SRI LANKA STANDARD 219:1973
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SPECIFICATION FOR

CROCKERY

BUREAU OF CEYLON STANDARDS

SPECIFICATION FOR CROCKERY
(METRIC UNITS)

SLS 219 : 1973

Gr. 4

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Sri Lanka.

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This Standard does not purport to include all the necessary provisions of a contract.

SRI LANKA STANDARD
SPECIFICATION FOR CROCKERY
(METRIC UNITS)

FOREWORD

This Sri Lanka Standard has been prepared by the Drafting Committee on Ceramics. It was approved by the Civil Engineering Divisional Committee of the Bureau of Ceylon Standards and was authorised for adoption and publication by the Council of the Bureau on 1973-09-10.

This standard covers the important requirements of crockery that are commonly used in day to day life.

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 observation shall be rounded off in accordance with CS 102 Presentation of numerical values. The number of figures to be retained in the rounded off value shall be the same as that of the specified value in this standard.

In the preparation of this standard, reference has been made to the publication of the Indian Standards Institution.

1 SCOPE

This standard specification covers the essential requirements, methods of test and sampling of crockery.

This standard does not cover the shapes and sizes of crockery.

2 GENERAL REQUIREMENTS

2.1 The crockery shall be a fired earthenware covered by a glaze properly matured and fitted to the body. The body upon fracture shall appear fine-grained in texture, dense and homogeneous. The crockery shall be sound shall be of good workmanship and shall be free from chipped edges.

2.2 The cup shall match the saucer in all respects.

2.3 The lid wherever used shall fit properly. In the case of tea and coffee pots the lid shall not fall while pouring liquids.

2.4 The spout shall be so designed that liquid shall not trickle down the sides while pouring or drip after pouring.

2.5 For visual assessment of crockery, defects in respect of appearance, workmanship, finish and decoration shall be classified as given in Table 1.

3 SPECIFIC REQUIREMENTS

3.1 Glazing

All surfaces shall be glazed. Surfaces or points where the crockery are supported in the kiln may be unglazed, but these unglazed surfaces shall be smooth.

3.1.1 The glaze shall be even, free from craze, pinholes, spit out patches and stain, and shall possess an impervious surface.

3.1.2 In the case of glazes containing lead, the lead solubility shall not exceed the limit prescribed in 3.3.

TABLE 1 - Classification of defects in crockery

Sl No.	Characteristics	Nature of defects	Classification of defects	
			Minor	Major
(1)	(2)	(3)	(4)	(5)
1	Appearance	a) Off standard colour	X	-
		b) Unground kiln dirt or glaze grinding marks (less than 0.8 mm) not more than two each. Total not more than three on the face and four on the back in the part not directly visible. No grouping.	X	
		c) Unground kiln dirt (0.8 mm or longer)		X
2	Workmanship	a) Cracks	-	X
		b) Chipping - on surfaces directly visible (body chips less than 1.6 mm in size on edge and 3.2 mm Max on foot which are glazed over not to be treated as defect)	-	X
		c) Lack of uniformity in texture and finish	-	X
		d) Pin-hole up to 0.4 mm in size, not to exceed three on face and four on back. No grouping.	X	-
		e) Pin-holes larger than 0.4 mm.	-	X
		f) Spots up to 0.4 mm in size not to exceed three on face and four on back. No grouping.	X	-
		g) Spots larger than 0.4 mm.	-	X
		h) Combined defects as given in 1) b), 2)d) and 2)f) not more than three either on face or back without grouping.	X	-

Sl No.	Characteristics	Nature of defects	Classification of defects	
			Minor	Major
(1)	(2)	(3)	(4)	(5)
2	Workmanship	(Cont'd)		
		i) Base spots in glaze. (One or more ground pin marks on back and fixture marks from spray machine are not to be treated as defects.	-	X
		j) Heavy glaze resulting in open air bubbles or greenish colour.	-	X
		k) Slight light glaze on the back only.	X	-
		l) Slight matt glaze on the back only	X	-
		m) Dunting and crazing	-	X
3	Finish	a) Warpage resulting in ovality not more than three per cent of nominal diameter or sagging less than five per cent of the height respectively.	X	-
		b) Misplaced handle	-	X
		c) Corner and sharp edges	-	X
		d) Over firing	-	X
		e) Flash discolour	-	X
4	Decoration, distinguishing marks	a) Smudged badging, if not noticeable	X	-
		b) Decoration misplacement	-	X

3.2 Crazing

When tested as prescribed in Appendix A, the articles shall show no crazing after undergoing three cycles of the test.

