



APPLICATION NOTE

The use of Seaflex for Marine Renewables Installation Projects



Introduction

The use of Seaflex for Marine Renewables Installation Projects

Introduction

+ Unique Seaflex have more than 20 years' experience of supplying inflatable buoyancy solutions for offshore engineering projects.

Our experience of such projects is vast, and allows us to not only supply industry-leading buoyancy and ballast bags with all necessary accessories but also to work with our clients from design engineering stage to optimize the specification of the buoyancy and the rigging as well as to jointly develop the methods to ensure the most efficient use of our equipment within the project.

If required, we can also provide BOSIET-ticketed technicians to assist with the correct and most efficient use of our equipment on the project.

Our client list is long, and within it you will find many of the most prominent names in offshore contracting.

Our bags are designed and manufactured in full compliance with IMCA D-016 or LEEA 051 guidelines, and come with type test certificates proving that they meet the required factors of safety. Within our rental pool, all bags are inspected, tested and recertified between each and every job, and each bag comes with its own logbook demonstrating that servicing regime and also providing full traceability down to component level for our customers' peace of mind.

Overview

Whilst new uses for our bags arise all the time, underneath is a summary of the main applications up to now for them within the field of offshore installation within the renewables sector:

- + Continuous support of cables during landings, with the SeaSerpent.
- + Support of cables, as an alternative to the SeaSerpent, with individual Dual Boom floats.
- + Lifting and towing of tidal and wave devices with Mono Buoyancy Units.
- + Ensuring the safe float out of monopoles with Contingency Buoyancy.
- + Reducing draft on transformers prior to float-outs with Air Lift Bags.
- + Ensuring stability of offshore structures during tow out using Water-Filled Bags as counterweights.

Further information on all these products, and their use within these applications, is given on the following pages. If you have any questions relating to these solutions, then please do not hesitate to contact us.



Unique Group

E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

Seaflex SeaSerpent™

Continuous Support for Cables

Perfected and Patented

- + SeaSerpent™ is the safest, most effective and most flexible cable installation buoyancy system in the market, and has become the industry's system of choice for installing cables in shallow water. Efficiently replacing outmoded multiple floats to support a submarine cable during installation in shallow water, the patented SeaSerpent™ buoyancy system is a continuous inflatable tube directly attached to the cable at 1 to 1.2 metre spacing intervals to suit the cable weight.

Optimised for your Operation

- + Unlike traditional solid floats, with the SeaSerpent™ it is easy to park the cable on the seabed during adverse tide or weather conditions and to re-float it when required. SeaSerpent™ even allows you to easily lift and reposition a cable to hit a trench, impossible with traditional methods. Sections of cable can also be easily towed to installation sites several kilometres from the launch point.

SeaSerpent™ is generally supplied in 'lay flat' form tightly wound on a braked deployment drum mounted above the cable where it exits the cable engine; the SeaSerpent™ tube is inflated as it unspools and is attached to the cable just before the launch point. This allows rapid and near continuous deployment. A powered drum can then be used to recover the SeaSerpent™. For one-off applications, SeaSerpent™ can also be supplied on a simple timber drum if so required.

The SeaSerpent™ integrated system is not subject to the high attrition rate of traditional individual cable floats and saves a huge amount of deck space and manpower at the launch point. With only 1.5 square metres of deck space required to deck load a remarkable 1 kilometre of buoyancy, SeaSerpent™ reduces transport, storage, handling and replacement costs alongside its operational advantages of speed and control.

Unrivalled Support and Control

- + SeaSerpent™ support and control of the cable cannot be matched. Its key advantage is the operational flexibility it allows the installer; the easy launching procedure is followed by a progressive and controlled sinking sequence which can be started, slowed, or reversed by simple surface control, without subsea intervention.

The form stiffness developed by the SeaSerpent™ inflation pressure greatly decreases cable kinking tendencies, eliminates catenary sagging between floats and thereby removes the requirement to keep constant tension on the cable. This is a particular advantage when the cable contains sensitive fibre-optic elements.

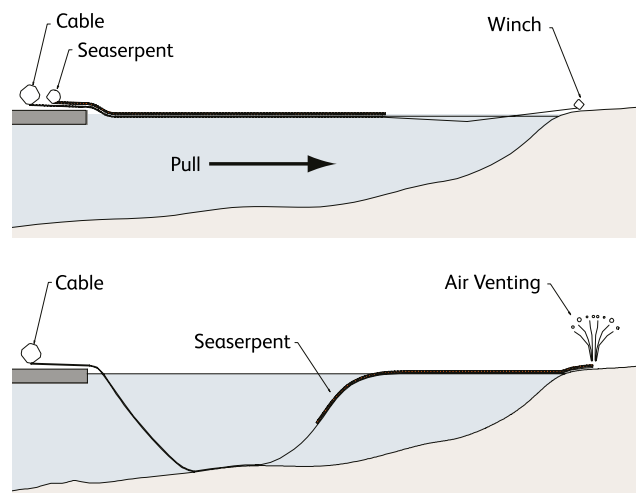
Customised SeaSerpents™ and Handling Systems

- + Most cable types and weights can be immediately addressed from stock using the standard SeaSerpent™ range, catering to up to 170kg of buoyancy per metre. However, in the unlikely event that your cable can't be covered by our standard range we will manufacture a SeaSerpent™ to suit your specific buoyancy requirement. SeaSerpent™ handling systems are available for hire, and customised launch and recovery systems can be built by us to a client's fabrication drawings.

On the Job Support

- + To assist our customers with the smooth operation of the SeaSerpent™, we are able to supply supervisory expertise from our own technicians - who have experience of working with the system on projects right around the world. Many of our SeaSerpent™ customers are now taking advantage of this service, to benefit from the efficiencies and the further cost-savings which result from having Seaflex expertise onboard their vessels.

