



# CATALOGUE

### **EQUIPMENT AND MATERIALS**

- Incident Prevention
- Emergency Response
- Energency Response
- Environmental Restoration
- Daily Pollution Treatment



**UIETNAM ENVIRONMENTAL INCIDENT RESPONSE CENTER (SOS)** P203-A5, Thang Long International Village, Tran Dang Ninh Street, Dich Vong Ward, Cau Giay District, Hanoi, Vietnam.

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#### VIETNAM ENVIRONMENTAL INCIDENT RESPONSE CENTER (SOS)



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- Incident Prevention
- Emergency Response
- Environmental Restoration
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### **Proactive Action With The Original Power**

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# ROUND OIL Containment boom

Round oil containment boom is manufactured from high - strength materials with outstanding features such as lightness, compactness and flexibility in transporting and deploying on rivers and seas.

#### **KEY FEATURES**

- Round oil containment boom is a temporary floating barrier designed for active prevention and containment of oil spills when loading and unloading goods at petrol stations near the water's edge or on the water, when transferring petroleum at ports, wharves, bays, rivers and inland waterways. It is also used to protect aquaculture cages from being contaminated with oil scum.

- Round oil containment boom has a sturdy structure which helps the boom withstand turbulent currents at ports. Each boom section is packaged in a PVC bag with handles and zippers for easy storage, preservation and space saving.

- The boom fabric is PVC, extremely durable, resistant to UV rays, oil, chemicals, and can be used outdoors at temperature up to 60°C. Stainless steel tensions cables are designed to increase the oil boom's tensile strength.

- The boom floating part is made of highly durable and stable material that is resistant to oil and chemicals. The boom skirt is balanced by a counterweight system to ensure high stability under the influence of turbulent flow, with a special design to prevent rust and overcome the limitations of ballast chains of other common booms. This design has been registered for intellectual property protection.

- Boom segments can be easily connected together for wide deployment by Universal standard 6061A marine grade aluminum connectors and ASTM SS304 locking pins. All fabric welds are made by high - frequency welding technology for superior strength and durability.



Use oil containment booms to isolate oil spill at port



Deploy oil containment booms in oil spill emergency response on lake





Use oil containment booms combined with oil filtering curtains to proactively prevent oil pollution in the water intake canal of a water plant



Deploy oil containment booms to protect fish cage areas from being contaminated with oil scum

SPECIFICATIONS AND MODEL	SOSBOOM-18	SOSBOOM-24	SOSBOOM-36	
Overall height (mm)	457	610	910	
Float freeboard (mm)	152	205	300	
Skirt draft (mm)	305	405	610	
Fabric	PVC resistant to UV rays, oil and chemicals. Thickness: 0.64mm (± 0.05mm)			
Flotation sizes	Ø150mm $ imes$ 900mm	$\emptyset$ 200mm $ imes$ 900mm	Ø300mm $ imes$ 1120mm	
Flotation material	PE foam resistant to oil and chemicals			
Ballast (kg/m)	1.07	2.1	3.54	
Tension cable	Inox Ø	8. Tensile strength: 44	l00kgf	
Total tensile strength (kgf)	6800	7900	13700	
Connectors and locking pins	Universal standard 6061 marine grade aluminum connectors and ASTM SS304 locking pins			
Standard section length (m) (,2)	30	30	20	
Packing size/ 1 standard section (mm)	$1100 \times 1000 \times 800$	1250 × 1100 × 1000	1550 × 1500 ×1300	
Weight/ 1 standard section (kg)	~79	~120	~140	

ho The length of one section can be changed according to Customer's request.



# FLAT OIL CONTAINMENT BOOM

Flat oil containment boom is manufactured from high - strength materials with outstanding features such as lightness, compactness and flexibility, suitable for use in waters with slow or moderate flow.

#### **KEY FEATURES**

- Flat oil containment boom is a temporary floating barrier designed for active prevention and containment of oil spills when loading and unloading goods at petrol stations near the water's edge, when transferring petroleum at ports and wharfs, etc, where water flow is slow or moderate.

- This oil boom is suitable for use in responding to oil spills occurring in shallow water such as fields, ponds, narrow ditches and small streams, etc.

- The flat oil containment boom has a sturdy and compact structure. Each boom section is packaged in a PVC bag with handles and zippers for easy storage, preservation and space saving. Thanks to this, it is convenient to equip petrol stations near the water's edge or small boats. More importantly, this oil containment boom can be easily transported by available vehicles such as motorbikes, basket boats, etc. The boom deployment is simple thanks to its compact and lightweight design, optimized through practical use in responding to more than 260 incidents on rivers, lakes, and shallow water areas.

- The boom fabric is PVC, extremely durable, resistant to UV rays, oil, chemicals, and can be used outdoors at temperature up to 60°C.

- The boom floating part is made of highly durable and stable material that is resistant to oil and chemicals. The boom skirt is balanced by a counterweight system to ensure high stability with a special design to prevent rust and overcome the limitations of ballast chains of other common booms. This design has been registered for intellectual property protection.

- Boom segments can be easily connected together for wide deployment by corrosion - resistant quick connectors. All fabric welds are made by high - frequency welding technology for superior strength and durability.





Use flat oil containment booms to isolate oil contaminated areas on agricultural land





Use flat oil containment booms to isolate oil contaminated areas on river



Deploy flat oil containment booms in oil spill emergency response on lake

SPECIFICATIONS AND MODEL	SOSBOOM-10F	SOSBOOM-12F	SOSBOOM-18F
Overall height (mm)	250	310	457
Float freeboard (mm)	75	110	165
Skirt draft (mm)	175	200	292
Fabric	PVC resistant to UV rays, oil and chemicals. Thickness: 0.64mm (± 0.05mm)		
Flotation material	PE foam	resistant to oil and ch	nemicals
Ballast (kg/m)	0.8	1.15	1.3
Total tensile strength (kgf)	2000	2000	6800
Standard section length (m) ()	5	15	15
Packing size/ 1 standard section (mm)	1100 × 400 × 250	$1000 \times 480 \times 350$	$1000 \times 600 \times 600$

ho The length of one section can be changed according to Customer's request.



# OIL FILTERING GONTAINMENT BOOM

Oil filtering containment boom not only has the function of containing spilled oil on the water surface like other conventional booms, but it is also a solution to the difficult but common problem of treating oil - contaminated water that is often encountered in actual oil spill response.

The boom skirt is made of special material that allows water to flow through easily, but filters and retains submerged oil particles in water caused by the impact of waves, currents and wind.

#### **KEY FEATURES**

- Protect aquaculture areas; protect water supply of water plants taken from surface water of rivers; control oil pollution from leaks and spills on the surface of oil terminals, petrol stations, factories, industrial parks flowing down wastewater, storm water drains into lakes, rivers and seas.

- The boom fabric is PVC, extremely durable, resistant to UV rays, oil, chemicals, and can be used outdoors at temperature up to 60°C. Stainless steel tension cables are designed to increase the oil boom's tensile strength. Polyethylene foam flotation is oil and chemical resistant. The boom skirt (oil filtering part) is manufactured from SOS-1 oil filtering fabric.

- Boom segments can be easily connected together for wide deployment by corrosion - resistant quick connectors. All fabric welds are made by high - frequency welding technology for superior strength and durability.







Deploy oil filtering containment booms to proactively prevent oil pollution in the water intake canal of a water plant

SPECIFICATIONS AND MODEL	SOSBOOM-18	SOSBOOM-24	SOSBOOM-36		
Overall height (mm)	457	610	910		
Float freeboard (mm)	152	205	300		
Skirt draft (mm) ( <sub>P</sub> )	305	405	610		
SOS-1 oil filtering fabric	0.75m wide $\times$ 5mm thick; withstand flow rate up to 250m <sup>3</sup> /h/m <sup>2</sup>				
Fabric	PVC resistant to UV rays, oil and chemicals. Thickness: 0.64mm (± 0.05mm)				
Flotation sizes	Ø150mm  imes 900mm	$\emptyset$ 200mm $ imes$ 900mm	Ø300mm $ imes$ 1120mm		
Flotation material	PE foam	resistant to oil and ch	nemicals		
Ballast (kg/m)	2.12	3.26	4.58		
Tension cable	Inox	Ø 8. Tensile strength: 4	1400kgf		
Total tensile strength (kgf)	6800	7900	13700		
Connectors and locking pins	Universal standard 6061 marine grade aluminum connectors and ASTM SS304 locking pins				
Standard section length (m) ()	30	30	20		
Packing size/ 1 standard section (mm)	1100 × 1000 × 800	1250 × 1100 × 1000	1550 × 1500 × 1300		
Weight/ 1 standard section (kg)	~135	~175	~185		

ho The width of oil filtering skirt and the length of one boom section can be changed according to Customer's request.



# PERMANENT OIL CONTAINMENT BOOM

When an oil spill occurs at a port, it can take 20 minutes to deploy oil containment booms, enough for the spilled oil to spread 500 meters away (with a flow speed of about 0.5 meters/second). Therefore, deploying oil booms at the port is no longer effective as soon as spilled oil flows out of the port area.

Permanent oil containment boom is specifically designed to proactively prevent oil spills when a ship docks to load or unload goods.

This oil boom is also commonly installed at locations where stormwater ditches flow into rivers, lakes, etc to 24/24h proactively respond to oil spills on the surface of warehouses, factories, industrial parks, etc.

#### **KEY FEATURES**

- Permanent oil boom is made of highly durable materials that are superiorly resistant to oil, chemicals, UV rays, marine-growth and severe weather, also withstand strong impacts of waves or crash.

