

# One Honeywell Refrigerant Solution for Each Application

DROP-IN <sup>(1)</sup>

				GWP 5TH IPCC REV	GWP 4TH IPCC REV	ASHRAE CLASS	NEW/ RETROFIT	CAPACITY	EFFICIENCY	COMPRESSOR <sup>(2)</sup>	COMMENTS	STATUS
HEAT PUMPS	Heat Pump Tumble Dryer	Baseline	R-134a	1300	1430	A1						
		Honeywell solution	<b>Solstice® N13 (R-450A)</b>	547	605	A1	New	10% lower	2% higher	Rotary	Wider operating envelope Better at higher ambient	Commercial
	Heat Pump Water Heater	Baseline	R-134a	1300	1430	A1						
Honeywell solution		<b>Solstice® N13 (R-450A)</b>	547	605	A1	New	10% lower	2% higher	Rotary	Wider operating envelope Better at higher ambient	Commercial	
Heat Pump Space Heater	Baseline	R-410A	1924	2088	A1							
	Honeywell solution	<b>Solstice® L41y (R-452B)</b>	676	698	A2L	New	Similar	2% higher	Rotary, Scroll	Works well at higher ambient Lower pressure fluid	Commercial	
CHILLERS	Chiller Low Pressure (Outdoor installation)	Baseline	R-123	79	77	B1						
		Honeywell solution	<b>Solstice® zd (R-1233zd)</b>	1	4.5	A1	New	40% higher	Similar	Centrifugal	Higher capacity range	Commercial
	Chiller Low Pressure (Indoor installation)	Baseline	R-123	79	77	B1						
		Honeywell solution	<b>Solstice® zd (R-1233zd)</b>	1	4.5	A1	New	40% higher	Similar	Centrifugal	Higher capacity range	Commercial
	Chiller Mid Pressure (Outdoor installation)	Baseline	R-134a	1300	1430	A1						
		Honeywell solution	<b>Solstice® ze (R-1234ze)</b>	<1	6	A2L	New	25% lower	5% higher	Screw/Centrifugal	Wider operating envelope Better at higher ambient Higher oil solubility	Commercial
Chiller Mid Pressure (Indoor installation)	Baseline	R-134a	1300	1430	A1							
	Honeywell solution	<b>R-515B *</b>	299	293	A1	New	25% lower	5% higher	Screw/Centrifugal		Available for sampling	
Chiller High Pressure (Outdoor installation)	Baseline	R-410A	1924	2088	A1							
	Honeywell solution	<b>Solstice® L41y (R-452B)</b>	676	698	A2L	New	Similar	2% higher	Scroll	Works well at higher ambient Lower pressure fluid	Commercial	
Chiller High Pressure (Indoor installation)	Baseline	R-410A	1924	2088	A1							
	Honeywell solution	<b>R-466A *</b>	696	733	A1	New	2% lower	2% higher	Scroll		Available for sampling	
COMMERCIAL & INDUSTRIAL REFRIGERATION	Centralized Systems & Condensing Units (non-hermetic compressors)	Baseline	R-404A	3943	3922	A1						
		Retrofit solution	<b>Solstice® N40 (R-448A)</b>	1273	1387	A1	Retrofit	Similar	5% to 10% higher	Recip., Rotary, Scroll, Screw	No TXV change	Commercial
		New build solution	<b>Solstice® L40X (R-455A) **</b>	146	148	A2L	New	4% lower LT; similar/higher MT	6% higher LT; 10% higher MT	Recip., Rotary, Scroll, Screw	Same discharge temperature in LT	Commercial
	Self-Contained Systems & Condensing Units (hermetic compressors)	Baseline	R-134a	1300	1430	A1						
		Retrofit solution	<b>Solstice® N13 (R-450A)</b>	547	605	A1	Retrofit	8% to 10% lower	Similar	Recip., Rotary, Scroll, Screw	Wider operating envelope Works well at higher ambient Flooded evaporator possible	Commercial
		New build solution	<b>Solstice® ze (HFO-1234ze) **</b>	<1		A2L	New	20% to 25% lower	1% to 5% higher	Recip., Screw	A1 alternative: R-515B	Commercial
		Baseline	R-404A	3943	3922	A1						
		Retrofit solution	<b>Solstice® 452A (R-452A)</b>	1945	2140	A1	Retrofit	Similar	Similar	Recip. Rotary, Scroll	Same discharge temperature in LT	Commercial
		New build solution	<b>Solstice® L40X (R-455A) **</b>	146	148	A2L	New	4% lower LT; similar/higher MT	6% higher LT; 10% higher MT	Recip., Rotary, Scroll	Same discharge temperature in LT	Commercial
Split Air-Conditioning	Baseline	R-410A	1924	2088	A1							
	Honeywell solution	<b>R-466A *</b>	696	733	A1	New	2% lower	2% higher	Rotary/Scroll		Available for sampling	
	Baseline	R-22	1760	1810	A1							
Split Air-Conditioning (High Ambient)	Honeywell solution	<b>R-444B *</b>	295	296	A2L	New	5% lower	5% lower	Rotary/Scroll		Available for sampling	
	Baseline	R-410A	1924	2088	A1							
VRF-Rooftop Units	Honeywell solution	<b>R-466A *</b>	696	733	A1	New	2% lower	2% higher	Rotary/Scroll		Available for sampling	
	Baseline	R-404A	3943	3922	A1							
TRANSPORT REFRIGERATION	DX	Short-Term	<b>Solstice® 452A (R-452A)</b>	1945	2140	A1	New/Retrofit	Similar	Similar	Recip. Rotary, Scroll	Same discharge temperature MT/LT	Commercial
		Long-Term	<b>Solstice® L40X (R-455A) **</b>	146	148	A2L	New	4% lower LT; similar/higher MT	6% higher LT; 10% higher MT	Recip., Rotary, Scroll	Same discharge temperature in LT	Commercial
		Baseline	R-245fa	858	1030	B1						
ORC	Honeywell solution	<b>Solstice® zd (R-1233zd)</b>	1	4.5	A1	New	Similar	Similar	Turbine		Commercial	

