Klea® Edge™ 485A

Low-Temperature Commercial & Residential Heat Pump Refrigerant

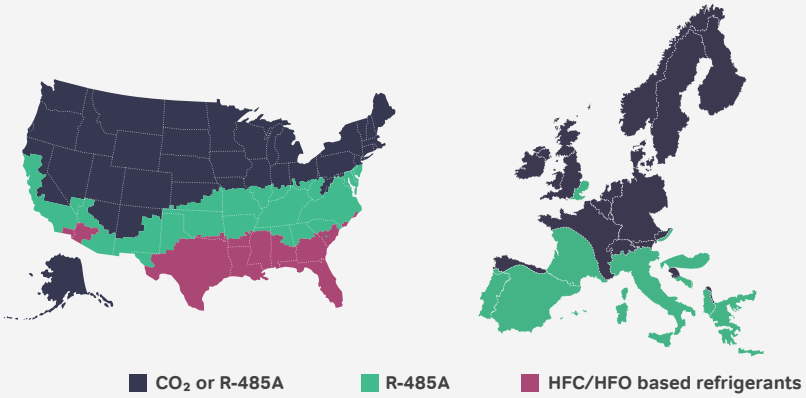
Orbia Fluor & Energy Materials has over 50 years of experience delivering high-performing, sustainable refrigerant solutions to solve thermal management challenges. We leverage our technical and market expertise to deliver the best outcome for both our customers and their consumers.

Klea® Edge™ 485A is a high-performing, enhanced CO_2 refrigerant for heat pump and A/C systems designed for R-744 refrigerant (CO_2). R-485A is a refrigerant blend, none of whose components are PFAS, that extends the applicability range in high ambient temperature regions.

Klea® Edge

orbia | Fluor & Energy Materials

This gives manufacturers the flexibility to achieve a single system design that could be charged with either CO_2 or R-485A. R-485A provides a higher efficiency option, while CO_2 offers a so-called "natural" option* with an efficiency penalty.



* CO_2 refrigerant, R-744, is currently produced from either collecting combustion gases during electricity generation or from fracked natural gas during ammonia production for fertilizers.

Klea® Edge™ 485A Refrigerant Physical Properties

Property**	Units	R-744	R-485A
GWP		1	143
Molecular Mass	g/mol	44.0	47.0
Critical Temperature	°C	31.0	41.2
Critical Pressure	kPa	7377	7170
Liquid Density (0 °C)	kg/m^3	927	935
Bubble Pressure (-40 °C)	kPa	1004	842
Bubble Pressure (0 °C)	kPa	3485	2875
Isentropic Index (Cp/Cv) (Saturated at 0 °C)	---	2.14	1.7
Latent Heat at 0 °C	kJ/kg	231	245
Evaporator Glide (2800 kPa)	K	0	7

** Properties calculated using REFPROP v10, including the use of internally developed fluid files for R-485A

Key benefits include:

- GWP < 150
- Can be non-flammable in handling and application
- 20-25% higher efficiency over CO_2 systems***
- 10% lower pressure than CO_2 with a higher critical point for more effective heat transfer
- Flexibility of charging: system can charge with either R-485A or CO_2 by changing only the compressor operating profile
- Uses same oils as CO_2

*** Low, R., et al., New Refrigerants for Air-Conditioning, Refrigeration and Heat Pumps. Proceedings of the 15th International Symposium on New Refrigerants and Environmental Technology, Kobe, Japan (2023)

For more information, contact
fem@orbia.com
orbia-fem.com

FMC_FLY_R_KL485A_25_ENUK_R01

Klea® Edge

orbia Fluor & Energy Materials