

SOLSTICE® 454A (R-454A)

TECHNICAL DATA SHEET

Solstice® 454A (R-454A) is a non-ozone depleting, zeotropic blend designed as a low GWP alternative to R-404A in refrigeration applications.

Solstice® 454A demonstrates approximately 6% improved efficiency, 8% better capacity and has 94% lower GWP than R-404A.

With its environmental qualities and an evaporator glide of ~roughly 8°F, R-454A can be an effective long-term refrigeration solution in many applications:

Supermarket refrigeration

- Low and medium temperature supermarket refrigeration systems
- Retail food condensing units
- Cold storage
- Industrial Process Refrigeration (chiller / non-chiller)

*Maximum 200lb in applications per EPA Technology Transitions Rule



GENERAL PROPERTIES

Class/Type	Zeotropic Blend
Formula	R-32 / R-1234yf (65% / 35%)
Appearance	Colorless
ODP	0
GWP (IPCC AR4)	239
Flammability Limits (% vol)	LFL = 8.4%, 17.5lb/1000 ft ³
ASHRAE Standard 34 Class	A2L

UNITS

Molecular weight	80.5 kg/kmol
Boiling temperature	-54.1°F
Critical temperature	179.1°F
Critical pressure	671.1psia
Critical volume	0.035 ft ³ /lbm
Critical density	28.49 lbm/ft ³
Vapor density at 0 psig (boiling point)	0.212 lbm/ft ³
Liquid density at 32°F	69.75 lbm/ft ³
Liquid density at 77°F	63.73 lbm/ft ³
Vapor density at 77°F	3.003 lbm/ft ³
Liquid heat capacity at 77°F	0.388 Btu/lbm-R
Vapor heat capacity at 77°F	0.29 Btu/lbm-R
Vapor pressure at 77°F	168.86 psia
Liquid thermal conductivity at 77°F	0.048 Btu/h-ft-R
Vapor thermal conductivity at 77°F	0.008 Btu/h-ft-R
Liquid viscosity at 77°F	0.000082 lbm/ft-sec
Vapor viscosity at 77°F	0.000008 lbm/ft-sec

BENEFITS

- Low GWP of 239
- Close capacity match to R-404A
- CARB & AIM compliant for new equipment
- Temperature glide similar to R-448A
- Miscibility with POE lubricants



SAFETY AND STORAGE

Solstice Advanced Materials recommends reading the Safety Data Sheet (SDS) before using the product. Solstice® 454A is a mildly flammable refrigerant (ASHRAE class A2L).

MATERIALS COMPATIBILITY

Solstice does not recommend the use of chlorinated solvents to clean refrigeration systems or components.

DESICCANTS

Desiccant driers compatible with Solstice® 454A are commercially available.

Individual drier manufacturers should be contacted for specific recommendations.

LUBRICANTS

Polyolester (POE) oil is recommended for using Solstice® 454A. Compressor manufacturers typically qualify specific lubricants for use with their products. Users should check with the equipment manufacturer for the recommended lubricants for their system.

