



# CJC™ in The Marine Sector



Clean Oil - Bright Ideas





## On-Board Applications

We all depend upon our machinery performing well  
- and performance improves with clean oil

# Have You Ever Experienced..?

- Sticking hatch covers?
- Non-operational cranes?
- Excess water content in thrusters?
- Excessive wear in reduction gears?
- Extraordinary overhaul on fuel pumps and injection nozzles?

- all of the above mentioned are due to contaminated oil, which you can avoid by off-line oil filtration!

### Steering gear

*Removal of particles and condensed water in the hydraulic system*

### Thrusters

*Removal of water and particles*

### Stern tube oil

*Removal of water*

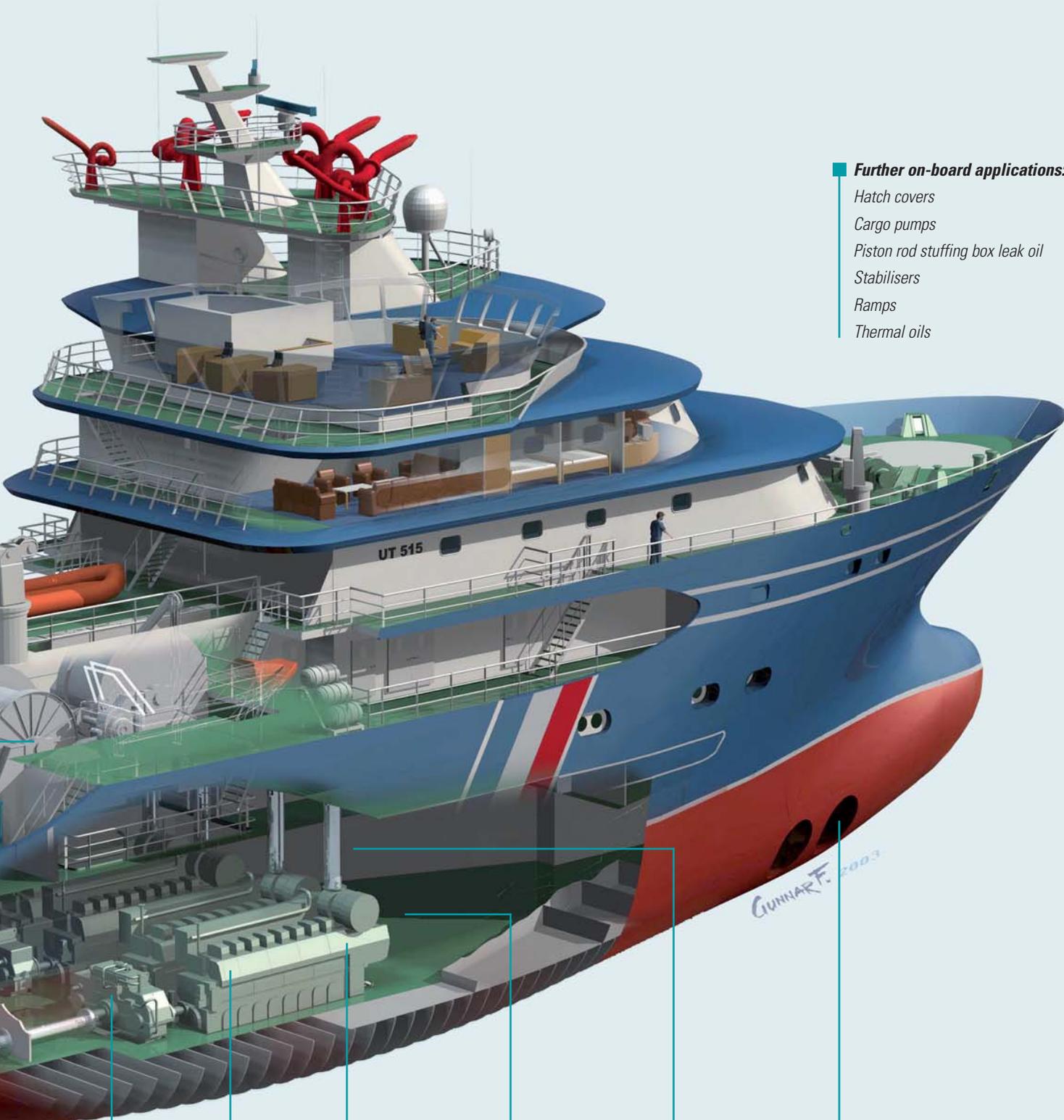
### Cranes

*Removal of particles, water and oil degradation products*

### Winch

*Removal of particles and condensed water*

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**Further on-board applications:**

- Hatch covers*
- Cargo pumps*
- Piston rod stuffing box leak oil*
- Stabilisers*
- Ramps*
- Thermal oils*

