

**From:** [McAtee Nancy](#)  
**To:** [Salazar Fabian](#)  
**Subject:** Email report-WPR19LA087 (Residue on compressor bleed valve) (corrected)  
**Date:** Friday, October 22, 2021 1:22:02 PM

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Fabian,

A scraping was taken from the surface of the compressor bleed valve surface. This sample 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(s).

The spectrum for the material contained the following combination of spectral peaks corresponding to particular functional groups found within molecular structure of the material. The presence of a broad peak at  $\sim 3000\text{ cm}^{-1}$  is indicative of an oxygen-hydrogen (O-H) stretching bond as well as a nitrogen-hydrogen (N-H) stretching bond. The presence of a doublet peak between  $\sim 2950\text{ cm}^{-1}$  and  $\sim 2850\text{ cm}^{-1}$  is indicative of a carbon-hydrogen (C-H) single stretching bond. A peak at  $\sim 17140\text{ cm}^{-1}$  is indicative of a carbon-oxygen (C=O) stretching double bond. Broad medium peaks at  $\sim 1650\text{ cm}^{-1}$  and  $\sim 1550\text{ cm}^{-1}$  are indicative of a nitrogen-hydrogen (N-H) bending bond. A single peak at  $\sim 1460\text{ cm}^{-1}$  is indicative of a carbon-hydrogen<sub>2</sub> group bending bond. A weak peak  $\sim 1370\text{ cm}^{-1}$  is indicative of a carbon-nitrogen (C-N) stretching bond. A doublet peak at  $\sim 1150\text{ cm}^{-1}$  and  $1100\text{ cm}^{-1}$  is indicative of a carbon-oxygen-carbon (C-O-C) bond. A peak at  $\sim 660\text{ cm}^{-1}$  is indicative of a nitrogen-hydrogen (N-H) out-of-plane bending bond. The spectrum was consistent with a carboxyamine. A spectral library search was performed on the scraping sample spectrum. The spectral search found a strong match to several surfactants. The scraping sample spectrum was compared to a spectrum of a dried down sample of Ardrex 6367, a turbine engine cleaner. The scraping sample spectrum had several spectral peaks in common with the Ardrex spectrum indicating that the material in the scrapings was likely a cleaner, similar to Ardrex 6367.

If you have any questions, feel free to contact me.

Nancy B McAtee  
Chemist  
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