Tech topic

What is a jet oil?

A base stock and additive combination formulated to handle extreme temperatures

Key insight

Jet oils are required to operate at extreme temperatures between

−40°C and **>250°C.**

The difference

Requirements for aviation lubricants (jet oils) are beyond the capabilities of petroleum-based oils, so synthetic lubricants were developed to meet these needs. Jet oils typically take seven to 15 years from the time a commitment is made to start development to the time of full approval and commercialization. Jet oils are comprised of an ester base stock and an additive package formulated to provide exactly the right combination of properties.

The Mobil Jet™ Oil process

Approval of jet oils to military and SAE AS5780 specifications, and by equipment manufacturers, is a long, difficult and costly procedure.

- ☑ We're a unique supplier, maintaining strict quality control from the raw materials to the final product.
- ☑ We manufacture both high-quality base stocks and additives, and also package the finished product.
- ☑ After testing is complete, a certificate of quality is issued for each batch of oil we produce.

Mobil Jet™

Technology by ExxonMobil

What is a jet oil?

Base stock

The base stock is selected to ensure the correct viscometric properties, bearing in mind the low temperature fluidity requirement for cold starting and the need to have a sufficient oil film even at the highest bearing temperatures. For 5cs viscosity grade lubricants, the base stock (ester) reacts to polyhydric alcohols with fatty acids. The resultant esters have exceptional thermal stability and are known chemically as neopentyl polyol esters.

Additives

The additive package contains antioxidants, metal passivator, defoamant, an antiwear additive and possibly a load-carrying additive. The antioxidant protects the base stock from oxidative breakdown and keeps the oil from forming deposits. It functions in a sacrificial way, being degraded in the process of protection. This is the cause of discoloration often noted with oils in service.

Although polyol esters are inherently good lubricants, the use of load-carrying additives has been found to be beneficial for applications involving highly loaded metallic contacts. Such additives are also known as EP additives. Selecting and incorporating such additives into an oil formulation requires careful judgment, as they can cause deterioration of other essential properties.

For more information

Please contact your ExxonMobil aviation sales representative.