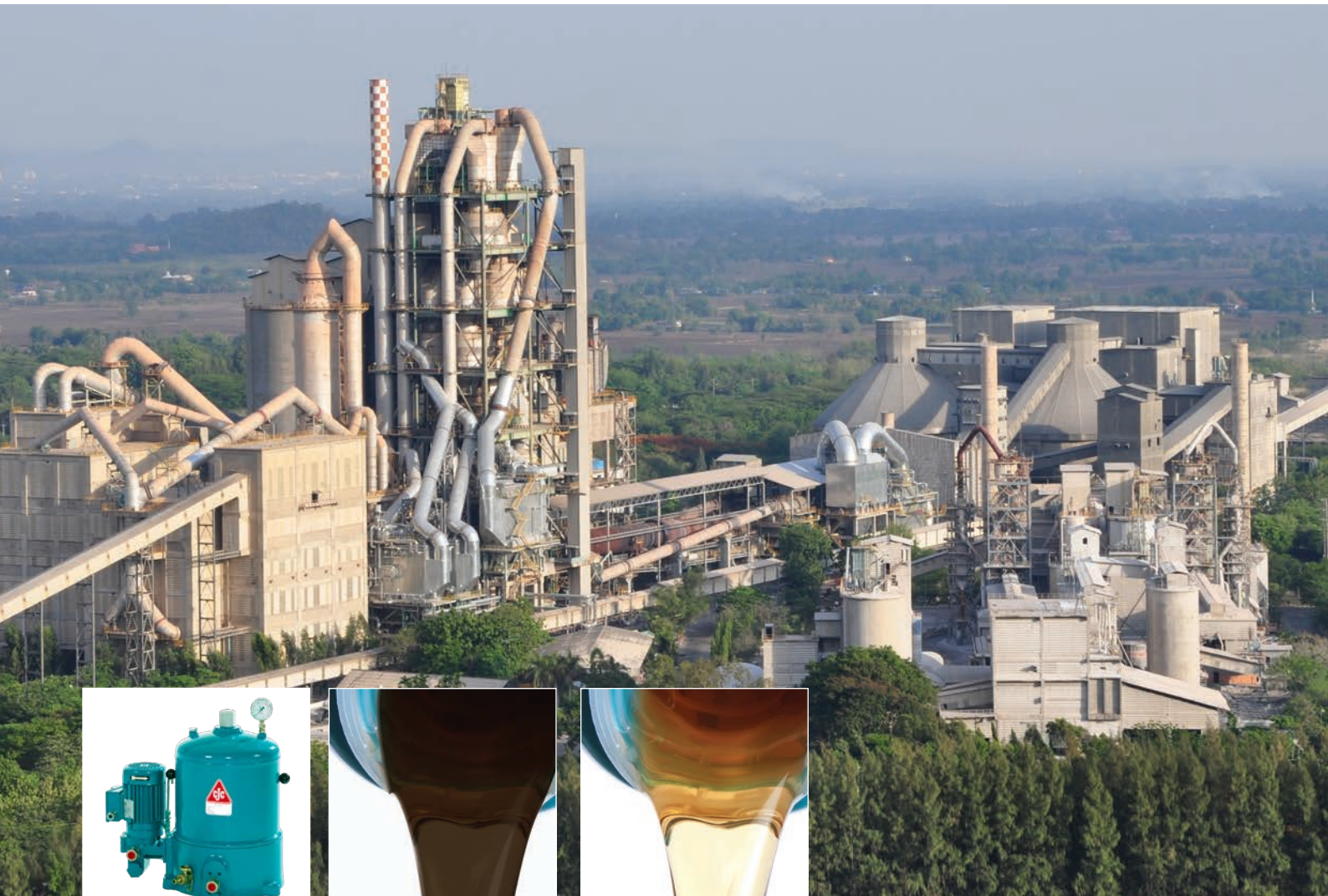




CJC® Offline Oil Filtration for the

# Cement Industry

Solutions for removal of particles, water, acidity and oil degradation products from hydraulic oils, gear oils, lubrication oils and diesel fuel



Documented & proven track record  
on reducing oil consumption,  
wear and downtime



# Do not change oil - clean it!

FACT: The condition of oil will determine uptime and life of your machinery!

