SLOVENSKI STANDARD
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Specifikacije za plinske aparate na utekočinjeni naftni plin - Prenosni aparati, ki delujejo s tlakom uparjenega plina

Specifications for dedicated liquefied petroleum gas appliances - Portable vapour pressure liquefied petroleum gas appliances

Festlegungen für Flüssiggasgeräte - Tragbare, mit Dampfdruck betriebene Flüssiggasgeräte

Spécifications pour les appareils fonctionnant exclusivement aux gaz de pétrole liquéfiés - Appareils portatifs alimentés à la pression de vapeur des gaz de pétrole liquéfiés

Ta slovenski standard je istoveten z: prEN 521

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27.060.20	Plinski gorilniki	Gas fuel burners

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

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European foreword

This document (prEN 521:2022) has been prepared by Technical Committee CEN/TC 181 “Appliances and leisure vehicle installations using liquefied petroleum gas and appliances using natural gas for outdoor use”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 521:2019+AC:2019.

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 Regulation (EU) 2016/426 of the European Parliament and of the Council of 9 March 2016 on appliances burning gaseous fuels and repealing Directive 2009/142/EC.

For relationship with EU Regulation (EU) 2016/426, see informative Annex ZA, which is an integral part of this document.

The changes from the 2019 version is the addition of a ZA Annex in relation with EU Regulation (EU) 2016/426 and adaptation of corresponding clauses.

1 Scope

This document specifies the construction and performance characteristics related to safety and the rational use of energy of portable appliances burning liquefied petroleum gases at the vapour pressure within the gas cartridge or gas cylinder, excepting those where the gas cartridge is inserted horizontally in the chassis.

NOTE These appliances are referred to in the body of the text as “appliances”.

This document applies to various types of portable appliances burning liquefied petroleum gases at vapour pressure and designed to be used with cartridges (which comply with EN 417) or gas cylinders.

This document covers appliances for outdoor or in well ventilated areas uses only.

For example the following types of appliances are covered:

a) cooking appliances (stoves, grills, barbecues...);

This document does not cover barbecues that can be used indoors;

b) lighting appliances;

c) heating appliances;

This document only applies to appliances with a maximum heat input of up to 3 kW (H_S) for outdoor use only;

d) blowtorches;

This document only applies to blowtorches without a flexible hose;

e) laboratory burners.

The requirements apply to these appliances or their functional sections whether or not the latter are independent or incorporated into an assembly.

Appliances covered by this document are not connected to a flue for the discharge of products of combustion and are not connected to the mains electricity supply.

This document covers neither appliances supplied with LPG in the liquid phase nor appliance with fixed integral container which may or may not be refilled by the user

It does not apply to lighters as defined in EN ISO 9994.

It does not apply to gas appliances operating with a valve cartridge which is horizontally integrated into the chassis of the appliance also called “flat portable gas stove”.

Requirements for rational use of energy have been included for stove burners.

However, such requirements have not been included for the other types of appliances because:

— for grills and barbecues, this is a type of cooking which is achieved by various means such as radiant elements; in addition this type of cooking varies according to the type of food and region where the appliance is used;

— for lighting appliances, the consumption is insignificant because these appliances have a very low rate and are used only for a few hours in a year;

— for heating appliances, all the heat produced is discharged into the environment;

— for tools such as blowtorches which are not professional tools in regular use, the gas consumption depends very much on the way it is used.

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.

<std>EN 30-1-1:—,[1)], Domestic cooking appliances burning gas fuel — Part 1-1: Safety — General</std>

<std>EN 125:2010+A1:2015, *Flame supervision devices for gas burning appliances — Thermoelectric flame supervision devices*</std>

<std>EN 437:2018, *Test gases — Test pressures — Appliance categories*</std>

<std>EN 549:2019, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*</std>

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1
stove
cooking appliance incorporating one or several burners and a pan support(s) designed in such a way that it(they) can support the vessels containing the food

3.2
flat portable gas stove
flat stove operating with a gas cartridge horizontally placed in the chassis for which the length or width is bigger than its height

Note 1 to entry: Figure 2 gives an example of a flat portable gas stove

3.3
vapour pressure appliance
appliance for which the pressure at the gas inlet is equal to the pressure in the gas cartridge or gas cylinder

Note 1 to entry: If the appliance is fixed directly to the gas cylinder by a rigid connection, the appliance inlet is the part of the connection that takes the gas from the cylinder. A pressure reducing device may be incorporated in the gas circuit, between the gas inlet and the injector.

