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Indian Standard

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घरेलू प्रेशर कुकर — विशिष्टि

(छठा पुनरीक्षण)

Domestic Pressure Cooker — Specification

(Sixth Revision)

ICS 98.540.50

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BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.org.in www.standardsbis.in

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FOREWORD

This Indian Standard (Sixth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Utensils, Cutlery and Domestic Hardware Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1963 and subsequently revised in 1966, 1974, 1987, 1995 and 2006. In this revision, all amendments have been incorporated and following major changes have been made:

a) New terminology have been incorporated;

b) Maximum nominal capacity has been increased from 22 litre to 24 litre in view of *The Indian Boilers* (*Amendment*) *Act*, 2007, where the Act defines the boiler with capacity 25 litre and above;

c) Provision of induction base cooker has been introduced; and

d) Certain other changes which would help in implementing the Indian Standard a better way.

The relevant SI units and corresponding conversion factors are given below for guidance:

Pressure 1Pa (Pascal) = 1 N/m^2

1 kgf/mm^2 = 9.806 65 MPa

The composition of the Committee responsible for the formulation of this standard is given in Annex Q.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

DOMESTIC PRESSURE COOKER — SPECIFICATION

(Sixth Revision)

1 SCOPE

The standard covers the requirements for domestic pressure cookers.

2 REFERENCES

The standards given in Annex A contain provisions, which through reference in this text, constitute provisions to this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Pressure Cooker — A closed domestic pressure cooking vessel for use with external heat source and capable of maintaining nominal cooking steam pressure up to 1.0 kgf/cm^2 gauge nominal (100 kN/m^2 approximately).

3.2 Capacity — The full water capacity of the vessel, that is, total internal volume with lid in position.

3.3 Cooking Capacity — The maximum cooking capacity of the vessel is two-thirds of the capacity as specified in **3.2**.

3.4 Container — Vessel which is placed inside the pressure cooker for cooking foods separately. It is also known as a separator.

3.5 Grid — Used inside a pressure cooker to ensure that there is a gap between the separator and the cooker inside base so that the food does not burn. This may be also used for cooking food in steam without getting into direct contact with water or base of the cooker. It may be used when separators are used.

3.6 Nominal Cooking Steam Pressure — Declared by manufacturer, at which the cooker operates, within a limit of ±20 percent of the declared nominal cooking steam pressure.

3.7 Pressure Regulator — Device which regulates the pressure inside the pressure cooker during its use.

3.8 Safety Relief Device — Device which prevents the pressure cooker from exceeding the safety pressure.

4 CAPACITIES

The nominal capacity of pressure cookers shall be from 1 to 24 litre and shall be expressed only in complete or half litre units. No negative tolerances shall be allowed on the nominal capacity.

4.1 The capacity of the cooker shall be tested as given in Annex B.

NOTE — If the capacity of a cooker is not in complete or half litre unit, its nominal capacity shall be marked as the nearest lower complete or half litre units. For example, in the case of a cooker having a capacity of 4.9 litre, the nominal capacity to be marked shall be 4.5 litre.

5 MATERIALS

All components of the cookers including the vessel, gasket, pressure regulating device and internal accessories which come in contact with food or steam shall be made of the materials satisfying the following requirements:

a) They shall not discolour the food or spoil the flavour or odour of the cooked food in the cooker or cause it to become toxic; and

b) They shall not be affected by contact with foods cooked in the cooker in such a way that the operational efficiency or safety of the cooker is impaired.

5.1 Body, Lid, Containers and Grid

5.1.1 The body and the lid of the pressure cookers, the containers and the grid shall be made from aluminum alloys conforming to IS 21 or stainless steel conforming to designation X04Crl9Ni9 or X07Crl8Ni9 of IS 5522.

5.1.2 The body and lid shall be made from the materials specified in **5.1.1** or a combination thereof.

5.1.3 If stainless steel pressure cooker is provided with composite bottom, the composite bottom shall conform to IS 15960.

5.1.4 If the aluminum cooker is provided with an induction friendly base, the material of the induction plate shall be as per 400 series as given in Table 1 of IS 6911.

NOTE — The containers and the grid shall form separate items and may not be supplied with the pressure cooker unless specifically ordered.

5.2 Safety Relief Device

The chemical composition of the fusible plug shall be such that it melts/ejects before a gauge pressure not greater than 3 kgf/cm^2 (300 kN/m^2 approximately) is reached. Lead based alloys shall not be used.

5.3 Gasket

The gasket shall conform to IS 7466.

5.4 Handles and Knobs

The handles and knobs shall confirm to IS 13395.

5.5 Pressure Regulating Device

The metallic part of pressure regulating device, except the vent seal pin which comes in contact with food shall be made of brass or stainless steel as per 200 or 300 series of IS 6911.

5.6 Vent Seal Pin for Pressure Regulating Device

Material used for vent seal pin shall be stainless steel conforming to X04Cr18Ni10 or X07Cr18Ni9 or X8CrNiS18-9.

5.7 Vent Pipe

The material used shall be nickel chrome plated brass or stainless steel conforming to 300 series of IS 6911.

5.8 Vent Pipe Nut

The material used shall be aluminium or suitable aluminium alloy as per IS 740 or stainless steel conforming to 300 series of IS 6911.

5.9 Spring

If the lid is operated by spring loaded mechanism, the spring shall be of stainless steel wire or spring steel wire, suitably coated.

6 CONSTRUCTION

The construction of the domestic pressure cooker shall be suitable to ensure an easy and safe handling, good performance and a reasonable life. The vessel shall be so constructed that no distortion takes place under normal conditions of use.

6.1 Pressure Regulating Device

Pressure regulation shall be effected by a free dead weight valve. There shall be no intermediate linkage between the vent pipe and weight valve.

6.1.1 The passage from the interior of the vessel giving access through the valve to the atmosphere shall be so arranged that it is not liable to clog while the cooking is in progress. Minimium inside diameter of vent pipe shall be 2.5 mm.

6.1.2 The pressure regulating device shall be easy to clean and so designed that when working parts are removed, the obstructions shall be clearly visible.

6.1.3 The pressure regulating device shall be provided with a suitable lifting attachment. It can be made of brass or stainless steel. The lifting attachment can also be made from heat insulating material like arnite, glass filled nylon, polycarbonates, etc that insulate the heat from the pressure regulating device sleeve. It can encapsulate any stainless steel metal as long as the metal does not come in contact with food.

