

# CJC<sup>®</sup> Desorber

Solutions for removal of water from low and high viscosity oils, even in stable emulsions



Removal of water from oil  
- even in stable emulsions



# Your challenge

Oil contaminated with water causes oil degradation via micro pitting, cavitation and breakdown of mechanical parts

## A contaminated oil system - Problems caused by water in oil

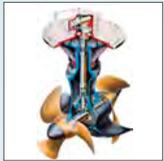
Water in oil eg. sea water or proces water, leads to depletion of additives as well as formation of rust and bacterial growth, increasing degradation of the oil. All of these factors lead to reduced lifetime of both components and oil and the risk of breakdown of production process.

### A contaminated oil system with only in-line filtration

#### without CJC® Desorber



Water contamination on steel mill/ gear



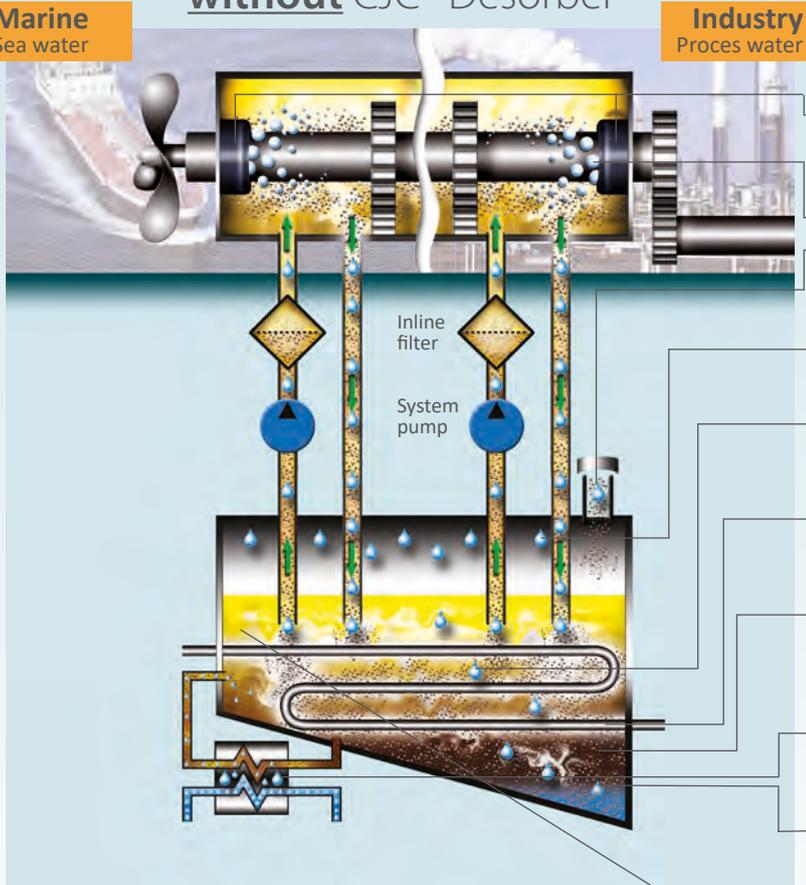
Water and particle wear on thruster



Corrosion on hydraulic rod



Oil and water emulsions



### Sources of contamination

#### Sea water ingress:

Leakage through seals  
Over time seals become worn, making ingress of water easy

#### Process water ingress:

Air vent  
Particles and water ingress through the air vent

Internal environment  
Water condenses in the oil reservoir

Water increases oxidation  
High temperature, dirty oil and water are a cocktail leading to varnish/sludge

Leakage in heating systems  
Leakages in steam heating systems cause water to ingress in the system oil

Rust/corrosion  
Water instigates the formation of rust particles, which are accumulated in the oil reservoir with sludge and particles

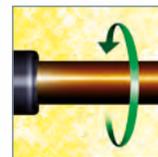
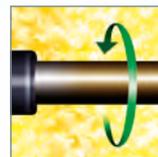
Cooler leaking water  
A leaking cooler results in water entering the oil reservoir

Settled water  
The water settles at the bottom of the oil reservoir

## Most common types of contamination

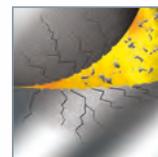
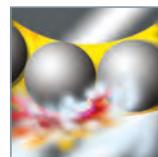
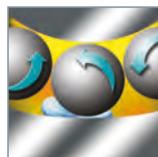
### Oil degradation

Wear metal, water and high temperatures lead to oil degradation, which is the precursor of varnish. This results in sticky varnish that deposits on metal surfaces.



