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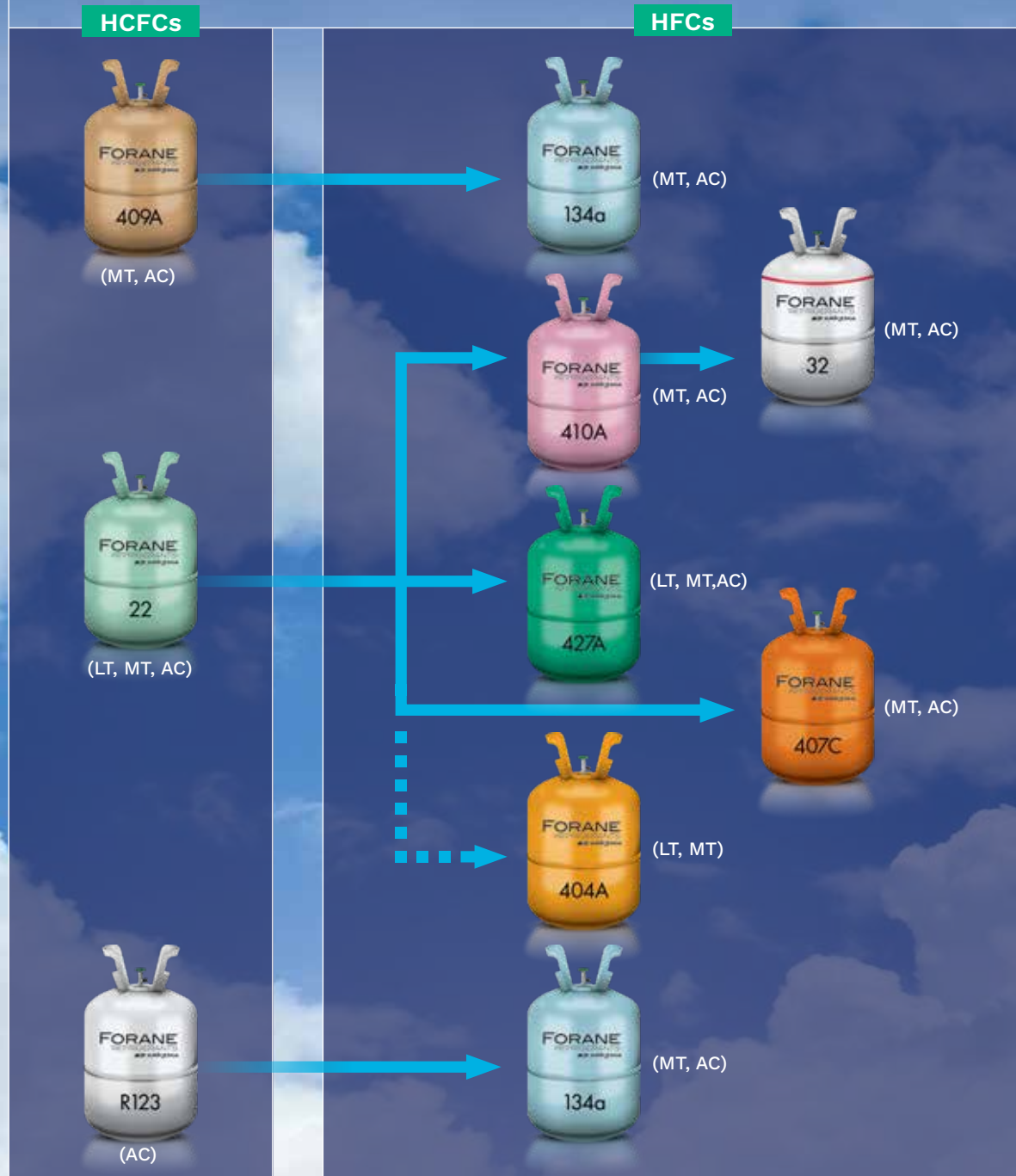
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## Refrigerant Flow Chart

