Karlsruhe Institute of Technology

Faculty of Mechanical Engineering
Dept. of Fluid Machinery
SRG Energy and Building Technology

Diploma thesis

Design and construction of flow diffuser and experimental investigation of flow distribution in thermal storage tank

Field of Mechanical Engineering or Process Engineering

Stratified thermal storage for water is a key component of a thermally driven heat pump system e.g. Adsorption heat pump. The stratified thermal storage 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 affects the stratification as the incorrect design causes mixing and destroys stratification. Hence it is important to investigate different inlet and outlet flow diffuser geometries and the flow distribution in the tank.

In this work, an innovative inlet flow diffuser will be designed, constructed and then tested. The flow diffuser will be modeled using a CAD tool (Pro-E/CATIA) and a corresponding CNC code will be generated using a CAM tool (ESPRIT).The machining will be performed with the support of the workshop at the institute. The construction of the diffuser will be achieved using tubes, foam and steel webbing. The performance of the diffuser will be qualitatively tested using dye test.

Start : June. 2012

Requirements:

- knowledge of CAD/CAM tool is an advantage
- 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:

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

Further information

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