Wågene Purifiner Technology

Purifiner oil cleaner

Shipping & Offshore

Entrepreneur, Construction & Mining

Industry & Power plants






Keep your oil clean, always

www.waagene.no

A company with the environment as a focus

From start-up in 1976 to today, there has been a massive development in oil cleansing. We have had the pleasure of participating in this.

Engineer Åge S. Wågene started his technical business in 1976 with compressed air technology. Wågene worked on a national level with sales and service of compressors and compressed air tools for over 35 years. At that time, the company represented FF Luft AS Denmark and ABAC Group in Italy. The compressor business was sold in 2011.

The company started the development of an oil cleansing unit for hydraulic and other lubricating oils in 1999. First with focus on the shipping market in Norway, and later expanded to the international market. The worlds shipping industry discovered Wågenes construction to efficiently keep the oil clean from particles and water. In recent years, maintenance of diesel has also been a priority.

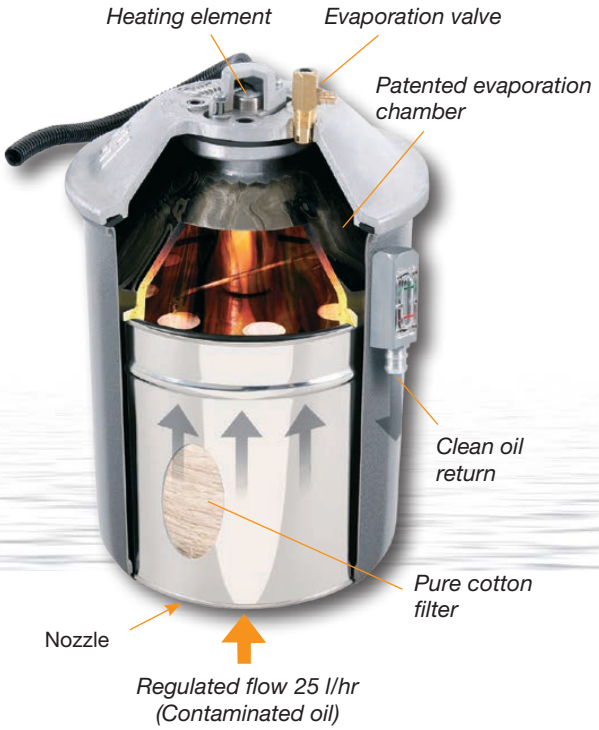
In 2011, Åge S. Wågene changed the company name from Ing. Åge S. Wågene to Wågene Purifiner Technology AS. Wågene have built a network of agents around the world for shipping, and have delivered more than 3,000 units to shipping worldwide. Some of the largest customers include Carnival Cruise Line; which consists of several cruise lines in the world with over 100 cruise ships, including Bourbon Offshore with over 400 offshore vessels.

In recent years, Wågene's filter structure has proven to be very effective in cleansing todays biodegradable oil, also known as EAL (environmentally acceptable lubricant) oil free of water.

We will continue to make history by

- **Reducing costs and oil consumption with clean oil**
- **Reduce the cost of breakdowns due to bad oil**
- **Obtaining big environmental gains**

Our patent filter removes particles down to 1-3 micron and the water evaporates in the specially designed top.



Our unique filter

The Purifiner is a by-pass filter constructed for ceaseless oil maintenance on hydraulic and lubricating oil systems.

To ensure high oil quality, our filter cleanse both particles and water simultaneously, including emulsified water.

The Purifiner is using a 100% cotton filter that absorbs all particles and contaminants of solid elements down to 1-3 micron. For water removing, it has an evaporation chamber that evaporates water, seawater and emulsified water in the oil down to 0.01% (100 ppm).

With constant use of the Purifiner 24/7 – 365 days a year – the oil has achieved a higher quality than new.

A EAL-oil is degraded in water, which means that the system must be free of water otherwise decomposes down inside the plant. Several oil suppliers recommend that EAL-oil should not have higher water contents one <0.1 % (1000 ppm).

The Purifiner cleanses and maintains all type of oils

The Purifiner have been on the world market for over 15 years, and our cleansing technology shows that it works on all types of oil. From common mineral oil and synthetic oil as well as EAL oil.

Unlike normal oil, EAL oil is biodegradable, which makes the oil highly sensitive to water if it enters a system. This is to prevent damage to the environment if a leak allows the oil to leave the system.

