

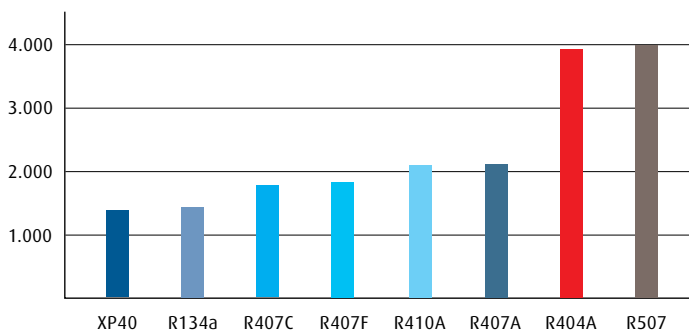
R449A – Opteon[®] XP40.

Lower global warming potential
replacement for R404A and R507.

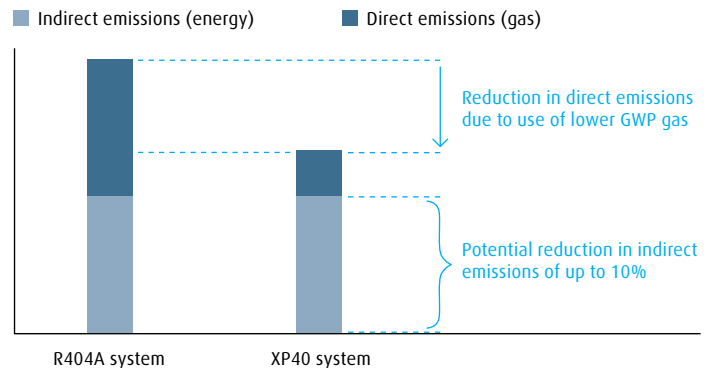


R449A – Opteon® XP40. Lower-GWP replacement for R404A and R507 in stationary refrigeration.

GWP of some common HFC refrigerants



Total emissions in an example system*



The environmental challenge

For over twenty years, R404A has been an extremely useful refrigerant gas in a number of applications, including commercial refrigeration systems such as those often used in supermarkets. However, refrigeration systems generate both direct and indirect CO₂ emissions during their lifetime.

Although an effective refrigerant, R404A has one of the highest global warming potentials (GWPs) of any refrigerant gas, often leading to high direct greenhouse gas emissions and therefore high CO₂ equivalent (CO₂e) emissions over the equipment lifetime.

A growing focus on the environmental impact of refrigerants is fuelling demand for refrigeration solutions that can provide satisfactory cooling performance with a lower global warming impact. This is propelling environmentally friendly refrigeration solutions to the top of the corporate sustainability agenda. In addition, local legislation, such as EU f-gas regulation 517/2014, is increasingly targeting refrigerant gases with a high GWP.

The low-GWP solution

Developed by DuPont™, Opteon® XP40 (R449A) is a next-generation HFO based refrigerant that combines excellent cooling performance with improved energy efficiency and environmental properties. With a GWP of just 1397, it provides a long-term refrigerant solution.

R449A is designed for use in direct expansion low and medium temperature commercial and industrial applications. It is suitable for new installations and the straightforward retrofit of existing systems.

	R404A	R449A – Opteon XP40
Constituents	R143a/R125/R134a	R32/R125/R1234yf/R134a
Preferred oil	Polyolester (POE)	Polyolester (POE)
ASHRAE safety classification	A1 – non-toxic and non-flammable	A1 – non-toxic and non-flammable
Boiling point @ 1atm	-46.5 °C	-46.0 °C
Critical temperature	72.0 °C	81.5 °C
Critical pressure	37.3 bar(a)	44.5 bar(a)
GWP**	3922	1397
GWP as % of R404A	100%	36%

* Systems will vary. Example assuming R404A system with equal direct and indirect emissions is retrofitted to operate on R449A. Energy use and refrigerant leakage assumed the same in both cases, however in many cases energy savings of up to 10% are possible.

** IPCC Assessment report 4



Benefits at a glance

Lower environmental impact

- Approximately 65% reduction in GWP compared with R404A
- Zero ozone depletion potential
- Non-toxic and non-flammable

Wide application range

- Low and medium temperature DX refrigeration
- Industrial and commercial systems
- New and retrofit applications

Easy retrofit process

- Long term solution – alternative to R404A, R407A/F and R507
- Compatible with the same oils, elastomers and plastics as R404A
- Supported by major equipment and component manufacturers
- Can be topped off after leaks

Impressive performance

- Similar cooling capacity to R404A
- Energy efficiency savings of up to 10% reported with many systems

Retrofit made easy

The changeover from R404A to Opteon XP40 is a relatively easy process. The gas is fully compatible with the POE lubricants used in an R404A system. In many cases, the original oil can be used.

XP40 (like other gases such as R407C) is a zeotrope. Therefore it must be charged in the liquid phase to prevent fractionation. The refrigerant has a moderate glide of approximately 4K that can be easily managed by a minor adjustment to the expansion device.

We also recommend that you overhaul your refrigeration system during the retrofit operation, including the filter drier and seals.

Trusted partner

The Gases Division of The Linde Group is one of the largest and most global distributors of refrigerants. For more than 40 years, we have been a trusted partner of refrigeration and air conditioning companies around the world. We operate throughout Europe, Africa, Asia-Pacific and the Americas.

Our broad product range spans both traditional fluorocarbon as well as next generation HFO and natural refrigerants. R449A is commonly available in cylinders. Other packages may be available upon request.

Our high-quality operations and vast distribution networks ensure the quality and availability of our products. We also offer a range of complementary services, including technical support, legislative compliance assistance and environmental audits.

Getting ahead through innovation.

With its innovative concepts, Linde is playing a pioneering role in the global market. As a technology leader, it is our task to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

Linde offers more. We create added value, clearly discernible competitive advantages, and greater profitability. Each concept is tailored specifically to meet our customers' requirements – offering standardised as well as customised solutions. This applies to all industries and all companies regardless of their size.

If you want to keep pace with tomorrow's competition, you need a partner by your side for whom top quality, process optimisation, and enhanced productivity are part of daily business. However, we define partnership not merely as being there for you but being with you. After all, joint activities form the core of commercial success.

Linde – Ideas become solutions.

Distribution partner for

Opteon[®] XP40
REFRIGERANT

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