Product Information

05.30.2019

MARLOTHERM LH

Product description

Marlotherm LH is a high-performance synthetic, organic heat-transfer fluid for use in the liquid phase and in the vapor-liquid phase in closed, forced circulation heat transfer systems. The upper use limit lies at a heater outlet temperature of 360°C. The film temperature should not exceed the limit of 380°C either significantly or for a prolonged period of time.

Marlotherm LH in the liquid phase is preferably used in unpressurized systems at working temperatures from 0° to 280°C. Due to its favorable viscosity, Marlotherm LH is the ideal heat-transfer fluid for heating and cooling processes.

In customary heat exchangers, Marlotherm LH provides good heat transfer down to temperatures around 0°C. At working temperatures below 0°C, the heat-exchange surface is to be matched to the technical characteristics of Marlotherm LH and the flow conditions.

Marlotherm LH is best suited to the temperature control of vessels, reactors and processing machines which are both heated and cooled by means of a central heat-transfer system, and in systems in which several consumers have to be supplied at very different temperature levels.
The heat-transfer systems should be designed and operated in accordance with the recommendations of DIN 4754 "heat-transfer installations working with organic heat-transfer fluids".

Marlotherm LH can be used at working temperatures above 280°C in pressurized systems. The advantage offered by using Marlotherm LH in this temperature range compared with "pressure-less" use of Marlotherm SH has to be assessed in each individual case. Owing to its narrow boiling range of about 4°C, Marlotherm LH can also be used in the vapor-liquid phase, e.g. for reactor cooling in exothermic processes. Heat-transfer plants containing Marlotherm LH can be started up without difficulty at temperatures down to about -30°C using centrifugal pumps with a rotating mechanical seal or permanent magnet drive, or by using canned motor pumps.

At operating temperatures below the boiling point of the heat-transfer fluid, Marlotherm LH circuits are advantageously operated using an inert gas back pressure of less than 100 mbar at the expansion vessel. Nitrogen has proven to be suitable as an inert gas. Inert gas blanketing is the best protection against changes in the heat-transfer charge caused by oxidation. Antioxidants are unstable at operating temperatures above 200°C and are ineffective even after short operating times.
At operating temperatures above the boiling point of Marlotherm LH, it is necessary to apply an inert gas back pressure which is sufficient to keep the heat-transfer fluid in the liquid state and prevent vaporization via the expansion vessel.

Marlotherm LH is thermally stable up to an operating temperature of 300°C. The Marlotherm LH charge can be used for several years without significant changes. At higher temperatures, low-boiling and high-boiling decomposition products are formed.

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Their degree of formation rises with increasing operating temperature. The decomposition products remain completely dissolved in the Marlotherm LH charge. The low ends should be removed via the expansion vessel in order to maintain reliable operation of the heat-transfer system. To assist, the temperature of the expansion vessel should be raised to about 150°C.

If used according to the recommended operation parameters, Marlotherm LH forms no deposits on the walls and does not lead to accumulation of solids in the heat transfer circuit.

Marlotherm LH circuits can be operated reliably and without high maintenance costs. In pressurized plants using Marlotherm LH above its boiling point, stricter operating instructions must be observed.

To check the operating condition of heat-transfer systems, quality controls should be carried out at appropriate intervals on representative samples from the main stream of the circuit. Scope of testing and sampling must be individually matched to the charge volume and the operating temperature of the heat transfer plant. The analysis can be carried out on request by Eastman customer service.

Product data (specification)

Property	Value	Unit	Test method
Appearance at 20 °C	liquid, clear	-	visual
Chlorine	< 10	ppm	DIN 51408
Acid number	≤0.02	mg KOH/g	DIN EN 2114
Density at 20 °C	0.99 - 1.00	g/ml	ASTM D 941
Viscosity at 20 °C	3.6 - 4.4	mm^2/s	DIN 51562

General product description

Property	Value	Unit	Test method
Boiling range at 1013 mbar	about 278 - 282	°C	ASTM D 1078
Pour point	about -30	°C	DIN ISO 3016
Flash point	about 130	°C	EN 22719
Ignition temperature	about 510	°C	Regulation (EU) 440/2008; Method A.15.
Permissible heater outlet temperature	360	°C	-
Permissible heater film temperature	380	°C	-
Pumpability limit	about -30	°C	-

