Freon™ 507
Refrigerant (R-507)

Properties and Applications of Freon™ 507 (R-507) Refrigerant

Product Information

Introduction

Freon™ 507 is a non-ozone depleting replacement for R-502 in refrigeration applications. This document will discuss general properties of Freon™ 507 and how it may be used in refrigeration applications.

Properties

Freon™ 507 is a mixture of hydrofluorocarbon refrigerants HFC-125 and HFC-143a. It is an azeotrope, is nonflammable, and has no ozone depletion potential (ODP). These properties make it a candidate refrigerant for applications where safety and consistency of performance are needed.

Freon™ 507 will maintain a very consistent composition if leakage occurs in a refrigeration system, which means that operating performance will remain consistent following leakage/recharge cycles. As with all mixtures, we recommend that the liquid phase be removed from the storage cylinder to minimize composition changes when charging. Freon™ 507 should not be mixed with any other refrigerant when charging, recycling, recovering, or reclaiming.

Table 1. General Properties of Freon™ 507

	Freon™ 507
Boiling Point (1 atm), °C (°F)	−46.7 (−52.1)
Critical Temperature, °C (°F)	70.9 (159.6)
Critical Pressure, kPa (psia)	3,793.6 (550)
Latent Heat of Vaporization at Boiling Point, kJ/kg (Btu/lb)	200.5 (86.2)
Saturated Vapor Density at −15 °C (5 °F), kg/m³ (lb/ft³)	19.6 (1.23)
Ozone Depletion Potential	0
Global Warming Potential	3,900
WEEL, ppm (8- and 12-hour TWA)*	1,000
Flammability	None

* Workplace Environmental Exposure Level (WEEL) established by the Occupational Alliance for Risk Science (OARS).

Being nonflammable, Freon™ 507 can be safely used in commercial systems, such as supermarkets or transport refrigeration, where personnel and the public are in the vicinity of the refrigeration equipment. Chemours recommends the use of polyolester lubricants with Freon™ 507; however, the compressor manufacturer should always be consulted for specific lubricant selection. R-507/polyolester mixtures have better miscibility than R-502/mineral oil at low temperatures, which should aid in oil return for low-temperature applications.

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Operating Characteristics

Freon™ 507 is a long-term replacement for R-502 and offers good operating characteristics when compared to R-502. Capacity and efficiency values should be nearly equivalent to R-502. The compressor discharge temperature may be as much as 7.4 °C (13.3 °F) lower than with R-502, which may equate to longer compressor life and better lubricant stability. For example, if a system were operated at –17.8 °C (0 °F) evaporation and 32.2 °C (90 °F) condensing, with an 18.3 °C (65 °F) suction gas temperature, estimated values of performance (with R-502 equal to 1.0) are as follows.

Table 2. Estimated Values of Performance

Capacity	1.06
Theoretical Efficiency	0.94
Discharge Temperature	7.7 °C (13.9 °F) lower than R-502
Discharge Pressure	149.9 kPa (21.7 psi) higher than R-502
Suction Pressure	26.8 kPa (3.88 psi) higher than R-502

Commercial Availability

Freon™ 507 components are TSCA (United States) and EINECS (Europe) listed; also, Freon™ 507 has been recognized by Underwriters Laboratories (UL).

Commercial quantities of Freon™ 507 are available. Contact Chemours or any Chemours authorized distributor for more information

For more information on Freon™ refrigerants, visit freon.com

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