Comparison chart for HFC and HFO replacement refrigerants

Current Refrigerant	Type	ASHRAE No	Brand name	GWP (AR5)*	Glide	Flammable	Oil	Refrigeration Capacity	Charge size	COP cool	Compressor Power [kW]	Mass Flow [m3/h]	Discharge Temperature [°C]	COP heat	Retrofit?	Additional notes
R22	HCFC	R22	R22	1760	0.0	No (A1)	MO and POE	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
	HFC	R407C	R407C	1624	7.2	No (A1)	POE	94.8%	93.7%	96.6%	103.5%	105.4%	89.2%	97.4%	Suitable for retrofit	Higher glide and must have oil change. System flush required
	HFC	R427A	Forane 427A	1828	6.8	No (A1)	POE	90.5%	92.9%	96.0%	104.2%	110.5%	85.4%	96.9%	Suitable for retrofit	Closest match to R22 with low discharge temperatures and lowest GWP. Oil change recommended
	HFC	R438A	MO99	2059	3.6	No (A1)	MO* and POE	86.9%	94.1%	94.6%	105.7%	115.1%	80.3%	95.8%	Suitable for retrofit	Higher GWP, low discharge temperature but lower capacity. Manufacturer claims no oil change required.
	HFC	R422D	Genetron 422D Isceon MO29	2230	2.3	No (A1)	MO* and POE	85.0%	92.7%	89.8%	111.3%	117.7%	74.7%	92.1%	Suitable for retrofit	High GWP with lower COPs and capacity. Manufacturer claims no oil change required.
	HFC	R434A	RS 45	3245	1.3	No (A1)	MO* and POE	90.9%	87.9%	88.0%	113.6%	110.0%	74.9%	90.7%	Suitable for retrofit	Very high GWP and lower COPs and low capacity
	HFO/HFC	?	Solstice N20	891		No (A1)	POE								Suitable for retrofit	
	HFO/HFC	R444B	Solstice L20	295	6.9	Low (A2L)	POE	94.3%	84.1%	97.2%	102.9%	106.0%	96.9%	97.8%	New equipment only	
R134a	HFC	R134a	R134a	1300	0.0	No (A1)	POE	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
	HFO/HFC	R450A	Solstice N13	547	0.6	No (A1)	POE	89.7%	97.0%	99.2%	100.9%	111.4%	92.4%	99.4%	Suitable for retrofit	Closest match to R134a with low GWP
	HFO/HFC	R513A	Opteon XP10	573	0.0	No (A1)	POE	107.6%	94.2%	95.5%	104.8%	93.0%	88.7%	96.6%	Suitable for retrofit	
	HFO	R1234yf	Solstice yf Opteon YF	<1	0.0	Low (A2L)	POE	94.0%	90.0%	94.6%	105.7%	106.4%	81.9%	96.0%	New equipment only	Automotive A/C
	HFO	R1234ze	Solstice ze	<1	0.0	Low (A2L)	POE	73.5%	97.2%	99.6%	100.5%	136.0%	87.7%	99.7%	New equipment only	A/C and refrigeration
	HFO/HFC	R516A	Forane 516A	131		Low (A2L)	POE	102.5%	89.9%	99.6%	103.6%	97.6%	88..9%	97.5%	New equipment only	
R404A	HFC	R404A	R404A	3943	0.9	No (A1)	POE	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
	HFC	R407A	Suva 407A	1923	4.1	No (A1)	POE	94.4%	111.0%	108.2%	92.4%	106.0%	126.0%	105.2%	Suitable for retrofit	High GWP and high discharge temps
	HFC	R407F	Performax LT	1674	4.3	No (A1)	POE	101.5%	108.3%	109.2%	91.6%	98.5%	138.3%	105.8%	Suitable for retrofit	High GWP and very high discharge temperature.
	HFO/HFC	R448A	Solstice N40	1273	3.5	No (A1)	POE	102.6%	106.8%	107.5%	93.1%	97.5%	125.0%	104.7%	Suitable for retrofit	Lower GWP. Improved COP but high discharge temperatures
	HFO/HFC	R449A	Opteon XP40	1282	3.3	No (A1)	POE	101.7%	107.4%	107.3%	93.2%	98.3%	123.1%	104.6%	Suitable for retrofit	Lower GWP. Improved COP but high discharge temperatures
	HFO/HFC	R449B	Forane 449B	1296	3.4	No (A1)	POE	101.9%	107.4%	107.5%	93.0%	98.1%	125.0%	104.7%	Suitable for retrofit	Lower GWP. Improved COP but high discharge temperatures
	HFO/HFC	R452A	Opteon XP44	1945	1.8	No (A1)	POE	103.0%	108.9%	100.4%	99.6%	97.1%	100.4%	100.3%	Suitable for retrofit	Prefered option for low temperature transport refrigeration.
	HFO/HFC	R455A	Solstice L40	145	8.2	Low (A2L)	POE	96.9%	94.7%	111.0%	90.1%	103.2%	117.4%	106.9%	New equipment only	
	HFO/HFC	R465A	Forane 465A	137		\ hv +D5,	POE	91.0%	100.8%	108.5%	92.1%	109.8%	113.5%	105.3%	New equipment only	
R410A	HFC	R410A	R410A	1924	0.1	No (A1)	POE	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
	HFO/HFC	R446A	Solstice L41z	715	4.0	Low (A2L)	POE	124.1%	95.3%	94.1%	106.2%	80.6%	105.3%	95.4%	New equipment only	
	HFO/HFC	R447A	Solstice L41	572	3.1	Low (A2L)	POE	128.1%	96.9%	94.3%	106.0%	78.0%	105.6%	95.6%	New equipment only	
	HFO/HFC	R452B	Opteon XL55	675	0.5	Low (A2L)	POE	140.6%	97.5%	93.2%	107.3%	71.1%	101.3%	94.7%	New equipment only	
	HFO/HFC	R459A	Forane 459A	461		Low (A2L)	POE	136.7%	100.2%	94.8%	106.8%	73.2%	102.2%	95.1%	New equipment only	
R123	HCFC	R123	R123	79	0.0	No (A1)	MO	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		
	HFO	R1233zd	Solstice zd	1	0.0	No (A1)	POE	140.0%	100.0%						New equipment only	Low pressure chillers

Table shows % comparison of various attributes to refrigerant it is replacing.

Similar → **Better**

Note: % above 100% is generally regarded as a better result for COP, Mass flow, and Refrigeration capacity.

% below 100% is a generally regarded as a better result for Compressor power, Discharge temp, and Charge size.

GWP based on AR5. Import of HFCs in Australia is limited by a quota system relative to the GWP of the imported refrigerants. Higher GWP refrigerants reduce total available quota volume so are likely to be higher priced.

* mineral oil is only suitable for some applications. Oil changes are sometime quoted as "not required" but well maintained systems are likely to perform better and with longer life if POE is used. If mineral oil is used and the oil level is falling, top up with POE.

The data in these charts was derived using CYCLE_D (NIST) software.

Parameters used:

R134A	SST=-5, SCT=45, SC=3
R404A	SST=-25, SCT=40, SC=3
R22	SST=7, SCT=50, SC=3
R410A	SST=7, SCT=50, SC=3