The To-Do List

Eight Steps to Selecting and Managing Your Lubrication System

Matthew Jaster, Senior Editor

Lubrication management should be standard operating procedure at any manufacturing facility. Vital to both operational and maintenance personnel, a strong, coherent and specific lubrication program will have lasting results in machine efficiency and maintenance. Of course, even those with the best intentions can't always keep up with the challenges presented day-to-day on the manufacturing floor. Thankfully, *PTE* is here to help with eight steps to selecting, storing, analyzing and managing your lubrication requirements.

#1 Get it Right the First Time

Enhancing equipment reliability starts with simply applying the right product at the right time and in the right amount and then monitoring it regularly, according to Bill Watson, director of marketing and engineering, Klüber Lubrication NA LP. "For example, taking a gear oil sample for analysis. It is also very important to follow the equipment manufacturer's recommendations," Watson said. This simple step will pay off immediately, potentially saving hours of downtime while extending the lifespan of the machine. Cindy Shearer Galloway, marketing director, Syn-Tech Ltd., says that paying strict attention to the correct amount of lubrication and applying it only when needed should be a top priority.

#2 Consistency Pays Off

Galloway also stresses the importance of compatibility. "It is important that replacement or maintenance lubricants are compatible with previous lubricant formulas. Incomplete lubricants can cause machine and lubrication failures," Galloway added.

Kluber offers a variety of lubricant management tools and resources for manufacturers today including KluberEnergy.

Klüber identifies lubrication issues early, particularly in the food and beverage industry, to avoid catastrophic failures.

#3 Do Your Research

Klüber provides onsite training, equipment mapping (a more detailed plant lubrication survey, labeling of equipment, applicators, and recommendations for lube rooms, plus lubrication analysis of both oils and greases. "First and foremost, we will ensure that the correct product is in use by examining all of the tribological conditions," Watson said.

Galloway believes several factors play a part in choosing the correct lubricant. "The lubricant must have the correct base fluid viscosity. If it's a grease, you need the correct National Lubricating Grease Institute (NLGI) number for the application. You also want the lubricant to provide the correct corrosion control. It should perform over the machinery's various temperature ranges. In addition, it's important to have the correct load capacity of the lubricant and evaluate the plastics and elastomers that the lubricant may come in contact with," Galloway said.

#4 Stay on Schedule

Following your maintenance schedule is the easiest, most efficient way to ensure your equipment stays in peak operating condition, according to Galloway. "Syn-Tech Ltd. lubricants offer increased life, extending maintenance intervals, increasing efficiency by reducing maintenance and downtime, ultimately saving money, time and equipment."

"In order to maintain equipment reliability, it's extremely important to not just have a maintenance plan in place, but ensure that it's followed on a consistent basis. Having a well-documented procedure understood by all operators ensures that even if roles change, the equipment receives the same high level of regular attention prescribed. Best practice would go even further and have the OEM lube chart available as well," Watson added.

#5 The Importance of Proper Storage

Galloway said that environmental and storage conditions have a great influence on the rate at which a lubricant degrades, affecting the lubricant's useful life once applied to a component. Adhering to some simple recommended practices for the storage and handling of lubricants will greatly improve the chances of a lubricant maintaining critical characteristics.

"Oil will naturally separate from most grease. Temperatures in excess of 110°F can greatly accelerate oil separation. The grease in storage containers should be checked periodically. If puddles of oil are found, do not pour or siphon off. Instead, thoroughly disperse the oil back into the grease with a clean spatula, paddle or mixing apparatus. When grease is removed from a drum or pail, the grease surface should be smoothed to prevent oil separation into the cavity," Galloway said.

Other simple steps that can help your cause, include wiping off the tops and edges of containers before opening to avoid contamination from debris. If drums must be stored outside, use plastic covers to direct water and contamination away from the bungs.

"If the customer is not sure about shelf life, our policy is generally four years from the date of manufacture," Galloway added. "Syn-tech Ltd. lubricants with an expired shelf life can be requalified at Syn-Tech Ltd. at no charge. Testing is conducted using our product manufacturing specifications. If no deficiencies are found, the lubricant is recertified for an additional four years. This eliminates the need for disposal and purchasing – an excellent cost savings for our customers."

"Cleanliness is paramount and the organization of products so that it is clear which applications the lubricant is used for," Watson said. "Making sure that containers are properly sealed, and contamination is not possible. If bulk storage is being used, ensure that even the transfer containers are then cared for in the same way; things like dedicated grease guns, hoses, etc. ensure that lubricants aren't being mixed, even when being moved from one area to another."

Syn-Tech manufactures lines of lubricants with varying viscosities.

Syn-Tech Ltd., based in Addison, Illinois, develops lubricants for automotive, aerospace, defense, industrial, medical and commercial industries.

#6 Education and Training

Toby Porter, food market manager, Klüber Lubrication NA LP, believes training is imperative in lubrication management. "Lubrication is a science, and very detailed at times – and it takes time to become knowledgeable in all of the pertinent facets. Yes, we emphasize training and its benefits regularly to our customers. The front line for predictive maintenance is the user of the equipment (the customer), we train so that if and when problems arise, they're likely caught early enough to avoid catastrophic failures leading to significant downtime," Porter said.