Together with our customers, we have tested the effectiveness of the Purifiner by removing emulsified water in EAL oil, and the tests have shown exceptional results. EAL oil; specially used for shipping, requires continuous maintenance due to its sensitivity to water.

The Purifiner cleanses all oil types with a viscosity from 32 to 320.

We make oil greener

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Importance of perpetual oil maintenance

To avoid wear and tear, continuous oil maintenance has become a concept today, where the user has realized that only continuous oil maintenance produces the best effect in the long run.

Save money on clean oil

Different research and studies show that 80% of all hydraulic failures are due to contaminated oil of solid elements. Between 30% to 40% of breakdowns are due to water and emulsified water in the oil.

The purity of oil must be maintained constantly

New oil is rarely clean due to pollution introduced in the distribution system; long storage, transport, condensation or water formation.

For systems that require high quality oil, it is important to cleanse it before it is used, and continuing with oil maintenance to preserve a high quality.

Take frequent oil analyzes

Oil analyzes are of importance to keep track of how the oil quality is changing. With constant oil analyzes, one will obtain the best overview of particle and water content in your oil. It costs so little to prevent damage that may occur due to polluted oil. Wågene uses Norsk Oljelaboratorium AS, 7900 Rørvik.

Norsk Oljelaboratorium AS

E-mail: post@norskoljelab.no

Purifiner – test of bio-oil

We have carried out a test on EAL oil

Focusing especially on removing water content in this type of oil as it is difficult to separate. Knowing there is a low amount of water in new oil; around 200-300 ppm or 0.02% to 0.03%, we added 2.5%(25,000 ppm) seawater into the oil to test our Purifiner.

We have taken several oil samples during testing:

- New oil
- After mixing 2.5% / 25.000ppm seawater in the oil
- After two, four and eight hours of cleansing

After eight hours of cleansing, particles have been decreased by 170,387/97.3% particles. Water content have decreased by 24,944/98.6% ppm.

Oil analyzes can be sent upon request.

After added water

After 4 hour of cleaning

	New oil	After added water	After 2 hours of cleaning	After 4 hours of cleaning	After 8 hours of cleaning
Number of particles	81 650	175 017	24 400	10 337	4 630
Water in ppm	298	25 290	1 100	646	346
Viscosity at 40 C cSt	70,4	70	69,1	69,2	69,7
Acid mg KOH/g	0,8	1,0	0,8	0,9	0,9
Sodium NA	1	68	8	5	2
Nas class	9	12	8	7	5
Carbon dioxide (ul/l)				610	
Nitrogen (ul/l)				50 937	
Oxygen (ul/l)				21 045	

All values of gas content after cleansing are at acceptable levels according to established limit values.

FZG test on cleansed hydraulic oil with The Purifiner

Forschungsstelle für Zahnräder und Getriebebau, Technische Universität München

An FZG test have been completed after cleansing Kluberbio oil EG 2-68. See previous procedure for purification with The Purifiner and oil analysis conducted by Norsk Oljelaboratorium December 2016.

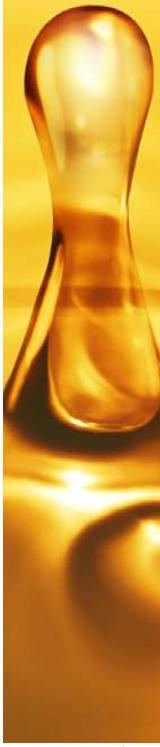
Cleansing of the oil used for the FZG test was carried out by Wågene The Purifiner Technology AS.

FZG test method A / 8.3 / 90 for relative wear resistance of oils

ISO 14635 is for most applications in industry and marine gear. This part of ISO 14635 determines the carrying capacity of the oil defined by damage on surface-wear. High surface temperatures due to high pressure and rotational speed that can start degrading lubricant films.