- The product's lifespan is up to 10-15 years for permanent deployment on water.

- The boom structure includes a floating part and a skirt with counterweights to keep the boom balanced.





Permanent oil containment booms installed at the drainage canal of a steel factory



Permanent oil containment booms installed at a petroleum port





Permanent oil containment booms installed at an aviation fuel port



Permanent oil containment booms installed at the cooling water intake area of a thermal power plant



Permanent oil containment booms installed at the drainage canal of a petrochemical refinery

SPECIFICATIONS AND MODEL	SOSSIGMA-18	SOSSIGMA-24	SOSSIGMA-36		
Overall height (mm)	457	610	914		
Float freeboard (mm)	254	254	254		
Skirt draft (mm)	203	356	660		
Total tensile strength (kgf)	11747	16329	23494		
Flotation material	HDPE plastic block with impact-resistant compound, Completely sealed				
Fabric	PVC-coated fiber reinforced rubber impregnated with marine-growth and UV inhibitors. Weight: 172-oz/sq-yd (5.8kg/m <sup>2</sup> )				
Connectors and locking pins	Universal standard 6061 marine grade aluminum connectors ASTM SS304 locking pins				
Standard section length (m) (,P)	15/20/30	15/20/30	15/20/30		

ho The length of one section can be changed according to Customer's request.



# OIL CONTAINMENT BOOM ANCHOR SYSTEM

The anchor system has the function of keeping deployed oil containment booms in place on the water surface, preventing the booms from drifting under the influence of currents or wind, especially in areas with complex water flows. The design focuses on safety and aesthetics. The anchor blades are foldable and securely latched, avoiding potential dangers caused by the sharp tip of the anchor blades when placed on the deck of a waterway vehicle.

SPECIFICATIONS AND MODEL	SOSAS-5	SOSAS-10	SOSAS-15	
Anchor weight (kg)	5	10	15	
Anchor length when folded (mm)	405	635	635	
Anchor blade diameter when opened (mm)	540	655	780	
Main material	Cast iron			
Anchor rope	Material: polypropylene. Dimensions: Ø 12 $ imes$ 12 m			
Anchor buoy	A-25	A-25	A-30	
Anchor chain	$\emptyset$ 8 $\times$ 2.4m $\emptyset$ 10 $\times$ 2.4m			
Anchor buoy's buoyancy (kg)	15	15	20	
Packaging size (mm)	$480\times250\times230$	$680 \times 250 \times 190$	$680 \times 260 \times 200$	
Total weight (kg)	~10.5	~ 17	~ 20	

#### INSTALLATION INSTRUCTIONS

#### 1. The anchor system includes components packaged in a carton, details are as follows:

No.	ITEM	QUANTITY
1	Anchor buoy rope	1
2	Shackle (1 ton)	4
3	Anchor buoy	1
4	Anchor rope	1
5	Anchor chain	1
6	Anchor	1
7	Anchor buoy needle	1

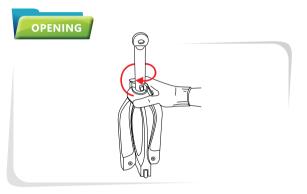


#### 2. Installation steps

Step 1: Assemble anchor buoy with buoy rope (2.4m) and anchor rope (12m) by using 1 shackle. Step 2: Assemble the remaining end of the anchor rope (12m) with the chain by using 1 shackle. Assemble the other end of the chain with the anchor by using 1 shackle.

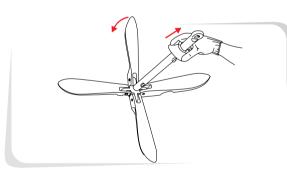
Step 3: Use the needle to inflate the buoy, pumping pressure is about 2 bar. Step 4: Release the anchor blades. Drop the anchor at the required position. (Note: Check the shackle locks to see if they are tightened before use)

#### 3. Instructions for opening and closing the anchor

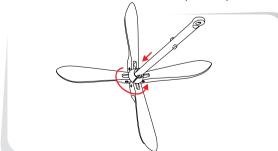




Step 1: Rotate the anchor cup clockwise to the slide

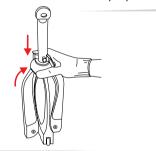


Step 2: Lift the anchor cup for the anchor blades to come out of the anchor cup and open

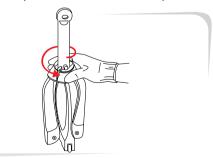


**Step 3:** Drop the anchor cup down, rotate the anchor cup counterclockwise to the stop to latch the anchor blades open

Step 1: Rotate the anchor cup clockwise to the slide, and lift the anchor cup up



Step 2: Fold the 4 anchor blades, lower the anchor cup to snap onto the anchor blade tips



Step 3: Rotate the anchor cup counterclockwise to the stop to lock the anchor blades



# **OIL-CHEMICAL SKIMMER SYSTEM**

Oil-chemical skimmer is a unique device that integrates many features with an extremely portable and compact design: Skim oil floating on water surface; Vacuum spilled oil and chemical on hard surfaces, ditches, in underground sewers, wells and in other hard-to-reach locations.

This multi - purpose device is the result of extensive research and improvement through SOS Center's practical experience of responding to more

#### **KEYS FEATURES**

- The skimmer system has a compact design. All parts are flexibly connected to each other by using quick couplers. Thanks to this, it can be easily pushed and lifted by hands, mobile transportation by popular vehicles such as motorbikes, carts, basket boats, small boats, etc to meet emergency requirements for accessing the incident scene, even in hard-to-reach places to promptly deploy response activities.

- It is multi-purpose equipment suitable for all facilities at risk of oil/chemical spill incidents:

than 260 environmental incidents. It is an optimal alternative solution that helps businesses minimize investment costs for oil/chemical spill response equipment. One product can simultaneously replace various types of oil skimmers suitable for different oil viscosities and specialized chemical suction pumps.

Petroleum warehouses; cargo ports, specialized ports; barges/pontoons selling petroleum on the water; oil tankers; construction projects on rivers and seas; petrol stations; petrol retailers on land, near the water's edge; chemical warehouses, factories/industrial parks related to the use of oil and chemicals, hazardous waste treatment facilities...

- Important parts of the skimmer system are made from special materials that are resistant to seawater, oil, and chemicals. Tool sets, racks, and couplers are made of SS304. Oil/chemical transfer pipes are reinforced with steel core.

### SOSE-2



#### SPECIFICATIONS

#### Engine

Model: Honda GX200 Power: 4.8 kW/3600 rpm Fuel: Gasoline Recoil starter

#### Pump

Capacity: 18 m<sup>3</sup>/h Suction depth: 8 m Pumping height: 20m Impeller: special rubber resistant to oil, chemicals and sea water Material: SS304 Inlet/Outlet: Ø 50mm

#### Pump frame

Yellow powder-coated steel tube frame Having handles and 02 wheels Dimensions: 680mm (H)  $\times$  600mm (W)  $\times$  620mm (L) Total weight of the pump:  $\sim$  70 kg

## SOSE-3

#### **SPECIFICATIONS**

#### Engine

Model: Honda GP200 Power: 5.5Hp/3600 rpm Fuel: gasoline Recoil starter

#### Pump

Capacity: 12m<sup>3</sup>/h Suction depth: 6m Pumping height: 30m Impeller: special rubber resistant to oil, chemicals and sea water Material: SS304 Inlet/Outlet: Ø 50mm

#### Pump frame

Material: Yellow powder coated steel Design of 04 rubber anti vibration pads. Dimensions: 460mm (H)  $\times$  395mm (W)  $\times$  570mm (L) Total weight of the pump: ~28kg

## **SOSE-3**+

#### **SPECIFICATIONS**

#### Motor

Model: KLYBDC-90L-4 Power: 1.5kW/1450rpm Voltage: 220V Rated current: 9.8A Insulation Class: F Ingress Protection (IP) rating: 55 Type of protection: Ex d IIB T4 Gb

#### Pump

Capacity: 12m<sup>3</sup>/h Suction depth: 6m Pumping height: 30m Impeller: special rubber resistant to oil, chemicals and sea water Material: SS304 Inlet/Outlet: Ø 50mm

#### Pump frame

Material: Yellow powder coated aluminum Design of 04 rubber anti vibration pads Dimensions: 330mm (H)  $\times$  206mm (W)  $\times$  600mm (L) Total weight of the pump: ~35kg



# **SOSE-7**+

#### **SPECIFICATIONS**

#### Motor

4-stroke engine, 208cc Power: 6.3Hp/3600rpm Fuel: Gasoline Recoil starter

#### Pump

Capacity: 30m<sup>3</sup>/h Suction depth: 6.5m Pumping height: 26m Material: Aluminum alloy Inlet/Outlet: Ø 50mm

#### Pump frame

Material: Yellow powder coated steel Having handles, 02 wheels and 02 rubber anti vibration pads Dimensions: 560mm (H)  $\times$  445mm (W)  $\times$  600mm (L) Total weight of the pump: ~40kg

### **SOSE-10** +

#### **SPECIFICATIONS**

#### Motor

Model: KIPOR KM178-FA Power: 5Hp/3600rpm Fuel: Diesel Spring starter

#### Pump

Capacity: 18m<sup>3</sup>/h Suction depth: 5m Pumping height: 45m Impeller: special rubber resistant to oil, chemicals and sea water Material: SS304 Inlet/Outlet: Ø 50mm

