



**YORA**  
SOLUTIONS

# Pit Cleaning and Oil Separation

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TECHNOLOGY PRESENTATION

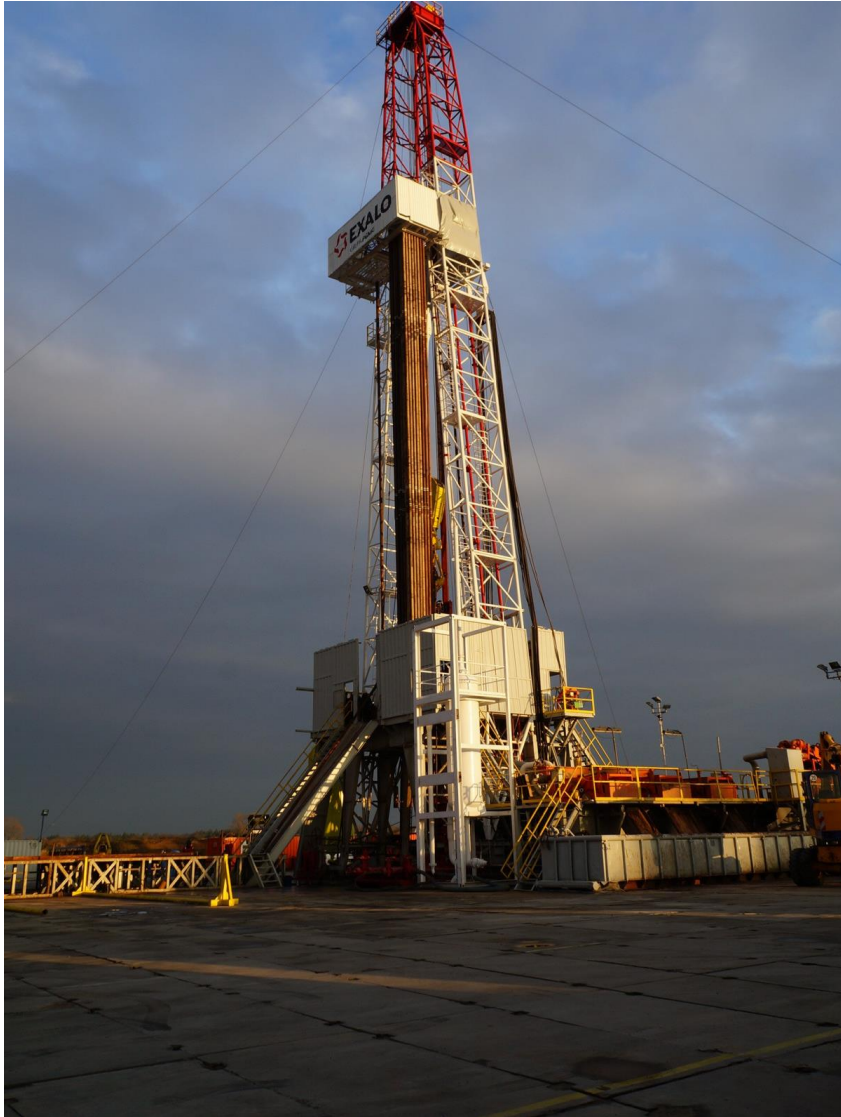


## Oil Pits

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Oil pits, also known as oil sumps or oil reservoirs, are excavated or constructed areas designed to collect and contain oil, usually as part of an oil extraction or refining process. These pits are typically lined with impermeable materials to prevent oil seepage into the surrounding soil and groundwater. They serve as temporary storage for crude oil or wastewater generated during oil drilling, production, or refining activities. Oil pits require proper management to prevent environmental contamination and ensure safe disposal or recycling of the collected oil.





# Oil Pit Composition

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The contents of an oil pit typically include crude oil, wastewater, drilling mud, sludge, and other byproducts generated during oil extraction, production, or refining processes. These substances may contain various contaminants such as hydrocarbons, heavy metals, and chemicals used in drilling and production activities.

