oreco

BLABO®

Non-man entry tank cleaning and oil recovery system

**Designed for large,
aboveground oil storage tanks
containing crude oil or heavy fuel oil**

health, safety and environment

Protecting human health and ensuring highest operational safety

Safety and protection of personnel during tank cleaning and oil recovery processes are our paramount concerns and every aspect of the BLABO® system has been designed with safety and human health in mind.

Designed for hazardous atmospheres

Our BLABO® system is constructed to operate safely in potentially hazardous areas and meets the highest international safety standards and directives, including ATEX in Europe, UL in USA or CSA/cUL in Canada. Other international standards can be met on request.

To avoid risk of explosion inside the tank an inert gas, typically nitrogen, is introduced, maintaining an oxygen level below 8 per cent volume in the tank throughout the cleaning process. At this oxygen level, no ignition can occur. Tank blanketing with an inert gas is an extremely viable and safe way of preventing costly accidents, and is an integral part of the Oreco tank cleaning process.

Process and constructional safety

Existing safety features include continuous process monitoring, warning systems for hydrocarbon vapours and automatic shutdown if the oxygen level reaches unacceptable levels. We constantly strive to improve and develop our systems to achieve even greater safety standards.

Non-man entry solution

Most accidents and hazardous situations are caused by human error. Unlike manual tank cleaning methods, which involve working inside the oil storage tanks, Oreco's automated BLABO® system is a non-man entry solution. This is BLABO®'s principal advantage as it practically removes the risks of human failure or negligence. Furthermore, it eliminates many personal health hazards such as exposure to harmful, carcinogenic substances.

Training

Personnel must undergo Oreco's training programme in operating the BLABO® system and in safety procedures. This ensures that Oreco systems are operated to the same consistently high safety standards no matter where in the world they are located.

Closed loop cleaning process

The BLABO® tank cleaning process is performed in a 'closed loop'. Media used for cleaning the tank flows in a closed circuit from the tank to the different BLABO® modules and back again to the tank. In this way, operators do not have contact with the sludge inside the tank and have less exposure to toxic and flammable liquid and gas. This reduces the number of hazardous situations and has a positive effect on the environment as hydrocarbon emissions escaping to the atmosphere are substantially reduced.

introduction

Safer, more environmentally friendly tank cleaning and oil recovery

The challenge

Manual tank cleaning is often a tedious and cumbersome process, putting both personnel and property at risk.

The stream of increasingly stringent Health, Safety and Environmental (HSE) legislation and standards means that the oil industry is under pressure to utilise safer and more environmentally friendly tank cleaning methods.

To keep up with the best, refineries, tank farms, import/export terminals – as well as tank cleaning service providers – are looking to automated, non-man entry methods as a viable alternative.

BLABO® – a clean and safe solution

Oreco's vision is to deliver efficient tank cleaning and oil recovery solutions that exceed the most demanding HSE measures.

Oreco has developed the BLABO® system, a fully-automated, non-man entry process system. Every component of BLABO® has been selected with HSE in mind. Equipped with a range of advanced safety features, BLABO® sets new standards for safe, environmentally friendly tank cleaning and oil recovery.

the technology

The BLABO® system

Oreco's patented BLABO® system offers an automated, non-man entry oil tank cleaning and oil recovery process. Mobile and modular, it is especially designed to clean large-volume above-ground oil storage tanks.

BLABO® is suitable for both floating and fixed roof tanks with tank volumes up to 200,000 m³/1,240,000 bbl with sludge contents easily exceeding 30,000 m³/185,000 bbl. BLABO® can also be used in tanks containing crude oil, heavy fuel oil, catalytic cracker residue, slop oil, and similar. Tank cleaning and oil recovery take place simultaneously.

The BLABO® process modules are built into 20-foot containers, enabling straightforward transportation and optimum manoeuvrability. The system includes modules for suction, recirculation, skimming and separation. Other optional auxiliary units such as an office/lab container, inert gas generator, and steam and power generator are available.

