

HFOS VS THE ALTERNATIVES

You're facing a tough challenge.
We can help with the transition, no matter the industry.

Europe's F-Gas Regulation seeks to reduce the amount of HFCs on the market by 98% by 2050 (compared to 2015). Because new restrictions on the use of F-gases in various types of equipment also exist, the transition away from HFCs will be much more difficult and expensive without HFOS.

SOLSTICE® HFOS ENABLE A SAFER FUTURE

We're ready to help you with the HFC phase-down approach. As quota systems tighten, HFOs can be a safe, energy efficient and economical alternative to HFCs that can be easily installed and maintained. And, HFOs comply with all safety standards compared to non-fluorinated industrial refrigerants including hydrocarbons, ammonia and CO₂:

	HFOS	AMMONIA	CO ₂	PROPANE
PRODUCTION				
GLOBAL WARMING POTENTIAL (GWP)	<1	<1	1	<1
DECOUPLED FROM EU NATURAL GAS	Yes	Potentially	No	Yes
TOXICITY	A Low toxicity	B <ul style="list-style-type: none"> • Toxic if inhaled • Severe skin burns and eye damage • Toxic to aquatic life 	A Low toxicity	A Low toxicity
FLAMMABILITY	1 – 2L Non-flammable to mildly flammable	2L Mildly flammable	1 Non-flammable	3 Extremely flammable gas
AVAILABILITY OF SERVICE TECHNICIANS	High	Low	Low	Low
TOTAL COST OF OWNERSHIP	Low	High	High	Low - Med




High Serviceability, Low Toxicity

You don't want hazard properties such as high toxicity, contribution to smog formation, flammability and/or high operational pressure. Without HFOS, the transition away from HFCs can have elevated risks and costs.

EFFICIENCY / TOTAL COST OF OWNERSHIP

COMPARING COSTS AND EFFICIENCY ACROSS INDUSTRIES

The F-Gas Regulation might affect you more in one industry than in others. HFOs have shown 15-29 percent improvements in energy efficiency in commercial refrigeration, industrial refrigeration and chillers compared to ammonia, propane, and CO₂. With these benefits, HFOs stand out against other options, no matter the industry:

	COMMERCIAL REFRIGERATION	INDUSTRIAL REFRIGERATION	CHILLERS
INDUSTRY			
ENERGY EFFICIENCY SAVINGS VS ALTERNATIVES (%)	15.1%	15.6%	28.9%
RUNNING COSTS: SAVINGS ON ELECTRICITY VS ALTERNATIVES (20Y)	€9.9B	€10.3B	€19.2B

EXAMPLES

COMMERCIAL¹

- Retail chain with 12,000 stores could save €3.8B over 10 years and reduce emissions by 2.97MT CO₂e

CHILLERS / INDUSTRIAL²

- Apple storage facility in France
- 15Kt cold storage under controlled atmosphere
- Replaced 4 Ammonia chillers (1.3MW total) with 3 1234ze chillers
- Energy savings of 25%, lifetime savings of ~€2M

HEATING³

- Derby College, Broomfield Hall Campus
- Replaced existing gas-fired boiler with heat pumps utilizing 454B
- 790,000 kWh energy savings
- 160t CO₂ annual emission reduction
- Total efficiency ration improved by 400%

1. Based on Honeywell model using customer supplied data
 2. Side-by-side comparison of R-1234ze and ammonia chiller conducted in 2020
 3. <https://trane.eu/uk/about-trane/story-details.html?storyId=87>

Number of units: Calculated based on Gluckman Model, EPEE Association adopted industry model.

Energy Price: €0.24/kWh (based on EU27 public data, household and non-household).

Commercial Refrigeration: Energy efficiency calculated in Honeywell model based on available public data. The model is validated by third party, Cemafruid.

Industrial Refrigeration: Energy efficiency calculated in Honeywell model based on available public data.

Chillers: Energy efficiency data from Eurovent and French Apple Storage side-by-side comparison of R-1234ze and ammonia chiller conducted in 2020.

Honeywell Advanced Materials

115 Tabor Road,
 Morris Plains, NJ 07950
advancedmaterials.honeywell.com/us/en

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**THE
 FUTURE
 IS
 WHAT
 WE
 MAKE IT**

Honeywell