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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 24747-2023

Safety technology conditions for organic heat transfer fluid

有机热载体安全技术条件

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Foreword

This document was issued on 23 May 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 23 May 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 24747-2023 governs the organic heat transfer fluid that carries heat in thermal fluid boilers and heat transfer systems, from the documents that must come with a new batch to the point at which the charge in service has to be discarded. It sets general requirements on the product and its accompanying paperwork, quality indexes with the test methods that measure them, rules for judging and disposing of a used charge, the inspection interval and the way samples are drawn, the conditions under which fluids of different composition or different phase may not be mixed, separation and refining of degraded material that still has value, cleaning of the system, and the criteria for replacement and abandonment. An annex gives the potentiometric titration procedure for acid value. Thermal fluid ages in service: it cracks where the film runs hot, takes up water and contaminants, and its viscosity, acid value and carbon residue drift away from the values it was bought at. Carbon lays down on the tube wall, the wall then runs hotter, cracking accelerates, and the end of that loop is a ruptured tube discharging hot flammable liquid. That is why sampling intervals and

discontinued-use limits are written down rather than left to the operator's judgement. Boiler and plant operators, fluid suppliers and inspection bodies use it.

This document specifies the safety technology conditions for organic heat transfer fluids used

by various types of boilers and heat transfer systems with organic heat transfer fluids.

This document is applicable to organic heat transfer fluids that use various organic heat transfer

fluid boilers, photothermal energy storage or other heating equipment as heating sources and

for the purpose of indirect heating. It is inapplicable to organic heat transfer fluids that are only

used for freezing and cryogenic cooling, nor is it applicable to organic silicone heat transfer fluid.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only

versions with a specified date are applicable to this document. In terms of references without a

specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 261 Determination of Flash Point - Pensky-Martens Closed Cup Method

GB/T 265 Petroleum Products - Determination of Kinematic Viscosity and Calculation of Dynamic Viscosity

GB/T 4756 Method for Manual Sampling of Petroleum Liquids

GB/T 6536 Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure

GB/T 6682 Water for Analytical Laboratory Use - Specification and Test Methods

GB/T 11133 Standard Test Method for Determination of Water in Petroleum Products, Lubricating Oils, and Additives - Coulometric Karl Fischer Titration Method

GB/T 11137 Black Petroleum Products - Determination of Kinematic Viscosity (reverse-flow method) and Calculation of Dynamic Viscosity

GB/T 16483 Safety Data Sheet for Chemical Products - Content and Order of Sections

GB/T 23800 Heat Transfer Fluids - Determination of Thermal Stability

3.5 liquid phase organic heat transfer fluid

Liquid phase organic heat transfer fluid is a synthetic organic heat transfer fluid and mineral oil

organic heat transfer fluid with a certain distillation range, which can only be used under liquid

phase conditions.

[source: GB 23971-2009, 3.6, modified]

3.6 maximum working temperature

Maximum working temperature is the maximum temperature of the main fluid of the organic heat transfer fluid allowed at the boiler outlet under the actual operating conditions of the heat transfer system.

NOTE: the average main fluid temperature of the organic heat transfer fluid measured at the boiler

outlet is the working temperature.

[source: GB 23971-2009, 3.9, modified]

3.7 initial boiling point; IBP

Initial boiling point is the temperature point, at which, the cumulative area is equal to 0.5% of

the total area of the obtained chromatogram when the petroleum fractions boiling range step-

by-step method is used for determination.

NOTE: the determination of boiling range distribution of petroleum fractions adopts NB/SH/T

0558.

3.8 low-boiling component

Low-boiling component is the substance whose distillation temperature in the organic heat

transfer fluid in use is lower than its initial boiling point when it is unused.

3.9 deteriorated material

Deteriorated material is a general term for substances different from the original properties of

the organic heat transfer fluid and generated under the influence of factors, such as: oxidation,

overheating and mixture of foreign matters, on the organic heat transfer fluid in use.

4 General Requirements

4.1 The organic heat transfer fluid products shall comply with the requirements of GB 23971.

The following documents, for example, product quality certificate, shall be provided at the same

time when the organic heat transfer fluid products are sold.

a) Product type test report that complies with GB 23971 and issued by the organic heat transfer type test institution.

b) Exit-factory quality inspection report of the batch of products issued by the manufacturer; if the supplier provides a copy of the report, the authenticity of the report shall be confirmed by the supplier.

c) Safety data sheet for chemical products that complies with the requirements of GB/T 16483.

4.2 The self-ignition point of the organic heat transfer fluid shall not be lower than the maximum

permitted bulk temperature.

4.3 The maximum permitted bulk temperature of the organic heat transfer fluid shall be at least

10 °C higher than the maximum working temperature of the organic heat transfer fluid boiler.

For electric heating boilers, coal-fired boilers or boilers with an average heat flux density greater than 0.05 MW/m² on the radiant heating surface of the furnace, the maximum permitted