



Notification from the Chemicals Division of
Daikin Industries, Ltd.

December 18, 2019

**Sales Launch in Japan of Low GWP Refrigerant Creard R-448A
Used in Commercial and Industrial Refrigeration**

Daikin Industries, Ltd. announces the sales launch in Japan of the refrigerant Creard R-448A (R-448A) from January 2020. With more than 64% less GWP of R-404A, R-448A will be sold as an alternative refrigerant to R-404A, which is commonly used in commercial and industrial refrigeration.

To curtail global warming, environmental regulations have become stricter worldwide in recent years. The Kigali Amendment to the Montreal Protocol established a phase-down reduction in the amount of HFCs by CO₂ equivalent to 40% in 2024 and 70% in 2029, when compared to the average of 2011-2013. In Japan, the Revised Ozone Layer Protection Act, which is based on Kigali Amendment, is enforced in 2019. This makes transition to a low GWP refrigerant crucial.

Against this background, Daikin has concluded an agreement with Honeywell International Inc. (Headquarters: Morris Plains, N.J) for supply and sale of R-448A in Japan in order to expand the Daikin lineup of refrigerants with low global warming impact.

R-448A is a blend refrigerant of HFO-1234yf/1234ze and HFC-32/125/134a. It does not destroy the ozone layer and has a GWP that is more than 64% lower than that of R-404A. Moreover, it is a nonflammable, safe refrigerant that excels in energy efficiency. As an alternative to R-404A, it has well-balanced physical properties. In addition to adoption for new facilities of commercial freezers and refrigerators, after sales service needs are expected.

As the only company that handles both air-conditioning equipment and refrigerants, Daikin is working to develop and promote refrigerants with high energy efficiency and low environmental impact. For the use of commercial freezers and refrigerators, we have been selling R-407H (self-developed product, GWP 1495 and non-flammable), but we have decided to expand our product lineup in order to further contribute to the global environment.

	R-404A	R-448A	R-407H
Composition	HFC-125/134a/143a (44/4/52 mass%)	HFC-32/125/134a HFO-1234yf/1234ze (26/26/21/20/7 mass%)	HFC-32/125/134a (32.5/15.0/52.5 mass%)
GWP*1	3,922 (3,943)	1,387 (1,273)	1,495 (1,378)
COP*2 (vs R404A)	100%	109%	112%
Capacity*2 (vs R404A)	100%	101%	99%
Temperature glide*2 (Eva.)	0.4°C	3.7°C	4.2°C
Saturated Pressure (25°C)	1.25 MPa	1.29 MPa	1.24 MPa
ASHRAE Std. 34 Safety Class	A1	A1	A1

*1 GWP value: IPCC rev 4th (rev 5th)

*2 Calculation condition: Condensing temp. 40°C, Evaporating temp. -40°C, Subcool temp. 0 K, Superheat temp 20 K, Compressor Efficiency 0.7

[Daikin's Approach to Refrigerant Selection]

As a manufacturer involved from development of refrigerants to the development of equipment, the Daikin Group believes that mitigating the impact of global warming is a social issue demanding the utmost attention and has long been active in developing energy-saving equipment and supporting conversion to low GWP refrigerants. To reduce the environmental impact spanning the entire refrigerant lifecycle, Daikin evaluates refrigerants from various aspects and selects the most appropriate refrigerant according to each equipment application.

Please access the following URL for information concerning Daikin's policy on the environmental impact of refrigerants.

https://www.daikin.com/csr/information/influence/daikin_policy-en.pdf

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