

Moisture Management of a Pressure Path



From left to right: Matt Glana, Luke Freimuth, Ben Coleman, Sal Geraci, Alondra Diaz

PROJECT BACKGROUND & DESIGN GOAL:

Collins Aerospace is a worldwide provider for aerospace systems. This project helps solve the buildup of moisture in an air data probe causing inaccurate data. An environmental chamber is being built to simulate hot and humid conditions that replicate real-world conditions. The system will control temperature, humidity, and pressure while also recording the data.

DESIGN OUTCOMES:

To achieve accurate and reliable control over the three environmental condition parameters, five control systems were introduced to a pressure tank containing the desired environment. These systems include a water mister and drain system to control humidity, an electric resistive heater to increase temperature, a liquid nitrogen mister to reduce temperature, a valve connected to pressurized dry nitrogen to increase pressure, and a vacuum pump to reduce pressure.



Pitot tubes and sensors on an A350



TEAM 7

INDUSTRY REPRESENTATIVE

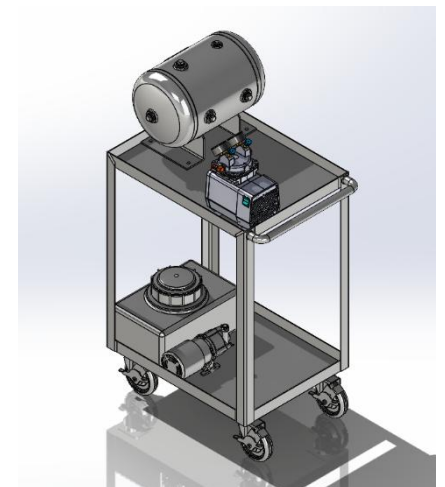
Robert Johnson, Jesse Knox

FACULTY ADVISOR

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DESIGN CONSTRAINTS:

- **Precise condition control**
 - Temp: $10 - 60 \pm 3$ °C
 - Humidity: $95\% \pm 5\%$ RH
 - Pressure: $3.5 - 30 \pm 0.5$ psia
- **Integratable** – environment transferable through tubing to sensors in other environments
- **Safe operation** – environmental venting must occur at safe rates



CAD file of environmental control test unit