



# CJC® Oil Filtration for the Wind sector

Solutions for removal of particles, water and oil degradation products from hydraulic oil and lube oil with online condition monitoring asset management



Oil contamination wears  
down your wind turbine  
**Let CJC® protect your assets!**



# Install a CJC® Oil Filter to protect your turbine and your investment

## The main cause for

The oil film between the mechanical parts of a wind turbine is  
Impurities in the oil will break the oil film and create

### Why is CJC® different?

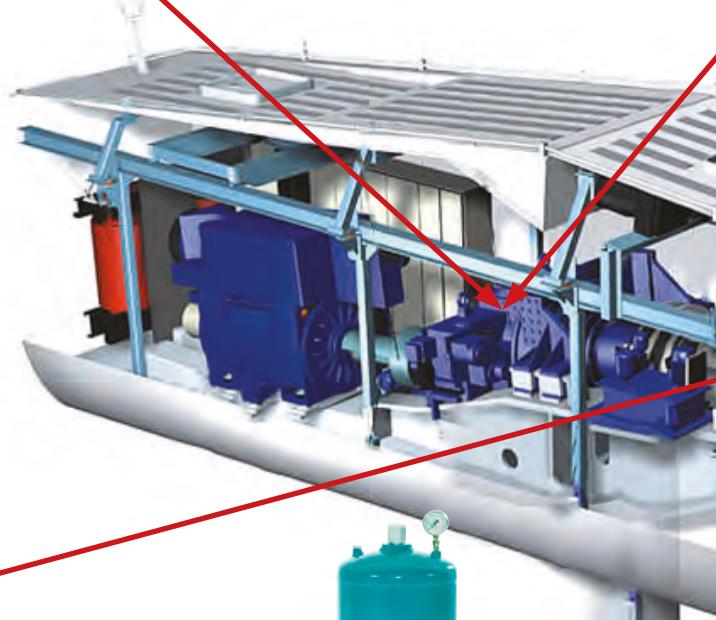
- CJC® Oil Filters remove even the small and very harmful particles along with water and varnish
- We deliver depth filtration systems, removing particles down to 0.8 microns
- Our oil filters have the highest dirt-holding capacity in the industry
- Particles are retained in the cellulose fibers, water is absorbed inside the cellulose together with oil degradation (varnish)
- We clean oil, tanks, gearboxes and systems while in operation
- We have more than 60 years of oil filtration knowledge
- High level of service
- Worldwide contact points
- We only use natural renewable cellulose fibres in our filter inserts
- Our monitoring system helps to detect abnormal equipment wear and oil condition and hereby reduce cost per repair

### Gearbox

*Keep your gearbox oil clean and dry with a CJC® Oil Filter to prolong the lifetime of your gearbox and reduce the risk of expensive gearbox repair, thus protecting your wind turbine!*



CJC® Fine Filter HDU 27/27 with  
CJC® Oil Contamination Monitor,  
OCM 15 and air bypass



### Main bearing

*Keep your main bearing oil system clean and dry with a CJC® Oil Filter ensuring long lifetime of the oil and the bearing.*

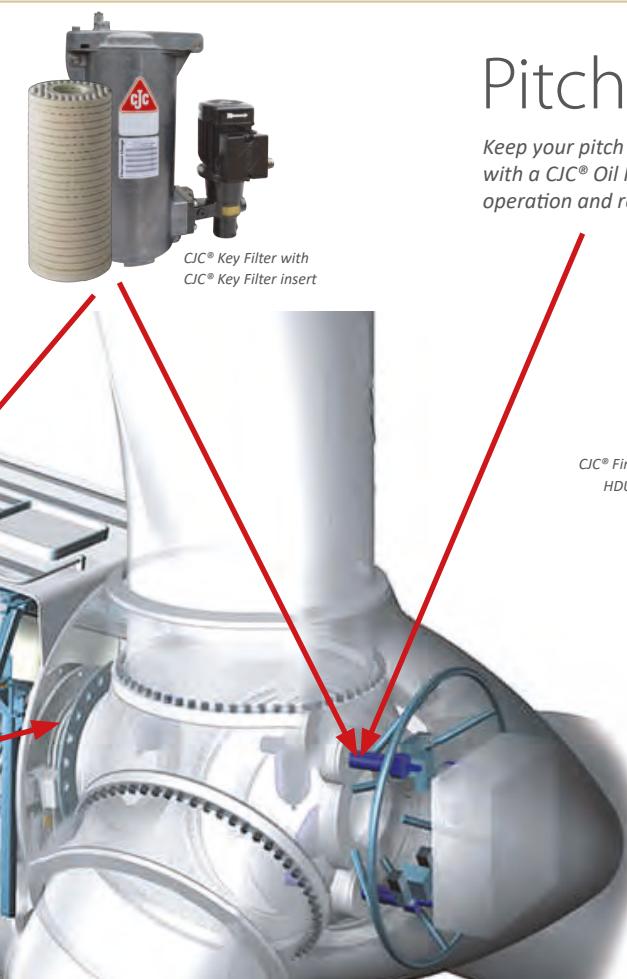


CJC® Fine Filter  
HDU 27/54

Install a CJC® Oil Filter to protect your

# equipment breakdown

the only thing keeping your turbine from immediate breakdown.  
mechanical contact, generating enormous friction and wear.



