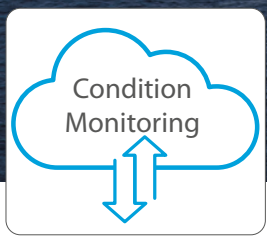
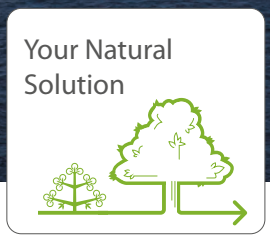
CJC® Oil Filtration for the

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

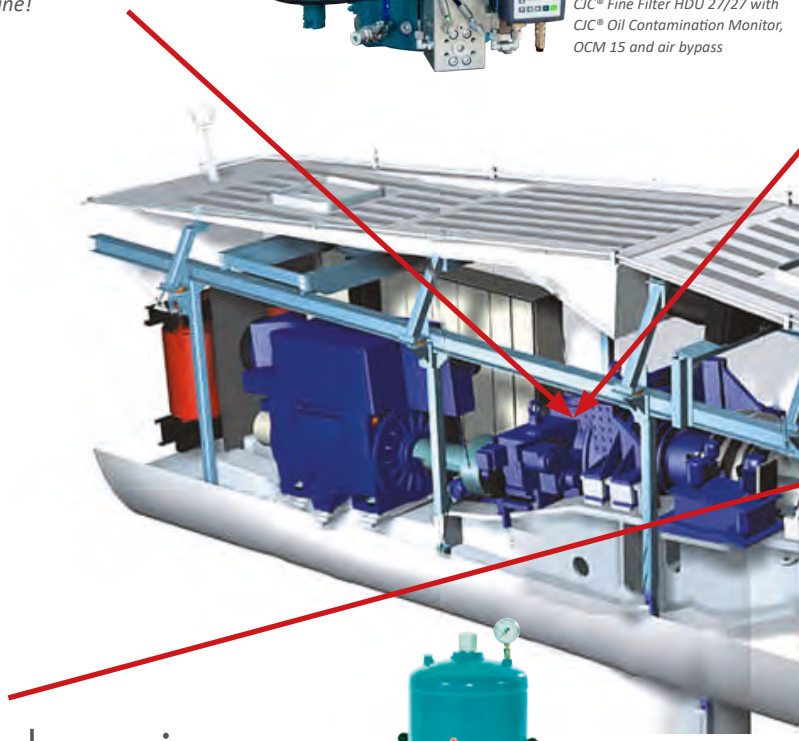
Why is CJC® different?

