

MAIN GEARBOX

MAIN BEARING

GENERATOR BEARING

PITCH BEARING

YAW BEARING

SLEW RING

LUBCHEM KOREA

Wind Power Specialty Lubrication Application Guide

Application-led specialty lubrication for wind turbine gearboxes, bearings, pitch and yaw systems across India

COMPILED FOR INDIAN INDUSTRY BY

Project Sales Corp

Industrial Solutions Since 2000 · Visakhapatnam · India

ENGINEERING APPROACH

Already Using a Wind Turbine Lubricant? Start There.

A wind turbine is not one lubrication application. The main gearbox, main bearing, generator bearing, blade pitch bearing and yaw system each face different combinations of speed, load, temperature, vibration and operating motion. The correct lubricant for one point is not automatically correct for another — even on the same turbine.

Project Sales Corp brings LUBCHEM Korea specialty lubricants for wind power applications to India. Send PSC the existing lubricant manufacturer and grade, the component or lubrication point, and preferably the current TDS. We can review the available information against documented LUBCHEM chemistry and applications and identify a potential LUBCHEM candidate for technical review.

HOW TO USE THIS GUIDE

- 1 **Start with the existing lubricant**
Manufacturer · Product / grade · Current TDS, if available
- 2 **Identify the component / lubrication point**
Main gearbox · Main bearing · Generator bearing · Pitch bearing · Yaw bearing · Slew ring drive
- 3 **Add turbine details where available**
OEM · Model · MW · Quantity · Chemistry · Temperature · Speed · Lubrication method
- 4 **Review documented LUBCHEM application**
Each section maps operating conditions to verified grades from Lubchem's wind-power literature.
- 5 **Ask PSC to verify before changing lubricant**
Send the existing product and lubrication point. Turbine and operating details can follow where needed.

Product recommendations are based on documented LUBCHEM wind-power application information and should be reviewed against actual turbine OEM requirements, existing lubricant chemistry, oil analysis and operating conditions before any lubricant change.



**Show us
the turbine.
Not just
the lubricant.**

You do not need the product code.
Send PSC the turbine OEM,
lubrication point and current
product. We start there.

PSC WIND APPLICATION CHECK

Turbine OEM / Model / MW
Lubrication Point
Current Lubricant
Quantity · Temperature
Load / Speed · Site Exposure
Lubrication Method
Current Interval

WIND TURBINE · SYSTEM OVERVIEW

One Turbine. Several Lubrication Problems.



LUBRICATION POINTS AND THEIR CHALLENGES

MAIN BEARING

Low speed · Oscillation
High load · Vibration

SB 6041 S

MAIN GEARBOX

Scuffing/micropitting
Seal compatibility ·
Bearings

GM 320 S / GH 320

GENERATOR BEARING

Low/high speed · Heat
Load · Vibration

SB 6041 S

PITCH BEARING

Oscillation · High load
Vibration · Low temp.

SB 6041 S

YAW BEARING

Oscillation · High load
Vibration

SB 6041 S

SLEW RING DRIVES

Slow speed · High load
Vertical tooth face ·
Corrosion

BE 2101 / BE 2102



**One turbine.
Six different
lubrication points.
Never treat the
nacelle as one
application.**

WIND TURBINE · MAIN GEARBOX

The Gearbox Is a Lubrication System, Not Just a Gear Set.

LUBCHEM's wind-power literature documents two ISO VG 320 synthetic gearbox oil options. The selection between PAO and PAG chemistry depends on the specific gearbox OEM requirement, existing oil chemistry, seal materials, operating temperature, and required oil-change interval.



