SLOVENSKI STANDARD
oSIST prEN 13203-7:2021

01-februar-2021

Plinske gospodinjske naprave za pripravo tople sanitarne vode - 7. del: Ocenjevanje rabe energije kombiniranih naprav s prigrajenimi napravami za vračanje toplote iz dimnih plinov

Gas-fired domestic appliances producing hot water - Part 7: Assessment of energy consumption of combination boilers equipped with a passive flue heat recovery device

Gasbefeuerte Geräte zur Warmwasserbereitung für den Hausgebrauch - Teil 7: Bewertung des Energieverbrauchs von Kombigeräten, ausgerüstet mit einer passiven Vorrichtung zur Wärmerückgewinnung im Abgasschacht

Appareils domestiques produisant de l'eau chaude sanitaire utilisant les combustibles gazeux Partie 7: Evaluation de la consommation énergétique d'une chaudière équipée d'un dispositif passif de récupération de la chaleur dans les fumées

Ta slovenski standard je istoveten z: **prEN 13203-7**

ICS:

91.140.65 Oprema za ogrevanje vode Water heating equipment

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ICS 91.140.65

English Version

Gas-fired domestic appliances producing hot water - Part 7: Assessment of energy consumption of combination boilers equipped with a passive flue heat recovery device

Appareils domestiques produisant de l'eau chaude sanitaire utilisant les combustibles gazeux - Partie 7 : Évaluation de la consommation énergétique d'une chaudière à deux services équipée d'un dispositif passif de récupération de la chaleur dans les produits de combustion

Gasbeheizte Geräte für die sanitäre Warmwasserbereitung für den Hausgebrauch - Teil 7: Bewertung des Energieverbrauchs von Kombigeräten, ausgerüstet mit einer passiven Vorrichtung zur Wärmerückgewinnung im Abgasschacht

This draft European Standard is submitted to CEN members for second enquiry. It has been drawn up by the Technical Committee CEN/TC 109.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European Foreword

This document (prEN 13203-7:2021) has been prepared by Technical Committee CEN/TC 109 “Central heating boilers using gaseous fuels”, the secretariat of which is held by NEN.

This document is currently submitted to the 2nd CEN Enquiry.

Introduction

This document refers to clauses of prEN 13203-2:2020 or adapts clauses by stating in the corresponding clause, on the principle:

— shall be according to prEN 13203-2:2020, (clause number) with the following modification;

— shall be according to prEN 13203-2:2020, (clause number) with the following addition;

— prEN 13203-2:2020, (clause number) is replaced by the following;

— prEN 13203-2:2020, (clause number) is not applicable.

1 Scope

This document is applicable to gas-fired appliances producing domestic hot water. It applies to condensing combination boilers with passive flue heat recovery device (PFHRD) that have:

— a heat input not exceeding 400 kW,

— a hot water storage tank capacity (if any) not exceeding 2000 l,

— a declared load profile between M to 4XL.

In the case of combination boilers, with or without storage tank, domestic hot water production is integrated or coupled, the whole being marketed as a single unit.

For this document, some tests and calculation results of EN 13203-2:2020 are used to calculate the energy consumptions.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 13203-2:2020, *Gas-fired domestic appliances producing hot water – Part 2: Assessment of energy consumption*

EN 13203-1:2015, *Gas fired domestic appliances producing hot water - Part 1: Assessment of performance of hot water deliveries*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 13203-2:2020 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
direct PFHRD contribution
energy recovered from the flue gases during domestic hot water production and used to preheat the cold domestic water

3.2
indirect PFHRD contribution
energy recovered from the flue gases during central heating production and used to preheat the cold domestic water

3.3
nominal average heat input (Q_a)
arithmetic mean of the adjustable maximum and minimum nominal heat input (kW) as declared by the technical documentation for range rating appliances

3.4
Passive Flue Heat Recovery Device (PFHRD)
device integrated in the appliance or supplied with the appliance to transmit recovered heat

3.5
thermal bridge
transfer of recovered heat to the PFHRD when the boiler is running in central heating mode by anything else than heat from the flue gasses

4 General test conditions

4.1 Reference condition

Shall be according to prEN 13203-2:2020, 4.1.

4.2 Measurement uncertainties

4.2.1 General

Shall be according to prEN 13203-2:2020, 4.2.1.

4.2.2 Steady-state conditions

Shall be according to prEN 13203-2:2020, 4.2.2.

4.3 Test conditions

4.3.1 General

Shall be according to prEN 13203-2:2020, 4.3.1, with the following modification:

The following sentence is not applicable:

"For combination gas boiler, the tests shall be carried out only in summer mode as defined in 3.3, and the appliance shall be set in summer mode."

