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Liquid Sorption Heat Storage for Domestic Application

Sorption Friends III, Taormina - Italy, 02.05.2023

Dr. Benjamin Fumey (benjamin.fumey@hslu.ch)

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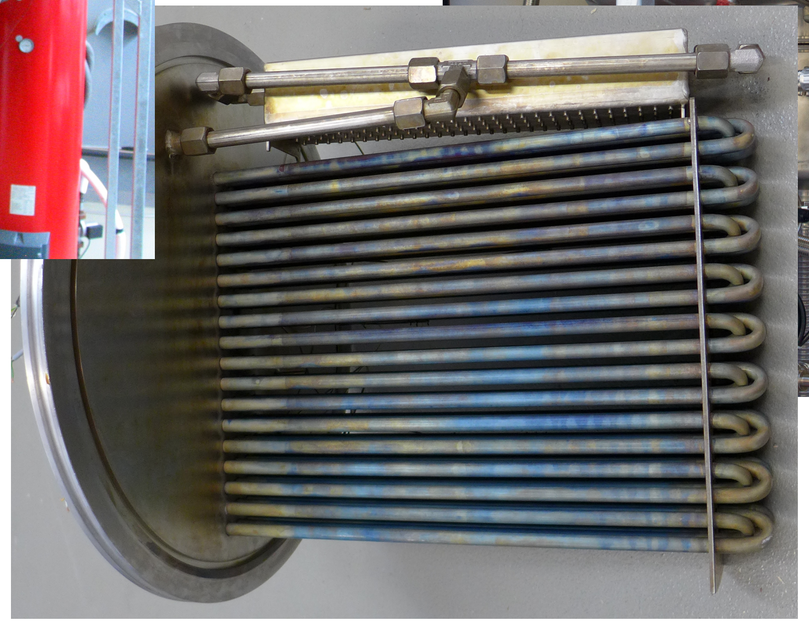
Liquid sorption heat storage research history (Empa)

