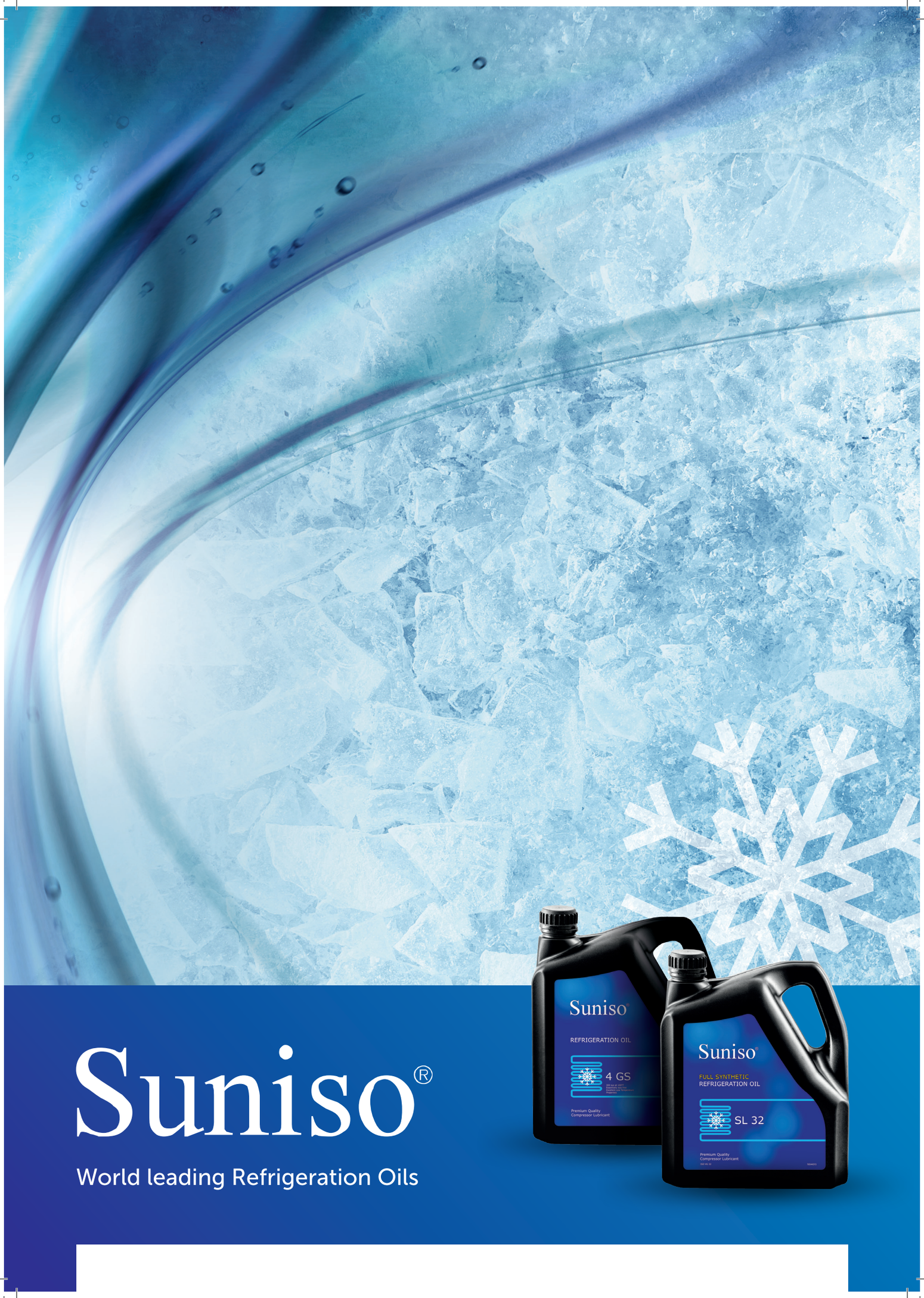


Suniso®

World leading Refrigeration Oils

World leading Refrigeration Oils

The design of modern air-conditioning and refrigeration compressors varies from manufacturer to manufacturer. However, all have one important characteristic: they require a highly specialized type of lubricating oil in order to assure a long trouble-free service of the refrigeration compressor.

Suniso® oils meet these special demands; they are of high stability and give long trouble-free service life in modern compressors designed to maximize output capacity with minimum physical size.

