SLOVENSKI STANDARD
SIST EN 1:2000/A1:2007

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Peļi za ogrevanje na tekoļa goriva z uparjalnimi gorilniki in priključļ kom na dimnik - Dopolnilo A1

Flued oil stoves with vaporizing burners - Amendment A1

Heizöfen für flüssige Brennstoffe mit Verdampfungsbrennern und Schornsteinanschluss

Poeles a combustible liquide avec bruleurs a vaporisation raccordés a un conduit d'évacuation des produits de la combustion

Ta slovenski standard je istoveten z: EN 1:1998/A1:2007

ICS:

97.100.40 Grelniki na tekoļ e gorivo Liquid fuel heaters

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EUROPEAN STANDARD

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ICS 97.100.40

English Version

Flued oil stoves with vaporizing burners

Poêles à combustible liquide avec brûleurs à vaporisation raccordés à un conduit d'évacuation des produits de la combustion

Heizöfen für flüssige Brennstoffe mit Verdampfungsbrennern und Schornsteinanschluss

This amendment A1 modifies the European Standard EN 1:1998; it was approved by CEN on 26 January 2007.

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 CEN 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 CEN Management Centre has the same status as the official versions.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 1:1998/A1:2007: E

Foreword

This document (EN 1:1998/A1:2007) has been prepared by Technical Committee CEN/TC 46 “Oil stoves”, the secretariat of which is held by DIN.

This Amendment to the European Standard EN 1:1998 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2007, and conflicting national standards shall be withdrawn at the latest by January 2009.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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

1 Scope

To replace Clause 1 with the following:

This standard applies to flued oil stoves with one or more vaporizing burners (hereafter referred to as "stoves") as used for individual heating in the domestic field and having either a draught regulator or a combustion air limiter as defined in 3.13 and a nominal heating capacity of not more than 15 kW.

This standard also applies to appliances with fan assisted vaporizing burners.

This standard does not cover

— Built-in appliances

— appliances equipped with an atomizing burner

— appliances incorporating a boiler or connected to a water system

According to the type of fuels used in the country of destination, the stoves are supplied for use with either:

— fuel oil with a maximum kinematic viscosity of 6,0 mm²/s at 20 °C

— or kerosene with a flash point of not less than 40 °C

2 Normative references

To add the following:

EN 60335-2-102:2006 *Household and similar electrical appliances – Safety – Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections (IEC 60335-2-102:2004, modified)*

ISO 2859 (all parts) *Sampling procedures for inspection by attributes*

3 Definitions

Add the following new definitions:

3.21
content of NO_X
content of NO_X in the dry flue gases measured as volume in ppm, calculated as NO_2, expressed in mg/MJ

3.22
content of unburnt Hydrocarbons
content of unburnt hydrocarbons in the dry flue gases measured as volume in ppm, calculated as C_3H_8, expressed in mg/MJ

4.2 Materials

Add the following text:

The stove shall be fire-resistant and safe to operate, and shall be designed such that

— no visible deformations following the performance tests according to Clause 6 occur;

— it can withstand the stresses arising during normal operation;

— the burner and the stove cannot become heated to create a hazard;

— dangerous accumulations of combustible gases (fuel mixed with air) in the combustion chamber and in the flues are prevented (for automatically operated burners only);

— gases cannot leak from the stove in dangerous quantities.

The stove shall be made of non-combustible materials except that combustible materials shall be allowed for the following:

— components of accessories e.g. burner covers, if the parts are fitted outside of the boiler;

— internal components of controls and safety equipment;

— operating handles;

— electrical equipment.

Component parts of covers, operating, control and safety devices and electrical accessories shall be arranged in such a way that their surface temperatures, under steady state conditions, do not exceed those specified either by the manufacturer or in the component part standard.

NOTE Because the entire heat dissipating surfaces of the appliance including the flue spigot/socket and the flue gas connector are working surfaces, there is no requirement for limiting the surface temperature of the appliance.

4.9 Fuel lines

Add the following text at the end of the subclause:

It shall not be possible to remove any component in the oil supply line to the burner without the use of a tool.

4.10 Built-in storage tank

Add the following text at the end of the subclause:

To ensure that any fire external to the stove is not transmitted to the contents of the built-in storage tank or, if a fire does occur, its effects are limited by either the tank being made of non-combustible materials e.g. metal or be enclosed with non-combustible fire resisting materials or construction. Any fuel lines from the tank to the burner shall also be fire resistant.

The filling orifice of the built-in storage tank shall have a cap and shall be easily accessible and it shall be so arranged that when filling the tank with fuel it is not possible to ignite the fuel from any hot components.

4.12 Drip tray

Replace the text of the subclause with:

Any stove incorporating a built-in storage tank shall incorporate a drip tray, below the parts of the stove containing fuel, for the collection of any spillage, having an edge height of a least 10 mm (inside depth) and capacity of a least 1 dm³.

