

Low Global Warm Potential (GWP) Refrigerants in ESPEC Chambers

The ESPEC Group is committed to reducing the environmental impact of our products through energy conservation, responsible handling of potentially hazardous substances, and adherence to regulations. As a global leader in our industry, we are taking action to address the impact of F-gases (fluorinated greenhouse gases) by expanding our use of low Global Warming Potential (GWP) refrigerants in our chambers. This document covers equipment manufactured in the United States by ESPEC North America, as well as equipment produced in Japan by ESPEC Corp. and commonly sold in North America.

Transitioning to R-449A as standard, in place of R-404A (April 2024)

R-404A refrigerant, which is currently used in nearly every ESPEC chamber, is beginning to be phased out in the USA due to EPA regulations under the American Innovation in Manufacturing (AIM) Act of 2020. Europe already has a phase-out schedule for R-404A. These restrictions have not yet impacted R-508B and R-23, the other main refrigerants used by ESPEC. The engineering teams in the USA and Japan have been working on low GWP refrigerant alternatives to satisfy these regulatory demands, corporate green initiatives, and to advance our refrigeration technology.

In 2024, ESPEC North America will phase out use of R-404A and transition to R-449A. This applies to all single-stage and the high-stage of cascade refrigeration systems. This change will reduce the GWP of the refrigerant used from 3920 to 1397, a 64% reduction. For chambers manufactured by ESPEC Corp. in Japan and sold in North America, R-449A will become standard for SH/SU, TSA, TSE, and TSD model series. The capability of all chambers using R-449A will remain unchanged, except for a reduction in the ultimate low temperature on single-stage Platinous models (from -35°C to -30°C). R-404A will still be available, if needed, but there will be a small upcharge.

Retrofit: Existing chambers using R-404A can be switched to R-449A with minor modifications (cap-tube, control valve). This is recommended only in conjunction with other service work on the refrigeration system.

Next: Low GWP Refrigerant Alternative for Low Stage of Cascade Systems

For the low-stage of cascade refrigeration systems, ESPEC North America and ESPEC Corp. are jointly testing R-473A as a low GWP alternative to R-23 and R-508B, which are currently in use. While there is no current regulatory requirement driving this development, the ESPEC Group is committed to advancing our technology to offer customers greener options in the future. There are no current targets for changes to low-stage refrigerants. The ESPEC Group will update customers as development progresses.

Benefits of using the newer refrigerants for the customer and the environment:

1. Lower global warming impact.
2. Stable refrigerant supply, ensuring future availability and serviceability.
3. Similar performance.
4. No cost impact (on new chamber purchases).

Refrigerant	Application	GWP	Current availability (New chambers)
R404A (high)	Single-stage & cascade high-side	3,920	Phasing out in 2024 Will be offered if requested
R-449A (high)	Single-stage & cascade high-side	1,397	Will become standard in 2024 USA Models: All Japan Models: SH/SU, TSA, TSE, TSD All other models upon request
R-23 (low)	Cascade low-side	14,800	Standard for TSA models
R-508B (low)	Cascade low-side	13,396	Standard for all models except TSA
R-473A (low)	Cascade low-side	1,830	In Development for all models