

Switching to Food-grade Lubricants Provides Safety Solution

BY DIANA JUDGE, SHELL LUBRICANTS

The use of high-performance mineral oil and synthetic-based food-grade lubricants to maintain the equipment used in food and beverage manufacturing facilities, a common practice overseas, is gaining popularity among U.S. food and beverage manufacturers. Surprisingly, research indicates that 60 percent of U.S. food and beverage manufacturers have not yet made the switch from conventional oils and greases to food-grade lubricants in food and beverage processing.

Machinery used in food and beverage processing has many moving parts requiring lubricants to operate reliably and efficiently. Food and beverage contamination can occur

from drips off chains, hydraulic hose failure, oil leaks from seals and gearboxes, or a release of compressed air containing an oily mist. Using nonfood-grade industrial oils and greases is inappropriate in these settings.

While initially they appear more expensive, synthetic food-grade lubricants provide a powerful buffer against wear and corrosion, and perform as well as or better than traditional oils and greases. Plants therefore have the opportunity to reduce maintenance costs and improve food safety. The price of food safety is immeasurable.

Food-grade lubricants are harmless if accidentally consumed in quantities below the maximum U.S. Food and Drug Administration (FDA)-prescribed level of 10 parts per million (ppm). The FDA has set a zero tolerance for contamination by nonfood-grade lubricants. It also regulates the components that are allowed to make up a food-grade lubricant. Further, the FDA maintains that it is illegal to sell "adulterated food"; or in other words, food contaminated with an alien substance. The U.S. Department of Agriculture (USDA) formerly approved lubricants as H1 (for incidental food contact) and published the list in what was commonly known as the "White Book." The USDA ceased this activity in 1998. NSF International has since taken over the "White Book" and now registers food-grade lubricants

Continued on Page 30



Continued from Page 28

as H1 food-grade. To determine if a lubricant is food-grade, check the list of NSF H1 certified nonfood compounds at www.nsf.org.

During performance, synthetic food-grades prove highly effective and compare favorably or surpass their nonfood-grade or traditional mineral oil-based food-grade counterparts. Not only can synthetics prolong oil service life and reduce downtime, but they can positively impact plant productivity. A large food and beverage manufacturer in the United States that recently made the switch to synthetic food grades realized a 21 percent reduction in the number of unplanned work orders. Additionally, the company was able to reduce downtime, measured in a reduction in repair hours, by a total of nearly 50 percent. It also realized dramatic decreases in total spending, by 57 percent well within the first year since making the switch.

Food-grade synthetics have a longer product life and need to be replaced less frequently in machinery. In many cases, this means up to four times more life from the oil, which reduces the chance of contamination during oil changes by the same amount.

Manufacturers often find that traditional mineral-based oils do not provide the same protection as compared to high-performance synthetic food-grade products. While the lubricant unit cost is higher for the performance option, the use cost may in fact be lower, particularly when the impact of lubricated component failure is considered. A can seamer, for example, using a mineral food-grade oil was found to cause more downtime and bearing failure than with a nonfood-grade alternative. By switching to a food-grade synthetic product, the canning company not only saved on maintenance in the first year but also improved the quality of can seam and extended relubrication intervals.

Synthetic food-grade lubricants are available in the United States, and a growing number of food and beverage manufacturers are using them. They are odorless, tasteless and generally outperform established food-grade mineral oil-based lubricants. They are specially engineered for extended performance under stressful conditions.

Most synthetic varieties provide an added benefit of extended fluidity (flow capable condition) with extremely low temperatures more effectively than most mineral options, and also provide extended viscous protection from the high heat of ovens. Their increased oxidation and thermal stability, compared to a mineral or traditional white oil-based food-grade lubricant, can extend equipment life and reduce downtime.

Evidence of Extended Benefit

Lubrication failures lead directly to production losses, so a robust lubrication program is effective in plant management. According to the Japanese Institute of Plant Maintenance (JIPM), "up to 65 percent of mechanical equipment failures can be attributed to some form of lubrication deficiency."

Plant quality managers and maintenance managers should identify areas of potential lubricant contamination. Some suppliers can assist by conducting a lubrication contamination control point survey (such as Shell's LCCP survey), which forms part of the plant food safety plan. The LCCP survey is based on hazard analysis critical control point (HACCP) principles and examines where the risks exist in a plant, what they are and what can be done about reducing and managing them.

