Technical Notes
# 027

*Exceeding Expectations*

# Jet Fuel Thermal Oxidation Test for Stability of Aviation Turbine Fuels (JFTOT)

The thermal oxidation stability of jet fuel is essential for estimating the amount of deposits in degraded fuel. To learn more about this test, let's apply the **AmSpec** approach.

## A = Application

All oils deteriorate in service due to oxidation. Oil is always in contact with air during use and most frequently combines with oxygen. This oil oxidation forms insoluble and soluble materials that form deposit on the engine.

Jet Fuel Thermal Oxidation Test (JFTOT) is a test method for measuring the high temperature stability of gas turbine fuels. It subjects the test fuel to conditions related to those occurring in turbine engine systems. The fuel is pumped at a fixed rate through a heater, after which it enters a stainless steel filter where fuel degradation products may become deposited. The essential data derived are the amount of deposits on an aluminum heater tube which is then visually rated.

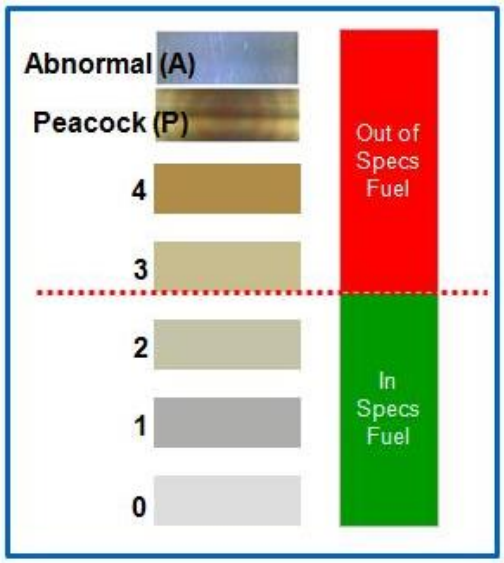


Figure 1 - Shows the JFTOT Rating System

# M = Methods

The most common method that AmSpec uses to determine the Thermal Stability of Aviation Turbine Fuels:

**D3241 – Thermal Oxidation Stability of Aviation Turbine Fuels**

# S = Scope

| Method | Products | Scope |
|---|---|---|
| **D3241** | Gas turbine fuels | Differential pressure values in mm Hg |

** *Please note below,* ***Turnaround Time*** *is defined as the actual length of time, on average, it takes to perform a particular method once the sample has arrived and logged in the lab, and prepared for testing.*

# P = Procedure Notes

| Method | Limitations | Instrumentation | Turnaround Time |
|---|---|---|---|
| **D3241** | N/A | **JFTOT –** Typically run at 275°C and 260°C for marginal fuels | 2.5 hours |

# E = Equivalents

| ASTM | IP | ISO | DIN | JIS | AFNOR |
|---|---|---|---|---|---|
| **D3241** | 323 | 6249 | | K2276B | M07-051 |

If you would like to be removed from our distribution list or you require information on a certain subject, please let us know via return email.
Also, please be advised individual / group AmSpec laboratory / operational tours can be arranged upon request.

# C = Cause & Effect

Thermal stability is a measure of the amount of heat jet fuel can be exposed to before it oxidizes. The thermal stability of fuel used requires improvement as aircrafts are upgraded to improve fuel consumption. It is a requirement because of the quantity of heat produced increases with flight velocity. Additionally, jet fuel absorbs excess heat from cooling aircraft components such as engine oil, which leads to fuel oxidation. The fuel performance during gas turbine operation can be assessed by the level of deposits that form when liquid fuel contacts a heated surface at a specified temperature. The final tube rating is an estimate of the degraded fuel deposit on the tube. This rating is just one basis for judging the overall stability of the fuel sample.

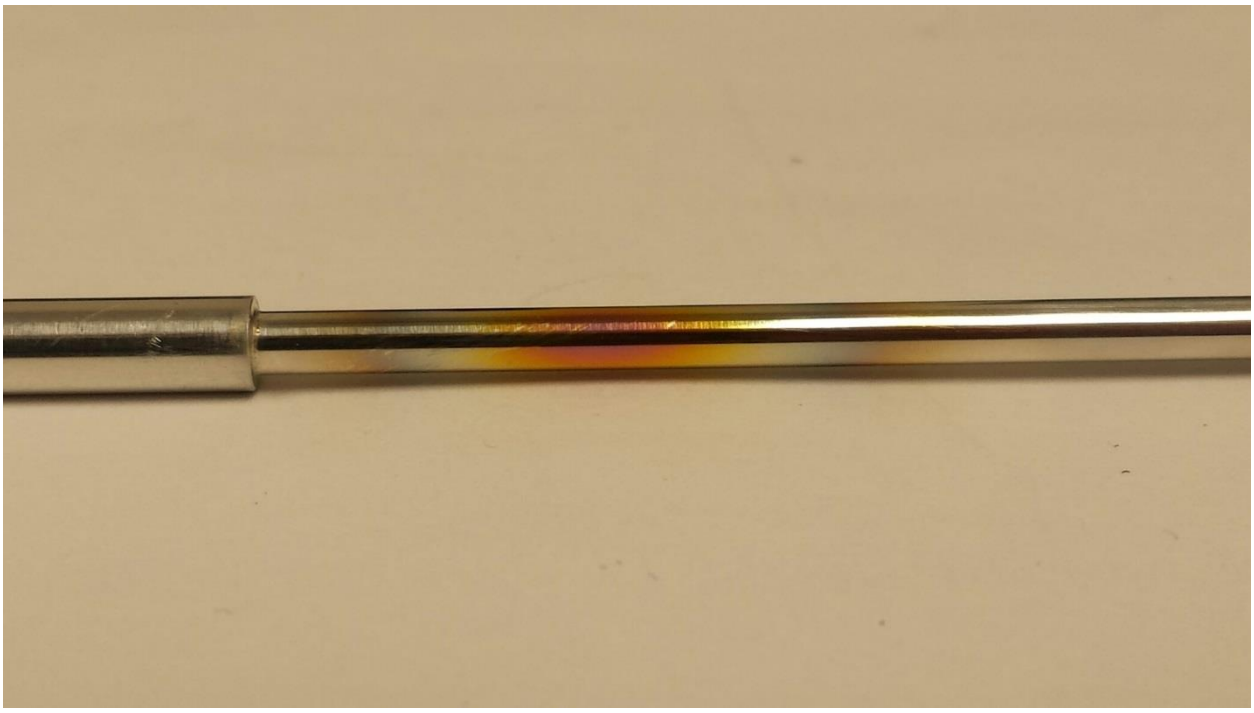

**Figure 2 – Picture of a Failing JFTOT Heater Tube Due to Peacocking**

For any questions about these methods, please contact Jennifer Nesci at JNesci@amspecllc.com

Also, please download the new & improved AmSpec Smart Phone app for a number of useful conversion tools and information.