

RENOLIN ZAF 68 MC

CASE STUDY

Energy saving hydraulic oils

Project Overview

Choosing the right quality hydraulic oil is paramount to the effective maintenance of any IMM. Traditionally, mineral oil based HLP specification hydraulic oils were used, containing zinc or zinc free EP additives, dependent on the OEM recommendation. However, as new IMM designs become smaller and faster, the hydraulic oil is forced to work harder which can result in accelerated oil ageing and contamination, reduced machine efficiency and increased energy consumption.

The customer wanted to examine the benefits of using a hydro-cracked base oil compared to traditional mineral oil based hydraulic oils with the focus on energy savings and ultimately cost savings. After testing, the results showed significant energy cost savings per machine which resulted in substantial cost savings across the customer's whole production line.

Problem

- Improved oxidation stability and ageing resistance
- Extended service intervals
- Energy saving potential

Solution

RENOLIN ZAF 68 MC

- Excellent oxidation stability and ageing resistance
- Wide operating temperatures
- High shear stable viscosity index
- Extended service intervals
- Excellent dispersant/detergent properties

Results

- Average kWh consumption was reduced by 4.7%
- Annual savings in excess of £38,000 per annum

The Customer

The customer is a globally acting manufacturer of plastic closures, with 21 factories in 19 countries across the world. Their reputation is built on delivering quality products and services to the highest standards to its global customer base, including many leading blue-chip companies.

The UK operation was interested in looking at the potential energy saving possibilities of FUCHS specialist hydraulic oils for their plastic injection moulding machines. The FUCHS products are based on hydro-cracked base oils as opposed to traditional mineral oil based hydraulic oils.

Application Details

Injection moulding machines (IMM) are commonly used in the plastic processing industry. Injection moulding utilises a ram or screw-type plunger to force molten plastic material into a mould cavity; this solidifies into a shape that has conformed to the contour of the mould. Most IMM's consist of a basic hydraulic system, comprising of an electric motor-driven hydraulic pump, control valves, pistons and interconnecting pipes and hoses.

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Testing

Following a review of the maintenance procedures at the customer's UK operation, FUCHS was requested to supply a proposal for the lubrication of 55 x IMM machines in use.

Following a site study by FUCHS UK Technical Engineers, the use of hydraulic oils based on hydrocracked base oils was suggested. This type of lubricant technology was chosen because of its propensity to deliver:

- Improved oxidation stability & ageing resistance
- Extended service intervals
- Energy saving potential

The customer has a number of different IMMs from various manufacturers, including Arburg, Husky and Netstal. Two identical IMMs were selected based on their consistently high output rates and were isolated for the entire period of the trial.

Each IMM was fitted with a specially designed ammeter which records, every 5 seconds, the KWh being used by the machine and also an average for each 30 minute period.

Cost Saving Evaluation

Based on the customer's energy charges (8.8p day and 5.2p night) and production rates, the use of RENOLIN ZAF MC, or the equivalent RENOLIN MR 68 MC (zinc containing oil) will equate to an **annual saving in excess of £700 per machine**. For 55 machines this provides an **annual saving of £38,500**.

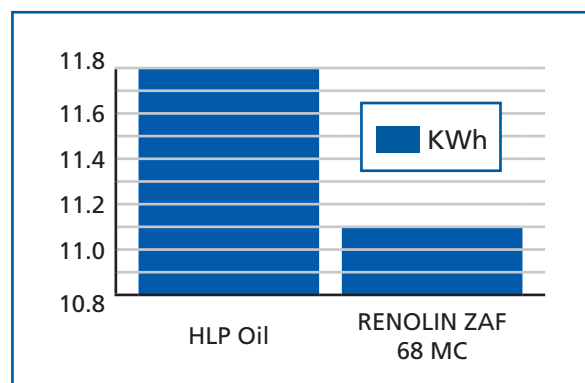
To start the trial, both machines were filled with traditional HLP type hydraulic oil. In this instance, due to the OEM recommendation, this was a zinc free specification. The machines were then run over an extended period and the results compared to show consistency.

Following this, one machine was drained, cleaned and re-filled with FUCHS RENOLIN ZAF 68 MC, a specialist HVLPD type hydraulic oil based on hydrocracked base oils. The machines were then returned to full production and the energy consumption compared.

Test Results

Almost 300 'average' energy consumption readings per machine were taken over the period and compared. It was shown that the average KWh consumption was reduced by 4.7% on the IMM that operated using FUCHS RENOLIN ZAF 68 MC.

Following the conclusion of this trial, a full proposal was submitted for the conversion of the entire 55x IMMs to the HVLPD technology. Despite an initial outlay in cost of lubrication, the calculated payback period for the change was less than 4 months.



Conclusion

When companies look to reduce maintenance costs, very few will investigate the savings available through lubricant technology. Through the selection of the correct lubricant technologies, significant savings can be achieved from choosing the right lubricants. Applied knowledge of how hydraulic efficiency can be improved through proper hydraulic fluid selection can increase the bottom line. Please consult FUCHS Lubricants - your hydraulic oil expert.

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