- 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

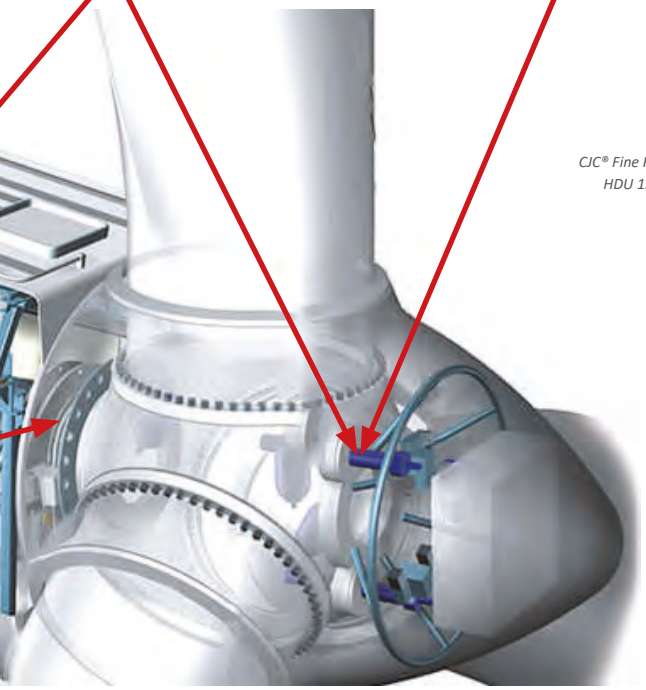
equipment breakdown

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

CJC® Key Filter with CJC® Key Filter insert

Pitch hydraulic

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



CJC® Fine Filter HDU 15/25

Longer lifetime of mechanical components

Increase oil lifetime up to 7 years

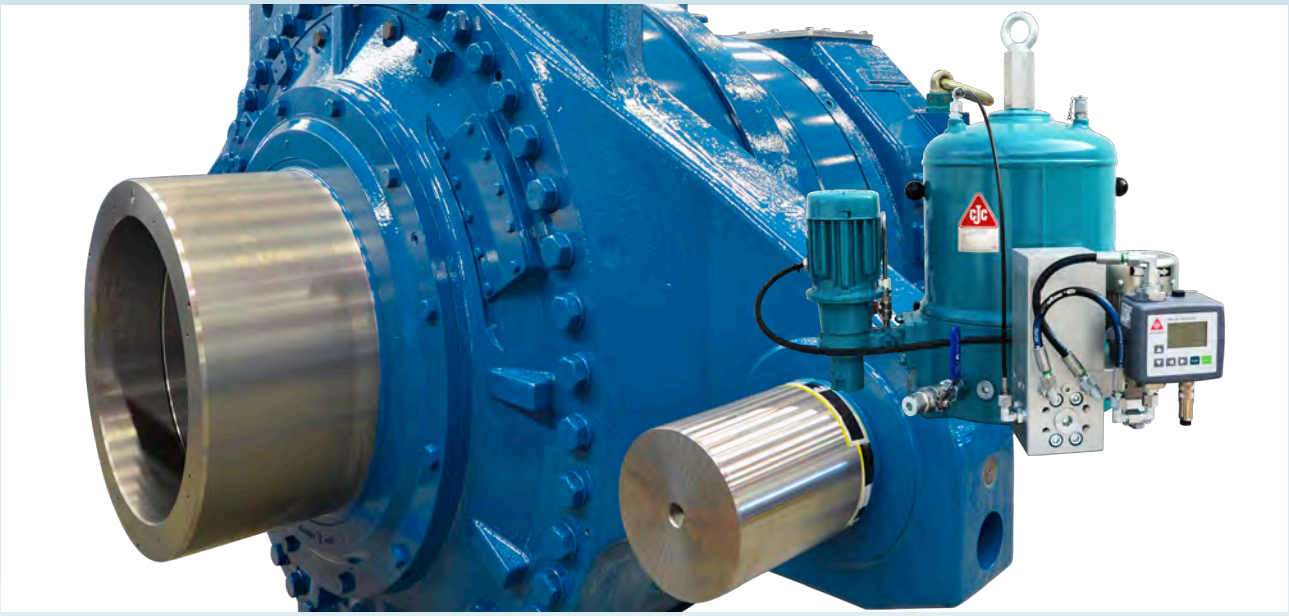
Increase availability

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

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® T²render 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

Gear Oil
GE 1.5 ESS, Wind Turbine Gearbox
CJC™ Application Study

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.

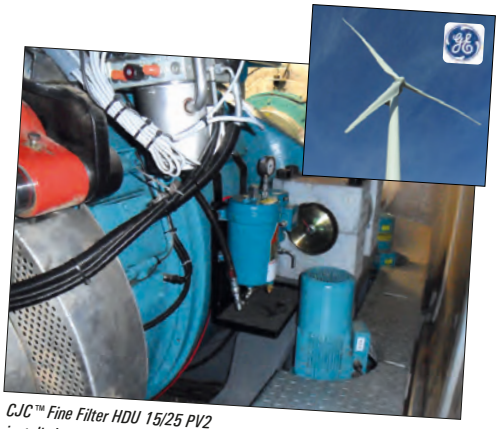
RESULT
After 110 days of continuous, 3-micron, offline filtration, the gear oil showed the below reduction:
- 92.76% in 4-micron particles
- 92.78% in 6-micron particles
- 93.10% in 14 micron particles

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

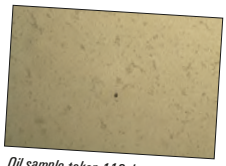
Thank You, C.C.JENSEN."



