

Honeywell Solstice® Refrigerants

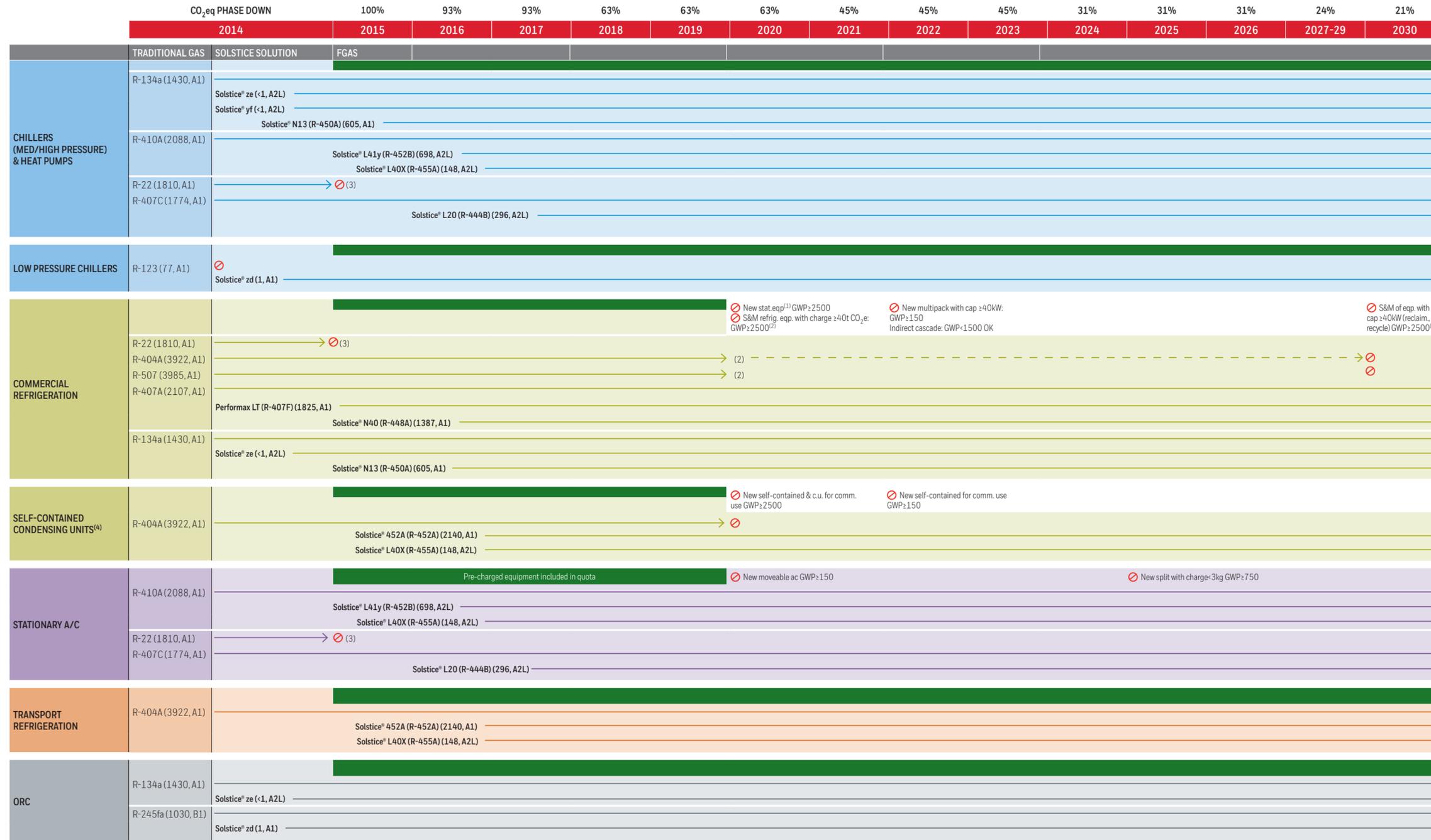
				DROP-IN (1)									
		Baseline		GWP 5TH IPCC REV	GWP 4TH IPCC REV	ASHRAE CLASS	NEW/RETROFIT	CAPACITY	EFFICIENCY	COMPRESSOR(2)	COMMENTS	STATUS	
CHILLERS, HEAT PUMPS & APPLIANCES	Med/High pressure chillers Heat pumps	Baseline	R-134a	1300	1430	A1				Screw, Centrifugal			
		Honeywell alternative	Solstice® N13 (R-450A)	547	605	A1	New/Retrofit*	8% to 10% lower	1% to 3% higher	Screw, Centrifugal	Wider operating envelope Better at higher ambient	Commercial	
		Honeywell alternative	Solstice® ze (HFO-1234ze)	<1		A2L	New	20% to 25% lower	1% to 5% higher	Screw, Centrifugal	Wider operating envelope Better at higher ambient Higher oil solubility	Commercial	
	Appliances	Baseline	R-410A	1924	2088	A1					Rotary, Scroll		
		Honeywell alternative	Solstice® L41y (R-452B)	676	698	A2L	New	Similar		1% to 5% higher	Recip., Rotary, Scroll	Works well at higher ambient Lower pressure fluid	Available for sampling
		Honeywell alternative	Solstice® L40X (R-455A)	146	148	A2L	New				Recip., Rotary, Scroll		Commercial
	Low pressure chillers	Baseline	R-123	79	77	A1					Centrifugal		
		Honeywell alternative	Solstice® zd (HFO-1233zd)	1		A1	New	40% to 45% higher	Similar		Centrifugal	Higher capacity range	Commercial**
	High temperature heat pumps	Baseline	Boilers, fossil fuels, electrical heaters										
		Honeywell alternative	Solstice® zd (HFO-1233zd)	1		A1	New				Centrifugal	Industrial processes Depending tre of use***	Commercial**
Honeywell alternative	Solstice® ze (HFO-1234ze)	<1		A2L	New					Screw, others tbd	Wider operating envelope Better at higher ambient Higher oil solubility	Commercial	
COMMERCIAL REFRIGERATION	DX	Baseline	R-404A	3943	3922	A1					Recip., Scroll, Screw		
		Honeywell alternative	Performax LT (R-407F)	1674	1825	A1	New/Retrofit	Similar		5% to 10% higher	Recip., Scroll, Screw	No TXV change Higher discharge temperature in LT	Commercial
		Honeywell alternative	Solstice® N40 (R-448A)	1273	1387	A1	New/Retrofit	Similar		5% to 10% higher	Recip., Scroll, Screw	No TXV change Good compressor envelope coverage	Commercial
	DX Medium Temp CO ₂ cascade	Baseline	R-134a	1300	1430	A1					Recip., Screw		
