Koura Klea®

Technical Data Sheet

Klea® 456A

Introduction

Current and new regulations are making R-134a availability and pricing turbulent. Klea® 456A was designed to extend the availability of R-134a in automotive MVAC while providing a cooling capacity boost for older vehicles. Klea® 456A is a drop-in and go replacement, no oil changes or other changes are required. Klea® 456A can be charged on top of the existing R-134a charge. Since Klea® 456A utilizes a HFO refrigerant (R-1234zeE), vehicle service can utilize a value added up sale of Shrieve's Zerol HFO additive. Klea® 456A lowers the GWP of the R-134a system by over 50% (from GWP 1,430 to GWP 687) giving regulators peace of mind that the existing R-134a fleet will "age out" gracefully.

Benefits

- Drop-in capability in R-134a auto
    - Same efficiency as R-134a
    - Up to a 10% cooling capacity boost
- Non-flammable – easy conversion, same safety classification as R-134a
- Over 50% reduction in GWP – good news for future availability to service R-134a fleets
- Ability to up-sale by co-selling with value added solutions for HFO refrigerants

Application

Klea® 456A is an ASHRAE A1 classified refrigerant (same as R-134a) that was tailored to be a drop-in replacement for R-134a in automotive air conditioning. It shares the same energy efficiency (fuel consumption) that the vehicle was designed for by the automaker. When used as a complete replacement, by removing all R-134a and replacing with pure Klea® 456A, the cooling capacity of the vehicle is increased by approximately 10% which gives a faster cool down in the hot summer months. However, in service it is not necessary to do a complete replacement of R-134a. Operators can top off a system with Klea® 456A or when pulled into a RRR service machine can be mixed in any proportion with R-134a. It is advisable to label the system as containing Klea® 456A, but if a user wants to move back to R-134a this flexibility is left to the professional service garage without any special considerations.

Charging Strategies

Klea® 456A can be used in R-134a systems without any change in the vehicle system. The system can be charged using one of three methods:

Method One

Charge to the R-134a nameplate weight listed on the sticker in the engine compartment. This is the same recommended charge amount for Klea® 456A.

Method Two

For an ambient temperature above 27°C (80°F), charge to a discharge pressure of 200 psig (13.8 barg) with the evaporator fan on high with fresh air.

For an ambient temperature, from 18°C to 27°C (65°F to 80°F), charge to a discharge pressure of 160 psig (11 barg) with the evaporator fan on high with fresh air. Depending on the vehicle, the system may cycle on and off in this operation mode or enter capacity modulation mode if cooling demand becomes satisfied during charging; while this method can still be performed with experience, if problems are experienced, switch to Method One.

For ambient temperatures below 18°C use Method One.

Method Three

For systems that are not TXV designed, but rather use an orifice tube, charge the system until the suction line runs cold, but not frozen to the touch. Again, this method cannot be used on newer TXV systems. If the system type is unknown, Method One is recommended.

> **Hint** — orifice tube systems utilize a suction accumulator in the suction line to catch excess liquid refrigerant from reaching the compressor.

Over charged systems do not run and cool well. If the outside temperature is below 40°C (104°F), and the high side pressure is over 250 psig (18.3 barg), the system is likely over charged and some refrigerant needs to be removed.

Leak Detectors

Leak detectors that are designed and qualified to detect R-134a and/or R1234yf leaks will detect Klea® 456A leaks. Klea® 456A is non-flammable and leaks should be treated the same as R-134a.