The Controlled Way to Install Cables in Shallow Water



E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

Seaflex SeaSerpent™ Overview

Key Features and Benefits at a Glance

For Your Peace of Mind

- + Tested and proven to greater than 3:1 over maximum working pressure.
- + Supports cable fully and gently, with reduced risk of kinking.
- + No stress point loads.
- + 50% reserve buoyancy factor at maximum working depth.
- + Low capital cost.

For Your Ease of Operation

- + Surface control of the sinking process.
- + Can be towed at up to 5 knots.
- + Lift capacities from 40-170 kg/m.
- + Compact and therefore cost-effective to ship, store and deploy.
- + No need for excessive cable tension.
- + Eliminates loss of individual floats.
- + Systems can be supplied with Seaflex technicians, or we can train your people to use it efficiently themselves.
- + Delivered ready for immediate use with universally compliant documentation: SeaSerpent™ specific log book containing certification, service records and operating manual.



Seaflex SeaSerpent Specifications

Type	Lay Flat Width	Inflated OD (mm)	Buoyancy Kg/m	Weight (Kg) 50m Section	100m Drum Diameter & Width
3000-6-20	230	147	17	32	770 x 450
3000-5-16	280	178	25	37	770 x 450
3000-4-13	355	226	40	43	770 x 450
3000-3-10	480	306	74	54	770 x 550
3000-2-7	730	465	170	76	770 x 800

Drums for 200m lengths have a diameter of 1100mm



Unique Group

E. buoyancyballast@uniquegroup.com
 W. www.uniquegroup.com

SeaSerpent™ Punctures

Frequently Asked Questions

One of the 'frequently asked questions' about SeaSerpent™ is "What happens if we get a leak, do we lose the whole cable?" The answer is 'No' - and here's the reason why:

Imagine a 50kg SeaSerpent™, with a 25kg/m cable attached, is floating on the surface with a positive pressure inside the tube of 0.2 bar. In this state it is quite firm to the touch and if any part of it was pushed underwater, it would maintain inflation (and thus its buoyancy) down to a depth of 2m. Lets say the total water depth is 14m.

Now take a sharp knife and slash a big hole in the SeaSerpent™. The pressure immediately drops around the hole as air escapes, the buoyancy disappears and it starts to sink towards the seabed.

As the leak passes the 2m depth, the tube collapses and no more air can escape.

Although no more air is escaping, there is now a length of cable with no support which will sink to the seabed and continue to drag down more and more cable each side of it until the pressure rise inside the SeaSerpent caused by the decreasing volume is sufficient to support the cable down to a certain depth. The actual depth at which this happens is the same %age of the overall depth of water as the reserve factor of buoyancy.

This is because the reserve factor of 50% means one metre of 50kg/m SeaSerpent™ will support 2m of 25kg/m cable. So if the water is 14m deep only half this depth of SeaSerpent will be required to support the cable to the seabed i.e. a depth of 7m.

So if the SeaSerpent™ is ruptured for any reason, all is not lost although a fair length of cable may be on the seabed and the SeaSerpent remaining on the surface will have increased pressure to equal that of its lowest point of inflation, in this case 0.7bar.

To recover the situation, the damaged SeaSerpent™ section must be repaired, sealed or replaced, after which the portion of cable on the seabed can easily be raised by putting more air into the SeaSerpent™.

This will progressively lift the cable off the seabed and back to the surface.

While on the subject of problems - there is another point that should be mentioned - namely, the ties.

It is absolutely essential that these are strong enough and secured so that they cannot come undone. Any decent knot ensures the latter but the strength required can be under estimated if the bursting stress of the tube is not allowed for.

It is not enough to say the cable weighs 20kg/m, so a tie every metre only needs to accept this load. In the sinking situation above, the last two or three ties are supporting 7m of cable which should be allowed for, as well as the load created by the internal pressure in the tube. As a rule of thumb, a safety factor of at least 6:1 should be used. 8mm, 10mm or 12mm polypropylene rope is usually favoured.

Having said all this, to date we have no reports of a SeaSerpent™ that has suffered a rupture failure and only one case where inadequate ties caused a problem. Provided propellers are kept away from the tube, it is a very robust and tolerant piece of equipment and gives very few problems in service.