**Gears**

*Removal of oil degradation products and particles*

**Lube oil**

*Removal of particles*

**MDO/MGO Fuel**

*Removal of particles and water equals zero bacterial growth*

**Bilge water**

*Absorption of oil from bilge water to below 5 ppm*

**Hydraulic Valves**

*Removal of oil degradation products and particles*

**Bow thruster**

*Removal of water and particles*



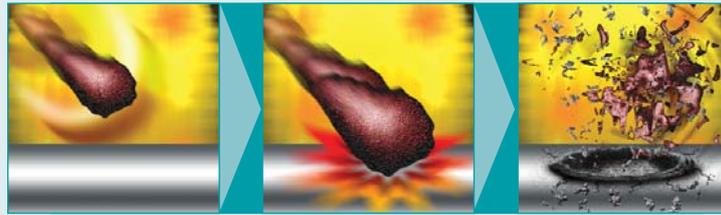


# The Most Common Types of Wear

80% of all machinery repair and maintenance costs are related to contaminated oil

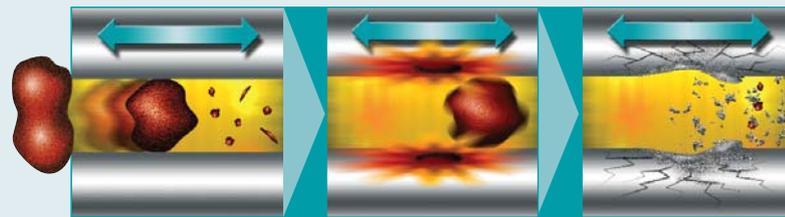
Oil care is important due to 80% of all machinery repair and maintenance costs can be traced back to oil contamination. This has been substantiated by several independent analyses. The main cause is wear induced by contamination through solid particles, water and oil degradation products - which are not intercepted effectively by most in-line filters.

## Particles



### **"Sandblasting"**

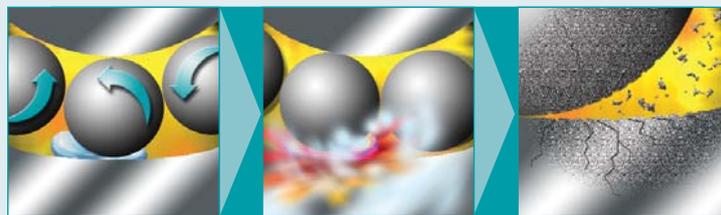
When particles are transported with the oil flow, the particles collide with metal parts, destroying the metal surface and forming new particles.



### **Grinding**

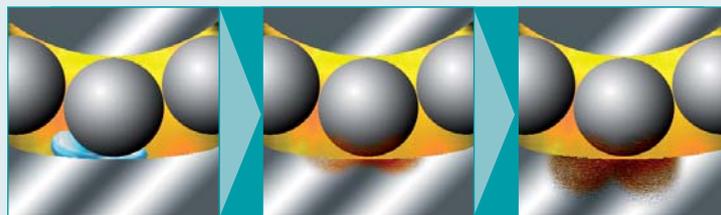
When clearance sized hard particles are wedged between movable metal parts, it destroys the metal surface further and can result in additional wear.

## Water



### **Cavitation**

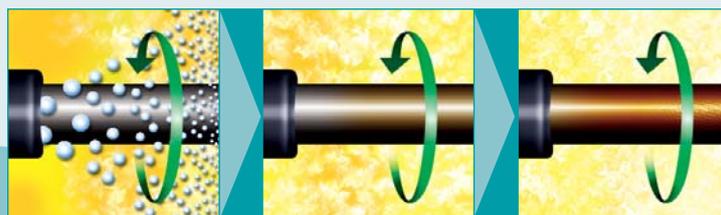
Cavitation occurs in areas where water is present and oil is compressed; the water implodes and blows particles off the metal surface, which cracks.



### **Corrosion**

Water or chemical contaminants in the oil cause rust or chemical reactions, which deteriorate the component surfaces.

## Varnish/ resin



### **Oil Degradation**

Worn seals cause ingress of water, which at high pressure emulsifies developing varnish deposits on system parts, creating a "sandpaper-like" surface.

