



Hawaii Natural Energy Institute Projects

Energy Efficiency & Transportation

Desiccant Dehumidification for Mechanical HVAC Systems in Tropical Environment

PROJECT SUMMARY

Humidity related problems have long been recognized as risks to occupants and building structures. Standard Heating Ventilation and Air Conditioning (HVAC) systems are challenged to deal effectively with elevated indoor humidity levels because sensible and latent cooling are not effectively decoupled.

In collaboration with Sustainable Design & Consulting, HNEI investigated non-conventional liquid desiccant dehumidification systems, identified applications in Hawaii, proposed a pilot design, and identified a potential site for the implementation of a pilot.

In HEET10, HNEI conducted an evaluation of currently available and the most promising desiccant dehumidification technologies and air-management processes applicable to new building development and for the retrofit of existing structures. In APRISES11 and 13 grants, HNEI expanded the research to include identification of a specific desiccant technology and a specific site in order to conduct a pilot installation with future funding.

The results of the project include a comprehensive Literature and Technology Review of relevant research to date for state of the art desiccant dehumidification technologies as applied to environmental control systems such as mechanically conditioned, naturally ventilated, and mixed mode buildings. The second deliverable is a Technical Feasibility Report on the different desiccant technologies currently developed, their application to HVAC systems and, if applicable, their availability on the market. The report includes cost benefit analysis, characteristics of each system type and their applicability in tropical climates.

PROJECT RELATED LINKS

TECHNICAL REPORTS:

1. [Assessment of Desiccant Dehumidification: Literature and Technology Review](#), July 2016
2. [Assessment of Desiccant Dehumidification: Technical Feasibility](#), July 2016
3. [Technology Review and Availability of Liquid Desiccant Systems](#), June 2017
4. [Application Potential of Liquid Desiccant Installations in Hawaii](#), July 2017
5. [Assessment of Liquid Desiccant Dehumidification System Potential in Hawaii](#), November 2017
6. [Design Study of a Packaged Liquid Desiccant \(LD\) System](#), November 2017
7. [Desiccant Dehumidification Applications in Hawaii Phase 1 Project Summary](#), November 2017