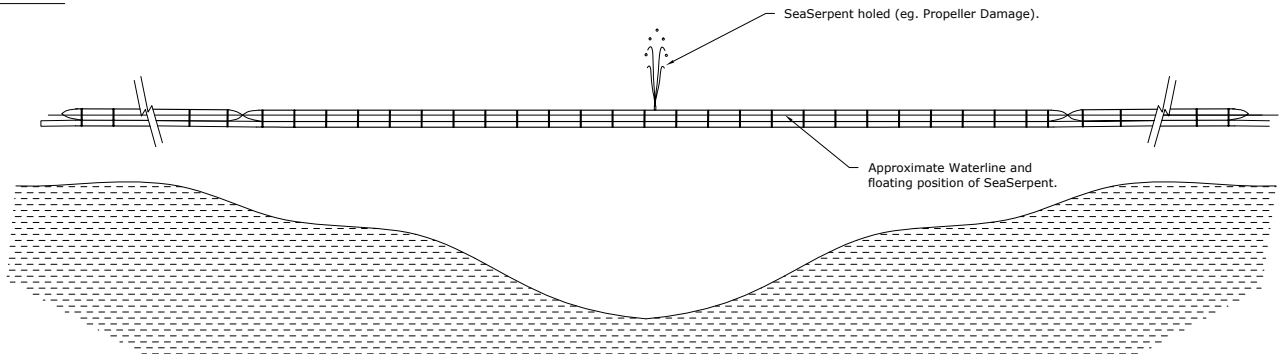


Unique Group

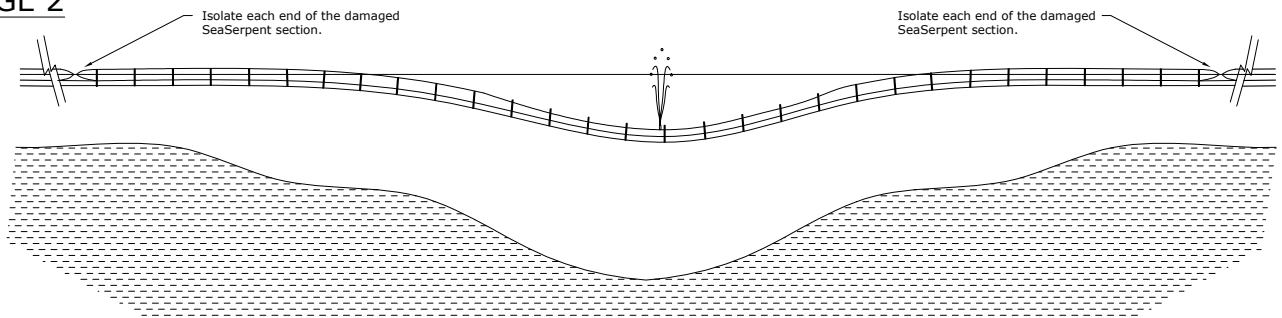
E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