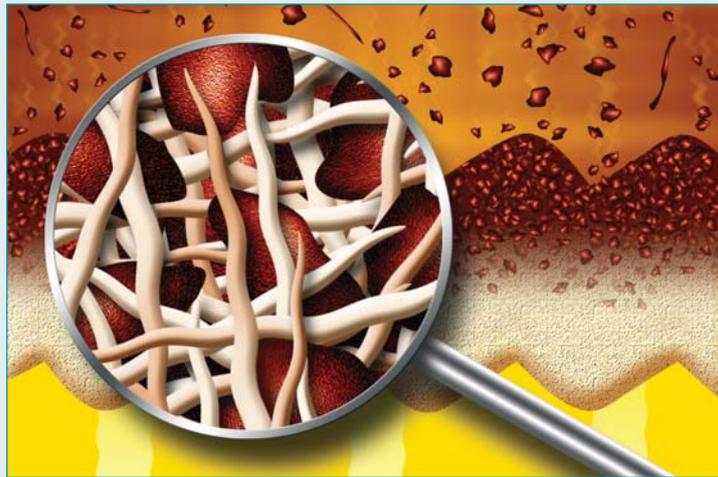


## One Filter - Three Solutions

CJC™ Off-line Filters remove particles, absorb water and adsorb oil degradation products round-the-clock

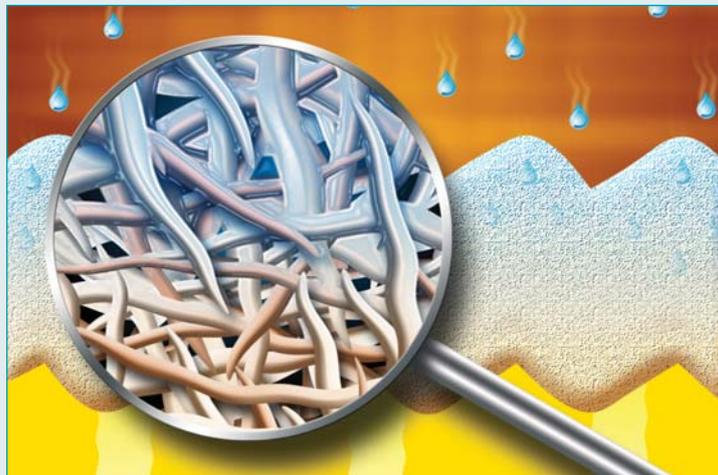
CJC™ Off-line Filters do not only retain solid particles and water. They also remove oil degradation by-products - "soft contaminants" - which are the precursors to the sticky varnish that deposits on metal surfaces. They cannot be removed by traditional filtration as they behave like a fluid in a fluid.

### Particles



**Removal of particles**  
Particles down to 0.8  $\mu\text{m}$  are retained in the unique CJC™ Filter Insert mass

### Water



**Absorption of water**  
The cellulose fibres in the CJC™ Filter Insert mass absorb the water

### Varnish/ resin



**Adsorption of oil degradation products (Varnish)**  
Resin in the oil attracts to the polar fibres in the CJC™ Filter Insert mass and are retained

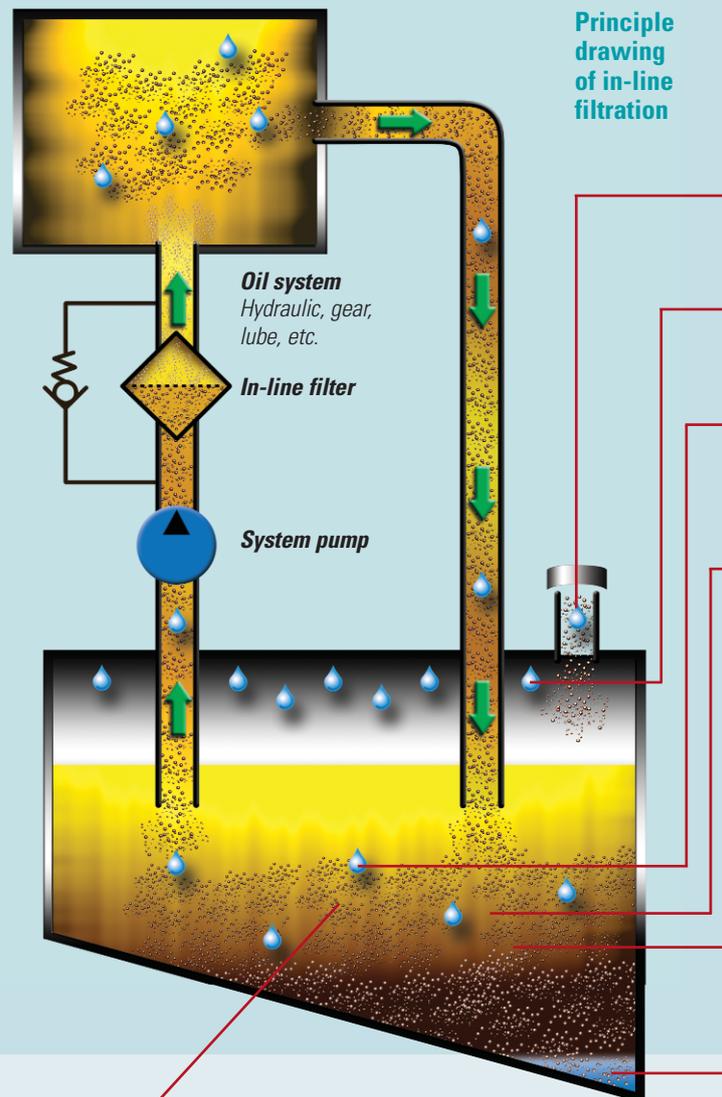


## Traditional In-line Filtration

In most applications the in-line filter alone will find it difficult to keep an oil system clean

