

# SOLSTICE® L40X (R-455A)

## CHARACTERISTICS

Solstice L40X (R-455A) is a zeotropic blend, mildly flammable refrigerant (A2L) designed to serve as an alternative for low-, medium-, and high-temperature applications in new systems. Its GWP of only 146 (IPCC AR5) makes it a long-term, F-Gas-compliant solution. It provides a close capacity match to R-404A, a similar operating envelope when compared to propane, and high energy efficiency.

## APPLICATIONS

Solstice L40X (R-455A) is an excellent refrigerant for commercial refrigeration applications like plug-ins, condensing units, foodservice, water-loop and monoblock systems. Its low GWP, extended operating envelope, high efficiency, high critical temperature and low critical pressure, also make it a potential match for other applications such as chillers, heatpumps, transport refrigeration, etc.

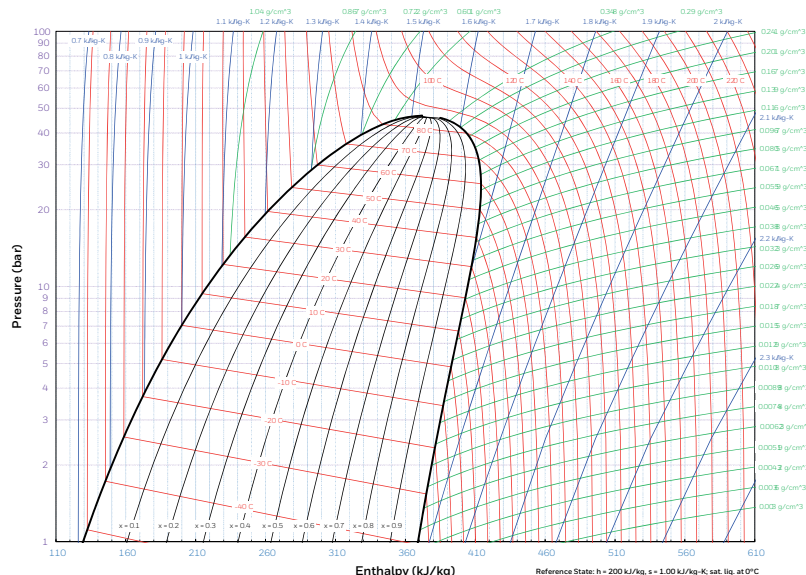
## PROPERTIES (S.I. UNITS)

| SOLSTICE® L40X (R-455A)             |                                    |
|-------------------------------------|------------------------------------|
| CLASS/TYPE                          | Zeotropic blend                    |
| FORMULA                             | 75.5%/21.5%/3% R-1234yf/R-32/R-744 |
| KIND                                | HFC / HFO                          |
| APPEARANCE                          | Colourless                         |
| ODP (ODP R11=1)                     | 0                                  |
| GWP REV /5TH IPCC                   | 146                                |
| ASHRAE STD. 34 SAFETY CLASS         | A2L                                |
| ATEL/ODL (kg/m³)                    | 0.393                              |
| PRACTICAL LIMIT (kg/m³)             | 0.086                              |
| LFL (% VOL)                         | 11.8-12.9                          |
| REACH                               | Registered                         |
| MOLECULAR WEIGHT                    | 87.5 kg/kmol                       |
| BOILING TEMPERATURE AT BUBBLE POINT | -52 °C                             |
| CRITICAL TEMPERATURE                | 85.6 °C                            |
| CRITICAL PRESSURE                   | 46.5 bar                           |
| CRITICAL VOLUME                     | 0.0022 m³/kg                       |
| CRITICAL DENSITY                    | 454.9 kg/m³                        |
| VAPOUR DENSITY AT BOILING POINT     | 4.75 kg/m³                         |
| LIQUID DENSITY AT 0°C               | 1128.8 kg/m³                       |
| LIQUID DENSITY AT 25°C              | 1033.4 kg/m³                       |
| VAPOUR DENSITY AT 25°C              | 45.6 kg/m³                         |
| LIQUID HEAT CAPACITY AT 25°C        | 1.57 kJ/kg-K                       |
| VAPOUR HEAT CAPACITY AT 25°C        | 1.14 kJ/kg-K                       |
| VAPOUR PRESSURE AT 25°C             | 10.42 bar                          |
| LIQUID THERMAL CONDUCTIVITY AT 25°C | 77 mW/m-K                          |
| VAPOUR THERMAL CONDUCTIVITY AT 25°C | 14.6 mW/m-K                        |
| LIQUID VISCOSITY AT 25°C            | 126 µPa-sec                        |
| VAPOUR VISCOSITY AT 25°C            | 12.2 µPa-sec                       |