Progression Toward Sustainable Refrigeration Products



LT = Low Temp, MT = Medium Temp, AC = Air-Conditioning



**FORANE®**  
REFRIGERANTS

QUICK  
REFERENCE  
GUIDE

## Application Reference Guide

ASHRAE #	TRADE NAME	REPLACES	TYPE	COMPOSITION (WT%)	GWP (100 YR) AR4	RECOMMENDED LUBRICANT	APPLICATIONS
R-22	Forane® 22		HCFC Single component fluid	R-22 – 100%	1,810	MO AB	Used in AC, MT, and LT systems. Scheduled for phase-out.
R-32	Forane® 32	R-410A	HFC Single component fluid	R-32 – 100%	675	POE	Replacement for R-410A in new residential and commercial air conditioning systems, heat pumps, dehumidifiers, and small chillers.
R-134a	Forane® 134a	R-12	HFC Single component fluid	R-134a – 100%	1,430	POE PAG (auto)	Replacement/retrofit for R-12 and R-500 systems. Recommended retrofit for R-12 automotive AC systems.
R-404A	Forane® 404A	R-502 R-22 R-402A R-408A	HFC Near-azeotropic blend	R-125 – 44% R-143a – 52% R-134a – 4%	3,922	POE	Replacement/retrofit for R-502 and R-22. Used in MT and LT refrigeration systems.
R-407C	Forane® 407C	R-22	HFC Zeotropic blend	R-32 – 23% R-125 – 25% R-134a – 52%	1,774	POE	Replacement/retrofit for R-22 systems. Used in AC and some refrigeration applications.
R-410A	Forane® 410A	R-22	HFC Near-azeotropic blend	R-32 – 50% R-125 – 50%	2,088	POE	Replacement for R-22 in smaller size chillers, and residential and light commercial AC systems. Never use as a retrofit for R-22 equipment.
R-427A	Forane® 427A The Easy Retrofit™	R-22	HFC Zeotropic blend	R-32 – 15% R-125 – 25% R-143a – 10% R-134a – 50%	2,138	MO* AB* POE	Recommended retrofit for R-22 systems. Used in AC, MT and LT.
R-1233zd	Forane® 1233zd	N/A	HFO Heat Transfer	R-1233zd – 100%	1 (AR5)	MO POE POVE	Used in centrifugal chillers, along with high efficiency, low environmental impact, and non-flammability.

\*A lubricant change may not be required but POE is always recommended for optimal performance

Global warming potential (GWP) values are relative to carbon dioxide on a 100-year basis and were obtained for the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC).

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The Easy Retrofit™ is a trademark of Arkema

