

# General Replacement Guide

R-22 Replacements						
Product Name	ASHRAE #	Applications <sup>1</sup>	Refrigerant Type <sup>2</sup>	Equipment Type	Compatible Oil <sup>3</sup>	GWP <sup>4</sup>
Opteon™ XP40	R-449A	LT, MT	HFO Blend	New, Retrofit	POE	1282
Freon™ 407A	R-407A	LT, MT	HFC Blend	New, Retrofit	POE	1923
Freon™ MO29	R-422D	LT, MT	HFC Blend	Service Only <sup>5</sup>	MO, AB, POE	2473
Freon™ MO99™	R-438A	MT, AC	HFC Blend	Retrofit	MO, AB, POE	2059
Freon™ NU-22B™	R-422B	MT, AC	HFC Blend	Retrofit	MO, AB, POE	2289
Freon™ 407C	R-407C	AC	HFC Blend	New, Retrofit	POE	1624
Freon™ 410A	R-410A	AC	HFC Blend	New	POE	1924

### R-22 Retrofit Recommendation:

**LT/MT: Opteon™ XP40:** Excellent performance match and lower discharge temperature vs. R-22 with 27% lower GWP

**AC: Freon™ MO99™ or NU-22B™:** Field proven, close performance match for R-22 in AC applications.

R-12, MP39, MP66, R-409A Replacements						
Product Name	ASHRAE #	Applications <sup>1</sup>	Refrigerant Type <sup>2</sup>	Equipment Type	Compatible Oil <sup>3</sup>	GWP <sup>4</sup>
Opteon™ XP10	R-513A	MT, AC	HFO Azeotrope	New, Retrofit	POE	573
Freon™ 134a	R-134a	MT, AC, Auto	HFC	New, Retrofit	POE, PAG	1300
Opteon™ YF	R-1234yf	MT, AC, Auto	HFO (A2L)	New	POE, PAG	<1
Freon™ MO49Plus	R-437A	LT, MT	HFC Blend	Retrofit	MO, AB, POE	1638
Freon™ Hot Shot-2™	R-417C	LT, MT	HFC Blend	Retrofit	MO, AB, POE	1820

### R-134a Retrofit Recommendation:

**Opteon™ XP10:** Azeotropic, near drop-in replacement for R-134a in stationary equipment with 56% lower GWP and comparable performance. Specified by major chiller OEMs

R-404A, 507, HP80, HP81, R-408A, 502 Replacements						
Product Name	ASHRAE #	Applications <sup>1</sup>	Refrigerant Type <sup>2</sup>	Equipment Type	Compatible Oil <sup>3</sup>	GWP <sup>4</sup>
Opteon™ XP40	R-449A	LT, MT	HFO Blend	New, Retrofit	POE	1282
Opteon™ XP44	R-452A	LT, Transport	HFO Blend	New, Retrofit	POE	1945
Freon™ MO79	R-422A	LT, MT	HFC Blend	Service Only <sup>5</sup>	MO, AB, POE	2846
Freon™ One Shot-C®	R-422C	LT, MT	HFC Blend	Service Only	MO, AB, POE	3100

### R-404A/507 Retrofit Recommendation:

**Opteon™ XP40:** Up to 12% energy savings vs. R-404A with 67% lower GWP. TXV adjustment required similar to 407 series

**Opteon™ XP44:** Ideal for R-404A systems that require a low discharge temperature (e.g., transport refrigeration and low temp hermetics)

R-503, R-13 Replacements						
Product Name	ASHRAE #	Applications <sup>1</sup>	Refrigerant Type <sup>2</sup>	Equipment Type	Compatible Oil <sup>3</sup>	GWP <sup>4</sup>
Freon™ 95	R-508B	VLT	PFC/HFC Blend	New, Retrofit	POE	11,700
Freon™ 23	R-23	VLT	HFC	New, Retrofit	POE	12,400

