BRITISH STANDARD

BS EN 12778:2002

Incorporating Corrigendum No. 1 and Amendment No. 1

Cookware — Pressure cookers for domestic use

The European Standard EN 12778:2002, with the incorporation of amendment A1:2005, has the status of a British Standard

ICS 97.040.20; 97.040.60

BSI British Standards

National foreword

This British Standard is the official English language version of EN 12778:2002, including Corrigendum December 2003 and amendment A1:2005. It supersedes BS 1746:1987 which is withdrawn.

The start and finish of text introduced or altered by CEN amendment is indicated in the text by tags [A1] 〈A1]. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by [A1] 〈A1].

The UK participation in its preparation was entrusted to Technical Committee CW/9, Cooking and catering containers, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

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This British Standard, having been prepared under the direction of the Consumer Products and Services Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 5 December 2002

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This European Standard was approved by CEN on 10 October 2002. Amendment A1 was approved by CEN on 14 April 2005.

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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

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Contents

Foreword

This document EN 12778:2002 has been prepared by Technical Committee CEN /TC 194 "Utensils in contact with food", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by May 2003, and conflicting national standards shall be withdrawn at the latest by May 2003.

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.

This document includes a Bibliography.

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

Foreword to amendment A1

This document (EN 12778:2002/A1:2005) has been prepared by Technical Committee CEN/TC 194 “Utensils in contact with food”, the secretariat of which is held by BSI.

This Amendment to the European Standard EN 12778:2002 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2005, and conflicting national standards shall be withdrawn at the latest by December 2005.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This European Standard defines terms, establishes manufacturing, safety and functional requirements and corresponding tests and specifies data for marking, labelling and instructions for use, for pressure cookers.

This standard is applicable to portable pressure cookers for domestic use, with gross volume up to 25 l, with working pressure over 4 kPa and less than 150 kPa, with either integrated or independent heating.

NOTE All pressures mentioned in this text are related to atmospheric pressure.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

EN 60335-1, *Safety of household and similar electrical appliances - Part 1: General requirements (IEC 60335-1:1991, modified)*.

EN 60335-2-15, *Safety of household and similar electrical appliances - Part 2: Particular requirements for appliances for heating liquids (IEC 60335-2-15:1995)*.

EN 12983-1:2000, *Cookware - Domestic cookware for use on top of a stove, cooker or hob — Part 1: General requirements.*

3 Terms and definitions

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

3.1
pressure cooker
cookware equipped with a removable lid being able to be fitted, specifically for the purpose of allowing cooking of foodstuffs by water and/or steam under pressure. It can be used on a stovetop or can be equipped with an integrated heating source

3.2
capacity
volume of water held when the pressure cooker, without the lid, is filled to the brim while standing on a level surface

3.3
gross volume
internal volume of the pressure cooker limited by the body and the lid

3.4
usable capacity
two thirds of the capacity

3.5
independent heating
heat source not constituting an integral part of the pressure cooker

3.6
integrated heating
heat source which constitutes an integral part of the pressure cooker

3.7
working pressure
actual pressure(s) at which cooking takes place

3.8
control pressure
pressure(s) declared by the manufacturer or supplier, at which the pressure control device works

3.9
maximum allowable pressure PS
maximum pressure for which the pressure cooker is designed, specified by the manufacturer

3.10
pressure control device
device which stabilises the pressure inside the pressure cooker during use

3.11
safety device
device which prevents the pressure cooker from exceeding the safety pressure

3.12
pressure indicator
visual and/or acoustic device indicating that there is a pressure inside the cooker

NOTE It can be one of the four types specified in 4.5.3.

3.13
safe opening system
system manual or automatic intended to prevent the pressure cooker from opening when it is under pressure

NOTE These systems can be used independently or coupled with the decompression system.

3.13.1
manual system
system actuated manually or automatically during or after the closing operation, intended to prevent the pressure cooker opening until the user unlocks the system with a manual action distinct from the opening operation, or carries out an operation contained in the sequence of events normally carried out to open the pressure cooker

3.13.2
automatic system
system which automatically prevents the pressure cooker from being opened if the internal pressure is higher than a certain value. This system is automatically unlocked, without any user's action, when the internal pressure is equal to or below this value, and before any opening operation can be effected (see 4.5.6)

3.14
decompression device
device intended to reduce, by its own action, the internal pressure of the pressure cooker, by a substantial emission of steam accumulated in the cooker. There are two types of decompression device: coupled and uncoupled

3.14.1
coupled device
decompression device, coupled to the safe opening system of the pressure cooker. This device, as long as it is not activated, automatically prevents the opening of the pressure cooker

3.14.2
uncoupled device
decompression device independent of the safe opening system of the pressure cooker, activated by a manual action, distinct from the opening operation

3.15
closed pressure cooker
pressure cooker in which an internal pressure higher than 4 kPa can be reached

3.16
opened pressure cooker
pressure cooker in which no device prevents the separation of the lid from the body

3.17
opening and closing device
all devices which affect the opening and closing of the appliance and its pressure tightness

3.18
progressive opening
system of opening where depressurisation of the pressure cooker can be controlled by the user during the opening operation

4 Requirements

4.1 General

Test and check methods relating to each of the following paragraphs are described in the corresponding paragraphs of clause 5.

4.2 Material

Materials used for the construction of the pressure cooker:

— shall have mechanical characteristics suitable for its manufacture and use;

— shall have adequate chemical resistance. They shall not be damaged under the effect of water, food and domestic cleaning products, in any way which may adversely affect the pressure cooker's operation or safety;

— shall not be sensitive to ageing or corrosion during their expected lifetime, to any extent that may adversely affect the pressure cooker's operation or safety.

The pressure cooker shall be made of materials of a type and purity that, under normal conditions of use, present no toxic hazards nor in any way affect the organoleptic qualities of food prepared in it.

Coatings shall comply with the requirements of EN 12983-1.

NOTE All the requirements for materials to comply with directive 97/23/CE are not addressed in this European Standard.