## Forane® Refrigerant Pressure Temperature Chart\*

Sat. Temp (°F)	PRESSURE (PSIG)												Sat. Temp (°C)
	R-22	R-32	R-134a	R-407A Liquid Pressure	R-407A Vapor Pressure	R-407C Liquid Pressure	R-407C Vapor Pressure	R-409A Liquid Pressure	R-409A Vapor Pressure	R-410A Liquid Pressure	R-427A Liquid Pressure	R-427A Vapor Pressure	
-50	6.1	5.2	18.7	0.8	9.0	2.7	11.0	12.2	18.7	5.0	3.5	11.4	-45.6
-45	2.7	8.0	16.9	1.7	5.7	0.6	8.0	9.6	16.9	7.7	0.1	8.4	-42.8
-40	0.6	11	14.8	3.9	2.0	2.7	4.6	6.7	14.8	10.8	2.2	5.1	-40.0
-35	2.6	14.4	12.5	6.4	1.0	5.1	0.9	3.5	12.5	14.1	4.5	1.5	-37.2
-30	4.9	18.2	9.8	9.2	3.3	7.7	1.6	0.0	9.9	17.8	7.0	1.3	-34.4
-25	7.4	22.3	6.9	12.2	5.8	10.6	3.9	1.9	7.0	21.9	9.7	3.5	-31.7
-20	10.2	26.6	3.7	15.6	8.5	13.7	6.5	4.0	3.8	26.3	12.8	6.0	-28.9
-15	13.2	31.7	0.0	19.2	11.5	17.2	9.3	6.3	0.2	31.2	16.1	8.7	-26.1
-10	16.5	37.1	1.9	23.2	14.9	20.9	12.3	8.8	1.8	36.5	19.7	11.7	-23.3
-5	20.1	42.9	4.1	27.5	18.5	25.0	15.7	11.6	4.0	42.2	23.6	15.0	-20.6
0	24.0	49.3	6.5	32.2	22.5	29.5	19.4	14.6	6.3	48.4	27.9	18.7	-17.8
5	28.3	56.1	9.1	37.3	26.9	34.3	23.5	17.8	8.8	55.2	32.6	22.6	-15.0
10	32.8	63.5	11.9	42.8	31.6	39.5	27.9	21.3	11.6	62.4	37.6	26.9	-12.2
15	37.8	71.4	15.0	48.7	36.7	45.2	32.7	25.1	14.7	70.3	43.0	31.5	-9.4
20	43.1	80.0	18.4	55.1	42.3	51.2	37.9	29.2	18.0	78.7	48.8	36.6	-6.7
25	48.8	89.2	22.1	62.0	48.3	57.7	43.5	33.6	21.6	87.7	55.0	42.1	-3.9
30	55.0	99.1	26.1	69.3	54.8	64.7	49.6	38.4	25.5	97.4	61.7	48.0	-1.1
35	61.5	109.7	30.4	77.2	61.8	72.2	56.1	43.4	29.7	107.7	68.9	54.3	1.7
40	68.6	121.0	35.0	85.6	69.4	80.2	63.2	48.9	34.2	118.8	76.6	61.2	4.4
45	76.1	133.0	40.1	94.6	77.4	88.8	70.7	54.7	39.1	130.6	84.8	68.5	7.2
50	84.1	145.9	45.4	104.2	86.1	97.9	78.8	60.9	44.3	143.2	93.6	76.4	10.0
55	92.6	159.5	51.2	114.4	95.3	107.6	87.5	67.4	49.9	156.5	102.9	84.8	12.8
60	101.6	174.1	57.4	125.2	105.2	118.0	96.8	74.5	55.9	170.7	112.8	93.8	15.6
65	111.3	189.5	64.0	136.7	115.8	128.9	106.7	81.9	62.3	185.8	123.3	103.4	18.3
70	121.4	205.8	71.1	148.8	127.0	140.5	117.3	89.8	69.1	201.8	134.4	113.7	21.1
75	132.2	223.2	78.7	161.7	138.9	152.8	128.6	98.2	76.4	218.7	146.2	124.6	23.9
80	143.6	241.5	86.7	175.3	151.6	165.8	140.5	107.0	84.2	236.5	158.6	136.1	26.7
85	155.7	260.9	95.2	189.7	165.1	179.6	153.2	116.4	92.5	255.4	171.8	148.4	29.4
90	168.4	281.3	104.3	204.8	179.3	194.1	166.7	126.2	101.2	275.4	185.7	161.5	32.2
95	181.8	302.9	114.0	220.8	194.5	209.4	181.0	136.6	110.5	296.4	200.3	175.3	35.0
100	195.9	325.7	124.2	237.7	210.4	225.5	196.1	147.6	120.3	318.6	215.8	189.9	37.8
105	210.8	349.7	135.0	255.3	227.4	242.4	212.1	159.1	130.7	341.9	232.0	205.4	40.6
110	226.4	374.9	146.4	273.9	245.2	260.3	229.0	171.2	141.7	366.4	249.1	221.7	43.3
115	242.8	424.8	158.4	293.5	264.1	279.0	246.9	183.9	153.3	392.3	267.0	238.9	46.1
120	260.0	429.3	171.2	314.0	284.0	298.6	265.8	197.2	165.6	419.4	285.8	257.1	48.9
125	278.0	458.7	184.6	335.4	305.0	319.2	285.7	211.1	178.5	447.9	305.5	276.3	51.7
130	296.9	489.5	198.7	357.9	327.1	340.7	306.7	225.7	192.0	477.9	326.2	296.5	54.4
135	316.7	521.8	213.6	381.5	350.5	363.3	328.8	241.0	206.3	509.4	347.8	317.8	57.2
140	337.4	555.8	229.2	406.2	375.1	387.0	352.1	257.0	221.3	542.5	370.5	340.3	60.0
145	359.0	591.4	245.7	431.9	401.0	411.7	376.6	273.7	237.1	577.3	394.1	363.9	62.8
150	381.7	628.8	262.9	459.1	429.1	437.5	402.5	291.1	253.6	613.9	418.9	388.8	65.6

Green Numerals in bold - Inches Hg Below 1 ATM

\*This data was generated using the NIST REFPROP Database (Lemmon, E.W., Huber, M.L., McLinden, M.O. NIST Standard Reference Database 23: Reference Fluid Thermodynamic and Transport Properties-REFPROP, Version 9.0, National Institute of Standards and Technology, Standard Reference Data Program, Gaithersburg, 2010)