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Pressed steel tanks — Specifications

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Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Trade, Industry and Cooperatives established under Cap 327, of the Laws of Uganda, as amended. UNBS is mandated to co-ordinate the elaboration of standards and is

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(b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and

(c) the National Enquiry Point on TBT Agreement of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of key stakeholders including government, academia, consumer groups, private sector and other interested parties.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

The committee responsible for this document is Technical Committee UNBS/TC 4, *[Mechanical Engineering and Metallurgy]*.

Pressed steel tanks — Specification

1 Scope

This draft Uganda Standard specifies requirements for materials, fabrication, erection and supply of pressed steel tanks for the storage of cold and hot water and certain other liquids, under a pressure not greater than the static head corresponding to the depth of the tank.

2 Normative references

The following referenced documents referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7452, *Hot – rolled steel plates — Tolerances on dimensions and shape*

ISO 887, *Plain washers for metric bolts, screws and nuts for general purposes — General plan*

ISO 10721-1, *Steel structures — Part 1: Materials and design*

ISO 10799-1, *Cold-formed welded structural hollow sections of non-alloy and fine grain steels — Part 1: Technical delivery conditions*

US ISO 15609-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding*

ISO 12944-1, *Paints and varnishes — Corrosion protection of steel structures by protective coating systems — Part 1: General introduction*

ISO 12944-2, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 2: Classification of environments*

ISO 12944-3, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 3: Design considerations*

ISO 12944-4, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 4: Types of surface and surface preparation*

ISO 12944-5, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 5: Protective paint systems*

ISO 12944-6, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 6: Laboratory performance test methods*

ISO 12944-7, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 7: Execution and supervision of paint work*

ISO 12944-8, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 8: Development of specifications for new work and maintenance*

ISO 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods*

US ISO 6929, *Steel products — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in US ISO 6929 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Working temperatures

For the purpose of this Draft Uganda Standard, the following working temperatures shall be applied:

4.1 **Cold liquid** — liquid at a temperature not exceeding 40 °C.

4.2 **Hot liquid** — liquid at a temperature above 40 °C, but not exceeding 100 °C.

5 Types of tanks

Pressed tanks shall be of the following three types:

a) **Type 1** — Tanks with all flanges external.

b) **Type 2** — Tanks with all flanges internal.

c) **Type 3** — Tanks with bottom flanges internal and side flanges external.

6 Processes of manufacture

Tank panels may be either hot pressed complete or cold pressed with flange corners welded.

7 Materials

7.1 Steel plates

The steel used in the manufacture of pressed steel tanks shall conform to ISO 7452.

7.2 Bolts, studs, nuts and washers

Bolts, studs and nuts used for the manufacture of steel tanks shall conform to ISO 8992. Bolts and nuts shall be hexagonal form, screwed ISO metric. Washers shall comply with ISO 887.

7.3 Jointing material

The material used for jointing shall be insoluble in the liquid to be stored, non-toxic where necessary and shall be capable of withstanding the temperature variation *(see Clause 3)*

The material shall be of a suitable type, depending upon the purpose for and conditions under which the tank is to be used.

7.4 Electrodes

Electrodes for welding shall be compatible with material.

7.5 Protective coating

All tanks shall be coated with suitable protective coatings such as fibreglass, epoxy paints, bituminous paints or galvanizing. All materials used for internal protective coating shall be non-toxic.

8 Dimensions of unit panels

The nominal size of unit panels shall be 1 220 mm^2 or 1 000 mm^2, the actual overall dimensions depending upon the particular manufacturer of the plates. The size of tanks shall be specified as multiples of the nominal dimensions. The typical sizes, approximate weights and nominal capacities of tanks shall be as shown in Tables 2, 3, 4, 5, 6, 7, 8, and 9.

9 Nominal thickness of unit panels

9.1 For cold liquids with a specific gravity of 1.0 the nominal thickness of the plate from which the unit panels are pressed shall be as given in Table 1.

Table 1 — Minimum thickness of panels

Depth of tank mm	Description of panels with regard to their location	Thickness of plates mm
1 000	Bottom of sides (cubic tanks only)	4.0
1 220	Bottom of sides (cubic tanks only)	5.0
2 000	Bottom and first tier of sides	4.0
	Top of sides	4.0
2 440	Bottom and first tier of sides	5.0
	Top of sides	5.0
3 000	Bottom and first tier of sides	5.0
	Second tier of sides	5.0
	Top tier of sides	4.0
3 660	Bottom and first tier of sides	5.0
	Second tier of sides	5.0
	Top tier of sides	5.0
4 000	Bottom and first tier of sides	5.0
	Second tier of sides	5.0
	Third and Top tier of sides	4.0
4 880 or 5 000	Bottom and first tier of sides	6.0
	Second tier of sides	5.0
	Third and Top tier of sides	5.0

9.2 For hot liquids, other than for domestic potable water, with a specific gravity not exceeding 1.0, no plate shall be less than 6 mm in thickness:

9.3 For cold or hot liquids with a specific gravity greater than 1.0 the plate thickness shall be agreed upon between the purchaser and the manufacturer.

