

# Performance of heat pump systems in building applications



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The theme of this issue is heat pumps. Part of the material in this issue has been compiled with the help of IEA Heat Pump Programme. The Programme plays an important role in accelerating the use of heat pumps in all applications where they can reduce energy consumption for the benefit of the environment.

In recent years there have been tremendous improvements in the performance of heat pumps, particularly in the efficiency of compressors and heat exchangers. Significant standardisation has helped the development.

However, the compressor is only one component in a heat pump system. Only with a good overall design and operation of the system is the predicted energy efficiency and good indoor environment achieved. When used in building applications, heat pumps are part of the heating and air-conditioning system with fixed boundary conditions. In building applications, a major challenge is to achieve good performance under varying conditions and temperature levels of heat source and sink.

A major advantage of heat pumps is their reversible operation. The need for cooling has been a driving force in the increasing use of residential, particularly air-to-air, heat pump applications. However, there remains a significant need for improvement in reducing their noise level and draft, to conform to commonly accepted standards for indoor environment.

Heat pump manufacturers often inform the customers only the peak performance efficiency of heat pumps. This is misleading in many cases, as operating hours at peak capacity are quite limited and heat pumps operate most of the time at part load conditions. This is why the European Union now requires data on the seasonal efficiency of the products sold in the EU area.

The effective use of heat pumps in buildings needs close cooperation between manufactures and building designers during the development of applications. Designers are represented nationally and internationally in several engineering associations. Standards should increasingly cover building applications, not only the primary components of heat pumps. Cooperation between designers and manufacturers is needed.

For the user of heat pumps, reliable performance data is crucial when making the purchase decision. For this

purpose a third party independent certification is necessary. Such certification procedures are available in several countries, some of which, like European certification, are used in more than one country. Unfortunately for the manufacturers, all national certification systems have their own procedures and test conditions, and one certification is not accepted in another country. Hopefully, in the future, certification process can be standardised internationally and rationalised. This would benefit manufactures and customers. ■

## TIME FOR FRESH AIR – my last issue

During the last six years, REHVA Journal has grown from a quarterly magazine with less than 200 pages to a well-recognized bi-monthly journal with close to 600 printed pages annually. Authors of the articles now represent the whole HVAC community in Europe with additional international input. Paper copies are sent to 6 000 addresses, mainly in Europe but also to important readers all over the world.

My target has been to develop a publication that offers readers good technical information, neither scientific reports nor commercial testimonies, but a balance between the two. Feedback from the readers shows that this approach has been widely accepted.

This is the last issue compiled by me as editor-in-chief. I have enjoyed working with

the authors and am grateful for their contributions. I am now looking forward to devoting more time to my professional activities in Finland.



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