SeaSerpent Self-Sealing Puncture Recovery Process

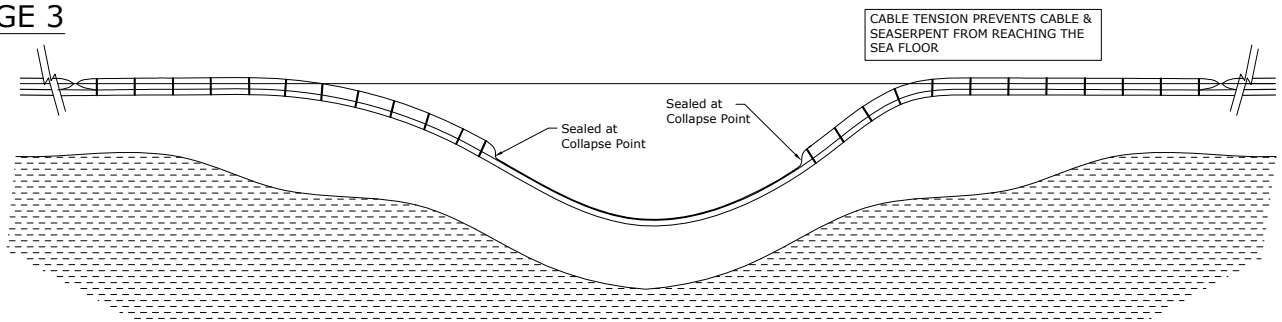
STAGE 1



STAGE 2



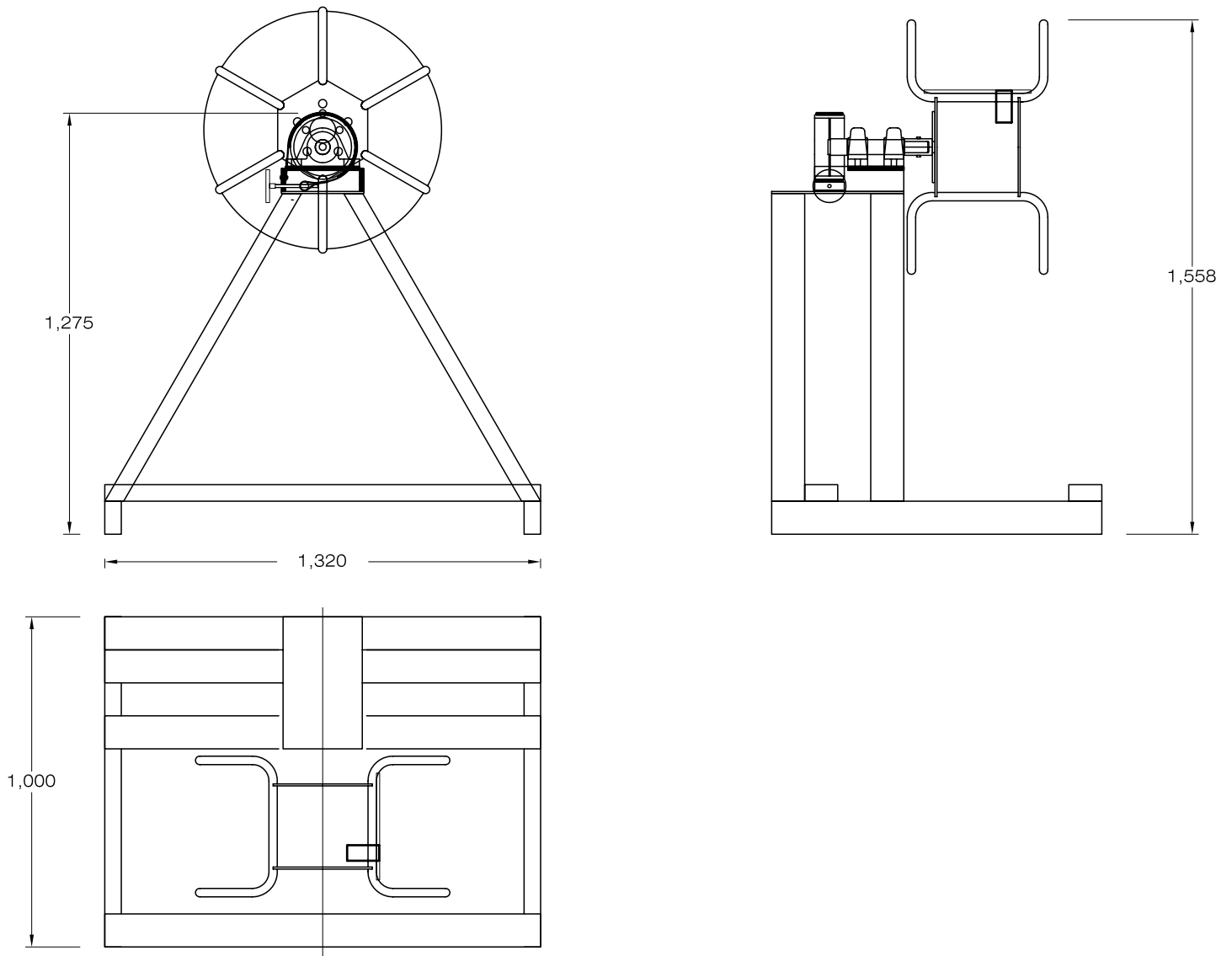
STAGE 3



Unique Group

E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

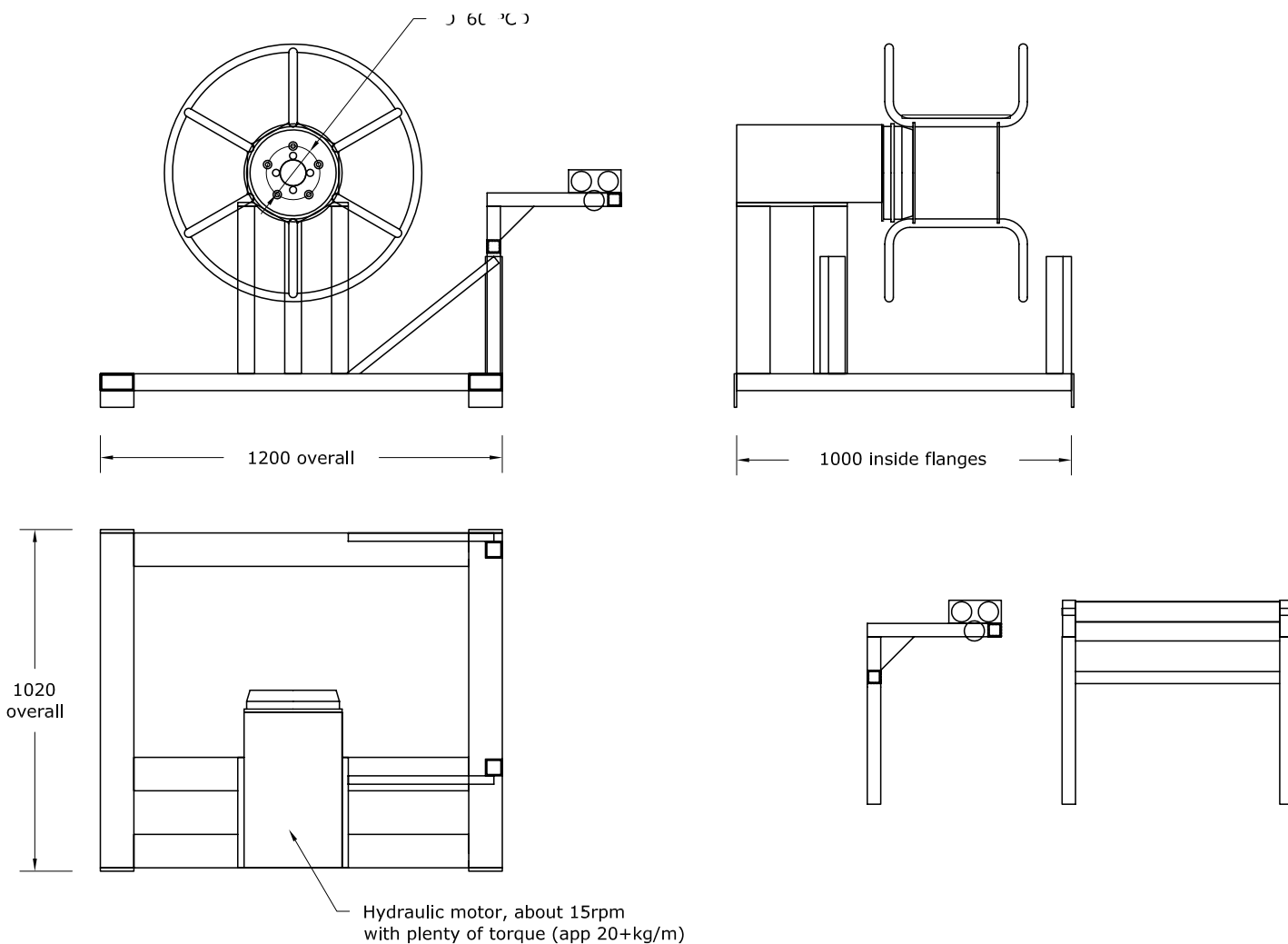
SeaSerpent Launch Pedestal



Unique Group

E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

SeaSerpent Recovery Pedestal



Unique Group

E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

Case Study

Channel Island Electricity Grid Project Submarine Cable Shore Landings

Client : **VDS CABLE BV**

Operator : **CHANNEL ISLAND ELECTRICITY GRID**

Location : **GUERNSEY - JERSEY - FRANCE**

Water Depth : **0 - 35 MSW**

Project Overview

+ VDS Cable bv, a Dutch Submarine Cable Installation Contractor, was awarded the contract for the installation of 2 HVAC power cables and 2 (bundled) fibre optic cables by the Channel Island Electricity Grid. The submarine cables were installed between the Channel Islands Guernsey and Jersey, then on to mainland France.

The power cables were manufactured by ABB High Voltage Cables of Norway; the fibre optic cables were manufactured by Ericsson of Sweden. The VDS Cable Installation Vessel 'SEA SPIDER' was used for the installation and burial of the cables.

Due to large currents and tidal ranges, combined with restricted vessel access for the shore approaches, Seaflex was contracted by VDS Cable to supply their patented cable flotation system - SeaSerpent.

Seaflex Involvement

+ Seaflex Ltd. supplied 2000m of SeaSerpent cable flotation system Type 2350/2/10 giving a linear buoyancy of 106kg/m.

The SeaSerpent was supplied in 100m (16 off) and 50m (8 off) sections delivered on steel transport, deployment, recovery (TDR) drums. To complement the flotation system two pedestal deployment and recovery systems (DRS) were also supplied.

One manual brake DRS was stationed on the CLV SEA SPIDER for controlled deployment and one hydraulic DRS was stationed with the beach party.