10 Permissible stresses

The calculated stress in any stay, attachment and bolts shall comply with the requirements of ISO 10721-1, and any allowance that may be required for corrosion shall be added to the calculated thickness.

11 Flanges of panels

Panels shall be pressed free of irregularities with flanges as shown in Figures 1 and 2, at an angle of 45° and 90° to the face of the panel on all four sides (Figure 1) or a single flange at an angle of 90° to the face of the panel on each of two, three or four sides (Figure 2). They shall be holed on one, two, three or four sides, according to the respective position of the plate in the tank and be free from irregularities.

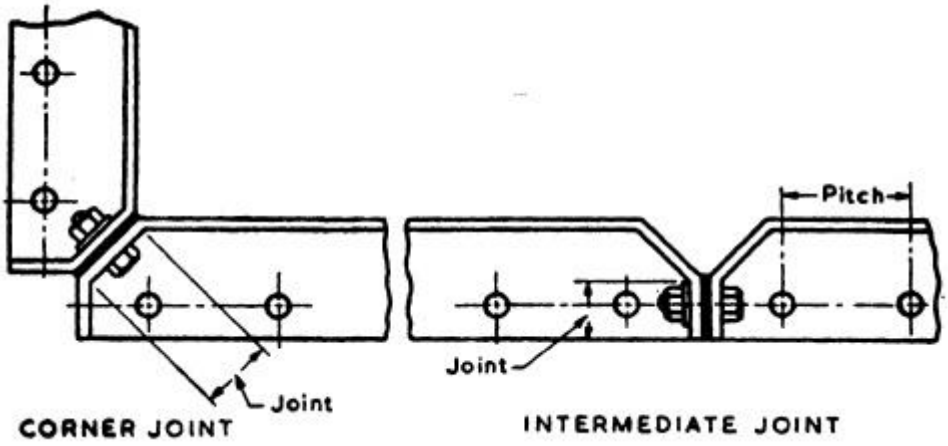

Figure 1 — 45^0 and 90^0 Flange jointed tank

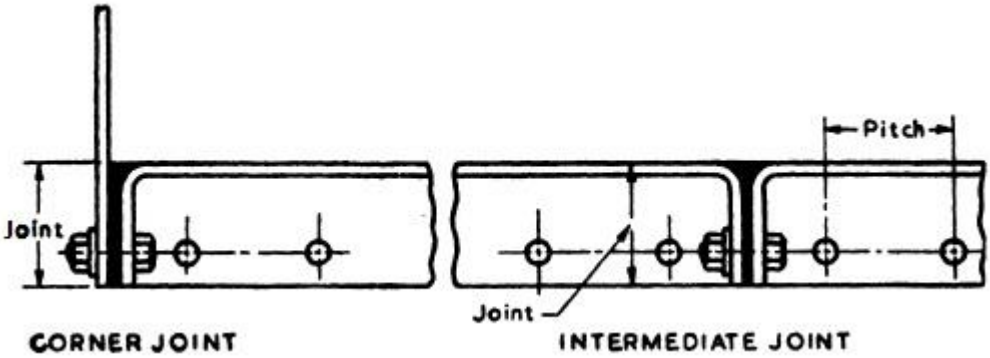

Figure 2 — 90^0 Flange jointed tank

The width of mating surfaces of flanges shall not be less than 45 mm, the holes for the bolts having a minimum diameter of 14 mm (M14). The spacing of the bolt holes shall not exceed 80 mm pitch.

12 Staying

12.1 The sides and ends of tanks shall be supported by stays at the junction of two or more panels. The stays shall be made from mild steel rolled sections calculated in accordance with Clause 8. Stays shall be attached to the panels by bolting to cleats of equal strength bolted to tank panels. Stay attachments to cleats and cleats to the tank plates shall be calculated taking into account an eccentricity of loading. The ends of the stays shall be attached to the cleats or tank panels by bolts.

