ANSWRS®
for Wind Energy

Answers that Outperform® your Windmill Performance

CENLUB SYSTEMS

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Poor lubrication is responsible for more than 50% of bearing failures

Prevent Bearing Damage

Research shows that more than 50% of premature bearing failures are caused by inadequate lubrication. When factoring in the damage from contaminated lubricants, this figure increases to 65%. A well researched selection of lubricant along with the right lubrication system can significantly reduce lubrication-related issues, ensuring maximum bearing efficiency and longevity.

Leverage ANSWRS expertise in Lubrication

ANSWRS delivers more than 1500 lubrication systems each month for all kinds of applications and conditions. We are happy to share our knowledge and experience with you to detail out a lubrication package best suited to your application.

The perfect lubrication solution for you

ANSWRS automatic lubrication system, unlike manual lubrication, delivers lubricant consistently and accurately to the moving parts within the nacelle. By providing the optimal amount of lubricant to all friction points while the machine operates, these systems minimize friction in bearings and help prevent contamination. This leads to extended bearing life, increased turbine uptime, and reduced labor costs—all contributing to enhanced profitability for wind farms.

Regular lubrication is essential for the longevity of bearings

Consequences of inadequate lubrication

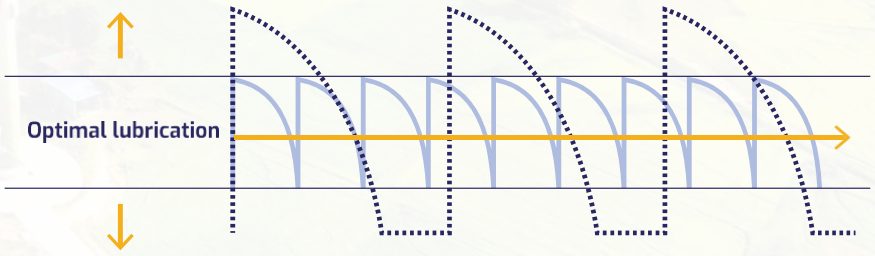
An efficient wind energy system requires appropriate lubrication for optimal performance. Factors such as vibrations, high mechanical loads, contamination, and moisture pose significant risks to the lifespan of bearings and gears. Additionally, servicing wind turbines can be both challenging and costly. With heights exceeding 120 meters and often situated in remote, hard-to-reach areas, maintenance can be particularly demanding.

ANSWRS Automatic lubrication systems ensure swift ROI

Automatic lubrication systems can quickly repay your investment by enhancing turbine availability, prolonging maintenance intervals, and preventing major component failures. Additional savings come from efficient lubricant management and usage. ANSWRS automatic lubrication systems are unparalleled in providing these advantages and more.

Why Automatic Lubrication?

Overgreasing = overheating, wastage and pollution



Undergreasing = wear, premature repairs, high repair costs

Manual lubrication — Automatic lubrication

- Increased Uptime and profitability
- Less wear
- 100% Greasing
- Lowering Maintenance Cost
- More Environment Friendly

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Reduce 54% in lubrication man-hours

Boost productivity & profitability by:

- Enhancing turbine reliability
- Minimizing unplanned downtime
- Lengthening repair intervals
- Lowering labor costs
- Increasing wind farm profitability

Reduce environmental impact by:

- Preventing over-lubrication
- Decreasing energy usage
- Lowering lubricant consumption
- Minimizing waste

Enhance worker health & safety by:

- Eliminating manual lubrication in hard-to-reach areas
- Reducing the risk of slips and falls with accurate lubrication

Maximize availability

Accurate automatic lubrication offers substantial advantages for operators facing growing demands to enhance energy output and control operating costs. By consistently supplying lubricant from a central source to all connected friction points in the power generation system, ANSWRS automatic lubrication systems effectively prevent bearing damage and unplanned turbine downtime while optimizing workforce resources

Optimize turbine availability while reducing maintenance tasks and expenses

Reduce operating costs

The superior quality of ANSWRS automatic lubrication systems offers numerous benefits. For instance, you can decrease lubricant consumption by up to 50%, which is especially crucial when utilizing pricier lubricants. Additionally, these systems operate nearly maintenance-free, with operators having the option to receive automatic alerts when lubrication reservoirs need refilling. This translates to lower operating costs and, ultimately, enhanced profitability for wind farms.

