FORANE® REFRIGERANTS BY ARKEMA

Retrofitting with Forane® Refrigerants

Quick Reference Guide

www.forane-us.com

Technical Support
(800) 738-7695

Customer Service
(800) 245-5858

	Recommended Retrofit Applications[1]	Recommended Lubricant Changes	Retrofit Charge Ratios	Charging Method	Suction Pressure Change	Discharge Pressure Change	Discharge Temperature Change
Forane® 427A	R-22 AC, MT, & LT DX Equipment	Partial POE, MO / AB with Oil Separator	95 - 100% Weight of R-22	Liquid Phase Only	0 - 5 psi Lower Than R-22	0 - 10 psi Higher Than R-22	25 - 45 °F Lower Than R-22
Forane® 407C	R-22 AC & MT DX Equipment	Change to POE Oil Required	90 - 95% Weight of R-22	Liquid Phase Only	0 - 2 psi Lower Than R-22	15 - 25 psi Higher Than R-22	10 - 15 °F Lower Than R-22
Forane® 407A	R-22 MT & LT DX Equipment	Change to POE Oil Required	95 - 100% Weight of R-22	Liquid Phase Only	0 - 3 psi Higher Than R-22	25 - 35 psi Higher Than R-22	20 - 35 °F Lower Than R-22
Forane® 404A	R-502 Equipment	Change to POE Oil Required	85 - 90% Weight of R-502	Liquid Phase Only	0 - 5 psi Higher Than R-502	15 - 25 psi Higher Than R-502	0 - 10 °F Lower Than R-502
Forane® 507A	R-502 Equipment	Change to POE Oil Required	85 - 90% Weight of R-502	Liquid Phase Only	0 - 5 psi Higher Than R-502	20 - 35 psi Higher Than R-502	0 - 10 °F Lower Than R-502
Forane® 408A	R-502 Equipment	No Oil Change Required	85 - 90% Weight of R-502	Liquid Phase Only	1 - 3 psi Lower Than R-502	0 - 5 psi Higher Than R-502	10 - 35 °F Higher Than R-502
Forane® 134a	R-12 / R-500[2] Equipment	Change to POE / PAG[3] Oil Required	90 - 95% Weight of R-12 / R-500	Liquid or Vapor Phase	1 - 3 psi Lower Than R-12	5 - 15 psi Higher Than R-12	0 - 10 °F Lower Than R-12
Forane® 409A	R-12 / R-500[2] Stationary DX Equipment	No Oil Change for AC - MT, Partial AB[4] for LT	80 - 90%[5] Weight of R-12 / R-500	Liquid Phase Only	0 - 5 psi Higher Than R-12	15 - 25 psi Higher Than R-12	5 - 25 °F Higher Than R-12

1: Follow OEM retrofit recommendations & change to an appropriate filter-drier 2: Forane® 409A is recommended for most R-12 / R-500 stationary retrofits. Use Forane® 134a for automotive A/C and flooded evaporators. 3: Use PAG in automotive AC only. 4: For evaporator temperatures < 0 °F, replace at least 30% original MO with AB. 5: Charge ratio is 80% for cap tubes & 85 - 90% for TXVs.

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Values listed are general guidelines only.
Actual system performance/ requirements may vary.