DOCUMENTED LUBCHEM WIND GEARBOX PRODUCTS

PRODUCT	CHEMISTRY	VISCOSITY
GM 320 S	PAO synthetic hydrocarbon	ISO VG 320
GH 320	PAG synthetic	ISO VG 320

DOCUMENTED REQUIREMENTS — FROM LUBCHEM WIND LITERATURE

- High resistance to scuffing and micropitting
- Compatibility with paints and elastomers
- Operating reliability in gears and bearings
- High FZG scuffing resistance (>12 stated in source for GH 320)
- NBR and FKM seal compatibility (GM 320 S)
- Low residue formation / clean gear operation (GM 320 S)

DO NOT INTERCHANGE PAO AND PAG BY VISCOSITY GRADE ALONE

GM 320 S (PAO) and GH 320 (PAG) are both ISO VG 320 but they are not interchangeable. Chemistry compatibility, seal materials, existing oil residue and required flush/changeover procedure must be established before any conversion.

GM 320 S

PAO SYNTHETIC GEAR OIL

Base	Synthetic hydrocarbon / PAO
Viscosity	ISO VG 320
Seal compat.	NBR, FKM
Oil change	Up to 3× mineral (source)

GH 320

PAG SYNTHETIC GEAR OIL

Base	PAG synthetic
Viscosity	ISO VG 320
FZG scuffing	>12 (stated in source)
Oil change	Up to 5× mineral (source)

GEARBOX REVIEW — SEND PSC

- Turbine OEM / Model
- Gearbox OEM / Stage
- Existing oil brand + grade
- Oil chemistry (PAO/PAG/mineral)
- Oil quantity · Seal materials
- Filter arrangement

WIND TURBINE · MAIN GEARBOX

GM 320 S

PAO Synthetic Gear Oil · ISO VG 320

Documented by LUBCHEM for wind-turbine main gearboxes and gear motors. GM 320 S is a fully synthetic gear oil based on synthetic hydrocarbon (PAO chemistry).



GM 320 S

PAO SYNTHETIC WIND GEARBOX OIL

Base oil	Synthetic hydrocarbon / PAO
Viscosity grade	ISO VG 320
Application	Main gearbox · Gear motors
Seal compat.	NBR, FKM
Stated interval	Up to 3× mineral

PERFORMANCE PROPERTIES — SOURCE: LUBCHEM WIND LITERATURE

- Synthetic high-performance oil, suitable for low speed and high load at elevated temperature
- 3× longer oil change interval compared to mineral oil (stated in LUBCHEM source)
- Fully synthetic gear oil based on synthetic hydrocarbon
- NBR and FKM seal material compatibility stated in source
- Low residue formation — clean gear operation
- Good anti-wear properties
- No blocking of oil filters

OIL-CHANGE INTERVAL CLAIM

LUBCHEM literature states an oil-change interval up to 3× mineral oil. The actual oil-change interval must be established from OEM requirements and used oil analysis — not from a brochure claim alone.

**PAO.
ISO VG 320.**
**Before selecting:
confirm OEM spec,
seal materials,
existing oil chemistry.**

WIND GEARBOX ENQUIRY
**Send PSC the turbine +
gearbox OEM + existing oil**

See also: GH 320 (PAG) → [Page 6](#)

WIND TURBINE · MAIN GEARBOX

GH 320

PAG Synthetic Gear Oil · ISO VG 320

A second documented LUBCHEM wind-turbine gearbox option. GH 320 is a fully synthetic PAG gear oil. LUBCHEM's wind literature documents it for main gearbox and gear motor applications at low speed, high load and elevated temperature.



PERFORMANCE PROPERTIES — SOURCE: LUBCHEM WIND LITERATURE

- Fully synthetic PAG gear oil, ISO VG 320
- Synthetic high-performance oil for low speed, high load, elevated temperature
- 5× longer oil change interval compared to mineral oil (stated in LUBCHEM source)
- High FZG scuffing resistance (>12 stated in source)
- Good anti-wear property
- Prevention of premature bearing failure due to high stability at elevated temperature

PAO AND PAG ARE NOT INTERCHANGEABLE

GH 320 (PAG) and GM 320 S (PAO) share the same viscosity grade but are different lubricant chemistries with different compatibility profiles. Confirm existing oil chemistry, compatibility with seals and a changeover or flush procedure before converting from one chemistry to the other.

GH 320

PAG SYNTHETIC WIND GEARBOX OIL

Base oil	PAG synthetic
Viscosity grade	ISO VG 320
Application	Main gearbox · Gear motors
FZG scuffing	>12 (stated in source)
Stated interval	Up to 5× mineral

PAG.
ISO VG 320.
5× stated interval
does not remove the
need for oil analysis.

