

As seen in

Air Conditioning | Heating | Refrigeration

the **NEWS**
THE HVACR CONTRACTOR'S WEEKLY NEWSMAGAZINE SINCE 1926
Sponsored Content

November 2021

More Complete Picture of HFO Degradation Comes Into Focus

Jordan Smith, Executive Director, globalFACT

When it comes to selecting the right refrigerant for their business, operators have to weigh several considerations, including environmental impact. Facing more decisions than ever before, end-users need as much information available to them as possible. That is why new data from [Colorado State University](#) on the environmental impact of HFOs is an important addition to the growing body of research to which end users should be paying attention. This latest study offers a more complete picture of HFO degradation in the atmosphere, giving operators another layer of assurance that low-GWP refrigerants are safe and viable refrigerant solutions.

The peer-reviewed study published in [Atmospheric Chemistry and Physics](#) simulated rainwater concentrations of trifluoroacetic acid (TFA) from the degradation of projected HFO-1234yf usage in India, China, and the Middle East through 2040.

Here are the points you need to know:

Skeptics of HFOs have suggested that the breakdown of HFO-1234yf results in appreciable amounts of TFA. Proponents of so-called "natural" refrigerants have latched onto TFA as a way of undermining the safety and sustainability of low-GWP HFO refrigerants when in reality, approximately 95% of TFA in the environment is naturally occurring. Previous studies conclude that TFA does not bioconcentrate in organisms or biomagnify in the food chain, indicating that the risk TFA poses to humans and the ecosystem is negligible.

The study, conducted by leading atmospheric scientists at Colorado State University, affirms that TFA from HFO-1234yf refrigerants will have a negligible effect on human and ecosystem health. These conclusions are consistent with findings of [previous studies](#) focused on the U.S., Europe, and China, further debunking the false claim that TFA from HFO-1234yf is harmful to life on earth. The study further bolsters our understanding of the negligible human and ecological impact of TFA from HFO-1234yf for the most populated and high economic growth regions in the world.

The study included data on past, present, and future TFA projections through the year 2040, and concluded that even for long-term scenarios envisioning the largest emissions of HFO-1234yf, TFA rainwater concentrations remain orders of magnitude below the no observable effect concentrations (NOECs) in ecological and mammalian toxicology studies. In simple terms: Even when looking at the most extreme emissions scenarios, TFA rainwater concentrations were well below the level needed to have any observable impact on organism health.

What does this mean for the HVACR industry? These findings are significant, as we expect India, China, and the Middle East to experience the largest percentage of HVACR infrastructure growth globally as their economies continue to develop. The findings are an important addition to the growing body of atmospheric research that strongly indicates that the risks of TFA from HFO-1234yf are insignificant.

At a time when proponents of so-called "natural" refrigerants are trying to push end-users away from low-GWP HFC and HFO solutions, this new research can and should give operators' the additional information needed to put their minds at ease. Advanced Climate Technologies—including low-GWP HFCs, HFOs, and blends—are safe and reliable solutions for the long term.

global**FACT**