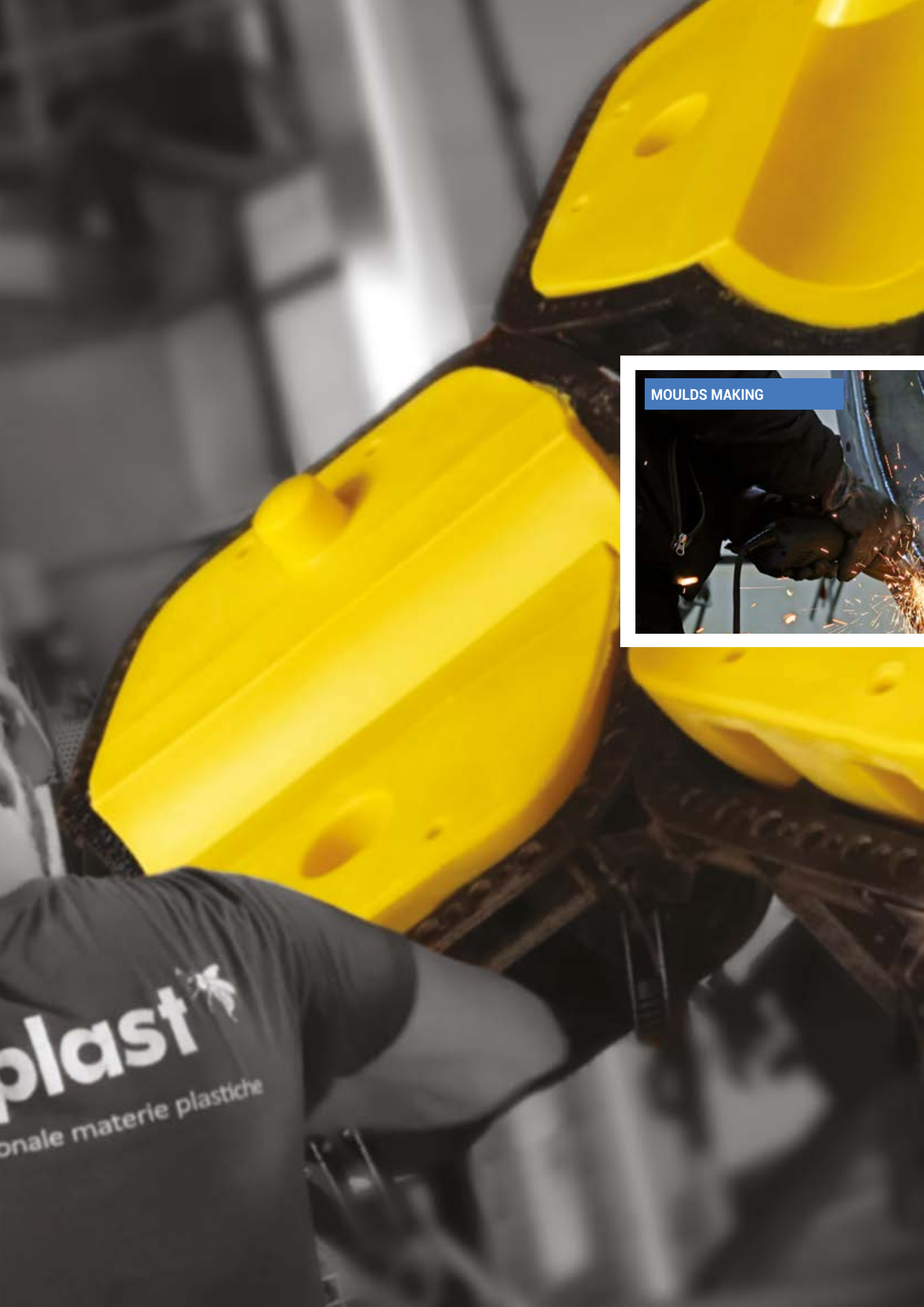


DREDGING FLOATERS

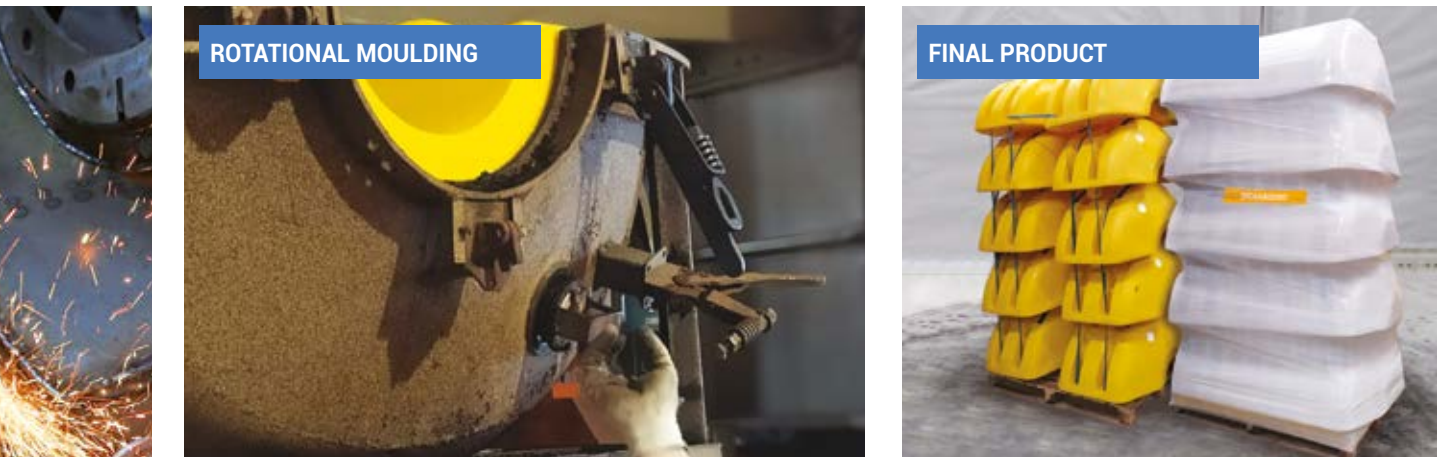


Starplast 



MOULDS MAKING





Starplast was born at the end of the year 2007. Since the very beginning, it has entered the rotational moulding market offering innovative solutions. The company's attention to details and the up-to-date quality of its products are what distinguishes Starplast from its competitors. From the idea to the maintenance of the products, the Starplast technical and sales staff takes care of the whole production process, covering the entire territory.