Actual drain intervals must be established from OEM requirements and oil analysis results — not from literature claims alone.

GEARBOX CHEMISTRY REVIEW

- Existing oil brand + grade
- PAO / PAG / mineral?
- Seal materials
- Changeover history

See also: GM 320 S (PAO) → [Page 5](#)

WIND TURBINE · BEARINGS

One Grease Family Across Four Documented Bearing Points

LUBCHEM's wind-power manual lists SB 6041 S for the main bearing, generator bearing, blade-pitch bearing and yaw bearing. The same product family covers all four points — but each application has different operating conditions that must still be reviewed individually before changeover.



SB 6041 S — DOCUMENTED PROPERTIES

- Wide service temperature range
- Good pumpability and metering in centralised lubrication systems
- Good grease distribution and oil release for trouble-free operation
- Good wear protection properties even under vibration conditions
- Designed around centralised system delivery and metering — per LUBCHEM source
- Extended bearing life under vibration conditions (stated in LUBCHEM wind manual)

SB 6041 S

WIND TURBINE BEARING GREASE

Base oil	Mineral
Thickener	Lithium soap
NLGI grade	1
Documented for	Main, Generator, Pitch, Yaw bearings

ALL FOUR BEARING POINTS

Main Bearing · Generator Bearing
Blade Pitch Bearing · Yaw Bearing

SB 6041 S — documented in LUBCHEM wind manual

Same product.
Four different
operating conditions.
Review each bearing
separately before
changeover.

Application verification remains necessary for each turbine and bearing arrangement individually.

BEARING REVIEW — SEND PSC

- Turbine OEM / Model
- Bearing point
- Centralised or manual?
- Current grease brand + grade
- Consumption · Temperature

WIND TURBINE · MAIN BEARING

Main Bearing

Slow Speed Does Not Mean Easy Lubrication.

The main bearing operates at low speed and under substantial load with oscillating movement and vibration. These conditions create specific demands on lubricant film formation, grease pumpability and centralised lubrication system performance.

OPERATING CONDITIONS — DOCUMENTED IN LUBCHEM WIND MANUAL

- Low speed
- Oscillating operation
- High load
- Vibration

SB 6041 S

MAIN BEARING GREASE

Base oil	Mineral
Thickener	Lithium soap
NLGI	1
Source	LUBCHEM wind-power manual



**Low speed.
High load.
Oscillation.**
**Three conditions
that demand specific
grease behaviour.**

Pumpability through the centralised lubrication system is as important as bearing-level performance.

WHAT PSC NEEDS TO VERIFY THE APPLICATION

- Turbine OEM / Model / MW
- Bearing type and arrangement
- Centralised lubrication system — pump, metering units
- Grease purge path and condition
- Current grease brand and consumption
- Bearing temperature (measured)

MAIN BEARING ENQUIRY

Turbine OEM · Model

Bearing arrangement

Lube system type

Current grease · Consumption

WIND TURBINE · GENERATOR BEARING

Generator Bearing

Speed Changes the Problem.

The generator bearing and the main bearing share the same LUBCHEM grade — SB 6041 S — but they do not share the same operating conditions. Generator bearings operate at both low and high speed, face higher temperatures and still operate under oscillation, load and vibration.

OPERATING CONDITIONS — DOCUMENTED IN LUBCHEM WIND MANUAL

- Low and high speed (wider speed range than main bearing)
- Oscillating operation
- Higher temperature
- High load
- Vibration

SB 6041 S	
GENERATOR BEARING GREASE	
Base oil	Mineral
Thickener	Lithium soap
NLGI	1

VERIFY BEFORE CHANGEOVER

Before changing the generator bearing grease, verify the bearing type, measured bearing temperature, grease quantity and relubrication method. Generator bearing running conditions differ from main bearing conditions even on the same turbine.



Same grade
as the main
bearing.
Different speed.
Different temperature.
Different review.