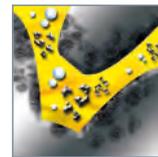
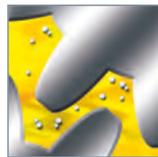
### Cavitation & pitting

Occurs in areas where water is present and oil is compressed; the water implodes, causing the metal surfaces to crack and release more particles.



### Pitting corrosion

When water accumulates in the oil, it causes metal wear, rust and galvanic corrosion of gear and mechanical parts.



### Emulsified water in oil

Oil sample with emulsions of water. Some oil types will create steady emulsions which cannot be separated by settling nor mechanical forces

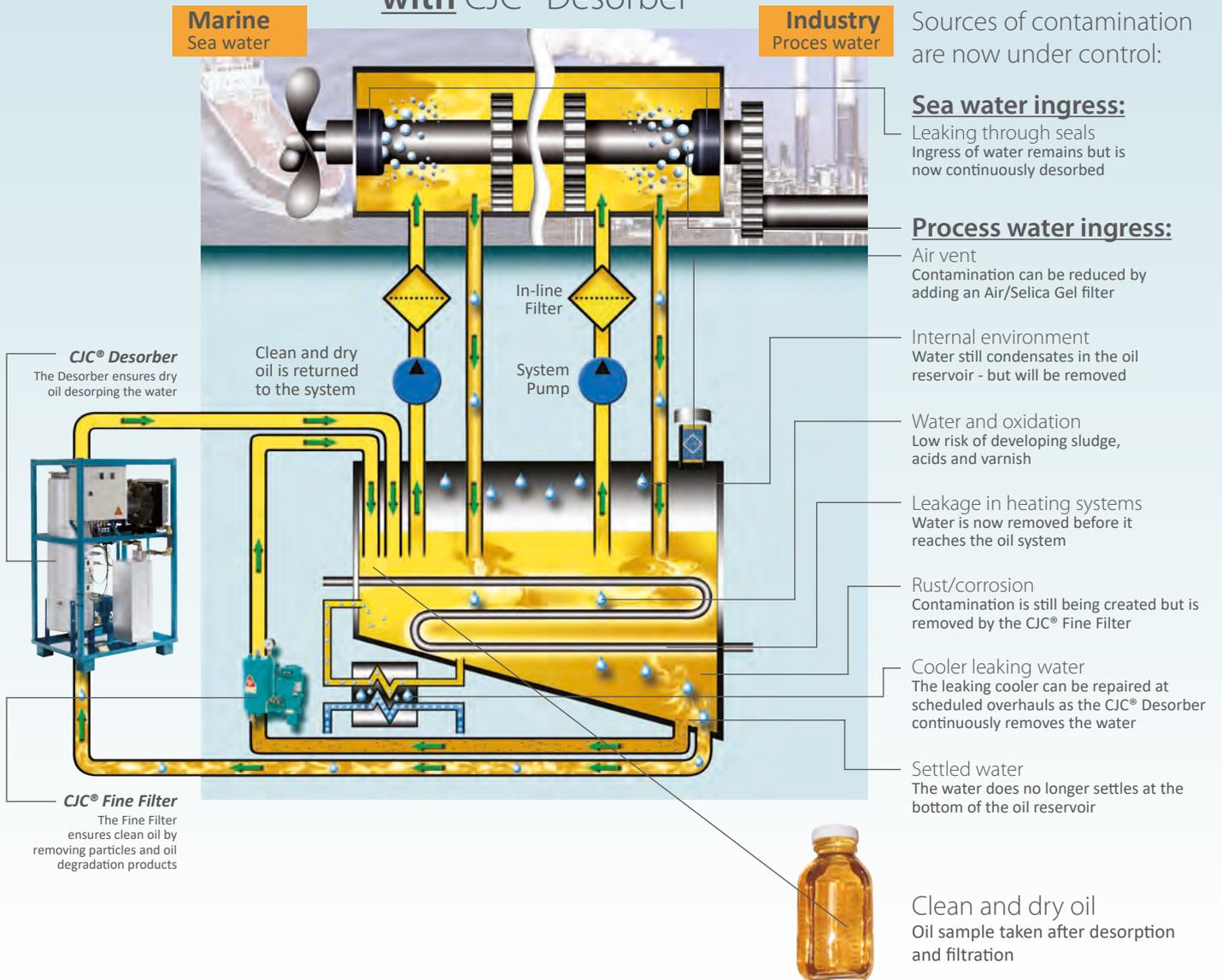
# Your natural solution

The CJC® Desorber is of uncomplicated design and almost maintenance free

## A clean and dry oil system - No oil contamination

The CJC® Desorbers provide solutions for removal of water (eg. sea water, proces water) in mineral, synthetic and high viscosity oils. Even in stable emulsions and in oils with a density above 1 e.g. ester or glycol based fluids.