C.C.JENSEN

Cleaning oil for more than 70 years.

Oil can be cleaned:

Most people change oil not because the properties of the oil are lost, but because the oil is dirty!

Oil can be cleaned and kept clean - while in operation!

Most common benefits:

- Cleaning oil, tanks, gearboxes and systems while they are in operation
- Reduced downtime – less planned as well as unscheduled shutdowns
- Industry lowest cost per kilo dirt removed
- Short pay-back time
- Reduced maintenance costs
- Enhanced process stability and efficiency
- Reduced wear on pumps, cylinders, bearings, etc.
- Avoid diesel bugs/ microbes
- Increased oil and component lifetime
- Significant reduction in use of in-line filters (up to several hundred percent reduction)

## Dump trucks & excavators

*Hydraulic oil, gear oil, lube oil, diesel fuel*

Changing operation conditions and rough environments entail dirt and condensate in the oil. Unclean diesel destroys injectors and fuel pumps rapidly. Unclean oil and varnish seize proper operation of hydraulic systems. Diesel bugs block in-line pressure filters and makes the diesel unsafe to use.



## Conveyor belts

*Gear oil, hydraulic oil*

In addition to the dirt ingress from the environment, gear and hydraulic oil systems in conveyor belts are contaminated with wear particles and oil degradation products (varnish).



## Crushers

*Lube oil, gear oil, hydraulic oil*

Extreme contamination of the oil systems with particles and water causes critical downtime and high replacement costs for the cost-intensive components. It is common to see crusher shutdowns because dirt needs to be shovelled out of the tanks.



## Mills

*Lube oil, gear oil*

Huge loads on bearings and gears lead to wear. Dirt and water ingress damage the system components. Depending on the process, increased temperatures can also accelerate the oil ageing. It is common to see mill shutdowns because dirt needs to be shovelled out of the tanks.





# If you have to ...

- shut down your system to shovel out dirt from tanks
- change in-line filters daily/weekly
- change bearings due to wear
- do frequent oil change



# ... install a CJC<sup>®</sup> Oil Filter!

What do we do differently than other filtration systems?

- We clean oil, tanks, gearboxes and systems while they are in operation.
- We do not only clean the oil, but also remove dirt from your tanks, pipes, gearbox, etc.
- We eliminate up to 80% of shutdowns because cleaning tanks is no longer needed.
- We remove particles, water and varnish.
- We filter down to 0.8 micron.
- Filter Insert can be changed without system shutdown.
- Our Oil Filters have industry highest dirt holding capacity.

## Cement kiln

*Gear & lube oil*

The main drive and the gear at the kiln are exposed to very high temperatures which degrades the oil rapidly, creating sludge and varnish. The gear oils are continuous exposed to a very high rate of contamination like particles from the dusty environment.

Also the bearing lubrication system generates a lot of metal particles, because of the pressure and load on the bearing.



## Bucket elevators & clinker coolers

*Hydraulic systems*

Hydraulic systems in cement plants are exposed to dirty and dusty environment, moisture or heat which result in break downs of valves and pumps. Very clean oil is required to keep the equipment in continuous operation.

### Hydraulic systems:

- hydraulic roller press
- bucket elevator
- clinker cooler
- vertical mill
- stacker/reclaimer
- etc.



## Storage tanks

*Lube oil, hydraulic oil, and diesel fuel*

Oil and fuel are already contaminated with particles and condensate from transportation and transferring. During storage, diesel can additionally be polluted with microbes due to water condensation (diesel bugs). Will make the diesel unfit for use.



## Transformers

*Tap changer oil, transformer cooling oil*

Too high soot level in the tap changer reduces the oil's resistivity which enables electric short circuits. Too high moisture level in the transformer cooling oil indicates significant water content in the paper insulation. Water destroys the insulation paper which will force the transformer to be taken out of service.



