



globaltherm®

S

HIGH PERFORMANCE SYNTHETIC FLUID  
For use in closed loop unpressurized systems

PRODUCT INFORMATION

# A superior high performance, energy efficient, synthetic, organic heat transfer fluid suitable for use in a wide variety of industrial process applications.

## 1. PRODUCT AND COMPANY IDENTIFICATION

### Product name

Globaltherm® S  
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® S Heat transfer fluid is a high-performance synthetic, organic heat transfer

medium for use in the liquid phase in closed, forced circulation heat transfer systems.

Globaltherm® S Heat transfer fluid can be used over the whole working range without being kept under pressure. The boiling range of the product at atmospheric pressure is above the use limit. The heat transfer medium is advantageously used in the temperature range from -5° to 350°C. The upper use limit corresponds to a heater outlet temperature of 350°C. The film temperature should not exceed the limit of 380°C either significantly or for a prolonged period.

Globaltherm® S Heat transfer fluid is most suitable for indirect heating of reactors, polymerisation vessels and distillation columns, of processing machines and driers, and heat exchangers in process plants and systems for heat recovery.

Globaltherm® S Heat transfer fluid is also suitable for use in heating and cooling systems. The technical characteristics of a Globaltherm® S Heat transfer fluid charge can also be matched to the specific requirements of a system and optimized by mixing with Globaltherm® L Heat transfer fluid.



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The heat transfer systems should be designed and operated in accordance with the recommendations of DIN 4754 "heat transfer installation working with organic heat transfer fluids".

Heat transfer plants containing a Globaltherm® S Heat transfer fluid charge can be started up at temperatures down to -5°C. Steam tracing is generally not necessary. At external temperatures below -5°C, the heat transfer medium is to be protected from excessive cooling during the shutdown phase, or the viscosity of the charge is to be lowered by mixing with an appropriate amount of Globaltherm® L Heat transfer

fluid. Globaltherm® L Heat transfer fluid can be added to a Globaltherm® S Heat transfer fluid charge without concern, if the system is operated at a heater outlet temperature below the boiling point of Globaltherm® L Heat transfer fluid.

At operating temperatures above the boiling point of Globaltherm® L Heat transfer fluid, it is necessary to first check whether the heat transfer plant is approved for operation at the higher pressure.

Globaltherm® S 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 a suitable inert gas. Inert gas blanketing is the best protection against changes caused by oxidation. Antioxidants are unstable at operating temperatures above 200°C and are ineffective even after short operating times.

Globaltherm® S Heat transfer fluid is thermally stable up to an operating temperature of 300°C. The Globaltherm® S 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 temperatures. The decomposition products remain completely dissolved in the Globaltherm® S Heat transfer fluid charge. A build-up of low boilers should, however, be avoided, since they can impair the operation of the heat transfer system, particularly in the upper range from 340 to 350°C.

For this reason, the low ends should be removed; their removal may be discontinuous, but at temperatures above 340°C should be continuous via the expansion vessel. 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® S Heat transfer fluid forms no deposits on the walls and does not lead to accumulation of solids in the heat transfer circuit. Globaltherm® S Heat transfer fluid plants can be operated reliably and without high maintenance costs.

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. Call us on +44 (0) 1785 760555 to speak to a member of our technical team.

### 3. APPLICATIONS

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

Globaltherm® S Heat transfer fluid has low toxicity. For food and pharma applications refer to Globaltherm® FG HT1 certified food grade heat transfer fluid.

### 4. SERVICE CONSIDERATIONS

Globaltherm® S 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.



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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® S Heat transfer fluid does not corrode the usual metallic materials used in construction of plants and machinery. Globaltherm® S 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 and mechanical strength.

Rubber-elastic binders swell on contact with Globaltherm® S Heat transfer fluid and should not be used in the seals for Globaltherm® S Heat transfer fluid plants.

Seals made of pure graphite have proven particularly useful in heat transfer plants using Globaltherm® S Heat transfer fluid. To increase the strength and dimensional stability, these seals are advantageously provided with a metallic insert, e.g. a sheet metal core.

### 6. HEALTH AND SAFETY

Globaltherm® S Heat transfer fluid is intended for use as heat transfer medium in a closed plant. 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® S Heat transfer fluid, the usual guidelines, and recommendations for handling organic liquids should be observed and precautions should be taken. Details are to be found in the latest Safety Data Sheet for Globaltherm® S Heat transfer fluid. Please contact the technical team on +44 (0) 1785 760555 for more information.

**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 ISO 2114	≤0.02
Density at 20°C	g/ml	DIN 51757	1.04 - 1.05
Viscosity at 20°C	mm <sup>2</sup> /s	DIN 51562	42 - 52
General product description	Unit	Code (ASTM/ISO/DIN)	Result
Boiling range at 1013 mbar	°C	ASTM D 1078	about 385 - 395
Pour point	°C	DIN ISO 3016	about -34
Flash point	°C	EN 22719	about 200
Ignition temperature	°C	DIN 51794	about 450
Permissible heater outlet temperature	°C	NTR	350
Permissible heater film temperature	°C	NTR	380
Pumpability limit	°C	NTR	about -5

**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® S 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® S Heat transfer fluid and when filling and operating a heat transfer system with Globaltherm® S 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® S Heat transfer fluid can be recycled or used for energy recovery observing local regulations. Used Globaltherm® S 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® S Heat transfer fluid, the viscosity and the chlorine content of the goods are to be determined beforehand. Speak to our technical team for more information about reprocessing of used oil on +44 (0) 1785 760555; fax: +44 (0) 1785 760444.

With regards to the classification of Globaltherm® S Heat transfer fluid under the regulation governing the transport of dangerous goods, reference should be made to the Material Safety Data Sheet. Please contact the technical team on +44 (0) 1785 760555 for more information.

In general, the waste code number for Globaltherm® S 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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