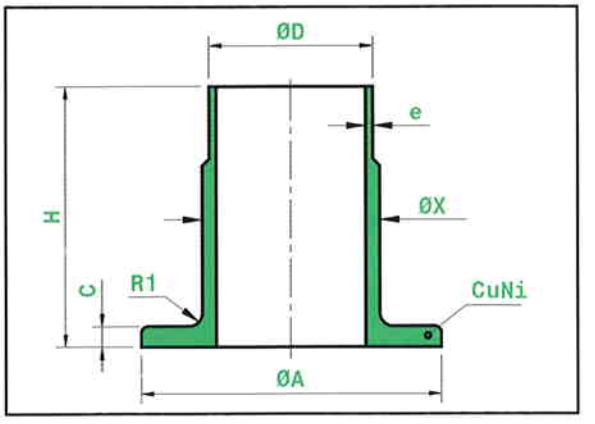
Composite weld neck flanges 16 Bar

Long inner flanges type EEMUA

Ref : **LBI-INR4114**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 145



Outside diameter of pipe ØD		Wall thickness e	ØA	H	C	ØX	R1	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	Kg/piece
1/2	16	2	40	51	4	18	2	0,09
3/4	25		50		5	27	3	0,19
1	30	2,5	60			32	4	0,23
1 1/4	38		70			40		0,29
1 1/2	44,5		80		6	46,5		0,44
2	57		99	64		59	5	0,61
2 1/2	76,1		120			78		0,80
3	88,9		130		7	91		0,97
4	108	3	158	76		110		1,50
6	159		212	89	9	161,5		2,90
8	219,1	4	270	102		222		5,10
10	267	4,5	320	127		270		8,90
12	323,9	5,5	370	152	11	327	7	13,80
14	368	6,5	430			371		16,60
16	419,1	7	482		12	422		20,25
18	457,2	8	530			460		23,60
20	508	8,5	585			511		28,65
24	610	10,5	685		14	613	9	39,25
28	711	12	800	190	19	719		75,30
32	813	13,5	905		20,5	827		94,60
36	914	15,5	1000		22	922		115,55

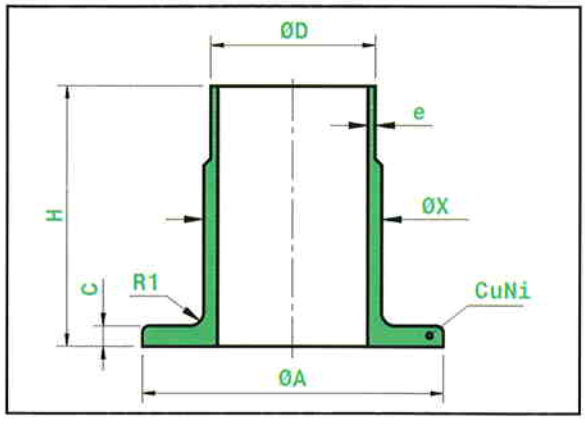
Composite weld neck flanges 20 Bar

Long inner flanges type EEMUA

Ref : **LBI-INR4115**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 145



Outside diameter of pipe ØD		Wall thickness e	ØA	H	C	ØX	R1	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	Kg/piece
1/2	16	2	40	51	4	18	2	0,09
3/4	25		50		5	27	3	0,19
1	30	2,5	60			32	4	0,23
1 1/4	38		70			40		0,29
1 1/2	44,5		80		6	46,5		0,44
2	57		99	64		59	5	0,61
2 1/2	76,1		120			78		0,80
3	88,9		130		7	91		0,97
4	108	3	158	76		110		1,50
6	159	3,5	212	89	9	161,5		2,90
8	219,1	4,5	270	102		222		5,20
10	267	5,5	320	127		270		9,80
12	323,9	7	370	152	11	327	7	15,40
14	368	8	430			371		19,00
16	419,1	9	482		12	422		23,95
18	457,2	9,5	530			460		26,40
20	508	11	585			511		33,85
24	610	13	685		14	613	9	45,50
28	711	15	800	190	19	719		86,20
32	813	17	905		20,5	821		100,15
36	914	19	1000		22	922		131,95

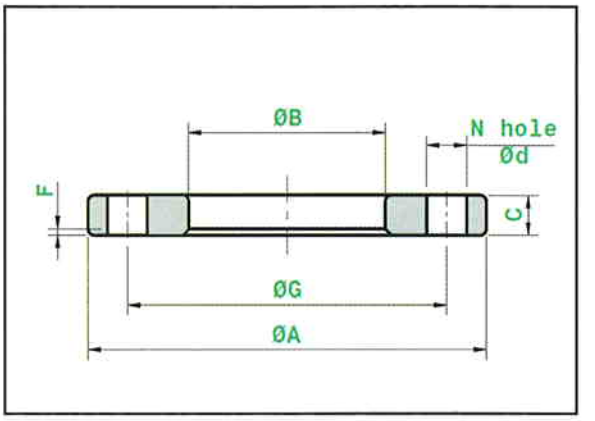
Composite weld neck flanges 10 Bar

Outer flanges

Ref : **LBI-FLG4211**

Material : Carbon steel A37 or A105
(Galvanised or epoxy coated upon request)

Dimension : ISO NP10 - DIN 86037



Outside diameter of pipe ØD		ØA	C	ØB	F	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	ØG mm	N mm	Ød mm	Kg/piece
3/4	25	105	14	28	3	75	4	14	0,80
1	30	115	16	33	4	85			1,10
1 1/4	38	140		42		100		18	1,65
1 1/2	44,5	150		50		110			1,85
2	57	165		62	5	125			2,20
2 1/2	76,1	185		81		145			2,65
3	88,9	200	18	94		160	8		3,30
4	108	220		113		180			3,65
5	133	250		138		210			4,55
6	159	285		164		240		22	5,60
7	193,7	315	22	200		270			7,50
8	219,1	340	20	225		295			7,45
10	267	395	22	273		350	12		10,30
12	323,9	445	24	331	7	400			12,00
14	368	505		375		460	16		16,00
16	419,1	565	26	426		515		26	20,00
18	457,2	615	28	465		565	20		25,00
20	508	670	30	517		620			31,00
24	610	780	32	618	9	725		30	40,00

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

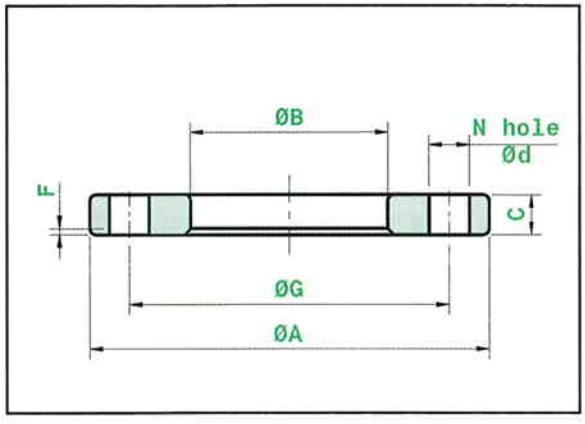
Composite weld neck flanges 150 Lbs

Outer flanges

Ref : **LBI-FLG4212**

Material : Carbon steel A105
(Galvanised or epoxy coated upon request)

Dimension : EEMUA Pub. N° 145



Outside diameter of pipe ØD		ØA	C	ØB	F	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	ØG mm	N mm	Ød mm	Kg/piece
1/2	16	89	14	19	2	60,3	4	15,9	0,60
3/4	25	98		28	3	69,8			0,80
1	30	108		33		79,4			0,90
1 1/4	38	117		41		88,9			1,10
1 1/2	44,5	127		48		98,4			1,20
2	57	152	18	62		120,6		19,0	2,10
2 1/2	76,1	178		81		139,7			2,60
3	88,9	190	19	94		152,4			2,90
4	108	229	24	113		190,4	8		5,90
6	159	279	27	164	4	241,3		22,2	8,40
8	219,1	343	31	225	5	298,4			12,35
10	267	406	38	273		362,0	12	25,4	19,70
12	323,9	483	41	330	7	431,8			32,20
14	368	533	45	374		476,2		28,6	38,20
16	419,1	597	51	426		539,8	16		52,15
18	457,2	635	52	465		577,8		31,8	54,05
20	508	698	58	517		635,0	20		73,20
24	610	813	71	618	9	749,3		34,9	114,25
28	711	927	81	727		864,0	28		151,80
32	813	1060	95	829		978,0		41,1	233,50
36	914	1168	105	931		1086,0	32		294,10

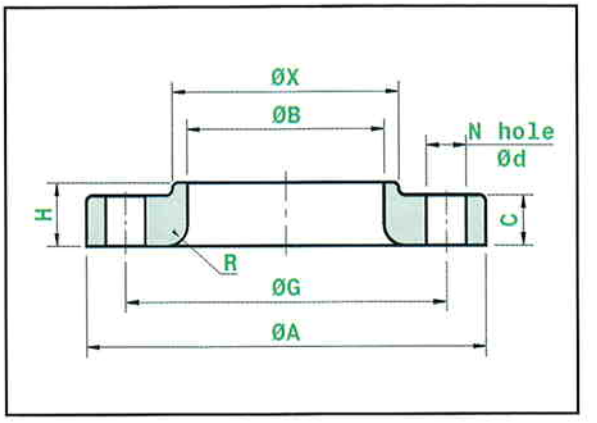
Composite weld neck flanges 150 Lbs

Outer flanges

Ref : **LBI-FLG4213**

Material : Carbon steel A105
(Galvanised or epoxy coated upon request)

Dimension : ANSI B16.5



Outside diameter of pipe ØD		ØA	H	C	ØX	ØB	R	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	ØG mm	N mm	Ød mm	Kg/piece
1/2	20	88,9	15,9	11,1	30,2	22	3,2	60,3	4	15,9	0,80
3/4	25	98,4		12,7	38,1	28		69,8			0,90
1	30	107,9	17,5	14,3	49,2	33		79,4			1,00
1 1/4	38	117,5	20,6	15,9	58,8	41	4,8	88,9			1,30
1 1/2	44,5	127,0	22,2	17,5	65,1	48	6,4	98,4			1,40
2	57	152,4	25,4	19,0	77,8	62	7,9	120,6		19,0	2,30
2 1/2	76,1	177,8	28,6	22,2	90,5	81		139,7			3,20
3	88,9	190,5	30,2	23,8	107,9	94	9,5	152,4			3,60
4	108	228,6	33,3		134,9	113	11,1	190,5	8		5,90
5	133	254,0	36,5		163,5	138		215,9		22,2	6,80
6	159	279,4	39,7	25,4	192,1	164	12,70	241,3			8,60
8	219,1	342,9	44,4	28,6	246,1	225		298,4			13,60
10	267	406,4	49,2	30,2	304,8	273		361,9	12	25,4	19,50
12	323,9	482,6	55,6	31,7	365,1	330		431,8			29,00
14	368	533,4	79,4	34,9	400,0	374		476,2		28,6	45,00
16	419,1	596,9	87,3	36,5	457,2	426		539,7	16		58,00
18	457,2	635,0	96,8	39,7	504,8	465		577,8		31,7	66,00
20	508	698,5	103,2	42,9	558,8	517		635,0	20		84,00
24	610	812,8	111,1	47,6	663,6	618		749,3		34,9	118,00

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

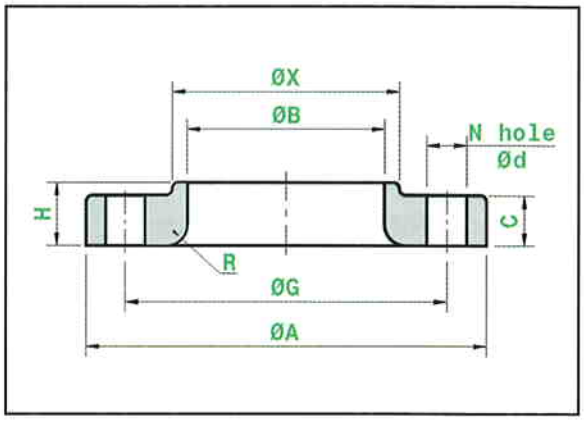
Composite weld neck flanges 300 Lbs

Outer flanges

Ref : **LBI-FLG4214**

Material : Carbon steel A105
(Galvanised or epoxy coated upon request)

Dimension : ANSI B16.5



Outside diameter of pipe ØD		ØA	H	C	ØX	ØB	R	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	ØG mm	N mm	Ød mm	Kg/piece
1/2	20	95,2	22,2	14,3	38,1	22		66,7		15,9	1,20
3/4	25	117,5	25,4	15,9	47,6	28	3,2	82,5			1,30
1	30	123,8	27,0	17,5	54,0	33		88,9	4	19,0	1,40
1 1/4	38	133,3		19,0	63,5	41	4,8	98,4			1,80
1 1/2	44,5	155,6	30,2	20,6	69,8	48	6,4	114,3		22,2	2,70
2	57	165,1	33,3	22,2	84,1	62	7,9	127,0		19,0	3,20
2 1/2	76,1	190,5	38,1	25,4	100,0	81		149,2			4,50
3	88,9	209,5	42,9	28,6	117,5	94	9,5	168,3	8		5,90
4	108	254,0	47,6	31,7	146,0	113	11,1	200,0		22,2	10,00
5	133	279,4	50,8	34,9	177,8	138		234,9			12,70
6	159	317,5	52,4	36,5	206,4	164		269,9	12		17,70
8	219,1	381,0	61,9	41,3	260,3	225		330,2		25,4	26,30
10	267	444,5	95,2	47,6	320,7	273		387,3	16	28,6	41,00
12	323,9	520,7	101,6	50,8	374,6	330		450,8		31,7	63,00
14	368	584,2	111,1	54,0	425,4	374	12,7	514,3	20		86,00
16	419,1	647,7	120,6	57,1	482,6	426		571,5			109,00
18	457,2	711,2	130,2	60,3	533,4	465		628,6		34,9	138,00
20	508	774,7	139,7	63,5	587,4	517		685,8	24		170,00
24	610	914,4	152,4	69,8	701,7	618		812,8		41,3	241,00

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

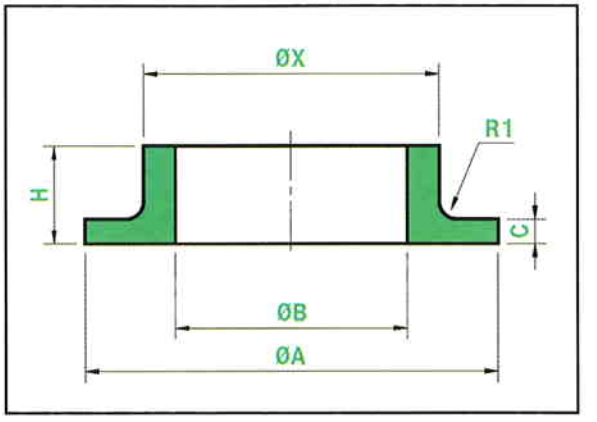
Composite slip on flanges — 10 Bar

Ref : **LBI-INR4311**

INNER FLANGES :

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86036



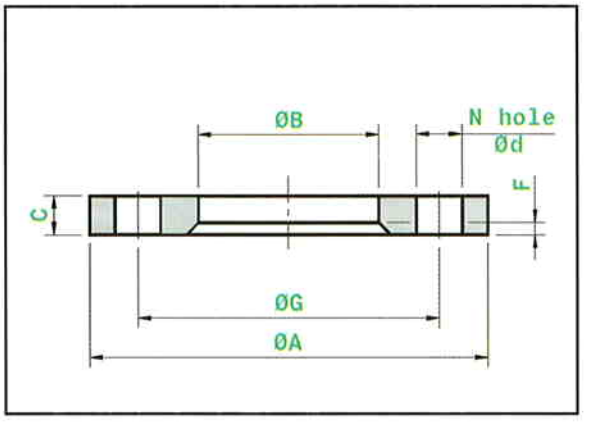
Outside diameter of pipe ØD		ØA	H	C	ØX	ØB	R1	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	Kg/piece
1/2	20	45	22	6	31	20,20	2	0,13
3/4	25	58			37	25,20		0,19
1	30	68	24		44	30,20		0,28
1 1/4	38	78			54	38,25		0,37
1 1/2	44,5	88			60	44,75		0,43
2	57	102			73	57,30		0,54
2 1/2	76,1	122			90	76,30		0,65
3	88,9	138	26		106	89,40		0,89
4	108	158			126	108,40		1,10

Ref : **LBI-FLG4312**

OUTER FLANGES :

Material : Carbon steel A37 or A105
(Galvanised or epoxy coated upon request)