Suniso® mineral oils are manufactured from well-refined petroleum lubricating oil stocks, while the synthetic ones are based on the finest synthetic base stocks. All represent the best choice among available compressor lubricants.



UNIQUE REQUIREMENTS FOR REFRIGERATION OILS

Refrigeration compressor oils must lubricate moving parts effectively while satisfying requirements not demanded from other general purpose lubricating oils. Unlike such oils, refrigeration oils are expected to give trouble-free service.

Lubrication, of course, is considered the primary function of a compressor oil. In addition, it must have certain other properties because:

1. It mixes intimately with the refrigerant used in the system.
2. It is carried over in small amounts into the refrigeration lines.
3. It is in direct contact with the motor windings in hermetic units.
4. It is exposed to temperature extremes: high temperatures at the compressor discharge valve, and very low temperatures at the expansion valve.

ADVANTAGES OF SUNISO® OILS

Suniso® refrigeration oils have the following characteristics which assure maximum trouble-free service life:

- **CHEMICAL STABILITY**
  To resist interaction with the refrigerant or metal parts in the system.
- **THERMAL STABILITY**
  To eliminate excessive carbon deposits at compressor hotspots such as valves or discharge ports.
- **LOW WAX CONTENT**
  To prevent separation of flocculent wax from the oil-refrigerant mixture at the low temperature points in the system.
- **LOW POUR POINT**
  To prevent separated oil from congealing in refrigerant lines.
- **HIGH DIELECTRIC STRENGTH**
  To ensure good insulating properties. In hermetic units, the oil-refrigerant mixture serves as an insulator between the motor and the compressor body.
- **PROPER VISCOSITY**
  To ensure high film strength at elevated operating temperatures and good fluidity under the coldest operating temperatures even when diluted with refrigerant.
- **NO CONTAMINATION**
  To prevent scarring of bearing surfaces, plugging of lines or oil ports and general deterioration.

SUNISO SYNTHETIC REFRIGERATION OILS



SUNISO® SL RANGE

SL22, SL32, SL46, SL68, SL100; SL170, SL220

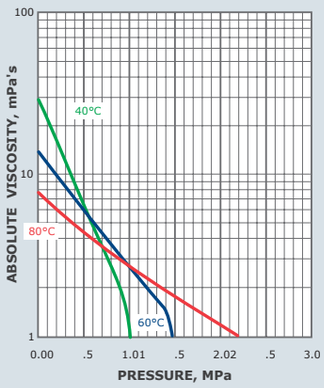
Suniso® SL synthetic refrigeration oils are formulated with select polyol ester base stock and additives, providing outstanding lubrication, stability and corrosion protection. Suniso® SL oils are miscible with HFC refrigerants* at extremely low temperatures. Suitable for use in compressors of refrigeration and air conditioning systems, working on ozone friendly alternative coolants.

	SL22	SL32	SL46	SL68	SL100	SL170	SL220
density at 15°C	0.990	0.980	0.970	0.960	0.960	0.990	0.990
viscosity at 40°C	22.0 cSt	32.0 cSt	47.2 cSt	70.1 cSt	100 cSt	170 cSt	220 cSt
viscosity at 100°C	4.6 cSt	5.8 cSt	7.2 cSt	9.1 cSt	11.3 cSt	17.2 cSt	20.8 cSt
viscosity index	127	125	112	105	100	109	111
flash point	232°C	235°C	235°C	252°C	254°C	260°C	264°C
pour point	-48°C	-48°C	-44°C	-36°C	-36°C	-24°C	-30°C
colour	L 0.5	L 0.5	L 0.5	L 0.5	L 0.5	L 0.5	L 0.5
water	< 100 ppm	< 100 ppm	< 100 ppm	< 100 ppm	< 100 ppm	< 100 ppm	< 100 ppm

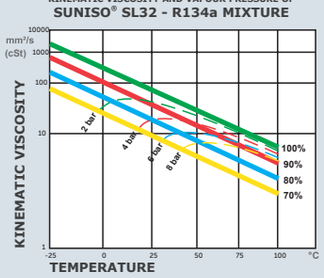
*overview of refrigerants

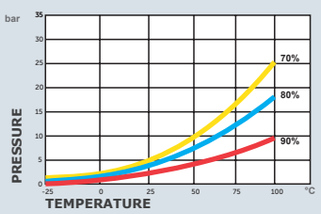
HFC	R23, R134a, R234fa, R404a, R407a, R407b, R407c, R410a, R507, R508

