

Quality is more than a word

ESPEC

New
**High Energy Efficient
Refrigerant**

R-473A

-70°C
Ultra Low

CREATING A SUSTAINABLE WORLD

Climate change caused by global warming is having a significant impact on Earth's environment and people's lives. The issue of climate change is intertwined with the various goals of SDGs, and **achieving carbon neutrality by 2050 is one of the most critical issues in the world**, and we must address it immediately.

Effects from climate change (examples)

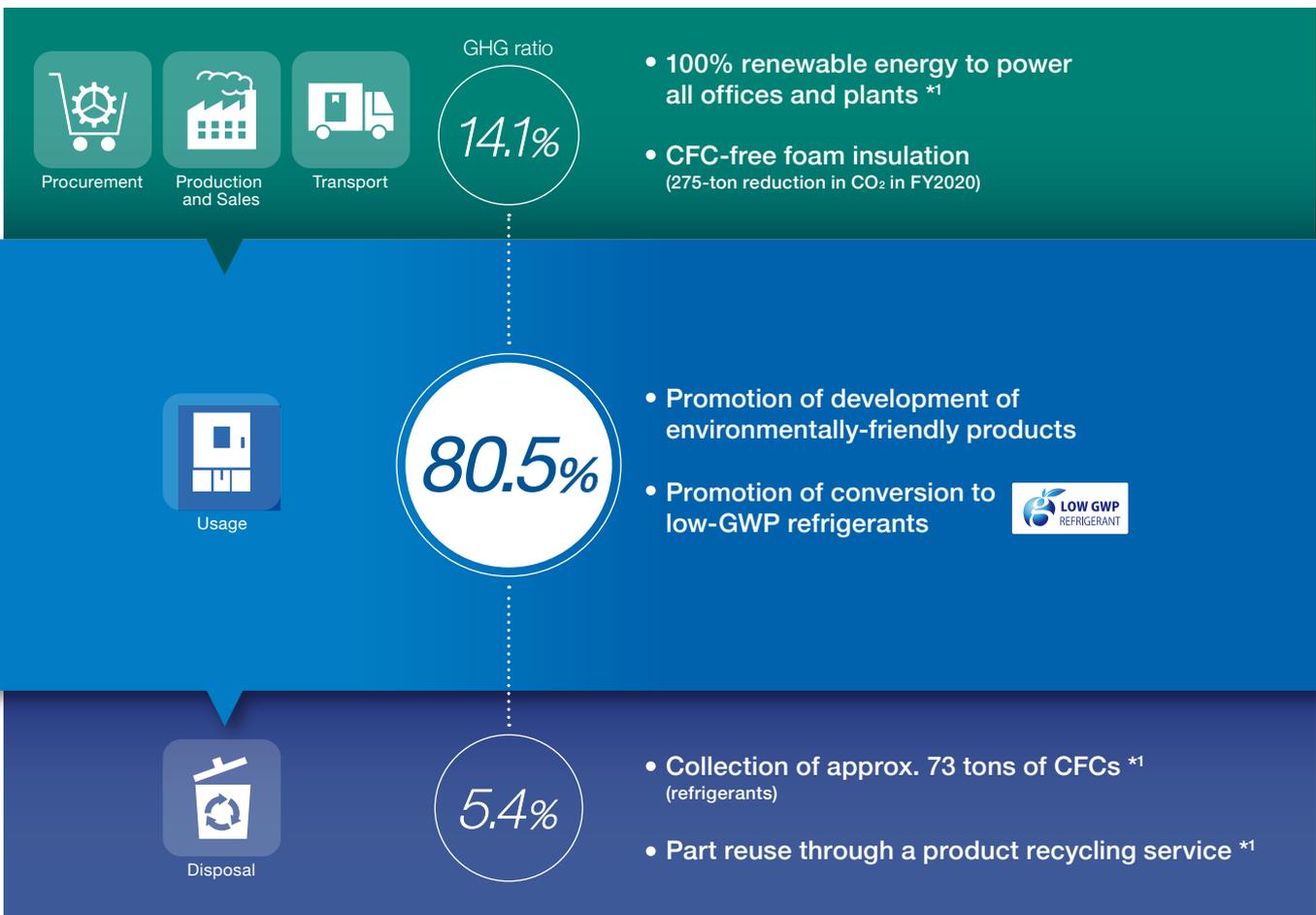


ESPEC programs to combat global warming

ESPEC recognizes that environmental conservation, preservation, and improvement are important themes for corporate management.

In the future, we will carry out activities for further energy savings in our manufacturing processes and at our offices, and will actively proceed with the introduction of renewable energy. We will also work for further energy savings in our products, encourage suppliers to set reduction targets, and carry out activities for reducing GHG emissions throughout the supply chain.

Programs for Greenhouse gas (GHG) emission ratios throughout the supply chain and their reduction



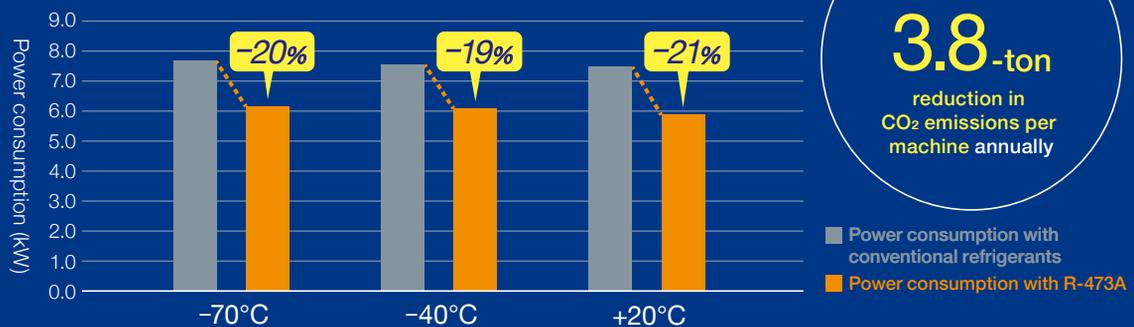
*GHG emission ratios were calculated based on results for FY2020. *1 In Japan only.