# Oil Pits Treatment

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**Containment:** Ensuring that the oil pit is properly lined and contained to prevent leakage of oil and contaminants into the surrounding soil and groundwater.



**Remediation:** Implementing techniques to remove or reduce contaminants from the contents of the oil pit. This may involve physical methods such as skimming or vacuuming off the oil layer, as well as chemical or biological treatments to break down or neutralize contaminants.



**Separation:** Separating different components of the oil pit contents, such as separating oil from water or solid particles, to facilitate proper disposal or recycling of each component.



**Treatment Technologies:** Utilizing various treatment technologies such as filtration, sedimentation, chemical oxidation, or bioremediation to treat the contents of the oil pit and reduce the concentration of pollutants.



**Disposal or Recycling:** Properly disposing of treated waste or recycling recovered oil for reuse, in accordance with regulatory requirements and environmental best practices



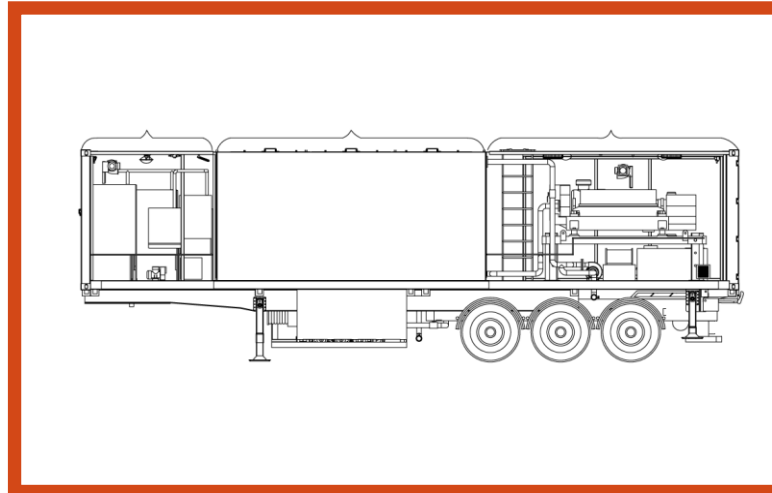
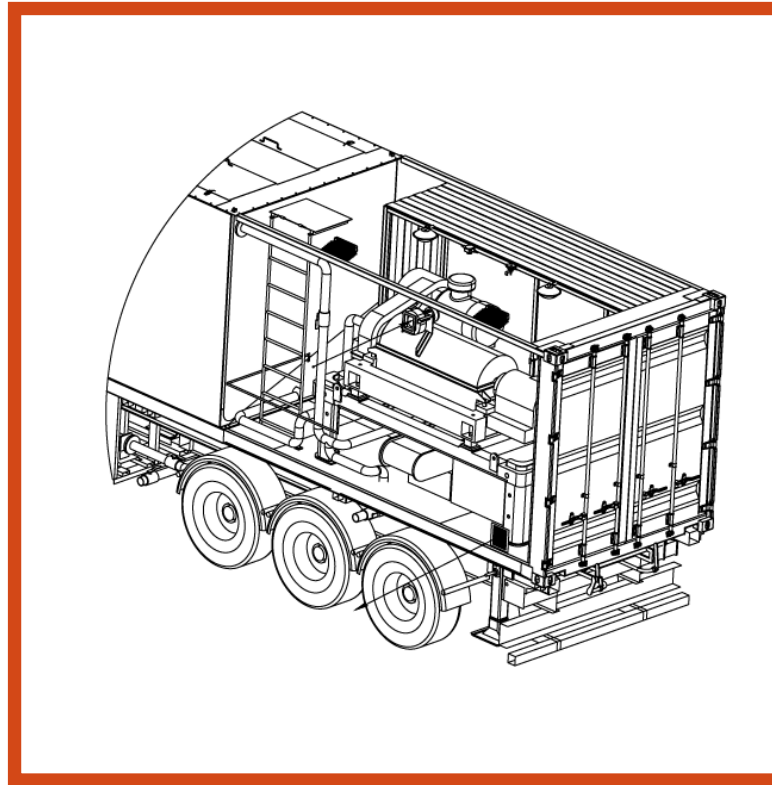
# Our Solution