12.2 Stays shall connect sides and ends to bottom, and/or horizontal sides to ends in accordance with Figure 3.

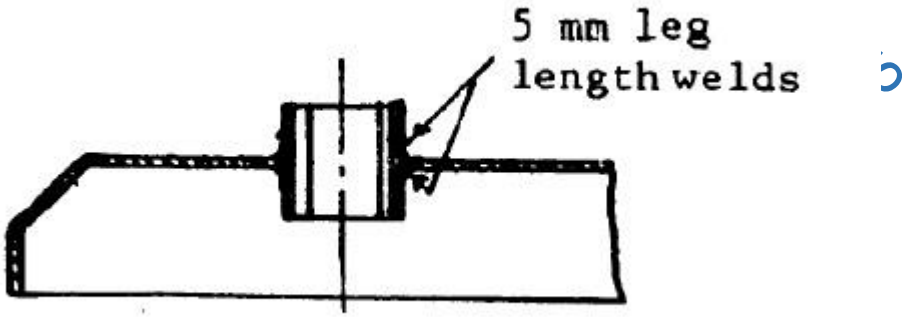

Figure 3 — Tapped socket and boss welded into tank plate

13 Connections

Pads for connections, tapped bosses, screwed flanges or sockets, as may be required, shall be welded or bolted to the inside or outside or the tank panel. Pads shall be seal welded and drilled, and/or tapped to suit flanges. Single pads shall be provided for connection on one side of the plate and double pads for connection on both sides of the plate. Tapped sockets shall comply with the requirements laid down in **ISO 10799-1** or any other relevant Uganda Standard.

Typical types of welded connections are shown in Figures 3 to 7.