## Pitch hydraulic

*Keep your pitch hydraulic system clean and dry with a CJC® Oil Filter. This ensures optimum operation and reliability.*



### Your benefits

- Increase uptime and availability
- Optimised power output and increased profit
- Reduce your WTG lost production factor
- Prolong the lifetime of your gearbox
- Reduce the risk of expensive gearbox repair
- Avoid expensive system breakdown
- Increase oil lifetime, up to 7 years
- Avoid costly and time-consuming oil changes
- Reduce component wear and tear
- Protect your asset

Longer lifetime of mechanical components

**cjc**

Increase oil lifetime up to 7 years

Increase availability

wind turbine and your investment!

# Wind turbine gearbox



## CJC® Oil Filtration for your wind turbine gearbox

The gearbox is the heart of the wind turbine, converting low speed from the rotor shaft to high speed on the generator side. The complex gear and bearing design is sensitive to particles and moisture. Combining high viscosity lubricants (ISO VG 320), high loads on components and harsh environments, make it even more crucial to keep the WTG oil clean and dry.

### Challenge

If the WTG lubricating oil is not kept clean and dry, you risk very expensive repairs or replacements, down time and possible penalties for not delivering power to the grid. Furthermore, contaminated oil cannot achieve a long life-time, so the oil may need to be replaced prematurely. Long oil lifetime can only be achieved if water, wear particles and oxidation products are removed from the oil continuously. In terms of servicing the oil filter, the often remote locations of the turbines result in high costs for replacing a clogged in-line filter insert outside of normal service routines. Furthermore, if the gearbox is new or refurbished there might be extraordinary amount of dirt from the production process / service, which lead to increase in wear, which has to be removed.

### Benefits

When you install a CJC® Oil Filter solution on your gearbox, you get the oil filter with the highest dirt holding capacity, suitable for the normal service intervals, so you do not need to service any oil filters untimely. CJC® Oil Filter is known for keeping oil clean, dry and without oxidation products, which is documented over many years in several thousand WTG installations. When you choose CJC® Offline Oil Filter, you ensure a long lifetime of the gearbox and the lubricant, you reduce maintenance and you avoid unplanned breakdowns. And you can even remotely monitor the condition of your system using the CJC® T<sup>2</sup>render Solution Suite.

### Your solution

The CJC® system solutions fit all gearboxes regardless of make, and we can deliver customized CJC® Filter Inserts as required. In close co-operation with technical organizations, we help select the most optimum solution depending on turbine type, lubricant type and operational conditions.

### Your benefits

- Protect your investment
- Optimise availability and uptime
- Reduce risk of expensive gearbox repairs
- Reduce risk of unplanned breakdowns
- Reduced repair costs and time
- In short: protect your asset and optimise your LCoE

# Satisfied customers – worldwide



## CJC™ Application Study

Gear Oil

GE 1.5 ESS, Wind Turbine Gearbox

Application Study  
written by:

Taylor Coleman  
C.C.JENSEN Inc.  
USA  
2012



### CUSTOMER

North American Wind Research and Training Center,  
Tucumcari, New Mexico, USA

### SYSTEM

System: Gearbox  
Turbine Type: GE 1.5 ESS  
Oil Type: Castrol A320 Gear Oil  
Oil Volume: 70 Gal (265 L)

### PROBLEM

After 2 years in operation, using only the O.E.M. 10-micron in-line filter, the wind turbine gearbox oil showed a particle count of more than 500,000 4-micron particles per/100 mL. The oil analysis showed high particle count (ISO 20/18/15).



### SOLUTION

CJC™ Filter: Offline Fine Filter HDU 15/25 PV2-7-4  
1x120V, 60hz  
incl. air bleed hose  
CJC™ Insert: BG 15/25, 3 Micron  
Flow Rate: ¼ gpm (57 L/h)

### TEST

The CJC™ Offline Oil Filter HDU 15/25 PV2 was installed in November 2010, configured to draw oil from lowest point (drain plug) and return oil to top of gearbox.

### RESULT

After 110 days of continuous, 3-micron, offline filtration, the gear oil showed the below reduction:

- 92.76% in 4-micron particles
- 92.78% in 6-micron particles
- 93.10% in 14 micron particles

### COMMENTS

Wind Energy Technology, John Hail Jr.  
Directorat North American Wind Research  
and Training Center:

"Since adding our C.C.JENSEN Offline Oil Filter, our oil analysis has showed considerable improvement, and our gearbox haven't had a single bearing failure, vibration analysis alarm, or high-heat signature. Other wind sites near us operating the same wind turbine make and model have had several gearbox bearing failures due to particle wear, and have even replaced two of their 2-year-old gearboxes.

Major repairs like those can cost over  
\$900,000

Thank You, C.C.JENSEN."