		Honeywell alternative	Solstice® N13 (R-450A)	547	605	A1	New/Retrofit*	8% to 10% lower	Similar		Recip., Screw	Wider operating envelope Works well at higher ambient Flooded evaporator possible	Commercial
		Honeywell alternative	Solstice® ze (HFO-1234ze)	<1		A2L	New	20% to 25% lower	1% to 5% higher		Recip., Screw	Outdoor/Atex compliance	Commercial
	Self-contained Condensing units	Baseline	R-404A	3943	3922	A1					Recip., Rotary, Scroll		
		Honeywell alternative	Solstice® 452A (R-452A)	1945	2140	A1	New/Retrofit	Similar		Similar	Recip. Rotary, Scroll, Herm.	Same discharge temperature MT/LT	Commercial
Honeywell alternative	Solstice® L40X (R-455A)	145	148	A2L	New	4% lower LT, similar/higher MT		6% higher LT; 10% higher MT		Recip., Rotary, Scroll	Same discharge temperature in LT	Commercial	
AIR CONDITIONING		Baseline	R-410A	1924	2088	A1					Rotary, Scroll		
		Honeywell alternative	Solstice® L41y (R-452B)	676	698	A2L	New	Similar		1% to 3% higher	Recip., Rotary, Scroll, Screw	Works well at higher ambient Lower pressure fluid	Available for sampling
		Honeywell alternative	Solstice® L40X (R-455A)	146	148	A2L	New				Recip., Rotary, Scroll		Commercial
	Baseline	R-407C	1624	1774	A1					Recip., Rotary, Scroll			
	Baseline	R-22	1760	1810	A1					Recip., Rotary, Scroll			
Honeywell alternative	Solstice® L20 (R-444B)	295	296	A2L	New	vs R-22: 95% vs R-407C: similar		vs R-22: 95% vs R-407C: 1% to 3% higher		Recip., Rotary, Scroll	Works well in warm climates	Available for sampling	
TRANSPORT REFRIGERATION	DX	Baseline	R-404A	3943	3922	A1					Recip.		
		Honeywell alternative	Solstice® 452A (R-452A)	1945	2140	A1	New/Retrofit	Similar		Similar	Recip. Rotary, Scroll, Herm.	Same discharge temperature MT/LT	Commercial
		Honeywell alternative	Solstice® L40X (R-455A)	146	148	A2L	New	4% lower LT; similar/higher MT		6% higher LT; 10% higher MT		Recip., Rotary, Scroll	Same discharge temperature in LT
ORC		Baseline	R-134a	1300	1430	A1							
		Honeywell alternative	Solstice® ze (HFO-1234ze)	<1		A2L	New			1% to 5% higher			Commercial
		Baseline	R-245fa	858	1030	B1							
Honeywell alternative	Solstice® zd (HFO-1233zd)	1	5	A1	New						Depending temperature of use***	Commercial**	

