

1. General

Regulation (EU) No. 517/2014 on fluorinated greenhouse gases (EU F-gases regulation) is limiting use of refrigerants with high GWP values (GWP – Global Warming Potential). Embraco offers full product line of HC (Hydrocarbons) compressors as a final solution to meet EU F-gases regulation. A series of intermediate GWP blends were proposed in order to bridge the transition to the final situation. Embraco already approved R452A as an alternative refrigerant for both LBP (low back pressure) and MBP (medium back pressure) applications maintaining the original R404A operating envelope. Other important transition alternative blend to R404A is HFC blend R449A. The main physical proprieties are indicated in the table below:

Parameter	R 404A	R449A
Type	HFC blend	HFC blend
Safety Class	A1	A1
Boiling Temp @ 1atm	-47 °C (-53 °F)	-46 °C (-51 °F)
Critical Temp	72 °C (162 °F)	82 °C (180 °F)
Temp Glide Bubble-Dew @1 bar(abs)	0.8 K	6.1 K
GWP (100y)	3920	1397

2. Declaration

Embraco, after performing extended reliability testing program on R449A concluded following:

Embraco approves R449A as an alternative refrigerant for Embraco R404A compressor series NEU, NT, NJ only for MBP application with limited operating envelope defined in Figure 1. It is important to respect restricted envelope while operating compressor with R449A to guarantee reliable operation because of much higher thermal profile. Electrical components are maintaining the same as originally defined for R404A. Compressor unit label and nomenclature will not change.

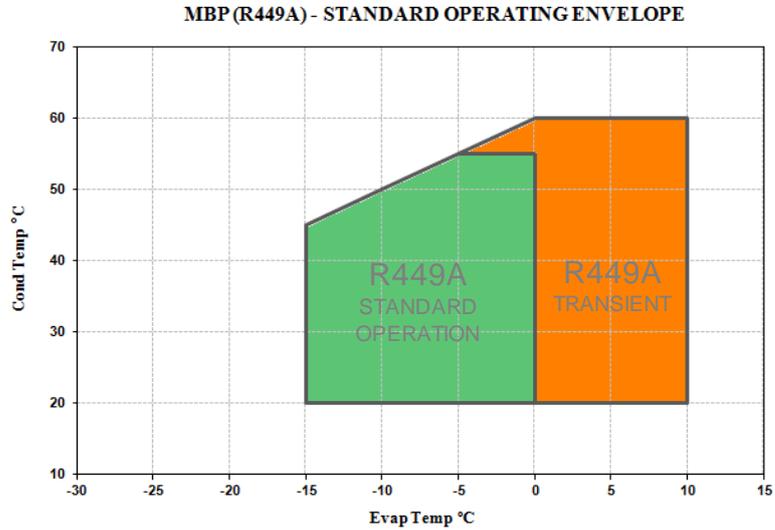


Figure 1. New limited operating envelope for R449A, return gas temperature 20°C, Evaporating range: -15 °C to 0°C for standard operation NEU/NT/NJ series

3. Performances

Refrigerant R449A, according to the calorimetric evaluation is showing impact on cooling capacity and COP depending on operating conditions. Final impact on performances has to be verified on specific application.

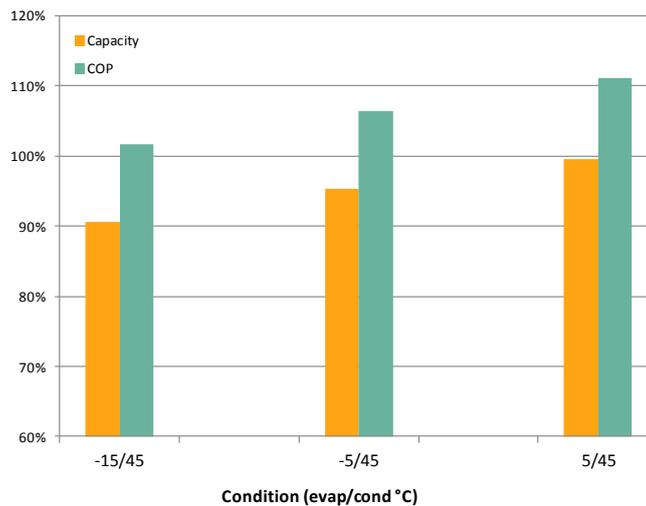


Figure 2. Calorimeter performance of R449A with baseline of R404A.