Interview with Eric Delforge

Unabated potential:

The ammonia working group on a refrigerant for the future.

In 2012, eurammon, the initiative for natural refrigerants, founded the ammonia working group. In an interview, working group chairman Eric Delforge explains why the working group was set up, the significance of the revised F-Gas Regulation and why natural refrigerants such as ammonia or CO_2 will continue to become more relevant in the long term.

Mr Delforge, how did the ammonia working group come to be set up?

Eric Delforge: As a natural refrigerant, ammonia offers a great potential in the future for many applications and various capacity ranges thanks to its high environmental benefits and energy efficiency. However, we still have decision makers even within the refrigeration, air-conditioning and heat pump industry who denounce ammonia is a dangerous refrigerant. Unfortunately, there is also a belief that ammonia installations are inherently expensive and do not offer a sufficient energy efficiency advantage to provide an acceptable return on investment. Furthermore, the use of ammonia is excessively penalized by local legislative restrictions in many EU member states. This is why we decided at a eurammon general meeting in Mechelen in 2012 to address these issues directly and set up the ammonia working group.

What are the working group's specific aims?

Eric Delforge: Our aim is to provide information about the various possible applications of NH_3 and to give ammonia a more objective image by communicating practical facts. Top priority is given to provide substantiated information about ammonia as a refrigerant, so that both the owners and, in the end, also the environment can benefit from the use of ammonia. General scientific data regarding energy efficiency and costs are supplemented by application examples from practical use.

Does the working group have a special project to help you achieve this aim?

Eric Delforge: To encourage a realistic appraisal of the facts, we want to show the industry how and where ammonia can be used safely and efficiently as a refrigerant. At the moment we are planning a series of short video interviews with companies that have already opted for an ammonia refrigeration system and to have them testify to their positive experiences. We hope the final list of end-users will include international representatives from the food manufacturing, temperature controlled storage, beverage, dairy and brewery sectors. We already work closely together with many operators who keep us informed with a constant flow of highly valuable information about the challenges involved in practical use. One example: the revised F-Gas Regulation provides a legal framework that is valid throughout Europe, stipulating which refrigerants are allowed or prohibited. But the individual Member States can have additional local rules, for example in terms of the safety regulations or eventually how refrigerants are taxed. We collect this information and make it available to the market as background information that is relevant to decision-making processes. Furthermore, we also compile the most frequent and important questions and the answers covering all aspects of ammonia. Eventually these will be published in a Q&A section of the eurammon website, together with a freely available presentation with basic information about the ammonia topic.

What is ammonia's role on the market at present and in future?

Eric Delforge: Most people ignore that ammonia has been used as a refrigerant for over a century, particularly in large capacity ranges, the so called industrial applications. Furthermore, ammonia also offers a huge potential for commercial systems in the medium capacity range. Initially we are looking to make the market aware of the fact that ammonia and other natural refrigerants are not just alternatives to synthetic refrigerants but that in the long term they can become the most widely used refrigerants. Aside from being very environmentally friendly – ammonia for example has a GWP and ODP of zero – we also have to emphasize their efficiency and future viability. Moreover, users are naturally also interested in the macroeconomic view. A look at the overall life cycle of refrigerating systems operating with ammonia shows that low operating costs not only swiftly compensate for the high end value in purchasing these systems, but also offer long term advantages in both ecological and economical terms. This applies all the more when taking into account that in future the taxation of refrigerants may depend heavily on environmental criteria. In the end however, the argument that convinces the most when I speak to high end decision makers is that applications using natural refrigerants tend to outperform all in total cost of ownership.

What does the revised F-Gas Regulation mean for the refrigerant branch in general and for ammonia as a natural refrigerant in particular?

Eric Delforge: The new F-Gas Regulation that was adopted in March 2014 has finally eliminated an investment hindrance for the branch. Companies now know the legal framework conditions applying to the installation of a refrigeration system, particularly in terms of which synthetic refrigerants will be allowed and which prohibited in future. However, these rulings are part of a dynamic process and must therefore not be considered as a definitive comfort zone. In other words, some conventional refrigerants that are basically still permitted today may suddenly become a real cost factor tomorrow. In Scandinavia for example, taxation depends on the GWP and ODP level of refrigerants. This scenario could be considered by more European countries, which is already happening. Most EU member states have undertaken actions to reduce their CO_2 emissions by 2020. EU reports today predict that many countries will fail to reach their targets and will face considerable high penalties. The next step could entail sharing the costs out according to the "polluter pays" principle – including many synthetic refrigerants. Finally and most important is the fact that the new F-gas regulation is a phase down scenario. This means that the available quota allowing the use of F-gasses will in time decrease dramatically fast. Ultimately the most important message is that natural refrigerants offer the ideal solution to both energy efficiency and environmental issues which are equally relevant and important. Furthermore the miniaturization of proven industrial refrigeration and heating technology to a commercial and domestic users scale will boost business, jobs and contribute largely to a sustainable society. I am convinced that the winners will be those equipment manufacturers and end users that will make the direct transition to natural refrigerants fast!