2004-2012

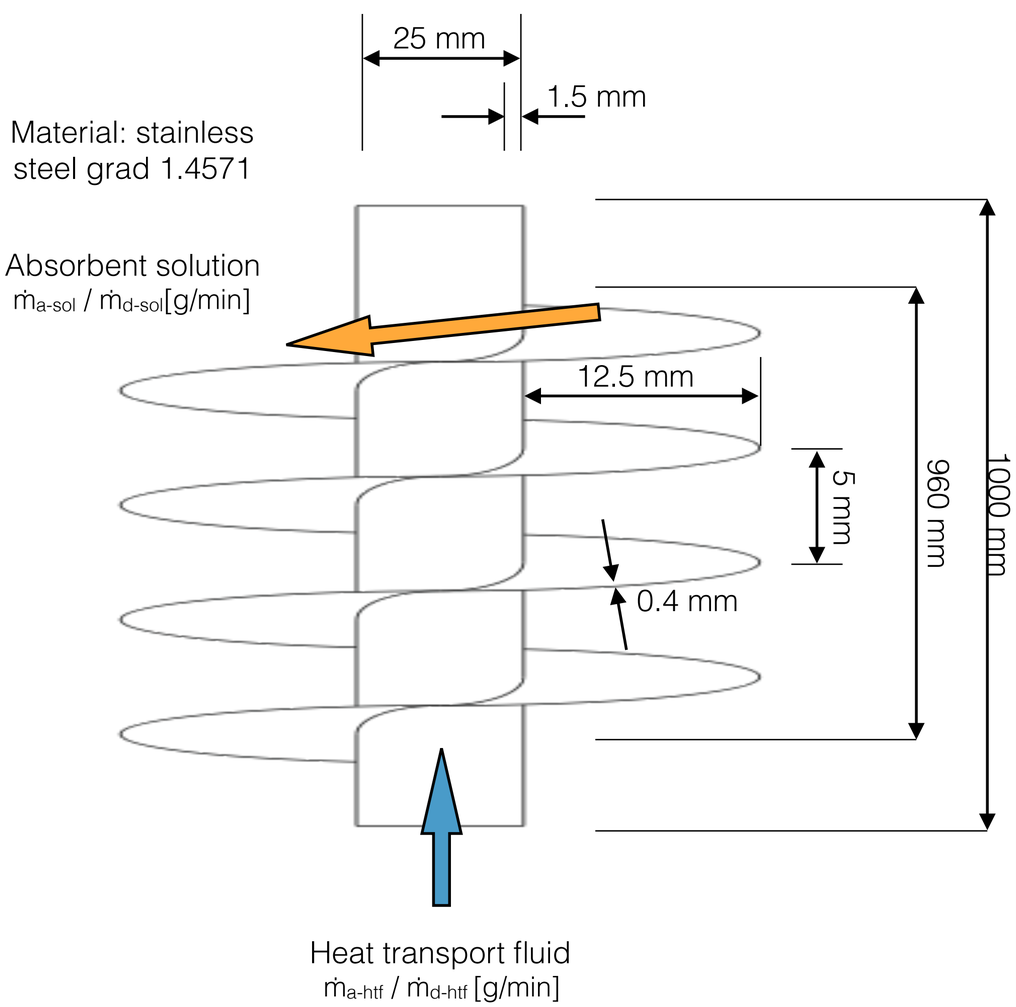
Vacuum 2008 82:708–16

2012-2016



Solar Energy, Volume 121, 2015, 17-30

Spiral finned heat and mass exchanger design



Applied Energy, Volume 200, 2017, 215-225

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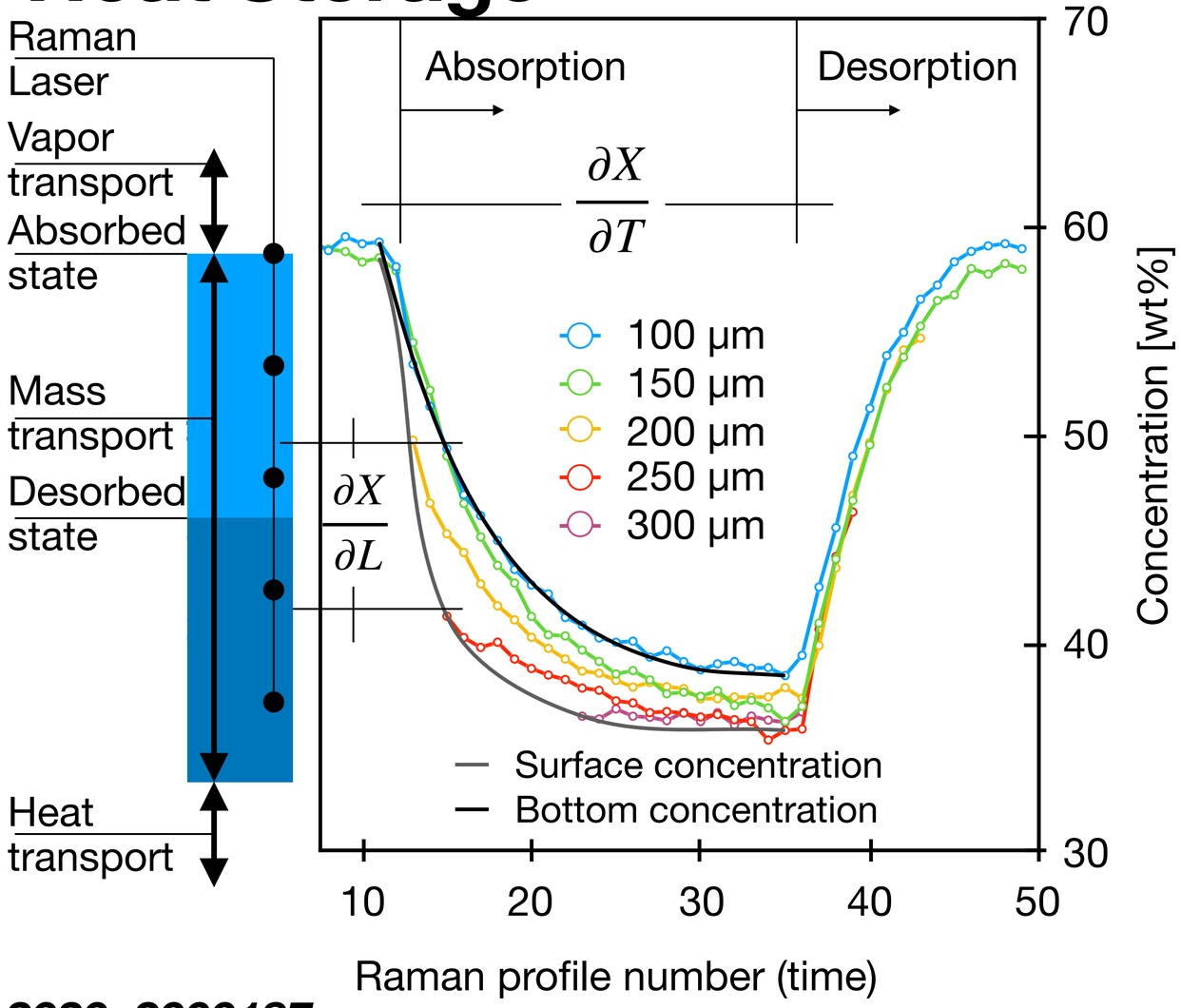
Water Transport in Aqueous Sodium Hydroxide Films for Liquid Sorption Heat Storage