ARKEMA INNOVATIVE CHEMISTRY

Forane® Refrigerant Pressure Temperature Chart*

PRESSURE (PSIG)*

Sat. Temp (°F)	R-22	R-407C Liquid Pressure	R-407C Vapor Pressure	R-410A Liquid Pressure	R-427A Liquid Pressure	R-427A Vapor Pressure	R-407A Liquid Pressure	R-407A Vapor Pressure	R-12	R-134a	R-409A Liquid Pressure	R-409A Vapor Pressure	R-401A Liquid Pressure	R-401A Vapor Pressure	R-401B Liquid Pressure	R-401B Vapor Pressure	R-502	R-408A Liquid Pressure	R-402A Liquid Pressure	R-402B Liquid Pressure	R-404A Liquid Pressure	R-507A	R-123	Sat. Temp (°C)
-50	*6.1*	*2.7*	*11.0*	5.0	*3.5*	*11.4*	*0.8*	*9.0*	*15.4*	*18.7*	*12.2*	*18.7*	*13.5*	*17.9*	*12.2*	*16.8*	*0.3*	*1.4*	2.5	1.1	0.5	0.9	*29.2*	-45.6
-45	*2.7*	0.6	*8.0*	7.7	0.1	*8.4*	1.7	*5.7*	*13.3*	*16.9*	*9.6*	*16.9*	*11.1*	*16.0*	*9.6*	*14.7*	1.8	1.3	4.9	3.2	2.6	3.0	*29.0*	-42.8
-40	0.6	2.7	*4.6*	10.8	2.2	*5.1*	3.9	*2.0*	*11.0*	*14.8*	*6.7*	*14.8*	*8.4*	*13.8*	*6.7*	*12.4*	4.0	3.5	7.4	5.6	4.9	5.4	*28.9*	-40.0
-35	2.6	5.1	*0.9*	14.1	4.5	*1.5*	6.4	1.0	*8.4*	*12.5*	*3.5*	*12.5*	*5.3*	*11.4*	*3.4*	*9.7*	6.4	5.8	10.3	8.2	7.5	8.1	*28.7*	-37.2
-30	4.9	7.7	1.6	17.8	7.0	1.3	9.2	3.3	*5.5*	*9.8*	0.0	*9.9*	*2.0*	*8.7*	0.1	*6.8*	9.1	8.5	13.4	11.1	10.3	11.0	*28.4*	-34.4
-25	7.4	10.6	3.9	21.9	9.7	3.5	12.2	5.8	*2.4*	*6.9*	1.9	*7.0*	0.8	*5.6*	2.0	*3.5*	11.9	11.3	16.8	14.2	13.4	14.1	*28.1*	-31.7
-20	10.2	13.7	6.5	26.3	12.8	6.0	15.6	8.5	0.5	*3.7*	4.0	*3.8*	2.9	*2.2*	4.1	0.1	15.1	14.5	20.5	17.7	16.8	17.6	*27.8*	-28.9
-15	13.2	17.2	9.3	31.2	16.1	8.7	19.2	11.5	2.4	0.0	6.3	*0.2*	5.1	0.7	6.5	2.0	18.5	17.9	24.5	21.4	20.5	21.4	*27.4*	-26.1
-10	16.5	20.9	12.3	36.5	19.7	11.7	23.2	14.9	4.5	1.9	8.8	1.8	7.5	2.8	9.1	4.2	22.2	21.7	28.8	25.5	24.6	25.5	*27.0*	-23.3
-5	20.1	25.0	15.7	42.2	23.6	15.0	27.5	18.5	6.7	4.1	11.6	4.0	10.1	5.0	11.9	6.6	26.3	25.7	33.6	29.9	28.9	30.0	*26.5*	-20.6
0	24.0	29.5	19.4	48.4	27.9	18.7	32.2	22.5	9.1	6.5	14.6	6.3	13.0	7.4	14.9	9.2	30.6	30.1	38.7	34.6	33.7	34.8	*25.9*	-17.8
5	28.3	34.3	23.5	55.2	32.6	22.6	37.3	26.9	11.7	9.1	17.8	8.8	16.1	10.1	18.2	12.1	35.3	34.9	44.2	39.8	38.8	40.1	*25.3*	-15.0
10	32.8	39.5	27.9	62.4	37.6	26.9	42.8	31.6	14.6	11.9	21.3	11.6	19.5	13.0	21.8	15.2	40.4	40.0	50.2	45.3	44.3	45.7	*24.6*	-12.2
15	37.8	45.2	32.7	70.3	43.0	31.5	48.7	36.7	17.7	15.0	25.1	14.7	23.1	16.2	25.7	18.6	45.8	45.5	56.5	51.3	50.2	51.8	*23.8*	-9.4
20	43.1	51.2	37.9	78.7	48.8	36.6	55.1	42.3	21.0	18.4	29.2	18.0	27.1	19.6	29.9	22.3	51.6	51.5	63.4	57.7	56.6	58.3	*22.9*	-6.7
25	48.8	57.7	43.5	87.7	55.0	42.1	62.0	48.3	24.6	22.1	33.6	21.6	31.4	23.4	34.4	26.3	57.9	57.8	70.7	64.5	63.4	65.3	*21.9*	-3.9
30	55.0	64.7	49.6	97.4	61.7	48.0	69.3	54.8	28.4	26.1	38.4	25.5	36.0	27.4	39.3	30.6	64.6	64.6	78.6	71.8	70.7	72.7	*20.8*	-1.1
35	61.5	72.2	56.1	107.7	68.9	54.3	77.2	61.8	32.5	30.4	43.4	29.7	40.9	31.8	44.5	35.2	71.7	71.9	86.9	79.7	78.6	80.7	*19.5*	1.7
40	68.6	80.2	63.2	118.8	76.6	61.2	85.6	69.4	36.9	35.0	48.9	34.2	46.2	36.5	50.1	40.2	79.3	79.7	95.8	88.0	86.9	89.2	*18.2*	4.4
45	76.1	88.8	70.7	130.6	84.8	68.5	94.6	77.4	41.6	40.1	54.7	39.1	51.8	41.6	56.0	45.6	87.4	88.0	105.3	96.9	95.8	98.3	*16.6*	7.2
