



Opteon™ XP40

Refrigerant

Product introduction

Opteon™ XP40(R-449A)는 오존층을 파괴하지 않으며 지구온난화지수(GWP)가 낮은 HFO(hydrofluoro-olefin) 기반의 불연성 냉매로서, 주요 컴프레서 제조업체로부터 승인을 받았습니다. Opteon™ XP40은 R-404A보다 GWP가 67%나 낮고, R-404A 대비 시스템 에너지 효율을 최대 12% 높일 수 있어 지속 가능성을 추구하는 슈퍼마켓을 위한 훌륭한 대체 냉매입니다. 현재 주문량과 고객 테스트 결과를 고려해 볼 때 Opteon™ XP40이 2016년 말까지 전 세계 1천 곳이 넘는 슈퍼마켓과 상업용 냉장 시스템에 적용될 것으로 예상하고 있습니다.

Properties

ASHRAE Number	R-449A	R-404A
Composition	R-32/R-125/HFO-1234yf/R-134a	R-143a/R-125
Weight %	24.3/24.7/25.3/25.7	52/44
Molecular Weight	87.2g/mole	97.6g/mole
Boiling Point at 1 atm(101.3kPa)	-46.0°C (-50.7°F)	-46.45°C (-51.62°F)
Critical Pressure	4447kPa [abs] (655.0psia)	3731.5kPa [abs] (541.2psia)
Critical Temperature	81.5°C (178.7°F)	72.1°C (161.7°F)
Liquid Density at 21.1°C (70°F)	1113.3kg/m ³	1063.1kg/m ³
Ozone Depletion Potential	0	0
AR5 Global Warming Potential	1282	3943
ASHRAE Safety Classification	A1	A1
Temperature Glide	~4K	0.5K

Benefits

- Low GWP: 65% reduction compared to R-404A/R-507
- 8-12% lower energy consumption compared to R-404A/R-507
- Safe and nonflammable(ASHRAE A1)
- Approved by major equipment and component manufacturers
- Extensively field tested with no equipment/lubricant/seal changes (superheat adjustment may be required)
- Alternative to R-407 series low- and medium temperature refrigerants (equivalent capacity)
- Compatible with existing equipment design/lubricants
- Can be topped off after leaks



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Thermodynamic Properties

Saturation Properties - Temperature Table

Temp [°C]	Pressure [bar]		Density [kg/m ³]		Enthalpy [kJ/kg]		Entropy [kJ/K-kg]	
	Liquid p _l	Vapor p _g	Liquid d _l	Vapor d _g	Liquid H _l	Vapor H _g	Liquid S _l	Vapor S _g
-40	1.3	1.0	1,331	5	146	376	0.79	1.79
-35	1.7	1.3	1,316	6	153	379	0.82	1.78
-30	2.1	1.6	1,300	7	159	382	0.84	1.77
-25	2.5	2.0	1,284	9	166	385	0.87	1.77
-20	3.1	2.5	1,267	11	172	388	0.90	1.76
-15	3.7	3.0	1,250	13	179	391	0.92	1.75
-10	4.4	3.6	1,233	16	186	393	0.95	1.75
-5	5.2	4.3	1,215	19	193	396	0.97	1.74
0	6.2	5.1	1,197	22	200	398	1.00	1.73
5	7.2	6.1	1,178	27	207	401	1.03	1.73
10	8.4	7.1	1,159	31	214	403	1.05	1.72
15	9.7	8.3	1,139	36	222	405	1.08	1.72
20	11.1	9.6	1,118	42	229	407	1.10	1.71
25	12.7	11.1	1,096	49	237	409	1.13	1.71
30	14.5	12.7	1,073	57	245	410	1.15	1.70
35	16.5	14.6	1,049	66	253	412	1.18	1.70
40	18.6	16.6	1,024	76	261	413	1.20	1.69
45	20.9	18.8	996	88	269	414	1.23	1.69
50	23.5	21.3	967	103	278	414	1.26	1.68
55	26.3	24.0	935	119	287	414	1.28	1.67
60	29.3	27.0	899	139	296	413	1.31	1.66

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