4.3 Manufacturing characteristics

4.3.1 The pressure cooker and its devices and accessories shall be designed and constructed so that all they require in the way of maintenance in addition to the maintenance specified by the manufacturer or supplier, is simple cleaning carried out without using special instruments.

Particular care shall be taken over the finish of inside surfaces so that cleaning can be carried out thoroughly and easily.

Surfaces shall not present any defects like blisters, blowholes, or cracks which could collect dirt.

No part of the pressure cooker shall have sharp edges that could injure the user.

4.3.2 The outside base of the pressure cooker shall not become convex.

This requirement is checked:

— at room temperature (23 °C ± 5 °C);

— when hot before and after the ageing of the bottom in accordance with 5.3.2.2;

— at declared control pressures during test 5.5.2.3.

The concavity of the bottom of the pressure cooker at room temperature, before and after ageing of the bottom as described in 5.3.2. shall be maximum 6 ‰ of the diameter of the bottom measured at room temperature.

The maximum 6 ‰ concavity requirement is not applicable to pressure cookers which are exclusively for use on exposed flame heat sources and/or exclusively for use on induction heat sources, which shall be marked as indicated in clause 6 nor to pressure cookers with an integrated heat system.

The diameter of the bottom of the pressure cooker shall fulfil the requirements of 6.2.3 of EN 12983-1:2000.

4.3.3 Lids shall be easy to set and safe to use when the pressure cooker is used in accordance with the manufacturer's instructions. The area of the pressure cooker's external closure system, or closing ring, shall be shaped so as to prevent any jets of steam released from directly hitting the user or the handles.

4.3.4 Pressure control devices and decompression devices shall be easy to clean and they shall be shaped so that any obstruction is clearly visible after the removal of demountable parts.

Steam exhaust devices shall be designed and positioned so as to prevent the obstruction of the steam escape orifices, in normal cooking use.

4.3.5 Capacity, measured as described in 5.3.5, shall be not less than the claimed capacity.

4.4 Lifting grips

4.4.1 The body and the lid of the cooker shall be equipped with secure, solid and durable lifting grips.

The body of the pressure cooker shall be equipped in such a manner that secure gripping and handling with two hands is possible.

The lid shall have at least one lifting grip.

The lifting grips, attached to the body of the pressure cooker shall be easy to use and shall be firmly attached so that they do not come loose. They shall not affect the stability of the pressure cooker, even while it is empty. They shall be positioned above the centre of gravity of the pressure cooker with its lid, when filled with water to its capacity. They shall fulfil the requirements of 7.2 to 7.6 of EN 12983-1:2000.

4.4.2 Lifting grips shall be designed in such a way that their temperature, when measured in accordance with 5.4.2 is not higher that the following values:

— metal 55 °C;

— plastics 70 °C;

— wood 89 °C;

— ceramic 66 °C.

If the values exceed these limits, it shall be indicated in the instructions for use that protections are required in order to ensure a safe handling of the pressure cooker.

Using a spherical probe 14 mm in diameter, it shall not be possible to touch any metal part contained within the insulated portion of the lifting grips which exceeds 55 °C.

4.5 Control and safety devices

4.5.1 General

The pressure cooker shall be equipped with the following devices:

— a pressure control device;

— a pressure indicator;

— a safety device;

— a decompression device;

— a safe opening system.

NOTE The decompression device can be either independent or integrated in one of the other above devices.

The pressure control device shall be separate from safety device.

4.5.2 Pressure control device

4.5.2.1 When the pressure control device has been in operation, there shall be a visual and/or acoustic signal, showing that the working pressure is reached or exceeded (type 2 indicator).

4.5.2.2 If necessary, the pressure control device shall be able to be easily disassembled for purposes of cleaning, inspection or replacement.

If parts can be removed while the pressure cooker is under pressure, this shall not present any hazard for the user.

If an incorrect fitting of the device is possible, so that the safety function is impaired, the pressure cooker shall not build up a pressure higher than 4 kPa (0,04 bar).

4.5.2.3 The pressure control device shall be able to hold the pressure(s) corresponding to the value(s) of control pressure(s) declared by the manufacturer for this device with a tolerance of ± 20 % (with a maximum of ± 20 kPa). However, minimum and maximum pressures obtainable when the device is in operation, shall never be less than 4 kPa (0,04 bar) or greater than 150 kPa (1,5 bar) respectively.

4.5.2.4 Weight valves shall be secured to the lid so that they cannot fall off when the pressure cooker is upside down.

4.5.2.5 In order to avoid the obstruction of the holes by food, the steam inlet of the pressure control device shall be designed either:

— with one circular hole without any steam inlet tube, the diameter of which is more than or equal to 3 mm or;

— with at least two holes with steam inlets in differently directed planes.

4.5.2.6 It shall not be possible for the steam released during operation of the pressure control device to directly reach the user, in a way that could cause injury when manipulating the appliance.

4.5.3 Pressure indicator

The pressure indicator shall be visual and/or acoustic of one of the following types:

1 - indicating the pressure progression from 4 kPa;

2 - indicating the control pressure;

3 - indicating the presence of pressure starting at a value equal to or below 4 kPa;

4 - indicating the pressure progression, functionally separate from the pressure control device.

The pressure control device is also a type 2 indicator (see 4.5.2.1).

4.5.4 Safety device

4.5.4.1 General

The elastic deformation of the body or the lid of pressure cooker shall not be considered as a safely device.

The safety device shall be designed so that no direct steam jet can hit the user manipulating the appliance or the lifting grips, nor extinguish the gas burner flame adjusted to its minimum.

The safety device can consist of gasket deformation or extrusion, if the gasket complies with the tests according to 5.5.4.3.

Detachable parts of the safety device shall be designed in such a way that, if a wrong assembly of the device is possible, the pressure cooker cannot reach a pressure higher than the maximum permissible pressure PS measured when the device is normally fitted.

Whenever the pressure cooker is equipped with several safety devices, the requirement of non extinction of the flame only applies to the first safety device which has operated.

