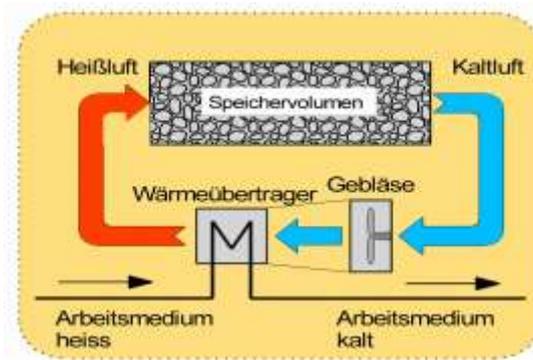


Short term heat or cold storage in industry, AiF 184 EN



Quelle: DLR Stuttgart

In many industrial processes heat is released at certain moments that could be reused at a later time, provided that temporary storage is possible. The goal of this project is the enumeration, evaluation and demonstration of the current and near future solutions for this. Existing storage techniques, like water or steam buffers, are used as comparative basic principles for aspects like temperature levels, heat loss, capacity/volume ratio, safety, durability and cost. Special attention is given to various PCMs (Phase Changing Materials) and storage through reversible endothermic/exothermic thermo-chemical reactions. Another important objective is the research into “system integration”. The heat or cold has to be absorbed, stored and released within a certain time frame and with a certain capacity and power (charge and discharge rate). Adapted simulation software will be developed to find optimized storage properties for a given process. The main focus regarding cold storage will be negative temperatures, also through PCMs, seeing as ice water and ice accumulation are already well known. A demo high temperature heat buffer will be set up linked to an existing Organic Rankine Cycle (ORC) test bench in Ghent University. The technical and economic feasibility of heat/cold storage will be investigated using case studies. Furthermore, its utility in the field of variable electricity and gas prices (spot and balancing market) will be verified. Based on price estimations found in literature, the economic prospects of heat storage systems are advantageous. In addition, parallel to the general tendency towards an energy transition, a phasing out of fossil fuels is recommended and the “all electric factory” option increasingly gains attention. When companies will generate all the required heat with (mainly renewable) electricity, storage will become crucial part. This social challenge was an important motive to propose this project at the current time.

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