Data loggers and sensors for measuring the performance of membrane-based enthalpy recovery units

COWIfonden has decided to provide financial support to the Danish Building Research Institute/Aalborg University for the acquisition of data loggers and sensors. The decision makes it possible to extend an ongoing research project examining the performance of membrane-based enthalpy recovery units. The instruments are to be used for measuring and recording relative humidity, temperatures and barometric pressures in a test setup developed at the Danish Building Research Institute's laboratory in Hørsholm. The Department of Energy and Environment at the Danish Building Research Institute/Aalborg University is involved in several projects focusing on optimisation of ventilation systems and development of solutions reducing pressure loss and ensuring lower energy consumption. Energy savings in ventilation systems are important in order to achieve the overall aim for energy savings, for instance as stated in the most recent energy policy agreement.

The purpose of the project is to analyse the energy performance of membrane-based enthalpy recovery units and to identify the advantages and disadvantages of such units and describe the possibilities and limitations of applications. Studies have shown that the energy demand in a ventilation system with a membrane-based enthalpy recovery unit may be 10-20% lower than that of a comparable system with a conventional heat recovery unit.

In conventional heat recovery units, such as crossflow heat exchangers and counter-flow heat exchangers, only sensible heat relating to differences in air temperatures are transferred. In enthalpy recovery units, both sensible heat and latent heat are transferred, ie the heat energy contained in the vapour content of the air. Transfer of latent heat means that the humidity of the indoor air is not significantly reduced. In new buildings, the humidity is often inappropriately low.

The funds received from COWIfonden will make it possible to record a larger number of parameters in connection with the studies, for instance air temperature, air humidity, surface temperature and barometric pressure.

The results will be of general use and provide new knowledge about the performance of ventilation systems to achieve the planned (in the design phase) energy efficiency. The findings will be summarised in an independent report and with reference to COWIfonden. The report will be available in June 2017.