

## Ozone Depletion Potential (ODP) & Global Warming Potential (GWP)

TYPE	PRODUCT	ODP	GWP
CFC	R-12	HIGH	HIGH
	R-502	HIGH	HIGH
HCFC	R-22	MEDIUM	MEDIUM
	R-123	MEDIUM	LOW
	R-401A	MEDIUM	MEDIUM
	R-401B	MEDIUM	MEDIUM
	R-402A	MEDIUM	HIGH
	R-402B	MEDIUM	MEDIUM
	R-408A	MEDIUM	HIGH
	R-409A	MEDIUM	MEDIUM
HFC	R-23	ZERO	HIGH
	R-32	ZERO	MEDIUM
	R-134A	ZERO	MEDIUM
	R-404A	ZERO	HIGH
	R-407A	ZERO	MEDIUM
	R-407C	ZERO	MEDIUM
	R-407F	ZERO	MEDIUM
	R-417A	ZERO	MEDIUM
	R-422A	ZERO	HIGH
	R-422D	ZERO	HIGH
	R-423A	ZERO	MEDIUM
	R-424A	ZERO	MEDIUM
	R-427A	ZERO	MEDIUM
	R-428A	ZERO	HIGH
	R-434A	ZERO	HIGH
	R-437A	ZERO	MEDIUM
	R-438A	ZERO	MEDIUM
	R-442A	ZERO	MEDIUM
	R-507A	ZERO	HIGH
	R-508B	ZERO	HIGH
	M089	ZERO	HIGH
HFO	R-1234yf	ZERO	LOW
	R-1234ze	ZERO	LOW
Natural	R-170	ZERO	LOW
	R-290	ZERO	LOW
	R-600a	ZERO	LOW
	R-717	ZERO	ZERO
	R-744	ZERO	LOW
	R-1150	ZERO	LOW
	R-1270	ZERO	LOW

CFCs are 100% banned in the U.S. HCFCs are in the final stage of phase-down; new production and import cease in 2020.

Ozone depletion potential (ODP) is a measure of the amount of ozone depletion caused by a substance.

Global warming potential (GWP) is a measure of the global warming impact of a substance.



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## REFRIGERANTS

- Ozone Depletion Potential (ODP)
- Global Warming Potential (GWP)
- Montreal Protocol
- Paris Accord

### HCFCs and Their Preferred HFC Replacements

HCFC	HFC REPLACEMENT	COMMENTS, ISSUES, AND CONSIDERATIONS
R-22	R-410A	Not a drop-in replacement. Requires major equipment redesign and replacement of existing systems due to much higher operating pressure. Commonly used in new residential and commercial HVAC.
R-22	R-407C	Drop-in replacement. Similar operating characteristics to R-22, but lower performance. Some oil differences. Blended refrigerant - leaks at different rates. Used in new residential and commercial HVAC and in older systems that can be easily repaired.
R-22	R-407F	Drop-in replacement for refrigeration applications. Similar characteristics to R-22. Blended refrigeration - leaks at different rates.
R-123	R134A	Not a drop-in replacement. Commonly used in centrifugal and screw chiller applications. Zero ODP, but medium-level GWP. R-123 is slightly carcinogenic, R-134A is not.

### HFCs Likely to be Targeted for Replacement per Paris Accord

HFC	HFO REPLACEMENT	COMMENTS, ISSUES, AND CONSIDERATIONS
R-404A (high GWP)	R-1234ZE	Refrigeration solution. Not a drop-in replacement. Requires major redesign.
R-507A (high GWP)	R-1234ZE	Refrigeration solution. Not a drop-in replacement. Requires major redesign.
R-23 (high GWP)	TBD	
R-410A (med. GWP)	R-1234YF	Residential and commercial HVAC (rotary and scroll).
R-134A (med. GWP)	R-1234YF	Commercial HVAC (screw and centrifugal)