Benefits of choosing BLABO®

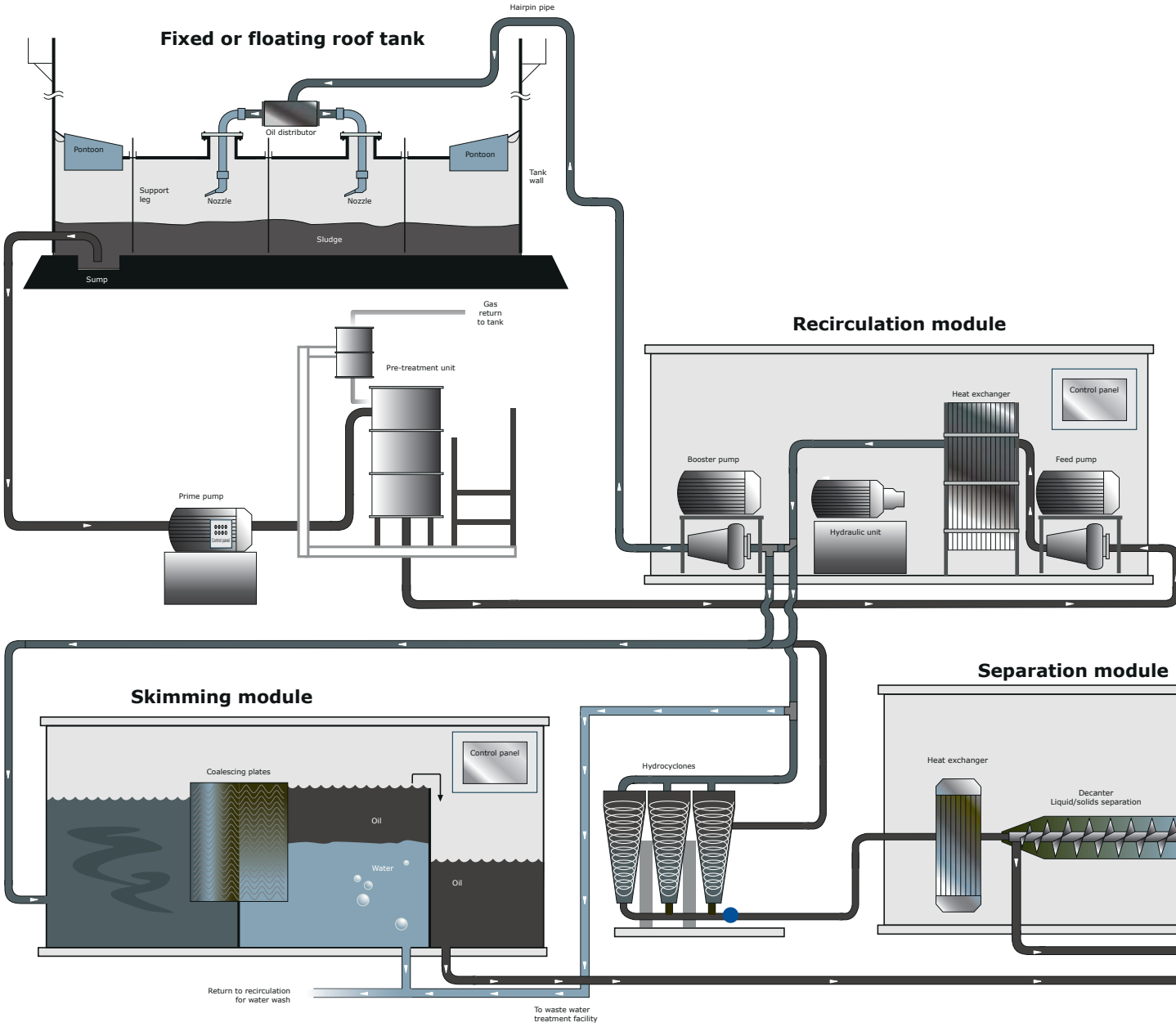
Compared with manual and semi-automated methods, Oreco's BLABO® system is an efficient and cost-effective solution offering a wide range of benefits:

- Non-man entry; operators do not enter the tank.
- Safe; BLABO® is designed to operate safely in hazardous areas.
- Efficient; offering desludging, tank cleaning and oil recovery in one integrated process.
- Valuable; with close to 100 per cent recovery of saleable hydrocarbons.
- Fast; with a reduction in tank down-time of up to 80 per cent.
- Environmentally-friendly; the process minimises hydrocarbon emissions and substantially reduces liquids and solid waste.
- Economical; BLABO® reduces your overall cleaning costs.