#### Pump frame

Material: Yellow powder coated steel Having handles and 04 wheels Dimensions: 850mm (H)  $\times$  530mm (W)  $\times$  800mm (L) Total weight of the pump: ~118kg



## SOSE-12

#### **SPECIFICATIONS**

#### Motor

Model: YBDC-100L1-4 Power: 2.2kW/1450rpm Voltage: 220V Rated current: 13A Insulation Class: F Ingress Protection (IP) rating: 55 Type of protection: Ex d IIB T4

#### Pump

Capacity: 15m<sup>3</sup>/h Suction depth: 5m Pumping height: 30m Impeller: special rubber resistant to oil, chemicals and sea water Material: SS304 Inlet/Outlet: Ø 50mm

#### Pump frame

Material: Yellow powder coated 304 stainless steel Design of handles and 04 rubber anti vibration pads. Dimensions: 890mm (H)  $\times$  670mm (W)  $\times$  910mm (L) Total weight of the pump: ~95kg





Use SOSE-2 to recover spilled oil at the stormwater collection gate of a petroleum depot



Use SOSE-2 to recover spilled oil at irrigation ditches



Use SOSE-7 to high-pressure wash oil-contaminated ditches



Use SOSE-7 to high-pressure wash oil-contaminated ditches and roads



# **SUCTION HEAD SYSTEM**

# SM-2

#### **Floating suction head**

Dimensions: Ø 1000mm  $\times$  450mm (H) Weight: 40kg Pipe diameter: Ø 50mm Suction particle size:  $\leq$  Ø 6mm Quick coupling with Ø 50mm suction pipe Color: Yellow powder coating Material: SS304 \* Use water to balance

#### Suction pump basket

Dimensions: Ø 170mm  $\times$  170mm (H) Suction particle size:  $\leq Ø$  6mm Quick coupling with suction pipe Ø 50mm Material: SS304

#### Suction/discharge pipe

Suction pipe: Ø 50mm  $\times$  8m (L) Discharge pipe: Ø 50mm  $\times$  12m (L) Quick coupling with suction pipe Ø 50mm Material: PVC with steel core

## SM-3

#### Floating suction head

Dimensions: Equilateral triangle 490mm × 280mm (H) Weight: 8kg Floating balls: 3 balls; Material: PVC; Ø 200mm × 210mm (H) Pipe diameter: Ø 25mm Suction particle size: Ø 6mm Quick coupling with Ø 25mm suction pipe Material: SS304

#### Flat suction head

Dimensions:  $105 \text{mm} \times 180 \text{mm}$ Suction particle size:  $\leq \emptyset$  6mm Quick coupling with  $\emptyset$  25mm suction pipe Material: SS304

#### Floor suction head

Dimensions: Ø 141mm  $\times$  128mm Suction particle size:  $\leq$  Ø 6mm Quick coupling with Ø 25mm suction pipe Material: SS304



#### Suction pump basket

Dimensions: Ø 118mm  $\times$  115mm (H) Suction particle size:  $\leq$  Ø 6mm Quick coupling with Ø 25mm suction pipe Material: SS304

#### Suction/discharge pipe

Suction pipe: Ø 25mm  $\times$  8m (L) Material: PVC with steel core Discharge pipe: Ø 25mm  $\times$  10m (L) Material: PVC Quick coupling with Ø 25mm suction pipe





### SM-4

#### Floating suction head

Dimensions: Ø 750mm × 312mm (H) Weight: 15kg Floating balls: 3 balls; Material: PVC; Ø230mm × 250mm (H) Pipe diameter: Ø 50mm Suction particle size:  $\leq Ø$  6mm Quick coupling with Ø 50mm suction pipe Material: SS304

#### Flat suction head

Dimensions: 150mm  $\times$  150mm Suction particle size:  $\leq \emptyset$  6mm Quick coupling with  $\emptyset$  50mm suction pipe Material: SS304

#### Floor suction head

Dimensions: Ø 140mm  $\times$  150mm Suction particle size:  $\leq$  Ø 6mm Quick coupling with Ø 50mm suction pipe Material: SS304

#### Suction pump basket

Dimensions: Ø 170mm  $\times$  170mm (H) Suction particle size:  $\leq$  Ø 6mm Quick coupling with Ø 50mm suction pipe Material: SS304

#### Suction/discharge pipe

Suction pipe: Ø 50mm  $\times$  8m (L) Discharge pipe: Ø 50mm  $\times$  12m (L) Quick coupling with suction pipe Ø 50mm Material: PVC with steel core







# **OPEN-TOP TEMPORARY STORAGE TANK**

Open - top temporary storage tank is a portable, self - erecting open - top reservoir for temporary storage of all types of liquids, suitable for many different applications such as oil/chemical emergency response, industrial and civil use. The tank can be used to temporarily store large amount of oil/chemical contaminated water collected from the process of oil/chemical/industrial waste spill recovery; or store water for firefighting, civil construction, etc and bulk storage of other liquids.

The product is an ideal alternative to conventional storage tanks/drums, which have many limitations such as being heavy, bulky, and unable to be equipped with vehicles. It is also a solution to overcome difficulties in mobilizing storage vehicles to the scene, especially in remote or hard-to-reach areas.

#### **KEY FEATURES**

- The tank is compact, lightweight and portable. It can be folded into the equipped bag, convenient for ready arrangement at warehouses, ports, petrol stations or equipped with tank trucks and other locations with high risk of oil/chemical spills for immediate deployment for emergency response.

- The tank can be deployed quickly in areas with limited space; no complicated frame or tools for assembly are required, meeting emergency response requirements when an oil/chemical spill occurs.

- The tank is constructed of highly durable PVC coated, resistant to UV, oil, chemicals, and can be used outdoors for a long time with radiant heat up to 60°C.

- The tank welds are processed by high - frequency welding technology to increase tensile strength.

- The tank's floating collar is made of oil-chemical resistant PE foam, helping the tank wall to automatically adjust up and down according to the level of liquid contained in the tank.

- The tank has one filling/drain valve (tanks with a capacity of over 5m<sup>3</sup> have two filling/drain valves) with quick coupling for convenient disassembly and assembly..



Use open-top temporary storage tank to temporarily store oil-contaminated water recovered from oil spill response activities



Use open-top temporary storage tank to store water for civil use



Use mobile tanks to temporarily store oil-contaminated water collected from oil recovery activities after a fire incident



Use mobile tanks to temporarily store oil-contaminated water recovered from oil spill response activities at the coastal area



Deploy mobile tank to store oil recovered from oil skimmer at a port

#### **SPECIFICATIONS AND MODEL**



Deploy mobile tank to catch oil leaks under a truck

	SOSLT-1	SOSLT-2	SOSLT-5	SOSLT-10	
Capacity (m3) (🔎	1	2	5	10	
Material	PVC coated fabric, r	esistant to UV, oil and	chemicals Thickness: 0	0.64mm (± 0.05mm)	
Filling/drain valve (mm)	Ø 50				
Tank size when filled (base × top × height) (mm) (,2)	Ø2100 × Ø1600 × 450	Ø1660 × Ø1100 × 800	Ø3100 × Ø1800 × 1100	Ø5000 × Ø3600 × 1250	
Packing size (mm)	520  imes 480  imes 420	610  imes 460  imes 300	660 × 600 × 400	1000 × 800 × 600	
Dry weight (kg)	~ 8	~ 10	~ 20	~ 45	

 $\wp$  Tank capacity and sizes can be changed according to Customer's request.



# HEXAGONAL TEMPORARY STORAGE TANK

Hexagonal temporary storage tank is used to store oil or liquid chemicals that need to be recovered in oil, chemical spills or leaks. It is manufactured with specialized materials with high durability. The tank is designed to be easily folded, occupy a small volume so making it easy to store in narrow spaces.

#### **KEY FEATURES**

- The tank is constructed of highly durable PVC coated fabric, resistant to UV, oil, chemicals, and can be used outdoors for a long time with radiant heat up to 60°C.

- It can be easily and quickly deployed on site, without the need for complicated frame or special training, and can be deployed in areas with limited space such as under vehicles, etc.

- The tank can be folded and stored in the supplied bag, convenient to equip vehicles, preserve and store.

- The tank walls are highly durable, high-quality PVC foam sheets. The tank welds are processed by high-frequency welding technology to increase adhesion and tensile strength.



Hexagonal tanks equipped for petrol stations

Deploy hexagonal tank to catch oil leaks under a truck





Hexagonal tanks with diverse storage capacities









Deploy hexagonal tanks to store oil collected from oil spill response activities at port

SPECIFICATIONS AND MODEL	SOSHT-0.2	SOSHT-0.5	SOSHT-1	
Capacity (m <sup>3</sup> )	0.2	0.5	1	
Material	PVC coated fabric, resistant to UV, oil and chemicals Thickness: 0.64mm (± 0.05mm)			
Filling/drain valve (mm)	Ø 27			
Tank size when filled (hexagon side $\times$ height) (mm)	580 × 300	680 × 450	800 × 660	
Packing size (mm)	600  imes 330  imes 60	700  imes 460  imes 60	810  imes 670  imes 60	
Dry weight (kg)	~ 4.5	~ 8	~ 16	



# FLOATING TEMPORARY STORAGE TANK

Floating temporary storage tank is specifically used to temporarily store oil/chemicals recovered during oil/ chemical spill response activities on rivers and seas. The tank can be easily towed to shore by boats/canoes to be pumped and transported for treatment.

The tank overcomes inadequate and even unfeasible technical solution that is often proposed when an incident occurs, which is mobilizing ships, barges, etc. to the scene to store oil/chemicals.

