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**Kamini na tekoča goriva - Dekorativne naprave, ki plamen vzdržujejo z gorivom na osnovi alkohola ali želatinastim gorivom - Uporaba v zasebnih gospodinjstvih - Dopolnilo A1**

Fireplaces for liquid fuels - Decorative appliances producing a flame using alcohol based or gelatinous fuel - Use in private households

Feuerstellen für flüssige Brennstoffe - Dekorative Geräte, die unter Verwendung eines Alkohol basierten flüssigen oder gelförmigen Brennstoffes eine Flamme erzeugen - Nutzung im privaten Haushaltbereich

Foyers pour combustibles liquides - Appareils décoratifs produisant une flamme à l'aide de combustible à base d'alcool ou de combustible gélifié - Utilisation domestique

**Ta slovenski standard je istoveten z: EN 16647:2015/prA1**

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**ICS:**

97.100.40      Grelniki na tekoče gorivo      Liquid fuel heaters

**SIST EN 16647:2015/oprA1:2020**      en,fr,de

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**EN 16647:2015**  
**prA1**

March 2020

ICS

English Version

**Fireplaces for liquid fuels - Decorative appliances  
producing a flame using alcohol based or gelatinous fuel -  
Use in private households**

Foyers pour combustibles liquides - Appareils  
décoratifs produisant une flamme à l'aide de  
combustible à base d'alcool ou de combustible gélifié -  
Utilisation domestique

Feuerstellen für flüssige Brennstoffe - Dekorative  
Geräte, die unter Verwendung eines Alkohol basierten  
flüssigen oder gelförmigen Brennstoffes eine Flamme  
erzeugen - Nutzung im privaten Haushaltbereich

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 46.

This draft amendment A1, if approved, will modify the European Standard EN 16647:2015. If this draft becomes an amendment, 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.

This draft amendment 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 (EN 16647:2015/prA1:2020) has been prepared by Technical Committee CEN/TC 46 “Fireplaces for liquid fuels”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document defines the requirements for the construction and operating methods, the operation tests, as well as for the production, labelling and the instruction manuals of decorative fireplaces/appliances producing a flame using liquid or gelatinous alcohol based fuels.

This document contains definitions regarding the technical safety of the appliances.

The requirements listed in the document refer to appliances which are ready for use only. Single components - like simple burner cups – are not considered herein (and are not considered safe when used on their own).

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**EN 16647:2015/prA1:2020 (E)****1 Modification to 4.4 “Materials”**

*Replace the 1st paragraph*

“The parts which are in contact with than alcohol shall be constructed with chrome-nickel steel 1.4301 or with material of better thermal, chemical, mechanical properties and corrosion resistance than chrome-nickel steel 1.4301.”

*by*

“The parts which are in contact with the alcohol shall be constructed with chrome-nickel steel 1.4301.

If different materials are used, their suitability in terms of thermal, chemical, mechanical properties and corrosion resistance shall be proven by specification or by test; special consideration shall be given to materials used in areas touching the flame.”

**2 Modification to Clause 5.8.7, “Combustion performance”**

*Replace Clause 5.8.7 with the following:*

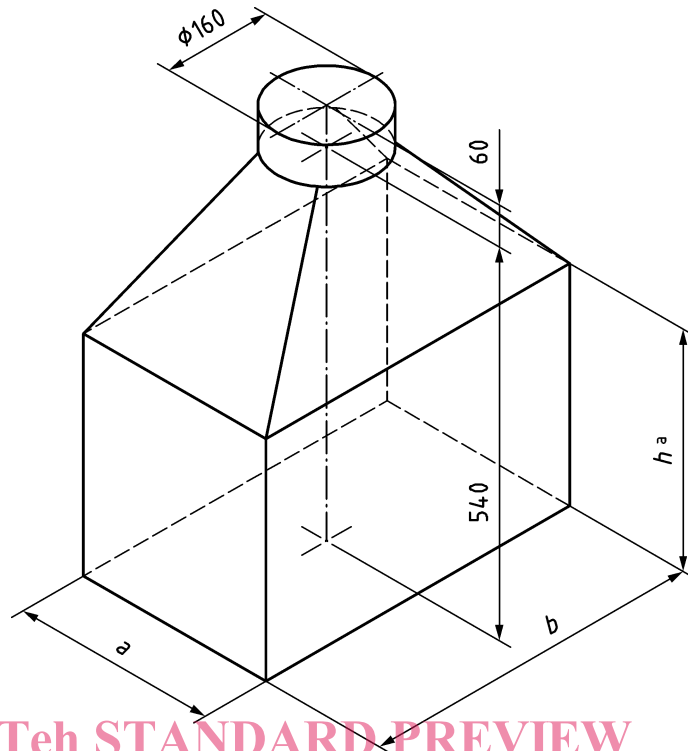
**5.8.7 Combustion****5.8.7.1 Combustion performance****5.8.7.1.1 General**

The following tests shall be performed in order to determine the emissions of CO, CO<sub>2</sub>, aldehydes, VOC, THC, particulate matter deriving from ethanol combustion.

