

Buoyancy systems & accessories

OFFSHORE & SUBSEA



PartnerPlast

Marine Substrat GmbH

www.partnerplast.de

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About PartnerPlast

PartnerPlast is a leading specialist in plastic materials, rotational moulding and product design.

We manufacture a wide range of products within our product segments: Seismic, Offshore & Subsea, Electronics and Industry.

The history of PartnerPlast stretches all the way back to 1946. The first buoyancy products were supplied to the offshore industry in 1979. The development of subsea products started in the late 1990's. These products were first marketed through our daughter company Marine Subsea Group. But as of 2009 the company and its products became an integrated part of PartnerPlast as an independent product segment called Offshore & Subsea. In 2014 PartnerPlast acquired Exploration Support Services Inc. in Houston and subsequently changed the company name to PartnerPlast Inc. PartnerPlast Inc. primarily offers operational support services, but also our full range of Seismic and Offshore & Subsea products. During 2014 Powex AS also became a fully integrated part of PartnerPlast. In 2015, the company Molstad Modell & Form AS was acquired, hence providing PartnerPlast AS with in-house manufacturing of a Polyurethane products as well as the capability of mould manufacturing. This signifies our continuous effort to provide an extended and broad product range, where our design and standards will meet even the toughest demands.

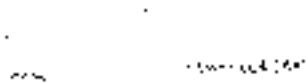
Our products within the Offshore & Subsea range include – but are not limited to – buoyancy solutions and other products for:

- Rig and FPSO moorings
- Subsea installation, operation and decommissioning
- Marker and pick-up buoys for harbours and offshore
- Bend restrictors, piggy back clamps, saddles, cable protection and other polyurethane based products
- ROV, subsea tooling and other subsea products

Since the beginning our experience and know-how has given our customers the needed assurance.

If our standard products do not match your demands, we are more than happy to design and manufacture products that will fit your unique needs and requirements.

We have our own in-house engineering department. The town of Åndalsnes is a center for the plastic industry in Norway and the key suppliers are located on our doorstep. This unique situation has enabled PartnerPlast to have an exceptional track record of supplying every project on time, and we will do everything to keep it that way!



Tom Samuelsen, CEO





HYDROLIFT

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promtec

Buoyancy systems and accessories

PartnerPlast has developed its products using feedback from our customers, to offer a unique product range. The products have evolved from the first buoyancy supply to the oil industry in 1979, to fulfill the demands of quality and documentation to the modern industry. PartnerPlast has in project after project demonstrated the dedication to deliver successfully.

The products are suitable for several applications, and are available from surface to deep water. Our core technology is based on high-performance syntactic foam adapted to the desired operating depth. The systems are modular with a variety of configurations, in order to meet requirements precisely. In addition to the standards listed, we can offer modifications on request.

Rapid delivery is important for our customers, and we keep the best-selling items constantly in stock.

Rig and FPSO moorings

Our standard buoyancy equipment is made to withstand rough handling when the anchors are launched; and not least when the buoyancy device is retrieved and pulled back onto the vessel. The modular system allows quick and easy replacement of damaged elements, to ensure a cost-effective operation of the buoys.

The modular mooring system is ideal also for FPSO moorings. The lifetime of the buoyancy elements can be specified up to 30 years. For the majority of rig and FPSO mooring projects we can offer a fast delivery from our stock of standard products.

Surface and Subsea Operations

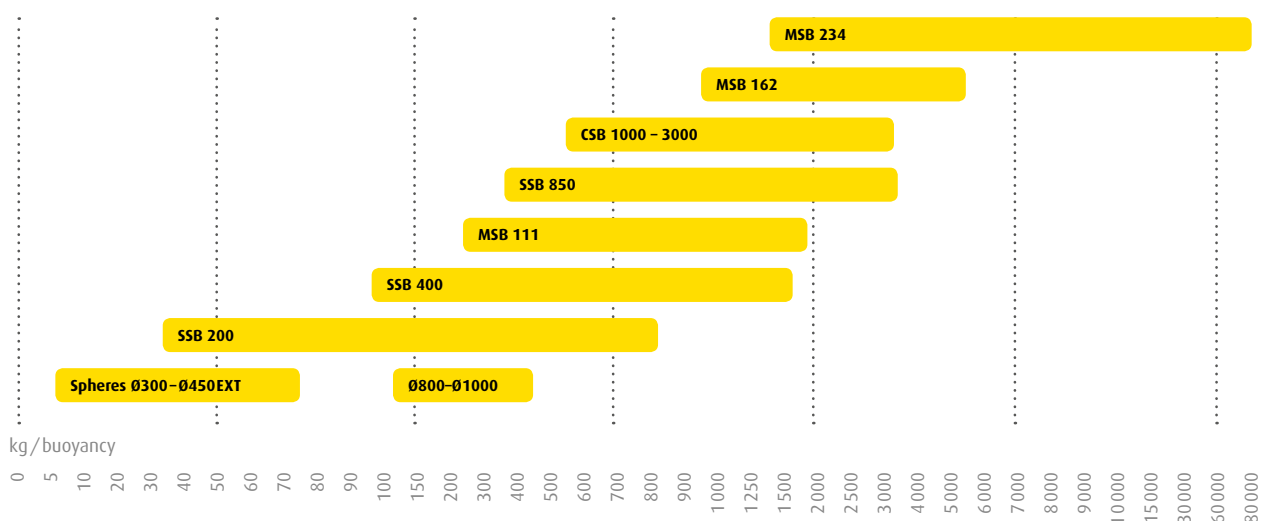
A broad range of modular buoyancy units ensures that buoyancy requirements from a few kilos to 50 tons can be met. Our products and equipment are flexible. The number of modules can be changed in order to reconfigure the net buoyancy. For the smallest series, this is a quick and easy job, and it could even be done offshore if necessary.

The modular buoys are designed to be used over and over again, and to be a trustworthy and cost-effective solution for subsea installation, operation or decommissioning

Our product navigator

For a faster search within our product range, you can use our Product Navigator below. Find your desired buoyancy on the x-axis, and then find the suitable families in the bars above that corresponds with your buoyancy choice.

The graph below shows the span of buoyancy for our products. The min and max figures are indicative, as they will vary depending on the actual chosen depth rating.










Technical information

Our buoyancy products are filled with PartnerPlast engineered and long term proven syntactic foam – with the type and recipe for the appropriate operating depth rating. The whole manufacturing process is fully monitored and traceable from end to end.

Our syntactic foams consists of several technologies with numerous recipes within each technology and spans from surface to 7000 msw.

MSW	Syntactic Foam	Density [kg/l]
Surface		0,1
800		0,3
800		0,4
3 000		
7 000		0,7

Test and quality assurance

PartnerPlast is ISO 9001:2008 certified, and has end-to-end quality assurance and control throughout the whole manufacturing process. Samples are made and tested for each batch, and records made.

When required, PartnerPlast uses independent 3rd parties for testing, verification and certification of both processes, technologies and products – such as Det Norske Veritas (DnV), SINTEF and other well reputed institutions.

How to read tables and data


All tables are done with equal set-up. For each product type, the different available depth ratings are given, and buoyancy and weight figures listed. Please note that a product with different depth ratings is actually different products – the buoyancy and weight is only valid for the product with the corresponding (max) operating depth.

However, a product with a buoyancy of 500 kg, will have (for all practical purposes) the same buoyancy (500 kg) on all depths (from max operating depth and less). A buoy should not be used on depths more than its operating depth, this might cause collapse and permanent damage to the buoy.

Example

The product in the table for max operating depth 500 msw, has a nominal buoyancy on 8 kgf, and weight 6 kg. This figures are valid for all depths <= 500 msw.




Correspondingly, another product for operating depth 250 msw, has 8,5 kgf buoyancy and should not be used for depths > 250 msw.

		
Ø300		
Depth	Buoyancy	Weight
Surface	11	2,9
250 m	8,5	5
500 m	8	6
800 m	7,5	6
1000 m	6,5	7
1500 m	6	8
2000 m	5,5	8,5
Buoyancy [kgf], weight [kg].		




Spherical Buoys

Our spherical buoys product range have a broad range of sizes and depths. The buoys are single-piece devices, and suitable for operations and needs where buoyancy requirement are modest. Sizes up to Ø450 mm have a 50 mm hole through the buoy, through which a rope or wire can be threaded. Pad eyes can be mounted as an option. The holes are also suitable for manual handling. The Ø800 mm and Ø1000 mm buoys have a Ø110 mm hole, and are most often delivered with pad eyes.


Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with a density of 1,025 kg/dm³. Weight figures are dry weight in air. Buoyancy figures are nominal net buoyancy.

						
	Ø300		Ø340		Ø400	
Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	11	2,9	16	4,1	26	6
250 m	8,5	5	13	7,5	20	12
500 m	8	6	12	8,5	19	13
800 m	7,5	6	11	9	18	14
1000 m	6,5	7	10	11	16	17
1500 m	6	8	9	12	15	18
2000 m	5,5	8,5	8,5	12	13	19

Buoyancy [kgf], weight [kg].

						
	Ø450		Ø450 Extended, L: 710 mm		Ø800	
Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	38	8	75	17	235	46
250 m	30	16	60	33	185	95
500 m	28	18	55	37	170	110
800 m	27	19	50	39	160	115
1000 m	23	23	50	40	130	140
1500 m	21	25	46	45	120	155
2000 m	19	27	42	48	115	165

Buoyancy [kgf], weight [kg].

