DRAFT FOR DEVELOPMENT

DD ENV
13834:2000

Cookware — Ovenware for use in domestic thermal ovens

ICS 97.040.60

National foreword

This Draft for Development is the English language version of ENV 13834:2000.

This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Developemnt series of publications and is of a provisional nature because experience is needed in the performance of some tests. It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

Comments arising from the use of this Draft for Development are requested so that UK experience can be reported to the European organization responsible for its conversion into a European Standard. A review of this publication will be initiated 2 years after its publication by the European organization so that a decision can be taken on its status at the end of its three-year life. The commencement of the review period will be notified by an announcement in *Update Standards*.

According to the replies received by the end of the review period, the responsible BSI committee will decide whether to support the conversion into a European Standard, to extend the life of the prestandard or to withdraw it. Comments should be sent in writing to the Secretary of BSI Technical Committee CW/9, Cooking and catering containers, at 389, Chiswick High Road, London W4 4AL, giving the document reference and clause number and proposing, where possible, an appropriate revision of the text.

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

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

Summary of pages

This document comprises a front cover, an inside front cover, the ENV title page, pages 2 to 22, an inside back cover and a back cover.

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EUROPEAN PRESTANDARD

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

ENV 13834

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English version

Cookware - Ovenware for use in conventional domestic ovens

Articles culinaires - Articles culinaires à usage domestique conçus pour la cuisson au four conventionnel

Kochutensilien - Ofengeschirre zur Verwendung in Haushalts-Backöfen

This European Prestandard (ENV) was approved by CEN on 17 September 2000 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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

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Contents

Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 194 "Utensils in contact with food", the secretariat of which is held by BSI.

The annexes A to K are normative.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies safety and performance requirements for items of ovenware for use in conventional domestic ovens. It is applicable to all ovenware regardless of material or method of manufacture.

It is applicable to products intended for use both 'on top of the stove' and 'in oven'.

This standard is not applicable to metal casseroles, items for single use, throwaway ovenware or ovenware intended for use in a microwave oven only.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These 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 1183, *Materials and articles in contact with foodstuffs - Test methods for thermal shock and thermal shock endurance.*

EN ISO 2064, *Metallic and other non-organic coatings - Definitions and conventions concerning the measurement of thickness (ISO 2064:1980).*

EN ISO 2360, *Non-conductive coatings on non-magnetic basis metals - Measurement of coating thickness - Eddy current method (ISO 2360:1982).*

EN ISO 2409: 1994, *Paints and varnishes - Cross-cut test (ISO 2409:1992).*

ISO 2742, *Vitreous and porcelain enamels - Determination of resistance to boiling citric acid.*

ISO 2744, *Vitreous and porcelain enamels - Determination of resistance to boiling water and water vapour.*

ISO 2747, *Vitreous and porcelain enamels – Enamelled cooking utensils - Determination of resistance to thermal shock.*

ISO 4532, *Vitreous and porcelain enamels - Determination of the resistance of enamelled articles to impact – Pistol test.*

3 Terms and definitions

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

3.1
ovenware
Utensil, in the form of a hollow or flat container, intended for use in the cooking of food either solid or liquid

NOTE Ovenwares includes the follow items :

- Gratin and roasting dishes used in the preparation and cooking of vegetable and meat dishes.

- Ceramic casseroles: used in the preparation and cooking of meats and/or vegetables.

- Bakeware: used in the preparation and cooking of various types of dough mixtures. Bakeware varies in shape and may include removable parts.

- Paté mould: used in the preparation and cooking of patés.

3.2
fixing system
Attachment method, or methods, utilized in fastening a handle to the body of an item of ovenware or to fix a knob to a lid where the handle or knob are not an integral part of the body or lid

3.3
furniture
Generic term covering handles and knobs which are attached to the body or lid of ovenware using a fixing system (3.2) and intended to facilitate the carrying and handling of the article in normal use.

3.4
removable furniture
Furniture designed to be attached and removed from the body or lid of ovenware without the use of tools

3.5
capacity
Volume of water contained when the ovenware is filled to the brim while standing on a level surface

3.6
usable capacity
Two thirds of the capacity

NOTE the true usable capacity of ovenware varies with the food being cooked. The figure given here is an average value intended for use in test situations only and not as information to the consumer.

