



DR. ERIK BARDY

Dr. Bardy is a professor and assistant chair of mechanical engineering professor at Grove City College (GCC), and the associate director of the GCC European Study Center program in Nantes France. He teaches courses in thermofluids science including HVAC. He has been the ASHRAE chapter advisor for over 10 years and leads students on research projects partnered with France in ASHRAE related topics.

TEAM MEMBERS

- Dr. Erik Bardy
- Sarah Trinkle, Joshua Brown, Samuel Calhoun, Jesse Litzenburg, Connor Monahan, Noah Stewart
- ASHRAE local chapter

FUNDING

ASHRAE Grant \$5000
GCC – supplemental funds

PARTNERSHIPS

ASHRAE local chapter – Pittsburgh
Oniris – University in Nantes France
GCC European Study Center, Nantes France

DURATION

9 months to design and build

Air Heating And Dehumidification For Low Airflow Velocities In Electrohydrodynamic (Ehd) Assisted Food Drying

Grove City College

OUR STORY

Research can be a great tool that informs a professor's teaching and includes students in pursuing new knowledge. Some research can be difficult to start due to the high cost of the needed equipment. I have been engaging in summer research in Nantes, France at an institution called Oniris. The research is in the field of using electro-statics to induce a local airflow over a food product for the purpose of dehydration. I desired to continue the research at GCC during the academic year to include students, but the high cost of the equipment made it prohibitive. This grant was used to fund a senior design project to recreate a more cost-effective version of the experimental system used for the research in France so that the work may be continued in the US at GCC during the academic year.

OUR PROJECT

The purpose of the project was to design and build an air-handling system to integrate an already student-built food dehydration platform. The platform works on the principle of an airflow caused by an ionic field that forms over the platform due to the presence of a high-voltage electrode. The airflow causes the food product on the platform to release moisture as long as the surrounding air has a low humidity. The goals of the air-handling system were to maintain a set-point relative humidity and air temperature at a very low airflow inside an air-flow chamber that integrates the food drying platform. The system needed to integrate a control system that includes measurements from the food drying platform, as well as measurements needed to maintain psychrometric conditions in the airflow chamber all while being modular enough to fit through standard size doors.