		
	Ø1000	
Depth	Buoyancy	Weight
Surface	450	80
250 m	355	180
500 m	330	205
800 m	315	215
1000 m	260	265
1500 m	240	290
2000 m	225	310

Buoyancy [kgf], weight [kg].

Spheres with pad-eyes

Buoy	Buoyancy loss [kgf]	Added [kg] weight
Ø 300	1,4	1,2
Ø 340	1,4	1,2
Ø 400	1,5	1,3
Ø 450	1,5	1,3
Ø 450 Extended	1,5	1,3
Ø 800	5,9	5,1
Ø 1000	6,1	5,3

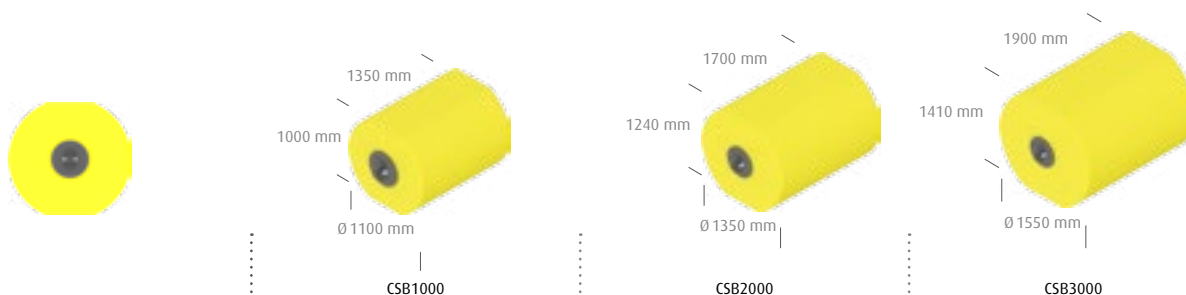
All depths



Cylindrical Support Buoys

The PartnerPlast CSB (Cylindrical Support Buoy) is a range of single-element buoyancy modules. The CSB range consist of three different sizes of buoys, and can be delivered with pad-eyes or chain through armature. Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with a density of 1,025 kg/dm³. Weight figures are dry weight in air. Buoyancy figures are nominal net buoyancy.

The CSB range is designed with emphasis on easy handling off and on board. The buoys have flat sides to prevent rolling and simplify stacking. Our customers have contributed actively with their competence and experience through the design process.



Depth	CSB1000		CSB2000		CSB3000	
	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	1000	230	1990	380	3200	550
250 m	780	450	1560	810	2500	1240
500 m	720	500	1450	920	2300	1420
800 m	690	540	1380	980	2200	1520
1000 m	680	550	1360	1010	2200	1570
1500 m	610	610	1230	1140	2000	1770
2000 m	540	690	1090	1280	1770	1990

Buoyancy [kgf], weight [kg].

Marker Buoy

The PartnerPlast Marker Buoy is equipped with a LED flasher for marking various types of equipment as buoys, anchor chains or moorings, oil cables etc. It is a surface buoy, with a daylight switch incorporated. The Marker Buoy has a bright yellow color, and with the flashing light it is easy to see the buoy even at night. If SOLAS approved light is required on the markerbuoy, the Jotron SL-300 light can be mounted to the buoy. A PE plastic adapter is needed to make it fit properly.

The Marker Buoy has a polyethylene outer shell filled with syntactic foam. The armature is zinc coated to provide excellent corrosion resistance.

Specifications

Weight:	13 kg
Buoyancy:	Net 27 kg
Design depth:	Surface
Light range:	2-3 NM Surface visibility
Light colour:	White
Endurance:	3 x 1,5 VDC D-Cells, expecting operating for 32 days
Flash rate:	25 flashes per minute. Daylight sensor incorporated
Software program.:	Flash rate, light-intensity and sync

Specifications SL-300 light

Approved according to SOLAS
Type: Unbreakable high intensity LED
Battery service life: 5 years
Self activated by tilt-switch
Light color: white
Light intensity: > 2 Candela



HUB 3000 Light buoy

HUB 3000 Light Buoy is a floating marker buoy containing the PWX Signal Light, battery, weight for stabilization and mooring connections. The battery is of replaceable alkaline type which is connected to the signal light inside the protected environment of the buoy. The Light Buoy is delivered with both yellow and white light, and the light source is LED (Light Emitting Diodes) used for long life operation. The Signal Light pattern and light intensity is programmable, and therefore the operational period between replacement of the battery will be indicated when calculating the light pattern. The PWX signal light also contains daylight switch and a GPS is available for synchronizing several lights.

Technical Specification

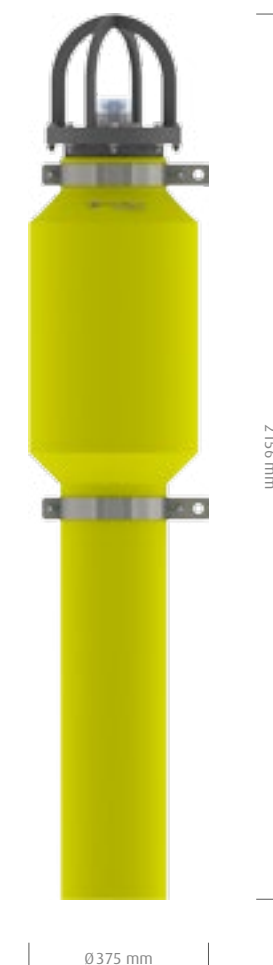
Material Body	UV resistant Polyethylene
Lantern material	Seawaterproof Aluminium and UV resistant Polycarbonate
Weight including battery	84kg
Degree of protection	IP 67
Approvals	NEMKO Report E14141.00
Battery	Alkaline battery 18V / 220Ah Electronic waste for recycling to be delivered disposal central
Synchronization	GPS
Light pattern	25 flash / min (0,5+1,9 = 2,4 sec period)

HUB 3000 Light Buoy – Yellow LED

Lantern intensity	18 cd (3 nm, 5,4 km) default. Programmable range 3-90 cd
Light colour	Yellow, Ref IALA
Vertical divergence	10° (+/-1°) @ 50 %
Battery intervals (18cd)	> 2 yrs (day/night period 50/50)

HUB 3000 Light Buoy – White LED

Lantern intensity	170 cd (10 km) default. Programmable range 6-280 cd
Light colour	White, Ref IALA
Vertical divergence	20° (+/-1°) @ 50%
Battery intervals (170cd)	> 150 days (day/night period 50/50)





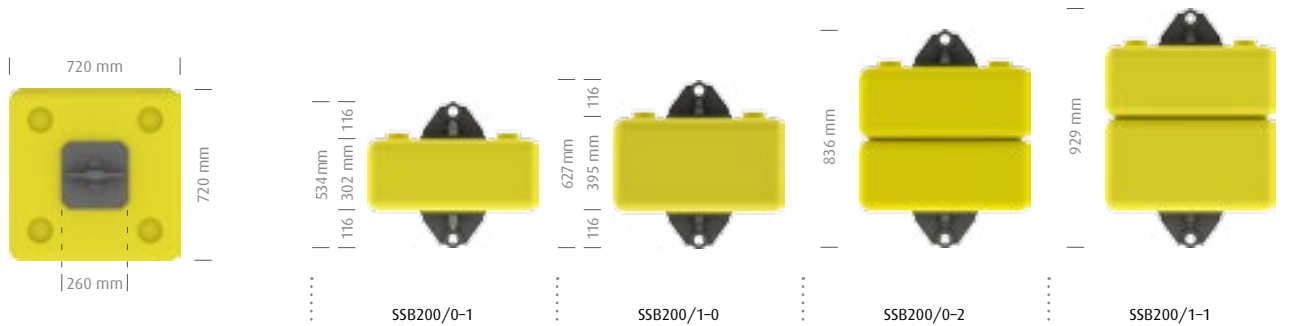
Modular Buoys

Our modular buoys consist of several families of sizes, and can be chosen depending on buoyancy need and type of usage. The buoys are suitable both for permanent and temporary use. The buoys are normally sold mounted as a buoy with steelworks, but elements and steelworks are available separately at request.

Subsea Support Buoy 200

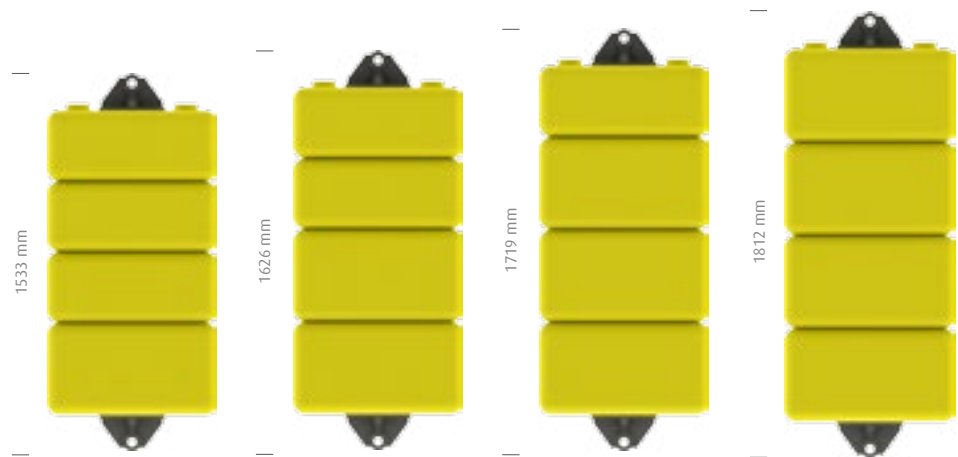
The SSB200 series is our smallest modular buoy. It consists of two module sizes and can be assembled in a wide range of combinations. The combination of two element sizes enables precise correspondence to actual buoyancy needs. The elements have pegs for fitting into each other. Standard pad eyes have a MBL of 22 t.

Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with a density of 1,025 kg/dm³. Weight figures are dry weight in air. Buoyancy figures are nominal net buoyancy.

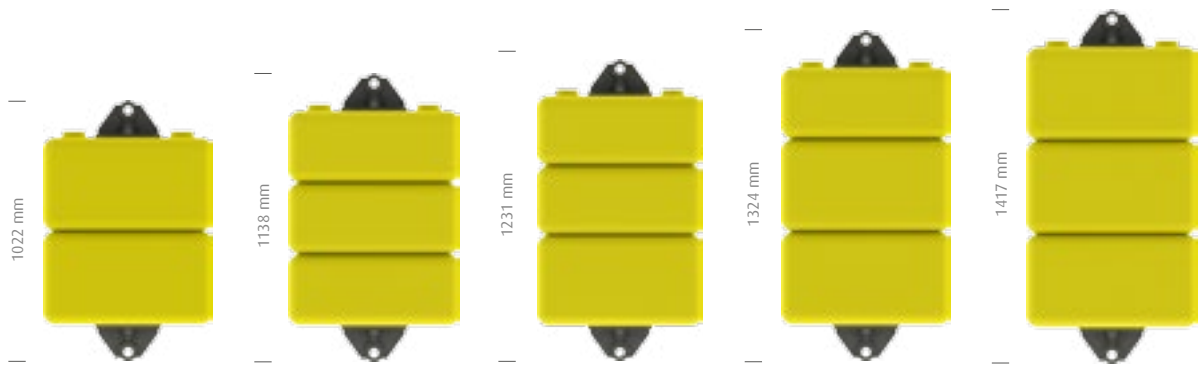


Depth	SSB200/0-1			SSB200/1-0			SSB200/0-2			SSB200/1-1		
	Buoyancy	Weight		Buoyancy	Weight		Buoyancy	Weight		Buoyancy	Weight	
Surface	90 (120)	60 (30)		135 (165)	70 (38)		205	95		250	100	
250	65 (95)	90 (55)		95 (125)	110 (80)		155	145		185	165	
500	60 (85)	95 (60)		90 (115)	115 (85)		145	160		170	180	
800	55 (85)	100 (65)		85 (110)	120 (90)		135	165		165	190	
1000	42 (70)	110 (80)		70 (95)	135 (105)		110	190		135	215	
1500	37 (65)	115 (85)		60 (90)	145 (110)		100	200		125	230	
2000	32 (60)	120 (90)		55 (80)	150 (120)		90	210		110	240	

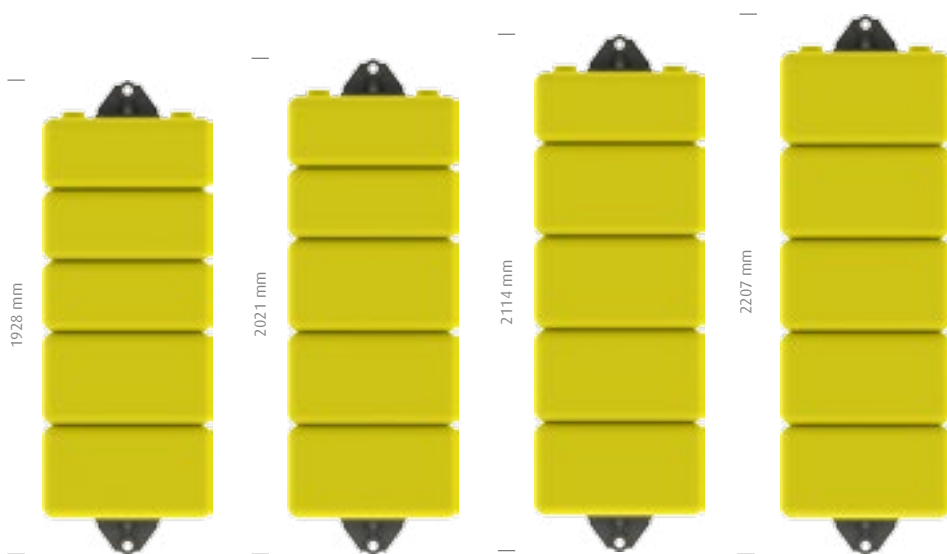
Buoyancy [kgf], weight [kg]. Figures in parentheses are element only.



Depth	SSB200/1-3			SSB200/2-2			SSB200/3-1			SSB200/4-0		
	Buoyancy	Weight		Buoyancy	Weight		Buoyancy	Weight		Buoyancy	Weight	
Surface	485	165		530	175		570	185		620	190	
250	370	285		400	305		430	325		460	350	
500	340	310		370	335		395	360		425	385	
800	325	325		355	350		380	375		405	400	
1000	275	380		300	405		325	430		350	460	
1500	250	400		275	430		295	460		320	485	
2000	230	425		250	455		270	485		295	520	



	SSB200/2-0		SSB200/0-3		SSB200/1-2		SSB200/2-1		SSB200/3-0	
Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	295	110	325	125	370	135	410	145	455	150
250 m	215	190	250	205	280	225	305	245	335	270
500 m	200	205	230	220	255	245	285	270	310	295
800 m	190	215	220	235	245	260	270	285	300	310
1000 m	160	245	180	270	205	300	230	325	255	350
1500 m	145	260	165	285	185	315	210	345	235	375
2000 m	135	275	150	300	170	330	190	365	215	395

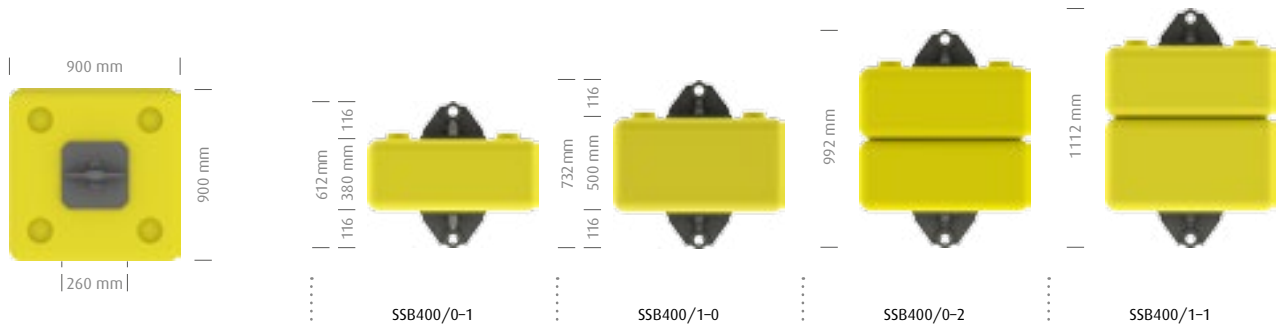


	SSB200/2-3		SSB200/3-2		SSB200/4-1		SSB200/5-0	
Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	650	205	690	215	730	225	780	230
250 m	490	360	520	385	550	405	580	430
500 m	455	400	480	425	510	445	540	470
800 m	435	420	460	445	490	470	510	495
1000 m	365	485	390	510	415	540	440	570
1500 m	340	510	360	540	385	570	405	600
2000 m	310	540	330	580	350	610	375	640

Subsea Support Buoy 400

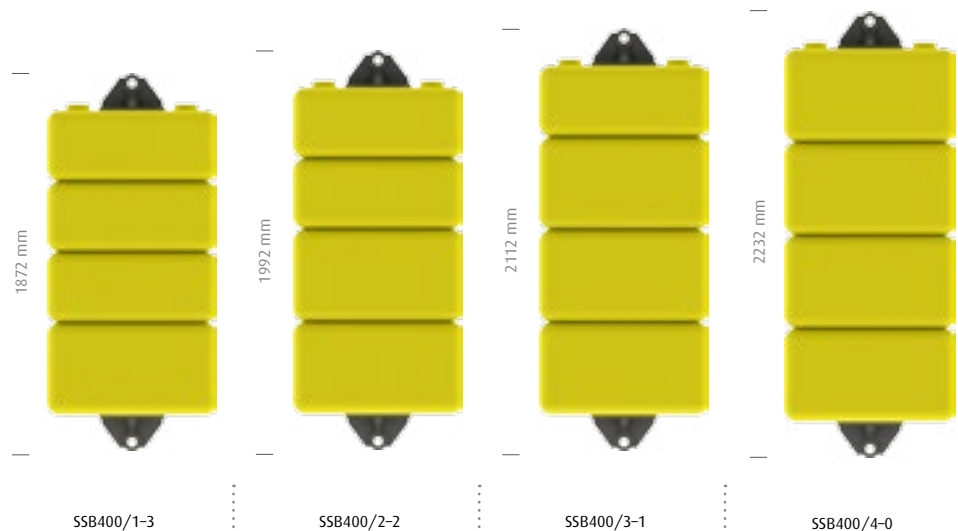
The SSB400 series consists of two module sizes and can be assembled in a wide range of combinations. The combination of two element sizes enables precise correspondence to actual buoyancy needs. The elements have pegs for fitting into each other. Standard pad eyes have a MBL of 22 t.

Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with a density of 1,025 kg/dm³. Weight figures are dry weight in air. Buoyancy figures are nominal net buoyancy.

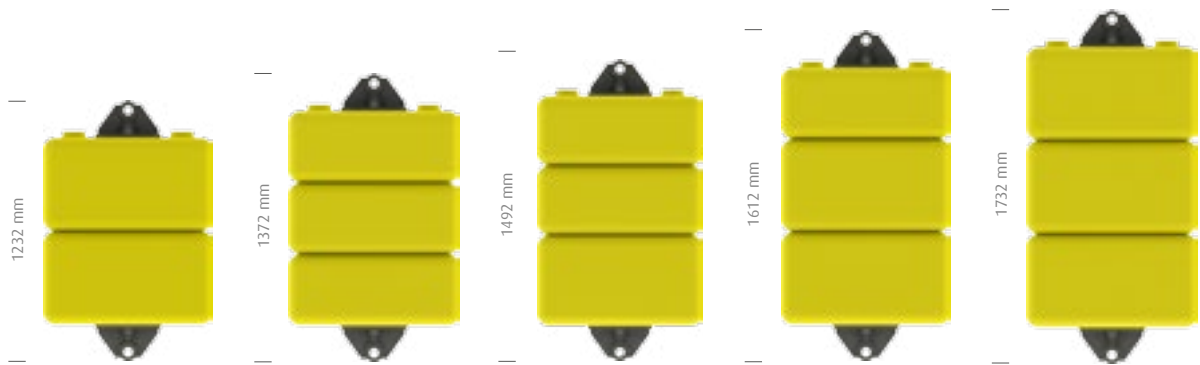


Depth	SSB400/0-1		SSB400/1-0		SSB400/0-2		SSB400/1-1	
	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	220 (250)	90 (60)	295 (325)	105 (75)	465	155	540	170
250 m	170 (195)	145 (110)	225 (255)	175 (145)	360	260	420	290
500 m	155 (185)	155 (125)	210 (235)	195 (160)	335	285	390	320
800 m	145 (175)	165 (135)	200 (225)	205 (170)	320	300	370	340
1000 m	120 (150)	190 (160)	165 (195)	235 (205)	270	350	315	395
1500 m	110 (135)	205 (170)	150 (175)	255 (220)	240	380	280	430
2000 m	95 (125)	215 (185)	135 (160)	265 (235)	220	400	255	455

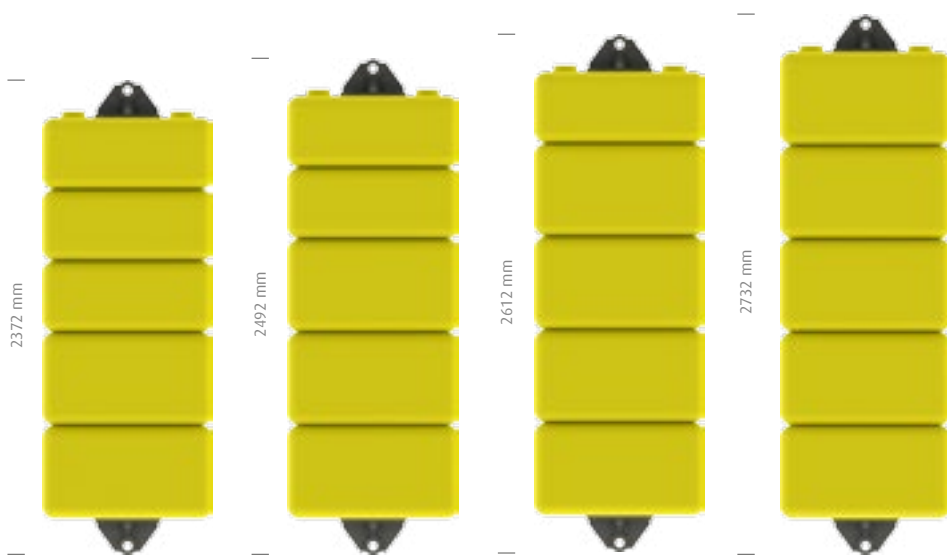
Buoyancy [kgf], weight [kg]. Figures in parentheses are element only.



Depth	SSB400/1-3		SSB400/2-2		SSB400/3-1		SSB400/4-0	
	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	1030	290	1110	310	1180	325	1260	340
250 m	810	520	870	550	920	580	980	610
500 m	750	580	800	610	860	650	910	680
800 m	720	610	770	650	820	690	870	720
1000 m	610	720	650	760	700	810	740	850
1500 m	550	780	590	830	630	880	670	930
2000 m	500	820	540	880	580	930	610	980



	SSB400/2-0		SSB400/0-3		SSB400/1-2		SSB400/2-1		SSB400/3-0	
Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	610	185	710	215	790	230	860	245	930	265
250 m	475	320	560	370	610	405	670	435	730	470
500 m	445	355	520	410	570	450	620	485	680	520
800 m	425	375	495	435	540	475	600	510	650	550
1000 m	360	440	420	510	460	560	510	600	550	650
1500 m	320	480	375	550	415	600	455	650	495	700
2000 m	295	510	345	580	380	640	415	690	455	740



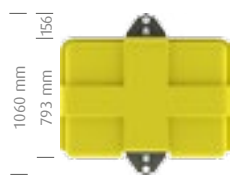
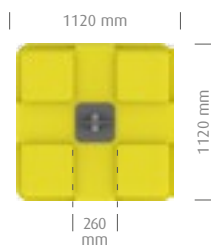
	SSB400/2-3		SSB400/3-2		SSB400/4-1		SSB400/5-0	
Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	1350	370	1430	385	1500	400	1580	420
250 m	1060	660	1120	700	1170	730	1230	760
500 m	990	740	1040	770	1090	810	1150	850
800 m	940	780	990	820	1040	860	1100	900
1000 m	800	920	850	970	890	1010	930	1060
1500 m	720	1000	760	1050	800	1100	800	1100
2000 m	660	1060	700	1110	740	1170	740	1170



Subsea Support Buoy 850

The SSB850 series is a mid-range buoy, and can be delivered with between one to five elements mounted together. The element has a cross-profile shape allowing elements to fit into each other. Standard Pad eyes have a MBL of 22t for up to four elements. The buoy with five elements has a steelwork with MBL 40t.

Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with a density of 1,025 kg/dm³. Weight figures are dry weight in air. Buoyancy figures are nominal net buoyancy.



SSB850/1



SSB850/2



SSB850/3



SSB850/4

Depth	SSB850/1		SSB850/2		SSB850/3		SSB850/4	
	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	680 (710)	180 (145)	1390	330	2100	480	2800	630
250 m	530 (560)	330 (295)	1080	630	1640	930	2200	1230
500 m	490 (520)	370 (335)	1010	710	1530	1050	2000	1390
800 m	470 (500)	390 (360)	960	750	1460	1110	1950	1480
1000 m	400 (425)	460 (430)	820	890	1250	1330	1670	1760
1500 m	360 (385)	500 (470)	740	980	1120	1450	1510	1920
2000 m	325 (355)	530 (500)	680	1040	1030	1540	1380	2000

Buoyancy [kgf], weight [kg]. Figures in parentheses are element only.



SSB850/5

Depth	Buoyancy	Weight
Surface	3400	870
250 m	2700	1630
500 m	2500	1820
800 m	2400	1930
1000 m	2000	2300
1500 m	1810	2500
2000 m	1660	2600

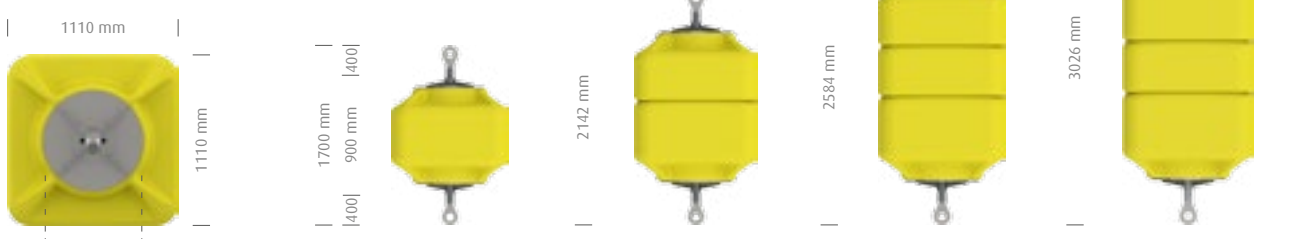


Modular Support Buoy 111

The MSB111 series has two element types. The buoy has an elegant design, and suits well demands that are smaller than the largest buoys. The steel work has an MBL of 40t.

Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with density 1,025 kg/dm³. Weight figures are dry weight in air.

Buoyancy figures are nominal net Buoyancy.