## PRESSURE AND TEMPERATURE

| PRESSURE | LIQUID (BUBBLE) TEMPERATURE | VAPOUR (DEW) TEMPERATURE |
|----------|-----------------------------|--------------------------|
| (kPa)    | (°C)                        | (°C)                     |
| 100      | -52.30                      | -39.45                   |
| 150      | -43.31                      | -30.58                   |
| 200      | -36.43                      | -23.80                   |
| 250      | -30.76                      | -18.24                   |
| 300      | -25.90                      | -13.48                   |
| 350      | -21.63                      | -9.30                    |
| 400      | -17.79                      | -5.56                    |
| 450      | -14.30                      | -2.16                    |
| 500      | -11.09                      | 0.96                     |
| 550      | -8.11                       | 3.85                     |
| 600      | -5.33                       | 6.54                     |
| 650      | -2.71                       | 9.07                     |
| 700      | -0.24                       | 11.45                    |
| 750      | 2.11                        | 13.71                    |
| 800      | 4.34                        | 15.86                    |
| 850      | 6.48                        | 17.90                    |
| 900      | 8.52                        | 19.86                    |
| 950      | 10.48                       | 21.73                    |
| 1000     | 12.37                       | 23.53                    |
| 1050     | 14.19                       | 25.27                    |
| 1100     | 15.95                       | 26.94                    |
| 1150     | 17.65                       | 28.55                    |
| 1200     | 19.30                       | 30.11                    |
| 1250     | 20.90                       | 31.62                    |
| 1300     | 22.46                       | 33.09                    |
| 1350     | 23.97                       | 34.51                    |
| 1400     | 25.44                       | 35.90                    |
| 1450     | 26.88                       | 37.24                    |
| 1500     | 28.27                       | 38.55                    |
| 1550     | 29.64                       | 39.83                    |
| 1600     | 30.98                       | 41.07                    |
| 1650     | 32.28                       | 42.29                    |
| 1700     | 33.56                       | 43.48                    |
| 1750     | 34.81                       | 44.63                    |
| 1800     | 36.04                       | 45.77                    |
| 1850     | 37.24                       | 46.88                    |
| 1900     | 38.42                       | 47.96                    |
| 1950     | 39.57                       | 49.03                    |
| 2000     | 40.71                       | 50.07                    |
| 2050     | 41.83                       | 51.09                    |
| 2100     | 42.92                       | 52.09                    |
| 2150     | 44.00                       | 53.08                    |
| 2200     | 45.06                       | 54.04                    |
| 2250     | 46.11                       | 54.99                    |
| 2300     | 47.14                       | 55.92                    |
| 2350     | 48.15                       | 56.83                    |
| 2400     | 49.15                       | 57.73                    |
| 2450     | 50.13                       | 58.61                    |
| 2500     | 51.10                       | 59.48                    |

## PRESSURE AND ENTHALPY



## SAFETY AND STORAGE

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

## LITERATURE

Honeywell has a range of literature available on Solstice L40X.

## PACKAGE SIZES

Solstice L40X is available in 4.5kg bottles, 50kg cylinders and ton tanks. For other packing sizes please contact Honeywell distribution network.

## LEAKS AND LEAK DETECTION

If a large release of Solstice L40X vapour occurs, the same measures as with any other non-azeotropic blend need to be taken. Hand-held leak detectors can be used for pinpointing leaks. Leak detection is important for protection of those in proximity of the system, refrigerant conservation, equipment protection and performance, and reduction of emissions. Customers should consult the equipment manufacturer for appropriate detectors.



## 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

POE (polyol ester) 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.

### 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.



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## For more information

[www.honeywell-refrigerants.com/europe](http://www.honeywell-refrigerants.com/europe)

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