GENERATOR BEARING REVIEW

- Generator OEM / Model
- Bearing type · Speed
- Measured temperature
- Grease quantity · Lube method
- Current grease

The blade pitch bearing moves under oscillating motion – it does not rotate continuously like a conventional bearing. This changes the lubrication demands substantially. Film formation, grease retention on the raceway and the ability to deliver lubricant reliably through a centralised system under oscillating motion are all important.

OPERATING CONDITIONS — DOCUMENTED IN LUBCHEM WIND MANUAL

- # SB 6041 S

Base oil	Mineral
Thickener	Lithium soap
NLGI	1

A close-up, high-angle photograph of a large, circular, metallic component, possibly a flywheel or a large gear. The component is made of a polished, reflective metal, likely aluminum or steel. It features a series of small, evenly spaced holes along its outer circumference. The inner part of the component is a solid, circular disc. The outer edge of the component is serrated or fluted, suggesting it might be designed for a specific type of mounting or connection. The lighting is bright, creating strong highlights and shadows that emphasize the metallic texture and the circular geometry.

**Oscillation.
Not rotation.
Lubrication
behaviour changes
under oscillating
motion.**

Confirm pitch-bearing design, centralised lubrication arrangement and low-temperature pumpability before changeover.

See also: Slew-ring drive (gear teeth) → **BE**
2101/2102 · Page 12

WIND TURBINE · YAW SYSTEM

Yaw System

Bearing and Gear Teeth Are Two Different Lubrication Points.

The yaw system must be considered as two separate lubrication requirements: the yaw bearing and the yaw drive gear teeth. LUBCHEM's wind manual documents SB 6041 S for the yaw bearing raceway, and the BE 2101 / 2102 family for the yaw slew-ring drive gear teeth.

YAW BEARING — SOURCE: LUBCHEM WIND MANUAL

APPLICATION	LUBCHEM
Yaw bearing raceway	SB 6041 S

- Oscillating movement
- High load
- Vibration

DO NOT APPLY BEARING GREASE TO THE YAW GEAR TEETH

The yaw bearing raceway and yaw slew-ring gear teeth have different lubrication requirements. SB 6041 S is documented for the bearing. The gear teeth require the BE 2101 / 2102 open-gear family. Record the yaw-drive arrangement, bearing grease and tooth lubricant separately. Inspect distribution, purging, corrosion and contamination individually.

YAW GEAR TEETH

APPLICATION	LUBCHEM
Yaw slew-ring drive gear teeth	BE 2101 / BE 2102

Slew-ring drives in detail → [Page 12](#)



Yaw bearing:
SB 6041 S

Yaw gear teeth:
BE 2101 / 2102
Two points.
Two products.
Same machine.

YAW SYSTEM REVIEW

- Yaw drive arrangement
- Bearing grease (current)
- Tooth lubricant (current)
- Corrosion / contamination
- Distribution & purge condition

WIND TURBINE · SLEW RING DRIVES

Pitch & Yaw Slew Ring Drives

Lubricating Vertical Tooth Faces Under Load, Vibration and Corrosion

Yaw and pitch slew-ring drive gear teeth face a combination of slow speed, high load, vertical tooth-face orientation and exposure to corrosion. LUBCHEM documents the BE 2101 / BE 2102 aluminium-complex grease family for these applications.

DOCUMENTED APPLICATION — SOURCE: LUBCHEM WIND MANUAL

APPLICATION	LUBCHEM
Yaw and pitch slew-ring drives (gear teeth)	BE 2101 / BE 2102

KEY PROPERTIES — SOURCE: LUBCHEM WIND MANUAL

- No grease dropping from vertical tooth flank — good adhesiveness
- Prevention of lubricant contamination due to bright grease colour (nacelle / tower visibility)
- Saving cleaning costs
- Useful in central lubricating systems — good pumpability
- High resistance to salty water and humid air — anti-corrosion in offshore application even during non-operation
- Suitable for large and small open gears (stated in LUBCHEM wind manual)

BE 2101 / BE 2102

YAW & PITCH SLEW RING DRIVE GREASE

Base oil	Mineral
Thickener	Aluminium complex soap
NLGI	1 / 2
Application	Yaw and pitch slew-ring drives



**Vertical teeth.
High load.
Corrosion.**

The grease must stay on the tooth under vibration.