### OIL SAMPLE

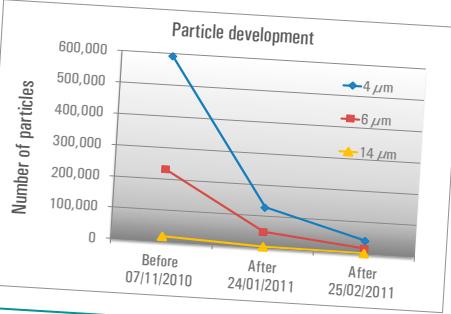


Oil sample taken BEFORE installation  
of CJC™ Oil Filter  
ISO 20/18/15

Oil sample taken 110 days AFTER  
installation of CJC™ Oil Filter  
ISO 16/15/11

### RESULT

Date (mm/dd/yyyy)	07/11/2010	24/01/2011	25/02/2011
>4 micron	591,500	129,200	42,800
> 6 micron	230,000	50,300	16,600
> 14 micron	17,400	3,800	1,200
ISO Code	20/18/15	17/16/12	16/15/11
pr. 100 ml			



C.C.JENSEN A/S  
Løvholmen 13 • DK-5700 Svendborg • Denmark  
Phone: +45 6321 2014 • Fax: +45 6222 4615  
sales@cjc.dk • www.cjc.dk

# Wind turbine pitch hydraulic



## CJC® Oil Filtration for your pitch hydraulic system

The hydraulic pitch system is a vital part of the modern wind turbines, constantly fine-tuning the angle of the blades to the wind to optimize the wind turbine's energy production. The pitch system is also acting as the main emergency brake which, under hard weather conditions or extreme wind speeds, is minimizing the risk of structural failure and accidents. So it is fair to say that the pitch system is important for the wind turbine, whether it is Geared or Direct Drive.

Therefore, it is of outmost importance to keep the oil in the pitch system clean from particles, water and oxidation products (varnish) to ensure safe and reliable operation of the wind turbine.

### Challenge

If the hydraulic oil is not kept clean and free from particles, varnish and water, you may experience malfunction or erratic operation of proportional or servo valves. Even leaking hydraulic cylinders can be the result of contaminated oil in a pitch system. This will result in standstill of the turbine, increased cost for repairs outside of normal service routines and last but not least, it reduces the output from the wind turbine.

### Benefits

When you install a CJC® Oil Filter solution on your pitch hydraulic system, your oil is treated by the oil filter with the best filtration performance and highest dirt holding capacity, suitable for long service intervals. CJC® Oil Filter is known for keeping oil clean and dry and without oxidation products (varnish), which is documented on many hydraulic systems. When you choose CJC® Oil Filters, you ensure correct function of the pitch system, a long lifetime of expensive hydraulic components, reduced maintenance and you avoid unplanned breakdowns. And you can even remotely monitor the condition of your system using the Oil Contamination Monitor, OCM 15.

### Your solutions

The CJC® system solutions fit all hydraulic systems regardless of make, and we can deliver customized CJC® Filter Inserts as required. In close co-operation with technical organizations, we help select the best solution depending on hydraulic components and environmental conditions.

### Your benefits

- Ensure maximum output
- Protect and ensure long lifetime of hydraulic components
- Reduce risk of expensive hydraulic components repairs/replacements
- Reduce risk of unplanned breakdowns
- Reduce maintenance costs

# Satisfied customers – worldwide



## Wind Turbine, Vestas V90-2MW, Pitch Hydraulic System CJC™ Application Study

### Application Study written by:

Jonas Rutgerson  
C.C.JENSEN AB  
Sweden

&

Martin Jansson  
Stema Wind  
Sweden  
2014



### CUSTOMER

Customer: Arise AB, Sweden  
Wind Farm: OXHULT, Sweden

### SYSTEM

Turbine: Vestas V90-2MW  
System: Pitch Hydraulic  
Manufacturer: PMC Technology  
Oil type: Texaco Rando HDZ 32  
Oil volume: Approx. 300 L

### PROBLEM

Arise was experiencing increased particle and water contamination in the pitch hydraulic systems of their Vestas V-90 2 MW wind turbines

### SOLUTION

Refurbished CJC™ HDU 15/25 PV - system #7  
After a retrofit on the gearbox the existing CJC™ HDU 15/25 PV was dismantled from the gearbox, cleaned and reinstalled on the pitch hydraulic system.

### RESULT

After only 1 month operating with the CJC™ HDU Fine Filter, the following results were obtained:

#### Particles:

The contamination level in the oil was reduced by 95% from 34,631 to 1,539 of 2 µm particles per 100 ml.

#### Water:

The water level was reduced from 1,859 ppm to 86 ppm also 20 times better than the initial start out level.

According to industry experience and Noria Corporation, this extends the life time of the hydraulic components with a factor of > 2.5 times.

### ENVIRONMENTAL BENEFITS

CJC™ Fine Filters are easy disposable and environmentally friendly.

