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SPECIFICATION FOR

GLASS JAM JARS

SRI LANKA STANDARDS INSTITUTION

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SLS 719:1985

Gr. 8

SRI LANKA STANDARDS INSTITUTION
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SRI LANKA STANDARD

SPECIFICATION FOR GLASS JAM JARS

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 1985-11-20, after the draft, finalized by the Drafting Committee on Glass Products had been approved by the Chemicals Divisional Committee.

Jam jars are intended to be filled with 450 g of jam, the density of which should lie in the range of 1.30 g/ml to 1.40 g/ml.

All standard values in this specification are given in SI units.

For the purpose of deciding whether a particular requirement of this specification is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with CS 102. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this specification.

1 SCOPE

This specification prescribes the requirements and methods of sampling and test for glass jam jars.

2 REFERENCES

CS 102 Presentation of numerical values

CS 124 Test sieves

SLS 428 Random sampling methods

SLS 601 Glass container finishes

Part 3 Omnia finishes

Part 4 Lug finishes

3 DEFINITIONS

For the purpose of this specification the following definitions shall apply:

3.1 blisters: Large bubbles in glass.

3.2 brimful capacity: The volume of the contents of a jar when filled to the brim with water at 27 ± 2 °C.

3.3 bubbles: Gas filled cavities in glass.

3.4 cords: Glassy inclusions of different composition particularly in the form of drawn out lines and possessing optical and other properties differing from those of the surrounding glass.

3.5 finish: Top part of the neck of a jar made to suit the closure.

3.6 hair lines: Fine cords on surface of glass.

3.7 insweep: An inward curved or tapered portion of a jar which joins the lower part of the sides to the base.

3.8 push-up: The bottom of the jar shaped to form a concavity.

3.9 sealing surface: The portion of the finish which makes contact with the sealing gasket or liner of the closure.

3.10 seeds: Small bubbles in glass.

3.11 stones: Imperfections in glass resulting from inclusions from such sources as batch materials, refractories and blow pipes or resulting from devitrification of glass or from any other sources.

3.12 wedged bottom (slugged bottom): Bottom of a container having thick glass on one side and thin glass on the other side.

4 REQUIREMENTS

4.1 Material and workmanship

The jars shall be of flint glass, shall be well annealed, free from cords, bubbles, blisters, seeds, stones, hairline cracks and any other defects that may impair the strength, efficiency or appearance of the jar.

The jars shall be well formed with uniform distributions of glass all over the walls, the base and the neck avoiding any wedged bottom and particularly any uneven thickness in the walls. There shall be no sharp edges inside the neck and the mould seam of the neck finish shall have no protruding edges.

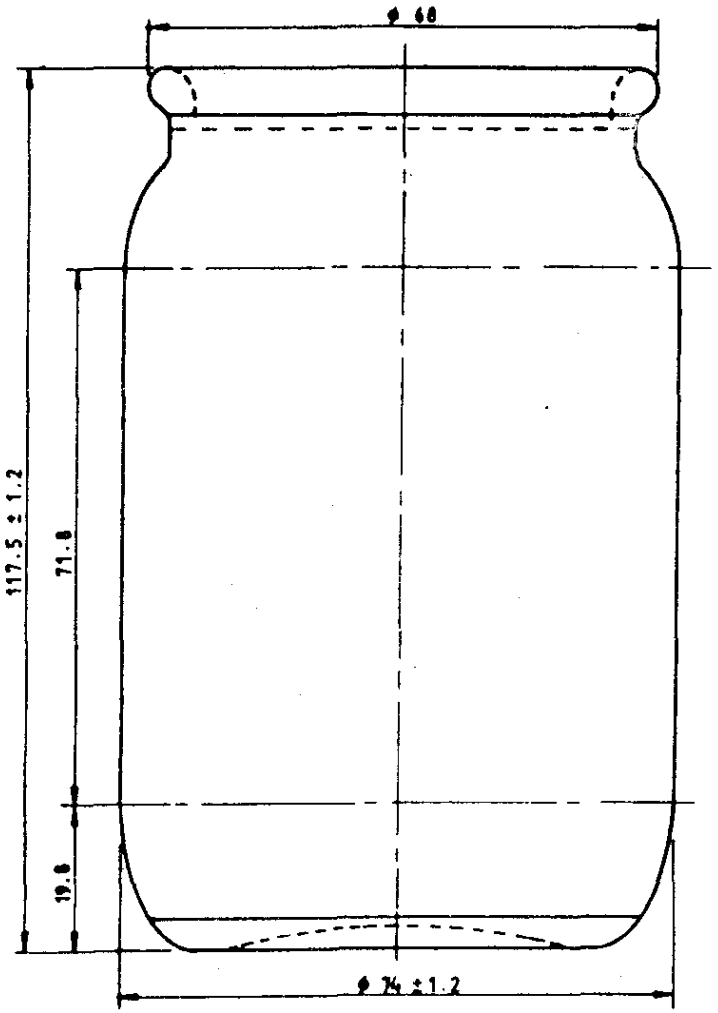
The jars shall have an insweep at the base of the body and the bottom of the jars shall have the minimum amount of push-up necessary to obviate the jar rocking on its base.

