

Solstice Range of Refrigerants

				Drop-in (1)								
				GWP 5th IPCC rev	ASHRAE class	New/Retrofit	Capacity	Efficiency	Compressor (2)	Comments	Status	
Chillers, Heat pumps & Appliances	Med/High pressure chillers	Baseline	R-134a	1300	A1				Screw, Centrifugal			
		Honeywell alternative	Solstice® N13 (R-450A)	547	A1	New/Retrofit*	8% to 10% lower	1% to 3% higher	Screw, Centrifugal	Wider operating envelope Better at higher ambient Flooded evaporators OK	Commercial	
		Heat pumps Appliances	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
			Baseline	R-410A	1924	A1				Rotary, Scroll		
	Low pressure chillers	Honeywell alternative	Solstice® L41 (R-447A)	572	A2L	New	7% to 10% lower	1% to 5% higher	Recip., Rotary, Scroll	Works well at higher ambient Lower pressure fluid	Available for sampling	
		High temperature heat pumps	Baseline	R-123	1300	A1				Centrifugal		
			Honeywell alternative	Solstice® zd (HFO-1233zd)	1	A1	New	40% to 45% higher	Similar	Centrifugal	Higher capacity range	Commercial **
				Baseline	Boilers, fossil fuels, electrical heaters							
Honeywell alternative	Solstice® zd (HFO-1233zd)		1	A1	New				Screw, others tbd	Industrial processes Depending t° of use****	Commercial **	
Stationary refrigeration	DX	Baseline	R-404A	3943	A1				Recip., Scroll, Screw			
		Honeywell alternative	Performax LT (R-407F)	1674	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	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	A1				Recip., Screw			
		Honeywell alternative	Solstice® N13 (R-450A)	546	A1	New/Retrofit*	8% to 10% lower	Similar	Recip., Screw	Wider operating envelope Works well at higher ambient Flooded evaporator OK	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	A1				Recip., Rotary, Scroll			
		Honeywell alternative	Solstice® L40X (R-455A)	145	A2L	New	4% lower	3% to 6% higher	Recip., Rotary, Scroll	Same discharge temperature in LT	Commercial 2016	
Air conditioning		Baseline	R-410A	1924	A1				Rotary, Scroll			
		Honeywell alternative	Solstice® L41 (R-447A)	572	A2L	New	7% to 10% lower	1% to 3% higher	Recip., Rotary, Scroll, Screw	Works well at higher ambient Lower pressure fluid	Available for sampling	
		Baseline	R-407C	1624	A1				Recip., Rotary, Scroll			
		Baseline	R-22	1810	A1				Recip., Rotary, Scroll			
		Honeywell alternative	Solstice® L20 (R-444B)	295	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 Commercial 2016	
Transport refrigeration	DX	Baseline	R-404A	3943	A1				Recip.			
		Honeywell alternative	Solstice® N40 (R-448A)	1273	A1	New/Retrofit	Similar	1% to 4% higher	Recip.	Higher discharge temperature in LT	Available for sampling Commercial	
ORC		Baseline	R-134a	1300	A1							
		Honeywell alternative	Solstice® ze (HFO-1234ze)	<1	A2L	New	20% to 25% lower	1% to 5% higher		Depending temperature of use***	Commercial	
		Baseline	R-245fa	858	B1							
		Honeywell alternative	Solstice® zd (HFO-1233zd)	1	A1	New				Depending temperature of use***	Commercial **	