6.1.4 The pressure regulating device dead weight shall not fall of when the lid is held upside down.

6.1.5 The vent pipe nut shall have a minimum of two holes. The combined area of the holes on the nut shall be more than the area of vent pipe hole. The holes shall not be blocked when fully tightened on the vent pipe.

6.2 Safety Relief Device

In addition to a pressure regulating device, an independent safety relief device with separate and direct connection with the interior of the vessel shall be fitted. This safety relief device may be of destructible type or resettable type or both.

6.2.1 The destructible type of safety relief device shall consist of an ejectable disc or fusible safety pellet or ejectable fusible pintle or other devices of a like character. The fusible safety relief device, under its normal conditions of use, shall not be susceptible to corrosion or dimensional changes which might interfere with its satisfactory functioning.

6.2.2 In the resettable type of safety pressure relief device, the orifice or orifices, disclosed when the device functions, shall be of a form not susceptible to clogging by the issue of food or other contents of the cooker.

NOTE — Steam release from safety relief device should not put off the flame of the stove.

6.3 Temperature Responsive Pressure Relief Device

If the safety pressure relief device is not of the fusible type, one of the additional requirements given in **6.3.1** and **6.3.2** shall be met.

6.3.1 A separate temperature responsive pressure relief device shall be provided which shall satisfy the test given in Annex C.

6.3.2 The cooker shall satisfy the type test prescribed in Annex D.

6.4 Handles and Knobs

6.4.1 The screws, studs/nuts, locking loop used for fitting handles and knobs shall be made from corrosion

resistant material such as stainless steel or brass. The brackets may be made of aluminum or Stainless Steel or a combination of aluminum and stainless steel.

6.4.1.1 The rivets shall be made from corrosion resistant metal.

7 WORKMANSHIP AND FINISH

7.1 The body and the lid shall be free from wrinkles, scratches and other surface defects.

7.2 The body and the lid shall be neat and clean.

7.3 The brass parts except the screws, studs and nuts shall be plated chromium over nickel and the plating shall conform to service condition number 2 of IS 1068.

7.4 The cooker, if hard anodized, fully or partially, shall satisfy the requirements as given in Annex E. The requirements of Annex E shall be applicable only to the anodized portions in the body and lid. Annex E is not applicable to other parts of pressure cookers.

8 TESTS

8.1 Air Pressure Test

The cooker shall be subjected to air pressure of 40 percent of the nominal cooking steam pressure, slowly raised to nominal cooking steam pressure as specified by the manufacturer. It shall not show any sign of leakage or deformation.

8.2 Proof Pressure Test

The cooker shall be subjected to a proof pressure test as prescribed in Annex F. It shall not show any sign of leakage or other forms of failure either during or after the test.

8.3 Operating Test for Pressure Regulating Device

The pressure regulating device shall operate within ± 20 percent of the nominal cooking steam pressure as declared by the manufacturer. The device shall pass the test prescribed in Annex G.

8.4 Test for Safety Pressure Relief Device

The device shall satisfy the test prescribed in Annex H. After the test, the cooker shall be in normal serviceable condition and the pressure regulating device shall satisfy the requirements of the test prescribed in Annex G.

8.5 Bursting Pressure Test

The bursting pressure of the cooker shall not be less than 6 kgf/cm^2. The cooker shall pass the test as prescribed in Annex J. The pressure should be developed in a reservoir approximate 10 kgf/cm^2 and then released gradually through a valve to the cooker under test.

8.6 Tests for Removal of Lid under Pressure

8.6.1 *For Outer Lid Cooker*

A force of 12 kgf (120 N approximately), when applied to the lid or cover or its fastening or locking device, shall not be able to release the lid or cover of the cooker unless the steam pressure inside has fallen below 0.18 kgf/cm^2 (18 kN/m^2 approximately) gauge (*see* Annex K).

8.6.2 *For Inner Lid Cooker*

A force of 12 kgf (120 N approximately), when applied to the lid or cover or its fastening or locking device, shall not be able to release the lid or cover of the cooker unless the steam pressure inside has fallen below 0.18 kgf/cm^2 (18 kN/m^2 approximately) gauge (*see* Annex L).

NOTE — This is a type test and the cookers having lids or covers fastened by screw clamps or similar device which ensure that the internal pressure is destroyed before the lid is freely released or opening are exempt from this requirement.

8.7 Test for Spring Loaded Mechanism

When the lid is operated by a spring-loaded mechanism, the spring shall be completely compressed and kept in that position for 24 h. It shall then be compressed completely and released 3 000 times consecutively. The spring shall not suffer a permanent set of more than 3 percent in length.

8.8 Test for stainless steel cookers, which have composite cooker base/bottom refer to the tests given in IS 15960.

8.9 For induction compatible base, the cooker shall be tested as prescribed in Annex M. It shall be conducted on a separate cooker.

8.10 The handles of the cooker shall comply to the following tests as given in IS 13395:

a) Resistance to burning,
b) Heat resistance,
c) Torque strength,
d) Bending strength,
e) Fatigue resistance; and
f) Thermal insulation test.

NOTES

1 The handle tests should be done at least once a year.

2 One from smallest and one from the largest is sufficient for complying with handle testing requirements.

3 There shall be no leakage through any fixing system of the sample cooker which has undergone tests given at **8.10**, when the cooker is subjected to proof pressure testing as per **8.2**.

4 All the materials shall be finished smooth and free from burrs, splinters or sharp edges.

5 The handles shall be positioned above the centre of gravity of the cooker when filled to its gross capacity. The mass and position of the handle shall be such that the cooker is stable when placed empty with or without lid on a flat surface.

6 Threaded fixing shall incorporate a locking washer or similar device or suitable thread locking or sealing adhesive to hold them secure.

9 SAMPLING

This may be carried out by the manufacturer as given below.

9.1 Routine Inspection

9.1.1 Cookers of same capacity and type shall be subjected to routine inspections at the levels given below:

Sl No.	*Characteristic/Test*	*Frequency of Inspection/Test*
(1)	(2)	(3)
i)	Workmanship and finish	Each cooker
ii)	Capacity test	One in every 1 000 cookers or 2 from a day's production, whichever is less.
iii)	Air pressure test	Each cooker
iv)	Proof pressure test:	
	a) For production up to 2 000 pieces per month	2 percent of the total production
	b) For production above 2 001 pieces per month	1 percent of the total production
v)	Operating test for pressure regulating device:	
	a) For production up to 2 000 pieces per month	2 percent of the total production
	b) For production above 2 001	1 percent of the total production
vi)	Test for safety pressure relief device	1 percent of the total devices produced
vii)	Bursting pressure test:	
	a) For production up to 2 000 pieces per month	One in every 500 cookers
	b) For production above 2 001	One in every 1 000 cookers
viii)	Test for removal of lid under pressure (whenever applicable)	One in every 500 cookers
ix)	Test for spring-loaded mechanism (wherever applicable)	One in every 100 cookers

9.1.2 When the purchaser desires, the procedures laid down in **9.2** may be followed for judging the conformity of the lot.

