



## Annex 43

# Fuel Driven Sorption Heat Pumps

## Executive Summary

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## Executive Summary

Fuel Driven Sorption Heat Pumps (FDHP) are known for many years as an interesting option in many cases for efficient heating of buildings and domestic hot water preparation as well as industrial heat supply, using fuel (gas or oil) to run a heat pumping process based on ab- or adsorption processes. Though market available for a long time, they still represent a niche market compared to mechanical driven vapour compression heat pumps and even more compared to gas condensing boilers.

This IEA-HPT Annex 43 "Fuel Driven Sorption Heat Pumps" started as a follow-up of Annex 34 "Thermally driven heat pumps for heating and cooling", now with a narrow focus on fuel driven sorption heat pumps for heating applications to widen their market penetration.

The technology of sorption heat pumps suffers from various obstacles. There are still technical barriers like complexity, power density and in some cases long-term reliability, but mainly cost reasons as well as lack of knowledge and trust of customers, installers and decision makers. Until now, fuel driven sorption heat pumps need to compete especially with gas condensing boilers.

Therefore this Annex aimed to overcome some of these barriers, bringing researchers and industry together to develop new, more efficient and cost effective appliances and generate trust and awareness by the means of workshops, conference participations and publications as well as more available best case examples. Several workshops and two conferences dedicated to sorption heat pumps with large industry participation are among the highlights of this highly interactive working group.

Also missing knowledge about the possibilities of this type of heat pumps and the pros and cons compared to different heating technologies as well as missing standards and performance evaluation tools have been addressed within this framework. The open source software tool SorpSim was enhanced by members of this Annex and much more knowledge and data have been generated and added to a database of sorption materials.

A round robin test of different performance evaluation standards has been carried out on a market available gas driven adsorption heat pump among four labs and pre-normative work was fed into the normative bodies. Especially the European standard EN12309 has been within the focus of this prenormative work

Three simulation studies have been carried out to model the role of FDHP in different markets and to determine best types and system configurations for different applications. This information was used to derive a potential road map for a market increase for this technology. FDHP are a competitive option e.g. for multi-family homes with higher heating supply temperatures. They can become very attractive as well for other cases when wall-hung solutions are developed.

But not all expectations could be met. Some companies stopped their engagement in this field during the lifetime of this Annex and therefore fieldtesting could not be done in the planned extent. Nevertheless there is still a lot more work to do to give this technology a robust place in the family of heat pumps.

There are still several companies developing new types of fuel driven sorption heat pumps and most members of this Annex will continue their work within the framework of the EHPA Working Group Thermally Driven Heat Pumps.



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