

SERVICE CALLS

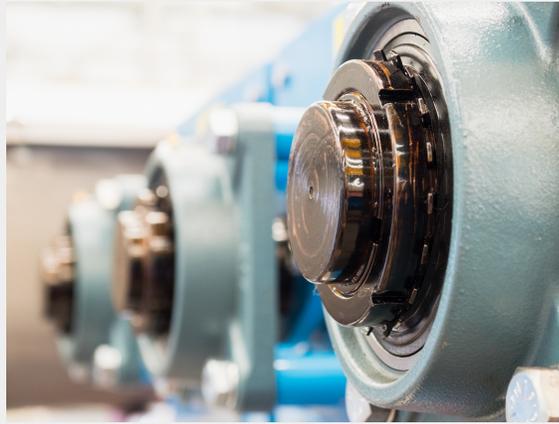
Grease Selection and Minimizing Bearing Failure



It was 17° outside when an overnight emergency call from a new customer came in with freezing temperatures in the facility. When our technician arrived before dawn, the building was extremely negative, with all rooftop MAUs tripped on freeze-stat and exhaust still running. We found that all rooftop piping was air-bound due to a small leak, which was quickly repaired. A second tech was called in to help refill the system over the next 6 hours to restore circulation and heat.



MSC was referred to a manufacturing facility having steam issues. A boiler was frequently shutting off due to low water, seriously disrupting their process. After reviewing the symptoms with the maintenance team, we walked down the piping with a thermal imaging camera. Two cool spots revealed two tucked-away strainers that were nearly plugged solid. Once cleaned and reinstalled, condensate flow was restored to the feed pumps and the problem was resolved.



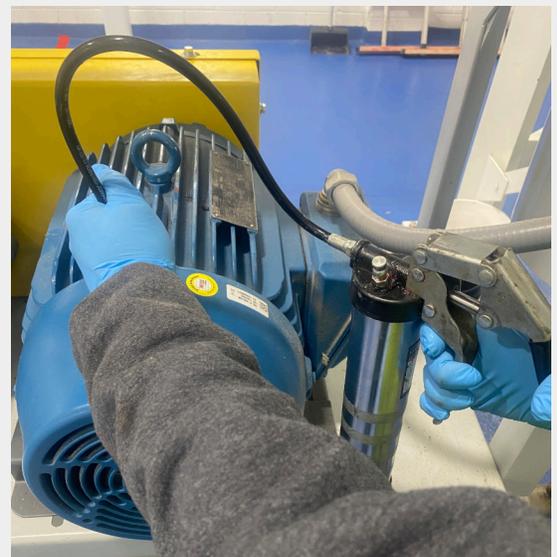
Bearing grease selection might not sound like the sexiest of topics, but its significance shouldn't be taken lightly. According to SKF, the world's largest bearing manufacturer, 36% of bearing failures are caused by poor lubrication. Fallout from bearing failure can be disastrous – it can shut down an entire mission-critical system or process within minutes and cause serious collateral damage

to shafts and fans. Repairs and replacements can be extremely costly and can take days, if not weeks, depending on the severity of the damage. So, with more than a third of all bearing failures being lubrication-related, grease selection is an important discussion to be had.

“Grease” is defined a solid or semi-solid lubricant comprised of a base oil, a thickening agent, and various additives for desired performance and viscosity. Different types of grease are graded by hardness on a numerical scale established by the National Lubricating Grease Institute (NLGI). Grease selection for a particular application cannot, however, rely solely on the NLGI consistency grade. Various other factors must be considered.

It's important to understand the relationship between oil viscosity and thickeners when determining the type of grease to use in bearings. Equipment data plates and manuals might only state, “use a NLGI No. 2 grease of good quality”, but not every No. 2 grease can be used for a particular motor. Oil viscosity and thickness usually oppose one another, and determining the proper balance for the application relies heavily on speed and temperature.

For example, a fast bearing needs a thin oil, but a stiff consistency. This is because a thinner oil can be carried and pumped at high speeds, whereas a thicker oil would build up heat due to the oil in shear. A stiffer grease consistency modifies the dropping point of the grease so that, at a certain temperature range, the oils are released.



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Continued from page 1 Additives and thickeners are used to meet specific requirements – anticorrosion, antioxidant, anti-wear, extreme pressure (EP), etc. Common grease thickeners include lithium complex, aluminum complex, polyurea, clay, and calcium complex. It should be noted that molybdenum, a popular additive for EP applications, is excellent for impact-loading surfaces, but should not be used for bearings as it can alter metal characteristics and cause bearing failure.

The volume of grease needed for a specific application can be determined using physical dimensions. Multiplying a bearing's outside diameter x width x 0.114 will yield how many ounces of grease it requires. Ideally, a bearing cavity should be filled to 40% for one-sided shielded or non-shielded bearings. Over-greasing can be just as detrimental as under-greasing as it can often result in blown seals, contamination, and increased temperatures. Different grease guns deliver varying amounts of grease, which service technicians must take into consideration during application.