4.2 Design and dimensions

4.2.1 *External body*

The external design and dimensions of the jars shall be as given in Figure 1. The jar height shall be measured as prescribed in 8.1.1.

NOTE - Untoleranced dimensions given in Figure 1 are only for guidance in mould-making.



(All dimensions in millimetres)

FIGURE 1 - Shape and dimensions for jars

4.2.2 *Neck finish*

The neck finish of the jars shall be as specified in SLS 601:Part 3 and SLS 601:Part 4. The neck finish diameter shall be measured as prescribed in 8.1.2.

4.3 Brimful capacity

The brimful capacity of a jar shall be 360 ± 5 ml

4.4 Mass

The mass of a jar shall be 230 ± 5 g.

4.5 Sealing surface

Deviation of the sealing surface from a plane surface at the specified angles should not be more than the limit given in Table 1, when measured as prescribed in 8.2

TABLE 1 - Limits for the deviation of the sealing surface

Angle	Deviation of the sealing surface, mm
22 ^{o}	0.05
45 ^{o}	0.08
90 ^{o}	0.18
180 ^{o}	0.38

4.6 Alkalinity

The jars shall comply with the requirements for alkalinity prescribed in B.5 when tested in accordance with Appendix B.

4.7 Parallelism between the base and top sealing surface

The base of the jar shall be parallel to the top sealing surface to within 0.03 ^{o} when tested in accordance with Appendix C.

4.8 Resistance to impact

The resistance of a jar to impact shall be such that when a jar is tested in the manner described in Appendix D, it shall not break or crack under the impact stresses specified therein.

4.9 Resistance to thermal shock

The resistance of a jar to a sudden change in temperature shall be such that a jar will not be damaged when subjected to thermal shock as described in Appendix E.

4.10 Stability

The bottom of a jar shall be flat and the jar shall be stable, when placed on a flat surface.

5 PACKAGING

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

6 MARKING

6.1 The jars shall be marked legibly and indelibly on the insweep of the bottle:

a) Name and address of the manufacturer;

b) Registered trade mark, if any;

c) The mould number; and

d) Year of manufacture or identification number.

6.2 The jars may also be marked with the Certification Mark of the Sri Lanka Standards Institution illustrated below on permission being granted for such marking by the Sri Lanka Standards Institution.

NOTE - The use of the Sri Lanka Standards Institution Certification Mark (SLS Mark) is governed by the provisions of the Sri Lanka Standards Institution Act and the regulations framed thereunder. The SLS mark on products covered by a Sri Lanka Standard is an assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by the Institution and operated by the producer. SLS marked products are also continuously checked by the Institution for conformity to the relevant standard as a further safeguard. Details of conditions under which a permit for the use of the certification mark may be granted to manufacturers or processors may be obtained from the Sri Lanka Standards Institution.

