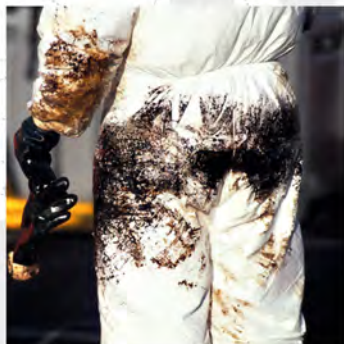


Markleen

Oil Spill Technology





Markleen

Oil Spill Technology

Markleen, your offshore specialists

Markleen's direct involvement in many oil spill scenarios has given us the opportunity to gain the experience and expertise necessary to help customers prepare a sustainable oil spill response (OSR). We pride ourselves on being able to offer a complete range of products knowing that these products have been tried and tested in the harshest of environments. Oceans, tropical waters, icy seas...no working environment is foreign to Markleen.

Our company can offer a complete oil spill response solution for offshore environments. Markleen is present in more than 30 countries worldwide. Oil rigs, oil tankers, bunkering vessels and offshore emergencies are what we specialise in.

Our containment booms, oil recovery systems and temporary storage tanks are manufactured from strong, high quality materials. All OSR equipment supplied by Markleen features the latest marine technology, and gives excellent results when being deployed and operated in the most demanding of sea conditions.

Markleen also supplies complementary product training and commissioning and can also offer preventive maintenance and after sales service and repairs. Safety and quality are our hallmark.

Contents

OSR *equipment* || OFFSHORE

CONTAINMENT BOOMS

- Uniboom® X
- Uniboom® Z
- Uniboom® Seamaster

SKIMMERS

- MultiSkimmer MS 30
- MultiSkimmer MS 50
- MultiSkimmer MS 60
- Skimmer MWS 280

OIL STORAGE TANKS

- Unibag®
- EasyTank

DISPERSANT SPRAY SYSTEM

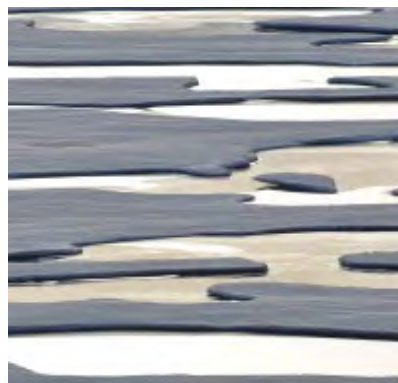
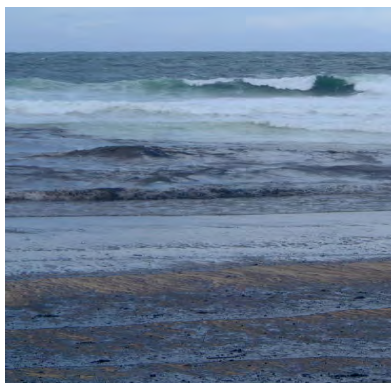
- Dispersant Spray System DSS 200 D

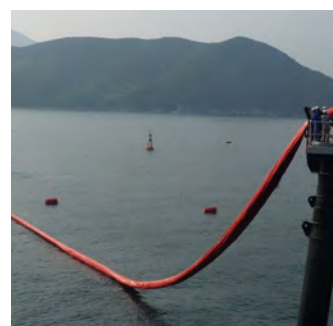
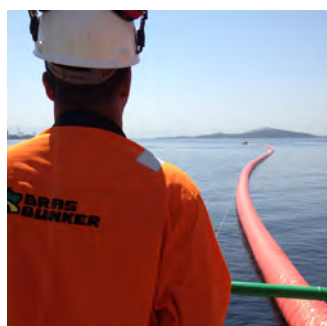
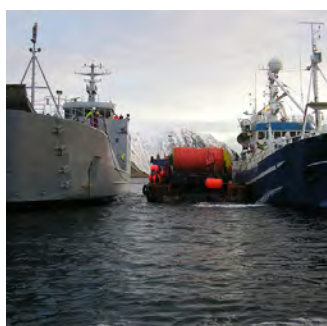
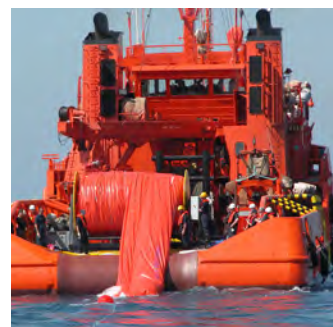
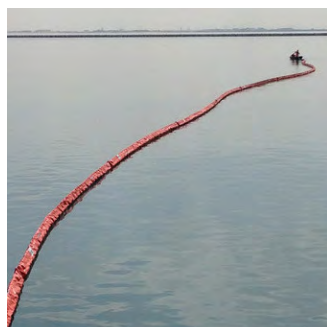
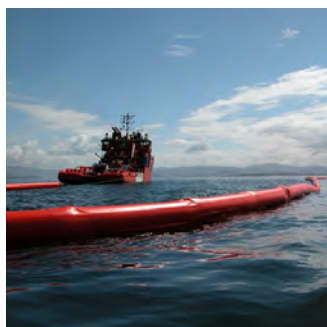
WORKBOATS

- Workboat T650 ALU

ANCILLARY EQUIPMENT

- Boom Reels
- Unireel
- Sea Containers
- Uniair
- Hydraulic Power Packs





Offshore containment booms

Containment booms are the first line of attack when dealing with an oil spill at sea. Markleen booms are ideal for surrounding an oil spill to prevent it from spreading and enabling it to be efficiently recovered. Markleen supplies a wide range of manually inflatable, self-inflating and self-expanding booms for offshore use.

Due to their compact storage and fast deployment characteristics, the booms are the most efficient means to be used against an oil spill in a marine environment.

Our booms are made from PVC or PVC-PU fabric, making them strong and versatile.

Rough seas and storms are no obstacle for Markleen equipment, which provide efficiency and safety of operation.



UNIBOOM® X



Uniboom® X

Single-point self-inflatable containment booms for offshore purposes

The UNIBOOM® X 1500, 1800, 1900, 2200 and 3000 are rapid deployment boom systems. They are self-inflatable single-point inflation booms, designed for use in open waters and offshore conditions. By utilising a special compressed air inflation system, the manpower and time for deployment and retrieval is reduced to a minimum.

Construction

The UNIBOOM® X-Series has two intertwined, high-pressure spiral-shaped air hoses which inflate the boom. Transverse bulkheads divide the float into 5-metre chambers. The longitudinal tension members give the boom high structural integrity, and its high freeboard and low weight provide for a particularly favourable buoyancy to weight ratio. The unique double-spiral framework gives the UNIBOOM® X far better structural integrity than competing brands of single-point inflation booms.

The UNIBOOM® X-Series has a secondary back-up inflation system that can be used to top up the boom's air chambers when necessary, allowing long term deployment of the boom in very rough seas.

The UNIBOOM® X-Series is stored on a hydraulic winder, called a UNIREEL, and the only required deck space during operation, is the UNIREEL's own footprint.



Key Features

- Rapid deployment
- Minimal manpower
- Minimal deck space required
- Excellent wave following characteristics
- Separate inflation systems provide fail-safe air filling
- Robust construction
- Radio remote control

Specifications

UNIBOOM® X	UNIBOOM® X 1500	UNIBOOM® X 1800	UNIBOOM® X 1900	UNIBOOM® X 2200	UNIBOOM® X 3000
Maximum wave height [m]	3	5	5	5.5	8
Max. towing force [kN]	25	60	60	60	120
Skirt depth [mm]	900	1000	1100	1200	1600
Freeboard, operational [mm]	565	740	740	940	1300
Draft [mm]	935	1060	1160	1260	1700
Inflation system	Self-inflatable, single-point inflation				
Primary inflation	Double inflatable air-spiral				
Weight [kg/m]	18.7	18.2		21.5	29.5
Volume [m ³ /300 m]	13	13		16	20
Boom fabric	Oiltex heavy duty oil boom fabric 1400 g/m2				
Air pressure, primary (spirals) [bar/psi]	min. 4 / 73				
Air pressure, secondary (back-up) [bar/psi]	min. 4 / 73				
Air volume, secondary (back-up) [m ³ min]	5.5 @ 4 bar				
Required personnel during deployment (on oil rec. vessel)	1				

In keeping with its policy of continuous improvement MARKLEEN reserves the right to modify its specifications without prior notice.



Harbour and
coastal use



Offshore
use



Extreme
weather



Deployed
automatically

UNIBOOM® Z



Uniboom® Z

Inflatable booms for open waters and offshore use

Uniboom® Z Series booms are oil containment booms with inflatable cylindrical floats for use in open waters and offshore. These booms are designed to offer fast deployment and reliable operation with low personnel requirements. Their proven design and construction, low inflation pressure and high buoyancy to weight ratio, give them excellent wave following characteristics and reliable oil containment even in adverse weather conditions.

Construction

The boom, which has internal replaceable buoyancy chambers, is particularly robust, giving a long service life with a minimum of maintenance.

The excellent buoyancy and wave following characteristics are achieved by way of large, cylindrical buoyancy chambers, slightly separated from each other, giving the boom flexibility when riding the waves.

All seams and unions are high frequency welded, maintaining the excellent mechanical properties of the fabric, and ensuring air and water tightness, and a uniform appearance.

All models are equipped with a high tensile strength ballast chain in a pocket at the base of the skirt.