Direct combustion tests shall be performed conveying the combustion products through a hood, allowing in such a way sampling and analysis of the emissions at a known dilution ratio with ambient air.

This standard refers to a hood designed according to standard EN 30-1-1:2008 on tests of hob gas burners, and to standard EN 613 for decorative fireplaces.

Dimensions in millimetres



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**Key**

- <sup>a</sup>  $h \geq 320$  mm in order to allow for opening of the shut-down lid or to allow free space between the device and any high-level grill

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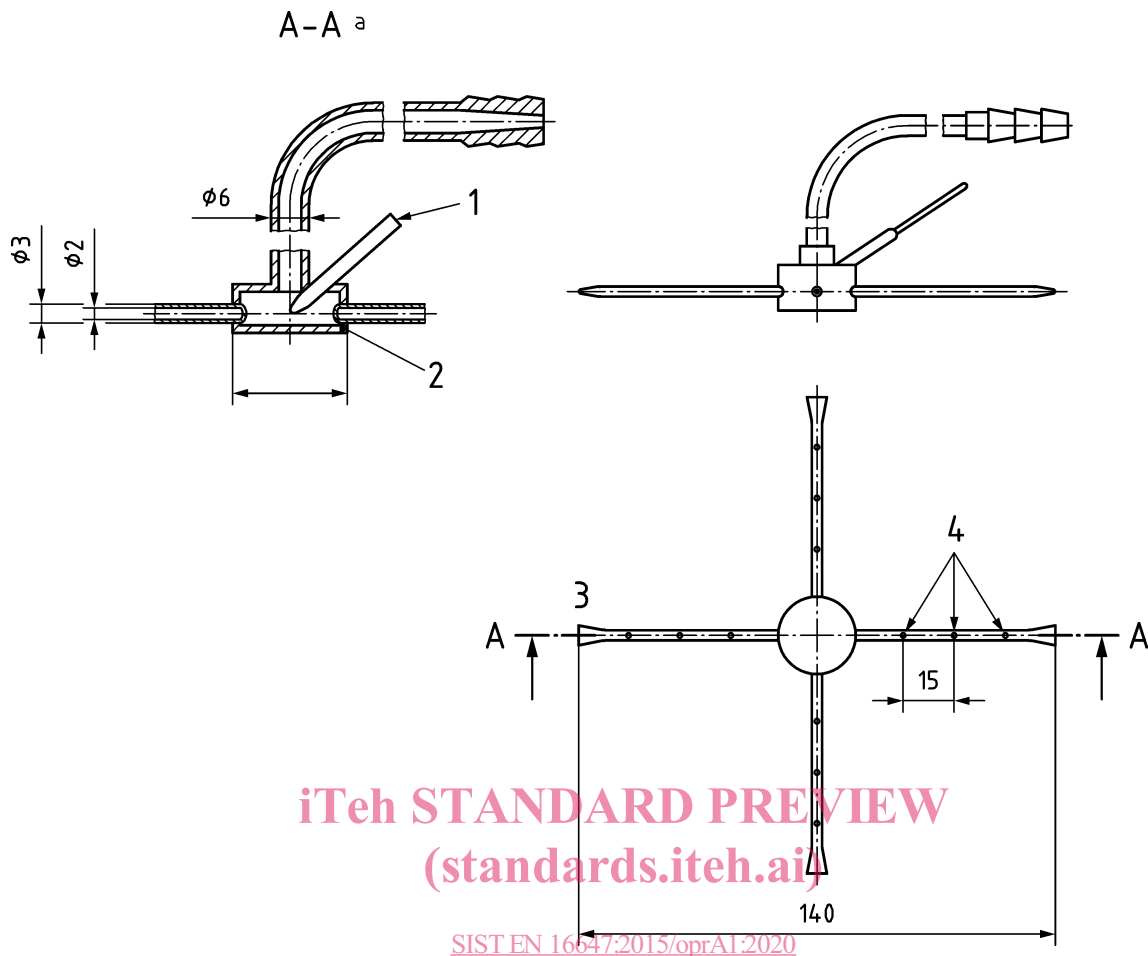
**Figure 6 — Combustion — Sampling hood**

**Table 3 — Dimensions of the sampling hood**

Value	Dimensions mm						
	<i>a</i>	300	500	580	680	710	630
<i>b</i>	500	600	700	680	780	1 140	1 000

NOTE 1 The sampling hood is also used for gas fired cooking alliances (e.g. EN 30-1-1) and decorative fire places (e.g. EN 613).