VISCOSITY - PRESSURE CHART FOR SOLUTIONS OF
R-134a in SUNISO® SL32 at 40°C, 60°C, 80°C



KINEMATIC VISCOSITY AND VAPOUR PRESSURE OF
SUNISO® SL32 - R134a MIXTURE





SUNISO MINERAL REFRIGERATION OILS



SUNISO® GS AND G RANGE

3GS, 3.5GS, 4GS, 4.5G, 5G

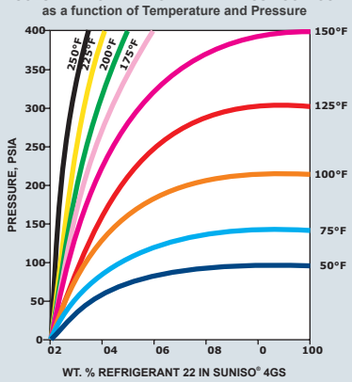
Recommended by most major equipment manufacturers and refined from specially selected naphthenic base oils. Highly stable, essentially wax free, thus providing excellent low temperature properties and assuring long trouble-free life. Suniso® GS oils can be used in virtually any installation, regardless of compressor or evaporation temperature and are miscible with (H)CFC refrigerants and natural refrigerants**. Therefor Suniso® GS oils can be applied in commercial as well as in residential refrigeration and air conditioning systems.

	3GS	3.5GS	4GS	4.5G	5G
density at 15°C	0.910	0.914	0.916	0.917	0.920
viscosity at 40°C	30 cSt	43 cSt	55 cSt	68 cSt	100 cSt
viscosity at 100°C	4.4 cSt	5.3 cSt	5.9 cSt	6.7 cSt	8.4 cSt
flash point	168°C	175°C	179°C	170 °C	182°C
pour point	-40°C	-37°C	-36°C	-24 °C	-24°C
floc point	-54°C	-50°C	-48°C	-33 °C	-33°C
aniline point	74°C	76°C	77°C	82 °C	82°C
colour	1.0	1.0	1.0	2.0	L2.0

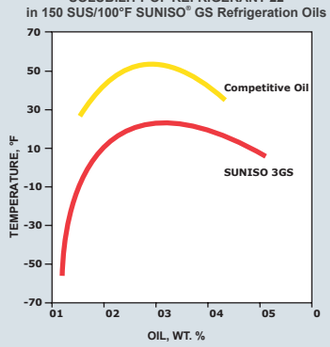
**overview of refrigerants

CFC	R11, R12, R13, R131b1, R113, R114, R500, R502, R503
HCFC	R22, R123, R124, R401a, R401b, R402a, R402b, R403b, R406a, R408a, R409a
Ammonia	R717
Isobutane	R600a
Propane	R290

SOLUBILITY OF REFRIGERANT 22 IN SUNISO® 4GS
as a function of Temperature and Pressure



SOLUBILITY OF REFRIGERANT 22
in 150 SUS/100°F SUNISO® GS Refrigeration Oils



Suniso® is designed to meet manufacturers' requirements and provide trouble-free service life.
Suniso® is known for its long standing years of OEM proven quality.

LIST OF SUNISO GS APPROVALS

AMANA
AMERICOLD
ASPERA
ARCELIK (BEKO)
BORG WARNER (YORK)
BRISTOL COMPRESSORS
CARLYLE (UTC)
CARRIER (UTC)
COPELAND
DANFOSS
DAEWOO
DORIN
HARTFORD COMPRESSORS (DUNHAM-BUSH)
ELECTROLUX
EMBRACO
EMERSON QUIET-KOOL
FORD
FRICK
FRIGIDAIRE
GENERAL ELECTRIC
GOLDSTAR
HEIL QUAKER (WHIRLPOOL)
HITACHI
LENNOX
MATSUSHITA (PANASONIC)
MAYTAG
MURRAY
NECCHI
SAMSUNG
SANDEN
SANYO
TECUMSEH
THERMOKING
TOSHIBA
TRANE
WHIRLPOOL
YORK INTERNATIONAL
ZANUSSI

LLOYD'S REGISTER · LRQA
ISO 9001 · ISO/TS 16949

Suniso®

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