

Oil Coking

Part Three: Laboratory/ Rig Testing

Introduction

Coking tests are run under conditions designed to accelerate deposit formation. Good precision is very difficult to achieve under such circumstances.

Coking tests cause very severe degradation of the test oil. Measurement of viscosity or acidity change has little relevance to the bulk deterioration of oil in a typical circulatory engine system.

- Correctly interpreted, some coking tests have been shown to have powerful predictive capability and are essential during oil formulation and development phases.
- These tests are also a vital part of oil approval testing for both commercial and military engine applications.
- Coking tests are designed to mimic engine coke formation zones proven to be problematic by service experience.

Also in line with service experience, the performance of oils can vary significantly from test to test dependant upon the strengths and weaknesses of the formulation. Some tests recognized and utilized by ExxonMobil Aviation Lubricants to ensure a match between applications and formulation are briefly introduced here. These are:

- Thin Film Oxidation
- Vapor Phase Coking Test
- Alcor High Temperature Deposition Test
- Erdco Bearing Test

Coking Testing

THIN FILM OXIDATION

ExxonMobil Aviation Lubricants proprietary test with exceptional predictive capability of deposits formed in a thin film regime.

Has excellent correlation with known field performance in turbine bearing and seal compartments.

Assessment is by a visual rating system.

VAPOR PHASE COKING TEST

An industry standard test.

Evaluates deposit from mist/vapor mixtures in a heated metal tube.

Assessment is by weight and visual appearance.

Simulates deposition in hot section vent lines.

ALCOR HIGH TEMPERATURE DEPOSITION TEST

An industry and military standard test.

Simulates flow through hot section oil lines.

Evaluates deposit from liquid oil flowing on the outside of a heated stainless steel tube.

Assessment is by weight and type of deposit.

ERDCO BEARING TEST

An industry and military standard test.

Simulates deposition in turbine bearing areas.

Evaluates bulk oil stability, deposition and load carrying in a bearing compartment.

Assessment is by a visual rating system.