

3 questions to ...

Thomas Spänich, member of the eurammon Executive Board

Heat pumps with natural refrigerants

1. *Mr Spänich, heat pumps are an energy-efficient option of generating required heating energy. Where in the industrial area is the application of these pumps particularly well suited?*

T.S.: Heat pumps can be applied exceptionally well, especially in areas where applications are coupled to heat recovery from industrial processes. For a long time, industry did not realise what potential was hidden in the recovery of thermal energy. The increasing relevance of renewable energy resulted in significant progress being made in terms of the reuse of existing heat energy. Since then, industry has increasingly focused on using this progress for heat pumps. For this purpose, industry primarily uses waste heat from cooling processes, but also exploits heat being generated in computer centres or sewage treatment plants. Compared to other energy sources, this renewable heat energy is climate-friendly, unlimited, and helps to significantly reduce the requirement for conventional energy. Thanks to their lower power consumption, heat pumps have developed in industry to become a very efficient option of generating heat energy, which has also led to an increase in their demand.

2. *What are the advantages of heat pumps that operate with natural refrigerants?*

T.S.: Using natural refrigerants with heat pumps has got one big advantage: they are exceptionally environmentally friendly. Contrary to synthetic refrigerants, they do not contain harmful fluorine and therefore they have either none or only an extremely low Global Warming Potential (GWP). The degree to which the different procedures of heat recovery comply with ecological requirements will be a decisive factor, of which methods will in future be able to penetrate the market. This is the particular advantage of using natural refrigerants for

heat pumps. They allow the recovery of the required heat energy very efficiently and at the same time in an environmentally friendly way.

3. *What is the current development of the heat pump market with natural refrigerants like? What challenges are applications with natural refrigerants faced with?*

T.S.: On the heat pump market, the trend is clearly towards using natural refrigerants. They are environmentally friendly and provide more cost- and energy-efficient heating than heat pumps with synthetic refrigerants. It is a challenge to the market to establish heat pumps with natural refrigerants for private use: it is the objective to also be able to use those refrigerants for smaller heat pumps, which were up to now only used in large industrial plants. Carbon dioxide and ammonia as refrigerants for small power units like heat pumps for (semi-)detached and terraced houses is already possible technically. Several manufacturers already offer heat pumps with carbon dioxide. The research project of Bezhad Abolhassani Monfared is an excellent example of an ammonia heat pump for small power requirements. With his heat pump, the runner-up of the eurammon Natural Refrigeration Award 2011 shows that the high safety precautions in handling ammonia will in future no longer be a stumbling block for using ammonia. We are looking forward to models, suitable for series production, which will allow the use of heat pumps with natural refrigerants in future in the private sector.