

# Improving food plant reliability: The synergy of high performance H1 lubricants and reliability products is totally clear



The Lever and Pistol Grip versions of the Clear Grease Guns / Tubes

In the ever-competitive food processing industry, companies continuously search for initiatives that will help them to effectively cut costs and increase their corporate profits. This is particularly important due to the current global economic slowdown. Fortunately this recession has coincided with a growing understanding and implementation of 'preventative maintenance' and 'reliability' practices within global industries.

How can improving the 'reliability' of your food processing plant actually help to reduce its operating & maintenance costs?

Lubrication of equipment in food industry applications requires high quality, high performance lubricants. Why? They need to be able to stand up to some of the harshest environmental conditions found anywhere.

Moisture is an ever-present destroyer of lubrication and is detrimental to good maintenance. The water or steam present is due to the necessity for constant cleanliness of the machinery and surrounding areas. It may also be a part of the process itself. This moisture can wash out lubricants, cause emulsions of greases and oil as well as rust and corrosion and the increase in the deterioration of lubricants.

Heat is often one of the more serious problems. High temperatures can come from drying and sterilising processes, or from steam and hot water used in cleaning. Higher temperatures can cause greases to melt and run out of bearings and will speed up oxidation of both greases and oils; thereby shortening their life.

Conversely, in some plants there may be refrigerated areas, coolers, etc. which require low temperature mobility in greases and low pour points in oils. Wear can result from channelling of the lubricant. These areas may also create moisture problems because of excessive condensation.

Shock loading or impact may be a factor in many departments. The lubricant may be pounded out of applications leaving metal-to-metal contact with consequent damage to surfaces; an increase in friction leads to heat & wear. Grease may lack cohesion or adhesion; oil may be light or won't penetrate to critical areas.

Long life of both the equipment and the lubricant is another challenge. Some operations run 24 hours a day. Again, they may be hot, wet, cold, subject to contamination etc., and therefore create doubly severe conditions. Grease may "shear down" or become very soft or liquid, oils oxidise rapidly and both may become contaminated. Both greases and oils may harden

or thicken in service, creating increased power demands.

One of the most severe requirements imposed on lubricants in the food processing industry is the demand for purity and the necessity for non-toxicity. Several agencies, such as the NSF and United States Department of Agriculture (USDA), concern themselves with controlling the possible effects of lubricants on beverage and food processing and packaging. There are stringent and very restrictive regulations in effect, which often limit a lubricant's ability to perform well. For years, the NSF & USDA ratings of H-1 and H-2 have been important features in the food processing industry and they are becoming increasingly vital ratings for lubrication in this industry.

So what are the solutions for these lubrication & maintenance problems that so often plague food processing equipment engineers & mechanics? Specialist, high performance H1 lubricants combined with lubrication 'reliability' solutions can provide effective maintenance solutions for the growing food processing industry:

## H1 waterproof grease

Most H-1 greases are easily removed by water washdown in food plants. This results in frequent bearing failures and a large consumption of grease (most of which gets washed down the drain). However a high performance, water resistant, 'tacky' H-1 grease such as LE 4025 QUINPLEX will save money by reducing bearing failure & grease usage.

Standard tests, which measure Resistance to Water Washout (ASTM D1264) and Resistance to Water Spray Off (ASTM D-4049), are useful for selecting a high performance grease. The water spray off test result is the more relevant test for environments with water washdown. A result of less than 10 per cent should be aimed for (which means that over 90 per cent of the grease remains in place).

This extra resistance to water washout is the most significant as it eliminates corrosion-related failures of the bearings which is usually the most common cause of failure in food plants. The increased adhesiveness will also result in much less grease being used as it will stay where it is put, reducing the amount that is needed to be added. Greasing intervals can then be increased to weekly and longer in many cases, once the waterproof grease is in the bearings. The result is that more grease stays in the bearings, less leaks out and contaminates the food.

## H1 non-tacky grease

There are however, numerous food processing applications that also require a non-tacky grease. Some food equipment that must be frequently washed down needs grease removal. A grease that doesn't contain any pigmentation, so appears nearly transparent in service is something that is often desired within the food industry. The non-tackiness of these products such as the new LE 4082 SHEERPLEX also provides outstanding pumpability properties for use in centralised lubrication systems. They still have excellent corrosion and wear protection in order to safeguard vital processing equipment.

## H1 low temperature oil

When processing frozen fruits, vegetables and frozen specialties, another consideration must come into play: low temperatures. Large freezers have chains, slides, conveyors and hydraulics that must function in extremely cold temperatures. These temperatures cause problems for many lubricants; most will stiffen or even freeze solid in the sub-zero temperatures. This is, therefore, obviously a major issue for the equipment and machinery that they run in.

There are synthetic H1 food grade oils that are particularly suited for many applications in sub-zero environments; some can be used for both low temperature applications such as chains, slides and hydraulics as well as for rotary screw air compressors. Frozen food plants can, therefore, consolidate their H1 sub-zero lubricant products into just one product for all applications.

