PRODUCT INFORMATION

globaltherm®

L

HIGH PERFORMANCE SYNTHETIC FLUID
For use in both liquid and vapor phases

A high-performance fluid for use in the liquid and vapour-liquid phase in closed, heat transfer systems for a variety of industrial process applications.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name
Globaltherm® L
Heat transfer fluid

Company Information
Globaltherm, Cold Meece Estate, Cold Meece, Stone, Stafford, ST15 0SP, UK

Emergency telephone
+44 (0) 1785 760555

Web
www.globaltherm.org

2. PRODUCT DESCRIPTION

Globaltherm® L Heat transfer fluid is a high-performance synthetic, organic heat-transfer medium 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.

Globaltherm® L Heat transfer fluid in the liquid phase is preferably used in unpressurized systems at working temperatures from 0° to 280°C. Due to its favourable viscosity behaviour, Globaltherm® L Heat transfer fluid is the ideal heat-transfer medium for heating and cooling processes.

In customary heat exchangers, Globaltherm® L Heat transfer fluid 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 Globaltherm® L Heat transfer fluid and the flow conditions.

Globaltherm® L Heat transfer fluid 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 must 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".

Globaltherm® L Heat transfer fluid can be used at working temperatures above 280°C in pressurized systems.

The advantage offered using Globaltherm® L Heat transfer fluid in this temperature range compared with "pressure-less" use of Globaltherm® S Heat transfer fluid must be assessed in each individual case. Owing to its narrow boiling range of about 4°C, Globaltherm® L Heat transfer fluid can also be used in the vapor-liquid phase, e.g. for reactor cooling in exothermic processes. Heat-transfer plants containing Globaltherm® L Heat transfer fluid 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 using canned motor pumps.

At operating temperatures below the boiling point of the heat-transfer medium, Globaltherm® L Heat transfer fluid 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 Globaltherm® L Heat transfer fluid, it is necessary to apply an inert gas back pressure which is sufficient to keep the heat-transfer medium in the liquid state and prevent vaporization via the expansion vessel.

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

Their degree of formation rises with increasing operating temperature. The decomposition products remain completely dissolved in the Globaltherm® L Heat transfer fluid charge. The low ends should however be removed via the expansion vessel to maintain reliable operation of the heat-transfer system. To assist this measure, the temperature of the expansion vessel should be raised to about 150°C.

If used according to the recommended operation parameters, Globaltherm® L Heat transfer fluid forms no deposits on the walls und does not lead to accumulation of solids in the heat transfer circuit.

Globaltherm® L Heat transfer fluid circuits can be operated reliably und without high maintenance costs. In pressurized plants using Globaltherm® L Heat transfer fluid 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 Global Heat Transfer. Contact the technical team on +44 (0) 1785 760555 to discuss expert sample and analysis services.

3. APPLICATIONS

Globaltherm® L Heat transfer fluid is intended for use as heat transfer medium in a closed plant.

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4. SERVICE CONSIDERATIONS

Globaltherm® L Heat transfer fluid is just one of the comprehensive range of high performance heat transfer fluids offered by the Global Oil Company for the temperature range from -90 to 600°C. Global Heat Transfer has more than 25 years' experience in the field of heat transfer technology. Our knowledge is available to you, should you have any questions or problems. Whether you have questions about the choice of Globaltherm® Heat transfer fluid for a certain application, about system design, troubleshooting, safety issues or specification problems, our technical experts are here to help you. Just give us a call +44 (0) 1785 760555 or fax: +44 (0) 1785 760444.

An analytical routine check of the heat transfer medium, while it is hot and circulating, should be part of the routine maintenance plan. This check should be carried out at least once a year, preferably three to four times a year. Testing can be carried out by Global Heat Transfer - via the Thermocare® lifecycle management programme - to all users of Globaltherm® Heat transfer fluids. The thermal fluid parameters which are measured will allow our experts an accurate assessment of the condition of the fluid. This way, Thermocare® testing and analysis programmes ensure prolonged and trouble-free operation of the fluid. Changes to the condition of the fluid are quickly detected and managed with Thermocare® and can be avoided in time before more extensive damage (to both system and fluid) and further costs are incurred.