Key Features

- High buoyancy to weight ratio
- Excellent wave-following characteristics
- Robust design
- Made of light yet highly resistant material
- High frequency welds provide strong fabric bonds
- Independent internal floatation chambers, providing extra protection against damage.
- Quick and easy deployment and recover
- Easy to clean

Specifications

MODEL	UNIBOOM® Z 1400 HD	UNIBOOM® Z 1600 HD	UNIBOOM® Z 1800 HD
Maximum wave height [m]	2	2.5	3
Tow speed (knots)	6		
Boom height deflated [mm]	1735	2030	2260
Boom height inflated [mm]	1380	1605	1760
Freeboard, operational [mm]	600	750	800
Draft [mm]	800	855	1000
End connectors	Norwegian type standard connectors		
Weight [kg/m]	10	13	14
Storage volume [m³/m]	0.030	0.032	0.040
Boom fabric	PVC-coated polyester, 1400g/m²		
Ballast material	13 mm grade 80 galv. steel chain	13 mm grade 80 galv. steel chain	16 mm grade 80 galv. steel chain
Ballast weight [kg/m]	3.73	3.73	4.25
Total strength [kN]	214	214	322



Offshore
use



Extreme
weather



UNIBOOM® SEAMASTER



Uniboom® Seamaster

Self-inflating oil boom

The Uniboom® Seamaster series is an advanced generation of air-filled booms which expand instantly by spring-loaded action. The automatic air-filling system and absence of check valves to close makes the Uniboom® Seamaster probably the fastest launching oil boom in the world.

The Uniboom® Seamaster is deployed from a hydraulic reel with a horizontal or vertical drum. No physical contact between the oil boom and deployment personnel is necessary, thereby eliminating the risk of injuries. The boom has a highly flexible and robust design with excellent wave-following capabilities. And the boom's modular construction eliminates system downtime.

Construction

The boom's freeboard expands by a frame consisting of four fibre-glass reinforced polyester (GRP) battens connected by rugged plastic hinges. When stored on the boom reel the hinges are designed to give the GRP strips tension. This tension starts the expansion of the freeboard when the boom comes off the reel during deployment. In the middle of each frame a strong stainless steel spring completes the expansion of the freeboard. The booms are equipped with internal solid flotation foam giving them plenty of reserve buoyancy in the event of a leak in one or more of the chambers and making them unsinkable.

Key Features

- Self-expanding
- No external air required
- Automatic air breathers
- Interior frames are fibre-glass reinforced polyester, plastic and stainless steel.
- Robust construction
- High-frequency welded PVC or PU/PVC blend fabric.

Specifications

MODEL	SEAMASTER 610	SEAMASTER 850	SEAMASTER 1150
Boom type	Self-inflatable expansion boom		
Operating environment	Coastal, open waters and offshore		
Freeboard	203 mm	350 mm	500 mm
Skirt	407 mm	500 mm	650 mm
Standard Length	25 m		
Fabric	PU/PVC blend coated polyester, 1000 g /m2		
Weight	5 kg/m	5.5 kg/m	6.7 kg/m
Ballast material	10 mm hot galvanised chain	10 mm hot galvanised chain	14 mm hot galvanised chain
Ballast weight	2 kg/m	2 kg/m	3.86 kg/m
Fabric tensile strength	4000 N/50 mm		
Total tensile strength	214kN	214kN	297 kN
Storage volume	0.027 m3/m	0.03 m3/m	0.04 m3/m
Wave height	2 m, depending on wave frequency and other circumstances	2.5 m depending on wave frequency and other circumstances	3 m depending on wave frequency and other circumstances

In keeping with its policy of continuous improvement MARKLEEN reserves the right to modify its specifications without prior notice.



Harbour and
coastal use



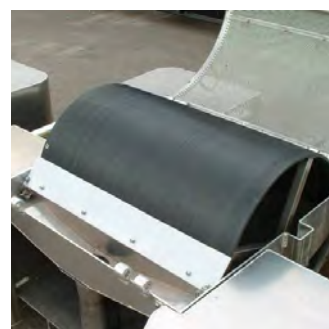
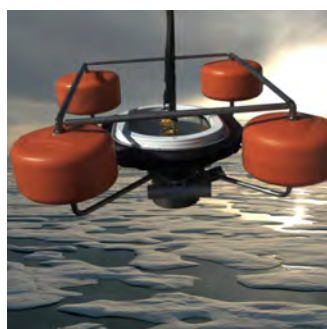
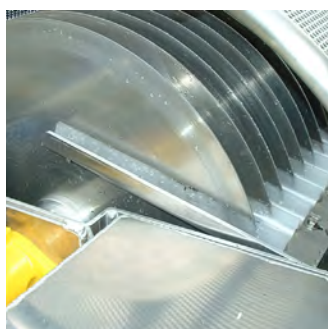
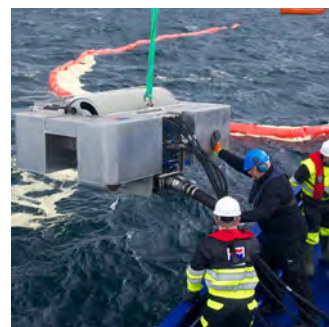
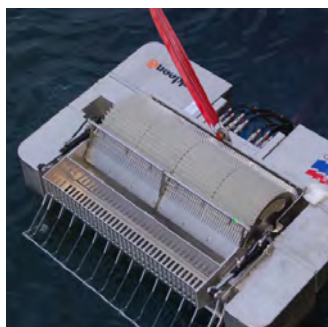
Offshore
use



Extreme
weather



Deployed
automatically



Markleen offshore Skimmers

Markleen skimmers are designed to recover all types of oil: diesel, grease and heavy oil can be efficiently recovered with a minimum water content. They are made from stainless steel or high quality aluminium, making them resistant to marine environments.

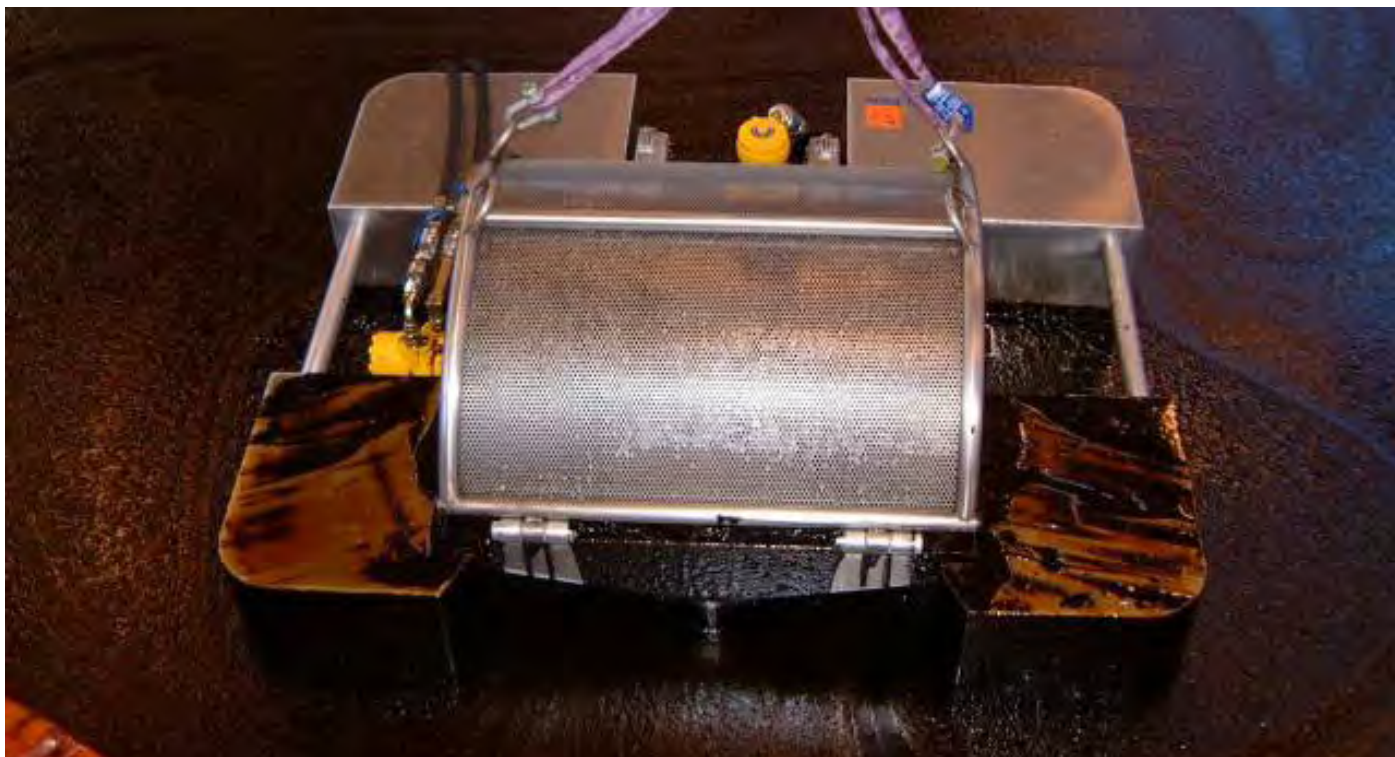
Markleen skimmers feature rotating brush cartridges, which can be easily changed for disc or drum cartridges to maximise oil recovery depending on viscosity. The cartridges can be changed in a matter of minutes without the need for tools, meaning that effectively the skimmer acts as three skimmers in one.