Depth	MSB111/1		MSB111/2		MSB111/3		MSB111/4	
	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	435 (580)	280 (95)	1010	385	1430	490	1860	590
250 m	340 (430)	435 (185)	770	630	1100	830	1430	1020
500 m	320 (395)	475 (210)	700	690	1010	910	1320	1130
800 m	305 (370)	495 (225)	670	730	960	960	1260	1190
1000 m	260 (300)	570 (265)	550	840	810	1120	1060	1390
1500 m	235 (260)	610 (290)	485	910	710	1210	940	1510
2000 m	220 (230)	640 (310)	435	960	650	1280	860	1600

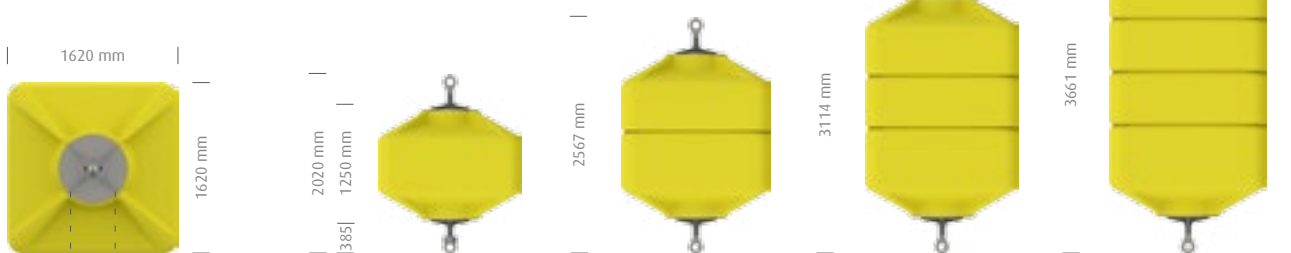
Buoyancy [kgf], weight [kg]. Figures in parentheses are element only.

Modular Support Buoy 162

The MSB 162 series offers two different sizes, with two element types. The buoy has an elegant design, and is well suited to situations that demand a smaller buoy. The steel work has a MBL of 40t.

Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with density 1,025 kg/dm³. Weight figures are dry weight in air.

Buoyancy figures are nominal net Buoyancy.



Depth	MSB162/1		MSB162/2		MSB162/3		MSB162/4	
	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	1210(1790)	465 (220)	3000	700	4200	930	5400	1170
250 m	950(1380)	880 (480)	2300	1370	3300	1860	4200	2300
500 m	880(1280)	980 (540)	2200	1540	3000	2100	3900	2600
800 m	850(1220)	1040 (580)	2100	1640	2900	2200	3700	2800
1000 m	830(1190)	1070 (600)	2000	1680	2800	2300	3600	2900
1500 m	760(1070)	1190 (670)	1820	1870	2600	2600	3300	3200
2000 m	670 (940)	1320 (760)	1600	2100	2300	2900	2900	3600

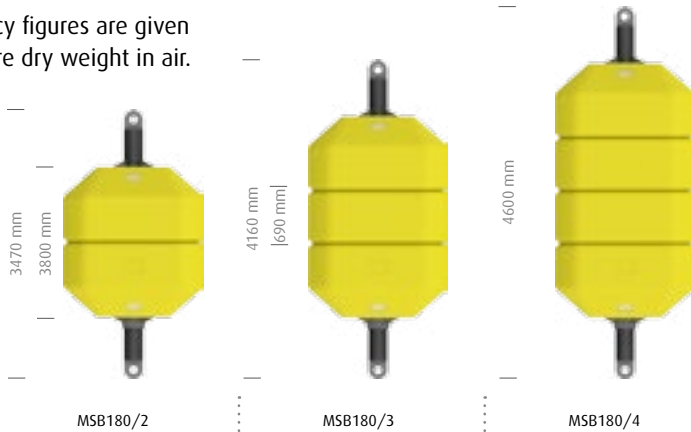
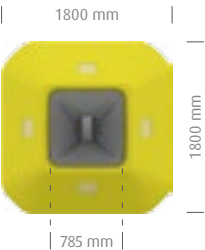
Buoyancy [kgf], weight [kg]. Figures in parentheses are element only.



Modular Support Buoy 180

The MSB 180 series is a mid-size buoy based on the same modularity principle as MSB 234, but with smaller dimensions. Available in all depth ratings from surface to 2000 meters. For surface buoys, AIS, radar reflector and light system can be provided as an option, with a detection range of four nautical miles. The steel work has a MBL of 85t.

Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with density 1,025 kg/dm3. Weight figures are dry weight in air. Buoyancy figures are nominal net Buoyancy.



Depth	MSB180/2		MSB180/3		MSB180/4	
	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	3610 (2070)	1440 (420)	5310 (1740)	1850 (380)	7010	2270
250 m	2760 (1650)	2300 (840)	4100 (1390)	3070 (730)	5450	3840
500 m	2520 (1540)	2540 (950)	3780 (1300)	3390 (820)	5040	4250

Buoyancy [kgf], weight [kg]. Figures in parentheses are element only – figures in parentheses on configuration MSB180/3 are center element only.

Modular Support Buoy 234

This is the most commonly used large modular buoy, both for permanent and temporary use. Available in all depth ratings from surface to 2000 meters. For surface buoys, AIS, radar reflector and light system can be provided as an option, with a nominal detection range of four nautical miles. The steel work has a MBL of 85t.

Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with density 1,025 kg/dm³. Weight figures are dry weight in air. Buoyancy figures are nominal net Buoyancy.



Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	3000 (3100)	1130 (560)	6500	1720	9400 (3500)	2400 (590)	12500	3000
250 m	2200 (2700)	1910 (1340)	4900	3300	7200 (2400)	4600 (1240)	9600	5900
500 m	2000 (2500)	2100 (1520)	4500	3700	6700 (2200)	5200 (1410)	8900	6600
800 m	1920 (2400)	2200 (1630)	4300	3900	6400 (2200)	5500 (1510)	8500	7000
1000 m	1880 (2400)	2200 (1670)	4200	4000	6300 (2100)	5600 (1530)	8400	7200
1500 m	1680 (2200)	2500 (1880)	3800	4400	5700 (1950)	6200 (1710)	7600	7900
2000 m	1430 (1920)	2700 (2100)	3300	4900	5000 (1720)	6900 (1940)	6600	8900

Buoyancy [kgf], weight [kg]. Figures in parentheses are element only – figures in parentheses on configuration MSB234/3 are center element only.

Modular Support Buoy 234 with half elements

The MSB 234 can be equipped with half elements in order to increase the granularity of buoyancy.



Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	4600 (1510)	1460 (300)	7900	2100	10900	2700	14000	3300
250 m	3400 (1160)	2600 (650)	6000	4000	8400	5300	10700	6600
500 m	3200 (1080)	2900 (730)	5600	4500	7800	5900	10000	7400
800 m	3000 (1040)	3000 (770)	5300	4700	7400	6300	9500	7800
1000 m	3000 (1040)	3100 (770)	5200	4800	7300	6400	9400	8000
1500 m	2700 (950)	3400 (860)	4700	5300	6600	7100	8500	8800
2000 m	2300 (840)	3700 (970)	4100	5900	5800	7900	7500	9900

Buoyancy [kgf], weight [kg]. Figures in parentheses are element only – figures in parentheses on configuration MSB234/3 are center element only.



Crucifix as standard
for surface version
(for all configurations)



MSB234/5

MSB234/6

MSB234/7

Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	15600	3600	18600	4200	21600	4900
250 m	12000	7200	14300	8500	16700	9800
500 m	11100	8100	13300	9500	15500	11000
800 m	10600	8600	12700	10100	14800	11700
1000 m	10400	8700	12500	10300	14600	11900
1500 m	9500	9700	11400	11500	13300	13200
2000 m	8300	10900	10000	12900	11700	14800



MSB234/5,5

MSB234/6,5

MSB234/7,5

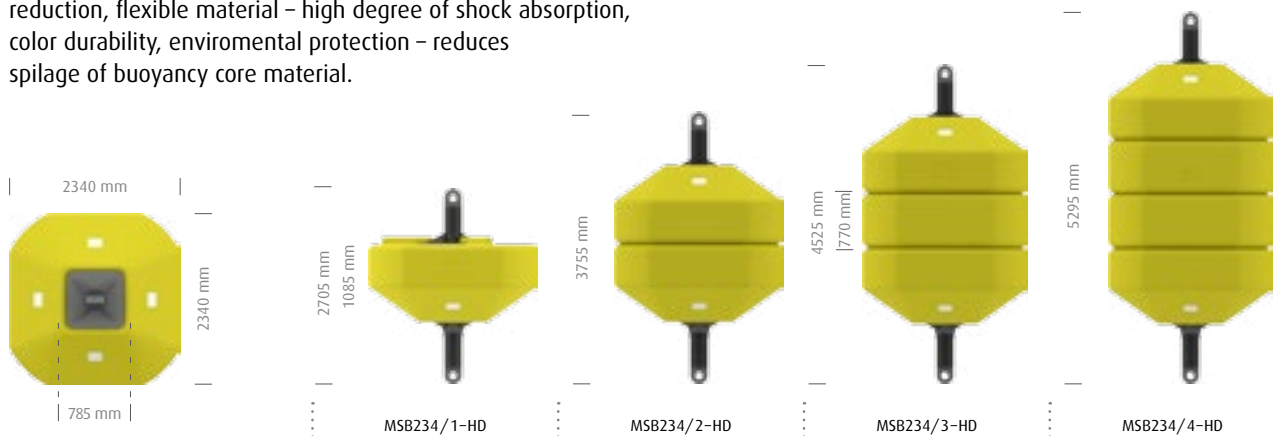
Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	17000	4000	20100	4600	23000	5400
250 m	13100	7900	15500	9200	17700	10600
500 m	12200	8800	14400	10300	16400	11900
800 m	11600	9400	13700	10900	15700	12700
1000 m	11500	9500	13500	11100	15500	12900
1500 m	10400	10600	12300	12300	14100	14300
2000 m	9100	11900	10800	13800	12300	16000

Modular Support Buoy 234 – Heavy Duty

The MSB 234 series can also be delivered with a Heavy Duty shell as an option, resulting in buoys that can survive even more harsh environments and rough handling.