For the start up of the project at Havelet Bay, Guernsey, Seaflex personnel were present to set up and initiate the first shore approach. During this first approach the cable was deployed at 260m per hour, 600m of SeaSerpent in total, cable towed to shore and laid in position within one tide. During the project the SeaSerpent spread was successfully used for a total of four HVAC and four F/O landings.



1. Early morning SeaSerpent equipment load-out on to CLV SEA SPIDER off Cowes, Isle of Wight.



2. SeaSerpent being attached to the HVAC cable showing Seaflex manual brake RDS.



3. The HVAC cable and SeaSerpent being deployed at Havelet Bay.



4. Small work boats are used to tow and position the cable.



Unique Group

E. buoyancyballast@uniquegroup.com

W. www.uniquegroup.com

Case Study

Al Khalij Cable Shore Approach Project

Client : **HAMSTO SUBMARINE CABLE CONTRACTORS**

Operator : **ELF PETROLEUM QATAR**

Location : **HALUL ISLAND, GULF OF ARABIA**

Water Depth : **0-60 MSW**

Project Overview

- + As part of the Al Khalij oilfield offshore Qatar, Elf Petroleum Qatar (EPQ) required the installation of a submarine power cable between Halul Island and the DP1 platform, as well as DP1 platform to the wellhead platform.

Through EPQ's main contractor, NPCC, HAMSTO was awarded the contract for the loading, transport and installation of the submarine cables. All cable operations were undertaken from the DP cable lay vessel 'HAM602'. The cables were manufactured by ABB Norsk Kabel AS, Tongsberg, Norway.

Seaflex Involvement

- + Seaflex Ltd. supplied the patented cable flotation system, SeaSerpent, for the vessel to beach cable pull-in operation. The SeaSerpent flexible buoyancy, complete with deployment/recovery system, was delivered to the vessel ready for immediate use.

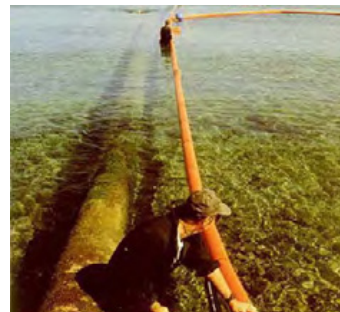
The complete system was seafastened in position before the vessel loaded the cable in Norway.

Once on location the SeaSerpent was successfully used to float the cable from the HAM602 in to the shallow water with the assistance of the lay vessel's MOB boat. Once at the landfall site the pulling wire was attached to the cable and pull-in operations commenced.

On completion of the pull-in, positioning and controlled lay-down was executed using SeaSerpent. The cable was positioned above the trench, running parallel to the pipeline, and by venting of the buoyancy from the shore end a controlled S-lay was performed.

Seaflex Equipment

- + **Type 2650/6/15 SeaSerpent**
Length: 500m (2 section of 250m)
Linear Buoyancy: 11kg per metre (cable @ 6.5kg/m)
Total Buoyancy: 5,500kg
- + **DRS System**
Seaflex Ltd. designed and fabricated the DRS (Deployment, Recovery and Storage) System in-house to the project requirements of the client. Steel drums with manual brake solution was provided to take a minimum deck footprint.



SeaSerpent in action.



SeaSerpent DRS system positioned on deck at aft overboarding station.



Halul Island, Qatar, Gulf of Arabia.



Unique Group

E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

Seaflex Dual Boom™ Cable Floats

Product Details

Introduction

+ Whilst many cable installation contractors are now making use of Seaflex's patented SeaSerpent™ system of continuous support, there are occasions when project parameters or vessel limitations mean that the most efficient, or indeed the only, way to install buoyancy onto the cable will be to fit individual units from a workboat once the cable has exited the stern of the barge.

In response to this demand, Seaflex have developed our Dual Boom™ range of cable floats, offering up to 600kg in buoyancy. There are two versions of the Dual Boom™ product, both manufactured from the same high-quality European origin materials as have been proven in heavy-duty service worldwide on our ranges of salvage bags and pipelaying buoyancy modules since 1987.

Dual Boom Premier™ consists of two separate floats made of 3x3 basecloth, which are linked by webbing the length of which can be adjusted via a buckle to ensure a good pinch on any diameter of cable – the main benefits of this being ease of configuration for use on cables of different sizes and the ability to replace a single damaged float in isolation if required. They are fitted as standard with Pressure Release Valves (PRVs).

+ Dual Boom Professional™ is a single-piece solution made of 2x2 basecloth, the floats are linked by a length of the same material (specified by the customer to best suit their immediate and ongoing requirements) which creates a cradle to support the cable. It is quicker and simpler to manufacture and so comes at a lower price point for those who do not require the greater flexibility offered by our Premier range.

All Dual Booms™ have been designed for easy installation and removal. They are interconnected via a predetermined length of rope to ensure that the correct spacing between them is maintained, and can be supplied complete with accessories such as blowers.

Already proven in service with contractors installing umbilicals, power cables and fibre optic cables, Seaflex Dual Booms™ are now available worldwide.

Dual Boom Premier™

- + Width adjustable to accommodate different cable diameters
- + Manufactured of our heaviest 3x3 basecloth
- + Fitted as standard with PRVs
- + Single floats replaceable in isolation

Dual Boom Professional™

- + Width not adjustable from initial (user-selected) cradle size
- + Manufactured of our standard 2x2 basecloth
- + PRVs are optional extras
- + Made in one piece



Unique Group

E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

Seaflex Dual Boom™ Cable Floats

Key Features

For Your Ease of Operation

- + Lightweight (approx 1% of capacity) and packed small for transport / stowage.
- + Easily inflated via standard monsoon valves prior to deployment.
- + Designed for the cable to sit low between the floats to achieve a good pinch.
- + Fitted with eyelets to allow for interconnection to ensure spacing along cable is maintained.
- + Low-profile design to avoid catching cross-currents.

For Your Peace of Mind

- + All materials of European origin.
- + General design concepts, manufacturing processes and material technology proven in offshore installation buoyancy applications since 1987: over 25 years' of experience go into the Seaflex Dual Boom™.