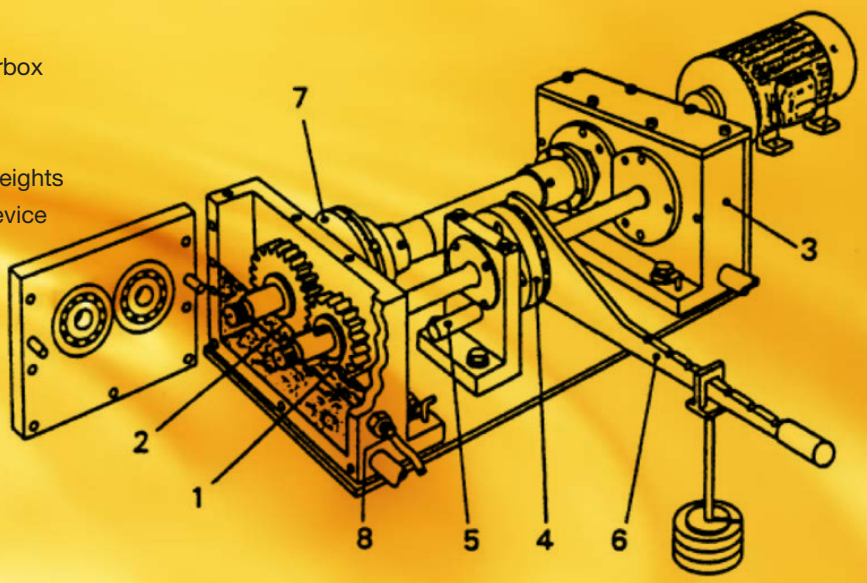
FZG test assesses the lubricants capabilities under defined conditions for temperature, rate of rotation and increased load.

Standard gear oil must handle a load stage of > 12. A test of our purified oil shows load stage > 13. This is the same as new unfiltered oil. Test results can be obtained upon request.



Drawing of FZG four gear oil test

1. Test pinion
2. Test gear
3. Speed reducing gearbox
4. Load clutch
5. Locking bolt
6. Loading lever with weights
7. Torque measuring device
8. Temperature sensor



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Why choose The Purifiner?

The Purifiner have been sold on the international market for over 15 years and provides the best oil cleansing and oil maintenance.

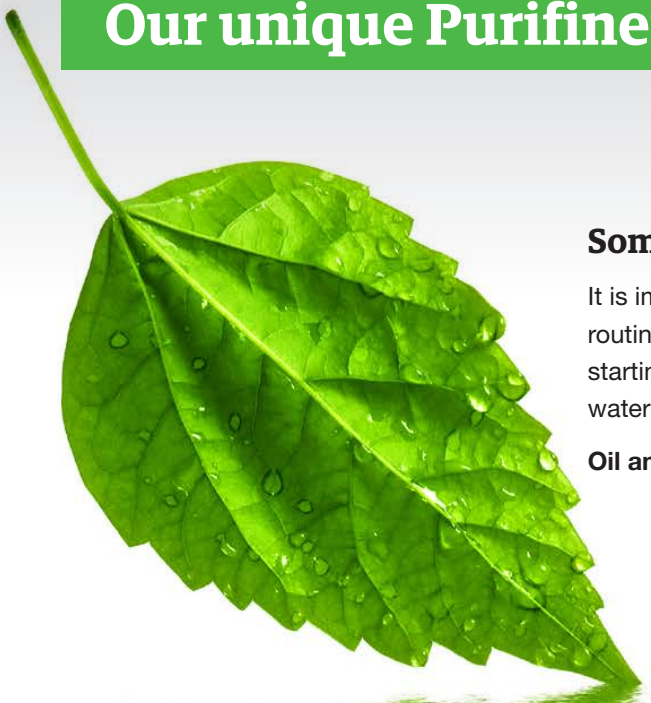
- With continuous operation, The Purifiner cleanses 600 liters per day, per filter. The slower the oil passes through the filter, the better the oil quality
- The Purifiner evaporates all water in the oil, also emulsified water. The water is NOT absorbed in the filter insert – Therefore low consumption of filter per year
- Cleanses the oil to a better quality then new
- Provides the best degree of purity
- Most reliable technology on the market
- Lowest operating costs on the market
- With constant use, it extends oil-life up to 10 - 15 times
- Provides significant cost savings
- Small investment with fast return
- Reduces the breakdown frequency and maintenance costs on the equipment
- Increases the life expectancy of the equipment
- Saves the environment

Oil standard on different systems - quality

ISO Standard	NAS Standard	Systems and components	Oil quality
23/21/18	12	Systems with low pressure and large clearance.	Low
20/18/15	9	Normal quality for new hydraulic oil directly from manufacturer. Low pressure industrial systems or areas where longevity isn't critical. For example, cylinders.	Average
19/17/14	8	General machinery, mobile systems, gear pumps, motors with medium pressure/capacity	Important
18/16/13	7	Reliable systems with high quality. Valves, piston pumps or control valves. General machine requirements and pressure control vents.	Very important
17/15/12	6	Proportional valves, highly advanced systems with high pressure and longevity.	Critical
16/14/11	5	Servo systems, and systems with high pressure and long service life, servo valves.	Critical
15/13/10	4	Control systems with very high reliability. High performance servo valves.	Very critical

These are recommendations from different equipment suppliers. In particular, newer servo valves for different machines are manufactured according to standards that require better and better oil quality.

