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Issue 04

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## Welcome to KEC Bearings

Dear Readers,

Welcome to the latest edition of the KEC Bearings newsletter! We're excited to share updates, innovations, and insights from the world of bearings and mechanical solutions. Thank you for being a part of our journey.

Best regards,

Mehul Viradia | Director - Operations | KEC Bearings Pvt Ltd

### • New Product Launch: Four Row Cylindrical Roller Bearings (313822)

We're thrilled to introduce our latest product, Four Row Cylindrical Roller Bearing - 313822, designed to give ultimate performance in Steel Rolling industry. This innovative solution aims to improve efficiency and gives better life expectancy for the users.



### • Upcoming Events

Join us at INDUSTRIAL ENGINEERING XPO on 27-30 DECEMBER 2024 at RAIPUR. We'll be showcasing our latest technologies and solutions. Don't miss the chance to connect with our team and explore new opportunities.

### • Team Spotlight

Highlights of our quarterly strategy meet with our Sales and technical team. During the meeting we have discussed various aspects regarding demand and supply of the industrial products, customers pain points, customer requirements, new innovation and delivering products timely with low cost and high accuracy.

We are also providing training sessions to our employees on various aspects of industrial products and latest trends as well as technology which will enrich their knowledge in the particular field and help them to solve complex problems of the industry ultimately increases efficiency of the industry.

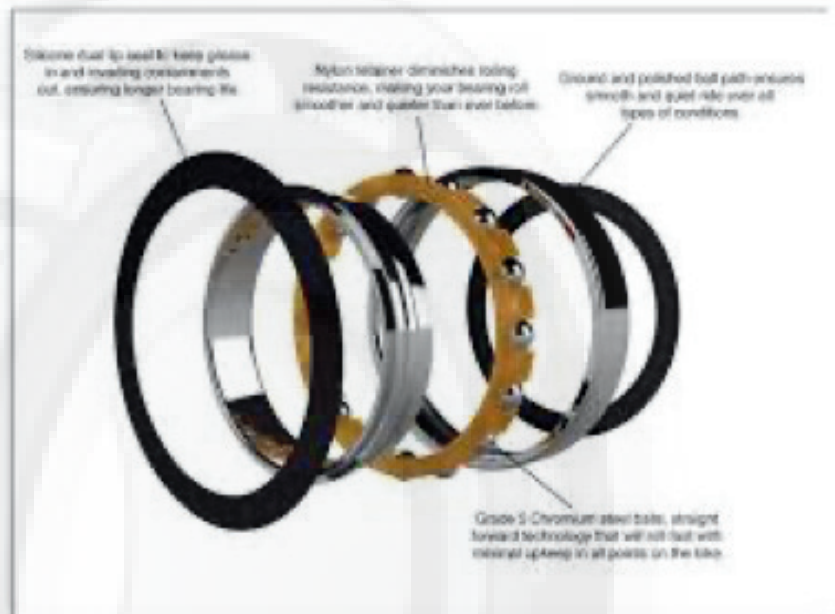


## • Industry Insights

### Latest Trends in Bearing Technology

Discover the latest trends and advancements in bearing technology. We are Currently working on LLB seals in Ball Bearing. LLB seals are a type of light contact seal used in bearings, particularly in bottom bracket and hub bearings. They are made of Nitrile rubber with a steel insert and are designed to,

- Keep Out Contamination
- Retain Grease
- Reduce Friction
- Increase bearing Life



## • Case Study: Gearbox in Wind Turbine Application

Read about our recent project with one of our gear box manufacturers, supplier of wind mill gear-boxes, where we Optimized gear box performance with our high-performance bearings. This case study highlights our commitment to delivering high-quality solutions tailored to our clients' needs.

Company: Spatial Gears Pvt Ltd

Industry: Gear Box Manufacturers

Location: Pune, India

Month: Sep, 2024

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## Background

Spatial Gears Pvt Ltd, a prominent Suppliers of gear boxes to wind mill manufacturers, manufactures different types of gear boxes used in wind mill assembly. Gear Boxes in wind mill are critical to the performance of the wind mill, and the performance of these mills directly impacts operational efficiency. However, one of the wind mills using spatial gear boxes faced challenges with frequent bearing failures in their gear boxes, leading to increased downtime and maintenance costs.

## Challenge

A wind turbine operator experienced consistent gearbox failures within their turbine system. The failures were primarily due to the premature wear of internal components such as gears and bearings. The company reported excessive vibration, overheating, and increased maintenance costs.

## Diagnosis

Upon investigation, it was identified that the bearings used in the gearboxes were not optimized for the high loads and stresses inherent in wind turbine applications. The bearings wore out quickly, leading to inefficient gear meshing, increased friction, and eventual failure of the gearbox.

