

What Is A Jet Oil?

Basestock + additives formulated to provide the right combination of properties



Introduction

Aviation lubricants (jet oils) are required to operate over an extreme temperature envelope. Down to minus 40 degrees Centigrade for cold starting and up to more than 250 degrees Centigrade for maximum bearing temperatures.

Such requirements are beyond the capability of petroleum-based oils, so synthetic lubricants were developed to meet these needs. Jet oils are comprised of an ester basestock and an additive package formulated to provide exactly the right combination of properties.

Basestock

The basestock 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, which are principally used in jet engines in airline service, the basestock (ester) is made by reacting polyhydric alcohols with fatty acids. The resultant esters have exceptional thermal stability and are known chemically as neopentyl polyol esters.

Additives

The additive package will have a number of components. A typical package will contain antioxidants, metal passivator, defoamant, an antiwear additive and possibly a load carrying additive.

The antioxidant is needed to protect the basestock from oxidative breakdown and to keep the oil from forming deposits. They function in a sacrificial way, being degraded in the process of protection. This is the cause of the 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. Selection and incorporation of such additives into an oil formulation requires careful judgment for they can cause deterioration of other essential properties.

Approval Process

Approval of jet oils to military specifications and by equipment manufacturers is a long, difficult and costly procedure. It takes typically five to 10 years from the time a commitment is made to start development to the time of full approval and commercialization of a jet oil.

- ExxonMobil Aviation Lubricants is a unique supplier in that it maintains quality control from raw materials to the finished product.
- We manufacture the high quality basestocks and many of the additives used in formulations and blends, and also package the finished product.
- Testing is done and a certificate of quality issued for each batch of oil we produce.