3.7
coating
Deposit and/or coating applied to a substrate to obtain specific performance properties independent of the properties of the substrate

3.8
non-stick coating
Coating usually applied to the interior of an item of ovenware to achieve an anti-adherent effect during cooking and facilitate cleaning.

3.9
easy clean coating
Coating applied to the interior of an item of ovenware to facilitate cleaning.

3.10
vitreous enamel
Inorganic non-metallic material formed from a mixture of mineral compounds, applied to a metallic substrate and fused at high temperature to form a homogeneous coating.

3.11
glaze
Substance resulting from the melting or sintering of inorganic constituents and designed to form a surface layer which is fused or is capable of being fused in one or more coats and the firing temperature of which is higher than 500 °C.

3.12
organic coating
Material formed from a mixture of resins and polymers, applied to a metallic substrate, cured at low temperatures to form a homogeneous coating

3.13
tinning or tin plating
Deposition of a thin coating of tin onto a steel substrate to ensure protection against corrosion.

3.14
glass
Inorganic non-metallic material produced by the complete fusion of a mixture of raw materials at high temperature into a homogeneous liquid which is then cooled to a rigid condition essentially without crystallization

3.15
glass-ceramic
Inorganic non-metallic material, produced by the complete fusion of a mixture of raw materials at high temperature, into a homogeneous liquid which is then cooled into a rigid material and heat treated to achieve a certain degree of crystallization, mainly submicroscopic small crystallites.

3.16
ceramic
Inorganic non-metallic material formed by firing a mixture of raw materials at high temperature. The firing temperature is high enough to give the necessary strength to the article, which is already shaped, but lower than the temperature which is necessary to achieve complete fusion of the mixture.

3.17
popping
Distinctive sound made by the application of a load to the apparently flat base of an item of ovenware due to the sudden transformation of the base from convex to concave.

4 Materials

No specific requirements for material(s) of manufacture for ovenware are given in this standard.

Ovenware 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.

5 General conditions for testing

Unless otherwise specified, all measurements shall be verified on an unused item of ovenware at ambient temperature of (23 ± 5) °C

6 Construction

NOTE Requirements 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5 and 6.1.6 may be verified on the same item of ovenware.

6.1 General

6.1.1 Stability

The product shall be stable when placed empty without lid on a level surface.

6.1.2 Hygiene

All surfaces intended to come into contact with food shall be easily cleanable under normal circumstances.

6.1.3 Mechanical hazards

All components shall be free from burrs, splinters or sharp edges that could cause injury or discomfort to the user.

6.1.4 Handle position with respect to ovenware

Handles shall be positioned above the centre of gravity of the item of ovenware when filled with sand to its capacity.

6.1.5 Knob Design

It shall be possible to use the knob for its normal purposes while using an oven glove or cloth. In addition the knob shall remain firmly attached to the lid after exposing it to a temperature 20°C above the manufacturer's maximum recommended temperature, or 250°C where no recommendation is given, for 30 min.

6.1.6 Lid Design

The design of the lid shall be such that it shall be possible to remove it from the body using a force equal to the weight of the lid, + 2N in any position at ambient temperature. This test shall be carried out both before and after exposing the product, filled to its usable capacity with water, to a temperature 20°C above the manufacturer's maximum recommended temperature for 30 minutes and allowing it to cool to ambient temperature. Where no maximum temperature is recommended the temperature used shall be 250°C.

The lid shall remain in place throughout the heating and cooling stages. If the lid is fitted with a locking device, this test shall be carried out with the device disengaged.

6.1.7 Thermal shock resistance of brittle materials

All ceramic, glass ceramic and glass ovenware shall be tested in accordance with EN 1183.

6.1.8 Heat resistance

The ovenware shall show no damage after testing as specified in Annex A for a temperature of 20°C above the manufacturer's recommended maximum temperature for 1 hour or 250°C where no maximum temperature is given.

6.1.9 Resistance to leakage

The design of ovenware, including those with folded seams and loose bottoms, shall be such that it does not leak when prepared according to the manufacturer's instructions and filled with any preparation which may be expected to be cooked in it.

6.2 Geometry

The points of measurement of any claimed dimensions shall be made clear to the consumer, e.g. by means of a simple sketch.

6.2.1 Capacity

The actual capacity shall be equal to or greater than the claimed capacity.

6.2.2 Dimensions

Any claimed dimension shall be within $\pm$ 5 mm of the average of two measurements of the actual dimension.

