

Isceon[®] MO29

(R422D)

Isceon[®] MO29 is a zero ozone depletion (ODP) hydro-fluorocarbon (HFC) refrigerant. Isceon[®] MO29 is a ternary blend of R125, R134a and R600a (65.1%/31.5%/3.4%). It is used as a retrofit replacement for HCFC R22 in medium and low temperature direct expansion (DX) systems.

APPLICATION

Isceon[®] MO29 applications include commercial supermarket systems, food storage and processing equipment, DX fluid chillers and transport refrigeration.

PROPERTIES AND PERFORMANCE

Isceon[®] MO29 is designed to meet the needs of many medium and low temperature refrigeration systems and chillers that are running on R22 and when correctly retrofitted provides similar cooling capacity and energy efficiency to R22. Isceon[®] MO29 is a zeotropic HFC refrigerant blend, which is rated A1 by ASHRAE (lowest levels of toxicity and flammability), having zero Ozone Depletion Potential and a Global Warming Potential of 2729.

LUBRICATION

Isceon[®] MO29 is compatible with mineral oils, alkylbenzene and polyolesters lubricants. Generally, if retrofitting from R22 there is no need to change the existing lubricant charge. If the system is operating on mineral or alkylbenzene lubricants at very low temperatures, has complex pipe runs or has a liquid receiver and lubrication problems are experienced, replacing 25% the lubricant charge with a polyolester lubricant may improve lubrication.

CHARGING

Due to the zeotropic nature of Isceon[®] MO29, it should be charged into the system as a liquid to prevent fractionation (changes in refrigerant composition due to vapour charging). In situations where vapour is normally charged into a system, a valve should be installed in the charging line to flash the liquid to vapour while charging.

RETROFITTING

When retrofitting from R22 to Isceon[®] MO29, it is not always necessary to replace the existing lubricant with POE oil, unless the problems due to the issues detailed above in LUBRICATION occur. The final charge weight of Isceon[®] MO29 will be about 95% that of the R22 charge. Filter driers and elastomeric seals/gaskets should be replaced as standard for all Isceon[®] MO29 retrofits. Adjustment of expansion valve superheat may be necessary to optimise performance. Detailed retrofit procedures are available from Harp International upon request.

MATERIAL COMPATIBILITY

Isceon[®] MO29 may not be compatible with the systems existing elastomeric seals and gaskets. For these reasons, before performing any Isceon[®] MO29 retrofit, Harp International recommends contacting the OEM for specific recommendations before retrofitting.



Isceon® MO29 (R422D)

Technical Data

Isceon® MO29 (R422D) BASIC PROPERTIES

Chemical formula	R125 – CHF ₂ CF ₃ R134a – CH ₂ FCF ₃ R600a – (CH ₃) ₃ CH	Molecular weight	109.9
		Boiling point at 1 atmosphere	-43.2°C
		Critical temperature	79.56°C
		Critical pressure	39.03 bar absolute

