



Previous Name: **Shell Clavus Oil S**

Shell Refrigeration Oil S2 FR-A 46

Refrigerator Compressor Lubricant

- *Reliable Performance*
- *Compatible with NH₃*

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.

• 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°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.

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.

Compatibility & Miscibility

• Seal Compatibility

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	
Kinematic Viscosity	@40°C	mm ² /s		46	
Kinematic Viscosity	@100°C	mm ² /s		6.7	
Flash Point (COC)			°C	ISO 2592	218

Properties		Method	Refrigeration Oil S2 FR-A 46
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 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.

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Previous Name: **Shell Clavus Oil S**

Shell Refrigeration Oil S2 FR-A 68

- *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.

- **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°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.

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.

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 68
ISO Viscosity Grade	ISO 3448	68
Refrigerator Oil	DIN 51503	KAA, KE

Properties			Method	Refrigeration Oil S2 FR-A 68
Kinematic Viscosity	@40°C	mm ² /s		68
Kinematic Viscosity	@100°C	mm ² /s		9
Flash Point (COC)		°C	ISO 2592	232
Pour Point		°C	ISO 3016	-39
Density	@15°C	kg/m ³	ISO 12185	862
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 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.

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Previous Name: **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, or the OEM Approvals website.

Typical Physical Characteristics

Properties		Method	Shell Refrigeration Oil S4 FR-F	
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	ISO 2592	>230
Pour Point		°C	ISO 3016	-48
Neutralisation Number		mg KOH/g	ASTM D664 (TAN)	<0.06
Characteristics when used with R134a - Flocc-point		°C	DIN 51351	<-30
Characteristics when used with R134a - Refrigerant Stability	@250°C		DIN 51393	>96
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 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

▪ 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.

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Previous Name: **Shell Clavus Oil R**

Shell Refrigeration Oil S4 FR-F 68

*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 68	
ISO Viscosity Grade		ISO 3448	68	
Refrigerator Oil Group		DIN 51503	KD	
Kinematic Viscosity	@40°C	mm ² /s	ISO 3104	66
Kinematic Viscosity	@100°C	mm ² /s	ISO 3104	8.8
Density	@15°C	kg/m ³	ISO 12185	991
Flash Point (COC)		°C	ISO 2592	>230
Pour Point		°C	ISO 3016	-42
Neutralisation Number		mg KOH/g	ASTM D664 (TAN)	<0.06
Characteristics when used with R134a - Flocc-point		°C	DIN 51351	<-30
Characteristics when used with R134a - Refrigerant Stability	@250°C		DIN 51393	>96
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 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

- **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.

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