Our unique Purifiner models



Some notions about water in oil

It is important to carry out continuous oil analyzes. Having good routines can prevent accidents, and give a signal when the oil is starting to lose the ability to lubricate because of contamination and water oxidation.

Oil analysis can tell the following about an oil:

Percent (%) of water in the oil	PPM (Parts Per Million)
10%	100.000
1%	10.000
0.1%	1.000
0.01%	100

A system containing 500 liters of oil where the oil analysis shows 1% or 10.000 PPM water there is 5 liters of water in the system.

NON PRESSURIZED SYSTEM

NP24ME

Mining and construction machinery

Applications: Mining and contractor machinery such as excavators, mobile cranes and overhead lifts, etc.

Specifications Purifiner Controller unit

Power Supply:	24 V
Nominal Wattage:	360W / 15A
Flow Rate:	600/24H – 25L/H
Back pressure:	Max 3 bar
Inlet pressure:	Max 200 bar
Filter:	1-3 micron (optional)
Water Removal:	Evaporation
Warranty:	12 months
Weight:	11 kg
Dimensions:	38 x 35.5 x 14 cm (H x W x D)

TF5060PMH

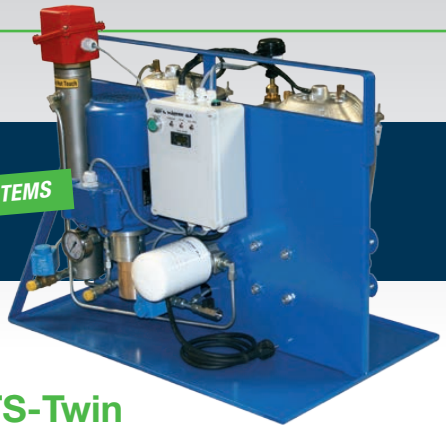
TF for non pressurized system

Applications: Hydraulic systems such as balers, compactors, ro-ro equipment. This is mounted on the IBC tank for cleaning oil, such as freezer compressor oil or other places where it is not possible to permanently instal the unit, There are two sets of oil in attendance, one to use and one for purification; just select one of the two as needed.

Specifications Purifiner TF5060PMH

Capacity:	600 litres/24 hour (Single filter) 1,200 litres/24H (Twin filter)
Oil amount:	Up to 3,000 litres (6,000l for Twin and 9,000l for Triple units)
Oil type:	All hydraulic and lubricating oils
Viscosity:	32 - 320
Max. pressure in:	No back-pressure
Power consumption:	2,400 watt, 230 volt, 16 amp circuit
Connection:	3/8” BSP external thread
Warranty:	12 months
Weight:	35 kg
Dimensions:	64 x 45 x 47 cm (H x W x D)

PRESSURIZED SYSTEMS



Twin
Purifiner TS-Twin

Applications: This unit is widely used for larger systems such as Azipod, Thrusters and Stern Tube on board vessels. Hydraulic central systems. The unit is highly accessible and can be used on any system where you have to collect the oil and return it back into the system.

Specifications Purifiner PS5060PMH-Twin

Capacity:	1,200 litres/24 hour
Oil amount:	Up to 6,000 litres (flow in the system / tank to be cleaned)
Oil type:	All hydraulic and lubricating oils
Viscosity:	32 - 320
Max pressure in:	200 bar (with reduction valve) 3 bar as standard
Max. back-pressure:	8 bar
Filter use:	Approx. 4 filters a year with continual use and in normal circumstances
Power consumption:	2,550 watt, 230 volt, 16 amp circuit
Connection:	3/8” BSP external thread
Warranty:	12 months
Weight:	60 kg
Dimensions:	64 x 76 x 47 cm (H x W x D)

PRESSURIZED SYSTEMS

Trippel
Purifiner TS-Triple

Applications: This unit is used extensively for large systems such as Azipod, Thrusters and Stern Tube on board vessels and hydraulic central systems. The unit is highly accessible and can be used on any system where you have to collect the oil and return it back into the system.