9.2 Lot Inspection Plan

9.2.1 *Lot*

All the domestic pressure cookers having the same capacity group and produced under similar conditions of manufacture shall be grouped together to constitute a lot.

9.2.2 *Number of Samples*

For ascertaining the conformity of the material in a lot to the requirements of the specification, tests shall be carried out on each lot separately. The number of samples to be selected from the lot shall depend upon the size of the lot and shall be in accordance with Table 1.

9.2.2.1 Each pressure cooker shall be selected at random from the lot (*see* IS 4905).

9.2.3 *Number of Tests and Criteria for Conformity*

9.2.3.1 Each pressure cooker selected in the sample as per col 2 of Table 1, shall be tested for workmanship and finish (*see* **7**). A pressure cooker failing in one or more of the above requirements shall be termed as defective. The lot shall be considered as conforming to the requirements of these characteristics, if the number of defective in the sample is less than or equal to the corresponding acceptance number given in col 3 of Table 1.

9.2.3.2 The lot which has been found satisfactory as per **9.2.3.1** shall then be tested for the requirements of air pressure test (*see* **8.1**), proof pressure test (*see* **8.2**), operating test for pressure regulating device (*see* **8.3**) and test for safety pressure relief device (*see* **8.4**) on the sub-sample selected as per col 4 of Table 1. Wherever applicable, two pressure cookers shall also be subjected to tests for removal of lid under pressure (*see* **8.6**) and test for spring-loaded mechanism (*see* **8.7**). The lot shall be considered as conforming to the requirements of this standard, if both the pressure cookers in the sample meet the requirements for any of the above mentioned tests.

9.2.3.3 The lot having been found satisfactory as per **9.2.3.2** shall be further subjected to bursting pressure tests (*see* **8.5**) and thickness and plating on the two pressure cookers in the sub-sample. Chemical composition should be done every 6 months or on production of a minimum of two lakhs cookers (whichever is higher).

NOTE — For every lot, certificate of supplier/manufacturer of the material is acceptable.

9.2.3.4 The lot shall be considered as conforming to the requirements of the standard, if all the pressure cookers in the sub-sample meet the corresponding requirements.

Table 1 Scale of Sampling
(*Clauses* 9.2.2, 9.2.3.1 *and* 9.2.3.2)

Sl No.	No. of Pressure Cookers in the Lot	No. of Pressure Cookers to be Selected in a Sample		Sub-sample for Physical Tests
		Sample Size	Acceptance No.	
(1)	(2)	(3)	(4)	(5)
i)	Up to 50	8	0	3
ii)	51 to 90	13	0	3
iii)	91 to 150	20	1	3
iv)	151 to 280	32	2	3
v)	281 to 500	50	3	3
vi)	501 to 1 200	80	5	3
vii)	1 201 to 3 200	125	7	5
viii)	3 201 and above	200	10	5

10 INSTRUCTIONS FOR USE

10.1 The manufacturer shall supply fully illustrated instructions for use with each cooker and shall include instructions or illustrations to identify features intended to reduce risks.

10.2 The instruction manual shall include the important safeguards specified in the **10.3**, **10.4** and **10.5**.

10.3 Unless otherwise indicated, the text of the instructions shall be verbatim to, or in equally definitive terminology as specified in **10.5**, except where specific conflict in the risk alluded to has been reduced. The items may be numbered. In a list of items, the phrases 'Read all Instructions', 'SAVE THESE INSTRUCTIONS' shall be first and last, respectively. Other important and safeguard items considered appropriate by the manufacturer may be inserted.

10.4 The instruction manual shall include instructions and caution statements for cleaning, user-maintenance operations recommended by the manufacturer and shall warn a user that any other servicing should be performed by an authorized service representative.

10.5 Important Safeguards

10.5.1 The instruction manual shall include the following: When using pressure cookers, basic safety precautions should always be followed:

a) Read all instructions before use.

b) Before putting the pressure regulating device on the cooker, it should be ensured that the steam starts coming out of the vent pipe of the cooker freely.

c) Aluminum pressure cooker body should not be used for deep frying.

d) Do not touch hot surfaces. Use handles or knobs.

e) Close supervision is necessary when the pressure cooker is used near children.

f) Do not place the pressure cooker in a heated oven.

g) Extreme caution must be used when moving a pressure cooker containing hot liquids.

h) Do not use pressure cooker for other than intended use.

j) This appliance cooks under pressure. Improper use may result in scalding injury. Make certain unit is properly closed before operating. *See* 'Operating Instructions'

k) Do not fill the unit over 2/3 full. When cooking foods that expand during cooking such as rice or dried vegetable, do not fill the unit over ½ full. *See* 'Food Preparation Instructions' (such instructions shall appear elsewhere in the manual as noted in **10.1**).

m) Food items which tend to foam, froth, and sputter are likely to block the pressure release device. Therefore, while cooking such items, the cooking instructions supplied by the manufacturer shall be strictly followed.

n) Always check the pressure release devices for clogging before use.

p) Do not open the pressure cooker until the unit has cooled and internal pressure has been reduced. If the handles of the body and lid are difficult to push apart, this indicates that the cooker is still pressurized. Do not use force to open the cooker. The pressure remaining in the cooker can be dangerous. *See* 'Operating Instructions'

q) Do not use this pressure cooker for pressure frying with oil.

r) After the normal cooking pressure has been reached, reduce the heat so that all the liquid inside the cooker which creates the steam, does not evaporate.

s) Ensure the handles are not loose. If found loose please tighten the same before use.

t) It is recommended to replace fusible safety relief device after one year of every day use.

u) 'SAVE THESE INSTRUCTIONS'

11 MARKING

Each cooker shall be marked with its capacity and batch number on the body. The nominal working pressure shall be marked on the body or lid. Name or Trade-mark of the manufacturer shall be marked on both the lid and the body.

11.1 Each cooker shall be indelibly and legibly marked on the lid or body with a notice emphasizing the reading of the instructions for example "IMPORTANT— Read Instructions before use".

