**Synergetic optimization of magnetic refrigerant and cooling system**

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We will start with a review of our recent works on developing magnetic refrigerants based on LaFeSi-, Heusler- and Fe2P-type compounds. Primary magnetocaloric properties are investigated, intrinsic and extrinsic contributions to hysteresis are analysed and secondary engineering properties are studied. These results are put into a broader context when in a MCE material´s library the (cyclic) adiabatic temperature of large number of candidate materials is matched with each other.

We then move to the description of our magnetocaloric test bench which allows the assessment of the above materials under real working conditions – the latter being quite different from the above elaborated measurements protocols commonly employed. These tests and additional FEM simulations of system parameters including the implementation of materials parameters ΔTad, heat capacity Cp and thermal conductivity λ help to develop further the cooling device and the magnetic refrigerant.

Key Words: MCE alloys, direct ΔTad measurements, simulation, heat exchanger.

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