Product (Premier or Pro)

Model	Buoyancy	Diameter (mm)	Length (mm)	Width
DB 200	200 kg	405mm	1000mm	User-determined
DB 400	400 kg	420mm	1500mm	User-determined
DB 600	600 kg	500mm	1500mm	User-determined



Unique Group

E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

Mono Buoyancy Units (MBUs)

Changing the Pipelaying Market

Designed for High Load Angles

- + Through listening to our customers, Seaflex has developed the MBU - a pioneering way of combining the different and hitherto incompatible operational benefits of our ALBs and IBUs.

The Seaflex MBU is enclosed buoyancy, but it has the essential advantage of having a single attachment point like an ALB, which makes it as tolerant to load angle as the parachute-type bag. So, unlike any other enclosed lifting bag in the world that we are aware of, the Seaflex MBU can be used in line with the load, and can be lifted through. Each Seaflex MBU design has been tested and proven to demonstrate a safety factor in excess of 5:1 on a pull through its axis (eg the 5t MBU design has been proven to resist a through-load of more than 25t). These loads are transmitted through the bag via a proprietary through-strop design, and as of today we are the only manufacturers to be able to demonstrate via testing that their product of this type is capable of offering any sort of safety factor over and above the capacity of the bag itself.

Easy to Handle and Deploy

- + MBUs are a more practical alternative to solid buoyancy in many situations, and are exceptional within towing scenarios. As they can be simply lifted from a single point, they can easily be recovered by crane with no possibility of tearing of the strop pocket or canopy. And 500t of MBU lifting capacity can fit into a single 20ft container.

User-controlled Buoyancy Variation

- + During the mobilisation phase, and particularly important during demobilisation, the air can be introduced and released in a controlled manner into and from single or multiple units to allow the load to settle gently into the correct position, or to reposition it if required, before the MBUs are vented and released under zero load.

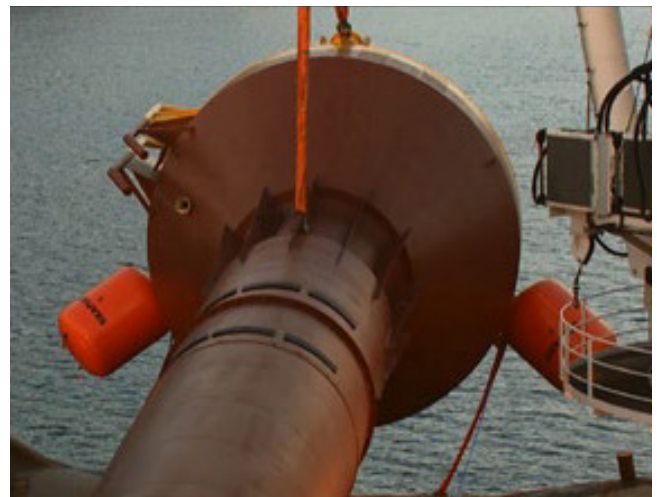
Made to Last

- + Made of our toughest High Tensile Trevira® Polyester 3/3 base cloth coated with heavy duty UV stabilised PVC coating, MBUs are massively reinforced with six reducing concentric rings of fabric layers at each end, and are terminated with a custom made stainless steel lifting ring fitted into this reinforcement, rather than having an external harness or system of strops, which would lend themselves to being connected onto for convenience, and to damage being caused to the bag as a result.

Tested, Proven, and Changing the Market

- + Seaflex MBUs are available in 1, 2, 3 and 5 ton lift sizes, and as with all our products they are fully type tested and proven to the relevant international standards.

Since their introduction, many pipelaying contractors who were previously taking standard IBUs from Seaflex or from one of our competitors have now made the switch to be able to benefit from the unique operational advantages of our proprietary MBU design.



Mono Buoyancy Units (MBUs)

Key Features and Benefits at a Glance

For Your Ease of Operation

- + Lightweight (approx 1% of capacity) and packed small for Fully compliant with IMCA D-016 recommended 5:1 factor of safety.
- + Overall assembly physically tested and proven to exceed a 5:1 minimum WLL safety factor. Independent Type Test Certificates are available.
- + Fitted with multiple pressure relief valves to ensure safety during use.
- + High performance structural fabric canopy.
- + RF welded seams.
- + Structural through-stop for transmission of lifting loads.

For Your Peace of Mind

- + Designed to transmit through-loads via single central connection, can be lifted via this point, can even be moored onto.
- + Rental units inspected and tested between every single job.
- + Buoyancy of individual or multiple units can be increased or decreased as required from the surface.
- + 2 x 3/4 inch BSP standard inflation/deflation valves with 316 stainless steel male Camlock adapter as standard.
- + Leaffield Marine high flow pressure relief valves (PRVs).
- + Delivered in an enclosed crate and ready for immediate use with universally compliant documentation: MBU specific log book containing certification, service records and operating manual.



Model No	Inflated (Kgs & Mtrs)			Packed (Kgs & Mtrs)			
	Lift	D	H	Wt	L	W	H
1 MBU	1000	1	1.5	15	0.6	0.5	0.2
2 MBU	2000	1.33	1.7	18	0.75	0.6	0.2
3 MBU	3000	1.5	2.2	27	0.8	0.65	0.2
5 MBU	5000	1.75	2.2	37	1	0.8	0.2



Unique Group

E. buoyancyballast@uniquegroup.com
 W. www.uniquegroup.com

Case Study

Tow-Out of Wave Generation Device

Client : **AQUAMARINE POWER**

Location : **SCOTLAND**

Background

- + During the deployment phase of the Oyster wave device, there was a requirement to both lift it to the surface and then fit additional buoyancy to assist during the towing process through busy shipping lanes.

Seaflex Involvement

- + Asked to advise about the best way to ensure sufficient buoyancy for the lift in relatively shallow water depths, Seaflex proposed the use of our enclosed Mono Buoyancy Units with single attachment points for a controlled lift.