[1)] Under preparation. Stage at the time of publication: prEN 30-1-1:2017

Note 2 to entry: If the appliance is connected to the gas cylinder by a flexible hose, the pressure in the flexible hose once it is connected to the gas cylinder is equal to the pressure in the gas cylinder. A pressure reducing device may be incorporated in the gas circuit downstream of the flexible hose

3.4
gas cylinder
refillable or non-refillable container fitted with a valve filled with gas or a gas mixture

3.5
gas cartridge
non-refillable container with a maximum capacity of 1 000 ml filled with gas or a gas mixture

Note 1 to entry: It may be fitted with a valve. If it is not fitted with a valve, the release of gas is carried out following perforation of the cartridge by means of a device incorporated in the appliance

3.6
cooking device
device supplied with the appliance designed to hold or receive the food to be cooked

Note 1 to entry: Grid, turnspit, baking tray etc.

3.7
useful part of a cooking device
part of the device in contact with food during cooking

3.8
grid
cooking device designed to hold the food to be cooked

Note 1 to entry: Its useful component(s) can be rigid or flexible

3.9
grid with flexible useful components
cooking device made up of two jointed components enabling tight gripping of the food to be cooked

Note 1 to entry: Each component consists of a rigid frame on which metallic wires are fixed and form a flexible mesh inside the frame distorting around the food

3.10
barbecue
appliance designed principally to roast and/or grill food

Note 1 to entry: Cooking is carried out by radiant heat and, possibly, by convection and conduction

3.11
griddle
part of a stove consisting of a plate placed above a burner, that allows the cooking of food by direct contact with the surface of the plate which is brought to a high temperature

3.12
stabilizer
part of the appliance designed to increase mechanical stability

3.13
pan support
support placed above an open stove burner and designed to support the pan to be heated

3.14
turnspit
cooking device enabling the rotation of the food to be roasted

Note 1 to entry: The rotation can be manual or using a mechanical or electrical motor (battery)

3.15
glass panel
glass surface or part of a glass surface allowing the inside of an enclosure to be seen

3.16
fittings
safety devices, controlling devices or regulating devices and sub-assemblies thereof, designed to be incorporated into an appliance or to be assembled to constitute an appliance

Note 1 to entry: for example valves, flame supervision devices

Note 2 to entry: cartridge is not considered as fittings

3.17
flame supervision device
device which, due to the presence of a flame on the sensing element, keeps open the gas flow to the burner and any pilot and which cuts off the gas supply to the burner and possibly a pilot in the event of extinction of the supervised flame

3.18
ignition delay time
time between the ignition of the supervised flame and the moment when the effect of this flame is sufficient to keep the closing device open

3.19
extinction delay time
time between the extinction of the supervised flame and the closure of the gas supply to the burner and possibly a pilot

3.20
tap
controlling device, part of the appliance, designed to isolate a burner from the internal gas pipework and possibly to adjust its rate during use

3.21
control handle
component designed to be operated manually so as to operate a control of the appliance

Note 1 to entry: e.g. a tap, thermostat etc.

3.22
gripping area
outside part of the appliance designed to be handled during use

3.23
burner
component that allows the gas to burn

Note 1 to entry: two types of burners are distinguished

— ignition burner: small burner whose flame is designed to light a main burner. It is referred to as “pilot” in this document;

— main burner: burner designed to fulfil a thermal function of the appliance. It is referred to as “burner” in this document

3.24
injector
component part that admits the gas into a burner

Note 1 to entry: An injector is said to be calibrated when the section of the outlet orifice is fixed

3.25
ignition device
device to ignite one or more burners directly or indirectly

3.26
primary air adjuster
device allowing the modification of the primary air rate

Note 1 to entry: The action consisting in operating this device is termed “primary air adjustment”

3.27
means of sealing
static or dynamic device designed to ensure leak tightness

Note 1 to entry: for example: flat-faced joints, O-ring or conical joints, diaphragms, grease, pastes, putties etc.

3.28
detachable
possible to dismantle without using a tool

3.29
removable
removal only possible with a tool

3.30
soft solder
solder for which the lowest temperature of the melting range, after application, is less than 450 °C

3.31
flame stability
flames are stable at the burner ports when the phenomena of flame lift or light back do not occur

3.32
flame lift
phenomenon characterized by the partial or total movement of the base of the flame away from the burner port

3.33
light back
phenomenon characterized by the return of the flame inside the body of the burner

3.34
calorific value
quantity of heat produced by the complete combustion, at a constant pressure equal to 1 013,25 mbar, of a unit volume or mass of gas, the constituents of the combustible mixture being taken at reference conditions and the products of combustion being brought back to the same conditions

Note 1 to entry: A distinction is made between:

— the gross calorific value Hs: the water produced by combustion is assumed to be condensed;

— the net calorific value Hi: the water produced by combustion is assumed to be in the vapour state

Note 2 to entry: The calorific value is expressed:

— either in megajoules per cubic metre (MJ/m3) of dry gas under the reference conditions;

— or in megajoules per kilogram (MJ/kg) of dry gas.

[SOURCE: EN 437:2018]

3.35
gas supply pressure
difference between the static pressure measured at the gas inlet connection of the appliance and the atmospheric pressure. It is expressed in bar

4 Classification

4.1 Classification of gases

Gases likely to be used are classified in three groups according to their pressures:

a) butane:

Mixture of hydrocarbons containing mainly butanes and butenes having a maximum pressure of 8 bar gauge at 50 °C;

b) butane-propane mixture:

Mixture of hydrocarbons containing mainly butanes, butenes, propane and propene having a pressure between 8 bar gauge and 12 bar gauge at 50 °C;

c) propane:

Mixture of hydrocarbons containing mainly propane and propene having a pressure above 12 bar gauge at 50 °C.

4.2 Categories of appliances

Appliances are classified in three categories according to the gases likely to be used:

— category direct pressure – butane;

— category direct pressure - butane-propane mixture;

— category direct pressure - propane.

5 Safety requirements

5.1 General

The test methods and the means of verification are indicated in Clause 6.

The design shall make it impossible to incorrectly fit or refit any user-removable or replaceable part(s) or component(s) that can have an adverse effect on combustion or cause CO emissions to exceed limits in Clause 5.26.

5.2 Adjustment of the burner

For appliances of types a), b) and c) of the scope of this document, not any adjustment of the burner shall be possible.

5.3 Materials

Non-metallic materials used as radiant elements in appliances (for example volcanic rocks, refractory blocks) shall resist to all tests of this documents without alteration.

The quality and thickness of materials used in the construction of appliances shall be such that the constructional and performance characteristics are not altered in use. In particular all the parts of the appliance shall withstand mechanical, chemical and thermal actions to which they may be submitted during use. In normal conditions of operation, of cleaning or of adjustment, they shall not be liable to any alterations which might impair their safety.

Sheet-metal parts, not made of corrosion-resistant material, shall be effectively protected against corrosion. This requirement does not apply to grilles supporting lava rocks nor to cooking devices.

Seals and joining compounds shall have characteristics suited to their use.

Rubber based materials shall comply with EN 549:2019 class A2 minimum, and LPG resistant.

Hoses being part of the appliance shall be LPG resistant.

Copper tubing shall be used upstream of the injector only if its temperature does not exceed 100 °C when the test described in 6.21 is carried out.

Asbestos or asbestos-based materials shall not be used.

With the exception of seals, membranes, parts in contact with gas shall be made of metallic materials.

Material intended to be in contact with food shall be:

— corrosion resistant;

— non toxic.

The materials shall:

— not transfer undesirable odours, colours or taint to the food;

— not contribute either to the contamination of food or have any adverse influence on the food.

NOTE For information see EN 1672-2.

5.4 Assembly, cleaning and maintenance

5.4.1 Assembly

The entire appliance gas circuit, including the injector and flexible hoses if any, shall be factory assembled. If clamps are used, they shall be of the machine formed type. Removable clamps are not permitted.

Parts, whose assembly is carried out by the user, shall be able to be assembled correctly by following the instructions given in the instructions.

It shall not be possible to dismantle parts which are adjusted at the factory, which are not intended to be dismantled by the user and whose dismantling would affect safety, without using tools. If dismantling is possible using an open ended spanner or a screwdriver, direct access to such nuts and screw heads shall not be possible, unless they are sealed.

If a pressure reducing device is integrated in the gas circuit, it shall not be removable nor replaceable by the user.

NOTE This device can provide the functions of adjustment, opening and closing of the gas flow.

Connections shall allow the flexible hose to move freely without risk of coming into contact with a part of the appliance whose temperature rise exceeds 70 K during the test defined in 6.21 when fitted in accordance with the instructions.

5.4.2 Cleaning, maintenance

All parts of the appliance requiring frequent cleaning by the user shall be easily accessible. It shall be possible to put these parts back correctly.

There shall be no sharp corners and edges on the accessible parts of an appliance which could give rise to injury, for example during cleaning.

5.5 Strength and stability

5.5.1 Strength

5.5.1.1 General

The construction of an appliance shall be such that, during normal conditions of use:

— any displacement of parts;

— any distortion;

— any deterioration

likely to impair safe operation will not occur.

5.5.1.2 Stove pan supports

The application of a mass as described in 6.5.1.2 on the pan support shall not cause any breakage or permanent distortion of the pan support exceeding 1 mm.

5.5.1.3 Glass components

The accessible edges of glass components shall not be sharp. They shall withstand the various stresses to which they are subjected during the tests described in this document without damage. In particular they shall withstand the tests described in 6.5.1.3.1 (when they are a part of the appliance) and in 6.5.1.3.2.

5.5.2 Stability

If the appliance is fitted with a foldable support, it shall be possible to lock this in the position of use (for example: stop, locking device).

If the radiant device of a barbecue or a grill can have several positions, a stop shall be provided for each of them.

The stability of an appliance designed to rest on a table or on the ground shall allow safe use on level ground. In addition, the appliance shall not tilt or fall over when it is placed on a slope of 10° and any lid shall not close.

This requirement shall also be met when the appliance is fitted with optional parts (for example: lamp extension posts).

These requirements shall be met under the test conditions described in 6.5.2.

5.6 Soundness of the gas circuit assembly

Holes for screws, pins, etc, intended for the assembly of components shall not open into the space reserved for the gas ways leading to the injector.

The soundness of parts and assemblies connected to the gas circuit shall be ensured by means of metal-to-metal joints or joints with seals (for example, flat-faced joints, O-rings or gaskets), i.e. excluding the use of any product which ensures soundness in the threads. For parts that do not require to be dismantled during normal maintenance, for example taps, the use of thread sealing compounds is permitted.

Removable components or the threaded parts of the gas pipework which may be dismantled during maintenance described in the instructions shall remain sound after five disconnections and re-connections in accordance with the instructions, if necessary after changing a gasket.

Soft solder (see definition in 3.30) shall not be used to ensure the soundness of the gas circuit. However it is permitted for internal connections within the gas circuit when they do not involve soundness.

Under the test conditions defined in 6.6.1, during each of the tests no. One and 2, the leak shall not exceed 0,07 l/h (1 013 mbar, 15 °C). This requirement shall also be met after all the tests on the appliance have been carried out, but before any dismantling of parts subjected to the soundness tests.

After the application of a load to the flexible hose under the conditions defined in 6.6.2, no leak greater than 0,07 l/h (1 013 mbar, 15 °C) shall be recorded.

5.7 Connections

5.7.1 General

Whatever the type of gas cartridge or gas cylinder, when following the instructions, connection of the appliance to the gas cartridge or gas cylinder shall be easy without gas leakage during more than 2 s.

5.7.2 Appliances intended to be directly fitted to the gas cartridge or gas cylinder

5.7.2.1 Appliances fitted to pierceable cartridges

a) design/construction of the appliance shall be such that there is no foreseeable replacement procedure sequence possible which can lead to an unsafe and/or unintended piercing of the cartridge by the user.

NOTE See in informative Annex C examples of solutions given in Figures C.1 to C.7

b) The cartridge holder and the piercing device shall be such that:

1) the piercing is centred in the position provided;

2) soundness is ensured before piercing;

3) after placing the cartridge, it shall not be possible to remove it, instantaneously and unintentionally, without first having to remove the piercing device.

Diagrams showing the correct sequence for the fitting of the cartridge to the appliance shall be marked on the appliance.

c) Concerning the compatibility between ILL (internal leakage limiter as defined in 3.15 of EN 417:2012) and piercing device:

— Piercing device should open and not damage ILL inside the cartridges.

— Piercing device should be such as the needle length penetrates cartridge for a distance between 7 and 9 mm (see Figure 3).

5.7.2.2 Appliances fixed onto cartridges with female valve and threaded centre boss as defined in EN 417 (see Figure 4)

5.7.2.2.1 The female thread of the adaptor (Figure 5) designed to be fixed onto the thread of the centre boss valve is defined as follows:

— 7/16 in - 28 threads Unified Form Special - (see Figure 6);

— major diameter : 10,96 mm minimum;

— effective diameter : 10,66 mm to 10,75 mm;

— minor diameter : 10,20 mm to 10,27 mm.

5.7.2.2.2 The part of the adaptor, with a full thread, shall be 3,10 mm ± 0,1 mm long (see Figure 5 a)).

5.7.2.2.3 The thread shall penetrate fully into the seal groove without reduction in form.

5.7.2.2.4 A valve actuator shall be fixed on the axis of the adaptor in such a way that it allows the drawing off of gas from a full cartridge in accordance with 5.7.1. The valve actuator shall allow the release of gas from the cartridge when the appliance is screwed onto the valve with a minimum torque of 3 Nm.

5.7.2.2.5 The diameter of the valve actuator shall not exceed 2,20 mm if it is solid and shall be between 3,10 mm and 3,15 mm if it includes a gas way as indicated in Figure 4 b). The valve actuator shall be