Dimension : ISO NP 10



Outside diameter of pipe ØD		ØA	C	ØB	F	Drilling			Theo. weight
						ØG	N	Ød	
nominal inch	actual mm	mm	mm	mm	mm	mm	bolt holes	mm	Kg/piece
1/2	20	95	14	32	2	65	4	14	0,65
3/4	25	105		38		75			0,75
1	30	115	16	45		85			1,01
1 1/4	38	140		55		100		18	1,50
1 1/2	44,5	150		62		110			1,71
2	57	165		75		125			2,00
2 1/2	76,1	185		92		145			2,41
3	88,9	200	18	108		160			3,00
4	108	220		128		180	8		3,26

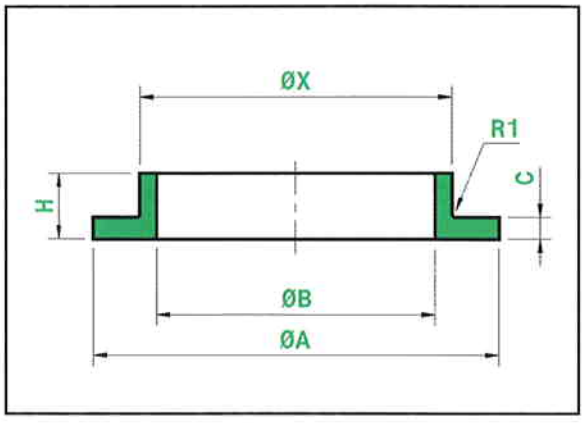
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Ref : **LBI-INR4313**

INNER FLANGES :

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 145



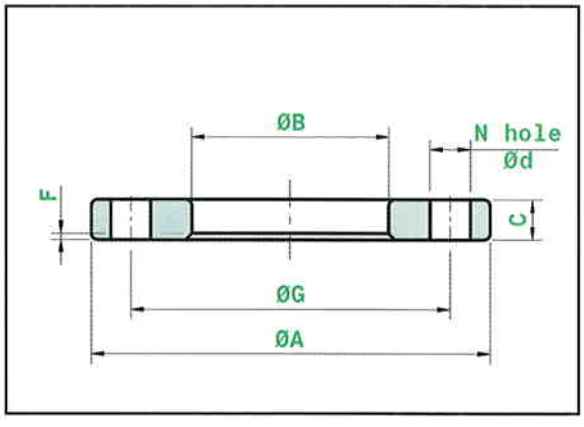
Outside diameter of pipe ØD		ØA	H	C	ØX	ØB	R1	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	Kg/piece
1/2	16	40	16	5	21	16,07	1	0,06
3/4	25	53			31	25,08		0,10
1	30	60	18		36	30,08		0,14
1 1/4	38	70			45	38,10		0,20
1 1/2	44,5	80	19		51	44,60		0,30
2	57	99		6	67	57,23		0,40
2 1/2	76,1	120			87	76,33		0,50
3	88,9	130	21	7	100	89,18		0,70
4	108	158	23		120	108,38		0,90

Ref : **LBI-FLG4314**

OUTER FLANGES :

Material : Carbon steel A105
(Galvanised or epoxy coated upon request)

Dimension : EEMUA Pub. N° 145 - Class 150 Lbs



Outside diameter of pipe ØD		ØA	C	ØB	F	Drilling ØG	Drilling N bolt holes	Drilling Ød	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm		mm	Kg/piece
1/2	16	89	14	23	3	60,3	4	15,9	0,75
3/4	25	98		33		69,8			0,80
1	30	108		38		79,4			0,95
1 1/4	38	117		47		88,9			1,10
1 1/2	44,5	127		53		98,4			1,15
2	57	152	18	69		120,6		19	2,10
2 1/2	76,1	178		89		139,7			2,60
3	88,9	190	19	103		152,4			2,90
4	108	229	24	123		190,5			5,90

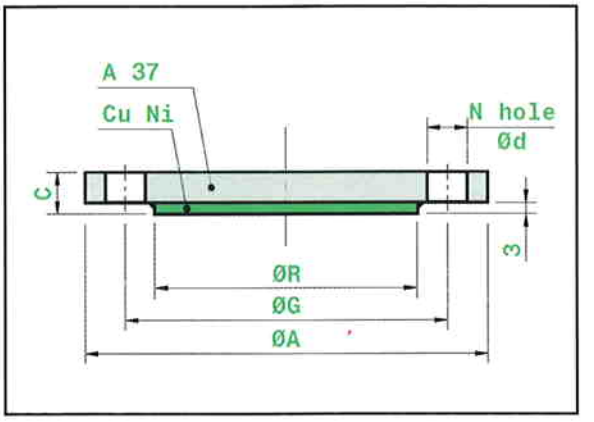
Composite blind flanges — 10 Bar

Ref : **LBI-FLG4411**

DISCS : Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

FLANGES : Material : Carbon steel A37 or A105
(Galvanised or epoxy coated upon request)

Dimension : ISO NP 10



Outside diameter of pipe ØD		ØA	C	ØR	Drilling			Theo. weight
					ØG	N	Ød	
nominal inch	actual mm	mm	mm	mm	mm	bolt holes	mm	Kg/piece
1/2	20	95	14	46	65	4	14	0,78
3/4	25	105	16	56	75			1,15
1	30	115		65	85			1,40
1 1/4	38	140	18	76	100		18	2,00
1 1/2	44,5	150		84	110			2,35
2	57	165	20	99	125			3,20
2 1/2	76,1	185		118	145			4,15
3	88,9	200		132	160	8		5,70
4	108	220	22	156	180			7,05
5	133	250		184	210			10,05
6	159	285	24	211	240		22	13,00
7	193,7	315		242	270			18,00
8	219,1	340		266	295			20,80
10	267	395	26	319	350	12		29,65
12	323,9	445		370	400			38,70
14	368	505		429	460	16		53,55
16	419,1	565	28	480	515		26	69,45
18	457,2	615		530	565	20		82,40
20	508	670	30	582	620			104,70
24	610	780	34	682	725		30	149,75

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

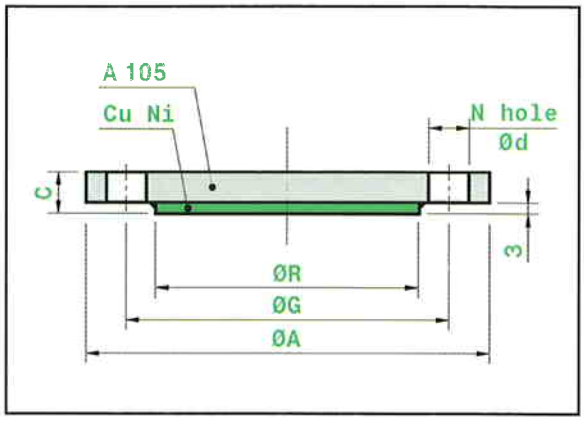
Composite blind flanges — 150 Lbs

Ref : **LBI-FLG4412**

DISCS : Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

FLANGES : Material : Carbon steel A105
(Galvanised or epoxy coated upon request)

Dimension : ANSI B16.5



Outside diameter of pipe ØD		ØA	C	ØR	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	88,9	12,5	34,9	60,3	4	15,9	0,80
3/4	25	98,4	14,1	42,9	69,8			0,90
1	30	108,0	15,7	50,8	79,4			1,00
1 1/4	38	117,5	17,3	63,5	88,9			1,30
1 1/2	44,5	127,0	18,9	73,0	98,4			1,40
2	57	152,4	20,5	92,1	120,6		19	1,80
2 1/2	76,1	177,8	23,6	104,8	139,7			3,20
3	88,9	190,5	25,2	127,0	152,4			4,00
4	108	228,6		157,2	190,5	8		8,00
5	133	254,0		185,7	215,9		22,2	9,00
6	159	279,4	26,8	215,9	241,3			12,00
8	219,1	342,9	30,0	269,9	298,4			20,00
10	267	406,4	31,6	323,8	361,9	12	25,4	32,00
12	323,9	482,6	33,2	381,0	431,8			50,00
14	368	533,4	36,3	425,1	476,2		28,6	59,00
16	419,1	596,9	37,9	482,6	539,7	16		77,00
18	457,2	635,0	41,1	533,4	577,8		31,7	95,00
20	508	698,5	44,3	584,2	635,0	20		123,00
24	610	812,8	49,0	692,1	749,3		34,9	186,00

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

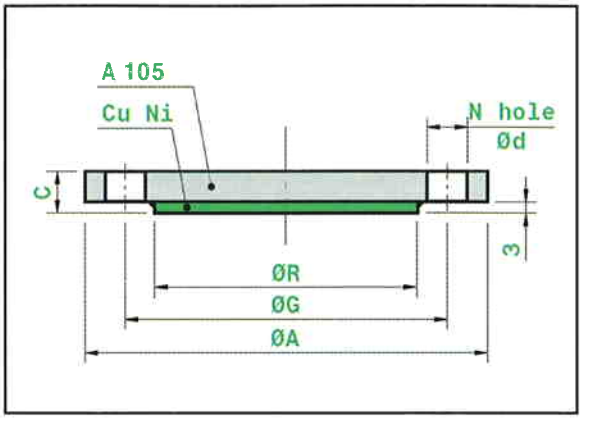
Composite blind flanges 300 Lbs

Ref : **LBI-FLG4413**

DISCS : Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

FLANGES : Material : Carbon steel A105
(Galvanised or epoxy coated upon request)

Dimension : ANSI B16.5

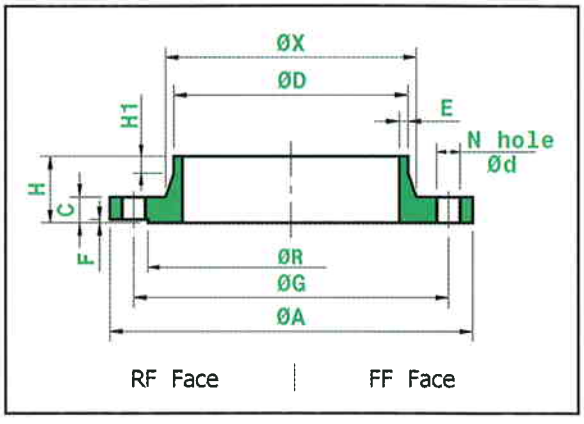


Outside diameter of pipe ØD		ØA	C	ØR	Drilling			Theo. weight
					ØG	N	Ød	
nominal inch	actual mm	mm	mm	mm	mm	bolt holes	mm	Kg/piece
1/2	20	95,2	15,6	34,9	66,7	4	15,9	1,00
3/4	25	117,5	17,3	42,9	82,5		19	1,50
1	30	123,8	18,9	50,8	88,9			2,00
1 1/4	38	133,3	20,4	63,5	98,4			2,50
1 1/2	44,5	155,6	22,0	73,0	114,3		22,2	3,00
2	57	165,1	23,6	92,1	127,0	8	19	3,50
2 1/2	76,1	190,5	26,8	104,8	149,2		22,2	5,50
3	88,9	209,5	30,0	127,0	168,3			7,00
4	108	254,0	33,2	157,2	200,0			12,00
5	133	279,4	36,3	185,7	234,9			16,00
6	159	317,5	37,9	215,9	269,9	12		23,00
8	219,1	381,0	42,7	269,9	330,2		25,4	36,50
10	267	444,5	49,0	323,8	387,3	16	28,6	57,50
12	323,9	520,7	52,2	381,0	450,8		31,7	83,00
14	368	584,2	55,4	425,1	514,3	20		107,00
16	419,1	647,7	58,6	482,6	571,5		34,9	139,00
18	457,2	711,2	61,7	533,4	628,6	24		177,00
20	508	774,7	64,9	584,2	685,8			223,00
24	610	914,4	71,2	692,1	812,8		41,3	342,00

- Other dimensions, wall thicknésses and outside diameters are also available upon request.

Solid welding neck flanges 10 & 16 Bar

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref : **LBI-FLG4511**

NP 10

Dimension : **DIN 2632**

Outside diameter of pipe ØD		ØA	H	C	ØX	ØR	F	E	H1	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	kg/piece
ND 1/2 to 7 Welding neck flanges as per DIN 2633, NP 16 are to be used.													
8	219,1	340	62	24	235	268	3	To be specified by purchaser	16	295	8	22	12,84
10	267	395	68	26	285	320				350	12		16,70
12	323,9	445			344	370	4			400			19,77
14	368	505			385	430				460	16		26,81
16	419,1	565	72		440	482				515		26	32,49
20	508	670	75	28	542	585				620	20		43,28
24	610	780	80		642	685	5		18	725		30	50,67

Ref : **LBI-FLG4512**

NP 16

Dimension : **DIN 2633**

Outside diameter of pipe ØD		ØA	H	C	ØX	ØR	F	E	H1	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	95	35	14	30	45	2	To be specified by purchaser	6	65	4	14	0,74
3/4	25	105	38	16	38	58				75			1,08
1	30	115			42	68				85			1,30
1 1/4	38	140	40		52	78				100		18	1,92
1 1/2	44,5	150	42		60	88	3		7	110			2,11
2	57	165	45	18	72	102			8	125			2,88
2 1/2	76,1	185			90	122			10	145			3,48
3	88,9	200	50	20	105	138				160	8		4,20
4	108	220	52		125	158			12	180			5,25
5	133	250	55	22	150	188				210			7,15
6	159	285			175	212				240		22	8,80
7	193,7	315	60	24	210	242				270			11,19
8	219,1	340	62		235	268			16	295	12		12,50
10	267	405	70	26	285	320				355		26	17,72
12	323,9	460	78	28	344	378	4			410			25,00
14	368	520	82	30	390	438				470	16		35,45
16	419,1	580	85	32	445	490				525		30	45,21
20	508	715	90	34	548	610				650	20	33	69,30
24	610	840	95	36	652	725	5		18	770		36	85,65

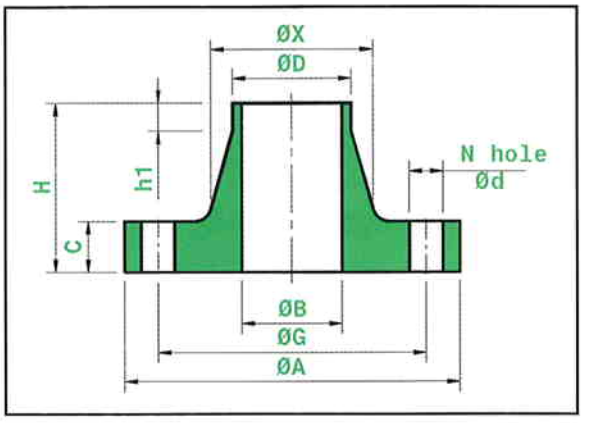
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Solid welding neck flanges 16 Bar

Ref : **LBI-FLG4513**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 145



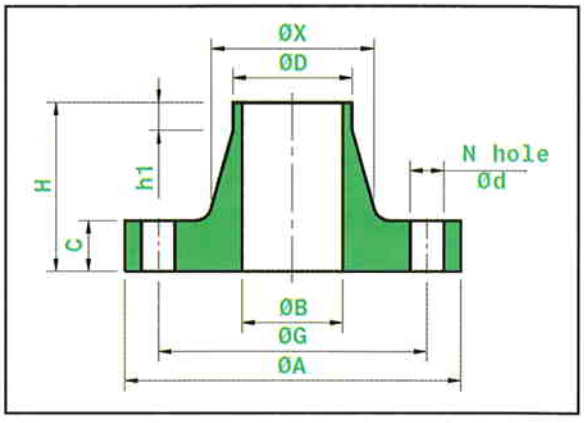
Outside diameter of pipe ØD		ØA	H	C	ØX	ØB	h1	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	ØG mm	N mm	Ød mm	Kg/piece
1/2	16	89	48	14	23	12,00	8	60,3	4	15,9	0,74
3/4	25	98	52	16	32	21,00	7	69,8			1,04
1	30	108	56		42	25,00	8	79,4			1,36
1 1/4	38	117	57	17	51	33,03		88,9			1,70
1 1/2	44,5	127	62	20	61	39,53	7	98,4			2,38
2	57	152	64	25	73	52,16	9	120,6		19	3,93
2 1/2	76,1	178	70	27	91	71,23	8	139,7			5,62
3	88,9	190			105	84,08		152,4			6,27
4	108	229	76		135	102,13		190,5	8		9,53
6	159	279	89		192	153,75		241,3		22,2	13,65
8	219,1	343	98	31	246	211,10		298,4			21,19
10	267	406			305	257,97		362	12	25,4	29,52
12	323,9	483		35	365	312,83		431,8			44,77
14	368	533	99	41	400	354,22		476,2		28,6	57,27
16	419,1	597	106	43	457	404,17		539,8	16		74,40
18	457,2	635	113	45	505	441,50		577,8		31,8	88,16
20	508	698	118		559	490,50		635,0	20		106,20
24	610	813	137	49	664	589,50		749,3		34,9	153,15
28	711	927	145	72	748	687,50		684,0	28		255,28
32	813	1060	160		876	786,50		978,0		41,1	291,45
36	914	1168	175		984	883,50		1086,0	32		356,45

