



Technical Data Sheet

Previous Name: Shell Clavus Oil AB

Shell Refrigeration Oil S4 FR-V 46

- *Reliable Performance*
- *Compatible with most standard Refrigerants*

Advanced Synthetic Refrigerator Compressor Lubricant

Shell Refrigeration Oil S4 FR-V is a synthetic refrigeration lubricant based on alkylated benzenes. It offers a universal solution to the lubrication requirements of most refrigeration compressors and is compatible with all commonly used refrigerants with the exception of HFCs.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **System efficiency**
Shell Refrigeration Oil S4 FR-V has high solvency and is designed to maintain refrigerant cleanliness and efficiency.
- **Extended maintenance intervals**
Shell Refrigeration Oil S4 FR-V 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 mineral oil based refrigerator oils.

Main Applications



- **Refrigerator compressors**
Shell Refrigeration Oil S4 FR-V 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.

Specifications, Approvals & Recommendations

- Shell Refrigeration Oil S4 FR-V meets the requirements of DIN 51503 KAA and KC.

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk, or the OEM Approvals website.

Compatibility & Miscibility

- **Refrigerant compatibility**
Shell Refrigeration Oil S4 FR-V is designed for use with most commonly occurring refrigerants:

Ammonia (R717) systems where it offers excellent performance, even under high compressor discharge temperatures or down to evaporation temperatures of -33°C or lower.

Carbon dioxide (R744) systems.

CFC and HCFC systems (R12 and R22).

Hydrocarbon systems such as propane (R290).
- **Seal compatibility**
Shell Refrigeration Oil S4 FR-V is compatible with all commonly used sealing materials used with mineral oils.
- **Lubricant compatibility**
Shell Refrigeration Oil S2 FR-V is completely miscible with mineral oil, other alkylated benzene and PAO based lubricants.

Typical Physical Characteristics

Properties	Method	Shell Refrigeration Oil S4 FR-V
ISO Viscosity Grade	ISO 3448	46
Refrigerator Oil Group	DIN 51503	KAA, KC
Kinematic Viscosity @40°C	mm ² /s	ISO 3104 46
Kinematic Viscosity @100°C	mm ² /s	ISO 3104 5.3
Density @15°C	kg/m ³	ISO 12185 869
Flash Point (COC)	°C	180

Properties		Method	Shell Refrigeration Oil S4 FR-V
Pour Point	°C		-42
Neutralisation Number	mg KOH/g	ASTM D664 (TAN)	<0.04
Characteristics when used with R12 - Flocc-point	°C	DIN 51351	<-30
Characteristics when used with R12 - Refrigerant Stability	@250°C	DIN 51393	>96
Characteristics when used with R22 - Flocc-point	°C	DIN 51351	<-30
Characteristics when used with R22 - Refrigerant Stability	@250°C	DIN 51393	>96
Miscibility			Miscible over the whole range of typical refrigeration temp.
Characteristics when used with R290 - Flocc-point	°C	DIN 51351	<-30
Characteristics when used with R290 - Refrigerant Stability	@250°C	DIN 51393	>96

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-V 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 Material Safety Data Sheet, which can be obtained from <http://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.