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SRI LANKA STANDARD 406 : 1976

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SPECIFICATION FOR STEEL DRUMS

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BUREAU OF CEYLON STANDARDS

SPECIFICATION FOR STEEL DRUMS

S. L. S. 406 : 1976

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SRI LANKA STANDARD SPECIFICATION FOR STEEL DRUMS

FOREWORD

This Sri Lanka Standard has been prepared by the Drafting Committee on Steel Drums. It was approved by the Mechanical Engineering Divisional Committee of the Bureau of Ceylon Standards and was authorised for adoption and publication by the Council of the Bureau on 1976-12-01.

This specification covers both Metric and Imperial sizes of drums. Imperial sizes specified are those which are presently being used in the trade. Metric sizes have been included in order to facilitate a smooth changeover to the Metric System of measurements.

The 63 Imperial Gallons (IG) and 51 Imperial Gallons (IG) drums specified in this standard are widely used in Sri Lanka for the export of coconut oil, and are more popularly known as ' 5 cwt ' and ' 4 cwt ' drums respectively in the coconut oil trade. The 56 IG drum is generally used in the petroleum industry for packing of bitumen. The 45 IG drum is a general purpose drum which is widely accepted in countries using imperial system of measurement.

The 200 litre (l) drum is intended to replace the 45 IG drum and also those used in the coconut oil trade at present. The 150 litre (l) drum is expected to replace the 36 IG ' Bitumen drum '. The 100 litre (l) capacity drum has been specified as an additional size.

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 shall be rounded off in accordance with CS 102 : 1971*. The number of significant figures to be retained in the rounded off values shall be the same as that of the specified value in this standard. Federal specifications and publications of the Indian Standards Institution, British Standards Institution were perused in the preparation of this standard and the assistance gained therefrom is acknowledged.

1. SCOPE

This standard covers the requirements for steel drums of the following capacities and types.

*CS 102 : 1971 - Presentation of Numerical Values.

Capacities : Metric sizes — from 100 litres upto 200 litres
Imperial sizes — from 36 Imperial Gallons (IG) upto 63 Imperial Gallons (IG).

Types : Fixed end
Removable end
Rolled on lid.

2. TERMINOLOGY

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

2.1 Bung — A fitting used to seal a sheet metal container usually a metal plug provided with threads to fit a screwed flange.

2.2 Chimb — The projecting edge, rim or brim at the ends of a drum. Also used to refer to the depth of the end stamping of a drum.

2.3 Drum — A normally straight-sided, flat ended and cylindrical metal (excluding tinplate) container.

2.4 Flange — A metal device which can be welded, soldered or pressed into appropriate position on the body or ends of a metal container, the device being threaded so as to accept a screwed bung.

2.5 Seaming Compound — Sealing gasket or film applied to one of the components of a joint prior to the assembly and completion of the joint.

2.6 Seam, Double — A rolled, mechanically formed joint comprising five interlocking faces or thicknesses of the two components thus joined and being two thicknesses of the one and three thicknesses of the other.

2.7 Rolled on Lid — A circular metal slip-on closure placed over the lip of the opening, and rolled on the outside either mechanically or manually by a special tool.

3. GRADES

The drums shall be of Grades A and B depending on material (Clause 4.1) and construction (Clause 4.2).

4. REQUIREMENTS

4.1 Materials

4.1.1 The body and ends of drums shall be made of low carbon cold rolled steel of commercial quality suitable for double seaming and resistance welding.

4.1.2 Thicknesses of sheets for the manufacture of drums shall be as given in Tables 1A and 1B for metric size drums and imperial size drums respectively.

