



# Opteon™ XL55

Refrigerant (R-452B)

## Product Information

Opteon™ XL55 (R-452B), a unique low global warming potential (GWP) refrigerant innovation from Chemours, delivers the optimal balance of performance, safety and design compatibility to replace R-410A in positive displacement, direct expansion air conditioning, heat pump and chiller applications. Opteon™ XL55 offers a GWP >66% lower than R-410A and very low flammability properties compared with other R-410A replacements. In addition to combining low GWP with high efficiency and low flammability, Opteon™ XL55 matches R-410A capacity, making it design compatible with R-410A equipment. The combination of design compatibility and reduced compressor discharge temperature, as compared to other R-410A alternatives such as R-32, enables OEMs to transition their R-410A equipment platform to Opteon™ XL55 with minimal re-design and capital expenditures.

Opteon™ XL55 is classified as a mildly flammable (ISO/ASHRAE class 2L) refrigerant. Please check your local regulations and Standards such as PED, EN378 or ISO5149 to verify the allowable filling charge, new equipment design and safe handling requirements for the intended application.

### Applications

- Positive displacement, DX air conditioning, heat pumps and chillers
  - Residential, light commercial, commercial
- Direct replacement for all equipment types designed for R-410A
  - Window units, portables, mini-splits, ducted splits, PTACs, multi-splits, DX chillers, and other

### Benefits

- Best performance, low GWP (reduction of >66 % versus R-410A) <sup>1)</sup>
- Superior performance compared to R-410A – up to 5% energy efficiency improvement <sup>2)</sup>
- Very low class 2L flammability properties – best-in-class of leading R-410A replacements
- Excellent performance in high ambient conditions
- Very close match to R-410A – easily convertible from R-410A design with minimal changes
- Very low temperature glide – can be topped off after leaks
- Non-toxic and mildly flammable (ASHRAE <sup>3)</sup> A2L)
- Allows >1.7 kg minimum filling charge under new Codes & Standards (e.g. ISO 5149 or EN 378)
- Miscible with POE lubricants

### Opteon™ XL55 properties

|  |   |
|--|---|
| ASHRAE Number                            | R-452B  |
| Composition Wt %                         | R-32/R-125/R-1234yf<br>67/7/26                                      |
| Molecular Weight                         | 63.5 g/mol  |
| Boiling Point @ 1 atm (101.3 kPa)        | -51 °C (-59.8 °F)   |
| Critical Temperature                     | 75.7 °C (168.2 °F)  |
| Liquid Density @ 21.1 °C                 | 1006 Kg/m <sup>3</sup> (62.8 lb/ft <sup>3</sup> )                   |
| Ozone Depletion Potential (CFC-11 = 1.0) | 0   |
| AR5 (AR4) GWP (CO <sub>2</sub> = 1.0)    | 676 (698)   |
| ASHRAE Safety Classification             | A2L   |
| Temperature Glide                        | -1 K  |
| LFL <sup>4)</sup>                        | 0.310 kg/m <sup>3</sup> (19.4 10 <sup>-3</sup> lb/ft <sup>3</sup> ) |
| Burning Velocity @ 23 °C                 | 3.0 cm/s (1.2 in/s)   |



<sup>1)</sup> According to Assessment Report 4 (AR4) which is the basis for the F-Gas regulation (EU) No. 517/2014.

<sup>2)</sup> Joshua Hughes, Next Gen Refrigerants for Stationary AC, Chemours Global Seminar Series.

<sup>3)</sup> American Society of Heating, Refrigerating and Air-Conditioning Engineers

<sup>4)</sup> Based on Worst-case formulation (WCF) flammability.



### What to expect at similar operating conditions

The data below was obtained from theoretical cycle calculations for lower- (-15 °C mean evaporating temperature) and higher temperature (8 °C mean evaporating temperature) applications. For both the heat-pump and the cooling scenarios the following parameters were used: evaporator superheat = 5 K, suction line superheat 3 K, Liquid subcooling 2 K and compressor efficiency = 70 %. <sup>5)</sup>

|                             | Lower Temperature |          | Higher Temperature |          |
|-----------------------------|-------------------|----------|--------------------|----------|
| Mean Condensing Temperature | 40 °C             | 60 °C    | 40 °C              | 60 °C    |
| Cooling Capacity            | -1 %              | +3 %     | -2 %               | +2 %     |
| C.O.P.                      | +2 %              | +6 %     | +1 %               | +5 %     |
| Relative Mass Flow          | -18 %             | -18 %    | -17 %              | -17 %    |
| Suction Pressure            | -29 kPa           | -29 kPa  | -54 kPa            | -54 kPa  |
| Discharge Pressure          | -140 kPa          | -188 kPa | -140 kPa           | -188 kPa |
| Discharge Temperature       | +6.6 K            | +7.7 K   | +10.5 K            | +11.8 K  |

+ is an increase, - is a decrease relative to R-410A

<sup>5)</sup> Actual performance for a specific system depends on a number of factors, including equipment conditions and operating environment.

For more information on the Opteon™ family of refrigerants or other refrigerants from Chemours, visit [opteon.com](http://opteon.com)

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