



Oil and gas industry service provider

Non-man entry tank cleaning solutions



Eco-friendly



Time-efficient



Cost-effective

Who we are

ARKOIL Technologies Nederland B.V. is a well established Dutch-formed oil and gas industry service provider which gathered talented oil industry specialists with a view to catering to the Clients' most ambitious needs and requirements.

What we do

- Storage tanks cleaning
- Microbiological remediation and oil-contaminated soil restoration
- Oil-contaminated soil washing
- Oil-contaminated groundwater cleaning and restoration
- Treatment of oil-containing waste
- Containment, migration trapping and extraction of LNAPL

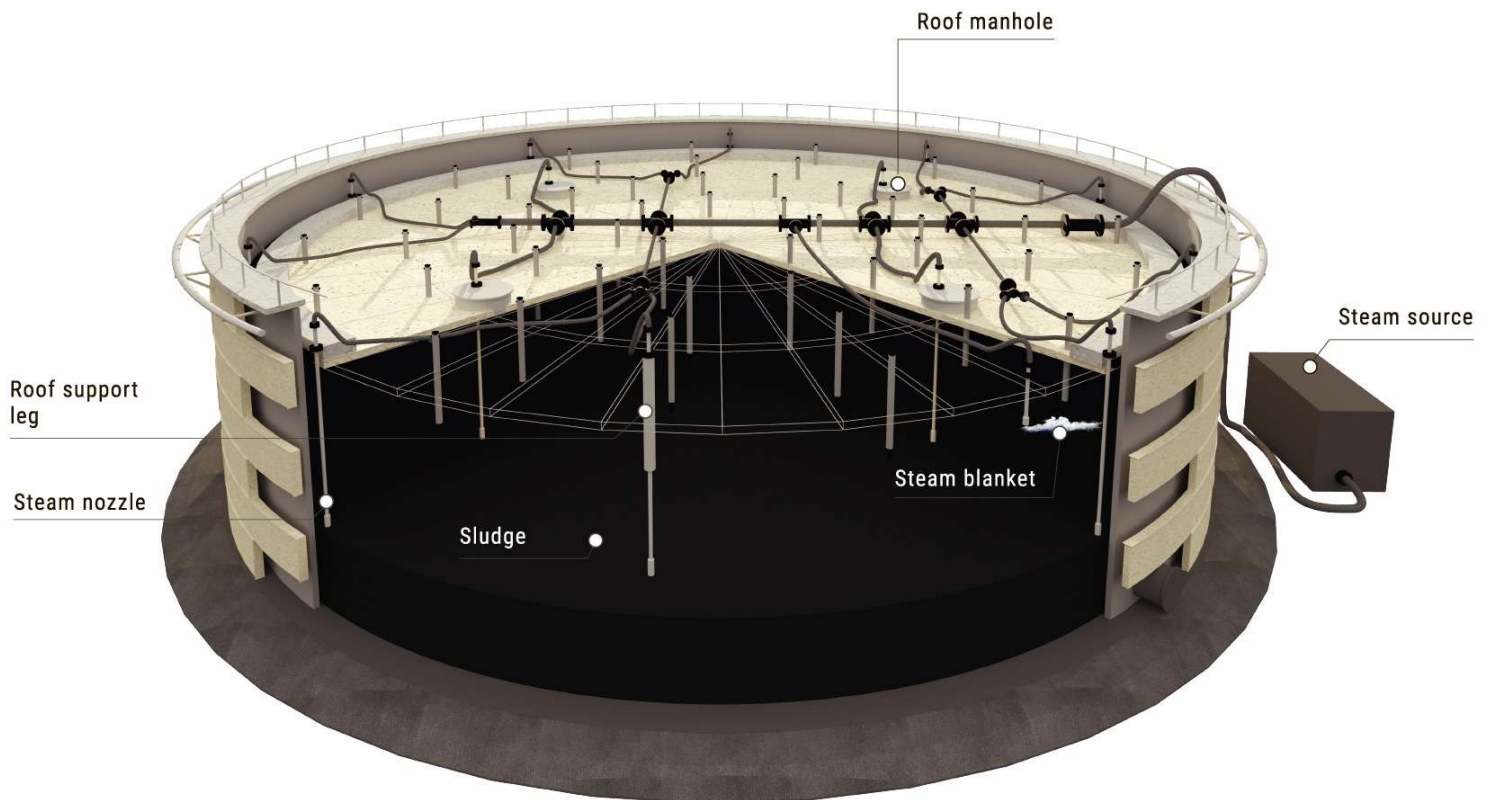
What we deliver

- ✓ Effective ecological solutions
- ✓ Client-oriented approach
