

Refrigerants and heat transfer media

Brief description

For use as heat transfer media, Kurt Obermeier GmbH & Co. KG supplies a variety of different products that are tailored to the respective application.

Product properties

Low-temperature range

We recommend **KORASILON® oils of the TT series** for use in the low-temperature range. These oils are low-viscosity linear polydimethylsiloxanes, allowing their use at temperatures as low as -80 °C due to their special product characteristics. For more detailed information, please refer to the separately available product data sheet for this product line.

Average temperature range

Open systems

KORASILON® oils of the M series offer the perfect combination between pour points well below 0 °C and a continuous thermal load of approximately 150 °C without a change in the oil being observed. The **KORASILON® oils of the M series** are water clear, transparent liquids; largely chemically inert, colourless, odourless, non-combustible and toxicologically safe. Furthermore, the **KORASILON® oils of the M series** in their factory-supplied state have good electrical insulation properties and are therefore particularly recommended for safety-critical systems.

KORASILON® oils of the M series can basically also be used at temperatures exceeding 150 °C, but at these temperatures the oils are affected by atmospheric oxygen which causes a gradual gelling of the material, recognisable by an increase in media viscosity. If the oils are used for an extended period at elevated temperatures in open systems, a vitreous solid body is ultimately formed which is virtually insoluble in common acids or bases. The resistance data of **KORASILON® M 100 oils** in open systems can be used as a guideline for realistic application intervals. Where this oil can be used for approximately 240 hours at a continuous load of 250 °C before gelling starts, at 300 °C its service life will be reduced to approximately 24 hours. If the operating temperature increases to 350 °C, its service life is reduced to less than 1 hour. For use in open systems and at elevated operating temperatures we therefore recommend the use of **KORASILON® oils of the HT series** or **AM series**, which will be described later in this document.

Experience has shown that when using **KORASILON® oils of the M series** at temperatures of approximately 150 °C, partial premature gelling can also be observed. The causes of such behaviour may be due, for example, to contact with strong oxidisers, acids and bases or with certain catalytically active substances. Another cause can be found in the area of the heating units, since quite significantly higher contact temperatures can occur here. It is therefore strongly recommended to limit the top heating temperatures to prevent premature gelling of the oil.

Closed systems

If the **KORASILON® oils of the M series** are used in closed systems or in systems under protective gas, the operating temperature can be increased up to 250 °C. It should be noted, however, that when thermal stress occurs under the exclusion of air, it leads to the gradual depolymerisation of the oil, which is manifested in decreasing oil viscosity. At the same time there is a risk that the flash point of the oil is also reduced by the formation of low molecular weight fragments. For the sake of sufficient operational safety it is advised to regularly check the oil viscosity and the flash point. We provide these measurements as a service for the **KORASILON® oils of the M series**. If interested, please contact our sales staff.