#### **KEY FEATURES**

- In oil/chemical spill response activities on rivers and seas, or in other offshore locations, it is extremely important to promptly ensure equipment to contain pollutants during the recovery process. If adequate storage equipment is not guaranteed, oil/chemicals will escape into the water environment, causing serious and long-term consequences for the environment and humans.

To minimize unpredictable dangers to the environment due to oil/chemical spills on water and offshore locations, with practical experience in responding to more than 260 environmental incidents, SOS has researched and developed floating temporary storage tanks with different storage capacities, suitable for available types of towing vehicles.

- The tank is designed from specialized materials that are highly durable, resistant to UV rays, oil, and chemicals, and can be used outdoors at temperature up to 60°C. It is easily folded for storage and simple to be deployed, towed and moved on the water by boats/canoes.

- The tank has two filling valves and one tank bottom discharge valve including a quick coupler with the existing oil pump pipe. The tank is equipped with a set of Universal standard connection bars, 6061A marine grade aluminum connectors and SS304 locking pins, making it easy to tow on the water surface as well as synchronously connect multiple tanks together.

- The tank welds are processed by high-frequency welding technology to increase adhesion and tensile strength.





Deploy floating tanks to temporarily store oil-contaminated water recovered from oil spill response activities on rivers and lakes



Deploy floating tanks to temporarily store oil-contaminated water recovered from oil spill response activities on rivers and lakes









Deploy floating tanks to temporarily store oil-contaminated water recovered from offshore oil spill response activities

SPECIFICATIONS AND MODEL	SOSMT-1.5	SOSMT-2.5	SOSMT-5	
Capacity (m <sup>3</sup> )	1.5	2.5	5	
Material	PVC coated fabric, resistant to UV, oil and chemicals Thickness: 0.64mm (± 0.05mm)			
Filling/drain valve (mm)	03 Ø 50 valves			
Tank size when deployed (mm)	$3500 \times 900 \times 750$	$3500\times1200\times1000$	$5600\times1200\times1000$	
Packing size (mm)	900  imes 700  imes 500	$1200\times800\times500$	$1100\times900\times800$	
Dry weight (kg)	~ 20	~ 30	~ 40	



# MOBILE OIL-CONTAMINATED WASTEWATER TREATMENT SYSTEM

Mobile oil-contaminated wastewater treatment system is capable of quickly filtering oil from a large amount of oil - contaminated water arising in on-site oil spill response activities. It is an alternative solution to overcome difficulties in transporting large volumes of oil contaminated water from the incident site to the treatment site as well as significantly reduce treatment costs.

### SOS-T3 Mobile oil filtering module

#### **KEY FEATURES**

- SOS-T3 is made of SS304 with a lightweight and compact structure, easy to transport by common vehicles such as motorbikes, canoes, basket boats or by hands, etc to hard-to-reach locations.

- The frame system design combined with specialized filtering layers optimizes the ability to filter oil from wastewater with a fast flow rate of up to 30m<sup>3</sup>/h, meeting the requirement for quick treatment of large volumes of oil-contaminated water generated during emergency oil spill response.

- Operating this device is very simple. Oil contaminated water is pumped or poured from outside then oil is separated by a system of filtering layers inside. There are no motorized parts so the maintenance is easy.







Use mobile oil filtering module to treat oil-contaminated water collected from incident response activities on-site

#### **SPECIFICATIONS**

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ITEM	SPECIFICATIONS
Filtration capacity (provided that total suspended solids (TSS) < 150 mg/l, total mineral grease < 300 mg/l)	20m³/h
Filtration capacity (provided that total suspended solids (TSS) > 150 mg/l, total mineral grease > 300 mg/l)	10m³/h
Filterable solid particle size	> 150µm
Filtering material: Polypropylene (thickness: 10mm), SOS-1 (thickness: 5mm)	2 layers
Have 1 inlet by the camlock connector	Ø 50mm
Have 2 outlets by the camlock connector	Ø 50mm
Material	SS304
Dimensions (L $\times$ W $\times$ H) (mm)	$500 \times 500 \times 485$
Weight	~ 30kg



### Oil-contaminated wastewater treatment module

#### **TECHNOLOGY**

The oil-contaminated wastewater treatment module consists of: Suction pump, receiving compartment, oil separator, sludge settling compartment, multi-level oil filter compartment.

With the purpose of thoroughly treating the amount of oil dissolved in oil-contaminated wastewater, the input water source is pumped by centrifugal suction through the pipeline into the treatment module. Based on the characteristics of oil and suspended waste that is lighter than water, it will float on the free surface, sludge and solid impurities will settle at the bottom of the compartments, along with the change in the flow rate of the water with the impact of the partitions and multi-layer filter materials. The process of combining the above factors has maximally affected the amount of oil dissolved in water that floats on the free surface and the amount of sludge and solid impurities that settle at the bottom of the receiving compartments, oil separator compartment and sludge settling compartment. The remaining amount of oil film is completely treated in the multi-level oil filter compartments containing SOS-1 oil filtering fabric trays. The final water source is guaranteed to meet the standards for oil-contaminated wastewater at petroleum depots (QCVN 29:2010 BTNMT).



Using oil-contaminated wastewater treatment module to treat oil-contaminated water on-site at petroleum depots

SOME PRACTICAL APPLICATION PHOTOS

90



Using oil-contaminated wastewater treatment module to treat oil-contaminated water on-site in oil spill response activities



Using oil-contaminated wastewater treatment module for on-site treatment of oil-contaminated water at hydropower plants

#### **FEATURES**

• Compact, closed module system, installation takes up little space.

- Easy to install, move when needed.
- Simple operation and maintenance. No need for regular technical experts.

• Requires few operators (2 people, operating 1-2 times/week. Each operation lasts 2-5 minutes, depending on the amount of oil discharged into the treatment tank).

• Unlike many systems that must maintain daily operation, maintenance, repair and replacement of spare parts, the oil-contaminated wastewater treatment module can stop operating for a long time or work continuously without problems, without maintenance, repair or replacement of spare parts.

• No need to significantly renovate and build existing items at the facility. When needed, the module can be moved to a new location for installation simply, inexpensively, ensuring maximum savings.

• Investment, operation and maintenance costs are much lower than the current traditional design

• Energy saving, low noise: The entire system has a power consumption of 1.1 KWh, operates smoothly with low noise and high efficiency, durable, low wear, and requires little maintenance. Automatic or manual process control.

• Especially suitable for small-scale treatment systems; low equipment maintenance costs, average inspection and discharge time of excess sludge is 3-4 months.

#### SPECIFICATIONS ()

ITEM		UNIT	SPECIFICATIONS
Capacity		m³/h	10
Electric power		kW	0.75
Power supply			220VAC/380VAC
Dimensions (Lx W x H)		mm	2500 x1400 x 1350
Frame material			SS304
Filtering material assembly		Set	02
Attached technological pipeline - Waste water pump pipeline: PVC/DN 60 - Drainage pipeline: PVC/DN 90 - Hand valve, one-way valve, pipe joints		Set	01
Control cabinet - Outdoor cabinet - Level sensor - Cable protection pipe - Pump control, power and control cables		Set	01
Oil filtering assembly	Frame assembly	Pc	04
	Frame material		SS304
	Dimensions (Lx W x H)	mm	940 x 598 x 72
	SOS-1 oil filtering fabric	Layer	02
	Minimum filterable solid particle size	μm	>150

ho Specifications can be changed according to capacity and Customer's request.



# SOS-1 OIL FILTERING FABRIC

SOS-1 is an ideal oil filtering material even with strong flow rates, especially suitable for responding to submerged oil spills penetrating coastlines, aquaculture fields, sensitive areas or oil spills into drains, ponds and lakes, etc.

SOS-1 is an effective alternative solution to separate oil from wastewater of factories, workshops, production facilities, mechanical repair stations, petrol stations; oil contaminated water at wharves and bays; oily bilge water, etc instead of investing in expensive complex oil separators.

#### **KEY FEATURES**

- Manufactured from 100% virgin plastic beads using nanotechnology, without impurities harmful to the environment.

- Solve the issue of filtering oil scum in wastewater that factories, production facilities, boats, etc are encountering but have no feasible and effective solution.

- Absorb oil or oil contaminated wastewater up to 20 times its own weight.

- Oil filtering capacity is not affected even when SOS-1 is submerged in water, the oil absorbed in will push the water out of the fabric and take the place.

- The fabric surface allows water to flow through with a maximum flow rate of up to  $250m^3/h/m^2$ .

- Simple to use (let oil-contaminated water flow through) instead of investing in expensive oil-water separator equipment.

- High economic efficiency because SOS-1 can be reused several times. Oil-saturated fabric can be burned for high heat with less than 1% ash.

- The product can be made in many different sizes and shapes: filter bag, oil trap mesh, pillow/oil absorbent pad for drains, shore covering to absorb oil and avoiding soil erosion, oil filtering curtain to collect oil scum at ports, etc.

#### SOME PRACTICAL APPLICATION PHOTOS

52 AN AT 12 3





Oil filtering fabric combined with oil containment booms to proactively prevent oil pollution in the water intake canal of a water plant



Oil filtering layer at the discharge drain of a thermal power plant

Oil filtering layers in oil-water separator @



#### **APPLICATIONS**

- Oil filtration and absorption: Filtering oil and oil contaminants from ditches, pipes, reservoirs, sewage pits, manholes, sewers, rivers, canals, etc.