Solid welding neck flanges — 20 Bar

Ref : **LBI-FLG4514**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 145



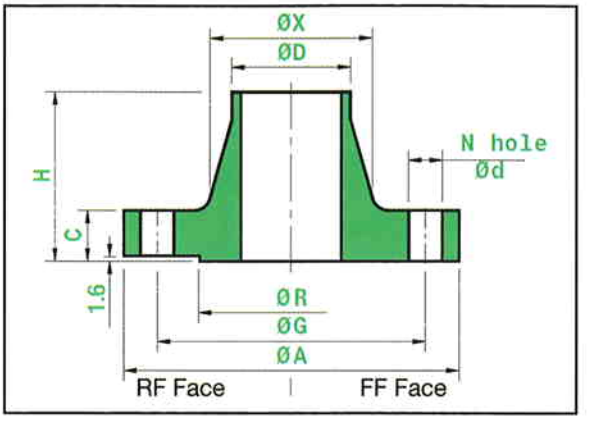
Outside diameter of pipe ØD		ØA	H	C	ØX	ØB	h1	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	16	89	48	14	23	12,00	8	60,3	4	15,9	0,74
3/4	25	98	52	16	32	21,00	7	69,8			1,04
1	30	108	56		42	25,00	8	79,4			1,36
1 1/4	38	117	57	17	51	33,03		88,9			1,70
1 1/2	44,5	127	62	20	61	39,53	7	98,4			2,38
2	57	152	64	25	73	52,16	9	120,6		19	3,93
2 1/2	76,1	178	70	27	91	71,23	8	139,7			5,62
3	88,9	190			105	84,08		152,4			6,27
4	108	229	76		135	102,13		190,5	8		9,53
6	159	279	89		192	152,38		241,3		22,2	13,99
8	219,1	343	98	31	246	210,10		298,4			21,57
10	267	406			305	255,93		362,0	12	25,4	30,47
12	323,9	483		35	365	309,74		431,8			46,56
14	368	533	99	41	400	351,00		476,2		28,6	59,49
16	419,1	597	106	43	457	399,84		539,8	16		78,03
18	457,2	635	113	45	505	438,50		577,8		31,8	91,08
20	508	698	118		559	486,50		635,0	20		110,65
24	610	813	137	49	664	584,50		749,3		34,9	160,79
28	711	927	145	72	748	681,50		864,0	28		249,09
32	813	1060	160		876	779,50		978,0		41,1	303,95
36	914	1168	175		984	876,50		1086,0	32		371,80

Solid welding neck flanges 150 Lbs

Ref : **LBI-FLG4515**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : ANSI B 16.5



Outside diameter of pipe ØD		ØA	H	C	ØX	ØR	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	88,9	47,6	11,1	30,2	34,9	60,3	4	15,9	0,68
3/4	25	98,4	52,4	12,7	38,1	42,9	69,8			0,91
1	30	107,9	55,6	14,3	49,2	50,8	79,4			1,25
1 1/4	38	117,5	57,1	15,9	58,7	63,5	88,9			1,58
1 1/2	44,5	127,0	61,9	17,5	65,1	73,0	98,4			2,05
2	57	152,4	63,5	19,1	77,8	92,10	120,6		19	3,05
2 1/2	76,1	177,8	69,8	22,2	90,5	104,8	139,7			5,10
3	88,9	190,5			107,9	127,0	152,4			5,20
4	108	228,6	76,2	23,8	134,9	157,2	190,5	8		7,90
5	133	254,0	88,9		163,5	185,7	215,9		22,2	10,10
6	159	279,4		25,4	192,1	215,9	241,3			12,20
8	219,1	342,9	101,6	28,6	246,1	269,9	298,4			20,00
10	267	406,4		30,2	304,8	323,8	361,9	12	25,4	27,00
12	323,9	482,6	114,3	31,8	365,1	381,0	431,8			42,00
14	368	533,4	127	34,9	400,0	425,1	476,2		28,6	53,00
16	419,1	596,9		36,5	457,2	482,6	539,7	16		66,00
18	457,2	635,0	139,7	39,7	504,8	533,4	577,8		31,7	72,00
20	508	698,5	144,5	42,9	558,8	584,2	635,0	20		87,00
24	610	812,8	152,4	47,6	663,6	692,1	749,3		34,9	134,00

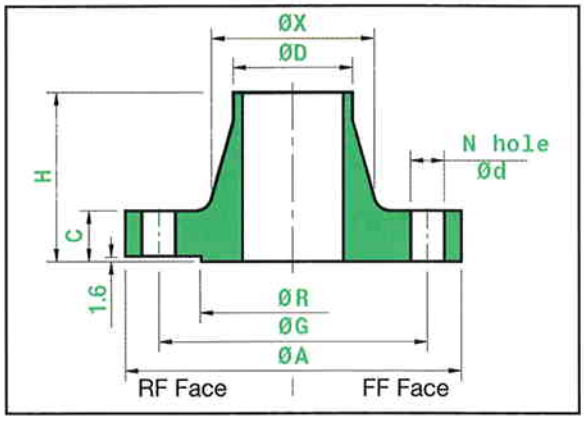
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Solid welding neck flanges 300 Lbs

Ref : **LBI-FLG4516**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : ANSI B 16.5



Outside diameter of pipe ØD		ØA	H	C	ØX	ØR	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	95,2	52,4	14,3	38,1	34,9	66,7	4	15,9	1,72
3/4	25	117,5	57,1	15,9	47,6	42,9	82,5		19	2,06
1	30	123,8	61,9	17,5	54,0	50,8	88,9			2,29
1 1/4	38	133,3	65,1	19,0	63,5	63,5	98,4			2,86
1 1/2	44,5	155,6	68,3	20,6	69,8	73,0	114,3		22,2	4,01
2	57	165,1	69,8	22,2	84,1	92,1	127,0	8	19	4,58
2 1/2	76,1	190,5	76,2	25,4	100,0	104,8	149,2		22,2	5,73
3	88,9	209,5	79,4	28,6	117,5	127,0	168,3			8,02
4	108	254,0	85,7	31,8	146,1	157,2	200,0			12,60
5	133	279,4	98,4	34,9	177,8	185,7	234,9	8		17,90
6	159	317,5		36,5	206,4	215,9	269,9	12		21,76
8	219,1	381,0	111,1	41,3	260,4	269,9	330,2		25,4	34,35
10	267	444,5	117,5	47,6	320,7	323,8	387,3	16	28,6	46,95
12	323,9	520,7	130,2	50,8	374,6	381,0	450,8		31,7	70,99
14	368	584,2	142,9	54,0	425,4	425,1	514,3	20		96,18
16	419,1	647,7	146,1	57,2	482,6	482,6	571,5		34,9	127,10
18	457,2	711,2	158,7	60,3	533,3	533,4	628,6	24		158,01
20	508	774,7	161,9	63,5	587,4	584,2	685,8			195,80
24	610	914,4	168,3	69,8	701,7	692,1	812,8		41,3	283,00

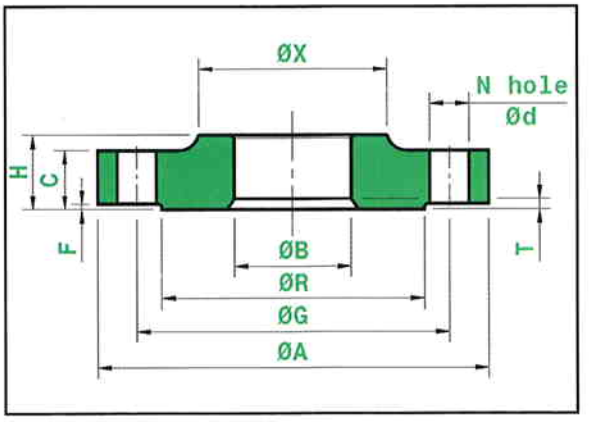
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Solid slip on flanges — 10 Bar

Ref : **LBI-FLG4611**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86033



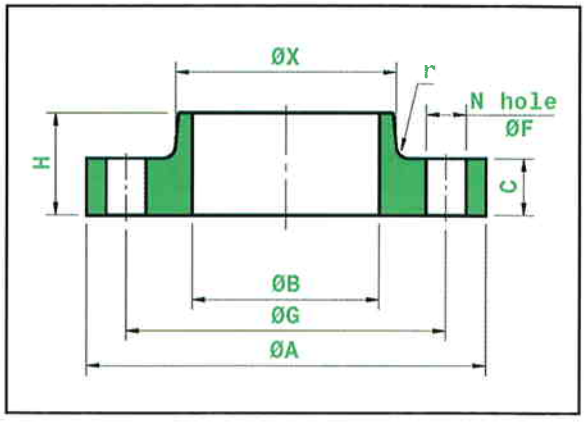
Outside diameter of pipe ØD		ØA	H	C	ØX	ØR	ØB	F	T	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	kg/piece
3/8	16	90	18	12	26	40	16,20	2	NO APPLICABLE	60	4	14	0,52
1/2	20	95			30	45	20,20			65			0,57
3/4	25	105			35	58	25,20			75			0,71
1	30	115			40	68	30,20			85			0,86
1 1/4	38	140	20	14	49	78	38,25			100		18	1,47
1 1/2	44,5	150			56	88	44,75	3		110			1,60
2	57	165	22	16	69	102	57,30			125			2,20
2 1/2	76,1	185			88	122	76,30			145			2,66
3	88,9	200	24	18	101	138	89,40			160	8		3,32
4	108	220	28	20	120	158	108,40	5		180			4,31
5	133	250			146	188	133,65		7	210			5,37
6	159	285	30	22	172	212	159,65			240		23	6,37
7	193,7	315	32		209	242	195,00			270			7,22
8	219,1	340		24	234	268	220,00			295			9,12
10	267	395	34	26	284	320	268,20	6		350	12		12,10
12	323,9	445	36		343	370	325,35			400			13,70
14	368	505	38	28	389	430	369,35			460	16		19,30
16	419,1	565	40		442	482	420,50			515		27	23,20
18	457,2	615	42		482	530	458,50			565	20		27,90
20	508	670	47	31	535	585	509,50	7	8	620			35,00
24	610	780	49		640	685	612,00	8		725		30	42,90

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Ref : **LBI-FLG4612**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 145



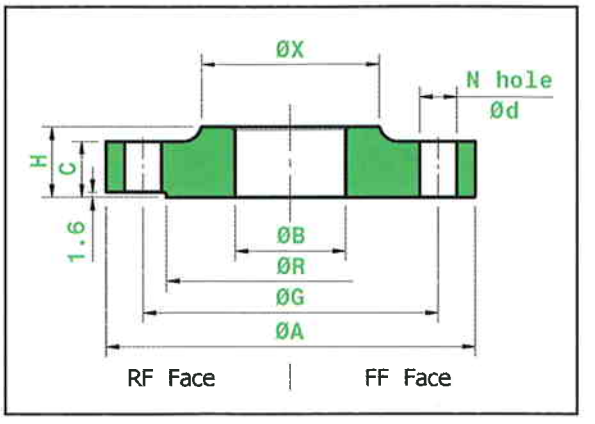
Outside diameter of pipe ØD		ØA	H	C	ØX	ØB	r	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	16	89	20	14	23	16,07	4	60,3	4	15,9	1,15
3/4	25	98	24	16	32	25,08		69,8			1,20
1	30	108			47	30,08		79,4			1,30
1 1/4	38	117	26	17	51	38,10	6	88,9			1,70
1 1/2	44,5	127		20	61	44,60		98,4			1,80
2	57	152	28	25	73	57,23		120,6		19	2,90
2 1/2	76,1	178	32	27	91	76,33		139,7			4,30
3	88,9	190	34		105	89,18		152,4			4,40
4	108	229	40		135	108,38	8	190,5	8		7,30

Solid slip on flanges — 150 Lbs

Ref : **LBI-FLG4613**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : ANSI B16.5



Outside diameter of pipe ØD		ØA	H	C	ØX	ØR	ØB	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	88,9	15,9	11,1	30,2	34,9	20,2	60,3	4	15,9	0,90
3/4	25	98,4		12,7	38,1	42,9	25,2	69,8			1,10
1	30	107,9	17,5	14,3	49,2	50,8	30,2	79,4			1,20
1 1/4	38	117,5	20,6	15,9	58,7	63,5	38,3	88,9			1,50
1 1/2	44,5	127,0	22,2	17,5	65,1	73,0	44,8	98,4			1,60
2	57	152,4	25,4	19,1	77,8	92,1	57,4	120,6		19,0	2,70
2 1/2	76,1	177,8	28,6	22,2	90,5	104,8	76,5	139,7			4,10
3	88,9	190,5	30,2	23,8	107,9	127,0	89,4	152,4			4,10
4	108	228,6	33,3		134,9	157,2	108,5	190,5	8		7,00
5	133	254,0	36,5		163,5	185,7	133,8	215,9		22,2	8,00
6	159	279,4	39,7	25,4	192,1	215,9	159,8	241,3			9,90
8	219,1	342,9	44,4	28,6	246,1	269,9	220,3	298,4			15,70
10	267	406,4	49,2	30,2	304,8	323,8	268,4	361,9	12	25,4	22,80
12	323,9	482,6	55,6	31,8	365,1	381,0	325,4	431,8			33,90
14	368	533,4	57,1	34,9	400,0	425,1	369,5	476,2		28,6	45,00
16	419,1	596,9	63,5	36,5	457,2	482,6	420,5	539,7	16		49,00
18	457,2	635,0	68,3	39,7	504,8	533,4	458,7	577,8		31,7	63,00
20	508	698,5	73,0	42,9	558,8	584,2	509,5	635,0	20		81,50
24	610	812,8	82,5	47,6	663,6	692,1	611,5	749,3		34,9	105,55

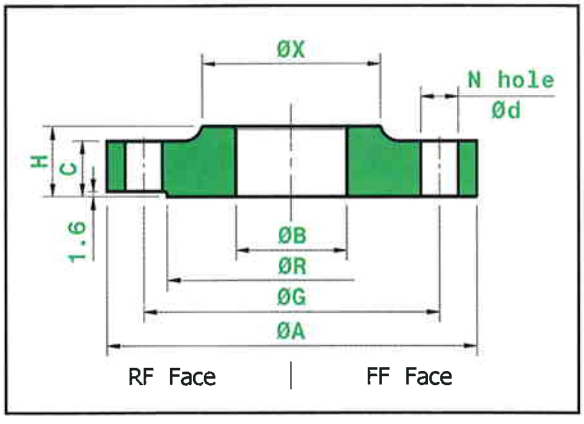
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Solid slip on flanges — 300 Lbs

Ref : **LBI-FLG4614**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : ANSI B16.5



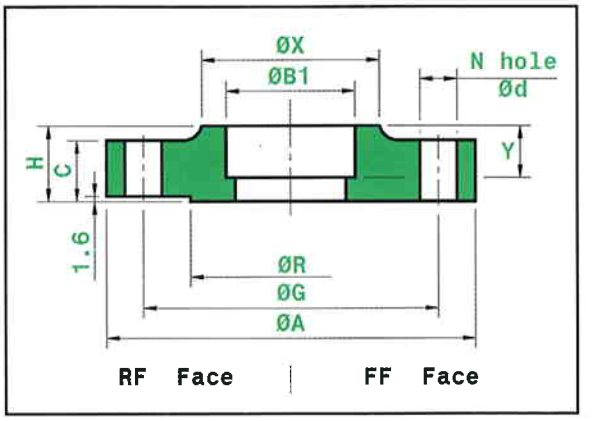
Outside diameter of pipe ØD		ØA	H	C	ØX	ØR	ØB	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	95,2	22,2	14,3	38,1	34,9	20,2	66,7	4	15,9	0,90
3/4	25	117,5	25,4	15,9	47,6	42,9	25,2	82,5		19	1,40
1	30	123,8	27,0	17,5	54,0	50,8	30,2	88,9			1,70
1 1/4	38	133,3		19,0	63,5	63,5	38,3	98,4			2,00
1 1/2	44,5	155,6	30,2	20,6	69,8	73,0	44,8	114,3		22,2	3,00
2	57	165,1	33,3	22,2	84,1	92,1	57,4	127,0	8	19	3,40
2 1/2	76,1	190,5	38,1	25,4	100,0	104,8	76,5	149,2		22,2	5,10
3	88,9	209,5	42,9	28,6	117,5	127,0	89,4	168,3			6,80
4	108	254,0	47,6	31,8	146,0	157,2	108,5	200,0			11,30
5	133	279,4	50,8	34,9	177,8	185,7	133,8	234,9			14,20
6	159	317,5	52,4	36,5	206,4	215,9	159,8	269,9	12		18,30
8	219,1	381,0	61,9	41,3	260,3	269,9	220,3	330,2		25,4	28,20
10	267	444,5	66,7	47,6	320,7	323,8	268,4	387,3	16	28,6	39,50
12	323,9	520,7	73,0	50,8	374,6	381,0	325,4	450,8		31,7	57,70
14	368	584,2	76,2	54,0	425,4	425,1	369,5	514,3	20		80,60
16	419,1	647,7	82,5	57,2	482,6	482,6	420,5	571,5			102,10
18	457,2	711,2	88,9	60,3	533,4	533,4	458,7	628,5		34,9	125,20
20	508	774,7	95,2	63,5	587,4	584,2	509,5	685,8	24		154,70
24	610	914,4	106,4	69,8	701,7	692,1	611,5	812,8		41,3	240,65