There shall be no movement of the pressure cooker during the operation of the safety device.

A self-destructing device shall be replaceable with a new one after each operation.

The manufacture of the device shall ensure that it is not possible for the device to throw off fragments.

All the above requirements are valid only for the safety device which operated first during test 5.5.4.

4.5.4.2 Working pressure of the safety device

The working pressure of the safety device shall be greater than the highest measured control pressure (as per 5.5.2.3) and shall not be greater than the maximum permissible pressure PS.

However, a momentary pressure surge limited to 10 % of PS is acceptable, but the pressure of the safety declared device shall not in any case be greater than 300 kPa (3,0 bars).

4.5.5 Decompression device

The decompression device can be coupled or uncoupled with the safe opening system of the pressure cooker.

It shall reduce the internal pressure of the pressure cooker by discharging a substantial part of the steam accumulated in the cooker while in operation, without any hazard for the user who is actuating the device

4.5.6 Safety at the opening

It is compulsory that the manual release of the system precedes any other operation which will allow opening of the pressure cooker.

Pressure cookers shall fulfil the specific requirements of the opening tests in Table 1 according to the type of pressure cooker and its equipment (e.g. decompression device, type of pressure indicator).

For pressure cookers with a non progressive opening, the internal pressure at the opening shall be less than or equal to 4 kPa.

When the safe opening system is an automatic one, it shall prevent the pressure cooker from being opened if the internal pressure is higher than 4 kPa.

Water projection is tolerated under the conditions defined in 5.5.6.2, but the lid shall not be projected during the opening test.

If parts of the safe opening system which are detachable by the user, have been incorrectly fitted, safety on opening shall be maintained, or it shall not be possible for the pressure cooker to reach a pressure greater than 4 kPa.

Table 1

Type of pressure cooker		Tests to be done[a]			Type of opening
		Decompression device	Type of pressure indicator		
			1,3 and 4	2	
Outside lid	Bayonets	with coupled device	A1	A2	Non progressive
		with uncoupled device or without device	A2	A2	
	Inside or outside segments or clamps	with coupled device	C1 or D1[b]	C2 or D2[b]	Non progressive
		with uncoupled device or without device	C2 or D2[b]	C2 or D2[b]	
	Clamp and screw	with coupled device	E	E	Progressive
		with uncoupled device or without device			
Inside lid	Clamp, cam and lever or knob, with or without spring rigid lid	with coupled device	B1	B1	Non progressive
		with uncoupled device or without device			
	Clamp, cam and with or without spring flexible lid	with coupled device	B1	B2	Non progressive
		with uncoupled device or without device	B2	B2	
	Long straight handle without clamp	with coupled device	A2 + B1	A2 + B2	Non progressive
		with uncoupled device or without device	A2 + B2	A2 + B2	Non progressive

[a] Letters from A to E indicate tests described in 5.5.6.

[b] Type C when opening requires the application of a torque.
Type D when opening requires the application of a force.

4.5.7 Mechanical resistance of safe opening systems

Safe opening systems shall not undergo any deformation which adversely affects their function when tested as described in 5.5.7.

4.6 Closing of the pressure cooker

When the pressure cooker is closed, it shall meet the requirements of 4.5.6 and 4.7, in the most unfavourable conditions (for example, with the lid incorrectly fitted).

4.7 Resistance to pressure

4.7.1 Resistance to deformation of the body and the lid

The body and the lid of the pressure cooker shall not undergo any permanent deformation which may impair their operation and safety under the test conditions defined in 5.7.1.

After testing, the pressure cooker shall comply with the requirements of 4.5.

A flattening out of the bottom surface is permitted in accordance with the provisions of 4.3.2.

4.7.2 Resistance to destruction of the body and the lid

When applying the pressure under the conditions specified in 5.7.2 and up to the specified pressure limit, the pressure cooker may undergo deformation but shall not show any incipient fracture nor any crack.

All connection points between the body and the lid shall be maintained.

If there is leakage, it shall occur without fracture.

The separation of an added base which may be present to promote heat conduction and distribution is acceptable.

4.8 Pressure cookers with integral heating device

Pressure cookers with integral heating devices shall conform to the electrical or gas safety requirements of the followings standards:

— EN 60335-1 and EN 60335-2-15 for integrated electrical heating equipment;

— EN 30-1-1 for integrated gas heating equipment.

5 Tests

5.1 General

The following tests shall be carried out on three pressure cookers of the same type and model, in the indicated order:

1 - pressure control device (5.5.2);

2 - safety device (5.5.4);

3 - safety at the opening (5.5.6);

4 - decompression device (5.5.5);

5 - safe opening system (5.5.7);

6 - resistance to deformation (5.7.1);

7 - resistance to destruction (5.7.2).

Carry out on the same pressure cooker, ageing of the bottom, ageing of the gasket and temperature measurements of the lifting grips.

5.2 Tests and measurements relating to materials and coatings

Check materials and coating as specified in clauses 4 and 8 of EN 12983-1:2000.

5.3 Tests and measurements relating to manufacturing characteristics

5.3.1 Maintenance and surface finish

Carry out a visual examination.

5.3.2 Deviation of the bottom

5.3.2.1 General

Measure the concavity of the base of the body, as described in 5.3.2.3 at room temperature; before and after the 25 cycles described in 5.3.2.2.

Check that there is no convexity:

— when hot, before and after the 25 cycles described in 5.3.2.2, the body containing 30 mm of a suitable oil (e.g. silicone oil) at temperature of (220 + 5) °C;

— at declared control pressures, during test 5.5.2.3.

5.3.2.2 Ageing of the bottom

Centre the empty and dry body of the pressure cooker, without the lid, over a heat source with the characteristics specified:

— in Table 3, for pressure cookers exclusively for use on exposed flame heat sources and/or on induction heat source;

— in Table 2, for other pressure cookers.

For pressure cookers with oval bottoms use the heat source corresponding to the smaller diameter of the ellipse.