We also supply high performance weir skimmers which handle all types of hydrocarbons.

Markleen skimmers are recommended for offshore, coastal and industrial use and are available in a wide range of capacities depending on the requirements of each operation.

[Markleen offshore Skimmers](#)

MULTISKIMMER MS 30



MultiSkimmer MS 30

Modular skimmer with interchangeable cartridges.

Markleen MultiSkimmer MS 30 is a compact, unit used for recovering all types of oil. Diesel oil, grease and heavy oil are quickly and efficiently recovered with a minimum of water content. All components used in the Markleen MultiSkimmer MS 30 are robust and water and oil resistant.

Depending on the viscosity of the substance to be recovered, a standard rotating brush Markleen Multiskimmer MS 30 may be converted to a drum or disc skimmer in just a few minutes and without the use of tools.

Operating principle:

MultiSkimmers operate based on the well proven oleophilic (oil attracting) properties of some materials and recover light oils through to heavy crude.

The rotating module powered by a hydraulic or pneumatic motor creates a current which draws the substance to be recovered towards the skimmer. The oil sticks firmly to the chosen module which is made of oil attracting and water repelling material. It then reaches the comb or scraper where it is separated and poured into an intermediate tank in the skimmer head. Due to the hydrophobic (water repelling) effect of the module, the water drains down before reaching the scraper. A transfer pump, totally integrated into the MultiSkimmer, then transfers the oil to an external tank.

Key Features

- Three skimmers in one: (brush, disc or drum)- no tools needed.
- Modular: All components can be easily dismantled for transport or maintenance.
- Versatile: Covers wide range of viscosities.
- Highly efficient: Recovered oil contains only 2 to 8% water.
- Long working life: Rugged corrosion resistant build.
- Made of marine grade aluminium and stainless steel

Specifications

MODEL	MS 30 HYDRAULIC
Service type	Brush, drum or disc
Measurements (l x w x h) [mm]	1445 x 1247 x 820
Max. draft [mm]	250
Weight (approx.) including pump [kg]	205
Oil recovered	Light to heavy
Max. recovery capacity [m ³ /h]	30
Cartridge speed [rpm]	0-40
Frame	Marine grade aluminium
Brushes / Drum	Thermoplastic
Discs	Marine grade aluminium
Skimmer max. hydraulic power	8 l/min @ 100 bar
Skimmer hydraulic couplings	Pressure: 3/8" Return: 3/8"
Pump location	Integral and extractable
Discharge connection	3" (75 mm) with Camlock coupling
Solids in inlet dia [mm]	0-20
Equipment required	Hydraulic power pack, Hydraulic manoeuvring panel, Discharge hose, Hydraulic hoses



Harbour and
coastal use



Offshore
use



Rivers

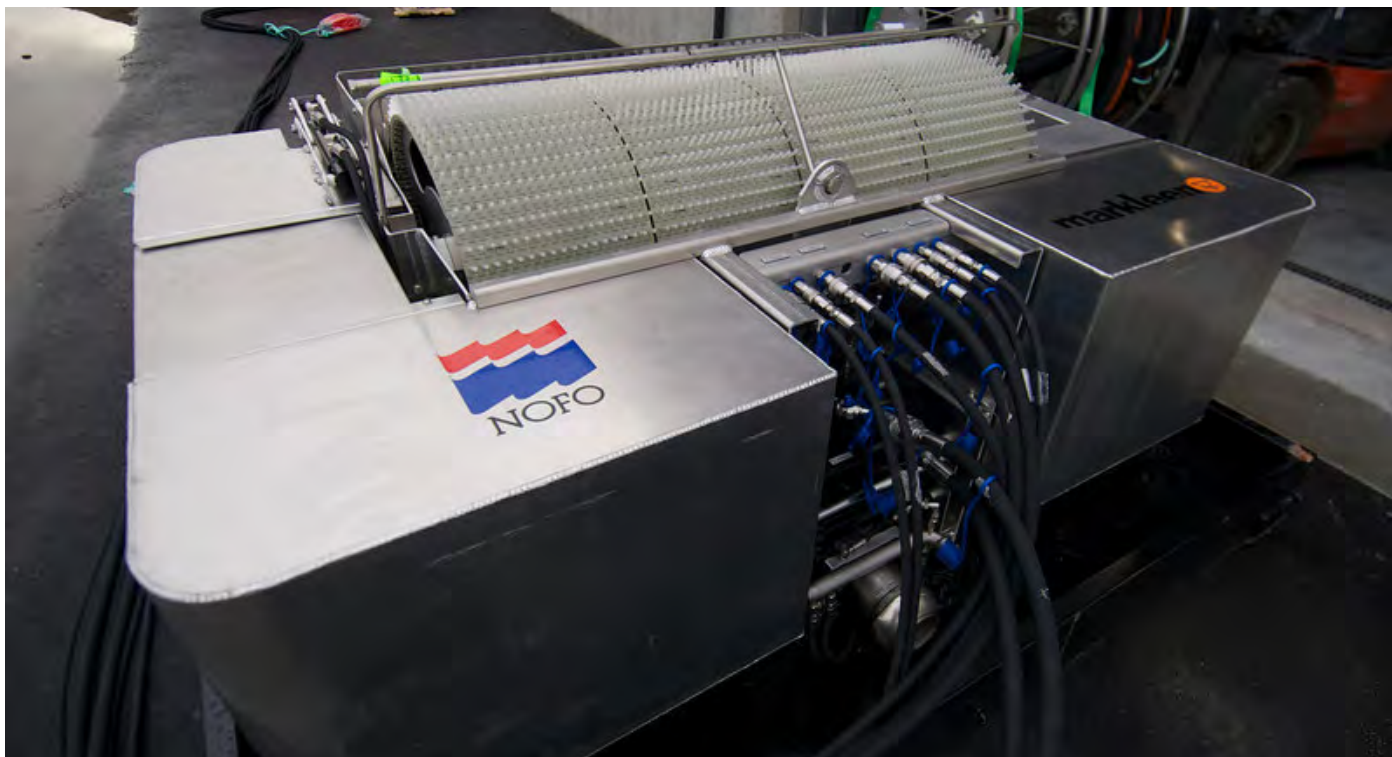


Industrial
use



Extreme
weather

MULTISKIMMER MS 50



MultiSkimmer MS 50

Modular skimmer with interchangeable cartridges.

Markleen MultiSkimmer MS 50 is a compact, unit used for recovering all types of oil. Diesel oil, grease and heavy oil are quickly and efficiently recovered with a minimum of water content. All components used in the Markleen MultiSkimmer MS 50 are robust and water and oil resistant .

Depending on the viscosity of the substance to be recovered, a standard rotating brush Markleen Multiskimmer MS 50 may be converted to a drum or disc skimmer in just a few minutes and without the use of tools.

Operating principle:

The rotating module powered by a hydraulic motor creates a current which draws the substance to be recovered towards the skimmer. The oil sticks firmly to the chosen module which is made of oil attracting and water repelling material. It then reaches the comb or scraper where it is separated and poured into an intermediate tank in the skimmer head. Due to the hydrophobic (water repelling) effect of the module, the water drains down before reaching the scraper. The brush cassette is used for oil with a higher viscosity, disc and drum cassette for a lighter viscosity. The pump which is placed below the water level, pumps the oil back to recovery vessel or a storage tank on land

Key Features

- Three skimmers in one: (brush, disc or drum)- no tools needed.
- Modular: All components can be easily dismantled for transport or maintenance.
- Versatile: Covers wide range of viscosities.
- Highly efficient: Recovered oil contains only 2 to 8% water.
- Long working life: Rugged corrosion resistant build.
- Made of marine grade aluminium and stainless steel

Specifications

MODEL	MS 50 HYDRAULIC
Service type	Brush, drum or disc
Measurements (l x w x h) [mm]	1914 x 1357 x 1060
Max. draft [mm]	550
Weight (approx.) including pump [kg]	314
Oil recovered	Light to heavy
Max. recovery capacity [m ³ /h]	55
Cartridge speed [rpm]	0-40
Debris handling	Mechanical flap
Frame	Marine grade aluminium
Drift of skimmer cassette	Hydraulic
Max. hydraulic pressure	8 l/min @ 150 bar
Viscosity range	0 – 100.000 cSt Up to 1.000.000 with water injection
Solids in inlet	40 mm
Discharge hose couplings	3" or 4" Laux coupling
Pump location	Integral and extractable
Discharge connection	3" (75 mm) with Camlock coupling
Equipment required	Hydraulic power pack, manoeuvring panel, discharge hoses, hydraulic hoses