CJC™ Fine Filter HDU 15/25 PV2 installed at North American Wind Research and Training Center

OIL SAMPLE

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

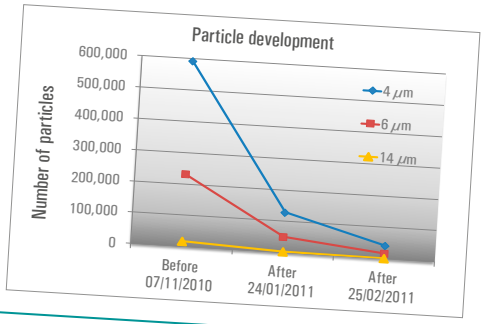


*Oil sample taken 110 days **AFTER** installation of CJC™ Oil Filter ISO 16/15/11*

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



ASWI9002-UK
Wind Turbines
17.02.2017

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

Hydraulic Oil
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 dismounted 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

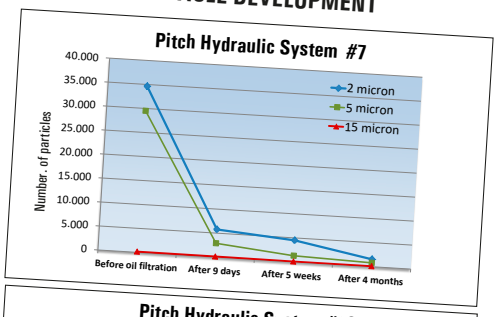
CJC™ Fine Filters are easy disposable and environmentally friendly.

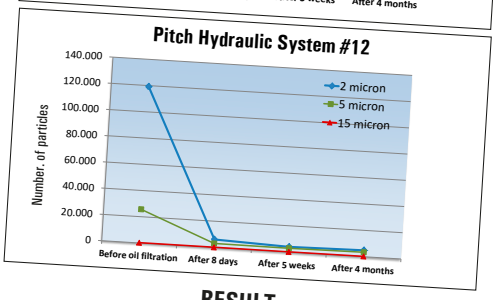
Guide for Oil Cleanliness	
Oil in wind turbine components	**Recommended ISO 4406 Oil Cleanliness**
Gearbox	17/15/12
Pitch hydraulic	16/14/11
Main bearing	16/14/11

*) 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
Pitch Hydraulic System #7				
> 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
Pitch Hydraulic System #12				
> 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

ASWI9007-UK
Wind Turbines
17.02.2017

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
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 T²render.

CJC® Sensor solutions								
Features	OCM 15	CMU					External sensors	
		OCM Oil Contamiation Monitor	**PT100** Temp.	**OMT** Oil Moisture Transmitter	**OQM** Oil Quality Monitor	**PT in** Pressure	**PT out** Pressure	**ODM** Oil Debris Monitor
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*

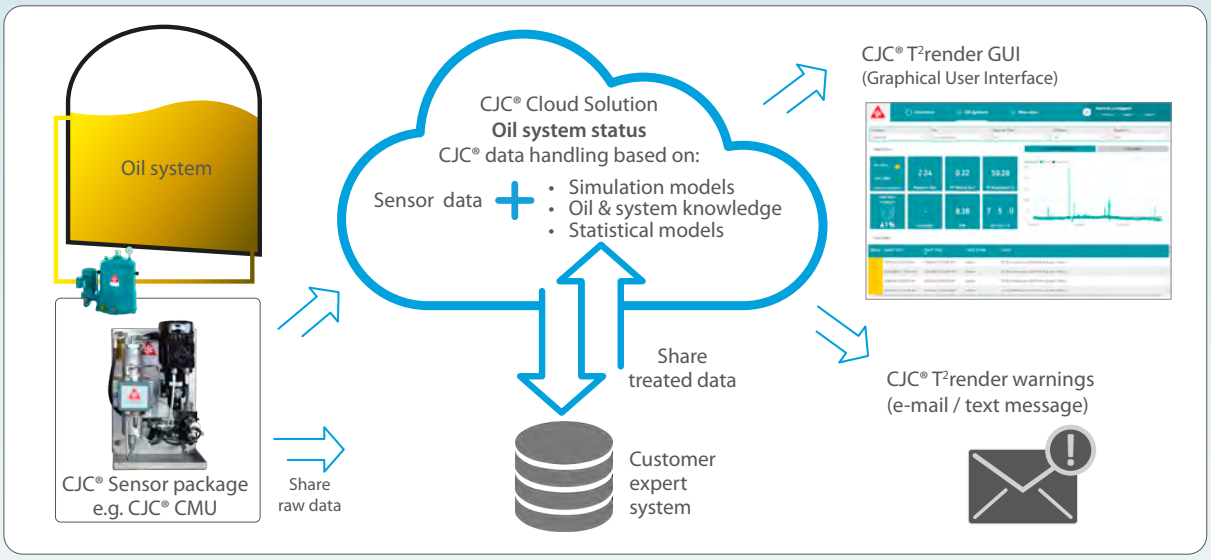
Online solution for monitoring **oil & equipment conditions**

CJC® T²render 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® T²render Solution Suite.