Benefits

Extremely strong and durable, mechanical properties remains even subzero temperatures, suited for arctic conditions, lower repair frequency and hence operational cost reduction, flexible material – high degree of shock absorption, color durability, enviromental protection – reduces spilage of buoyancy core material.

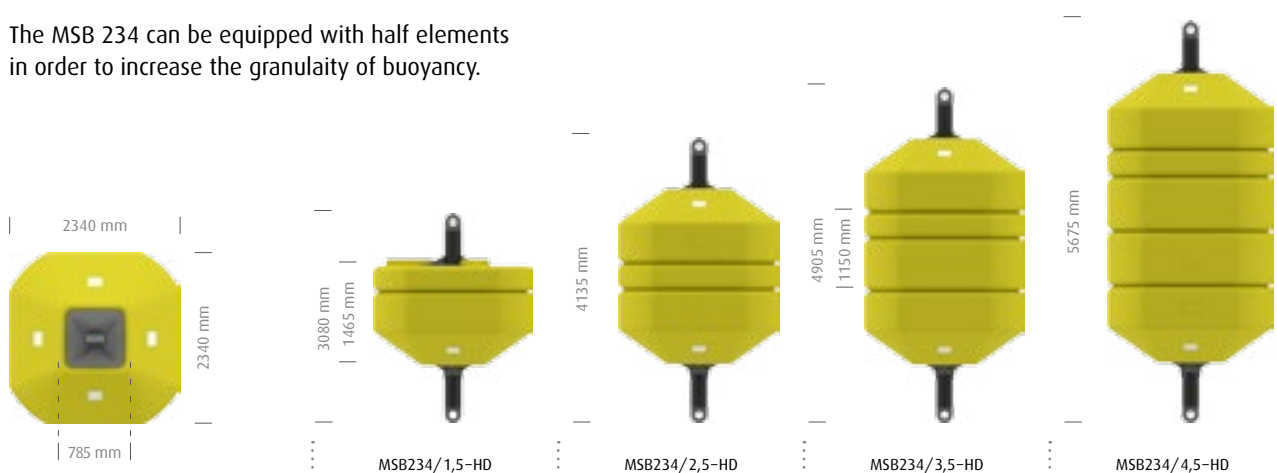


Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	3200 (3700)	1150 (620)	6900	1770	10000 (3200)	2500 (570)	13200	3100
250 m	2400 (2900)	1970 (1400)	5200	3500	7700 (2500)	4800 (1280)	10200	6100
500 m	2200 (2700)	2200 (1600)	4800	3800	7100 (2400)	5400 (1460)	9400	6900
800 m	2100 (2600)	2300 (1710)	4600	4100	6800 (2300)	5700 (1550)	9000	7300

Buoyancy [kgf], weight [kg]. Figures in parentheses are element only – figures in parentheses on configuration MSB234/3 are center element only.

Modular Support Buoy 234 with half elements – Heavy Duty

The MSB 234 can be equipped with half elements in order to increase the granulaity of buoyancy.



Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	4800 (1600)	1490 (310)	8400	2200	11600	2800	14800	3400
250 m	3600 (1230)	2700 (680)	6400	4200	8900	5500	11400	6800
500 m	3300 (1150)	3000 (760)	5900	4600	8200	6100	10600	7600
800 m	3200 (1100)	3100 (810)	5700	4900	7900	6500	10100	8100

Buoyancy [kgf], weight [kg]. Figures in parentheses are element only – figures in parentheses on configuration MSB234/3 are center element only.



Crucifix as standard
for surface version
(for all configurations)



MSB234/5-HD

MSB234/6-HD

MSB234/7-HD

Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	16400	3700	19600	4300	22700	5000
250 m	12600	7500	15100	8800	17600	10100
500 m	11700	8400	14000	9900	16400	11400
800 m	11200	8900	13400	10500	15600	12100



MSB234/5,5-HD

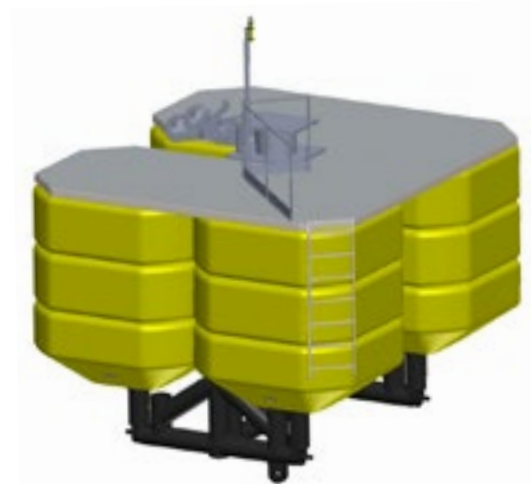
MSB234/6,5-HD

MSB234/7,5-HD

Depth	Buoyancy	Weight	Buoyancy	Weight	Buoyancy	Weight
Surface	18000	4000	21200	4700	24200	5500
250 m	13900	8200	16300	9500	18700	10900
500 m	12900	9100	15200	10700	17400	12300
800 m	12300	9700	14500	11300	16600	13100

MSB 234 Duo & Quad

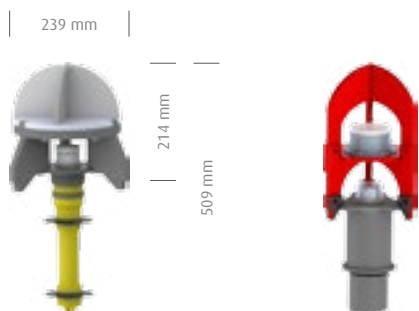
In addition to the shown alternative configurations for MSB 234, PartnerPlast also delivers parallel (Duo) and double parallel (Quad) MSB 234 configurations. This doubles or quadruples the buoyancy lift possible within this product type. Typically a (surface) buoy in Duo configuration can be configured to a buoyancy up to approx. 40 tonne, and hence a Quad configuration up to 80 tonne. The Quad configuration can also be delivered with a platform (optional).



MSB accessories

Light and Radar Reflector kits

As an option, the MSB 234 (surface) buoys can be equipped with light and radar reflector kits. The radar reflector is a stainless steel cross.



Buoy Tracker

The Buoy tracker is a Product for the MSB 234 and MSB 180. It is equipped with a Satellite tracking system (DTAC), a RATDMA based AIS (Automatic Identification System) and synchronized signal lights. The unit has an internal battery source.

AIS	Type 1 and Type 3 AIS AtoN
DTAC	Iridium tracking unit
PWX LED	Signal light, White LED 10 km
Battery	120Ah / 18V Alcaline



Device Tracking and Control – DTAC

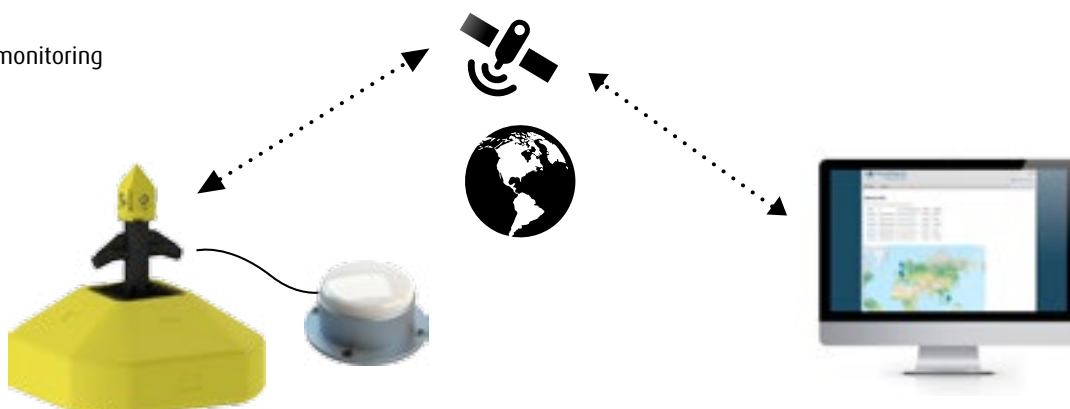
The DTAC marine is a high performance – high reliable communication device for remote applications. It is approved according to the marine regulations EN 60945 and DNV 2.4 Environmental requirements ensuring reliable operation in marine applications.

The DTAC can track and interface your equipment onboard ships or in remote installations and give you a “hands on” experience all around the world. The power consumption is very low and the DTAC can be running from a backup battery for years depending on the chosen data rate.

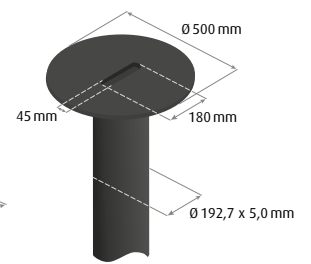
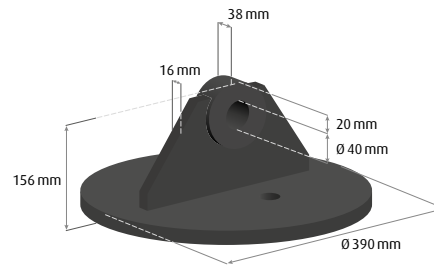
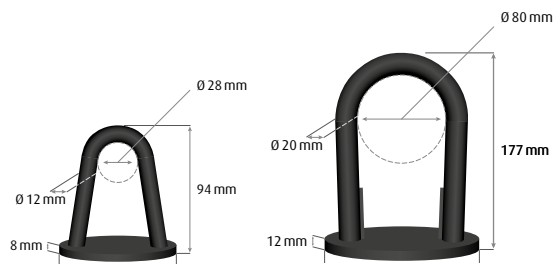
The DTAC Web-page provides easy and intuitive user interface. Key information like positioning and data are presented in a map or graphically. The DTAC is configurable through the web page with respect to data transfer rate and geofencing settings. Geofencing functionality enables the user to receive information if the DTAC moves outside a preset geofence.