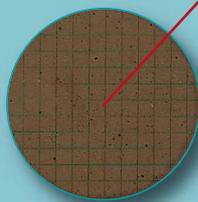
In-line filters are usually of very compact design but must still cope with high flow rates. This affects their minimum pore size and consequently the optimum oil cleanliness can only seldomly be achieved. Oil degradation products, water and micro particles will accumulate in the oil.

# In-line Filtration



### Contamination sources:

- Air vent**  
Particles and water is ingressing through the air vent
- Internal environment**  
Water condensate in the oil reservoir
- Oil reservoir**  
Contamination is returned to the oil reservoir from the system
- Water produced by oil degradation**  
High temperature + dirty oil = Acid, water and resin
- Rust/corrosion**  
Water instigates the formation of rust particles which together with oil degradation products and particles are accumulated in the oil reservoir
- Varnish/resin**  
Oil degradation products, micro particles and water are accumulated in the bottom of the oil reservoir



Millipore membrane  
Sample taken **before**  
off-line filtration

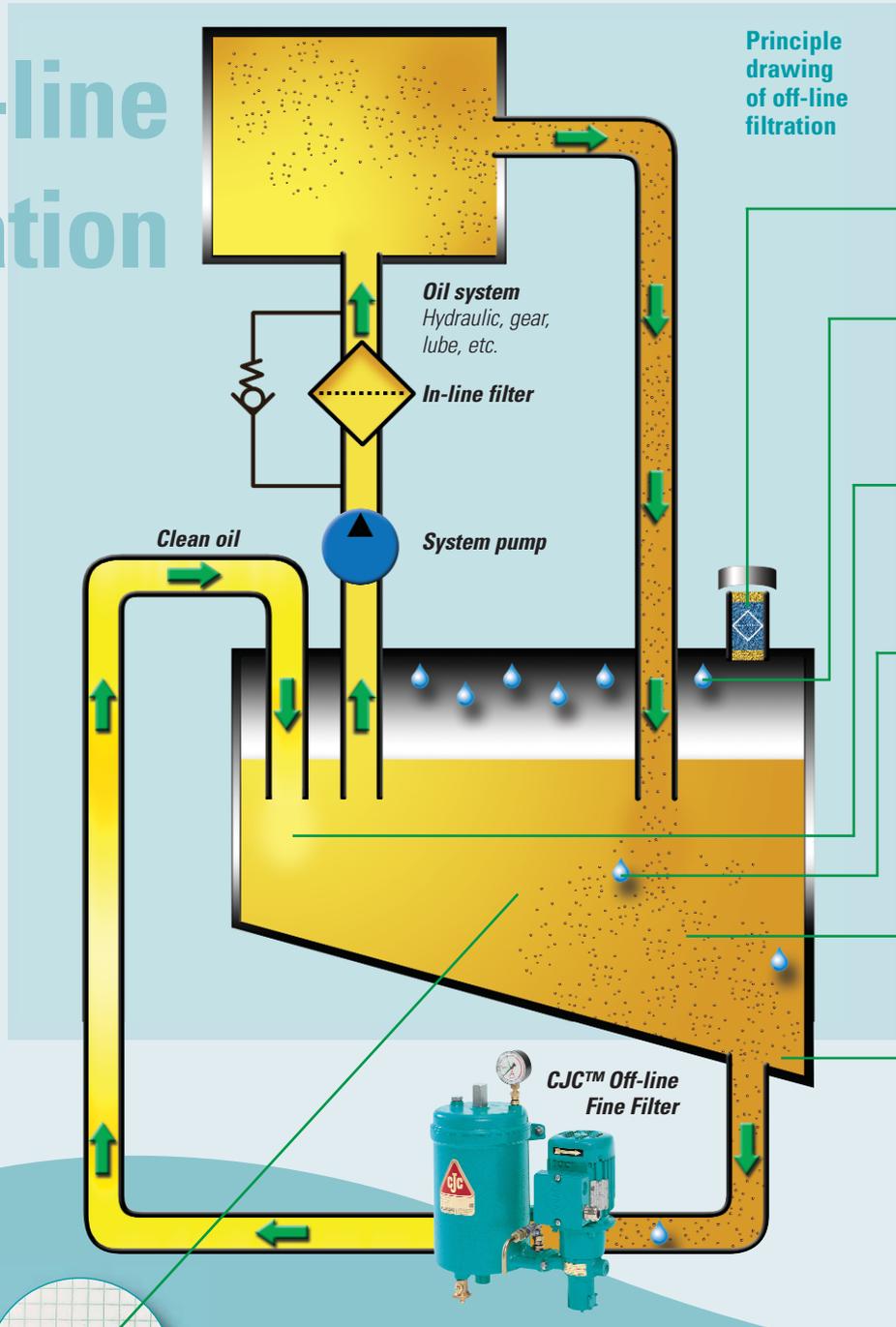


# The CJC™ Off-line Solution

Round the clock removal of particles, water and oil degradation in the same operation