- ✓ Safety-conscious attitude to the project
- ✓ Extra profit for Clients

ARKOIL Technologies has been developing and has been successfully implementing innovative **Non-Man Entry Crude Oil Tank Cleaning and Oil Recovery Solutions.**

High efficiency is proved by many years of **experience** and multiple references from the leaders of the oil and gas industry. About 1,000 storages have been cleaned using our genuine technologies, of which 400 are crude oil tanks.

TANK STEAMING PLAN



Steam is supplied into the oil sludge through specially designed steam nozzles

Steam nozzles installation can be performed:

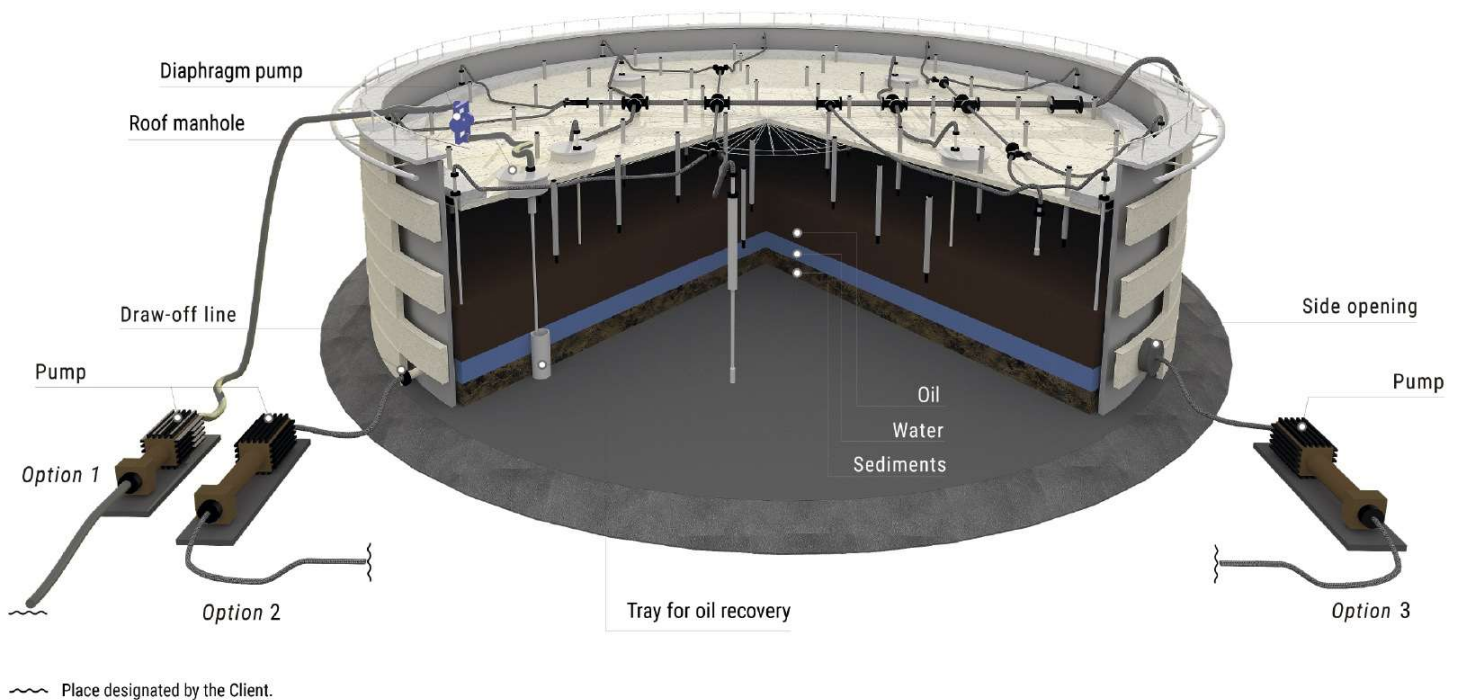
- Through the space between tank shell and tank roof seal
- Through the roof manholes
- Through the roof support legs sleeves