3.3 Lead solubility

The lead solubility of the glaze of any of the samples shall be not more than 2 µg/g when tested as prescribed in Appendix B.

3.4 Water absorption

The average water absorption of the material shall be not more than 10 per cent when tested in accordance with Appendix C.

3.5 Thermal shock resistance

When subjected to five cycles of thermal shock tests in accordance with the method described in Appendix D the material shall not show any body crack or glaze crazing.

4 SCALE OF SAMPLING

4.1 Samples to determine the conformity of a consignment of fine china crockery to the requirements of this specification shall be drawn in accordance with the procedure given below.

4.2 Lot

In any consignment all crockery articles of the same category (such as cups, pots and plates), same quality and manufactured approximately at the same time shall be grouped together to constitute a lot of 1000 pieces or less.

4.3 Samples shall be taken from each lot to ascertain the conformity of the crockery to the requirements of this specification.

4.4 Scale of sampling

The number of crockery articles to be selected in the sample for various tests shall be as given in Table 2. These shall be selected at random using preferably random number tables. If the pieces are packed in a number of boxes, 20 per cent of the boxes in the lot (subject to a minimum of 5) shall be opened and equal number of pieces shall be taken from each box to give the required sample size.

TABLE 2 - Scale of Sampling

Lot size	For workmanship, finish, appearance and decoration		
	Sample size	Acc. No. of major defects	Acc. No. of minor defects
(1)	(2)	(3)	(4)
up to 100	8	0	7
101 to 300	13	1	10
301 to 500	20	1	14
501 to 1000	32	2	21

5 CRITERIA FOR CONFORMITY

5.1 Appearance, workmanship, finish and decoration

The sample of crockery selected according to Table 2 shall be individually examined for the presence of major defects and minor defects as classified in Table 1. The total number of major defects on the sample sizes shall not exceed the acceptance number given in Column 3 and the total number of minor defects, in turn, shall not exceed the corresponding limit specified in Column 4, if the lot is to be accepted under this test.

5.2 Other tests

Separate tests shall be conducted for crazing, lead solubility, water absorption and thermal shock resistance. The lot will be deemed unsatisfactory if failure is reported in any of these tests.

6 PACKING AND MARKING

6.1 Packing

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

6.2 Marking

Each article of the crockery shall, permanently and legibly, be marked on its lower surface with the maker's name or his registered trade mark, if any.

6.2.1 Where badging is required, it shall be as agreed to between the purchaser and the supplier.

APPENDIX A

TEST FOR CRAZING

A.1 PRINCIPLE

A.1.1 The articles are subjected to 5 cycles of pressure of 5 bar (5 kgf/cm^2) of saturated steam for one hour and cooled to room temperature. The glaze is then examined for crazing.

A.2 REAGENT

A.2.1 *Eosin solution,* 0.5 per cent (m/v), in water.

A.3 PROCEDURE

A.3.1 Place fresh, whole articles in an autoclave or any suitable pressure vessel and subject to a constant pressure of 5.0 ± 0.2 bar (5.0 ± 0.2 kgf/cm^2) in saturated steam. Allow 30 minutes for raising the steam pressure. Keep the articles under pressure for one hour, and then release the pressure quickly. Allow the articles to cool to room temperature in the pressure vessel. Then examine for crazing by applying eosin solution to both the inner and outer glazed surfaces. Repeat the test 5 times.

A.3.1.1 The articles shall be considered to have passed the test if no coloured hair lines are noticed on the surface.

APPENDIX B

TEST FOR LEAD SOLUBILITY

B.1 PRINCIPLE

B.1.1 Test pieces are boiled in dilute acetic acid, and hydrogen sulphide is then bubbled through it. The colour (of lead sulphide) thus generated is compared with that of the standard lead solution which is similarly treated with hydrogen sulphide.

B.2 REAGENTS

B.2.1 *Dilute acetic acid,* 5 per cent (v/v) made from pure grade acid and containing gelatine 0.25 per cent (m/v).

B.2.2 *Standard lead solution*

Dissolve 0.2744 g of lead acetate in water and dilute to 1000 ml. Pipette 2 ml of this solution into a 150-ml measuring flask. Make up the volume to the mark with dilute acetic acid (see B.2.1) to give 2 µg/g lead solution.

B.3 TEST PIECES

B.3.1 Take two fresh, whole articles. Cut or break from each fresh whole article two pieces, each having an area approximately 30 cm^2 on one face. The test pieces shall be more or less flat so that they may dip completely in the test solution. At least two major surfaces of the test pieces shall be glazed.