Energy Technol., Volume 8, 2020, 2000187

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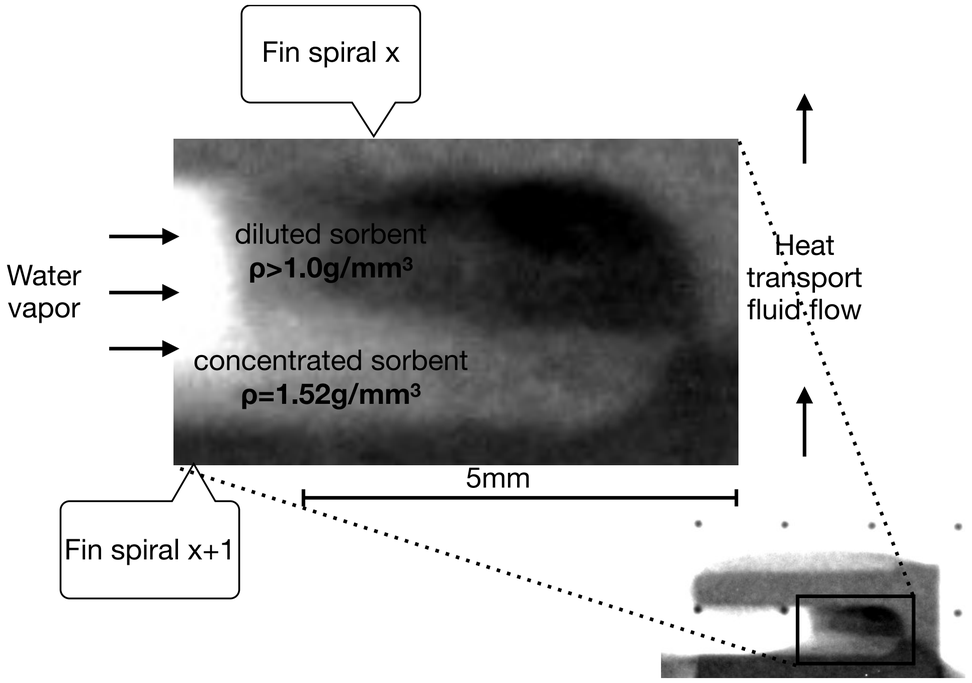
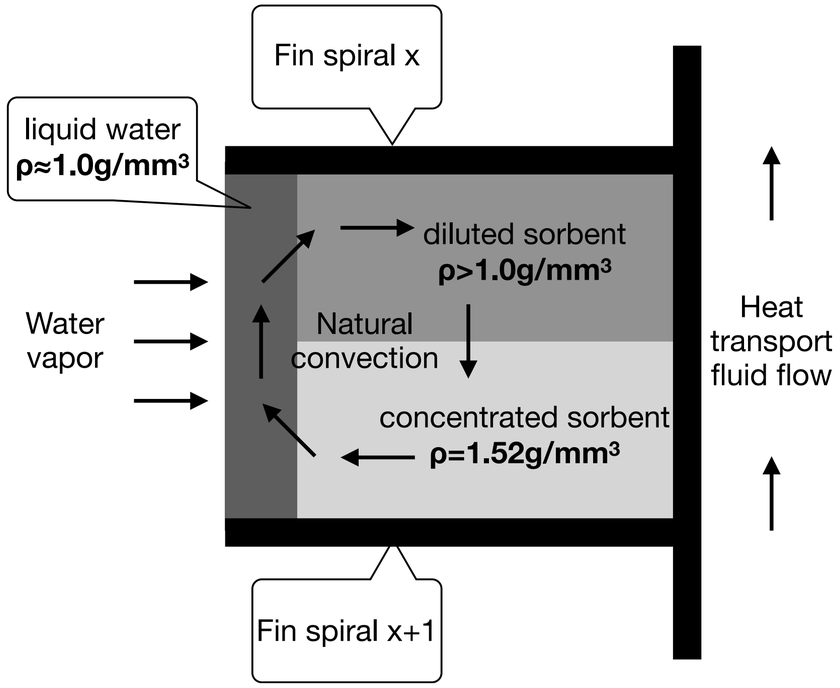
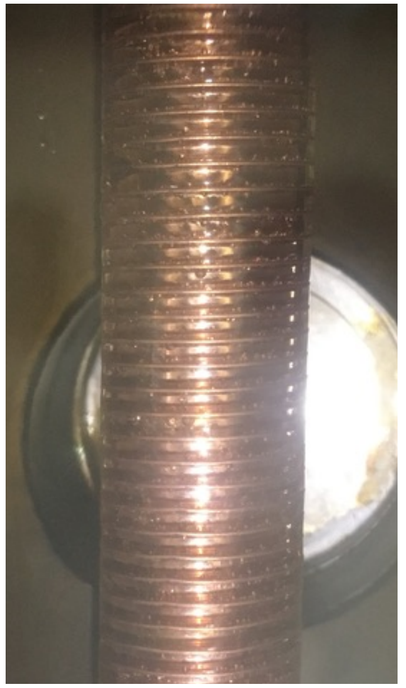
Enhanced gas-liquid absorption through natural convection studied by neutron imaging