7 SAMPLING

The method of drawing representative samples of the material shall be as prescribed in Appendix A.

8 METHODS OF TEST

Tests shall be carried out as specified in 8.1, 8.2 and in accordance with Appendices B and E.

8.1 Measurement of jar dimensions

8.1.1 *Jar height*

Jar height shall be measured by a measuring instrument of accuracy sufficient to carry out the measurement, to the precision indicated by the specified height.

8.1.2 *Neck finish diameter*

The diameter of the neck finish shall be measured by a measuring instrument of accuracy sufficient to carry out the measurement.

8.2 Sealing surface

Place the jar on a surface plate, with its sealing surface touching it. Starting from a point where it touches the surface plate, measure the gap between the surface plate and the sealing surface using feeler gauges, at points indicated in Figure 2.

9 CONFORMITY TO STANDARD

A lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied:

9.1 Each jar inspected as in A.3.1 satisfies the marking requirements.

9.2 The number of jars not conforming to one or more requirements when tested as in A.3.2 is less than or equal to the corresponding acceptance number given in Column 3 of Table 2.

9.3.1 The values of expressions $(\bar{x} + 1.4s)$ and $(\bar{x} - 1.4s)$ calculated using test results on dimensions, brimful capacity and mass when tested as in A.3.3 lie between the relevant upper and lower specification limits.

NOTES

1) *Average* $(\bar{x})$ $= \dfrac{\textit{Sum of the observed values}}{\textit{Number of values}}$

2) *Standard deviation* (s) = *The positive square root of the average of the squares of the deviation of the individual values taken from their average.*

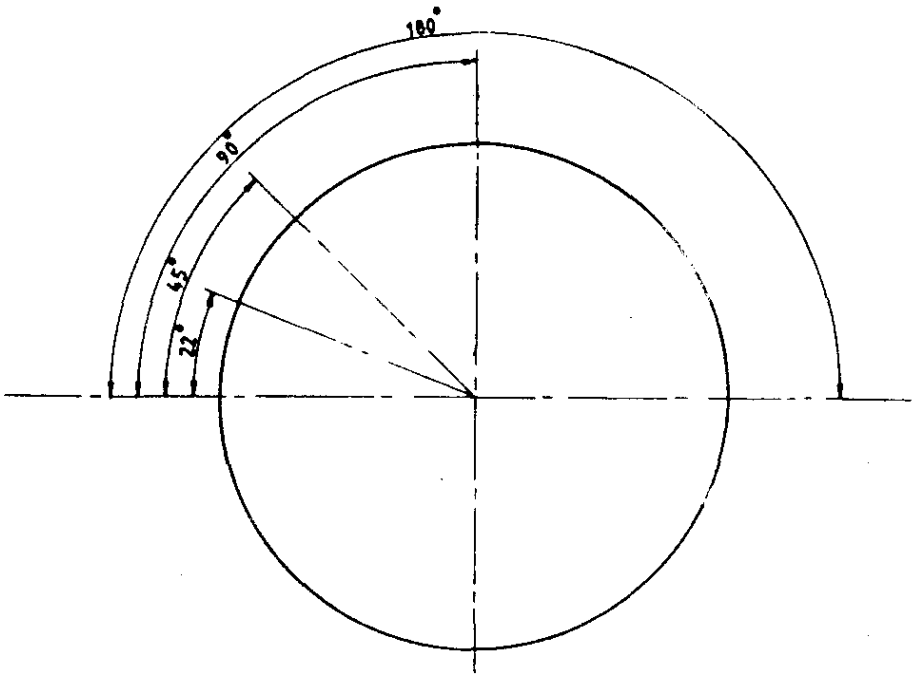


FIGURE 2 - Positions at which deviations of the sealing surface are measured

9.3.2 The value of the expression 1.3s calculated using test results on dimensions, brimful capacity and mass when tested as in A.3.3 is less than or equal to the difference between relevant upper and lower specification limits.