Ceramic ovenware is exempted from this requirement due to the inherent size variations caused by firing during its manufacture.

7 Furniture

The requirements of this clause are applicable only to furniture which is attached to the ovenware by means of a fixing system.

7.1 Materials

No specific requirements for materials or combinations of materials for the manufacture of ovenware furniture are given in this standard but any material used shall comply with the requirements of the appropriate tests.

7.2 Properties

7.2.1 General

It is not the intention that all these tests are passed in sequence. Except where otherwise stated each test shall stand alone.

7.2.2 Heat resistance

Any furniture designed to be attached to an item of ovenware shall show no damage after being subjected to the test described in Annex A for 4 cycles of heating to a temperature 20° C higher than the recommended maximum temperature for 1 hour, or 250 °C where no recommendation is made, and allowing to cool to ambient temperature.

7.2.3 Fatigue Resistance.

A handle assembly shall withstand 5 000 cycles, without permanent distortion or permanent loosening of the handle or its fixing system, when tested as described in Annex B.

8 Coatings

NOTE Coatings may be decorative, non stick, protective or energy related.

8.1 Non-stick coatings

8.1.1 Cross-cut adhesion test

There shall be no removal of the coating greater than classification 2 when tested as described in EN ISO 2409:1994 for hard substrates, with the following modifications:

a) precondition the test piece by immersing it in continuously boiling water for 15 mins, allowing it to cool to ambient temperature and wiping it dry ;

b) repeat clause 7.2.6 of EN ISO 2409:1994 a further 3 times applying the tape at 90° to the previous application each time.

8.1.2 Non-stick performance tests

8.1.2.1 When tested in accordance with Annex C for 20 cycles, any item of bakeware with a non-stick coating shall permit the test food to be fully released and the surface to be wiped clean.

8.1.2.2 When roasting and gratin dishes are tested in accordance with Annex D for 20 cycles, the test food shall not adhere to the surface and it shall be wiped clean.

NOTE The surface is deemed to be clean if unaided visual examination made subsequent to wiping reveals no trace of solid material.

8.2 Vitreous enamel on steel and cast Iron

8.2.1 Boiling citric acid test

When the interior enamel coat is tested in accordance with ISO 2742 the maximum acceptable weight loss shall be 5,0 g/m² for the liquid phase and 10,0 g/m² for the vapour phase over a test period of 24 h.

8.2.2 Boiling water test

When the interior enamel coat is tested in accordance with ISO 2744 the maximum acceptable weight loss shall be 1,5 g/m² for the liquid phase and 4,5 g/m² for the vapour phase over a test period of 24 h.

8.2.3 Thermal shock test

When tested in accordance with ISO 2747, the minimum acceptable failure temperature shall be 250 °C.

8.2.4 Resistance to impact

When tested in accordance with ISO 4532 the exterior enamel shall resist a minimum impact of 20 N, showing no damage greater than 2 mm after 24 h.

8.3 Adhesion test for vitreous enamel on aluminium

When tested as described in Annex E exposure of the base metal shall not exceed 3 mm from the test edge.

8.4 Hard anodised aluminium.

8.4.1 Thickness

The minimum average thickness of an anodised layer shall be 25 µm when measured as specified in EN ISO 2064 and EN ISO 2360.

This check shall be carried out only where the hard anodised coating is not covered by a separate coat of a different material.

8.4.2 Stain Resistance

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

8.4.3 Alkali resistance

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

8.4.4 Hardness

Coatings claimed to be hard anodised shall have a hardness greater than 350 HV 0,5 or equivalent.

8.5 Organic external coatings

8.5.1 Cross-cut adhesion test

There shall be no removal of the coating greater than classification 2 when tested as described in EN ISO 2409:1994 for hard substrates, with the following modifications:

a) precondition the test piece by immersing in continuously boiling water for 15 min, allow it to cool to ambient temperature and wipe it dry ;

b) repeat clause 7.2.6 of EN ISO 2409:1994 a further 3 times applying the tape at 90° to the previous application each time.

8.6 Tinning

8.6.1 An item of tinned bakeware shall show no trace of oxidisation when tested in accordance with Annex C for 20 cycles. It is permissible to use a tool (wooden or plastic spatulas) to remove residues to assist examination.

8.6.2 Tinned roasting and gratin dishes shall show no trace of oxidisation when tested in accordance with Annex D for 20 cycles.

