

## Lubrication Checkup: Synthetics For Ammonia Compressors

Written by Dr. Lube, aka Ken Bannister  
Wednesday, 20 February 2013 15:00

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**Symptom:** “Dear Dr. Lube: In the past we’ve always used mineral oil to lubricate the ammonia-refrigerant compressors that operate our ice rinks. As part of our sustainability program, I have been asked to review the use of synthetic lubricants. Are these available for refrigeration compressors? Can I expect benefits to offset their cost?”

**Diagnosis:** The life of a compressor lubricant is not easy! A regular mineral-based oil can deteriorate quickly. Deterioration leads to oxidation-caused carbon, gum and varnish buildups that result in excessive wear of all mechanical moving parts, increased energy costs and reduced compressor efficiency and availability.

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**Prescription:** A variety of synthetic compressor fluids for large commercial ammonia refrigeration systems have been formulated to relieve many of the problems associated with volatile solvent-refined paraffinic and naphthenic mineral oils, including:

- Wax deposit problems at very low temperatures
- Excessive oil consumption resulting from oil carry over into the refrigerant low-temperature side
- Premature oxidation causing oil thickening, deposits and sludge formation

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In large commercial refrigeration operations, temperatures can be lower than -60 F (-51 C). Synthetics provide the viscosity stability required for dealing with the extreme hot and cold temperatures. They're also less soluble in ammonia refrigerant than their mineral counterparts and can significantly reduce oil consumption and subsequent refrigerant contamination effects.

Compared to typical mineral-based lubricants with a recommended maximum life of 3000 hours, synthetics are often rated for up to 8000 hours, thus reducing downtime, maintenance and environmental impact. Synthetic-oil manufacturers also claim energy savings of up to 4%. Your choice of synthetic type will usually vary among polyalphaolefins, alkyl benzines, polyol esters and polyalkylene glycols. Selection is based on compressor type, operating conditions, oil-separator efficiency and system design.

To learn if a synthetic is right for your application, discuss the refrigeration-system design with your lubricant supplier. Based on that information, the vendor can develop a business case with a return-on-investment statement that will allow you to determine if the change meets the needs of your sustainability program. **MT**

*Lube questions? Ask Dr. Lube, aka Ken Bannister, author of the book Lubrication for Industry and the Lubrication section of the 28th edition*

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