Lower bearing ownership costs in harsh environments

MAXAM® Bearings perform in heat, shock, moisture, load, and contamination problems that cause conventional bearings to fail

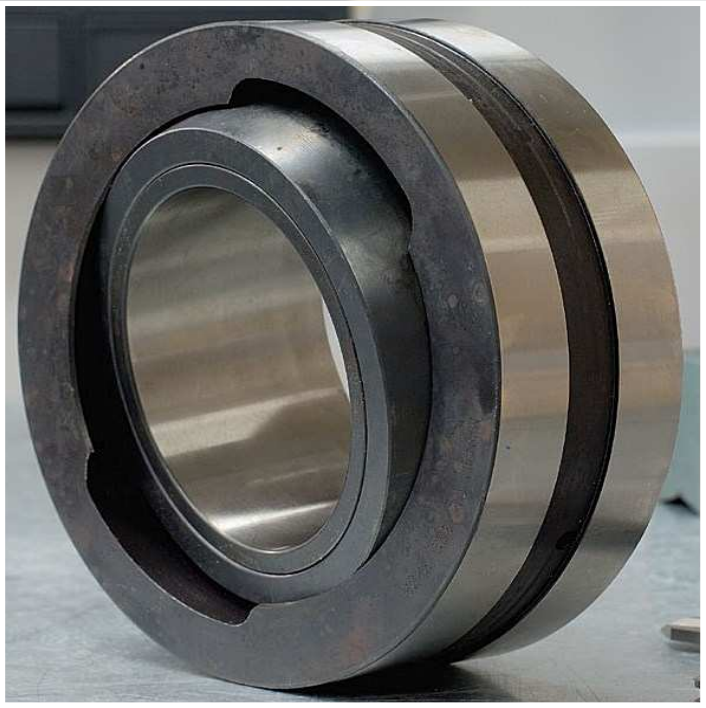
The MAXAM® Bearing from McNeil Industries solves application problems in harsh operating environments. It performs in conditions of heat, moisture, shock, contamination, and loading that can cause many ball- and roller-element bearings to fail.

The product was conceived by former steel-company maintenance supervisor with experience in rolling and finishing mills. As he worked to reduce downtime in the mill, he observed how harsh environmental conditions could lead to bearing failures:

- Extreme heat could cause internal expansion and bearing seizure.
- Shock loads caused brinelling.
- High loading contributed to cracking and spalling of bearing raceways.
- Contamination, seal failure, or "bake off" at high temperatures led to lubrication loss or failure.

Later, after joining a manufacturing company, the former supervisor joined a team investigating new bearings that could perform in harsh industrial environments. But instead of trying to improve the lubricant, cooling, or sealing mechanisms used to protect conventional ball- and roller-element bearing designs from damage, the team took a clean-sheet approach.

To cope with shock, the team envisioned a plain bearing, with heavy construction to absorb shock and carry high radial loads. A basic, two-piece plain style bearing was joined by a non-roller spherical replacement bearing, suited for misaligned loads. (Later, a full-complement cylindrical bearing was also added.) These designs would be "friction" rather than anti-friction style bearings, geared toward lower operating speeds (≤400 rpm).



The inner ring of two–piece and three-piece MAXAM Bearings provides a wide, continuous load zone to carry high radial loads without the risk of galling or spalling problems.

Through repeated trials, the team devised a special metallurgical treatment process. This patented process would give the specially chosen materials used in the MAXAM bearing a unique set of characteristics.

The result was a remarkably durable bearing product, produced with a standard material rated to 650° F, and a high-temperature material rated to 1000° F. Both materials could tolerate significant temperature spikes as well: up to 800° F for the standard and 1200° F for the high-temp grade.

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To minimize the risk of lube-, lube-seal, or contaminant-related failures, the material used in the product provided a hard, ceramic-like surface. The surface was highly resistant to corrosion, mild acids, moisture, and other common contaminants.

Early tests and applications showed that the material was highly wear-resistant, making it useful for applications where extreme loading was a factor. On opposed bearing surfaces, the material would slide easily under load. It also tolerated contaminants, a key contributor to premature wear for many roller-element bearings.

Experience proved that the bearing would operate with many lubricants, and in conditions of marginal lubrication. In addition to conventional oils and greases, the bearing could utilize "ambient" or contaminant fluids including mild acids, wastewater, industrial fluids or powders, even sewage.

This capability eliminated the need for lubricant seals—another potential failure point—and enables MAXAM bearings to replace sealed bearings in many applications where immersion is required.

MAXAM bearings perform under extreme temperatures in caster segments, hot mills, cooling beds, transfer tables, and other metals-related applications. The product's temperature ratings—650°F standard to 1000°F for high-temp material—far exceed the ratings of many conventional bearings.

The corrosion-resistant, ceramic-like surfaces of MAXAM bearings (black, at center) contrast with untreated steel wheel assemblies exposed to high-temperature steaming (left) and unused (right).