CJC™ Off-line Filters are easy to install and the depth filter insert has a very large dirt holding capacity. CJC™ Filters have low operational costs and are also almost maintenance free. All CJC™ Fine Filter Inserts have a 3 µm absolute filtration ratio and will remove particles, water and oil degradation products in one and the same operation.

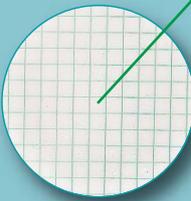
## Off-line Filtration



Principle drawing of off-line filtration

### Contamination sources are now under control:

- Air vent**  
Contamination can be reduced by adding an Air/Silica Gel filter
- Internal environment**  
Water still condensates in the oil reservoir but with the CJC™ Fine Filter installed it is removed before it reaches the oil system
- Oil reservoir**  
Clean oil from the CJC™ Fine Filter is pumped into the oil reservoir - ready to be used in the system
- Water produced by oil degradation**  
The risk of developing water, acids, and oil degradation products has been considerably decreased
- Rust/corrosion**  
Contamination is still being created but is removed by the CJC™ Filter Insert
- Varnish/resin**  
Oil degradation products and micro particles are now practically gone from the bottom of the oil reservoir



Millipore membrane  
Sample taken **after** off-line filtration





## The CJC™ Oil Filtration Crew

Each application performs specific tasks - so do CJC™ Off-line filters in order to ensure high oil cleanliness

On-board oil systems have a hard time dealing with high levels of contaminants from the environment. Some applications face a high level of solid particles, some of humid air and water, some of developing varnish-like deposits, and most face a mix of all three contaminants in various degrees. CJC™ Off-line Filters are designed to deal with all of them.

### **Hydraulic systems**

Hydraulic systems are vulnerable in terms of particle contamination from external sources as well as internal sources and oxidation of the oil. This, combined with the fact that hydraulic systems are often used on critical operational equipment such as cargo cranes, cargo pumps, winches, ramps and hatches, makes reliability of high importance.

The CJC™ HDU series offers increased reliability as well as improved component lifetime and reducing maintenance costs.



**CJC™ Fine Filter**

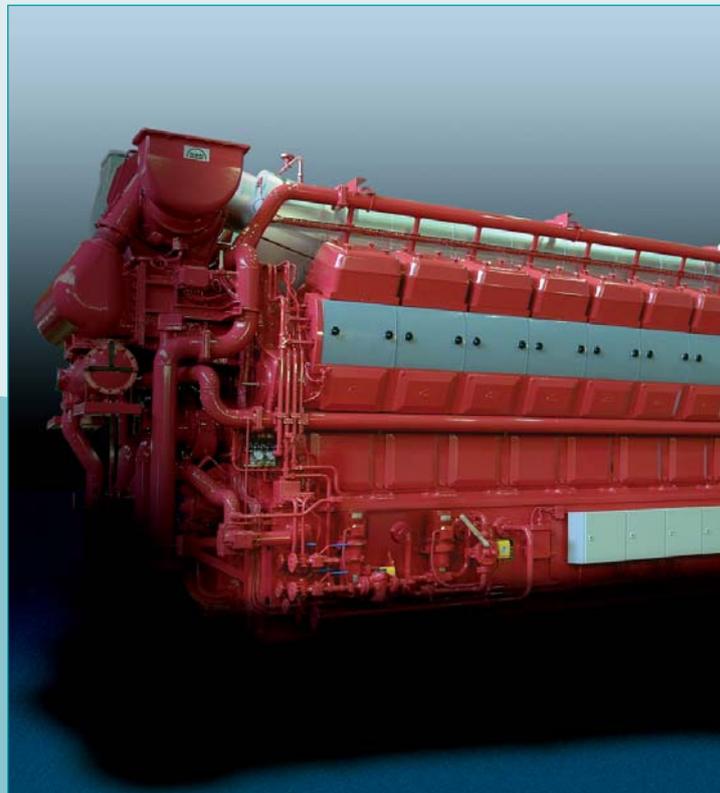


### **Diesel engines**

Service- and settling tanks in diesel engines are often accumulating solids and water, seriously influencing the performance of fuel oil pumps and injectors.