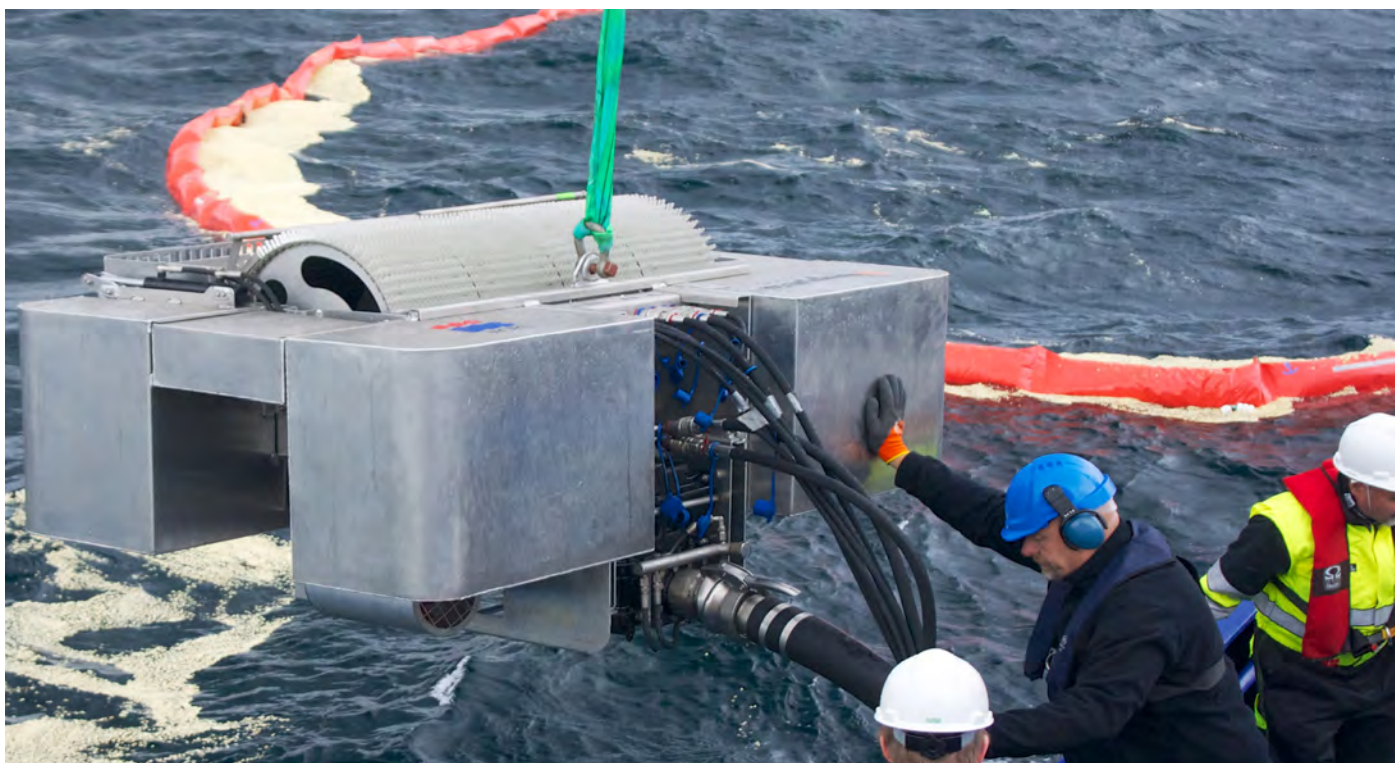


Offshore
use



Extreme
weather

MULTISKIMMER MS 60



MultiSkimmer MS 60

Modular skimmer with interchangeable cartridges.

Markleen MultiSkimmer MS60 is a compact unit used for recovering all types of oil. Diesel oil, grease and heavy oil are quickly and efficiently recovered with a minimum of water content. All components used in Markleen MultiSkimmers MS60 are robust and water and oil resistant.

Depending on the viscosity of the substance to be recovered, standard rotating brush Markleen MultiSkimmer MS60 may be converted to a drum or disc skimmer in just a few minutes and without the use of tools. Thus Markleen MultiSkimmers MS60 offer the advantages of having three skimmers in one.

Operating principle:

MultiSkimmers MS60 operate based on the well proven oleophilic (oil attracting) properties of some materials and recover light oils through to heavy crude.

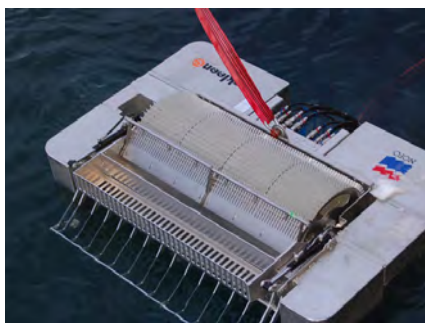
The rotating module powered by a hydraulic motor creates a current which draws the substance to be recovered towards the skimmer. The oil sticks firmly to the chosen module which is made of oil attracting and water repelling material. It then reaches the comb or scraper where it is separated and poured into an intermediate tank in the skimmer head. Due to the hydrophobic (water repelling) effect of the module, the water drains down before reaching the scraper. A transfer pump, totally integrated into the MultiSkimmer MS60 then transfers the oil to an external tank.

Key Features

- Three skimmers in one: (brush, disc or drum)- no tools needed.
- Modular: All components can be easily dismantled for transport or maintenance.
- Versatile: Covers wide range of viscosities.
- Highly efficient: Recovered oil contains only 2 to 8% water.
- Long working life: Rugged corrosion resistant build.
- Made of marine grade aluminium
- Hydraulic thrusters: Skimmer can be moved via a hydraulic panel

Specifications

MODEL	MS 60 HYDRAULIC
Service type	Brush, drum or disc
Measurements (l x w x h) [mm]	2015 x 1150 x 1060
Max. draft [mm]	550
Weight (approx.) including pump [kg]	350
Oil recovered	Light to heavy
Max. recovery capacity [m ³ /h]	60
Cartridge speed [rpm]	0-40
Debris handling	Mechanical flap
Frame	Marine grade aluminium
Drift of skimmer cassette	Hydraulic
Max. hydraulic pressure	8 l/min @ 150 bar
Max. Hydraulic power required	90 l/min @ 180 bar
Solid in inlet dia. [mm]	45
Viscosity range	0 – 100.000 cSt Up to 1.000.000 with water injection
Solids in inlet dia. [mm]	45
Discharge connection	4" (100 mm) with Camlock coupling
Equipment required	Hydraulic power pack, maneuvering panel, discharge hoses, hydraulic hoses



Offshore
use



Extreme
weather

SKIMMER MWS 280



Skimmer MWS 280

High performance weir skimmers

Markleen MWS skimmers are high performance weir skimmers for harbour, coastal or offshore oil spills. These skimmers handle all types of hydrocarbons, from light diesel to heavy crude oil. All models are suitable for advancing and stationary skimming operations.

Markleen MWS skimmers feature a well proven self-adjusting flow-controlled inlet weir, with automatic parallel weir lip movement to water surface. The weir working depth is controlled by the pump flow rate, and determines the quantity of water in the recovered product.

The skimmer incorporates two heavy duty submersible Archimedes Twin Disc Screw pumps which provide 70% higher capacity than traditional screw pumps. The pumps are hydraulically driven and need as such a hydraulic power pack for their operation. The stainless steel pump casing as standard provides high resistance against corrosion and abrasive wear.

The skimmers are mounted on a robust stainless steel frame which sustains the four floats and protects the pumps.

Key Features

- MWS skimmers handle all types of oil spills, from light diesel to heavy crude mixed with debris.
- Extremely high recovery capacities at low pump revolutions.
- Large 360° inlet opening with strong cutting knives for efficient debris handling
- The pump casing is easily dismantled for maintenance and cleaning.
- Pumps can be removed for use as oil transfer or discharge pumps

Specifications

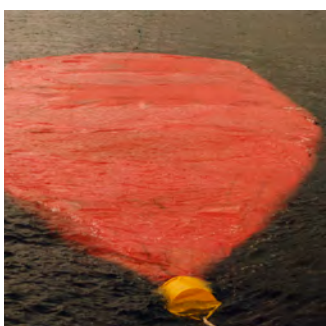
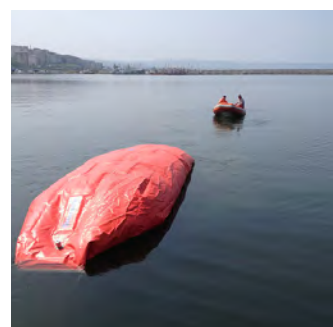
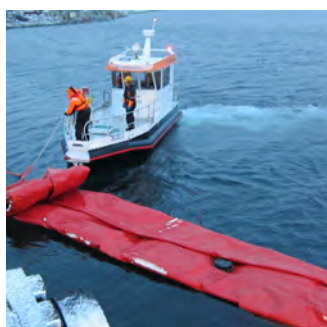
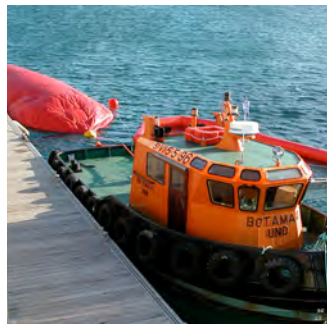
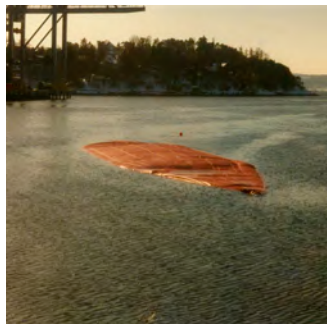
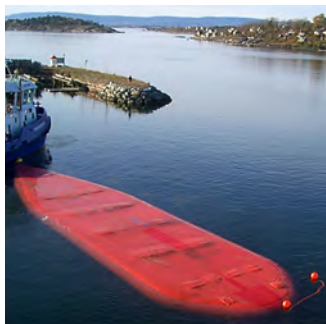
MODEL	MARKLEEN WEIR SKIMMER MWS 280
Skimmer capacity [m ³ /h]	280
Dimensions L x W x H (frame incl. pump) [mm]	3180 x 2500 x 1400
Total skimmer weight, dry [kg]	500
Weir skimmer gap	0-150
Shipping volume [m ³]	7.0
Lifting method	single point
Max. pressure [bar]	10
Debris handling	4 cutting knives at inlet and 3 at outlet on each pump
Inlet opening [mm]	250 x 150, 360°, each pump
Maximum solids dia. [mm]	65
Hydraulic flow rate [l/min]	0 - 150
Max. hydraulic oil pressure [bar]	200 cont.
Rotation speed [rpm]	0 – 750
Weir dimensions L x Ø [mm]	1250 x 900
Pump hydraulic couplings- pressure	2 x 1" female
Pump hydraulic couplings-return	2 x 1" male
Floation frame	Stainless steel



Offshore
use



Extreme
weather



Storage tanks for offshore use

Markleen tanks are designed for the temporary storage of oil or other liquids. Markleen supplies towable floating tanks and tanks for use on land.