PLASTICS AND ELASTOMERS

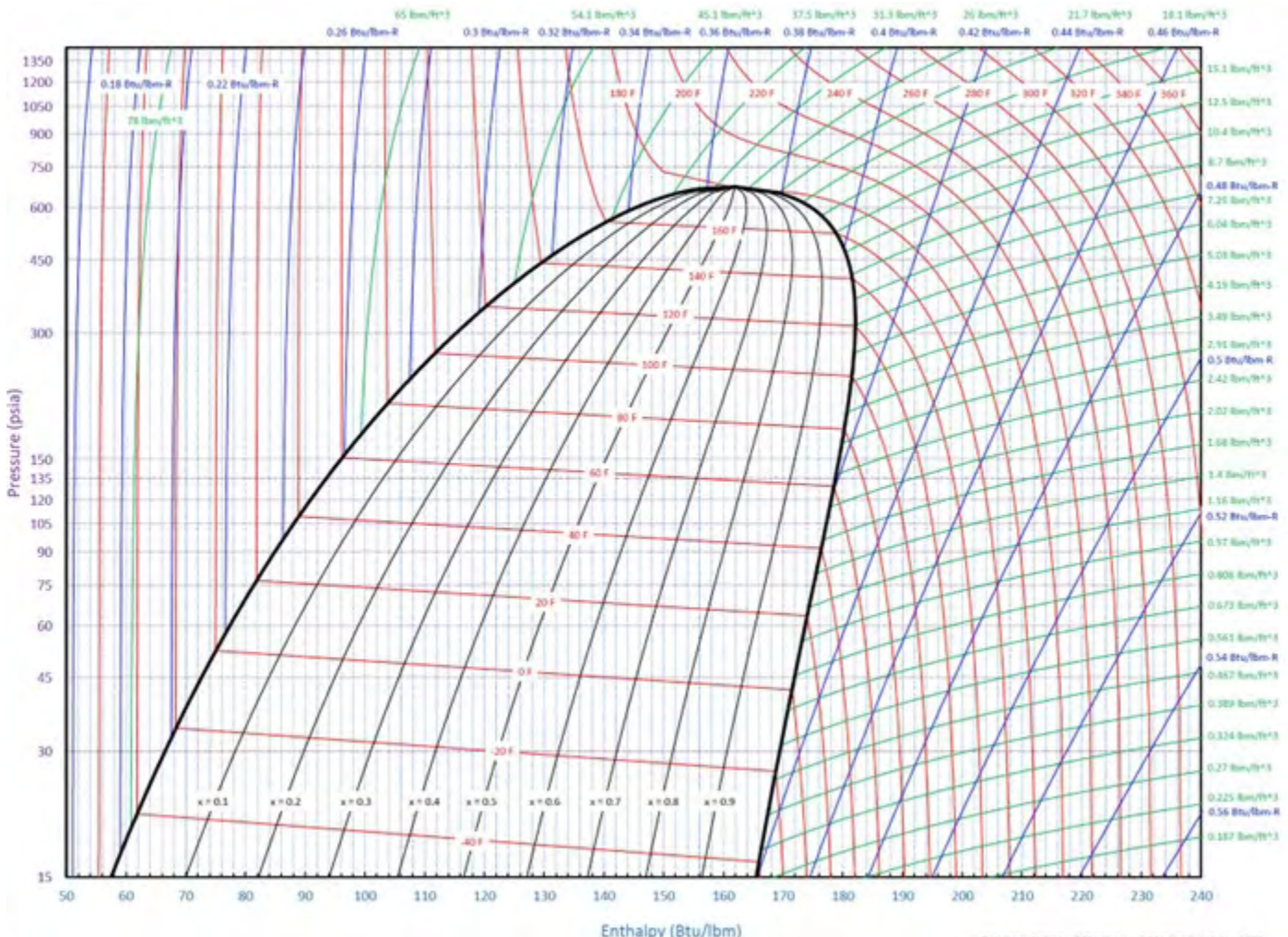
Solstice® 454A is compatible with most common materials. There are many different grades and formulations of these materials, we recommend that compatibility testing be performed on the specific grade of materials under consideration and at the conditions of use when designing new systems. Customers should consult the manufacturer or conduct further independent testing.

LEAK DETECTION

Leak detectors can be used for pinpointing specific leaks or for monitoring an entire room on a continual basis. Leak detection is important for refrigerant conservation, equipment protection and performance, reduction of emissions and protection in case of contact with the system. Customers should consult the equipment manufacturer for appropriate detectors.

PRESSURE AND ENTHALPY

Solstice® 454A (R-454A)



R-454A		
PRESSURE (PSIG)	VAPOR TEMPERATURE (F)	BUBBLE TEMPERATURE (F)
0	-54.1	-43.9
5	-42.9	-32.6
10	-33.8	-23.5
15	-26.0	-15.7
20	-19.1	-8.8
22	-16.6	-6.3
24	-14.2	-3.8
26	-11.8	-1.5
28	-9.6	0.7
30	-7.4	2.9
32	-5.3	5.0
34	-3.3	7.0
36	-1.4	9.0
38	0.6	10.9
40	2.4	12.7
42	4.2	14.5
44	6.0	16.2
46	7.7	17.9
48	9.3	19.6
50	10.9	21.2
55	14.8	25.1
60	18.5	28.8
70	25.4	35.6
80	31.7	41.8
90	37.5	47.6
100	42.9	53.0
105	45.5	55.5
110	48.0	58.0
115	50.4	60.4
120	52.7	62.7
125	55.0	64.9
130	57.3	67.1
135	59.4	69.3
140	61.5	71.4

R-454A		
PRESSURE (PSIG)	VAPOR TEMPERATURE (F)	BUBBLE TEMPERATURE (F)
145	63.6	73.4
150	65.6	75.4
155	67.6	77.3
160	69.5	79.2
165	71.4	81.1
170	73.3	82.9
175	75.1	84.7
180	76.9	86.4
185	78.6	88.1
190	80.4	89.8
195	82.1	91.5
200	83.7	93.1
205	85.3	94.7
210	86.9	96.2
215	88.5	97.8
220	90.1	99.3
230	93.1	102.2
240	96.1	105.1
250	98.9	107.9
260	101.7	110.5
270	104.4	113.2
280	107.1	115.7
290	109.6	118.2
300	112.1	120.6
310	114.6	122.9
320	117.0	125.2
330	119.4	127.5
340	121.7	129.7
350	123.9	131.8
360	126.1	133.9
370	128.3	136.0
380	130.4	138.0
390	132.5	139.9
400	134.6	141.8



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