



MOLYKOTE
FROM DOW CORNING

Food Processing Plant Prevents Emulsification, Reduces Costs with Synthetic Hydraulic Oil

Smart Lubrication™

CASE HISTORY

Plant Lubricants

Application

Oil in hydraulically operated conveying equipment (“dumpers”) at a meat processing plant in the Midwestern U.S.

Problem

Frequent (daily) washdown using spray equipment exposed oil reservoir under the equipment to water under pressure. Conventional mineral oil combined readily with water and emulsified, leading to frequent changeouts. Premature changeouts caused higher annual oil expenditures and higher labor costs to change oil, which frequently interrupted production.

Product Selected

Molykote® L-1346FG Synthetic Blend Hydraulic Oil

Results

Switch to new synthetic oil eliminated formation of emulsion in contact with water. The new oil ran successfully in the hydraulic system for a six-month rated lifetime. The plant gained significant savings from reduced oil consumption, reduced disposal cost, labor savings and fewer interruptions to production.

Molykote® L-1346FG Synthetic Blend Hydraulic Oil

Lubricating your hydraulic system with Molykote L-1346FG Synthetic Blend Hydraulic Oil is a cost-effective way to prevent premature lubricant failure and extend maintenance intervals. Unlike oils made in conventional fractionation processes, the synthetic oil is made by combining smaller molecular “building blocks” to meet targeted performance specifications and to minimize impurities. For this reason, the synthetic oil inherently resists emulsification, resulting in less friction and less frequent need for oil changes.

A U.S. food processing plant employs hydraulic drive systems to operate “dumpers” in material handling applications throughout the facility. Mineral oils were originally used for lubrication and motion transmission in this equipment. The mineral oil product contained a zinc additive and was rated at 20W (46 ISO) with a viscosity index (VI) of 98.

During daily washdown, water under pressure from spray cleaning equipment would impact oil reservoirs located under the dumpers. Some of the water would mix with the oil and form a thick, sticky emulsion. It was not unusual for the department to shut down with the oil “OK” after washdown and then to discover at start-up that the oil would have to be changed because of water contamination.

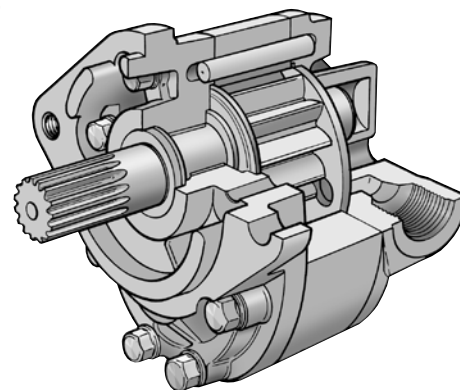
Because the emulsion degraded lubricating performance and the oil’s ability to circulate properly in the hydraulic system, this plant typically performed oil changes at 30-day intervals, well before the oil’s rated lifetime.

Equivalent Synthetic Oil

In an effort to prevent costly formation of emulsion in the oil, the maintenance manager switched to Molykote® L-1346FG Synthetic Blend Hydraulic Oil, a Dow Corning product. This oil also features a viscosity of 20W (46 ISO) with a VI of 112. The synthetic oil’s antiwear (AW) additives meet ASTM D 2882, the standard for piston and vane pumps used for pressures lower than 2000 psi. Unlike the original oil, which is made in conventional fractionation processes, the synthetic oil is engineered by combining smaller molecular “building blocks” to meet targeted performance specifications and to minimize impurities.

During a trial period, the oil was sampled and analyzed at regular intervals. The results indicated that the fluid remained in good condition.

Installation of the synthetic hydraulic oil followed thorough draining of the old oil. The new oil was monitored monthly using vendor-provided oil sample analysis. It ran successfully for 6 months, when the anti-oxidant tested depleted. No special flush fluid was used. No signs of emulsification occurred during the life of the oil. Oil sampling revealed the presence of zinc additives, which were left over from the original product.



Residual acid zinc additives typically shorten the lifetime of the anti-oxidant used in synthetic oils. After the initial changeout of the new oil, oil life increased as the amount of residual zinc declined.

Economic Benefit

The plant appreciated annual cost savings of 57 percent because of the extended effective lifetime of the hydraulic oil used in the dumpers. The former hydraulic oil was consumed at a rate of 180 gallons/year for an annual cost of \$1044, \$720 for product and \$324 for disposal, for each dumper. The new synthetic oil was consumed at a rate of 30 gallons/year for an annual cost of \$396 for product and \$54 for disposal for each dumper.

In addition to the \$594 per dumper direct cost savings, the reduced labor costs incurred by more frequent oil changes by 80 percent and reduced downtime process interruptions for oil changes by a factor of five. The hydraulic equipment operated more reliably and safely because there were no "sudden" premature changes in viscosity due to emulsification.

Synthetic Product Simplifies Compliance

Use of the new synthetic hydraulic oil reduced inventory required to meet the plant's MRO needs. Fewer oil changes and the oil's food-grade formulation simplified the plant's compliance with Hazard Analysis and Critical Control Point (HACCP) reporting. The oil conforms to USDA requirements applicable to meat and poultry plants and is qualified for direct food contact under FDA regulations.

Plant management has adopted a policy of using only food-grade synthetic polyalphaolefin (PAO) products for its MRO needs. Although in many cases these products exceed the unit cost of the conventional mineral oils they replace, their superior performance more than makes up for the difference. Standardizing on food-grade products eliminates the possibility that plant workers will confuse one type of oil with another.

Benefits to Food Processing Plants

- Reduce amount of lubricant needed
- Extend interval between lubricant change – reduce process interruptions
- Reduce labor for scheduled and unscheduled maintenance
- Simplify record-keeping for Hazard Analysis and Critical Control Point (HACCP)
- Extend lifetime of hydraulic system
- Ensure safe operation of hydraulic equipment
- Standardize plant in use of food-grade fluids and lubricants

WARRANTY INFORMATION

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