## EN 16647:2015/prA1:2020 (E)



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Material - stainless steel <https://standards.iteh.ai/catalog/standards/sist/5d5604d4-43bc-4c4a-a96d-ffa2d494c09d/sist-en-16647-2015-opra1-2020>

#### Key

- 1 steatite tube with two holes into which thermocouple wires are sealed
- 2 measuring point
- 3 pipe ends closed
- 4 3 holes  $\varnothing 1$  per branch

**Figure 7 — Example for a sampling probe**

The height of the hood base, referred to the burner plane, is adjusted so that the  $\text{CO}_2$  measured concentration is as close as possible to 1%, to prevent any possible influence of the hood itself on the combustion process.

#### 5.8.7.1.2 Sampling and methods

Combustion tests often show that many appliances have an initial peak of CO and TOC emissions, corresponding to the ignition phase, followed by a steady combustion phase, with emission levels nearly constant in time, but different for each appliance. This period lasts for a time as long as the capacity of the fuel tank, but when the tank is nearly empty the flame starts vanishing, becoming shorter and only partially visible. During this last phase the pollutant emissions of unburnt substances, produced by the fading flame, generally increase, also depending on the burner configuration. The CO emission reaches a maximum, corresponding to the complete extinction of the flame, while the TOC is



further increased and remains very high for a long period of time because of the evaporation of the residual fuel, especially in open-burner appliances.

#### 5.8.7.1.3 CO, CO<sub>2</sub>, NOX, (COT)

The tests shall be performed at the maximum combustion rate (where the appliance is adjustable); the monitoring period for emissions shall start at the lighting on of the appliance and it ends when the 80 % of the fuel mass is consumed. The time necessary to reach the requested consumption percentage can be directly determined either positioning the appliance on a balance during the test, or from data deriving from the fuel consumption test ( $r_{fuel}$ ) described in 5.8.3 of the present standard. Data from automatic analyzers are continuously acquired during the test period, with a minimum time resolution of 1 minute.

#### 5.8.7.1.4 Aldehydes

The tests shall be performed at the maximum combustion rate (where the appliance is adjustable); the monitoring period for emissions shall start when 50 % of the fuel mass is consumed. The time necessary to reach the requested consumption percentage can be directly determined either by positioning the appliance on a balance during the test, or from data deriving from the fuel consumption test ( $r_{fuel}$ ) described in 5.8.3 of the present standard. The Aldehydes concentration (formaldehyde) shall be determined by active sampling techniques using sorbent cartridges. In particular, specifically sorbents for aldehydes and ketones (DNPH cartridges) shall be used. A total volume ranging from 5 to 20 NL, depending on the aldehydes concentration and capacity of sorbent cartridges, of exhaust gases shall be extracted from the same sample line used for automatic analyzers. Sampling parameters shall be adapted to fulfill the detection limit of the analytical technique and the saturation limit of the cartridge.

Three samples shall be performed in a maximum time period of 30 min, in order to minimize fluctuations due to the variability of ambient conditions which could influence the flame or the combustion process or even to minimize procedural and practical mistakes.

#### 5.8.7.1.5 Calculation of emission factors

The emission factor (E.F.) which shall be used in the model is calculated as follows.

- 1) The concentration of each parameter shall be normalized at 15% CO<sub>2</sub>:

$$(C)N = (CO_2)N * ((C)m - (C)amb) / ((CO_2)m - (CO_2)amb)$$

where:

(C)N = normalized concentration of the component during direct combustion test (mg/Nm<sup>3</sup>, dry gases)

(CO<sub>2</sub>)N = normalizing concentration for CO<sub>2</sub>, equal to 15 % vol.

(C)m = measured concentration of the component during direct combustion test (mg/Nm<sup>3</sup>, dry gases)

(C)amb = ambient concentration (mg/Nm<sup>3</sup>, dry gases) of the species measured before the beginning of the direct combustion test (at least 30 min for continuous analyzers); if it is not measured, it can be assumed to be zero.