

NEW PRODUCT INTRODUCTION



Green Refrigerant

- NOW AVAILABLE -

NEW "GREEN" Zero Global Warming and Zero Ozone Depleting, Energy-Saving Refrigerant for Appliance, Refrigerated Display Case, Vending Machine and Automotive Markets

R441a (HCR 188C)

R441a (HCR188C) is a green, natural hydrocarbon refrigerant with **Zero Global Warming Potential and is Non-Ozone Depleting**. Energy draw tests have shown a 48% and better decrease in power consumption while using only 25% to 35% of the normal refrigerant charge when compared to refrigerated systems operating with R134a refrigerant. Reduced electrical power consumption can be expected in air conditioners, kitchen appliances, refrigerated commercial display cases and vending machines as well as other refrigerated applications such as window air-conditioners and automotive air-conditioners.

R441a (HCR188C) is the first hydrocarbon refrigerant to be approved for sale in the United States by the U.S. Environmental Protection Agency. R441a (HCR188C) is **EPA approved under the Significant New Alternative Policy (SNAP)** for use in household refrigerators, freezers and window air conditioners, and is under review for use in automotive air-conditioning systems. It has been certified by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) as being non-toxic. R441a operates with mineral oil and can be used as a direct replacement in residential appliances, commercial refrigeration units and automotive cooling systems designed for R12, R134a and R22. While R441a is flammable the very small amount of this climate-friendly refrigerant required makes the risk assessment a non-factor.

- Replacement for R12, R134a and R22
- Energy efficient; uses 25% to 35% of normal charge amount
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)

[SEE REVERSE SIDE FOR PHYSICAL PROPERTIES]

Available for immediate shipping.

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NEW PRODUCT INTRODUCTION

R441a (HCR188C)

The new Zero ODP/ Zero GWP Replacement for R12/R134a/R22.

Energy-efficient. Compatible with all lubricants.

Applications

This refrigerant is intended for use in refrigerators, freezers and window air-conditioners, as well as vending machines and automotive air-conditioners, with expected typical evaporating temperatures of (but not limited to) 0°C and condensing temperature of (but not limited to) 37°C.

R441a Physical Properties

Formulation Components	R170/290/600a/600
Molecular mass as formulated	48.23 g/mol
Molecular mass of the vapor at 60°C (140°F)	44.77g/mol
Critical temperature	117.3°C
Dew-point temperature at 101 kPa (14.7 psia)	-20.4°C
Bubble-point temperature at 101 kPa (14.7 psia)	-41.9°C
Latent heat of the vapor at 60°C (140°F)	285.48 kJ/kg
Specific heat ratio of the vapor at 60°C (140°F)	1.36
Maximum temperature glide At the normal boiling point At 20°C (68°F)	21.5°C 17.2°C
Specific volume at the critical point	0.005295 m ³ /kg
Ozone Depletion Potential (ODP)	0
Global Warming Potential (GWP)	0

Lubricants

R441a (HCR188C) is compatible with both the traditional and new synthetic lubricants so there is no need to change the oil when converting from R12, R134a or R22. R441a (HCR188C) is suitable for use with mineral, alkybenzene and polyol ester lubricants.

Safety

The components of R441a (HCR188C) have been subjected to toxicity tests carried out by Alternative Fluorocarbons Environmental Acceptability Study (AFEAS) and have been declared to be non-toxic. Risk of flammability is very small due to the small amount required for efficient use.

Servicing

Because R441a (HCR188C) is a blend, it should be charged into the system in the liquid (as opposed to vapor) form.