Technical Data Sheet

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

Shell **Refrigeration Oil *S4 FR-F 46***

- Reliable Performance
- For use with HFC Refrigerants

Advanced Synthetic Refrigerator Compressor Lubricant

Shell Refrigeration Oil S4 FR-F is a synthetic refrigeration lubricant with a polyol ester base fluid. It has been developed for use with R134a and other HFC refrigerants.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Extended maintenance intervals**
  Shell Refrigeration Oil S4 FR-F has excellent high temperature and oxidation stability providing long service life even where high compressor discharge temperatures are found.
- **Wear protection**
  Shell Refrigeration Oil S4 FR-F has been designed to minimise the wear in bearings and pistons – the most critical parts of a reciprocating compressor.

Main Applications

- **Refrigerator Compressors**
  Shell Refrigeration Oil S4 FR-F 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 S4 FR-F is recommended for use with R134a and other types of HFC refrigerant.
- **Seal Compability**
  Shell Refrigeration Oil S4 FR-F is compatible with all sealing materials commonly used with HFC refrigerant systems.

Specifications, Approvals & Recommendations

- Shell Refrigeration Oil S4 FR-F meets the requirements of DIN 51503 KD.

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

Typical Physical Characteristics

Properties			Method	Refrigeration Oil S4 FR-F 46
ISO Viscosity Grade			ISO 3448	46
Refrigerator Oil Group			DIN 51503	KD
Kinematic Viscosity	@40°C	mm^2/s	ISO 3104	42
Kinematic Viscosity	@100°C	mm^2/s	ISO 3104	6.2
Density	@15°C	kg/m^3	ISO 12185	973
Flash Point (COC)		°C minimum	ISO 2592	230
Pour Point		°C	ISO 3016	-48
Neutralisation Number		mg KOH/g maximum	ASTM D664 (TAN)	0.06
Characteristics when used with R134a - Floc-point		°C maximum	DIN 51351	-30
Characteristics when used with R134a - Refrigerant Stability	@250°C	minimum	DIN 51393	96

Properties	Method	Refrigeration Oil S4 FR-F 46
Miscibility		Miscible over the whole range of typical refrigeration temperatures

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 S4 FR-F 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

- **Product Handling**

  Due to the hygroscopic nature of the base fluid it is recommended that, when filling the system, air contact should be avoided as much as possible. Once an oil pack has been opened it must be sealed carefully after use and the remaining contents should be used within a few days.

- **Advice**

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