



## Product Information

16.07.2010

# MARLOTHERM<sup>®</sup> XC

### Product description

Covering a wide temperature range from – 90 to 300°C in a heat transfer circuit with a single heat transfer medium represents a real challenge. To solve this problem, different physical parameters of the medium should be optimally coordinated. MARLOTHERM<sup>®</sup> XC is the heat transfer fluid from Sasol, which meets these conditions in an excellent way.

MARLOTHERM<sup>®</sup> XC, a high performance, synthetic organic heat transfer fluid, is designed specially for use in the liquid phase in closed heat transfer systems with forced circulation. Because of the wide application range between – 90 to 153 °C in unpressurized circuits and its superior physical and thermal properties in this temperature range, MARLOTHERM<sup>®</sup> XC is best suited to a multitude of heat transfer processes. Heating and cooling circuits can be simultaneously operated. In pressurized systems MARLOTHERM<sup>®</sup> XC is also applicable above 153 °C. The upper use limit corresponds to a heater outlet temperature of 300 °C and the film temperature should not exceed 320 °C.

MARLOTHERM<sup>®</sup> XC is the ideal heat transfer fluid for heating and cooling in the most varied fields of application e.g. for multi-purpose-facilities in the fine chemicals, speciality chemicals and pharmaceutical industry. Obviously the same applies to systems in which one heat transfer fluid supplies various consumers, each requiring a different temperature level.

MARLOTHERM<sup>®</sup> XC, an inert, aromatic hydrocarbon has excellent thermal stability up to operating temperatures of 300 °C, even after many years of use.

Because of its superior thermal conductivity MARLOTHERM<sup>®</sup> XC can be used in the temperature range from – 90 to 300 °C. Even at very low operating temperatures the circulation pumps require comparatively little driving power due to the low viscosity of the fluid.

MARLOTHERM<sup>®</sup> XC can be easily circulated by single stage centrifugal pumps equipped with mechanical seals at temperatures as low as – 90 °C. Canned motor pumps and centrifugal pumps can likewise be installed in the heat transfer circuit.

It is advantageous to operate MARLOTHERM<sup>®</sup> XC circuits with a little inert gas back pressure of 50-200 mbar at the expansion vessel. Nitrogen has proven to be suitable as an inert gas. When operating the heat transfer system at different temperatures the excess pressure of the nitrogen prevents the entry of air moisture into the system during cooling. At higher temperatures inert gas blanketing provides the best protection against changes in the heat transfer fluid caused by oxidation. At operating temperatures above the boiling point of MARLOTHERM<sup>®</sup> XC it is necessary to apply an inert gas backpressure which is sufficient to keep the heat transfer medium in the liquid state and prevent vaporization via the expansion vessel.

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Sitz der Gesellschaft: Hamburg Registergericht: Amtsgericht Hamburg HRB 78475



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### Typical physical and chemical properties

#### Product data (specification)

Property	Value	Unit	Test method
Appearance at 20°C	liquid, clear	-	visual
Ethylbenzene content	≤ 0.5	% by volume	GC
Water	≤ 0.03	% by mass	DIN 51777
Density at 20 °C	0.855 – 0.865	g/ml	DIN 51757
Viscosity at 20°C	0.5 – 1.0	mm <sup>2</sup> /s	DIN 51562

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#### General product description

Property	Value	Unit	Test method
Boiling range at 1013 mbar	about 153	°C	ASTM D 1078
Pour point	< - 90	°C	DIN ISO 3016
Flash point	about 31	°C	EN 22719
Ignition temperature	about 420	°C	DIN 51 794 (ASTM D659)
Permissible heater outlet temperature	300	°C	-
Permissible heater film temperature	320	°C	-

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## Material data for MARLOTHERM<sup>®</sup> XC