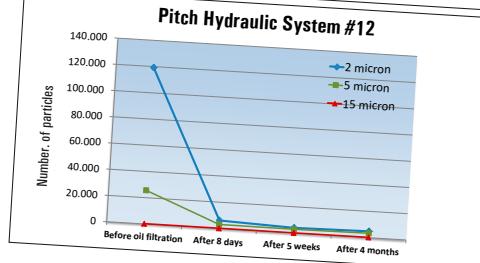
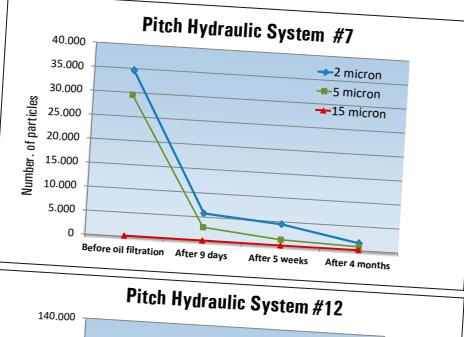
Guide for Oil Cleanliness	
Oil in wind turbine components	Recommended ISO 4406 Oil Cleanliness
Gearbox	17/15/12
Pitch hydraulic	16/14/11
Main bearing	16/14/11

\*) Source: Noria Corporation



Vestas Wind Turbine V90, Pitch Hydraulic System with a CJC™ HDU 15/25 PV installed

### PARTICLE DEVELOPMENT



### RESULT

pr. 100 ml	Before Oil Filtration	After 9 days	After 5 weeks	After 4 months
<b>Pitch Hydraulic System #7</b>				
> 2 micron	34,631	5,773	4,489	1,539
> 5 micron	29,503	2,887	1,285	797
> 15 micron	149	123	75	98
ISO Code	16/15/8	13/12/7	13/11/7	11/10/7
Water, ppm	1,859	977	89	86
<b>Pitch Hydraulic System #12</b>				
> 2 micron	119,287	6,147	4,005	4,811
> 5 micron	25,653	3,093	2,887	3,367
> 15 micron	133	99	63	145
ISO Code	17/15/8	13/12/7	13/12/6	13/12/8
Water, ppm	347	143	87	82

# Wind turbine condition monitoring

## ► Sensor solutions

The CJC® Sensor Package consists of CCJ validated sensors, mounted in connection with a CJC® Offline Oil Filter, ensuring valid sensor values. Customer can retrieve the sensor signals locally through eg. MODBUS TCP, CAN BUS, MQTT etc.



CJC® Oil Contamination Monitor, OCM 15  
mounted on a CJC® Fine Filter HDU 27/27

Selection guide		
	OCM 15	CMU
HDU 15/25		✓
HDU 27/-	✓*)	✓
Key Filter		✓

\*) Not suited for retrofit



CJC® Condition Monitor Unit, CMU

### CJC® Oil Contamination Monitor, OCM 15

The OCM15 sensor package sends data to on your SCADA system, for early warning of breakdowns.

The CJC® OCM 15 measures according to the ISO 4406 standard. The monitor is specially designed for high viscous oils. The CJC® OCM 15 is suited to measure in oils with large amounts of entrained air. The CJC® OCM 15 not only measures particles, but also moisture and temperature.

### CJC® Condition Monitor Unit, CMU

The CJC® CMU is an advanced oil sensor suitable to retrofit on all CJC® Offline Oil Filters. The monitor is also designed for high viscous oils and suited to measure in oils with large amounts of entrained air. The CJC® CMU can be configured to the exact need of oil sensing.

The CMU require internet connection, since the data are analysed by the CJC cloud based solution called T<sup>2</sup>render.

Features	OCM 15	CJC® Sensor solutions					
		OCM Oil Con- tamination Monitor	PT100 Temp.	OMT Oil Moisture Transmitter	OQM Oil Quality Monitor	PT in Pressure	PT out Pressure
Particles according to ISO4406	✓	✓					
Oil Temperature	✓		✓	✓			
Oil RH%	✓			✓			
Oil Condition						✓	
Filter inlet pressure	✓**)						✓
Filter outlet pressure	✓**)						✓**)
Particles (40-1000 µm)							✓**)
External input (Filter/Equipment Operation on/off & load 0-100% *)	✓					✓	
Data to CJC® Cloud *) 3G/4G/Wi-Fi/Ethernet	✓					✓	
Local data extract *) MODBUS etc.	✓					✓	
Display on monitor	✓						

