



REFLO™ A AMMONIA REFRIGERATION COMPRESSOR FLUID

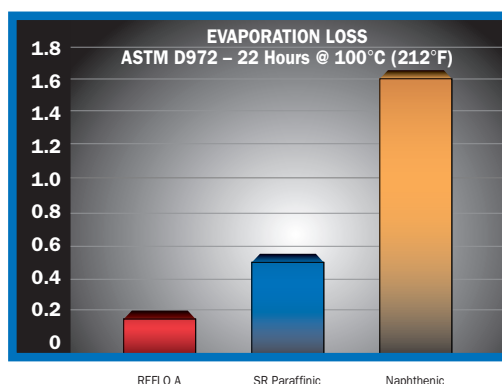
Introduction

Petro-Canada's REFLO™A is an ammonia refrigeration compressor fluid used in industrial refrigeration systems. REFLO A is formulated to outperform solvent refined paraffinic and naphthenic refrigerant oils by extending service life while significantly reducing operating costs.

REFLO A's superiority results from more than 25 years formulating experience. Using a patented HT purity process, Petro-Canada produces 99.9% pure base oils – one of the purest in the world. Free of impurities that can hinder fluid performance; these crystal clear base oils are fortified with specialty selected additives. The result is a refrigeration compressor fluid that offers reliable, long-term performance with significant operational cost savings.

Features and Performance Benefits

- **Lower oil volatility reduces fluid consumption and maintenance costs**
 - Significantly less volatile than solvent refined paraffinics or naphthenics at high temperatures
 - Results in less oil carryover to the refrigeration system's low temperature side, reducing fluid consumption by up to 80%
 - Lower oil carryover also reduces sludging and deposit formation in evaporators, lowering maintenance costs



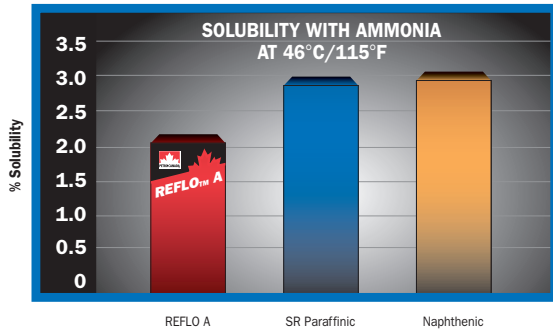
REFLO A's lower oil volatility significantly reduces the oil carryover experienced with solvent refined paraffinic and naphthenic fluids. Lower oil carryover can cut fluid consumption by up to 80%.

- **Lower solubility in ammonia improves system efficiency and performance**
 - REFLO A is less soluble in ammonia refrigerant than solvent refined paraffinics and naphthenics
 - Less ammonia is absorbed into the compressor fluid, which can reduce foaming in separator tanks and increase system efficiency
 - Lower concentrations of ammonia in the fluid allows it to maintain viscosity, so it lubricates better, reducing wear
 - Less compressor fluid is absorbed into the ammonia, reducing the potential for fluid to block piping, valves and filters
 - Lower concentrations of compressor fluid in the ammonia also help to maintain refrigerant purity, improving system efficiency and performance

What is the HT difference?

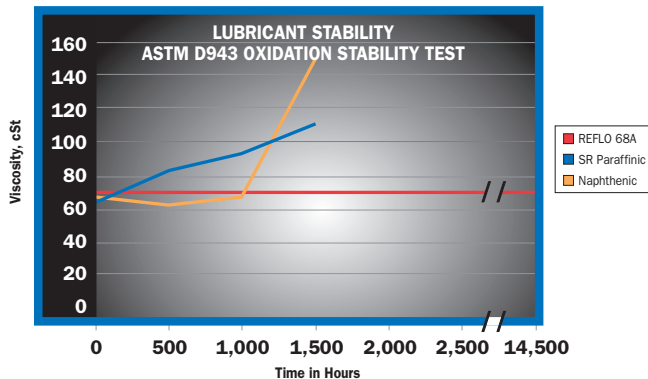
Petro-Canada starts with the patented HT purity process to produce water-white, 99.9% pure base oils. The result is a range of lubricants, specialty fluids and greases that deliver maximum performance for our customers.





REFLO A is less soluble in ammonia versus solvent refined paraffinic and naphthenic fluids. This can improve system performance and efficiency, and ensure better protection against wear.