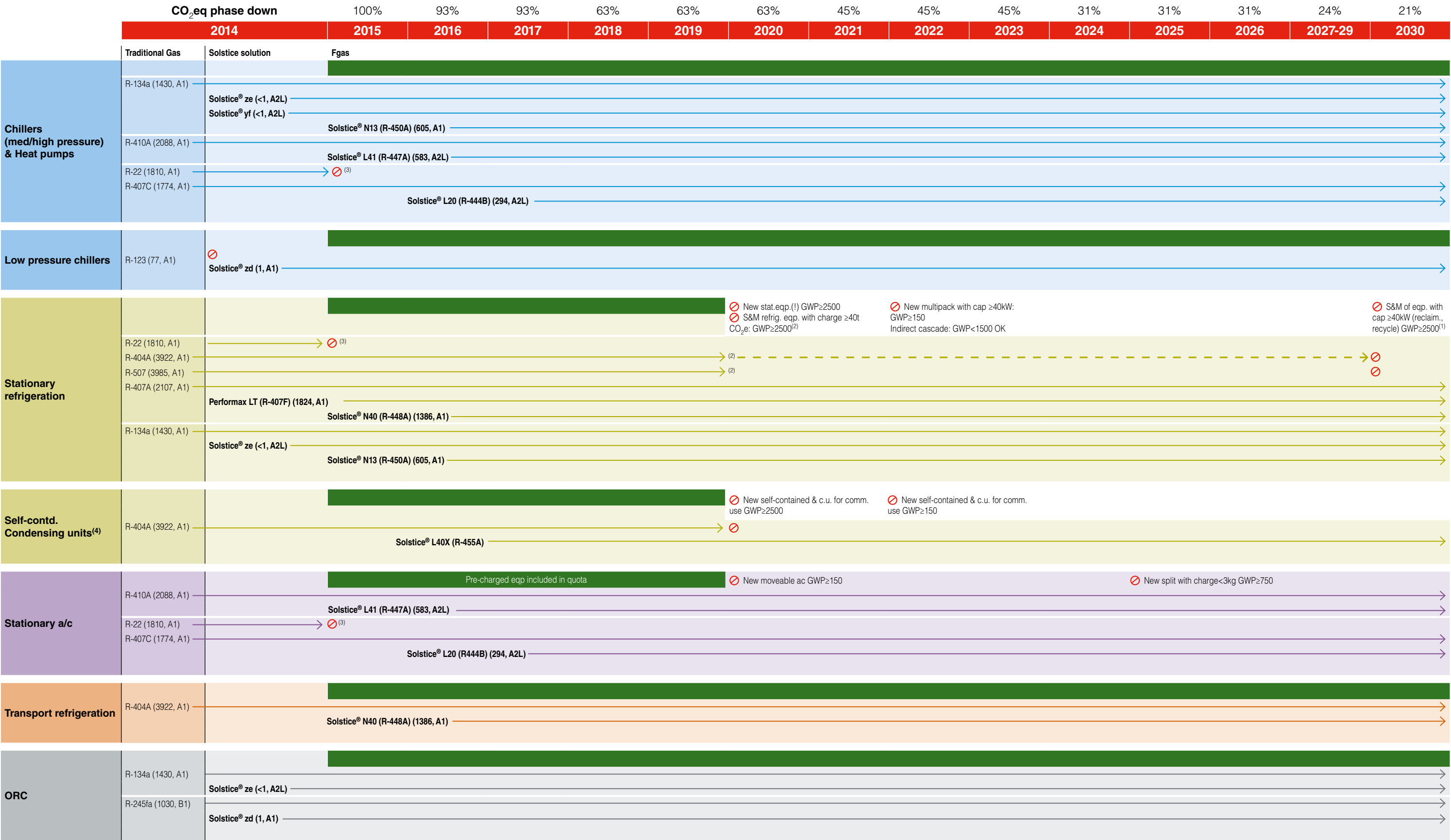
Solstice® Refrigerants



Solstice refrigerants roadmap:
the new industry standard

(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 overdimensioned
** Ask Honeywell for agreement
*** Check with Honeywell technical department

The future of refrigerants begins with Honeywell Solstice®



Key		Notes	
R-134a (1430, A1)	Refrigerant (GWP, ASHRAE class)	S&M	Service and maintenance
	Fgas: no restrictions during this period on this application	GWP values	IPCC revision 4, as per Fgas Regulation, except for Solstice yf/zd/ze (IPCC rev5)
	Refrigerant can no longer be used after January 1st of this year	c.u.	condensing units
	Continue to use but only reclaimed or recycled – not virgin		

Honeywell's key environmental focus is on safe, lower GWP sustainable solutions, whilst still maintaining energy efficiency at the heart of the product range. We have invested in both

R&D and manufacturing capacity for continuous improvement 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)	that contain HFCs with GWP of 2500 or more	1 January 2020
	that contain HFCs with GWP of 150 or more	1 January 2022
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	Extruded polystyrene (XPS)	1 January 2020
	Other foams	1 January 2023
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

More information

Download the free software from Honeywell Genetron Properties Suite at:
<https://www.honeywell-refrigerants.com>

Download the **PT retrofit calculator** applications for **iOS** and **Android** free



www.honeywell-refrigerants.com/europe

DISCLAIMER

The information provided herein is believed to be accurate and reliable, but is presented without guarantee or warranty of any kind, express or implied. User assumes all risk and liability for use of the information and results obtained. Statements or suggestions concerning possible use of materials and processes are made without representation or warranty that any such use is free of patent infringement, and are not recommendations to infringe any patent. The user should not assume that all safety measures are indicated herein, or that other measures may not be required.



RESPONSIBLE CARE®
OUR COMMITMENT TO SUSTAINABILITY

RESPONSIBLE CARE

Honeywell Performance Materials and Technologies, as a member of the American Chemistry Council, has adopted Responsible Care® as the foundation of health, safety, and environmental (HS&E) excellence in our business. Responsible Care is the chemical industry's global voluntary initiative under which companies, through their national associations, work together to continuously improve their health, safety and environmental performance, and to communicate with stakeholders about their products and processes.

Our commitments:

The safety of our employees
The quality of our products
Being responsible stewards for the protection of the environment, the communities in which we operate and our customers

Honeywell Belgium N.V.

Gaston Geenslaan 14
3001 Heverlee, Belgium
Phone: +32 16 391 212
Fax: +32 16 391 371
E-mail: fluorines.europe@honeywell.com

fluorines.europe@honeywell.com