The following sentence is modified as follows:

"The load profile used for the measurement shall be the one declared in the technical instruction of the appliance".

4.3.2 Test room

Shall be according to prEN 13203-2:2020, 4.3.2.

4.3.3 Water supply

prEN 13203-2:2020, 4.3.3 is replaced by the following:

"For the tests:

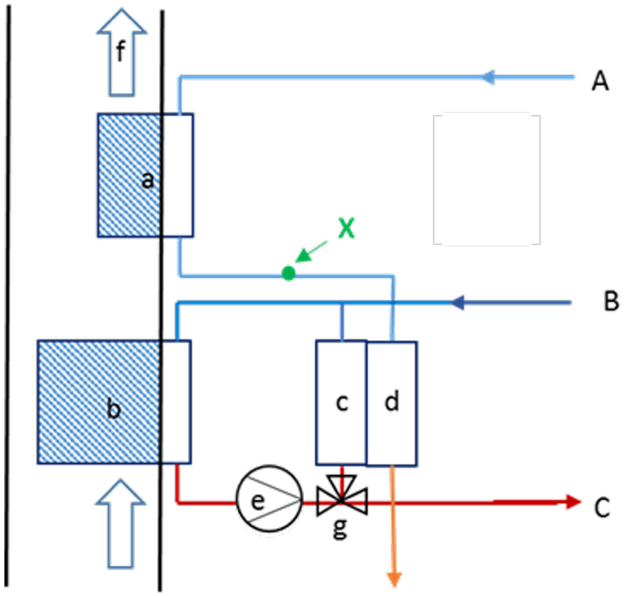
— The domestic water pressure is the static water inlet pressure measured as close as possible to the product.

— The inlet temperatures are measured immediately upstream of the cold water inlet connection in the centre of the flow.

— An additional (rapid response) sensor X shall be placed immediately in the domestic water outlet of the PFHRD construction. This sensor shall be situated in the centre of the flow. If the PFHRD is an integrated part of the boiler, an adapter is needed to install the temperature sensor X. The technical documentation

shall give a figure of this adapter. The appliance under test shall be fitted with an adapter that is supplied with the appliance accessories. This flow will continue for 10 min after the thermal equilibrium.

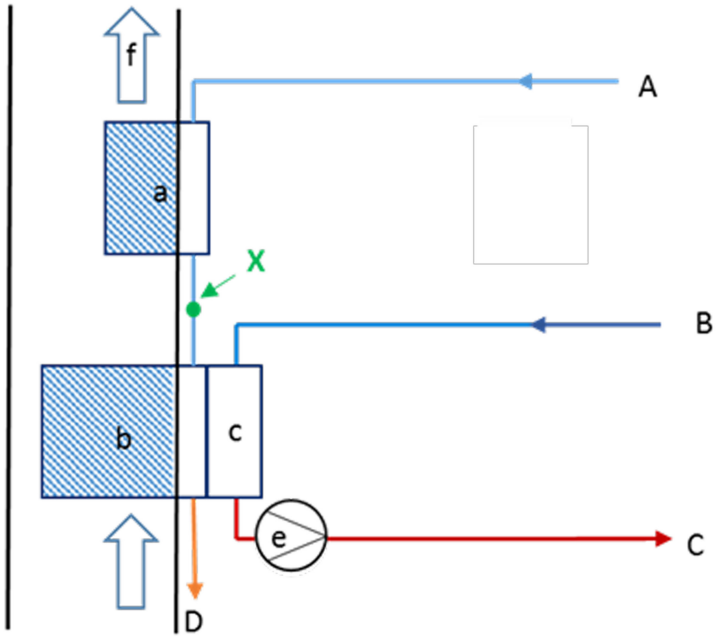
Water temperatures shall be measured with a rapid response temperature sensor.



Key

a	PFHRD	X	Temperature measurement point
b	Boiler	A	DHW in
c	Heat exchanger (CH circuit)	B	CH in
d	Heat exchanger (DHW circuit)	C	CH out
e	CH pump	D	DHW out
f	Flue		
g	3 way valve”		

Figure 1 — Position of the X sensor for boilers with separated secondary heat exchanger



Key

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e	CH pump	D	DHW out
f	Flue		
g	3 way valve"		

Figure 2 — Position of the X sensor for boilers with integrated secondary heat exchanger

4.3.4 Initial adjustment of the appliance

Shall be according to prEN 13203-2:2020, 4.3.4 with the following modification:

"Load profile XS is not applicable."