- **Excellent thermal and oxidative stability extends fluid life, reducing maintenance costs and downtime**
 - Excellent resistance to oxidative and thermal breakdown guards against oil thickening, deposits and sludge formation
 - Helps to keep the compressor, heat exchanger and expansion valves operating at their design efficiency and performance standards
 - Extends fluid life, even in the presence of impurities in the ammonia refrigerant, saving on downtime and change-out costs



REFLO A's strong oxidation stability guards against fluid breakdown in systems where air or oxygen contamination is an issue. Fewer fluid change-outs can reduce costly downtime.

Additional Performance Benefits

- **High viscosity index ensures proper lubrication and protection from wear over a wide range of operating temperatures**
- **High flash point ensures safe operation at elevated temperatures**
- **REFLO A provides some rust and corrosion resistance to help protect components from attack by moisture and chemical impurities**

Applications

REFLO A is formulated to lubricate ammonia refrigeration compressors used in large commercial operations such as cold stores, food processing plants, marine systems and ice arenas. REFLO A is also used in manufacturing industries that require low temperature control, such as pharmaceuticals and microelectronics. REFLO A can be used in ammonia refrigeration systems where evaporator temperatures are greater than -42°C/-44°F.

REFLO A is compatible with mineral oils such as solvent refined (SR) paraffinics and naphthenics, and may be used to top-up systems using these types of fluids. The full benefits of REFLO A will not be realized without a complete fluid change-out.

Most OEM's use Neoprene® (Polychloroprene), HSN (Highly Saturated Nitrile) or BUNA N (Nitrile) and REFLO A fluids are fully compatible with these types of materials. However, when a compressor is converted from one oil formulation or type to another, there is always a risk of seal swell or shrinkage. Unlike naphthenic fluids or fluids derived from aromatic chemicals such as alkyl benzenes, REFLO A fluids cause little or no seal swell. Although tightening flanges can sometimes correct minor leaks, we advise that whenever possible, new seals should be retrofitted during the oil conversion. Follow the OEM's seal recommendation for Hydrotreated Paraffinic oil (ie. Mycom W series reciprocating compressors should use HSN or Neoprene® only).

OEM Approved

REFLO A is approved or meets the requirements of most major compressor OEM's, including:

- Bitzer
- Frigoscandia
- Grasso
- Howden
- Huppman
- Sullair
- Vilter

Food Industry Approved

- Acceptable as a lubricant in and around food processing areas where there is no possibility of food contact
- NSF H2 registered
- Registered with the Canadian Food Inspection Agency (CFIA)



**Nonfood Compounds
Program Listed H1**

Typical Performance Data

PROPERTY	ASTM TEST METHOD	DIN TEST METHOD	REFLO	
			46A	68A
Density, kg/L @ 15°C	D4052	—	0.860	0.866
Viscosity, cSt @ 40°C	D445	51550	46	58
cSt @ 100°C			6.9	7.9
SUS @ 100°F			237	268
SUS @ 210°F			49	52
Viscosity Index	D2270	—	106	104
Pour Point, °C/°F	D97	51597	-42/-44	-42/-44
Flash Point, °C/°F	D92	51376	222/372	236/457
Foam Characteristics, ml	D892	51566		
Sequence 1			0/0	0/0
Sequence 2			10/0	10/0
Sequence 3			0/0	0/0
Total Acid Number (TAN), mg KOH/g	D664	51558	0.05	0.05
Specific Heat, Calories/g/°C, 38°C	—	—	0.47	0.47
BTU/lb, 100°F	—	—	0.47	0.47

The values quoted above are typical of normal production. They do not constitute a specification.

Health and Safety

To obtain Material Safety Data Sheet (MSDS), contact one of Petro-Canada's TechData Info Lines.

TechData Info Lines

If you would like to know more about Petro-Canada's REFLO A, or any other product in our complete line of quality lubricants, please contact us at:

Lubricants Head Office
Petro-Canada
2310 Lakeshore Road West
Mississauga, Ontario
Canada L5J 1K2



Canada - West Phone 1-800-661-1199
- East (English) Phone 1-800-268-5850
(French) Phone 1-800-576-1686
Other Areas Phone (416) 730-2408
E-mail lubecsr@petro-canada.ca
Internet lubricants.petro-canada.ca

Petro-Canada Europe Lubricants
The Manor, Haseley Business Centre
Warwick, Warwickshire
CV35 7LS

United Kingdom
Phone +44 (0) 2476-247294
Fax +44 (0) 2476-247295

Petro-Canada America Lubricants
980 North Michigan Avenue
Suite 1400, #1431
Chicago, Illinois
USA 60611

Phone 1-888-284-4572
Fax (708) 246-8994
E-mail email@petro-canadaamerica.com