# Risk of failure on

Nowhere are the level of contamination and cost

## The main cause for equipment breakdown

80% of oil related breakdowns, machinery repair and maintenance costs are caused by contaminated system oils and fluids. Hydraulic fluids, lube oil and fuel carry destructive solids, corrosive sediments and water to the various sensitive components in the system. Since cement is an extremely dirty and rough environment, proper oil care will have significant impact on reliability and lifetime of equipment and fluids ▶



### Crushers

The key equipment for effective production in a mine are the primary, secondary and tertiary crushers.

This equipment operates under extreme environmental conditions which can lead to badly contaminated system with ISO cleanliness levels as high as 29/27/25. The recommended level should be 18/16/14 (100 times lower) if the crushers are to operate reliably and efficiently.

Seal failures cause water and particle contamination, leading to oil degradation (varnish). The combination of all contaminants results in wear of system parts and component failure plus frequent oil changes.

These failures lead to unscheduled stoppages and unbudgeted replacement of parts. This is particularly relevant for sensitive components such as bushings, socket liners and bevel gears. Most importantly, the effect of contaminated oil is down-time and lost production!



CJC® PTU3  
27/81



CJC® HDU  
427/108

When CJC® Offline Oil Filters have been installed on crushers, there is no need to shovel dirt out of the tanks!!



### Mills

Mills in cement plants operate under extremely rough environmental conditions

Operating under extremely rough environmental conditions leads to very contaminated oil with high ISO classes. The recommended ISO cleanliness level of the oil is 19/16/13, if the mills are to work reliably and effectively, and thereby add to a profitable production. Typically, the CJC® Fine Filters and Filter Separators are installed on the lube oil systems containing 400-10,000 L of oil, in order to match recommended cleanliness.

The lube oil system is most often contaminated by oil degradation products, silica dust, and water. The result of this contamination can be extremely expensive repair and downtime. The most sensitive components are bearings and bronze bushings found in the system.



CJC® HDU  
27/108



CJC® HDU  
427/108

Cement companies, who have installed CJC® Oil Filters on their mills, have saved 50% in maintenance costs due to longer lifetime of equipment and critical parts!



# your cement equipment

of downtime as high as within the cement industry!

► The main cause is wear induced by contamination through solid particles, water and oil degradation products. Oil degradation products - "soft contaminants" - are precursors to the sticky varnish that deposits on metal surfaces. It is a common perception that in-line oil filtration is sufficient. **However it is the smaller particles - below 10 micron - which do most harm to a system. You will only see the real effect of oil filtration once you remove the small particles.**

## Dump trucks & excavators

Earth moving equipment operates under extreme operating conditions

The exposure to extreme weather, a dusty environment and vibrations can severely stress the sensitive system components.

The particle contamination in the oil is often very high.

Moisture and condensate is formed due to frequent start/stops.

Furthermore, the harsh operation conditions cause oil degradation, leading to reliability issues and lost production.

By installing CJC® Oil Filters these problems will be reduced to a minimum. Sensitive components such as hydraulic pumps, motors, transmission gears, steering systems and injector pumps will operate more efficiently and for longer hours, thus increasing reliability and equipment lifetime.

For all systems, it is possible to reduce oil changes and maintenance costs, thereby achieving fast pay back on investment!

In cases where a permanent oil filter cannot be installed, a mobile flushing unit can clean the vehicle's oil systems while it is in for service.

For all systems, it is possible to reduce oil changes and maintenance costs, thereby achieving fast pay back on investment!



CJC® Heavy Duty Series:



CJC® HD  
HDU 15/12



CJC® HD  
HDU 15/25



CJC® MFU  
Mobile Flushing Unit

## Storage tanks

Oil cleanliness levels of ISO 23/21/19 are common

Oil delivered to storage tanks is generally contaminated with particles, water and sludge. Oil cleanliness levels of ISO 23/21/19 are common. This is above the recommended cleanliness level of equipment manufacturers, therefore the oil has to be filtered before being put into operation.

Many cement plants change in-line filters every day which is expensive - it does not have to be this way.

