
FROM IMPROVING TURBINE EFFICIENCY TO POWERING NATIONS
SHELL LUBRICANTS MAKES IT POSSIBLE
Advanced technology wind power lubricants and services designed to help you to reduce your total cost of ownership
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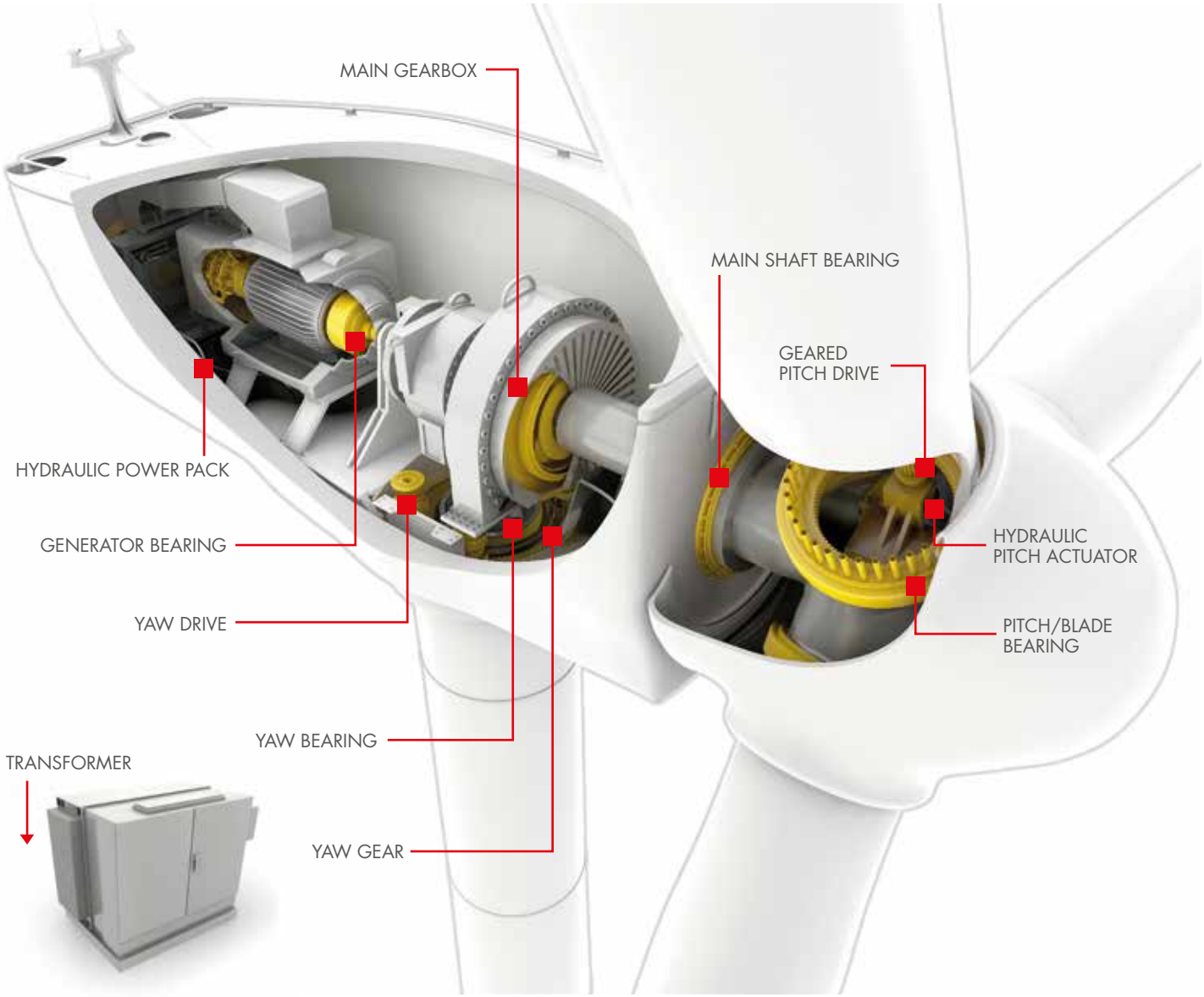
SHELL LUBRICANTS
TOGETHER ANYTHING IS POSSIBLE

LOCALLY SUPPORTED GLOBAL PRODUCTS AND SERVICES



UNDERSTANDING YOUR NEEDS

Shell customers operate wind turbines under diverse conditions and Shell has the expertise to meet their specific demands. We also understand that operating turbines in remote on- and offshore areas with extreme climatic conditions and difficult access adds to the challenge. Whether you want to extend maintenance intervals and increase reliability with purpose-designed, fully synthetic, low-temperature capable gearbox oils or to protect blade bearings from fretting corrosion and false brinelling using specialist greases, we have a wide range of lubricants to choose from.