Starplast has

- RANGE** To this day, it is the widest range of products and services for the treatment of waste waters.
- INNOVATION** There is a constant study of customized and performing project solutions.
- TECHNOLOGY** Thanks to a constant study, plants and equipments are technologically advanced, as well as the geometry and raw materials.
- EXPERTISE** The technical and sales staff is competent and constantly trained.
- CERTIFICATIONS** They are always aligned with both the National and the Foreign regulations.

THE PRODUCTION AND TECHNOLOGY OF THE ROTATIONAL MOULDING

Starplast is leader in the production of plastic materials through the "rotational moulding" technology.

This method is specifically used to produce hollow artifacts like dredging floaters, for example. It consists of melting the polyethylene powder using hot air.

The hot air is thrown into hollow moulds which rotate on their two axes. The moulds are made up either of steel or sheet metal, and will give to the final product the desired shape and texture.

Today Starplast employs three high-technology rotational machines, which can print artifacts ranging to a diameter of 3,50 meters.



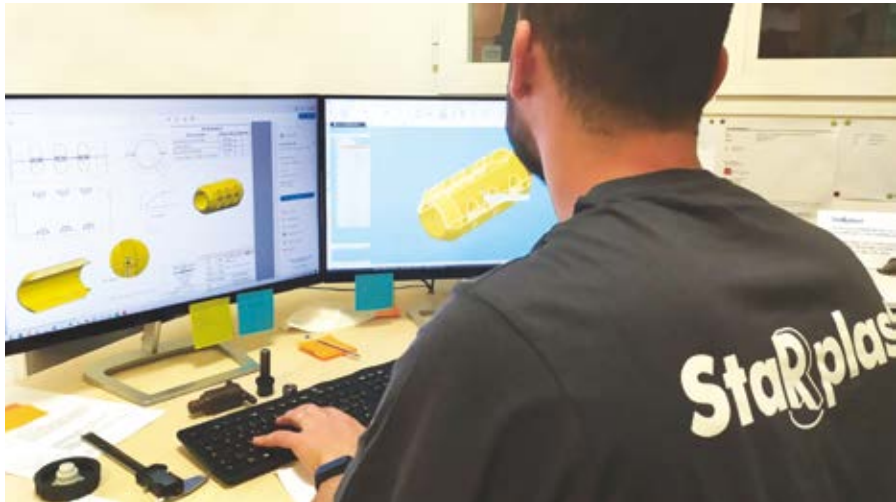
This is an example of foam-filled floater with an ID of 850 millimeters, designed for iron pipelines.

Innovation and enterprise, plus the drive towards the ambitious and customer-friendly aims, bring to the study of innovative processes and solutions. Through internal projects, Starplast aims at reducing times and costs, keeping a keen eye on the environment.



TECHNICAL DEPARTMENT AND DESIGNING PROCESS

Starplast counts on a young and competent technical staff that customizes new projects using up-to-date softwares. Before the production, there is a testing phase. If the staff gives the greenlight, the regular process can start: a specific mould will be created, samples will be produced, and the final project will be carried out.



CERTIFICATIONS AND QUALITY PROTOCOL



Since the beginning, Starplast has gained company certifications as a key quality factor on the global scale market. Starplast has both compulsory and optional certificates, which are very important image and credibility wise.

Compulsory company certifications are required by National regulations - i.e. safety and health procedures in the work environment.

The optional certifications that Starplast has gained are necessary for assessing the quality of the processes and products, both respectful of the environment, the safety and the people's health.

IMPORTANT: the dimensional values of the polyethylene artifacts created with the rotational moulding method may vary of +/- 3%.

When producing floaters, spot samples are picked to undergo the following tests:

VISUAL AND STRUCTURAL

control of the surface and thickness

DIMENSIONAL

measurement of the length and the diameter (internal and external)

MECHANICAL

installation on the alleged pipeline

Each conforming floater is labeled and classified as SUITABLE and ready to be despatched.

On the left, the image shows an example of floater testing table.

MODELS



L 550 / Ø est 450



L 700 / Ø est 800



L 700 / Ø est 960



L 700 / Ø est 1400



L 700 / Ø est 1400



L 1200 / Ø est 750



L 1200 / Ø est 850



L 1200 / Ø est 1250



L 1200 / Ø est 1500



L 1150 / Ø est 2200

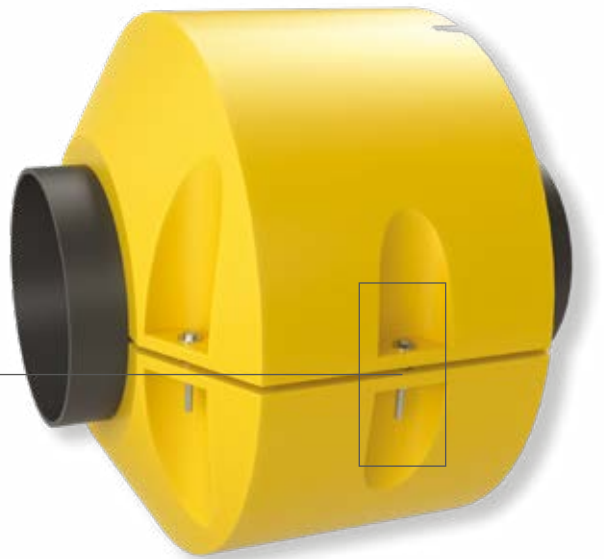
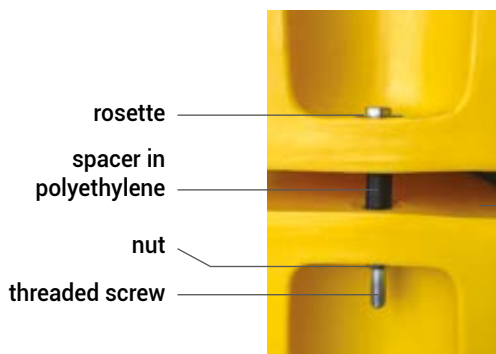


L 1900 / Ø est 900

FLOATER COMPOSITION FOR POLYETHYLENE PIPELINES

Starplast's dredging floater is made up of two semi-shells in polyethylene with an internal thickness of 12 millimeters.

