

Genetron 422D Temperature-Pressure Chart

Temperature °C	Bubble Pressure psig	Dew Pressure psig
-45	89	76
-40	118	93
-35	146	119
-30	182	150
-25	225	189
-20	270	229
-15	325	279
-10	389	338
-5	434	408
0	543	482
5	630	571
10	739	668
15	850	777
20	985	904
25	1121	1040
30	1286	1196
35	1455	1361
40	1651	1555
45	1859	1752
50	2089	1989
55	2327	2222
60	2609	2512

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Honeywell Genetron® Refrigerants



THE MOST EFFECTIVE
R22 RETROFIT OPTION

Genetron® 422D

Honeywell

Genetron® 422D

Genetron® 422D is a non-ozone-depleting HFC-based refrigerant for replacement of R22 in low- and medium-temperature refrigeration systems. Genetron 422D is a blend refrigerant suitable for direct expansion evaporators. It should not be used in systems that employ flooded evaporators.

Physical Properties

Chemical Formula and Composition

Component	Formula	Weight %
HFC-134a	CF ₃ CH ₂ F	31.5
HFC-125	CF ₃ CHF ₂	65.1
Isobutane	CH(CH ₃) ₃	3.4

Average molecular weight	109.94
Boiling Point (Bubble) @ 1atm (°C)	43.20
Critical Temp (°C)	79.55
Critical Pressure (KPa)	3903
Critical density (kg/m ³)	529
Saturated liquid density @ 26.7 °C (kg/m ³)	1135.23
Heat of vapo (Kj/kg)	228.9
Spec. heat of liquid @ 26.7 °C (Kj/Kelvin-kg)	1.26
Spec. heat of vapor @ 1atm and 26.7 °C (Kj/K-kg)	1.796

Applications

Examples of low- and medium-temperature commercial refrigeration applications include:

- Supermarket display cases
- Food preservation and food processing
- Ice machines

Features

- Can replace R22 in many cases without having to change compressor lubricant.
- May be used with alkyl benzene (AB), mineral oil (MO), and polyol ester (POE) lubricants. If inadequate oil return is observed for AB or MO, addition of POE may be needed.
- Genetron 422D can, in most cases, be used with existing R22 thermostatic expansion valves. Larger valves may be needed in cases where the R22 valve is near its maximum capacity.
- Lower discharge temperature than R22 which may extend compressor longevity.
- Non-ozone-depleting HFC refrigerant.
- ASHRAE classification A1 (low toxicity, non-flammable per ASTM E-681 method).
- Allows for use of existing equipment.

Retrofit Performance

Genetron® 422D has been evaluated in laboratory tests using typical commercial refrigeration systems. Based on these laboratory tests, subsequent field trials, and theoretical thermo-dynamic cycle calculations, the following observations were made:

Genetron 422D should be suitable for use with MO or AB in most commercial systems. If adequate oil return is not achieved, addition of POE should be considered.

Capacity and energy efficiency at low- and medium-temperature tends to be lower than R22. If the present R22 system was at its maximum capacity during design conditions, additional capacity may be needed (such as upsizing compressor sizes).

Genetron 422D mass flow is higher compared to R22. Existing R22 TXVs may be acceptable in many cases. If the existing valve was near its maximum capacity for R22, a larger valve may be needed when retrofitting to Genetron 422D.

As with any retrofit, consideration should be given to the age of seals and gaskets. Over time, sealing devices may experience compression set, thermal set, and extraction. Aged sealing devices may not perform adequately after retrofitting service. Seal replacement may be required in some cases.