Extend service life

ANSWRS automatic lubrication systems provide the precise amount of the right lubricant to the appropriate locations at the optimal times. Alongside enhancing reliability and availability, these systems contribute to extending service life, lowering operational and lubricant costs, and minimizing environmental impact by preventing over-greasing. Additionally, ANSWRS can help you optimize lubrication settings and intervals, as well as develop a tailored lubrication program. A worldwide network of service partners is available to support you in maximizing your farm's performance.

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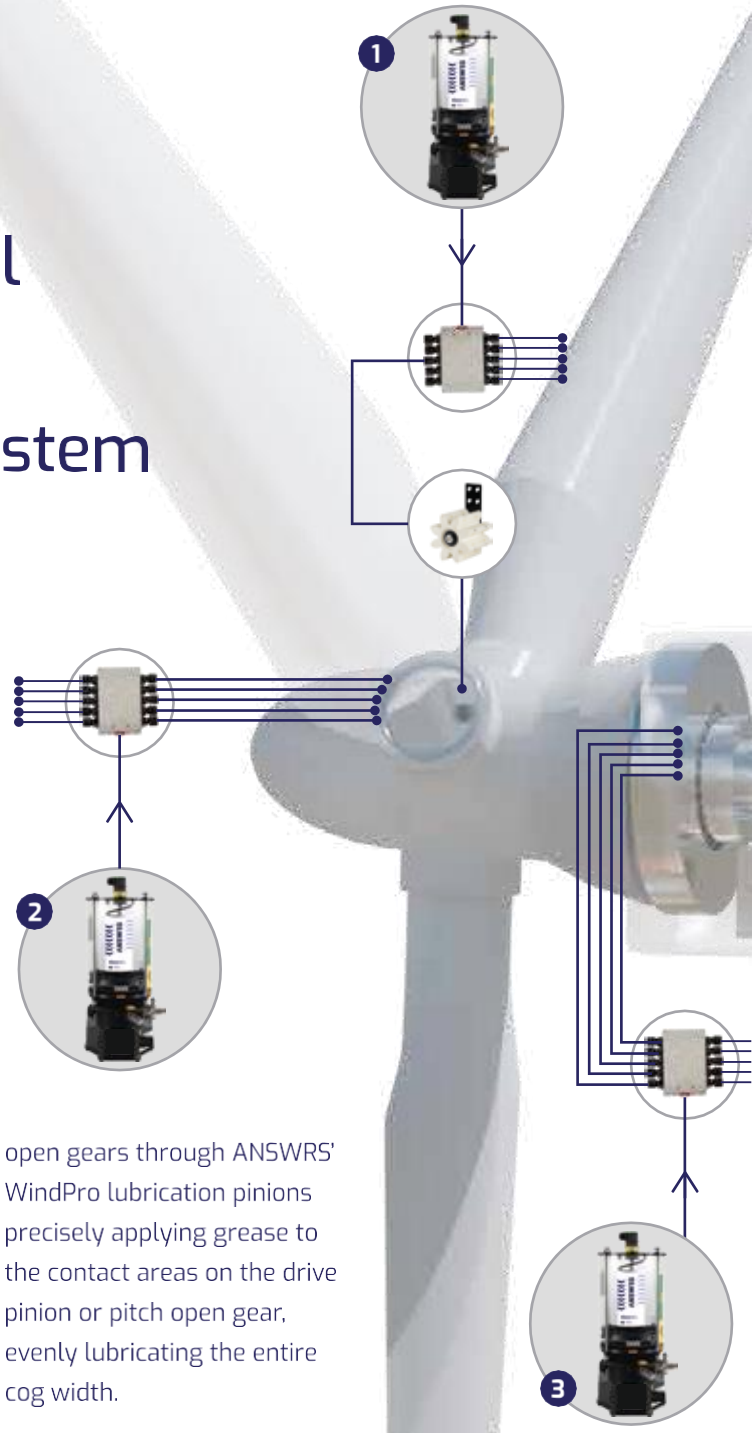
Unlock the full potential of your windmill with WindPro Lubrication System



Pitch Bearings 1

The Pitch System of a wind turbine adjusts the angle of the rotor blades in relation to the wind to control the rotor's speed and the turbine's power output. The pitch system is a critical component of a wind turbine's design and is essential for its efficiency and safety. The pitch bearings are subjected to heavy loads due to continuous load changes and hence need a regular supply of lubricant. The ANSWRS' WindPro Grease Pump, mounted within the rotor, rotates along with it, adjusting to the constant vibration and centrifugal force delivers the desired quantity of lubricant. It is equipped with a spring loaded follower plate, ensuring grease is always available to the pumping elements, allowing effective suction even during rotation and upside down orientation. The grease is then delivered to the lube points via progressive blocks which ensure a positive metering and predefined dosages being delivered.