## Solution

The manufacturer partnered with a bearing manufacturer to design and integrate specialized bearings with improved performance characteristics:

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- Bearing Type:** The selected bearings were tapered roller bearings designed to handle higher radial and axial loads more efficiently.
- Material Selection:** The bearings were made from high-quality, heat-treated steel to enhance wear resistance and durability.
- Lubrication System:** An optimized lubrication system was installed to ensure the bearings operated under proper lubrication conditions, reducing the risk of overheating and metal-to-metal contact.

## Results

After the new bearings were installed, the following performance enhancements were observed:

- Increased Load Capacity:** The tapered roller bearings handled both radial and axial loads more effectively, reducing stress on the gearbox's internal components.
- Reduced Friction and Energy Loss:** The enhanced material properties and optimized lubrication system lowered friction between rotating parts. This led to a 5% improvement in energy efficiency, as less power was lost to heat due to friction.
- Improved Durability and Lifespan:** The high-quality steel bearings showed 20% longer operational life compared to the previous bearings, reducing the need for frequent replacements and lowering the cost of maintenance.
- Vibration and Noise Reduction:** The new bearings reduced gearbox vibrations by 15%, which also decreased the overall noise levels of the system. This made the wind turbines more reliable and quieter during operation.
- Temperature Stability:** With the improved bearing design and lubrication, the gearbox experienced less overheating, ensuring more stable and longer operation under fluctuating environmental conditions.

- **Analysis of Bearing's Role in Gearbox Performance Enhancement**

## 1. Friction Reduction

Bearings minimise friction between moving parts, allowing for smooth operation of gears. In this case, the optimised lubrication and high-quality bearings ensured minimal frictional losses, directly improving energy efficiency.

## 2. Load Distribution

The bearings in gearboxes support both radial and axial loads. If the bearings are inadequate, the gears experience uneven load distribution, which can lead to wear and failure. By choosing bearings capable of handling the heavy loads in wind turbines, the gearbox was protected from stress-induced damage.

## 3. Heat Dissipation

Excessive heat generation can damage gearbox components. Proper bearings, combined with an efficient lubrication system, dissipate heat more effectively, keeping the gearbox within a stable temperature range during operation.

## 4. Vibration Damping

High-quality bearings reduce vibrations within the gearbox. This not only improves performance but also prevents excessive wear and tear on the gearbox, reducing noise and increasing overall system stability.

## 5. Extended Lifespan

The lifespan of the gearbox is closely linked to the quality and durability of its bearings. In this case, upgrading to better materials and improved design led to longer operational life, lowering long-term maintenance costs.

## Conclusion

Bearings play an integral role in the performance of gearboxes, especially in demanding applications like wind turbines. The right selection of bearings can lead to significant performance enhancements, including increased load-handling capacity, reduced friction, lower energy consumption, enhanced durability, and improved vibration control. This case study highlights how a simple upgrade in bearings can transform the efficiency and reliability of a gearbox system, reducing operational costs and increasing the overall lifespan of the machinery.

- **Technical Tips**

## How to reduce continuous bearing failures

Bearing failures are one of the leading causes of equipment downtime in mechanical systems, often leading to costly repairs and reduced efficiency. By taking a proactive approach and following key technical guidelines, you can significantly reduce the likelihood of bearing failures. Below are some tips to enhance bearing performance and extend their service life.

### 1. **Proper Lubrication**

Lubrication plays a critical role in preventing bearing failures by reducing friction and wear. Insufficient or improper lubrication is a major cause of premature bearing failure.

### 2. **Proper Installation**

Incorrect installation is a common reason for bearing failure. Bearings should be handled with care to avoid misalignment, contamination, or damage.

### 3. **Alignment**

Misalignment of the bearing relative to the shaft or housing can result in uneven load distribution, leading to early fatigue and wear.

### 4. **Contamination Control**

Contaminants such as dirt, dust, moisture, and debris can infiltrate the bearing and cause premature wear, corrosion, and failure.

### 5. **Load Management**

Bearings are designed to carry specific loads (both radial and axial). Overloading can cause rapid wear, fatigue, or even catastrophic failure.

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## • Community Engagement Sustainability Initiatives

At KEC Bearings we have initiated a campaign to plant more and more trees around the rural as well as urban areas. By this kind of initiative, we are connected to our core values and enable environment to retain its original properties and gives us below benefits.

Tree plantation initiatives are essential for combating environmental challenges like climate change, deforestation, and biodiversity loss. These initiatives involve planting trees in urban and rural areas to restore ecosystems, enhance air and water quality, and promote sustainable habitats for wildlife. By absorbing carbon dioxide, trees help mitigate greenhouse gas emissions while providing oxygen, reducing soil erosion, and improving local climates. Tree planting efforts also promote community engagement, raise environmental awareness, and contribute to the creation of green spaces, fostering healthier, more resilient environments for future generations.

## • Contact Us

We'd love to hear from you! If you have any questions, feedback, or would like to learn more about our products and services, please contact us at:

- **Email: [marketing@kecbearings.com](mailto:marketing@kecbearings.com)**
- **Phone: +91 9330 96 9330**

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