Annex

Ammonia (NH3)

Ammonia has been successfully used as a refrigerant in industrial refrigeration plants for over 100 years. It is a colourless gas, liquefies under pressure, and has a pungent odour. In coolant technology, ammonia is known as R 717 (R = Refrigerant) and is synthetically produced for use in refrigeration. Ammonia has no ozone depletion potential (ODP = 0) and no direct global warming potential (GWP = 0). Thanks to its high energy efficiency, its contribution to the indirect global warming potential is also low. Ammonia is flammable. However, its ignition energy is 50 times higher than that of natural gas and ammonia will not burn without a supporting flame. Due to the high affinity of ammonia for atmospheric humidity it is rated as “hardly flammable”. Ammonia is toxic, but has a characteristic, sharp smell which gives a warning below concentrations of 3 mg/m³ ammonia in air possible. This means that ammonia is evident at levels far below those which endanger health (>1,750 mg/m³). Furthermore ammonia is lighter than air and therefore rises quickly.

Ozone Depletion and Global Warming Potential of Refrigerants

	Ozone Depletion Potential (ODP)	Global Warming Potential (GWP)
Ammonia (NH3)	0	0
Carbon dioxide (CO2)	0	1
Hydrocarbons (propane C3H8, propene C3H6, isobutane C4H10)	0	<3
Water (H2O)	0	0
Chlorofluoro-hydrocarbons (CFCs)	1	4680–10720
Partially halogenated chlorofluoro-hydrocarbons (HCFCs)	0.02–0.06	76–12100
Per-fluorocarbons (PFCs)	0	5820–12010
Partially halogenated fluorinated hydrocarbons (HFCs)	0	122–14310

Ozone Depletion Potential (ODP)

The ozone layer is damaged by the catalytic action of chlorine, fluorine and bromine in compounds, which reduce ozone to oxygen and thus destroy the ozone layer. The Ozone Depletion Potential (ODP) of a compound is shown as chlorine equivalent (ODP of a chlorine molecule = 1).

Global Warming Potential (GWP)

The greenhouse effect arises from the capacity of materials in the atmosphere to reflect the heat emitted by the Earth back onto the Earth. The direct Global Warming Potential (GWP) of a compound is shown as a CO2 equivalent (GWP of a CO2 molecule = 1).

About eurammon

eurammon is a joint initiative of companies, institutions and individuals who advocate an increased use of natural refrigerants. As a knowledge pool for the use of natural refrigerants in refrigeration engineering, the initiative sees as its mandate the creation of a platform for information sharing and the promotion of public awareness and acceptance of natural refrigerants. The objective is to promote the use of natural refrigerants in the interest of a healthy environment, and thereby encourage a sustainable approach in refrigeration engineering. eurammon provides comprehensive information about all aspects of natural refrigerants to experts, politicians and the public at large. It serves as a qualified contact for anyone interested in the subject. Users and designers of refrigeration projects can turn to eurammon for specific project experience and extensive information, as well as for advice on all matters of planning, licensing and operating refrigeration plants. The initiative was set up in 1996 and is open to companies and institutions with a vested interest in natural refrigerants, as well as to individuals e.g. scientists and researchers.

Internet URL: www.eurammon.com

Contacts

eurammon contact
eurammon
Dr. Karin Jahn
Lyoner Strasse 18
D-60528 Frankfurt
Germany
Phone: +49 (0)69 6603-1277
Fax: +49 (0)69 6603-2276
E-mail: karin.jahn@eurammon.com

Press contact
FAKTOR 3 AG
Judith Geller / Petra Resedaritz
Kattunbleiche 35
D-22041 Hamburg
Germany
Phone: +49 (0)40 679446-6106
Fax: +49 (0)40 679446-11
E-mail: eurammon@faktor3.de