

Refrigerants types

CFC

CFCs (chlorofluorocarbons), such as R11, R12, R113, R114 and R115, are categorized as having high ODP (Ozone Depleting Potential) and high GWP (Global Warming Potential). Consequently, the use of these products is subject to legislation. This includes a sales ban in Article 2 (developed) countries from 1996, and Article 5 (developing) countries from 2010, in accordance with the Montreal Protocol.

We support and adhere to all such legislation and can help you choose suitable replacement products that have less impact on the environment whilst still providing effective chilling and cooling capacity.

For more information see the section on CFC phase-out legislation.

HCFC

HCFCs (hydrochlorofluorocarbons) are the second generation of fluorine based gases, the original replacements for CFC's. These products, which include R-22, R-123, R-401A, R-401B, R-402A, R-402B, R-408A, AND R-409A, are categorized as having medium ODP (Ozone Depletion Potential) and medium to high GWP (Global Warming Potential). Consequently, they offer a slightly more environmentally friendly alternative to CFC's. They also often provide a quick and simple "retrofit" of existing CFC equipment.

As HCFCs contribute both to ozone depletion and global warming, the use of HCFCs is being phased out as part of global legislation, such as the Montreal Protocol. Some countries and regions are operating an accelerated phase out. In the EU, for example, the use of virgin HCFCs was phased out in January 2010. Reclaimed or recycled HCFCs, however, may be used until January 2015.

We sell a wide range of HCFC products in many locations and in a variety of packages including cylinders, drum tanks and bulk supplies. This includes reclaimed HCFC's in some locations. We also support the transition away from the use of ozone depleting products and can offer advice on alternative products, such as hydrofluorocarbons (HFCs) and natural refrigerants, which have a lower impact on the environment.

HFC

HFCs (hydrofluorocarbons) are the third generation of fluorine-based gases.

These products are categorized as having zero ODP (Ozone Depleting Potential) and medium to high GWP (Global Warming Potential) and so offer a more environmentally friendly alternative to CFC's and HCFC's. HFCs are used in a wide range of refrigeration and air conditioning equipment specifically designed for them, and as "drop in" retrofit gases for older CFC or HCFC equipment. HFCs are also used in selective propellant and foam blowing applications.

A growing focus on the environmental impact of refrigerants is fueling demand for refrigeration solutions that can provide satisfactory cooling performance with a lower impact on global warming. This is propelling environmentally friendly refrigeration solutions to the top of the corporate sustainability agenda. In addition, local legislation is increasingly targeting refrigerant gases with high GWP.

Linde offers a number of lower GWP HFC solutions, such as the use of R-407A or R-407F instead of R-404A. For new equipment purchases, we also supply a wide range of HFC alternatives. These include HFO and natural refrigerants, both of which provide a viable, lower GWP alternative to HFCs.

HFO

HFOs (hydrofluoro-olefins) are the fourth generation of fluorine-based gases. HFC refrigerants are composed of hydrogen, fluorine and carbon atoms connected by single bonds between the atoms. HFO refrigerants are composed of hydrogen, fluorine and carbon atoms but contain at least one double bond between the carbon atoms.

The first HFO, jointly developed by DuPont and Honeywell, is HFO 1234yf which is sold under the brand names Opteon YF and SOLSTICE yf. This is a low GWP (Global Warming Potential) replacement for R-134a for use in mobile air conditioning (MAC) systems in the automotive sector.

HFO refrigerants are categorized as having zero ODP (Ozone Depletion Potential) and low GWP and so offer a more environmentally friendly alternative to CFC's HCFC's and HFC's.