The T²render 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® T²render 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.



T²render Solution Suite is available in two variations:

CJC® T²render Basic:

The CJC® T²render 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® T²render Pro:

In addition to the Basic solution, the CJC® T2render 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® T²render Solution Suite			
Features	CJC® Sensor package	CJC® T2render Basic	CJC® T2render 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**

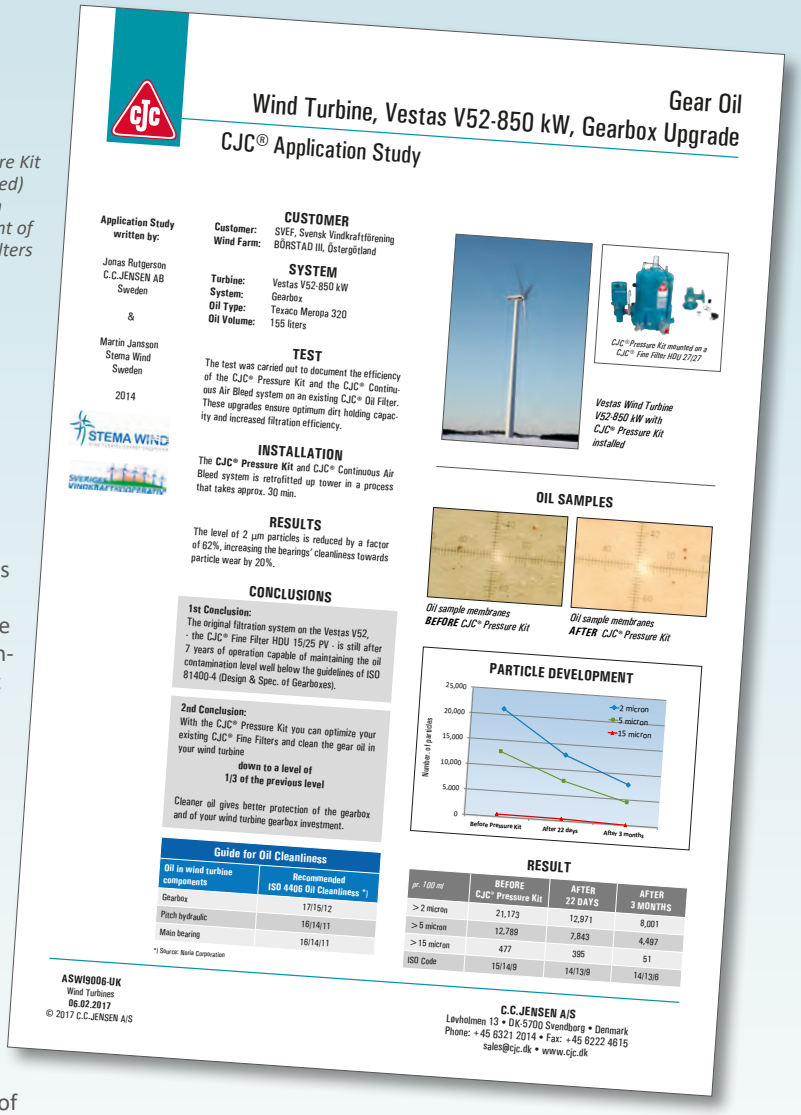
CJC® Pressure Kit

Performance improvement for CJC® Oil Filters

CJC® HDU 27/27 with air bleed

CJC® Pressure Kit

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



Wind Turbine, Vestas V52-850 kW, Gearbox Upgrade

Gear Oil

CJC® Application Study

Application Study written by:

Jonas Rutgerson
C.C.JENSEN AB
Sweden

&

Martin Jansson
Stema Wind
Sweden

2014

CUSTOMER

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

SYSTEM

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 µm 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	18/14/11
Main bearing	18/14/11

