

## Product Information Bulletin

ISCEON® MO99™ is the first versatile R22 retrofit refrigerant for replacing R-22 in direct expansion (DX) air conditioning and refrigeration systems.

ISCEON® MO99 refrigerant, invented and patented by DuPont, combines R-22 pressure - enthalpy characteristics with mineral oil compatibility in a unique HFC refrigerant that can be used to replace R-22 over a wide range of evaporator temperatures. ISCEON® MO99 is compatible with traditional and new lubricants; in most cases, no change of lubricant type during retrofit is required.

### Applications

- Commercial Air Conditioning
  - Roof Top Units
  - Indoor Packaged Units
  - DX Chillers
  - Split Systems
- Residential Air Conditioning
- Refrigeration (Low and Medium Temperature)
  - Self Contained Systems
  - Condensing Units
  - Rack Systems

### Benefits

- Lower retrofit costs versus HFC/POE options
  - No expansion valve or line set changes
  - Eliminates disruptive oil changes
    - Compatible with AB, MO and POE lubricants
  - Minimizes time spent on control set point adjustments and subsequent service calls
- Not subject to phaseout under the Montreal Protocol and the U.S. Clean Air Act
- 42% lower Global Warming Potential (GWP) than R-404A

### ISCEON® MO99 Compressor Calorimeter Performance Compared to R-22 at Refrigeration and Air Conditioning Conditions

*Performance with subcooling based on thermocycle calculations from calorimeter data and do not include heat transfer effects*

	<b>Low Temperature*</b> <b>-25°F evaporator</b> <b>105°F condenser</b> <b>65°F return gas</b> <b>with 10°F subcooling</b>	<b>Medium Temperature</b> <b>20°F evaporator</b> <b>120°F condenser</b> <b>65°F return gas</b> <b>with 10°F subcooling</b>	<b>A/C &amp; High Temperature</b> <b>45°F evaporator</b> <b>115°F condenser</b> <b>65°F return gas</b> <b>with 15°F subcooling</b>
Discharge Temperature, °F	-22	-45	-31
Discharge Pressure, psi	+3	+6	+5

+ is increase and - is decrease for ISCEON® MO99 vs. R-22

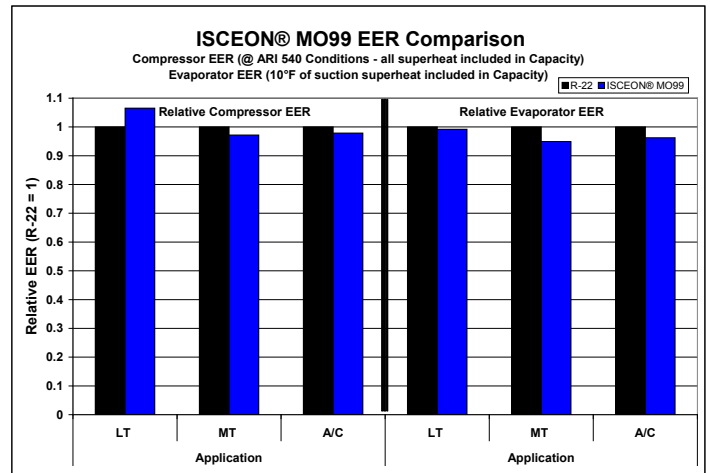
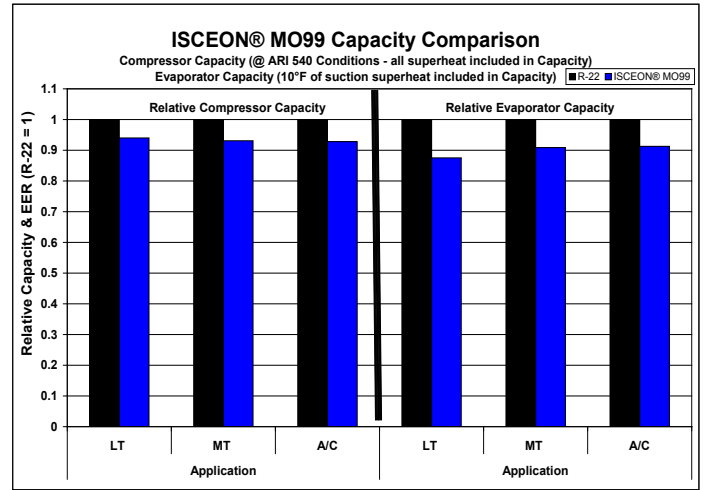
\*R-22 assumes demand cooling with low temp discharge temperature of 275°F

## Expected Performance After Retrofit

Based on field experience, calorimeter testing and thermodynamic property data, ISCEON® MO99™ provides similar cooling capacity and energy efficiency versus R-22 in most systems, while operating at a lower compressor discharge temperature. Evaporator and condenser pressures are similar to R-22. No set point changes are needed during the retrofit; however, some minor adjustments may be necessary to optimize system performance after the retrofit. Actual performance depends on system design and operating conditions. After retrofit, the system can be topped off during service without removing the entire refrigerant charge.

## Retrofit Considerations

ISCEON® MO99 is compatible with traditional and new lubricants – mineral oil, alkylbenzene and polyol ester. In most cases no change of lubricant is required. Oil return is determined by a number of operating and design conditions. In some systems with mineral oil and complex piping configurations, POE may need to be added. Minor equipment modifications (e.g. seal replacement, TXV adjustment) may be required. No expansion device replacements are required if the system was properly designed and operating with R-22. Refer to the ISCEON® MO99 Retrofit Guidelines for details.



Low Temperature (LT) : -25°F Evaporator, Seasonal Average Condenser (70% @ 80°F/ 30% @ 105°F), 10°F subcool liquid, 65°F return gas  
Medium Temperature (MT): 20°F Evaporator, Seasonal Average Condenser (70% @ 80°F/ 30% @ 120°F), 10°F subcool liquid, 65°F return gas  
Air Conditioning (A/C): 45°F Evaporator, 115°F Condenser, 15°F subcool liquid, 65°F return gas

## ASHRAE #: R-438A

### ISCEON® MO99 Product Composition

Component	Weight %
HFC-32	8.5
HFC-125	45.0
HFC-134a	44.2
n-butane (HC-600)	1.7
Isopentane (HC-601a)	0.6

For more information: (877) 683-3566 or [isceon.com](http://isceon.com)

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