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CONTAINERIZED REMOTE SOLUTIONS

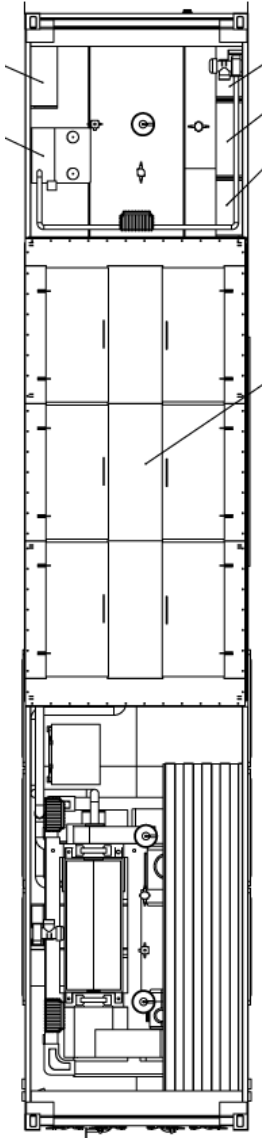


One Stop  
Shop Oil Pits  
Treatment



# Technology

- discharge and transportation of diluted bottom sediments out of a tank
- recycling of washing out water for cleaning of a tank
- separation of cake ( mechanical impurities ) from the sludge
- oil recovery from the sludge.



Equipment



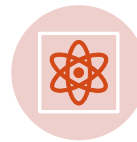
40 Ft Container



Semi Trailer



Vacuum Pump



Gravity Dynamic Separator GDS



Centrifugal Decanter (Optional)

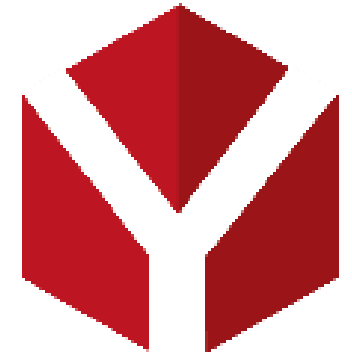


Belt Conveyor

# The process

The complex is installed on a flat prepared base (soil, concrete pad, road, concrete slabs, etc.) before or after the oil tank's dike, the installation is leveled using hydraulic outriggers. Then stairs and railings are to be installed. Further, the complex is connected to the electrical grid (or diesel generator). After power is supplied, the power supply, instrumentation and fire alarm systems are started, and all devices and equipment are checked, the GDS is filled with 18CBM of water.

Vacuum pumps is installed and ready to start the pumping of the oil pit mix onto the GDS System.

