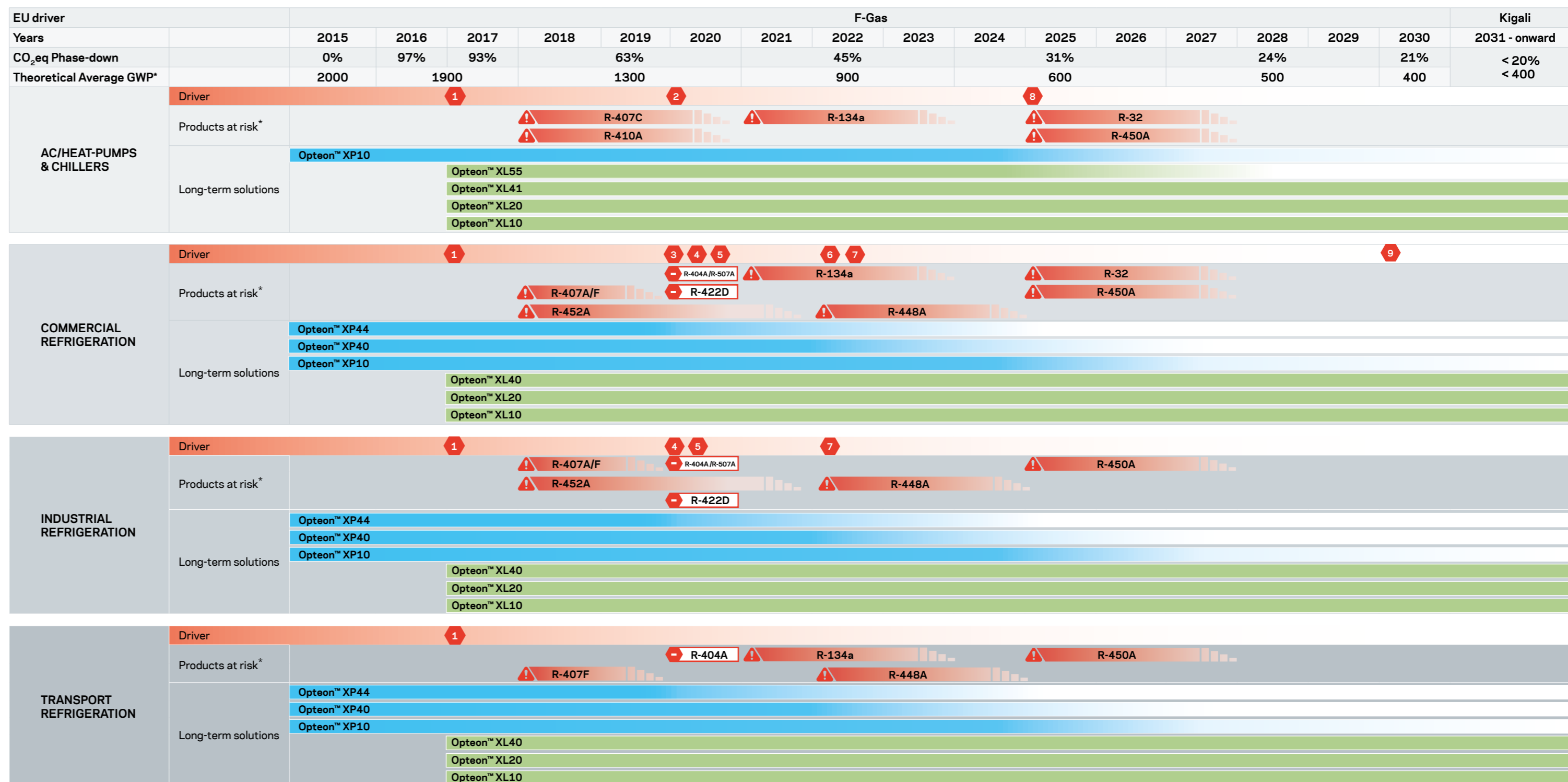




Opteon™ Sustainable Solutions HFO Refrigerants Under F-Gas

Phase-down of HFCs under the EU F-Gas Regulation



*Products at risk in the year of the prohibition and/or control of use, or phase-down:

Products at risks because of the prohibition and/or control of use Products at risk because of the phase-down

- 1** **1 Jan 2017:** Refrigeration, air-conditioning and heat-pump equipment pre-charged with F-gases may not be placed on the market unless F-gases charged into this equipment are accounted for within the quota system referred to in Chapter IV of the F-Gas. When placing pre-charged equipment on the market after the date, manufacturers and importers must issue a declaration of conformity which must be verified by an independent auditor
- 2** **1 Jan 2020:** Movable room air-conditioning equipment (hermetically sealed equipment which is movable between rooms by the end user) that contain HFCs with GWP of 150 or more
- 3** **1 Jan 2020:** Virgin F-gases with GWP ≥ 2500 for servicing refrigeration equipment with a charge size of 40 tons of CO₂ eq. or more. The service ban is not applicable to military and low temperature (-50°C Product temperature) equipment
- 4** **1 Jan 2020:** Stationary refrigeration equipment, that contains, or whose functioning relies upon, HFCs with GWP of 2500 or more except equipment intended for application designed to cool products to temperatures below -50°C

- 5** **1 Jan 2020:** Refrigerators and freezers for commercial use (hermetically sealed equipment) that contain HFCs with GWP of 2500 or more
- 6** **1 Jan 2022:** Multipack centralized refrigeration systems for commercial use with a rated capacity of 40 kW or more that contain, or whose functioning relies upon, fluorinated greenhouse gases with GWP of 150 or more, except in the primary refrigerant circuit of cascade systems where fluorinated greenhouse gases with a GWP of less than 1500 may be used
- 7** **1 Jan 2022:** Refrigerators and freezers for commercial use (hermetically sealed equipment) that contain HFCs with GWP of 150 or more
- 8** **1 Jan 2025:** Single split air-conditioning systems containing less than 3 kg of fluorinated greenhouse gases, that contain, or whose functioning relies upon, fluorinated greenhouse gases with GWP of 750 or more
- 9** **1 Jan 2030:** Recycled and reclaimed F-gases with GWP of 2500 or more for servicing refrigeration equipment with a charge size of 40 tons of CO₂ eq. or more



Opteon™ Refrigerants Applications

Find the Opteon™ solution for your specific application

		Incumbent products	Opteon™ XP solutions	Opteon™ XL solutions	
		High GWP refrigerants	0 ODP A1 Low GWP Non-flammable For retrofit / new equipment	0 ODP A2L Very low GWP Lower flammability For new equipment	0 ODP A2L Ultra low GWP Lower flammability For new equipment
A/C - HEAT PUMPS & CHILLERS	Air-to-Water HP	R-134a R-410A R-407C	Opteon™ XP10	Opteon™ XL20 Opteon™ XL41 Opteon™ XL55	Opteon™ XL10
	Air-to-Air AC	R-410A R-407C	no replacement	Opteon™ XL20 Opteon™ XL41 Opteon™ XL55	
	AC Chillers	R-134a R-410A	Opteon™ XP10	Opteon™ XL41 Opteon™ XL20 Opteon™ XL55	Opteon™ XL10
	AC Roof-Tops	R-410A R-407C	no replacement	Opteon™ XL20 Opteon™ XL41 Opteon™ XL55	
	Home Appliances	R-134a R-410A R-407C	Opteon™ XP10	Opteon™ XL20 Opteon™ XL41 Opteon™ XL55	Opteon™ XL10
COMMERCIAL REFRIGERATION	Supermarket - Centralised Systems	R-404A R-407A/F R-507A	Opteon™ XP40	Opteon™ XL20 Opteon™ XL40	
	Integral Systems, Condensing Unit	R-134a R-404A R-407A/F	Opteon™ XP40 Opteon™ XP44 Opteon™ XP10	Opteon™ XL20 Opteon™ XL40	Opteon™ XL10
	Retailers- Restaurants	R-134a R-407A/F R-407A	Opteon™ XP40 Opteon™ XP44 Opteon™ XP10	Opteon™ XL20 Opteon™ XL40	Opteon™ XL10
INDUSTRIAL REFRIGERATION	Large Capacity DX Industrial Chillers	R-404A R-507A	Opteon™ XP10 Opteon™ XP40 Opteon™ XP44	Opteon™ XL40	
	Mid Capacity Chillers	R-404A R-507A	Opteon™ XP40 Opteon™ XP44	Opteon™ XL20 Opteon™ XL40	
	Flooded Systems	R-134a R-404A R-507A	Opteon™ XP10		Opteon™ XL10
	Food processing - Environmental Chambers	R-404A R-507A	Opteon™ XP40 Opteon™ XP44 Opteon™ XP10	Opteon™ XL20 Opteon™ XL40	
TRANSPORT REFRIGERATION	Trucks and Trailers	R-134a R-404A R-407F	Opteon™ XP40 Opteon™ XP44 Opteon™ XP10	Opteon™ XL20 Opteon™ XL40	Opteon™ XL10
	Marine Containers	R-134a R-404A	Opteon™ XP10 Opteon™ XP40	Opteon™ XL20 Opteon™ XL40	Opteon™ XL10