And especially on trunk engines, the lifetime of the oil is often reduced by the contamination of soot particles.

A combination of CJC™ HDU and PTU series filters ensures prolonged lifetime of your engine, reduced cost of maintenance and improved environmental performance.



**CJC™ HDU 27/54**



**CJC™ PTU 27/54**



# CJC™ Off-line Filters for All On-board Applications

CJC™ Filters are of compact design and based on a modular build-up principle, depending on purpose and volume of oil. The CJC™ Filter types shown here are only a very small extract of the whole range. If needed, CJC™ Filters can be customized to meet certain conditions.

## **Thrusters**

*Thrusters operate in a difficult environment. Besides the contamination of particles and oxidation residues, there is a risk of continuous water ingress.*

*The CJC™ PTU and D series are capable of removing water to very low levels continuously. If the oil will demulsify, the PTU series offer water removal and fine filtration in one unit.*

*If the oil is emulsified, the D series offer a solution to remove the water. In both cases you can avoid expensive unscheduled dry-dockings.*



**CJC™ PTU 2 27/27**



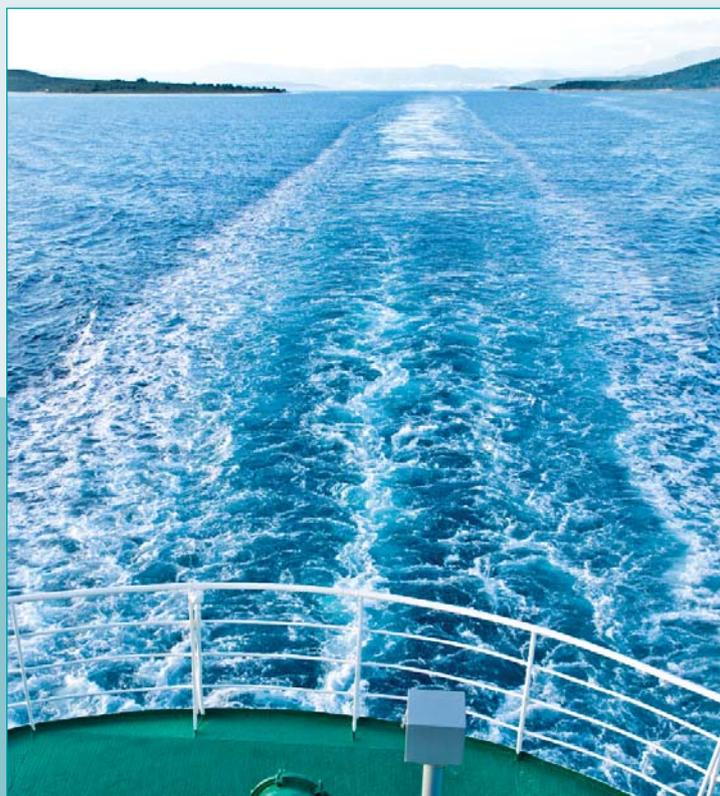
**CJC™ D10**



## **Oily water separator**

*Overboard discharges from Oily Water Separators receive increased attention from Port State Authorities. Regulations dictate an oil content of 15 ppm as a maximum in the effluent.*

*The CJC™ Blue Baleen System is capable of bringing the effluent below 5 ppm, reducing the environmental footprint and ensuring compliance with regulations, locally and globally.*



**Blue Baleen System**





## CJC™ Series of Solutions

All CJC™ Series are of uncomplicated design, easy to install and almost maintenance free

Using CJC™ Off-line Filters will have a positive effect on your maintenance budget as well as increase your productivity and reduce your energy consumption - all advantages to the total economy!

### HDU Series



#### **CJC™ HDU Series**

The CJC™ Fine Filter removes particles, water and oxidation by-products for hydraulic and lubricating oils and have flow rates from 45 to 20.000 L/h

A used CJC™ Filter Insert (sliced half way down) showing the large dirt holding capacity



### PTU Series



#### **CJC™ PTU Series**

The CJC™ Filter Separators combine depth filtration with water separation and are used for water contaminated diesel, hydraulic and lubricating oils.

The CJC™ PTU Series continuously remove water from oil in large volumes



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# Optimal Oil Performance With CJC™ Off-line Filters

## Desorber Series



### **CJC™ Desorbers**

The CJC™ Desorbers provide solutions for desorption of water in mineral, synthetic and high viscosity oils

The Desorbers remove water from even stable emulsions and in oils with a density above 1.



## Blue Baleen System



### **CJC™ Blue Baleen System**

The CJC™ Blue Baleen System absorbs oil from bilge water effluent and is capable of reducing the oil content to a value less than 5 ppm. This ensures that environmental performance, objectives and targets are met.