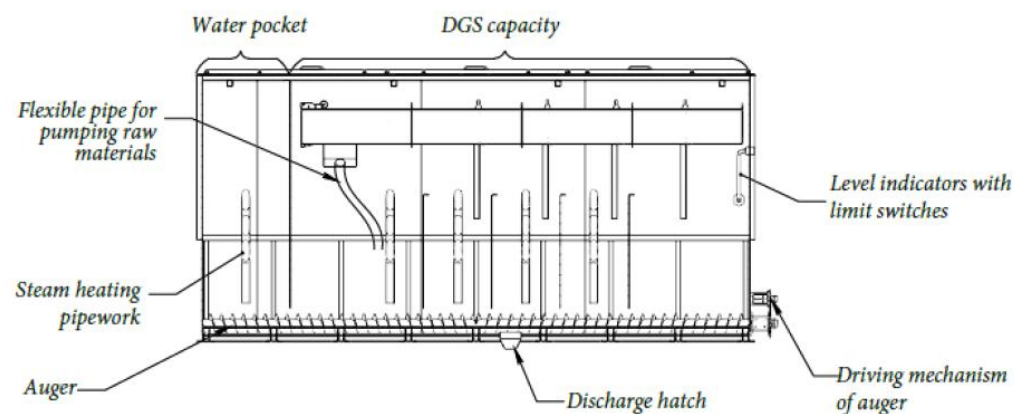


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# Gravity Dynamic Separator

## THE SYSTEM



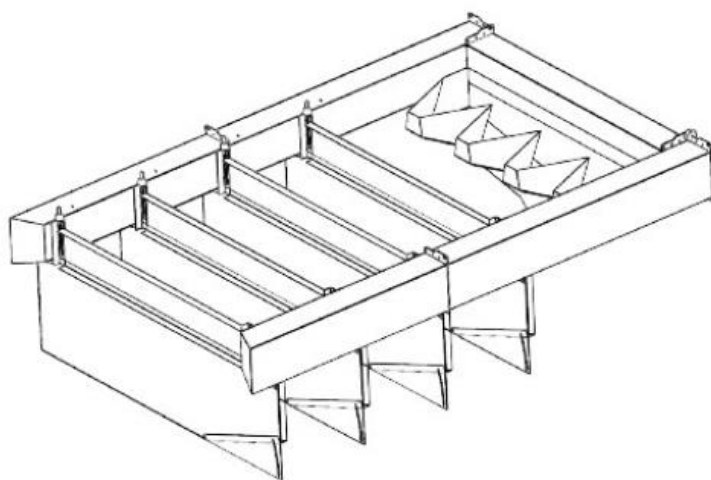
## THE PRINCIPAL

In the GDS, sludge is separated into oil (hydrocarbons), clarified water, and flooded cake (solution of water and mechanical impurities). The GDS is equipped along the way with oil sludge (a mixture of water, oil, and cake) with special vertical partitions, which contribute (by lengthening the path of the flow entering it for processing) to a more complete separation of oil and water, as well as the solid phase contained in the sludge. Such a design forms sections in the GDS and ensures organized movement and separation of sludge into two liquid phases (water and oil) due to the fact that gradually the lighter phase (oil) is pushed to the top of the flow. The separated oil is collected on the GDS's surface using a skimmer device of a special design and is pumped out of it by a gear pump to the Customer's process system.

# Gravity Dynamic Separator

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## SKIMMER



## WATER RE-USE AND SEPARATION

Clarified (purified) water accumulates in the GDS's water "pocket" and is repeatedly (multiply) sent by means of the centrifugal multi-stage pump into the tank to dilute sludge or for re-sue and cleaning purposes. Flooded cake (solution of mechanical impurities and water) accumulates on the bottom of the GDS and is transported by a hydraulically driven screw to the discharge outlet located in the center of the bottom of the GDS, and then by a screw pump to a centrifugal decanter (two-phase horizontal centrifuge). The GDS can operate continuously with any amount of incoming sludge (for any flow of sludge) due to divided vertical 3 partitions, the upper part of which is connected to a floating pontoon, thereby ensuring a stable process of phase separation.

# Gravity Dynamic Separator

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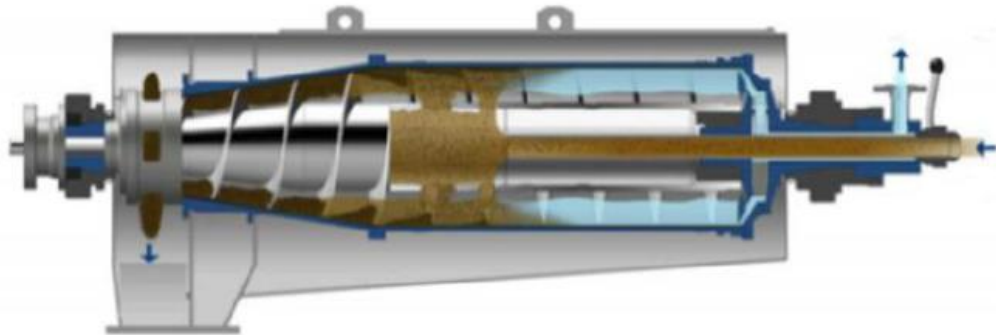


The GDS is equipped with:

- skimmer device
- skimmer arrangement
- mechanical level gauge
- screw conveyor to unload mechanical impurities.
- Oil Suction Pump

# Centrifugal decanter (two-phase horizontal centrifuge).

## DECANTER



## THE PROCESS (OPTIONAL)

The GDS requires 3CBM/HR without the decanter, the Centrifugal decanter serves the purpose of reducing water consumption and densifying the sludge cake.