Heat to a temperature of (220 ± 5) °C, measured inside at the hottest point, previously situated.

Remove the body of the pressure cooker from the heat source and cool down by complete immersion in water until its temperature reaches 15 °C to 20 °C.

Repeat this operation 25 times.

Table 2 — Solid plate characteristics

Declared diameter (D) of the base of the pressure cooker mm	Nominal power kW	Hotplate diameter mm
$D \leq 175$	1	145
$175 < D \leq 215$	1,5	180
$D > 215$	2	220

Table 3 — Gas burner characteristics

Declared diameter (D) of the base of the pressure cooker mm	Nominal power kW	Hotplate diameter mm
$D \leq 200$	1,5	≅ 60
$200 < D \leq 220$	2,3	≅ 75
$D > 220$	3	≅ 90

5.3.2.3 Measurement

Carry out the measurement using an appropriate tool:

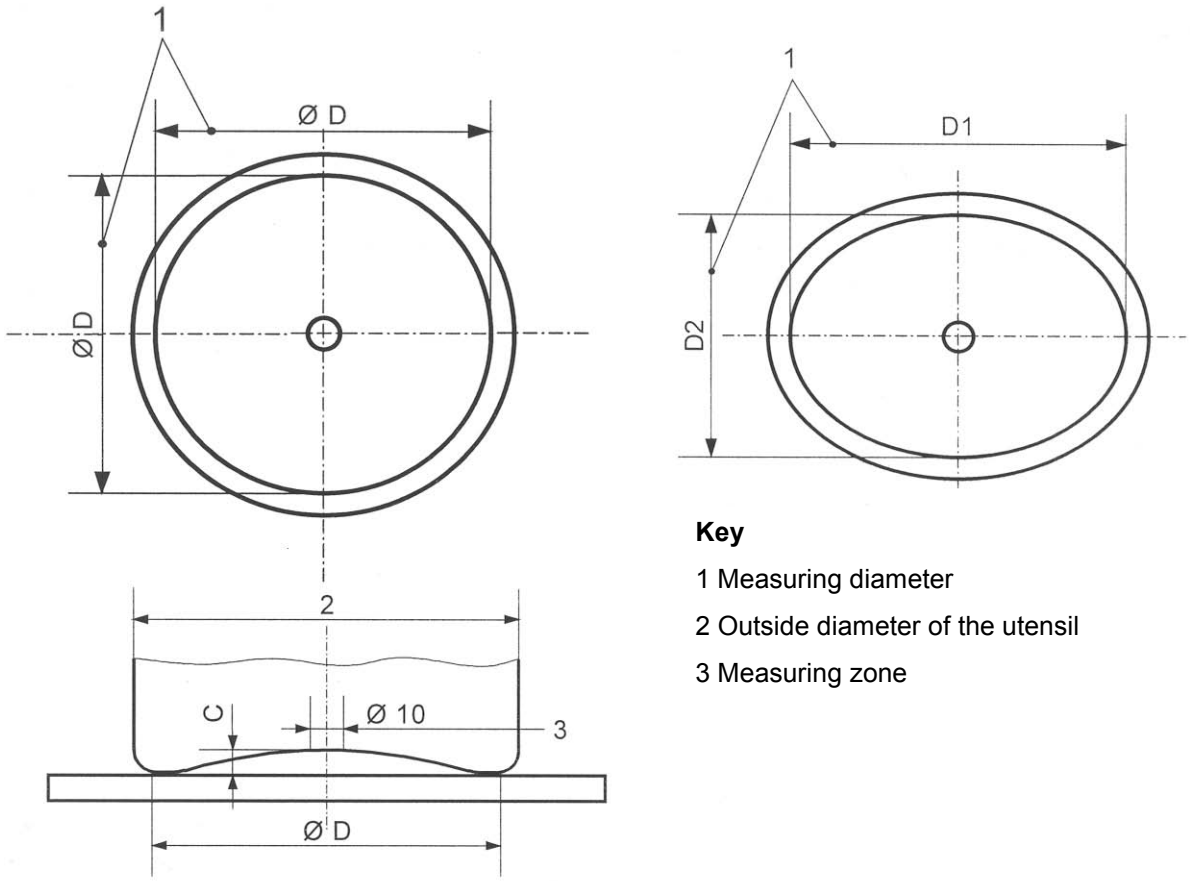
- for pressure cookers with a circular bottom: in two perpendicular diameters;

- for pressure cookers with an oval bottom: on the longest and shortest diameters of the ellipse.

Record the flatness defect at the four intersection points between these diameters and the 10 mm diameter circle in the centre of the bottom.

Calculate the average C of the four measurements.

The concavity C shall not exceed the value stated in 4.3.2, after disregarding any machining, marking or stamping of the bottom.



Key

1 Measuring diameter

2 Outside diameter of the utensil

3 Measuring zone

Figure 1 — Measurement of concavity

5.3.3 Design of the closing ring

Visually check during the operating test that steam jet does not hit the user or the handles directly.

5.3.4 Cleaning of the pressure control devices and decompression devices

Remove the demountable parts of the pressure control devices and decompression devices according to the manufacturer's instructions and check whether a possible obstruction can be observed visually.

5.3.5 Measurement of capacity

The measured capacity is determined by the maximal quantity of water that can be contained by the body, when placed on a flat and horizontal surface.

5.4 Tests and measurements relating to lifting grips

5.4.1 Physical and mechanical tests

Lifting grips shall conform to requirements of 4.4.1, being tested as indicated in EN 12983-1:2000 (annexes A, B, C, D and E).

5.4.2 Temperatures measurement

Determine temperature rises by means of appropriate sensors (e.g. fine-wire thermocouples) chosen and positioned so that they have the minimum effect on the temperature of the part under test.

Fix the sensors permanently at the place marked with a point in Figure 2.

Fill the pressure cooker with water to one half of its capacity. Close the pressure cooker in accordance with the manufacturer's instructions.

When the pressure cooker is designed to meet different working pressures, carry out the test at the highest pressure.