Our tanks are compact and easy to assemble, transport and store. They provide ease of handling when used on beaches, in harbours or even offshore.

All models of Markleen temporary storage tanks come in a wide range of sizes. They are made from strong, long-lasting materials and are maintenance free.

UNIBAG®



Unibag®

Towable tanks for temporary oil storage

The Markleen Unibag® is a towable, collapsible floating storage container which can be deployed quickly for temporary storage and towing of recovered oil spills. The Unibag® is available in sizes ranging from 5 to 1000 tons. The Unibag® can be towed at a maximum of 5 knots, and loaded or discharged at 10 to 400 tons per hour. The Unibag® is exceedingly strong, durable and light and requires very little maintenance. It is compact in storage, easy to transport and manageable in operations even in high seas.

In the event of a grounding or collision, a Unibag® can provide the additional temporary storage to minimise the spillage. Often only a small proportion of a damaged tank's content, quickly transferred, can prevent a major disaster. Due to its light weight and compact size, the Unibag® is capable of being transported by helicopter to the site of operation.

Key Features

- High capacity
- Excellent towing capabilities
- Quick deployment
- Compact storage
- Optional Equipment: Nose cone with integrated pump, hydraulic winder for the Unibag®, cargo hose w/integrated towing arrangement

Specifications

MODEL	UNIBAG® 150	UNIBAG® 200	UNIBAG® 250	UNIBAG® 300	UNIBAG® 500	UNIBAG® 1000
Length [m]	25.1	27.8	27.9	31.7	37.5	50.1
Width [m]	5.8	6.4	7.3	7.3	8.7	10.9
Empty weight [kg]	890	1040	1220	1320	1770	2470
Storage box L x W x H [mm]	2300 x 1690 x 1650		2300 x 2290 x 2250			2300 x 3290 x 2250
Fabric	PU/PVC-coated polyester					
Fabric weight [g/m²]	1600					
Fabric tear strength [N]	1500/1700					
Fabric tensile strength [N/5 cm]	9000/8500					
Filling/discharge connection (male Camlock)	4"-6"	4"-6"	4"-6"	4"-6"	4"-6"	4"-6"
Max. towing speed - empty [kts]	8	8	8	8	8	8
Max. towing speed - loaded [kts]	5	5	5	5	5	5
Max. draft [m]	1.6	1.8	2.0	2.0	2.4	3.0



Offshore
use



Extreme
weather

EASYTANK



EasyTank

Portable tanks for temporary oil storage

Markleen EasyTanks are designed for temporary oil or liquids storage. Their transportability, quick and easy assembly, light yet robust construction and large storage capacity give the tanks a unique versatility and make them ideal for emergency response services

Design:

- **Foldable fabric:** EasyTanks are made of PVC-coated polyester. This strong yet lightweight material is resistant to oil, a wide range of chemicals and detergents, climatic conditions and UV light.
- **Frame:** EasyTanks have sturdy frames made of marine grade aluminium tubes held together by strong plastic fittings reinforced with fibre glass. Frames consist of only two kinds of parts, vertical and horizontal tubes, making the tanks very easy to erect.
- **Roof cover:** Made of oil and UV resistant fabric, included as standard.
- **Connections:** EasyTanks are provided with a 2" discharge Camlock coupling and a 1" bottom drain connection via a ball valve.
- **Storage box:** EasyTanks come complete with a reusable wooden storage box.

Key Features

- Made of oil resistant materials
- Easily transportable
- Quick and easy assembly
- Compact storage
- Light yet robust
- Large storage capacity

Specifications

MODEL	EASYTANK 4	EASYTANK 7.5	EASYTANK 10	EASYTANK 15
Total volume [m ³]	3.7	7.5	10	15
Size deployed, DIA x H [mm]	2235 x 950	3730 x 1000	3730 x 1500	4190 x 1500
Size stored L x W x H [mm]	1720 x 540 x 640	1750 x 600 x 900	1750 x 600 x 900	1750 x 600 x 900
Empty weight [kg]	37	65	75	95
Shipping weight [kg]	100	130	140	160
Container material	1100 gr/m ² oil resistant PVC-coated polyester			
Structure	Marine grade aluminium			
Fittings	High impact-resistant plastic reinforced with fibre glass			
Fill/discharge access	Open top / side wall 2" Camlock connection			
Drain	1" ball valve			

In keeping with its policy of continuous improvement MARKLEEN reserves the right to modify its specifications without prior notice.



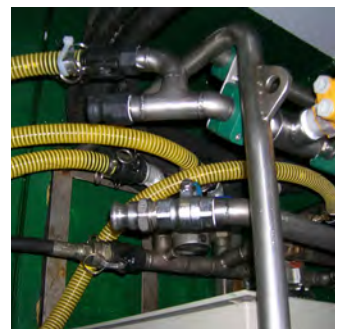
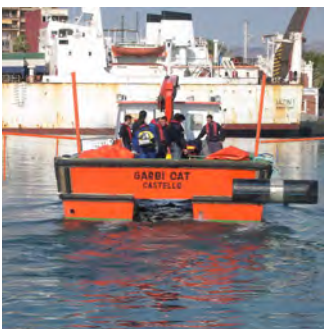
Harbour and
coastal use



Offshore
use



Extreme
weather



Dispersant Spray System

The Markleen Dispersant Spray System can be installed on any kind of boats, tugs, offshore supply vessels, other craft or even tractor mounted on the beach.



DISPERSANT SPRAY SYSTEM DSS 200 D



Dispersion Spray System DSS 200 D

Markleen Dispersion Spray System DSS 200 D consists of a portable diesel unit plus two dispersant spray arms that can be installed on any type of working vessel or even on a tractor for beach applications.

The portable diesel unit is mounted on a compact stainless steel frame. The diesel engine drives a roller pump, which is provided with two independent inlets with Camlock couplings for water and dispersant. A manual valve adjusts the dilution of the water-dispersant mixture through a Venturi injector, and the system can be used with concentrated or diluted dispersant.

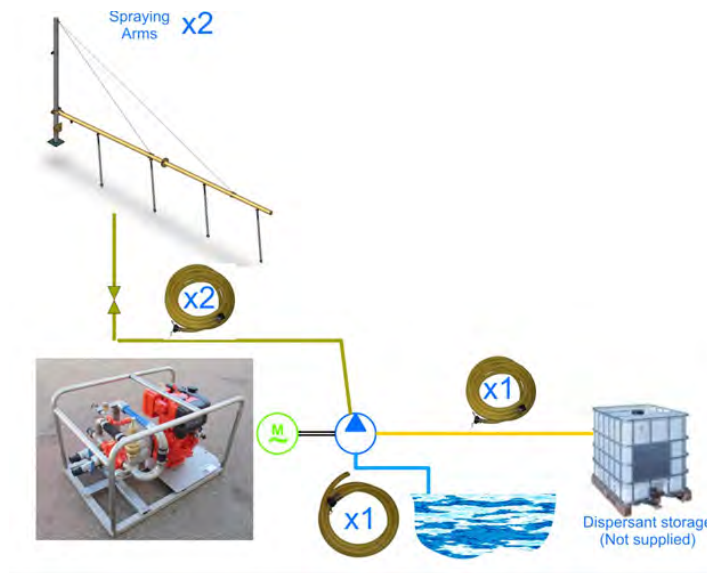
Each outlet is provided with a manual ball valve that allows the operator to control operation.

The outriggers (dispersant spray arms) can be used in two positions: one operational, deployed in a perpendicular position to the hull of the vessel, and a second storage position, folded parallel to the hull. The system can also be easily dismantled, thereby simplifying stowage on the deck of the vessel itself when the system is not being used.

Key Features

- Handles concentrated or diluted dispersant
- Aluminium spray arms
- Compact design
- Other fittings made of stainless steel
- Strong and corrosion resistant build
- Easily transportable
- No specialist knowledge required
- Optionally, monitors and lances for manual operation may be supplied.