The two shells are bound together by fasteners of zinc plated steel (stainless steel is available on request) such as:



The hardware varies according to the floater type, which is linked to the pipe's diameter.

Starplast chose this method because it allows the floater to stick to the pipeline and to create a single body.

This makes the product more resistant to the elements and the currents it endures once in place and working.



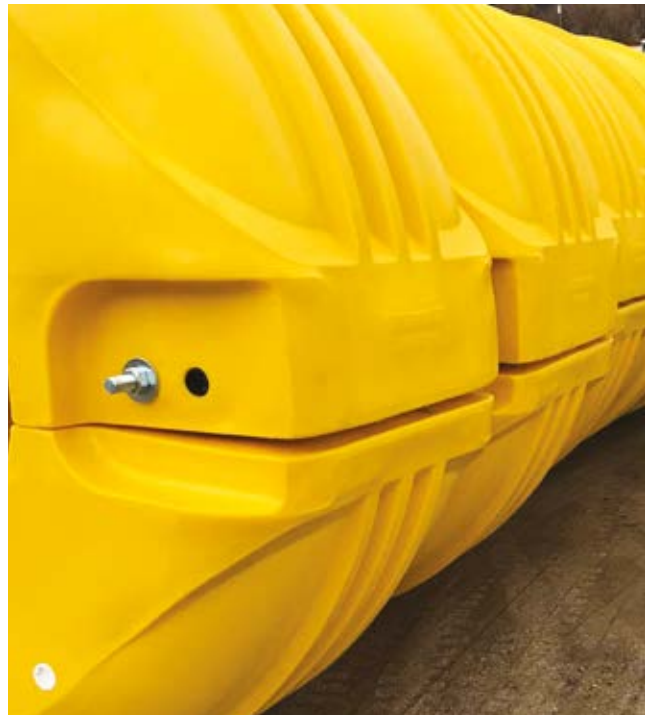
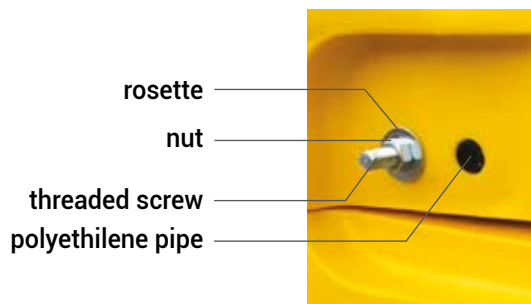
FLOATER COMPOSITION FOR IRON PIPELINES

Starplast has specifically designed a floating system for iron pipelines.

Although this system is similar to the one suitable for the polyethylene pipelines, the floaters for iron pipelines are thicker and filled with high-density expanded polyurethane foam.

These two characteristics combined make the product more resistant to the solicitations and loads the product is to endure.

The two shells are bound together by fasteners such as:



EXPANDED POLYURETHANE FOAM

If the floater is to endure continuous weight and solicitations, or if the whole dredging unit is to be kept below the surface, the same floater must be filled with expanded polyurethane. Its density can span from 35 kg/m³ to 100 kg/m³.

Higer values of density are possible, but they have to be agreed upon with the Starplast engineering offices.

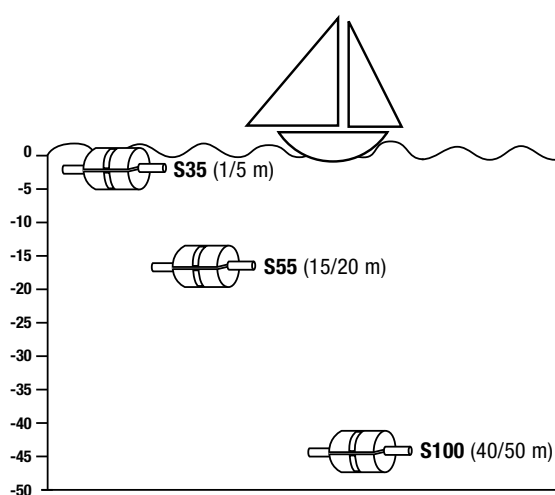
The expanded polyurethane is a mixture of Polyol and Isocyanate.

Through a specific machine, the two elements are injected into the floater. As soon as they come into contact, the two substances create a mixture that can reach 80° C.

During this process and until its complete cooling, the floater is kept inside a specific template to avoid the deformity that the reaction gases could cause.