11.2 BIS Certification Marking

Each pressure cooker may also be marked with the Standard Mark on the body and lid of the cooker.

11.2.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which a license for the use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

12 PACKING

Each pressure cooker shall be suitably packed in a carton with suitable cushioning.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
21 : 1992	Wrought aluminium and aluminium alloys for manufacture of utensils — Specification (*fourth revision*)
1068 : 1993	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium (*third revision*)
1342 : 2002	Oil pressure stoves — Specification (*sixth revision*)
4246 : 2002	Domestic gas stove for use with liquefied petroleum gases — Specification (*fifth revision*)
4905 :1968	Methods for random sampling
5522 : 2014	Stainless steel sheets and strips for utensils (*third revision*)
5523 : 1983	Methods of testing anodic coatings on aluminium and its alloys (*first revision*)
6012 : 1992	Measurement of coating thickness by eddy currents method (*first revision*)
6057 : 1988	Hard anodic coatings on aluminium and aluminium alloys
6911 : 1992	Stainless steel plate, sheet and strip — Specification (*first revision*)
7466 : 1994	Rubber gaskets for pressure cookers — Specification (*first revision*)
13395 : 1995	Performance of handles and handle assemblies attached to cookware — Specification
15960 : 2013	Specification for composite bottom stainless, steel cooking utensils/ ressure cookers

ANNEX B

(*Clause* 4.1)

CAPACITY TEST

B-1 PROCEDURE

The pressure cooker shall be filled with water up to the brim of vent pipe. The volume of the water shall be measured with the help of a measuring jar. This shall give the full water capacity of the pressure cooker.

ANNEX C

(*Clause* 6.3.1)

TEST FOR TEMPERATURE RESPONSIVE SAFETY PRESSURE RELIEF DEVICE

C-1 PROCEDURE

The cooker, fitted with a calibrated pressure gauge, with all relief device, sealed and containing a quantity of water equal to 1/16 part of the internal volume of the cooker, shall be placed in still air on a burner such as a pressure stove (*see* IS 1342) or LPG stove (*see* IS 4246). Before sealing the cooker, it shall be ensured that the steam starts coming out of vent pipe of the cooker steadily. The temperature responsive device shall release before a gauge pressure not greater than 3 kgf/cm^2 (300 kN/m^2 approximately) is reached.

ANNEX D

(*Clause* 6.3.2)

TEMPERATURE TEST FOR COOKERS WITHOUT TEMPERATURE RESPONSIVE PRESSURE RELIEF DEVICE OR FUSIBLE RELIEF DEVICE

D-1 PROCEDURE

The openings in the vessel of the cooker shall be suitably sealed and the provision shall be made for applying internal pressure by means of compressed air. In an ambient temperature of not less than 15°C, the cooker empty and dry, shall be placed in still air on a burner such as a pressure stove. After 30 min an air pressure equal to four times the greatest nominal cooking pressure shall be applied and maintained for 10 min, heat being applied continuously. While subjected to this pressure and the heat, the vessel of the cooker shall not fail and on examination after the test vessel shall not show any sign of impending failure.

CAUTION — Failure of the cooker under test is likely to be accompanied by an explosion. Therefore, before conducting this test, adequate protection for operator as well as property shall be provided.

ANNEX E

(*Clause* 7.4)

TEST FOR HARD ANODIZED SURFACE

E-1 FINISH AND APPEARANCE

E-1.1 Basic Metal, shall be as given in **5.1** of IS 6057.

E-1.2 Finish of the Coating, shall be as given in **5.2** of IS 6057.

E-2 THICKNESS

The minimum thickness of anodized layer shall be 25 µm. Thickness of the hard anodic coating shall normally be determined by microscopic method as specified in IS 5523 or with the help of instruments based on Eddy current principle as specified in IS 6012.

E-3 ABRASION RESISTANCE, shall be as given in **7** of IS 6057.

E-4 HARDNESS

Hard anodized coating shall be tests as follows:

E-4.1 Type Test

Hardness shall be tested by micro-indentation method (type test to be tested once in 6 month or once in 2 lakh cooker produced (which ever is greater). The hardness should be more than 350 HV.

E-4.2 Routine Test

Routine test for hardness shall be carried out as specified in **10.1** of IS 6057.

E-5 RESISTANCE TO STAINING OF ANODIZED COATINGS

When tested as specified in Annex N there shall be no staining visible on any surface intended to come in contact with food.

E-6 ALKALI RESISTANCE

When tested as specified in Annex P there shall be no loss of the insulating properties of the coating of any surface intended to come in contact with food.

ANNEX F

(*Clause* 8.2)

PROOF PRESSURE TEST

F-1 PROCEDURE

The cooker shall be coupled to a hydraulic test pump provided with a calibrated pressure gauge. All the remaining openings in the body and lid of the cooker shall be suitably sealed. A pressure not less than twice the greatest nominal cooking pressure shall be applied. The cooker shall not show any sign of leakage or other forms of failure either during or after the test.

NOTE — The instructions given by the manufacturer in the Instruction manual regarding the fixing of the gasket shall be followed.

ANNEX G

(*Clauses* 8.3 *and* 8.4)

OPERATING TEST FOR PRESSURE REGULATING DEVICE

G-1 PROCEDURE

The cooker shall be fitted with a calibrated pressure gauge in place of safety pressure relief device. It shall be half filled with water and placed in still air on a burner such as a pressure stove. The heat input shall be continued until the pressure regulating device first operates and the pressure noted. Operating pressure shall be within ± 20 percent of the nominal cooking pressure declared by the manufacturer.

ANNEX H

(*Clause* 8.4)

TEST FOR SAFETY PRESSURE RELIEF DEVICE

H-1 PROCEDURE

The cooker shall be fitted with a calibrated pressure gauge in place of the pressure regulating device. It shall be filled with water equal in quantity to 1/16 of the internal volume of the vessel and placed in still air on a burner such as a pressure stove (*see* IS 1342) or LPG stove (*see* IS 4246). Before starting the test it shall be ensured that the steam starts coming out of the vent pipe of the cooker steadily.

H-1.1 For Destructible Devices

The relief device shall be deemed to have passed the test, if it functions when the steam reaches a gauge pressure between 1.5 kgf/cm^2 and 3 kgf/cm^2.

H-1.2 For Resettable Devices

The device shall be deemed to have passed the test if it functions when the steam reaches a gauge pressure between 1.5 kgf/cm^2 and 3 kgf/cm^2.