B.4 APPARATUS

B.4.1 *Nessler cylinder*, of 50-ml capacity.

B.5 PROCEDURE

B.5.1 Place two test pieces from one of the two test samples in a 500-ml beaker and cover them completely with dilute acetic acid (see B.2.1). The ratio of the total area of the glazed test pieces in cm^2 to the volume of the test solution in ml shall be 4:5. Use a few glass beads to separate the two test pieces from each other as also from the bottom of the beaker. Bring the solution in the beaker to boiling in about two minutes and transfer the beaker with its contents to a boiling water-bath and heat for 30 minutes. Decant the solution and allow to cool to room temperature. Pass hydrogen sulphide through 50 ml of the solution in a Nessler cylinder.

B.5.2 Pass hydrogen sulphide through 50 ml of standard lead soltuion taken in another Nessler cylinder. Compare the colour of the test solution with that of the standard lead solution.

B.5.2.1 The specimens shall be considered to have passed the test if the intensity of colour developed with the sample is not greater than that developed with standard lead solution.

B.5.3 Report the colour of the test solution as lighter or darker than that of a standard lead solution.

B.5.4 Repeat the test with test pieces taken from the other sample.

B.5.5 Both the samples shall pass the test.

NOTE - The lead solubility test shall be completed on the same day since the solutions kept overnight do not give the same intensity of colour with hydrogen sulphide as the freshly prepared solution.

APPENDIX C

TEST FOR WATER ABSORPTION

C.1 PRINCIPLE

C.1.1 The amount of water absorbed by an article is determined by boiling the article in distilled water and finding the increase in mass.

C.2 TEST PIECES

C.2.1 Cut or break three test pieces from three different specimens to get a sufrace area of about 16 cm^2. Two faces of the test pieces shall be glazed and other sides unglazed and freshly broken.

C.3 PROCEDURE

C.3.1 Clean the test pieces with distilled water and dry to a constant mass at a temperature between 105 °C and 110 °C and then cool to room temperature in a desiccator. Weigh the pieces to an accuracy of 0.01 g. Immerse the weighed pieces in distilled water in a beaker and boil for 5 hours. Use a few glass beads to prevent the test pieces from touching the bottom of the beaker. After boiling, cool to room temperature allowing the pieces to remain in water for 20 hours. Take them out and wipe carefully with a soft, damp cloth to remove excess water adhering to the surfaces. Weigh the test pieces.

C.3.2 Water absorption of the test pieces shall be calculated as follows:

$$\text{Water absorption per cent by mass} = \frac{m_2 - m_1}{m_1} \times 100$$

where,

m_2 = mass, in g, of the test pieces after boiling in water, and

m_1 = mass, in g, of the dry pieces.

C.3.3 Report the average of results on three test pieces.

APPENDIX D

TEST FOR RESISTANCE TO THERMAL SHOCK

D.1 GENERAL

D.1.1 Theraml shock is measured by the difference between the upper temperature t_1, to which the specimens are heated, and the lower temperature t_2 of the cold water bath into which they are placed after heating.

D.2 APPARATUS

D.2.1 *Air oven*

With a temperature range of 35 °C to 250 °C and provided with an air stirrer or circulator to ensure uniformity of temperature. The oven shall have a thermostat capable of maintaining the temperature constant to ± 1 degree Celsius upto 180 °C ± 2 degrees Celsius between 180 °C and 250 °C. It shall also be provided with a thermometer capable of being read to an accuracy of ± 1 degree Celsius.

D.2.2 *Bath*

Having a capacity of at least five litres provided with a suitable stirrer or any other device to ensure uniformity of temperature throughout the bath. It shall also be provided with a thermometer capable of being read to an accuracy of ± 1 degree Celsius.

D.3 REAGENT

D.3.1 *Eosin solution,* 0.5 per cent (m/v) in water.

D.4 PROCEDURE

D.4.1 Place the specimens in the air oven previously heated to the upper temperature t_1, so that the difference

$(t_1 - t_2)$ is equal to 150 degrees Celsius, t_2 being the temperature of tap water in the cold water bath. Maintain the oven at that temperature for 30 minutes. Then remove the specimens from the oven, one at a time, by means of tongs with asbestos-covered tips, completing the process of transference in 5 $\pm$ 1 seconds for each article, and immerse the specimens for a specified period not exceeding two minutes, into the cold water bath, dry the specimens and then immerse in the eosin solution. Examine the test specimens after cleaning. The specimens shall be subjected to this test 5 times.

D.4.2 The specimens shall be considered to have satisfied the requirements of the test if there is no indication or crazing of the glaze or cracking of the ware.

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