Video

Any nozzles installation option is available upon the Client's request

OIL RECOVERY PLAN

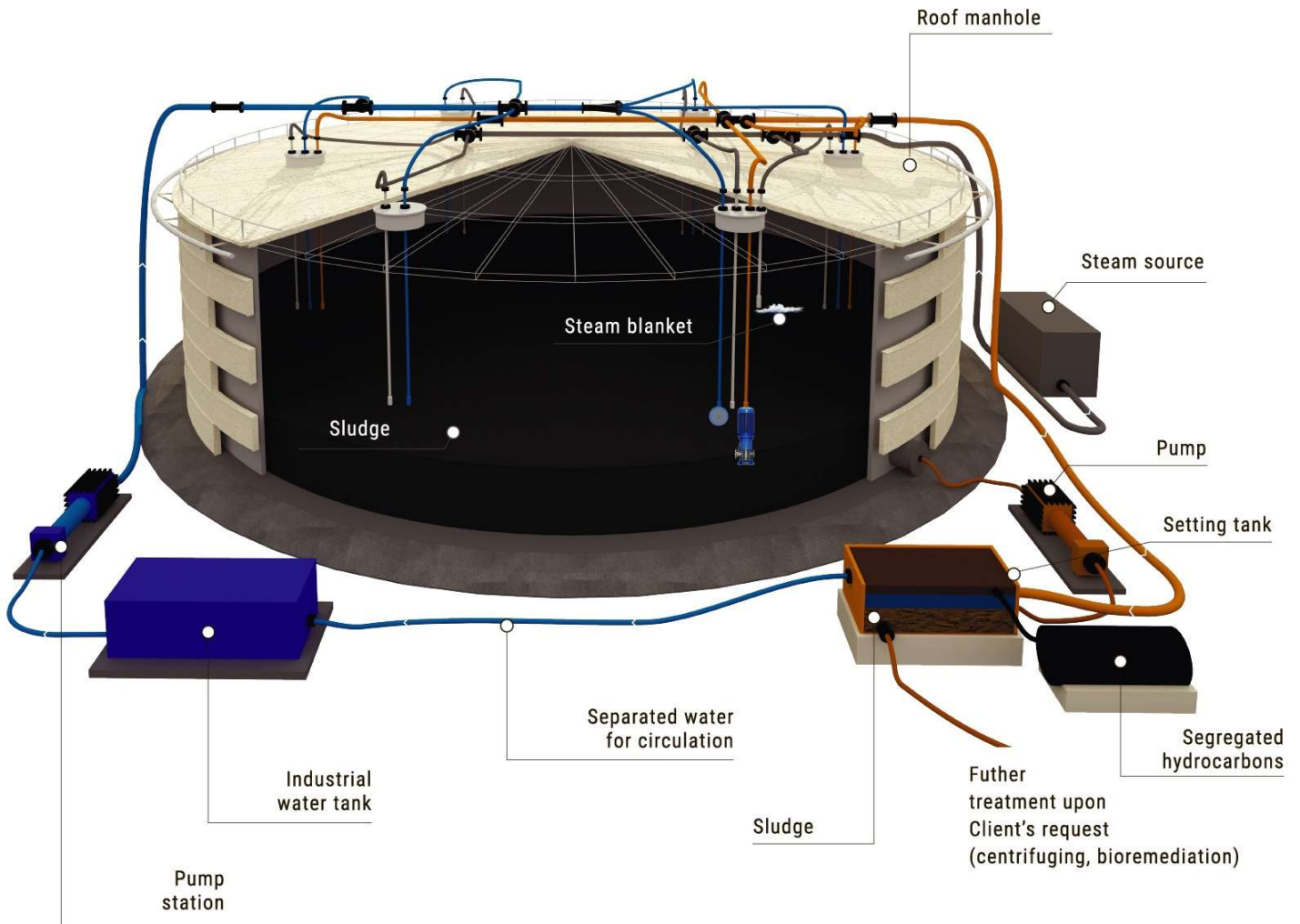





As a result of steam cleaning, the inner side of the shell, the underside of the roof, and roof support legs are clean and oil-free; the oil sludge is separated into three layers (recovered oil, water, sediments)

Oil recovery can be performed:

- Through a roof manhole (option 1)
- Through a draw-off line (option 2)
- Through a side opening (option 3), if the oil sludge level is lower than the level of the side opening

HYDRAULIC WASHING TANK CLEANING SYSTEM (CLOSED LOOP PRINCIPLE)



-  - Water injection
-  - Slurry pump-out
-  - Steam supply

The system is applicable for tanks containing sludge with high content of asphaltens, sulphur or low content of hydrocarbons, and also for heavy oil tanks.



Video

Profit

- Recovery of 95-97% of oil
- Profit from oil recovery often significantly exceeds the expenses for the services
- The recovered product is substantially free of mechanical impurities
- Minimal disposal of sediments

Safety

- No chemicals, additional crude oil or oil products used
- No personnel exposure inside the tank until the total degassing of the tank
- No emissions to the atmosphere
- Maintenance of the tank's integrity

Flexibility

- No weather or seasonal restrictions
- Applicable to any tank capacity and roof type
- Applicable to damaged tanks
- Tailored to the clients' special needs and requirements