NOTE — In case both the devices are provided in the same functions pressure cooker, each device is to be tested separately by blocking the other and both should pass the test separately.

ANNEX J

(*Clause* 8.5)

BURSTING PRESSURE TEST

J-1 PROCEDURE

J-1.1 The cooker shall be coupled to a hydraulic test pump provided with a calibrated pressure gauge, suitably graduated. All the remaining openings in the body and lid of the cooker shall be suitably sealed or deactivated or removed.

J-1.2 A gradually increasing hydraulic pressure shall be applied to the vessel of the cooker until:

a) a rupture takes place, or
b) a deformation occurs so that an appreciable leakage takes place at the joint of the lid or elsewhere.

J-1.3 The maximum gauge pressure obtained as in **J-1.2** shall be taken as the bursting pressure of the cooker for the purpose of this standard. In case the cooker satisfactorily stands a pressure of 6 kgf/cm^2, further applications of pressure is not necessary.

Caution — Failure of the cooker under test is likely to be accompanied by an explosion. Therefore, before conducting this test, adequate protection for operator as well as property shall be provided.

ANNEX K

(*Clause* 8.6.1)

TESTS FOR REMOVAL OF LID UNDER PRESSURE FOR OUTER LID COOKER

K-1 Use a new gasket.

K-2 Boil the gasket for 2h in water.

K-3 Dry and let it cool down to room temperature.

K-4 Put the gasket in the lid.

K-5 Open and close the cooker three times.

K-6 Fill the cooker to 50 percent of its body capacity, use distilled water. Boil this water for 15 min in the open cooker body.

K-7 Close the pressure cooker.

K-8 Connect the pressure cooker to a calibrated gauge.

K-9 Put the pressure cooker on the testing equipment. The cooker should be held in place. The cooker body should be held such that it does not rotate. The wire should be connected one side to the handle and the other side should have an option to load weight of 12 kg (*see* Fig. 1).

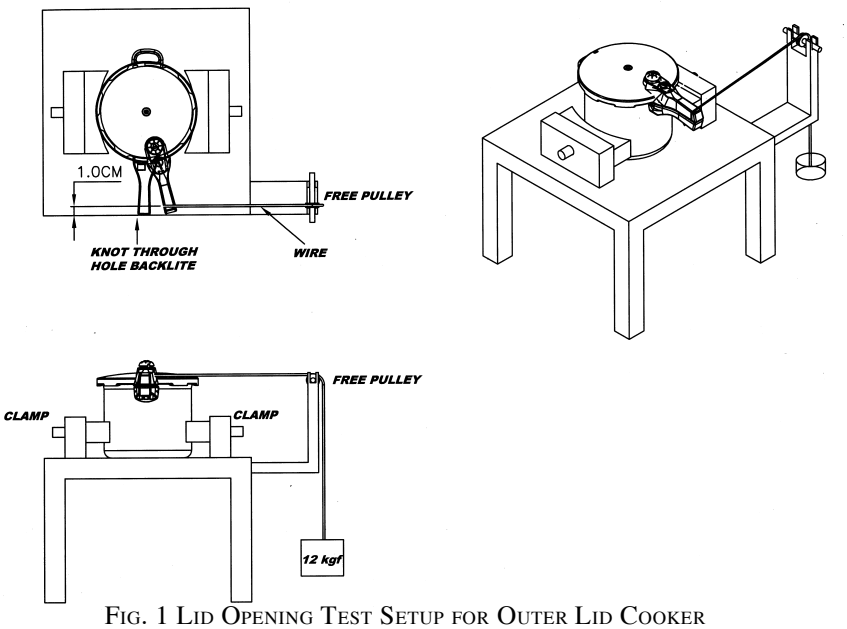

FIG. 1 LID OPENING TEST SETUP FOR OUTER LID COOKER

K-10 The test equipment should have a heat source. Switch on the heat source and increase the pressure inside the pressure cooker to the maximum operating pressure.

K-11 Once the pressure is reached, switch off the heat source.

K-12 Put a load on 12 kg. The cooker should not open until the pressure inside has fallen below 0.18 kgf/cm^2.

NOTES

1 The wire should be fitted around up to 15 mm from the edge of the handle.

2 Breakage of the handle during testing would mean failure of the test.

3 For inner lid cookers follow the same method, except that the Lock lever is removed before applying the Load on the Lid.

ANNEX L

(*Clause* 8.6.2)

TESTS FOR REMOVAL OF LID UNDER PRESSURE FOR INNER LID COOKER

L-1 Use a new gasket.

L-2 Boil the gasket for 2 h in water.

L-3 Dry and let it cool down to room temperature.

L-4 Put the gasket in the lid.

L-5 Open and close the cooker three times.

L-6 Fill the cooker to 50 percent of its body capacity, use distilled water. Boil this water for 15 minutes in the open cooker body.

L-7 Close the pressure cooker.

L-8 Connect the pressure cooker to a calibrated gauge.

L-9 Put the pressure cooker on the testing equipment. The cooker should be held in place. The wire should be connected to the clip of the handle as shown in Fig. 2 to load weight of 12 kg.

L-10 The test equipment should have a heat source. Switch on the heat source and increase the pressure inside the pressure cooker to the maximum operating pressure.

L-11 Once the pressure is reached, switch off the heat source.

L-12 Put a load on 12 kg. The cooker should not open until the pressure inside has fallen below 0.18 kgf/cm^2.

