



MEMORANDUM FOR RECORD

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Air Safety Investigator
Eastern Region Aviation

April 20, 2021

Subject: ERA20LA278
Who: Nancy McAtee – NTSB Senior Chemist

The fuel inlet filter screen from the accident aircraft was submitted to the Materials Laboratory. A sample of an unknown material was removed from the screen. The material was examined using a Fourier Transform Infrared (FTIR) spectrometer with a diamond attenuated total reflectance (ATR) accessory in accordance to 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 triplet peak at $\sim 2950\text{ cm}^{-1}$, $\sim 2925\text{ cm}^{-1}$ and $\sim 2850\text{ cm}^{-1}$ is indicative of a carbon-hydrogen (C-H) (alkane) stretching bond. A peak at $\sim 1716\text{ cm}^{-1}$ is indicative of a carbon-oxygen (C=O) double bond. Peaks at $\sim 1450\text{ cm}^{-1}$ and $\sim 1400\text{ cm}^{-1}$ are indicative of a carbon-carbon (C=C) double bond. A peak at $\sim 1340\text{ cm}^{-1}$ is indicative of a carbon-hydrogen(3) (C-H₃) bending bond. A series of peaks at $\sim 1250\text{ cm}^{-1}$, 1100 cm^{-1} and 1020 cm^{-1} is indicative of a carbon-oxygen-carbon (C-O-C) bond. A peak at $\sim 725\text{ cm}^{-1}$ is indicative of a carbon-hydrogen(2) (C-H₂) bending bond. 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.