

Life extension upgrade solution for Gears and Engines in Wind Turbines

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Summary

REWITEC® is a medium-sized business that develops an innovative nano- and micro-particle based surface treatment technology. This technology uses lubricants as a carrier for a protective and repairing silicon coating in engines, gears and bearings in industry sectors like WIND ENERGY, INDUSTRY, MARITIME & AUTOMOTIVE. When applying the products treated machinery, gearboxes and bearings can run better with reduced friction, temperature and great reliability and durability due to reduced abrasion and wear.

1. REWITEC® - Examples of Application

1.1 Aim of the application

The gearbox of a GE 1.5sl wind turbine was after operation prophylactically treated against tribological wear such as micro pitting, and seizing of surfaces. In order to visualize the effect of the REWITEC® DuraGear® product (DuraGear W100), the analysis was documented with the aid of surface imprints before and after the application of the selected tooth flank. The tooth flank is marked with an oil-resistant paint, so that it can be found at the same spot later for the second inspection.

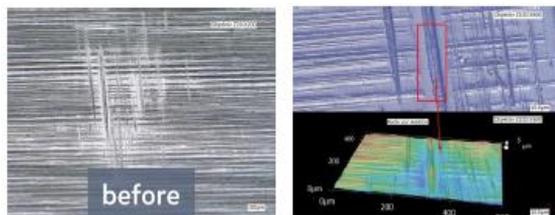


Fig. 1: Imprints before the application

Before treatment with REWITEC® there was operational wear visible and in the foot area visible seizing and stray metallic particle run through marks.

The wind turbine was inspected again and a second imprint could be taken.

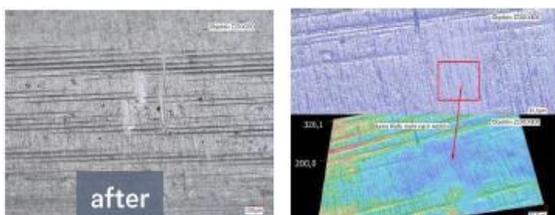


Fig. 2: Imprints after the application

The addition of REWITEC® resulted in a significant improvement of the surface roughness. Stray metallic particle run through and seizure are greatly smoothed out. Run through marks and pitting are greatly smoothed out, too.

2. Scientific Tests

2.1 FE-8 Test

The FE-8 Test is used to examine lubricating oils and greases with regard to their wear and friction behaviour under lubricant and bearing-specific influences. To assess the suitability of the lubricant to be tested, the friction and temperature behaviour and the wear is determined in conjunction with the resulting weight loss of the bearings in the test arrangement. The tests also allow the creation of surface measurements and lubricants and reaction layer analyses.

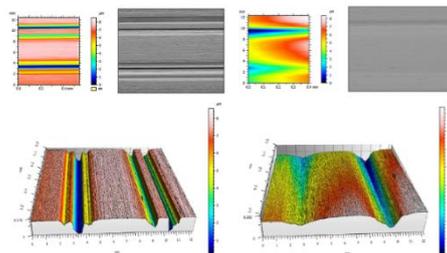


Fig. 3: Bearing examination under a microscope without and with REWITEC®

The result of the FE-8 test has additionally been positive. By the test once without and once with REWITEC® resulted the evaluation:

- Light run marks and smoother surface
- 17% less wear with the REWITEC® treated lubricant

3. Result

The innovative technology increases reliability and extends system lifetime by permanently reducing surface roughness, friction and temperature. Utilizing REWITEC® within the Wind Energy Industry will help reduce operational expenses and thus help drive the lower cost of energy making clean energy more sustainable.