The BE 2101/2102 family is documented in the LUBCHEM wind manual with explicit salty-water / humid-air language for coastal and offshore applications.

SLEW RING DRIVE REVIEW

Turbine OEM · Drive type

Tooth size · Drive power

Manual or centralised

Current product · Consumption

Corrosion history

WIND TURBINE · SITE CONDITIONS

Environment Changes the Lubrication Requirement.

Indian wind installations range from arid inland sites to humid coastal locations. The same turbine component faces very different exposure depending on site. Do not assume the same lubricant selection is appropriate for every geography without reviewing site conditions.

ONSHORE / INLAND

- Dust · Temperature cycling
- Monsoon season moisture
- Long-service interval requirements
- Contamination control

COASTAL / OFFSHORE EXPOSURE

- Humid air
- Salt-laden atmosphere
- Corrosion becomes a dominant challenge
- Lubricant must protect during non-operation as well as operation



Same turbine. Different site. Different lubrication challenge.

A turbine in Rajasthan and a turbine in coastal Tamil Nadu may use the same OEM-specified grade — but the application review criteria are different.

BE 2101 / 2102 HAS DOCUMENTED OFFSHORE LANGUAGE

Of the products documented in this guide, the BE 2101 / 2102 slew-ring-drive family is the one with explicit "salty water / humid air" and offshore anti-corrosion language in the LUBCHEM wind manual. Do not infer offshore suitability for every product family. For gearbox and bearing products, confirm the actual turbine OEM requirement and site condition.

INDIA WIND APPLICATION

Tell PSC the site location alongside the turbine details

SITE CONDITION REVIEW

- Wind farm location
- Onshore / coastal / offshore
- Distance from sea
- Humidity / monsoon exposure
- Current lubrication intervals
- Any corrosion history

WIND TURBINE · LUBRICANT CHANGEOVER

A Product Name Can Start the Cross-Reference Review.

A competitor product name is enough to start the review - but not enough to complete it. PSC can use the existing manufacturer and grade to identify a potential LUBCHEM candidate, then verify the TDS, component, chemistry, OEM requirements and compatibility before any lubricant change.

BEFORE ANY LUBRICANT CHANGE — ESTABLISH ALL OF THESE

- 1 **Turbine OEM / Model / MW rating**
Identify the exact turbine platform and year
- 2 **Component and lubrication point**
Gearbox, main bearing, generator, pitch, yaw — not just "turbine grease"
- 3 **Existing lubricant brand, grade and chemistry**
PAO, PAG, mineral or ester base? NLGI grade? Oil or grease?
- 4 **Oil or grease condition and analysis**
For gearbox oil: viscosity trend, wear debris, contamination, acid number. For grease: condition, contamination, bearing temperature.
- 5 **Seal and elastomer materials**
Especially for gearbox oil conversion between PAO and PAG chemistry
- 6 **Required flush or compatibility procedure**
PAO→PAG or PAG→PAO conversion is not a simple oil change

A name match is not a product match.
Chemistry, OEM and compatibility come first.

Send the competitor manufacturer and product grade to start. PSC can identify a potential LUBCHEM alternative for technical review; final selection remains subject to TDS, application, chemistry, OEM and compatibility review.

CHANGEOVER REVIEW — SEND PSC

Turbine / component / point
Current product + chemistry
OEM specification
Seal materials
Oil analysis / grease condition
Number of turbines

PSC COMMITMENT

Existing product → potential LUBCHEM candidate → technical review

WIND TURBINE · OIL ANALYSIS / CONDITION

The Lubricant Can Tell You What Is Happening Inside.

LUBCHEM's wind-power literature explicitly discusses used-oil analysis and lubricant engineering support. Oil analysis should be part of a wind turbine's planned maintenance programme — not only a response to failure or an excuse to extend drain intervals beyond OEM requirements.