Pitch Open Gears 2

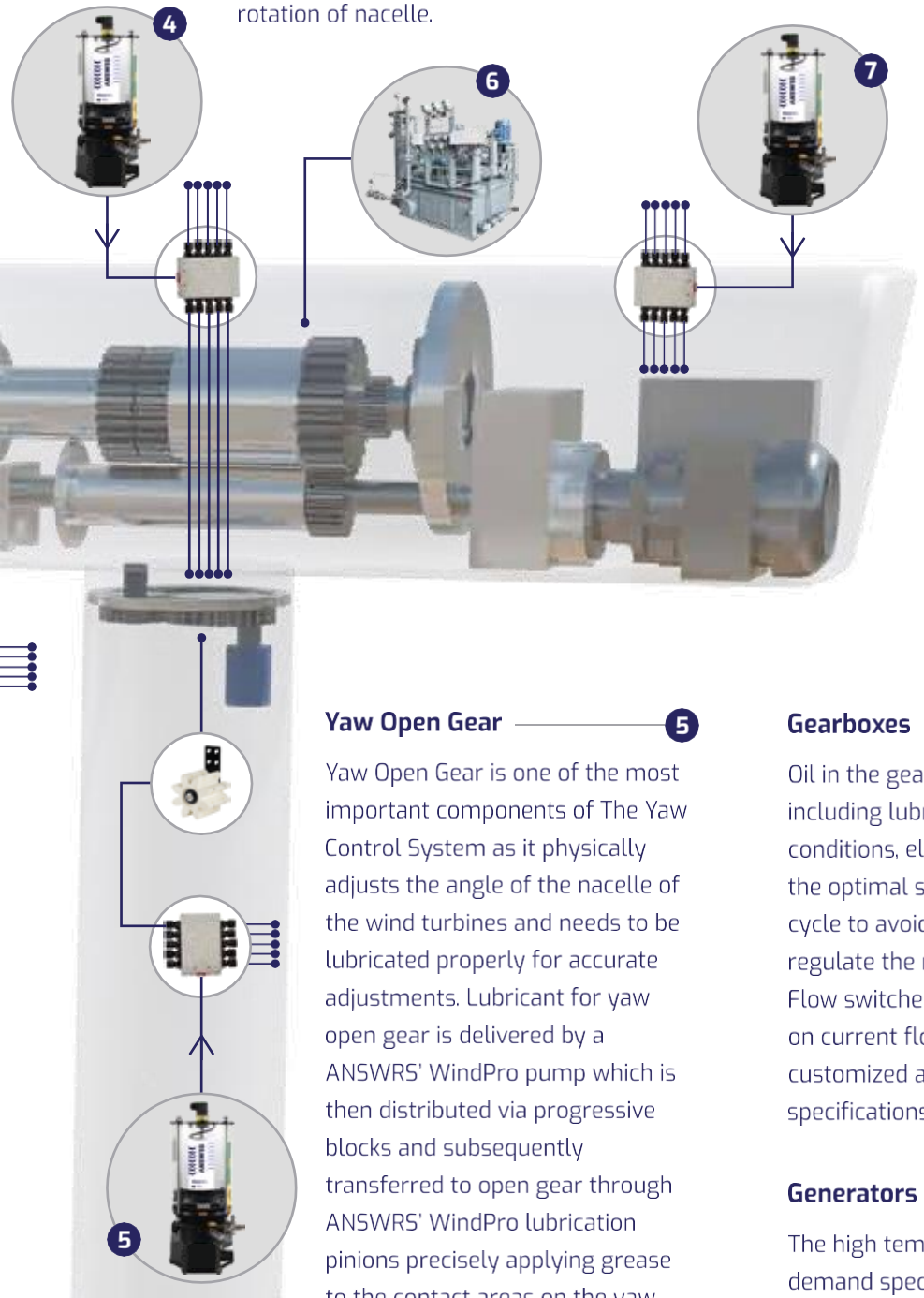
Pitch Open Gears are one of the most important components of The Pitch System as they physically adjust the angle of the rotor blades in wind turbines and need to be lubricated properly for accurate adjustments. Lubricant for pitch open gears is delivered by a ANSWRS' WindPro pump designed for rotary applications. It is mounted within the rotor, rotates along with it, adjusting to the constant vibration and centrifugal force. It is equipped with a spring loaded follower plate, ensuring grease is always available to the pumping elements, allowing effective suction even during rotation and upside down orientation. The grease is then distributed via progressive blocks and subsequently transferred to open gears through ANSWRS' WindPro lubrication pinions precisely applying grease to the contact areas on the drive pinion or pitch open gear, evenly lubricating the entire cog width.

