

IS 2552 : 1989
(Reaffirmed 2005)
(Reaffirmed 2013)
(Reaffirmed 2018)

Indian Standard

**STEEL DRUMS (GALVANIZED
AND UNGALVANIZED) – SPECIFICATION**

(Third Revision)

भारतीय मानक

इस्पात ड्रम (जस्तीकृत और गैर जस्तीकृत) – विशिष्टि

(तीसरा पुनरीक्षण)

UDC 621.798.144 [669.14]

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December 1989

Price Group 2

Metal Containers Sectional Committee, MTD 32

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards on 6 June 1989, after the draft finalized by the Metal Containers Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1963 and revised in 1970 and 1979. In this revision of the standard, the following changes have been incorporated:

- a) A uniform tolerance of ± 1.5 mm on internal diameter of drums of all capacities has been given.
- b) Provision has been made for recessing the top and bottom diameters of drums for their easy stackability in storage and transportation.
- c) Side and end seams with folded and grooved plain construction have been deleted.
- d) In the end seam construction, the requirement regarding the overlap dimension (V) to be 0.60 of the total depth of the seam (W) was creating ambiguity in its measurement. It has, therefore, been deleted.
- e) Clarification on testing of drums with closures has been given.

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 : 1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

IS 2552 : 1989

Indian Standard

STEEL DRUMS (GALVANIZED AND UNGALVANIZED) – SPECIFICATION

(Third Revision)

1 SCOPE

1.1 This standard specifies the requirements for mild steel (galvanized and ungalvanized) drums with fixed ends of nominal capacity ranging from 3 to 150 litres.

2 REFERENCES

IS No.	Title
IS 277 : 1985	Galvanized steel sheets (plain and corrugated) (<i>fourth revision</i>)
IS 513 : 1986	Cold rolled low carbon steel sheets and strips (<i>third revision</i>)
IS 1079 : 1973	Hot rolled carbon steel sheet and strip (<i>third revision</i>)
IS 1394 : 1984	Glossary of terms relating to metal containers trade (<i>third revision</i>)
IS 1784 : 1984	Screwed closures for drums (<i>second revision</i>)
IS 2474 : 1982	Metal closures for drums (<i>first revision</i>)
IS 3259 : 1966	Methods for sampling of metal containers

3 TERMINOLOGY

3.1 For the purpose of this standard, the terms given in IS 1394 : 1984, shall apply.

4 GRADES

4.1 The drums shall be designated by the nominal capacity and Grade A1, A2, B1, B2 and C depending upon the steel sheet thickness (*see* 6.2) and manufacture (*see* 7.1.2).

4.1.1 Drums of Grade A1 and A2 are recommended for packing petroleum products and other highly inflammable materials with a flash point below 24.5°C which give rise to a fire risk in case of leakage.

4.1.2 Drums of Grades B1 and B2 are meant for packing less inflammable materials with a flash point above 24.5°C. Grade B1 drums are made of thicker sheets as compared to Grade B2 and are intended to be used as returnable packs.

4.1.3 Drums of Grade C are meant for packing materials of non-toxic, non-poisonous and non-hazardous nature with flash point above 30°C.

5 CAPACITY AND DIMENSIONS

5.1 There shall be 13 sizes of drums with their nominal capacities and internal diameter as given in Table 1. For stackable drums, the diameter at the top or bottom may be suitably recessed to allow easy resting of drums on one another.

Table 1 Sizes and Capacities of Steel Drums

Sl No.	Nominal Capacity	Internal Diameter	Gross Capacity	
			Minimum	Maximum
(1)	(2)	(3)	(4)	(5)
	litres	mm	litres	litres
		± 1.5		
1	3	200	3.12	3.22
2	5	200	5.25	5.50
3	10	250	10.50	10.75
4	15	280	15.75	16.15
5	20	280	21.00	21.50
6	25	280	26.25	26.90
7	30	355	31.50	32.25
8	40	355	42.00	43.00
9	50	355	52.50	53.75
10	75	450	78.75	80.65
11	100	450	105.00	107.50
12	125	480	131.25	134.40
13	150	480	157.50	161.25

6 MATERIAL

6.1 The body and the ends of the drums shall be made of mild steel sheets or galvanized iron sheets as required by the purchaser. The zinc coating of the G.I. sheets shall be as specified by the purchaser.

6.2 Thickness

The thickness of the sheet metal used for the body and the ends shall comply with the values given in Table 2. Variations in thickness shall comply with the limits specified in IS 513 : 1986, IS 1079 : 1973 or IS 277 : 1985.

