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Draft Indian Standard

EARTHENWARE CROCKERYWARE-SPECIFICATION

(Fourth Revision)

(ICS 81.060.20; 97.040.60)

Ceramicware Sectional Committee, CHD 09

Last Date for Comments: 3 November 2023

FOREWORD

(Formal clause to be added later)

This standard was originally published in 1964 and subsequently revised in 1976 and 1995. Third revision of this standard was brought out in 2002 and the limits for release of lead and cadmium had been modified to align with the ISO/DIS 6486-2:1999 'Ceramicware, glass-ceramicware and glass dinnerware in contact with food — Release of lead and cadmium — Part 2: Permissible limit', which incorporates present regulatory requirements of major world bodies, in order to obviate any non-tariff barriers apart from ensuring protection of the population against possible hazards arising from the use of improperly formulated and/or processed crockeryware used for preparation, serving and storage of food and beverages.

In this revision, grade 2 and grade 3 has been removed as the grades are only distinguished based on visual assessment test.

The various test methods have been given in IS 14179:1999 'Methods of test for ceramic tableware' and IS 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*).

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 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

This standard prescribes requirements and methods of sampling and test for earthenware crockeryware.

2 REFERENCES

The following Indian Standards contain provisions which, through reference in this text, constitute provision of 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 indicated below:

| <i>IS No.</i> | <i>Title</i> |
|---------------|--|
| 2781:1975 | Glossary of terms relating to ceramicware (<i>first revision</i>) |
| 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 (<i>first revision</i>) |
| 14179:1999 | Methods of test for ceramic tableware |

3 TERMINOLOGY

3.1 For the purpose of this standard, the definitions given in IS 2781, in addition to the following, shall apply.

3.1.1 *Earthenware* — A glazed non-vitreous ceramicware.

3.1.2 *Crockeryware* — It shall mean all types of dinnerware, tableware, etc (other than artware) made from earthenware, stoneware, fine (bone) china, porcelain, vitreous china and glass-ceramics.

4 REQUIREMENTS

4.1 Material

It shall be a ceramic material, white/coloured, having high porosity, non-translucency, and less mechanical strength, biscuitied at higher temperature, glazed at relatively lower temperature and covered with a properly matured fritted glaze. The glaze shall be of uniform colour, impervious and as free as possible from visual defects.

4.2 Workmanship

4.2.1 General

All items of earthenware crockeryware in a set shall be generally of a matching design, colour and decoration.

4.2.2 The cup shall rest in the middle of the saucer without rocking or spinning.

4.2.3 The handle, where provided, shall not be misplaced.

4.2.4 The lip or spout shall be so designed that liquids may not trickle down from the sides of the ware while pouring.

4.2.5 The lid, where used, shall fit properly and shall not fall down while pouring out liquids.

4.2.6 The capacity of the tea pot/coffee pot in a set shall correspond to the capacity of the cups.

4.3 Finish

The entire surface of items of earthenware crockeryware shall be covered by a smooth uniform, continuous, impervious and fritted glaze except for the resting surface (bottom rim) of the hollow ware which is cleanable and retains this quality. In addition, the resting surface of items other than hollow ware shall be non-abrasive in texture.

4.3.1 The glazed surface shall be even, free from defects, namely, craze, speck, crawling, patches, finger prints and pin holes and shall comply with the requirements of visual assessment as prescribed in Annex A.

4.3.1.1 The pinhole shall be determined by applying a dye-based fountain pen ink on the surface of the article under test. Allow it to dry. Wipe out the ink from the article with a wet cloth and observe the spot wherever ink stain has remained.

4.4 Warpage

4.4.1 Out-of-roundness

The out-of-roundness of various items of earthenware crockeryware shall not exceed 0.8 mm on the nominal diameter when measured in accordance with the method prescribed in **7.1** of IS 14179.

4.4.2 Edge-warpage and Slope of Flatware

The edge-warpage and slope of the flatware shall not exceed 1.5 mm and 3° respectively when measured in accordance with the method prescribed in **7.2** of IS 14179.

4.4.3 Flatness of Dinner Plate

The eating surface of the dinner plate shall be flat within 2 mm total indicator run-out when measured in accordance with the method prescribed in **7.3** of IS 14179.

4.5 Release of Lead and Cadmium (Toxic Elements)

The limits of release of lead (Pb) and cadmium (Cd) extracted from earthenware crockeryware shall not exceed the following limits when tested as prescribed in IS 9806.

| <i>Type of Ware</i> | <i>Minimum Number of Specimen</i> | <i>Unit</i> | <i>Lead Limit</i> | <i>Cadmium Limit</i> |
|---------------------------|-----------------------------------|--------------------|-------------------|----------------------|
| Flatware | 4 | mg/dm ² | 0.8 | 0.07 |
| Large | 4 | mg/l | 1.0 | 0.25 |
| hollow ware Small | 4 | mg/l | 2.0 | 0.50 |
| hollow ware Cups and mugs | 4 | mg/l | 0.5 | 0.25 |
| hollow ware Storage | 4 | mg/l | 0.5 | 0.25 |
| Cooking ware | 4 | mg/l | 0.5 | 0.05 |

NOTE — Flatware shall constitute a minimum source of lead and cadmium burden from earthen articles. Limits for flatware (lead and cadmium) refer to the value obtained when the individual values of the pieces tested are averaged. All other limits are expressed in absolute maximum values, in that, no individual unit comprising a sample exceeds these levels.

