

TAKING ON THE CHALLENGE OF GREASE LUBRICATION IN WIND TURBINES

Have you ever stopped at a wind turbine and been impressed at the sheer scale of the engineering challenges of constructing such a large harvester of wind energy? Developing and selecting the correct lubricant to address the challenges faced by these engineering monuments requires not only knowledge of lubrication solutions, but also a deep experience of the factors present in the turbine during the full range of operations. So why is correct grease selection so critical in tribological terms?



With higher load and scaled up energy output requirements, every equipment component is under increased strain, especially in offshore wind farms that operate in harsh environments and under extreme operating conditions. Take the main bearing in the wind turbine for example. Large, heavy loaded, remote, high moisture atmospheres - none of these are new conditions, but wind turbines have proven to be extremely difficult to master from a lubrication viewpoint. With pressure to capture return on investment and safety being a top priority, getting grease lubrication right is essential for operators. ExxonMobil Fuels & Lubricants has sound experience in wind turbine lubrication, helping customers unleash productivity in the very competitive power generation market. That is why equipment builders and operators rely on high performance synthetic lubricants for wind grease applications.

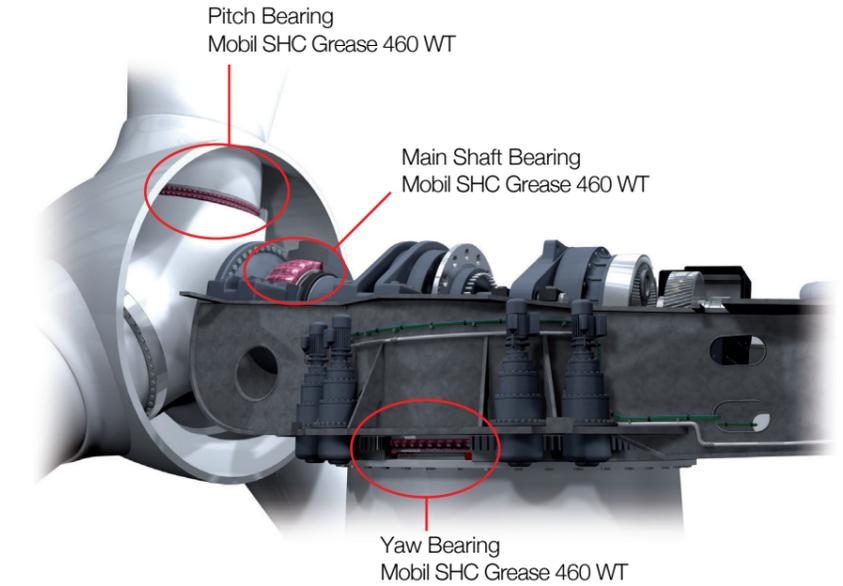
PROVEN PERFORMANCE IN KEY WIND TURBINE APPLICATIONS

Mobil SHC Grease 460 WT is a high performance product designed, in particular, to meet the demanding requirements for wind turbine applications including severe conditions and extreme temperatures. Specially formulated to lubricate the slowly oscillating, high loaded yaw and pitch bearings as well as the low speed main bearings, it has become the product of choice through proven performance.

This new generation grease is recognised for its innovation and reliable technical performance by Original Equipment Manufacturers (OEMs) around the world, selecting it as the first fill product of choice for main, yaw and pitch bearings. A close contact with equipment builders helps ensure that the product is designed to provide performance in sync with continually evolving industrial equipment designs.

GREASE FOR INCREASED PRODUCTIVITY

Mobil SHC Grease 460 WT combines the unique features of synthesized hydrocarbon-based fluids with those of an advanced lithium-complex thickener, which help contribute to excellent low and high temperature performance, structural stability, and resistance to water. A carefully selected proprietary additive system helps provide outstanding benefits, such as excellent wear protection, and rust and corrosion inhibition. The low internal friction and high natural viscosity index of the base fluids offer the potential for low starting and running torque, and excellent low temperature pumpability. Additional benefits include enhanced grease and bearing life, a wide operating temperature range down to -40°C and the suitability for use with either manual or centralised greasing systems —helping to reduce maintenance costs and improve profitability.



SINGLE SOLUTION FOR MULTIPLE BEARING APPLICATIONS

Because the slow speed main bearing is subject to high loads, reliable protection from wear is required to extend its service life. The high base oil viscosity of Mobil SHC Grease 460 WT helps to maintain proper lubricant film thickness to protect the bearing from wear. Plus, low internal friction of the base fluid offers the potential of reduced low temperature starting torque, features that are not present in most general multi-purpose greases.

Similarly, pitch and yaw bearings move slowly through only a few degrees of rotation, hindering the development of a proper lubricant film. Furthermore, blade vibrations caused by the wind pressure waves are transferred to the pitch and yaw bearings, which makes false brinelling protection the most important lubricant feature for this application. New generation greases often meet industry test standards for fretting corrosion and false brinelling protection, along with excellent rust and corrosion protection.

CONCLUSION

Mobil branded greases can permit consolidation of main, pitch and yaw bearing greases into one product, minimising the risk of re-lubricating with the wrong product and without introducing unnecessary operational risks. Whilst determining the right lubrication solution to meet the challenges faced by wind turbines, more operators and equipment builders can testify that using this proven technology can increase productivity and help reduce maintenance costs.

MAIN CHARACTERISTICS

| DIN 51825 | Color | NLGI Grade / Viscosity Grade | Operating Temperature, °C* | Applications |
|-------------|-------|------------------------------|----------------------------|------------------------------|
| KPHC1-2N-40 | Red | 1.5/460 | -40 to 150 | Main, pitch and yaw bearings |

*Low-temperature claims based on DIN Low Temperature Flow Pressure results vs. maximum limits of 1,400 hPa at test temperature.

Robert Pears
ExxonMobil Fuels & Lubricants