Wherever your wind turbines are located and whatever your needs, our international network of specialists can design a package of products and services for your business. We supply an extensive range of lubricants and related services that can help you to

- choose the right products
- store, handle and apply your lubricants correctly
- achieve continuous improvement through equipment performance monitoring.

PRODUCT GROUP	PRODUCT NAME	APPLICATIONS											
		Main gearbox	Geared pitch drive	Yaw drive	Pitch/blade bearing	Yaw bearing (roller bearing design)	Yaw bearing (plain bearing design)	Generator bearing	Main shaft bearing	Yaw gear	Hydraulic brake and pitch system	Transformer	Transformer (offshore HVDC converter stations)
GEAR OILS	Shell Omala S5 Wind 320	■	■	■									
	Shell Omala S4 GXV range		■	■									
	Shell Omala S4 WE range (PAG)		■	■									
GREASES	Shell Rhodina BBZ				■	■							
	Shell Gadus S5 V100							■					
	Shell Gadus S5 V110 KP				■	■							
	Shell Gadus S5 V460 KP						■		■				
	Shell Gadus S5 T460						■						
	Shell Gadus S4 OG range									■			
HYDRAULIC OILS	Shell Tellus S4 VX 32										■		
	Shell Tellus S4 ME 32										■		
	Shell Tellus S2 VX 32										■		
	Shell Naturelle HF-E 32 (biodegradable)										■		
TRANSFORMER	Shell Diala S4 ZX-I											■	■
	Shell Naturelle Transformer Fluid S4 I (biodegradable)											■	

SERVICES	
Shell **LubeAnalyst**	Oil and equipment monitoring service
Shell **LubeCoach**	Lubrication training
Shell **LubeAdvisor**	Expert advice from Shell technical team

DESIGNED TO DELIVER RELIABILITY AND EFFICIENCY

Keeping wind turbines working efficiently and reducing operating costs can be critical for a profitable business. At Shell Lubricants, we appreciate that turbines operate in tough conditions, and that, to be competitive, you need them to be reliable and have high availability. Your lubricants must protect your equipment to help reduce operating and maintenance costs. Choosing the right lubricants and services for your business needs can help to make a real difference to your power generation operations.

Our advanced technology wind turbine lubricants, which are developed, researched and supported by our international team, are designed to help you to

- extend oil and grease life
- extend your equipment lifetime
- improve your system efficiency and energy yields

thereby supporting your efforts to reduce your total cost of ownership.

THE GUOHUA WIND FARM EXPERIENCES EXCELLENT LUBRICANT PERFORMANCE AFTER SWITCHING TO SHELL OMALA S5 WIND 320 IN ITS WIND TURBINE GEARBOXES

ENHANCING PERFORMANCE

The Guohua wind farm in Dailiji, Inner Mongolia, China, operates 33 1.5-MW turbines from Dongfang Electric New Energy Equipment that began productive operation in late 2009. The wind farm is in an area that experiences a yearly temperature range of –30.5 to +38.9°C.

The wind farm operator, Guohua (Tongliao) Wind Power Co., Ltd, wanted to ensure maximum uptime and availability for the turbines by using a high-performance lubricant. Although the turbines' gearboxes are not prone to frequent faults, a failure would result in a long period of downtime for the affected turbine.

The management team enlisted the help of the Shell technical team and the equipment manufacturer, who recommended that the wind farm should trial Shell Omala S5 Wind 320, Shell's next-generation gear oil for wind applications, in two of its turbines.

Guohua wind farm tracked the operation of the two turbines and the properties of the oil during the two-year trial and found that

- the runtime of the turbines was significantly longer
- a foaming problem in the gearboxes had been alleviated
- the cold startup time of the turbines was shorter
- the additive content of the oil remained stable
- the amount of wear metals in the oil was much lower than the industry standard limit.

Find out more by visiting
www.shell.com/lubricants

'Shell Lubricants' refers to the various Shell companies engaged in the lubricant business.