*) Source: Noria Corporation

CJC® Pressure Kit mounted on a CJC® Fine Filter HDU 27/27

Vestas Wind Turbine V52-850 kW with CJC® Pressure Kit installed

OIL SAMPLES

Oil sample membranes BEFORE CJC® Pressure Kit

Oil sample membranes AFTER CJC® Pressure Kit

PARTICLE DEVELOPMENT

RESULT

pr. 100 ml	BEFORE CJC® Pressure Kit	AFTER 22 DAYS	AFTER 3 MONTHS
> 2 micron	21,173	12,971	8,001
> 5 micron	12,789	7,843	4,497
> 15 micron	477	395	51
ISO Code	15/14/9	14/13/9	14/13/6

ASW9006-UK
Wind Turbines
06.02.2017
© 2017 C.C.JENSEN A/S

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

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 compromissing 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
- Lover your ISO code
- Improved WTG availability
- Reduced oil change interval
- Even cleaner gear oil

CUSTOMER STATEMENT

VATTENFALL

Mr. Thomas Stalin, Senior Wind Technology Expert, Vattenfall Wind Power AB

"By rebuilding my CJC® Oil Filter HDU 15/25 with a Pressure Kit increasing the pressure over the CJC® Filter Insert and by draining the air in the mainline filter of 9 x Vestas V90 2 MW turbines, I decreased the particles by a factor of 10 in about 3 months operation. The cost was about 500 Euro in equipment. Now I have better cleanliness than 16/14/11 according to ISO 4406:06"

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, RWE

"*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 RWE Wind Services

CJC® Filter Insert Change Kit, used by RWE 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

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

HDU 15/25

Key Filter & Key Filter insert

HDU 27/54

HDU 27/27 with OCM 15

Condition Monitor Unit CMU

T²render Solution Suite

Filter Insert Change Kit

Pressure Kit

CJC® Filter Insert system

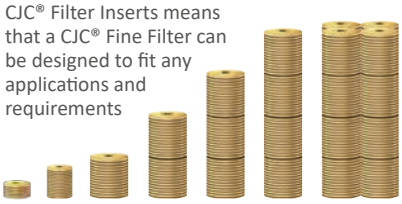
All CJC® Filter Inserts have a 3 µm absolute filtration ratio. The CJC® Filter Inserts are produced of **100% natural cellulose fibres** from sustainable resources - no metal, no plastic, no chemicals.

- **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.

*CJC® Filter Insert **before** filtration*

*CJC® Filter Insert **after** filtration, contamination has now been removed from the system*

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 manufactures 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 manufactures without passing our 200 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.

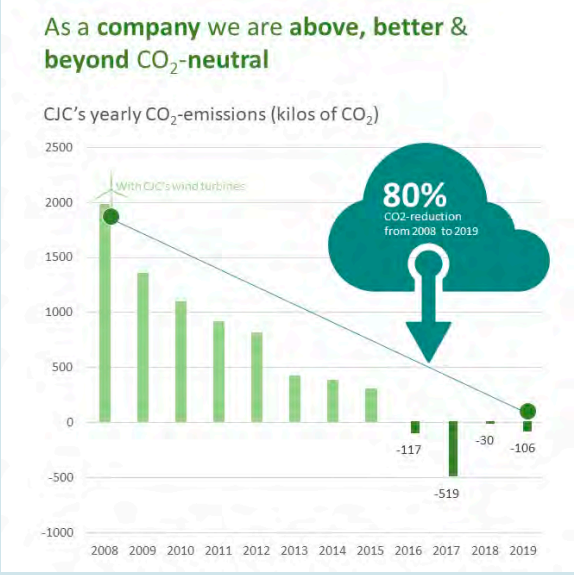
Our Global C.C.JENSEN Wind Team

Our global CJC® distribution network
visit - www.cjc.dk/contact

We are a CO_2 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_2 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_2 emissions must be reduced to help the global environment!



C.C.JENSEN
- contact us today!

1953-2021 68 Over 68 years of increasing reliability and reducing costs

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

- or give us a call!

Your local C.C.JENSEN Distributor

C.C.JENSEN A/S
www.cjc.dk