8.7 Easy clean coatings on metallic ovenware

8.7.1 Easy clean bakeware shall permit the complete removal of all food residues when tested as described in Annex C for 20 cycles.

Any hard water staining is ignored.

8.7.2 Easy clean roasting and gratin dishes shall permit the complete removal of all food residues when tested as described in Annex D for 20 cycles.

Any hard water staining is ignored.

8.8 Easy clean coating on ceramic ovenware

8.8.1 Easy clean bakeware shall permit the complete removal of all food residues when tested as described in Annex C for 20 cycles.

Any hard water staining is ignored.

8.8.2 Easy clean roasting and gratin dishes shall permit the complete removal of all food residues when tested as described in Annex D for 20 cycles.

Any hard water staining is ignored.

9 Performance

9.1 Stability - Deformation test

9.1.1 Central loading

An item of ovenware shall show no permanent deformation or popping when tested as described in Annex H.

This requirement applies to all items of ovenware except those with a hollow central part (e.g. ring mould, kugelhopf mould).

9.1.2 Eccentric loading

Gratin and roasting dishes shall show no permanent deformation or popping when tested as described in Annex J.

9.1.3 Distributed loading

An item of ovenware shall show no permanent deformation when tested as described in Annex K**.**

10 Product Information

10.1 Point of sale information

All products or their packaging shall be labelled with the following information so that it is visible at the point of sale:

a) an indication as to the type and size (dimension or capacity) of the product ;

b) the name of the manufacturer, importer or retailer and reference of the product ;

c) the maximum operating temperature ;

d) the types of oven for which the product is suitable ;

e) the non-suitability of the product for use under a grill, if applicable.

10.2 Care and use instructions.

All products shall be accompanied by appropriate care, safety and use instructions including the following.

a) advice on preparation before first use ;

b) advice on cleaning after use ;

c) advice on obtaining optimum performance ;

d) general safety advice ;

e) specific advice on the care of non-stick surfaces where appropriate ;

f) special safety instructions and warnings of any hazards inherent in the use of the product ;

g) advice on what to do if the product proves to be unsatisfactory ;

h) name and contact address of manufacturer, importer or retailer.

Annex A
(normative)

Test for heat resistance of ovenware - Test for heat resistance of furniture

A.1 Apparatus

A.1.1 An air circulating oven capable of maintaining the set temperature $\pm$ 2 °C.

A.1.2 A means of measuring the duration of the test $\pm$ 1 min.

A.2 Procedure

A.2.1 Bring oven to the required temperature.

A.2.2 Place the item to be tested in the oven.

A.2.3 Allow oven to return to set temperature.

A.2.4 Start timer and maintain the oven at the required temperature for the specified time.

A.2.5 Remove test item, place on a dry surface and allow to cool to ambient temperature.

A.2.6 Visually examine the test item (reference distance 250 mm) for any damage. Record findings.

Annex B
(normative)

Handle fatigue test

B.1 Apparatus

B.1.1 A means of continuously raising and lowering a loaded item of ovenware, from a level surface covered by a rubber plate (thickness 5mm; hardness 50 ± 10 Shore) 25 times per minute by means of its handle.

NOTE The general form of a suitable apparatus is show in figure B.1

B.1.2 Materials allowing the ovenware to be steadily loaded during the test, for example aluminium oxide, mesh size 46.

