HCFC-Refrigerant Phase-Out in Russia

... and what to do?

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Two Environmental Issues

Ozone Depletion

Climate Change (GWP)
EU Regulation (EC) No 1005/2009

1 Jan. 2010
Stop of R22-Sales
Stop of R22-Service
R22-Phase-Out -- Options for Retrofit

Four Options

- Maintain operation using recycled R-22 = Risk!

- Replace with new equipment running on:
  - ammonia
  - hydrocarbons
  - CO₂
  - HFC, e.g. Suva®

- Keep running existing equipment:
  - change of oil and further technical modifications are required:
    - HFCs of the Suva® range, e.g. R404A or R407C

- Keep running existing equipment:
  - only moderate modifications are necessary:
    - retrofit with DuPont™ ISCEON® 9 Series Refrigerants

Attention!
The **Lowest Cost Option for Retrofits and new Installations**

Select an HFC refrigerant that…

- Based on R-22 Technology
- Minimizes component changes
- Eliminates need for oil change
ISCEON® MO99 refrigerant: THE BASICS

- **ASHRAE #:** R-438A
- **HFC blend:** Zero ozone depletion
- **GWP:** 1890 (SAR)
- **ASHRAE safety:** A1 non-flammable
- **UL:** Certified
- **Glide:** 3-4K
- **Can be topped off while servicing (do not mix with R-22)**
- **Compatible with MO, AB, and POE lubricants**
- **Approved by Bitzer and Emerson** (Copeland® Discus® LT/MT supermarket)
Tools available to you
Innovative Refrigerants from the Makers of Freon® 22

R-22 is Going Away
ISCEON® refrigerants help you manage through the R-22 phaseout by enabling continued use of existing equipment with minimal downtime for retrofit and avoiding costly equipment replacement for the equipment owner.

R-22 Price May Be Volatile
Since January of 2003, the price of R-22 in the U.S. market has increased by more than 500%, and the supply reductions created by ongoing regulations are likely to continue to influence R-22 price in the future.

Replace R-22 with ISCEON® Refrigerants
Retrofitting to ISCEON® refrigerants and away from Freon® 22 puts your business in a position to avoid expected R-22 supply shortages, pricing volatility and labor shortages, and can even provide you with a low-cost supply of R-22 by including retrofit, recovery and reclaim in your refrigerant management plan.

First-hand Experience: Convert from HCFC-22 to ISCEON® M099™
Owners of R-22 A/C Systems: What You Need to Know
Business Opportunity for Contractors: Retrofit During Service Calls
Business Opportunity for Contractors: AC Value Prop

GET THE FREE APP!
Pressure-Temperature
Mobile App
FREE tool from DuPont Refrigerants

Helpful Links
Retrofit of an
R-22 Air Conditioning System
ISCEON® M099™ Refrigerant
CLICK to View this YouTube video!

ISCEON® MSDSs
Contact the ISCEON® Team
Global DuPont Refrigerants

Critical Information
DuPont Refrigerant Expert™ (DUPREX)
Now Includes Line Sizing and ISCEON® M099™
Download DUPREX 1.2
App icon for Apple devices

Droid app: development starting Feb 2012, with launch by June 2012
Introducing the
DuPont Refrigerants P/T Calc App
Outcome of EU-Contractor Survey

Benefits of ISCEON® 9 series

- Ongoing use of existing equipment
- Virtually identical cooling performance
- Short time required for conversion
- Low investment costs
- No oil change required (in most cases)
- Availability of refrigerant
- Lower discharge temperature

Mentions (%)
### DuPont Refrigerants Today and Tomorrow

<table>
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<th><strong>R22 Phase out</strong></th>
<th><strong>EU: ISCEON® 9-series</strong></th>
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<tr>
<td>• Lower retrofit costs versus HFC/POE-options</td>
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<td>• &gt; 5 Years successful retrofit experience in US and EU</td>
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<th><strong>HFO-1234yf: Global Solution for Auto-AC</strong></th>
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<td>• No ODP and Low GWP</td>
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<td>• Very similar to R134a-Properties</td>
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<tr>
<th><strong>New Low GWP Opteon® Refrigerant Series</strong></th>
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<tr>
<td>• Alternatives to high GWP-Refrigerants, e.g. R404A, R410A</td>
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<td>• Developmental Products in tests with Partners</td>
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Several solutions are available, Contractor companies need to learn to use it properly.

ISCEON® MO99 (R438A) is the most versatile alternative to R22, which can be used in new systems and as well for retrofit.

With regards to capacity, energy efficiency and cost-effectiveness, DuPont™ ISCEON® MO29 (R422D) or MO99 (R438A) are preferred solution in US and in EU.

ISCEON® MO29 (R422D) has shown as well acceptable performance after retrofits in pump circulation systems.

Russia might consider to accelerate the current HCFC-phase-out schema.
Thank you!