## H1 penetrating oils

The majority of chains in food processing plants that are exposed to washdown are suffering unnecessarily short lives. But in most cases, the problem is not at all the fault of the chains but rather the method in which they are lubricated.

Often, the current chain lubrication practice is to apply a heavy oil or grease to the outside of the chain. While this does a nice job of lubricating the sprockets and the outside of the chain, it does very little to protect the most vulnerable area of the chain: the contacting surfaces inside the pin and bushing/plate/roller/hook.

The fact is that most chains fail from the inside. They stretch or kink up due to wear and corrosion wear inside the pin and bushing area. To lubricate them properly, the lubricant needs to be engineered to penetrate into the inside of the chain, clean the inside of the chain (to remove contaminants and to displace any trapped water

that it encounters) and leave behind a heavy film of oil, grease or solid lubricant. A penetrating-type chain lubricant not only displaces water, but it also cleans dirt and wear metals out of the pins of the chain and off the sprockets. It is essentially an oil change for chains. It is crucial that the lubricant is aimed into the pin & bushing area.

When chains are subject to water wash down in food plants and there is incidental food contact, it is imperative to displace water from the chain on a regular basis by using a H1 penetrating type of chain lubricant such as LE 4059 QUINPLEX. Regular oil and grease are non-polar and therefore unable to grab on to the water and remove it. A polar organic solvent included in the formulation of the lubricant works best.

### Reliability products – “Best Practice” for food manufacturing facilities

Lubrication Engineers, The Lubrication Reliability Source™ believes however, the use of high performance H1 lubricants alone will not allow a food plant to fully benefit from powerful improvements in reliability – they need to be used in partnership with a variety of other reliability solutions. The importance of ‘Reliability’ has never been more vital to food manufacturing facilities worldwide; a reliable plant is much more likely to be a profitable and successful one. Many of the reliability solutions that are available to the market offer, like high performance lubricants, an excellent return on investment (ROI) to the customer. Companies such as L.E. are able to offer a full ‘turnkey solution’ for the reliability needs of food plants; providing a reliability centred maintenance programme’

Examples include:

The durable oil safe lubricant transfer containers are critical to best practice lubrication programs. Colour coded and fully sealing, these containers ensure the accurate delivery of clean lubricant from bulk storage to point of use every time.

Proper labelling of all equipment then ensures that the correct lubricant is delivered in the correct quantities to the correct application in the food plant. Expensive downtime is then avoided due to



The Des Case Hydroguard breather is an ideal solution for management of lubricant condition in washdown applications.

the incorrect application of lubricants.

Des-Case desiccant breathers are air filter and water vapour removal systems designed to replace traditional breather caps on fluid containing



The Esco oil Sight Glass & Level Monitor installed on a gearbox.



Tote-A-Lube poly tanks and Oil Safe containers in the lube room of FPL Foods, USA

reservoirs, storage tanks and gearboxes. The breathers eliminate damaging moisture and contaminants in these systems, thereby improving their performance and reliability.

Moisture contamination can also be prevented in the food industry by utilising oil sight glasses such as those manufactured by ESCO in the US. These sight glasses provide continuous fluid monitoring of the clarity, colour, sediment and water contamination as well as the oil level on equipment with fluid lubrication systems. The



The range of Oil Safe lubricant transfer containers

ability to see the oil, monitor and drain the water accumulation as well as pinpointing where water is mixing with oil will greatly reduce the damage done by moisture contamination in food plants. The result is longer oil and equipment life and improved reliability.

Recently launched patented Clear Grease Tubes allow food processing plants to have 100 per cent visual grease identification, therefore avoiding costly grease cross-contamination errors. Standard grease guns currently on the market do not allow the grease to be seen meaning that proper grease identification is not possible. The Clear Grease Tubes provide a simple, cost-effective reliability solution to eliminating grease misapplication mistakes. The tubes are available with a variety of assorted colour end caps. Colour co-ordinate the grease gun tube with the grease points in order to eliminate mishaps, thereby creating multiple forms of positive identification.

### Conclusion

In these tough economic times, it has never been more important for the food manufacturing industry to focus on improving the reliability of their plants. As explained, this can be achieved by the use of both premium quality H1 Food Grade lubricants and simple, cost effective reliability products.

Food manufacturers will then benefit from:

- Longer equipment life – fewer capital expenditures
- Extended service intervals – reduced lubricant consumption
- No contamination of food products
- Energy reductions
- Fewer repairs – fewer parts & less labour
- Less inventory – multi-purpose products
- Improved plant reliability – less downtime and lost production

The investment in these high quality H1 Food Grade lubricants & reliability solutions will then more than pay for themselves many, many times over – corporate profits will subsequently increase.

The resulting maintenance improvements and cost savings will then be totally ‘clear’ for all to see.



The range of colour coded Clear Grease Tubes marketed by L.E.

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