The new CJC™ Blue Baleen OilAbsorb Insert ensures a fast return of investment due to its high yield compared to the cost of landing bilge water ashore.



# CASES

## Some Cases And Statements From Our Maritime Customers



Problem-solving has almost become a trademark for C.C.JENSEN - can we assist you?

### J. Lauritzen Shipping Company



#### **Ole Svendsen**

Senior inspector  
of the J. Lauritzen  
company

The J. Lauritzen  
shipping company  
is one of the major  
Danish shipowners



#### **Small investment benefits both the environment and competitiveness**

##### **Problem**

The J. Lauritzen shipping company has solved the problem of expensive crane breakdowns by buying simple oil filters

##### **Solution**

The small and simple CJC™ Fine Filter has provided the solution to a costly problem for the shipping industry. Crane breakdowns and nonworking hydraulic hatches are expensive and can create problems for both employees and the environment due to extended time in harbours and too frequent repairs and oil changes.

J. Lauritzen shipping company invested in filters for each of their current nine reefer vessels. In the years 1995 to 1999, just one of the ships suffered no less than four crane breakdowns. Each time it required a ten-hour repair, the replacement of 1,000 litres of oil and a number of spare parts.

#### **Mr. Ole Svendsen, Senior inspector of the J. Lauritzen company**

*"Since we installed CJC™ Fine Filters on the cranes of all refrigerator ships in 1999, we have had just one crane breakdown,"* said senior inspector Ole Svendsen of J. Lauritzen. He added, *"This saves us money, but it is also advantageous for the environment. It is very important, both for us as a responsible shipping company and for our customers to protect the environment as much as possible."*

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## Gulf Offshore Norway



*M/S North Truck,  
Gulf Offshore  
Norway A/S*

### **Problem**

In year 2000 Gulf Offshore Norway struggled with water in the thruster oil on "North Truck".

### **Solution**

A CJC™ Thruster Filter was installed in order to arrest the water problem and to introduce oil maintenance. Ultimately, the drained water is sea water, i.e., no salt is left in the oil.

### **Mr. Bjørn Helge Amundsen, Tech. Superintendent, Gulf Offshore Norway:**

*"After having tested nearly every piece of water removing equipment on the market in order to solve our water and contamination problem, we went for the CJC™ Filter Systems, because it was simply the best. The filters did the job to our greatest satisfaction, removing particles, water and other waste products.*

*CJC™ Filter Systems for oil maintenance are a very good investment. The return of investment is very short."*

## Bourbon Offshore Norway



*M/S Bourbon Mistral,  
Bourbon Offshore  
Norway A/S*

### **Problem**

Ever since they were new, the engines have had problems with high levels of insolubles (0.7 to 1.0% wt) and getting very dirty inside.

### **Solution**

A CJC™ Filter was installed on one of the four engines. After 18 days of operation, an oil sample was sent to Castrol for analysis, showing that insolubles were reduced to 0.1% wt.

### **Mr. Lars Inge Klauset, Chief engineer of M/S Bourbon Mistral:**

*"I recommend that our LO separators are left ashore and that CJC™ Filters are purchased also for the other main engines."*

### **Mr. Torbjørn Gravdal, Technical Inspector, Bourbon Offshore, Norway:**

*"I have sailed as a chief engineer for many years, and have good experience with the CJC™ Filters, so I was not surprised to see the effect of the filters. We are now going to install similar filters on the 3 other engines of the Bourbon Mistral, and on all 4 engines of the sister ship, the M/S Bourbon Monsoon."*

## Remøy Shipping



*M/V Ocean Odyssey,  
Remøy Shipping A/S*

### **Problem**

The bilge water separator did not clean the bilge water sufficiently well. The Oil Discharge Monitor (ODM) gave 15 ppm alarm.

### **Solution**

A CJC™ OilAbsorb Filter was applied after the bilge water separator, but before the Oil Discharge Monitor.

### **Mr. Arve Bjørneberg, Chief Engineer of M/V Ocean Odyssey:**

*"The system works very well - the ppm monitor shows less than 5 ppm most of the time. Personally, I am very pleased. Applying this filter means that we have no bilge water problems. Prior to installing this filter we delivered an average of approx. 30-35 m<sup>3</sup> per month.*

*As long as we have filter inserts on board we no longer need to deliver bilge water ashore. We haven't bought particularly many inserts either. We also have an incinerator with a sludge burner that can burn waste oil, which is separated from the bilge water."*



## Clean Oil - Bright Ideas

Clean Oil – Bright Ideas is the mission of C.C.JENSEN that is being adhered to by all of our international offices and cooperation partners.