Specifications Purifiner TS5060PMH-Triple

Capacity:	1,800 litres/24 hour
Oil amount:	Up to 9,000 litres (flow in the system / tank to be cleaned)
Oil type:	All hydraulic and lubricating oils
Viscosity:	32 - 320
Max pressure inn:	200 bar (with reduction valve) 3 bar as standard
Max. Back-pressure:	8 bar
Filter use:	Approx. 4 filters a year with continual use and in normal circumstances
Power consumption:	2,700 watt, 230 volt, 16 amp circuit
Connection:	3/8” BSP external thread
Warranty:	12 months
Weight:	70 kg
Dimensions:	64 x 76 x 47 cm (H x W x D)

PRESSURIZED SYSTEMS

TS5060PMH
TS for pressurized systems

Applications: Azipods, Thrusters, Stern tube on board vessels. It can also be used on all other hydraulic systems. The Purifiner can purify lubricating systems as well.

Specifications Purifiner TS5060PMH

Capacity:	600 litres/24 hour
Oil amount:	Up to 3,000 litres (flow in the system / tank to be cleaned)
Oil type:	All hydraulic- and lubricating oils
Viscosity:	32 - 320
Max pressure in:	200 bar (with reduction valve) 3 bar as standard
Max Back-pressure:	8 bar
Filter use:	Approx. 4 filters a year with continual use and in normal circumstances
Power consumption:	2,400 watt, 230 volt, 16 amp circuit
Connection:	3/8” BSP external thread
Warranty:	12 months
Weight:	45 kg
Dimensions:	64 x 45 x 47 cm (H x W x D)

PRESSURIZED SYSTEMS

TS5060PMH-Mobile
Purifiner TS-Mobile

Applications: Suitable for cleaning many smaller systems such as elevators, presses, overhead lifts, small machinery, cranes, etc. The unit is well suited for rental companies to use on their own and others’ fleet. Service and maintenance firms etc.

Specifications Purifiner TS5060PMH-Mobile

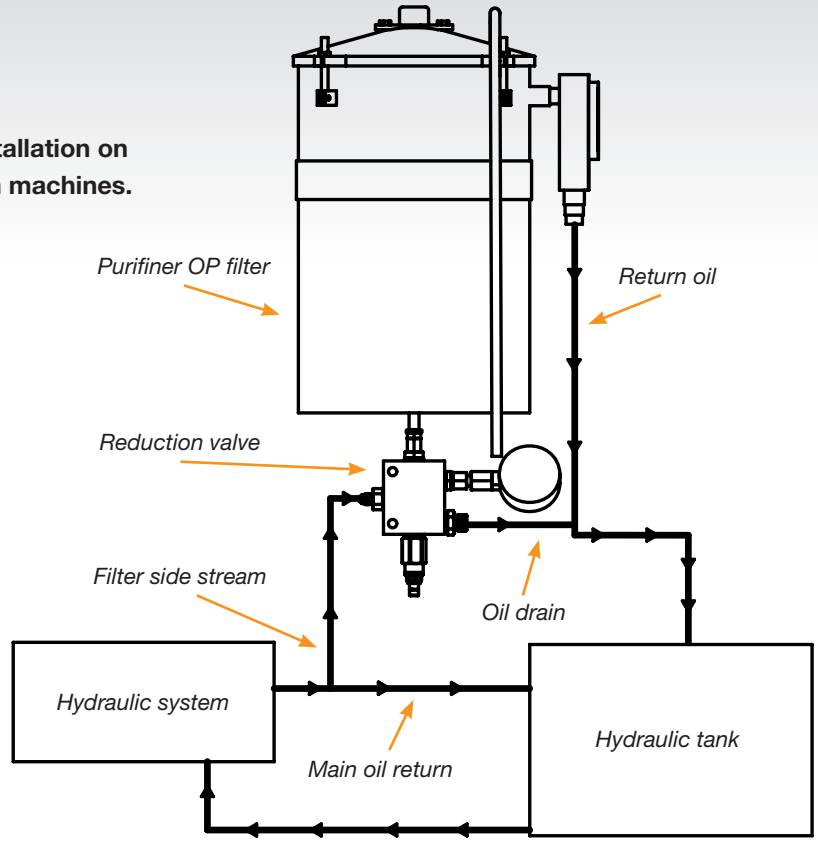
Capacity:	600 litres/24 hour
Oil amount:	Up to 3,000 litres (flow in the system / tank to be cleaned)
Oil type:	All hydraulic- and lubricating oils
Viscosity:	32 - 320
Max pressure in:	200 bar (with reduction valve) 3 bar as standard
Max Back-pressure:	8 bar
Filter use:	Approx. 4 filters a year with continual use and in normal circumstances
Power consumption:	2,400 watt, 230 volt, 16 amp circuit
Connection:	3/8” BSP external thread
Warranty:	12 months
Weight:	60 kg
Dimensions:	115 x 55 x 50 cm (H x W x D)