R-123 Replacements						
Product Name	ASHRAE #	Applications <sup>1</sup>	Refrigerant Type <sup>2</sup>	Equipment Type	Compatible Oil <sup>3</sup>	GWP <sup>4</sup>
Opteon™ XP30	R-514A	AC, MT	HFO Blend (B1)	New, Retrofit <sup>6</sup>	POE	2

### R-123 Retrofit Recommendation:

**Opteon™ XP30:** Azeotropic, with zero glide. Ideal for low pressure centrifugal chillers in commercial and industrial applications

<sup>1</sup>VLT=Very Low Temperature, LT=Low Temperature, MT=Medium Temperature, AC=Air Conditioning, Transport=Transport Refrigeration, Auto=Automotive Air Conditioning

<sup>2</sup>All Refrigerants listed have ASHRAE A1 Safety Classification, unless otherwise noted.

<sup>3</sup>MO=Mineral Oil, AB=Alkylbenzene, POE=Polyol Ester, PAG=Polyalkylene Glycol for Mobile AC

<sup>4</sup>GWP=Global Warming Potential, IPCC Fifth Assessment Report, AR5

<sup>5</sup>In Canada, Freon™ MO29 is not available. Freon™ MO79 is available in limited package size.

<sup>6</sup>Retrofit options for Opteon™ XP30 are under development. Please consult your equipment manufacturer for more details.

## Performance Comparison of Retrofit Refrigerants from Chemours

The following data is meant to provide general guidance for retrofit consideration. For data on actual field conversions, please consult a Chemours representative.

Product	Compared To	Application Conditions <sup>1</sup>	Relative Capacity (%)	Relative EER (%)	Relative Mass Flow (%)	Suction Pressure (psi)	Discharge Pressure (psi)	Discharge Temperature (°F)
Opteon™ XP40 (R-449A)	R-22 <sup>2</sup>	LT	+5	-1	+18	+2	+33	-32
	R-22	MT	+4	-5	+14	+6	+33	-29
	R-404A	LT	-1	+4	-23	-4	-9	+32
	R-404A	MT	0	+2	-20	-7	-9	+18
	R-408A	LT	-4	-2	-5	-2	+9	-3
	HP80	LT	-11	+3	-30	-6	-25	+17
Opteon™ XP10 (R-513A)	R-134a	MT	+3	-2	+19	+8	-13	-13
	MP39	MT	-6	-1	+14	-3	-39	-34
	MP66	MT	-12	-1	+8	-13	-42	-37
	R-409A	MT	+6	-1	+10	-2	-42	-3
Opteon™ XP44 (R-452A)	R-404A	LT	-1	0	+2	-1	+2	+1
	R-404A	MT	0	-1	+3	-2	+2	+1
Freon™ MO99™ (R-438A)	R-22 <sup>2</sup>	LT	-12	-1	+11	-2	+4	-49
	R-22	MT	-10	-5	+10	-3	+4	-40
	R-22	HT	-7	-4	+12	-3	+5	-30
Freon™ NU-22B™ (R-422B)	R-22	HT	-11	-4	+20	-4	-5	+37
Freon™ 407A	R-22 <sup>2</sup>	LT	+2	-1	+15	+1	+30	-31
	R-22	MT	+2	-5	+14	+4	+31	-28
Freon™ 407C	R-22	HT	0	-4	+3	+1	+20	-17

Performance data is based on theoretical calculations at typical application conditions (outlined below). Actual performance will vary depending on system design and conditions.

<sup>1</sup>Application Conditions:

LT=Low Temperature; -22 °F avg evaporator, 104 °F avg condenser, 14 °F return gas T, 97 °F subcool T

MT=Medium Temperature; 20 °F avg evaporator, 105 °F avg condenser, 40 °F return gas T, 95 °F subcool T

HT=High Temperature (A/C); 45 °F avg evaporator, 115 °F avg condenser, 65 °F return gas T, 100 °F subcool T

<sup>2</sup>Corrected for liquid injection to maintain compressor discharge temperature at or below 250 °F