International Journal of Heat and Mass Transfer 182 (2022) 121967

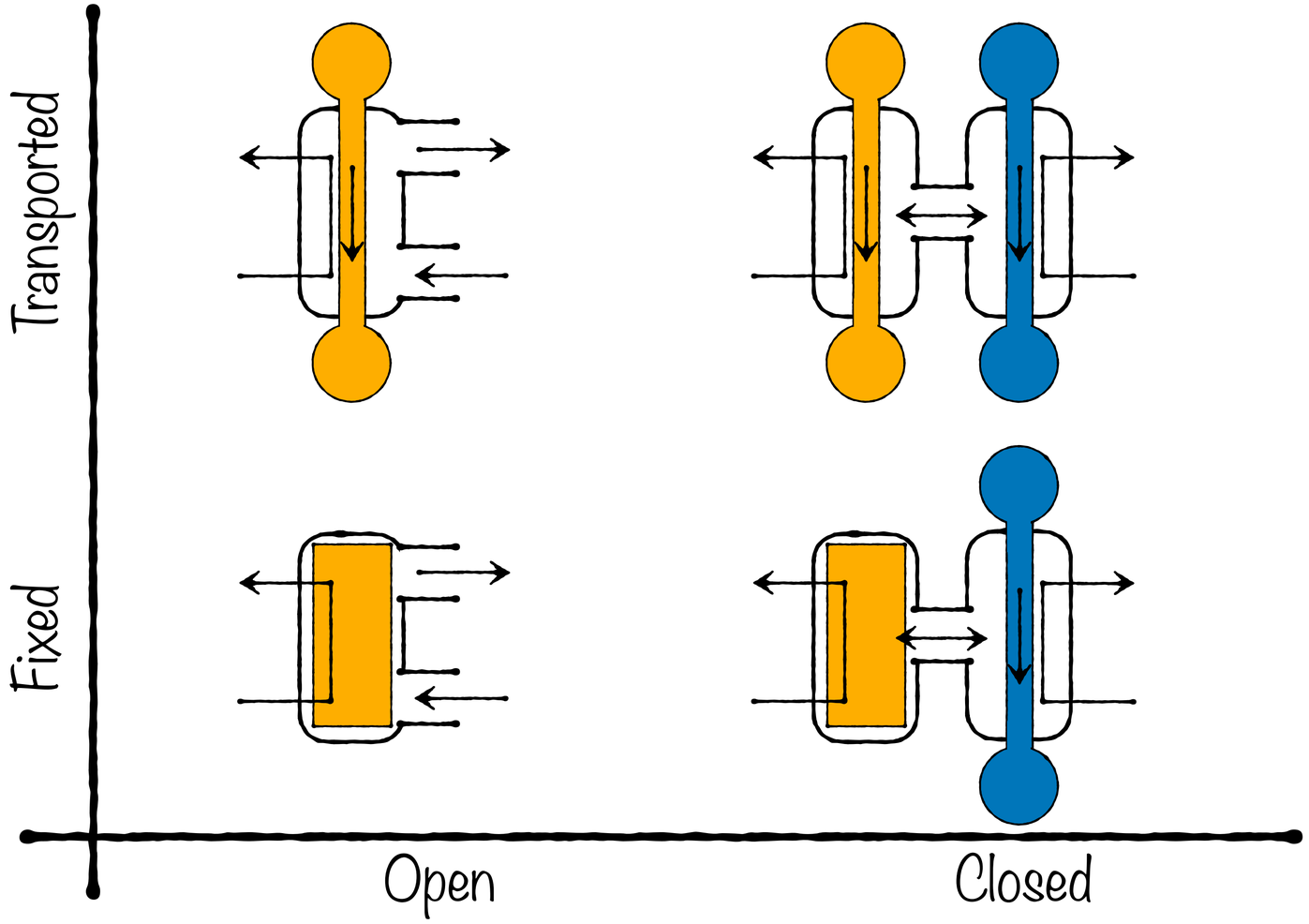
International Energy Agency Activities

- SHC/ES Task/Annex 58/33: Material and Component Development for Thermal Energy Storage
  - Leading subtask 4T: Component design for Thermo Chemical Materials
- SHC/ES Task 67/40: Compact Thermal Energy Storage Materials within Components within System
  - Leading Subtask E: Effective Component Performance With Innovative Materials

