SOLSTICE® 454C (R-454C)

TECHNICAL DATA SHEET

Solstice® 454C (R-454C) is a non-ozone depleting, zeotropic blend designed as a low Global Warming Potential (GWP) refrigerant for low, medium, and high temperature applications in new systems.

Solstice® 454C is an excellent refrigerant option for commercial refrigeration applications. Its low GWP, extended operating envelope, high efficiency, high critical temperature and low critical pressure makes it a potential match for other applications such as chillers, heat pumps, and others. Solstice® 454C demonstrates nearly 10% improved efficiency and capacity within 8% of R-404A, with a GWP that's 96% lower than R-404A.

With its environmental qualities and an evaporator glide of less than 8° Fahrenheit (F), R-454C can be an effective long term refrigeration solution in many applications:

- Supermarket refrigeration
- Convenience store refrigeration
- Cold storage
- Plug-in refrigeration equipment

PHYSICAL PROPERTIES

GENERAL PROPERTIES	
Class/Type	Zeotropic Blend
Formula	"R-32 / R-1234yf (21.5% / 78.5%)"
Appearance	Colorless
ODP (ODP-R11=1)	0
GWP (IPCC AR4)	146
ASHRAE Standard 34 Class	A2L

UNITS	
Molecular weight	90.776 lbm/lb-mol
Boiling temperature	-50.0°F
Critical temperature	180.2°F
Critical pressure	626.4 psia
Critical volume	0.035 ft^3/lbm
Critical density	28.82 lbm/ft^3
Vapor density at 0 psig (boiling point)	0.214 lbm/ft^3
Liquid density at 32°F	70.94 lbm/ft^3
Liquid density at 77°F	65.08 lbm/ft^3
Vapor density at 77°F	2.78 lbm/ft^3
Liquid heat capacity at 77°F	0.368 Btu/lbm-R
Vapor heat capacity at 77°F	0.271 Btu/lbm-R
Vapor pressure at 77°F	141.68 psia
Liquid thermal conductivity at 77°F	0.044 Btu/h-ft-R
Vapor thermal conductivity at 77°F	0.008 Btu/h-ft-R
Liquid viscosity at 77°F	0.000087 lbm/ft-sec
Vapor viscosity at 77°F	0.000008 lbm/ft-sec

HIGHLIGHTS

- Maximum UL 60335-2-89 charge of 165lbs
- Low GWP of 146, 96% lower than R-404A
- Close capacity match to R-404A
- ~10% higher COP than R-404A
- Temperature glide similar to R-448A
- Miscibility with POE lubricants

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SAFETY AND STORAGE

Solstice Advanced Materials recommends reading the Safety Data Sheet (SDS) before using the product. Solstice® 454C 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® 454C are commercially available.

Individual drier manufacturers should be contacted for specific recommendations.

LUBRICANTS

Polyolester (POE) oil is recommended for using Solstice® 454C. 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

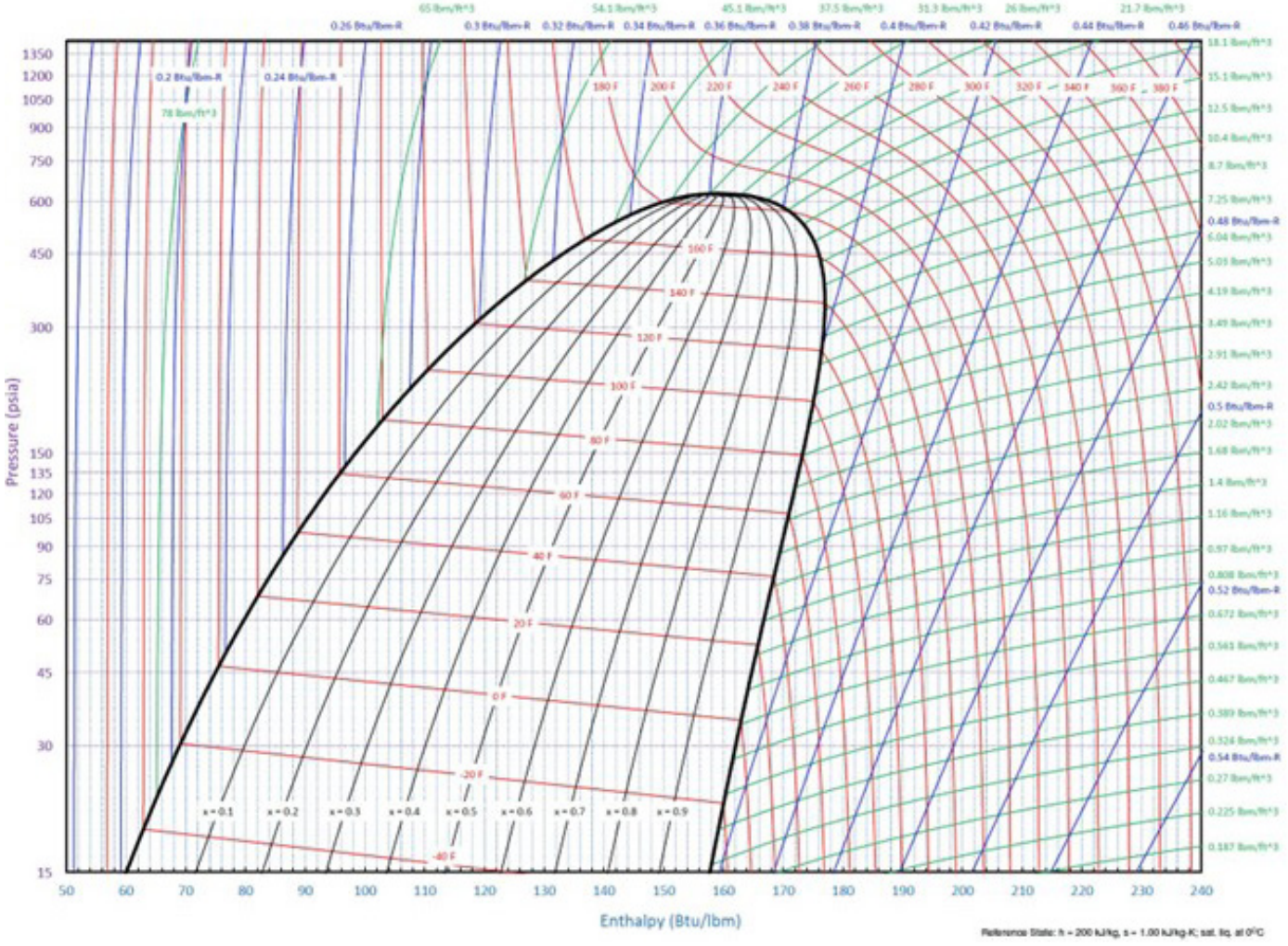
Solstice® 454C is compatible with most common materials. There are many different grades and formulations of these materials, we recommend that compatibility testing be performed on the specific grade of materials under consideration and at the conditions of use when designing new systems. Customers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

