



## Texaco Services for Wind Turbines

### Computex Professional

COMPUTEX PROFESSIONAL is Texaco's solution for lubrication maintenance management and is a user-friendly Windows PC based programme. All relevant plant, equipment, lubricant requirements and factory information are recorded within the database. As a result you are able to effectively control your lubrication scheduling, optimise lubrication resources, reduce unscheduled downtime, and increase output. Additional features include stock management, order processing, and a comprehensive reporting system.

### Texchek

TEXCHEK is Texaco's programme for used oil analysis. By tracking component wear, oil additive levels, and contaminants you are able to maximise component and lubricant life and reduce maintenance costs through less unplanned maintenance and lower lubricant use. Oil samples are processed through the laboratory within 48 hours of receipt and reported through e-mail, hard copy or via web access – whichever method best suits your business needs. Texaco's highly trained technical team will recommend any remedial action required, allowing you to plan maintenance more effectively with minimum disruption to production.

### Condition Monitoring

CONDITION MONITORING when used correctly by trained staff is an effective diagnostic and monitoring tool.

Combined with Texchek, it provides a complete picture of the health of critical machinery. Vibration analysis is carried out on rotating equipment, measuring movements out of alignment from the main rotation. Shock pulse monitoring is used to assess the noise level from micro-impacts within bearings, providing an early warning for remedial action. When Condition Monitoring and Texchek Oil analysis are integrated with site maintenance planning systems, significant savings can be realised for both component spend and plant downtime.

### Training

TRAINING is an essential element in the development of a robust Fluid Management programme. It is available to your personnel to ensure that everyone involved with maintenance and lubrication fully understands the purpose of Fluid Management, the properties of lubricants, their selection and lubrication principles. Additional training is available on Computex, Texchek, Health & Safety and Waste Stream Management.

### Texaco's Commitment

Texaco's commitment to you is to provide products and services that will improve your company's performance and profitability.

### Freedom to Manage

With planned lubrication provided by Texaco you will achieve improved maintenance planning, resource management and cost reductions.

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# ILS

Industrial Lubrication Solutions:



## Lubricants for wind powered systems





## Texaco Gear Oils for Wind Turbines

### Meropa

The MEROPA range of extreme pressure industrial gear oils are manufactured from selected mineral base oils and special additives that provide the products with high load carrying capabilities. Their outstanding wear protection and good adhesion qualities guarantee reduced wear under shock and heavily loaded conditions. Excellent oxidation stability ensures the oil has a long service life and anti corrosion additives protect gears and bearings. MEROPA gear oils also exhibit good anti foam properties and separate easily from water.

### Meropa WM

The MEROPA WM range of extreme pressure industrial gear oils are manufactured from selected mineral base oils and special additives that provide the products with extremely high load carrying capabilities and added protection against micropitting. Their outstanding wear protection and good adhesion qualities ensure reduced wear under shock and heavily loaded conditions. Excellent oxidation stability ensures the oil has a long service life and anti corrosion additives protect gears and bearings. MEROPA WM gear oils also exhibit good anti foam properties and separate easily from water.

### Pinnacle EP

The PINNACLE EP range of high performance extreme pressure industrial gear oils are formulated from synthetic base oils and special additives that provide the products with high load carrying capabilities. They are used for the lubrication of gearboxes working in particularly adverse or arduous operating conditions. The PINNACLE EP range is manufactured from thermally stable polyalphaolefins and polyolesters as well as highly effective extreme pressure additives. Their outstanding wear protection and good adhesion qualities ensures reduced wear under shock and heavily loaded conditions, in high operating temperatures and/or in the presence of water. Along with good anti foam and air release properties they protect the interior of the gearbox against corrosion and do not react adversely with yellow metal alloys. Synthetic oils of this type exhibit excellent

viscosity/temperature characteristics and their low pour points result in extremely good cold flow properties. In comparison to conventional mineral gear oils they also exhibit less friction which results in energy savings.