NOTES

1 Breakage of the handle during testing would mean failure of the test.

2 The wire should be fitted around up to 15 mm from the edge of the handle.

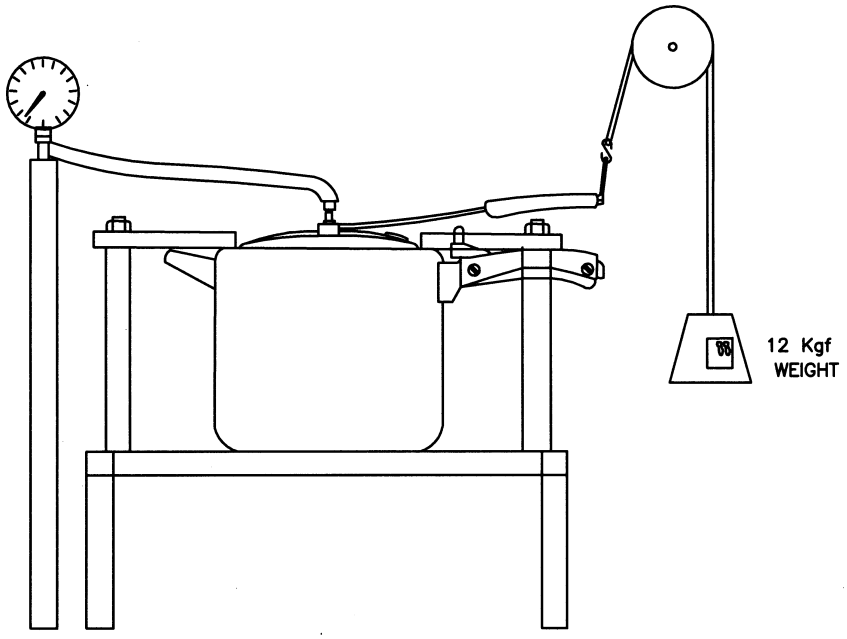

FIG. 2 LID OPENING TEST SETUP FOR INNER LID COOKER

ANNEX M

(*Clause* 8.9)

TEST FOR INDUCTION BOTTOM

M-1 Dry heat the cooker body on induction cook top to 250^{+25}_{-0}°C and then quench in water at ambient temperature. Repeat the test 25 times.

M-2 Dry heat the same cooker body used in **M-1** on Gas stove to 250^{+25}_{-0}°C and then quench in water at ambient temperature. Repeat the test 25 times. The induction steel base shall not peel off or separate from the aluminum cooker bottom during or on completion of a total of 50 heat cycles (25 cycles of gas heat and 25 cycles of Induction heat).

NOTE — Temperature to be measured at inside bottom of the cooker body.

ANNEX N

(*Clause* E-5)

RESISTANCE TO STAINING OF ANODIZED COATINGS

N-1 APPARATUS

A means of raising the temperature of the sample and the solution to 25 ± 5°C and maintaining them at that temperature during the test.

N-2 REAGENTS

N-2.1 A 40 ± 5 percent *v*/*v* aqueous solution of Nitric acid (HNO_3) solution, freshly prepared on the day of the test.

N-2.2 Dye, aluminum blue 2LW or methyl violet with methyl alcohol or anthraquinone violet R dye solution prepared by dissolving 1 g in 50 ml distilled water.

N-3 PROCEDURE

N-3.1 Apply a drop of the nitric acid (**N-2.1**) to the anodized surface and allow to stand for 120 ± 5 s.

N-3.2 Wash the test area thoroughly with running water and dry with a clean, dry cloth.

N-3.3 Apply a drop of the dye solution (**N-2.2**) to the test area and allow it to remain for 300 ± 10 s.

N-3.4 Wash the test area thoroughly and dry with clean, dry cloth.

N-3.5 Visually examine the test area to ascertain if the oxide coating has taken up any of the dye.

ANNEX P

(*Clause* E-6)

RESISTANCE TO ALKALI OF ANODIZED ALUMINIUM

P-1 APPARATUS

P-1.1 A means of raising the temperature of the sample and the solution to 35 (+5/-2) °C and maintaining them at that temperature during the test.

P-1.2 Multimeter, or any meter capable of measuring the electrical conductivity between the coating and the substrate, operating at 9 V.

P-2 REAGENTS

P-2.1 Five percent sodium hydroxide solution, freshly prepared on the day of the test.

P-2.2 Degreasing Agent

Any substance which will degrease the test specimen without leaving any residue.

P-3 PROCEDURE

P-3.1 Remove sufficient of the oxide coating to allow contact by the multimeter probe from an area close to the test area (the contact area).

P-3.2 Clean the test area with the degreasing agent, rinse with deionized water and dry.

P-3.3 Raise sample and test solution to 35 (+5/-2) °C.

P-3.4 Apply the sodium hydroxide solution to the test area to cover at least a 10 mm diameter spot to a depth greater than 2 mm, allow to sit for 2 min at a temperature of 35 (+5/-2) °C.

P-3.5 Rinse the solution from the test area with deionized water and dry.

P-3.6 Apply the multimeter probes between the contact area and any point of the surface not under test. Note any current flow.

P-3.7 Apply the multimeter probes between the test area and the contact area and check if there is a difference in current flow from that found in **P-3.6**.

ANNEX Q

(*Foreword*)

COMMITTEE COMPOSITION

Utensils, Cutlery and Domestic Hardware Sectional Committee, MED 33

Organization	*Representative (s)*
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This Indian Standard has been developed from Doc No.: MED 33 (1446).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.org.in

Regional Offices: *Telephones*

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002 — 2323 7617, 2323 3841

Eastern : 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi, KOLKATA 700054 — 2337 8499, 2337 8561, 2337 8626, 2337 9120

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Published by BIS, New Delhi

AMENDMENT NO. 1 NOVEMBER 2018
TO
IS 2347 : 2017 DOMESTIC PRESSURE COOKER — SPECIFICATION

(Sixth Revision)

(*Page* 2, *clause* **5.2**, *second sentence*) — Substitute the following for the existing:

'Maximum lead content shall not exceed 0.05 percent by mass in fusible plug pellet, when determined by any standard instrumental method or chemical method.'

(*Page* 2, *clause* **5.4**) — Substitute the following for the existing:

'**5.4 Handles and Knobs**

Construction and material of the handle/knob shall conform to IS 13395.'

(*Page* 2, *clause* **5.5**) — Substitute the following for the existing:

'**5.5 Pressure Regulating Device**

The metallic part of pressure regulating device except the vent seal pin, shall be made of brass as per IS 319 or stainless steel of designation X02Cr18Ni11 / X04Cr18Ni10 / X07Cr18Ni9 / X10Cr17Mn6Ni4 as per IS 6527 or stainless steel of designation X02Cr19Ni10 / X10Cr17Mn6Ni4N as per IS 6603 or stainless steel of properties conforming to Annex Q.

NOTE — Only chemical composition of stainless steel and brass needs to be complied with.'

(*Page* 2, *clause* **5.6**) — Substitute the following for the existing:

'**5.6 Vent Seal Pin for Pressure Regulating Device**

Material used for vent seal pin shall be stainless steel conforming to the designation X04Cr18Ni10 / X07Cr18Ni9 as per IS 6527.

NOTE — Only chemical composition of stainless steel needs to be complied with.'

Amendment No. 1 to IS 2347 : 2017

(*Page* 2, *clause* **5.7**) — Substitute the following for the existing:

'**5.7 Vent Pipe**

The material used shall be nickel chrome plated brass (brass as per IS 319 and nickel chrome plating with service condition 2 as per IS 1068) or stainless steel of properties conforming to Annex Q.

