SLOVENSKI STANDARD
SIST EN 1117:1999/A1:2004

01-januar-2004

Prenosniki toplote ï Kondenzatorji hladiv, hlajeni s tekoļ ino ï Postopki preskuģanja za ugotavljanje tehniļ nih karakteristik - Dopolnilo A1

Heat exchangers - Liquid cooled refrigerant condensors - Test procedures for establishing the performance

Wärmeaustauscher - Flüssigkeitsgekühlte Kältemittelverflüssiger - Prüfverfahren zur Leistungsfeststellung

Echangeurs de chaleur - Condenseurs refroidis par un liquide - Procédures d'essais pour la détermination de la performance

Ta slovenski standard je istoveten z: **EN 1117:1998/A1:2002**

ICS:

27.060.30	Grelniki vode in prenosniki toplote	Boilers and heat exchangers
27.200	Hladilna tehnologija	Refrigerating technology

SIST EN 1117:1999/A1:2004 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1117:1998/A1

October 2002

ICS 27.060.30; 27.200

English version

Heat exchangers - Liquid cooled refrigerant condensors - Test procedures for establishing the performance

Echangeurs de chaleur - Condenseurs refroidis par un liquide - Procédures d'essais pour la détermination de la performance

Wärmeaustauscher - Flüssigkeitsgekühlte Kältemittelverflüssiger - Prüfverfahren zur Leistungsfeststellung

This amendment A1 modifies the European Standard EN 1117:1998; it was approved by CEN on 14 September 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This amendment 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Ref. No. EN 1117:1998/A1:2002 E

Contents

Foreword

This document (EN 1117:1998/A1:2002) has been prepared by Technical Committee CEN /TC 110 "Heat exchangers", the secretariat of which is held by BSI.

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 April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

This amendment is introduced to accommodate newly available refrigerants such as R404A, R407C and R410A.

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

3 Definitions

Insert the following definition after 3.6.2:

3.7 condensing pressure

Pressure at the refrigerant at the inlet connection of the condenser.

NOTE All pressures are average values ascertained over the test duration, and are absolute pressures.

Amend the sub-clause numbers 3.7 to 3.7.4 as follows [the content of these clauses is to be retained]:

3.8 temperatures

3.8.1 ***liquid inlet temperature:***

3.8.2 ***liquid outlet temperature:***

3.8.3 ***ambient air temperature:***

3.8.4 ***refrigerant temperatures:***

Amend sub-clause number 3.7.4.1 and modify text as follows:

3.8.4.1 *condensing temperature:* Dew point temperature of the refrigerant corresponding to the condensing pressure.

Amend the sub-clause numbers 3.7.4.2 and 3.7.4.3 as follows [the content of these clauses is to be retained]:

3.8.4.2 *superheated vapour temperature:*

3.8.4.3 *subcooled refrigerant temperature:*

Insert the following definition after 3.8.4.3:

3.8.4.4 *bubble point temperature:* Temperature corresponding to the absolute pressure of the refrigerant at the outlet connection of the condenser.

Amend the sub-clause numbers 3.8 and 3.8.1 and 3.8.2 as follows [the content of these clauses is to be retained]:

3.9 liquid pressure

3.9.1 ***liquid inlet pressure:***

3.9.2 ***liquid outlet pressure:***

Amend the sub-clause numbers 3.9 and 3.9.1 and 3.9.2 as follows [the content of these clauses is to be retained]:

3.10 temperature differences

3.10.1 ***inlet temperature difference:***

3.10.2 ***superheating:***

Amend sub-clause number 3.9.3 and modify text as follows:

3.10.3 ***subcooling:*** Difference between the bubble point temperature and the subcooled refrigerant temperature.

Amend the sub-clause number 3.9.4 as follows [the content of this clauses is to be retained]:

3.10.4 ***liquid temperature difference:***

Insert the following definition after new 3.10.4:

3.11 high glide: Refrigerant where the difference between the condensing and bubble point temperatures at a condensing temperature of 40°C is greater than 3K.

Amend the sub-clause number 3.10 as follows [the content of this clause is to be retained]:

3.12 fouling resistance:

Insert the following definition after 3.12:

3.13 oil content: Proportion of oil by mass in the pure refrigerant circulating in the heat exchanger.

4 Symbols

4.1 Letters

Correct entry for $t_{(pR2)}$ to read $t_{(PR2)}$.

5 Standard capacity

5.2 Standard capacity conditions

Modify final sentence to read:

Δt_{sup} for common refrigerants shall be determined according to:

R134a	25K	NH_3	50K
		R404A	25K

		R407C	35K
		R410A	40K

6 Manufacturer's data

Delete reference d) 'Correction factors for other refrigerants that may be used' and revise subsequent identifiers accordingly.

7 Measurements

Table 2 – Uncertainty of measurements

Add to table:

Measurements	Uncertainty of measurements
Refrigerant mixture	± 1 % by mass for each refrigerant component

7.2 Measurement criteria

Add further sub-clause 7.2.6

7.2.6 *Non-azeotropic refrigerant*

For high glide refrigerants the refrigerant mixture shall be measured unless it can be guaranteed that the mass fraction varies by less than 2 % from the refrigerant manufacturer's data.

8 Testing methods and equipment

8.1.1 *General*

Add the following text after existing:

The testing arrangement shall be designed in such a way that the condenser under test can be placed under conditions as in practical operation. In particular the following shall be assured:

- free drainage of the liquid refrigerant from the condenser to the liquid receiver shall be provided;

- with non azeotropic refrigerants care shall be taken, than there are no liquid refrigerant accumulations in the refrigerant cycle.

NOTE Non-azeotropic refrigerants are mixtures of more than one refrigerant with different individual boiling temperatures. If the mixture is separated at a two phase state e.g. in a vessel, one of the two phases can accumulate affecting the concentration of each refrigerant within the rest of the system. While testing, it should be ensured that the concentration of the individual refrigerants within the mixture circulating through the condenser is identical with the concentration with which it was originally filled.

- the liquid flow through the condenser being tested shall not be modified;

- Recirculation of air shall neither be created nor prevented if it is a normal feature.

Add the following sub-clause after 8.2.3:

8.2.4 *Liquid Receiver*

For high glide refrigerants the internal volume of the liquid receiver shall be less than 4 % of the total system volume.