Add the following new subclause:

4.18 Additional requirements for appliances with automatic burners

The burner and control system in combination shall be such that, in the event of failure to ignite when starting, the burner will assume a safe condition (lock-out) and will require a manual reset of its sequencing control. In the event of a flame failure occurring when running, the appliance shall fail safe.

A temperature or pressure sensing device shall be provided on the appliance to start and stop the burner. In addition, a separately operating limiting device shall be provided to stop the burner before the temperature in the appliance exceeds safe limits.

Controls and safety devices shall be coupled so that operation of each occurs in the correct sequence and timing; coupling may be electrical or mechanical. The controls and safety devices shall:

a) ensure that the start-up sequence is not able to commence unless the flame sensing equipment has confirmed the no-flame condition;

b) establish satisfactory ignition of the oil;

c) maintain normal operation if the flame is satisfactorily established, and switch off ignitor;

d) automatically vary the burner firing rate, where applicable;

e) stop the burner when the demand for heat is satisfied;

f) stop the oil supply and lock-out system if flame is not satisfactorily established;

g) provide means for a visible or audible indication that the unit is in a lock-out condition;

h) ensure that any interruption of the electricity supply does not give rise to a dangerous condition.

If the control sequences are such that an attempt to re-ignite the burner can be made the burner shall either:

i. ignite and burn in a safe manner whilst the surplus oil is burnt off and the burner is returning to normal operation conditions; or

ii. not ignite.

Manually operated dampers or other movable devices for restricting the flow of gases shall not be fitted. Automatically operated dampers, if fitted, shall be interlocked with the fuel supply and arranged so that the burner cannot operate with a closed flue.

Replace the title of Clause 5 as follows:

5 Performance and operating requirements

The following subclauses of EN 1:1998 are changed or supplemented.

Replace the title of 5.4 as follows:

5.4 Appliance classes for efficiency and emissions

Replace the subclause as follows:

The requirements of Table 1 shall be fulfilled as appropriate to the appliance class.

Table 1 – Appliance Classes

Appliance Class	CO mg/MJ	C_nH_m mg/MJ	NO_x mg/MJ	Efficiency at nominal heat output %		Smoke number	
				appliances < 4 kW	appliances ≥ 4 kW	Gas oil	Kerosene
1[a]	20	6	35	78	81	1	1
2[b]	400	—	—	75	75	2	2
3[b]	400	—	—	75	75	3	2
4[b]	400	—	—	70	70	3	2
5[b]	400	—	—	60	60	—	—

[a] measured at nominal heat output and low rate only

[b] measured in the whole heat output range

NOTE 1 National regulations might request the statement of efficiency values as well as the class. Therefore in these cases it is allowed to state the efficiency value in addition on the data plate and/or in the technical information (see 7.4).

NOTE 2 National regulations might request the statement of efficiency values in addition to these measured at nominal heat output.

Structure of the document to be in subclauses of 5.4, delete 5.5 and 5.7

5.5 Smoke number

Replace the subclause as follows:

For appliances of the classes 1, 2 and 3 according to Table 1, in the whole heat output range the smoke number shall not exceed 3 for gas oil and 2 for kerosene. For appliances of class 1 according to Table 1, at nominal heat output and at low rate only the smoke number shall not exceed 1 for both gas oil and kerosene.

The flue gases shall not contain oil rest particles.

Under the test conditions of 6.5.1.2, 6.5.1.4 and 6.5.3.1 for gas oil, the smoke number may be one more.

5.7 CO in the flue gases

Add as 3rd para:

In addition for appliances of class 1 according to Table 1, the content of CO measured at nominal heat output and at low rate shall not exceed 20 mg/MJ.

To add the following subclauses:

5.9 Floor temperature

Add as last para:

This requirement is not applicable if the manufacturer states that the appliance shall not be installed on combustible floor.

5.10 Wall temperature

Add as last para:

This requirement is not applicable if the manufacturer states that the appliance shall not be installed adjacent to combustible walls.

5.12 Draught regulator

Delete the whole subclause.

Delete 5.13 and replace it by following new subclause 5.12:

5.12 Electrical safety

EN 60335-2-102 shall apply with the following condition:

The tests described in Clause 19 of EN 60335-2-102:2006 shall not apply for safety relevant circuits when the mechanical components ensure that any failure or interruption of the electronic circuits does not affect the safe operation of the appliance.

Add a new subclause 5.13:

5.13 NOX and unburnt hydrocarbons (CnHm) in the flue gases

In addition for appliances of class 1 only according to Table 1, measured at nominal heat output and at low rate the content of NO_x must not exceed 35 mg/MJ and the content of unburnt hydrocarbons must not exceed 6 mg/MJ.