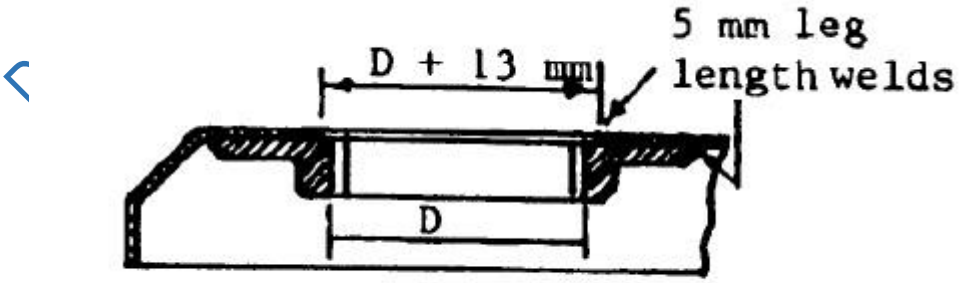

Figure 4 — Screwed flange welded to tank plate

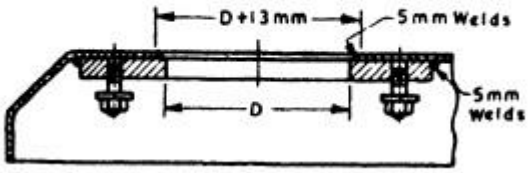

Figure 5 — Single pad welded to tank plate

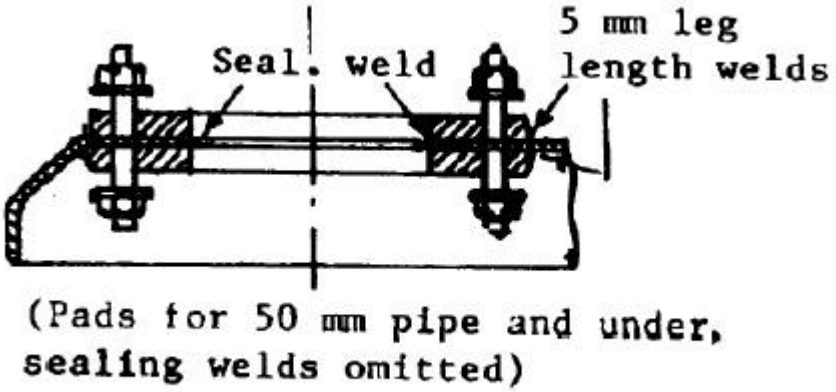

Figure 6 — Double pad welded to tank plate

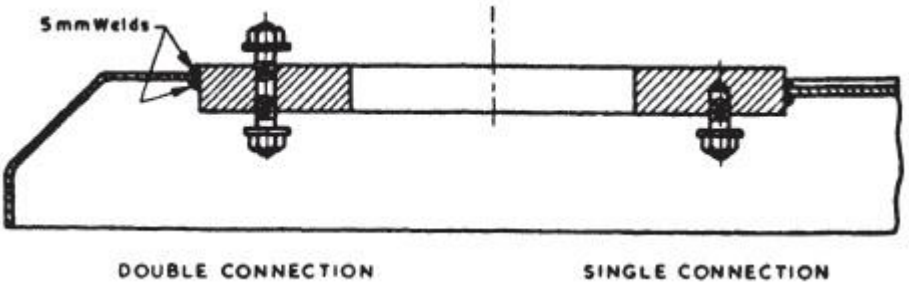

Figure 7 — Thick pad welded to tank plate

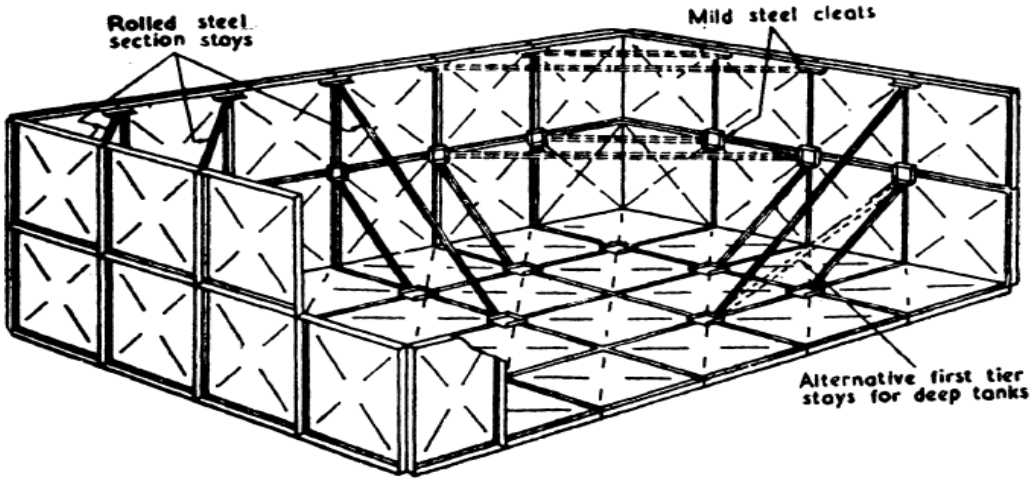

Figure 8 — Typical press steel sectional rectangular tank with external flanges

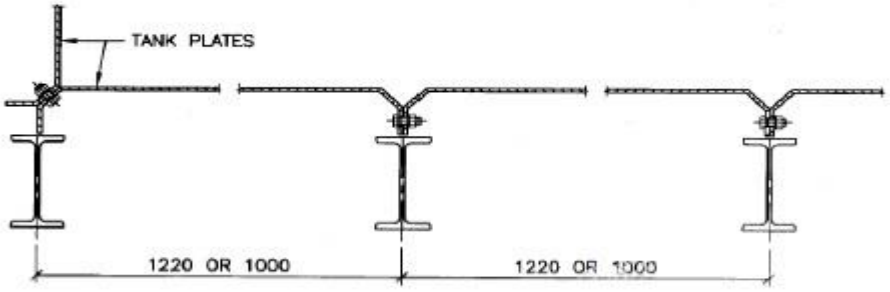

Figure 9 — Rolled steel joist supports for pressed steel tanks

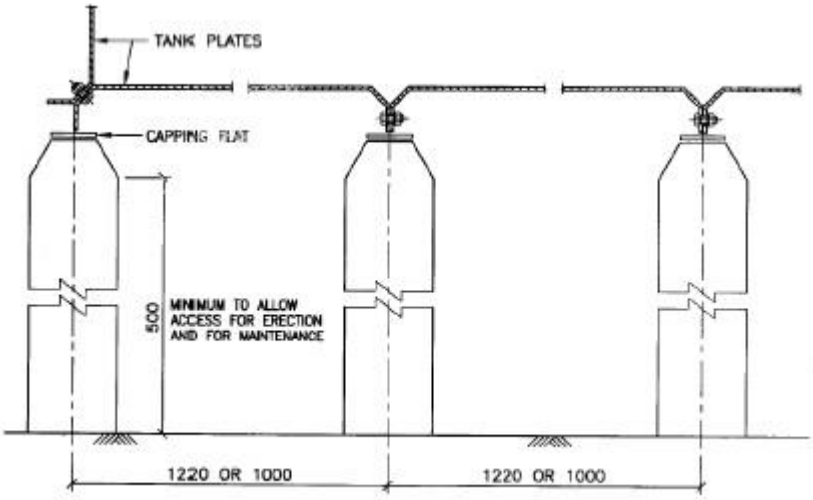

Figure 10 — Dwarf wall supports for pressed steel tanks

14 Welding of connections.

Where connections are welded to the tanks as well as where the corners are welded, the welding shall be done by the metal-arc process complying with US ISO 15609-1 or any other relevant Uganda Standard. The plates and connections and fusion faces shall be free from rust, paint or other foreign matter. Where the plates are cut, edges shall be dressed smooth. Pads shall be flush with the plates before welding commences. The size of the welds shall conform to those shown in Figures 3 to 7 and the welds shall be even and free from cracks or blow holes. The welds shall be completely fused to the parent metal without under cut.