Installation of a CJC® Offline Oil Filtration System will clean the oil in the tanks to the cleanliness level required by the manufacturers (trucks, dozers, excavators). Most manufacturers recommended ISO cleanliness level is below 19/16/13, which enhances the performance of the machinery immediately.

The above mentioned facts are also applicable to diesel oil storage, where diesel bugs (microbial contamination) are a major problem.

The reality is that in modern engines, it is advisable to go well below the manufacturers' recommended cleanliness levels, and the impact this has on a diesel engine, is significant. E.g. providing diesel ISO cleanliness level 14/12/9 rather than ISO cleanliness level 19/17/14, will extend the lifetime of your engine by a factor of 4<sup>1)</sup>.

The key to reliable machinery & effective production is clean oil and diesel!

<sup>1)</sup>Source: Noria Corporation



CJC® PTU3  
2x27/108



CJC® HDU  
427/108

# Satisfied customers

Problem solving & preventive maintenance are keywords in the cement industry

## Lafarge Republic Inc., Iligan Plant, Philippines

Cement mill, finish grinding mill (FGM), gearbox, gear oil



Finish grinding mill No. 1, Gearbox at Lafarge Republic Inc. Iligan Cement Corp. with CJC® Fine Filter HDU 27/108 installed

### Problem

On December 2014 - part of Lafarge's quarterly oil check - the analysis revealed that Finish Mill No. 1 gearbox contained large amounts of wear elements and was heavily contaminated with silicon (cement dust). Due to operational demand, they could not afford to stop production to carry out an oil change.

### Solution

A CJC® Fine Filter, HDU 27/108 was installed to filter and re-condition the oil. After only 3 weeks of continuous oil filtration, wear elements and solid contamination were removed and oil cleanliness level was improved significantly.

### Mr. Joseph Janerol Methods Manager

*"As we are satisfied with the performance of the CJC® Offline Oil Filtration, we are contemplating to the purchase of our own CJC® Offline Oil Filtration Unit"*

### Benefits

Aside from extending the lifetime of their oil, Lafarge was able to operate continuously without production stop related to oil contamination. Furthermore, Lafarge Iligan Finish Mill became more reliable and productive.

### Financial benefits

The customer saved 2,400 liters of oil, approximately amounting to **7,142 EUR** on production loss, spare parts and labor cost due to an oil change.

## Cement Plant, Ireland

Cement mill, trunnion bearings, fixed & floating, lube oil



Cement Mill Ireland CJC® HDU 27/54 installed at Trunnion FIXED and FLOATING bearings

### Problem

Short pump life was the norm. Every 3 months a pump had to be replaced. Extremely dirty environment, high pressure system and heavy load, made the pumps wear out very quickly. Lost production, increased maintenance hours, and of course cost of new pumps was an issue.

### Solution

2 x CJC® Fine Filter HDU 27/54 were installed. One oil filter on the fixed bearing lube tank and one on the lube tank for the floating bearing.

### Mr. Stephen Beirne Maintenance Manager

*"Since installation of the offline oil filter across site, this has allowed us to move from a situation where oil replacements were frequent to nearly no oil changes at all. CJC® Oil Filters have been a huge help in this program."*

### Benefits

The effect of the CJC® Oil Filter has been extreme. Since the installation, the cement plant has not changed any pumps on those lube oil systems. No unplanned maintenance hours has been used, no lost production and no cost for new pumps since 2008.

### Financial benefits

Cost savings on pumps:  
2 system, 7,5 years = **42,390 EUR**

## Coal mill in Ireland

Coal mill, gearbox, MAAG gear, gear oil



Gearbox,  
MAAG Gear  
with installation of  
a CJC® Fine Filter  
HDU 27/54 PV

### Mr. Frank Hughes Maintenance Planner

*"A permanent installation of the CJC® Oil Filter was a must to be able to have a very clean oil system. We have removed 99,9 % of the dirt, and the oil filter still has not blocked. Amazing!"*

### Problem

Oil analysis from July 2014 indicated a very high particle count, ISO 23/21/15, mostly metal wear and coal dust. Chemically the oil was in good condition, it just needed to be cleaned. Contaminated oil results in wear and tear on gears and equipment failure.