Main Bearings 3

Main bearings in wind turbines endure significant forces and typically require large volumes of lubricant. ANSWRS' WindPro range of grease pumps for wind turbine generators are designed to meet these demands. These pumps along with progressive blocks continuously supply grease to the main bearings, even while the turbine is in motion ensuring effective lubrication at all times.

Yaw Bearings 4

The purpose of a Yaw Bearing in a wind turbine is to realign the nacelle in the direction of the wind. This is done by the yaw system, which is located between the nacelle and tower. It enables the wind turbine to capture the maximum available wind. The Yaw Bearing needs to be regularly lubricated for a smooth rotation of nacelle.



ANSWRS' WindPro grease pump supplies lubricant to the yaw bearing through progressive blocks which ensure a positive metering and predefined dosages being delivered. The automatic lubrication system ensures a sufficiently thick lubricant film, preventing excessive wear and the "stick-slip" effect during turning. Used grease is efficiently removed by a lubricant collector, which deposits it into a collection bottle, preventing drips on the nacelle floor and enhancing worker safety within the nacelle.

Yaw Open Gear 5

Yaw Open Gear is one of the most important components of The Yaw Control System as it physically adjusts the angle of the nacelle of the wind turbines and needs to be lubricated properly for accurate adjustments. Lubricant for yaw open gear is delivered by a ANSWRS' WindPro pump which is then distributed via progressive blocks and subsequently transferred to open gear through ANSWRS' WindPro lubrication pinions precisely applying grease to the contact areas on the yaw pinion, evenly lubricating the entire cog width.

Gearboxes 6

Oil in the gearbox performs multiple functions, including lubrication, cooling and filtration. In cold conditions, electric heaters are employed to achieve the optimal start-up temperature for the lubrication cycle to avoid cold start issues. Flow control valves regulate the required oil flow, ensuring consistency. Flow switches and transmitters can provide feedback on current flow rates if needed. These systems are customized and are designed as per OEM specifications.

Generators 7

The high temperatures and speeds of generators demand speciality lubricants and a reliable automatic lubrication system. ANSWRS' range of Grease Pumps have undergone several years of iterations, improvements and field feedback and are highly reliable to deliver in the most extreme conditions.

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Comprehensive Product Range

The ANSWRS portfolio includes a full range of ANSWRS' WindPro Pumps, Lubrication Pinions, Metering Devices, Control and Monitoring units, Suction Elements and Lubricant Collectors. All components are compatible with standard greases up to NLGI Grade 2 and are designed for use in the demanding environment of Wind Turbines.

Heavy Duty Precision Pumps for Your Application

Selecting the right lubricant pump depends on various factors, such as environmental conditions, delivery rate, and maintenance intervals. ANSWRS provides a broad range of WindPro electrically driven pump units, available with or without integrated control units:

- **Reservoir capacity: 2–15 liters**
- **Pressure ranges: 200–300 bar**
- **Delivery volumes: 6 cm^3/min/pumping element**

Reliable Progressive Lubricant Metering Blocks

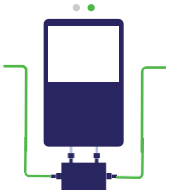
ANSWRS offer progressive type lubricant metering devices in both monoblock and modular construction and are known for their durability and ease of installation. These devices ensure accurate lubricant distribution, even under high back pressure at lubrication points, thanks to integrated pistons and check valves (optional) at the outlets. System operation can be easily verified through electronic or visual monitoring of individual pistons.

WindPro 5L 8L 15L

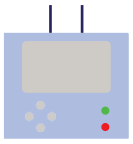
Continuous Lubrication with Customized Progressive Systems

In progressive automatic lubrication systems, a piston pump delivers a precise amount of lubricant through the main line to the metering device, which then distributes it to each outlet.