- Support for water - oil separator: Water coming out of oil-water separators often still has thin oil scum. SOS-1 is used to eliminate oil scum in the final stage before discharging water into the environment.

- Oil filtering/anti-erosion layer of ditches, pond banks: There are 4 simultaneous effects: Preventing oil scum or oil in water from contaminating the pond bank; Preventing oil contaminated in the soil from escaping into the water environment; Preventing the soil of the ditch/pond from being eroded; Absorbing and holding oil in the fibers of the fabric to give the natural environment time to decompose. - Oil filtering layer on river/sea (shoreline protection): Used as a barrier to prevent spilled oil from entering the shore, easy to deploy even in rocky shore areas or uneven water bottom.

- Wastewater filtration: Especially effective when used to filter grease in wastewater, oil sump without blocking the flow.

- Oil spill response: Used as a filter membrane, helps retain oil and allows clean water to flow through, preventing oil from spreading and minimizing the risk of water pollution. PACKAGING

#### Product is packaged in standard roll with

dimensions: 1.5m (W) imes 75m (L) imes 5mm (T).

(Product sizes can be adjusted according to Customer's request)



Filtering oil-contaminated water recovered from oil spill response activities



Oil filtering frames at an industrial park's discharge sewer



# OIL ABSORBENT POWDER

Kleen-HAZO is an industrial oil absorbent used for daily clean up of oil spills and leaks on floors at petrol stations, petrol retailers, factories, warehouses, boat/ ship decks, etc, as well as oil spill emergency response. The product is made from natural cellulose, simple to use and preserve, safe for the environment and human health.



#### **KEY FEATURES**

- Quickly absorb and clean liquid spills and leaks such as gasoline, oil, paint, chemicals, etc.

- Effective absorbency (1kg of Kleen-HAZO can absorb 2-4kg of oil, depending on viscosity).

- Encapsulate the liquids it absorbs, does not release them back into the environment (even when immersed in water or compressed under burial pressure). It is an excellent alternative to conventional absorbents with low oil absorption capacity (for example: 1kg of sand holds 0.2kg of oil, creating a 6-fold increase in the amount of hazardous waste that must be treated, incapable of encapsulation, allowing oil to release back into the environment).

- The product is made from materials of natural origin, 100% biodegradable.

- Safe for human, animals and the environment.

- Simple to use.

#### **APPLICATIONS**

 Absorb and clean oil spills and leaks at oil and gas terminals, petrol stations, petrol retailers, tankers, mechanical maintenance and repair workshops, factories, warehouses, construction projects on land, at ports, dredging projects, etc, and all locations where oil and other hydrocarbon solutions often spill or leak.

- Absorb and clean chemical solutions that do not react with cellulose, and other types of spilled liquids in industrial parks, factories, production facilities, etc.

#### PACKAGING

Plastic pail, net weight: 8kg.

#### **INSTRUCTIONS FOR USE AND STORAGE**

- Step 1: Sprinkle Kleen-HAZO to cover the spill, spread from outside to inside.

- Step 2: Use a broom/brush to maximize Kleen-HAZO's absorbency. Sprinkle additional Kleen-HAZO to thoroughly absorb spilled solution if any remains on the surface.

- Step 3: Take Kleen-HAZO and absorbed solution mixture for treatment according to local regulations.

**Note:** Keep the product dry before use. Avoid direct exposure to sunlight and heat sources.



#### **SOME PRACTICAL APPLICATION PHOTOS** (Kleen-HAZO cleans oil sticking on rough metal floors of petrol stations)



1. The floor is stained with oil



2. Sprinkle a little Kleen-HAZO powder on the floor



3. Use a brush to scrub



4. The floor is clean, no oil left



# **Bio Bio Remediation** Powder

Bio-HAZO oil absorbent and bioremediation powder has dual purposes: Rapidly absorbs gasoline, oil and other hydrocarbon solutions immediately upon contact; and biodegrades encapsulated hydrocarbons by "oil-eating" microorganisms, converting toxic substances into carbon dioxide and water.

Bio-HAZO is made from natural Cellulose, which decomposes into humus after a period of time microorganisms "eat" all the oil, creating a source of fertilizer for soil. Bio-HAZO is completely safe for the environment and human health.



#### **KEY FEATURES**

- Rapid absorption of hydrocarbon compounds.

- Rapid encapsulation and immobilization of hydrocarbons: eliminate leaching of hydrocarbon into the environment even when immersed in water or compressed by burial.

- Decompose hydrocarbons by microorganisms available in Bio-HAZO, converted into carbon dioxide and water.

- Deodorization (because Bio-HAZO simultaneously treats  $NH_4$  and  $H_2S$ ).

- The product is made from natural Cellulose, non-toxic to human health, animals, plants and the environment.

- The final product is a form of humus useful for soil.

- Economical and effective oil spill remediation and restoration, with full control of on-site treatment: Reduce the cost of labor, machinery for excavating, loading and transporting as well as huge cost of treating large amount of oil contaminated soil.

- Safe and simple to use, no specialist or special training required.

#### **APPLICATIONS**

- On-site treatment of sand, soil, rocks, river banks, beaches, etc that are contaminated by oil spills on rivers and seas.

- On-site treatment of sand, mud, gardens, fields, etc due to oil spills from vehicles, petroleum depots, underground oil pipes, underground oil tanks.

- Used to clean daily oil spills or leaks on wharves, decks, and floors.

- On-site treatment of oil contaminated sludge arising from washing and cleaning of petroleum storage tanks.

#### PACKAGING

Plastic pail, net weight: 8kg.

#### **INSTRUCTIONS FOR USE AND STORAGE**

- Mix Bio-HAZO with soil (about 1-2 pails of 8kg/1m3 of contaminated soil). Bio-HAZO will absorb oil rapidly, encapsulate and immobilize oil inside the cotton fibers without leaching even when being in the rain, submerged in water, exposed to the sun or buried. This superior isolation property eliminates the risk of oil spreading, seeping deeply into the soil or dispersing into the air.

- Biodegradation of encapsulated oil by Bio-HAZO microorganisms takes place shortly thereafter. 70-80% of absorbed oil is decomposed after 2 months. Under optimal conditions, 80% of hydrocarbons are decomposed after 30 days. Bio-HAZO microorganisms optimize the ability to decompose oil in the temperature range above 4°C and below 40°C, humidity 40%, pH 6-8. The time hydrocarbons are completely decomposed is much faster than the time Bio-HAZO cotton fibers decompose themselves, therefore it is not harmful to the environment.

- For the treatment of polluted oil that has penetrated deep into the soil, it is necessary to use equipment for digging, mixing, ect.

- Keep the product dry before use.

#### SOME PRACTICAL APPLICATION PHOTOS (before and after treatment)

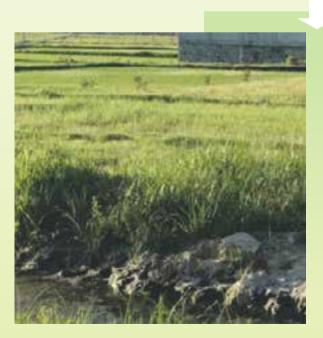


Using Bio-HAZO in environmental restoration after oil spill in agricultural land























## HAZ-SORB CHEMICAL ABSORBENT AND NEUTRALIZING POWDER

HAZ-SORB chemical absorbent and neutralizing powder is specialized for quickly absorbing, neutralizing and cleaning chemical solutions when spills or leaks occur in warehouses, workshops, factories and ports related to storage, transportation, and use of chemicals.

The product is made from natural inorganic mineral materials, safe for human and the environment.

#### **KEY FEATURES**

- Human and environmentally-friendly.

- Good absorption of liquid chemicals such as: Acids (including concentrated acids), bases, solvents, petroleum.

- Absorbency: 1kg of HAZ-SORB can absorb from 0.8-2.5 liters of chemicals (depends on the viscosity of the solution).

Ability to neutralize acids and bases: Depends on the concentration of acids and bases.

#### PACKAGING

Plastic pail, net weight: 2kg

#### **INSTRUCTIONS**

- Sprinkle HAZ-SORB to cover the spill, spread from outside to inside.

- Use a broom/brush to maximize HAZ-SORB's absorbency. Sprinkle additional HAZ-SORB to thoroughly absorb spilled solution if any remains on the surface.

Take HAZ-SORB and absorbed chemical solution mixture for treatment according to local regulations.

#### SOME PRACTICAL APPLICATION PHOTOS

407\_SORE





Use HAZ-SORB to soak up and neutralize chemical spills on hard surface



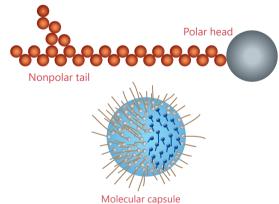
# INDUSTRIAL DEODORIZER

HAZO is a specialized solution used to eliminate odors, gases, smoke, toxic vapors such as gas, gasoline vapor, benzene, CO,  $H_2S$ , methane, acid vapor, garbage odor, etc arising from production, processing, and waste treatment activities in industry, agriculture, forestry, and fishery, etc.; clean fine dust and toxic chemicals on surfaces and clothes.

HAZO is also used for emergency response to incidents involving toxic gases caused by fires or chemical spills.

#### **MECHANISM OF ACTION**

HAZO uses Encapsulate Technology, a biotechnology that creates a substance with a molecular structure including a hydrophilic polar head and a hydrophilic nonpolar tail. When mixing HAZO solution with water, the molecules will quickly form spherical molecular capsules with the polar head facing outward and the infinity tail facing inward. The mechanism of action of molecular encapsulation can be explained as follows:



+ Carrying the same charge, they tend to repel each other. The distance between molecular capsules depends on the concentration of HAZO mixed with water. The lower the concentration, the greater the stability and dispersion.