### Pinnacle WM

The PINNACLE EP range of high performance extreme pressure industrial gear oils are formulated from synthetic base oils and special additives that provide the products with extremely high load carrying capabilities and added protection against micropitting. Typically used for the lubrication of gearboxes working in particularly adverse or arduous operating conditions, the PINNACLE EP range is manufactured from thermally stable polyalphaolefins and polyolesters as well as highly effective extreme pressure additives. Their outstanding wear protection and good adhesion qualities ensures reduced wear under shock and heavily loaded conditions, in high operating temperatures and/or in the presence of water. Along with good anti foam and air release properties they protect the interior of the gearbox against corrosion and do not react adversely with yellow metal alloys. Synthetic oils of this type exhibit excellent viscosity/temperature characteristics and their low pour points result in extremely good cold flow properties. In comparison to conventional mineral gear oils they also exhibit less friction which results in energy savings.

### Synlube CLP

The SYNLUBE CLP range of high performance extreme pressure industrial gear oils are formulated from synthetic polyalkylene glycol base oils. They are used for the lubrication of gearboxes working in extremely adverse or arduous operating conditions. The combination of special polyalkylene glycol base oils and additives enhance the oxidation stability and wear and corrosion protection compared to more conventional synthetic gear oils. Polyalkylene glycol base oils exhibit excellent viscosity/temperature characteristics even after sustained periods under high load and temperature. Their high oxidation stability also ensures a long service life between oil changes reducing total downtime and maintenance costs. It should be noted that the SYNLUBE CLP range is not miscible with other lubricants based on

mineral oils or different synthetic base oils so technical advice should always be requested for applications where SYNLUBE CLP is to be used. The SYNLUBE CLP range can be recommended for many types of applications in place of other oils that maybe unsuitable for particular operating conditions. SYNLUBE CLP oils are particularly recommended for roller bearings and friction bearings working under high loads.

## Texaco Hydraulic Oils for Wind Turbines

### Rando EP Ashless

The RANDO EP ASHLESS range of ashless hydraulic oils are manufactured from highly refined mineral base oils and special additives which provide enhanced wear protection and oxidation stability, and ensure a long service life. Inhibitors are present to prevent corrosion, along with additives to provide good anti foam and air release properties. Good anti foam and air release characteristics help to prevent air locks, ensuring optimal performance under all operating conditions. Filterability of the Rando EP Ashless range is excellent and water absorption tendency is extremely low so any water contamination in the system can be quickly eliminated. In comparison to products containing zinc based anti wear additives, the RANDO EP ASHLESS range exhibits excellent hydrolytic stability.

### Rando HDZ LT

The RANDO HDZ LT range of high quality, viscosity stable hydraulic oils are manufactured from highly refined mineral base oils and special additives which enable the lubricant to exhibit multigrade characteristics. Excellent viscosity/temperature performance is achieved from the inclusion of a highly shear stable viscosity improver additive. The RANDO HDZ LT range helps to prevent wear in a variety of pumps including axial, gear and vane types. Inhibitors are present to prevent corrosion, along with additives to provide good anti foam and air release properties.

### Hydra

The HYDRA range of environmentally friendly, zinc-free, biodegradable hydraulic oils are formulated from synthetic base oils. Supplementary additives prevent corrosion, increase oxidation stability and improve wear protection. The results of

tests conducted according to CEC-L-33-A-93 show that these products exhibit a high degree of biodegradability. Due to their good environmental compatibility, they are recommended for use both in the hydraulics and lubrication systems of machines which run over extended periods outdoors, where accidental contact with soil or water may occur. The Hydra range displays excellent viscosity/temperature characteristics and hence finds application over a wide temperature range, from -30°C to 95°C.

### Synstar Hydraulic HT 32

SYNSTAR HYDRAULIC HT 32 is a zinc-free, biodegradable hydraulic oil for use in the clutches of wind turbines. SYNSTAR HYDRAULIC HT 32 is manufactured with synthetic esters which exhibit high temperature and oxidation stability. Specially selected additives further improve oxidation stability, corrosion protection and load carrying capabilities. SYNSTAR HYDRAULIC HT 32 delivers high biodegradability performance in excess of 60% in OECD 301B tests, and is specifically formulated to meet Swedish Standard 15 54 34 specifications. SYNSTAR HYDRAULIC HT 32 is used where there is a potential for accidental contact with soil or water and in machines that are not under constant supervision. SYNSTAR HYDRAULIC HT 32 is also recommended for hydraulic equipment operating in enclosed spaces at operating temperatures of between -35°C and 150°C and is approved for use in Voith clutches present in wind turbines.

