

Solstice® L40X (R-455A)

Technical Data Sheet

Introduction

Solstice® L40X (R-455A) is a mildly flammable, zeotropic blend designed to serve as an alternative for low-, medium- and high-temperature applications in new systems. It has a low global-warming-potential (GWP) of only 145. In addition, it provides a close capacity match to R-404A, extended operating envelope when compared to propane or air-conditioning refrigerants, and high energy efficiency.

An application for listing Solstice L40X under the U.S. EPA Significant New Alternatives Policy (SNAP) program has been submitted and is pending.

Applications

Solstice L40X is an excellent refrigerant option for commercial refrigeration low-temperature applications such as plug-ins, condensing units, food service, water-loop systems and similar. 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 supermarkets, chillers, heat pumps, transport refrigeration, and others.

Physical Properties

Solstice® N40 (R-448A)	
Class/Type	Zeotropic blend
Formula	75.5%/21.5%/3% R-1234yf/R-32/R-744
Kind	HFC / HFO
Appearance	Colorless
ODP (ODP-R11=1)	~0
GWP REV /5TH IPCC	145
ASHRAE STD. 34 Safety Class	A2L
LFL (% vol)	11.8 – 12.9
Reach	Registered
Units	
Molecular weight	87.5 lbm/lbmol
Boiling temperature	-61.6 °F
Critical temperature	186.1 °F
Critical pressure	675 psia
Critical volume	0.0352 ft ³ /lbm
Critical density	0.296 lbm/ft ³
Vapor density at boiling point	0.296 lbm/ft ³
Liquid density at 32°F	70.47 lbm/ft ³
Liquid density at 77°F	64.51 lbm/ft ³
Vapor density at 77°F	2.84 lbm/ft ³
Liquid heat capacity at 77°F	0.375 Btu/lbm·°R
Vapor heat capacity at 77°F	0.272 Btu/lbm·°R
Vapor pressure at 77°F	151.2 psia
Liquid thermal conductivity at 77°F	0.0445 Btu/h·ft·°R
Vapor thermal conductivity at 77°F	0.0084 Btu/h·ft·°R
Liquid viscosity at 77°F	8.53 x 10 ⁻⁵ lbm/ft·sec
Vapor viscosity at 77°F	8.08 x 10 ⁻⁶ lbm/ft·sec

Pressure and Temperature

Liquid Pressure	Average	Liquid Temperature	Vapor Temperature
psig	°F	°F	°F
0.0	-50.1	-61.6	-38.5
5.0	-38.6	-50.1	-27.1
10.0	-29.2	-40.6	-17.8
15.0	-21.2	-32.5	-9.8
20.0	-14.1	-25.4	-2.8
25.0	-7.8	-19.1	3.4
30.0	-2.1	-13.3	9.0
35.0	3.1	-8.0	14.2
40.0	7.9	-3.1	19.0
45.0	12.5	1.5	23.5
50.0	16.7	5.8	27.6
55.0	20.7	9.8	31.6
60.0	24.5	13.7	35.3
65.0	28.1	17.4	38.9
70.0	31.5	20.8	42.3
80.0	38.0	27.4	48.6
90.0	43.9	33.5	54.4
100.0	49.5	39.1	59.8
110.0	54.7	44.4	64.9
120.0	59.5	49.4	69.7
130.0	64.2	54.1	74.2
140.0	68.6	58.6	78.5
150.0	72.7	62.9	82.6
160.0	76.7	67.0	86.5
170.0	80.6	70.9	90.2
180.0	84.2	74.7	93.7
190.0	87.8	78.4	97.2
200.0	91.2	81.9	100.5
210.0	94.5	85.3	103.7
220.0	97.7	88.6	106.7
230.0	100.8	91.8	109.7
235.0	102.3	93.4	111.2
240.0	103.8	94.9	112.6
245.0	105.2	96.5	114.0
250.0	106.7	98.0	115.4
255.0	108.1	99.4	116.8
260.0	109.5	100.9	118.1
265.0	110.9	102.3	119.4
270.0	112.3	103.8	120.7
280.0	114.9	106.6	123.3
290.0	117.5	109.3	125.8
300.0	120.1	112.0	128.2
310.0	122.6	114.6	130.6
320.0	125.0	117.1	132.9
330.0	127.4	119.6	135.2
350.0	132.0	124.5	139.5
370.0	136.4	129.2	143.7
390.0	140.7	133.7	147.7

Materials Compatibility

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

Desiccants

Desiccant driers compatible with Solstice L40X are commercially available.