50	84.1	97.9	78.8	143.2	93.6	76.4	104.2	86.1	46.6	45.4	60.9	44.3	57.9	47.0	62.4	51.4	96.0	96.8	115.4	106.3	105.3	108.0	*15.0*	10.0
55	92.6	107.6	87.5	156.5	102.9	84.8	114.4	95.3	51.9	51.2	67.4	49.9	64.3	52.8	69.2	57.5	105.1	106.2	126.1	116.3	115.3	118.3	*13.2*	12.8
60	101.6	118.0	96.8	170.7	112.8	93.8	125.2	105.2	57.6	57.4	74.5	55.9	71.2	59.0	76.5	64.1	114.7	116.1	137.4	127.0	126.0	129.2	*11.2*	15.6
65	111.3	128.9	106.7	185.8	123.3	103.4	136.7	115.8	63.7	64.0	81.9	62.3	78.5	65.7	84.2	71.2	125.0	126.7	149.4	138.2	137.3	140.8	*9.0*	18.3
70	121.4	140.5	117.3	201.8	134.4	113.7	148.8	127.0	70.1	71.1	89.8	69.1	86.3	72.8	92.3	78.7	135.8	137.8	162.1	150.1	149.3	153.0	*6.6*	21.1
75	132.2	152.8	128.6	218.7	146.2	124.6	161.7	138.9	76.8	78.7	98.2	76.4	94.5	80.3	101.0	86.7	147.2	149.6	175.5	162.7	162.0	165.9	*4.0*	23.9
80	143.6	165.8	140.5	236.5	158.6	136.1	175.3	151.6	84.0	86.7	107.0	84.2	103.2	88.4	110.2	95.2	159.2	162.1	189.7	176.0	175.4	179.6	*1.2*	26.7
85	155.7	179.6	153.2	255.4	171.8	148.4	189.7	165.1	91.6	95.2	116.4	92.5	112.4	96.9	119.9	104.2	171.9	175.3	204.6	190.0	189.5	194.1	0.9	29.4
90	168.4	194.1	166.7	275.4	185.7	161.5	204.8	179.3	99.6	104.3	126.2	101.2	122.2	106.0	130.1	113.8	185.3	189.2	220.3	204.7	204.5	209.3	2.5	32.2
95	181.8	209.4	181.0	296.4	200.3	175.3	220.8	194.5	108.0	114.0	136.6	110.5	132.5	115.6	140.9	123.9	199.4	203.8	236.8	220.2	220.2	225.4	4.2	35.0
100	195.9	225.5	196.1	318.6	215.8	189.9	237.7	210.4	116.9	124.2	147.6	120.3	143.3	125.8	152.3	134.7	214.1	219.2	254.2	236.5	236.8	242.3	6.1	37.8
105	210.8	242.4	212.1	341.9	232.0	205.4	255.3	227.4	126.3	135.0	159.1	130.7	154.8	136.5	164.3	146.0	229.7	235.3	272.5	253.7	254.2	260.1	8.1	40.6
110	226.4	260.3	229.0	366.4	249.1	221.7	273.9	245.2	136.1	146.4	171.2	141.7	166.8	147.8	176.9	158.0	246.0	252.3	291.6	271.7	272.5	278.8	10.3	43.3
115	242.8	279.0	246.9	392.3	267.0	238.9	293.5	264.1	146.4	158.4	183.9	153.3	179.4	159.8	190.1	170.6	263.1	270.2	311.8	290.5	291.8	298.5	12.6	46.1
120	260.0	298.6	265.8	419.4	285.8	257.1	314.0	284.0	157.3	171.2	197.2	165.6	192.7	172.4	204.1	183.9	281.0	288.9	332.9	310.3	312.1	319.2	15.1	48.9
125	278.0	319.2	285.7	447.9	305.5	276.3	335.4	305.0	168.6	184.6	211.1	178.5	206.6	185.7	218.6	197.9	299.8	308.6	355.0	331.0	333.3	340.9	17.7	51.7
130	296.9	340.7	306.7	477.9	326.2	296.5	357.9	327.1	180.5	198.7	225.7	192.0	221.2	199.7	233.9	212.6	319.4	329.2	378.1	352.7	355.7	363.8	20.6	54.4
135	316.7	363.3	328.8	509.4	347.8	317.8	381.5	350.5	193.0	213.6	241.0	206.3	236.5	214.5	250.0	228.1	340.0	350.7	402.4	375.4	379.1	387.8	23.6	57.2
140	337.4	387.0	352.1	542.5	370.5	340.3	406.2	375.1	206.0	229.2	257.0	221.3	252.5	229.9	266.7	244.3	361.6	373.3	427.8	399.2	403.7	413.0	26.8	60.0
145	359.0	411.7	376.6	577.3	394.1	363.9	431.9	401.0	219.7	245.7	273.7	237.1	269.3	246.2	284.3	261.4	384.1	397.0	454.5	424.0	429.6	439.5	30.2	62.8
150	381.7	437.5	402.5	613.9	418.9	388.8	458.9	428.3	233.9	262.9	291.1	253.6	286.8	263.2	302.6	279.3	407.7	421.7	482.3	450.0	456.8	467.4	33.8	65.6