B.2 Procedure

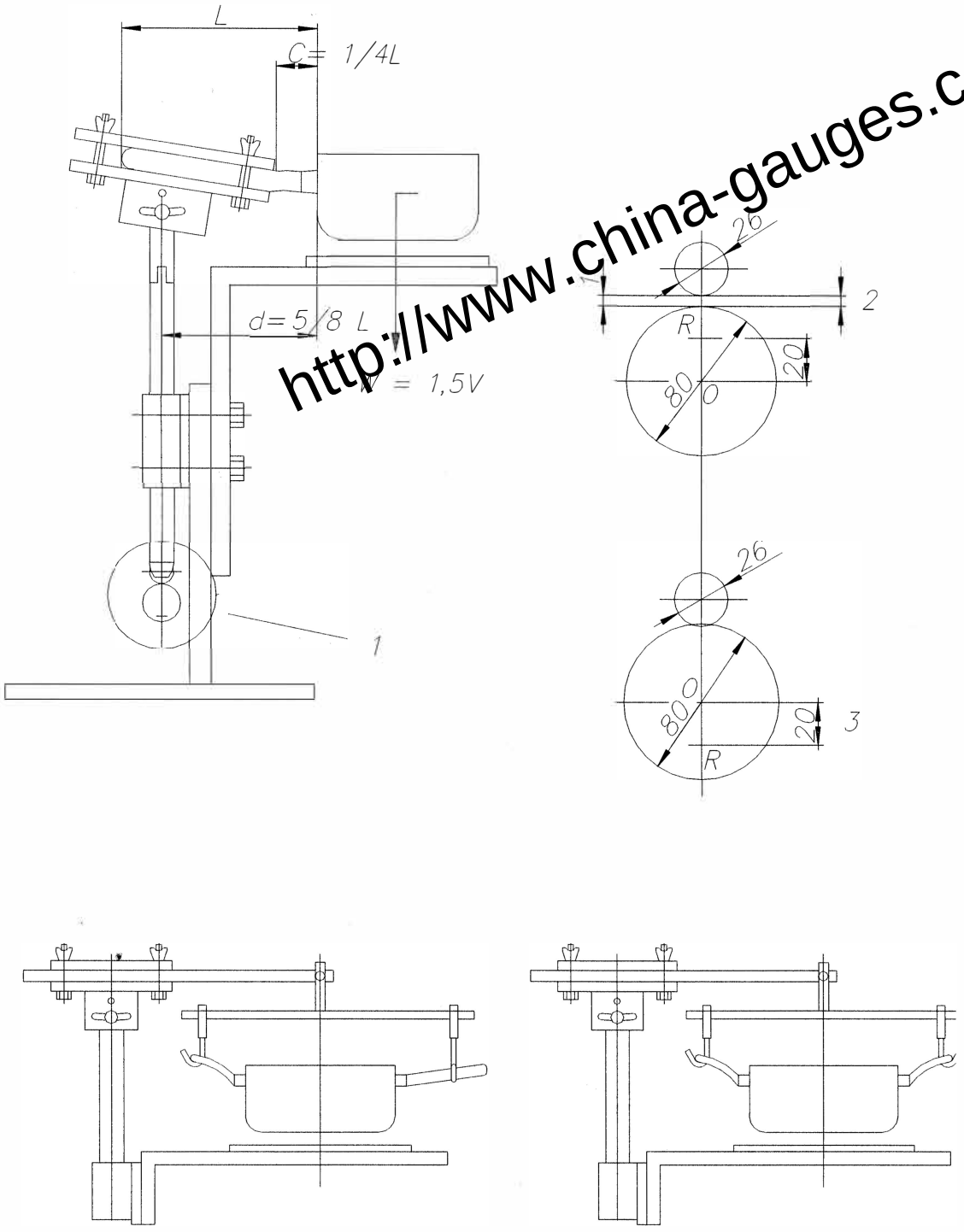
B.2.1 Precondition the ovenware by subjecting it to the heat resistance test described in Annex A**.**

B.2.2 Attach the ovenware securely to the apparatus, as shown in figure B.1**,** appropriate to the type and number of handles. Ensure that it sits flat on the table and that there is a gap of 1 mm between the cam and the follower when the cam is at its lowest point.

B.2.3 Place into the ovenware a loading of equivalent to 1,5 times the mass of water at the capacity of the ovenware.

B.2.4 Run the apparatus for the required number of cycles. After which remove the ovenware from the apparatus, examine and record any permanent damage to the handle or fixing system.

Dimensions in millimetres



1 – circular cam
2 – circular cam in low position
3 – circular cam in high position
O = cam centre
R = rotation centre

Figure B.1 — Handle fatigue test

Annex C
(normative)

Non-Stick performance test for bakeware - Easy clean performance test for metallic and ceramic bakeware - Corrosion test for tinned bakeware

C.1 Prepare the bakeware by following the manufacturer's instructions or, where none are available, greasing the interior with a thin film of butter.

C.2 Prepare sufficient mixture, to the following recipe:

Ingredients:
- Plain flour
- Butter
- Caster sugar
- Eggs

} Weight equal to the weight of the eggs

- Chemical raising agent (10g/3 eggs).

Example of proportions : for a 24cm diameter baking tin 3 eggs are required.

C.3 Half fill the bakeware with the mixture or, for flat items, apply approximately 100 g of the mixture directly to the surface.