While it's true that sound maintenance and operational practices tend to lower the chances of product contamination, leaks and spills can still occur. Any plant using nonfood-grade lubricants is risking an expensive product recall that could damage the company's brand and reputation. The possibility for lubricant contamination is a constant threat for the food and beverage industry, and even more so for consumer food safety at large.

Some recent examples underscore this threat: 86,000 pounds of sliced turkey inadvertently exposed to a nonfood-grade lubricant during processing caused consumer complaints of temporary intestinal discomfort from off-color, off-odor turkey; a recall was issued.

A packing company had to recall nearly a half-million pounds of smoked boneless hams tainted with gear lubricant after several customers

Premium Synthetic Lubricants

reported a "bad taste" and "burning in the throat for up to three hours" from eating the ham. A grocery store chain issued a recall of one manufacturer's soft drinks on its shelves due to possible contamination by a lubricant that caused "irritation if consumed."

A baby food producer recalled its infant formula and milk powder after the discovery of contamination by industrial oil and metal in the mixtures. Another manufacturer received complaints from a mother that a jar of baby food "smelled of tar". Investigators found the food was contaminated with toxic mineral oil lubricant during the manufacturing process.

Besides endangering consumer health, contaminated products have far-reaching implications for the supplier and distributor. The cost of a recall - in storage, shipping, notifying the public and destroying bad food - is just the beginning. Companies sustain forgone profits, a tarnished reputation, withering consumer confidence and trust, reduced brand equity, potential legal exposure and major costs to regain market share. It is no wonder that many manufacturers the world over are taking stock of their production methods and looking for high-performance products that can guarantee a level of safety in the food supply.

Food safety is a growing international concern. The World Trade Organization's 147 member countries comprise just one of the watchdogs to monitor and sanction food and produce safety. For the sake of our global and national economy, the safety of our food chain and the preservation of our own health, it is not a question of "if" but "when". The time is ripe to switch to synthetic food-grade lubricants in our food manufacturing facilities. **ML**

Editor's Note:

This article with complete references can be found online at www.machinerylubrication.com. The online version also lists contamination incidents and recalls attributed to nonfood-grade lubricant contamination.

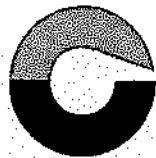
- Compressors • Gears & Bearings • Food Grade Lubricants •
• Vacuum Pumps • A/C Compressors • Oven Chains •
• Heat Transfer Oils • Synthetic ATF •
• Calendar Oils •

Minimum Order—One 5-gallon pail
Private Label
Free Oil Analysis
Technical Service Support
Plant Surveys
Fast Shipping
Choice of totes, drums, or pails.
East and West Coast Shipping Points

Improve and expand your business with Ultrachem Synthetics

900 Centerpoint Blvd., New Castle, DE 19720

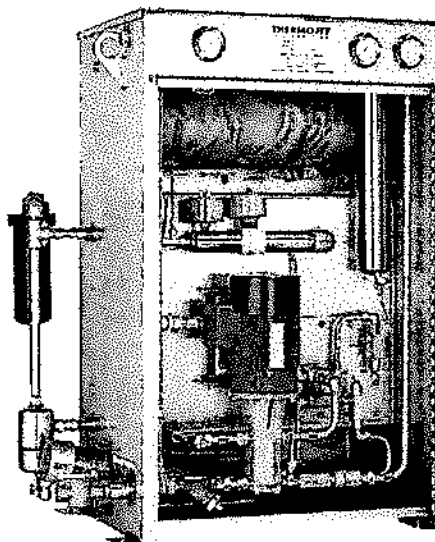
302-325-9880 Fax: 302-325-0335



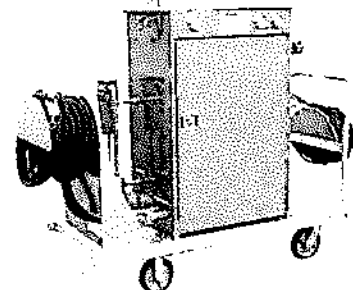
www.ultracheminc.com

THERMOJet® Oil Purification Keeps Oil "Like" New

Removes Total Water to <100 PPM



- Simple, On/Off Operation
- Extremely Reliable
- Eliminates Oil Disposal
- Improves Machinery Life
- Portable
- For Purchase or Rental



Phone: 832.264.TJET • Fax: 617.507.5615

Email: mack@lsc.com • www.lsc.com