6 Test methods

The following subclauses of EN 1:1998 are changed or supplemented :

6.1.1 General

Replace the first para with the following:

The stove shall be installed on test apparatus (see Figure B.1) and connected to the test chimney by means of measuring sleeve (see Figures B.2 and B.3). The test floor and walls together with the accessories shall be as shown in figures by B.4a, B.4b and B.4c.

Replace the last para with the following:

Gravimetric measuring process for determining the quantity of fuel supplied using a weighing tank and scale having a measuring tolerance of ± 10 g and a scale graduation of at least 2 g or an equivalent volumetric measuring process.

Add the following new measurement equipment downstream the measurement equipment for CO in the flue gases:

— NO_x-content in the flue gases

Continuously recording instrument for the measurement of NO_x-content with an inaccuracy of maximal ± 5 ppm

— C_nH_m- content in the flue gases

Continuously recording instrument for the measurement of C_nH_m-content with an inaccuracy of maximal ± 5 ppm

More information to measurement of nitrogen oxides (NO_x) and total hydrocarbons (C_nH_m) are given in Annexes C and D.

Add the following as a new para:

The draught regulator shall be inoperative during the tests. If a locking device is available, this shall be locked during the tests and unlocked, if necessary, when the stove is installed.

6.5.2.1 nominal heat output

Add the following new indents:

— NO_x-content in the flue gases (for class 1 appliances only)

— C_nH_m-content in the flue gases (for class 1 appliances only)

6.5.2.2 low rate

Add the following new indents:

— NO_x-content in the flue gases (for class 1 appliances only)

— C_nH_m-content in the flue gases (for class 1 appliances only)

Add the new subclauses 6.6.4 and 6.6.5 as detailed below and renumber subclauses 6.6.4 flue gas mass rate in 6.6.6 and 6.6.5 formula signs and units in 6.6.7.

6.6.4 NO_x in the flue gas

During the tests at nominal heat output 6.5.2.1 and at low rate 6.5.2.2, the flue gas composition and the mean NO_x-content in the flue gases (in ppm) shall be measured.

The NO_x-content in the flue gases in (mg/MJ) shall be calculated by the following equations:

$$NO_x \left[\frac{mg}{MJ} \right] = NO_{xref} - 0{,}2 \cdot \left(N_{meas} - N_{ref} \right)$$

$$NO_{\text{xref}}\left[\frac{mg}{MJ}\right] = NO_{\text{xrech}} + (h_{\text{meas}} - 10)\cdot\left(\frac{0{,}02\cdot NO_{\text{xrech}} - 0{,}34}{1 - 0{,}02\cdot(h_{\text{meas}} - 10)}\right) + 0{,}85\cdot(20 - t_{\text{meas}})$$

$$NO_{\text{xrech}}\left[\frac{mg}{MJ}\right] = \frac{1}{3{,}6}\cdot\left(NO_{\text{xppm}}\cdot 2{,}056\cdot\left(\frac{21}{21 - O_{2\text{meas}}}\right)\cdot\left(\frac{V_{\text{A,th,tr,min}}}{H_{\text{i}}}\right)\right)$$

Where:

NO_x	NO_x – content in mg/MJ, corrected nitrogen content (N) in the oil For the test, the nitrogen content (N) in the oil shall be analysed and should be between 70 and 200 mg/kg.
NO_{xref}	NO_x – value in mg/MJ corrected according reference conditions for air humidity of 10 g/kg and room temperature of 20 °C
NO_{xrech}	From the measurement calculated NO_x – value in mg/MJ
NO_{xppm}	measured NO_x-content in the flue gases in ppm
O_{2meas}	measured O_2-content in the flue gases in %
h_{meas}	measured air humidity in g/kg dry air during the NO_{xppm} measurement (between 5 and 15 g/kg)
t_{meas}	measured combustion air temperature in °C during the NO_{xppm} measurement (between 15 and 30 °C)
N_{meas}	measured nitrogen content (N) in the oil in mg/kg
2,056	Specific gravity of NO_2 in kg/m³
H_i	net calorific value of the oil = 11,86*3,6 MJ/kg (mean value)
$V_{A,th,tr,min}$	Theoretical flue gas volume, dry = 10,46 m³/kg (mean value)
N_{ref}	Reference value for nitrogen content (N) in the oil = 140 mg/kg (mean value)

NOTE The analysed values for the test oil can be used.

6.6.5 Unburnt hydrocarbons in the flue gas

During the tests at nominal heat output 6.5.2.1 and at low rate 6.5.2.2, the flue gas composition and the mean C_nH_m-content in the flue gases (in ppm) shall be measured.

