MOLYKOTE®
FROM DOW CORNING
TM

# Food Processing Plant Extends Service Interval Ten Times, Eliminates Varnish Buildup with Synthetic Compressor Oil

*Smart Lubrication™* | *CASE HISTORY* | *Plant Lubricants*

## Application

*Lubrication of a rotary screw compressor in a food processing plant. Under full load oil is recirculated at 15 GPM at normal operating temperature range of 71-88°C (160-190°F).*

## Problem

*Life of conventional food-grade (FG) mineral oil formulations in this application (compressor capacity 30 gal.) was limited to 500 hours, or less than two months. In addition, these oils would degrade and leave varnish deposits inside the compressor, necessitating costly internal cleaning.*

## Product Selected

Molykote® *L-1200FG Series Synthetic Compressor Oils*

## Results

*Oil lifetime was extended to a 5500-hour service cycle in a typical compressor. Varnish deposits were nil in over 5 million hours of monitored compressor operation. New formulation is a functional equivalent to the approved OEM fill product by all compressor manufacturers.*

## *Molykote*® L-1200FG Synthetic Compressor Oils

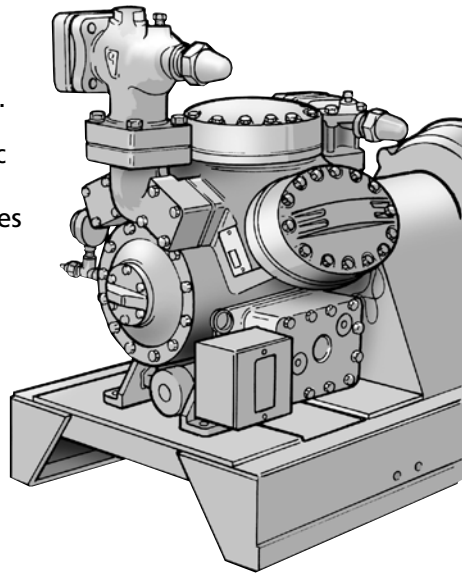
*Lubricating rotary screw and reciprocating compressors with* Molykote *L-1200FG Series Synthetic Compressor Oils is a cost-effective way to prevent premature lubricant failure, extend maintenance intervals and prolong compressor lifetime. Unlike oils made in conventional fractionation processes, the synthetic oils are made by combining smaller molecular "building blocks" to meet targeted performance specifications and to minimize impurities. They are compatible with new-generation additives that enhance lubrication performance. The synthetic oil greatly extends changeout intervals and eliminates varnish buildup inside compressors due to its greater purity and inherent oxidation stability.*

A U.S. food processing plant relies on a rotary screw compressor to provide power for hand equipment throughout the plant. Mineral oils were originally used as coolants and lubricants with this equipment. Food-grade formulation (H-1) mineral oils were only serviceable for 500 hours of operation (one or two months). If permitted, non-food-grade mineral oils were recommended by compressor manufacturers to be changed at 1000 hour intervals. In either case, normal life variations were dependent on heat rejection values, operating temperatures, circulation rates and oil sump capacities. Upper operating temperatures for compressor equipment were limited to 32°C (90°F) ambient to keep fluid temperatures below 82°C (180°F).

The conventional mineral oil, produced in a fractionation process, showed a significant content of "impurities." The high percentage of impurities was thought to shorten the oil's service lifetime. The oil's breakdown was accelerated by its sensitivity to the high operating temperatures. As the oil degraded inside the compressor, by-products of its breakdown would cause a build-up of a hard, sticky "varnish" on the internal metal surfaces of the compressor. This buildup adversely affected the performance of the system. At intervals of about 30 months, the compressor had to be taken apart and internal parts painstakingly cleaned – a process that cost more than 5 years' supply of conventional replacement oil.

## *Synthetic Product Extends Lifetime*

To extend lubricant lifetime and prevent buildup of "varnish," the plant switched to *Molykote*® L-1200FG Series Synthetic Compressor Oils from Dow Corning. Unlike oils made in conventional fractionation processes, the synthetic oils are engineered by combining smaller molecular "building blocks" to meet targeted performance specifications and to minimize impurities.



The molecular structure of the synthetic oil effectively withstands temperature spikes in the 82°C (180°F) range and does not break down. The result is improved lubricity and virtual elimination of varnish formation. The oil conforms to USDA listing requirements applicable to meat and poultry plants and is qualified for direct food contact under FDA regulations.

During its first usage cycle, the oil was tested at monthly intervals and allowed to run its full rated lifetime of 6000 hours before changeout. Throughout this period there was no need for addition of oil. The internal cleaning previously required after two or three years was no longer necessary.

The new synthetic oil is a functional equivalent of OEM fill products specified by all manufacturers of rotary screw compressors for this application.

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 between lubricant change*
- *Reduce labor for scheduled and unscheduled maintenance*
- *Simplify record-keeping for Hazard Analysis and Critical Control Point (HACCP)*
- *Extend lifetime of compressor system*
- *Eliminate need for periodic costly internal cleaning of compressors*
- *Standardize plant in use of food-grade fluids and lubricants*



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