Klea® 456A and Klea® Edge™ 444A

Appliance Refrigerants

Orbia Fluor & Energy Materials has over 50 years of experience delivering high-performing, sustainable refrigerant solutions to solve thermal management challenges. We leverage our technical and market expertise to deliver the best outcome for both our customers and their consumers.

Klea® 456A and Klea® Edge™ 444A are high-performing, lower-GWP replacements for R-134a and R-1234yf [respectively] for residential and commercial hot water heater, commercial clothing dryer, and other applications where non-flammability or 2L flammability is preferred over propane.

Key benefits include:

Klea® 456A

- GWP reduction of >50% over R-134a
- Minimal changes from R-134a system design
- Non-flammable safety classification, same as R-134a

Klea® Edge™ 444A

- Higher performance and efficiency* than R-1234yf
- Minimal changes from R-1234yf system design
- A2L flammable classification, same as R-1234yf (10% higher LFL than R-1234yf)

*Based on third party test data from automotive application.

Klea® Klea® Edge

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Appliance Refrigerant Physical Properties

°F	R-456A (psig)	(barg)
-10	1.4	0.1
0	5.8	0.4
20	17.4	1.2
40	33.6	2.3
60	**66.2**	**4.6**
80	**97.1**	**6.7**
100	**136.1**	**9.4**
120	**184.5**	**12.7**
140	**243.4**	**16.8**
150	**277.3**	**19.1**

°F	R-444A (psig)	(barg)
-10	0.6	0.0
0	4.9	0.3
20	16.0	1.1
40	31.6	2.2
60	**76.3**	**5.3**
80	**109.1**	**7.5**
100	**150.0**	**10.3**
120	**199.9**	**13.8**
140	**259.9**	**17.9**
150	**294.1**	**20.3**

*Calculated using REFPROP 10
Black - vapor, Bold - liquid

Features and benefits

- R-444A won't produce persistent *TFA (trifluoroacetic acid) during decomposition
- R-456A uses the same charge amount as R-134a
- R-444A uses the same charge amount as R-1234yf
- R-444A offers up to 10% higher cooling/heating capacity** in direct replacement scenarios
- R-444A complies with the EPA Technology Transitions rule for applications requiring GWP < 150

*Based on the findings EFCTC Position Paper 08 October 2021 which states 'HFO-1234ze, HFO-1336mzz and HCFO-1233zd are broadly estimated to contribute less than 0.01 µg/L to the average concentration of TFA in European rainwater through to 2050.

**Third party test data from automotive application confirmed R-444A delivered 2-3°C colder air and 4-minute faster pulldown to 22°C than R-1234yf.

For more information, contact
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Klea® Klea® Edge

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