TALKING AMMONIA...

Ammonia: the green alternative refrigerant

J & E Hall safety and environmental manager Malcolm Coates explains why training and the right preparation is important before installing ammonia systems.

Ammonia is a versatile, effective and efficient natural refrigerant. The F-Gas stepdowns now make it the refrigerant of choice for many installers and end-users. Ammonia is a green alternative to more commonly-used industrial refrigerants and there are excellent reasons for choosing it for an application.

Primarily, it is a natural refrigerant which does not deplete the ozone layer and has excellent thermodynamic qualities which give it a wide temperature range.

Like any refrigerant, ammonia has to be treated with respect but it has a fine safety record and is used in many applications in the food processing and drinks industry. This includes facilities involving meat, poultry, dairy, brewing and soft-drink production where cooling is a necessity.

But new technologies in cooling are extending its range of admirers and it has been employed successfully in large cold stores where the scale and range of cooling can be enormous.

Ammonia has been around since the beginning of time and I have every confidence that it has hundreds of years of use to come in refrigeration. The benefits are many. With zero ozone depletion and zero global warming potential it is a future-proof alternative to high GWP HFCs which are being phased out under the F-Gas stepdowns.

> ***"It has fantastic thermodynamic properties, is widely available and can be employed at very low temperatures – as low as -40°C in some instances."***

It is cheap to buy and use which means it can make a significant impact on energy bills. This can make a big difference to the bottom line at a large scale cooling operation.

Improvements in technologies involving heat exchangers, compressor controls and low-pressure receivers have allowed the charge size to be reduced and this in turn lowers the risk of leaks. Importantly, ammonia – even in small quantities – has a recognisable odour which can be viewed as its greatest single safety asset.

As with any refrigerant, safety is a key issue and you would not dream of installing a new system without ensuring that all the checks and balances are in place before work begins. We take safety very seriously at J & E Hall and before starting any job we take a long, hard look at what's needed on an individual basis for each installation.

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With systems now capable of running on only a few kilograms of ammonia, the potential for leaks can be controlled easily. As with any refrigerant it's all a matter of understanding that risk. Refrigerants are not bad in themselves – its how you handle them.

The J & E Hall safety package offers a bespoke risk assessment for every installation. Before any work takes place we visit the site, speak to the managers, operators and maintenance engineers, and from these discussions complete a full risk assessment for the customer. This gives them a true picture on what to do to keep the site running efficiently and how to react in an emergency. They may also be considering installing a glycol-based secondary system and so its important to provide a clear and detailed insight into how this dovetails with the ammonia package.

> ***"Ammonia has a fine safety record when installed and maintained correctly. It is necessary that installers and operators of ammonia-based systems be made aware and work to the safety legislation put in place to protect them and the public."***

At J & E Hall we provide all the assistance needed to help customers cross these bridges safety wise and make the most of their ammonia package. For the customer, employing ammonia in a system will require a new set of skills for their staff.

There are new technical aspects to consider too. In many of the places where J & E Hall has installed ammonia systems there has been the need for steel piping – breweries are a good example of this. The valves may differ too but with the right training, maintenance teams can soon understand all that's required to keep the system running smoothly.

With the F-Gas stepdowns now firmly in place and supplies of virgin HFC gases in short supply, it's a good time for some end-users to consider switching to an ammonia system. It's a naturally-occurring material and this gives it a huge advantage over other gases.

From my point of view it's efficiencies and environmental properties make it a superb choice for a refrigeration system where cooling is needed on a large scale. But the key to success is to ensure that the system is installed and designed correctly and that the people using it are well trained.

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