1. Quality output with centrifugal decanter:
  - The average weight content of water in recovered oil is 5%
  - The average weight content of moisture in the solid residue intended for disposal is 40%.
2. Quality output without centrifugal decanter:
  1. The average weight content of water in recovered oil is 5%.
  2. The average weight content of moisture in the solid residue intended for disposal is 90-95 % or even more.

# Centrifugal decanter (two-phase horizontal centrifuge).

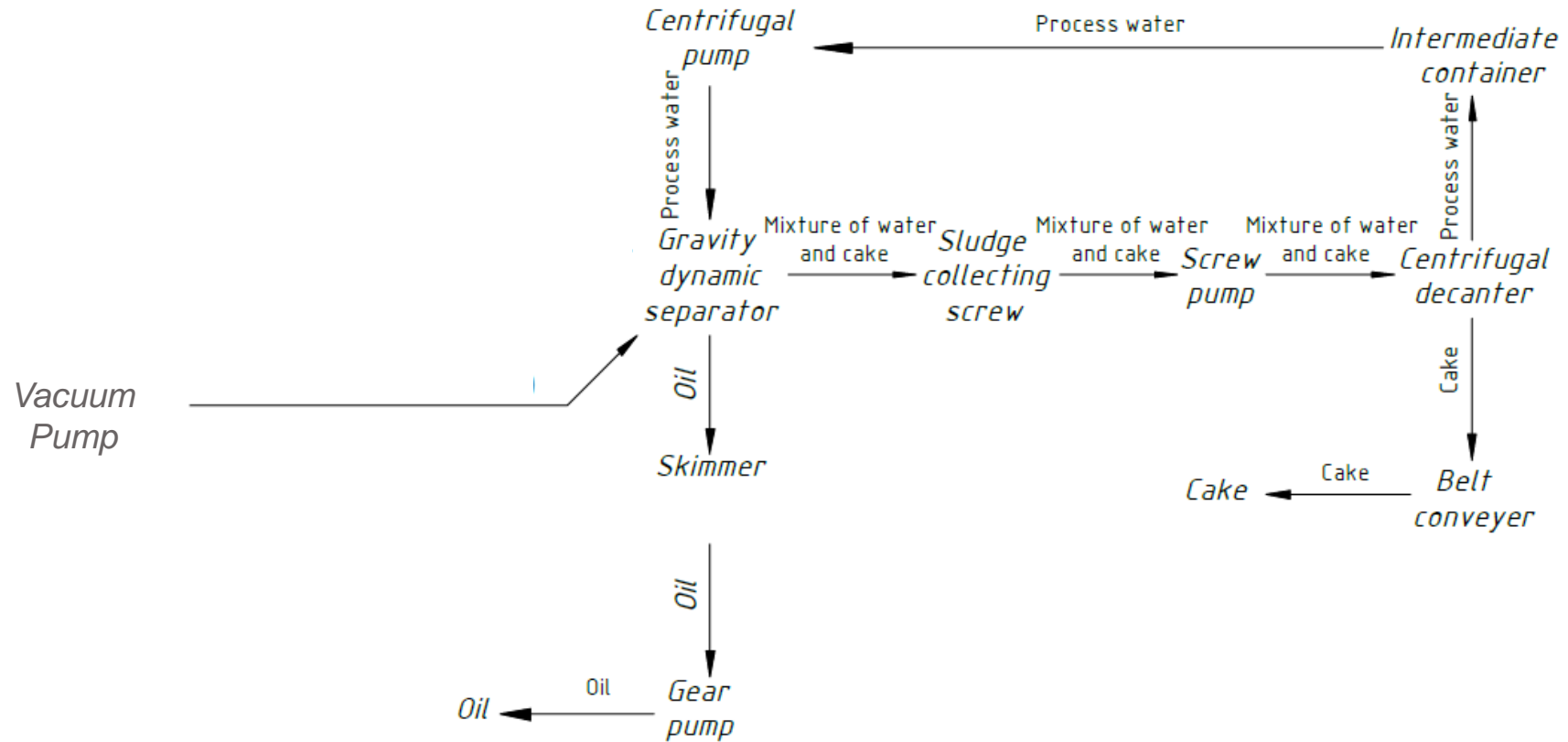
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## DESIGN

