



FACTS ABOUT HFOS AND TFA

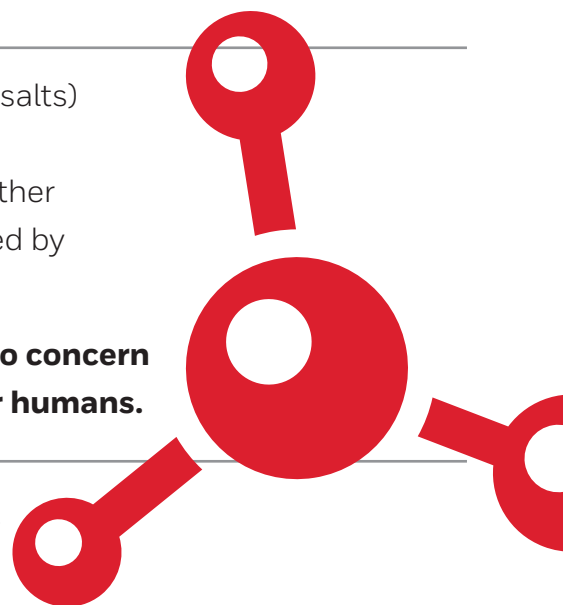
WHAT IS TFA

TFA " $\text{CF}_3\text{C(O)OH}$ " (trifluoroacetic acid and its salts) is a naturally occurring substance which is stable in the environment and resistant to further degradation (breakdown). TFA is also produced by the breakdown of some fluorocarbons.

TFA from manmade products represents no concern for the environment, aquatic organisms or humans.

Over 200 million tonnes are present in the oceans, both coastal and deepocean seawater.

More than **95%** of TFA found in the oceans is **naturally produced.**



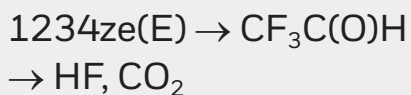
HFC-134a

20%

of emissions transform to TFA.
HFC-134a is currently the **largest** fluorocarbon source of TFA.

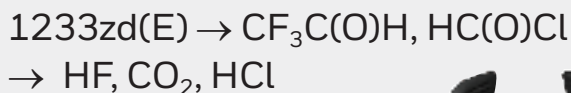
HFO-1234ze

does **not** form TFA during decomposition



HFO-1233zd

does **not** form TFA during decomposition



HFO-1234yf

If all Air Conditioning units of all cars in the world were equipped by HFO-1234yf, it would add

0.04%

of TFA to oceans.

The study* for the EU assessed a worst case European HFO-1234yf emission and subsequent TFA formation and distribution scenario: The conclusions imply that the aquatic concentrations of TFA will remain well below the noeffect level of the most sensitive algae, even in the most extensive HFO 1234yf use conditions in mobile air conditioning.

*Henne S., Shallcross D.E., Reimann S., Xiao P., Brunner D., O'Doherty S., Buchmann B., *Future Emissions and Atmospheric Fate of HFC-1234yf from Mobile Air Conditioners in Europe*, Environmental Science & Technology 46 (3):1650-8 (2012).

Using Solstice® yf refrigerant has helped avoid the release of 27,255,766 metric tons of CO₂e into the atmosphere so far, equivalent to carbon sequestered by

131,646

square kilometers of trees, nearly the size of Greece.



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