## A clean and dry oil system with CJC® Desorber

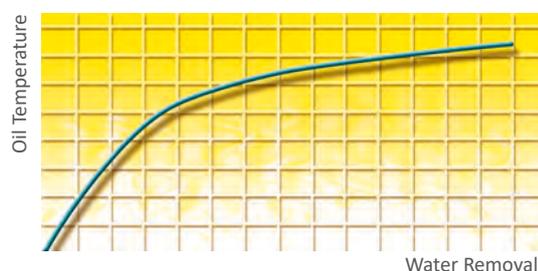


## Desorber efficiency

The desorber's ability to remove water is dependant upon oil temperature and cooling temperature, and therefore it is essential to obtain the right mix of the following parameters:

- Oil temperature in tank
- Oil heating system
- Ambient temperature
- Temperature of cooling medium
- Oil type

## Performance chart based on Mollier diagram



# Desorber principle

Dry oil through the CJC® Desorption process  
- even in systems with emulsified oil

## CJC® Desorber Range

The Desorbers are able to remove larger amounts of water and the water removal ability is unaffected by viscosity and additive package. The Desorbers treats mineral oils as well as synthetic fluids, and is even able to break stable emulsions.



Desorber D10



Desorber D30



Desorber D40



Desorber D88

## CJC® Desorber/Filter Combi Units:

The Desorber/Filter Combi units removes **large amounts of water AND particles** from a wide range of lubricants including emulsified oils and EAL's (Environmentally Acceptable Lubricants)/ Biodegradable Lubricants.



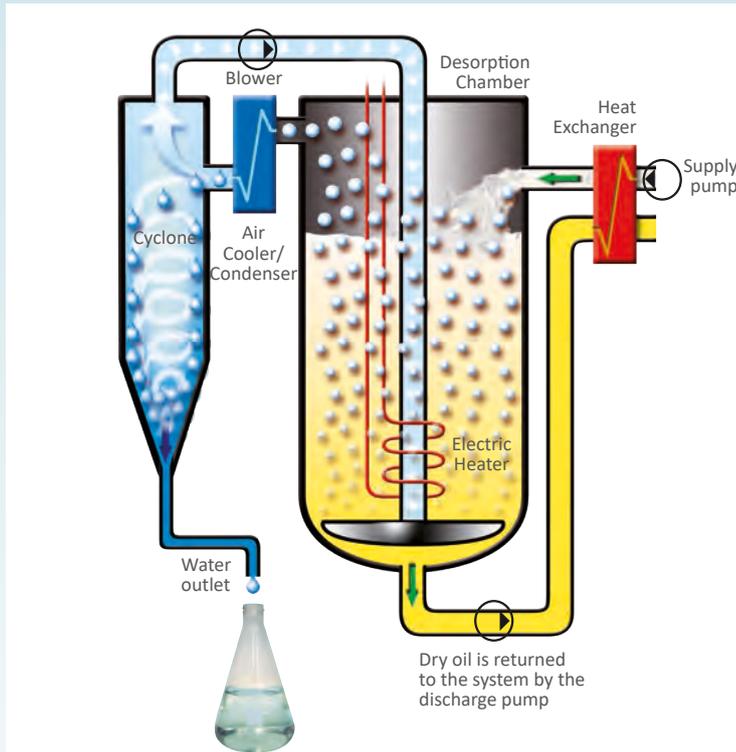
Desorber/Filter Combi Unit, D5



Desorber/Filter Combi Unit, D10

The desorption process is based on the principle that heated air can effectively hold large quantities of water. In the CJC® Desorbers the oil is pre-heated and met by a counter flow of cold air. The air, heated very quickly by the hot oil, will expand and absorb any water present, thus reduce the water in oil content.

## Desorber operation principle



## What happens in a Desorber:

The oil is drawn from the system by the supply pump and preheating if necessary. The oil is supplied into the top of the desorber chamber and distributed evenly in the chamber.