There are a few simple and steadfast rules to consider, according to Galloway. For example, here are some specific in-plant suggestions for grease applications:

Release pressure from a pumping apparatus during downtimes, shift changes or overnight. This will reduce the amount of oil separation from the grease.

For application equipment it is important to avoid sharp transitions in supply lines, keep pumping pressures down, below 100 psi if possible and keep supply lines as short as possible. This will allow lower pumping pressures.

When changing over to a new lubricant on a line, it is very important to ensure that all old lubricant has been removed. When assembling new lines, plan for additional couplings, valves, etc., that will make purging the system easier. Develop a specification for changeover procedures.

Check brushes and sponges used to apply grease regularly for deterioration.

Keep grease storage containers in a dry, cool area when not in use. Keep the tops clean and free of dirt and debris.

#7 Stay Up on Market Trends

It might be an overstatement to say that some technologies and methods work and some don't. This isn't just an issue in lubrication, but an ongoing struggle in the world we live in today.

On occasion, tried and true methods remain reliable and consistent, but there's always new ideas that may or may not pan out. The secret is to be aware of everything that is happening in your particular area of expertise, stay up on trends and follow the organizations that seem to be doing it right.

"For example, there has been a movement towards equipment operators or production line supervisors taking on regular lubrication tasks, so that maintenance can focus more on equipment reliability- as an efficiency gain," Porter said.

Many customers have begun implementing what's known as Total Productive Maintenance (TPM). The strategy and implementation can vary, but one common theme is the transfer of lubrication practices to the operators and line workers of the machinery. "This can have benefits in multiple ways, but one is that the staff working on the equipment has a closer connection to the typical operating conditions and can more easily recognize anything out of the ordinary. This can improve the predictive maintenance and decrease the sometimes lengthy downtime that comes from problems going unnoticed," he added.

Syn-Tech's goal is to extend the length of lubrication intervals and machinery, according to Galloway. "We want our customers to consider lube for life lubricants, zero migration lubricants when oil leakage is a problem," she added. "Our customers should consider the lubricant early in the machine design and consider one lubricant for various pieces of equipment to reduce purchasing and stock, eliminating confusion and redundancy, and in some instances cost."

#8 Experience Never Hurts

Have questions or need advice on how to manage your lubrication system? There are plenty of resources available at (*www.powertransmission.com/Lubrication.htm*). Our online Buyer's Guide features companies that provide greases, oils, lubricants and lubricating equipment. The companies that provided information for this article are also a valuable resource for lubrication methods and best practices:

Syn-Tech Ltd. was founded in 1968. The company, based in Addison, Illinois, develops lubricants for the automotive, aerospace, defense, industrial, medical and commercial industries. Syn-Tech not only formulates lubricants for individual applications, but they manufacture lines of lubricants with varying viscosities, thickeners and base fluids including H-1 and H-2 food grade lubricants.

Klüber Lubrication is a full subsidiary of Freudenberg Chemical Specialities and is a company of the Freudenberg Group since 1966, headquartered in Weinheim, Germany. Klüber Lubrication offers approximately 2,000 different speciality lubricants, many of them developed and manufactured to specific customer requirements. **PTE**

For more information:

Klüber Lubrication NA LP
Phone: (603) 647-4104
www.klueber.com

Syn-Tech Ltd.
Phone: (630) 628-7290
www.syn-techlube.com

Stay the Course

Noria's Reliable Plant 2016 took place April 5-7 in Louisville, Kentucky. If you missed the opportunity to attend this conference, the company provides a variety of education and training sessions on lubrication throughout the year. These include public courses, onsite training and online training resources. Here is a brief rundown of what they offer through the year.

Industrial Lubrication Fundamentals

Industrial Lubrication Fundamentals is an introduction to optimal lubrication practices, which covers the common activities of a lubrication technician. This training is considered to be a key component to support a lubrication excellence program. This interactive course uses a variety of activities and media to provide the lube technician with the technical knowledge and methodologies of lubrication excellence, which enhance their competencies to execute qualified lubrication duties.

Machinery Lubrication Level I

Attendees will learn proven industry methods for selecting, storing, filtering and testing lubricants to boost reliability and generate lasting results in machine efficiency/maintenance. They will also gain better understanding of oil analysis, so they can align their efforts with those of maintenance professionals or oil analysis experts.

Machinery Lubrication Level II

If you have already scratched the surface of the amazing improvement and resource-saving potential in good lubrication practices, ML II will round out your perspective with excellent preventive maintenance techniques. Attendees will learn how to identify wear patterns, degraded lubricants and those small but significant leaks that can spell disaster over a period of time.

Oil Analysis Level II

Lubricants can serve as a wellspring of information for preventive maintenance. If you find yourself wanting to bring the valuable benefits of on-site fluid testing to your workplace, Oil Analysis II will equip you with everything you need. Attendees will learn what to look for when sampling and performing their own on-site oil tests – detecting harmful particle and thermal stressors that degrade lubricants before they do serious damage.