### Solution

A CJC® Fine Filter HDU 27/54 with a CJC® Oil Contamination Monitor, OCM15 (an online particle counter).

### Benefits

With clean oil, the risk of gearbox breakdown and plant shut down is minimized, increasing the reliability and the production of the entire coal mill. Furthermore, less unplanned maintenance work, results in less risk of work accidents. - *A reliable plant is a safe plant!*

## Golden Bay Cement, Whangarei, New Zealand

Cement mill, rotary kiln trunion bearing, lube oil



Mr. Phil Immes &  
Mr. Brad Lewis  
Golden Bay Cements  
Rotary Kiln  
with CJC® HDU 27/27  
Mobil Fine Filter installed

### Mr. Phil Immes Lubrication Technician

*"We were impressed with the results achieved installing the CJC® Mobile Fine Filter. After one week of filtration, the lubricate showed a significant ISO level improvement. Extra bonus is that we did not realize we had water problems. This has been solved since the CJC® Fine Filter was put into service. We find that Filter Insert change is very easy."*

### Problem

The oil samples indicated a high level of particle and water contamination, resulting in frequent changes of the 1000 cSt lubricant and a reduced bearing life.

### Solution

A CJC® Fine Filter HDU 27/27 with CJC® Filter Insert B 27/27. The mobile CJC® Fine Filter was connected to the bearing drain outlet.

### Benefits

Longer periods between services and lubricant replacement based on cost of lubricant. The pay back on the customer's CJC® Fine Filter investment will be within 12 months.

## Portlandzementwerk Wittekind, Germany

Cement mill, main gearbox, gear oil



Portlandzementwerk  
Wittekind  
with a CJC® Fine Filter  
installed at the main  
gearbox of the  
cement mill ZM I

### Mr. Michael Peitz Leader Locksmithery

*"„The comprehensive oil analyses of OELCHECK convinced us. They clearly show the continuous improvement of the oil quality – further gearboxes will be retrofitted with CJC® Oil Filters."*

### Problem

Although the oil was changed two years ago the gear oil was heavily contaminated especially with metal particles and swarf as well as other abrasive solid particles.

### Solution

CJC® Fine Filter 27/108 with 4 x CJC® Filter Inserts B 27/27.

### Benefits

Due to the removal of particles and water from the oil, not only system and components are protected against wear, but also oil changes are avoided. That is a financial advantage and simultaneously a decision in favour of our environment.



# Your challenge

80% of oil related failures and breakdowns are caused by contaminated oil  
- avoid expenses on repairs and oil changes