Put the pressure cooker in the middle of a gas burner of a domestic hob.

Place the long handles or loop handles in a position of normal use above the cooking surface without any part of the supporting bars acting as a screen.

The hob surroundings shall be in accordance with the following characteristics (see Figure 3):

— the hob shall be set up 75 mm far from the wall;

— the side screen shall be 500 mm from the hob and minimum high of 500 mm;

— the height from the ceiling (test room) shall be a minimum of 2,50 m;

— there shall be no mechanical air extractors.

Measure the room temperature at the place indicated on Figure 3, point 3. It shall be 20 °C ± 5 °C.

The gas burner shall have the following characteristics:

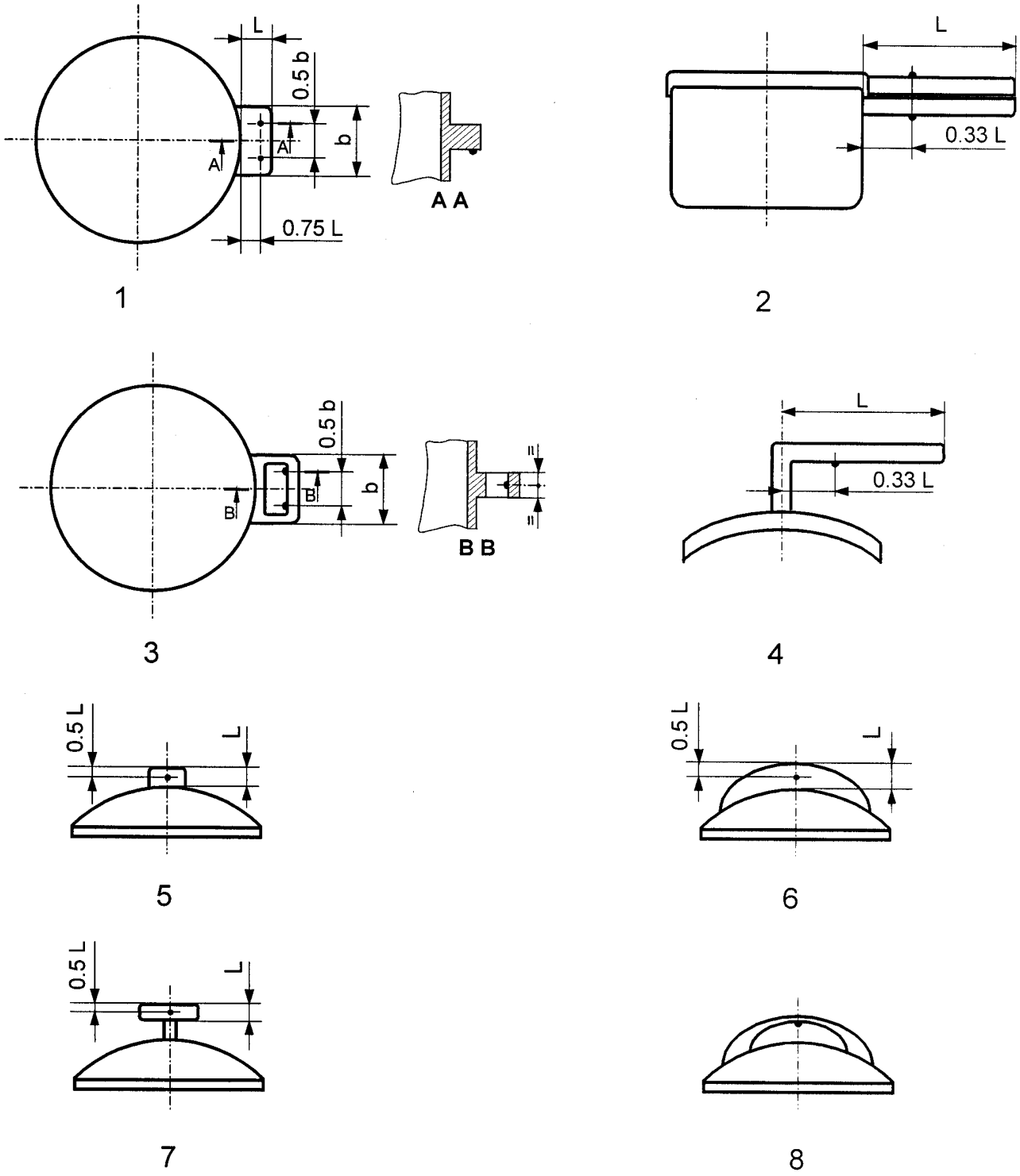
— domestic hob conforming to EN 30-1-1;

— butane gas G30 between 28 and 30 mb;

— power and diameter of the burner as specified in Table 3 (see 5.3.2.2).

Start the test with the burner adjusted to its nominal input.

As soon as the highest working pressure is reached, reduce the heat source to the minimum value necessary to maintain this pressure for 30 min. After this time, cut the heat source and after one minute record the temperature with an accuracy of ± 1 °C.