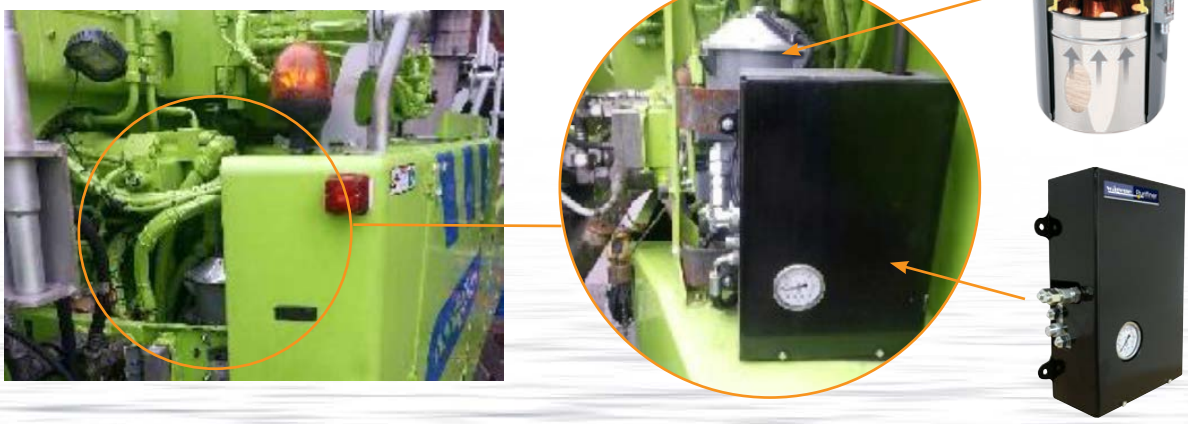
The Purifiner - Installation in all industries

Purification of environmentally friendly EAL oil on all types of hydraulic systems

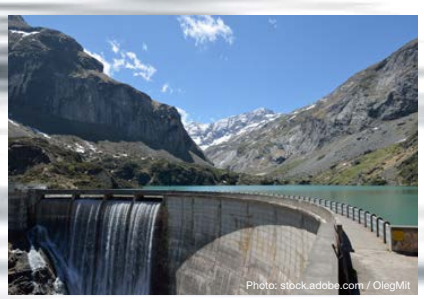
- Shipping
- Stern-tube
- Winches
- Thrusters
- Cranes
- RoRo equipment

Example of easy installation on various construction machines.





