SLOVENSKI STANDARD
SIST EN 1148:1999

01-december-1999

Prenosniki toplote – Prenosniki toplote voda/voda za daljinsko ogrevanje – Postopki preskušanja za ugotavljanje tehničnih karakteristik

Heat exchangers - Water to water heat exchangers for district heating - Test procedures for establishing the performance data

Wärmeaustauscher - Wasser/Wasser- Wärmeaustauscher für Fernheizung - Prüfverfahren zur Feststellung der Leistungsdaten

Echangeurs thermiques - Echangeurs eau/eau pour chauffage urbain - Procédures d'essai pour la détermination des performances

Ta slovenski standard je istoveten z: **EN 1148:1998**

ICS:

27.060.30	Grelniki vode in prenosniki toplote	Boilers and heat exchangers
91.140.10	Sistemi centralnega ogrevanja	Central heating systems

SIST EN 1148:1999 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1148

September 1998

ICS 91.140.10

Supersedes ENV 1148:1993

Descriptors: heat transfer, heat exchangers, heating, hot water heating, tests, determination, thermodynamic properties, performance evaluation, measurements, calorific power

English version

Heat exchangers - Water to water heat exchangers for district heating - Test procedures for establishing the performance data

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Wärmeaustauscher - Wasser/Wasser-Wärmeaustauscher für Fernheizung - Prüfverfahren zur Feststellung der Leistungsdaten

This European Standard was approved by CEN on 3 September 1998.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 1148:1998 E

Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 110 "Heat exchangers", the secretariat of which is held by BSI.

This European Standard supersedes ENV 1148:1993.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 1999, and conflicting national standards shall be withdrawn at the latest by March 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European Standard is part of a series of European Standards dedicated to heat exchangers. It has been drawn up by CEN/TC 110.

1 Scope

This standard applies to series produced water to water heat exchangers, for district heating appliances and its purpose is to establish uniform methods to test and ascertain the following:

- product identification;
- performance characteristics;
- pressure drop.

This European standard does not cover technical safety aspects.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publications referred to applies.

EN 306:1997	Heat exchangers - Methods of measuring the parameters necessary for establishing the performance
EN 45001	General criteria for the operation of testing laboratories

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 classification: Series produced water to water heat exchangers for district heating of the following types:

a) shell and tube heat exchangers

b) plate heat exchangers

3.2 district heating heat exchanger: Heat exchanger transferring heating energy from district heating network to radiator network, domestic warm water, ventilation system or to some special applications. In the following term heat exchangers is used.

3.3 shell and tube type: Heat exchanger consisting of a shell with a tube arrangement inside the shell.

3.4 plate type: Heat exchanger consisting of parallel plates separating the two fluids.

3.5 water flow

3.5.1 ***primary water flow:*** Water flow through the heat exchanger with the higher inlet temperature.

3.5.2 ***secondary water flow:*** Water flow through the heat exchanger with the lower inlet temperature.

3.6 capacity: Product of the water mass flow rate and the difference between the specific enthalpies at the inlet and outlet connections.

3.7 temperatures

NOTE: All temperatures are average values ascertained over a certain period of time.

3.7.1 ***water inlet temperature:*** Temperature of the water at the inlet connection, taking into consideration the inlet water velocities.

3.7.2 ***water outlet temperature:*** Temperature of the water at the outlet connection, taking into consideration the outlet water velocities.

3.8 types of test

3.8.1 ***type testing:*** Testing of a generic type of heat exchanger for specified duty at a selected range of operating conditions.

NOTE: Type testing is usually carried out for series or mass produced heat exchangers in the laboratory.

3.8.2 ***acceptance testing:*** Testing of a specific heat exchanger, at the appropriate operating conditions.

3.8.3 ***performance testing:*** Testing of heat exchangers, usually carried out in situ.

NOTE: It can be similar to acceptance testing when detailed thermal hydraulic performance data is required.

4 Symbols

For the purposes of this European Standard the following apply:

4.1 Letters

A	heat transfer surface	m^2
c_p	specific heat capacity	kJ/(kg.K)
F	correction factor for LMTD	-
h	specific enthalpy	kJ/kg
k	overall heat transfer coefficient	$W/(m^2 \cdot K)$
$LMTD$	logarithmic mean temperature difference	K
p	pressure	Pa
P	capacity	kW
q_v	volume flow rate	m^3/s
q_m	mass flow rate	kg/s
ro	density	kg/m^3
T	absolute temperature	K
t	temperature	°C
Δt	temperature difference	K

4.2 Subscripts

1	primary side (cooled flow)
2	secondary side (heated flow)
11	inlet conditions on primary side
12	outlet conditions on primary side
21	inlet conditions on secondary side
22	outlet conditions on secondary side

av	average
m	mass
max	maximum
min	minimum
v	volume

4.3 Special characters

(...') measured value or value calculated from measurements.

($\overline{...}$) calculated value from the manufacturer's formula.

5 Manufacturer's data

The manufacturer or supplier shall supply the test house with the following minimum information for every heat exchanger to identify the heat exchanger and allow its traceability.

a) manufacturer (name and address);

b) type (designation);

c) manufacturing number and year;

d) internal volumes (primary and secondary);

e) installation instructions;

f) materials;

g) nominal capacity at clean heat exchanger surface (inlet and outlet temperatures, mass flows, pressure drops and capacity).

The data shall be supplied to the test house before the test is started.

6 Performance conditions

6.1 Temperature ranges of European district heating companies

The operating temperatures of the district companies are classified into three groups. They mainly comprise the operating ranges of the heat exchangers for heating and domestic hot water.