\*) With CMU communication box

\*\*) Mounted directly on the filter unit

# Online solution for monitoring oil & equipment conditions

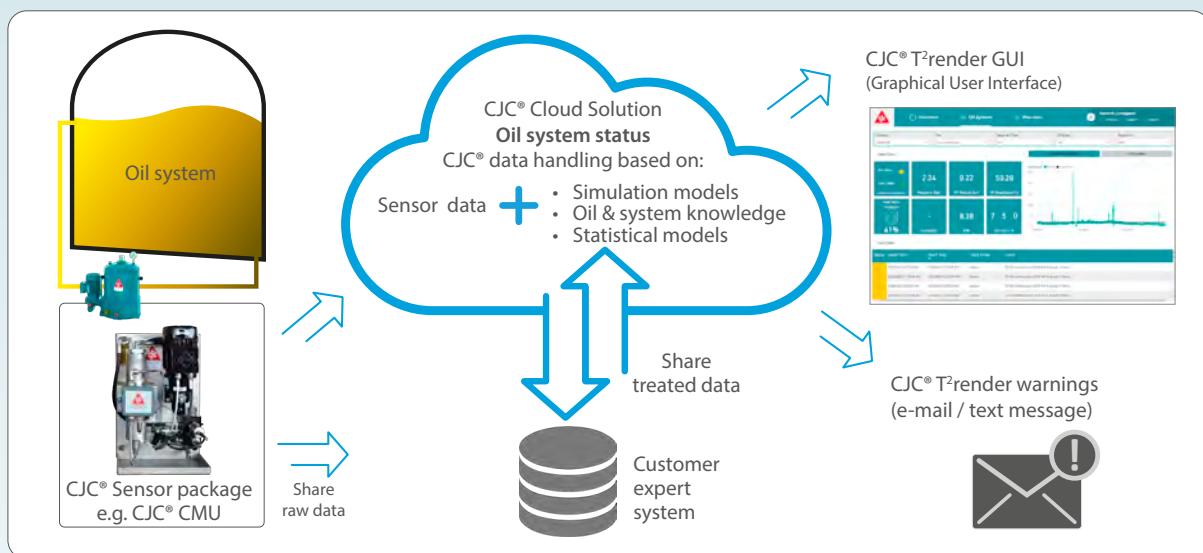
## ➤ CJC® T<sup>2</sup>render Solution Suite

The Sensor packages can be equipped with a communication package which can make the data available locally through different communication protocols and/or establish data connection to the CJC® T<sup>2</sup>render Solution Suite.

The T<sup>2</sup>render Solution Suite is a Software as a Service (SaaS) Solution that provides data surveillance of the oil system in connection to an installed CJC® Offline Filter Unit with a CJC® Sensor Package including access via a user interface and an API

to the data stored on the CJC® Cloud. On the CJC® Cloud solution the data are validated, stored and evaluated and includes a built-in warning system by email and by text message.

The CJC® T<sup>2</sup>render Solution Suite is suitable for both hydraulic oils, lube oils and gear oils. It can be configured to fit the exact needs for monitoring and major damages can be PREDICTED and PREVENTED by stopping and repairing early in the wear process. This obviously will improve your PROFIT.



T<sup>2</sup>render Solution Suite is available in two variations:

### CJC® T<sup>2</sup>render Basic:

The CJC® T<sup>2</sup>render Basic Solution provides online monitoring of oil and system conditions. Will generate warning messages to the equipment owner when the sensor values exceed pre-defined limits e.g. ISO codes.

### CJC® T<sup>2</sup>render Pro:

In addition to the Basic solution, the CJC® T<sup>2</sup>render Pro Solution is using machine learning and mathematical T2 models for individual system adaption. This online monitoring software will predict failures and can be used for optimizing maintenance and repairs. Warning messages will be generated and sent to the equipment owner when oil or equipment operating conditions deviate from normal operation patterns.

CJC® T <sup>2</sup> render Solution Suite			
Features	CJC® Sensor package	CJC® T <sup>2</sup> render Basic	CJC® T <sup>2</sup> render Pro
Local Monitoring of ISO, RH% & oil temp with Display on Sensor (OCM15) (MODBUS RTU data interface)	✓		
Sensor/CMU and local data transfer	✓	✓	
Sensor/CMU w. 30 days offline data logging & CJC® Cloud data storage		✓	✓
Web Portal with overview dashboard, monitoring of validated sensor data & logbook of historical & current events		✓	✓
Share raw & treated sensor data via API		✓	✓
Offline oil filtration performance analysis		✓	✓
Warning status & messages based on individual sensor limits		✓	✓
Automatic analysis of many sensor signals converted into one oil condition and one equipment condition value			✓
Detection of abnormal equipment and oil conditions for predictive maintenance			✓
Automatic and valid warnings uniquely adapted to each oil system with appointed direct cause			✓

# Improve the performance of your existing CJC® Solutions

## CJC® Pressure Kit

Performance improvement for CJC® Oil Filters

By upgrading your already installed CJC® Fine Filter with the CJC® Pressure Kit, a higher static pressure across the CJC® Filter Insert is applied, thereby allowing for a higher particle retention rate. In order to ensure a continuous high performance of the CJC® Fine Filter, a permanent air bleed is installed, removing collection of entrained air. The air bleed will by-pass the insert without any effect on oil filter performance.

On the contrary, this ensures an even better performance of the CJC Fine Filter.

Air-contaminated oil is a challenge in relation to filtration, since the air entrained in the oil will expand when passing from the high-pressure side to the low-pressure side of the oil filter. The air bubbles increase in size at lower pressures and results in poor filtration and release of already captured contaminants, thus compromising oil filter efficiency.

