

From: [Nancy McAtee](#)
To: [Ralph Hicks](#)
Cc: [Matthew Fox](#); [Michael Budinski](#)
Subject: Email report-ERA24FA380 (Material from aircraft fuel system)
Date: Monday, March 24, 2025 3:42:07 PM

Ralph,

An unknown material from the fuel system of the accident aircraft was submitted to the Materials Laboratory. The material was examined using a Fourier Transform Infrared (FTIR) spectrometer with a diamond attenuated total reflectance (ATR) accessory in accordance with ASTM E1252-98 (American Society for Testing Materials E1252-98: *Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis*). The spectrometer was used to collect and process infrared wavelength absorbance spectra of the unknown material.

The spectrum for the material contained the following combination of spectral peaks corresponding to particular functional groups found within the molecular structure of the material. The presence of a peak $\sim 3430\text{ cm}^{-1}$ is indicative of a carbon-hydrogen (C-H) (aromatic) bond. The presence of a doublet peak at $\sim 2970\text{ cm}^{-1}$, and $\sim 2900\text{ cm}^{-1}$ is indicative of a carbon-hydrogen (C-H) (alkane) stretching bond. A peak at $\sim 1710\text{ cm}^{-1}$ is indicative of a carbon-oxygen (C=O) double bond. Peaks at $\sim 1580\text{ cm}^{-1}$, $\sim 1505\text{ cm}^{-1}$ and $\sim 1470\text{ cm}^{-1}$ are indicative of a carbon-carbon (C=C) double bond. A peak at $\sim 1400\text{ cm}^{-1}$ is indicative of a carbon-hydrogen₃ (C-H₃) bending bond. A peak at $\sim 1340\text{ cm}^{-1}$ is indicative of an oxygen-hydrogen (O-H) bending bond. A peak at $\sim 1240\text{ cm}^{-1}$, 1100 cm^{-1} and 1020 cm^{-1} is indicative of a carbon-oxygen-carbon (C-O-C) bond. Peaks at $\sim 870\text{ cm}^{-1}$ and $\sim 725\text{ cm}^{-1}$ are indicative of a carbon-hydrogen₂ (C-H₂) bending bonds. The spectrum was consistent with an ester with aromatic and straight chained groups.

A spectral library search was performed on the unknown spectrum. The spectral search found a very strong match for polyethylene terephthalate (PET). PET is a thermoplastic polymer of the polyester family. It's commonly found in fuel system components.

If you have any questions, please let me know.

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