4.6 Thermal Shock Resistance

All items of earthenware crockeryware shall withstand a thermal shock of 120°C for three cycles when tested in accordance with the method prescribed in **13** of IS 14179.

4.7 Water Absorption

The water absorption of the items of the earthenware crockeryware when tested in accordance with the method prescribed in **10** of IS 14179 shall be less than 8 percent.

4.8 Impact Strength and Chipping Resistance

The impact strength and chipping resistance of the various items of earthenware crockeryware when tested in accordance with the method prescribed in **9** of IS 14179 shall be as prescribed below:

| <i>Item of Crockeryware</i> | <i>Impact Strength Min</i> | <i>Chipping , Resistance, Min</i> |
|-----------------------------|----------------------------|-----------------------------------|
| | Nm | Nm |

| | | |
|--|------|------|
| Cup, mug, sugar pot, milk pot, tea pot, coffee pot and bowl. | 0.20 | — |
| Flatware | 0.22 | 0.20 |

4.9 Resistance to Detergents

When tested by the method prescribed in **11** of IS 14179, the test article shall not show any loss of gloss of the glaze when compared with the untested test specimen.

4.10 Resistance to Citric Acid

When tested by the method prescribed in **12** of IS 14179, the test article shall not show any loss of gloss of the glaze when compared with the untested test specimen.

4.11 crazing Resistance

When tested in accordance with **8** of IS 14179, the articles of the crockeryware shall show no crazing after undergoing three cycles.

5 MARKING AND PACKING

5.1 Marking

Each item of earthenware crockeryware shall be indelibly and legibly marked with its source of manufacture.

5.1.1 In addition to the above, each package shall be marked with the following particulars:

- a) Indication of the source of manufacture;
- b) Description of the items;
- c) Quantity;
- d) Batch number and lot number;
- e) Grade and type;
- f) Decoration quality number, if any; and
- g) Month and year of manufacture.

5.1.2 BIS Certification Marking

The packages may also be marked with the Standard Mark.

5.1.2.1 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the Bureau of Indian Standards Act, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the standard mark.

5.2 Packing

The crockeryware shall be packed as agreed to between the purchaser and the supplier.

6 SAMPLING

Representative samples of the earthenware crockeryware shall be drawn in accordance with 4 of IS 14179.

ANNEX A

(Clauses 4.1 and 5.3.1)

VISUAL ASSESSMENT FOR EARTHENWARE CROCKERYWARE

A-1 GENERAL

Visual assessment for grading of earthenware crockeryware is done on the basis of the nature, number and distribution of the defects in the final ware in respect of its appearance, finish and decoration as given in Table 1.

A-2 ASSESSMENT

A-2.1 Any item of the earthenware crockeryware having not more than 4 defects out of first thirteen characteristics as described in Table 1.

Table 1 Classification of Defects Earthenware Crockeryware

(Clauses A-1, A-2 and A-2.1)

| Sl No. | Characteristic | Earthenware Crockeryware |
|--------|---|--|
| (1) | (2) | (3) |
| i) | Pin holes | |
| | a) Body | 2 up to 0.8 mm |
| | b) Glaze | 10 upto 1.0 mm |
| ii) | Grog | |
| | a) Surface | Nil |
| | b) Bottom | 2 up to 0.8 mm |
| iii) | Iron specks and colour specks on glaze/body | |
| | a) White glaze | 1 up to 1.0 mm |
| | b) Colour glaze | 3 up to 1.0 mm |
| iv) | Clay particle | |
| | a) Surface | 1 up to 2.0 mm |
| | b) Handle | 4 up to 2.0 mm |
| v) | Cracks, lengthwise | |
| | a) Surface | Nil |
| | b) Bottom | 1 up to 0.8 mm (thickness 10 percent of the thickness of the item) |
| | c) Handle | Nil |
| vi) | Handle replacement | Handle replacement |
| vii) | Chips | |
| | a) Rim | Nil |
| | b) Bottom | 1 up to 0.8 mm |
| viii) | Uneven glaze | |
| | a) White | Nil |
| | b) Colour | 10 percent |
| ix) | Glaze cut | |
| | a) Surface | Nil |
| | b) Bottom | 1 up to 3.0 mm |

| | | |
|--------|---------------------|----------------|
| x) | Off glaze | |
| | a) Rim | 1 up to 0.5 mm |
| | b) Surface | 2 up to 0.5 mm |
| | c) Bottom | 3 upto 1.0 mm |
| xi) | Blister | Nil |
| xii) | Droper | 1 upto 3.0 mm |
| xiii) | Glaze grinding mark | 1 up to 0.8 mm |
| xiv) | Scuming | Nil |
| xv) | Loss of sound | Nil |
| xvi) | Decoration | Nil |
| xvii) | Burning decoration | Nil |
| xviii) | Off decoration | Nil |

Note more than four in a cluster