15 Inlet and overflow pipes

Inlet pipes and the overflow pipes, if arranged through the bottom of the tank, shall be of bell mouth type.

16 Access ladders

Tanks over 1 220 mm deep shall be provided with a steel internal access ladder of a minimum width of 400 mm. The maximum spacing of rungs shall be 300 mm. In the case of covered tanks the ladder shall be adjacent to the manhole.

17 Covered tanks

17.1 Roofing and framing members shall be designed to withstand superimposed loads.

17.2 Covers may be flat for indoor use and shall be pitched or cambered for outdoor use, and jointed to ensure that they are dust and water proof.

17.3 Covers shall be constructed of mild steel sheets or galvanized sheets complying with ISO 1461 with a minimum thickness of 2 mm.

17.4 In all cases, covered tanks shall be provided with a manhole of not less than 450 mm diameter if circular or 450 mm x 450 mm if square, to give access to the inside of the tank. Covered tanks shall be insect and dust free. Vent pipes shall be provided, and have a flanged bend at the top and be filtered.

18 Minimum access

Where tanks with external flanges are to be erected in a confined space, it is essential that a clearance of not less than 500 mm shall be provided all round the outside and underneath to facilitate erection. For access to the top of a closed tank the clearance from the highest point shall be not less than 750 mm. Allowance should be made for inspection and maintenance including valves or other external fittings.

19 Supports

Supports for the tanks shall be in accordance with the engineers' details and manufacturers' instructions. All tanks should be effectively supported in accordance with the manufacturer's instructions. Supports should be provided continuously under each bottom flange in one direction at 1 220 mm or 1 000 mm. Tanks with internal bottom flanges can also rest directly on a flat level base. A sand/bitumen bed 50 mm thick is recommended in that case. Where steel joints are used they should be designed to carry the imposed load with a maximum deflection of one five-hundredth (1/500) of the span. Attention is drawn to the extra reaction on the supports under the side, end and division plates when the stays of sides, ends and divisions are inclined to the bottom of the tank. (For typical support details *see* Figures 9 and 10.)

20 Finishing

After erection, unless otherwise specified, the tank shall be internally finished with two coats of non-toxic, anti-corrosion paints in accordance with ISO 12944, Parts 1-8.

21 Test

Each tank shall be tested on site after erection for leakage under full static head. Testing shall be by filling the tank with water or the liquid to be stored for a minimum of 12 hours or as agreed between the purchaser and the manufacturer. The water or liquid shall be supplied by the purchaser

22 Inspection

22.1 Works inspection

The purchaser or his representative shall have access to the works of the manufacturer at all reasonable times and shall be at liberty to inspect and to reject any material which does not comply with the requirements of this standard. Such inspection shall include verification that the unit panels shall mate together and assemble. Where partial or complete assembly is required at the works of the manufacturer, this shall be agreed between the purchaser and the manufacturer at the time of enquiry and order.

22.2 Site inspection

The purchaser or his representative shall ensure that supports are within the tolerances required by the manufacturer before the commencement of erection. Foundation details for the supports of the tanks shall conform to the engineer's details.

23 Packing

Precautions shall be taken to protect the components of the tank from damage while in transit. Unit panels and components shall be packed in convenient bundles, riveted or bolted together or bound with iron strip or suitable wire. All rivets, bolts, nuts, etc. shall be packed in suitable containers.

24 Marking

Tank panels shall be legibly marked with the following particulars:

a) manufacturer's name or trade mark;

b) size and thickness of the panels; and

c) the number of this standard.

Table 2 — Typical sizes, approximate weights and nominal capacities of tanks

Tanks 1 220 mm deep. Plates 5 mm thick

Nominal tank size Length x Breadth	No. of panels in tank	Nominal capacity (Litres)	Approximate total weight when empty (kg)	Approximate outside dimensions		
				Length (mm)	Breadth (mm)	Depth (mm)
1 220 x 1 220	5	1 818	400	1 400	1 400	1 300
2 440 x 1 220	8	3 637	660	2 600	1 400	1 300
3 660 x 1 220	11	5 455	863	3 800	1 400	1 300
2 440 x 2 440	12	7 273	965	2 600	2 600	1 300
3 660 x 2 440	16	10 910	1 270	3 800	2 600	1 300
4 880 x 2 440	20	14 547	1 575	5 000	2 600	1 300
6 100 x 2 440	24	18 184	1 930	6 200	2 600	1 300
3 660 x 3 660	21	16 366	1 676	3 800	3 800	1 300
4 880 x 3 660	26	21 821	2 083	5 000	3 800	1 300
6 100 x 3 660	31	27 276	2 489	6 200	3 800	1 300
7 320 x 3 660	36	32 731	2 896	7 500	3 800	1 300
8 540 x 3 660	41	38 186	3 353	8 700	3 800	1 300
4 880 x 4 880	31	29 094	2 591	5 000	5 000	1 300
6100x4 880	38	36 368	3 048	6 200	5 000	1 300
7 320 x 4 880	44	43 641	3 505	7 500	5 000	1 300
3 540 x 4 880	48	50 915	4 064	8 700	5 000	1 300
9 760 x 4 880	56	58 189	4 674	10 000	5 000	1 300
6 100 x 6 100	45	45 460	3 607	6 200	6 200	1 300
7 320 x 6 100	52	54 552	4 166	7 500	6 200	1 300
7 320 x 7 320	60	65 462	4 724	7 500	7 500	1 300
8 540 x 8 540	77	89 102	6 147	8 700	8 700	1 300

