

Diploma thesis

Experimental investigation of stratified thermal storage using optical flow visualization techniques

Field of Mechanical Engineering or Process Engineering

Stratified thermal storage for water is an key component of a thermally driven heat pump system e.g. Adsorption heat pump. The stratified thermal storages enables the thermal cycle to be driven with low temperature differences and therefore achieve higher coefficient of performance. The degree of stratification is a very crucial factor. The geometry of inlet and outlet flow diffusers affect the stratification as it causes mixing and destroys stratification. Hence it is important to investigate different inlet and outlet flow diffuser geometries and the flow inside the tank.

In this work, a tank made of plexiglas is to be built. The fluid circuit is required to be designed. The optical system required for the BOS (Background Oriented Schlieren) is required to be built which consists of cameras, background illumination, computers for controlling the cameras and data logging system. The acquired data has to be analyzed using cross-correlation software and has to be documented appropriately. A PIV (Particle Image Velocimetry) measurement could also be taken. Therefore necessary changes in the test set up have to be made.

Start : Sep. 2011

Requirements:

- strong motivation and independent work
- interest in familiarizing with new fields of knowledge and activity
- reliability and systematic methodology
- knowledge and skills in experimental work would be a plus
- good knowledge in the field of fluid dynamics and thermodynamics

We offer:

- interesting and promising field of activity
- scientific documentation
- extensive support
- good laboratory facilities
- motivating scientific working atmosphere

Further information

M.Sc. Chirag Joshi, SRG Energy and Building Technology
Department of Fluid Machinery
Engelbert Arnold Str. 12, Geb. 10.95, Raum Nr.104
Tel.: +49 721 608 42353, E-Mail: chirag.joshi@kit.edu

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