FOR GEARBOX OIL — WHAT TO TREND

- Viscosity (change from new oil value)
- Contamination (water, particles, dust)
- Wear debris (iron, copper, aluminium, tin)
- Acid number / oxidation indicators
- Filter blockage frequency
- Top-up quantity between samples

USE TRENDS, NOT SINGLE RESULTS

One oil sample in isolation is rarely sufficient for a maintenance decision. Track parameters over multiple sample intervals. Tie oil analysis results to vibration monitoring and temperature data from the turbine SCADA system.

SAMPLING DISCIPLINE

- Sample consistently from the same representative point
- Record oil hours since last change
- Record top-up quantity between samples
- Record filter changes
- Take samples under comparable operating conditions



Oil analysis supports the interval decision.
It does not replace the OEM's requirement.

Do not extend drain intervals solely on a brochure claim or a single analysis result. OEM requirements and oil analysis together determine the interval.

EXISTING OIL-ANALYSIS REPORT?

Where available, send it with your cross-reference enquiry. It can provide useful supporting information when reviewing lubricant condition and a proposed change.

WIND POWER · QUICK REFERENCE

LUBCHEM Wind Power Application Selector

Find the documented LUBCHEM family, then verify against the actual turbine OEM, lubrication point and operating conditions before use. Source: LUBCHEM wind-power application manual.

TURBINE COMPONENT / APPLICATION	LUBCHEM PRODUCT	CHEMISTRY	GRADE
Main gearbox	GM 320 S	PAO synthetic hydrocarbon	ISO VG 320
Main gearbox (alt. option)	GH 320	PAG synthetic	ISO VG 320
Gear motors	GM 320 S / GH 320	PAO or PAG — confirm OEM	ISO VG 320
Main bearing	SB 6041 S	Mineral + Li-soap	NLGI 1
Generator bearing	SB 6041 S	Mineral + Li-soap	NLGI 1
Blade pitch bearing	SB 6041 S	Mineral + Li-soap	NLGI 1
Yaw bearing	SB 6041 S	Mineral + Li-soap	NLGI 1
Yaw & pitch slew-ring drives (gear teeth)	BE 2101 / BE 2102	Mineral + Al-complex soap	NLGI 1 / 2

This table identifies the documented LUBCHEM product family for each application. It does not substitute for: OEM approval verification · compatibility review · used oil analysis · changeover procedure · turbine-specific application review.

DON'T SEE YOUR TURBINE?

- Send PSC:
- Turbine OEM / Model / MW
- Component / Lubrication Point
- Current Lubricant
- Quantity per turbine
- Number of turbines

ALREADY KNOW THE PRODUCT CODE?

- Product code → Pack size
- Quantity → Delivery location

PROJECT SALES CORP

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Using an Existing Wind Turbine Lubricant?

Send PSC the existing lubricant manufacturer and grade, the component or lubrication point, and preferably the current TDS. We will check whether LUBCHEM Korea has a potential candidate for technical review.

Existing Lubricant Manufacturer	Existing Product / Grade
Component / Lubrication Point	Current Product TDS, if Available
Approx. Quantity / Turbine	Number of Turbines

ADDITIONAL DETAILS - WHERE REQUIRED

Turbine OEM / model, operating temperature, speed, lubricant chemistry, lubrication system, seal materials and site conditions may be requested where necessary to complete the technical review.

- GM 320 S
- GH 320
- SB 6041 S
- BE 2101
- BE 2102

What Lubricant Are You Using Today?

START WITH THE CURRENT PRODUCT

Manufacturer · Product / Grade ·
TDS if available

TELL US THE APPLICATION

Component / Lubrication Point ·
Quantity · Number of Turbines

PSC DESK-BASED REVIEW

Potential LUBCHEM candidate ·
Technical / compatibility review ·
Quote / Trial

SEND PSC THE EXISTING LUBRICANT.

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Product recommendations are subject to application review. Equipment and manufacturer names, where referenced, identify applications only and do not imply OEM approval unless expressly documented. Source: LUBCHEM Korea wind-power application literature and PSC technical documentation.