Note 1. Approximate total weights include plates, stays, cleats, nuts, washers and jointing material.

Note 2. Nominal capacities are without allowance for freeboard.

Table 3 — typical sizes, approximate weights and nominal capacities of tanks

Tanks 2 440 mm deep. Plates 5 mm thick.

Nominal tank size	No. of panels in tank	Nominal capacity (Litres)	Approximate total weight when empty (kg)	Approximate outside dimensions		
Length x breadth (mm)				Length (mm)	Breadth (mm)	Depth (mm)
2 240 x 1 220	14	7 273	1 168	2 600	1 400	2 500
3 660 x 1 220	19	10 910	1 626	3 800	1 400	2 500
4 880 x 1 220	24	14 547	2 083	5 000	1 400	2 500
2 440 x 2 440	20	14 547	1 676	2 600	2 600	2 500
3 660 x 2 440	26	21 821	2 184	3 800	2 600	2 500
4 800 x 2 440	32	29 094	2 692	5 000	2 600	2 500
6 100 x 2 440	38	36 368	3 150	6 200	2 600	2 500
3 660 x 3 660	33	32 731	2 743	3 800	3 800	2 500
4 880 x 3 660	40	43 641	3 302	5 000	3 800	2 500
6 100 x 3 660	47	54 552	3 912	6 200	3 800	2 500
7 320 x 3 660	48	65 462	4 470	7 500	3 800	2 500
8 540 x 3 660	48	76 373	5 080	8 700	3 800	2 500
4 880 x 4 880	48	58 190	4 013	5 000	5 000	2 500
6 100 x 4 880	56	72 736	4 674	6 200	5 000	2 500
7 320 x 4 880	64	87 283	5 385	6 200	5 000	2 500
8 540 x 4 880	72	101 830	6 096	7 500	5 000	2 500
9 760 x 4 880	80	116 378	6 807	10 000	5 000	2 500
6 100 x 6 100	65	90 920	5 537	6 200	6 200	2 500
7 320 x 6 100	74	109 104	6 147	7 500	6 200	2 500
7 320 x 7 320	84	130 925	7 061	7 500	7 500	2 500
8 540 x 8 540	105	178 203	8 738	8 700	8 700	2 500

Note 1. Approximate total weights include plates, stays, cleats, nuts, washers and jointing material.

Note 2. Nominal capacities are without allowance for freeboard

Table 4 — typical sizes, approximate weights and nominal capacities of tanks

Tanks 3 660 mm deep. Plates 5 mm thick.

Tank size	No. of panels in tank	Nominal capacity (Litres)	Approximate total weight when empty (kg)	Approximate outside dimensions		
Length x breadth (mm)				Length (mm)	Breadth (mm)	Depth (mm)
3 660 x 3 660	45	49 097	4 572	3 800	3 800	3 700
4 880 x 3 660	54	65 462	5 537	5 000	3 800	3 700
4 880 x 4 880	64	87 283	6 553	5 000	3 000	3 700
6 100 x 4 880	74	109 104	7 620	6 200	5 000	3 700
6 100 x 6 100	85	136 380	8 687	6 200	6 200	3 700
7 320 x 6 100	96	163 656	9 957	7 500	6 200	3 700
7 320 x 7 320	108	175 500	196 387	7 500	7 500	3 700
8 540 x 7 320	120	229 118	12 495	8 700	7 500	3 700
8 540 x 8 540	133	267 305	13 868	8 700	8 700	3 700
8 760 x 8 540	146	305 491	15 240	10 000	8 700	3 700
10 980 x 8 540	159	343 678	16 612	11 100	8 700	3 700
9 760 x 9 760	160	349 133	16 713	10 000	10 000	3 700
10 980 x 9 760	174	392 774	18 237	11 100	10 000	3 700
12 200 x 9 760	188	436 416	19 710	12 400	10 000	3 700
10 980 x 10 980	189	441 871	19 812	11 100	11 100	3 700
12 200 x 10 980	204	490 960	21 387	12 400	11 100	3 700
12 200 x 12 200	220	545 520	23 165	12 400	12 400	3 700
13 420 x 12 200	236	600 072	24 841	13 600	12 400	3 700
13 420 x 13 420	253	660 079	26 772	13 600	13 600	3 700
14 640 x 13 420	270	720 086	28 550	14 800	13 600	3 700
14 640 x 14 640	288	785 549	30 531	14 800	14 800	3 700
15 860 x 14 640	306	851 011	32 410	16 000	14 800	3 700
15 860 x 15 860	325	921 929	34 493	16 000	16 000	3 700