Applications

- Remote control and monitoring
- Diagnostics
- Tracking
- Geo Fencing
- Event triggering and synchronization
- Buoys



Steelwork and pad-eyes

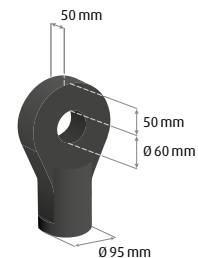
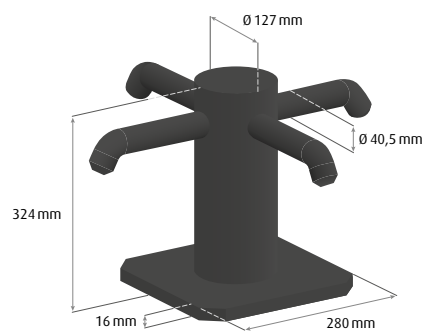
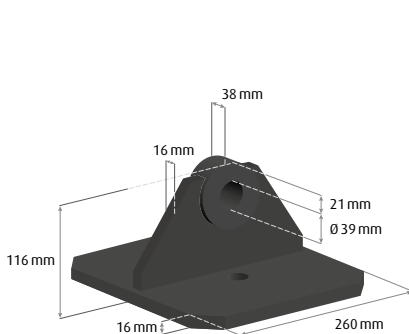


Spheres

Buoyancy spheres can be delivered with pad-eyes in stainless steel. Pad-eye for Spheres Ø300–450 ext has MBL of 1t and for Ø800 and Ø1000 2t MBL.

CSB 1000–3000

The CSB can be equipped with pad-eyes of MBL 22t, carbon steel, black coated. As an option, the CSB can be equipped with a chain-through armature in one end instead of pad-eye.



SSB 200/400/850

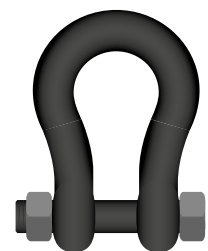
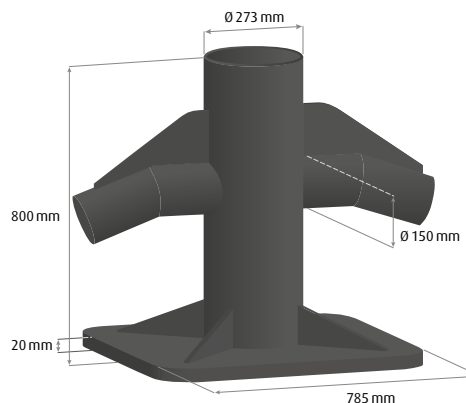
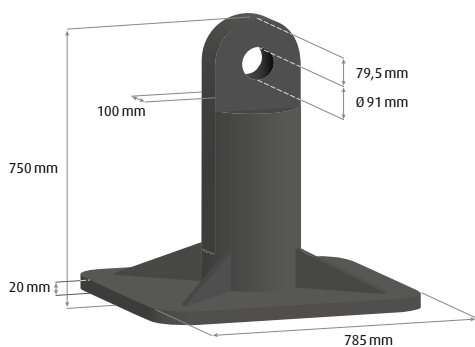
The SSB 200, 400 and 850 series are equipped with pad-eyes of black coated carbon steel with a MBL of 22t.

SSB 200/400/850

As an option, the SSB 200, 400 and 850 can be equipped with a crucifix in one end instead of pad-eye.

SSB 850, MSB 111/162

The MSB 111, MSB 162 and the SSB850/5 are equipped with pad-eyes of MBL 40t, carbon steel, black coated.



MSB 234

The MSB 234 buoyancy is delivered as standard with crucifix in one end and pad-eye in one end for surface. For subsea, the buoys are delivered with pad-eyes in both ends. The pad-eyes are of carbon steel with black coating.

As an option, the (surface) buoys can be equipped with light and radar reflector kits. The radar reflector is available in two options: 1) a stainless steel “cross” and a polyethylene half-bulb filled with reflecting core material. The MSB234 buoy can be delivered with Jotron lamp and radar reflector kit.

Accessories

PartnerPlast can supply a wide range of accessories related to our main products.

Ask us for shackles, lifting slings, ROV hooks, acoustic release hooks or other needs.



Tie In Buoyancy

Our product is perfectly designed for buoyancy support of pipeline deployment. Either the buoyancy units can be customer specifically designed to fit a pipe diameter, or a universal design can be used. In addition, adaptors can be supplied to existing units for fitting several diameters.

Mounting can be done by affordable solutions that can easily be cut by a diver after pipe deployment is finalized. The buoys have eyes for attaching lifting gear for rapid removal. The buoys are filled with syntactic foam suitable for any chosen water depth. As an alternative, release systems for ROV or acoustic release can be provided.

Adapter

Adapters that fit the already existing tie in buoy can be supplied. These are designed according to customer needs to fit either one or two different pipe diameters.



Tie In 160



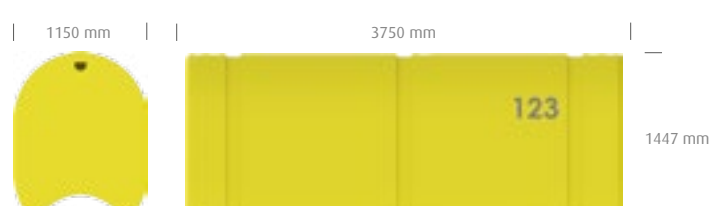
Tie In 225

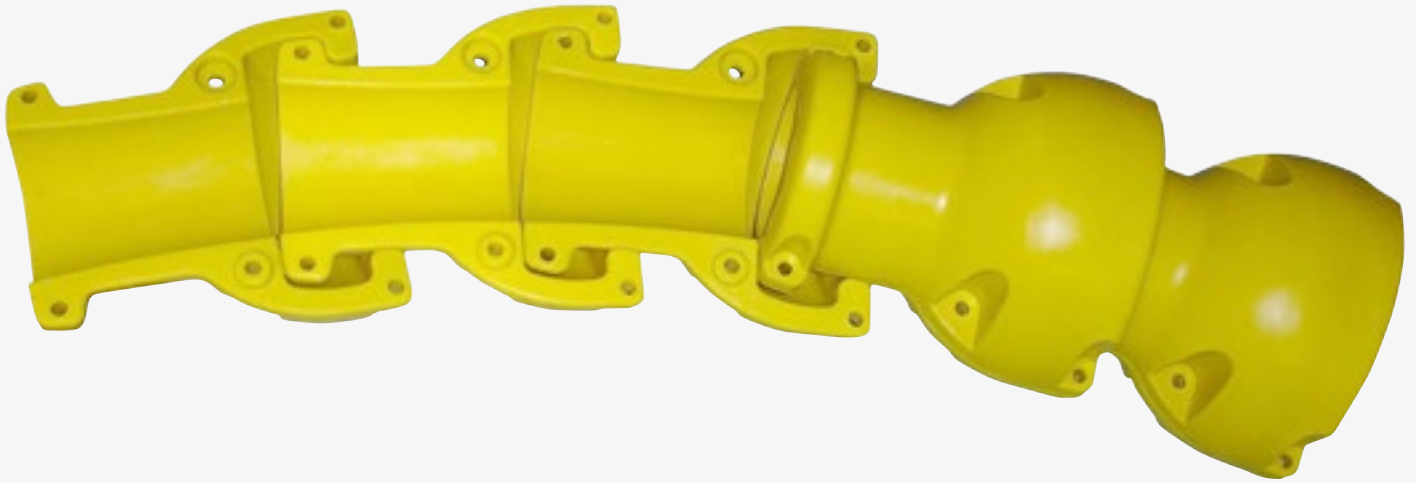


Tie In 250



Tie In 375





Bend restrictor

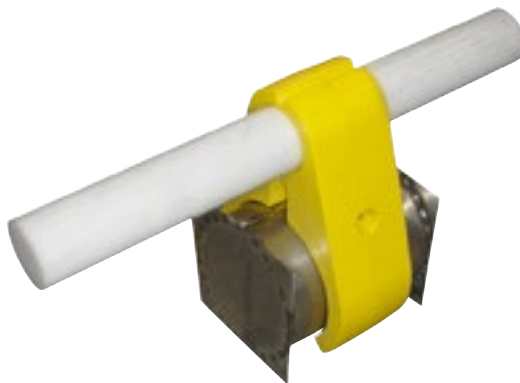
Polyurethane products

PartnerPlast offers a wide range of products based on Polyurethane technology manufactured in-house. The products includes but are not limited to Bend Restrictors, Piggy-back clamps, impact and cable protection and spacers.

The products can be designed according to customer specifications and delivered in a selected and engineered grade of polyurethane.



