Previous Name: **Shell Clavus Oil AB**

# Shell **Refrigeration Oil *S4 FR-V***

## *Advanced Synthetic Refrigerator Compressor Lubricant*

- ***RELIABLE PERFORMANCE***
- ***COMPATIBLE WITH MOST STANDARD REFRIGERANTS***

**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.**

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## Performance 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.

## 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

- ***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 S4 FR-V is completely miscible with mineral oil, other alkylated benzene and PAO based lubricants.

## Specifications and Approvals

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

## Health and Safety

Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from your Shell representative.

## Protect the environment

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

## Advice

Advice on applications not covered in this leaflet may be obtained from your Shell representative

## Typical Physical Characteristics

| Viscosity grade | | ISO 3448 | 32 | 46 | 68 | 100 |
|---|---|---|---|---|---|---|
| Refrigerator oil-group | | DIN 51503 | KAA , KC | | | |
| Kinematic viscosity | | ISO 3104 | | | | |
| at 40°C | $mm^2/s$ | | 29 | 46 | 68 | 107 |
| at 100°C | $mm^2/s$ | | 4.1 | 5.3 | 6.2 | 7.2 |
| Density at 15°C | $kg/m^3$ | ISO 12185 | 870 | 869 | 871 | 869 |
| Flashpoint COC | °C | | 180 | 180 | 190 | 200 |
| Pourpoint | °C | | -45 | -42 | -39 | -36 |
| Neutralisation number | mg KOH/g | ASTM D 664 (TAN) | <0,04 | <0,04 | <0,04 | <0,04 |
| Characteristics when used with R12 | | | | | | |
| Floc-point | °C | DIN 51351 | <-50 | <-30 | <-30 | <-15 |
| Refrigerant stability (250°C | | DIN 51593 | >96 | >96 | >96 | >96 |
| Characteristics when used with R22 | | | | | | |
| Floc-point | °C | DIN 51351 | <-50 | <-30 | <-30 | <-15 |
| Refrigerant stability (250°C | | DIN 51593 | >96 | >96 | >96 | >96 |
| Miscibility | | | Miscible over the whole range of typical refrigeration temperatures | | | |
| Characteristics when used with R290 | | | | | | |
| Floc-point | °C | DIN 51351 | <-50 | <-30 | <-30 | <-15 |
| Refrigerant stability (250°C | | DIN 51593 | >96 | >96 | >96 | >96 |

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