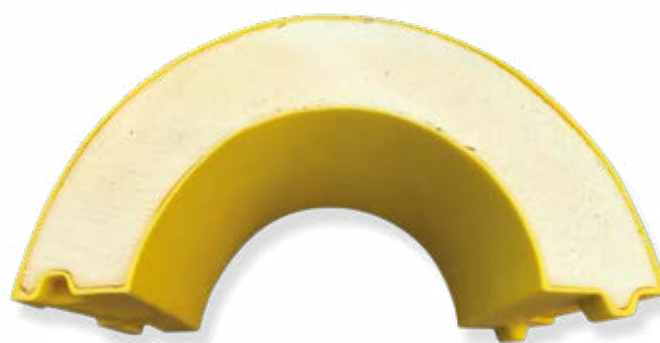
Table of depths







S35 = 35 kg/1 m³

S55 = 55 kg/1 m³

S100 = 100 kg/1 m³



TECHNICAL CHART

icon	model	dimensional values					
		internal Ø	external Ø	Lu	shells	semi-shell volume	total volume
		mm	mm	mm	n.	lt	lt
	DR GAL 24.125.400 CE	24	125	400	2	16	32
	DR GAL 38.125.400 CE	38	125	400	2	15	30
	DR GAL 50.400.400 CE	50	400	400	2	17	34
	DR GAL 70.400.400 CE	70	400	400	2	17	34
	DR GAL 95.400.400 CE	95	400	400	2	16	32
	DR GAL 105.400.400 CE	105	400	400	2	16	32
	DR GAL 55.45.110 ..	110	450	550	2	32	64
	DR GAL 55.45.125 ..	125	450	550	2	31	62
	DR GAL 55.45.140 ..	140	450	550	2	30	60
	DR GAL 55.45.160 ..	160	450	550	2	29	58
	DR GAL 70.80.180 ..	180	800	700	2	121	242
	DR GAL 70.80.200 ..	200	800	700	2	119	238
	DR GAL 70.80.225 ..	225	800	700	2	109	218
	DR GAL 70.80.250 ..	250	800	700	2	106	212
	DR GAL 70.100.280 ..	280	960	700	2	182	364
	DR GAL 70.100.315 ..	315	960	700	2	177	354
	DR GAL 70.100.355 ..	355	960	700	2	170	340
	DR GAL 70.140.400 ..	400	1.400	700	2	390	780
	DR GAL 70.140.450 ..	450	1.400	700	2	377	754
	DR GAL 70.140.500 ..	500	1.400	700	2	364	728
	DR GAL 70.140.560 ..	560	1.400	700	2	347	694
	DR GAL 120.75.180 ..	180	750	1.200	2	215	430
	DR GAL 120.75.225 ..	225	750	1.200	2	208	416
	DR GAL 120.75.250 ..	250	750	1.200	2	203	406
	DR GAL 120.85.280 ..	280	850	1.200	2	216	432
	DR GAL 120.85.315 ..	315	850	1.200	2	157	314
	DR GAL 120.85.350 ..	355	850	1.200	2	197	394
	DR GAL 120.85.400 ..	400	850	1.200	2	180	360
	DR GAL 120.125.400 ..	400	1.250	1.200	2	516	1.032
	DR GAL 120.125.450 ..	450	1.250	1.200	2	500	1.000
	DR GAL 120.125.500 ..	500	1.250	1.200	2	478	956
	DR GAL 120.125.560 ..	560	1.250	1.200	2	450	900
	DR GAL 120.125.630 ..	630	1.250	1.200	2	412	824
	DR GAL 120.150.630 ..	630	1.500	1.200	2	682	1.364
	DR GAL 120.150.710 ..	710	1.500	1.200	2	626	1.252
	DR GAL 100.75.225 CR	1000	750	225	2	140	280
	DR GAL 100.75.250 CR	1000	750	250	2	134	268
	DR GAL 100.75.280 CR	1000	750	280	2	127	254
	DR GAL 120.85.315 CR	1200	850	315	2	185	370
	DR GAL 120.85.355 CR	1200	850	355	2	170	340
	DR GAL 120.85.400 CR	1200	850	400	2	155	310
	DR GAL 190.75.500	500	750	1.900	2	165	330
	DR GAL 190.90.560	560	900	1.900	2	262	524
	DR GAL 190.120.710	1900	1200	710	2	550	1.100
	DR GAL 720.1700.1150	720	1700	1150	2	830	1660
	DR GAL 910.2000.1050	910	2000	1050	2	1000	2000
	DR GAL 850.2000.1150	850	2000	1150	2	1145	2290
	DR GAL 950.2200.1150	950	2200	1150	2	1400	2800
	DR GAL 910.2400.1150	910	2400	1150	2	1810	3620
	DR GAL 1100.2400.1150	1100	2004	1150	2	1655	3310

V = empty	S35 = foamed	S55 = foamed	S100 = foamed
net thrust			
kg			
28	26	25	23
26	25	24	21
30	27	26	24
28	26	25	23
26	25	24	22
26	25	24	22
52	50	49	46
50	48	47	44
48	55	45	42
46	44	43	40
214	204	201	188
210	200	197	184
190	181	177	165
184	175	172	160
330	317	311	293
320	307	302	284
306	293	288	270
720	691	681	642
694	666	655	617
668	641	631	594
634	609	599	564
390	374	368	347
376	361	355	335
366	351	345	326
386	370	364	342
268	253	247	226
348	334	328	309
314	301	296	278
962	926	911	866
930	895	881	834
886	853	840	794
830	799	787	744
754	726	715	676
1.274	1.225	1206	1.139
1.162	1.117	1.100	1.039
244	234	228	216
232	220	214	205
218	208	205	192
320	305	300	283
290	277	270	256
260	248	243	230
272	260	252	240
456	420	428	404
1020	980	960	910
1540	1480	-	-
1800	1730	-	-
2110	2020	-	-
2580	2480	-	-
3350	3212	-	-
3135	3015	-	-

