ELICiT Environmentally Low Impact Cooling Technology

Newsletter 2016



Third and final ELICiT workshop at Thermag VII, Turin (Italy)

November 28, 2016

Third and final workshop: A great success at ThermagVII!

At the occasion of the ThermagVII conference held in Turin (Italy), attended by approximately 200 delegates of which more than 70 came from companies, the IIR organized, coordinated and facilitated the last ELICiT workshop held on September 14, 2016.

The workshop was attended by 60 participants mainly from industry. The ELICiT project coordinator, Raffaele Paganini from Whirlpool R&D, opened the workshop by introducing the objectives and the structure of the project. The results and achievements of the project were presented by the other partners.

In particular, Alessandro Pastore from Camfridge presented the highly scalable industrial processes developed by Camfridge for manufacturing a compact and low cost magnetic cooling engine for high-efficiency domestic appliances. Several preliminary results of the magnetic cooling engine obtained in various operational environments limited by the availability of the magnetocaloric material were presented, as well as a clear commercial exploitation plan.

Marcel van Beek from Re/genT presented the results related to the design of low cost heat exchangers for a domestic refrigerator cabinet taking into consideration the magnetic cooling engine operational specifications.

Stefano Guarino from S.C.I.R.E presented the results of the characterization of innovative metal foam to be used in heat exchangers. These results were a world premiere and allowed the design of innovative, high performing heat exchangers.

Thomas Michineau from Cemafroid presented the different EU regulations applicable to magnetic refrigerators with an emphasis on new international test standard IEC: 62552-2015.

Rossella Luglietti from Politecnico di Milano presented the Simulation Toolbox based on the Life Cycle Assessment and the Life Cycle Costing principles developed during the ELICiT project that allowed for the economic and environmental assessment both of components and of the magnetically cooled domestic refrigerator already at the design stage.
Rossella also presented the environmental assessment of the domestic refrigerator using the gas compressor. One insightful result of this work was that the preindustrial and industrial phase of traditional refrigerator presents an environmental impact of equivalent magnitude of the magnetically cooled domestic refrigerator prototype developed by ELICiT.

Download the presentations
from the 3rd and final ELICiT Workshop at ThermagVII
at www.elicit.project.eu

November 8, 2016

Support and participation in the joint I-SWG/DIN Magnetic Refrigeration workshop

On November 8, 2016 in Berlin (Germany), the German Institute for Standardization 'DIN' co-organized its first 'creative standards workshop' for magnetic refrigeration as a technology, which attracted a large number of participants.

Stakeholders such as OEM developers, metallic refrigerants, plus others in the future supply chain and academics, came together to brainstorm the consumer and industrial standards required to establish and support an 'Industrial Environment' from 2020.

This focused mainly, but not exclusively, on metallic refrigerants and the integration of heat pumps in end user devices, with the objective being to independently highlight the initial topics and work priorities.

Alessandro Pastore, from Camfridge, attended representing not only one of the world leading companies developing magnetic cooling technologies, but also the ELICiT project.

With twenty participants, including both chairmen of the IIR Industry Sub Working-Group (I-SWG), Tim Lorkin and David Beers of GE Appliances, Nextpac, Astronautics and Camfridge represented four out of five OEM's, and academics interested in industrialization processes such as forming, endurance and aging also actively participated.

Other participants came from different levels of the value chain in VAC (major magnet and future metallic refrigerants supplier) and future end users such as BSH (Bosch).

The results of this day supported the ongoing actions at DIN to establish EU and ISO level standards for this technology, with future ambitions to support such a future project currently being reviewed.



High spirits at the final ELICiT meeting at Whirlpool in the presence of Wanda Gaj (Project Officer, DG Research & Innovation, European Commission)



ELICiT partners visit the working machine under test conditions at Whirlpool Research Lab in Cassinetta

Partner News

Camfridge

Within the framework of the ELICiT project, Camfridge developed all the industrial processes necessary to scale up the production of Camfridge magnetic cooling technology. As an immediate follow-up of the project, Camfridge has expanded its testing and production facilities offering additional fridge manufacturers the opportunity to evaluate and test the Camfridge magnetic cooling solution. This represents a major step towards commercialization.

Cemafroid

Cemafroid performed a comparison between operating parameters of the ELICiT prototype with other magnetic cooling engines. The ELICiT prototype demonstrated a good trade-off between cost, magnetic flux, specific power density, size and performance. Cemafroid analyzed the results of the test performed on the entire appliance.

International Institute of Refrigeration (IIR)

As work package leader of the dissemination, throughout the project the IIR organized three ELICiT workshops, facilitated the publication of two academic articles in the International Journal of Refrigeration and four articles in refrigeration technical journals. The IIR also promoted ELICiT worldwide at eleven trade exhibitions, eleven IIR conferences and eight IIR co-sponsored conferences.

Politecnico di Milano

Politecnico di Milano evaluated the environmental impact and costs of magnetic refrigeration throughout the life cycle. During the three-year project it shared knowledge with the consortium partners providing the necessary information to make informed decisions regarding components with a lower environmental impact and costs. The Simulation Toolbox has been left to the consortium for continuous improvements of their products.

PSUtec

During the last year of the project, besides the day-to-day assistance in the management of the project, PSUtec supported the partners in the preparation of their plans for the exploitation of the project results. Firstly, with the help of a questionnaire, all the potential exploitation routes were identified; secondly, the exploitation plans were developed and documented.

Re/genT

Re/genT has further increased its knowledge in designing low-cost high-efficiency heat exchangers and has successfully developed four heat exchangers that met the project goals. Two of these heat exchangers are made from plastic, which next to being low cost, have been demonstrated to have a significantly smaller impact on the environment than conventional metal exchangers.

TCS Micropumps

TCS Micropumps have successfully developed the MG1000 gear pump to a level that surpasses the requirements of the magnetic refrigeration system. It is a small, precision pump that with its seal-less, brushless design has proven reliability and durability. In parallel, TCS Micropumps also developed the all new “R” pump, that has significant advantages over all other pumps, with a low environmental impact and production costs.

S.C.I.R.E

Starting from the HEX prototype, a numerical model of a HEX was realized, validated and used to optimize a given HEX geometry. The goal was to increase the amount of HEX dissipated power. The geometry optimization process of the aluminum metal foam heat exchanger led to an increase of the heat flux equal to 34%.

Whirlpool R&D

Whirlpool had the possibility to evaluate the magnetic cooling engine integrated with all the optimized technologies on a modified production appliance. Key component specifications and control parameters were identified: the acquired knowledge during the three years spent on the ELICiT project is extremely important as it reduces the gap between the research and the production phases.

Thank you!

A big thank you to all those who made the ELICiT project a success!

Find more news at **www.elicit.project.eu**

#MagneticCooling

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