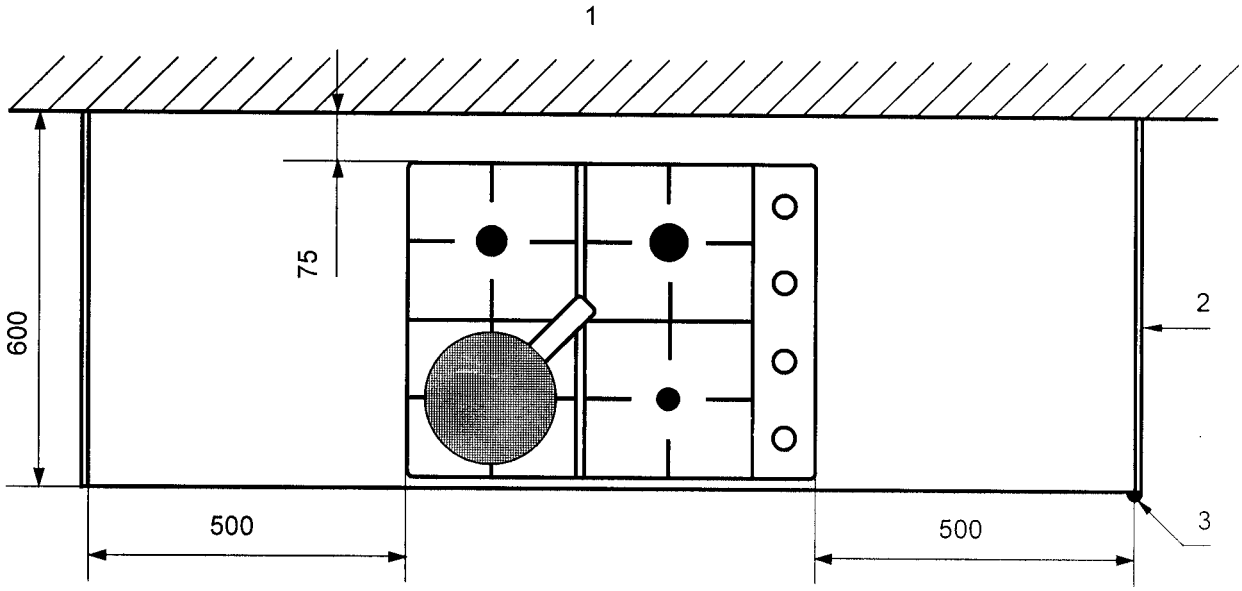


Key

1 Solid flange handgrip
2 Handle
3 Loop handgrip
4 Lever
5 Knobs
6 Full arch
7 Handwheel or knob
8 Hollow arch

Figure 2 — Location of thermocouples

Dimensions in millimetres



Key

1 Wall of 500 mm high minimum.

2 Side screen of 500 mm high minimum.

3 Measure of ambient temperature at 250 mm above the cooking surface on one of the screen sides.

NOTE Height under the ceiling of 2,5 m minimum.

Figure 3 — Hob surroundings

5.5 Tests on control and safety devices

5.5.1 General

The following devices shall be tested:

— pressure control device;

— pressure indicator;

— safety device;

— decompression device;

— safe opening system.

5.5.2 Verification of pressure control device

5.5.2.1 Signal

Check the existence of a visual and/or acoustic signal during the operating test.

5.5.2.2 Incorrect fitting

Look for the various possibilities of incorrect fitting of the device and check that the requirement of 4.5.2.2 is met.

5.5.2.3 Control pressures check

Carry out the following procedure:

— equip the pressure cooker with a pressure measuring device;

— fill the cooker with water up to 50 % of the capacity specified by the manufacturer;

— place the cooker on a heating source:

  — as described in Table 3 for pressure cookers exclusively for use on exposed flame heat source and/or on induction heat source;

  — as described in Table 2 for the other pressure cookers;

— heat until the control pressure given by the manufacturer has been reached, then observe the operation of the control device for 5 min;

— check that the pressure is within the tolerance limits specified in 4.5.2.3 with a maximum uncertainty on the measurement of 10 %;

— carry out the verification for each level of control pressure;

— repeat the test three times on the same device.

5.5.2.4 Check of direct weight valves

Turn the pressure cooker so that the weight valve is placed vertically downwards and check that the weight cannot be lost.

5.5.2.5 Inlets of steam

Visually check and measure inlets of steam.

5.5.2.6 Steam jet

Check during the operating test that the requirement of 4.5.2.6 is fulfilled.

5.5.3 Verification of pressure indicator

Check the indications given by the pressure indicator during the operating tests.

5.5.4 Verifications of safety device

5.5.4.1 General

Check for any wrongly assembled parts of the safety device and check that the requirement of 4.5.4.1 is met.

During the measurement of the safety pressure (following 5.5.4.2), check that the steam jet does not directly hit the operator or the lifting grips and that there is no significant movement of the pressure cooker.

Verify that the safety device is separate from the pressure control device.

5.5.4.2 Measurement of the working pressure of the safety device

Carry out the following procedures:

— equip the pressure cooker with a pressure measuring device;

— fill the cooker with water up to 50 % of the capacity specified by the manufacturer;

— block the pressure control device(s);

— place the cooker on a heating source as described in Table 3;

— continue heating after the actuation of the safety device until the pressure stabilizes, and for at least 5 min starting from the release;

— record the pressure and check that the requirements of 4.5.4.2 are met and that the flame has not been extinguished;

— record the maximum pressure reached;

— repeat the test three times on the same cooker with the same initial conditions of temperature and water volume (after replacing the device if it is self-destructing).

Take for the calculation the maximum value obtained during these three tests.

5.5.4.3 Gasket ageing test

This test is to be carried out on the gasket when it is part of the cooker's safety device, following 4.5.4.1.

It consists in checking that the device operates, before and after ageing of the gasket, at a pressure lower than or equal to 300 kPa.

Carry out the test on five new gaskets taken at random from the same batch.

1) Preparation

— mark each of the five gaskets with a reference number;

— mark on each gasket its position in the lid during the first operating test of the safety device (before ageing).

2) First operating test (before ageing)

— make the necessary arrangements to carry out the test safely;

— block the pressure control device(s);

— place the gasket in the lid in accordance with the mark previously made;

— fill the cooker with water up to 50 % of its capacity;

— close the cooker and heat it on a heating source as described in Table 3;

— record the working pressure of the device.

3) Gasket ageing

— place the same gasket in the lid with the marked section moved 90° from its initial position;

— fill the cooker with water up to 50% of its capacity;

— close the cooker and heat it on a convenient heating source until the maximum working pressure is reached;

— maintain this pressure until the end of the heating time;

— heat for 8 h and leave to cool off for 16 h;

— repeat this cycle 9 times;

— leave the lid on the pressure cooker during cooling periods;

— the cooker shall only be opened if it is necessary to add water;

— the cooker is closed again immediately after the water level has been restored;

— at the end of the 9 cycles open the cooker, turn the lid over and leave undisturbed for 7 days.

