



CLEAN OIL
BRIGHT IDEAS

Wind Turbine, Vestas V52-850 kW, Gearbox Upgrade

CJC™ Application Study

Application Study
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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	16/14/11
Main bearing	16/14/11

*) Source: Noria Corporation

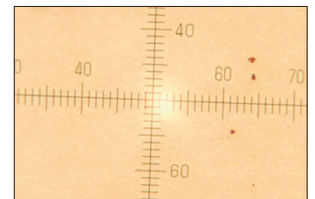


Vestas Wind Turbine V52-850 kW with CJC™ Pressure Kit installed

OIL SAMPLES

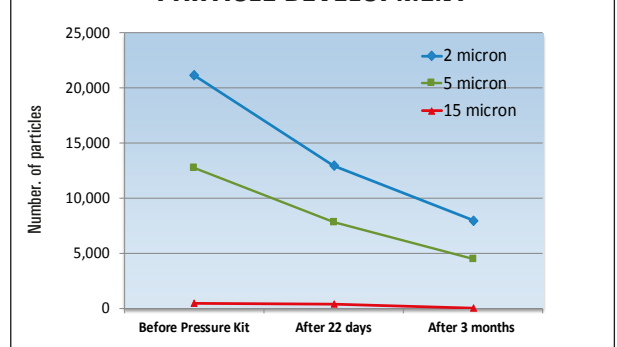


Oil sample membranes BEFORE CJC™ Pressure Kit



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