

# How the right lubricant can improve energy efficiency

Today's manufacturers are being tasked with being more corporately responsible and sustainable, which means being more energy efficient, adopting best practices and investing in energy-efficient processes, but to do this requires overcoming the biggest enemy of efficiency – friction.

According to the article "Global impact of friction on energy consumption, economy and environment" published in FME Transactions, a peer reviewed, open access journal on mechanical engineering, 100 million terajoules are needed annually worldwide just to overcome this friction<sup>1</sup>. However, improved-technology lubricating oil can significantly boost efficiency by reducing friction and thus minimize wear.

The chemical industry, including petrochemicals, is a top greenhouse gas (GHG) emitter, contributing approximately 20 percent of the world's GHG total<sup>2</sup> but just as mineral oils in the automotive industry have been replaced with synthetic types, specialty lubricants and meticulous monitoring can also benefit industrial applications found in the chemical industry such as compressors, gearboxes, heat-transfer systems, and exchangers.

Our multi-step approach includes Energy Consulting, Energy Measurement, Energy Analysis and Reporting which can help the Chemical Industry increase process efficiency and demonstrate operational energy savings. The relevant results such as cost savings, CO2 emissions, ROI, and energy consumption are presented in a clear, understandable way and savings can be quantified according to ISO 50015 and IPMVP\* to support energy management systems for example ISO 50001.

## Compressors

Air, gas, and refrigeration compressors are found in many chemical processes, often operating under severe conditions, but poor lubricant choice can directly impact both compressor reliability and efficiency, possibly causing a catastrophic failure. With gas compressors, the situation is particularly critical as compressor oils can react with process gases or attack downstream catalysts, causing production issues.

Klüber Lubrication has a full range of **Klüber Summit** compressor oils, whatever your compressor technology type that offer good viscosity vs temperature behaviour and high resistance to oxidation.

## Gearboxes

Chemical industry gearboxes are found within reactor agitators, mixers, extruders, conveyors, grinding mills, centrifuges, cooling towers, bucket elevators, rotary driers/coolers and other rotating equipment. They are designed

to transfer power from an electric motor to equipment in motion, and lubrication can directly influence their efficiency. Polyglycols (PAG) based lubricants offer the best energy efficiency, longest service life and highest wear protection.

Our **Klübersynth GH 6** product family of PAG based lubricants outperform all other synthetic base oils particularly in high-sliding applications such as worm and hypoid gears as the lower coefficient of PAG oils reduces friction within the gearboxes resulting in lower operating temperature and reduced power loss.

## Keeping your equipment clean to maintain efficiency

Many chemical enterprises still use mineral oils in most of their severe and heavy-duty applications but pushing mineral oils to their performance and service life limits will most probably lead to varnish and carbon build-up in the entire equipment or circulation system. These sticky residues will cause higher energy consumption, stuck valves, overheating, clogged oil lines and filters, and increased downtime due to maintenance.

**Klüber Summit Varnasolv** is a concentrated conditioner fluid that acts like a detergent/dispersant to dissolve varnish and carbon deposits during operation in various equipment items, with no dismantling needed. It is miscible with mineral oils, synthetic hydrocarbons, ester oils and polyglycols. The product can also recondition and restore efficiency in oil heat transfer systems that have accumulated a hard deposit, known as fluid coking on piping inner surfaces. If not eliminated, fluid coking can decrease system heat transfer coefficients, increase energy consumption, exhaust gas temperature, and even block pipelines that can lead to fires and explosion hazards.

## Challenges faced by the Chemical Industry

As many chemical enterprises juggle choices regarding carbon footprint and limited production capacity, they can choose to add new production lines and pay accordingly or improve their process efficiencies. Sometimes, customers decide to use the improved energy efficiencies realized by our specialty lubricants to increase production rather than reduce energy demand, but whatever your energy efficiency ambition or business objective our application knowledge combined with our specialty lubricants is the winning recipe to improve your process efficiency and reliability. Contact us for a free technical consultation

**For further details visit <https://www.klueber.com/uk/en/>**

## References

<sup>1</sup>Global impact of friction on energy consumption, economy and environment, FME transactions, K. Holmberg, A. Erdemir, 2015.

<sup>2</sup>Global Efficiency Intelligence, Infographic: Chemical Industry's Energy Use and Emissions, Ali Hasanbeigi, November 11, 2018

\* IPMVP: International Performance Measurement and Verification Protocol