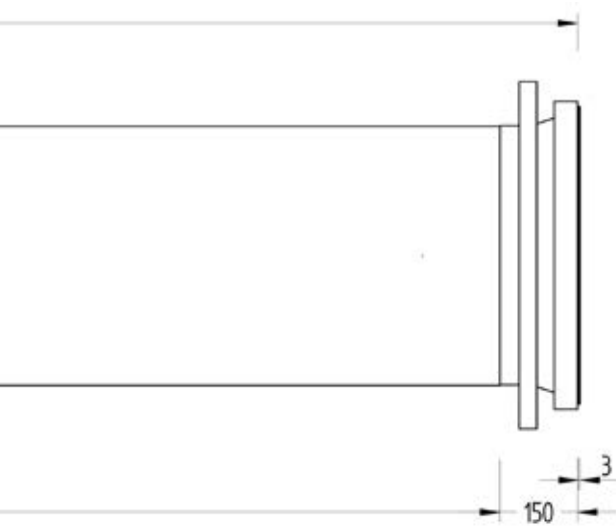
PIPES - TECHNICAL CHART

external diameter	SDR 21 PN8						SDR 17 PN10					
	thickness	∅ internal	bars 6 metres		bars 12 metres		thickness	∅ internal	bars 6 metres		bars 12 metres	
			tot. weight	tot. vol.	tot. weight	tot. vol.			tot. weight	tot. vol.	tot. weight	tot. vol.
	mm	mm	kg/m	lt	kg/m	lt	mm	mm	kg/m	lt	kg/m	lt
110	-	-	-	-	-	-	6,6	96,80	18,14	43,40	30,40	86,80
125	-	-	-	-	-	-	7,4	110,20	21,14	56,25	36,78	112,49
140	-	-	-	-	-	-	8,3	123,40	25,78	70,53	45,43	141,05
160	7,70	144,60	31,09	96,84	52,16	193,68	9,5	141,00	35,47	92,08	61,16	184,16
180	-	-	-	-	-	-	10,7	158,60	42,10	116,50	74,66	233,00
200	9,60	180,80	46,16	151,40	79,01	302,79	11,9	176,20	53,16	143,79	93,39	287,58
225	-	-	-	-	-	-	13,4	198,20	62,95	181,94	113,90	363,88
250	11,90	226,20	69,84	236,98	120,76	473,95	14,80	220,40	80,89	224,98	143,44	449,96
280	-	-	-	-	-	-	16,60	246,80	94,93	282,11	173,51	564,21
315	15,00	285,00	105,67	376,19	186,54	752,39	18,70	277,60	123,42	356,91	222,99	713,82
355	16,90	321,20	143,29	477,83	245,97	955,66	21,10	312,80	166,00	453,16	292,60	906,33
400	19,10	361,80	185,07	606,26	315,81	1.212,52	23,70	352,60	213,10	575,82	373,36	1.151,64
450	21,50	407,00	244,74	767,20	410,29	1.534,41	26,70	396,60	280,37	728,50	483,48	1.456,99
500	23,90	452,20	273,64	947,07	478,12	1.894,14	29,70	440,60	317,80	899,11	568,81	1.798,21
560	-	-	-	-	-	-	33,20	493,60	417,87	1.128,42	732,17	2.256,85
630	30,00	570,00	413,46	1.504,77	736,92	3.009,55	37,40	555,20	484,47	1.427,65	882,75	2.855,29
710	-	-	-	-	-	-	42,10	625,80	627,30	1.813,81	1.132,60	3.627,63
800	-	-	-	-	-	-	47,40	705,20	812,89	2.303,28	1.453,95	4.606,56
900	-	-	-	-	-	-	53,30	793,40	999,05	2.915,45	1.810,03	5.830,91
1.000	-	-	-	-	-	-	59,30	881,40	1.269,35	3.598,05	2.271,79	7.196,11



SDR 11 PN16

thickness mm	∅ internal mm	bars 6 metres		bars 12 metres	
		tot. weight	tot. vol.	tot. weight	tot. vol.
		kg/m	lt	kg/m	lt
10,00	90,00	23,72	37,52	41,69	75,03
11,40	102,20	28,57	48,38	51,84	96,75
12,70	114,60	35,20	60,83	64,25	121,65
14,60	130,80	47,93	79,24	86,08	158,48
16,40	147,20	57,65	100,35	105,86	200,71
18,20	163,60	75,09	123,96	134,55	247,92
20,50	184,00	89,42	156,80	164,76	313,61
22,70	204,60	112,84	193,88	205,56	387,76
25,40	229,20	134,44	243,30	250,65	486,61
28,60	257,80	174,67	307,81	321,86	615,63
32,20	290,60	229,48	391,12	416,26	782,25
36,30	327,40	295,81	496,45	533,06	992,91
40,90	368,20	391,07	627,90	691,75	1.255,80
45,40	409,20	449,07	775,52	819,95	1.551,04
50,80	458,40	591,81	973,22	1.056,65	1.946,44
57,20	515,60	696,82	1.231,25	1.285,60	2.462,51
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-



LOCKING COLLAR

In extreme situations, the entire dredging line can endure significant solicitations.

In such cases, putting collars on the pipeline is recommended.

These electrowelded collars lock the center of the floater and avoid its sliding.

This locking system prevents a possible mutual crash of the floaters, but also supports the homogenous distribution of the pipeline weight.

The solicitations the dredging system has to endure can be of natural origin:

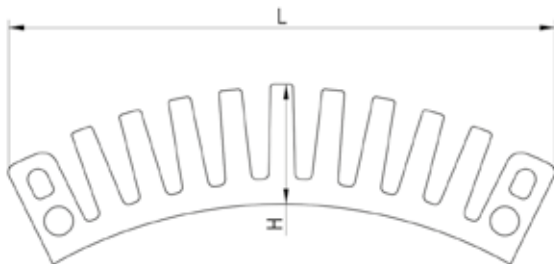
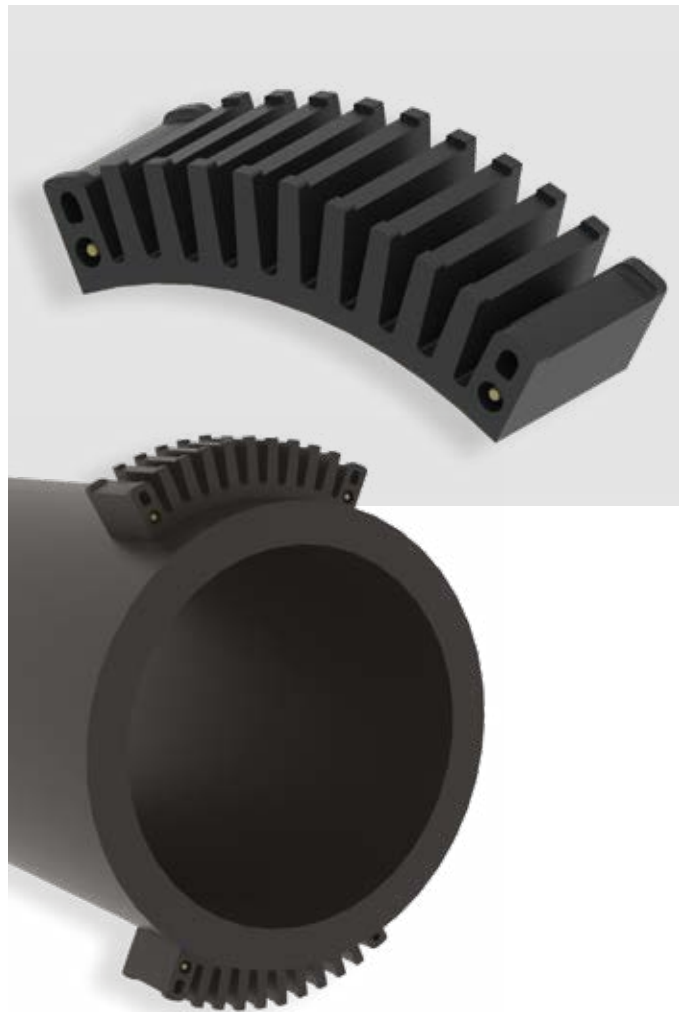
- wind (km/h)
- wave motion (m)
- water flow (m/sec)
- debris (kg)

The solicitations the dredging system has to endure can as well be of artificial origin:

- dredger speed and thrust (Kn)
- dredged material flow (kg)

The locking collar is:

- suitable for a polyethylene pipe with a diameter spanning between 160-1600 millimeters.
- in polyethylene 100 (PE4710).
- suitable for welding through optical control unit reader or manual input (25V).
- endowed with an axial tensile strength: 50kN for one Flex.



TECHNICAL CHARACTERISTICS

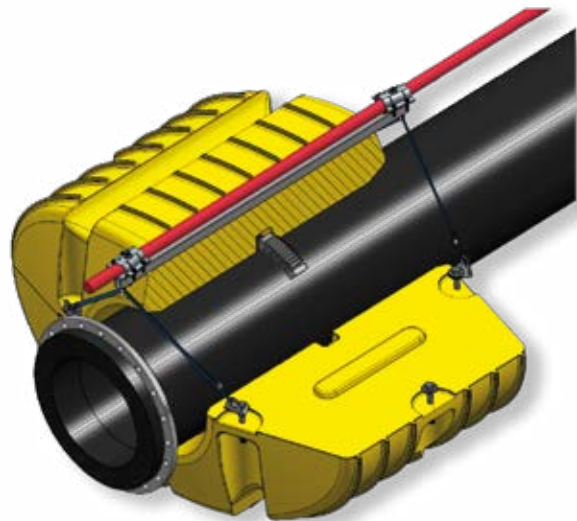
ANTI-SCREWING COLLAR

For the correct operation of the line and to avoid its overturning, it is essential that the floats maintain the ideal arrangement along the longitudinal axis of the tube.

For this it is necessary to provide an appropriate locking system of the float on the tube.

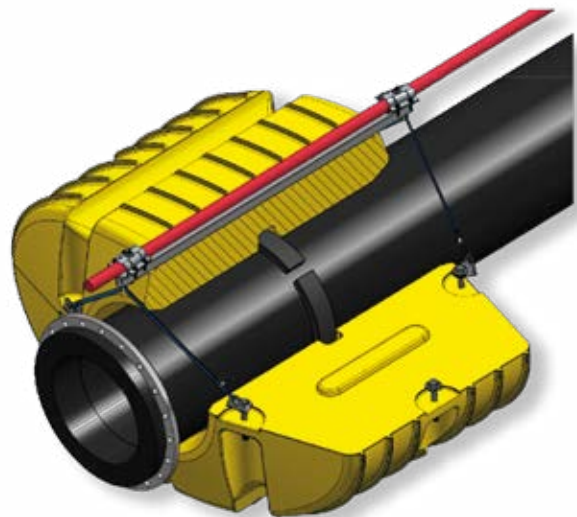
1 BARS AND RODS IN HDPE

Previous solution: insertion of n. 02 electro-weldable PE bars that assume the function of axial constraint