4.3.5 Conditions for the determination of the maximum load profile

PrEN 13203-2:2020, 4.3.5 is not applicable.

4.3.6 Electrical supply

Shall be according to PrEN 13203-2:2020, 4.3.6.

The following new Clause 5 is added:

5 Determination of applicability of the present standard

To ensure that the appliance is in the scope of this standard it shall be proved that during central heating production there is no significant heat transfer to the PFHRD construction.

This heat transfer can be caused by a so called “thermal bridge” where conduction, convection (even by self-circulation in a single tube with a net water flow of zero) and radiation during the production of central heating water can occur.

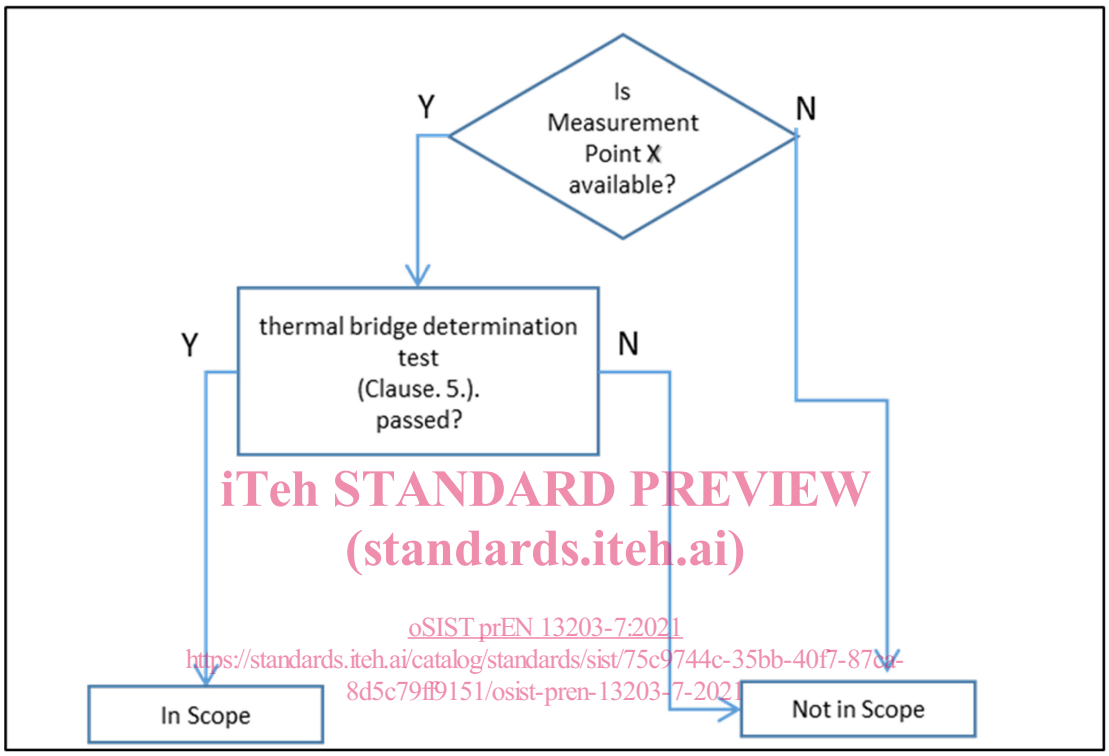

Figure 3 — Determination of applicability of the present standard

Test method:

a) The domestic hot water circuit including the PFHRD shall be cooled by a water flow at 10 °C and with the nominal water flow rate according to EN 13203-1:2015 (5.2), until the appliance water temperature (D in Figures 1 and 2) has reached the thermal equilibrium. After that, this flow will continue for 10 min.

b) After that the central heating circuit (including the primary heat exchanger) shall be heated up by an external heat source. The water rate through the boiler is adjusted so as to obtain a return water temperature of (60 ± 0,5) °C and a temperature difference between flow and return water temperature of (20 ± 1) °C at an average temperature of 70 °C ± 1 K until thermal equilibrium is reached. 60 min after this thermal equilibrium, the circulation over the central heating circuit is stopped.

c) One minute after the circulation stop over the central heating circuit, a domestic water draw off with cold water of 10 °C and a water flow of 0,5 to 1,0 l/min is started. During this draw off, the water flow, the cold water inlet temperature $T_{DHW\text{-}in}$ and the water outlet temperature of the PFHRD (T_X of sensor X) shall be measured with a sample rate not less than once per second. The draw off will be stopped when $T_x \leq T_{DHW\text{-}in} + 1$ K during 10 (±1) seconds.