(1) Drop-in test in a non-optimised system (2) Suitable compressor technology (check with Honeywell technical department for qualified models)

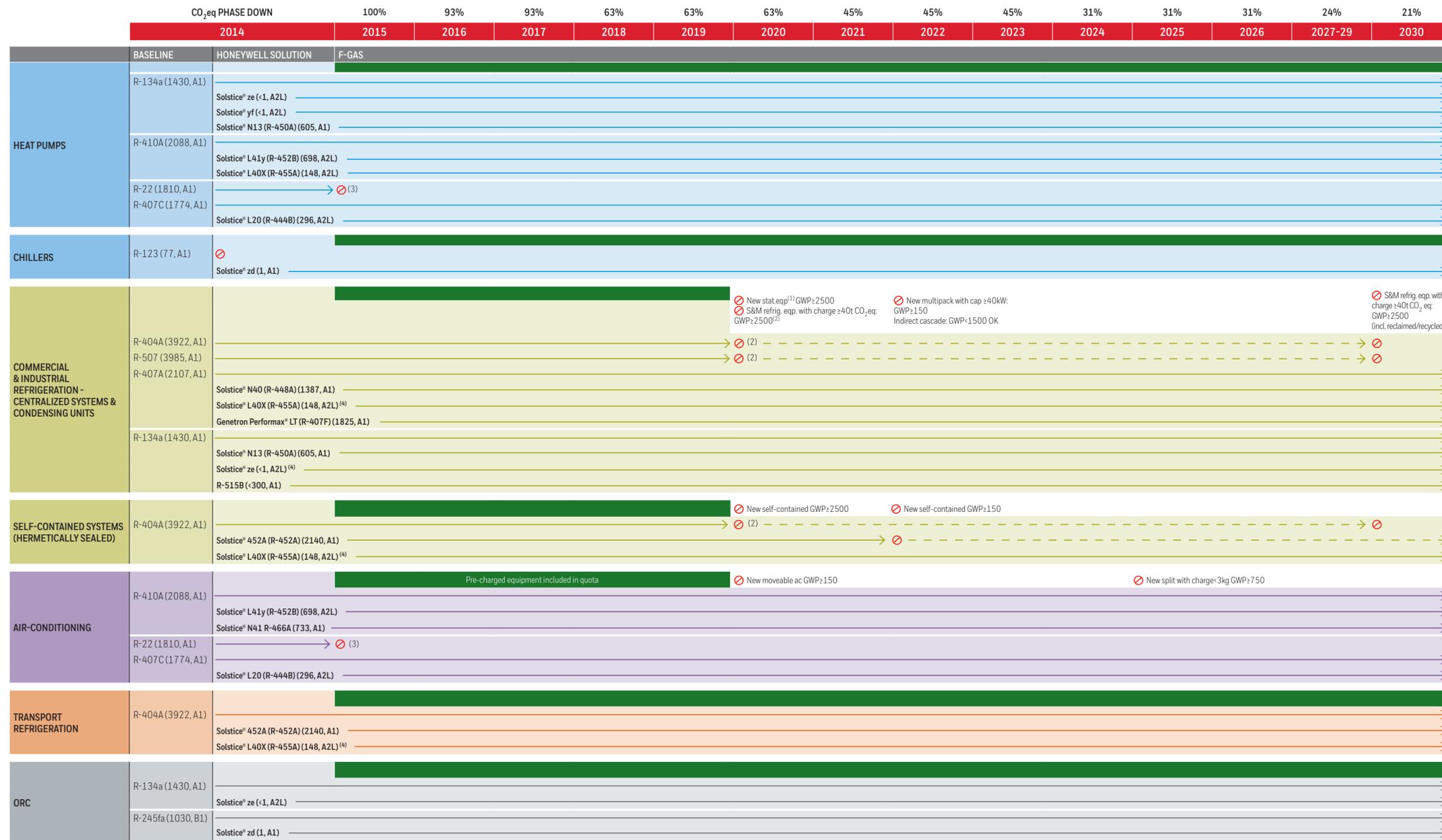
\* Preliminary ASHRAE number \*\* Please verify if there are charge restrictions