Temperature °C	Density kg/m <sup>3</sup>	Specific heat kJ/kg K	Thermal conductivity W/m K	Kinematic viscosity mm <sup>2</sup> /s	Vapour pressure hPa
- 90	948	1,61	0,154	9,2	-
- 80	941	1,64	0,151	4,7	-
- 60	925	1,69	0,147	2,7	-
- 40	910	1,73	0,142	1,8	-
- 20	895	1,77	0,137	1,2	0,2
0	879	1,80	0,133	0,92	1,1
20	862	1,84	0,128	0,72	4,4
40	846	1,87	0,124	0,59	14,6
60	829	1,90	0,113	0,49	40
80	811	1,93	0,114	0,42	97
100	798	1,97	0,110	0,37	207
120	782	2,01	0,105	0,34	403
140	755	2,07	0,101	0,31	726
160	735	2,12	0,096	0,28	1229
180	714	2,19	0,092	0,26	1970
200	692	2,27	0,087	0,25	3014
220	669	2,37	0,083	0,23	4432
240	644	2,48	0,078	0,22	6295
260	617	2,60	0,074	0,21	8678
280	587	2,75	0,070	0,21	11652

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### Material compatibility

If used according to the recommended operation parameters (temperature, pressure) in leakproof systems, MARLOTHERM<sup>®</sup> XC does not corrode the usual metallic materials used in the construction of plants and machinery. For example: stainless steel, aluminium, titan, carbon steel, hastelloy, cast steel, copper, bronze. Synthetic rubber, and materials in which synthetic rubber has been processed, swell on contact with MARLOTHERM<sup>®</sup> XC. The fluid is compatible with materials for seals frequently used in heat transfer plants such as gaskets made by PTFE, Fluoro-Elastomers, Viton and Kalrez. The gasket manufacturers' recommendations regarding heat resistance and mechanical strength should be taken into account. Gaskets should ensure good sealing even during temporary operation of the system at stress limits. When the plant is running under extreme conditions, for example at constantly high temperatures or under frequent changes in temperature, then a completely sealed system is of great importance. In this case we recommend gaskets made from graphite, preferably with a metal inlay

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### Storage and transport

MARLOTHERM<sup>®</sup> XC is delivered in road tankers or 177 kg steel drums. During transport of the heat transfer fluid the national and international regulations concerning the shipment of dangerous goods should be heeded. References for this can be taken from the EC safety data sheet.

MARLOTHERM<sup>®</sup> XC has a virtually unlimited storage life when stored in closed containers made of steel or aluminium. No special safety precautions are required during storage. When handling MARLOTHERM<sup>®</sup> XC, in particular during filling and operation of a heat transfer circuit, care should be taken that the fluid cannot enter the soil or the sewer system. If necessary, and in compliance with official regulations, used MARLOTHERM<sup>®</sup> XC may be recycled or incinerated for the production of energy.

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## Toxicological properties and safety aspects

When handling organic chemicals the usual guidelines and recommendations should be observed.

MARLOTHERM<sup>®</sup> XC is intended for use in closed systems, therefore the leakage of heat transfer fluid from the plant has to be prevented or minimised for safety and environmental reasons using suitable design measures.

Details on toxicological, ecological and safety aspects of the heat transfer fluid are to be found in the latest EC safety data sheet for MARLOTHERM<sup>®</sup> XC.

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## Customer service

MARLOTHERM<sup>®</sup> XC is just one of the comprehensive range of high performance heat transfer fluids offered by Sasol for the temperature range from – 90 to 360 °C: Detailed information is available on request. Sasol has more than 50 years experience in the field of heat transfer technology. This know-how is available to you, should you have any questions or problems. Whether you have questions about the choice of heat transfer medium for a certain application, about system design, troubleshooting, safety issues or specification problems, our experts are here to help you. Just give us a call!

(Phone: +49 2365 49 5371; fax: +49 2365 49 9180)

An analytical routine check of the heat transfer medium should be part of the maintenance regulations. This check should be carried out at least once a year and is offered by Sasol to all users of MARLOTHERM<sup>®</sup>. The system parameters which are measured will allow our experts an accurate assessment of the condition of the material. This way, prolonged and trouble-free operation of the plant can be ensured. Faults in the plant are quickly detected and can be avoided in due time before more extensive damage and costs occur.

[www.marlotherm.com](http://www.marlotherm.com)

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