+ Hollow molecular capsules tend to be affected by free electrons in water (due to water-soluble agents such as microorganisms, CH<sup>+</sup>, small metal nanoparticles...) and kinetic energy. Specifically, when exposed to kinetic energy, the molecular capsules will tend to enclose the impurity molecules inside until they are balanced in water. The new structure is still spherical capsules with polar heads outside and impurity molecules inside. This structure is very difficult to break by temperature and energy impact from the outside. Due to the same electrostatic state, these molecular capsules still tend to repel each other.

+ When spraying HAZO into the air, HAZO droplets will be created. These droplets have a structure consisting of a shell with polar head facing the water surface and nonpolar tails facing outward. Inside the droplet is a solution containing water and molecular capsules. Due to the reduced surface tension of water, the tendency for droplets to split during contact with air happens very quickly. With the characteristic of being sensitive to CH<sup>+</sup> molecules, fine dust, bacteria, viruses, etch in the air, these droplets tend to stick to and cover these materials during the falling process.

+ In case of spraying nano-sized HAZO droplets, an aerosol will be created. Microscopic HAZO droplets can remain in the air for longer periods of time just like water vapor humidifies the air. However, the difference is that the weight of these microscopic droplets will increase rapidly when exposed to CH+ molecules and impurities flying in the air and falling.

+ When HAZO adheres to surfaces, it will create a molecular film covering the water surface and in the ultra-thin water layer there exist millions of molecular capsules. These molecular capsules tend to enclose free molecules and materials (including microorganisms) on the surface.

#### **KEY FEATURES**

- **Suppression of thermal energy:** When exposed to a heat source in the form of radiation, contact, or convection, the polar tails become the heads that absorb heat energy and transmit it to the structure of molecular capsules. Because the heat transfer mechanism converts to the molecular form, the heat energy dissipation is very large in a short time.

- Encapsulation of diffusible molecules: With nonpolar tails and molecule encapsulation structure, molecular droplets are capable of encapsulating diffusing molecules in the form of gases, fine dust, vaporized liquids, even liquid fuels.

- **Neutralization:** With encapsulator mechanism, the molecular droplets have the effect of reducing the pH of water as well as the concentration of other corrosive active ingredients.

- **Eco-friendly:** Molecular droplets after encapsulating diffuse molecules help to reduce toxicity to the environment. Manufacturing technology is environmentally-friendly biotechnology.

#### PACKAGING

20L plastic pail, 5L plastic pail, 500ml bottle





Spray HAZO to clean fine dust and toxic chemicals on the surface of clothes



Spray HAZO to deodorize during barn cleaning



20L plastic pail



5L plastic pail



500ml bottle













Spray HAZO to eliminate gasoline vapor dispersion and prevent the risk of fire and explosion during oil spill emergency response



## C-PEC

## **MULTI-PURPOSE ENCAPSULATOR AGENT**

C-PEC is a specialized solution for cleaning oil spills on the surface and underground, sand, gravel, rocks, etc; Treating oil contaminated soil and groundwater when combined with Bio-HAZO. The product has unique function of fire prevention and fighting and many other superior features. C-PEC is safe for human health, non-corrosive, alcohol-free, non-flammable, environmentally friendly.

#### **KEY FEATURES**

C-PEC is manufactured by Encapsulator Technology with outstanding features such as: Human and environmentally friendly; 100% biodegradable; Fluorine - free; Non - corrosive, non - toxic; Easy to use and store.

#### PACKAGING

20L plastic pail, 6L aluminum compressed air tank

#### **APPLICATIONS**

#### 1. Oil spill response

- Cleaning up oil spills on rivers and seas.

- Treating oil pollution on the surface, oil sticking to sand, gravel, and rocks.

- Treating deep oil contamination in soil (combined with Bio-HAZO).

#### 2. Rapid heat reduction

- Preventing the process of retaining heat and transferring heat of combustion elements, encapsulating fuel molecules in contact with oxygen causing combustion. Controlling fuel ignition by reducing surface temperature below the ignition threshold, neutralizing fuels

- Rapid cooling, creating an anti-flame layer on the surface of combustible materials

- Capable of extinguishing batteries and accumulators

- Easy to use with any available fire protection equipment

- Reducing toxicity, encapsulating soot, black smoke and harmful substances generated in fires

- Increasing visibility and extending reach

- Used as a fast coolant, reducing time to increase cooling efficiency, cooling molds, and cooling equipment, heat exchangers...



- Cooling workers in high temperature conditions by spraying on clothes

#### 3. Fine dust removal

- Cleaning coal dust deposited on transmission systems, combustion equipment, factories, mines, etc, reducing the risk of fire and explosion

- Cleaning flammable dust suspended or sticking to the surface of equipment and workshops, minimizing the risk of fire and explosion.

- Cleaning up toxic dust such as soot, dust containing fluorine and benzene derivatives, etc, contributing to a clean living and working environment, protecting human health.

#### 4. Surface cleaning

- Dissolving oil particles, removing oil spills on the water surface, reducing environmental pollution.

- Surface cleaning of equipment in refineries and petrochemical plants, lubrication systems, operating floors, substations, oil and gas tanks, etc.

- Removing grease in the kitchens; cleaning floors contaminated with grease, oil leaks and spills in production workshops, mechanical repair workshops, etc.

#### 5. Ensure safety for people evacuating from fire areas with toxic gases

- Use C-PEC to wet masks, towels, cloths... to cover the nose, reduce toxicity, cover soot, black smoke and toxic substances generated in the fire, increase visibility and expand the access area.

#### SOME PRACTICAL APPLICATION PHOTOS



Use C-PEC to treat oil-contaminated groundwater



Use C-PEC to clean spilled oil on asphalted roads of a lubricant warehouse









Spray C-PEC to treat oil pollution in soil, restore the environment after an oil spill



### NANO Dil-Chemical

## Absorbent Materials

Size of Nanofiber Diameter: 1nm ~ 1000nm

Nano oil-chemical absorbent materials are manufactured by advanced Japanese technology with microscopic nano-sized fibers, thus having outstanding ability to absorb and retain liquids. Products are designed in a variety of shapes and sizes, suitable for many different applications.

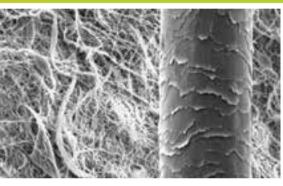
#### **KEY FEATURES**

- The fiber is made from polypropylene using nano melt-blown technology to create outstanding absorbency, up to 50 times its weight.

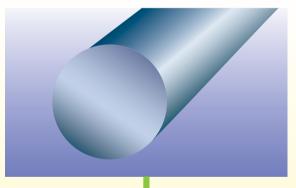
- The product is manufactured with anti-static feature, ensuring strict fire safety standards when used in environments with high risk of fire and explosion, such as petrochemical refinery plants, petroleum depots, chemical warehouses, drilling rigs, etc.

- Products are diverse in types, shapes and sizes (pads/booms/pillows/rolls/pulp, etc), suitable for different purposes and application locations. The outer layer is a non-woven fabric to shape the product as well as prevent the product from tearing when absorbing oil/chemicals.

- Products are manufactured according to ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, SGS standards.



Human's hair



Nanofiber



#### **PRODUCT CLASSIFICATION, SPECIFICATIONS**

1. Nano oil absorbent pad: Used to absorb spilled oil on the water surface or ground.



**2. Nano oil absorbent boom:** 2 functions - contain and absorb oil both on the ground and water. The boom cover is manufactured by non-woven fiber technology and supplemented with mesh to prevent tearing when absorbing oil. Booms are designed with hooks for easy connection to large-scale deployment.



Model	Dimensions diameter × length (cm)	Absorbency (liter)	Weight (gram/pc)	Packaging (pcs/box)
nanoBOOM115	10 × 150	9 - 10	450	8
nanoBOOM130	$10 \times 300$	18 - 20	900	4
nanoBOOM230	$20 \times 300$	50 - 60	2750	2
nanoBOOM160	$10 \times 600$	36 - 40	1800	2
nanoBOOM260	$20 \times 600$	100 - 120	5500	1
nanoFLATBOOM260	$20 \times 600$	100 - 120	5500	1
nanoFLATBOOM2120	20 × 1200	200 - 240	11000	1

**3. Nano oil absorbent pillow:** Used to recover large amount of spilled oil both on ground and water, often placed under leaking locations or dropped in sewage tanks, bilge water to collect floating oil. The pillow cover is manufactured by non-woven fiber technology and supplemented with mesh to prevent tearing when absorbing oil.



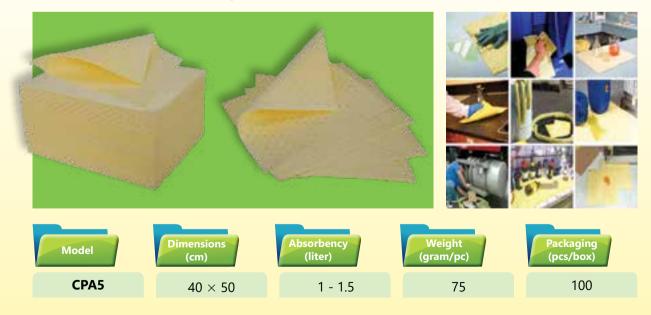
**4. Nano oil absorbent pulp:** A super absorbent material, suitable for oil recovery on water surface in hard-to-reach locations such as underground sewers, grass bushes, mangroves, etc.