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Solid socket welding flanges 150 & 300 Lbs

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : ANSI B 16-5



150 Lbs Ref : LBI-FLG4711

Outside diameter of pipe ØD		ØA	H	C	ØX	ØR	ØB1	Y	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	88,9	15,9	11,1	30,2	34,9	20,2	9,5	60,3	4	15,9	0,80
3/4	25	98,4		12,7	38,1	42,9	25,2	11,1	69,8			1,10
1	30	107,9	17,5	14,3	49,2	50,8	30,2	12,7	79,4			1,20
1 1/4	38	117,5	20,6	15,9	58,7	63,5	38,3	14,3	88,9			1,50
1 1/2	44,5	127,0	22,2	17,5	65,1	73,0	44,8	15,9	98,4			1,60
2	57	152,4	25,5	19,1	77,8	92,1	57,4	17,5	120,6		19	2,70
2 1/2	76,1	177,8	28,6	22,2	90,5	104,8	76,5	19,0	139,7			4,10
3	88,9	190,5	30,2	23,8	107,9	127,0	89,4	20,6	152,4			4,10
4	108	228,6	33,3		134,9	157,2	108,5	23,8	190,5	8		7,00

300 Lbs Ref : LBI-FLG4712

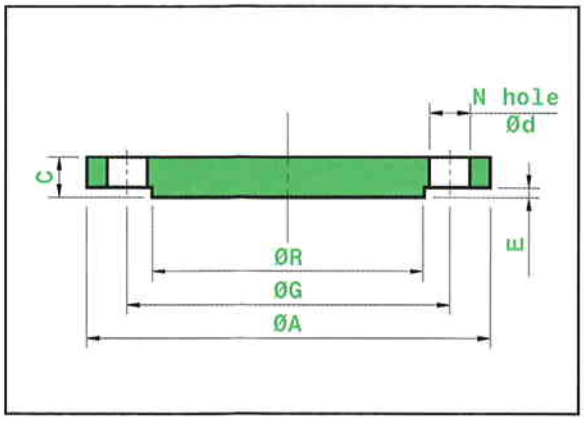
Outside diameter of pipe ØD		ØA	H	C	ØX	ØR	ØB1	Y	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	95,2	22,2	14,3	38,1	34,9	20,2	9,5	66,7	4	15,9	0,90
3/4	25	117,5	25,4	15,9	47,6	42,9	25,2	11,1	82,5		19	1,40
1	30	123,8	27,0	17,5	54,0	50,8	30,2	12,7	88,9			1,70
1 1/4	38	133,3		19,0	63,5	63,5	38,3	14,3	98,4			2,00
1 1/2	44,5	155,6	30,2	20,6	69,8	73,0	44,8	15,9	114,3		22,2	3,00
2	57	165,1	33,3	22,2	84,1	92,1	57,4	17,5	127,0	8	19	3,40
2 1/2	76,1	190,5	38,1	25,4	100,0	104,8	76,5	19,0	149,2		22,2	5,10
3	88,9	209,5	42,9	28,6	117,5	127,0	89,4	20,6	168,3			6,80
4	108	254,0	47,6	31,8	146,0	157,2	108,5	23,8	200,0			11,30

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Ref : **LBI-FLG4811**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : ISO NP10 NFE 29207



Outside diameter of pipe ØD		ØA	C	ØR	E	Drilling ØG	Drilling N bolt holes	Drilling Ød	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm		mm	Kg/piece
1/2	20	95	14	46		65			0,80
3/4	25	105	16	56	2	75		14	1,15
1	30	115		65		85			1,40
1 1/4	38	140	18	76		100	4		2,05
1 1/2	44,5	150		84		110			2,40
2	57	165	20	99		125			3,25
2 1/2	76,1	185		118		145		18	4,15
3	88,9	200		132		160			5,75
4	108	220	22	156		180			7,05
5	133	250		184	3	210	8		10,10
6	159	285		211		240			13,00
7	193,7	315	24	242		270			17,55
8	219,1	340		266		295		22	20,40
10	267	395		319		350	12		29,65
12	323,9	445	26	370		400			37,60
14	368	505		429		460	16		52,45
16	419,1	565	28	480	4	515			68,40
18	457,2	615		530		565		26	80,95
20	508	670	30	582		620	20		103,75
24	610	780	34	682	5	725		30	149,35

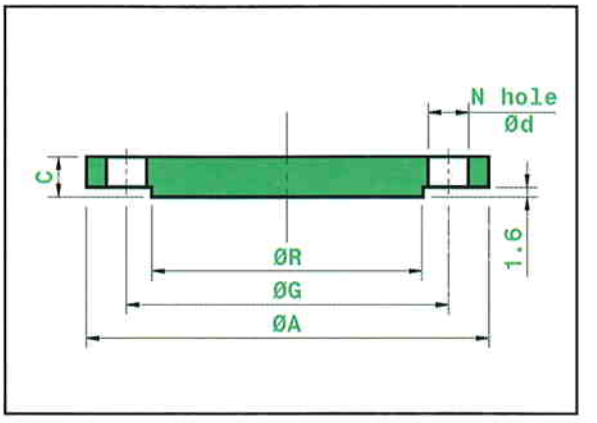
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Solid blind flanges 150 Lbs

Ref : **LBI-FLG4812**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : ANSI B16.5



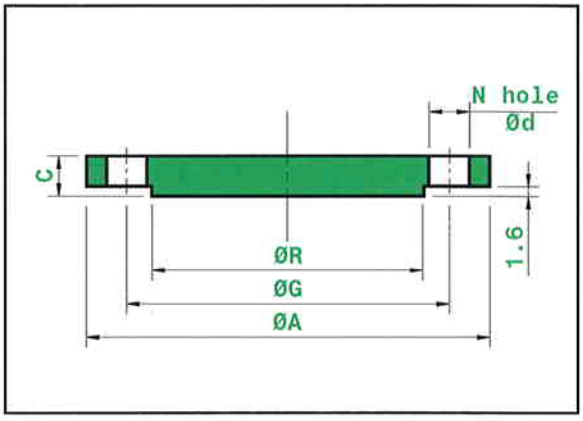
Outside diameter of pipe ØD		ØA	C	ØR	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	88,9	11,1	34,9	60,3	4	15,9	0,90
3/4	25	98,4	12,7	42,9	69,8			1,05
1	30	108,0	14,3	50,8	79,4			1,15
1 1/4	38	117,5	15,9	63,5	88,9			1,50
1 1/2	44,5	127,0	17,5	73,0	98,4			1,60
2	57	152,4	19,1	92,1	120,6		19	2,05
2 1/2	76,1	177,8	22,3	104,8	139,7			3,65
3	88,9	190,5	23,8	127,0	152,4			4,55
4	108	228,6		157,2	190,5	8		9,10
5	133	254,0		185,7	215,9		22,2	10,25
6	159	279,4	25,4	215,9	241,3			13,70
8	219,1	342,9	28,6	269,9	298,4			22,80
10	267	406,4	30,2	323,8	361,9	12	25,4	36,45
12	323,9	482,6	31,8	381,0	431,8			57,00
14	368	533,4	34,9	425,1	476,2		28,6	67,25
16	419,1	596,9	36,5	482,6	539,7	16		87,80
18	457,2	635,0	39,7	533,4	577,8		31,7	108,30
20	508	698,5	42,9	584,2	635,0	20		140,25
24	610	812,8	47,6	692,1	749,3		34,9	212,05

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Ref : **LBI-FLG4813**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : ANSI B16.5



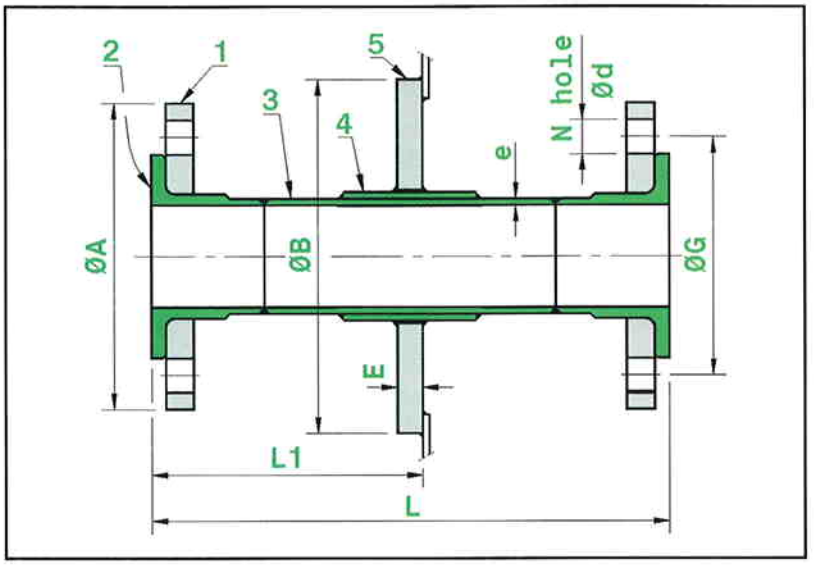
Outside diameter of pipe ØD		ØA	C	ØR	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
1/2	20	95,2	14,3	34,9	66,7	4	15,9	1,15
3/4	25	117,5	15,9	42,9	82,5		19	1,70
1	30	123,8	17,5	50,8	88,9			2,30
1 1/4	38	133,3	19,0	63,5	98,4			2,85
1 1/2	44,5	155,6	20,6	73,0	114,3		22,2	3,40
2	57	165,1	22,2	92,1	127,0	8	19	4,00
2 1/2	76,1	190,5	25,4	104,8	149,2		22,2	6,30
3	88,9	209,5	28,6	127,0	168,3			8,00
4	108	254,0	31,8	157,2	200,0			13,70
5	133	279,4	34,9	185,7	234,9			18,25
6	159	317,5	36,5	215,9	269,9	12		26,20
8	219,1	381,0	41,3	269,9	330,2		25,4	41,60
10	267	444,5	47,6	323,8	387,3	16	28,6	65,55
12	323,9	520,7	50,8	381,0	450,8		31,7	94,60
14	368	584,2	54,0	425,1	514,3	20		122,0
16	419,1	647,7	57,2	482,6	571,5		34,9	158,45
18	457,2	711,2	60,3	533,4	628,6	24		201,80
20	508	774,7	63,5	584,2	685,8			254,20
24	610	914,4	69,8	692,1	812,8		41,3	389,90

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Bulkhead pieces type 1 — 10 Bar

Ref : **LBI-BLK4911**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe
CuNi pipe *item 3 and 4*
CuNi inner flanges *item 2*
Carbon steel A37-2 for *item 1 and 5*



Outside diameter of pipe ØD		PN	E	ØB	L1	ØA	L	e	Drilling		Ød	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	mm	Kg/piece
3/4	25	16	14	150	100	105	200	2	75	4	14	4,10
1	30			160		115			85			5,10
1 1/4	38			185	110	140	220		100		18	7,10
1 1/2	44,5			205		150			110			8,50
2	57			220	115	165	230		125			10,00
2 1/2	76,1			240	120	185	240	3	145			12,50
3	88,9			255	130	200	260	2,5	160	8		15,10
4	108			275		220		3	180			17,60
5	133		16	305		250		3,5	210			22,70
6	159			340	135	285	270		240		22	29,10
7	193,7			370	140	315	280	4	270			36,30
8	219,1	10		395		340			295			38,70
10	267			460	150	395	300	5	350	12		53,60
12	323,9		20	525	160	445	320		400			71,60
14	368			585	170	505	340	6	460	16		91,60
16	419,1			645	180	565	360	8	515		26	120,40

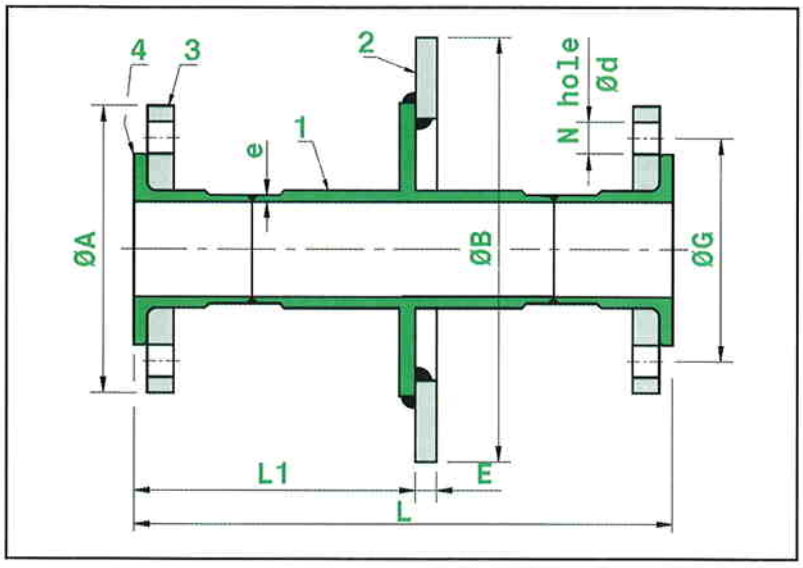
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Bulkhead pieces type 2 — 10 Bar

Ref : **LBI-BLK4912**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

CuNi socket piece *item 1*
CuNi inner flanges *item 4*
Carbon steel A37-2 for *item 2 and 3*



Dimension : DIN 86 068 NP 10

Outside diameter of pipe ØD		E	ØB	L1	ØA	L	e	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
3/4 to 7	25 to 194	Dimensions as per DIN 86069 NP 16 are to be used									
8	219,1	16	395	140	340	280	3	295	8	22	39,30
10	267		460	150	395	300	4	350	12		51,85
12	323,9	20	525	160	445	320		400			72,90
14	368		585	170	505	340	5	460	16		95,45
16	419,1		645	180	565	360		515		26	119,80

Dimension : DIN 86 069 NP 16

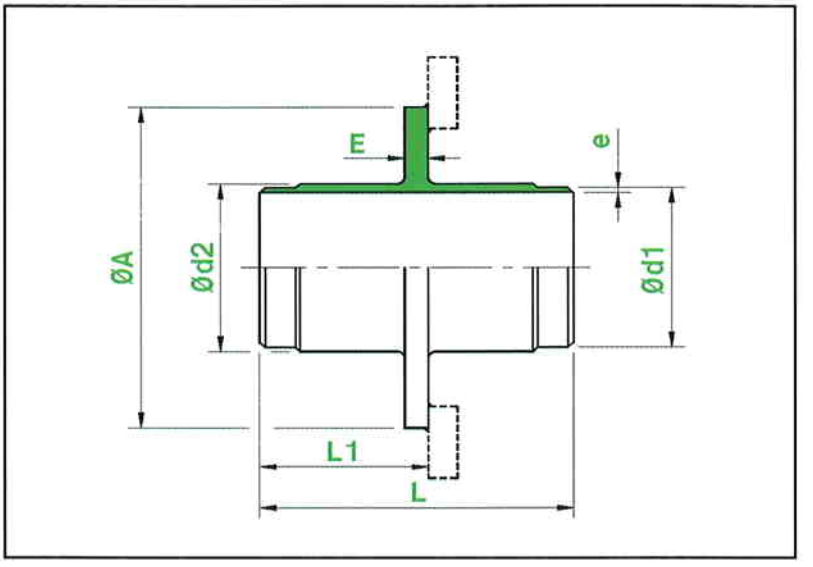
Outside diameter of pipe ØD		E	ØB	L1	ØA	L	e	Drilling			Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	ØG mm	N bolt holes	Ød mm	Kg/piece
3/4	25	14	151	100	105	200	2	75	4	14	4,05
1	30		160		115			85			5,20
1 1/4	38		185	110	140	220		100		18	7,15
1 1/2	44,5		205		150			110			8,75
2	57		220	115	165	230		125			10,25
2 1/2	76,1		240	120	185	240	3	145			12,45
3	88,9		255	130	200	260	2,5	160	8		15,50
4	108		275		220		3	180			17,90
5	133	16	305		250		3,5	210			22,80
6	159		340	135	285	270		240		22	29,70
7	193,7		370	140	315	280	4	270			34,10
8	219,1		395		340			295	12		40,40
10	267		460	150	405	300	5	355		26	55,25
12	323,9	20	525+	160	460	320	6	410			77,10
14	368		585	170	520	340		470	16		105,30
16	419,1		645	180	580	360	8	525		30	131,60

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Ref : **LBI-BLK4913**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86068