Diagram



Specifications

MODEL	DSS 200 D
Power supply	Manual start Lombardini diesel engine 15LD400 (7.3 kW @ 3600 rpm)
Pump	Hypro roller pump
Capacity [l/m]	180-235
Injector	Venturi injector, Mazzei Airjection
Mixer valve	Manual valve to adjust water-dispersant mixture
Pipework and frame	Stainless steel
Water inlet	1½" male Camlock quick coupling
Dispersant inlet	¾" male Camlock quick coupling
Pump outlets (spray arms)	2 x 1½" male Camlock quick coupling (with manual ball valve)
Pressure relief valve	0 to 10 bar setting
Gauges	Pressure gauge, 0 – 10 bar
Spray arms	2 x 6 m arms made of marine grade aluminium
Support Mast	2 x 3 metres long - stainless steel
Fore / Aft Stays	4 nylon stays
Topping wires	2 stainless steel topping wires
Nozzles	4 per spray arm. 1 spare nozzle kit for a single arm
Hoses	5 m per spray arm

In keeping with its policy of continuous improvement MARKLEEN reserves the right to modify its specifications without prior notice.



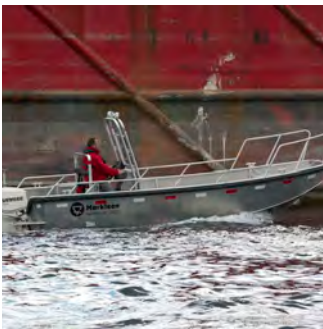
Harbour and
coastal use



Offshore
use



Extreme
weather



Workboats

Markleen workboats are an integral part of any oil spill response operation. They are designed for use in coastal waters. The workboats are built robustly in marine grade aluminium and provide safety of operation, high stability and a high loading capacity.

Markleen workboats are virtually maintenance free, even in demanding circumstances. All materials making up the boats are environmentally friendly and easily recyclable. Markleen adapts the boats' design to customer requirements.



WORKBOATS



Workboat T650 ALU

Aluminium workboats for offshore use

Robust workboats for demanding conditions, made from seawater resistant aluminum and designed for oil spills in coastal waters and offshore. The boats are robust, secure, with high stability, high load capacity, and are virtually maintenance free. The boats, which are adapted to each customer's needs, have a continuous longitudinal reinforcement which makes them particularly suitable for beaching under harsh conditions. The workboats are self bailing with a full payload. They have been used for many years by fire and rescue services in Germany and the Netherlands, and their moderate V hull gives them good directional stability, high load capacity and high performance.

The boats have safety equipment intended for professional use including powerful fenders keeping guard on both sides of the bow, high range, solid lifting points, joints on the deck for securing loads, lockable storage and a rescue ladder on the stern. Also a non-slip deck and reflectors provide the user with safe and secure working conditions at sea. The seawater resistant aluminum construction is also maintenance free, environmentally friendly and can be easily recycled.



Key Features

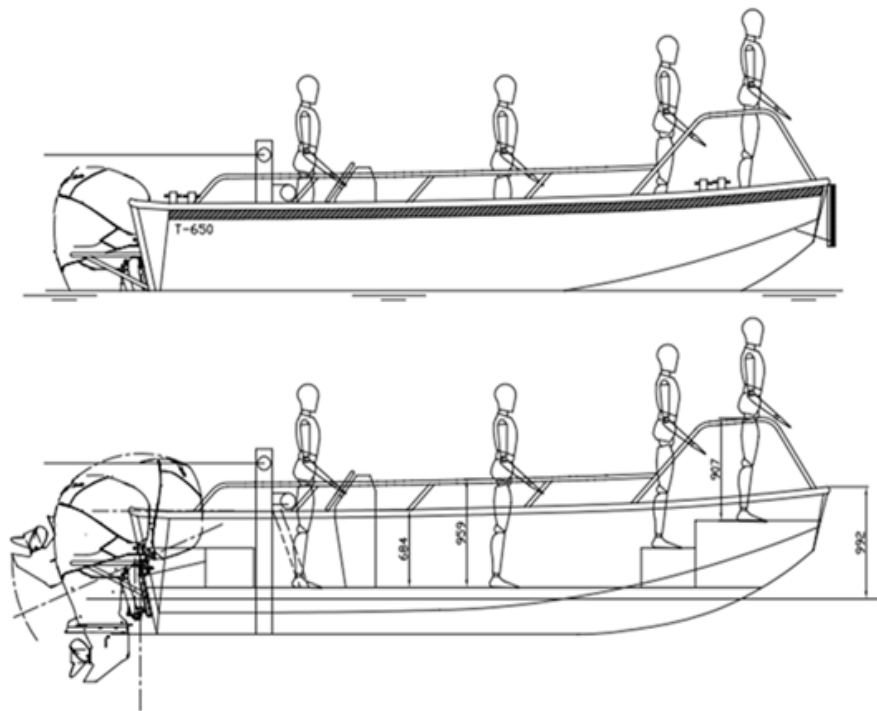
- Butt bow designed for safe and easy loading / unloading
- Longitudinal reinforcement to protect the keel
- Strong holding pockets on both sides of the bow
- Non-slip deck
- Steering console with windscreen and powerful bar
- Driver seat
- Powerful fender rubber
- Hydraulic steering wheel
- Hinged protective guard around the motor
- 4 oversized bollards and 4 oversized lifting points
- 8 door attachment points
- Automatic and manual bilge pump
- Mooring Lines and chart plotter

Specifications

MODEL	WORKBOAT T650 ALU
Length L.O.A	6.50 m
Width B.O.A.	2.30 m
Weight without / with motor	800 / 1050 kg
Payload	1000 kg
Max. people	6
Recommended engine size	115 HP
Max. motor size	150 HP
V-shaped bow party / rear	25° / 18°
Shaft	Extra long

In keeping with its policy of continuous improvement MARKLEEN reserves the right to modify its specifications without prior notice.

Sketch



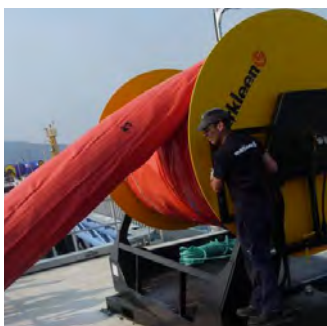
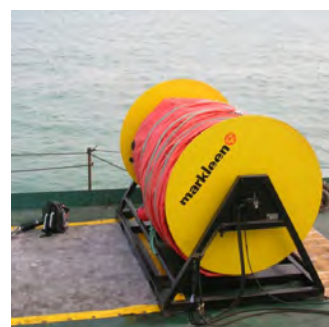
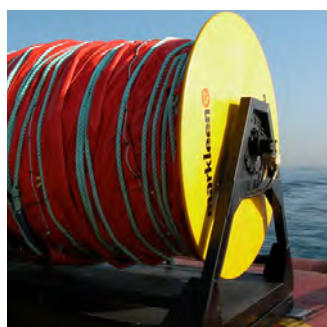
Harbour and
coastal use



Offshore
use



Extreme
weather



Ancillary equipment

Markleen manufactures a wide range of ancillary equipment to cover all the requirements of an oil recovery and clean-up operation. We supply boom reels, pressure washers, air compressors, hydraulic power packs, storage cages and storage containers. In all cases our equipment is adapted to our customers' needs.

BOOM REELS



Boom Reels

Hydraulic winders for deploying and storing containment booms

Markleen hydraulic boom reels make boom deployment quick and easy. There are standard models of any size and for every application. Common to all models are their safe and simple variable speed operation and compact design with the reduction gear installed inside the hub of the drum.

The entire structure is corrosion protected with a high quality marine grade coating, in accordance with NOR-SOK M-501, system 2B, providing increased product durability and minimum maintenance in marine environments.

Markleen hydraulic boom reels are fitted with ISO forklift pockets, 4 hoisting points on the frame and 4 anchoring points for fixing the base of the reel to a dockside, ship deck or container bottom.

They are also equipped with an automatically activated negative hydraulic braking system which ensures complete control over the drum during boom deployment and recovery.

Only prestigious brands of hydraulic components are used, guaranteeing that the boom reels deliver in the most demanding of situations.

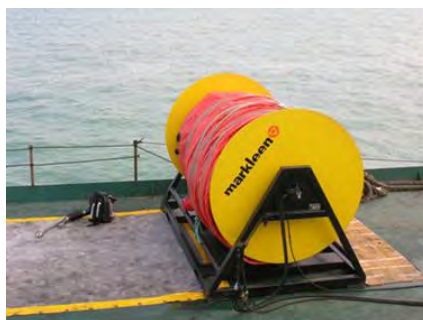
Key Features

- Safety and ease of operation
- Durable construction
- Optional turntable base
- Compact storage
- Optional extras: turntable mounted boom reels and boom reels mounted on frames made to ISO container measurements, including isocorners.

Specifications

MODEL	BR5	BR8	BR10	BR12	BR16	BR24
Construction	Frame, discs and drum made of corrosion protected carbon steel.					
Coating specification	NORSOK M-501, system 2B: 100 µm thermally sprayed zinc, 125 µm tie coat, 75 µm top coat					
Drum diameter [mm]	508	508	508	508	610	610
Disc outside diameter [mm]	2020	2020	2020	2020	2350	2350
Distance between discs [mm]	1755	2908	3360	4050	4000	5800
Net volume [m ³]	5.2	8.7	10	12.1	16.1	24
Hydraulic motor	Danfoss					
Reducer	Brevini					
Brake	Pressure loss hydraulic disc, negative hydraulic brake.					
Working pressure [bar]	175					
Bearing	Seat with rotating bearing					
Max. pull [kgf]	600					
Braking capacity	Greater than max. pull					
Operating speed	0 - 12 rpm depending on flow rate					
Handling and transport	Hoisting points and 2 fork pockets					
Length [mm]	2290	3432	3895	4575	4545	6355
Width [mm]	2020	2020	2020	2020	2438	2438
Height [mm]	2275	2220	2104	2275	2830	2830
Weight [kg]	1335	1500	1650	1780	2360	2900

In keeping with its policy of continuous improvement MARKLEEN reserves the right to modify its specifications without prior notice.