The content of the unburnt hydrocarbons (C_nH_m) in the flue gases (in mg/MJ) as propane-equivalent shall be calculated by the following equation:

$$C_{\text{n}}H_{\text{m}}\left[\frac{mg}{MJ}\right] = \frac{V_{\text{tr,min}}}{H_{\text{u}}}\cdot\frac{M_{\text{HC}}}{22{,}4}\cdot CH_{\text{meas}}$$

Where

C_nH_m	Value of unburnt Hydrocarbons (C_nH_m) in the flue gases as propan-equivalent in mg/MJ
$V_{tr,min}$	Theoretical flue gas volume, dry (Propane) = 21,8 m³/m³$_{Br}$
H_u	net calorific value (Propane) = 93,2 MJ/m³$_{Br}$
M_{HC}	Mol mass of unburnt Hydrocarbons (C_nH_m) in the flue gases = 36,75 kg/kmol (mean value)
CH_{meas}	measured mean C_nH_m-content in the flue gases in ppm

Add the following new subclause:

6.7 Test report

Each page of the test report shall be numbered consecutively and shall specify the results of the testwork and any other additional information and shall contain at least the following details concerning the testwork undertaken on the appliance:

a) name and address of the appliance manufacturer;

b) name, serial number and description of the appliance;

c) statement describing whether the materials, design and construction requirements specified in Clause 4 are met or failed, supported by actual measured values of dimensions, thicknesses, etc. together with certificates as appropriate;

d) statement describing whether the performance and operating requirements specified in Clause 5 are met or failed, supported by detailed test results as specified in Clause 6;

e) statement describing whether the installation and operating instructions comply with the requirements specified in Clause 7;

f) copy of the marking information given on the appliance, and a statement whether the marking information complies with the requirements specified in Clause 8;

g) name and address of the test laboratory;

h) unique serial number for the report;

j) date of issue of the report;

k) signature and legible name of the person taking responsibility for the content of the report;

l) analysis and specifications of the test fuels used during the testwork.

Amend Clause 7 as follows:

7 Instructions and marking of the appliance

The following subclauses of EN 1:1998 are changed or supplemented :

7.1 General

Instructions written in the language of the country of intended destination shall accompany the appliance and shall describe the installation, operation, maintenance and, if assembled on site, the assembly of the appliance. The instructions shall not be in contradiction to the requirements or test results according to Clauses 4, 5 and 6 of this standard.

7.2 Installation instructions

The installation instructions shall contain at least the following information:

— statement to the fact that all local regulations, including those referring to national and European Standards need to be complied with when installing the appliance;

— type (model or number) of the appliance;

— class of the appliance after Table 1 with the number of this European Standard like: flued oil stove EN 1 – class x;

— nominal output in kW, from ... (lowest) kW to ... (highest) kW or W;

— right fitting removable Parts;

— horizontal assembly;

— chimney connection;

— safety clearances against combustible materials, and the other protective measures that shall be taken to protect the building construction;

— requirements for the supply of combustion air, for the simultaneous operation with other appliances and for the operation of exhaust air devices;

NOTE Extractor fans when operating in the same room or space as the appliance, may cause problems.

— need of any air inlet grilles to be so positioned that they are not liable to blockage;

— mass of the appliance in kg;

— minimum flue draught (in Pa) for nominal heat output;

— flue gas mass flow in g/s;

— whether the appliance is suitable for installation in a shared flue system;

— flue gas temperature directly downstream of the flue spigot/socket in °C, under nominal heat output conditions;

— appliance shall be installed on floors with an adequate load-bearing capacity. If an existing construction doesn't meet this prerequisite, suitable measures (e.g. load distributing plate) shall be taken to achieve it;

— advice on the need to provide access for cleaning the appliance, the flue gas connector and the chimney flue;

— installation of the damper device, if applicable;

— assembly of the appliance on-site, if applicable.

7.3 User operating instructions

The operating instructions shall contain at least the following information:

— statement to the fact that all local regulations, including those referring to national and European Standards need to be complied with when installing the appliance;

— kind of fuel (appropriate commercial identification of the country of destination);

— details of the method of refuelling the appliance and the maximum filling height and typical refuelling intervals at nominal heat output;

— description of the correct instructions for safe and efficient operation of the appliance including the ignition procedure;

— advice on the purity of the air;

— advice on the measure to reignition after safety shutdown;

— warning advice: "Don't ignite the flued oil stove in a warm condition";

— advice on the maximum working pressure of oil downstream the oil regulating device from 300 mbar with integrated oilcontainer;

— advice that a flued oil stove with feed pressure limiter with locking is lock-out release when the maximum feed pressure in the chimney given by the manufacturer is exceeded;

— operation of all adjusting devices, dampers and controls;

— ventilation requirements for simultaneous operation with other heating appliances, where applicable;

— correct operations for seasonal use and under adverse flue draught or adverse weather conditions;

— advice on the need for regular maintenance by a competent engineer;