



# 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  | <b>66.2</b>  | <b>4.6</b>  |
| 80  | <b>97.1</b>  | <b>6.7</b>  |
| 100 | <b>136.1</b> | <b>9.4</b>  |
| 120 | <b>184.5</b> | <b>12.7</b> |
| 140 | <b>243.4</b> | <b>16.8</b> |
| 150 | <b>277.3</b> | <b>19.1</b> |

| °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  | <b>76.3</b>  | <b>5.3</b>  |
| 80  | <b>109.1</b> | <b>7.5</b>  |
| 100 | <b>150.0</b> | <b>10.3</b> |
| 120 | <b>199.9</b> | <b>13.8</b> |
| 140 | <b>259.9</b> | <b>17.9</b> |
| 150 | <b>294.1</b> | <b>20.3</b> |

\*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.

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