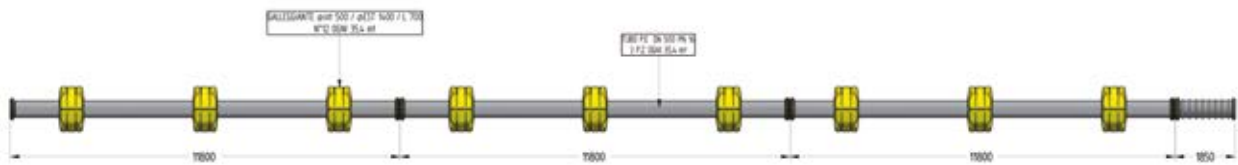


2 COLLAR IN HDPE

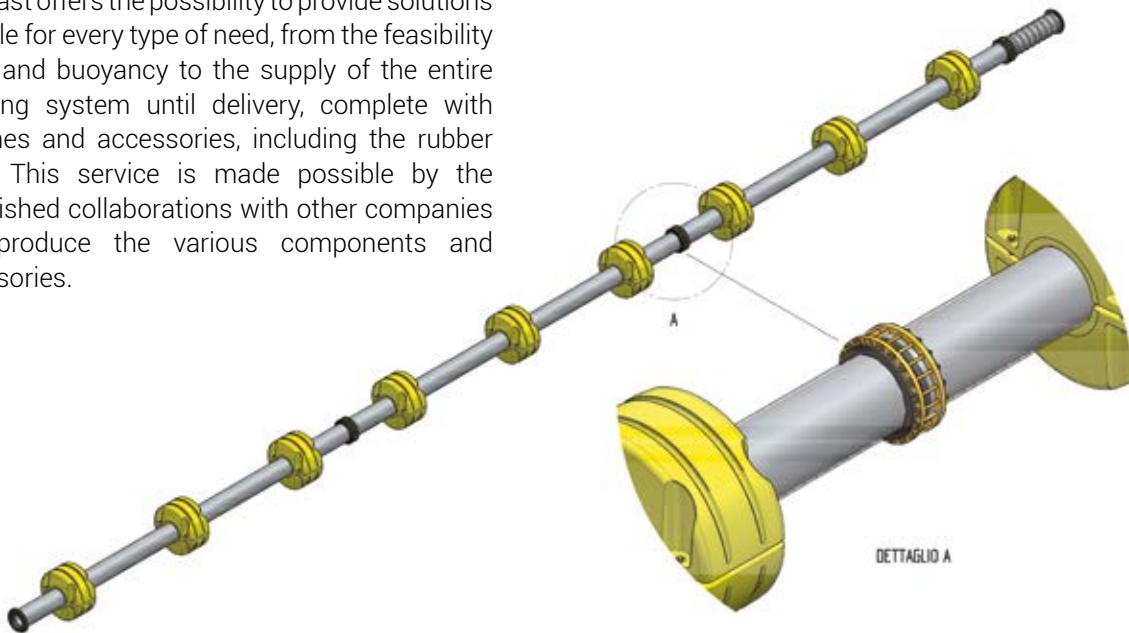
New solution: insertion directly on the tube n. 01 "collar" in HDPE welded by means of an LPDE wire, positioned in the center of the float, equipped with housing compartment for the same.



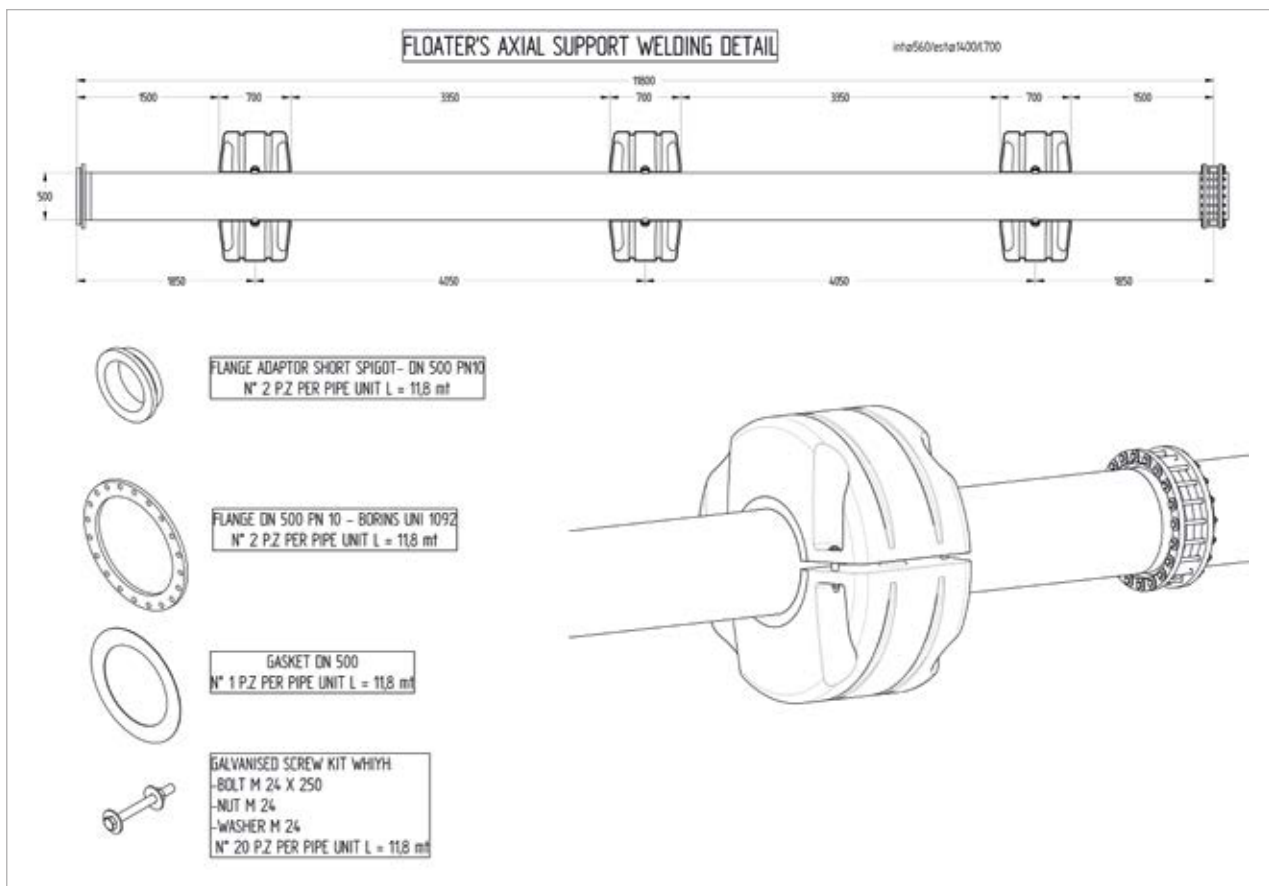
THE “TURN-KEY PROJECT”



Starplast offers the possibility to provide solutions suitable for every type of need, from the feasibility study and buoyancy to the supply of the entire dredging system until delivery, complete with pipelines and accessories, including the rubber cuffs. This service is made possible by the established collaborations with other companies that produce the various components and accessories.