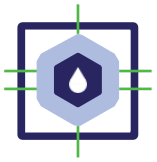
Advantages



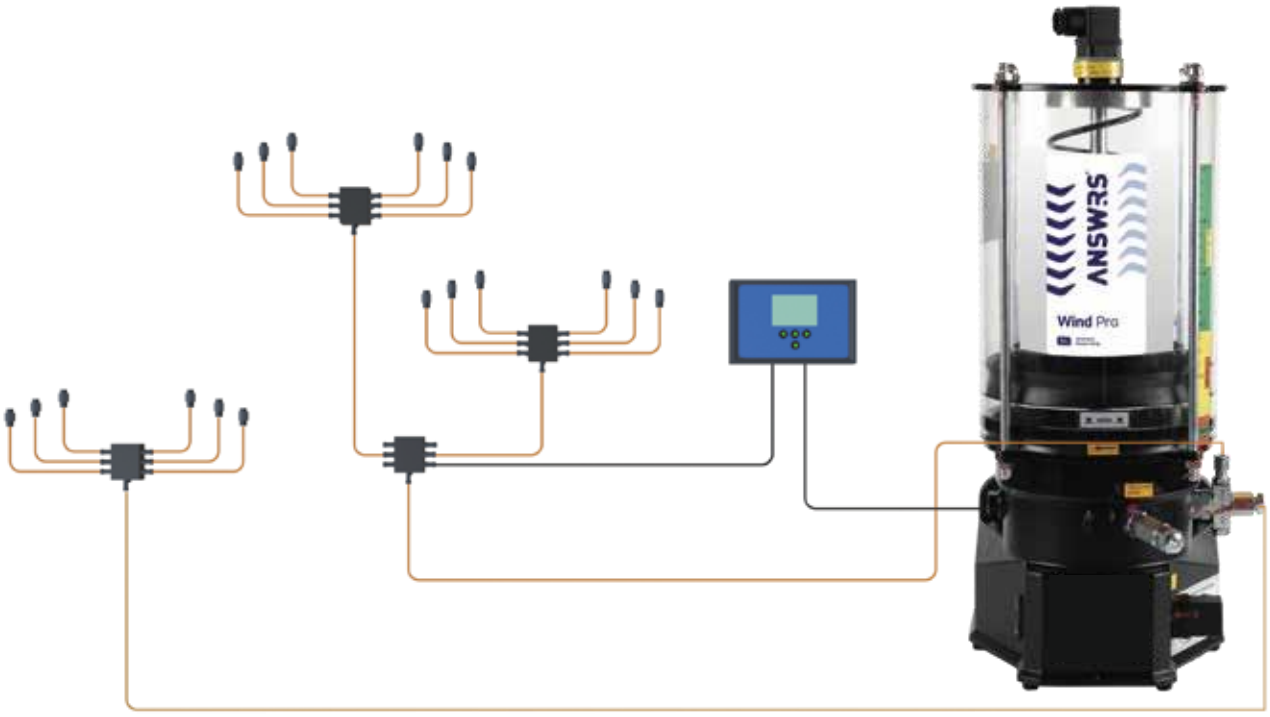
Continuous lubricant delivery during pump operation



Simplified system monitoring



Compatible with integrated control units



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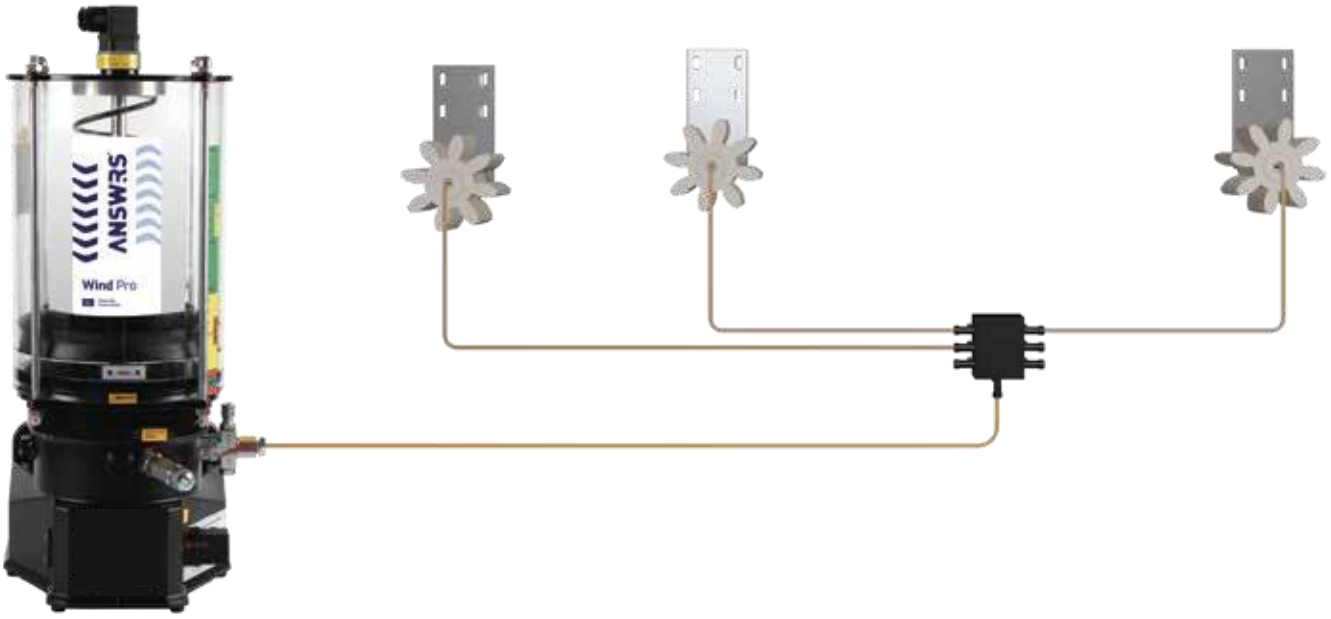
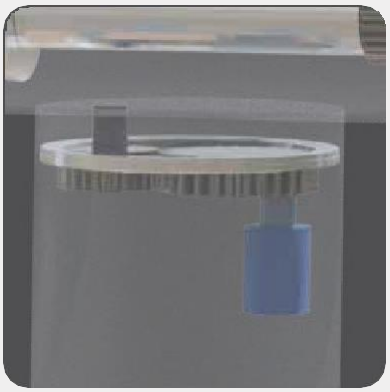
Lubrication Pinions and Lubricant Collection Systems