SHC
SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

energy storage
IEA Technology Collaboration Programme

Process classification and analysis of performance limitations



Renewable and Sustainable Energy Reviews 111, 2019, 57–74

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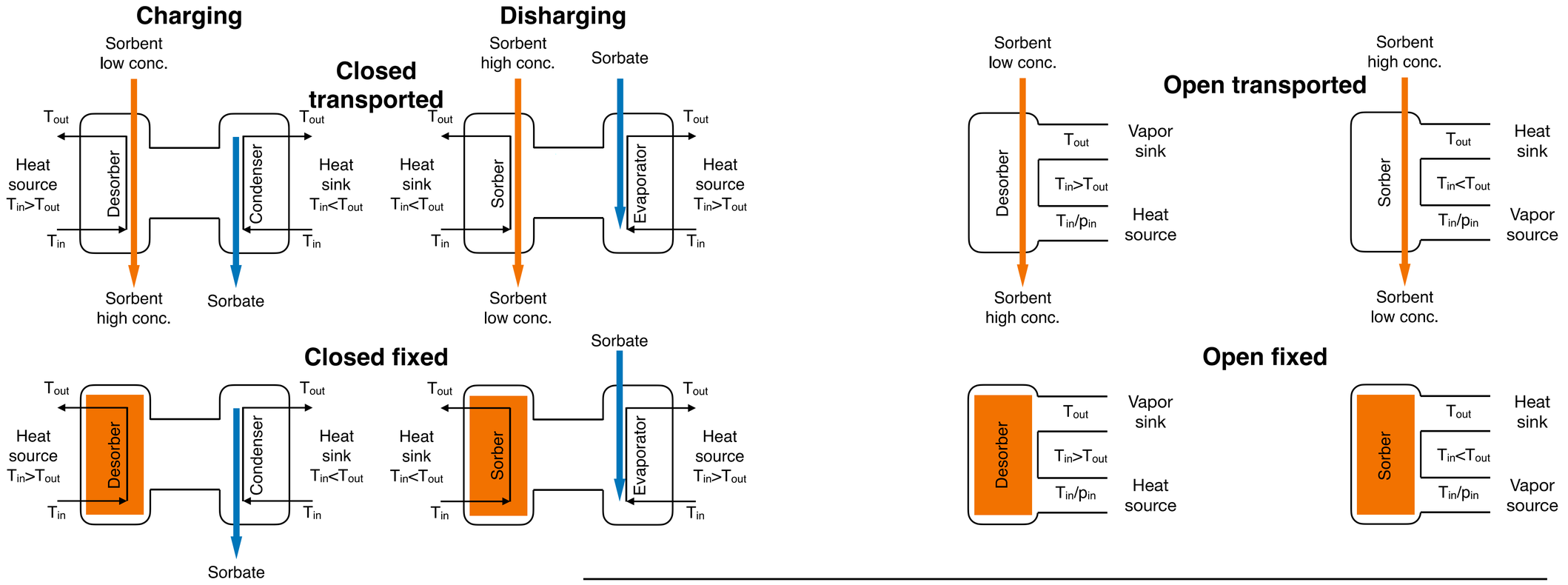
Static Temperature Guideline for Comparative Testing of Sorption Heat Storage Systems for Building Application