C.4 Bake in an oven preheated to 180°C ± 15°C until the mixture will no longer adhere to a clean smooth stainless steel knife blade.

C.5 Remove the cake from the oven and allow to cool for 5 minutes.

C.6 Turn out the cake by inverting the bakeware and, if necessary, lightly tapping the base and /or the edge.

C.7 Soak metal bakeware in water, at 60°C ± 5°C, containing domestic washing up liquid for 10 s and wash using a natural sponge. Rinse in hot and then cold water and dry. Examine the surface and note results.

C.8 Soak ceramic bakeware in water, at 60° C ± 5° C, containing domestic washing up liquid for 2 h and wash using a natural sponge. Rinse in hot and then cold water and dry. Examine the surface and note results.

Annex D
(normative)

Non-Stick perfomance test for roasting and gratin dishes - Easy clean performance test for roasting and gratin dishes - Corrosion test for tinned roasting and gratin dishes

D.1 Place a piece of raw rump steak, free from any visible fat, of area 200 ± 25 cm^2 into the sample. Place in an oven preheated to 180 °C ± 10 °C and cook for one hour.

D.2 Remove the sample from the oven, check and note whether the meat is stuck to the coating or not.

D.3 Remove the meat from the sample and pour out any liquid juices.

D.4 Soak metallic samples in water, at 60°C ± 5°C, containing domestic washing up liquid for 10 s and wash using a natural sponge. Rinse in hot and then cold water and dry. Examine the surface and note results.

D.5 Soak ceramic samples in water, at 60° C ± 5°C, containing domestic washing up liquid for 2 hours and wash using a natural sponge. Rinse in hot and then cold water and dry. Examine the surface and note results.

Annex E
(normative)

Adhesion test for vitreous enamel on aluminium

E.1 Principles

A test specimen, cut from a complete product, is immersed in an aqueous solution of antimony trichloride at ambient temperature for a period of 20 h.

E.2 Reagents

E.2.1 Antimony trichloride, 10 g/l solution, prepared by dissolving 10 g of analytical grade antimony trichloride in 1 l of distilled or deionized water.

Prepare a fresh solution on the day of the test. Do not use wet or damp $SbCl_3$.

Antimony trichloride is very hygroscopic and shall be stored under suitable conditions.

E.2.2 Degreasing agent

E.3 Test specimens

The test specimen shall be free from pitting, lumps, depressions or blow holes.

Each specimen, cut with a saw from a complete product, shall have one cut edge, the test edge, at least 150 mm long.

The test edge shall be filed smooth at 90° to the coated face.

E.4 Procedure

E.4.1 Fill a suitable container with fresh test solution (E.2.1) to depth of at least 160 mm**.**

E.4.2 Degrease the test specimen with a suitable solvent and rinse in deionized water.

E.4.3 Suspend the test specimen in the test solution so that the test edge is at least 150 mm deep in the solution.

E.4.4 After 20 h immersion at ambient temperature (18 to 28)° C, wash the specimen in deionized water and air dry.

E.4.5 Inspect the enamel coating adjacent to the test edge for flaking of the coating from the base metal. Measure and record the dimensions of the base exposed by any such flaking.

Annex F
(normative)

Resistance to staining of hard anodised coatings

F.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.

F.2 Reagents

F.2.1 A (40 ± 5) % Nitric acid (HNO_3) solution, freshly prepared on the day of the test.

F.2.2 Dye, Aluminium Blue 2LW dye solution prepared by dissolving 1 g in 50 ml distilled water.

F.3 Procedure

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

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

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

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

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

Annex G
(normative)

Resistance to alkali of hard anodised aluminium

G.1 Apparatus

G.1.1 A means of raising the temperature of the sample and the solution to 35° C and maintaining them at that temperature during the test.

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

G.2 Reagents

G.2.1 5 % Sodium hydroxide solution**,** freshly prepared on the day of the test.

G.2.2 Degreasing agent: any substance which will degrease the test specimen without leaving any residue.

G.3 Procedure

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

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

G.3.3 Raise sample and test solution to 35 ° C.

G.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 °C.

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

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

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

Annex H
(normative)

Central loading test

H.1 Apparatus

H.1.1 A flat surface.

H.1.2 Two supports 7 cm x 7 cm at least 3 cm in height.