Harbour and
coastal use



Offshore
use



Extreme
weather

UNIREEL



Unireel

Hydraulic winders for deploying and storing self-inflatable containment booms

Markleen Unireel hydraulic boom reels make self-inflatable boom deployment safe, quick and easy. Common to all models are their safe and simple variable speed operation and compact design with the reduction gear installed inside the hub of the drum.

These turntable mounted boom reels are provided with an integrated air delivering system for Markleen Uni-boom® X Series containment booms. Safety of operation is maximised due to a control panel featuring a distributor valve which controls direction of rotation, rotational speed of base and drum (adjustable between 0 and 12 rpm) and the hydraulic brake. The automatically activated negative hydraulic braking system ensures complete control over the drum during boom deployment and recovery.

The entire structure is corrosion protected with a high quality marine grade coating, in accordance with NOR-SOK M-501, system 2B, providing increased product durability and minimum maintenance in marine environments.

Markleen Unireel hydraulic boom reels are fitted with ISO forklift pockets, hoisting points on the frame and 4 anchoring points for fixing the base of the reel to a dockside, ship deck or container bottom.

Key Features

- Safe operation
- Optional Radio control
- Durable construction
- Turntable base
- Compact storage

Specifications

MODEL	UNIREEL 10	UNIREEL 12	UNIREEL 16	UNIREEL 20	UNIREEL 26
Construction	Frame, discs and drum made of corrosion protected carbon steel.				
Drum diameter [mm]	508	508	508	508	610
Disc outside diameter [mm]	2380	2380	2380	2350	2380
Distance between discs [mm]	2480	2925	4090	5030	6330
Net volume [m ³]	10	12	16	20	26
Hydraulic motor	Danfoss				
Reducer	Brevini				
Brake	Pressure loss hydraulic disc, negative hydraulic brake.				
Hydraulic flow [l/min]	70	70	70	70	70
Max Working pressure [bar]	200	200	200	200	200
Bearing	Seat with rotating bearing				
Max. pull [kgf]	700	700	1200	1200	1200
Braking capacity	Greater than max. pull				
Operating speed	0 - 12 rpm depending on flow rate				
Handling and transport	Hoisting points and 2 fork pockets				
Length [mm]	2882	3312	4518	5458	6805
Width [mm]	2438	2438	2438	2438	2438
Height [mm]	3290	3290	3290	3290	3290
Weight [kg]	3825	4990	5500	5800	6125

In keeping with its policy of continuous improvement MARKLEEN reserves the right to modify its specifications without prior notice.



Harbour and
coastal use



Offshore
use



Extreme
weather



MARKLEEN SEA CONTAINERS



Markleen Sea Containers

Markleen sea containers are designed to store and deploy the oil containment and recovery equipment typically used during an oil spill response operation. As well as standard sizes, Markleen can supply containers with measurements which adapt to customer requirements

Key Features

- Standard design or custom made
- Strong build ensures optimum protection and deployment of oil spill response equipment
- End and/or side doors
- Easily transportable

30°

40°

50°



Harbour and coastal use



Offshore use



Rivers

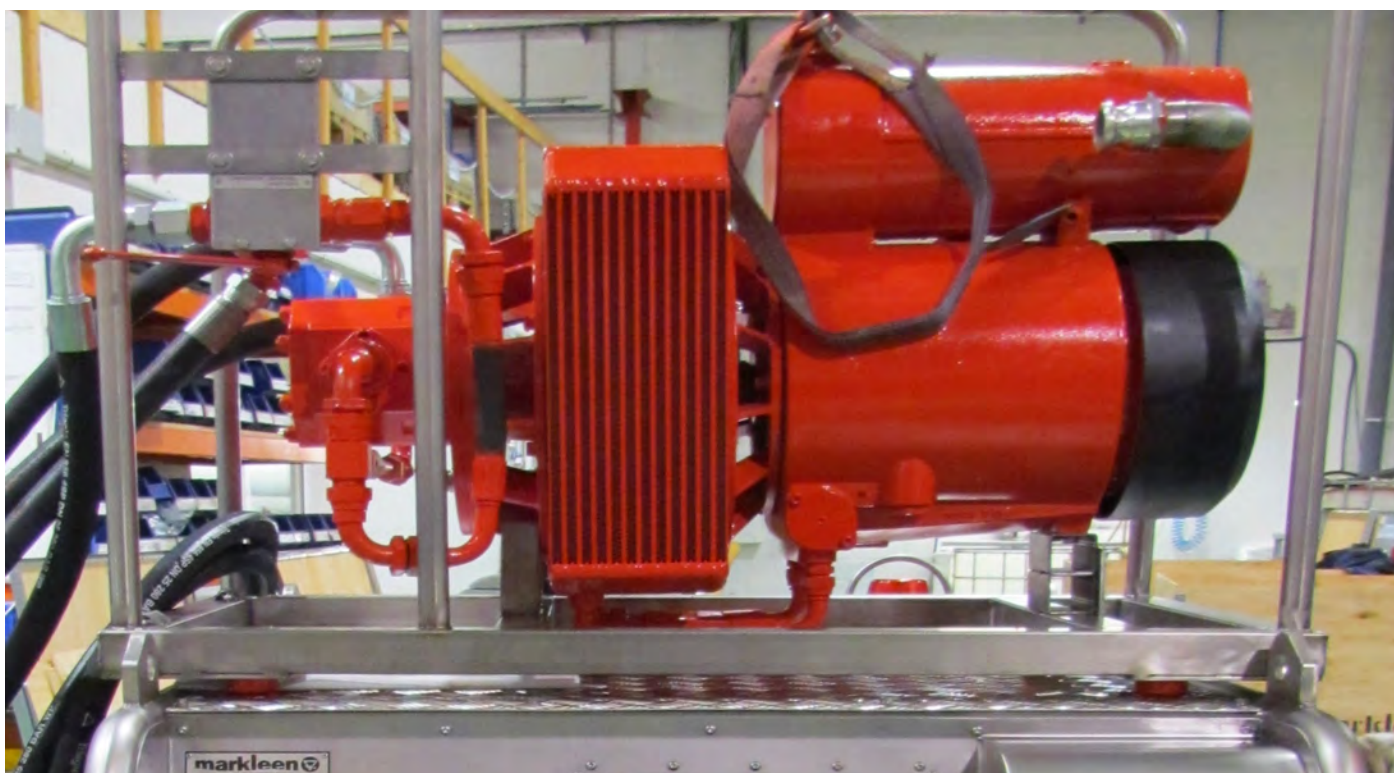


Inland waters



Extreme weather

UNIAIR 5000/8



Uniair 5000/8

Air compressor for inflating Markleen Uniboom® X single-point inflatable boom

The Markleen Uniair 5000/8 air compressor supplies a high rate of compressed air flow to operate a variety of equipment such as pneumatic pumps and tools, although its main function is to inflate Markleen Uniboom® X single-point inflatable boom. The high rate of compressed air flow supplied by the Uniair compressor allows the booms to be inflated extremely quickly, both via the primary inflation circuit at 8 bar pressure and the secondary (back-up) circuit at atmospheric pressure.

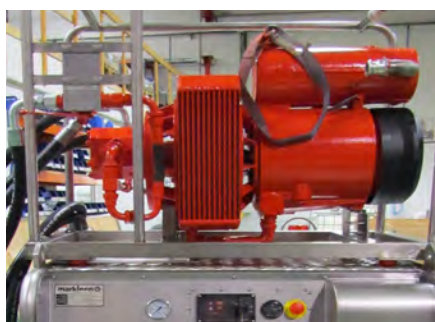
Due to the fact that the Uniair compressor is operated hydraulically and contains no electrical components, it is suitable for use in explosive or flammable environments



Specifications

MODEL	UNIAIR 5000/8
Build	Stainless steel frame
Compressed air flow rate [l/min]	5000
Maximum air pressure [bar]	10
Continuous air pressure [bar]	8
Hydraulic flow rate required [l/min]	130
Hydraulic pressure required [bar]	200
Length [mm]	1150
Width [mm]	650
Height [mm]	925
Weight [kg]	210

In keeping with its policy of continuous improvement MARKLEEN reserves the right to modify its specifications without prior notice.



