

# Project Report: Blakey Lab Goes Green: Year 6

**PI:** Simon Blakey

**Team:** Eleda Plouch, Keili Diaz, Wesley Pullara

**Awarded:** \$3,312.44 ; **Spent:** \$3204.00

## Objective

The objective of this project was to implement Findensers as a greener alternative to traditional water-based condensers in our organic chemistry laboratory. Findensers offer significant environmental and operational advantages, such as reducing water consumption and eliminating the risk of water leaks. This report summarizes the steps taken to integrate Findensers into our processes, the benefits observed, and any challenges encountered.

## Background

Traditional water-based condensers are widely used in organic chemistry to condense vapors back into liquids during reactions. However, they have several drawbacks, including high water usage, potential for water leaks, and the need for continuous water flow. Findensers address these issues by using a finned aluminum design that improves heat exchange without the need for running water.

## Methodology

- 1. Acquisition and Setup:**
  - Ordered Findensers from the supplier (Heidolph).
  - Installed Findensers in place of traditional water condensers on standard laboratory setups.
- 2. Training and Safety:**
  - Conducted training for laboratory staff on the proper use of Findensers. This included the solvents successfully used with the Findenser and those that are less successful (highly volatile solvents).
  - Reviewed safety protocols and emergency procedures related to the new equipment.
- 3. Integration into Laboratory Procedures:**
  - Findensers were integrated into typical laboratory procedures upon arrival.
  - Conducted trial runs to qualitatively compare the performance of Findensers with traditional water condensers.

## Results

- 1. Environmental Impact:**
  - **Water Conservation:** The implementation of Findensers eliminated the need for continuous water flow, resulting in significant water savings.

- **Leak Prevention:** The risk of water leaks and associated damage was completely mitigated.
- 2. **Operational Efficiency:**
  - **Reaction Efficiency:** Findensers demonstrated equivalent or superior efficiency in condensing most vapors compared to traditional water condensers.
  - **Temperature Control:** Findensers provided effective temperature control, maintaining stable reaction conditions.
- 3. **Cost Savings:**
  - **Water Costs:** The reduction in water usage will translate into direct cost savings.
  - **Maintenance and Downtime:** Reduced maintenance needs and downtime associated with water leaks contributed to overall cost efficiency.

## Conclusion

The implementation of Findensers as a greener alternative to traditional water-based condensers in our organic chemistry laboratory has been highly successful. The transition will result in substantial water conservation for the foreseeable future, improved operational efficiency, and significant cost savings. The environmental benefits, combined with the operational advantages, make Findensers a valuable addition to the Blakey Lab's equipment.

## Our Recommendations

- **Wider Adoption:** Based on the positive outcomes, it may be recommended to expand the use of Findensers across the Emory chemistry department.



Photo captions, from left to right: Findenser boxes upon arrival; a happy grad student with a Findenser, ready to set up reactions; an exemplary reaction setup with a Findenser.



The Blakey Lab