Introducing the new R-473A refrigerant that is effective at -70°C

Energy savings and sustained performance

By combining Espec's unique technology with this highly energy-efficient refrigerant, power consumption during product usage can be reduced. CO₂ emissions can also be contributed to reduce.

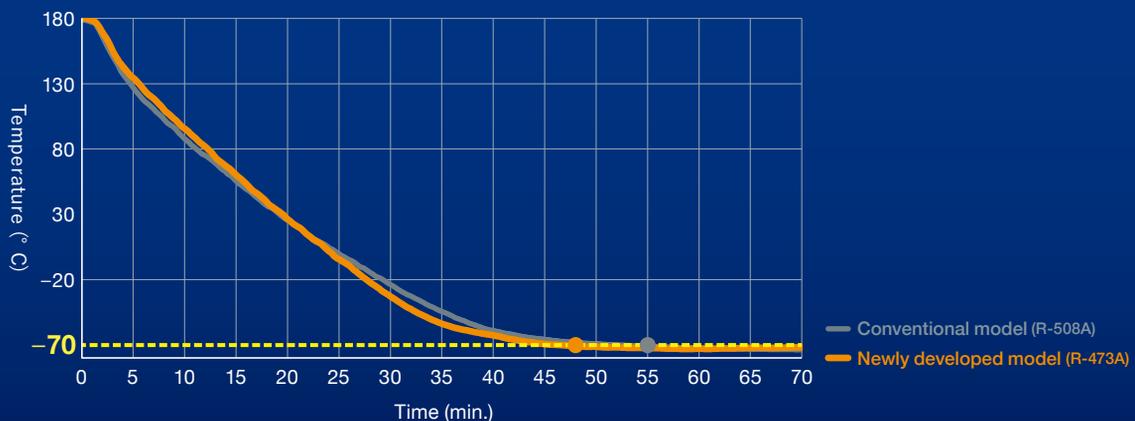
ARS-0680-5 (Example)



Approx. **3.8-ton** reduction in CO₂ emissions per machine annually

[Comparison of time to reach target temperature] Measurement example of ARS-0680-5

Refrigeration system	Conventional model (R-508A)	Newly developed model (R-473A)
Time to reach -70°C from $+180^{\circ}\text{C}$	55 min.	48 min.



*Because the data shown above are examples of actual measurement data, they are not guaranteed values. Contact ESPEC for details.

Lineup of main products converted to low-GWP refrigerant

$-40^{\circ}\text{C}_{\text{type}} / -20^{\circ}\text{C}_{\text{type}}$ [R-404A → R-449A Conversion Complete]

Temperature & Humidity Chamber



Bench-top Type Temperature (& Humidity) Chamber



Constant Climate Cabinet



Platinous J Series



Environmental Stress Chamber



Walk-In Temperature (& Humidity) Chamber

$-70^{\circ}\text{C}_{\text{type}} / -60^{\circ}\text{C}_{\text{type}}$ [R-404A → R-449A Conversion Complete]

R-23/R-508A → R-473A Scheduled for Release in 2022

R-23/R-508A → R-473A Scheduled for Release in 2023



Environmental Stress Chamber



Rapid-Rate Thermal Cycle Chamber



Bench-top Type Temperature (& Humidity) Chamber



Platinous J Series

$-70^{\circ}\text{C}_{\text{type}}$ [R-404A → R-449A Conversion Complete]

R-23/R-508A → R-473A Scheduled for Release in 2022

Thermal Shock Chamber



Damper Type TSA Series



Elevator Type TSD

Characteristics of the new R-473A refrigerant

Safety	<ul style="list-style-type: none"> • Non flammable, non toxic (A1 ASHRAE classification) 	Energy efficiency	<ul style="list-style-type: none"> • 15% higher refrigeration capacity than R-23 • Lowest attainable temperature of -75°C • Improved cooling capacity compared to R-23
Environmental conservation	<ul style="list-style-type: none"> • Zero ozone depletion potential • GWP value of 1830 (88% lower than R-23) • Charge size reduction of up to 15% 	Security of supply	<ul style="list-style-type: none"> • Global supply chain

R-473A is an environmentally friendly low-GWP refrigerant that has cleared the regulations of each country. Its characteristics **make it possible to reduce both power consumption and refrigerant filling amount**. ESPEC's aim is to suppress greenhouse gas emissions throughout the supply chain **by using this refrigerant and by making comprehensive judgements based not only on GWP values, but also on product power consumption and refrigerant filling amount**.

	R-23	R-473A	R-508A
Safety classification	A1	A1	A1
GWP	14800	1830	13210
Saturation temperature	-82.1°C	-84°C	-85.7°C
Temperature glide	0°C	4°C	0°C
Density (saturated steam, 1 ATM)	4.61kg/m ³	3.46kg/m³	6.73kg/m ³
Critical temperature	26.1°C	29.7°C	13.2°C

The ESPEC Group's global network

ESPEC group has companies in countries around the world and **its sales & service network allow for stable procurement of refrigerants across the globe**. ESPEC will continue to provide high-quality and environmentally friendly products and services to its customers across the globe in its drive to be a highly trusted global company.



Global Network Information



ESPEC will never
harm the precious
environment of
the Earth

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● Specifications are subject to change without notice due to product improvements.