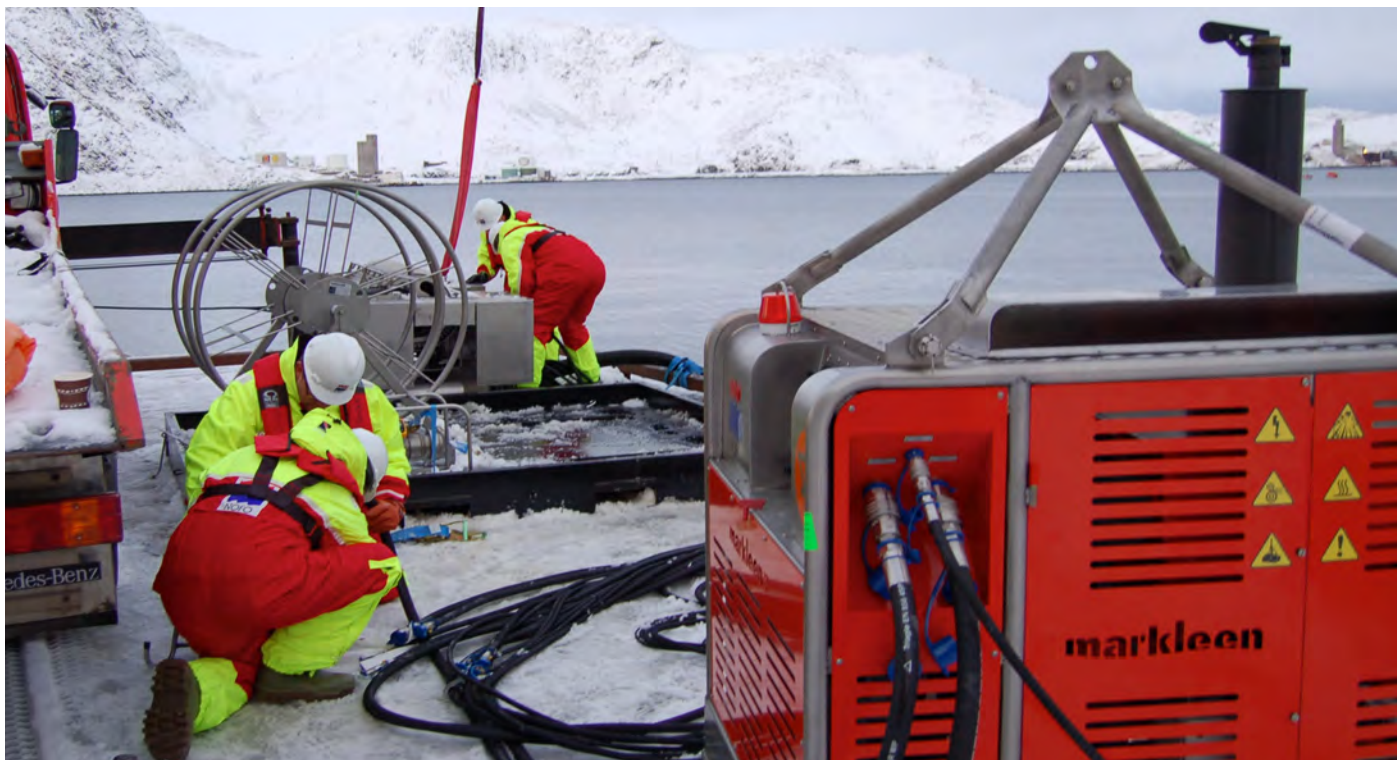
Offshore
use



Extreme
weather



HYDRAULIC POWER PACKS, 25-90 kW



Hydraulic Power Packs ,25-90 kW

Closed frame build including heat exchangers

Markleen multipurpose power packs are the heart of any oil spill response operation. Markleen has developed a wide range of power packs for marine applications. They are designed to power all hydraulic machinery, including boom reels, skimmers, air compressors, pumps and hoists.

Operation

Markleen power packs feature an ergonomic control panel allowing the operator to monitor all main hydraulic and engine functions.

Their automatic monitoring system (including warning signals and automatic shutdowns) controls all main operating variables and means the power packs can be left unsupervised for long periods of time.

Build

Markleen power packs are hard-wearing and corrosion resistant. Frame, tanks and panels are made of stainless steel and all other components are protected by a corrosion resistant coating.

Markleen power packs feature 4 hoisting points and ISO fork pockets.

Key Features

- Compact design
- Robust, stainless steel structure
- High quality diesel engines with worldwide service networks
- Ergonomic control panel
- Easily transportable

Specifications

MODEL	DHPP 25	DHPP 40	DHPP 60	DHPP 90
Structure	Frame: AISI 304 stainless steel Side panels: AISI 304 stainless steel Tanks: AISI 304 stainless steel Top cover: Magnal 30 marine grade aluminium			
Starter	Electric. 12 V / 55 Ah battery	Electric. 12 V / 70 Ah battery	Electric. 12 V / 95 Ah battery	Electric. 12 V / 95 Ah battery
Max. rated power	27 kW @ 3000 rpm	38 kW @ 3000 rpm	63 kW @ 2500 rpm	93 kW @ 2400 rpm
Hydraulic pump	Gear pump		Variable displacement pump	
Heat exchanger	Air / Oil	Air / Oil	Air / Oil	Air / Oil
Max. hydraulic oil flow rate [l/min]	80	105	150	235
Max. hydraulic oil pressure [bar]	170	185	225	210
Number of hydraulic circuits	1	1	1	1
Fuel tank capacity [litres]	55	80	115	115
Controls	Engine management system including visual and acoustic alarms for high engine temp. and low oil pressure, accelerator, emergency stop button and battery isolator switch.			
Instruments	Pressure gauge, hydraulic oil level and temp. gauges, fuel level gauge.			
Measurements (l x w x h) [mm]	1250 x 950 x 1250	1450 x 1100 x 1250	1770 x 1170 x 1660	1770 x 1170 x 2000
Weight (dry/ full tanks) [kg]	415 / 535	445 / 596	995 / 1330	1140 / 1480

In keeping with its policy of continuous improvement MARKLEEN reserves the right to modify its specifications without prior notice.



Harbour and
coastal use



Offshore
use



Extreme
weather

Sales Offices

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Markleen Ltd

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Markleen
Oil Spill Technology

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Markleen Terra S.L.U.

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Fax: +34 976 683 001

www.markleen.com
markleen@markleen.com

MANAGEMENT SYSTEM CERTIFICATE

Certificate No:
264824-2018-AQ-IBE-ENAC

Initial certification date:
17 July 2006

Valid:
27 July 2018 - 27 July 2021

This is to certify that the management system of

MARKLEEN GROUP

Pol. Ind. Río Gallego, C./ E, nº 22, 50840, San Mateo de Gallego, Zaragoza, Spain
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Quality Management System standard:
ISO 9001:2015

This certificate is valid for the following scope:

Design, manufacture and sale of:

- Oil and chemical spill response equipment and systems.
- Marine technology for aquaculture and fishing.

Place and date:
Barcelona, 27 July 2018



For the issuing office:
DNV GL – Business Assurance
Edificio Inbisa Mas Blau, C/ Garrotxa 6-8,
3º 1ª, El Prat de Llobregat, 08820,
Barcelona, Spain


Ana del Río Salgado
Management Representative

Certificate No: 264824-2018-AQ-IBE-ENAC
Place and date: Barcelona, 27 July 2018

Appendix to Certificate

MARKLEEN GROUP

Locations included in the certification are as follows:

Site Name	Site Address	Site Scope
MARKLEEN AS	Slemmestadveien 416, N-1390 Vollen, Norway	Design and sale of: <ul style="list-style-type: none">• Oil and chemical spill response equipment and systems.• Marine technology for aquaculture and fishing.
MARKLEEN	Pol. Ind. Río Gallego, C./ E, nº 22, 50840, San Mateo de Gallego, Zaragoza, Spain	Design, manufacture and sale of: <ul style="list-style-type: none">• Oil and chemical spill response equipment and systems.• Marine technology for aquaculture and fishing.

MANAGEMENT SYSTEM CERTIFICATE

Certificate No:
264823-2018-AE-IBE-ENAC

Initial certification date:
19 July 2012

Valid:
27 July 2018 - 27 July 2021

This is to certify that the management system of

MARKLEEN

Pol. Ind. Río Gallego, C./ E, nº 22, 50840, San Mateo de Gallego, Zaragoza, Spain

has been found to conform to the Environmental Management System standard:
ISO 14001:2015

This certificate is valid for the following scope:

Design, manufacture and sale of:

- Oil and chemical spill response equipment and systems.
- Marine technology for aquaculture and fishing.

Place and date:
Barcelona, 27 July 2018



For the issuing office:
DNV GL – Business Assurance
Edificio Inbisa Mas Blau, C/ Garrotxa 6-8,
3º 1ª, El Prat de Llobregat, 08820,
Barcelona, Spain


Ana del Río Salgado
Management Representative

MANAGEMENT SYSTEM CERTIFICATE

Certificate No:
264825-2018-AE-IBE-ENAC

Initial certification date:
15 January 2013

Valid:
27 July 2018 - 11 March 2021

This is to certify that the management system of

MARKLEEN

Pol. Ind. Río Gallego, C./ E, nº 22, 50840, San Mateo de Gallego, Zaragoza, Spain

has been found to conform to the Occupational Health and Safety Management System standard:

OHSAS 18001:2007

This certificate is valid for the following scope:

Design, manufacture and sale of:

- Oil and chemical spill response equipment and systems.
- Marine technology for aquaculture and fishing.

Place and date:
Barcelona, 27 July 2018



For the issuing office:
DNV GL – Business Assurance
Edificio Inbisa Mas Blau, C/ Garrotxa 6-8,
3º 1ª, El Prat de Llobregat, 08820,
Barcelona, Spain


Ana del Río Salgado
Management Representative