4) Second operating test (after ageing)

Repeat the procedure described in 5.5.4.3 and 5.5.4.2, placing the gasket in the lid in such a way that the marked section is at 180° from its position during the first operating test.

5.5.5 Verification of decompression device

Actuate the decompression device in order to verify that it conforms to the requirement of 4.5.5.

5.5.6 Opening tests

5.5.6.1 Preparation and procedure

For pressure cookers to which A1 and A2 tests are applicable, use a new gasket prepared as follows:

— boil it for two hours in tap water;

— dry and let it cool down to room temperature;

— put it in the lid.

For all pressure cookers, carry out the following procedure:

— open and close the pressure cooker three times at room temperature;

— fill the pressure cooker up to 50 % of its capacity with distilled water and boil this water for 15 min in the open body;

— close the pressure cooker following the requirements of 4.6 and connect it to a pressure and motion of the lid measurement system with XY recorder, with a response time less than or equal to 2 ms;

— put the pressure cooker on a heat source and increase the pressure up to the highest working pressure which can be reached;

— then, put the cooker under pressure on a testing equipment where the body can be fixed in such a way the body doesn't become deflected and the resistance to opening is unchanged;

— apply forces or torques specified in 5.5.6.2, continuously and in the way which makes easier the opening of the pressure cooker;

NOTE A torque is the application of two equal, parallel and diametrically opposite forces.

For type A tests (A1 and A2) and type B tests (B1 - first test and B2 - first test), apply the force specified in 5.5.6.2, at 15 mm from the end of the handle or lever if its length is greater than 50 mm, otherwise at its end.

For type B tests (B1 - second test and B2 - second test), apply the force specified in 5.5.6.2 vertically downward on the edge of the lid.

For types C, D and E tests, apply forces or torques in the order specified in 5.5.6.2.

Carry out types A, B, C and D tests the manual safe opening system, if there is any fitted onto the pressure cooker, being open.

Repeat tests three times with the same pressure cooker.

For pressure cookers to which type A tests are applicable, turn the gasket at 120 degrees after each test.

Look for any possibility of wrongly assembly of the safe opening system by the user and check that the requirements of 4.5.6 are still met.

5.5.6.2 Tests

Type A tests

A1: apply a force of 65 N as described in 5.5.6.1.

A2: apply a force of 100 N as described in 5.5.6.1.

Type B tests

B1 - first test: apply a force of 65 N on the handle or lever as described in 5.5.6.1.

B1 - second test: apply a force of 65 N on the lid as described in 5.5.6.1.

B2 - first test: apply a force of 100 N on the handle or lever as described in 5.5.6.1.

B2 - second test: apply a force of 100 N on the lid as described in 5.5.6.1.

Type C tests

C1 – first test: push the lid downward with the force required to make opening easier (with a maximum of 100 N) and apply a torque of 5Nm.

C1 - second test: apply the force required to make the opening easier (with a maximum of 65 N), alternately on each segment, if it is accessible by the user, in direction of its disengagement from the body edge.

C2 - first test: push the lid downward with the force required to make opening easier (with a maximum of 100 N) and apply a torque of 10 Nm.

C2 - second test: apply the force required to make the opening easier (with a maximum of 100 N) alternately on each segment, if it is accessible by the user, in direction of its disengagement from the body edge.

Type D Tests

D1 - first test: apply the force required to make the opening easier (with a maximum of 65 N) on the opening device without causing the pressure cooker to topple down.

D1 - second test: apply the force required to make the opening easier (with a maximum of 65 N) alternately on each segment, if it is accessible by the user, in direction of its disengagement from the body edge.

D2 - first test: apply the force required to make the opening easier (with a maximum of 100 N) or; the opening device without causing the pressure cooker to topple down.

D2 - second test: apply the force required to make the opening easier (with a maximum of 100 N) alternately on each segment, if it is accessible by the user, in direction of its disengagement from the body edge.

Type E tests

E - first test: place the cooker on a heat source and turn the closing knob to maintain an internal pressure of 4 kPa, then apply a torque of 25 Nm to the clamp.

E - second test: Increase the pressure inside the cooker up to the highest working pressure which can be reached. Start to unscrew at the rate of one turn for five seconds, until steam begins to escape. Then unscrew by one fourth turn in 0,25 s to 0,50 s.

Check:

— during types A, B, C and D tests that the pressure inside the cooker at the opening is less than or equal to 4 kPa and that there is not any water projection as long as the internal pressure exceeds 4 kPa;

— during type E tests, at no moment, the clamp comes out from its location.

5.5.7 Mechanical resistance test of safe opening systems

This test is only applicable to pressure cookers with a manual safe opening system.

Prepare the cooker as described in 5.5.6.1.

Carry out the test, depending on the type of cooker, following the procedure described in 5.5.6.1, applying forces or efforts the values of which are given in 5.5.6.2, safety system at the opening being not activated (opened).

5.6 Tests relating to opening and closing devices

Tests relating to these devices are included in the tests described in 5.5.6 and 5.7.

5.7 Tests relating to resistance to pressure

5.7.1 Test of resistance to deformation of the body and the lid

Carry out the following procedure:

— after having prevented the pressure control device and all the safety devices (see 4.5.4.1) from functioning and after equipping the pressure cooker with a device for measuring the pressure, fill the pressure cooker with enough water to conduct the test;

— close and heat the pressure cooker in conditions enabling the pressure specified below to be reached;

— for progressive tightening pressure cookers, close the cooker with the maximum possible torque value and up to a limit of 400 R Nm where R is the radius in metres of the circle which circumscribes the tightening device;

— maintain the pressure with wet steam for 5 min at the value which is twice as high as the PS (the higher between the measured PS and the PS declared by the manufacturer) with a maximum of 360 kPa;

— if the pressure cannot be reached because the pressure cooker leaks, continue heating for 5 min. Record the pressure reached which shall be above the PS.