**5. Nano oil absorbent roll:** Suitable for absorbing medium and large oil spills. With 50m length, the oil absorbent roll is used to spread the aisles in production workshops and factories to absorb oil leaks; or used as corridors in and out of contaminated areas to prevent cross-contamination.



#### 6. Nano chemical absorbent pad



7. Nano chemical absorbent boom





Model	Dimensions diameter × length (cm)	Absorbency (liter)	Weight (gram/pc)	Packaging (pcs/box)
CS7612	7.6 × 120	9 - 10	420	20
CS10030	10 × 300	18 - 20	900	4
CS10060	10 × 600	36 - 40	1800	2
CS20030	20 × 300	50 - 60	2750	2
CS20060	20 × 600	100 - 120	5500	1

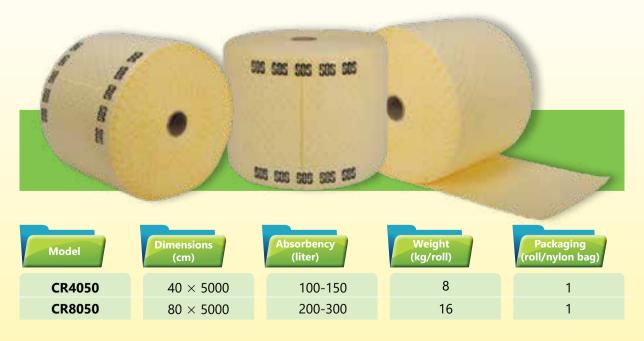
8. Nano chemical absorbent pillow



9. Nano chemical absorbent roll

 $40 \times 50 \times 10$ 

CP4050



5-6

250

16



### EMERGENCY OIL/FUELS CHEMICAL SPILL RESPONSE KIT

Emergency oil-chemical spill response kit is designed to meet the need for mobile, effective and on-site response to small and medium-sized petroleum and chemical spills/leaks.

This is essential equipment to be equipped in areas with potential risks of fuel and chemical spills such as petrol retailers, petrol stations, chemical warehouses, and any other locations where chemicals are used such as workshops, factories, laboratories, or oil/ chemical transport vehicles, etc.

#### **KEY FEATURES**

- Emergency oil-chemical spill response kit includes necessary supplies such as: oil-chemical booms/pads/pillows/powder, oil-chemical vapor deodorizer, hazardous waste bags and and personal protective equipment, etc to quickly and promptly handle spills and leaks of fuel and chemicals according to the 3-step response process "Contain - Recover - Clean".

- Meet regulations on on-site emergency oil and chemical spill response equipment.

- Diverse configurations and treatment capacities, suitable for different types of spill risk areas.

- Compact, portable, and cost-effective.
- Simple to use, no special training required.

W240-0

#### SOME STANDARD CONFIGURATIONS OF EMERGENCY OIL – CHEMICAL SPILL RESPONSE KIT

#### W240-O EMERGENCY OIL SPILL RESPONSE KIT

- 01 pail of Kleen-HAZO oil absorbent powder (8kg/pail)
- 02 pails of Kleen-HAZO oil absorbent powder (2kg/pail)
- 02 bottles of HAZO deodorizer (500ml/bottle)
- 50 nanoPAD45 oil absorbent pads (40cm  $\times$  50cm)
- 02 nanoBOOM130 oil absorbent booms (10cm  $\times$  3m)
- 01 nanoBOOM160 oil absorbent boom (10cm  $\times$  6m)
- 04 nanoPIL45 oil absorbent pillows (40cm  $\times$  50cm)
- 01 oil and chemical resistant coveralls
- 01 pair of safety goggles
- 01 protective mask
- 01 pair of oil and chemical resistant gloves
- 01 pair of oil and chemical resistant gloves
- 01 set of dustpan and brush
- 10 hazardous waste bags
- (80cm  $\times$  1.2m)
- 01 instruction card
- 01 240L wheeled container

#### W240-OC EMERGENCY OIL-CHEMICAL SPILL RESPONSE KIT

- 01 pail of Kleen-HAZO oil absorbent powder (8kg/pail) 02 pails of Kleen-HAZO oil absorbent powder (2kg/pail) 02 bottles of HAZO deodorizer (500ml/bottle) 30 nanoPAD45 oil absorbent pads (40cm  $\times$  50cm) 02 nanoBOOM130 oil absorbent booms ( $10 \text{ cm} \times 3 \text{ m}$ ) 02 nanoPIL45 oil absorbent pillows (40cm  $\times$  50cm) 30 CPA5 chemical absorbent pads (40cm  $\times$  50cm) 02 CS10030 chemical absorbent booms (10cm  $\times$  3m) 02 CP4050 chemical absorbent pillows (40cm  $\times$  50cm) 01 oil and chemical resistant coveralls 01 pair of safety goggles 01 protective mask 01 pair of oil and chemical resistant gloves 01 set of respirators and filters 01 pair of oil and chemical resistant boots 01 set of dustpan and brush 10 hazardous waste bags (80cm  $\times$  1.2m) 01 instruction card
- 01 240L wheeled container

#### W240-C EMERGENCY CHEMICAL SPILL RESPONSE KIT

01 pail of Kleen-HAZO oil absorbent powder (8kg/pail) 02 pails of Kleen-HAZO oil absorbent powder (2kg/pail) 02 bottles of HAZO deodorizer (500ml/bottle) 50 CPA5 chemical absorbent pads (40cm  $\times$  50cm) 02 CS10030 chemical absorbent booms (10cm  $\times$  3m) W240-( 01 CS10060 chemical absorbent boom (10cm  $\times$  6m) 04 CP4050 chemical absorbent pillows (40cm  $\times$  50cm) 01 oil and chemical resistant coveralls 01 pair of safety goggles 01 protective mask 01 pair of oil and chemical resistant gloves 01 set of respirators and filters 01 pair of oil and chemical resistant boots 01 set of dustpan and brush 10 hazardous waste bags (80cm  $\times$  1.2m) 01 instruction card 01 240L wheeled container

W240-0C

#### W120-O EMERGENCY OIL SPILL RESPONSE KIT

01 pail of Kleen-HAZO oil absorbent powder (8kg/pail) 01 pail of Kleen-HAZO oil absorbent powder (2kg/pail) 02 bottles of HAZO deodorizer (500ml/bottle) W120-0 30 nanoPAD45 oil absorbent pads (40cm  $\times$  50cm) 02 nanoBOOM115 oil absorbent booms (10cm  $\times$  1.5m) 01 nanoBOOM130 oil absorbent boom (10cm  $\times$  3m) 04 nanoPIL23 oil absorbent pillows (20cm  $\times$  30cm) 01 oil and chemical resistant coveralls 01 pair of safety goggles SPILL KIT 01 protective mask 01 pair of oil and chemical resistant gloves 01 pair of oil and chemical resistant boots 01 set of dustpan and brush 10 hazardous waste bags (80cm  $\times$  1.2m) 01 instruction card 01 120L wheeled container

W120-00

#### W120-OC EMERGENCY OIL - CHEMICAL SPILL RESPONSE KIT

- 01 pail of Kleen-HAZO oil absorbent powder (8kg/pail)
- 01 pail of Kleen-HAZO oil absorbent powder (2kg/pail)
- 02 bottles of HAZO deodorizer (500ml/bottle)
- 20 nanoPAD45 oil absorbent pads (40cm  $\times$  50cm)
- 01 nanoBOOM130 oil absorbent boom (10cm  $\times$  3m)
- 02 nanoPIL23 oil absorbent pillows (20cm  $\times$  30cm)
- 20 CPA5 chemical absorbent pads (40cm x 50cm)
- 01 CS10030 chemical absorbent boom (10cm  $\times$  3m)
- 02 CP2025 chemical absorbent pillows (20cm  $\times$  25cm)
- 01 oil and chemical resistant coveralls
- 01 pair of safety goggles
- 01 protective mask
- 01 pair of oil and chemical resistant gloves
- 01 set of respirators and filters
- 01 pair of oil and chemical resistant boots
- 01 set of dustpan and brush
- 10 hazardous waste bags (80cm imes 1.2m)
- 01 instruction card
- 01 120L wheeled container

#### W120-C EMERGENCY CHEMICAL SPILL RESPONSE KIT

01 pail of Kleen-HAZO oil absorbent powder (8kg/pail)
01 pail of Kleen-HAZO oil absorbent powder (2kg/pail)
02 bottles of HAZO deodorizer (500ml/bottle)
30 CPA5 chemical absorbent pads (40cm × 50cm)
02 CS7612 chemical absorbent booms (7.6cm × 1.2m)
01 CS10030 chemical absorbent boom (10cm × 3m)
04 CP2025 chemical absorbent pillows (20cm × 25cm)
01 oil and chemical resistant coveralls
01 pair of safety goggles
01 poir of oil and chemical resistant gloves
01 set of respirators and filters
01 pair of oil and chemical resistant boots
01 set of dustpan and brush

- 10 hazardous waste bags (80cm  $\times$  1.2m)
- 01 instruction card
- 01 120L wheeled container

