MOLYKOTE®
FROM DOW CORNING
TM

Synthetic Chain Oil Ends Sticky Linkages in Freezer Conveyor

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

Application

Lubrication of a conveyor chain in a frozen-food plant.

Problem

A U.S. manufacturer of frozen low-calorie meals was experiencing a high degree of chain jumping due to sticking linkages inside its -18°C (0°F) processing freezer. The tackifier used in the conventional chain oil caused oil thickening. Exposure to the freezer temperatures increased the thickening effect, preventing the internal chain components from being penetrated by oil. The result was poor oil coverage on the internal surfaces of the chain, leading to rust. In addition, this conventional chain oil was not approved for contact with food.

Product Selected

Molykote® *L-1468FG Synthetic Freezer Chain Oil.*

Results

The ISO 68 viscosity synthetic oil formulated with anti-wear (AW) additives and a food-grade tackifier remained fluid at the freezer's operating temperatures. The tackifier also did not thicken the oil, allowing it to maintain its viscosity. The new synthetic oil kept the chain linkages from sticking and protected all chain components from rusting.

Molykote® L-1468FG Synthetic Freezer Chain Oil

Lubricating chains in low temperature conditions with Molykote *L-1468FG Synthetic Freezer Chain Oil is a cost-effective way to prevent premature lubricant failure, extend maintenance intervals and ensure smooth conveyor operation. 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. It is compatible with new-generation additives that enhance lubrication performance. The synthetic oil adheres to chains in frequent washup conditions, but without emulsifying and blocking penetration of lubricant to internal chain surfaces.*

A national manufacturer of frozen, low-calorie meals was experiencing problems with its conveyor chain in its frozen-food plant. The conventional chain oil in use contained a tackifying agent, added to ensure adherence of the oil to all surfaces of the chain during its conveyor usage. The tackifier, however, acts as a thickening agent, increasing the oil's viscosity. This thickening can result in blockage by the thickened oil in certain locations. The blockage prevented the movement of the protective oil film to internal chain components.

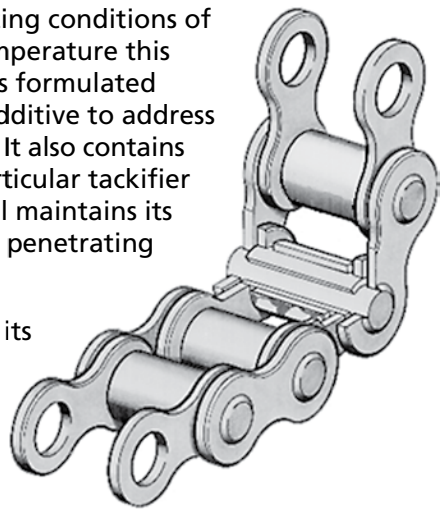
Age also tends to enhance the thickening of conventional chain oils as they oxidize, thus increasing the likelihood of blockage. Thickening and blockage lead to a lack of oil reaching all chain components. The unprotected chain would rust. The rust would lead to sticking of the chain linkages, causing erratic motion in the conveyor, reduced efficiencies and increased energy consumption.

Tackifying Without Thickening

To improve chain lubrication and simplify maintenance, the plant switched to a formulation equivalent to *Molykote*® L-1468FG Synthetic Freezer Chain Oil, a Dow Corning product. 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.

The custom-blended polyalphaolefin (PAO) synthetic oil gives excellent lubrication at high and low temperatures, reduced volatility and compatibility with equipment designed for use with mineral oils. It conforms to USDA requirements applicable to meat and poultry plants, and is qualified for direct food contact under FDA regulations.

The oil features a low pour point. Operating conditions of the freezer were -18°C (0°F), at which temperature this synthetic oil would remain fluid. The oil is formulated with a new-generation anti-wear (AW) additive to address sliding conditions of the chain side plates. It also contains a food-grade tackifying additive. This particular tackifier does not thicken the oil. Therefore the oil maintains its low viscosity, even under cold conditions, penetrating the internal surfaces of the chain links.



The oil maintains its design viscosity over its service life due to its synthetic nature, ensuring that proper oil films exist at all times. The thickening and subsequent

blockage exhibited by the conventional chain oil did not occur. In this way, the new tacky chain oil maintained oxidation protection on all surfaces of the chain. In this way, the new tacky chain oil maintained oxidation protection on all surfaces of the chain.

Rust-Free Operation

Testing and acceptance of the new food-grade chain oil took only 90 days. The new synthetic oil maintained its desired viscosity, even at continuous operating temperatures of -18°C (0°F), ensuring that all chain components were protected by a film of oil. The prevailing benefit of the new oil was that it eliminated the erratic motion caused by chain rusting, since the film strength of the food-grade oil was much better than that of conventional chain oils.

With periodic reapplication, the new oil continued its protection to the conveyor chain for over five years, when the plant was moved to a new location.

Benefits to Food Processing Plants

- *Adherence to regulatory standards*
- *More reliable lubrication at low temperatures*
- *Longer chain life*
- *Reduce use of lubricant*
- *Extend interval between application of lubricant*
- *Simplify record-keeping for Hazard Analysis and Critical Control Point (HACCP)*
- *Maintain better conveyor performance*

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