At C.C.JENSEN - nowadays mainly referred to by its brand name CJC™ - the mission is unmistakable - the CO<sub>2</sub> outlet must be reduced and the global environment made cleaner. The company contributes to this goal by making room and space for the development of **Bright Ideas** and for making them accessible to the rest of the world.

Ever since the founder of CJC™ became aware of the importance of **Clean Oil** to the environment as well as to the economy of individual production units, **Clean Oil** has been the focal point and the aim of all initiatives and development processes in the company – and successfully.

Throughout all the years, CJC™ has chosen the opposite direction of the general trend in society where rules and regulations continue to govern all activities and initiatives. Instead, already from the very beginning in 1953, it was decided to focus on the free initiative and freedom with responsibility as the basis for a work environment where professional challenges, a positive corporate culture and employee commitment contribute to nurturing **Bright Ideas** and to maintaining CJC™'s position on the market.

This is why, today, CJC™ is respected as a company that worships values like quality, traditions, reliability, credibility and stability – but which is, at the same time, in front when it comes to responsibility for the future and a joint effort concerning environmental problems and “green” solutions to the benefit of the global environment.

At CJC™ we believe that only in an open atmosphere based upon security, mutual trust and a belief in the future is it possible to create and realize ideas – and this is why at CJC™ **Clean Oil – Bright Ideas** makes sense.



*The CJC™ Blue Baleen OilAbsorb Insert is made of 100% organic material*



Clean Oil - Bright Ideas

# Bright Ideas





# C.C.JENSEN All Over The World

The CJC™ Off-line Filters are distributed by our own international sales organisation and designated distributors

*CJC™  
stands for  
reliable supply  
all over the  
world*



## Manufacturer

**Denmark:** C.C.JENSEN A/S • Løvholmen 13 • DK-5700 Svendborg • Denmark  
Tel.: +45 63 21 20 14 • Fax: +45 62 22 46 15 • E-mail: filter@cjcdk • www.cjcdk

## Subsidiaries

- UK:** C.C.JENSEN LTD. • Tel.: +44 1 388 420 721 • E-mail: filtration@cjcdk.co.uk • www.ccjensen.co.uk  
**USA:** C.C.JENSEN INC. • Tel.: +1 770 692 6001 • E-mail: ccjensen@ccjensen.com • www.ccjensen.com  
**Spain:** C.C.JENSEN Ibérica, S. L. • Tel.: +34 93 590 63 31 • E-mail: ccjensen.es@cjcdk • www.cjcdk  
**Poland:** C.C.JENSEN Polska Sp. z o.o. • Tel.: +48 22 648 83 43 • E-mail: ccjensen@ccjensen.com.pl • www.ccjensen.pl  
**Netherlands:** C.C.JENSEN Benelux B.V. • Tel.: +31 182 37 90 29 • E-mail: ccjensen.nl@cjcdk • www.ccjensen.nl  
**Ireland:** C.C.JENSEN Ireland • Tel.: +353 61 374 943 • E-mail: ccjensen.ie@cjcdk • www.ccjensen.ie  
**Chile:** C.C.JENSEN S.L. Limitada • Tel.: +56 2 739 29 10 • E-mail: ccjensen.ch@cjcdk • www.ccjensen.cl  
**Greece:** C.C.JENSEN Greece LTD. • Tel.: +30 210 42 81 260 • E-mail: ccjensen.gr@cjcdk • www.ccjensen.gr  
**France:** C.C.JENSEN France • Tel: +33 3 59 56 16 58 • E-mail: cjcdk.fr@cjcdk • www.ccjensen.fr  
**China:** C.C.JENSEN A/S China • Tel: +86 10 6436 4838 • E-mail: ccjensen.cn@cjcdk • www.ccjensen.cn  
**United Arab Emirates:** C.C.JENSEN Middle East • Tel: +971 (0)50 453 8203, 7916 6739 • E-mail: ccjensen.uae@cjcdk • www.cjcdk.ae  
**Denmark:** C.C.JENSEN Denmark • Tel: +45 72 28 22 22 • E-mail: ccjensen.dk@cjcdk • www.cjcdk.dk  
**Germany:** KARBERG & HENNEMANN GmbH & Co. KG • Tel: +49 (0)40 855 04 79 0 • E-mail: kontakt@cjcdk.de • www.cjcdk.de  
**Italy:** KARBERG & HENNEMANN srl • Tel: +39 059 29 29 498 • E-mail: info@cjcdk.it • www.cjcdk.it

*Your local CJC™ distributor*

*We are represented all over the world by distributors. Find your nearest distributor on our website: [www.cjcdk](http://www.cjcdk) - or give us a call.*

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**Head office:**

**C.C.JENSEN A/S • Denmark**  
Løvholmen 13 • DK 5700 Svendborg  
Tel. +45 63 21 20 14 • Fax: +45 62 22 46 15  
filter@cjcdk • www.cjcdk