** 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 Technology, Standard Reference Data Program, Gaithersburg, 2010)*

Red Numerals (in bold and italics) - Inches Hg Below 1 ATM

Forane® Refrigerant Cylinder Identification

Type		Color Code	Size in lbs. (Container Type)
R-12	CFC	White	30 (A), 50 (A), 145 (B), 2000 (E)
R-502	CFC	Lavender	30 (A), 125 (B)
R-22	HCFC	Light Green	30 (A), 50 (A), 125 (B), 1000(D), 1750 (E)
R-123	HCFC	Light Blue Grey	100 (C), 200 (C)
R-401A	HCFC	Pinkish Red	30 (A), 125 (B)
R-401B	HCFC	Mustard	30 (A), 125 (B)
R-402A	HCFC	Sand	27 (A), 110 (B)
R-402B	HCFC	Olive	13 (A)
R-408A	HCFC	Medium Purple	24 (A), 100 (B), 1300 (E)
R-409A	HCFC	Tan	30 (A), 125 (B), 1800 (E)
R-134a	HFC	Light Blue	30 (A), 125 (B), 1000 (D), 1750 (E)
R-404A	HFC	Orange	24 (A), 100 (B), 800 (D), 1300 (E)
R-407A	HFC	Lime Green	25 (A), 115 (B)
R-407C	HFC	Brown	25 (A), 115 (B), 1000 (D), 1600 (E)
R-427A	HFC	Green	25 (A) 110 (B)
R-410A	HFC	Rose	25 (A), 100 (B), 850 (D), 1350 (E)
R-507A	HFC	Teal	25 (A), 100 (B), 800 (D), 1400 (E)