

## **euramm<sup>o</sup>n Policy Statement**

### **euramm<sup>o</sup>n – Initiative for natural refrigerants**

euramm<sup>o</sup>n is an association of leading, multinational companies in the refrigeration sector, as well as individuals and institutions in natural refrigerants, committed to advocating the increased use of natural refrigerants. euramm<sup>o</sup>n is linked with international associations and institutions around the world through a network of cooperations and memberships. The industry initiative sees itself as a centre of expertise on the use of natural refrigerants and is fuelled by the strong personal commitment of its members.

Hence euramm<sup>o</sup>n shoulders social responsibility in the interest of an eco-industrial policy. The initiative's members develop innovative, future-proof solutions and approaches and push ahead with their implementation. euramm<sup>o</sup>n supports sustainable business practices in refrigeration and the use of energy-efficient systems. The initiative's mission is to promote the use of natural refrigerants across national borders.

### **Climate protection the natural way**

Recent worldwide efforts to step up climate protection have heightened people's interest in natural refrigerants, which have been used successfully in refrigeration technology for over 100 years. In the 1950s and 60s, they were displaced in new plants by synthetic refrigerants, touted by the chemical industry as so-called safety refrigerants. Since that time, numerous regulations were passed that unjustifiably restricted competition. However, thanks to technological innovations and thanks to their effectiveness, natural refrigerants have nevertheless become established as an efficient, safe solution for use in a wide range of industries. The most economically relevant among them are ammonia, carbon dioxide and hydrocarbons.

Natural refrigerants do not deplete the ozone layer (Ozone Depletion Potential, ODP) and either have no global warming potential – like ammonia – or only a negligible GWP. This puts them beyond comparison from a climate perspective. However, using natural refrigerants is worthwhile from an economic standpoint as well. The refrigerants themselves are inexpensive and available in vast quantities. The great efficiency of natural refrigerants and the plants that use them have a positive effect on operating costs. Ammonia, for instance, is acknowledged as the most efficient refrigerant of all. Add to that the inexpensive disposal of natural refrigerants once a plant has reached the end of its life.

### **Attributes of Natural Refrigerants**

**Ammonia** has been successfully used as a refrigerant in industrial refrigeration plants for over 130 years. It is a colourless gas, liquefies under pressure, and has a pungent odour. 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 and is toxic to skin and mucous membranes. 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 used all over the world as fertiliser. It is toxic, but has a characteristic, sharp smell which gives a warning below concentrations of 3 mg/m<sup>3</sup> ammonia in air possible. This means that ammonia is evident at levels far below those which endanger health. Furthermore ammonia is lighter than air and therefore rises quickly.

**Carbon dioxide** has a long history in refrigeration, extending back to the mid 19th century. It is a colourless gas that liquefies under pressure, with a slightly sour odour and taste. Carbon dioxide has no ozone depletion potential (ODP = 0) and negligible direct global warming potential (GWP = 1) when used as a refrigerant in closed cycles. It is non-flammable, chemically inert and heavier than air. Carbon dioxide is an element in the respiration process and becomes narcotic and harmful to human health only in high concentrations. Carbon dioxide is available in abundance.

**Hydrocarbons** such as propane, propene or iso-butane have been in operation for many years. Hydrocarbons are colourless and nearly odourless gases that liquefy under pressure, and have neither ozone depletion potential (ODP = 0) nor significant direct global warming potential (GWP < 3). Thanks to their outstanding thermodynamic characteristics, hydrocarbons make particularly energy efficient refrigerants. Hydrocarbons are available cheaply all over the world; thanks to their ideal refrigerant characteristics they are commonly used in small plants with low refrigerant charges.

## Refrigeration in the Future

Whether in the food and beverage industry, in air-conditioning, in sport and recreation facilities, the chemicals and pharmaceuticals industry or in automotives – refrigeration plants using natural refrigerants have proven themselves as an environmentally friendly, economical and reliable solution for producing cold energy. The European initiative eurammon puts its expertise at the service of opening up new areas of application for natural refrigerants and is open to anyone interested in refrigeration, the natural way.

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