Table 1A — Thicknesses of Sheets for Drums (Metric Size)

Nominal Size l	Grade	Heads mm	Bottom mm	Body mm
200	A	1·25	1·25	1·25
	B	1·25	1·25	1·25 or 1·00
150	B	0·63	0·63	0·63
100	A	1·25	1·25	1·25 or 1·00
	B	1·00	1·00	1·00

Table 1B — Thicknesses of Sheets for Drums (Imperial Size)

Nominal Size IG	Grade	Head BG No.* (in)	Bottom BG No.* (in)	Body BG No.* (in)
63	B	18 (0·0495)	18 (0·0495)	18 (0·0495)
51	B	18 (0·0495)	18 (0·0495)	18 (0·0495)
45	A	18 (0·0495)	18 (0·0495)	18 (0·0495)
	B	18 (0·0495)	18 (0·0495)	20 (0·0393)
36	B	24 (0·0247)	24 (0·0247)	24 (0·0247)

4.1.3 Unless otherwise specified, seaming compound used in the double seam on top drum heads and bottom drum heads shall be commercially approved non-hardening type. The seaming compound used shall not affect or be affected by the product being packed.

4.2 Construction

4.2.1 **Body** — The body of the drum shall be provided with two rolling hoops which protrudes well beyond the chimbs. The rolling hoops shall appear within the middle one third of the height of the drum. The body may be provided with corrugations as required by the purchaser.

4.2.2 **Top and Bottom** — The top and bottom of the drums may be plain or corrugated as agreed to between the purchaser and supplier. The top ends shall be of the types indicated below, and as detailed in Clause 5.

Metric Sizes — 200 l — Fixed end type or Removable end type
150 l — Rolled on lid type
100 l — Fixed end or removable end type.

* Birmingham Gauge Number.

Imperial Sizes — 63 IG — Fixed end type
51 IG — Fixed end type
45 IG — Fixed end or removable end type
36 IG — Rolled on lid type.

4.2.3 Side and End Seams — Construction of the side and end seams shall be as follows :

Grade A — side seams resistance welded and ends double seamed and resistance welded.

Grade B — side seam resistance welded and ends double seamed.

4.3 Workmanship and Finish

4.3.1 The drums shall be smoothly finished all over. The quality of the workmanship shall be such as to comply with the requirements given in Clauses 4.3.2 to 4.3.4.

4.3.2 The drums shall be in a clean condition, the inside being free from all traces of rust and foreign matter. In the case of drums made of galvanized steel sheet with welded joints, the galvanized surface of the body at the joint damaged during welding, shall be repaired by coating with solder, aluminium paint or other rust inhibitive material as required by the purchaser. The galvanized surface shall be free from white incrustation.

4.3.3 The purchaser shall specify in his enquiry and order the nature of the internal and external finish required.

4.3.4 For resistance welding of drums made from galvanized steel, the zinc coating shall be thoroughly ground off from the place to be welded both in the side and the end seams. Gas welded joints shall be free from brittleness, porosity and other defects which adversely affect the strength.

4.4 Capacity — Drums shall be of the capacities indicated in Tables 2A and 2B.

4.5 Dimensions — The internal diameters of drums shall be as given in Tables 2A and 2B with a tolerance of $\pm$ 1·5 mm or $\pm$ 1/16 in for metric size drums and imperial size drums respectively. The height of drums shall be such as to comply with the maximum and minimum gross capacities specified in Tables 2A and 2B.

5. CLOSURES

5.1 Closures for Fixed End Type — The drums shall be provided with two closures one 50 mm or 2 in and the other 20 mm or $\frac{3}{4}$ in located diametrically opposite each other on the top head of the drum. The closures when assembled shall not protrude beyond the chimbs even after they have been cap sealed. Flanges must have 3 or more complete threads and the bungs must have sufficient length of thread so that three full threads are engaged when the bung is screwed tight with gasket in place. Bungs shall be designed so that they may be removed or inserted by means of a simple tool. Flanges and Bungs shall be zinc plated, unless otherwise specified by the purchaser. When specified, closures shall be provided with cap seals. The seals shall be capable of being applied to the closures with hand tools.

5.2 Closure for Removable End Type — The lid and the rim of the drum shall be so formed as to provide a good matching fit. The top closure shall be one of the following types as specified by the purchaser. The choice of the type of closure must be determined by the nature of contents and the gross mass of the drum.