Outside diameter of pipe ØD		E	ØA	L	L1	Ød1	Ød2	e	Theo. weight
nominal inch	actual mm	mm	mm	mm	mm	mm	mm	mm	Kg/piece
3/4	25	8	100	120	60	25	27,00	1,5	0,70
1	30		110			30	33,0		0,92
1 1/4	38		120	140	70	38	40,0		1,09
1 1/2	44,5	10	130	130	65	44,5	46,5		1,46
2	57		143	140	70	57	59,0		1,74
2 1/2	76,1		162	150	65	76,1	78,1	2	2,36
3	88,9	12	179	160	80	88,9	91,0		3,20
4	108		198			108	110,0	2,5	3,95
5	133		223			133	135,5		4,85
6	159	16	257	170	85	159	161,5		7,37
7	193,7		292	180	90	193,7	197,0	3	9,23
8	219,1		317			219,1	222,0		10,67
10	267		365	200	100	267	270,0		13,44
12	323,9		422	220	110	323,9	327,0	4	18,97
14	368		482	240	120	368	371,0		25,23
16	419,1	18	540	260	130	419,1	422,0		30,83
18	457,2		590			457	460,0		35,40
20	508		646			508	511,0	4,5	41,74
24	610		755			610	613,0		51,00

MACHINED FITTINGS

Elbows 45°
Socket welding or capillary ends
LBI-ELB5110

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Elbows 90°
Socket welding or capillary ends
LBI-ELB5111

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Equal Tees
Socket welding or capillary ends
LBI-TEE5120

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Reducing tees
Socket welding or capillary ends
LBI-TEE5121

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Straight couplings
Socket welding or capillary ends
LBI-FIT5130

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Half couplings
Socket welding or capillary ends
LBI-FIT5131

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Reducing couplings
Socket welding or capillary ends
LBI-FIT5132

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Couplings
Threaded
LBI-FIT5133

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Half couplings
Threaded
LBI-FIT5134

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Reducing inserts
SW or capillary ends x Male ends
LBI-FIT5135

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Reducing inserts
Male x SW or capillary ends
LBI-FIT5136

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Union connectors
Socket welding or capillary ends
LBI-UNI5140

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Union connectors
Butt welding ends
LBI-UNI5141

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Male union connectors
SW or capillary end x Male thread
LBI-UNI5142

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Male union connectors
Butt welding ends x Male thread
LBI-UNI5143

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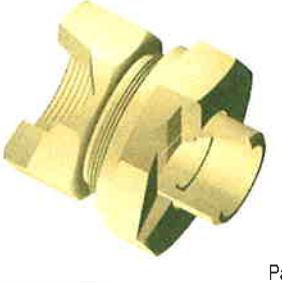
Female union connectors
SW or capillary end x Female thread
LBI-UNI5144



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Female union connectors
Butt welding ends x Female thread
LBI-UNI5145

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Straight connectors
SW or capillary end x Male thread
LBI-FIT5150

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Straight connectors
SW or capillary end x Female thread
LBI-FIT5151

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Male adaptors
Butt welding end x Male thread
LBI-FIT5160

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Female adaptors
Butt welding end x Female thread
LBI-FIT5161

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Sprinkler bushes
LBI-FIT5170

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Male plug
LBI-FIT5180

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End caps
Socket welding or capillary ends
LBI-UNI5190

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End caps
Threaded
LBI-FIT5191

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Hexagonal nipples
Threaded
LBI-FIT5200

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Pipe nipples
Threaded
LBI-FIT5201

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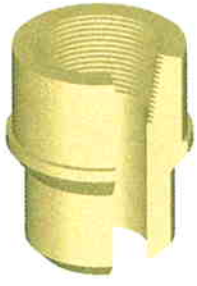
Bosses
Threaded
LBI-FIT5210



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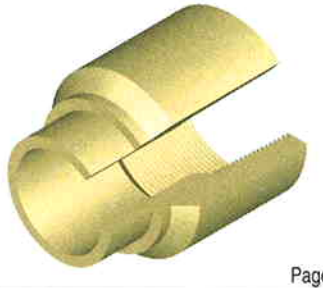
Couplets
Threaded
LBI-FIT5211



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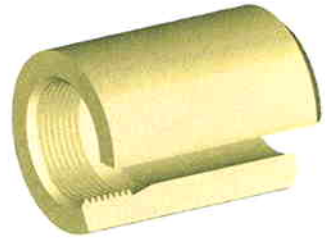
Threaded sockets
Form B
LBI-FIT5212



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Threaded sockets
Form C
LBI-FIT5212

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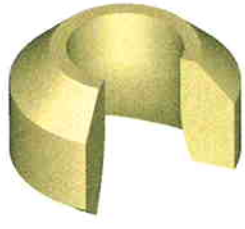
Weldolets
LBI-OLT5220



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Sockolets
LBI-OLT5221

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Threadolets
LBI-OLT5222

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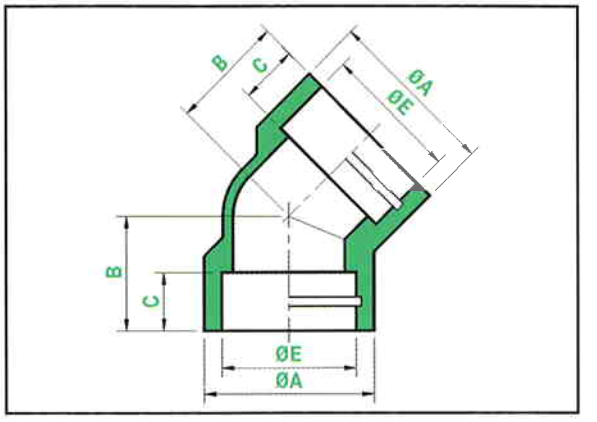
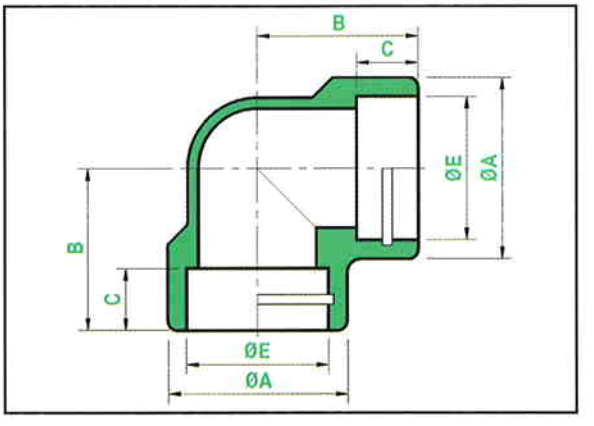
Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref : **LBI-ELB5110**

Elbows 45°

Outside diameter of pipe ØD		ØA	B	C	ØE	Theoretical weight
nominal inch	actual mm	mm	mm	mm	mm	Kg/piece
3/8	16	22,20	19,0	10	16,1	0,07
1/2	20	26,05			20,1	0,10
3/4	25	33,00	22,5	13	25,1	0,26
1	30	38,00	25,5		30,1	0,41
1 1/4	38	46,00	28,5		38,1	0,64
1 1/2	44,5	56,00	33,0		44,6	0,69
2	57	63,50	36,0	16	57,3	1,09



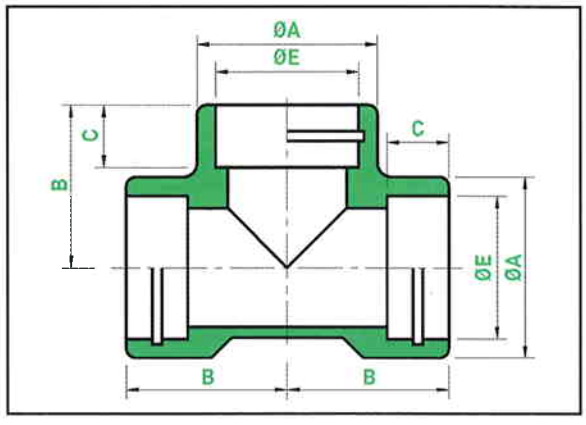
Ref : **LBI-ELB5111**

Elbows 90°

Outside diameter of pipe ØD		ØA	B	C	ØE	Theoretical weight
nominal inch	actual mm	mm	mm	mm	mm	Kg/piece
3/8	16	22,20	20	10	16,1	0,07
1/2	20	26,05	25		20,1	0,10
3/4	25	33,00	29	13	25,1	0,26
1	30	38,00	34		30,1	0,32
1 1/4	38	46,00	38		38,1	0,59
1 1/2	44,5	56,00	44		44,6	1,01
2	57	63,50	50	16	57,3	1,31

Ref : **LBI-TEE5120**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

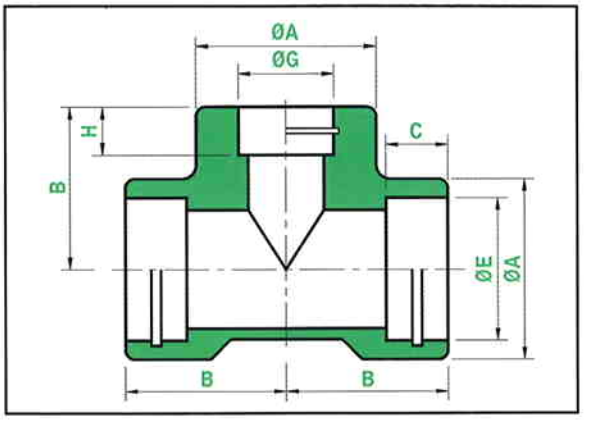


Outside diameter of pipe ØD		ØA	B	ØE	C	Theoretical weight
nominal inch	actual mm	mm	mm	mm	mm	Kg/piece
3/8	16	22,20	20	16,1	10	0,09
1/2	20	26,05	25	20,1		0,12
3/4	25	33,00	29	25,1	13	0,31
1	30	38,00	34	30,1		0,37
1 1/4	38	46,00	38	38,1		0,65
1 1/2	44,5	56,00	44	44,6		1,08
2	57	63,50	50	57,3	16	1,43

Reducing tees Socket welding or capillary ends

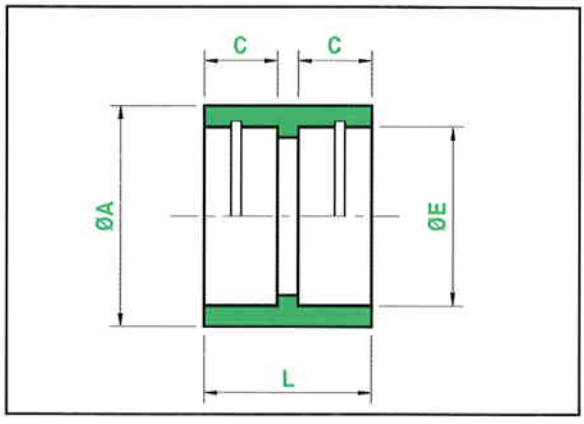
Ref : **LBI-TEE5121**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter of pipe ØD						ØA	B	ØE	C	ØG	H	Theoretical weight
nominal inch			actual mm			mm	mm	mm	mm	mm	mm	Kg/piece
1/2	x	1/8	20	x	16	26,05	25	20,1	10	16,1	10	0,14
3/4	x	1/8	25	x	16	33	29	25,1	13			0,37
	x	1/2		x	20					20,1		0,35
1	x	1/8	30	x	16	38	34	30,1		16,1		0,47
	x	1/2		x	20					20,1		0,45
	x	3/4		x	25					25,1	13	0,41
1 1/4	x	1/8	38	x	16	46	38	38,1		16,1	10	0,83
	x	1/2		x	20					20,1		0,81
	x	3/4		x	25					25,1	13	0,77
	x	1		x	30					30,1		0,73
1 1/2	x	1/8	44,5	x	16	56	44	44,6		16,1	10	1,35
	x	1/2		x	20					20,1		1,33
	x	3/4		x	25					25,1	13	1,29
	x	1		x	30					30,1		1,25
	x	1 1/4		x	38					38,1		1,17
2	x	1/8	57	x	16	63,5	50	57,3	16	16,1	10	1,89
	x	1/2		x	20					20,1		1,87
	x	3/4		x	25					25,1	13	1,83
	x	1		x	30					30,1		1,79
	x	1 1/4		x	38					38,1		1,71
	x	1 1/2		x	44,5					44,6		1,62

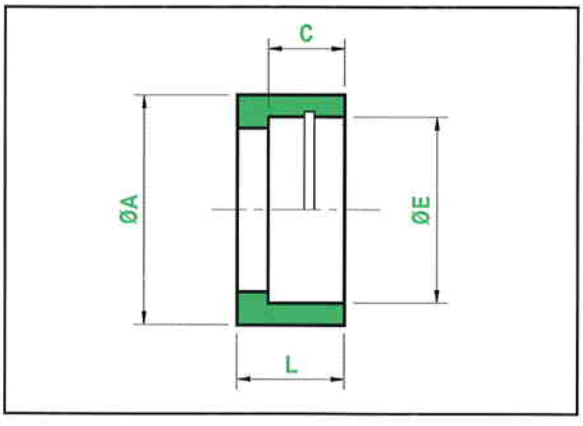
Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref : **LBI-FIT5130**

Straight couplings

Outside diameter of pipe ØD		ØA	L	ØE	C	Theoretical weight
nominal inch	actual mm	mm	mm	mm	mm	Kg/piece
3/8	16	23	23	16,1	10	0,04
1/2	20	27		20,1		0,06
3/4	25	32	30	25,1	13	0,08
1	30	37		30,1		0,10
1 1/4	38	45		38,1		0,12
1 1/2	44,5	52	31	44,6		0,17
2	57	64	38	57,3	16	0,22



Ref : **LBI-FIT5131**

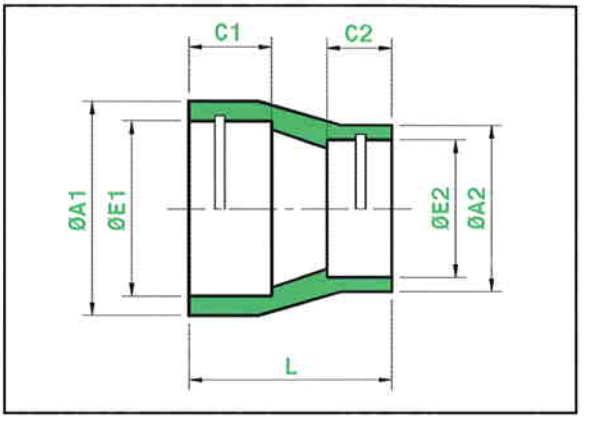
Half couplings

Outside diameter of pipe ØD		ØA	L	ØE	C	Theoretical weight
nominal inch	actual mm	mm	mm	mm	mm	Kg/piece
3/8	16	23	13	16,1	10	0,02
1/2	20	27		20,1		0,03
3/4	25	32	17	25,1	13	0,04
1	30	37		30,1		0,05
1 1/4	38	45		38,1		0,06
1 1/2	44,5	52	18	44,6		0,08
2	57	64	22	57,3	16	0,11

Reducing couplings Socket welding or capillary ends

Ref : **LBI-FIT5132**

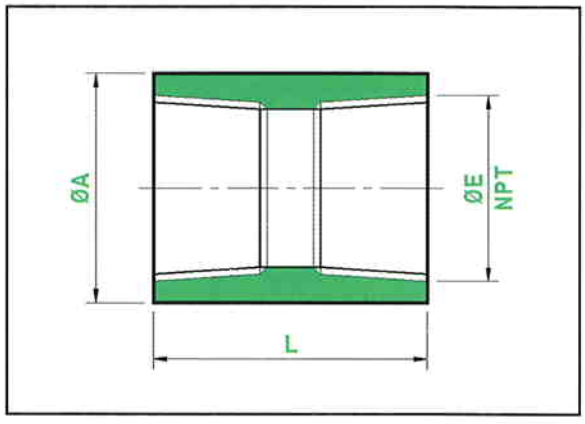
Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter of pipe ØD						ØA1	ØE1	C1	ØA2	ØE2	C2	L	Theoretical weight
nominal inch			actual mm			mm	mm	mm	mm	mm	mm	mm	Kg/piece
1/2	x	1/8	20	x	16	27	20,1	10	21	16,1	10	27	0,07
3/4	x	1/8	25	x	16	30	25,1	13		16,1		33	0,07
	x	1/2		x	20				25	20,1		27	0,08
1	x	1/8	30	x	16	35	30,1		21	16,1		35	0,09
	x	1/2		x	20				25	20,1		31	0,08
	x	3/4		x	25				30	25,1	13	31	0,08
1 1/4	x	1/8	38	x	16	45	38,1		21	16,1	10	45	0,18
	x	1/2		x	20				25	20,1		41	0,17
	x	3/4		x	25				30	25,1	13	36	0,16
	x	1		x	30				35	30,1		33	0,15
1 1/2	x	1/8	44,5	x	16	51	44,6		21	16,1	10	51	0,20
	x	1/2		x	20				25	20,1		47	0,21
	x	3/4		x	25				30	25,1	13	42	0,22
	x	1		x	30				35	30,1		39	0,23
	x	1 1/4		x	38				45	38,1		36	0,24
2	x	1/8	57	x	16	65	57,3	16	21	16,1	10	45	0,28
	x	1/2		x	20				25	20,1		58	0,27
	x	3/4		x	25				30	25,1	13	54	0,26
	x	1		x	30				35	30,1		50	0,25
	x	1 1/4		x	38				45	38,1		47	0,24
	x	1 1/2		x	44,5				51	44,6		41	0,23

