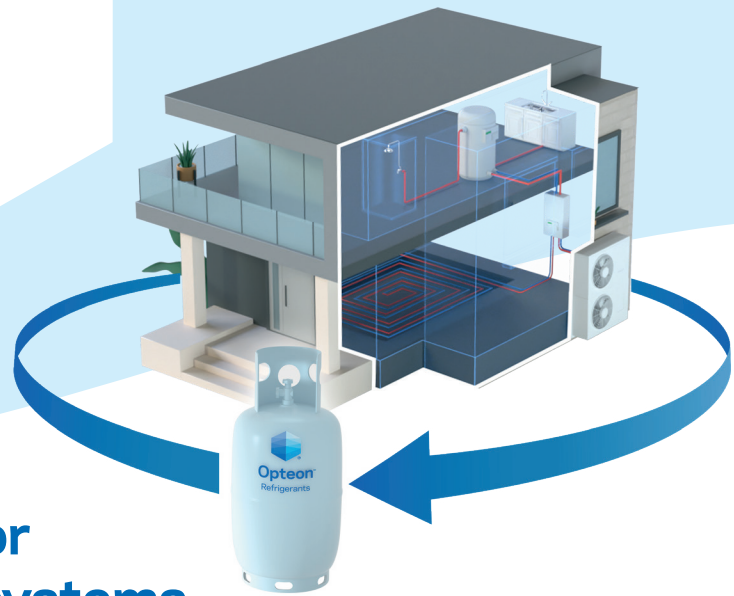


Opteon™ XL

Time for Energy Efficiency



Essential considerations for refrigerants in heat pump systems

1. How a refrigerant solution influences energy efficiency, cost and sustainability?

The thermodynamic efficiency of a refrigerant in a heat pump system plays a pivotal role in optimising energy expenditure. We expect comfortable ambient air and hot water temperatures all year round at home, in schools or at work. This means using a refrigerant which achieves suitable flow temperature ranges in different climate conditions that can be applied to newly built properties and renovation of existing buildings without relying on back-up fossil fuel heating systems.

2. What solutions are available which are compliant with climate change protocols?

Climate change protocols drive a phase-out of ozone-depleting refrigerants and a phase-down of those carrying high global warming potential (GWP).

The shift to heat pump technology in domestic and commercial buildings is recognised as a game-changer in reducing carbon emissions and achieving global and regional climate change targets.

This chart shows the properties of commonly found refrigerants, some of which are being phased-out in favour of low-GWP alternatives.

Group	R-Number	Known as	GWP (AR4)	Toxicity	Flammability	Supply status	Typical system application
Hydrocarbon (HC)	R-290	Propane	3	Lower (A)	Higher (3)	Good	Residential and commercial refrigeration and heating
Inorganic	R-744	CO ₂	1	Lower (A)	NFP (1)	Dependent on other industries	Commercial refrigeration & Industrial refrigeration
	R-717	Ammonia	0	Higher (B)	Lower (2L)		
HydroFluoroCarbons (HFC)	R-404A	Freon™ 404A	3922	Lower (A)	NFP (1)	Low Low Low	Commercial refrigeration, Heat Pump & Mobile air conditioning
	R-410A	Freon™ 410A	2088	Lower (A)	NFP (1)		
	R-134a	Tetrafluoroethane	1430	Lower (A)	NFP (1)		
Hydrochlorofluorocarbon (HCFC)	R-22	Freon™ 22	1810	Lower (A)	NFP (1)	Very low	Air conditioning & commercial refrigeration (being phased-out)
Hydrofluoroolefins (HFO)	R-454C	Opteon™ XL20	148	Lower (A)	Lower (2L)	Good	Commercial refrigeration, Heat Pump & Mobile air conditioning
	R-454B	Opteon™ XL41	466	Lower (A)	Lower (2L)		
	R-1234yf	Opteon™ YF	4	Lower (A)	Lower (2L)		
	R-513A	Opteon™ XP10	631	Lower (A)	NFP (1)		

Another question to consider in the design of new heat pump systems or upgrades to existing products is supply availability of current and future solutions.

3. How versatile, safe refrigerants maintain equipment integrity?

Working with a heat pump refrigerant that offers a good technical fit with a wide range of applications can make it easier for equipment designers to implement performance enhancements to systems and components.

But most importantly, a refrigerant with lower flammability and lower toxicity helps maintain a safe operating environment at any stage of a heat pump design, installation, maintenance and operation.

Opteon™ XL: Power in Partnership

Opteon™ XL refrigerants are a range of non-ozone-depleting, low GWP solutions. They are designed for enabling modern equipment to work efficiently and safely.

Opteon™ XL refrigerants offer multiple essential benefits for a wide variety of applications.



Cost-effective

Opteon™ XL refrigerants offer lower installation, operation and maintenance costs.



Energy-efficient

The Opteon™ XL range allows for the reduction of system emissions through increased efficiency.



Reliable equipment

Opteon™ XL refrigerants are versatile and offer long-term operational benefits for system equipment.



Sustainable

Opteon™ XL refrigerants have lower global warming potential meaning lower carbon emissions and long-term sustainability.



Compliant

The Opteon™ XL range facilitates compliance with new regulations driving higher global warming potential refrigerants phase down.



Safe

Opteon™ XL refrigerants are less likely to ignite as they are low flammability.

Our Team

We believe in superior product solutions paired with a strong, knowledgeable team to support our customers. Rely on our experts to help you build a more sustainable solution for your business.

Muhtar Ali, Ali.Muhtar@chemours.com