

# Lofrix® Windpower

Lofrix® Windpower has all the features of Lofrix® Original but has been specially formulated to cope with the extreme conditions encountered in wind turbines.

The differences in operating speeds, temperatures and pressures within the single gearbox of a wind turbine are a particularly harsh environment for lubricating oils. Wind turbine gearboxes are subject to highly complex loads and throughout the gearbox, bearing performance criteria differs widely. In some operating conditions bearings carry medium-sized loads at low speeds, while elsewhere bearings need to carry much lower loads but at far higher speeds.

Rapid changes in operating speeds can cause high shock loads, while the high-load/low-speed conditions that arise when winds are light can lead to the breakdown of essential lubricating film.

Lofrix® Windpower is extremely tolerant of shock loads and stresses and is able to withstand temporary absence of lubricant. These properties help to smooth out the environmental extremes, enabling the lubricating oil to operate effectively within its tolerances.

## Benefits

- Improves productivity
- Increases plant life
- Reduces shock and stress
- Lowers operating temperature
- Reduces vibration
- Reduces noise levels
- Reduces corrosion
- Reduces maintenance costs

## Features

- Effective in all oils
- Simplifies lubricant stocks
- Bonds to most metals
- Cleans and lubricates
- Waterproof
- Low hazard in use
- Non flammable
- Contains no solid particles

## Applications

- Wind turbine gearboxes

## Application

The recommended amount of Lofrix® Windpower, which is between 1% and 2% of the bulk oil amount, can be added directly into the gearbox while it is working, or as part of routine maintenance. Mixing will occur automatically.



# Case Study

A major wind power operator conducted tests of Lofrix® Windpower to see if it would reduce the high failure rate which is common in turbine gearboxes.

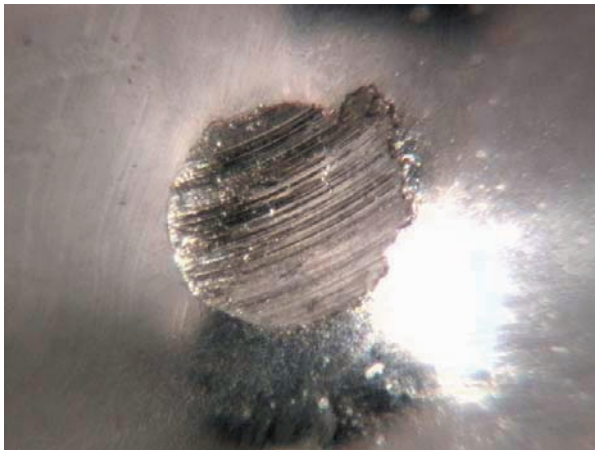
Five turbines were identified by the company's monitoring procedures as being in danger of failure, with an estimated remaining life span of two to three weeks. On adding Lofrix® Windpower the operating temperature of the gearboxes dropped by an average of 12%. The turbines continued to operate satisfactorily, well beyond the predicted failure dates prompting further successful trials in more turbines.

Following these initial positive results, the company commissioned the National Centre of Tribology to assess the long and short term effects of Lofrix® Windpower in wind turbine gearboxes.

These tests showed:

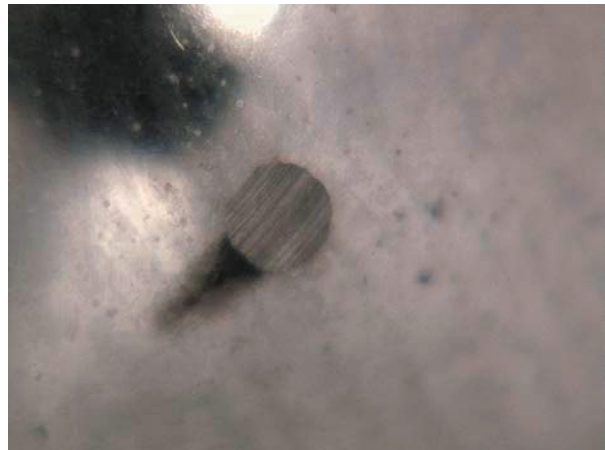
- A reduction in wear scar width in 4-ball tests under 980N load of 40% - 51%, as shown below
- A reduction in friction forces generated in Falex pin-in-vee block tests of 14% - 22%
- A reduction in the cold start up friction coefficient of 50%, to the same levels as normal operating temperatures in dowel-on-plate tests

## Without Lofrix® Windpower



4-ball wear scar from Q8 El Greco 320 @ 980N.

## With Lofrix® Windpower



4-ball wear scar from Q8 El Greco 320 @ 980N with 1% Lofrix® added.