The optimum balance of properties



Global Warming Potential (GWP)



The **Opteon™ XP series** was introduced by Chemours as more environmentally sustainable refrigerants with low GWP for refrigeration and air conditioning applications. The range is suitable for use in new equipment as well as for **retrofit** of existing systems.

The **Opteon™ XL** refrigerants were developed as very low and ultra-low GWP alternatives to existing HFCs for new equipment.

Opteon™ Refrigerants Properties

Product brand name	ASHRAE #	ASHRAE Safety class	GWP (AR5)	Retrofit / new equipment	Replaces	Composition Wt%	Boiling point @ 1 atm (101.3 kPa)	Critical temperature	Temperature glide	Burning velocity @ 23 °C
Opteon™ XP44	R-452A	A1	1945	Retrofit / new equipment	R-404A, R-507A	R-32/R-125/R-1234YF 11.0/59.0/30.0	-46,9	75,0	-3 K	-
Opteon™ XP40	R-449A	A1	1282	Retrofit / new equipment	R-404A, R-507A, R-22, R-407A/F	R-32/R-125/R-1234YF/R-134a 24.3/24.7/25.3/25.7	-45,7	82,1	-4 K	-
Opteon™ XP10	R-513A	A1	573	Retrofit / new equipment	R-134a, R-22, R-407C	R-1234YF/R-134a 56.0/44.0	-29,6	94,9	0 K	-
Opteon™ XL55	R-452B	A2L	698	New equipment	R-410A	R-32/R-125/R-1234YF 67/7/26	-50,7	77,1	-1 K	3.0 cm/s (1.2 in/s)
Opteon™ XL41	R-454B	A2L	467	New equipment	R-410A	R-32/R-1234YF 68.9/31.1	-50,5	78,1	-1.5 K	5.2 cm/s (2.0 in/s)
Opteon™ XL40	R-454A	A2L	238	New equipment	R-404A, R-507A, R-22, R-407A/F	R-32/R-1234YF 35/65	-47,8	81,7	-5 K	2.4 cm/s (0.9 in/s)
Opteon™ XL20	R-454C	A2L	146	New equipment	R-404A, R-507A, R-22, R-407A/F	R-32/R-1234YF 21.5/78.5	-45,6	85,7	-6 K	1.6 cm/s (0.6 in/s)
Opteon™ XL10	R-1234yf	A2L	1	New equipment	R-134a	R-1234YF 100	-29,5	94,7	-	1.5 cm/s (0.59 in/s)

For more information on the **Opteon™** family of refrigerants, or other Chemours refrigerants products, visit opteon.com, or follow us on [Twitter@RefrigChemours](https://twitter.com/RefrigChemours).

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