NOTE — Only chemical composition of brass needs to be complied with.'

(*Page* 2, *clause* **5.8**) — Substitute the following for the existing:

'**5.8 Vent Pipe Nut**

The material used shall be aluminium alloy of designations 19000 / 19500 / 64430 as per IS 733 or stainless steel of properties conforming to Annex Q.

NOTE — Only chemical composition of aluminium alloy needs to be complied with.'

(*Page* 2, *clause* **5.9**) — Substitute the following for the existing:

'**5.9 Spring**

If the lid is operated by spring loaded mechanism, the spring shall be of stainless steel wire as per IS 4454 (Part 4).

NOTE — Only chemical composition of stainless steel needs to be complied with.'

(*Page* 6, *clause* **11.2.1**) — Substitute the following for the existing:

'**11.2.1** The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.'

(*Page* 6, Annex A) — Insert the following at appropriate place:

IS No.	*Title*
228	Method of chemical analysis of steel (issued in various parts)
319 : 2007	Free cutting brass bars, rods and section — Specification (*fifth revision*)
733 : 1983	Wrought aluminium and aluminium alloy bars, rods and sections (for general engineering purposes) (*third revision*)
4454 (Part 4) : 2001	Steel wires for mechanical springs — Specification: Part 4 Stainless steel wire (*second revision*)
6527 : 1997	Stainless steel wire rod — Specification (*first revision*)
6603 : 2001	Stainless steel bars and flats — Specification (*first revision*)

(*Page* 12, *Annex* P) — Insert the following new annex:

‘ANNEX Q
(*Clauses* 5.5, 5.7 *and* 5.8)

STAINLESS STEEL PROPERTY

Q-1 CHEMICAL PROPERTIES

Q-1.1 The steel shall conform to the following chemical composition (in percent):

C	0.15, *Max*
Si	1.00, *Max*
Mn	2.00, *Max*
S	0.15 – 0.25
P	0.20, *Max*
Cr	17.0 to 19.0
Ni	8.0 to 10.0

Q-1.2 The analysis of the steel shall be carried out according to IS 228 and its relevant parts or any other established instrumental/chemical method. In case of dispute, the procedure given in IS 228 and its relevant parts shall be referee method.'

(MED 33)

Publication Unit, BIS, New Delhi, India

AMENDMENT NO. 2 DECEMBER 2018
TO
IS 2347 : 2017 DOMESTIC PRESSURE COOKER — SPECIFICATION

(Sixth Revision)

[*Second cover page*, *Foreword*, *para* 4 (*see also Amendment No.* 1)] — Substitute 'The composition of the Committee responsible for the formulation of this standard is given in Annex R' *for* 'The composition of the Committee responsible for the formulation of this standard is given in Annex Q'.

(*Page* 1, *clause* **1**) — Insert the following at the end of clause:

'This standard does not cover electrical pressure cookers and microwaveable pressure cookers.'

(*Page* 1, *clause* **3.1**) — Substitute the following for the existing:

'**3.1 Pressure Cooker** — A closed domestic pressure cooking vessel for use with external heat source and capable of maintaining nominal cooking steam pressure over 0.1 kgf/cm^2 and upto 1.0 kgf/cm^2 gauge nominal.'

(*Page* 1, *clause* **5**) — Delete the following text:

'All components of the cookers including the vessel, gasket, pressure regulating device and internal accessories which come in contact with food or steam shall be made of the materials satisfying the following requirements:

a) They shall not discolour the food or spoil the flavour or odour of the cooked food in the cooker or cause it to become toxic; and
b) They shall not be affected by contact with foods cooked in the cooker in such a way that the operational efficiency or safety of the cooker is impaired.'

[(*Page* 2, *clause* **5.6** (*see also Amendment No*. 1)] — Substitute the following for the existing:

'**5.6 Vent Seal Pin for Pressure Regulating Device**

Material used for vent seal pin shall be stainless steel conforming to the

Price Group 2

designation X04Cr18Ni10 / X07Cr18Ni9 as per IS 6527 or stainless steel of properties conforming to Annex Q.

NOTE — Only chemical composition of the stainless steel needs to be complied with.'

[(*Page* 2, *clause* **5.8** (*see also Amendment No*. 1)] — Substitute the following for the existing:

'**5.8 Vent Pipe Nut**

The material used shall be aluminum alloy of designations 19000 / 19500 / 64430 as per IS 733 or stainless steel of designation X04Cr18Ni10 / X02Cr18Ni11 / X07Cr18Ni9 as per IS 6527 or stainless steel of properties conforming to Annex Q.

NOTE — Only chemical composition of aluminum alloy and stainless steel needs to be complied with.'

(*Page* 3*, clause* **6.4.1.1**) — Substitute the following for the existing:

'**6.4.1.1** The rivets shall be made from aluminum as per IS 740 or stainless steel of designation X04Cr18Ni10 / X02Cr18Ni11 / X07Cr18Ni9 as per IS 6527 or stainless steel of properties conforming to Annex Q.

NOTE — Only chemical composition of aluminum and stainless steel needs to be complied with.'

(*Page* 4*, clause* **8.10**) — Insert the following new clauses:

'**8.11 External Coating**

8.11.1 The pressure cooker if coated with powder coating externally, the powder coating shall conform to IS 13871.

8.12 Internal Coating

8.12.1 The pressure cooker, if coated with non-stick coating internally, the non-stick coating shall conform to IS 9730.'

(*Page* 4, *clause* **9**) — Delete the following text:

'This may be carried out by the manufacturer as given below.'

(*Page* 4, *clause* **9.1**, *title*) — Delete.

(*Page* 4, *clause* **9.1.1**) — Delete.

(*Page* 4, *clause* **9.1.2**) — Renumber 'clause **9.1.2**' as 'clause **9.1**'.

(*Page* 6, Annex A) — Insert the following at an appropriate places:

IS No.	*Title*
740 : 1977	Wrought aluminium and aluminium alloy rivet stock for general engineering purposes (*second revision*)
9730 : 2008	Non-stick unreinforced plastics coatings on domestic cooking utensils — Specification (*first revision*)
13871 : 1993	Powder coatings — Specification

(*Page* 10, *clause* **L-12**, *Note* 2) — Substitute the following for the existing:

'**2** The wire should be fitted to the handle loop as shown in Fig. 2.'