(1) Drop-in test in a non-optimised system
 (2) Suitable compressor technology, check with Honeywell technical department for qualified models
 * Retrofit if original installed capacity is oversized
 ** Ask Honeywell for agreement
 *** Check with Honeywell technical department



**Solstice® refrigerants roadmap:
The future of refrigerants**

The future begins with Honeywell Solstice® Refrigerants



Key		Notes	
R-134a (1430, A1) Refrigerant (GWP, ASHRAE class)		S&M Service and maintenance	(1) Except applications at -50°C
FGAS: no restrictions during this period on this application		GWP values IPCC revision 4, as per Fgas Regulation, except for Solstice yf/ze (IPCC rev5)	(2) Except recycled/reclaimed
⊘ Refrigerant can no longer be used after January 1st of this year		c.u. condensing units	(3) Banned in EU28 and Saudi
--- Continue to use but only reclaimed or recycled – not virgin			(4) Please verify if there are charge restrictions

Honeywell is focusing on safer, lower GWP solutions, whilst still maintaining energy efficiency. We have invested in both R&D and manufacturing capacity for continuous

innovation to help countries and companies meet the global commitments for carbon footprint reduction.

F-gas – Annex III: new placing on the market prohibitions

PRODUCTS AND EQUIPMENT	DATE OF PROHIBITION
Fire protection equipment that contain HFC-23	1 January 2016
Domestic refrigerators and freezers that contain HFCs [...] with GWP of 150 or more	1 January 2015
Refrigerators and freezers [...] for commercial use (hermetically sealed systems)	1 January 2020
Stationary refrigeration equipment, that contains, or that relies upon for its functioning HFCs with GWP of 2500 or more except equipment intended for application designed to cool products to temperatures below -50°C	1 January 2020
Multipack centralised refrigeration systems for commercial use with a capacity of 40kW or more that contain, or that rely upon for their functioning, 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	1 January 2022
Movable room air-conditioning appliances (hermetically sealed equipment which is movable between rooms by the end user) that contain HFCs with GWP of 150 or more	1 January 2020
Single split air-conditioning systems containing less than 3kg of fluorinated greenhouse gases, that contain, or that rely upon for their functioning, fluorinated greenhouse gases with GWP of 750 or more	1 January 2025
Foams that contain HFCs with GWP of 150 or more except when required to meet national safety standards	1 January 2020
Technical aerosols that contain HFCs with GWP of 150 or more, except when required to meet national safety standards or when used for medical applications	1 January 2018

Note: 'HFCs' refers to blends, not individual components of blends

F-gas – Annex III: control of use

MAINTENANCE AND SERVICING	DATE OF PROHIBITION
Virgin F-gases with GWP>2500 or more for servicing refrigeration equipment with a charge size of 40 tons of CO ₂ eq or more. This service ban is not applicable to military and low temp (-50°C) equipment.	1 January 2020
Recycled and reclaimed F-gases with GWP of 2500 or more for servicing refrigeration equipment with a charge size of 40 tons of CO ₂ eq or more.	1 January 2030
PRE-CHARGED EQUIPMENT	DATE OF PROHIBITION
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. When placing pre-charged equipment on the market after that date, manufacturers and importers must issue a declaration of conformity which must be verified by an independent auditor.	1 January 2017

Did you know...

- HFOs are not considered fluorinated greenhouse gases: Solstice ze/zd/yf/L40X are not subject to quota nor taxes.
- Using Genetron Performax® LT (R-407F), Solstice® N40 (R-448A) or Solstice N13 (R-450A) after 2022 in an existing refrigeration system placed on the market before 2022 is possible.
- Systems that were placed on the market before 2022 can be retrofitted with R-407F, R-448A and R-450A after 2022.
- There is no end date for R-407F, R-448A and R-450A for service and maintenance.
- Prohibition related to the use of refrigerants with GWP>150, or GWP>1500 in indirect cascade systems does not apply to industrial installations where end users cannot access the sale of the product. R-407F, R-448A and R-450A can be used in new industrial installations after 2022.

More information

Find answers to your refrigerants questions with Honeywell Refrigerants suite of apps, calculators, and software:

- Genetron Properties software
- Genetron Performax and Solstice N40 supermarket on line calculators
- PT Chart App and Refrigeration Selection Tool



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OUR COMMITMENT TO SUSTAINABILITY

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