

DuPont™ ISCEON® MO99

Product Information Bulletin

ISCEON® MO99 is the newest and most versatile 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
- Heat Pumps
- DX-Refrigeration

Benefits

- Lower retrofit labour costs versus HFC/POE options
 - No expansion valve or change of pipe sizing
 - Eliminates disruptive oil changes
 - Compatible with AB, MO and POE lubricants
 - Minimizes time spent on control set point adjustments and subsequent service calls
- Non-ozone depleting HFC refrigerant
- 42% lower Global Warming Potential (GWP) than R-404A (IPCC AR4)

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

	Low Temperature* -32°C evaporator 41°C condenser 18°C return gas with 5.5K subcooling	Medium Temperature -7°C evaporator 49°C condenser 18°C return gas with 5.5K subcooling	A/C & High Temperature 7°C evaporator 46°C condenser 18°C return gas with 8K subcooling
Discharge Temperature, K	-12	-25	-17
Discharge Pressure, kPa	+20	+41	+35

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

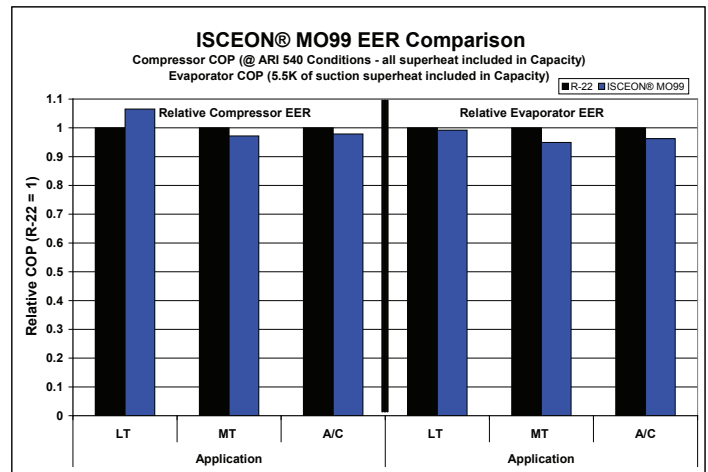
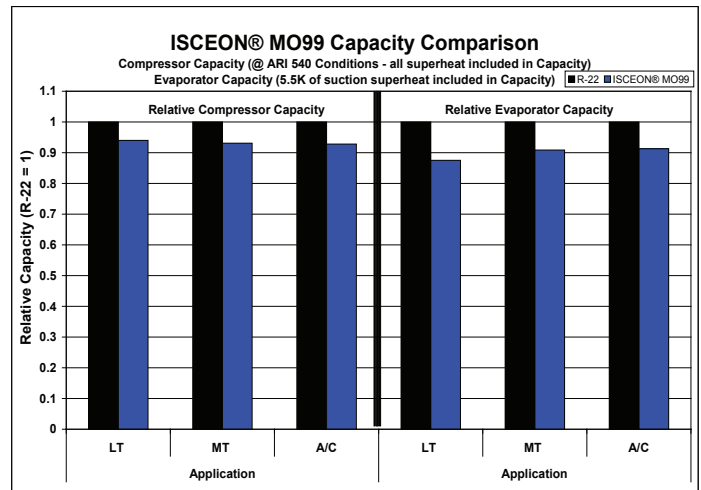
*R-22 assumes demand cooling with low temp discharge temperature of 135°C

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 (MO), alkylbenzene (AB) and polyolester (POE). 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) or expansion device adjustments may be required in some applications. Refer to the ISCEON® MO99 Retrofit Guidelines for details.



Low Temperature (LT)): -32°C Evaporator, Seasonal Average Condenser (70% @ 27°C/ 30% @ 41°C), 5.5K subcool liquid, 18°C return gas
 Medium Temperature (MT): -7°C Evaporator, Seasonal Average Condenser (70% @ 27°C/ 30% @ 49°C), 5.5K subcool liquid, 18°C return gas
 Air Conditioning (A/C): 7°C Evaporator, 46°C Condenser, 8K subcool liquid, 18°C return gas

ASHRAE #: R-438A

ASHRAE Safety Classification: A1

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 further information: isceon.com/UK

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