### Benefits

With a CJC® Pressure Kit you will improve the filtration efficiency of your installed CJC® Oil Filter, with the following benefits:

- Removal of entrained air
- Lower your ISO code
- Improved WTG availability
- Reduced oil change interval
- Even cleaner gear oil



CJC® Pressure Kit (incl. air bleed)  
for filtration improvement of CJC® Fine Filters

**Wind Turbine, Vestas V52-850 kW, Gearbox Upgrade**

**CJC® Application Study**

**Customer:** SVEF, Svensk Vindkraftförening  
**Wind Farm:** BÖRSTAD III, Östergötland

**Turbine:** Vestas V52-850 kW  
**System:** Gearbox  
**Oil Type:** Texaco Meropa 320  
**Oil Volume:** 155 liters

**TEST**  
The test was carried out to document the efficiency of the CJC® Pressure Kit and the CJC® Continuous Air Bleed system on an existing CJC® Oil Filter. These upgrades ensure optimum dirt holding capacity and increased filtration efficiency.

**INSTALLATION**  
The CJC® Pressure Kit and CJC® Continuous Air Bleed system is retrofitted up tower in a process that takes approx. 30 min.

**RESULTS**  
The level of 2  $\mu$ m particles is reduced by a factor of 62%, increasing the bearings' cleanliness towards particle wear by 20%.

**CONCLUSIONS**  
**1st Conclusion:** The original filtration system on the Vestas V52, the CJC® Fine Filter HDU 15/25 PV is still after 7 years of operation capable of maintaining the oil contamination level well below the guidelines of ISO 81400-4 (Design & Spec. of Gearboxes).  
**2nd Conclusion:** With the CJC® Pressure Kit you can optimize your existing CJC® Fine Filters and clean the gear oil in your wind turbine down to a level of 1/3 of the previous level.  
Cleaner oil gives better protection of the gearbox and of your wind turbine gearbox investment.

**Guide for Oil Cleanliness**

Oil in wind turbine components	Recommended ISO 4406 Oil Cleanliness *
Gearbox	17/15/12
Pitch hydraulic	16/14/11
Main bearing	16/14/11

\* Source: Noria Corporation

**PARTICLE DEVELOPMENT**

**RESULT**

per. 100 ml	BEFORE CJC® Pressure Kit	AFTER 22 DAYS	AFTER 3 MONTHS
> 2 micron	21,173	12,971	8,001
> 5 micron	12,893	7,843	4,487
> 15 micron	477	395	51
ISO Code	15/14/8	14/13/9	14/13/6

**ASWB006-UK**  
Wind Turbines  
06.02.2017  
© 2017 C.C.JENSEN A/S

**C.C.JENSEN A/S**  
Lavholmen 13 • DK-5700 Svendborg • Denmark  
Phone: +45 6321 2014 • Fax: +45 6222 4615  
sales@cjc.dk • www.cjc.dk

# ► CJC® Filter Insert Change Kit

A pumping unit for quick change of Filter Inserts for Oil Filters

When the CJC® Filter Inserts needs to be changed, the CJC® Oil Filter must be drained of oil. To perform this oil draining quick and easy, use the CJC® Filter Insert Change Kit.

The CJC® Filter Insert Change Kit transfers lubricants from the CJC® Oil Filter drain port and returns it at the same location (contaminated side) after CJC® Filter Insert replacement. The CJC® Filter Insert Change Kit handles lubricants up to 2000 Cst with flow rates of up to 7.5 L/min. (2 gpm)

Special tools for the service task are included within the CJC® Filter Insert Change Kit. Operating distance is 5 meters from the oil filter via a wired remote unit.

## Benefits

- Huge reduction of service time when replacing Filter Inserts
- Limited oil waste
- No oil spillage while draining or filling
- Compact and easy to handle



The CJC® Filter Insert Change Kit

## CUSTOMER STATEMENT



### Mr. Allan Topp Petersen, Production Manager, E.ON Wind Services A/S

*"We have used the CJC® Filter Insert Change Kit unit and we agreed that it is a product which is easy to use. Operation is simple and straightforward.*

*Usually, when we empty the filter housing, oil residues were found in the bottom, which then flowed into the waste tray when the housing is lifted. Using the new unit, ensures that the housing is emptied and it requires very limited cleaning. Users of the unit, reports that a filter insert change is carried out within 30 minutes."*



Even a large oil filter is drained within minutes.  
Installation at E.ON Wind Services



CJC® Filter Insert Change Kit, used by E.ON Wind Services

# Do not rely only on in-line filtration - go for a dual filter strategy

## ► In-line & offline - a complete oil reliability program

### In-line filter efficiency

An in-line filter alone does not keep the oil system clean and dry. A typical in-line filter ranges from 6-30 µm and is for urgent protection of components, hence acting like a "police filter". The in-line filter provides a much needed last chance protection against large particles that make it downstream of the pump, prior to coming in contact with any critical system components. The in-line filter is also designed to handle the entire flow rate of the system, to assure delivery of enough volume to the critical system components. But, the in-line filter does not remove smaller particles, below 6 µm!

### Offline filtration efficiency

By implementing a CJC® Oil Filter solution - which is installed offline - you remove particles down to less than 1 micron in size. Only approx. 10% of the particles are bigger than 10 µm and approx 70-80% of the particles are between 1-5 µm, so fine oil filtration is needed to protect components.