9.4 Each jar tested in accordance with A.3.4 and A.3.5 satisfies the relevant requirements.

APPENDIX A

SAMPLING

A.1 LOT

In any consignment all the jars produced in one day under the same conditions of manufacture shall constitute a lot.

A.2 SCALE OF SAMPLING

A.2.1 Samples shall be tested from each lot for ascertaining the conformity of the jars to the requirements of this specification.

A.2.2 The number of jars to be selected from the lot shall be in accordance with Column 1 and Column 2 of Table 2.

A.2.3 The jars shall be selected at random. In order to ensure randomness of selection random number tables as given in SLS 428 shall be used.

TABLE 2 - Scale of sampling

Number of bottles in the lot (1)	Number of bottles to be selected (2)	Acceptance number (3)	Sub sample size (4)
Up to 8 000	32	2	25
8 001 to 35 000	50	3	30
35 001 to 110 000	80	5	40
110 001 and above	120	8	50

A.3 NUMBER OF TESTS

A.3.1 Each jar selected as in A.2.2 shall be inspected for marking requirements.

A.3.2 Each jar selected as in A.2.2 shall be inspected for requirements given in 4.1, 4.5, 4.7 and 4.10.

A.3.3 A sub sample of size as given in Column 4 of Table 2 shall be selected from the jars selected as in A.2.2 and inspected for the requirements given in 4.2, 4.3 and 4.4.

A.3.4 If the lot has been found satisfactory with respect to the requirements given in 4.1 to 4.5, 4.7 and 4.10, ten jars shall be selected at random and shall be tested for requirements given in 4.8 and 4.9.

A.3.5 If the lot has been found satisfactory with respect to the requirements given in 4.1 to 4.5 and 4.7 to 4.10, five jars shall be taken at random and tested for the requirements given in 4.6.

APPENDIX B

TEST FOR ALKALINITY

B.1 APPARATUS

B.1.1 *Erlenmeyer flask assembly*, of chemically resistant glass, preferably borosilicate, consisting of Erlenmeyer flask of 250 ml capacity with a suitable reflux condenser with ground glass joints.

B.1.2 *Graduated flask*, of chemically resistant glass, of known brand (preferably borosilicate), 250 ml capacity.

B.1.3 *Mortar*, a suitable mortar made of steel.

B.1.4 *Test sieves*, of aperture size 425 µm and 600 µm conforming to CS 124.

B.2 REAGENTS

B.2.1 *Hydrochloric acid*, standard volumetric solution, c(HCl) = 0.01 mol/l.

B.2.2 *Ethyl alcohol*, 95 per cent (*V/V*) solution.

B.2.3 *Methyl red indicator*, Dissolve 0.04 g of methyl red in 75 ml of ethyl alcohol or rectified spirit. Add 1.5 ml of 2 g/l sodium hydroxide solution or a quantity sufficient to ensure that the colour of the solution corresponds to pH 5.2, and then dilute to 100 ml with water.

B.2.4 *Test solution*, Take 1.0 ml of standard hydrochloric acid (B.2.1) and 1.0 ml of methyl red indicator (B.2.3) in a previously tested Erlenmeyer flask and add 240 ml of water. Boil for five minutes. Cool quickly under running water and make up to 250 ml in the graduated flask.

B.3 TESTING OF ERLENMEYER FLASK ASSEMBLY

B.3.1 Transfer 100 ml of test solution to the Erlenmeyer flask to be tested. Place the flask quickly in a bath of boiling water so that the level of the solution in the flask is below the level of the water in the bath and attach a small reflux condenser. Continue boiling for one hour and at the end of this period observe the colour of the solution. Reject the flask if any change of colour of the test solution has taken place.

B.3.2 Erlenmeyer flask assemblies which have once passed the test for suitability may fail to do so after prolonged storage. In such a case, they may be re-used by washing with 5 per cent (*m/V*) solution of glacial acetic acid followed by washing with water until free from acid before use.