Phone: +44 (0) 1785 760555 or fax: +44 (0) 1785 760444 to ask about Thermocare® preventative maintenance programmes and heat transfer fluid testing and analysis.

5. COMPATIBILITY

Globaltherm® L Heat transfer fluid does not corrode the usual metallic materials used in construction of plants und machinery. Globaltherm® L Heat transfer fluid is compatible with pure graphite, PTFE and 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 und mechanical strength of the material. Seals made of pure graphite have proven useful in heat-transfer plants using Globaltherm® L Heat transfer fluid, even when the operating temperatures regularly change greatly, e.g. because 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 und dimensional stability, the seals are advantageously provided with a metal insert, e.g. a sheet metal core.

Rubber-elastic binders swell on contact with Globaltherm® L Heat transfer fluid und should not be used in the seals for heat transfer plants using Globaltherm® L Heat transfer fluid.

6. HEALTH AND SAFETY

Globaltherm® L Heat transfer fluid is intended for use as a heat-transfer medium in closed plants. For safety and environmental reasons, escape of the heat-transfer medium is to be prevented or limited to a minimum amount by means of appropriate construction measures. When handling Globaltherm® L Heat transfer fluid, the usual guidelines, and recommendations for handling organic liquids should be observed. Details are to be found in the latest Safety Data Sheet for Globaltherm® L Heat transfer fluid. Please contact our technical team on +44 (0) 1785 760555 for more information.

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7. PHYSICAL AND CHEMICAL PROPERTIES

Parameter	Unit	Code (ASTM/ISO)	Result
Appearance at 20°C	N/A	Visual	Liquid, clear
Chlorine	ppm	DIN 51408	<10
Acid number	mg KOH/g	DIN EN 2114	≤0.02
Density at 20°C	g/ml	ASTM D 941	0.99 - 1.00
Viscosity at 20°C	mm^2/s	DIN 51562	3.6 - 4.4
General product description	**Unit**	**Code (ASTM/ISO/DIN)**	**Result**
Boiling range at 1013 mbar	°C	ASTM D 1078	about 278 - 282
Pour point	°C	DIN ISO 3016	about -30
Flash point	°C	EN 22719	about 130
Ignition temperature	°C	DIN 51794	about 450
Permissible heater outlet temperature	°C	NTR	360
Permissible heater film temperature	°C	NTR	380
Pumpability limit	°C	NTR	about -30

Note: The information given in the typical data does not constitute a specification but is an indication based on current production and can be affected by allowable production tolerances. The right to make modifications is reserved. This edition supersedes all previous editions and information contained within them. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product. Abbreviations: OC, open cup test; COC, Cleveland open cup test; and, NTR, no test reported.

8. OTHER INFORMATION

Storage and transport

Globaltherm® L Heat transfer fluid 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. When handling Globaltherm® L Heat transfer fluid and when filling and operating a heat-transfer system with Globaltherm® L Heat transfer fluid, care must be taken that the heat transfer medium cannot enter the soil or sewer system. The product is almost insoluble in water.

If necessary, used Globaltherm® L Heat transfer fluid can be recycled or used for energy recovery observing local regulations. Used Globaltherm® L Heat transfer fluid can be reclaimed by fractional distillation for reuse as a heat-transfer medium. This reclaiming is possible in plants containing a Globaltherm® Heat transfer fluid. However, for economic reasons, amounts of approximately 10 t or more must be supplied. It is necessary to adhere to the requirements for returned goods which are set down according to criteria specific to the reclaiming and to legal criteria for waste. The values of the residue content of Globaltherm® L Heat transfer fluid, the viscosity and the chlorine content of the goods are to be determined beforehand.

With regards to the classification of Globaltherm® L Heat transfer fluid under the regulation governing the transport of dangerous goods, reference should be made to the Safety Data Sheet.

In general, the waste code number for Globaltherm® L Heat transfer fluid 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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