

Final Report Aircraft Air Quality and Bleed Air Contamination Detection: [Supporting Dataset]

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This dataset supports research report: **Final Report Aircraft Air Quality and Bleed Air Contamination Detection**, available at this link: <https://doi.org/10.21949/1524479>

Dataset Metadata

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Report Description: The purpose of this project was to provide a data-driven process to identify sensing technology with good potential for detecting bleed air contamination from engine oil, hydraulic fluid, or deicing fluid. Reports from major aircraft cabin air studies were reviewed to identify the range of constituents that can be expected in cabin air, especially as they pertain to the aforementioned contaminants and their potential markers. One of the projects was the National Aeronautics and Space Administration Vehicle Integrated Propulsion Research (NASA-VIPR) project where controlled amounts of engine oil were injected into the engine compressor of a C-17 transport aircraft and the resulting contaminants in the bleed air measured. Three additional cabin air quality studies conducted on revenue flights were reviewed. These three studies provide data for a combined total of 249 flights on a variety of makes and models of aircraft. These studies provide adequate documentation of typical aircraft cabin air. Information from this review was used to identify potential markers of the bleed air contaminants. Additionally, collaboration was established with several technical committees from the Society of Automotive Engineers (SAE), American Society of Heating, Air-Conditioning and Refrigerating Engineers (ASHRAE), and American Society for Testing and Materials (ASTM) technical committees and with project personnel from the prior European Union Aviation Safety Administration (EASA)-funded cabin air study. There was extensive interaction with SAE E31b and a formal collaboration agreement was established between ASHRAE research project 1830-RP and Kansas State University. Two industry webinars were held to obtain industry input and participation in the industry working group that was formed. Key objectives of the project were to identify sensors and sensing technology with potential for detection of one or more of the three aforementioned bleed air contaminants and to develop a plan for test stand engine experiments to evaluate the sensors with controlled amounts of the three contaminants. Sensors and instruments were identified and a test plan was developed. The detailed plan describing contaminants, rates, and operating conditions is presented in Section 4.11 of this report and instruments recommended for testing are described in Section 5.2. Additionally, through the collaboration with ASHRAE 1830 and the support of the industry working group, many of the experiments identified in the test plan were completed.

About the data: The compressed data files in this zip file are still quite large: over 2 GB. The zip file can be unzipped using any zip compression/decompression software. Data files in the zip folder include: .txt files, accessible via any text editor; .docx files, accessible via Microsoft Word or open document programs; .xlsx spreadsheets, accessible via Microsoft Excel or other open spreadsheet programs; and .PDF files, accessible Adobe PDF readers or other PDF reading

programs. Because this is a large dataset, it is not attached to this ROSA P record. Please use this link to download the data zip file directly: <https://doi.org/10.21949/1524480>

National Transportation Library (NTL) Curation Note:

This data is presented "As-Is". NTL staff have taken no further curation steps. If, in the future, you have trouble accessing this dataset, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.