[*Page* 13, *Annex* Q (*see also Amendment No.* 1)] — Substitute 'Annex R' *for* 'ANNEX Q'.

(MED 33)

Publication Unit, BIS, New Delhi, India

AMENDMENT NO. 3 DECEMBER 2019

TO

IS 2347 : 2017 DOMESTIC PRESSURE COOKER — SPECIFICATION

(Sixth Revision)

[*Page* 1*, clause* **1,** *second sentence* (*see also Amendment No.* 2)] — Substitute the following for the existing:

'This standard does not cover microwaveable pressure cookers.'

[*Page* 1, *clause* **3.1 (***see also Amendment No.* 2)] — Substitute the following for the existing:

'**3.1 Pressure Cooker** — A closed domestic pressure cooking vessel for use with external/intergral heat source and capable of maintaining nominal cooking steam pressure over 0.1 kgf/cm^2 and upto 1.0 kgf/cm^2 gauge nominal.'

(*Page* 1, *clause* **4**) — Insert the following at the end of the clause:

'For pressure cooker with integral electrical heating (*see* **8.13**), nominal capacity shall be from 1 to 10 litre'

(*Page* 1, *clause* **5.1.1**) — Substitute the following for the existing clause :

' **5.1.1** The body and the lid of the pressure cookers, the containers and the grid shall be made from aluminium alloys conforming to IS 21 or stainless steel conforming to designation X04Cr19Ni9 / X07Cr18Ni9 of IS 5522 or stainless steel conforming to designation X8Cr16Mn8Cu2Ni2N of IS 15997.'

[*Page* 2, *clause* **5.7** (*see also Amendment No.* 1)] — Substitute the following for the existing:

'**5.7 Vent Pipe**

The material used shall be nickel chrome plated brass (Brass as per IS 319 and nickel chrome plating with service condition 2 as per IS 1068) or stainless steel of designation X02Cr18Ni11 / X04Cr18Ni10 / X07Cr18Ni9 / X10Cr17Mn6Ni4 as per IS 6527 or stainless steel of designation X02Cr19Ni10 / X10Cr17Mn6Ni4N as per IS 6603 or stainless steel of properties conforming to Annex Q.

NOTE — Only chemical composition of stainless steel and brass needs to be complied with.'

(*Page* 3*, clause* **8.5**) — Insert the following at the end of clause:

'During this test, the pressure cooker may undergo deformation but shall not show any incipient fracture nor any crack. The separation of base/bottom of composite cooker (*see* **8.8**) is acceptable.'

[*Page* 4*, clause* **8.11.1 (***see also Amendment No.* 2)] — Substitute the following for the existing:

'**8.11.1** The pressure cooker if coated with powder coating or ceramic coating or high temperature resistant liquid coating fully or partially externally, shall conform to the thickness test, salt water corrosion test, adhesion test as per IS 9730. The coating shall comply with IS 9806. The minimum thickness of the coating shall be declared by the manufacturer. The externally coated cooker shall be subjected to thermal shock test as given at **8.11.1.1**.

8.11.1.1 Dry heat the cooker body on gas stove to 220^{+5}_{-0} °C and then quench in water at ambient temperature. Repeat the test 25 times. There shall be no blistering of coating from the cooker during or on completion of 25 gas heat cycles.

NOTE — Temperature to be measured at inside bottom of the cooker body.'

[*Page* 4*, clause* **8.12.1 (***see also Amendment No.* 2)] — Insert the following new clause:

'8.13 Pressure cooker with integral electrical heating device shall conform to the electrical requirements as per IS 302-2-15.'

(*Page* 6*, Annex* A) — Insert the following new entries at an appropriate place:

IS No.	*Title*
302 (Part 2/ Sec 15) : 2009	Safety of household and similar electrical appliances: Part 2 Particular requirements, Section 15 Appliances for heating liquids (*first revision*)
9806 : 2001	Methods of test for and permissible limits of toxic materials released from ceramicware, vitreous enamelware, glassware and glass-ceramicware in contact with food (*first revision*)
15997 : 2012	Low nickel austenitic stainless steel sheet and strip for utensils and kitchen appliances — Specification

[*Page* 6, *Annex* A **(***see also Amendment No.* 2)] — Delete the following:

IS No.	*Title*
13871 : 1993	Powder coatings — Specification

(*Page* 9, *clause* **J-1.1**) — Insert the following Note at the end of clause:

'NOTE — If the pressure can not be reached, because the pressure cooker leaks due to gasket or resettable device, an artificial sealing method (like special gasket, etc) can be applied to ensure the burst pressure is achieved.'

(MED 33)

Publication Unit, BIS, New Delhi, India

AMENDMENT NO. 4 NOVEMBER 2020

TO

IS 2347 : 2017 DOMESTIC PRESSURE COOKER — SPECIFICATION

(Sixth Revision)

(*Page* 1, *clause* **5.1.4**) — Insert the following new sub clause:

'**5.1.5** If the Body of the pressure cooker is made of a 3-ply construction, 3-ply material shall be made with inner layer – designation X04Cr19Ni9 (grade 304) of IS 5522, middle layer – aluminium as per IS 21 and outer layer – designation X07Cr17 (grade 430) of IS 6911.

NOTE — Only chemical composition of stainless steel and aluminium needs to be complied with.'

[*Page* 4, *clause* **8.13** (*see also Amendment No*. 3)] — Insert the following new clause:

'**8.14** For 3 ply construction cooker body, the body shall be tested as per Annex S. The body shall not show any separation (or delamination) of the 3-ply or shall not show blisters, after the completion of 50 cycles.'

[*Page* 13, *annex* Q (*see also Amendment No*. 2)] — Insert the following new annex:

'ANNEX S

(*Clause* 8.14)

TEST FOR ADHESION OF 3 PLY CONSTRUCTION COOKER BODY

S-1 Heat the pressure cooker body to 250°C (+25 °C /-0 °C) and quench in water at ambient temperature. Before quenching, the cooker body shall be checked at

a minimum of two locations to confirm, that the temperature of the cooker body has attained 250°C (+25 °C /-0 °C) . Temperature to be measured at inside bottom and top edge (mouth portion) of the cooker (record the temperature for atleast the first and the last cycle). Repeat this cycle 50 times.

NOTES:

1 Hold (soak) the cooker body for 2 min at 250°C (+25/-0) under heating condition, before measuring and subsequent quenching in ambient temperature water.

2 For guidance purpose, heating source may be hot air oven or any other equipment which can be used to achieve such temperature.'