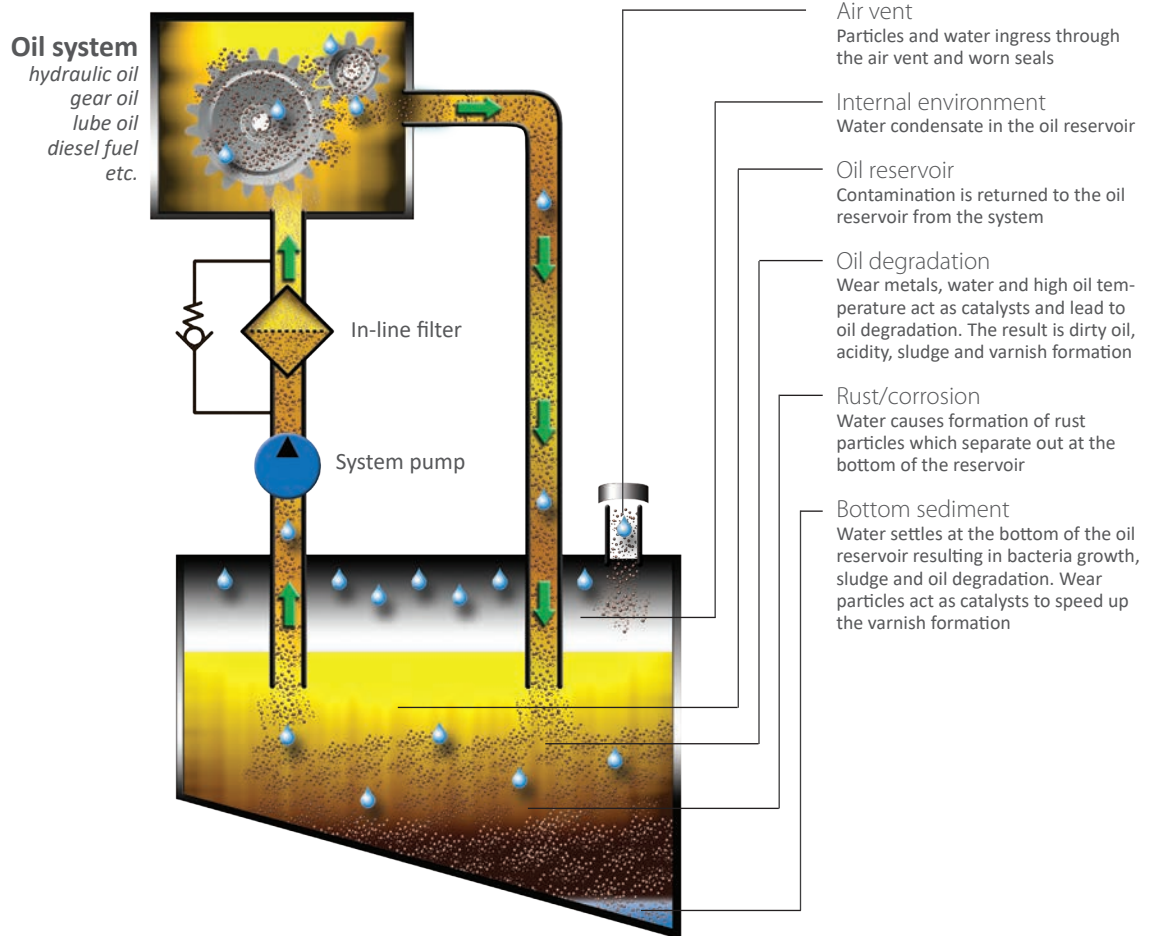
In-line filters alone do not keep the oil system clean & dry!

Contamination of an oil system leads to various problems which can result in machine downtime, frequent repairs of equipment and reduced oil lifetime. All of which means inefficient production and unnecessary expenses spent on repair and oil change.

**Before**

MPC  
membrane  
sample taken  
before offline  
oil filtration

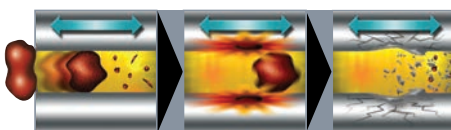
A contaminated oil system with only in-line filtration  
**without** CJC® Oil Filter installed



## Most common types of contamination

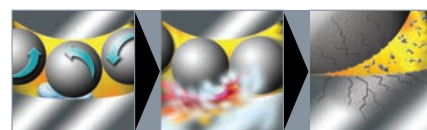
### Particles (abrasive wear / grinding)

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



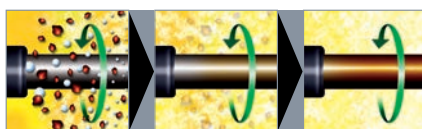
### Water (cavitation & pitting)

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



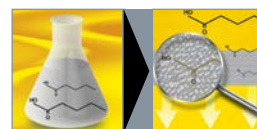
### Oil degradation

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.



### Acidity

Acidity can be found in oil as by-products of oil degradation, combustion of gas or fuel, hydrolysis of Ester-based fluids etc. The amount of acidity in oil should be limited, since acidity



will cause chemical corrosion of machine components and shorten the lifetime of the oil, just to mention a few of the unwanted effects.