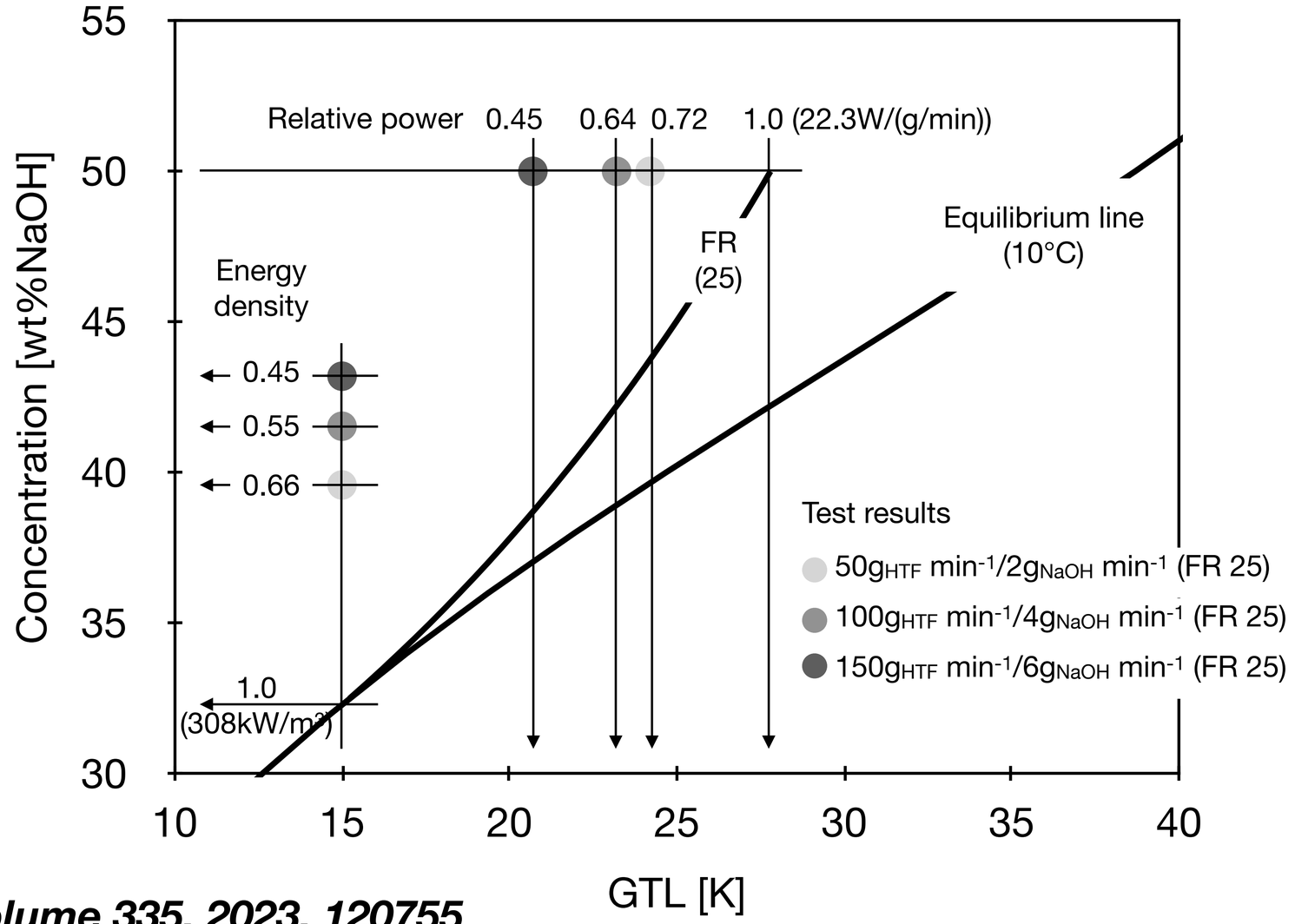


Process	Input Temperature (Vapor Pressure *)	Output Temperature
Desorption	95 °C (3.0 kPa)	92 °C
Condensation	30 °C	35 °C
Evaporation	10 °C (0.87 kPa)	7 °C
Sorption	30 °C	35 °C

* Vapor pressure is relevant only for open systems.

Energies 2021, 14, 3754

Performance mapping of a closed liquid sorption heat storage process



Applied Energy, Volume 335, 2023, 120755

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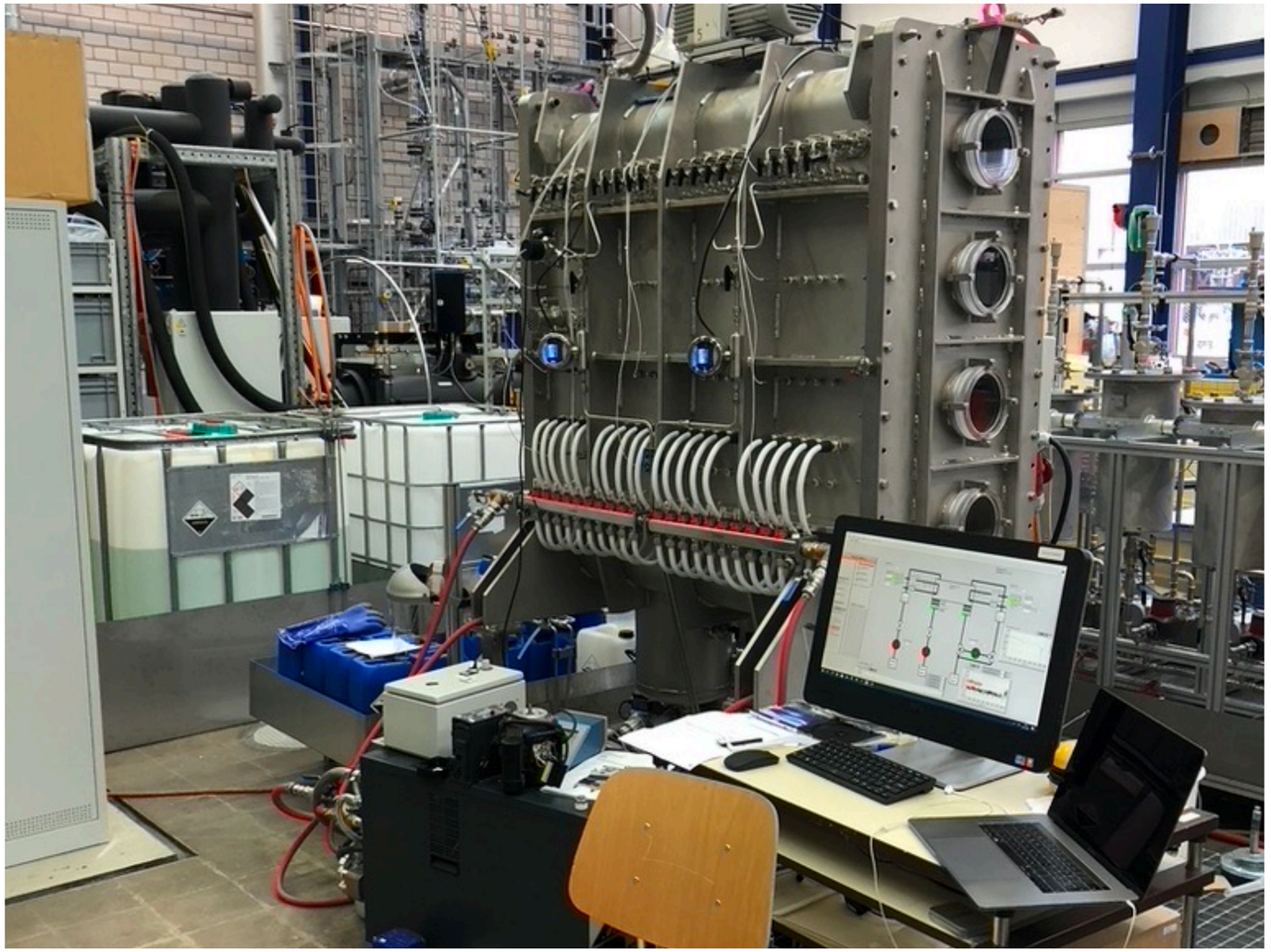
Upscaled Heat and Mass Exchanger