**Honeywell** | Refrigerants



**Solstice® Refrigerants Roadmap:  
One Solution for Each Application**

# The future begins with Honeywell Solstice® Refrigerants



**Key**  
 R-134a (1430, A1) Refrigerant (GWP, ASHRAE class)  
 F-gas: no restrictions during this period on this application  
 Refrigerant can no longer be used after January 1st of this year  
 Continue to use but only reclaimed or recycled – not virgin

**Notes**  
 S&M Service and maintenance  
 GWP values IPCC revision 4, as per F-gas Regulation, except for Solstice yf/zd/ze (IPCC rev5)  
 (1) Except applications at -50°C  
 (2) Except recycled/reclaimed for servicing  
 (3) Banned in EU28 and Saudi  
 (4) Please verify if there are charge restrictions

# 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 that contain HFCs with GWP of 150 or more
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) Other foams
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 2020 1 January 2023 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 of 2500 or more for servicing refrigeration equipment with a charge size of 40 tons of CO <sub>2</sub> 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 <sub>2</sub> 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...

- HFO pure substances are not considered fluorinated greenhouse gases: Solstice® ze/zd/yf are not subject to quota nor country taxes.
- Systems that were placed on the market before 2022 can be retrofitted with Solstice® N40 (R-448A) or Solstice® N13 (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.

**For more information**  
[www.honeywell-refrigerants.com/europe](http://www.honeywell-refrigerants.com/europe)

Find answers to your refrigerants questions with Honeywell Refrigerants suite of apps, calculators, and software:  
 - Genetron Properties software  
 - Solstice N40 supermarket online calculators  
 - PT Chart App and Refrigerant Selection Tool



Solstice is a registered trademark of Honeywell International Inc.

**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](mailto:fluorines.europe@honeywell.com)

Although Honeywell International Inc. believes that the information contained herein is accurate and reliable, it is presented without guarantee or responsibility of any kind and does not constitute any representation or warranty of Honeywell International Inc., either expressed or implied. A number of factors may affect the performance of any products used in conjunction with user's materials, such as other raw materials, application, formulation, environmental factors and manufacturing conditions among others, all of which must be taken into account by the user in producing or using the products. The user should not assume that all necessary data for the proper evaluation of these products are contained herein. Information provided herein does not relieve the user from the responsibility of carrying out its own tests and experiments, and the user assumes all risks and liabilities (including, but not limited to, risks relating to results, patent infringement, regulatory compliance and health, safety and environment) related to the use of the products and/or information contained herein.

FPR-004-2018-10-EN\_v.1  
 © 2018 Honeywell International Inc. All rights reserved.