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Phys. data of MARLOTHERM LH

Temperature		Density		Specific heat		Thermal conductivity		Viscosity kinematic		Vapor pressure	
°c	°F	kg/m³	lb/ft³	kJ/kg K	Btu/lb °F	W/m K	Btu/ft*hr °F	mm²/s	cSt	hPa	psi
- 20	- 4	1026	64.1	1.48	0.353	0.136	0.079	17	17	-	-
0	32	1010	63.1	1.55	0.370	0.134	0.077	8.30	8.30	-	-
20	68	996	62.2	1.62	0.387	0.132	0.076	4.00	4.00	-	-
40	104	980	61.2	1.68	0.401	0.129	0.075	2.60	2.60	-	-
60	140	966	60.3	1.75	0.418	0.127	0.073	1.90	1.90	-	-
80	176	950	59.3	1.82	0.435	0.125	0.072	1.50	1.50	-	-
100	212	936	58.4	1.88	0.449	0.122	0.070	1.10	1.10	2.2	0.03
120	248	920	57.4	1.95	0.466	0.120	0.069	0.86	0.86	6	0.09
140	284	906	56.6	2.02	0.482	0.118	0.068	0.71	0.71	15	0.22
160	320	890	55.6	2.08	0,497	0.115	0.066	0.61	0.61	33	0.48
180	356	873	54.5	2.15	0.514	0.113	0.065	0.54	0.54	68	0.99
200	392	856	53.4	2.22	0.530	0.111	0.064	0.47	0.47	131	1.90
220	428	839	52.4	2.29	0.547	0.109	0.063	0.43	0.43	237	3.44
240	464	822	51.3	2.35	0.561	0.106	0.061	0.39	0.39	408	5.92
260	500	804	50.2	2.42	0.578	0.104	0.060	0.36	0.36	672	9.75
280	536	786	49.1	2.49	0.595	0.102	0.059	0.32	0.32	1061	15.39
300	572	766	47.8	2.55	0.609	0.099	0.057	0.30	0.30	1619	23.49
320	608	747	46.6	2.62	0.626	0.097	0.056	0.28	0.28	2394	34.73
340	644	726	45.3	2.69	0.642	0.095	0.055	0.27	0.27	3442	49.93
360	680	703	43.9	2.75	0.657	0.092	0.053	0.26	0.26	4826	70.01

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Material compatibility

Marlotherm LH does not corrode the usual metallic materials used in construction of plants and machinery. Marlotherm LH is compatible with pure graphite, PTFE und fluoroelastomers. These materials can be used as base materials for seals. In selecting the seals, note must be taken of the seal manufacturer's data for temperature resistance and mechanical strength of the material. Seals made of pure graphite have proven useful in heat-transfer plants using Marlotherm LH, even when the operating temperatures regularly change greatly, e.g. as a result of frequent switching between heating and cooling processes. Of the materials which can be used, graphite provides the best compensation for operational temperature changes. To increase the strength and dimensional stability, the seals are advantageously provided with a metal insert, e.g. a sheet metal core. Rubber-elastic binders swell on contact with Marlotherm LH und should not be used in the seals for heat-transfer plants using Marlotherm LH.

Toxicological properties and safety

Marlotherm LH is intended for use as a heat-transfer fluid in closed plants. For safety and environmental reasons, escape of the heat-transfer fluid is to be prevented or limited to a minimum amount by means of appropriate construction measures. When handling Marlotherm LH, the usual guidelines and recommendations for handling organic liquids should be observed.

Details can be found in the latest safety data sheet for Marlotherm LH.

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Storage and transport

Marlotherm LH has a virtually unlimited storage life when stored in closed metal containers (e.g. aluminium or steel). No special protective measures are necessary during storage of the heat-transfer fluid. When handling Marlotherm LH and when filling and operating a heat-transfer-system with Marlotherm LH, care must be taken that the heat-transfer fluid cannot enter the soil or sewer system. The product is almost insoluble in water. If necessary, used Marlotherm LH can be recycled or used for energy recovery observing local regulations.

Experience has shown that Marlotherm LH charges do not have to be replaced even after many years of use. The limits for reliable use of the heat-transfer fluid will only be reached after long-term use of Marlotherm LH above its boiling point. In this case, the used Marlotherm LH can be reclaimed by fractional distillation for reuse as a heat-transfer fluid. However, for economic reasons, amounts of approximately 10 t or more are required for distillation. The values of the residue content of Marlotherm LH, the viscosity and the chlorine content of the goods; the values are to be determined beforehand.

In regards to the classification of Marlotherm LH, reference should be made to the EU Safety Data Sheet.

In general the waste code number for Marlotherm LH will be determined by its application according to the EWC. In those cases in which it has not been used as heat transfer fluid follow your local regulations.

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Customer service

Marlotherm LH is just one of the comprehensive range of high performance heat transfer fluids offered by Eastman for the temperature range from - 90 to 360 °C: Detailed information is available on request. Eastman has more than 50 years of experience in the field of heat transfer technology. This know-how is available to you, should you have any questions or concerns. Whether you have questions about the choice of heat transfer fluids for a certain application, about system design, troubleshooting, safety issues or specification problems, our experts are here to help you. You can reach Marlotherm customer service by phone, or online: P: +31 10 2402 111 | Marlotherm.

An analytical routine check of the heat transfer fluid should be part of the maintenance regulations. This check should be carried out at least once a year and is offered by Eastman to all users of Marlotherm. 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 before more extensive damage and costs occur.