H.1.3 Cylindrical mass equal to 1,5 times the mass of water required to fill the utensil to its usable capacity.

The cylinder's diameter shall be 5 cm for items of ovenware with at least one dimension less than 8 cm, and shall be 10 cm for all other items.

H.2 Procedure

H.2.1 Determine the usable capacity in accordance with 3.6.

H.2.2 Position the item of ovenware with the two supports under the normal lifting points.

H.2.3 Place the cylindrical load in the centre of sample without impact.

H.2.4 Record any temporary deformation under load and whether any popping occurred.

H.2.5 Remove the load and record any permanent deformation and whether any popping occurred.

Annexe J
(normative)

Eccentric loading test

J.1 Apparatus

J.1.1 A flat surface.

J.1.2 Two supports 7 cm x 7 cm at least 3 cm in height.

J.1.3 Two cylindrical masses each equal to equivalent to 1,5 times the mass of water required to fill the utensil to its usable capacity.

The cylinder's diameter shall be 5 cm for items of ovenware with at least one dimension less than 8 cm, and shall be 10 cm for all other items.

J.2 Procedure

J.2.1 Determine the usable capacity in accordance with 3.6.

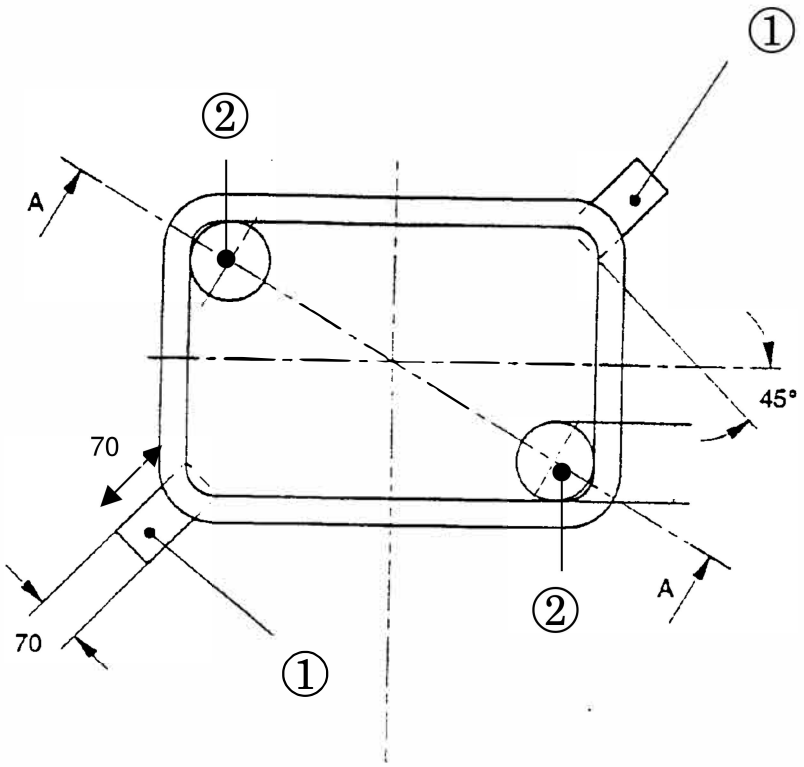
J.2.2 Position the item of ovenware with the two supports under diagonally opposite corners, as shown in figure J.1

J.2.3 Place the cylindrical loads without impact in the corners along the other diagonal, as shown in figure J.1.

J.2.4 Record any temporary deformation under load and whether any popping occurred.

J.2.5 Remove the load and record any permanent deformation and whether any popping occurred.

Dimensions in millimetres



1 – support
2 – cylindrical mass

Figure J.1 Eccentric loading test

Annex K
(normative)

Distributed load test

K.1 Apparatus

K.1.1 A flat surface.

K.1.2 Free flowing material to uniformly load the test item during the test, e.g. aluminium oxide mesh size 46 or sand.

NOTE The loading material may be contained within a flexible plastic bag for ease of handling.

K.2 Procedure

K.2.1 Determine the usable capacity in accordance with 3.6.

K.2.2 Evenly distribute a mass of material (K.1.2) equal to 1,5 times the mass of water required to fill the utensil to the usable capacity across the base of the sample.

K.2.3 Lift the sample and hold for 30 s.

K.2.4 Remove the material and place the sample on the flat surface.

K.2.5 Examine the sample and record any permanent deformation.

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