## Texaco Greases for Wind Turbines

### Starplex EP 2

STARPLEX EP 2 is premium grease for universal use in roller and friction bearings over extended periods at high temperatures. Formulated from highly refined mineral base oils and a thermally stable lithium complex soap it displays excellent oxidation stability and corrosion inhibition. Extreme pressure additives increase its load carrying capabilities which are retained throughout its service life. Through high film strength and good adhesion qualities friction and wear under high loads are minimised. Optimal corrosion protection is provided even in unfavourable, aggressive wet environments.

STARPLEX EP 2 protects effectively against penetration from moisture and dirt and is

particularly suitable for 'fill for life' ball and roller bearings operating at high temperatures. It possesses very good worked stability and is particularly suitable for bearings subject to vibration. Its ability to withstand high pressure, outstanding water resistance, good adhesion, and a broad operating temperature range provide lubrication security between extended greasing intervals. When continuous lubrication is provided by a central lubrication unit STARPLEX EP 2 can be used at operating temperatures up to a maximum of 220°C.

### Starplex Premium 1

STARPLEX PREMIUM is a lithium complex grease possessing excellent corrosion protection, long service life and a high load carrying capability. It possesses very good worked stability and is suitable for high loading as well as adverse operating conditions where resistance to water and high temperature performance are required. The high ISO VG 460 base oil viscosity contributes to a significant reduction in friction between rollers and slide ways at very high loads.

### Polystar Synthetic 4602

POLYSTAR SYNTHETIC 4602 is a specially formulated non EP polyurea grease containing a viscous, synthetic base oil as well as carefully selected additives to enhance oxidation stability and corrosion protection. The grease is particularly suitable for the lubrication of roller and ball bearings in industrial applications.

POLYSTAR SYNTHETIC 4602 possesses excellent water resistance characteristics and provides outstanding corrosion protection even in the presence of chemically aggressive moisture such as sea water. The synthetic base oil and polyurea thickener ensure that the product does not harden, even at high temperatures and over long service intervals. POLYSTAR SYNTHETIC 4602 can be used over a broad range of operating temperatures and is therefore recommended for all applications in which more general lubricating greases tend to harden at high temperatures.

## Other Fluids for use in Wind Turbines

### Way Lubricant X

The WAY LUBRICANT X range are high quality mineral oil based chlorine-free slide way lubricants for the lubrication of



the slide and guide ways in industrial applications. Special additives ensure a uniform pressure resistant film between the sliding surfaces and that "stick-slip" is prevented. Other additives help to reduce wear and ensure adequate lubrication even under very high loads.

WAY LUBRICANT X products are suitable for all metal-to-metal and plastic-to-metal slide pairings. Their high adhesion properties ensure that the lubricating film is not washed away by emulsions and inhibitors protect the lubricated components against corrosion.

WAY LUBRICANT X 46 and X 68 are recommended primarily for the lubrication of horizontal slide and guide ways operating under normal loads. On vertical slide and guide ways WAY LUBRICANTS form tenacious lubricating films. For vertical lubricated surfaces under high loads WAY LUBRICANT X100 or X220 is recommended.

### Extended Life Coolant XLC

HAVOLINE XLC is a radiator corrosion inhibitor and anti-freeze containing ethylene glycol which when diluted with water guarantees maintenance free corrosion and frost protection over long service intervals. HAVOLINE XLC contains additives based upon patented silicate-free aliphatic acid technology that ensure optimal long-term protection in all cooling circuits in both conventional and aluminium motors. Havoline XLC can be supplied as a concentrate or in operator friendly pre diluted 35% or 50% concentrations, ideal for remote locations where a good quality deionised or distilled water supply may not be readily available.