Extra bags were then fitted at the surface and the towing operation commenced. The ease of use and flexibility of the Seaflex solution along with the engineering support on offer were what set it apart from the alternatives.



Unique Group

E. buoyancyballast@uniquegroup.com

W. www.uniquegroup.com

Case Study

Bespoke Bags for Monopiles

Client : **BALLAST NEDAM**

Operator : **LONDON ARRAY LIMITED**

Location : **NORTH SEA**

Water Depth : **5M – 30M INSHORE AND OFFSHORE**

Project Overview

+ The London Array is an offshore wind farm in the outer Thames Estuary in the United Kingdom. With 1,000 megawatt (MW) capacity, it became the world's largest offshore wind farm. The site is 17.77 miles (28.60 km) off North Foreland on the Kent coast in the area of Long Sand and Kentish Knock, and covers 90 square miles (230 km²) between Margate in Kent and Clacton in Essex. The first foundation was installed in March 2011 and phase I was completed end 2012 at a cost of £2.2 billion.

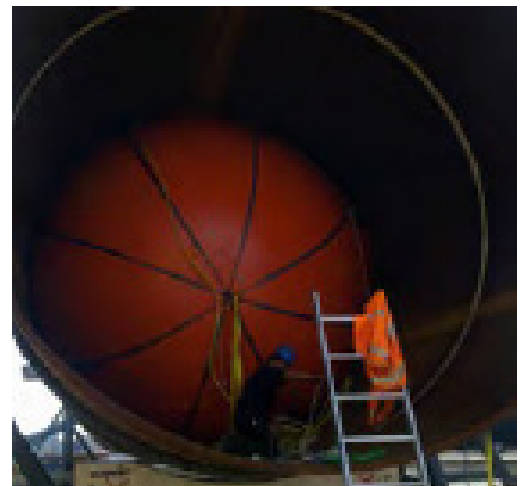
Seaflex Involvement

+ Seaflex Ltd were contacted by Ballast Nedam on the 8th July 2011 to see if we could supply specialist buoyancy for monopiles to be floated out to the site off the Kent coast from Vlissingen in Holland.

Ballast Nedam had successfully floated out a number of monopiles on a previous project without incident and without internal buoyancy however, this time the insurance company insisted that they had contingency buoyancy as they would be crossing deep water and shipping lanes.

The requirement was to provide 6 off 88t buoyancy units each with a diameter of 4.5m and 6m in length to be fitted inside each pile, 2 sets would be required.

A prototype was built and approved by Ballast Nedam and the remaining 11 bags completed and despatched to Vlissingen, Holland within 2 weeks of the order confirmation.



E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

Case Study

Buoyancy for Transformer Draught Reduction

Operator : **UMC**

Location : **BELFAST, UK**

Water Depth : **NOT ENOUGH!!!**

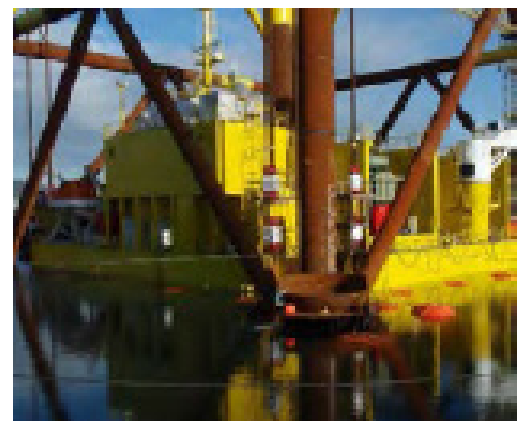
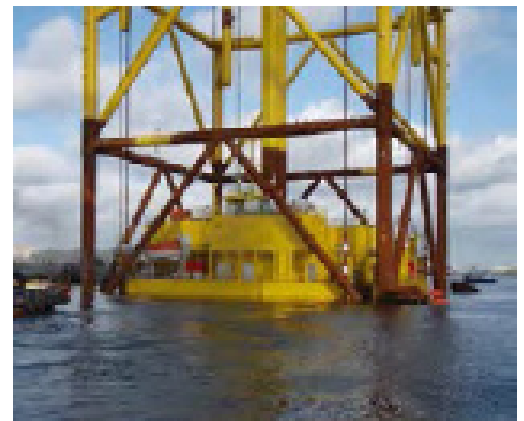
Project Overview

- + When it came to float the Bard 1 transformer out from drydock in Belfast, it became apparent that due to modifications the weight of the structure was too great to avoid it hitting the sill at the entrance to the drydock. Calculations showed that approximately 620t of additional uplift would be required to allow the transformer to be towed out.

Seaflex Involvement

- + From initial contact, Seaflex were able to establish that a spread of our parachute-style Air Lift Bags distributed around the base of the transformer to be inflated as the drydock is flooded would be the best solution.

A fleet of bags, each up to 35t in size, complete with all necessary accessories such as hoses was despatched to Belfast from our rental stock within the space of a few days – where it was met by a Seaflex technician who then assisted the client with their use on the project.



Unique Group

E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

Case Study

Waterbags for Tow-Out Stability

Client : **SEARENERGY, HAMBURG**

Operator : **SIEMENS**

Location : **NORTH SEA**

Project Overview

- + The Helwin Alpha Self-Erecting Offshore Transformer Platform was constructed at Nordic Yards in Germany and ultimately transported to Esbjerg in Denmark for final towout to site as part of the HelWin1 cluster wind farm connection project for Dutch transmission grid operator TenneT.

Seaflex Involvement

- + Seaflex were initially contacted by Siemens in the early summer of 2013, as concerns had risen about weight distribution during the tow-out operation.

This led to a series of meetings with Siemens and their appointed tow out contractor SeaReenergy of Hamburg, to determine how best to apply counterweights to the platform to balance off the load and ensure no unusual heel angles during the tow.

Many different options and scenarios were considered and discussed before the final solution was settled upon, this being the supply of 9 x 35t waterbags contained within frameworks sitting on the deck of the platform.