For most critical bearing applications, MSC recommends Mobil Polyrex EM, a polyuria-based oil designed for use in electric motors as well as other roller element bearings. It provides consistent lubrication across a wide range of temperatures and is commonly specified by equipment manufacturers. Polyrex EM offers excellent cross-compatibility for various equipment including fan bearings and high-load applications.

Many companies adopt SOPs to minimize bearing failure and take preventive steps like installing vibration detection leads to facilitate quarterly inspections and bearing wear indicators to detect temperature rise and shut down the unit before critical failure can occur. Not many, however, take bearing lubrication into serious account. All Mechanical Service Corporation HVAC service technicians are fully-trained in bearing grease selection to protect against catastrophic bearing failure. For more information, contact MSC at 973-884-5000.

Permit-Required Confined Spaces

A confined space, as defined by OSHA, is an area that has limited openings for entry or exit, is large enough for entering and working, and is not designed for continuous occupancy. Working in a confined space is often required of MSC service technicians who must enter air handlers, exhaust fan plenums, tanks, filter assemblies, various process equipment, pits, and tunnels on a routine basis.

A confined space is considered “permit-required” when it has one or more of the following characteristics: contains, or has the potential to contain, a hazardous atmosphere; contains material that has the potential to engulf an entrant; walls that converge inward or floors that slope downward and taper to a smaller area that could trap or asphyxiate an entrant; contains any other recognized safety or health hazard such as unguarded machinery, exposed live wires, or heat stress. All MSC technicians are trained in confined space safety and awareness, and a number of our service technicians are fully trained in permit-required confined space entry. We also have an internal confined space rescue team as required by OSHA for permit-required work, enabling MSC to perform all types of confined space work as an important turnkey service.



Before entering any confined space, workers must identify physical hazards, follow proper entry procedures, and know how and when to exit. The atmosphere should be tested and monitored for oxygen content, flammability, toxicity, and explosive hazards as necessary. Required equipment may be necessary for fall protection, rescue, air monitoring, ventilation, lighting, and communication per established procedures. Finally, workers must maintain visual, phone, or radio contact with trained attendant at all times while in a confined space.

An Ode to the Seasoned Service Technician

The seasoned HVAC service technician has saved the day more times than you can count. We won't use the word "old" as the preferred term is "heavily experienced in the trade".

The relationships and human bonds that exist between people who run production facilities and their HVAC go-to person are almost like family. When your process plant goes down in the middle of a snowstorm and your seasoned service tech's van rolls up to security and into your parking lot and he bails you out in the middle of the night, you remember that. You appreciate that.

The seasoned HVAC service tech remembers when pneumatics were the current state-of-the-art technology and "ancient" arts like steam, how to soft-solder upside down without any drips, and most importantly, what to say and how to say it. The "dinosaurs", as they're sometimes called, hold many tricks that are not taught in any trade school, webinar, or app. These are things they've picked up along the way from four-and-a-half decades of service calls, some in the middle of the night. Sure, young technicians in their twenties are more hip to the incoming barrage of new HVAC technology, but the dinosaurs know their longtime clients' systems better than anyone.

The seasoned service tech worked together with their customers during 9/11 and they've been there during very hard economic times. The seasoned service tech helped the plant pull through by doing small repairs rather than spending big money on equipment replacements.

With forty-five years in the trade, you can bet the seasoned HVAC service technician has had his share of minor injuries. Various cuts, abrasions, pulled muscles, maybe a little frostbite, burns and scars from soldering or brazing, definitely a few knuckle-busters. The seasoned service tech knows his way around a first aid kit and can dress a wound properly, though I must say that some Scotch 33+ electrical tape and a paper towel work very well in a pinch. The seasoned service technician has also seen a few not-so-lucky techs over the years who needed a lot more than some Scotch 33+ to tend to their injuries.

The seasoned northern New Jersey service technician has worked outside in frigid, sub-zero weather and in stifling 100-degree heat waves. Sometimes, when you're working outside on a rooftop on one of those gorgeous "top ten" days people talk about on the radio, you feel like you had the day off and pity the poor souls locked in their cubicles.

Here's to the seasoned service technician!



By Pete McGrath



Are You Ready for Spring?

Spring is just weeks away, and it's almost time to turn off heating systems and perform the necessary PM to prepare for warmer months.

Replace winter filters and clean evaporator coils, condensing coils, and drain pans. Cooling towers and tower water filtration systems should be cleaned and tested. Flush and blow out chilled water systems and clean strainers; the same goes for reheat hot water systems. Check for refrigerant leaks in all DX systems. Spring is swing season when we run cooling during the day and heat at night, so make sure economizer cycles are programmed correctly. Lastly, make sure all systems operate to design intent to conserve energy and extend equipment life.