IS 2552 : 1989

Table 2 Nominal Thickness of Sheet for Drums
(Clause 6.2)

Sl No.	Nominal Capacity litres	Sheet Thickness in mm									
		Grade A1		Grade A2		Grade B1		Grade B2		Grade C	
		Body	Ends	Body	Ends	Body	Ends	Body	Ends	Body	Ends
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	3 to 10	0.63	0.63	0.50	0.63	0.50	0.63	0.50	0.50	0.40	0.50
2	Over 10, up to and including 30	0.80	0.80	0.63	0.63	0.63	0.63	0.50	0.63	0.50	0.50
3	40 and 50	1.00	1.00	0.80	0.80	0.63	0.80	0.63	0.63	0.50	0.63
4	75 to 150	1.25	1.25	1.00	1.00	0.80	0.80	0.63	0.80	0.63	0.63

7 CONSTRUCTION

7.1 Body

The body of the drum shall be made from a single sheet of metal.

7.1.1 When a drum is made from uncoated mild steel sheet, the longitudinal seam shall be welded (see Fig. 1A).

7.1.2 For Grade C drums, when a drum is made from tinplate, galvanized or otherwise treated steel sheet, the longitudinal seam shall be folded and locked (see Fig. 1B); alternatively, the seam shall be welded and, if required, suitably recoated internally and externally.

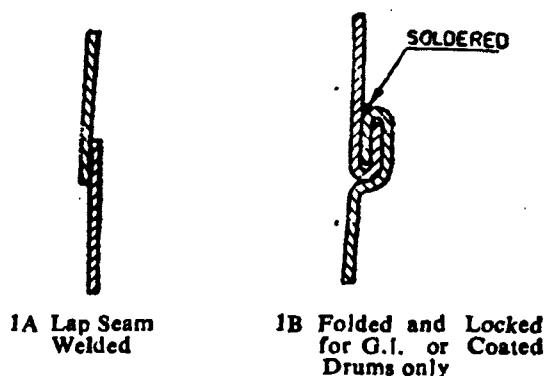


FIG. 1 TYPICAL SIDE SEAM

7.2 Drums with Plain or Corrugated Bodies

The drums up to 30 litres capacity may have plain or corrugated body whereas drums of higher capacity shall have corrugated body only. Drums of 125 litres capacity and above shall have two rolling beads projecting beyond the surface of the body.

7.3 Ends

The ends shall be pressings suitably formed to fit the body of the drum.

7.3.1 End Seam Construction

Drums of Grade A1 and A2 up to 10 litres capacity and grade B1, B2 and C of all capacities made from plain mild steel sheet shall have end seam, double seamed with seaming compound as shown in Fig. 2A. Drums of Grade A1 and A2 of nominal capacity above 10 litres shall be double seamed and welded as shown in Fig. 2B. G.I. drums or drums with other coating shall be double seamed and soldered as shown in Fig. 2C.

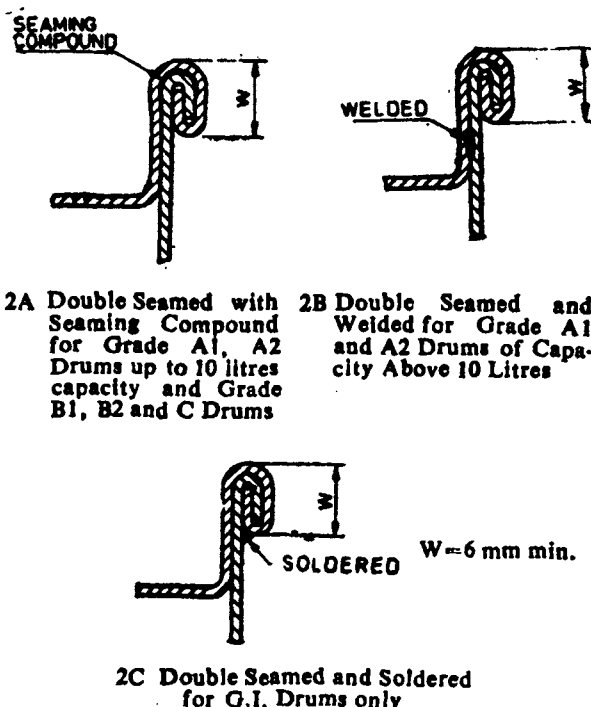


FIG. 2 TYPICAL END SEAMS (TOP AND BOTTOM)

7.4 Closure

The drums may be provided with suitable closures as agreed to between the purchaser and the supplier. The Indian Standards IS 2474 : 1982 and

IS 2552 : 1989

IS 1784 : 1984 may be referred to for the selection of closures. Plug type closures or lever lid closure (Fig. 1, 2 and 3 of IS 2474 : 1982) shall fit tight on the drum neck. Screwed closure of the type shown in Fig. 4 of IS 2474 : 1982 or IS 1784 : 1984 shall not be tested for air pressure tests on the drum top but shall be tested separately on a fixture according to 6.2 of IS 2474 : 1982 and Annex A of IS 1784 : 1984.

7.5 Handle

Drums up to 25 litres capacity may be fitted with a sheet metal strap handle or wire drop handle. The strap handle or the wire drop handle in the down position, shall not project above the chimb. The design and construction of the handle shall be strong enough to withstand the handle pull test as detailed in 9.3 without any permanent distortion or disruption of the handle or the seat of the handle. The minimum sheet thickness of the strap handle shall be 0.5 mm, nominal and the wire thickness of the wire handle shall be 5.0 mm, nominal. The chimb of the drum shall protrude at least 1 mm above the closure and the handle, and shall be not less than 10 mm deep.