5.2.1 Type 1 Closure — The upper edge of the drum body shall be rolled over to form a full curl and the periphery of the top shall be curved slightly to fit over the curl. The top shall be secured to the body by a circular ring of " U " shape cross-section that has a split in its circumference and means for pulling the edges of the split together tightly after the ring has been placed around the top and the rim of the body. The crossing ring shall be made of steel of appropriate thickness.

Table 2A — Sizes of Steel Drums (Metric Size)

Nominal capacity l	Internal diameter mm	Height* mm	Gross capacity,** l	
			Min.	Max.
200	572	883	210·0	215·0
150	500	810	157·5	161·3
100	450	660	105·0	107·5

Table 2B — Sizes of Steel Drums (Imperial Size)

Nominal capacity IG	Internal Diameter in	Height* in	Gross Capacity,** IG	
			Min.	Max.
63	24·5	38·75	66·15	67·72
51	22·5	38·38	53·55	54·82
45	22·5	34·00	47·25	48·38
36	19·75	34·00	37·80	38·70

5.2.2 Type 2 Closure — the upper edge of the drum body shall be rolled over to form a full curl and the periphery of the top shall have extended lugs that can be so crimped over the lower surface of the curl on the body so as to secure the lid in position.

5.3 Closure for Rolled on Lid Type — Closures for 150 l drum and 36 IG bitumen drums shall be of the rolled on lid type, of 177 mm or 7 in diameter respectively located at the centre. It may be provided with rubber packing rim.

* Height is given only as a guide.

** The maximum and minimum gross capacities correspond respectively to 7.5 to 5 per cent ullage over the nominal capacity of the drum.

6. TESTS

The drums shall comply with the tests given below.

6.1 Air Pressure Test — All drums of grades A and B shall be subjected to an internal air pressure of 48 kN/m^2 or 7 lbf/in^2 and when immersed in water for at least 15 seconds shall show no sign of leakage.

6.2 Drop Test — All sizes of drums of Grades A and B except 150 l and 36 IG sizes shall be subjected to the test described in Clauses 6.2.1 and 6.2.2. Subject one sample drum from each lot of 2,000, to the tests laid down in Clauses 6.2.1 and 6.2.2. If the drum fails in the tests, subject two more sample drums from the same lot to these tests. If both these samples pass the tests, the whole lot shall be accepted. The lot shall be rejected if one of these two samples fails in the tests.

6.2.1 Fill a drum to 98 per cent of its total capacity with water, close the drum properly, keep its diagonal in a vertical position and drop it four times from a height of one metre or 3 ft. on a concrete floor arranging in such a manner that the following four points of the drum strike the floor on each drop in turn.

(*a*) The bottom rim near its junction with the side seam.

(*b*) The top rim near its junction with the side seam.

(*c*) The bottom rim diametrically opposite the position at (*a*).

(*d*) The top rim diametrically opposite the position at (*b*).

6.2.2 Empty the drum after the conclusion of four drops, immerse it in water and subject it to an internal air pressure of 48 kN/m^2 for at least 15 seconds. The drum shall not show any sign of leakage.

6.3 Hydraulic Pressure Test — All sizes of drums of Grades A and B except 150 l and 36 IG sizes shall be subjected to the test described in Clause 6.3.1. Subject one sample drum from each lot of 2,000 to the test laid down in Clause 6.3.1. If the drum fails in the test subject two more sample drums to this test. If both these samples pass the test the whole lot shall be accepted. The lot shall be rejected if one of these two samples fails in the test.

6.3.1 The drum when subjected to a gradually applied hydrostatic pressure of 275 kN/m^2 or 40 lbf/in^2 for a period of not less than 5 minutes, shall not show any sign of leakage.

7. MARKING

Manufacturer's name or trade mark shall be clearly and indelibly marked or embossed on the drums.

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