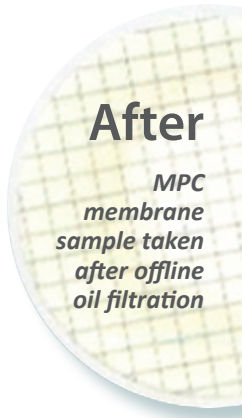
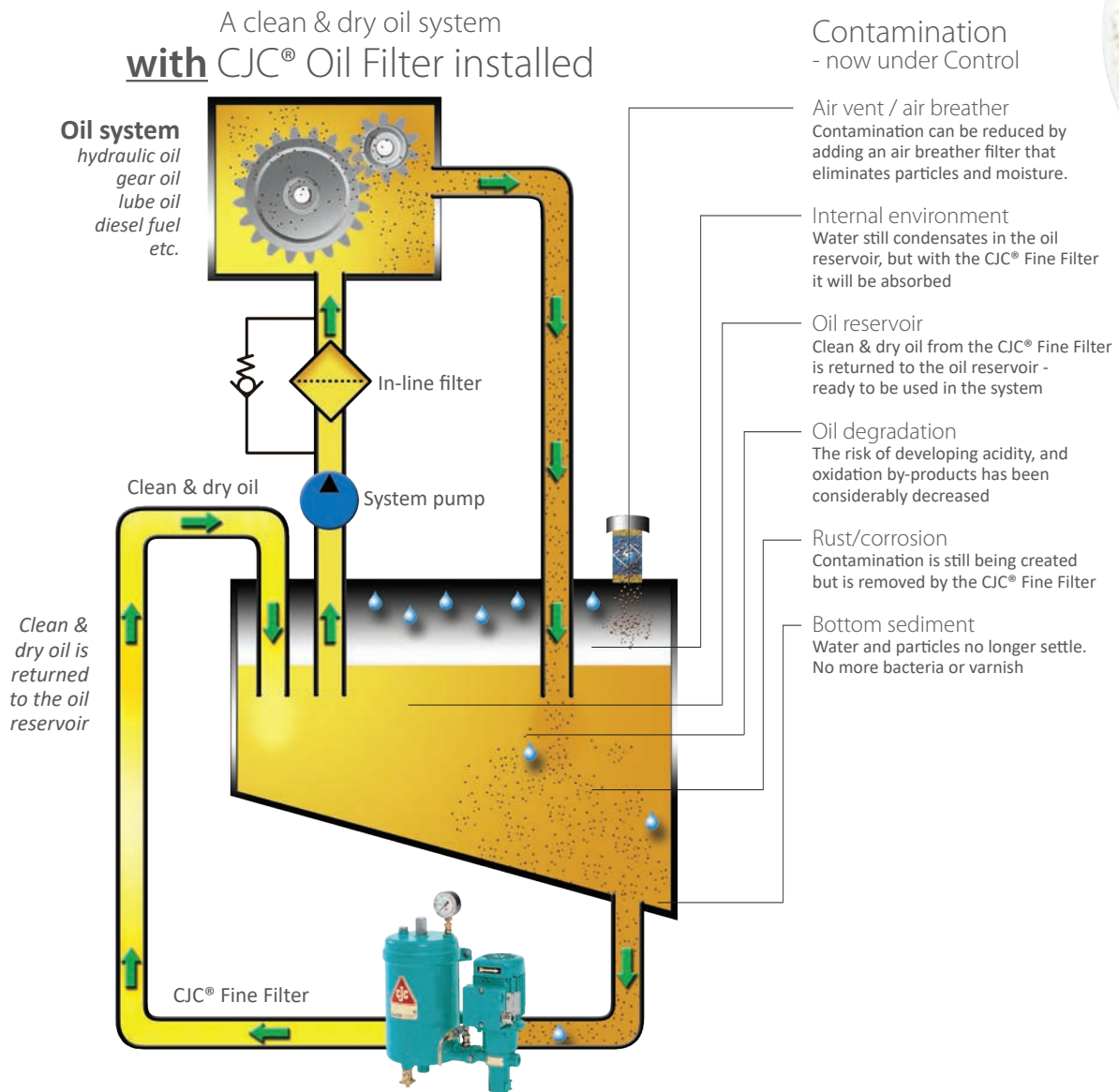


# Your natural solution

Clean & dry oil and guaranteed success through oil filtration  
- we offer highly qualified technical back-up

## 1 oil filter - 4 solutions

Installing a CJC® Offline Oil Filter solution, you ensure clean & dry oil in your systems, removing both particles, water, acidity and oil degradation products - in one and the same process.



