Maximizing Bearing Performance with the Right Lubrication

Lubrication is a critical factor in ensuring the longevity and reliability of bearings. Whether you're designing for high speeds, extreme temperatures, or precision applications, selecting the right lubricant can enhance performance and reduce maintenance requirements.

🔹 Why Lubrication Matters

Proper lubrication:

✅ Reduces friction and prevents metal-to-metal contact
✅ Minimizes wear on retainers and rolling elements
✅ Prevents oxidation and corrosion
✅ Acts as a barrier against contaminants
✅ Transfers heat away from the bearing

🔹 Oil vs. Grease – Which One is Right for Your Application?

🔧 **Oils:** The fundamental lubricant for ball and roller bearings, available in both petroleum-based and synthetic formulations (diesters, silicone polymers, and fluorinated compounds). These offer superior low-temperature properties, reduced volatility, and improved viscosity stability.

🪨 **Greases:** A pre-lubricated solution that simplifies maintenance by keeping the lubricant in place, requiring less frequent reapplication. Ideal for applications where an external lubrication system isn't feasible. However, grease can increase initial torque and is less effective at dissipating heat compared to oil.

🔹 Key Factors in Lubricant Selection

✅ **Viscosity** – Must match the bearing's operating temperature and speed requirements.
✅ **Temperature Range** – Standard greases perform up to **150°C**, while specialty greases can handle up to **260°C** for short periods.
✅ **Speed Limitations** – Grease has a lower maximum speed capacity than oil due to its thickening agents.
✅ **Consistency (NLGI Class*)** – Softer greases are ideal for low temperatures, while stiffer greases work best for high temperatures and outer ring rotation applications.

***NLGI Class** refers to the **National Lubricating Grease Institute (NLGI) consistency number**, which indicates the **thickness or stiffness** of grease. It's one of the most important properties to consider when selecting grease for bearing applications.

🔢 **NLGI Grades (from softest to hardest):**

NLGI Grade	Consistency	Typical Use
000	Fluid-like	Centralized systems, gearboxes
00	Semi-fluid	Enclosed gear drives
0	Very soft	Low-temp or high-speed bearings
1	Soft	Cold climates, automated systems
2	Normal (peanut butter)	Most common for ball and roller bearings
3	Firm	High-temp or vertical applications
4–6	Very stiff	Special applications only

🧠 **Why It Matters:**

- **Softer greases** (lower NLGI) flow better and are good for **low temps or high speeds**.
- **Stiffer greases** (higher NLGI) stay put and are better for **high loads or hot environments**.
- The wrong consistency can cause poor lubrication, overheating, or component failure.

For most standard bearing applications, **NLGI Grade 2** is the go-to choice.

Avoid Common Lubrication Mistakes!

❌ Over-greasing can cause ball skidding and overheating.

❌ Under-greasing can lead to premature wear and failure.

✅ **Best Practice:** Fill only **25-35%** of the bearing's free space (or **10-15%** for high-speed applications).

Choosing the right lubrication strategy is key to maximizing the efficiency, performance, and service life of your bearings.

Contact CW Bearing today to find the best lubrication solution for your application!

Your Requirements Are Our Standard CW Bearing collaborates with customers to deliver precision, reliability, and innovation. Whether standard or custom-engineered, we are your trusted partner.

Contact Us: CW Bearing USA, Inc. 15200 Technology Drive, Northville, MI 48168 USA
Phone: +1 734 781-4000 Email: sales@cwbearing.com Website: www.cwbearing.com

FOLLOW US on social media: