



# SLOVENSKI STANDARD

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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 a la pression de vapeur des gaz de pétrole liquéfiés

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English Version

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This European Standard was approved by CEN on 28 December 2005.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard 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 Central Secretariat has the same status as the official versions.

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

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## Foreword

This European Standard (EN 521:2006) has been prepared by Technical Committee CEN/TC 181 "Dedicated liquefied petroleum gas appliances", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by August 2006, and conflicting national standards shall be withdrawn at the latest by August 2006.

This European Standard supersedes EN 521:1998.

This European Standard 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.

This European Standard only applies to type testing.

In 2001 the Netherlands raised a formal objection in respect of 5.7.2.1 "appliances fitted to pierceable cartridges" of standard EN 521:1998, on the grounds that it does not fully satisfy the essential requirements of Directive 90/396/EEC.

The decision of the commission was that the standard EN 521:1998 shall continue to confer the presumption of conformity to the relevant provisions of Directive 90/396/EEC.

At the same time, the European mandate M/327 was created, with the aim of taking into account the risks emerged by the particular condition of the replacement of the gas cartridge in portable (camping) gas appliances, in order to improve the intrinsic level of safety with regards to the replacement of the cartridge. The revision of this European Standard is an answer to this mandate M/327.

In the view of answering to this mandate, CEN/TC 181/WG 4 carried out a study on the pierceable appliances, whose conclusions are integrated in this European Standard. The modifications brought to this European Standard are focused on 5.7.2.1, and are the answer to the mandate M/327.

A new informative annex (Annex C) is also included, and supplements the changes brought to paragraph 5.7.2.1. It gives examples of authorized solutions, which specify the connecting requirements regarding the replacement of pierceable cartridges.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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

This European Standard 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 container. It also defines test methods and the requirements for marking and the information to be given in the instructions.

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

This European Standard applies to various types of portable appliances burning liquefied petroleum gases at vapour pressure and designed to be used with (non refillable) cartridges as complying with EN 417 or any types of gas cylinders other than cartridges. For example the following types of appliances are covered:

a) cooking appliances (hotplates, grills, barbecues...).

This European Standard does not cover barbecues that can be used indoors;

b) lighting appliances;

c) heating appliances.

This European Standard only applies to appliances with a maximum heat input of up to 3 kW ( $H_s$ ) for outdoor use only;

d) blowlamps.

This European Standard only applies to blowlamps without a flexible hose;

e) laboratory burners.

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

This European Standard only applies to type examination.

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

This European Standard covers neither appliances supplied with LPG in the liquid phase nor those incorporating a fixed gas reservoir which may or may not be refilled by the user. This European Standard does not cover gas containers or flexible hose.

It does not apply to smokers' lighters covered by EN ISO 9994.

Requirements for rational use of energy have been included for hotplate 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 referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 30-1-1, *Domestic cooking appliances burning gas fuel — Part 1-1: Safety — General*

EN 125, *Flame supervision devices for gas burning appliances — Thermo-electric flame supervision devices*

EN 549, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

EN 60335-1:2002, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1:2001, modified)*

ISO 301, *Zinc alloy ingots intended for casting*

## 3 Terms and definitions

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

### 3.1

#### **cooking device**

devices supplied with the appliance designed to hold or receive the food to be cooked

NOTE grid, turnspit, baking tray etc.

### 3.2

#### **detachable**

possible to dismantle without using a tool

### 3.3

#### **vapour pressure appliance**

pressure at the inlet of the appliance is equal to the pressure in the gas container.

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.

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

### 3.4

#### **appliance with fixed integral container**

appliance incorporating a gas container which is not intended to be disconnected for refilling

NOTE See Clause 1

### 3.5

#### **auxiliary equipment**

control and device that can affect the safety of operation of a gas appliance

NOTE for example valves, flame supervision devices

### 3.6

#### **barbecue**

appliance designed principally to roast and/or grill food. Cooking is carried out by radiant heat and, possibly, by convection

### 3.7

#### **locking of an adjuster**

action performed by the manufacturer or by an installer, in its adjustment position by any means

NOTE e.g. a screw etc.

### 3.8

#### **soft solder**

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

### 3.9

#### **turnspit**

cooking device enabling the rotation of the food to be roasted.

NOTE The rotation can be manual or using a mechanical or electrical motor (battery)

### 3.10

#### **burner**

component that allows the gas to burn.

- ignition burner: small burner whose flame is designed to light a main burner. It is referred to as "pilot" in this European Standard;
- main burner: burner designed to fulfil a thermal function of the appliance. It is referred to as "burner" in this European Standard

### 3.11

#### **gas cartridge**

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

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

### 3.12

#### **heat input**

product of the mass rate and the gross calorific value of the gas brought to the same reference conditions.

NOTE It is expressed in kilowatts. The nominal heat input of a burner is the value of the heat input declared by the manufacturer

### 3.13

#### **flame lift**

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

### 3.14

#### **removable**

removal only possible with a tool

### 3.15

#### **ignition device**

device to ignite one or more burners directly or indirectly

**3.16****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

**3.17****grid**

cooking device designed to hold the food to be cooked.

NOTE Its useful component(s) can be rigid or flexible

**3.18****grid with flexible useful components**

<wallet grid>

made up of two jointed components enabling tight gripping of the food to be cooked.

NOTE 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

**3.19****griddle**

part of a hotplate 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

**3.20****radiant grill**

appliance or part of an appliance allowing cooking by radiation from a surface brought to a high temperature

**3.21****pan support**

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

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**3.22****glass panel**

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

**3.23****injector**

component part that admits the gas into an aerated burner

NOTE An injector is said to be calibrated when the section of the outlet orifice is fixed.

**3.24****control handle**

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

NOTE e.g. a tap, thermostat etc.

**3.25****means of sealing**

static or dynamic device designed to ensure soundness

NOTE for example: flat-faced joints, O-ring or conical joints, diaphragms, grease, pastes, putties etc.

**3.26****gripping area**

outside part of the appliance designed to be handled in normal use

**3.27**

**primary air adjuster**

device allowing the primary aeration rate of a burner to be set to a predetermined value according to the supply conditions.

NOTE The action consisting in operating this device is termed "primary air adjustment"

**3.28**

**gas rate adjuster**

device allowing the gas rate to a burner to be set at a predetermined value according to the supply conditions.

NOTE 1 The adjustment can be continuous (adjustment screw) or discontinuous (change of calibrated orifices).

NOTE 2 The action of changing the setting of this device is termed the "adjustment of the gas rate"

**3.29**

**useful part of a cooking device**

part of the device in contact with food during cooking

**3.30**

**calorific value**

quantity of heat produced by complete combustion at a constant pressure of 1 013,25 mbar, of unit mass of the gas, the constituents of the gas mixture being at 0 °C or 15 °C, 1 013,25 mbar and the products of combustion being brought to the same conditions.

NOTE 1 In this European Standard, the gross calorific value (symbol  $H_g$ ) is used, that is to say that the water produced by combustion is assumed to be condensed.

NOTE 2 The calorific value is expressed in units of energy per unit of mass of dry gas. It is expressed in megajoules per kilogramme (MJ/kg)

**3.31**

**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

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**3.32**

**hotplate**

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

**3.33**

**hotplate with grill**

cooking appliance consisting of a hotplate and a radiant grill

**3.34**

**light back**

phenomenon characterized by the return of the flame inside the body of the burner

**3.35**

**tap**

device designed to isolate a burner from the gas supply pipework and possibly to adjust its rate during use

**3.36**

**sealing of an adjuster**

means of locking an adjuster, such that any attempt to change the adjustment causes the breaking of the sealing device or sealing material and makes the interference with the adjuster apparent.

NOTE 1 The adjuster is said to be sealed in the adjusted position

NOTE 2 A factory sealed adjuster is considered as non existent

### 3.37

#### stabilizer

device which is integral with an appliance or which can be fixed to it designed to increase stability

### 3.38

#### flame stability

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

### 3.39

#### 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

### 3.40

#### 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

## 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.

### 5.2 Conversion to different gases

Unless necessary so as to adjust the flame for various types of work (for example: tools such as blow lamps, laboratory burners), the appliances shall not incorporate any adjuster (other than controlling the gas flow) intended to be adjusted by the user.

### 5.3 Materials

Non-metallic materials used as radiant elements in appliances (for example volcanic rocks, refractory blocks) shall be of a quality suitable to their use. The appliance manufacturer shall give the identification of the element to be used in the user instructions.

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 performance.

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.

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.

The nature and finish of materials likely to be in contact with food shall be such that they cannot contaminate or affect the food.

Zinc alloys shall not be used in contact with gas unless they are of ZnAl4 or ZnAl4Cu in accordance with ISO 301 and provided that such parts do not exceed a temperature above 80 °C under the test conditions in 6.21.

With the exception of seals, parts in contact with gas shall not be made of plastics.

### 5.4 Assembly, cleaning and maintenance

#### 5.4.1 Assembly

The entire appliance gas circuit, including the injector, shall be assembled by the manufacturer.

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 (see 3.3), it shall not be removable nor replaceable by the user. This device may provide the functions of adjustment, opening and closing of the gas flow.

The appliance gas circuit shall not incorporate a reservoir placed between the appliance gas inlet connection and the valves, intended to receive part of the gas in the liquid phase contained in the supply vessel during connection.

#### 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 Hotplate 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 European Standard 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.

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