ANSWRS' WindPro lubrication pinions handle the automatic lubrication of open gear rims in wind turbines, ensuring optimal distribution of lubricant across the entire tooth flanks and cog width. Suction elements and lubricant collectors effectively capture excess grease directly from the system's lubricating gears. This prevents grease from escaping into the environment or contaminating the system during gear engagement.



Pinion Application for Windmills

Pitch Open Gear



Yaw Open Gear

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Lubrication Expertise to Monetise the Winds Better

Branch Offices

Bangalore
Baroda
Pune
Chennai
Kolkata
Coimbatore
Rajkot

Manufacturing Locations

4

ZED Gold
Ministry of MSME, India

2024

Top 10 Lubrication Systems manufacturer by Industry Outlook

2022 / 2024

INDIA 5000
Best MSME AWARDS

2023

STAI
Industry Excellence Award

2024

CERTIFIED

Best Places to Work

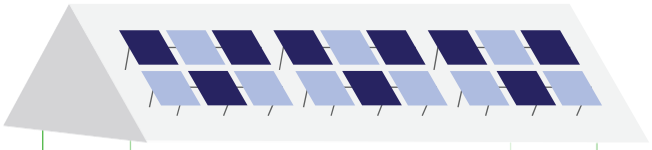
BEST PLACES TO WORK
2024

Innovating **ANSWRS** for Wind Energy

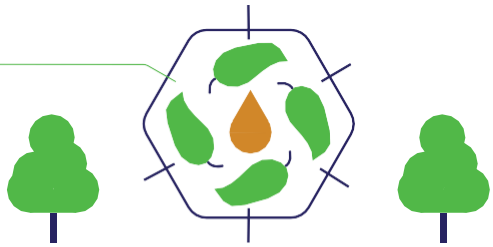
Answers for OEMs

Rapid industrial growth needs robust production capacities. India and other global leading manufacturing economies are growing rapidly, needing a robust industrial support system to keep up with growing demands. ANSWRS is gearing forward with its multiplied capacities to cater to original equipment manufacturers (OEMs).

Answers for Sustainability



ANSWRS has already moved towards adoption of renewal energy by investing in solar plants across its manufacturing facilities.



ANSWRS lubrication systems eliminate lubricant wastage compared to conventional lubrication setups. Spillage, leakage of lubricants harm the environment as it cannot be re-extracted, leading to environmental hazards and pollution.

Answers for Safety

Our products are engineered for safe use by direct users and our facilities are built with safe practices for the workforce.

We have the **ANSWRS** to all your lubrication needs

Our thoroughly designed service division actively works on eliminating stresses during plant and equipment downtimes, as well as addressing untimely issues faced by our clients in their lubrication processes, with an agile response team. Connect with and speak to our advisor to learn more about how we can help reduce lubrication-related maintenance loops that hamper your speed of production.

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