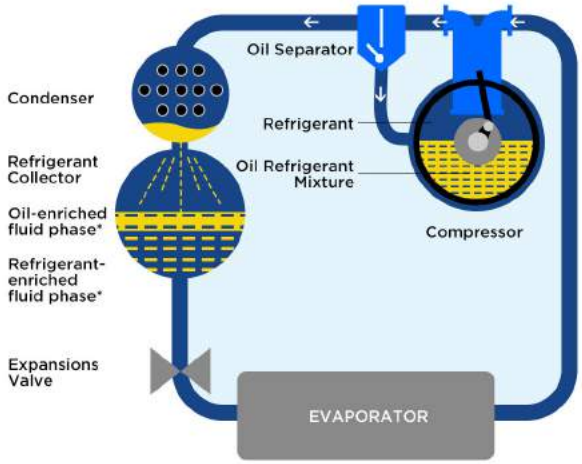
REFRIGERATION OILS FOR AMMONIA

Ammonia (R-717) as a refrigerant remains widely used in piston-type compressors in industry, and continues to be recommended by various OEM's, due to its reliability, affordability and availability. However, a compatible and high-performing refrigeration lubricant is just as important in any refrigeration system, as an incorrectly selected lubricant can cause cooling and mechanical failures.

Not only are refrigeration oils are required in a compressor to lubricate – to reduce friction and wear of the mechanical components - they should also be able to function or perform in the following manner,

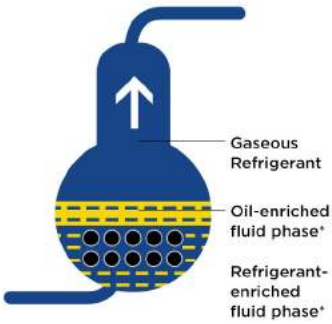
1. **Withstand the hot-cold cycles of the system without premature degradation or oxidation,**
2. **Absorb the heat generated by the discharge and the phase-change,**
3. **Flow from the cold areas without solidification to facilitate return to the compressor,**
4. **Exhibit miscibility with the refrigerant, and,**
5. **Keep contaminants from coagulating (detergency and dispersancy), to prevent blockage at the filters and expansion valves.**

SCHEME OF REFRIGERATION CIRCUIT



SYSTEM 1: DRY EVAPORATION

SYSTEM 2: FLOODED EVAPORATION



*In the area of the miscibility gap: When the density of the refrigerant enriched phase is greater than the density of the oil-enriched phase.

Through the years, Nyfrost has proven to be an excellent choice for compressor lubrication running on Ammonia, due to the qualities exhibited by its wax-free Napthenic base-stock. Compared to the normal paraffinic-based refrigeration oils commonly found in the market, Nyfrost simply outperforms.

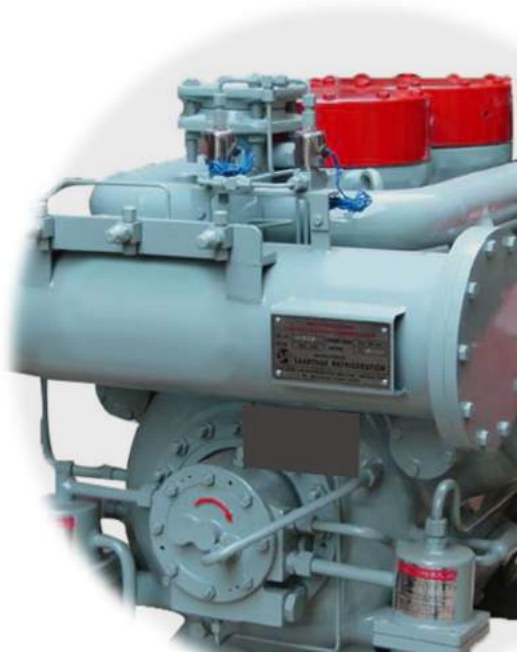
NYFROST 32, NYFROST 46, NYFROST 68, NYFROST 100

SUITABLE MISCIBILITY WITH REQUIRED REFRIGERANT MEDIUM
R 717, R600a, R22

EXCELLENT LOW TEMPERATURE PROPERTIES
Low pour points

EFFICIENT HEAT TRANSFER AND GOOD THERMAL STABILITY
Low viscosity index and prevention of cooking

HIGH SOLVENCY KEEPS CONTAMINANTS IN SOLUTION
Prevention of clogging of filter and expansion valve