### WHY

Contamination of an oil system leads to various problems like gearbox breakdown, frequent repairs of equipment and reduced oil lifetime. All of which means inefficient production and unnecessary expenses spent on repair and oil change.

### Your dual solution

Going for a dual filter strategy - relying on both in-line and offline filtration - you have a solution, complementing each other, ensuring clean and dry oil.

## ► Cellulose vs. synthetic fibres

### Why use natural cellulose fibres as filtration media?

Of course due to the basic foundation of the entire industry, which is sustainability

Natural organic sustainable fibres are nature's best with properties superior to those of synthetic fibres. Natural cellulose fibres come in many sizes and shapes. To make the best oil filters, we mix and treat raw fibres before making our unique composition and design, which is comprised of only organic cellulose filter material. It contains neither metal, plastic nor chemicals. The mix of fibres and the density of the CJC® Filter Insert provide efficiency in terms of not only the filtration degree but also the capacity of the filter insert. This means that original CJC® Filter Inserts have specific properties depending on the actual requirements of the application, the oil to be filtered and the degree of oil contamination. The filter inserts are uniquely designed for specific applications only plus the operating conditions of the gear, the pitch and the bearings.

### Cellulose fibres' properties

- High surface filtration area (no void areas)
- Large amount of cellulose media to retain the contamination
- The organic cellulose fibres have a polar charge/attraction that naturally attracts particles, water and varnish
- This filter media can consist of both natural micro fibres and nano fibres, which makes it possible to produce filter insert for specific applications, lubricants and contamination sources
- Contains no metal, no chemicals, and no plastic



Only one oil filter is as natural as the energy you produce



#### A renewable resource

100% natural cellulose fibres from sustainable resources



#### Reduce your carbon footprint

- No metal
- No plastics
- No chemicals



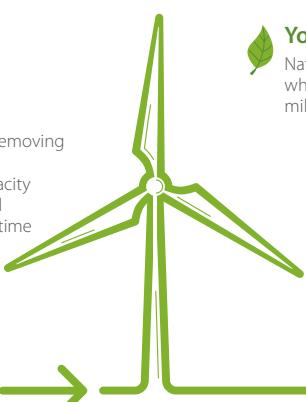
#### Your benefits

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



#### Your natural solution

Nature's best! We use what nature invented millions of years ago



#### Choice of leading OEM's



#### Protect your investment

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

# Your natural solution - CJC® Oil Filtration systems

## CJC® Oil Filters - Key figures

The CJC® Oil Filters are offline depth filters for hydraulic, gear and lubrication oils.

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.

## CJC® Solution overview for wind turbines



## CJC® Filter Insert system

All CJC® Filter Inserts have a 3 µm absolute filtration ratio. The CJC® Filter Inserts are produced of **100% natural cellulose fibres** from sustainable resources - no metal, no plastic, no chemicals.



- **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** (varnish) are removed by the attraction to the polar fibers.



### CJC® Filter Inserts for standard CJC® Offline Oil Filter Units - 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



### CJC® Key Filter insert, KFi

Specially designed for use in our CJC® Key Filter unit and is ideal for filtration of mineral and synthetic based gear and hydraulic oils.



## The original oil filter

Always use the original CJC® Filter Insert in your CJC® Oil Filter – the only product approved by the OEMs and the only product that guarantees protection of your wind turbine & your investment.



## What do we do differently?

Compared to a standard in-line filter, CJC® Oil Filters have proven their many benefits.

### Main benefits:

- Huge dirt holding capacity
- 24/7 offline oil filtration
- Removal of all contaminants - all in one and the same operation
- 100% natural organic cellulose fibres

# Chosen as the market leader

## ► More than 110,000+ CJC® Oil Filters installed

With more than 110,000+ CJC® Oil Filter installed worldwide in wind turbines and more than 20 OEM customers trusting us to protect their gearbox designs, we have proven ourselves to be the clear market leader in oil treatment of wind turbine gearboxes. CJC® Oil Filters are constantly protecting gearboxes, pitch hydraulic and main bearing systems - *optimising our customers' investment in wind turbines!*

## ► Chosen by leading OEMs

We are proud to be chosen by leading manufacturers like Vestas, Siemens, Gamesa, MHI Vestas Offshore, GE, Suzlon, Mitsubishi and many other important players in the market, as we base our collaboration on mutual trust, approved and documented quality, flexibility and a strong business case for all parties.



## ► R&D engineers

Our R&D Engineers are continuously developing new solutions to address the challenges we meet in the wind turbine industry.

We have CJC® Oil Filters and CJC® Filter Inserts especially developed for wind industry applications.

No lubricant is approved by the leading wind turbine manufacturers without passing our 2,000 hour test carried out at our state-of-the-art test facilities.



*Test of oil samples at C.C.JENSEN A/S laboratory*

# Close to you – worldwide!



## Worldwide organisation

C.C.JENSEN is very proud of being the trusted partner of more than 20 wind turbine manufacturers in countries like Germany, US, Denmark, China, India, Spain, South Korea, Japan, etc. All our personnel in the wind segment have passed application-specific technical courses in order to ensure our wind industry customers a professional and rapid response – worldwide.



