MEMBRANE BASED CLIMATE CONTROL SYSTEM TO EXTEND THE RANGE OF ELECTRIC VEHICLES

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Substantial amount of energy is required to run auxiliary systems within electric vehicles (EV), which is a major drain on the battery and so limits the driving range of the EV.
A new Climate Control System (CCS) has been developed in the framework of a project called XERIC and funded by the European Commission under the programme H2020.

Specifically, XERIC's CCS controls the temperature and the humidity within EV's cabin and can reduce by more than 50% the energy used for passenger comfort.

With current technologies (other than the XERIC CCS), air is dehumidified thanks to climate control systems based on a Vapour Compression Cycle (VCC), which cools air below its dew point.

Alternatively, desiccants can be used to dehumidify air without cooling it below its dew point. This is an efficient way which allows controlling temperature and humidity independently.

XERIC partners developed up to TRL 6 a hybrid system, combining a liquid desiccant cycle (operating on humidity) with a traditional VCC (dealing with temperature). In such a system, the VCC operates at higher refrigerant evaporation temperature and lower condensation temperature. The result is energy saving.

This hybrid combination is possible thanks to an innovative 3-Fluids-Combined Membrane Contactor (3F-CMC) that works simultaneously with air, desiccant solution and refrigerant.

Although the main applications targeted within the project are EV and boats, XERIC CCS can be exploited also for other applications where humidity needs to be removed from the air, such as in buildings, industrial applications (food and pharmaceutical industries) and refrigeration sectors in general.

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