Centrifugal decanter is designed for mechanical centrifugal separation of the mixture of liquid/mechanical impurities (two-phase). Separation occurs due to the different density of substances.

# Flow Diagram



# Optional Items

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## DEHYDRATOR WITH RECEIVING TANK



## APPLICATION

Dehydrator is designed to separate mechanical impurities from water-oil emulsion and for the drainage of separated mechanical impurities.



# Optional Items

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CHEMICAL REAGENT SUPPLY NODE  
EQUIPPED WITH DOSING PUMPS



## APPLICATION

Chemical reagent supply node is designed to dose reagents (coagulants and flocculants) into the system, if necessary, and for qualitative separation of mechanical impurities from persistent oil sludge mixtures.

# Optional Items added value\*

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- Oil: Basic Sediments & Water (BS&W) is less than 2 %;



- Water: Oil in water is less than 50 ppm;



- Solid Sludge: Oil content is less than 5 %, Solid content is more than 50 % and the remaining is water content.

# Process Description

**Vacuum Pump Extraction:** Initially, a vacuum pump is utilized to extract the contents of the oil pit, encompassing crude oil, wastewater, and contaminants. This extraction efficiently removes the bulk of the material from the pit and pumps it to the GDS for separation.

**Gravity Dynamic Separator (GDS):** The extracted mixture is then directed to a gravity dynamic separator equipped with a skimmer. Within this separator, gravity segregates the components based on their densities. Solid particles and sediment settle at the bottom and are then directed towards the centrifugal decanter, while oil floats to the surface and is skimmed off, enhancing the purity of the recovered oil.

**Centrifugal Decanter:** Following the initial separation in the GDS, the residual mixture, consisting of a combination of water, some residual solids, and possibly traces of oil, undergoes further processing in a centrifugal decanter. Here, centrifugal force effectively separates the remaining components. Water, free from contaminants, is returned to the GDS for potential reuse, promoting water conservation efforts. Meanwhile, the denser sludge cake, comprising primarily solids, is directed to barrels or bags for appropriate disposal as waste.

This comprehensive approach ensures the efficient treatment of oil pit contents, effectively recovering oil for potential reuse, minimizing environmental impact, and promoting sustainable resource management practices by reducing water consumption.

# Technical details

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## GDS

volume: 18 CBM;

Performance: from 30 to 43 cbm per hour. (depending on viscosity and other characteristics of oil sludge);

A metal container with a double steel wall with a layer of insulation (the upper part (roof) is made of hatches that allow maintenance of the GDS and visual control of the technological process);

## CENTRIFUGAL DECANTER

Allows to remove mechanical impurities of more than 25 microns

Capacity, max. 40 m<sup>3</sup>/hour

Speed 3200 RPM ( regulated with a help of a frequency converter)

The electric power of the main motor is 30 kW, electric power of the auxiliary motor 7.5 kW

Protection from aggressive fluids

# Technical details

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## BELT CONVEYOR

Designed to unload mechanical impurities from the horizontal centrifuge into barrels or big-bags

## 40 FT CONTAINER

ISO container

12.19 (L) x 2.44 ( W) x 2.591 (H) m

Net weight 3,800 kg

It is equipped with an additional door , stairs with handrails, a slider unit that allows to enlarge useful space of the container



20 bar

remote control

hydraulic system

oil sludge viscosity  
up to  $10^6$  cP  
productivity  
up to 60 m<sup>3</sup>/hour

4x4 bridging

# Thank You

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