Example of Starplast specifications

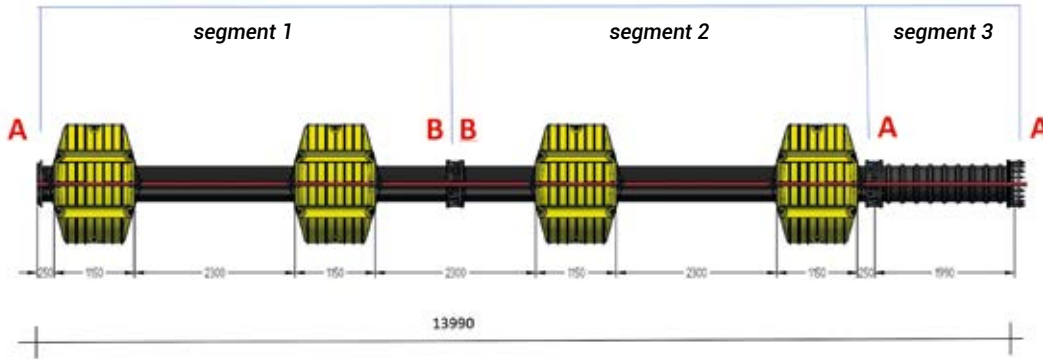


COMPLETE LINE OF DREDGING

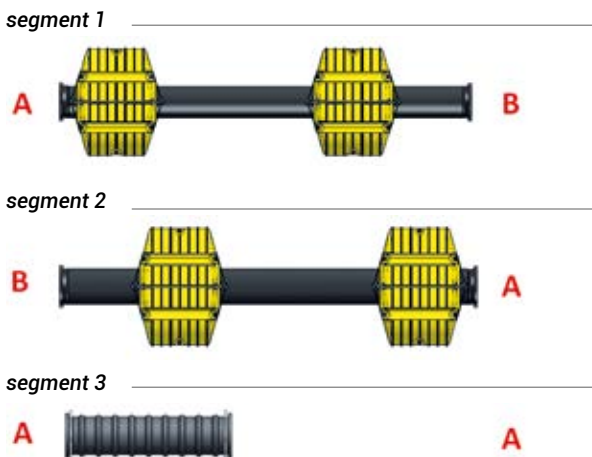
MINIMUM UNIT OF EQUILIBRIUM

The complete line proposed has been conceived as a multiple of the "minimum unit of equilibrium" which must:

- Be made according to the assembly diagram below
- Serve as an example and reference for calculations made



BOX MINIMUM UNIT



Bills of components:

n. 4 floaters
(8 semi shells)

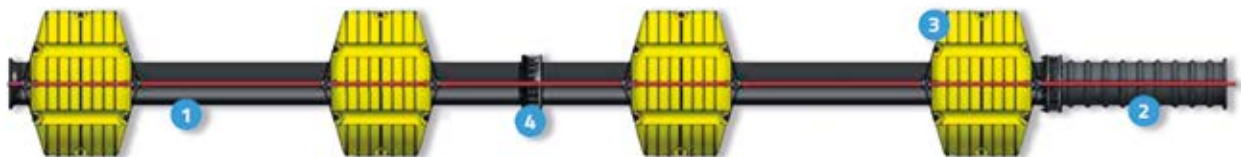
n.2 pipe bars

n.1 hose

n.1 box of
holders
and flange

**n.11 total
packages**

SINGLE COMPONENTS



1

PIPE
SDR 17 PN 10
Material HDPE
OD 450/500 mm
L 5700 mm
q.ty 2

2

HOSE
Flexible joint HDPE pipes
Material rubber
OD 450/500 mm
L 1800 mm
Relevant galvanized hardware included
q.ty 1

3

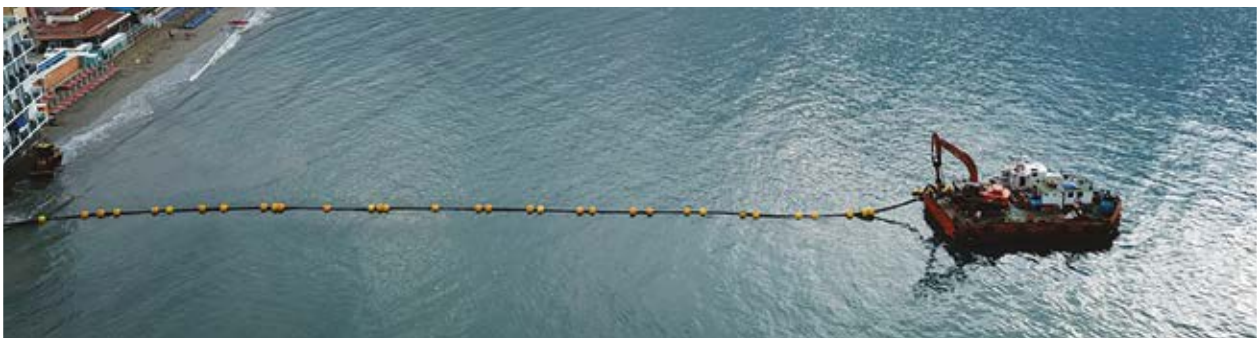
BLOCKING COLLAR (FLOAT ON PIPE)
Electro-welded collar to prevent the float from sliding along the pipe axis
Material HDPE
OD 560 mm
q.ty 4

4

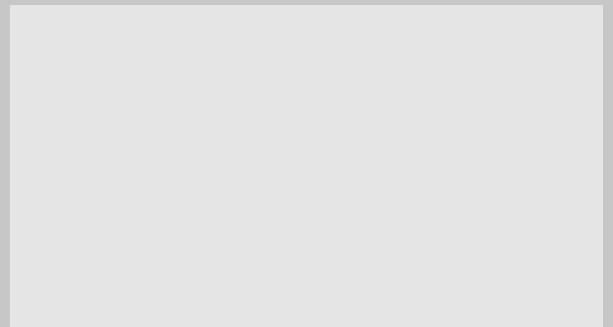
FLANGE ADAPTORS
For HDPE pipes
OD 450/500mm
Material polythylene
OD 560 mm
q.ty 4

FLANGE
For HDPE pipes
OD 450/500 mm
Material Stainless steel
Relevant galvanized hardware included
q.ty 4





AUTHORIZED DEALER



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