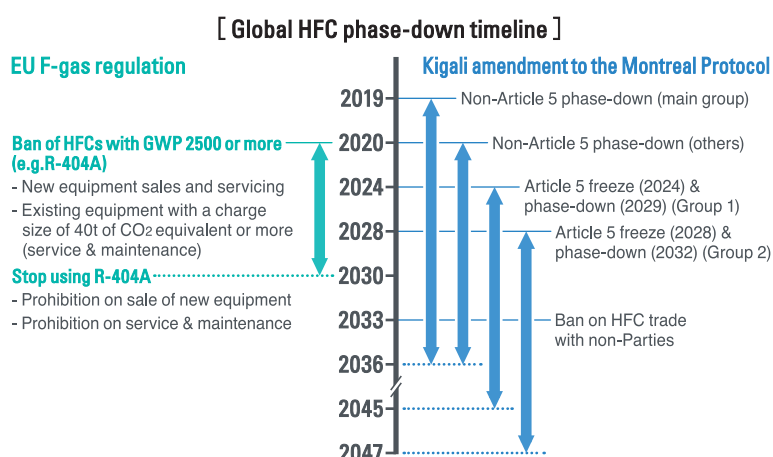


Transition to low GWP refrigerant R-449A

ESPEC is dedicated to reducing the environmental impact of our products through energy conservation, responsible handling of potentially hazardous substances, and adherence to regulations.

HFC refrigerant R-404A replaced by low GWP refrigerant R-449A

As a global leader in taking strong measures on F-gases (fluorinated greenhouse gases), ESPEC is starting to use very low Global Warming Potential (GWP) refrigerant R-449A in our main test chambers, which is a climate friendly alternative to HFC refrigerant R-404A that has a higher GWP of 3,920. This minimizes our chambers' potential environmental impact and is also in compliance both the EU "Regulation No 517/2014" (known as "F-gas Regulation"), and the Kigali Amendment on global phase-down of the consumption and production of HFCs, which is under the Montreal Protocol on substances that can deplete the ozone layer.



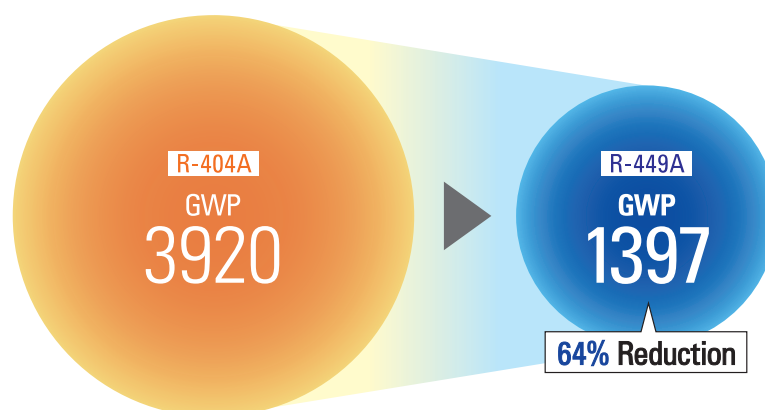
For more details : https://ec.europa.eu/clima/sites/clima/files/faq_kigali_amendment_en.pdf

R-449A is the best alternative to R-404A

R-404A has been replaced by R-449A in all new models launched after September 2018 with more climate friendly technology.

On-site retrofits are available

ESPEC can retrofit your existing chambers with suitable alternative low GWP refrigerant to extend the period of maintainability.



Product line-up with low GWP refrigerant R-449A

| Product | Model with HFC refrigerant R-404A | Available model with low GWP refrigerant R-449A* | Product | Model with HFC refrigerant R-404A | Available model with low GWP refrigerant R-449A* |
|---|--|--|-----------------------|--|---|
| Temperature & Humidity Chamber Platinous J Series | PL/PU-□K [1997-2011] | PL/PU-□J PSL/PG-□J R-449A is available from 2020. PR-□J R-449A is available from 2020. | Thermal Shock Chamber | TSA Series TSA-□□1 [1999-2011] | TSA-□□3 Water-cooled type only |
| | PL/PU-□J [2011-] | | | TSA-□□2 [2011-2015] | |
| | PSL/PG-□K [1997-2012] | | | TSA-□□3 [2014-] | |
| | PSL/PG-□J [2012-] | | | | |
| | PR-□K [1997-2011] | | | | |
| | PR-□J [2011-] | | | | |
| Environmental Stress Test Chamber AR Series | Standard Type ARL/ARU/ARS/ARG-□□□□-J [2009-] | ARL/ARU/ARS/ARG-□□□□-J | | TSD-100 [2005-2016] TSD-101-W [2016-] | TSD-101-W |
| | Rapid-rate Temperature Cycle Type ARSF/ARGF-□□□□ [2016-] | ARSF/ARGF-□□□□ ARS/ARG-□□□□-5 | | | |
| Bench-Top Type Temperature (& Humidity) Chamber | SH/SU-221,261,641,661 [2001-2013] SH/SU-222,262,642,662 [2013-] | SH/SU-222,262,642,662 | | | |
| Faster Temperature (& Humidity) Chamber SM series | SML/SMU/SMS/SMG-2 [2004-2018] SML/SMU/SMS/SMG-21 [2017-] | SML/SMU/SMS/SMG-21 | | TSE-10 [1999-2001] TSE-11A [2001-2016] TSE-12-A [2016-] | TSE-12-A R-449A is available from August 2019. |
| Walk-In Type Temperature (& Humidity) Chamber | H Series TBE/TBF/TBL/TBU/TBR/TBUU-□□H [2000-2011] E Series TBE/TBF/TBL/TBU/TBR/TBUU-□□E [2010-] | TBE/TBF/TBL/TBU/TBR/TBUU-□□E | | | |

*on request