With the solution determined, the manufacture commenced – and within a few short weeks the bags were complete and in Esbjerg awaiting installation. But Seaflex’s involvement in this project did not stop there – a Seaflex technician was also dispatched to site to assist with the correct installation and operation of the bags prior to the tow out taking place, successfully, during the late summer of 2013



E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com

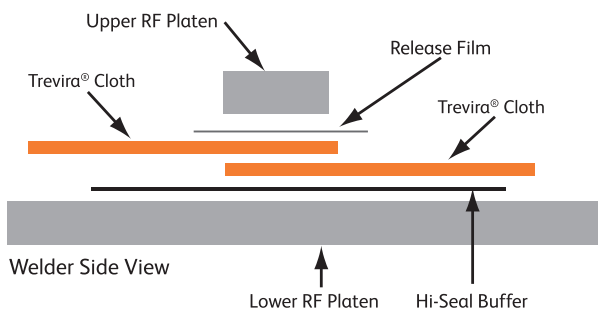
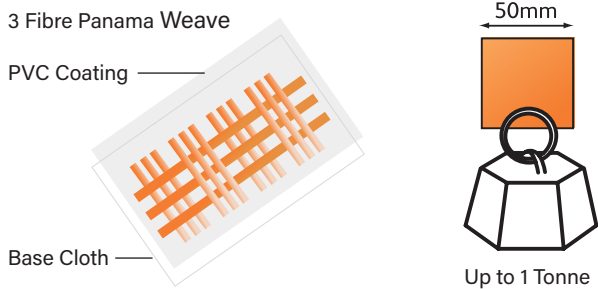
Technology, Service and Support

Manufacturing Technology

+ All Seaflex products are designed and manufactured in the UK. Our bag canopies are constructed from High Tensile Trevira® Polyester base cloth (either 2 /2 or 3 /3 fibre panama pattern weave) coated with heavy duty UV stabilised PVC coating or, for special applications, polyurethane. Trevira is incredibly strong; a 50 mm wide 3/3 strip has a break load of approximately 1 tonne. The panels for our bags are precision cut on our 15 metre long, 3 metre wide advanced automated table for perfect repeatability. Once inspected and approved panels are assembled by skilled personnel to using Radio Frequency welding to strict quality control standards.

Certification

+ All our work is carried out within a system which complies with the ISO 9001-2009 Quality Management Standard as audited by Lloyds Register Quality Assurance for full traceability – and we have now gained ISO 14001 and ISO 18001 accreditation.



Service

+ Whether for hire or sale, all Seaflex products are sent out fully tested and inspected against their build criteria. And we do also offer on-site support to our clients in the use of our products – this most often happens within the more complex buoyancy applications for our products.

In the event that your Seaflex product should suffer minor damage in service, we can supply an approved, boxed field service kit comprising of patches, a professional quality heat gun and instruction manual to make good minor leaks prior to product refurbishment.

We can also advise on the viability of carrying out more extensive repairs, which would typically be undertaken either at our factory or at one of our approved service centres.

Support

+ Our support philosophy is "Wherever, Whenever". This underlines the Seaflex commitment to not just sending out tested, proven products in proper shipping crates and with the most comprehensive documentation package in the business – but to assisting our customers in every way possible throughout their time using our products, whether the job is a hire project or an equipment sale.

We offer worldwide support to our customers via either email or phone from head office in the UK and via our ever-growing network of offices and partners around the world.

You can put your trust in Seaflex – we won't let you down.



E. buoyancyballast@uniquegroup.com
W. www.uniquegroup.com



Local presence
worldwide

UNIQUE GROUP OFFICES

MIDDLE EAST

UAE

Unique Group FZC
Sharjah
T. +971 6 5130333
E. uaesales@uniquegroup.com

QATAR

Unique System Tr & Eng WLL
Doha
T. +974 44147079
E. qatarsales@uniquegroup.com

SAUDI ARABIA

Muraba Alshahra Trading LLC
Riyadh and Al Khobar
T. +966 13 802 0614
E. ksasales@uniquegroup.com

ASIA PACIFIC

SINGAPORE

Unique System (SEA) Pte Ltd
Singapore
T. +65 6542 1800
E. fareastsales@uniquegroup.com

INDIA

Unique Hydrographic Systems Pvt Ltd
Navi Mumbai and Vadodara
T. +91 22 27619939/40/41/75
E. indiasales@uniquegroup.com

AUSTRALIA

PERTH

Unique Subsea Australia Pty Ltd
Perth Airport Park
T. +61 418 205 212
E. aussales@uniquegroup.com

QUEENSLAND

Unique Subsea Australia Pty Ltd
Pinkenba, Queensland
T. +61 418 205 212
E. aussales@uniquegroup.com

USA

CENTRAL

Unique System Inc
Houston, Texas
T. +1 713 937 6193
E. usasales@uniquegroup.com

EAST COAST

Water Weights Inc
Suwanee, Georgia
T. +1 678 730 4180
E. buoyancyballast@uniquegroup.com

WEST COAST

Water Weights Inc
Montclair, California
T. +1 909 626 8316
E. buoyancyballast@uniquegroup.com

AFRICA

SOUTH AFRICA

Unique Hydra (Pty) Ltd
Cape Town
T. +27 21 835 7900
E. sasales@uniquegroup.com

NIGERIA

Unique Charkin System Ltd
Port Harcourt
T. +234 908 5659444
E. nigeriasales@uniquegroup.com

EUROPE

UK

Unique Seaflex Ltd
Cowes, Isle of Wight
T. +44 1983 290 525
E. buoyancyballast@uniquegroup.com

Unique System (UK) Ltd

Water Weights Ltd
Aberdeen, Scotland
T. +44 1224 723 742
E. uksales@uniquegroup.com

NETHERLANDS

Unique System BV
T. +31 850 513 700
Water Weights BV
T. +31 850 513 750
Werkendam
E. info.wwnl@uniquegroup.com

Unique Group's Buoyancy & Ballast products are available for hire or purchase from more than 20 other worldwide locations via our network of independent partners. Please contact us for more details.