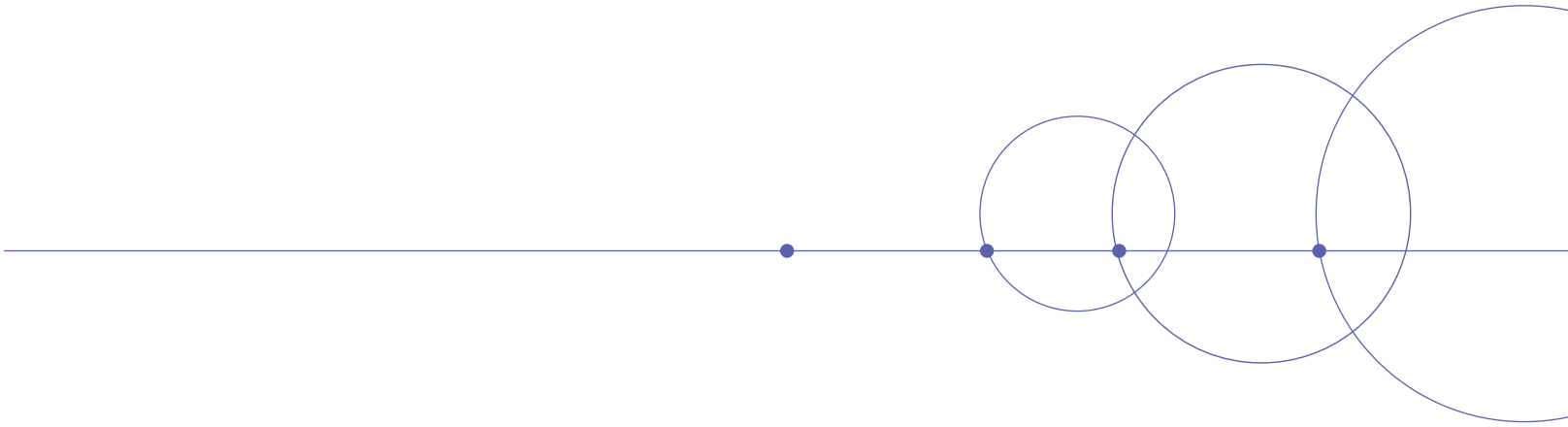
PRESSURE AND ENTHALPY

Solstice® 454C (R-454C)



R-454C		
PRESSURE (PSIG)	VAPOR TEMPERATURE (F)	BUBBLE TEMPERATURE (F)
0	-50.0	-36.0
5	-38.5	-24.4
10	-29.1	-14.9
15	-21.0	-6.9
20	-14.0	0.2
22	-11.4	2.8
24	-8.9	5.3
26	-6.5	7.7
28	-4.2	10.0
30	-1.9	12.2
32	0.2	14.4
34	2.3	16.4
36	4.4	18.5
38	6.3	20.4
40	8.2	22.3
42	10.1	24.2
44	11.9	26.0
46	13.7	27.7
48	15.4	29.4
50	17.1	31.1
55	21.1	35.1
60	24.9	38.9
70	32.0	45.9
80	38.5	52.3
90	44.5	58.3
100	50.1	63.8
105	52.8	66.4
110	55.4	68.9
115	57.9	71.4
120	60.3	73.8
125	62.7	76.1
130	65.0	78.4
135	67.3	80.6
140	69.5	82.7

R-454C		
PRESSURE (PSIG)	VAPOR TEMPERATURE (F)	BUBBLE TEMPERATURE (F)
145	71.6	84.8
150	73.7	86.8
155	75.8	88.8
160	77.8	90.8
165	79.8	92.7
170	81.7	94.6
175	83.6	96.4
180	85.5	98.2
185	87.3	99.9
190	89.1	101.7
195	90.8	103.4
200	92.6	105.0
205	94.3	106.7
210	95.9	108.3
215	97.6	109.8
220	99.2	111.4
230	102.4	114.4
240	105.4	117.3
250	108.4	120.2
260	111.3	122.9
270	114.1	125.6
280	116.9	128.2
290	119.6	130.8
300	122.2	133.2
310	124.8	135.6
320	127.3	138.0
330	129.8	140.3
340	132.2	142.5
350	134.5	144.7
360	136.8	146.8
370	139.1	148.9
380	141.3	150.9
390	143.5	152.9
400	145.7	154.9



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