

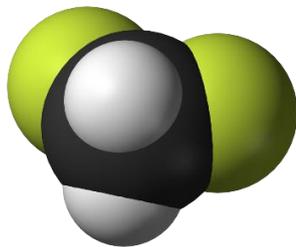
New Refrigerant Gas Sensor

R454B

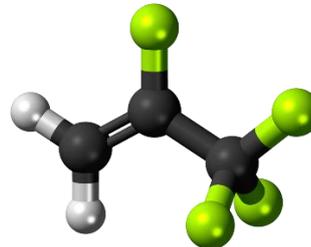
Extremely flammable gas according the EU Regulation 1272/2008¹, “Mildly Flammable Gas” (A2L) according the ASHRAE² classification, the R454B is one of the most promising candidates in replacement of the widely used R410A, in new direct expansion air conditioning, heat pump and chiller equipment.

R454B produced by Chemours as Opteon™ XL41 is a non-ozone depleting, low global warming potential (GWP) hydrofluoro-olefin (HFO) based refrigerant.

R454B provides the lowest GWP available (466) of all near-drop-in solutions with a reduction of 78% compared to R410A. Its Ozone Depletion Potential is zero. In addition to that, it is a very close match to R410A and in some cases even provides superior performances with respect to capacity and efficiency, while providing over 30 percent reduction in GWP when compared to R32, another industry candidate to replace R410A.



R32 – Difluoro Methane³



R1234yf - 2,3,3,3-Tetrafluoropropene⁴

R454B is composed by R32 and R1234yf in the ratio of 68.9 / 31.1 %. It has a LFL (LEL) of 0.303 kg/m^{3,5}

¹ <https://www.climalife.co.uk/docs/Opteon-XL41-R454B-MSDS-v3.4.pdf>

² 2009 ASHRAE Handbook

³ <https://en.wikipedia.org/wiki/Difluoromethane>

⁴ <https://en.wikipedia.org/wiki/2,3,3,3-Tetrafluoropropene>

⁵ https://www.chemours.com/Opteon_Stationary/en_GB/assets/downloads/Opteon-XL41_PIB.pdf



R454B allow much higher charge sizes than other flammable refrigerants and can be used by following the applicable codes and standards.

R454B, has been selected by primary equipment manufacturers and to replace R410A in ducted residential and light commercial packaged products to move towards more environmentally sustainable solutions.⁶

Compared to the R32 alone, it is a bit more difficult to manage, being a mixture of two gases, being R32 a single component gas.

This come in place especially when there is a leakage and the two components may not leak at the same rate, changing the composition of the initial mixture.

The immediate leakage detection is extremely important in order to avoid financial losses and environmental damages.

NET has developed a specific sensor for R454B that is available both in PRO and LITE Version.

<http://www.nenvitech.com/wp-content/uploads/2019/07/DS4585-R454b-LEL-rev0.pdf>

<http://www.nenvitech.com/wp-content/uploads/2019/07/DS4467-rev2-IREF-L-1.pdf>

The sensor is SIL2 rated, in standard industrial 7-series size (32 mm), to fit existing detectors, allocated in solid, rugged construction with stainless steel enclosure.

The PRO sensor is designed for the high-end market, where accuracy and precision are requested. The Lite version is designed for HVAC-R and price sensitive markets.

With one-year calibration span, to reduce maintenance costs and MTBF of more than 5 years, for greater sensor lifetime, it can work on an extended temperature range (-20 to +50 °C), for use in any environment.

Fast T90 response time and superior selectivity, for critical and life-saving applications, ModBus or analogue output (proportional for the PRO version, and thresholds for the LITE version).

⁶ <http://www.acr-news.com/carrier-chooses-opteon-xl41-to-replace-r410a>