B.4 PROCEDURE

Use Erlenmeyer flasks as tested under B.3.1. Rinse the jars selected for this test with distilled water, dry in a stream of dry air and crush them in the mortar such that the glass particles pass through a sieve of aperture size 600 µm but fail to pass through a sieve of aperture size 425 µm. The crushing and sieving should be done in three to four stages to avoid too much fines. Spread the sieved particles weighing more than 5 g on a glazed paper and pass a magnet over them to remove any particles of iron which may have been introduced during crushing. Wash the sieved glass free from dust in an Erlenmeyer flask with four successive 30-ml portions of ethyl alcohol (B.2.2) and dry the flask and contents at 100 ± 2 °C. Take two more Erlenmeyer flasks and transfer 5 g of the sieved, clean, dry glass, weighed to the nearest 0.001 g to one of the two flasks. Transfer a 100-ml portion of the freshly prepared test solution to both flasks. Place the flasks quickly in a bath of boiling water so that the levels of the contained solutions are below the level of the water in the bath and attach the previously tested reflux condensers. Keep the flasks in the boiling water bath for 30 minutes and then take them out and cool quickly under running water. From the first flask containing the powdered glass sample, decant out the test solution into a third Erlenmeyer flask. Add 4 ml of water to the powdered glass residue in the first flask, shake a little and decant out into the third flask, taking care to see that transference of the powdered glass is avoided as far as possible. Also add 4 ml of water to the second flask containing only the test solution (blank), titrate the solution in the third flask immediately with standard hydrochloric acid (B.2.1) to the pink colour of the blank test solution in the second flask.

B.5 RESULT

The bottles shall be taken to have satisfied the test if not more than 3 ml hydrochloric acid (B.2.1) is required for the titration.

APPENDIX C

TEST FOR PARALLELISM BETWEEN THE BASE AND THE TOP SEALING SURFACE

C.1 APPARATUS

Any acceptable apparatus suitable for determining whether the base of the jar is parallel to the top sealing surface. *Two optically flat plates* and *a spirit level* calibrated to the accuracy required for the purpose may be used.

C.2 PROCEDURE

Test each jar for compliance with the requirements specified in 4.7.

APPENDIX D

TEST FOR RESISTANCE TO IMPACT

D.1 PROCEDURE

The jars shall be struck with a hardened spherical steel ball of mass 400 g falling from a height of 100 mm. The ball shall be made to strike once at the following points:

a) four different points at a height of about 100 mm from the base;

b) on both seams; and

c) at the extremities of a diameter, at right angles to the joining seam.

D.2 RESULT

A jar shall be deemed to have failed the test if there is a complete fracture, that is, a piece of glass falls off from it, or if a crack develops in its body.

APPENDIX E

TEST FOR RESISTANCE TO THERMAL SHOCK

E.1 APPARATUS

The apparatus shall consist essentially of *a basket* for holding the bottles upright, *two water-baths*, one containing hot water and the other containing cold water. The temperature of the water baths shall be controlled within $\pm$ 2 °C. Each water bath may also be provided with a stirrer to maintain a uniform temperature.

E.2 PROCEDURE

Adjust the cold water bath to a convenient temperature between 27 °C and 35 °C. The water in the hot water bath shall be maintained at a temperature of 42 $\pm$ 2 °C above that of the cold water bath. Place the empty jars in the basket vertically with the mouth upwards. When the baths have attained the prescribed temperatures, immerse immediately the basket containing the jars in the hot bath in such a manner that the jars become completely filled with the hot water. Allow the containers to soak for 15 minutes. Transfer the basket with the jars filled with hot water to the cold bath so that the jars are immersed in water. Keep the jars immersed for 5 minutes. Remove the basket from the cold bath. The process of transfer from the hot bath to the cold bath shall be completed in 15 $\pm$ 2 seconds. Take every precaution to protect the apparatus from draughts. Inspect each container for cracks or breaks.

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

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SRI LANKA STANDARDS INSTITUTION

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The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

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