



Tecumseh

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Date: August 2009

Subject: Alternate Refrigerant Position, HCFC Refrigerant R22

For many years, HCFC refrigerant R22 has been a popular choice for applications ranging from air conditioners and heat pumps to commercial refrigeration equipment such as display cases, ice machines and beverage dispensers. Driven by the 1992 amendment to the Montreal Protocol that calls for the phase-out of HCFCs, refrigerant manufacturers began developing HFC alternatives.

As outlined below, R22 phase-out schedules differ by geographic region.

Year	Europe	USA	Latin America & India
2000	R22 discontinued for use with new equipment.		
2010	End sales of virgin R22 for service and maintenance. Only recovered and recycled R22 may be used.	As of January 1, 2010, production and import of R22 banned for use in new equipment. R22 production and importing continues for service of existing equipment.	
2013			Freeze base level production of R22
2015	R22 phased-out for service and maintenance use.		Ten percent (10%) reduction in production of R22 from base level.
2020		As of January 1, 2020, production and import of R22 will be banned entirely. Only recycled, reclaimed and/or stockpiled R22 may be used for servicing existing equipment.	Thirty-five percent (35%) reduction in R22 production from base level.
2025			Sixty-seven and one-half percent (67.5%) reduction from base level.
2030			One hundred percent (100%) reduction in R22 production with two and one-half percent (2.5%) of base level available for service until 2040
2040			R22 completely phased out.

Note: Refer to web reference links on the bottom of Page 2 for additional information.

Tecumseh continues to work with refrigerant and lubricant manufacturers to stay up-to-date with on-going research and development. We review available solutions and test our compressors for capacity and efficiency gains/losses and, for adequate lubrication. While we review an assortment of refrigerants, our standard practice is to develop compressors for well proven, commercially available refrigerants.



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Today, a number of R22 alternative refrigerants are available for use in Low, Medium, and High temperature applications. Some of the popular commercially available HFC refrigerants include R134a, R404A/R507, R407C and R410A.

A broad range of Tecumseh compressors and condensing units are available for use with refrigerants R134a, R404A/R507 and R407C to serve our diverse customer base. For certain applications, compressors are available for use with R410A. Please consult our R22 Alternate Refrigerant Selection Guidelines for compressor types that are available for use with various alternate refrigerants (reference document no. RD-0002-E).

Refrigerant suppliers promote a number of alternate blends for use in service and maintenance of equipment. Tecumseh is involved with programs to evaluate R417A, R422A, R422B, R422C and R422D as potential candidates to replace R22. At this time however, only refrigerants approved by Tecumseh are to be used with Tecumseh compressors (reference Refrigerant Matrix, RD-0001-E and R22 Alternate Refrigerant Selection Guidelines, RD-0002-E).

We recognize the benefits offered by alternate blends and understand they have a place in the service business. Guidelines for the use of R407C, R417A and R422 blends are available on our website (reference document nos. RD-0003-E and RD-0005-E).

Original Equipment Manufacturers (OEMs) that would like to use a refrigerant blend are encouraged to contact Tecumseh for consultation. Testing is required prior to Tecumseh approving a compressor and/or condensing unit for use with a particular refrigerant and lubricant.

Please consult our Refrigerant Matrix (reference document no. RD-0001-E) for information on potential HCFC alternatives. We recommend that you review the application carefully prior to making decisions regarding retrofit or replacement refrigerants as oftentimes there can be capacity and efficiency losses.

This document, as well as Tecumseh's refrigerant selection guidelines and the refrigerant matrix, can be found under the "Refrigerant Guidelines" tab in the Technical Resource Center of Tecumseh's North American Compressor Group website (see web address below). If you need assistance, please contact our Technical Services Team (800.211.3427).

WEB REFERENCE LINKS

<u>Web Site / Document</u>	<u>Web Address</u>	<u>Content</u>
EU Protection of the Ozone Layer	http://ec.europa.eu/environment/ozone/community_action.htm	European Phase-Out
U.S. Environmental Protection Agency	http://www.epa.gov/ozone/strathome.html	U.S. Refrigerant Phase-Out
India Ministry of Environments & Forests	http://www.ozonecell.com/index.jsp	Brazil & India Refrig. Phase-Out
Tecumseh Technical Resource Center	http://202.56.127.90/nacg/	Refrigerant Matrix & Guidelines