Time

- Simultaneous cleaning and oil recovery
- Minimal tank downtime against conventional method

ADVANTAGES

COW-based
methods

ARKOIL

Economic efficiency

Return of the recovered oil to the Client	✓	✓
Profit from the oil recovery often significantly exceeds the expenses for the tank cleaning services	✓	✓
Time-efficient mobilization due to the technology mobility	✗	✓
Unnecessity of the inert gas (nitrogen) injection into the tank	✗	✓
Maintenance of the tank's integrity	✗	✓
Simultaneous cleaning and oil recovery	✗	✓
Reduction of the intervention time and the tank non-availability period	✓	✓
Non-application of any cutter stocks or chemical agents	✗	✓

Application results

Recovered oil is substantially free of sediments	✓	✓
Drained water is safe and can be discharged into the industrial sewage system	✓	✓
High degree of sediments cleaning from hydrocarbons	✓	✓
Tank internals are clean and oil-free after the oil recovery without any additional washing	✗	✓

Safety

No personnel exposure inside the tank	✓	✓
No emissions to the atmosphere	✓	✓
No risk of the electrostatic energy formation	✗	✓

Flexibility

Technology can be used for damaged tanks	✗	✓
Technology effectiveness in case the oil sludge height is less than 0.6 - 1 m	✗	✓
No weather or seasonal restrictions	✗	✓
Technology can be tailored to the Clients' special needs and requirements	✗	✓
Technology is applicable to any tank size, design and roof type	✗	✓
Possibility of the application for a double-deck roof tank	✗	✓