Note 1. Approximate total weights include plates, stays, cleats, nuts, washers and jointing material.

Note 2. Nominal capacities are without allowance for freeboard.

Table 5 — typical sizes, approximate weights and nominal capacities of tanks

Tanks 4 880 mm deep. Plates 5 mm and 6 mm thick.

Nominal tank size	No. of panels in tank	Nominal capacity (Litres)	Approximate Total weight when empty (kg)	Approximate outside dimensions		
Length x breadth (mm)				Length (mm)	Breadth (mm)	Depth (mm)
3 660 x 3 660	57	65 462	6 350	3 800	3 800	4 900
4 880 x 3 660	68	87 283	7 722	5 000	3 800	4 900
4 880 x 4 880	80	116 378	8 890	5 000	~ 5 000	4 900
6 100 x 4 880	92	145 472	10 211	6 200	5 000	4 900
6100x6100	105	181 840	11 684	6 200	6 200	4 900
7320x6100	118	218 208	13 208	7 500	6 200	4 900
7 320 x 7 320	132	261 850	14 834	7 500	7 500	4 900
8 540 x 7 320	146	305 491	16 358	8 700	7 500	4 900
8 540 x 8 540	161	356 406	18 034	8 700	8 700	4 900
9 760 x 8 540	176	407 322	19 812	10 000	8 700	4 900
10 980 x 8 540	191	459 237	21 438	11 100	8 700	4 900
9 760 x 9 760	192	465 510	21 641	10 000	10 000	4 900
10 980 x 9 760	208	523 699	23 571	11 100	10 000	4 900
12 200 x 9 760	224	581 888	25 298	12 400	10 000	4 900
10 980 x 10 980	225	589 162	25 705	11 100	11 100	4 900
12 200 x 10 980	242	654 624	27 381	12 400	11 100	4 900
12 200 x 12 200	260	727 360	20 464	12 400	12 400	4 900
13 420 x 12 200	278	800 096	31 496	13 600	12 400	4 900
13 420 x 13 420	297	880 106	33 782	13 600	13 600	4 900
14 640 x 13 420	316	960 115	35 916	14 800	13 600	4 900
14 640 x 14 640	336	1047 398	38 202	14 800	14 800	4 900
15 860 x 14 640	356	1134 682	40 538	16 000	14 800	4 900
15 860 x 15 860	377	1229 238	42 977	16 000	16 000	4 900

Note 1. Approximate total weights include plats, stays, cleats, nuts, washers and jointing material.

Note 2. Nominal capacities are without allowance for freeboard.

Table 6 — typical sizes, approximate weights and nominal capacities of tanks

Tanks 1 000 mm deep. Plates 4 mm thick

Nominal tank size	No. of panels in tank	Nominal capacity (Litres)	Approximate total weight when empty (kg)	Approximate outside dimensions		
Length x breadth (mm)				Length (mm)	Breadth (mm)	Depth (mm)
2 000 x 1 000	8	2 000	400	2 100	100	1 100
3 000 x 1 000	11	3 000	550	3 100	1 100	1 100
4 000 x 1 000	14	4 000	710	2100	1 100	1 100
2 000 x 2 000	12	4 000	640	2100	2 100	1 100
3 000 x 2 000	16	6 000	840	3 100	2 100	1 100
4 000 x 2 000	20	80 00	1 040	4 100	2 100	1 100
5 000 x 2 000	24	10 000	1 270	5 100	2 100	1 100
3 000 x 3 000	21	9 000	1 080	3 100	3 100	1 100
4 000 x 3 000	26	12000	1 340	4 100	3 100	1 100
5 000 x 3 000	30	15000	1 610	5 100	3 100	1 100
6 000 x 3 000	36	18 000	1 880	6 100	3 100	1 100
4 000 x 4 000	32	16 000	1 670	4 100	4 100	1 100
5 000 x 4 000	38	20 000	1 990	5 100	4 100	1 100
6 000 x 4 000	44	24 000	2 320	6 100	4 100	1 100
7 000 x 4 000	50	28 000	2 630	7 100	4 100	1 100
8 000 x 4 000	56	32 000	2 920	8 100	4 100	1 100
5 000 x 5 000	45	25 000	2 370	5 100	5 100	1 100
6 000 x 5 000	52	30 000	2 740	6 100	6 100	1 100
6 000 x 6 000	60	36 000	3 170	6 100	6 100	1 100
7 000 x 6 000	68	42 000	3 580	71 00	6 100	1 100
7 000 x 7 000	77	49 000	4 080	7 100	7 100	1 100

Note 1. Approximate total weights include plats, stays, cleats, nuts, washers and jointing material.

