Klüber Summit R 100, 150, 200, 300, 400

Fully synthetic oils for NH_3 and CO_2 refrigerators and heat pumps

Your benefits at a glance

- Lower maintenance costs due to long oil change intervals and reduced oil consumption because
  - the oil shows excellent thermal and chemical stability
  - the product's solubility in ammonia is low
  - separation of the oil/ NH3 mixture in the separator is very good
- Higher refrigerator efficiency due to lower oil content in the refrigerant and very good flow characteristics at low temperatures
- Lower operating costs due to long oil filter and oil separator lifetimes
- Suitability for food-processing due to NSF H1 registration for use in food and pharmaceutical industries; compliant with FDA 21 CFR Sec 178.3570

Your requirements - our solution

In many plants, refrigerators and heat pumps are at the core of the production processes. Breakdown of these machines can incur substantial costs and/or significant loss of production.

By using suitable refrigeration oils such as those of the Klüber Summit R series, efficient and smooth operation of refrigerators can be attained and optimised. This helps to reduce oil consumption and the associated need for maintenance as well as to optimise downtime.

Klüber Summit R oils are fully synthetic high-performance lubricants especially developed for heavily loaded ammonia refrigerators and heat pumps.

The Klüber Summit R series is characterised especially by its high chemical and thermal stability attained with the carefully selected base oils on the basis of polyalphaolefins. Depending on the system design, Klüber Summit R products might also be successfully used with carbon dioxide (R744).

The Klüber Summit R series has a high viscosity index, good shear stability and excellent low-temperature flow behaviour, giving the products large reserve capacity compared with the mineral oils available on the market. Furthermore, the Klüber Summit R series is characterised by low solubility in R717 and R 744. This enables higher film thickness in the lubrication point, contributing to reliable, low-wear compressor operation. The Klüber Summit R series can be used at high operating temperatures and in refrigerators with very low evaporator temperatures.

The products' chemical stability and low vapour pressure give rise to reduced oil carryover and oil vapour content, leading to lower oil consumption with positive effects on refrigerator efficiency. The products have a lower friction coefficient than mineral oils, which likewise contributes to the system's efficiency. Klüber Summit R oils are successfully used e.g. in refrigerators and heat pumps made by GEA, Mayekawa and Howden.

Klüber Summit R oils are registered as NSF H1 and therefore comply with FDA 21 CFR § 178.3570. The lubricants were developed for incidental contact with products and packaging materials in the food-processing, cosmetics, pharmaceutical or animal feed industries. The use of Klüber Summit R oils can contribute to increased reliability of your production processes. We nevertheless recommend conducting an additional risk analysis, e.g. HACCP.

Application

The Klüber Summit R series was especially developed for the lubrication of heavily loaded refrigerators and heat pumps.

Due to the wide viscosity range of the Klüber Summit R series from ISO VG 32 to 150, extremely varied operating conditions can be handled with a single oil series, reducing the variety of products having to be stored.

The different viscosity variants of Klüber Summit R series are used according to manufacturers' specifications for reciprocating-piston and screw-type compressors in industrial applications, heat pumps and maritime cooling systems. Refrigerants for which these oils are preferably used are ammonia and carbon dioxide.

The Klüber Summit R series can be used for natural hydrocarbon-based refrigerants such as propane (R290), propylene (R1270) or butane (R600). For such applications, the solubility of the gas in the

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oil under operating conditions and any consequent drop in viscosity should be taken into account.

For selecting a suitable oil, please turn to Klüber Lubrication for advice.

Application notes

Drain old oil from the whole circuit of the refrigeration compressor while still warm. We recommend replacing all oil filters and oil separators and completely drain oil traps of the refrigeration circuit. Then refill the compressor with an oil of the Klüber Summit R series.

Material safety data sheets

Material safety data sheets can be requested via our website www.klueber.com. You may also obtain them through your contact person at Klüber Lubrication.

Pack sizes	Klüber Summit R 100	Klüber Summit R 150	Klüber Summit R 200	Klüber Summit R 300
Canister 20 l	+		+	+
Bucket 19 l			+	+
Drum 200 l	+		+	+
Drum 208 l		+	+	+
Container 1000 l			+	

Pack sizes	Klüber Summit R 400
Canister 20 l	
Bucket 19 l	+
Drum 200 l	
Drum 208 l	+
Container 1000 l	

Characteristics	Klüber Summit R 100	Klüber Summit R 150	Klüber Summit R 200	Klüber Summit R 300
Article number	050040	050137	050041	050042
Appearance	clear	clear	clear	clear
Colour space	colourless	colourless	colourless	colourless
NSF H1 registration number	134117	150873	134122	134123
Requirements of refrigerator oils, DIN 51503-1, KAA, limited requirements for products with additives	passed	passed	passed	passed
Density, DIN 51757, 20°C	approx. 0.83 g/cm³	approx. 0.83 g/cm³	approx. 0.83 g/cm³	approx. 0.84 g/cm³
Flash point, DIN EN ISO 2592, Cleveland open cup	≥ 230 °C	≥ 240 °C	≥ 230 °C	≥ 275 °C
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 100°C	approx. 5.9 mm²/s	approx. 7.9 mm²/s	approx. 10 mm²/s	approx. 15 mm²/s
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 40°C	approx. 32 mm²/s	approx. 46 mm²/s	approx. 68 mm²/s	approx. 105 mm²/s

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Characteristics	Klüber Summit R 100	Klüber Summit R 150	Klüber Summit R 200	Klüber Summit R 300
Viscosity index, DIN ISO 2909	≥ 120	≥ 130	≥ 130	≥ 138
Pour point, DIN ISO 3016	≤ -60 °C	≤ -51 °C	≤ -51 °C	≤ -43 °C
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	36 months	36 months	36 months	36 months

Characteristics	Klüber Summit R 400
Article number	050210
Appearance	clear
Colour space	colourless
NSF H1 registration number	163959
Requirements of refrigerator oils, DIN 51503-1, KAA, limited requirements for products with additives	
Density, DIN 51757, 20°C	approx. 0.84 g/cm³
Flash point, DIN EN ISO 2592, Cleveland open cup	≥ 255 °C
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 100°C	approx. 20 mm²/s
Kinematic viscosity, DIN EN ISO 3104 / DIN 51562-1 / ASTM D445 / ASTM D7042, 40°C	approx. 150 mm²/s
Viscosity index, DIN ISO 2909	≥ 138
Pour point, DIN ISO 3016	≤ -39 °C
Minimum shelf life from the date of manufacture - in a dry, frost-free place and in the unopened original container, approx.	36 months

Klüber Lubrication – your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 90 years.

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