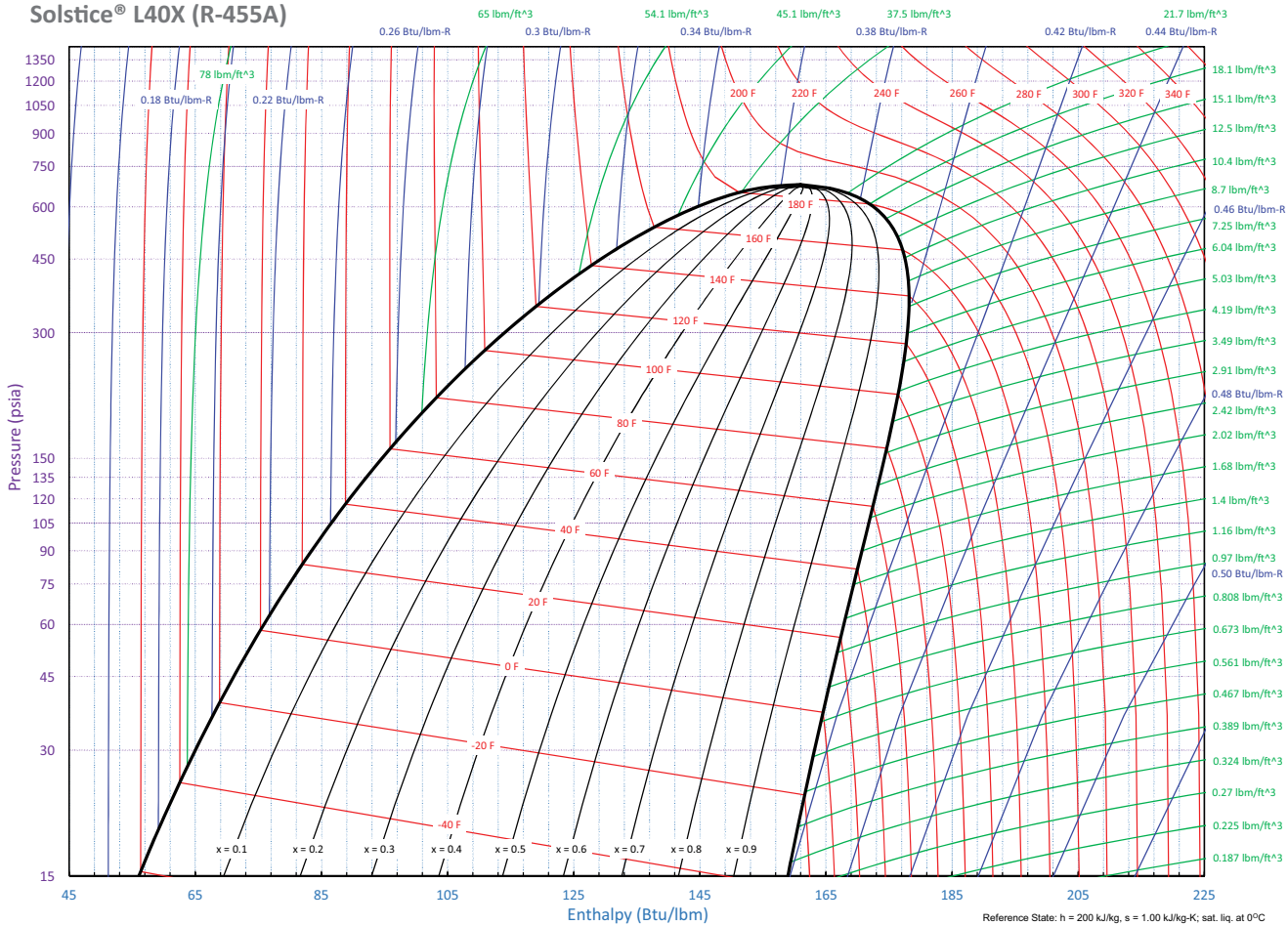
Individual drier manufacturers should be contacted for specific recommendations.

Lubricants

Polyol ester (POE) oil is recommended for using Solstice L40X. 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.

Pressure and Enthalpy

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Plastics and Elastomers

Solstice L40X is compatible with most common materials. Since 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.

Safety and Storage

Honeywell recommends reading the Safety Data Sheet (SDS) before using the product. Solstice L40X is a mildly flammable refrigerant (ASHRAE class A2L) and needs to be handled appropriately.

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 of those coming in contact with the system. Customers should consult the equipment manufacturer for appropriate detectors.

For more information:

www.honeywell-refrigerants.com
or send an email to
refrigerants@honeywell.com

Honeywell Refrigerants

115 Tabor Road
Morris Plains, NJ 07950
Phone: 1-800-631-8138

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