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

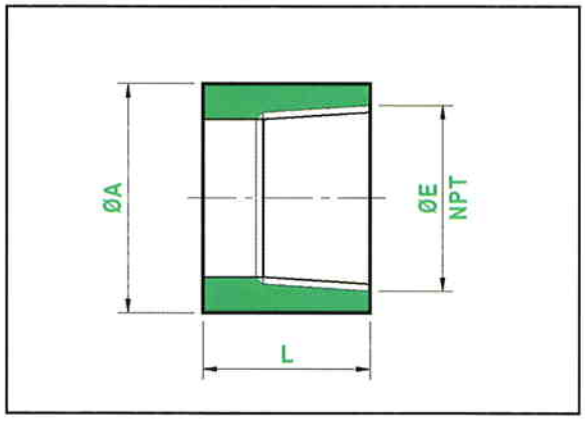
Dimension : EEMUA Pub. N° 146



Ref : **LBI-FIT5133**

Straight couplings

Outside diameter of pipe ØD		ØA	L	ØE	Theoretical weight
nominal inch	actual mm	mm	mm	Thread (NPT)	Kg/piece
1/2	16	29	48	1/2"	0,16
3/4	25	35	51	3/4"	0,28
1	30	44	60	1"	0,38
1 1/4	38	57	67	1" 1/4	0,58
1 1/2	44,5	64	79	1" 1/2	0,78
2	57	76	86	2"	1,42



Dimension : EEMUA Pub. N° 146

Ref : **LBI-FIT5134**

Half couplings

Outside diameter of pipe ØD		ØA	L	ØE	Theoretical weight
nominal inch	actual mm	mm	mm	Thread (NPT)	Kg/piece
1/2	16	29	24,0	1/2"	0,08
3/4	25	35	25,5	3/4"	0,14
1	30	44	30,0	1"	0,19
1 1/4	38	57	33,5	1" 1/4	0,29
1 1/2	44,5	64	39,5	1" 1/2	0,39
2	57	76	43,0	2"	0,71

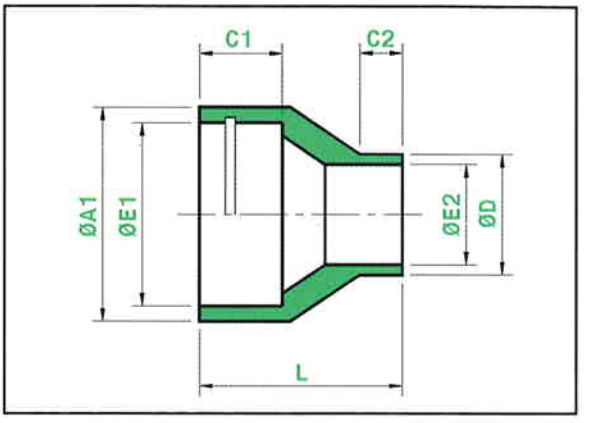
- Other threads than NPT are also available upon request.

Reducing inserts

Capillary x male ends

Ref : **LBI-FIT5135**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter of pipe ØD						ØA1	ØE1	C1	ØD (OD)	ØE2	C2	L	Theoretical weight
nominal inch			actual mm			mm	mm	mm	mm	mm	mm	mm	Kg/piece
1/2	x	3/8	20	x	16	25	20,1	10	16	14	12	29	0,03
3/4	x	3/8	25	x	16	30	25,1	13				31	0,04
	x	1/2		x	20				20	18		29	0,04
1	x	3/8	30	x	16	35	30,1		16	14		35	0,05
	x	1/2		x	20				20	18		33	0,05
	x	3/4		x	25				25	21		30	0,06
1 1/4	x	3/8	38	x	16	45	38,1		16	14		43	0,06
	x	1/2		x	20				20	18		41	0,07
	x	3/4		x	25				25	21		38	0,07
	x	1		x	30				30	26	13	37	0,09
1 1/2	x	1/2	44,5	x	20	51	44,6		20	18	12	44	0,10
	x	3/4		x	25				25	21		42	0,12
	x	1		x	30				30	26	13	41	0,13
	x	1 1/4		x	38				38	34	17		0,14
2	x	3/4	57	x	25	65	57,3	16	25	21	12	49	0,14
	x	1		x	30				30	26	13	48	0,19
	x	1 1/4		x	38				38	34	17		0,21
	x	1 1/2		x	44,5				44,5	40,5		44	0,23

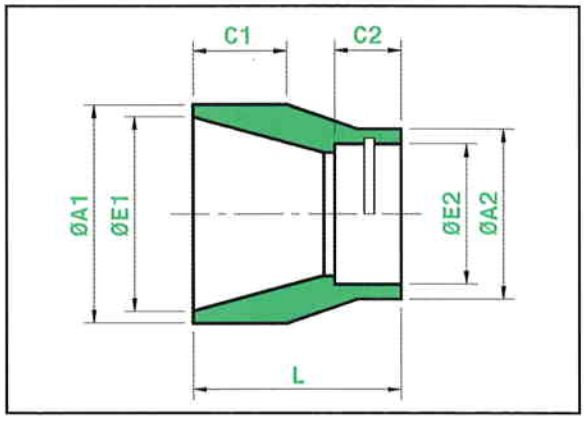
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Reducing inserts

Male x capillary ends

Ref : **LBI-FIT5136**

Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

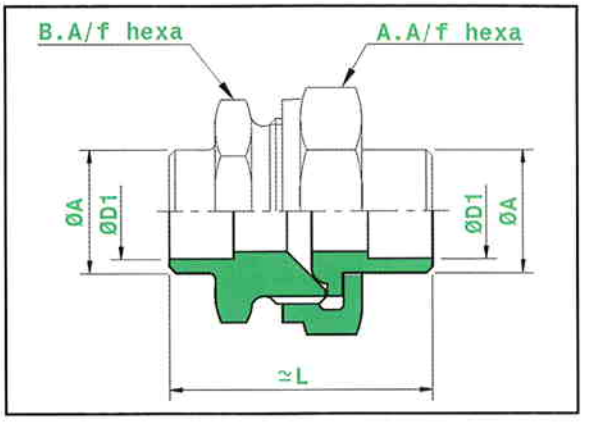


Outside diameter of pipe ØD						ØA1	ØE1	C1	ØA2	ØE2	C2	L	Theoretical weight
nominal inch			actual mm			mm	mm	mm	mm	mm	mm	mm	Kg/piece
1/2	x	3/8	20	x	16	20	18	12	21	16,1	10	23	0,03
3/4	x	3/8	25	x	16	25	21			16,1			0,05
	x	1/2		x	20				25	20,1			0,04
1	x	3/8	30	x	16	30	26	13	21	16,1		30	0,06
	x	1/2		x	20				25	20,1		24	0,06
	x	3/4		x	25				30	25,1	13		0,06
1 1/4	x	3/8	38	x	16	38	34	17	21	16,1	10	41	0,12
	x	1/2		x	20				25	20,1		36	0,12
	x	3/4		x	25				30	25,1	13	32	0,12
	x	1		x	30				38	30,1		30	0,10
1 1/2	x	3/8	44,5	x	16	44,5	40,5	17	21	16,1	10	43	0,18
	x	1/2		x	20				25	20,1		42	0,18
	x	3/4		x	25				30	25,1	13	38	0,16
	x	1		x	30				35	30,1		34	0,15
	x	1 1/4		x	38				44,5	38,1			0,11
2	x	3/8	57	x	16	57	53		21	16,1	10	52	0,30
	x	1/2		x	20				25	20,1		43	0,31
	x	3/4		x	25				30	25,1	13	45	0,31
	x	1		x	30				35	30,1			0,32
	x	1 1/4		x	38				45	38,1		42	0,28
	x	1 1/2		x	44,5				51	44,6		36	0,26

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Union connectors

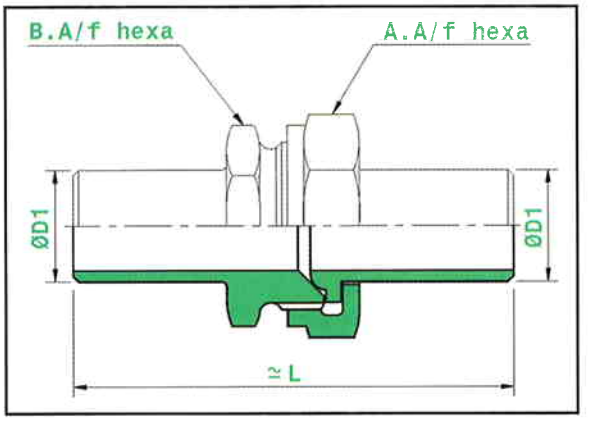
Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref : **LBI-UNI5140**

Socket welding or capillary ends

Outside diameter of pipe		ØA	≃ L	A.A/f	B.a/f	Theoretical weight
nominal inch	ØD1 actual mm	mm	mm	mm	mm	Kg/piece
3/8	16	21	62	42	36	0,24
1/2	20	25	62	42	36	0,31
3/4	25	30	73	50	46	0,44
1	30	35	73	60	50	0,55
1 1/4	38	45	79	70	65	0,73
1 1/2	44,5	51	84	70	65	1,08
2	57	65	94	85	80	1,54



Ref : **LBI-UNI5141**

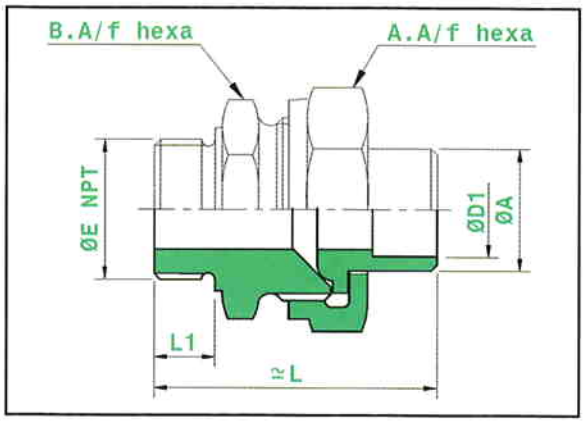
Butt welding ends

Outside diameter of pipe		≃ L	A.A/f	B.A/f	Theoretical weight
nominal inch	ØD1 actual mm	mm	mm	mm	Kg/piece
3/8	16	95	42	36	0,35
1/2	20	99	42	36	0,45
3/4	25	101	50	46	0,59
1	30	105	60	50	0,88
1 1/4	38	110	70	65	1,15
1 1/2	44,5	113	70	65	1,54
2	57	120	85	80	2,30

- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Male union connectors

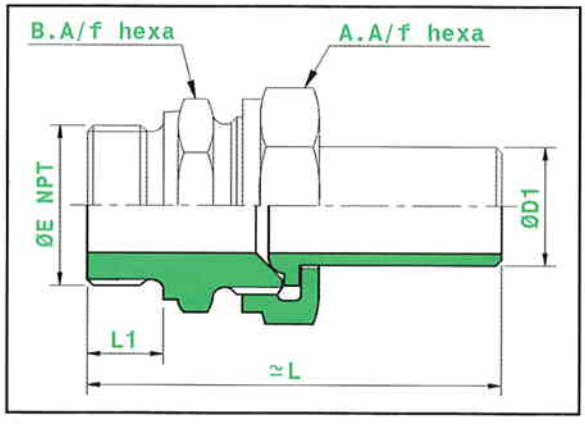
Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref : **LBI-UNI5142**

Socket welding or capillary end x Male

Outside diameter of pipe		ØE	ØA	L1	≃ L	A.A/f	B.A/f	Theoretical weight
nominal inch	ØD1 actual mm	Thread NPT	mm	mm	mm	mm	mm	Kg/piece
3/8	16	3/4"	21	19	74	42	36	0,35
1/2	20	3/4"	25		79	42	36	0,47
3/4	25	1"	30	21	82	50	46	0,55
1	30	1" 1/4	35	23	89	60	50	0,73
1 1/4	38	1" 1/2	45	25	97	70	65	1,05
1 1/2	44,5	1" 3/4	51	25,5	100	70	65	1,55
2	57	2"	65	27,5	109	85	80	2,00



Ref : **LBI-UNI5143**

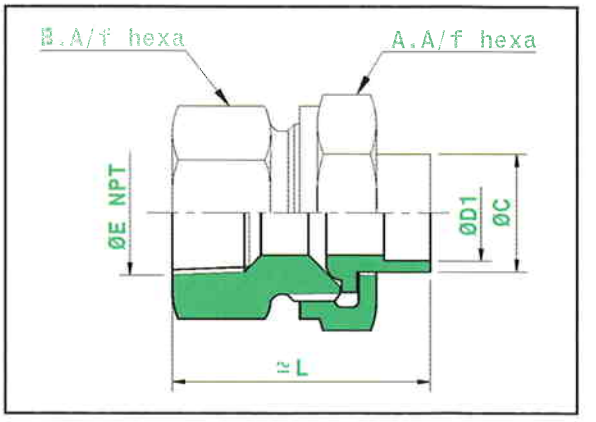
Butt welding end x Male

Outside diameter of pipe		ØE	L1	≃ L	A.A/f	B.A/f	Theoretical weight
nominal inch	ØD1 actual mm	Thread NPT	mm	mm	mm	mm	Kg/pieces
3/8	16	3/4"	19	84	42	36	0,37
1/2	20	3/4"		92	42	36	0,50
3/4	25	1"	21	95	50	46	0,60
1	30	1" 1/4	23	100	60	50	0,80
1 1/4	38	1" 1/2	25	106	70	65	1,15
1 1/2	44,5	1" 3/4	25,5	115	70	65	1,65
2	57	2"	27,5	130	85	80	2,15

- Other threads than NPT are also available upon request.
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Female union connectors

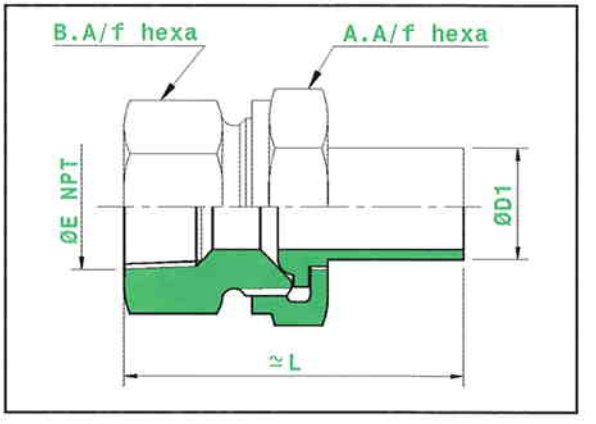
Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref : **LBI-UNI5144**

Socket welding or capillary end x Female

Outside diameter of pipe		ØE	ØC	≃ L	A.A/f	B.A/f	Theoretical weight
nominal inch	ØD1 actual mm	Thread NPT	mm	mm	mm	mm	Kg/piece
3/8	16	1/2"	21	50	42	36	0,25
1/2	20	1/2"	25	51	42	36	0,31
3/4	25	3/4"	30	56	50	46	0,43
1	30	1"	35	60	60	50	0,45
1 1/4	38	1 1/4"	45	68	70	65	0,72
1 1/2	44,5	1 1/2	51	70	70	65	0,85
2	57	2"	65	76	85	80	1,35



Ref : **LBI-UNI5145**

Butt welding end x Female

Outside diameter of pipe		ØE	≃ L	A.A/f	B.A/f	Theoretical weight
nominal inch	ØD1 actual mm	Thread NPT	mm	mm	mm	Kg/piece
3/8	16	1/2"	60	42	36	0,25
1/2	20	1/2"	61	42	36	0,28
3/4	25	3/4"	69	50	46	0,38
1	30	1"	73	60	50	0,41
1 1/4	38	1 1/4"	87	70	65	0,68
1 1/2	44,5	1 1/2"		70	65	0,77
2	57	2"	96	85	80	1,05

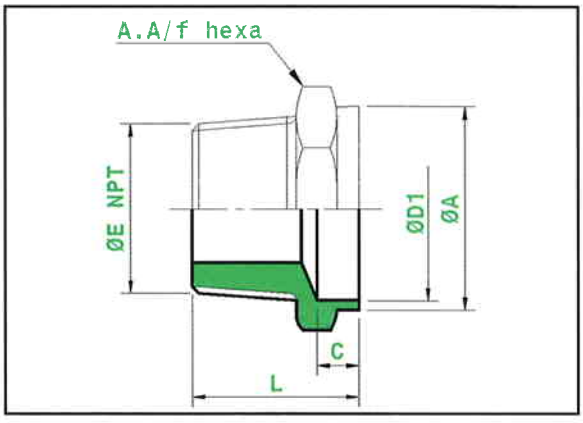
- Other threads than NPT are also available upon request.
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Straight connectors