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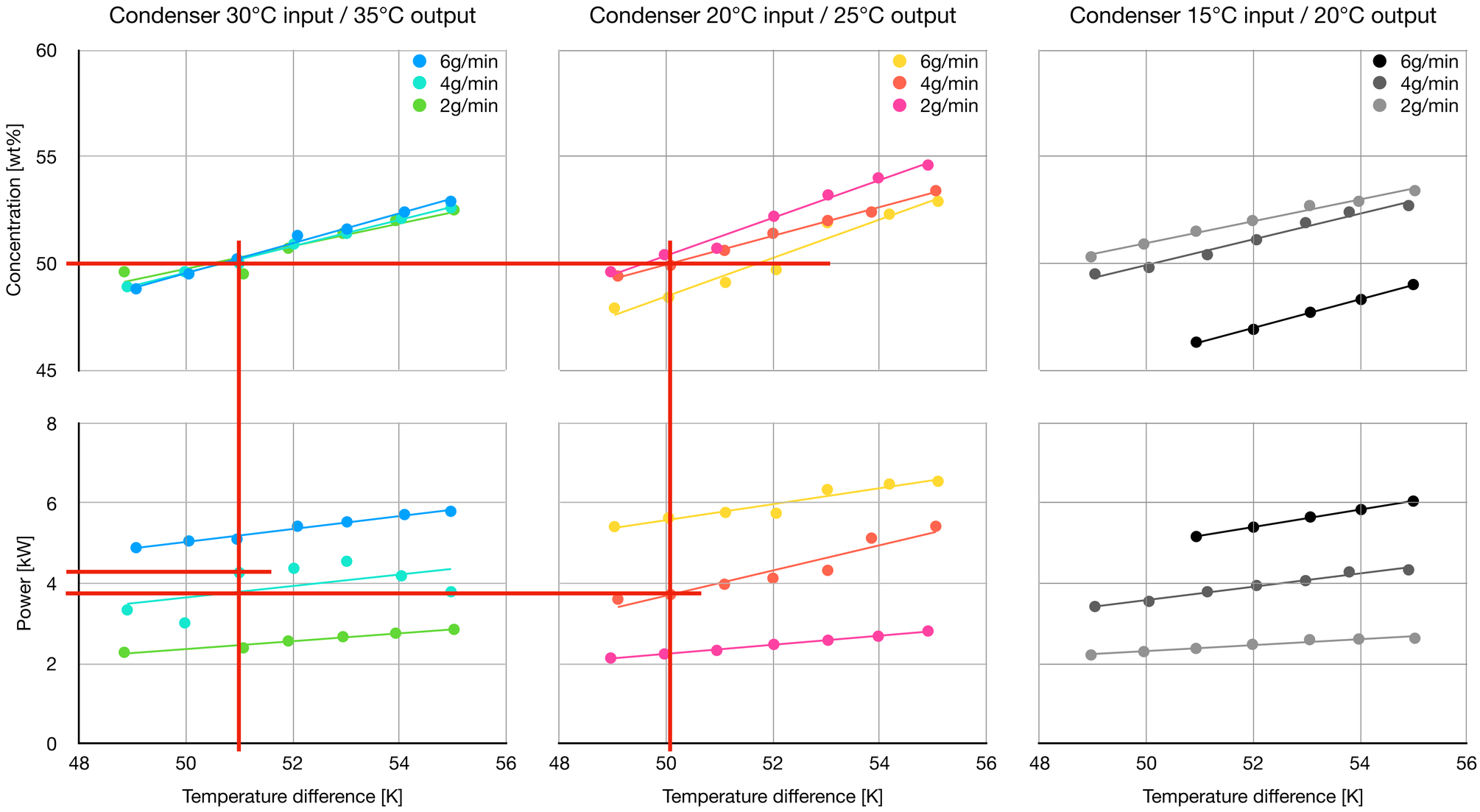
HMX Performance in desorption