Oil Analysis Level III

Attendees will learn the more detailed aspects of fluid analysis, technologies associated with it, and even how to go a step further from simply performing on-site tests to launch a strong oil analysis program at your workplace. **PTE**

For more information:

Noria Corporation
Phone: (800) 597-5460
www.noria.com

Surface Refinement with Nanotechnology

REWITEC OFFERS SURFACE TREATMENT SOLUTION FOR WIND APPLICATIONS

Rewitec's innovative surface refinement technology with nano- and micro-particle-based bonding components can be utilized in wind, industrial, shipping and automotive applications.

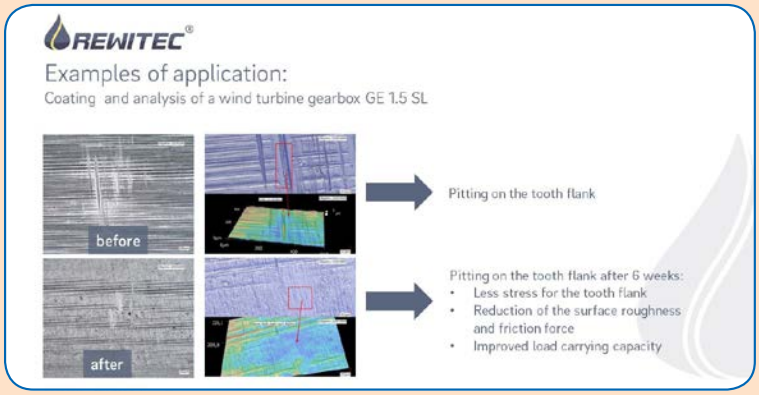
While applying the products, lubricants are used as a carrier for the active components. This allows the treatment of metal surfaces (gearboxes, bearings and internal combustion engines) to run with greater reliability and durability due to reduced friction, temperature and wear.

"Rewitec is a longtime supplier to the wind power industry specializing in surface wear protection and refinement of metal surfaces in tribologic systems," said Torsten Trute, technical sales at Rewitec. "Our products are applied to reduce friction and wear and to extend the life and energy efficiency in the main, pitch, and azimuth gearboxes, as well as the main, generator and pitch bearings."

How it works

Rewitec will get added to each lubricant and then the chemical is applied during operation on the treated metal surfaces. The lubricant in this case acts as a means of transportation and carries the silicon coating onto loaded metal surfaces. By using friction energy and crystalline temperatures that arise in the so-called mixed friction range, the products passivate the surface and reduce the roughness. This affects the service life and safety of the systems.

"This innovative technology ensures that life and machine performance are enhanced over the long term and the wear in the tribological systems is reduced. Once added to the lubricant, the Rewitec products, specifically developed for each respective purpose, provide our clients with protection over many hours of operation," Trute said. "The concentrated active agents are generally supplied pre-mixed in a neutral oil, which is compatible with practically all standard lubricants. For special lubricants, such as polyglycol oils, we are able to provide appropriate special products. It is also possible to apply our active agents to special lubricants supplied by the client as well."



Testing Results

The Competence Center for Tribology of Mannheim University of Applied Sciences examined with a rolling wear tester the effect of Rewitec in gear oils under rolling-sliding motion. The experiment was carried out on a modern two-disc test assembly which makes it possible to simulate tooth flank operating conditions. The evaluation showed the extent of change in friction behavior and in temperature after adding Rewitec.

Tests were carried out with two gear oils. A conventional mineral oil (Agip Blasia 150) and a high-performance PAO based oil (Agip Blasia SX320). Each performed with and without the addition of Rewitec. The results were compared. Two tests were performed including a short-term tests for 20 hours and 20 minutes and long-term tests for 61 hours with higher stress.

Compared to a standard mineral oil, Rewitec lowered the friction by 23 percent and the temperature by eight percent in the first short-term test. Compared to a high performance PAO oil, Rewitec lowered the friction by 18 percent and the temperature by four percent in the second short-term test.

During the long-term test at a higher pressure, Rewitec compared to a high-performance PAO oil with a 33 percent friction reduction, 20 percent temperature reduction and the surface roughness reduced by approximately 50 percent.

Field Application

Availon s.r.l., located in Italy, partnered with Rewitec GmbH for the surface improvement of the gears and bearings in their wind turbine gearboxes. The company utilized Rewitec DuraGear W100 Gearbox Surface Protection to a gearbox after ten months of operation. Based on the evaluation, the application of the Rewitec product resulted in an improvement to the surface structure and roughness of the tooth flanks, a reduction in run through marks, micropitting and seizure and the electrical resistance from the gearbox improved significantly.

"In dealing with Rewitec products, experience has shown that the wear of our wind turbines is significantly delayed," said Jochen Holling, mechanical engineer, global technical support and engineering, Availon GmbH. "In most cases, the progressive damage in certain gearboxes and bearings with pre-mechanical damage was even eliminated." **PTE**

For more information:
Rewitec GmbH
Phone: +49 (0)6441 44599 0
www.rewitec.com