Socket welding or capillary end x Male thread

Ref : **LBI-FIT5150**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter of pipe nominal inch			Outside diameter of pipe ØD1 x ØE actual mm			ØE Thread NPT	ØA mm	C mm	L mm	A.A/f mm	Theoretical weight Kg/piece
3/8	x	1/2	16	x	20	1/2"	21	10	33	24	0,10
	x	3/4		x	25	3/4"			33	30	0,13
	x	1		x	30	1"			38	36	0,28
1/2	x	1/2	20	x	20	1/2"	25		33	27	0,11
	x	3/4		x	25	3/4"			34	30	0,14
	x	1		x	30	1"			39	36	0,25
	x	1 1/4		x	38	1 1/4"			43	46	0,51
3/4	x	3/4	25	x	25	3/4"	30	13	35	32	0,15
	x	1		x	30	1"			39	36	0,20
	x	1 1/4		x	38	1 1/4"			43	46	0,46
	x	1 1/2		x	44,5	1 1/2"			44	50	0,62
1	x	3/4	30	x	25	3/4"	35		38	36	0,24
	x	1		x	30	1"			41	41	0,25
	x	1 1/4		x	38	1 1/4"			44	46	0,39
	x	1 1/2		x	44,5	1 1/2"			45	50	0,55
1 1/4	x	3/4	38	x	25	3/4"	45		44	46	0,30
	x	1		x	30	1"					0,27
	x	1 1/4		x	38	1 1/4"			45		0,32
	x	1 1/2		x	44,5	1 1/2"			46	50	0,36
1 1/2	x	1	44,5	x	30	1"	51		47	55	0,40
	x	1 1/4		x	38	1 1/4"			48		0,48
	x	1 1/2		x	44,5	1 1/2"					0,48
	x	2		x	57	2"			51	65	0,87
2	x	1 1/4	57	x	38	1 1/4"	65	16			0,68
	x	1 1/2		x	44,5	1 1/2"					0,65
	x	2		x	57	2"					0,57
	x	2 1/2		x	76,1	2 1/2"			60	75	1,17

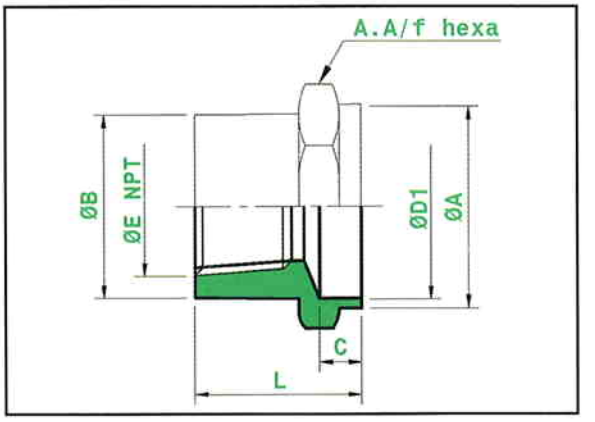
- Other threads than NPT are also available upon request.

Straight connectors

Socket welding or capillary end x Female thread

Ref : **LBI-FIT5151**

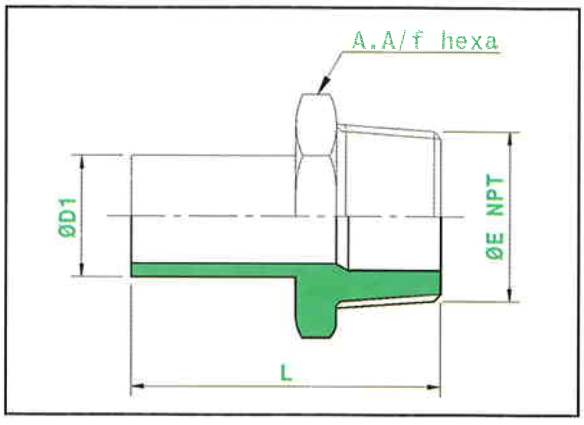
Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Outside diameter of pipe nominal inch			Outside diameter of pipe ØD1 x ØE actual mm			ØE Thread NPT	ØA mm	C mm	ØB mm	L mm	A.A/f mm	Theoretical weight Kg/piece
3/8	x	1/2	16	x	20	1/2"	21	10	27	31	27	0,07
	x	3/4		x	25	3/4"			32	33	32	0,10
	x	1		x	30	1"			40	38	41	0,20
1/2	x	1/2	20	x	20	1/2"	25		27	28	27	0,08
	x	3/4		x	25	3/4"			32	32	32	0,11
	x	1		x	30	1"			40	37	41	0,31
	x	1 1/4		x	38	1 1/4"			49	40	50	0,29
3/4	x	3/4	25	x	25	3/4"	30	13	32	31	32	0,10
	x	1		x	30	1"			40	35	41	0,20
	x	1 1/4		x	38	1 1/4"			49	39	50	0,29
	x	1 1/2		x	44,5	1 1/2"			55	41	55	0,32
1	x	3/4	30	x	25	3/4"	35		32	31	41	0,23
	x	1		x	30	1"			40	35		0,19
	x	1 1/4		x	38	1 1/4"			49	38	50	0,28
	x	1 1/2		x	44,5	1 1/2"			55	40	55	0,30
1 1/4	x	3/4	38	x	25	3/4"	45		32	39	46	0,39
	x	1		x	30	1"			40			0,31
	x	1 1/4		x	38	1 1/4"			49	40	50	0,29
	x	1 1/2		x	44,5	1 1/2"			55	42	55	0,32
1 1/2	x	1	44,5	x	30	1"	51		40	43		0,55
	x	1 1/4		x	38	1 1/4"			49	39		0,50
	x	1 1/2		x	44,5	1 1/2"			55	40		0,43
	x	2		x	57	2"			70	43	70	0,65
2	x	1 1/4	57	x	38	1 1/4"	65	16	49	45	65	0,80
	x	1 1/2		x	44,5	1 1/2"			55	40		0,73
	x	2		x	57	2"			70		70	0,65
	x	2 1/2		x	76,1	2 1/2"			85	49	85	0,97

- Other threads than NPT are also available upon request.

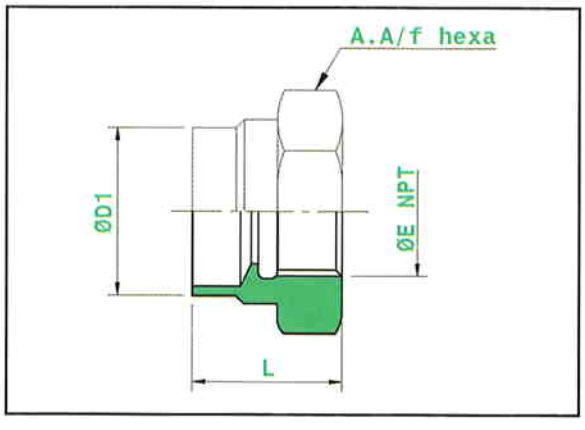
Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref : **LBI-FIT5160**

Butt welding end x Male thread

Outside diameter of pipe nominal inch			ØD1 x ØE actual mm			ØE Thread NPT	L mm	A.A/f mm	Theoretical weight Kg/piece
3/8	x	1/2	16	x	20	1/2"	40	24	0,15
1/2	x	1/2	20	x	20				0,16
3/4	x	3/4	25	x	25	3/4"	45	32	0,22
1	x	3/4	30	x	25		48		0,28
	x	1		x	30	1"	53	38	0,32
1 3/4	x	1 1/2	38	x	44,5	1" 1/2	53	50	0,50
1 1/2	x	1 1/2	44,5	x	44,5				0,60
2	x	1 1/2	57	x	44,5		65	65	0,85
	x	2		x	57	2"	70		0,98



Ref : **LBI-FIT5161**

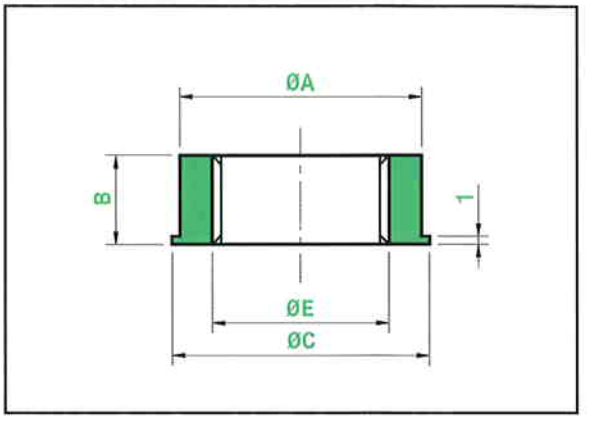
Butt welding end x Female thread

Outside diameter of pipe nominal inch			ØD1 x ØE actual mm			ØE Thread NPT	L mm	A.A/f mm	Theoretical weight Kg/piece
3/8	x	1/2	16	x	20	1/2"	34	27	0,07
1/2	x	3/4	20	x	25	3/4"	37	32	0,10
3/4	x	3/4	25	x	25		34	32	0,15
1	x	1		x	30	1"	41	41	0,19
	x	1	30	x	30		39		0,25
1 3/4	x	1 1/2	38	x	44,5	1" 1/2	50	55	0,35
1 1/2	x	1 1/2	44,5	x	44,5		47		0,40
2	x	1 1/2	57	x	44,5			70	0,50
	x	2		x	57	2"	51		0,50

- Other threads than NPT are also available upon request.
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Sprinkler bushes & male plugs

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

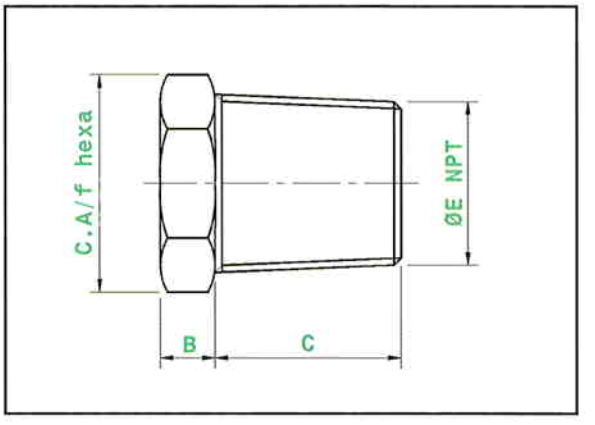


Ref : **LBI-FIT5170**

Sprinkler bushes

Outside diameter of pipe		ØE Thread	ØA	ØC	B	Theoretical weight
nominal inch	actual mm		mm	mm	mm	Kg/piece
3/8	16	ON APPLICATION	16	18	11	0,01
1/2	20		20	22		0,01
3/4	25		25	27		0,02
1	30		30	32	12	0,03
1 1/4	38		38	40	16	0,06
1 1/2	44,5		44,5	47		0,08
2	57		57	59		0,09

NOTE : ØE-3/8", 1/2", 3/4", 1", 1" 1/2, NPT or BSP to be specified.



Dimension : EEMUA Pub. N° 146

Ref : **LBI-FIT5180**

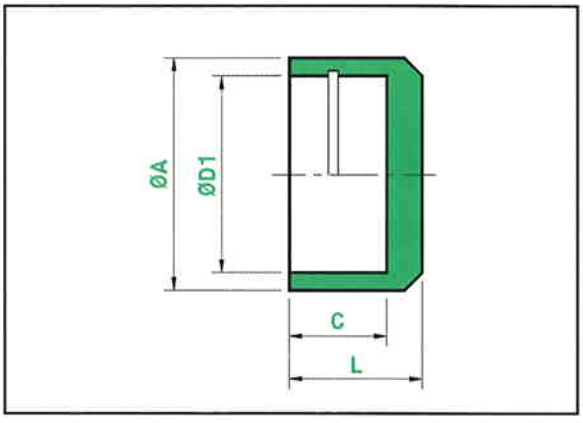
Male plugs

Outside diameter of pipe		ØE Thread NPT	B	C mini	C.A/f	Theoretical weight
nominal inch	actual mm		mm	mm	mm	Kg/piece
1/2	16	1/2"	8	14,5	22	0,17
3/4	25	3/4"	10	16	27	0,30
1	30	1"		19	35	0,55
1 1/4	38	1" 1/4	14	20,5	44,5	0,95
1 1/2	44,5	1" 1/2	16		51	1,10
2	57	2"	17	22	63,5	1,85

- Other threads than NPT are also available upon request.
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

End caps

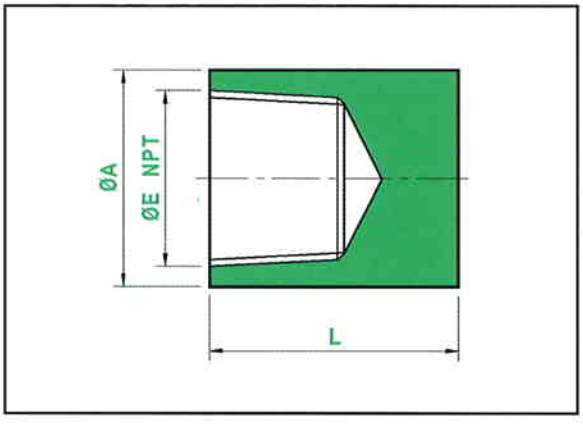
Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref : **LBI-FIT5190**

Socket welding or capillary ends

Outside diameter of pipe		ØA	L	C	Theoretical weight
nominal inch	actual mm	mm	mm	mm	Kg/piece
3/8	16	21	14,0	10	0,04
1/2	20	25	14,5		0,05
3/4	25	30	15,0	13	0,07
1	30	35	16,0		0,08
1 1/4	38	45	20,0		0,13
1 1/2	44,5	51	21,0		0,19
2	57	65		16	0,22



Dimension : EEMUA Pub. N° 146

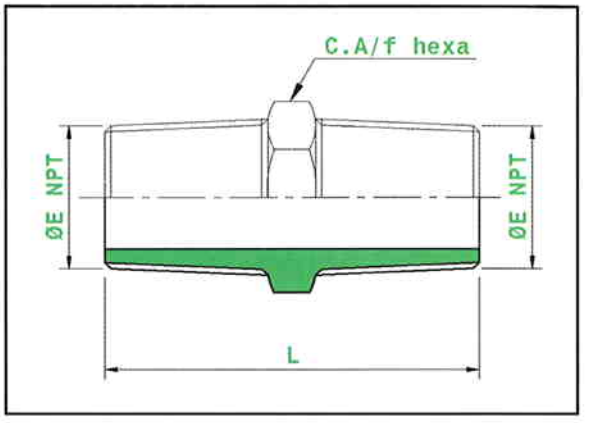
Ref : **LBI-FIT5191**

Female threaded

Outside diameter of pipe		ØE Thread NPT	ØA	L	Theoretical weight
nominal inch	actual mm		mm	mm	Kg/piece
1/2	16	1/2"	29	32	0,17
3/4	25	3/4"	35	37	0,30
1	30	1"	44	38	0,55
1 1/4	38	1" 1/4	57	41	0,95
1 1/2	44,5	1" 1/2	64		1,10
2	57	2"	76	42	1,85

- Other threads than NPT are also available upon request.