Refrigerants and heat transfer media

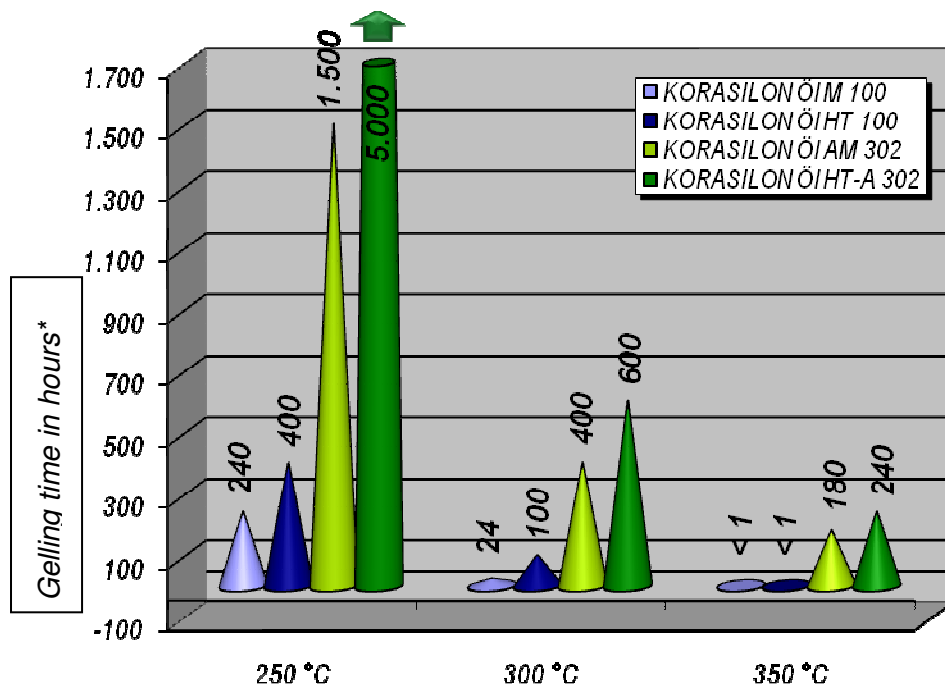
Increased temperature range

Open systems

The **KORASILON® oils of the HT series** were specifically developed for use in open systems and at operating temperatures of up to 300 °C. The **KORASILON® oils of the HT series** are based on the **KORASILON® oils of the M series**, but contain another special additive to improve their thermal stability. The **KORASILON® oils of the HT series** are characteristically stained brown and transparent to slightly cloudy liquids. The difference in performance shall be explained using an oil with a viscosity of 100 cSt as an example. At 250 °C the service life of the respective **KORASILON® HT oil** increases to approximately 400 hours compared to 250 hours of the non-stabilised variant, at 300 °C a service life of approximately 100 hours is usually reached, as opposed to a service life of approximately 24 hours for the non-stabilised variant. If you are interested in the **KORASILON® oils of the HT series**, please request additional information on this product line from our sales staff.

As an alternative to the **KORASILON® oils of the HT series**, **KORASILON® oils of the AM series** can also be used for higher temperatures. So, for example, **KORASILON® AM-302 oil** can be used in open systems and at temperatures of 200 °C without any problems and even at 250 °C it reaches a service life of 1500 hours. We mainly recommend **KORASILON® AM oils** with high aryl content to use as heat transfer media. For more detailed information, please refer to the separately available information material about the products of the **AM series**. Unlike the products of the **KORASILON® HT series**, the oils of the **AM series** are odourless, colourless, water-white and clear liquids, which are characterised by improved resistance to strong oxidisers and by improved radiation resistance.

For special applications we supply the **KORASILON® oils of the HT-A series** based on selected products of the **KORASILON® AM series**. These oils contain a special stabiliser and are stained a characteristic brown. When used in open systems, these oils display the highest thermal resistance of the **KORASILON® heat transfer media**, as shown in the figure below.



Refrigerants and heat transfer media

Detailed product information is contained in the information material on the products of the **KORASILON® HT series**, which can be requested from our sales staff.

Closed systems

The **KORASILON® oils of the AM series** can be used in closed heat systems or systems overlaid by protective gas at temperatures of up to 400 °C. For this temperature range preference is given to **KORASILON® oils of the AM series** with high aryl content. Please refer to the separately available product data sheet for a detailed product description. It should be noted, however, that when thermal stress occurs under the exclusion of air, it can lead to the gradual depolymerisation of the oil, which is manifested in decreasing oil viscosity. At the same time there is a risk that the flash point of the oil is also reduced by the formation of low molecular weight fragments. For the sake of sufficient operational safety it is advised to regularly check the oil viscosity and the flash point. We provide these measurements as a service for the **KORASILON® oils of the AM series**. If interested, please contact our sales staff.

High temperature applications

Closed systems

As an addition to the above-described heat transfer media, we supply products from the LANXESS diphyl series for use in closed pressure systems or closed heating circuits operated in a depressurised state. These products are silicone free and are based on different blends based on complex phenyl systems and corresponding phenyl ethers. The recommended applications for the products of the diphyl series are classified as follows:

	Composition:	Pour point approx. [°C]	Boiling point approx. [°C]	Flash point ¹⁾ approx. [°C]	Application approx. [°C]	Max. operating temperature
<i>Diphyl® KT</i>	Benzyl toluene Dibenzyl toluene	-60	290	146	-45 to +350 ²⁾	Approx. 370 °C ²⁾
<i>Diphyl® DT</i>	Ditolyl ether	-54	290	135	-30 to +330 ²⁾	Approx. 330 °C ²⁾
<i>Diphyl® THT</i>	Terphenyl Polyphenyls (partly hydrogenated) Terphenyl (hydrogenated)	-33	352	190	0 to +345	Approx. 370 °C ²⁾
<i>Diphyl®</i>	Diphenyl + diphenyl oxide 1:3	13	257	115	13 to +400 ²⁾	Approx. 400 °C ²⁾
<i>KORATHERM DBT</i>	Dibenzyl toluene Mixed isomers	-34	380	200	0 to +350 ³⁾	Approx. 370 °C
<i>KORATHERM AB</i>	Alkyl benzenes	-45	320	160	-10 to +310	Approx. 340 °C

- 1) Because of the flash points, operation in closed systems with an inert gas overlay is generally recommended.
- 2) Maximum operating temperature can only be achieved under positive pressure or at suitability for vaporous heat transfer media.
- 3) 370 °C maximum film temperature under exclusion of air.

For more detailed product information on this product group, please contact our sales staff.

Refrigerants and heat transfer media

Selection guide - open systems

	< 0° C ¹⁾	<150 °C	<250 °C	> 250 °C
<i>KORASILON TT series</i>	+++	+++	#	#
<i>KORASILON M series</i>	++	+++	++	+
<i>KORASILON AM series</i>	++	+++	+++	++
<i>KORASILON HT series</i>	+	+++	+++	++
<i>KORASILON HT-A series</i>	+	+++	+++	+++
<i>Diphyl series</i>	#	#	#	#
<i>KORATHERM series</i>	#	#	#	#

Legend:

- +++ recommendable
 - ++ conditionally recommendable (possibly reduced stability)
 - + only limited recommendable (possibly significantly shorter stability)
 - # not recommendable
- ¹⁾ The actually achievable low temperatures depend mainly on the product viscosity.

Selection guide – closed systems

	< 0° C	<150 °C	<250 °C	> 250 °C
<i>KORASILON TT series</i>	+++	+++	++	#
<i>KORASILON M series</i>	++	+++	+++	++
<i>KORASILON AM series</i>	++	+++	+++	+++
<i>KORASILON HT series</i>	2)	2)	2)	2)
<i>KORASILON HT-A series</i>	2)	2)	2)	2)
<i>Diphyl series</i>	+	++	+++	+++
<i>KORATHERM series</i>	+	++	+++	+++

Legend:

- +++ recommendable
 - ++ conditionally recommendable (possibly reduced stability)
 - + only limited recommendable (possibly significantly shorter stability)
 - # not recommendable
- ¹⁾ The actually achievable low temperatures depend mainly on the product viscosity.
²⁾ There are currently no empirical values for this application

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Finishing

Guidelines on material compatibility and respective handling instructions are available in the data sheets on the individual product groups.

Safety instructions

Please observe the available product information and the respective material safety data sheets for the individual products.

Product information

Refer to individual data sheets

Shelf life

Refer to individual data sheets

Miscellaneous

Apart from a large range of standard products for use as heat transfer media, we also provide customised solutions to suit your requirements. If interested, please contact our sales staff.

For more information on product safety and handling, please refer to the safety data sheet.

Our technical advice whether spoken, written or through test trials is given to the best of our knowledge, is to be understood as non-binding in character and in relation to any possible industrial property rights of third parties; it is not a substitute for your, the buyer's, own tests and trials on the products supplied by us to determine whether they are suitable for the intended processes and purposes. The application, use and processing of the products are beyond our control and, therefore, entirely your own responsibility. In the event that a liability is nevertheless considered, any compensation will be limited to the value of the goods supplied by us and used by you. Of course, we guarantee the perfect quality of our products according to our general terms and conditions.

*This information is intended as a guide and should not be used in preparing specifications

**Kurt Obermeier GmbH & Co. KG, Berghäuser Str. 70 - D-57319 Bad Berleburg, Germany Tel.: +49 2751 524-0
Fax: +49 2751 5041, Email: info@obermeier.de www.obermeier.de**