technical specifications

BLABO® PROCESS MODULES	Installed power capacity kW/HP	Other consumption (discontinuous)	Performance capacity	Length m/ft	Width m/ft	Height m/ft	Weight kg/lb
Suction module	57 / 76	N/A	Suction: 150 m³/hr at 5 bar / 660 USg/m at 72 psi	4.050 / 13'3"	1.200 / 4'	2.591 / 8'6"	3500 / 7700
Recirculation module	88 / 118	Steam: 0 - 4000 kg/hr / 0 - 8800 lbs/hr	Flow to nozzle: 100 m³/hr at 12-15 bar / 440 USg/m at 172-215 psi	6.058 / 20'	2.438 / 8'	2.896 / 9'6"	17000 / 37400
Separation module	87 / 117	Steam: 1000 kg/hr / 2200 lbs/hr Fresh water: 1 m³/h / 4.4 USg/m	High-speed separator: 7.5 m³/hr / 33 USg/m Decanter: 15 m³/hr / 66 USg/m	6.058 / 20'	2.438 / 8'	2.896 / 9'6"	10000 / 22000
Skimming module	2 / 3	N/A	N/A	6.058 / 20'	2.438 / 8'	2.896 / 9'6"	6000 / 13200
General module specifications	Electrical power supply: Available in 400V/50 Hz or 440V/60 Hz, other on request Operating altitude: 1-1000 m / 1-3200 ft above sea level Working ambient temperature 0-40˚C / 32-104˚F. Other temperature ranges on request Process temperature: Media temperature max 80˚C / 176˚F Module containers: 20' High Cube (HC) containers approved for transport						
AUXILIARY UTILITY EQUIPMENT (OPTIONAL)							
Office/workshop container	4 / 5	N/A	N/A	6.058 / 20'	2.438 / 8'	2.896 / 9'6"	5000 / 11000
Auxiliary storage container	1 / 1	N/A	N/A	6.058 / 20'	2.438 / 8'	2.896 / 9'6"	Varies
Power generator 400 KVA / 320 kW		Fuel: 120 l/hr / 32 USg/hr for all 4 BLABO® modules	N/A	6.058 / 20'	2.438 / 8'	2.896 / 9'6"	6000 / 13200
Power generator 500 KVA / 400 kW		Fuel: 150 l/hr / 40 USg/hr for all 4 BLABO® modules					
Nitrogen generator 250 Nm³/h / 8800 SCFH	48 / 64	N/A	N/A	6.058 / 20'	2.438 / 8'	2.896 / 9'6"	7000 / 15400
Nitrogen generator 500 Nm³/h / 17600 SCFH	96 / 129	N/A	N/A	6.058 / 20'	2.438 / 8'	2.896 / 9'6"	10600 / 23300
Steam generator 5000 kg/hr / 11000 lbs/hr	15 / 20	Fresh water: 5 m³/hr / 22 USg/m without reuse of condensate Fuel: 400 l/hr / 105 USg/hr	N/A	N/A	N/A	N/A	N/A
SafeTap® cold-tapping tool	Cold work: Complies with API/IP definition of cold work Certification: Certified and approved by notified body Ignition preventative measures: Include using 'spark reducing material' in the construction of the tool, temperature control facility and limitation of the speed of moving parts.						

the system


Fixed or floating roof tank
Hairpin pipe
Oil distributor
Pontoon
Pontoon
Support leg
Nozzle
Nozzle
Tank wall
Sludge
Sump
Gas return to tank
Pre-treatment unit
Prime pump
Recirculation module
Heat exchanger
Control panel
Booster pump
Feed pump
Hydraulic unit
Skimming module
Control panel
Coalescing plates
Oil
Water
Oil
Hydrocyclones
Separation module
Heat exchanger
Decanter
Liquid/solids separation
Return to recirculation for water wash
To waste water treatment facility

BLABO® in action

Here we outline a typical BLABO® tank cleaning process of a floating roof tank with simultaneous oil recovery

Mobilisation

The process begins with the installation of equipment according to a thorough installation plan approved by the tank owner. The suction, recirculation, separation and skimming modules, plus required auxiliary equipment, are set up in compliance with the prevailing regulations concerning potentially hazardous zones.

Tank blanketing

To avoid risk of explosion, an inert gas – typically nitrogen – is injected into the tank before the cleaning process is started to reduce the oxygen level to below 8 per cent. This level is maintained throughout the entire tank cleaning process.

Tank cleaning nozzles

Depending on the tank's diameter, the required number of nozzles is installed in the roof – either through existing or new perforations made with the Oreco SafeTap® tool. Oreco's specially designed, patented Single Nozzle Sweepers (SNS) use the re-circulating oil as their primary cleaning media. Their far-reaching, low pressure, high impact jets make them extremely efficient.

Desludging

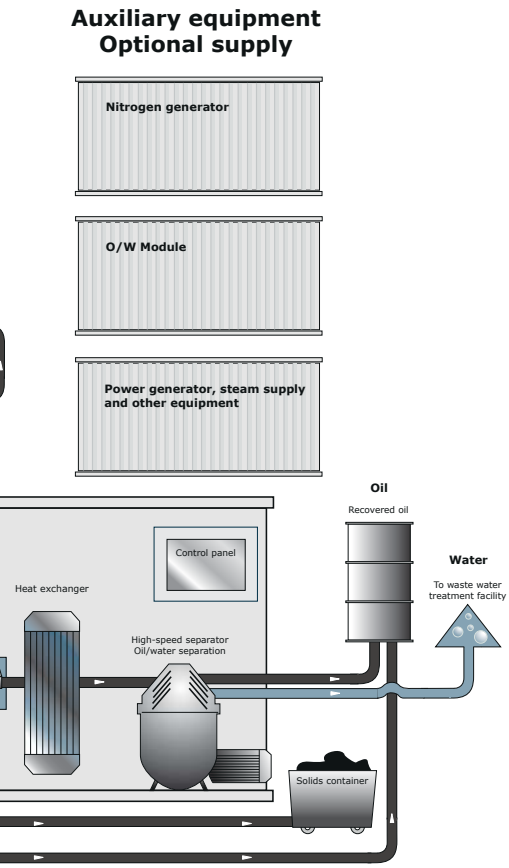
The cleaning process starts with desludging. Depending on the nature and complexity of the sludge, it may be necessary to add cutter stock to re-liquefy the sludge. The sludge is taken in by the suction module. It then passes through pre-filters to strain off foreign objects before entering the vacuum tank, where gases, if any, are returned to the oil storage tank.