Spacer



Piggy-Back Clamp



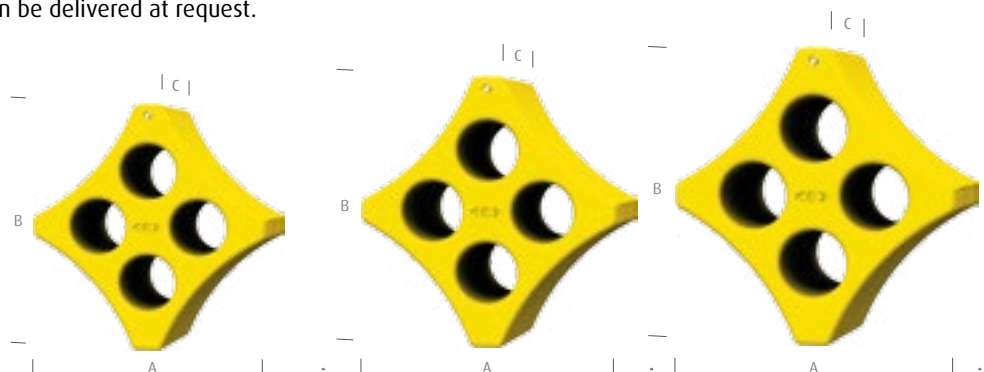
Cable protection



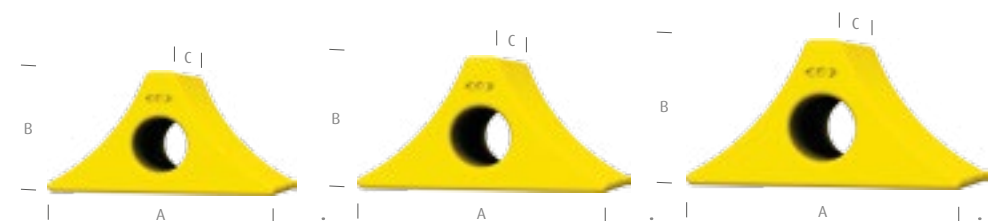
Pipe Stacking Units

For safe storage of drilling riser buoyancy on deck, PartnerPlast has developed stacking devices to minimize skidding and increase safety on board. We supply two types – one for the first (deck) layer and one for the following layers.

The products can be delivered for several dimensions of drill risers. The block has fixing points for connecting of wire or strap in order to fasten a sling to the steel pipe of the riser module if desired. The modules are of low weight (approx. 25 kg) for easy handling. Other dimensions can be delivered at request.



	54" Quad	56" Quad	58" Quad
Width (A)	782 mm	774 mm	774 mm
Height (B)	826 mm	820 mm	820 mm
Depth (C)	500 mm	500 mm	500 mm
Weight	25 kg	25 kg	25 kg



	54" Duo	56" Duo	58" Duo
Width (A)	772 mm	772 mm	772 mm
Height (B)	400 mm	400 mm	400 mm
Depth (C)	500 mm	500 mm	500 mm
Weight	14 kg	14 kg	14 kg



Pipe Float

The PartnerPlast Pipe Float is a product designed to fit to hoses, wires and umbilicals. The Pipe Float consists of two half-cylindrical buoyancy elements, and six distance- and friction blocks. The Roblon Quick Strap and tensioner fastens the complete module to the pipe/umbilical/wire. The pipe floats are available in all depth ratings from surface to 2500m. Standard color: bright yellow, optional: orange. Buoyancy figures are given seawater with density 1,025 kg/dm³. Weight figures are dry weight in air. Buoyancy figures are nominal net Buoyancy.

The Pipe Float has inner distance blocks in suitable thickness to fit the diameter of the customer's umbilical/pipe size. The blocks are made of Polyurethane shore 80A. The blocks are fitted and locked inside the PE half-cylindrical parts. Friction will keep the Pipe Float onto the umbilical/pipe. The Maximum hose/wire/pipe diameter is 250 mm. Although, any other smaller diameter for customer is available.

Main specifications

Depth	Buoyancy (kgf)	Weight (kg)
Surface	115,6	43,5
250 m	90,9	68,2
500 m	87,8	71,3



Custom buoyancy

To build a successful buoyancy solution PartnerPlast knows the tough demands from this industry. An important niche is the customized product range, and this is perhaps also the most challenging. PartnerPlast engineers will work closely with your engineers in order to capture the best solution. Only through teamwork and collaboration can the necessary skills can be brought together.

The goal is not only to make a successful project, but to lay the foundation for future projects for us and for our customers. PartnerPlast has manufactured licensed products for serial production and unique new designs.

Custom buoys can either be one-off tailor-made buoyancy devices for a specific and dedicated need, or a custom design adapted to the customer's requirement, produced in larger series. For the latter, the customer's logo can be included in the shell, either as a permanent emboss or a mould on graphic.

Buoyancy design examples:

- Buoyancy for tools for subsea operations
- Buoyancy for transponders
- Buoyancy for ROVs
- Buoyancy for subsea covers



Transponder buoyancy



Buoyancy for ROV



Buoyancy for subsea tool

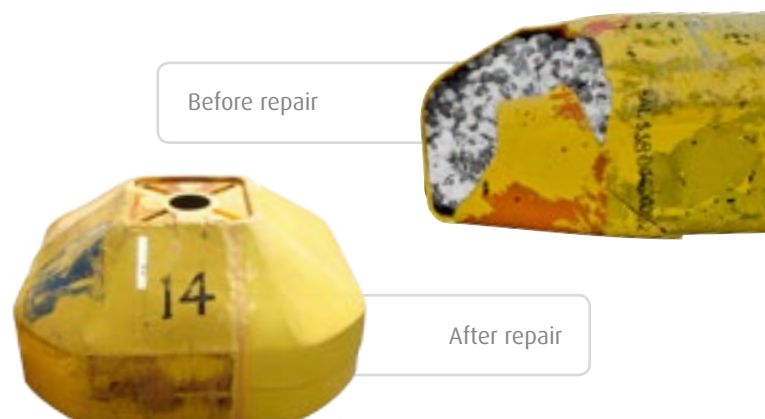
Customer specific marking and logo

PartnerPlast can offer customer specific logo that is moulded into the shell itself. (see example picture). The logo can have almost any graphic, and be adapted to the size of the actual area(s) to be placed.



Buoyancy Repair

PartnerPlast offers a repair program for the complete range of surface and subsea buoyancy. Our highly skilled and trained technicians can repair any type of damage. Usually the job starts with an inspection to identify how severe the damage is. If repair proves to be economically viable for the owner, PartnerPlast will restore the broken unit to be as good as new. Repair can be done either at PartnerPlast site or at customer site.





Engineering

PartnerPlast has a professional skilled team with the capacity to develop and design new products. The product development process is covered through these steps:

- Concept design
- Production and testing of prototype
- Final design ready for production

Our technical capacity covers more than the shaping of plastic products. PartnerPlast has a long history in successful and innovative development of complete product combinations. Our plastic components are used in combination with steel and aluminium structures as well as electrical or electronic systems.

Service & Support

- Installation and technical support
- Plastic welding and repair
- Electronics
- Software and hardware support
- Training

Buoyancy Rental

As an alternative we also offer buoys for rental. This option is chosen by customers who either only require buoyancy for a limited period or who do not want to keep buoyancy devices in stock between operations.

Plant

Øran Vest



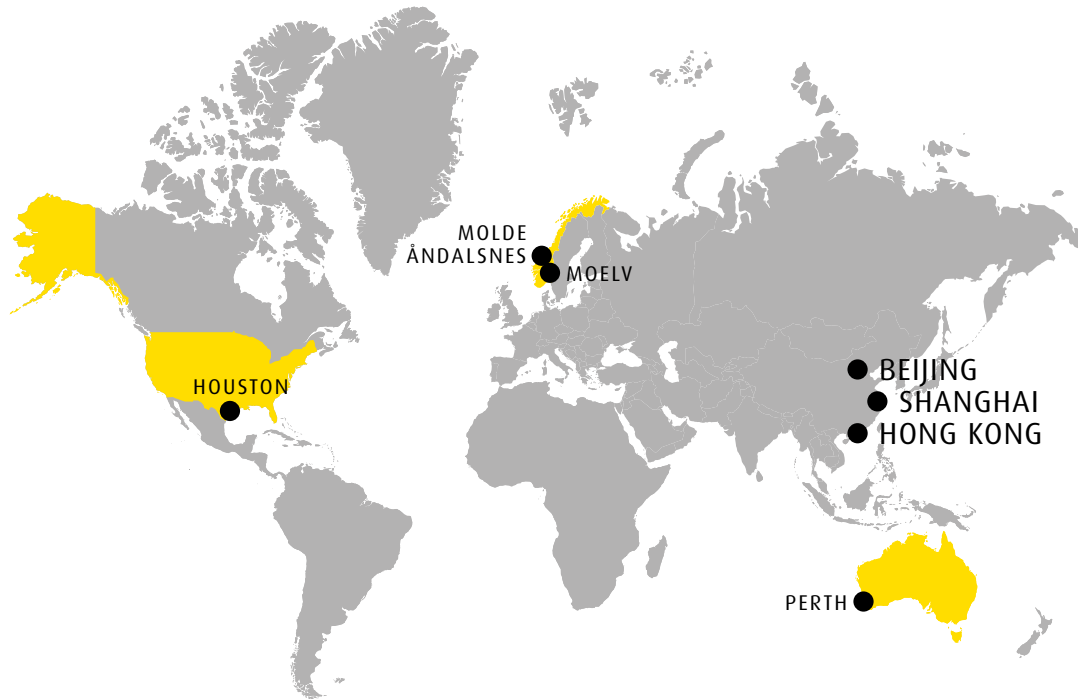
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Strandgata



Åndalsnes – Romsdal

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