

PRESS RELEASE

Trend to use 'green' refrigerants to future-proof air-con systems

25 April 2018: The trend to use R32 refrigerant in air-conditioning systems as a 'green' alternative to R410A is a good example of the global impact of the phasedown programme initiated by the Montreal Protocol and Kigali Agreement.

The Kigali Amendment, signed on 15 October 2016, includes specific targets and timetables to replace HFCs with more environment-friendly alternatives; provisions to prohibit or restrict countries that have ratified the protocol or its amendments from trading in controlled substances with states that are yet to ratify it; and an agreement by developed countries to help finance the transition of poor countries to alternative safer products.

In all regions in which A-Gas operates, Ozone Depleting Substances (ODS) are regulated under the Montreal Protocol. The Kigali Amendment encompasses an orderly and gradual phasedown of high-GWP virgin HFC products, which is an important expansion of the Montreal Protocol's framework.

In particular, African countries opted to phase down the chemicals faster than required, citing the grave threats the region faces due to climate change. The final agreement split the world's major economies into three groups, each with a target phase-down date. The most developed countries, including the US and the European Union, will reduce the production and consumption of HFCs from 2019.

Most of the world, including China, Brazil, and all of Africa, will freeze the use of HFCs by 2024. A small group of the world's hottest countries, such as Bahrain, India, Iran, Iraq, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia, and the UAE, only have to halt HFC production and use by 2028.

R32 has a Global Warming Potential (GWP) of 675, as opposed to a GWP of 2088 for R410A. In terms of new equipment, A-Gas South Africa suggests that R407F (GWP = 1824) instead of R404A (GWP = 3922) or R507 (GWP = 3985) for new equipment is a good option to prevent future liability.

R32 has higher pressures than many mainstream refrigerants, in addition to mild flammability. "This is an excellent example of the industry overcoming its current environmental and regulatory challenges, and keeping up to date with the latest innovations and technological developments," A-Gas South Africa National Sales Manager **Michael Labacher** comments.

HFO refrigerants such as R1234yf, R1233zd and R1234ze (GWP = < 6) are now also available. In addition, global refrigerant manufacturers are blending HFO and HFC components to create low-GWP blends like R448A and R449A designed to match the characteristics and performance of mainstream HFCs. These new blends are ideal for both new equipment and retrofit replacements.

These blends are being designed as retrofit replacements for existing high-GWP products. These gases are designed to be non-flammable, which translates into a higher GWP. However, it offers a safe retrofit option, with a significant reduction in terms of the HFC GWP's being replaced.

Equipment manufacturers are being innovative in their approach, while evaluating the best solution for their business in the long term. For instance, in transport refrigeration, the two biggest global suppliers are now offering equipment using R452A (GWP = 2140) as an alternative to R404A (GWP = 3922).

R452A is a non-flammable HFO blend with a significant GWP-saving compared to R404A. It offers a useful interim product with minimal engineering work on the system until a long-term solution can be selected.

Natural refrigerants are becoming more established, with the technology around their safe use becoming more mature globally. In this regard, R717 (Ammonia) (GWP = 0) dominates the industrial and process cooling sector due to its superior energy efficiency and low fluid price.

However, R717 (Ammonia) systems have a high installation capex due to toxicity and a lack of compatibility with copper and brass. However, this is balanced out by lower operating costs. R744 (CO₂) (GWP = 1) has become the refrigerant of choice in the supermarket sector for new installations, with both sub-critical and transcritical systems.

Sub-critical cascade systems with a R134a (GWP = 1430) primary refrigerant and a R744 secondary refrigerant can be upgraded easily to a non-flammable HFO blend such as R513A (GWP = 631) in order to reduce the carbon footprint even further.

Hydrocarbons such as R600a (Butane), R290 (Propane) and R1270 (Propylene) have been slower to penetrate the market internationally, mainly due to the misuse of these products in retrofit, domestic and automotive applications, resulting in highly-publicised incidents in which people were injured. However, the revision of our existing SANS 10147:2014 Edition 5 will entrench the safe use of hydrocarbons, and encourage their wider application.

A-Gas was founded in 1993 to bring more environmentally acceptable solutions to the then widely-used Chlorofluorocarbons (CFCs) primarily in the refrigeration and air conditioning markets. "We have built on this guiding principle since 1993 by specialising in the supply of the latest environmentally acceptable refrigerants and developing world class refrigerant recovery and reclamation facilities," Labacher concludes.

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Notes to the editor

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About A-Gas

A-Gas is a leader in the supply and lifecycle management of speciality chemicals. This includes: refrigerants, blowing agents, industrial gases, halon and fire protection agents used in industries operating in the HVAC, refrigeration, insulation, solvent, manufacturing and medical sectors. Delivering innovative and sustainable solutions for environmentally-sensitive gases and chemicals for more than 20 years, A-Gas offers a tailored 'one-stop shop' solution of products and services, helping its clients meet their regulatory obligations responsibly and sustainably.

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