5.7.2 Test of resistance to destruction of the body and the lid

This test is only applicable to pressure cookers with non-progressive tightening that have not leaked during the test described in 5.7.1, and to pressure cookers with progressive tightening:

— after having prevented the pressure control device and all the safety devices aimed in 4.5.4.1 from functioning, and equipping the pressure cooker with a device measuring the pressure, connect it to hydraulic apparatus allowing a smooth increase in pressure;

— Increase the pressure steadily up to 500 kPa at a speed of 8 kPa/s + 10 %, and maintain it for one minute;

— if the pressure cannot be reached because the pressure cooker leaks:

  — for pressure cookers with non-progressive tightening system, apply an artificial sealing method, then continue the test until the cooker leaks once more and up to 500 kPa;

  — for pressure cookers with progressive tightening system, close the cooker applying the maximum possible torque, up to 400 R Nm where R is the radius, in metres, of the circle which circumscribes the tightening device, then continue the test until the cooker leaks once more, and up to 500 kPa.

NOTE In the case of cast aluminium pressure cookers, it is recommended that the manufacturer hydraulically test all products (100 % control) up to a pressure which is twice as high as the working pressure. If necessary, block off all control and safety devices.

6 Marking, labelling and handbook

6.1 Marking, labelling and the handbook shall provide at least the information shown in Table 4.

6.2 All instructions and markings on labelling and/or packaging shall be in the language of the intended country of sale.

6.3 Basic safety instructions shall be distinct from other information.

6.4 Markings on the product shall be indelible and shall be legible with a minimum height of 3,0 mm.

6.5 A gasket having a safety function shall be marked with the name of the producer and a reference enabling it to be clearly identified.

〈A1〉 Table 4 — Marking and labelling

	on packaging or labelling	In instructions	on product
1.0 IDENTIFICATION			
1.1 Manufacturer or distributor		x	x
1.2 Identification of the pressure cooker, e.g. type, model, identification of the series or batch or manufacturing number		x	x
1.3 Year of manufacture			x
1.4 Working pressure		x	x
1.5 Maximum allowable pressure			x
1.6 Capacity			x
1.7 For pressure cookers with integrated heating, voltage and power			x
2.0 DESCRIPTION			
2.1 Description of product		x	
2.2 Usable capacity		x	
2 3 Heating source	x	x	
3.0 INSTALLATION and ASSEMBLY			
3.1 Assembly instructions, if necessary		x	
3.2 Warnings of improper installation		x	
3.3 Safety measures to be taken by user	⊗	x	⊗
4.0 OPERATING INSTRUCTIONS			
4.1 Description of operating devices		x	
4.2 Description and operation of safety devices		x	
4.3 Instruction for use and method of operation		x	
4.4 Special precautions in use		x	
4.5 Warnings of dangers of incorrect use		x	
4 6 Check list in the event of failure		x	
5.0 MAINTENANCE			
5.1 Safety precautions		x	
5.2 Care, cleaning method and frequency		x	
5.3 Routine maintenance and minor repairs that may be done by the user		x	
5.4 Warning of repairs only to be made by authorized personnel		x	
5.5 Repair services offered		x	
5.6 Identification of spare parts		x	☒
5.7 Storage advice		x	

⊗ Marking on product or on packaging (or labelling).
☒ Only for gasket having a safety function (see 6.5).

NOTE Attention is drawn to publication ISO/IEC Guide 37 [1]. 〈A1〉

At least, the substance of the following instructions shall be included on the handbook, these instructions shall be placed at the head of the handbook:

IMPORTANT PRECAUTIONS

a) Read all the instructions.

b) Do not let children near the pressure cooker when in use.

c) Do not put the pressure cooker into a heated oven.

d) Move the pressure cooker under pressure with the greatest care. Do not touch hot surfaces. Use the handles and knobs. If necessary, use protection.

e) Do not use the pressure cooker for a purpose other than the one for which it is intended.

f) This appliance cooks under pressure. Scalds may result from inappropriate use of the pressure cooker. Make sure that the cooker is properly closed before applying heat. see "Instructions for use".

g) Never force open the pressure cooker. Do not open before making sure that its internal pressure has completely dropped. see the "Instructions for use".

h) Never use your pressure cooker without adding water, this would seriously damage it.

i) Do not fill the cooker beyond 2/3 of its capacity. When cooking foodstuffs which expand during cooking, such as rice or dehydrated vegetables, do not fill the cooker to more than half of its capacity.

j) Use the appropriate heat source(s) according to the instructions for use.

k) After cooking meat with a skin (e.g. ox tongue) which may swell under the effect of pressure, do not prick the meat while the skin is swollen; you might be scalded.

l) When cooking doughy food, gently shake the cooker before opening the lid to avoid food ejection.

m) Before each use, check that the valves are not obstructed. See the Instructions for use.

n) Never use the pressure cooker in its pressurized mode for deep or shallow frying of food.

o) Do not tamper with any of the safety systems beyond the maintenance instructions specified in the instructions for use.

p) Only use manufacturer's spare parts in accordance with the relevant model. In particular, use a body and a lid from the same manufacturer indicated as being compatible.

q) KEEP THESE INSTRUCTIONS.

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 97/23/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 97/23/EC.

Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this standard given in table ZA confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 – Correspondence between this European Standard and Directive 97/23/EC

Clause(s)/sub-clause(s) of this EN	Essential Requirements (ERs) of Directive 97/23/EC	Qualifying remarks/Notes
4.3.2	2.2.1, Design for adequate strength	
4.3.4, 4.4	2.3, Safe handling and operation	
4.3.4	2.5, Discharge	
4.5	2.11, Safety accessories	
4.7	2.2.2, Experimental design method	
5.3, 5.4, 5.5, 5.6, 5.7	2.2.4, Experimental design method	
6	3.3, 3.4, Marking and operating instructions	

WARNING: Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Bibliography

[1] ISO/IEC Guide 37:1995, *Instructions for use of products of consumer interest*.

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