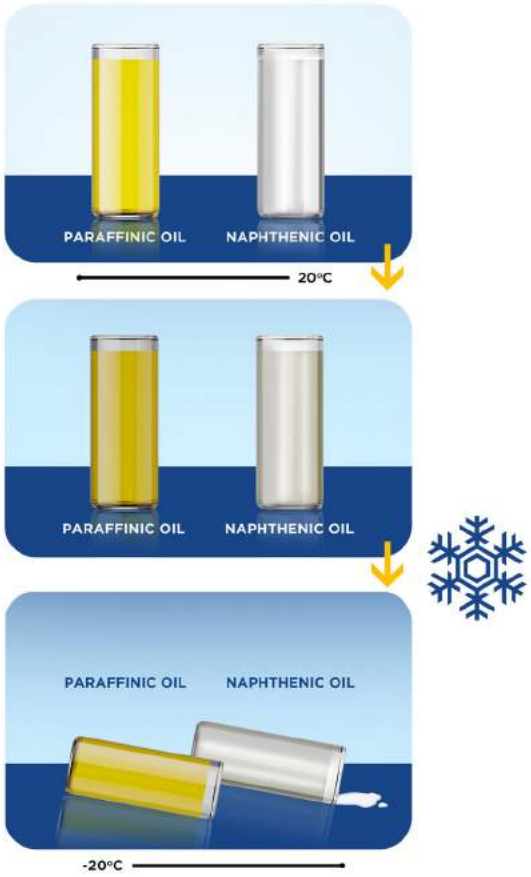


Our range is complete to satisfy the different requirements of the OEM's

CHARACTERISTICS	TEST METHOD ASTM	NYFROST 32	NYFROST 46	NYFROST 68	NYFROST 68x
Density, 15°C, g/cm³	D 4052	0,905	0,910	0,913	0,895
Viscosity, 40°C, cSt	D 445	32	46	68	68
Viscosity, 100°C, cSt	D 445	4,5	5,4	6,6	7,6
Flash Point, COC °C	D 92	190	194	200	206
Flash Point, PM	D 93	176	180	185	195
Pour Point, °C	D 97	-45	-36	-30	-39
Color	D1500	0,5	1,0	1,0	<0,5
Neutralisation number, mgKOH/g	D974	<0,01	<0,01	<0,01	<0,01

*Available in 200 liter drums

OUTSTANDING LOW TEMPERATURE CAPABILITY

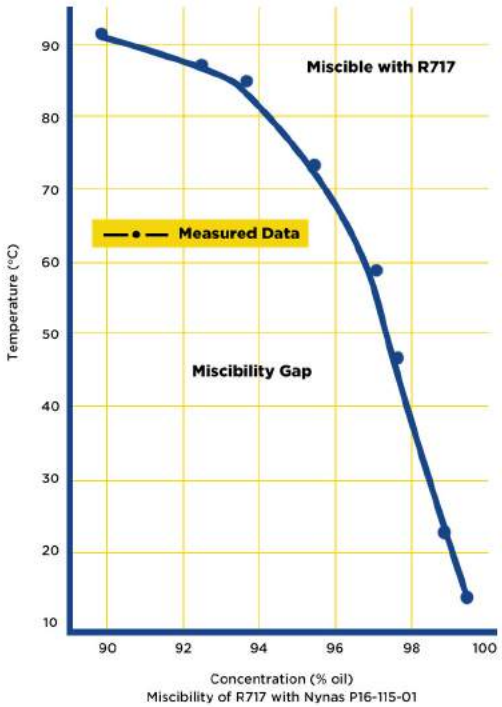


Temp at -20°C paraffinic oils "waxy crystallizes" formed but naphthenic still flow.

OUTSTANDING MISCIBILITY

NYFROST™ Miscibility with ammonia

- The miscibility of ammonia (R717) in NYFROST oil was determined in the range from 90% to 99.5% according to DIN 51514
- At ambient temperature (20°C), approximately 1% of the R717 is miscible in the oil
- At 40°C, approximately 2% R717 is miscible in the oil



Miscibility of R717 with Nynas P16-115-01

We also have a range of Polyolester Synthetic Lubricants (POE), suitable for refrigeration systems using CFC, HCFC refrigerants and being evaluated in CO_2 systems. Please inquire from us for any requirement.

MANUFACTURED AND DISTRIBUTED BY:

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