Our Global C.C.JENSEN Wind Team

Our global CJC® distribution network  
visit - [www.cjc.dk/contact](http://www.cjc.dk/contact)



## We are a CO<sub>2</sub> neutral company

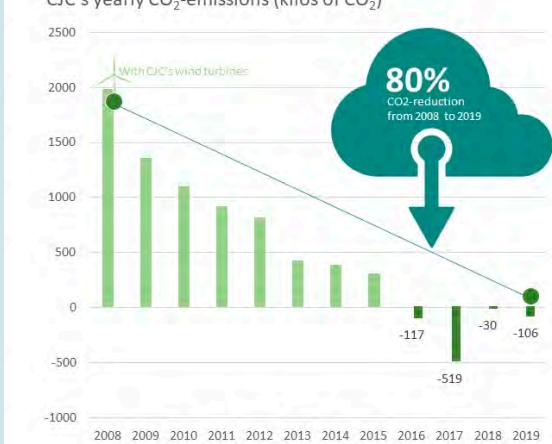
At C.C.JENSEN, we have during the past many years worked intensively on reducing our carbon footprint - and with great success - we are now a **CO<sub>2</sub> neutral company**.

We have invested in our own wind turbines, installed solar power panels for electricity production and reduced our consumption of oil using alternative energy in our production processes and many other great initiatives improving the sustainability of our company.

**Our vision is clear:**  
CO<sub>2</sub> emissions must be reduced  
to help the global environment!

As a **company** we are **above, better & beyond CO<sub>2</sub>-neutral**

CJC's yearly CO<sub>2</sub>-emissions (kilos of CO<sub>2</sub>)



# C.C.JENSEN

## - contact us today!



Manufacturing & headquarters

C.C.JENSEN A/S  
Løvholmen 13 | DK - 5700 Svendborg | Denmark  
Tel. +45 6321 2014  
sales@cjc.dk | www.cjc.dk

### C.C.JENSEN worldwide

#### Benelux

C.C.JENSEN Benelux B.V.  
Tel.: +31 182 37 90 29  
info.nl@cjc.dk  
www.ccjensen.nl

#### Chile

C.C.JENSEN S.L. Limitada  
Tel.: +56 2 739 2910  
ccjensen.cl@cjc.dk  
www.ccjensen.cl

#### China

C.C.JENSEN Filtration Equipment (Tianjin) Co. Ltd.  
Tel: +86 10 6436 4838  
ccjensen.cn@cjc.dk  
www.ccjensen.cn

#### Denmark

C.C.JENSEN Danmark  
Tel: +45 7228 2222  
ccjensen.dk@cjc.dk  
www.cjc.dk

#### France

C.C.JENSEN France  
Tel: +33 366 753 170  
contact.fr@cjc.dk  
www.ccjensen.fr

#### Germany

KARBERG & HENNEMANN GmbH & Co. KG  
Tel: +49 (0)40 855 04 79 0  
kontakt@cjc.de  
www.cjc.de

#### Greece

C.C.JENSEN Greece Ltd.  
Tel.: +30 210 42 81 260  
ccjensen.gr@cjc.dk  
www.ccjensen.gr

#### India

C.C.JENSEN India  
Tel.: +91 4426241364  
ccjensen.in@cjc.dk  
www.ccjensen.in

#### Ireland

C.C.JENSEN Ireland  
Tel.: +353 86 827 1508  
ccjensen.ie@cjc.dk  
www.ccjensen.ie

#### Italy

KARBERG & HENNEMANN srl  
Tel: +39 059 29 29 498  
info@cjc.it  
www.cjc.it

#### Poland

C.C.JENSEN Polska Sp. z o.o.  
Tel.: +48 22 648 83 43  
ccjensen@ccjensen.com.pl  
www.ccjensen.pl

#### Spain

C.C.JENSEN Ibérica, S. L.  
Tel.: +34 93 590 63 31  
ccjensen.es@cjc.dk  
www.cjc.dk

#### Sweden

C.C.JENSEN AB  
Tel.: +46 8 755 4411  
sales@ccjensen.se  
www.ccjensen.se

#### United Arab Emirates

C.C.JENSEN Middle East  
Tel.: +971 4 447 2886  
ccjensen.uae@cjc.dk  
www.cjc.ae

#### United Kingdom

C.C.JENSEN Ltd.  
Tel.: +44 1 388 420 721  
filtration@cjcuk.co.uk  
www.ccjensen.co.uk

#### USA

C.C.JENSEN Inc.  
Tel.: +1 770 692 6001  
ccjensen@ccjensen.com  
www.ccjensen.com



Scan the QR code and find  
your nearest distributors  
at [www.cjc.dk/contact](http://www.cjc.dk/contact)

*- or give us a call!*

Your local C.C.JENSEN Distributor

**C.C.JENSEN A/S**  
[www.cjc.dk](http://www.cjc.dk)