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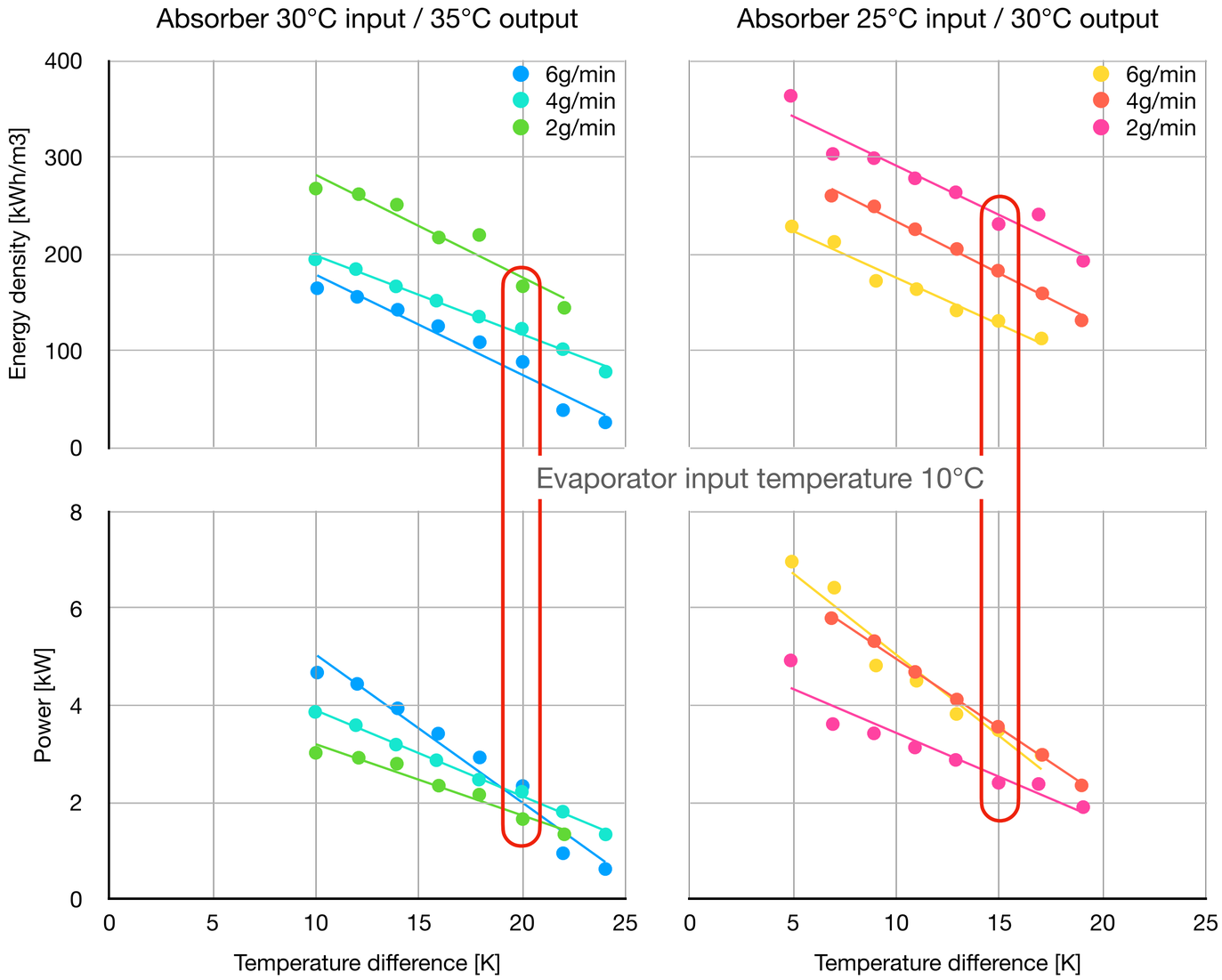
HMX Performance in absorption



HSLU Lucerne University of Applied Sciences and Arts

Dr. Benjamin Fumey
Senior Research Associate of the
Lucerne University of Applied Sciences
Technikumstrasse 21
6048 Horw
Switzerland

Tel: +41 41 349 39 02
benjamin.fumey@hslu.ch