Oils, Polymers, Desiccants and Additives

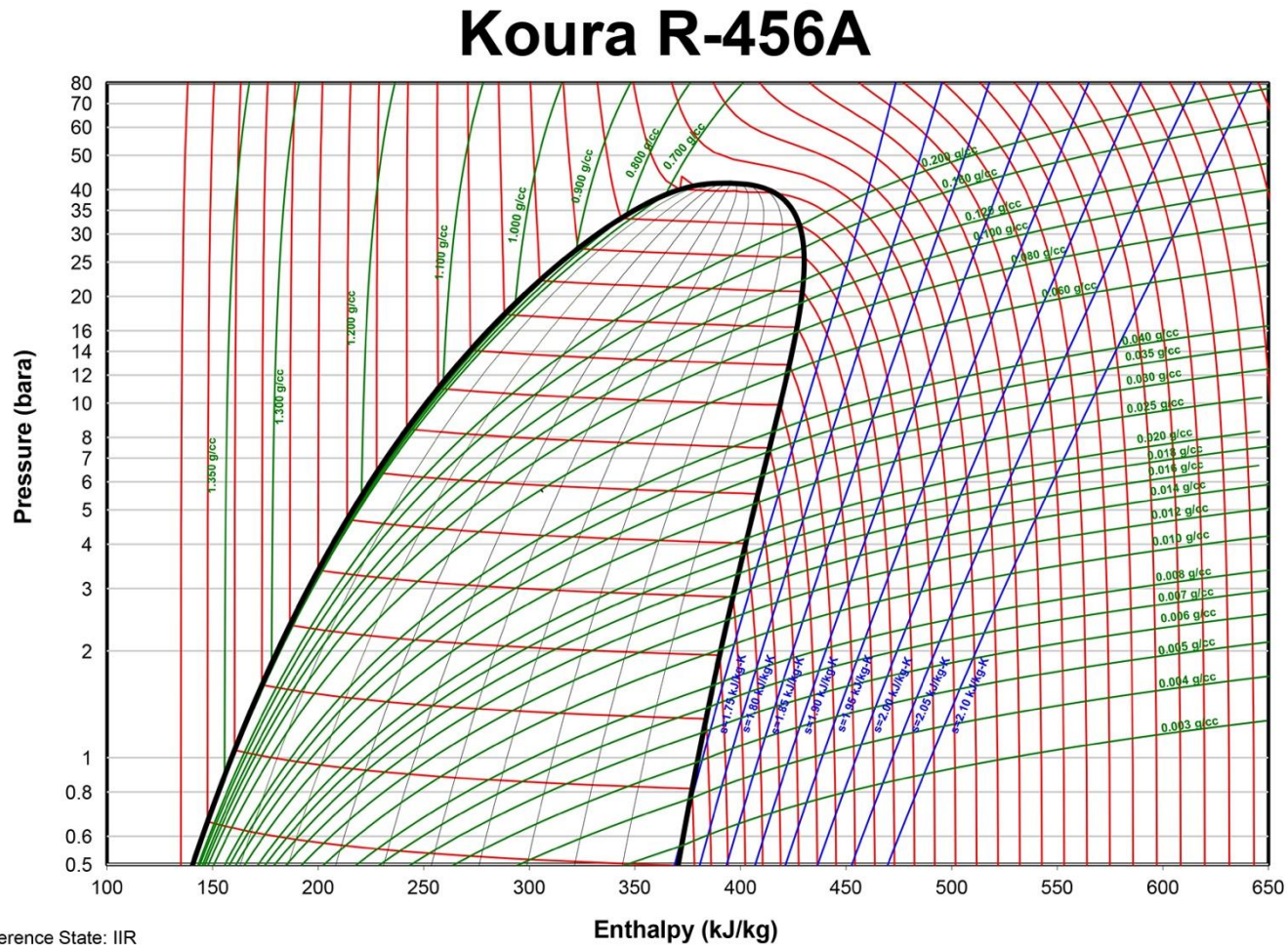
Klea® 456A is designed to work with OE grade R-134a and R-1234yf lubricants. There is no need to change the oil when converting a system from R-134a to Klea® 456A. Optional dosing of stabilizing additives is recommended, such as Shrieve's Zerol® HFO which is designed as a stabilizer booster for automotive HFO-based refrigerants. If the system needs additional lubricant, R-1234yf OE oils such as Denso’s ND-12, Shrieve’s HD-46, or Sanden’s SP-A2 are recommended. For R-134a electric systems, use the OE recommended lubricant.

O-rings, hoses, and seals that are compatible with R-134a and R-1234yf are compatible with Klea® 456A. EPDM and HNBR are the preferred seals for all automotive systems with polyether (OE named “PAG”) lubricants. Hoses do not need to be changed from the original R-134a system, but if a hose must be changed, hoses for R-1234yf are reverse compatible with R-134a and Klea® 456A.

Use OE replacement desiccants if replacement is necessary.

R-1234yf aftermarket additives can be used with Klea® 456A; aftermarket R-134a additives are not recommended. R-134a is a very stable refrigerant that has led to some additives on the market that can only be used with R-134a – these additives can cause damage if used in Klea® 456A or R-1234yf systems.

Ph Chart



Reference State: IIR
h = 200 kJ/kg, s = 1.0 kJ/kg-K
@ sat. liq at 0 ºC

PT Table

METRIC			IMPERAL		
Pressure	Bubble Temperature	Dew Temperature	Pressure	Bubble Temperature	Drew Temperature
bara	for condenser subcooling	for evaporator superheat	psig	for condenser subcooling	for evaporator superheat
	°C	°C		°F	°F
1.0		-25.7	0.0		-13.7
1.5		-16.4	7.5		3.4
2.0		-9.3	15.0		16.4
2.5		-3.5	22.5		27.0
3.0		1.5	30.0		36.1
3.5		5.9	37.5		44.1
4.0		9.8	45.0		51.2
4.5		13.4	52.5		57.7
5.0		16.7	60.0		63.7
5.5		19.7	67.5		69.2
6.0		22.5	75.0		74.4
7.0	23.3	27.7	90.0	75.8	83.8
8.0	28.0	32.3	105.0	84.4	92.2
9.0	32.3	36.6	120.0	92.3	99.9
10.0	36.3		135.0	99.5	
11.0	40.0		150.0	106.2	
12.0	43.4		165.0	112.4	
13.0	46.6		180.0	118.3	
14.0	49.7		195.0	123.9	
15.0	52.6		210.0	129.1	
16.0	55.3		225.0	134.2	
17.0	58.0		240.0	138.9	
18.0	60.5		255.0	143.5	
19.0	62.9		270.0	147.9	
20.0	65.3		285.0	152.1	
21.0	67.5		300.0	156.2	
22.0	69.7		315.0	160.2	
23.0	71.8		330.0	164.0	
24.0	73.8		345.0	167.6	
25.0	75.7		360.0	171.2	