✓ – method fits the point

✗ – method misfits the point

ADVANTAGES

Conventional
method

ARKOIL-TECH

Economic efficiency

Return of 96 – 97 % of the recovered oil to the Client	✗	✓
Profit from the oil recovery often significantly exceeds the expenses for the tank cleaning services	✗	✓
Maintenance of the tank's integrity	✗	✓
Simultaneous cleaning and oil recovery	✗	✓
Reduction of the intervention time and the tank non-availability period	✗	✓
Non-application of any cutter stocks or chemical agents	✗	✓

Application results

Recovered oil is substantially free of sediments	✗	✓
Drained water is safe and can be discharged into the industrial sewage system	✗	✓
High degree of sediments cleaning from hydrocarbons	✗	✓
Minimum sediments to dispose	✗	✓
Tank internals are clean and oil-free after the oil recovery without any additional washing	✗	✓

Safety

No personnel exposure inside the tank	✗	✓
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Flexibility

Technology can be used for damaged tanks	✗	✓
No weather or seasonal restrictions	✗	✓
Technology can be tailored to the Clients' special needs and requirements	✗	✓
Technology is applicable to any tank size, design and roof type	✗	✓

✓ – method fits the point

✗ – method misfits the point

Is steam safe for tank internals (painting, coating, accessories, etc.) and staff involved into tank cleaning operations?

Yes, it is. Steaming as a standard process is widely used in oil industry for cleaning of vessels, hoses, including rubber hoses. Steam is supplied straight into the sludge. Steam jets are not directed towards the tank internals, so steam does not heat or damage them. During steaming, tank cleaning operations are performed without staff presence inside the tank.

Is this technology suitable for tanks with floating or fixed roofs?

The proposed technology can be applied for floating roof tanks, fixed roof tanks and fixed roof tanks with internal floating roofs.

Where do you get steam from?

It can be sourced either from a steam line (if available on site) or a steam generator.

How nozzles are installed inside the tank?

Steam nozzles can be installed:

- Through the space between tank shell and tank roof seal
- Through the roof manholes
- Through the roof support legs sleeves

Do you use any chemicals while the tank cleaning process?

No, we do not. It helps us to keep the technology green and environmentally friendly. Moreover, it helps to avoid any damage to pipelines and/or other facilities.

What is the amount and the quality of the recovered oil?

Up to 97% of oil can be recovered. Due to the high quality and compliance with the requirements, the recovered oil can be returned to the Client.

Where can the recovered oil be transferred after cleaning?

It can be transferred into another operating crude oil tank or production line or another place designated by the Client.

What is the procedure for pumping out the recovered oil?

Oil recovery can be performed:

- Through a roof manhole
- Through a draw-off line
- Through a side opening if the oil sludge level is lower than the level of the side opening

Is nitrogen required to prevent emissions to the atmosphere?

No, it is not. As the steam blanket is used.

Are there any emissions to the atmosphere?

No, there are not.

Before the inlet of the steam directly into the oil sludge, the steam is supplied into the space between the sludge and the roof. Thus, the steam blanket appears, which prevents possible emissions of gases to the atmosphere.

Does your tank cleaning technology require cold cutting?

No, it is not required. This is one of the advantages of the technology over the other tank cleaning methods – maintenance of tank integrity

How many containers are required to deliver the tank cleaning system to the site?

The tank cleaning system can be transported in a 40 ft. container, so it can be mobilized within a very short time.

Is your tank cleaning technology cost-effective?

Yes, it is. The benefits gained by the Client are as follows:

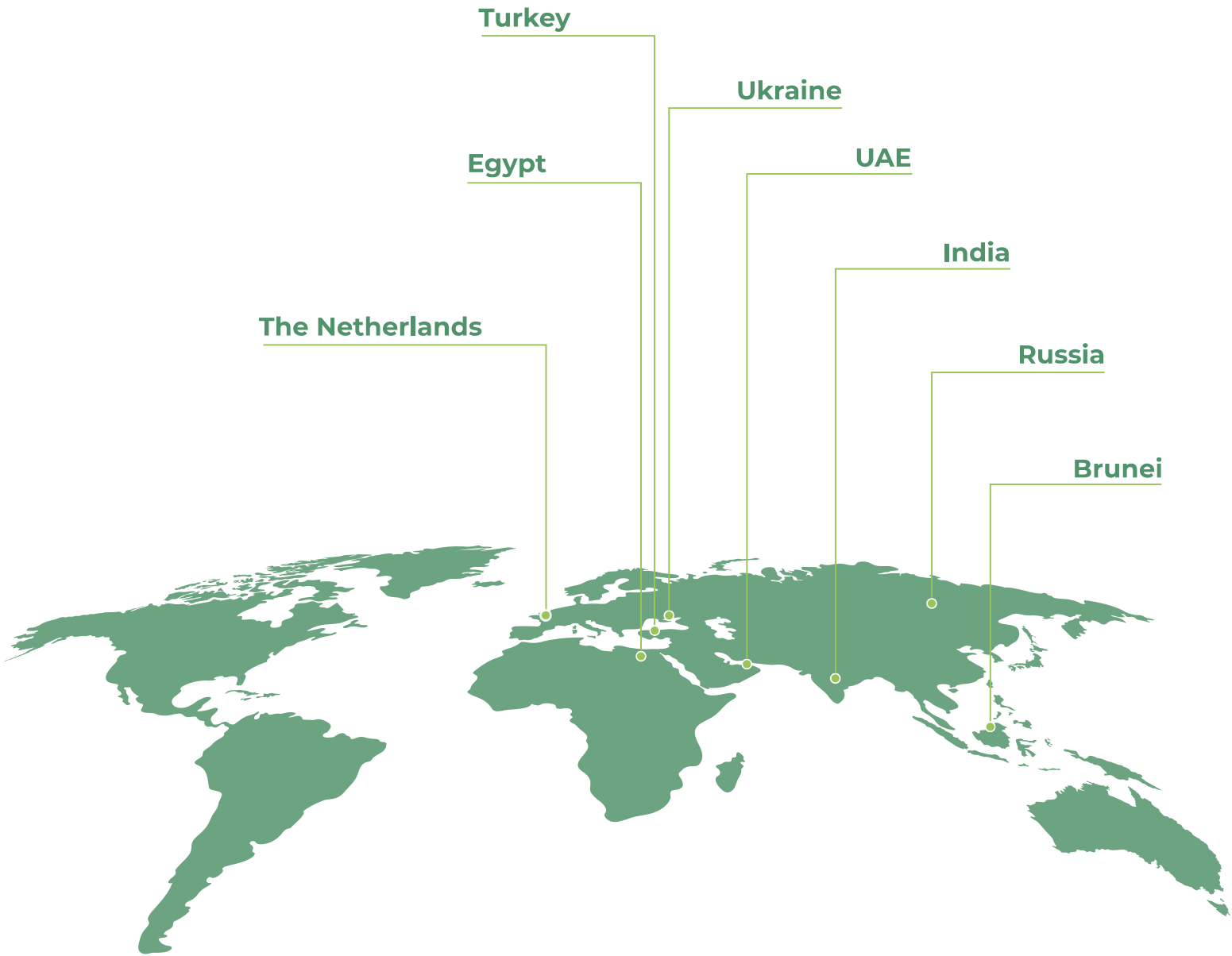
- Minimal tank downtime against other methods
- Minimal disposal of sediments
- High value of oil recovery

Why do you claim your technology can be applied for damaged tanks?

- The technology does not require any staff presence inside the tank during steaming and oil recovery stages
- Steam nozzles can be immersed into the sludge from any available location, not only through the roof.
- Arkoil has an extensive experience in cleaning of tanks with damaged roofs, collapsed pontoons, leaking bottoms, etc. The system can be customized to any type of damage

Are there any ambient temperature restrictions for tank cleaning operations?

No, there are not. The tank cleaning technology proved to be effective at extreme weather conditions (low and high temperatures, high humidity, etc.).







ARKOIL
Technologies

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