Heat transfer systems operating with organic heat transfer media

Safety requirements and testing

DIN 4754

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Wärmeübertragungsanlagen mit organischen Wärmeträgern – Sicherheitstechnische Anforderungen, Prüfung

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

This standard includes safety requirements within the meaning of the *Gerätesicherheitsgesetz* (German Equipment Safety Law).

The design and construction of heat transfer systems operating with organic heat transfer media require special skills. Such systems may thus only be manufactured and installed by companies with personnel that have the relevant expertise.

The content of this standard has been harmonized with the stipulations of the *Druckbehälterverordnung* (German Pressure Vessels Regulation).

The circuit diagrams included in this standard are simplified representations of basic circuits; they should not be regarded as recommendations for particular types of circuit.

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Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.

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In addition to being covered by this standard, heat transfer systems utilizing organic heat transfer media are also subject to the *Unfallverhütungsvorschrift* (Accident Prevention Regulation) VBG 64, *Wärmeübertragungsanlagen mit organischen Wärmeträgern* (Heat transfer systems operating with organic heating media), issued by the German industrial employers' liability insurance associations. The present standard and VBG 64 have been coordinated in terms of content, and cross reference each other to facilitate comprehension of the specifications.

1 Scope and field of application

This standard deals with heat transfer systems in which organic media are heated to temperatures below or above their initial boiling point at atmospheric pressure. It applies to heat consumers only where the heat transfer medium passes through them.

This standard does not cover refrigerating plant[1]), heat pumps, cooling devices, portable radiators (used to heat individual rooms), or solar heating systems in which the heating is generated solely by solar energy (cf. Explanatory notes).

This standard provides design specifications aimed at implementing the general safety requirements stipulated in VBG 64.

2 Concepts

2.1 Heat transfer system

A system in which organic heat transfer media are contained in a closed circuit and in which the heat input is effected by way of heaters. For the purposes of this standard, a heat transfer system comprises all equipment necessary for the given mode of operation, including reserve equipment kept on stock.

In heat transfer systems, the medium is heated in the heater, conducted by natural or forced circulation to the heat consumer and then returned to the heater for reheating (cf. figures A.1 to A.5).

2.2 Heater

A system component in which the heat transfer medium passing through is heated by fuel, flue gas or electricity.

2.3 Minimum volume flow rate

In forced-circulation heaters, the minimum volume flow rate is the rate specified by the system manufacturer as that which must be maintained in order to avoid excessive overheating of the heating medium.

2.4 Allowable working pressure

The maximum safe working pressure specified by the operator/owner or the manufacturer.

2.5 Temperatures

For the purposes of this standard, the temperatures described below refer to the different temperatures of the heating medium at various points in the circuit (heater, heat consumer, feed and return pipes).

2.5.1 Allowable working temperature

The maximum safe temperature of the heat transfer medium specified for the various components of the system by the operator/owner or the manufacturer.

2.5.2 Heat transfer medium temperature

The temperature of the heat transfer medium at the flow cross section.

2.5.3 Feed temperature

The temperature of the heat transfer medium at the heater outlet.

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[1]) Refrigeration systems are covered by the *Unfallverhütungsvorschrift Kälteanlagen und Wärmepumpen* (Accident prevention regulation for refrigerating plant and heat pumps) (VBG 20), obtainable from *Carl Heymanns Verlag KG*, Luxemburger Straße 449, D-50939 Köln.