

# When it comes to refrigerants, Trane takes a balanced approach.



All factors considered, R-123 offers the greatest advantages.



No refrigerant is perfect. Each has pros and cons that must be thoughtfully considered in terms of cost, performance and environmental impact. Trane has always selected, and continues to select, the best refrigerant for centrifugal chillers based on a number of criteria, each substantiated by scientific evidence.

## Most environmentally preferable

Trane considers the overall impact on the environment, taking both Ozone Depletion (ODP) and Global Warming Potential (GWP) into consideration. That dictates our preference for low-pressure, high-efficiency refrigerant—specifically, R-123.

## Low pressure reduces leakage

Low pressure makes R-123 refrigerant far less likely to leak from the system. And as long as the refrigerant stays in the system, it can't harm the environment. In fact, Trane guarantees a leakage rate of less than 0.5 percent per year for our CenTraVac® centrifugal chillers, which is a fraction of federal allowable limits in the United States.

## High-efficiency, low-energy use

Chillers that use R-123 are capable of achieving the HVAC industry's highest levels of efficiency; they require a lower volume of refrigerant to operate, and consume less energy to cool. Energy use is a key factor in a chiller's environmental impact: 95 percent of a typical chiller's global warming potential is attributable to the CO2 emissions from the power plant that generates the electricity to run the chiller. Therefore, a more efficient chiller reduces energy use, which leads to the indirect benefit of less CO2 emissions from power plants.

When all environmental factors are weighed and balanced, R-123 offers the greatest overall advantages.

	R-123	R-134a
Ozone depletion potential	0.012	0
Global warming potential	76	1320
Energy efficiency	13.5% over next competitor	Baseline
Low leakage rate	<0.5% per year	est. 2% per year
Short atmospheric lifetime	1.3 years	14 years

## Current scientific and industry perspectives

When the Montreal Protocol was written in 1987, it was the first environmental treaty of its kind. At that time, the scientific community had a narrower understanding of the pros and cons of various refrigerants. The treaty's timeline for refrigerant phase-out was based solely on the issue of ozone depletion, and did not take global warming potential into account.

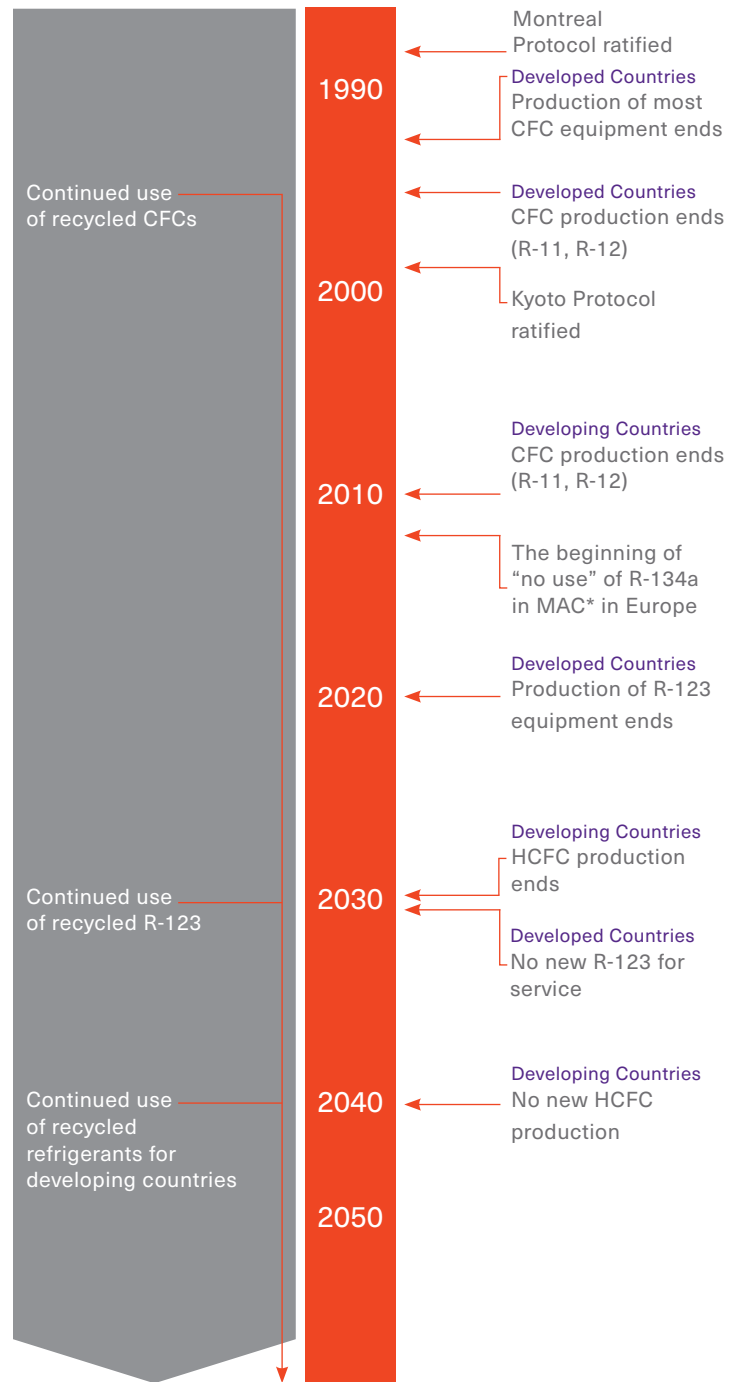
Today, as a result of a stronger understanding of environmental issues, scientists and environmentalists evaluate refrigerants using a broader set of criteria. Global warming, energy efficiency, low leakage rates and overall carbon footprint now all factor into the equation. While R-123 is included in the phase-out schedule, new equipment utilizing this refrigerant will still be manufactured until 2020, and production of refrigerant will continue until 2030 per the timeline. After 2030, recycled R-123 will continue to be available for use for developed countries. Currently, the United States Green Building Council (USGBC) supports the use of R-123 by allowing LEED® credits:

**LEED existing building standard (EB) and a CIR for new construction (NC) allow a one-point credit for R-123 chillers with low leakage rates.**

All hydrofluorocarbon (HFC) refrigerants are in legislative jeopardy due to their high global warming potential—R-134a included. R-123 continues to be the best all-around choice for refrigerants today—but Trane has always been open to change. We will continue to evaluate alternative refrigerants as they become commercially available. Rest assured, our chillers will continue to use whatever refrigerant delivers the best all-around performance and lowest environmental impact.

LEED is a registered trademark of the United States Green Building Council.

## Timeline of refrigerant usage



\*MAC: Mobile Air Conditioning

**Note:** Included in the use of "recycled" refrigerants is also the use of stockpiled supplies of the refrigerant produced before the phase-out date. In addition, there is no restriction on the importation of recycled and recovered supplies of refrigerants.



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