#### W720-O EMERGENCY OIL SPILL RESPONSE KIT

- 02 pails of Kleen-HAZO oil absorbent powder (2kg/pail)
- 02 bottles of HAZO deodorizer (500ml/bottle)
- $\underline{30}$  nanoPAD33 oil absorbent pads (30cm  $\times$  30cm)
- <u>02</u> nanoBOOM115 oil absorbent booms (10cm  $\times$  1.5m)
- <u>02</u> nanoBOOM130 oil absorbent booms (10cm  $\times$  3m)
- <u>02</u> nanoPIL23 oil absorbent pillows (20cm  $\times$  30cm)
- 01 oil and chemical resistant coveralls
- 01 pair of safety goggles

- 01 protective mask
- 01 pair of oil and chemical resistant gloves

W120-C

- 01 pair of oil and chemical resistant boots
- 01 set of dustpan and brush
- 05 hazardous waste bags (80cm  $\times$  1.2m)
- 01 instruction card
- 01 storage bag



#### W72-OC EMERGENCY OIL - CHEMICAL SPILL RESPONSE KIT

- 02 pails of Kleen-HAZO oil absorbent powder (2kg/pail)
  02 bottles of HAZO deodorizer (500ml/bottle)
  15 nanoPAD33 oil absorbent pads (30cm × 30cm)
  02 nanoBOOM115 oil absorbent booms (10cm × 1.5m)
  01 nanoBOOM130 oil absorbent boom (10cm × 3m)
  01 nanoPIL23 oil absorbent pillow (20cm × 30cm)
  15 CPA5 chemical absorbent pads (40cm × 50cm)
  02 CS7612 chemical absorbent booms (7.6cm × 1.2m)
  01 CS10030 chemical absorbent boom (10cm × 3m)
- 01 CP2025 chemical absorbent pillow (20cm  $\times$  25cm)

- 01 oil and chemical resistant coveralls
- 01 pair of safety goggles
- 01 protective mask
- 01 pair of oil and chemical resistant gloves
- 01 set of respirators and filters
- 01 pair of oil and chemical resistant boots
- 01 set of dustpan and brush
- $\underline{05}$  hazardous waste bags (80cm imes 1.2m)
- 01 instruction card
- 01 storage bag



#### W72-C EMERGENCY CHEMICAL SPILL RESPONSE KIT

<u>02</u> pails of Kleen-HAZO oil absorbent powder (2kg/pail) <u>02</u> bottles of HAZO deodorizer (500ml/bottle) <u>30</u> CPA5 chemical absorbent pads (40cm  $\times$  50cm) <u>02</u> CS7612 chemical absorbent booms (7.6cm  $\times$  1.2m) <u>02</u> CS10030 chemical absorbent booms (10cm  $\times$  3m) <u>02</u> CP2025 chemical absorbent pillows (20cm  $\times$  25cm) <u>01</u> oil and chemical resistant coveralls <u>01</u> pair of safety goggles

- 01 protective mask
- 01 pair of oil and chemical resistant gloves
- 01 set of respirators and filters
- 01 pair of oil and chemical resistant boots
- $\overline{01}$  set of dustpan and brush
- 05 hazardous waste bags ( $80 \text{cm} \times 1.2 \text{m}$ )
- 01 instruction card
- 01 storage bag



#### **W30-O EMERGENCY OIL SPILL RESPONSE KIT**

01pail of Kleen-HAZO oil absorbent powder (2kg/pail)02bottles of HAZO deodorizer (500ml/bottle)20nanoPAD33 oil absorbent pads (30cm  $\times$  30cm)02nanoBOOM115 oil absorbent booms (10cm  $\times$  1.5m)02nanoPIL23 oil absorbent pillows (20cm  $\times$  30cm)

- 01 oil and chemical resistant coveralls
- 01 pair of safety goggles

- 01 protective mask
- 01 pair of oil and chemical resistant gloves
- 01 pair of oil and chemical resistant boots
- 01 set of dustpan and brush
- <u>03</u> hazardous waste bags (80cm  $\times$  1.2m)
- 01 instruction card
- 01 storage bag



#### W30-OC EMERGENCY OIL - CHEMICAL SPILL RESPONSE KIT

<u>01</u> pail of Kleen-HAZO oil absorbent powder (2kg/pail)
<u>02</u> bottles of HAZO deodorizer (500ml/bottle)
<u>10</u> nanoPAD33 oil absorbent pads (30cm × 30cm)
<u>01</u> nanoBOOM115 oil absorbent boom (10cm × 1.5m)
<u>10</u> CPA5 chemical absorbent pads (40cm × 50cm)
<u>01</u> CS7612 chemical absorbent boom (7.6cm × 1.2m)
<u>01</u> oil and chemical resistant coveralls

01 pair of safety goggles

- 01 protective mask
- 01 pair of oil and chemical resistant gloves
- 01 set of respirators and filters
- 01 pair of oil and chemical resistant boots
- 01 set of dustpan and brush
- 03 hazardous waste bags (80cm  $\times$  1.2m)
- 01 instruction card
- 01 storage bag



#### **W30-C EMERGENCY CHEMICAL SPILL RESPONSE KIT**

- 01 pail of Kleen-HAZO oil absorbent powder (2kg/pail) 02 bottles of HAZO deodorizer (500ml/bottle) 20 CPA5 chemical absorbent pads (40cm  $\times$  50cm) 02 CS7612 chemical absorbent booms (7.6cm  $\times$  1.2m) 02 CP2025 chemical absorbent pillows (20cm  $\times$  25cm) 01 oil and chemical resistant coveralls
- 01 pair of safety goggles
- 01 protective mask

- 01 pair of oil and chemical resistant gloves
- 01 set of respirators and filters
- 01 pair of oil and chemical resistant boots
- 01 set of dustpan and brush
- 03 hazardous waste bags (80cm  $\times$  1.2m)
- 01 instruction card
- 01 storage bag



#### W240-M MARINE EMERGENCY OIL SPILL RESPONSE KIT



#### HEXAGONAL TEMPORARY STORAGE TANKS SUPPLEMENTED TO SPILL KITS

SPECIFICATIONS AND MODEL	SOSHT-0.2	SOSHT-0.5	SOSHT-1	
Capacity (m <sup>3</sup> )	0.2	0.5	1	
Material	PVC coated fabric, resistant to UV, oil and chemicals. Thickness: 0.64mm (± 0.05mm)			
Filling/drain valve (mm)	Ø 27			
Tank size when filled (hexagon side $\times$ height) (mm)	580 × 300	680 × 450	800 × 660	
Packing size (mm)	600  imes 330  imes 60	700  imes 460  imes 60	810  imes 670  imes 60	
Dry weight (kg)	~ 4.5	~ 8	~ 16	









#### SOME PRACTICAL APPLICATION PHOTOS



Spill kits equipped for petrol stations



Spill kits equipped at chemical spill risk points of medical equipment factory



Spill kits equipped for internal fuel station of aviation fuel depot



Spill kits for boats, ships



## **ABANAKI OIL SKIMMER**

ABANAKI oil skimmer operates on the principle of using belts made from materials attractive to oil and repellent to water. The belt, operating on a motor and pulley system, runs through oily water to pick up oil from the surface. After travelling over the head pulley, the belt passed through tandem wiper blades where oil is scraped off both sides of the belt and discharged to the external tank.

The machine is capable of picking oil and grease with different viscosities, from water level with a minimum depth of 15cm, to a maximum height of 30m.

#### **KEY FEATURES**

- Ease of installation, operation and maintenance: Abanaki skimmer's small imprint allows easy installation with little or no modification to existing structures. At the same time, it is easy to move from one location to another when using one device to pick up oil at many points.

- Great range of capacities:

+ Removal rates ranging from 4 liters/hour to 760 liters/hour.

+ Hazardous duty and food grade options.

+ Work in liquid with the pH ranging from 3 to 11.

+ Pick up light, medium, and heavy oils.

+ Many options for motor type (standard, industrial or explosion-proof).

+ The device is made of stainless steel or plated steel depending on the installation environment.

- Output quality: High oil recovery rate (98%). In addition, with an oil concentrator, the oil skimmer will pick up less than 1% water with the removed product.

#### **BENEFITS**

- A single unit performs two functions of elevating oil and separating oil from water without the need of expensive pumps.

- High durability, low power consumption.

- Require little labor: Fast cleaning and minimal maintenance.

- Require little installation area.
- Ease of installation, operation and maintenance.
- Conserve wash water, lengthen coolant life.

- Help meet government requirements for water discharge: Help businesses solve the problem of treating oil contaminated wastewater before discharging into the environment at low cost.

#### **APPLICATIONS**

The machine is used to remove grease from wastewater tanks before being discharged into the environment, industrial machine cooling water, immersion tanks, mechanical parts washing tanks/machines, CNC machine bottoms, ponds and lakes, used in conjunction with oil filtration equipment to increase the performance of the filtration equipment, etc.

Industries where oil skimmers are operated: Steel & Metal; Manufacturing; Electrical and electronic machines & equipment; Chemicals; Oil and Gas; Food Processing; Textile; Paper & wood; Printing & publishing; Rubber & plastic; Leather; Stone, glass, concrete products; Transportation equipment; Medical industry products; Mining; Construction; Railway and waterway transport; Automotive washing and repair, services and garages; Wastewater treatment plants, etc.





Oil skimmers installed in the oily wastewater collection tanks of mechanical repair workshops



Oil skimmers installed in the oily wastewater collection tanks of mechanical manufacturing factories





**3.8L/h** Chip Grabber



**7.6L/h** Mighty Mini



**11-45L/h** Tote-it



**11-45L/h** PetroXtractor



**76L/h** Oil Grabber 4"

**151L/h** Oil Grabber 8"

**303-757L/h** Multi-Belt



