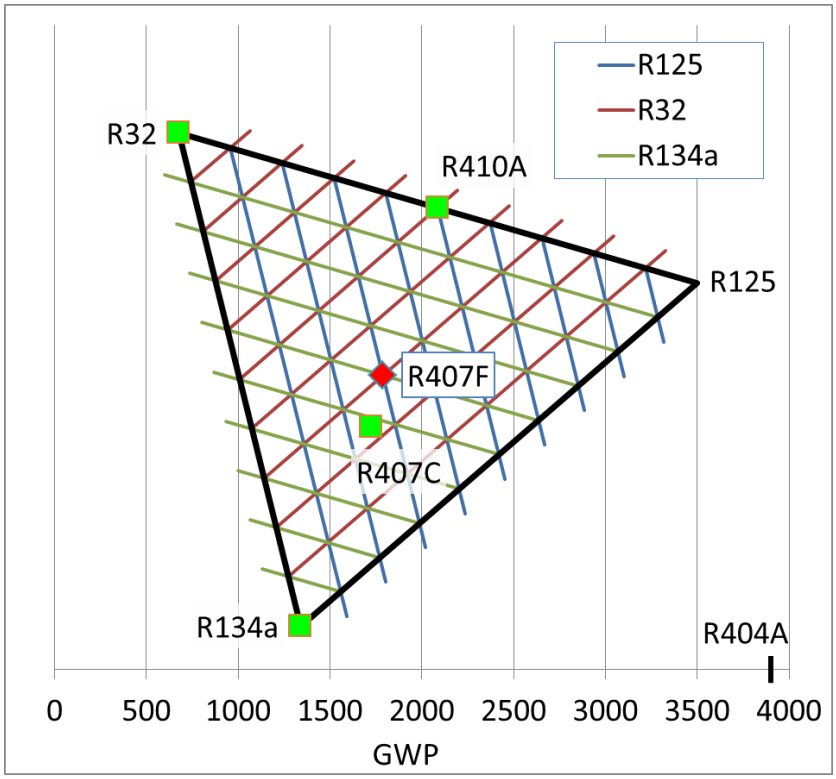
ENGINEERING TOMORROW

R407F: A lower GWP alternative to R404A

R407F is a refrigerant developed by Honeywell. It is a blend of R32, R125 and R134a, and is related to R407C, but has a pressure which better matches R22, R404A and R507.

Although R407F was originally intended as an R22 replacement it is now also used in supermarket applications where its GWP of 1800 makes it a lower GWP alternative to R404A which has a GWP of 3900.

As is illustrated on the figure, R407F is based on the same molecules as and has a similar composition to R407C, and all Danfoss valves and other control products which are approved for R22/R407C also works well with R407F.



Compressor selection

The Danfoss guideline for retrofitting or installing compressors in new equipment with our current range has been updated with technical recommendations for replacing R404A with potential blends available on the market such as R407F. Please contact Danfoss for more information.

Valve selection

When selecting a thermostatic expansion valve chose a Danfoss valve which can be used for both R22 and R407C, since the vapor pressure curve matches these valves better than the valves only usable with R407C. For correct superheat setting, the TXVs must be re-adjusted by “opening” by 0,7K (at -10C). Capacities of thermostatic expansion valves with R-407F will be approximately 10% larger than the capacity for R22.

For capacities correction factors for thermostatic expansion valves and other types of valves, please see the back side of this leaflet.

Using R407F as drop-in in R404A systems

Danfoss does not have enough experience with the effect of using R407F in systems which have already contained 404A, and therefore Danfoss does not accept any liability for this use. Danfoss does however recommend following the refrigerant manufactures procedures carefully, including changing filter driers.

Capacity correction factors for R407F

R407F capacity correction factors for thermostatic expansion valves from R22 capacities:

Thermostatic expansion valve		Condensing Temperature (°C)							
		25	30	35	40	45	50	55	60
Evaporator Temperature (°C)	-40	1.10	1.09	1.07	1.06	1.04	1.02	0.99	0.96
	-30	1.12	1.10	1.09	1.07	1.05	1.03	1.00	0.98
	-20	1.13	1.12	1.10	1.08	1.06	1.04	1.02	0.99
	-10	1.16	1.14	1.12	1.10	1.08	1.05	1.03	1.00
	0	1.19	1.16	1.14	1.11	1.09	1.07	1.04	1.02
	10	1.26	1.21	1.17	1.14	1.11	1.08	1.06	1.03

R407F capacity correction factors for other types of valves, for instance solenoid valves, non-return valves, ball valves, from R22 capacities:

Liquid line		Condensing Temperature (°C)							
		25	30	35	40	45	50	55	60
Evaporator Temperature (°C)	-40	0.80	0.80	0.79	0.79	0.79	0.79	0.78	0.78
	-30	0.81	0.81	0.81	0.81	0.81	0.80	0.80	0.79
	-20	0.83	0.83	0.83	0.82	0.82	0.82	0.81	0.81
	-10	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.82
	0	0.85	0.85	0.85	0.85	0.84	0.84	0.84	0.83
	10	0.86	0.86	0.86	0.86	0.85	0.85	0.85	0.84

Suction gas		Condensing Temperature (°C)							
		25	30	35	40	45	50	55	60
Evaporator Temperature (°C)	-40	0.96	0.97	0.98	1.00	1.02	1.04	1.06	1.10
	-30	0.97	0.98	0.99	1.01	1.02	1.04	1.07	1.10
	-20	0.98	0.99	1.00	1.01	1.03	1.05	1.07	1.10
	-10	0.99	1.00	1.01	1.02	1.03	1.05	1.07	1.10
	0	0.99	1.00	1.01	1.03	1.04	1.06	1.08	1.10
	10	1.00	1.01	1.02	1.03	1.05	1.06	1.08	1.11

Hot gas		Condensing Temperature (°C)							
		25	30	35	40	45	50	55	60
Evaporator Temperature (°C)	-40	0.98	0.99	1.00	1.01	1.02	1.03	1.05	1.08
	-30	0.98	0.98	0.99	1.00	1.01	1.02	1.04	1.06
	-20	0.97	0.98	0.98	0.99	1.00	1.01	1.03	1.05
	-10	0.97	0.97	0.98	0.98	0.99	1.00	1.02	1.04
	0	0.96	0.97	0.97	0.98	0.98	0.99	1.01	1.02
	10	0.96	0.96	0.97	0.97	0.98	0.99	1.00	1.02