The oil is pumped on to the recirculation module where it is led through hydrocyclones to separate heavy solid particles from the recirculating cleaning media. A booster pump returns the cleaner oil fraction through the cleaning nozzles in the storage tank where it is used to re-liquefy more sludge.

Cleaning

The nozzles play a vital part in the cleaning process. They can be programmed via a PLC to focus on areas that require more intensive desludging. A hydraulic unit controls their speed and movement. The process of mixing cutter stock with the sludge is continued until all sludge has been removed.

The entire BLABO® process is automated, and personnel do not enter the tank before or during cleaning. Easy to operate, BLABO® can be monitored by just a handful of trained operators using the built-in PLCs and user-friendly control panels.



Separation and recovery of oil

If the oil from the bottom of the hydrocyclones matches the tank owner's specifications, it is pumped directly to the pipeline. Should the oil need further treatment, the separation module is used. Separation of the sludge takes place simultaneously with desludging and is separated into clean oil, solids and water. BLABO® recovers close to 100 per cent of the hydrocarbons.

There are two separation steps. First a liquid/solids separation takes place in the decanter, where solids are removed from the oil. The solids are deposited in containers for disposal or treatment, if required. If the recovered oil still contains water, a further oil/water separation is performed via the high-speed separator. The clean oil is pumped to the pipeline while the water can be pumped directly to a local waste water treatment facility. Heat exchangers are used to facilitate the separation process. Regular lab tests make sure the separated oil conforms to the tank owner's specifications.

Final water wash

At this stage there is no sludge left in the tank, only a layer of oil containing solid sediments (sand, rust) on the bottom and walls. To clean the tank completely, a water wash is needed, which is when the skimming module comes into action.

Fresh water is introduced via the nozzles and pumped through the skimming module where coalescing plates perform the last oil/water separation. The oil is skimmed off and returned to the tank owner as recovered oil. This procedure is repeated until there is no oil left in the tank.

Ventilation and demobilisation

After the water wash, the manholes are opened to vent the tank. Once the tank atmosphere has been approved by a safety officer, personnel are free to enter. It may be necessary to manually remove some sand or rust scales. The tank is now ready for maintenance and hot work.


1


2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4


5

1/ In the separation module the sludge is separated into clean oil, solids and water.
2/ The non-man entry concept of the BLABO® system means that personnel do not enter the tank during cleaning.
3/ User-friendly control panels and continuous monitoring make the BLABO® system easy to operate.
4/ A view inside a clean crude oil tank after a successful cleaning.
5/ The decanter performs a liquid/solids separation.

About Oreco

Oreco develops, manufactures and markets automated tank cleaning and engineered oil-water-solid separation systems as well as related products and consultancy services.

Oreco's knowledge is based on several decades of experience within tank cleaning and engineered solutions for separating oil-water-solids. Our systems operate at refineries, tank farms and in the oil fields around the world. Oreco systems have cleaned more than a hundred large crude oil tanks around the world and separated oil-water-solids to the highest satisfaction of our customers.

All Oreco products are fully compliant with the latest industry regulations and all Oreco systems are constructed to operate safely in potentially hazardous and harsh environments.

Quality and safety will always remain our primary concern. Our business is ISO-certified (ISO 9001) to ensure the continuous improvement of all procedures, guaranteeing that we maintain the same high standards at all times – all over the world.

Choosing a solution from Oreco is your guarantee of efficient, cutting edge technology that adheres to HSE requirements.

Premium service and expertise

Do you require oil storage tank cleaning/oil recovery services? We have access to a large network of tank cleaning and oil recovery experts offering their services using BLABO® systems to refineries, tank farms, and export/import terminals around the world. And Oreco ensures premium service by providing thorough training in BLABO® system operation to all of our recommended specialists.

Contact Oreco or visit our website for a list of service providers.

ISO 9001 BUREAU VERITAS Certification

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