## Contamination capacities

All CJC® Filter Inserts have outstanding oil filtration capabilities with filtration degrees of 3 µm (micron) absolute. This means that 98.7% of all solid particles larger than 3 µm and approximately 50% of all particles larger than 0.8 µm are retained - in one single pass.

Capacities:	15/25 series:	27/27 Series:	
Particles	1.5 kg	4-8 kg	per insert
Water	0,75 L	2 L	per insert
Varnish	1 L	4 L	per insert



# Your natural solution

CJC® Oil Filters - user-friendly design with low maintenance  
- and we offer highly qualified technical back-up

## CJC® Oil Filter - Key figures

The CJC® Oil Filters are offline depth filters for hydraulic oil, gear oil, lube oil and diesel fuel.

CJC® Offline Oil Filters have an unmatched high dirt holding capacity, and remove particles, water, acidity and oil degradation products, all in one and the same operation.

Our oil filters are installed offline, meaning they are not system critical, e.g. machinery shutdown is not necessary when changing filter insert.

The cleanliness level achieved and maintained by offline oil filtration means that the predicted lifetime of machine components and oil will be extended 2-10 times!

Using CJC® Offline Oil Filters will have a positive effect on your maintenance budget as well as increase your productivity and reduce your energy consumption.

Our product range covers tailor made solutions for all system volumes.

- all advantages in terms of your total economy!

## CJC® HDU Series

CJC® Fine Filters are offline oil filtration systems with integrated circulating pumps for off-line installation. The oil filters are recognized around the world as highly efficient purification systems for cement applications.

CJC® Fine Filters have a 3 µm absolute filtration ratio and remove particles, water, acidity and oil degradation products from oils and fluids - in one and the same operation.



CJC® Heavy Duty  
HD HDU 15/12



CJC® HDU 15/25



CJC® Heavy Duty  
HD HDU 15/25



CJC® MFU  
Mobile Flushing Unit



CJC® HDU 27/27



CJC® HDU 27/54



CJC® HDU 27/108



CJC® HDU 427/108

C.C.JENSEN will back you up  
- we have more than 70 years of experience!



## CJC® PTU Series

The CJC® Filter Separators combine depth filtration with water separation and are used for water contaminated diesel fuel, hydraulic and lubricating oils. The CJC® PTU Series continuously remove water from oil in large volumes.



CJC® PTU3 27/81



CJC® PTU3 2x27/108

## CJC® Filter Insert system

All CJC® Filter Inserts have a 3 µm absolute filtration ratio and are produced of **100% natural cellulose fibres** from sustainable resources.

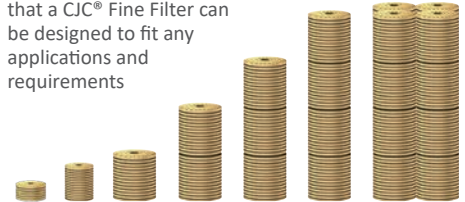


- **Particles** down to 0.8 µm are retained in the unique CJC® depth filter media (cellulose).
- **Water** is removed either by absorption or separation according to oil system requirements.
- **Acidity** can be neutralized with ion exchange resin media.
- **Oil degradation products** are removed by the attraction to the polar fibers.



### Modular build-up

The modular build-up of the CJC® Filter Inserts means that a CJC® Fine Filter can be designed to fit any applications and requirements



Only one oil filter is made of 100% natural cellulose fibres from sustainable resources



### A renewable resource

100% natural cellulose fibers from sustainable resources



### Your natural solution

Natures best! We use what nature invented millions of years ago



### Your benefits

- Clean & dry oil
- High efficiency removing small particles
- Highest dirt capacity
- Extended oil and components lifetime



### Protect the investment in your cement production

- Maximized output
- Reduced downtime
- Reduced O&M costs
- Optimized ROI

Choice of leading OEM's



### Reduce your carbon footprint

- No metal
- No plastics
- No chemicals





C.C.JENSEN

# Contact us today



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