

High Temperature Lubricants

Many factors must be considered when selecting a lubricant for an application, high in priority is the likely operating temperature of the component. Some applications operate cyclically between a maximum and minimum temperature. Others are more consistent and operate at a fairly steady nominal temperature.

In all cases the nominal, maximum and minimum temperature of operation must be considered in order to determine the most appropriate lubricant.

Simplistically both oils and greases evaporate or degrade at elevated temperatures, some types more than others. Synthetics are generally more thermally stable and resistant to extremes of temperature however for all lubricants a good rule of thumb is that for every 10-15°C raise in temperature, you typically half the life of the lubricant.

Another factor to consider is the viscosity and also the Viscosity Index (VI) of the lubricant. The Viscosity is basically how 'thick' the fluid is at a set temperature, usually at 40°C and is measured in Centistokes cSt. The Viscosity Index is a measure of how the viscosity changes with temperature. Fluids become thicker at lower temperatures and thinner at higher temperatures, the ideal lubricant offers a more stable viscosity throughout a wide temperature range, a high VI.

The key to choosing a lubricant with the correct viscosity is knowing the operating temperature and the viscosity can be then chosen to give an adequate lubricant film at that temperature.

Mineral oils are less resistant to degradation than Synthetic oils however additives can also be used to enhance the VI and resistance to oxidation.

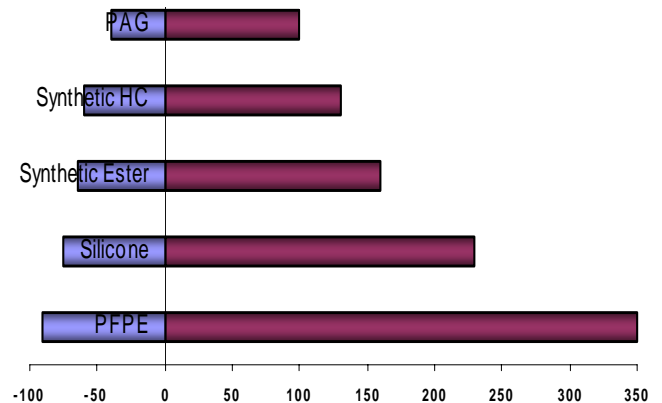
When we consider grease lubrication the base oil properties must still be considered however we must also be careful with selecting the ideal thickener and additives. Some soaps are more thermally stable than others, some will melt at relatively low temperatures rendering the product useless, some are not compatible with certain materials, some are more resistant to water washout there are many factors to consider.

What is High temperature?

Obviously what we consider as high temperature is relative and varies from industry to industry and application to application however a simple guide is as follows:

Product type	Temperature Range
General Purpose	50 to 100 °C
Middle to High Temperature	100 to 200 °C
High Temperature	200 to 300 °C
Extreme Temperature	300+ °C

The typical operating temperature range of various synthetic oils are shown below, greases can be formed from these base oils to give similar operating temperatures in most cases.



Usually the larger the operating temperature requirement the more costly the product however it is the cost effectiveness that we must consider. In some cases using the correct product can save having to re-lubricate frequently, extend product life and reduce wear and failures leading to increased productivity & big savings.

IKV Group are specialists in high temperature lubricants, oils greases and dry film coatings.