Isceon® MO29 (R422D) THERMODYNAMIC PROPERTIES

Absolute Pressure (bar)	Liquid Temperature (°C)	Vapour Temperature (°C)	Liquid Density (kg/m ³)	Vapour Density (kg/m ³)	Liquid Enthalpy (kJ/kg)	Vapour Density (kJ/kg)	Liquid Entropy (kJ/kg.K)	Vapour Entropy (kJ/kg.K)
0.5	-57.1	-51.8	1445.7	3.07	132.5	330.9	0.780	1.688
0.6	-53.7	-48.5	1435.1	3.64	136.6	332.9	0.798	1.684
0.7	-50.7	-45.6	1425.7	4.20	140.1	334.7	0.814	1.681
0.8	-48.1	-43.1	1417.3	4.77	143.3	336.3	0.829	1.678
0.9	-45.7	-40.7	1409.7	5.33	146.2	337.7	0.841	1.675
1.0	-43.5	-38.6	1402.6	5.88	148.8	339.0	0.853	1.673
1.013	-43.2	-38.4	1401.8	5.95	149.2	339.2	0.854	1.673
1.5	-34.5	-29.9	1373.5	8.63	159.7	344.3	0.899	1.666
2.0	-27.7	-23.3	1350.6	11.35	168.2	348.3	0.934	1.662
2.5	-22.1	-17.8	1331.3	14.05	175.2	351.5	0.962	1.659
3.0	-17.2	-13.2	1314.4	16.75	181.3	354.2	0.986	1.657
3.5	-13.0	-9.1	1299.2	19.45	186.7	356.5	1.007	1.655
4.0	-9.2	-5.4	1285.3	22.15	191.5	358.6	1.025	1.654
4.5	-5.7	-2.0	1272.4	24.87	196.0	360.4	1.042	1.653
5.0	-2.6	1.1	1260.4	27.60	200.2	362.1	1.057	1.652
5.5	0.4	3.9	1249.0	30.34	204.1	363.6	1.071	1.651
6.0	3.1	6.6	1238.1	33.10	207.7	365.0	1.084	1.650
6.5	5.7	9.1	1227.8	35.89	211.2	366.3	1.097	1.650
7.0	8.2	11.5	1217.8	38.69	214.4	367.5	1.108	1.649
7.5	10.5	13.7	1208.2	41.52	217.6	368.6	1.119	1.649
8.0	12.7	15.9	1198.9	44.37	220.6	369.6	1.130	1.648
8.5	14.8	17.9	1189.9	47.24	223.5	370.6	1.140	1.648
9.0	16.8	19.9	1181.1	50.15	226.3	371.5	1.149	1.647
9.5	18.7	21.7	1172.5	53.08	228.9	372.3	1.158	1.647
10.0	20.6	23.5	1164.2	56.04	231.6	373.1	1.167	1.646
11.0	24.1	26.9	1147.9	62.07	236.5	374.5	1.183	1.646
12.0	27.3	30.1	1132.1	68.23	241.2	375.8	1.199	1.645
13.0	30.4	33.1	1116.8	74.53	245.7	376.9	1.213	1.644
14.0	33.3	35.9	1101.9	81.00	250.0	377.8	1.227	1.643
15.0	36.1	38.6	1087.2	87.65	254.2	378.7	1.240	1.642
16.0	38.7	41.1	1072.7	94.48	258.1	379.4	1.253	1.640
17.0	41.2	43.6	1058.4	101.51	262.0	380.0	1.265	1.639
18.0	43.6	45.9	1044.1	108.76	265.7	380.6	1.277	1.638
19.0	45.9	48.1	1029.9	116.26	269.4	381.0	1.288	1.636
20.0	48.1	50.2	1015.7	124.02	273.0	381.3	1.299	1.635
21.0	50.2	52.3	1001.4	132.06	276.5	381.6	1.309	1.633
22.0	52.3	54.3	987.1	140.43	279.9	381.8	1.319	1.631
23.0	54.3	56.2	972.5	149.14	283.3	381.8	1.329	1.630
24.0	56.2	58.0	957.8	158.25	286.6	381.8	1.339	1.627
25.0	58.0	59.8	942.8	167.80	289.9	381.7	1.349	1.625
26.0	59.8	61.5	927.5	177.84	293.2	381.4	1.358	1.623
27.0	61.6	63.2	911.8	188.46	296.4	381.1	1.368	1.620
28.0	63.3	64.8	895.5	199.74	299.7	380.6	1.377	1.617
29.0	64.9	66.4	878.6	211.80	302.9	380.0	1.386	1.614
30.0	66.6	67.9	860.9	224.78	306.2	379.3	1.396	1.610
31.0	68.1	69.4	842.2	238.89	309.5	378.3	1.405	1.607
32.0	69.6	70.8	822.2	254.41	312.9	377.2	1.415	1.602
33.0	71.1	72.2	800.4	271.76	316.4	375.8	1.425	1.597
34.0	72.6	73.6	776.3	291.62	320.1	374.1	1.435	1.591
35.0	74.0	74.9	748.6	315.15	324.1	371.8	1.446	1.583