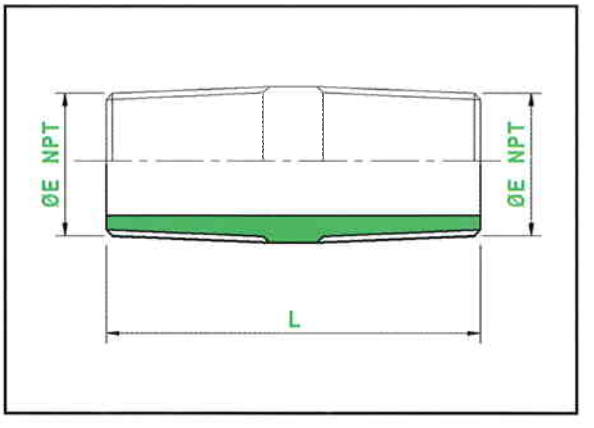
Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref.: **LBI-FIT5200**

Hexagonal nipples

Outside diameter of pipe		ØE Thread NPT	L	C.A/f	Theoretical weight
nominal inch	actual mm		mm	mm	Kg/piece
1/4	12	1/4"	42	17	0,05
3/8	16	3/8"	47	22	0,11
1/2	20	1/2"	48	24	0,13
3/4	25	3/4"	52	30	0,20
1	30	1"	60	36	0,29
1 1/4	38	1" 1/4	72	46	0,36
1 1/2	44,5	1" 1/2	74	50	0,43
2	57	2"	78	65	0,59



Ref.: **LBI-FIT5201**

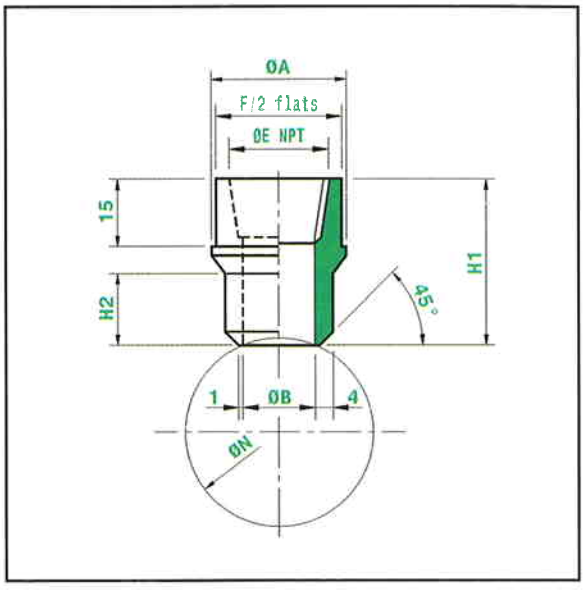
Pipe nipple

Outside diameter of pipe		ØE Thread NPT	L	Theoretical weight
nominal inch	actual mm		mm	Kg/piece
1/4	12	1/4"	42	0,04
3/8	16	3/8"	47	0,10
1/2	20	1/2"	48	0,12
3/4	25	3/4"	52	0,19
1	30	1"	60	0,28
1 1/4	38	1" 1/4	72	0,35
1 1/2	44,5	1" 1/2	74	0,42
2	57	2"	78	0,58

- Other threads than NPT are also available upon request.
- Other dimensions, wall thicknesses and outside diameters are also available upon request.

Threaded bosses & couplets

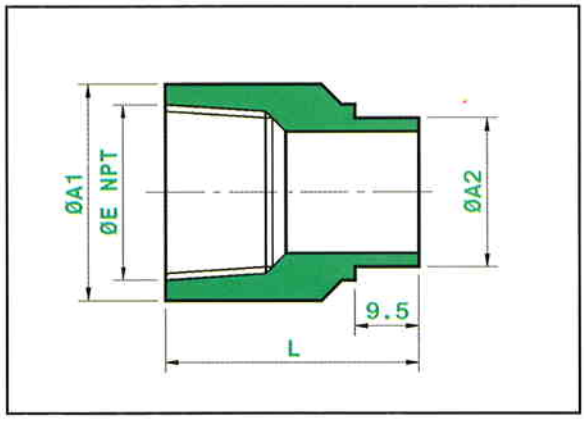
Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe



Ref : **LBI-FIT5210**

Threaded bosses

Outside diameter of pipe		ØE	ØA	ØB	H1	H2	F/2	Theoretical weight
nominal inch	actual mm	Thread NPT	mm	mm	mm	mm	flats mm	Kg/piece
1/2	16	1/2"	35	17	37	13	31	0,17
3/4	25	3/4"	40	23	39	16	35	0,13
1	30	1"	45	29	43		40	0,28
1 1/2	44,5	1" 1/2	60	43,5	50	20	55	0,48



Ref : **LBI-FIT5211**

Couplets

Outside diameter of pipe		ØE	ØA1	ØA2	L	Theoretical weight
nominal inch	actual mm	Thread NPT	mm	mm	mm	Kg/piece
1/4	12	1/4"	20	13,7	30	0,06
3/8	16	3/8"	22	17,1		0,11
1/2	20	1/2"	30	21,3	33,5	0,13
3/4	25	3/4"	35	26,7		0,21
1	30	1"	46	33,4	43	0,26
1 1/4	38	1" 1/4	57	42,2	47,5	0,34
1 1/2	44,5	1" 1/2	64	48,3	51	0,37
2	57	2"	76	60,3	57,5	0,41

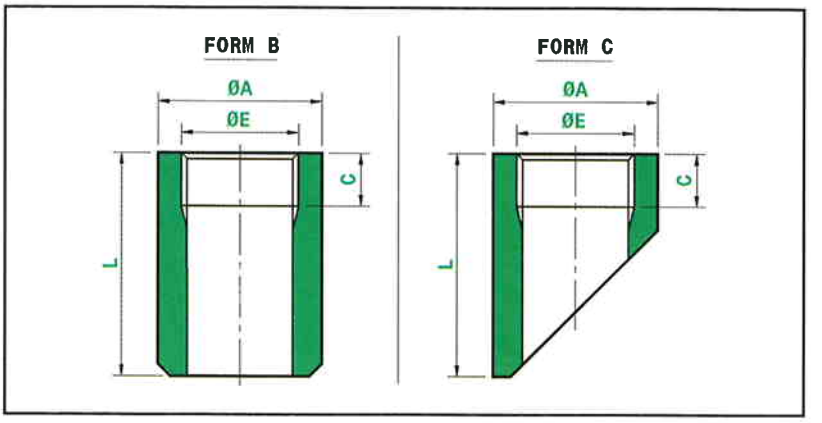
- Other threads tha NPT are also available upon request.

Sockets

Ref.: **LBI-FIT5212**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : DIN 86103

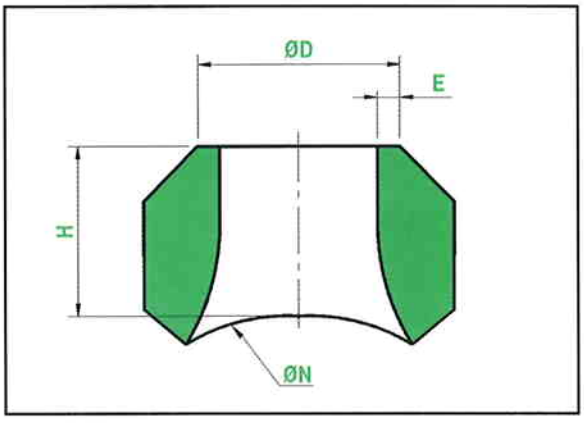


ØD Thread NPT	FORM B ØA mm	C mm	L mm	Theoretical weight Kg/piece	ØE Thread NPT	FORM C ØA mm	C mm	L mm	Theoretical weight Kg/piece
R 1/4"	20	12	20	0,03					
R 3/8"	25			0,05					
R 1/2"	30	14	25	0,08	R 1/2"	30	14	50	0,14
			50	0,17					
			75	0,25					
			100	0,34					
			125	0,44					
R 3/4"	38	16	25	0,14	R 3/4"	38	16	60	0,24
			50	0,28					
			75	0,42					
			100	0,56					
			125	0,70					
R 1"	45	18	25	0,19	R 1"	45	18	70	0,35
			50	0,35					
			75	0,52					
			100	0,70					
			125	0,88					
R 1" 1/4	57	20	30	0,29	R 1" 1/4	57	20	80	0,63
R 1" 1/2	62	22		0,37	R 1" 1/2	62	22	100	0,92
R 2"	75	23	40	0,68	R 2"	75	23	111	1,25

Ref : **LBI-OLT5220**

Material : NAVINIC 10® CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146

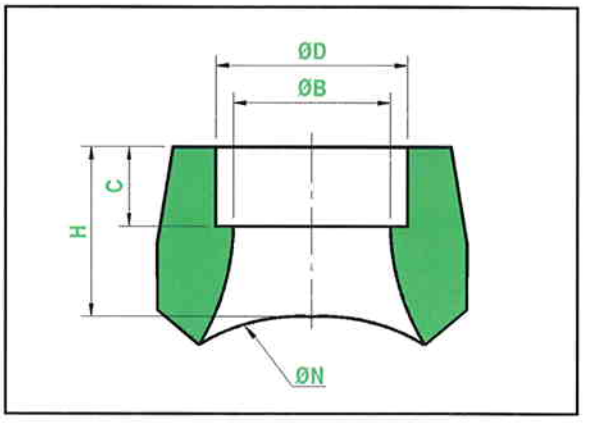


Outside diameter of branch pipe ØD		Outside diameter of header ØN		E		H	Theoretical weight
nominal inch	actual mm	nominal inch	actual mm	mm		mm	Kg/piece
1/2	16	1/2 to 1 1/2	16 to 44,5	2		19,05	0,07
		2 to 24	57 to 610			17,50	
3/4	25	3/4 to 1 1/2	25 to 44,5			22,20	0,11
		2 to 24	57 to 610			20,60	
1	30	1 to 1 1/2	30 to 44,5	2,5		27,00	0,18
		2 to 24	57 to 610			22,20	
1 1/4	38	1 1/4 to 1 1/2	38 to 44,5			30,20	0,32
		2 to 24	57 to 610			25,40	
1 1/2	44,5	1 1/2	44,5			33,30	0,36
		2 to 24	57 to 610			28,60	
2	57	2 to 2 1/2	57 to 76,1			38,10	0,68
		3 to 24	88,9 to 610			33,30	
2 1/2	76,1	3 to 4	76,1 to 108			47,60	1,40
		6 to 24	159 to 610			44,50	
3	88,9	3 to 4	88,9 to 108			47,60	1,70
		6 to 24	159 to 610			44,50	
4	108	4	108	3		46,80	3,00
		6	159			52,40	
		8 to 24	219,1 to 610			49,20	
				16 Bar	20 Bar		
6	159	6 to 24	159 to 610	3	3,5	60,30	6,40
8	219,1	8 to 24	219 to 610	4	4,5	69,90	12,70
10	267	10 to 24	267 to 610	4,5	5,5	77,80	17,70
12	323,9	12 to 24	323,9 to 610	5,5	7	85,70	29,50
14	368	14 to 24	368 to 610	6,5	8	88,90	31,80
16	419,1	16 to 24	419,1 to 610	7	9	93,70	41,70
18	457,2	18 to 24	457,2 to 610	8	9,5	96,80	53,20
20	508	20 to 24	508 to 610	8,5	11	115,90	68,30
24	610	24	610	10,5	13	115,90	91,20

Ref : **LBI-OLT5221**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

Dimension : EEMUA Pub. N° 146

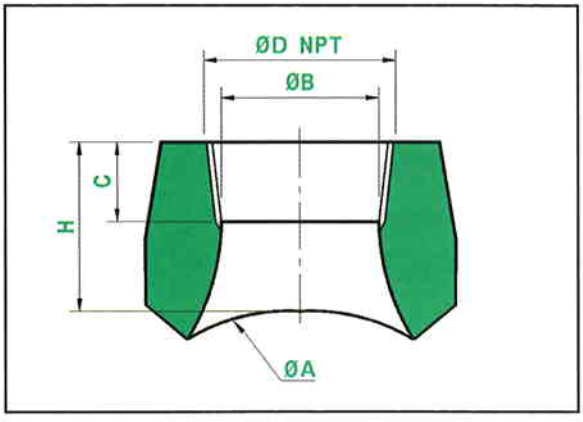


Outside diameter of branch pipe ØD		Outside diameter of header ØN		ØB	H	C	Theoretical weight
nominal inch	actual mm	nominal inch	actual mm	mm	mm	mm	Kg/piece
1/2	16	3/4 to 1 1/2	25 to 44,5	12,0	25,4	10	0,10
		2 to 36	57 to 914		23,8		
3/4	25	1 to 1 1/2	30 to 44,5	21,0	26,9	13	0,13
		2 to 36	57 to 914		25,4		
1	30	1 1/4 to 1 1/2	38 to 44,5	25,0	33,3		0,22
		2 to 36	57 to 914		28,6		
1 1/4	38	2 to 36	57 to 914	33,0	33,3		0,35
1 1/2	44,5	2 to 36	57 to 914	39,5	30,2		0,50
2	57	2 1/2 to 36	76,1 to 914	52,0	38,1	16	0,90

Ref : **LBI-OLT5222**

Material : **NAVINIC 10®** CuNi10Fe1Mn
NAVINIC 30® CuNi30Mn1Fe

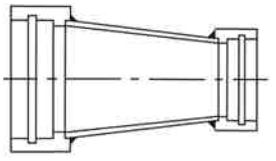
Dimension : EEMUA Pub. N° 146



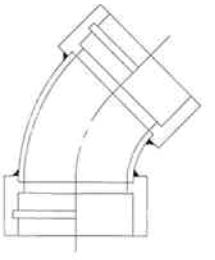
Outside diameter of branch pipe ØD		Outside diameter of header ØA		ØB (bore) mm	H mm	C mini mm	Theoretical weight Kg/piece
nominal inch	actual NPT	nominal inch	actual mm				
1/2	1/2"	3/4 to 1 1/2	25 to 44,5	11,74	25,4	13,5	0,10
		2 to 36	57 to 914		23,8		
3/4	3/4"	1 to 1 1/2	30 to 44,5	15,58	26,9	14	0,13
		2 to 36	57 to 914		25,4		
1	1"	1 1/4 to 1 1/2	38 to 44,5	20,70	33,3	17,5	0,22
		2 to 36	57 to 914		28,6		
1 1/4	1 1/4"	2 to 36	57 to 914	29,50	33,3	18	0,35
1 1/2	1 1/2"	2 to 36	57 to 914	34,02	30,2	18,5	0,50
2	2"	2 1/2 to 36	76,1 to 914	42,82	38,1	19	0,90

MISCELLANEOUS SPECIAL FITTINGS

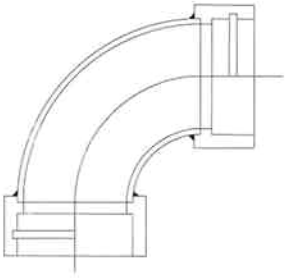
Concentric reducers
with welded-on brazing sleeves



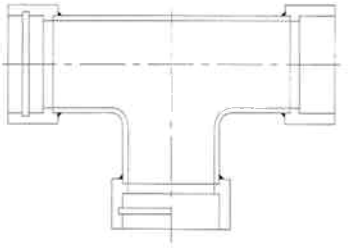
Elbows long radius - 45°
with welded-on brazing sleeves



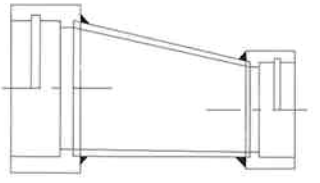
Elbows long radius - 90°
with welded-on brazing sleeves



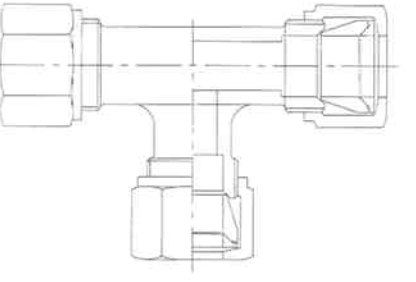
Tee-pieces
with welded-on brazing sleeves



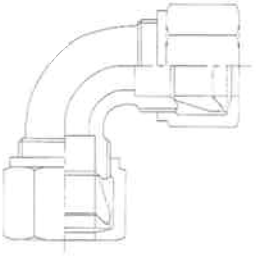
Eccentric reducers
with welded-on brazing sleeves



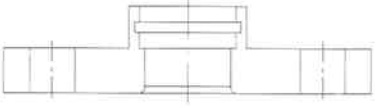
Tee-unions
with double wedge ring



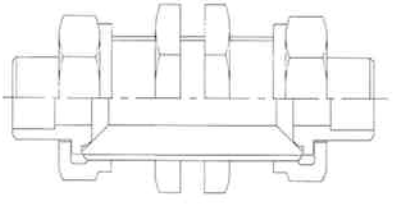
Elbow unions 90°
with double wedge ring



Flanged connectors cap. end

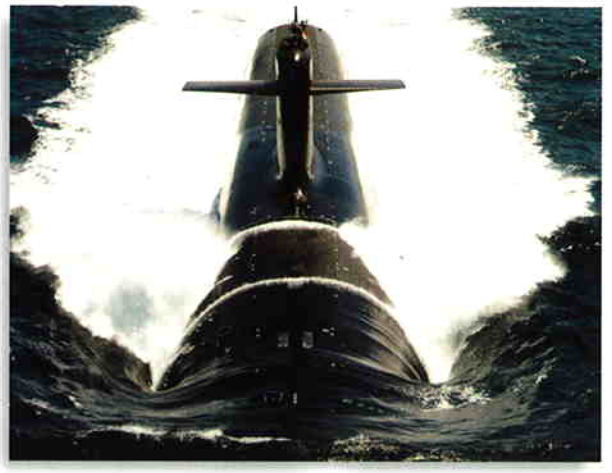


Bulkhead unions
with collar bushing



Protecting tubes

Above fittings are a few examples of special pieces that we can produce upon request.



French Navy-operated nuclear powered submarine
« LE TRIOMPHANT » built by DCN Cherbourg

« LAFAYETTE » type frégate built by DCN Lorient

LNG Carrier « MUBARAZ » built by KVAERNER Masa Yards

Shell-operated T.L.P. « URSA » built by BELLELI / J.R. Mc DERMOTT

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