Technical Data Sheet

Formerly Known As: **Shell Clavus Oil S**

Shell **Refrigeration Oil *S2 FR-A 46***

- Reliable Performance
- Compatible with NH3

Refrigerator Compressor Lubricant

Shell Refrigeration Oil S2 FR-A is a low miscibility compressor lubricant intended for use in refrigeration compressors using Ammonia refrigerant. It is formulated from specially refined paraffinic base oils in combination with additives selected to minimise system deposits and provide long service life.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **System efficiency**

  Shell Refrigeration Oil S2 FR-A has been specially optimised for use in systems where oil separation is required. It has been designed to reduce “light end” oil carryover; this minimises oil thickening in the compressor and reduces oil coating of internal evaporator surfaces thus maintaining overall system efficiency.

- **Extended maintenance intervals**

  Shell Refrigeration Oil S2 FR-A has excellent high temperature and oxidation stability providing long service life even where high compressor discharge temperatures are found.

  In addition it is formulated to provide excellent control of deposit and sludge formation resulting in extended oil drain intervals in comparison with conventional mineral oil based refrigerator oils.

Main Applications

- **Refrigerator compressors**

  Shell Refrigeration Oil S2 FR-A is recommended for use in open, semi-open and hermetic compressors in domestic, commercial and industrial refrigeration systems. It can be used in both rotary and reciprocating compressor types.

- **Refrigerant compatibility**

  Shell Refrigeration Oil S2 FR-A is recommended for use with ammonia (R717) based refrigeration systems where it offers excellent performance, even under high compressor discharge temperatures, or down to evaporation temperatures of -30^{0}C.

  It can also be used in systems using hydrocarbons such as propane (R290).

  Shell Refrigeration Oil S2 FR-A is not recommended for use with CFC, HCFC or HFC refrigerants such as R12, R22 or R134a.

Specifications, Approvals & Recommendations

- Shell Refrigeration Oil S2 FR-A meets the requirements of DIN 51503 KAA and KE.

  For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Compatibility & Miscibility

- **Seal Compability**

  Shell Refrigeration Oil S2 FR-A is compatible with all commonly used sealing materials designed for use with mineral oils.

- **Lubricant Compatibility**

  Shell Refrigeration Oil S2 FR-A is completely miscible with mineral oil, alkylated benzene and PAO based lubricants.

Typical Physical Characteristics

Properties	Method	Refrigeration Oil S2 FR-A 46
ISO Viscosity Grade	ISO 3448	46
Refrigerator Oil	DIN 51503	KAA, KE

Properties			Method	Refrigeration Oil S2 FR-A 46
Kinematic Viscosity	@40°C	mm^2/s	ISO 3104	46
Kinematic Viscosity	@100°C	mm^2/s	ISO 3104	6.7
Flash Point (COC)		°C	ISO 2592	218
Pour Point		°C	ISO 3016	-39
Density	@15°C	kg/m^3	ISO 12185	859
Neutralisation Number		mg KOH/g	ASTM D664 (TAN)	-
Miscibility with R290				Completely miscible with hydrocarbon based refrigerants

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Refrigeration Oil S2 FR-A is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Safety Data Sheet, which can be obtained from https://www.epc.shell.com/

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.