7.5.1 The handle shall be so designed and dimensioned as to provide for comfortable and easy handling. The handle shall be securely fixed to the drum by spot welding or riveting with flat 5 mm rivets. In the case of fixed handles, the portion of the drum below the handle shall be suitably dished.

7.5.2 Drums of higher capacity (above 30 litres) may be fitted with two or more handles if required by the purchaser.

8 FINISH

8.1 The internal and external finish of the drums shall be as agreed between the purchaser and the manufacturer.

8.2 The drums as delivered shall be dry, clean and free from rust, scale and foreign matter.

9 TESTING

9.1 Air Pressure Test

Each drum of Grade A1 and A2, B1 and B2 and C, when required for packing liquid products, shall be subjected to an internal air pressure of 40 kPa (0.40 kgf/cm²) while fully immersed under water or coated over with soap water. The drum shall show no sign of leakage.

9.1.1 Air pressure test shall be carried out before the drums are given protective coating.

9.2 Drop Test

The drums of Grade A1 and A2 shall be subjected to the drop tests detailed in 9.2.1 and 9.2.2.

9.2.1 Fill the drum to 98 percent of its total capacity with water, close the drum properly and keep its diagonal in a vertical position. Drop the drum four times from a height of one metre on a concrete floor, drops arranged in such a manner that the following four points of the drum strike the floor on each drop in turn:

- The bottom rim near its junction with the side seam;
- The top rim near its junction with the side seam;
- The bottom rim diametrically opposite to the position at (a); and
- The top rim diametrically opposite to the position at (b).

9.2.2 Empty the drum after the conclusion of the four drops, and subject it to the air pressure test detailed in 9.1. The drum shall not show any sign of leakage.

9.3 Handle Pull Test

The handle of the drum shall be subjected to the gradual pull as given below, distributed uniformly over the length of the handle for a period of two minutes:

<i>Nominal Capacity of Drums</i>	<i>Pull Load</i>
Up to 10 litres	30 kg
Above 10 litres	72 kg

Figure 3 illustrates a hook attachment that can be used to achieve an even distribution of load across the carrying width of the handle.

9.3.1 After removal of the load, no permanent distortion or damage shall be observed on the handle retaining lugs or rivets or welding on the handle seat.

10 MARKING

10.1 The drums shall be marked indelibly or embossed with the following information on top or bottom ends:

- Manufacture's name or identification mark.
- Grade of the drum, and
- Year of manufacture.

IS 2552 : 1989

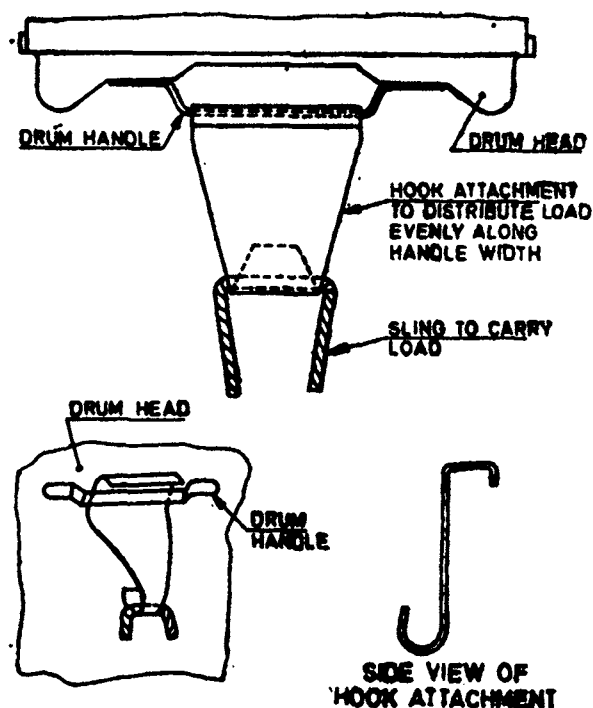


FIG. 3 DRUM HANDLE TEST-USE OF
HOOK ATTACHMENT

11 SAMPLING

11.1 Representative samples for test shall be drawn as prescribed in IS 3259 : 1966.

12 INFORMATION TO BE SUPPLIED BY THE PURCHASER WHEN ORDERING

12.1 As this standard contains certain alternatives to the requirements for metal drums, the purchaser shall state his alternative requirements, if applicable, as follows:

- Whether the steel sheets are to be coated (8.1);
- Whether the seam of the body is to be folded and locked or welded (applicable to Grade C drums only, see 7.1.2);
- Whether drums up to 30 litres capacity are to have plain or corrugated bodies (7.2);
- What form of circumferential end seaming is to be used (7.3.1);
- Whether or not a handle is required and, if so, type required (7.5);
- Details of closure (7.4); and
- Details of internal and external finish required (8).

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Doc : No. MTD 32 (3668)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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