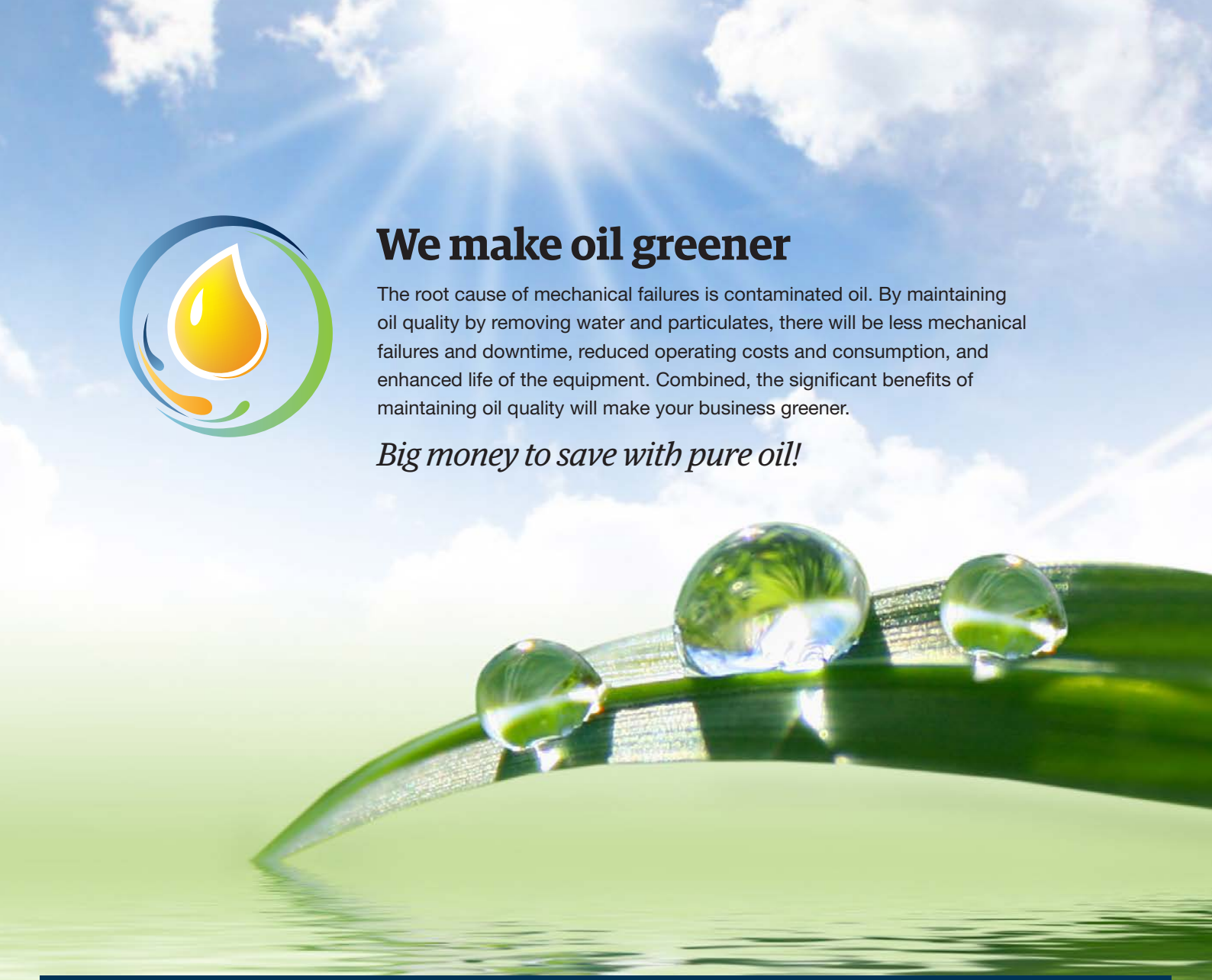
Big money to save with pure oil!



We make oil greener

The root cause of mechanical failures is contaminated oil. By maintaining oil quality by removing water and particulates, there will be less mechanical failures and downtime, reduced operating costs and consumption, and enhanced life of the equipment. Combined, the significant benefits of maintaining oil quality will make your business greener.

Big money to save with pure oil!



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It is safe to choose us as many others have done

Color Line Sandefjord / Norwegian Cruise Line Miami / Bourbon Offshore France / Hurtigruten Tromsø
Conoco Phillips USA / Norled Bergen / Bukser og Berging Oslo / Rolls-Royce Marine Ulsteinvik
Carnival Cruise Miami / Fjord 1 Florø / Knutsen OAS Haugesund / Costa Cruise Genova / Teekay Shipping Stavanger / Royal Caribbean Cruise Line Miami / Remøy Management Fosnavåg / Subsea 7 Arendal
Columbia Ship Management Cyprus / Louis Dreyfus France / Olympic Shipping Fosnavåg / Havyard Leirvik
Solstad Offshore Skudeneshavn / Frydenbø Schottel Nordic Oslo / Torghatten Nord Tromsø
OSM Ship Management Kristiansand / JJ Ugland Companies Canada / Westcon Contractors Ølensvåg
BOA Trondheim / Deep Sea Supply Arendal / Alpha Maskin AS Fetsund / Andersen Mek Verksted Flekkefjord
LKAB Kiruna / Polar Int. Sandefjord / Entreprenørservice Sandvika / TTS Bergen / Drammen Lifutleie
Nøste Kjetting Mandal / Nordic Crane Fredrikstad / Kystekspressen Trondheim / Fosen Namsos Sjø Trondheim
Bastø Fosen Horten / Nasta Larvik.

Sellihca empowered by Achilles Qualified

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