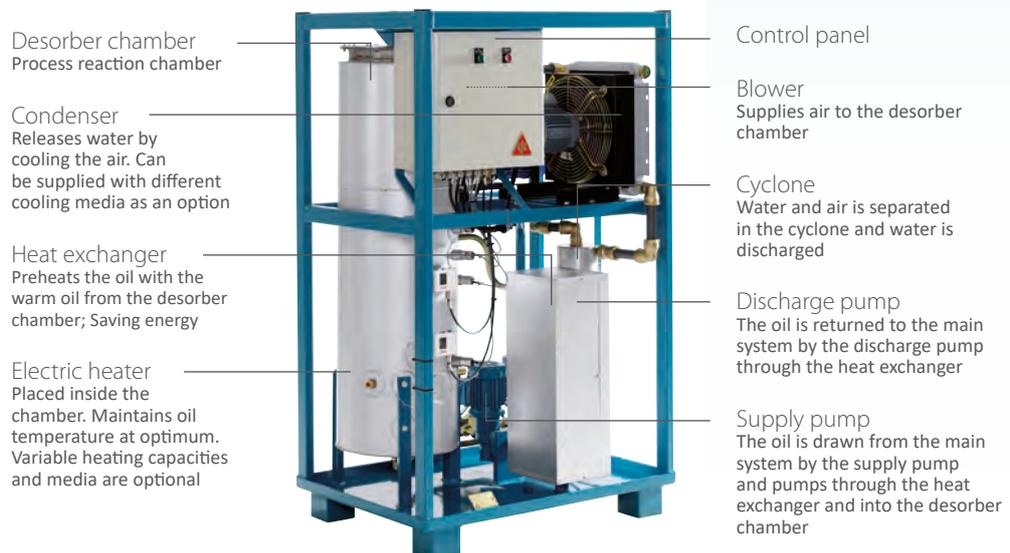
Air passes from the air pump and is released through several hundred nozzles in the bottom of the chamber.

The cold air meets the hot and wet oil in a counter flow. The air is instantly heated by the oil, expands and is saturated by the water in the oil.

The saturated air is condensed by the air cooler and the free water is separated and discharged in the cyclone. The cold air is reused in a closed circuit.

The discharge pump returns dry oil to the main system through the heat exchanger at an oil temperature close to the original oil temperature.

## Main components



# Your benefits

Increased lifetime of both your oil and components, reduced risk of breakdown thus improving your maintenance budget

The benefits obtained when installing a CJC® Desorber will have a positive effect on your maintenance budget as well as increase your productivity and reduce your energy consumption.

## Less maintenance

- Less wear and increased lifetime of components and oil
- Longer time between service intervals
- Enhanced operational precision

## Increased productivity

- Fewer unplanned breakdowns and improved reliability
- Leaking coolers can be repaired at scheduled overhauls

## Lower energy consumption

- Lubricating capabilities remain intact and internal friction is lowered
- Reduced pressure drop over in-line filters
- Viscosity index is kept stable and efficiency is maintained

- all advantages to your total economy!



## Satisfied Customers

### MARINE:

Fleet Manager on TMS-Dry, Greece:

*“The CJC® Combi Unit effectively removed the water from a very expensive lubricant, while our crew is very satisfied with easy installation and low maintenance cost of the CJC® Units”.*

### Problem:

The EAL oil was highly contaminated with water, reaching a level of 366,502 ppm. The customer drained the oil from the stern tube and stored it in drums to avoid damage on components such as bearings and seals. As the oil was highly emulsified, water separation was not possible, neither by centrifugal forces nor by gravitational separation.

### Solution:

Before installation of the CJC® Desorber/Filter Combi Unit, a sample was taken and analysed by a laboratory. This sample indicated that the water content reached a level of 351,900 ppm (35.19%). The CJC® Desorber/Filter Combi Unit was installed on the drums and after 72 hours in operation, a second sample was taken. The water content was now reduced to 600 ppm (0.06%)! This successful water removal made the customer purchase the unit.

### Result:

After only a few days of filtration on the first drum water was efficiently reduced from 351,900 to 600 ppm (35.2 to 0.06%).



*Dirty CJC® Filter Insert, saturated with dirt from the highly emulsified EAL oil. After filtration, the stern tube oil was free of water. Thus, risk of breakdown reduced!*

### POWER:

United Kingdom Oil Fired Power Plant:

*“The CJC® Desorber D30 was considered a success by the power plant. Water content was maintained to acceptable levels. Considerable savings in usage of expensive oil were achieved.”*



### INDUSTRY:

Mr. Per-Erik Halvorsen,  
Maintenance Manager, Norske  
Skogindustrier ASA, Norway:

*“The result proves that the CJC® Desorber we have purchased is an extremely efficient water removing device. We also have experienced that the Desorber is very easy to operate and maintain. After running-in it requires no adjustments and almost no surveillance. It is remarkable how much water it is able to remove.”*

*“It is remarkable how much water it is able to remove.”*

C.C.JENSEN will back you up  
- we have over  
**60 years of experience!**

# C.C.JENSEN - contact us today!



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