Note 2. Nominal capacities are without allowance for freeboard.

Table 7 — typical sizes, approximate weights and nominal capacities of tanks

Tanks 2 000 mm deep. Plates 4 mm thick

Nominal tank size	no. of panels in tank	nominal capacity (Litres)	approximate total weight when empty (kg)	approximate outside dimensions		
Length x breadth (mm)				Length (mm)	Breadth (mm)	Depth (mm)
2 000 x 1 000	14	4 000	740	2 100	1 100	2 100
3 000 x 1 000	19	6 000	1 000	3 100	1 100	2 100
4000x1000	24	8 000	1 270	4 100	1 100	2 100
2 000 x 2 000	20	8 000	1 130	2 100	2 100	2 100
3 000 x 2 000	26	12 000	1 470	3 100	2 100	2 100
4 000 x 2 000	32	16 000	1 810	4 100	2 100	2 100
5 000 x 2 000	38	20 000	2 140	5 100	2 100	2 100
3 000 x 3 000	33	18 000	1 810	3 100	3 100	2 100
4 000 x 3 000	40	24 000	2 200	4 100	3 100	2 100
5 000 x 3 000	47	30 000	2 590	5 100	3 100	2 100
6 000 x 3 000	54	36 000	2 980	6 100	3 100	2 100
4 000 x 4 000	48	32 000	2 700	4 100	4 100	2 100
5 000 x 4 000	56	40 000	3 120	5 100	4 100	2 100
6 000 x 4 000	64	48 000	3 570	6 100	4 100	2 100
7 000 x 4 000	72	56 000	4 020	7 100	4 100	2 100
8 000 x 4 000	80	64 000	4 420	8 100	4 100	2 100
5 000 x 5 000	65	50 000	3 530	5 100	5 100	2 100
6 000 x 5 000	74	60 000	4 040	6 100	5 100	2 100
6 000 x 6 000	84	72 000	4 600	6100	6 100	2 100
7 000 x 6 000	94	84 000	5 160	7 100	6 100	2 100
7 000 x 7 000	105	98 000	5 720	7 100	7 100	2 100

Note 1. Approximate total weights include plats, stays, cleats, nuts, washers and jointing material. Note 2. Nominal capacities are without allowance for freeboard.

Table 8 — typical sizes, approximate weights and nominal capacities of tanks

Tanks 3 000 mm deep. Plates 4 mm and 5 mm thick

Nominal tank Size	**No. of panels in tank**	**Nominal capacity (Litres)**	**Approximate Total weight when empty (Kg)**	**Approximate outside dimensions**		
Length x breadth (mm)				**Length (mm)**	**Breadth (mm)**	**Depth (mm)**
3 000 x 3 000	45	27 000	2 890	3 100	3 100	3 100
4 000 x 3 000	54	36 000	3 450	4 100	3 100	3 100
4 000 x 4 000	64	48 000	4 240	4 100 ^	4100	3 100
5 000 x 4 000	74	60 000	4 920	5 100	4 100	3 100
5 000 x 5 000	85	75 000	5 550	5 100	5 100	3 100

6 000 x 5 000	96	90 000	6 330	6 100	5 100	3 100
6 000 x 6 000	108	108 000	7 200	6 100	6 100	3 100
7 000 x 6 000	120	126 000	8 030	7 100	6 100	3 100
8 000 x 6 000	132	144 000	8 880	8 100	6 100	3 100
7 000 x 7 000	133	147 000	8 870	7 100	7 100	3 100
8 000 x 7 000	146	168 000	9 790	8 100	7 100	3 100
9 000 x 7 000	159	189 000	10 720	9 100	7 100	3 100
8 000 x 8 000	160	192 000	10 800	8 100	8 100	3 100
9 000 x 8 000	174	216 000	11 790	9 100	8 100	3 100
10 000 x 8 000	188	240 000	12 770	10 100	8 100	3 100
9 000 x 9 000	189	243 000	12 820	9 100	9 100	3 100
10 000 x 10 000	220	300 000	15 000	10 100	10 100	3 100
11 000 x 10 000	236	330 000	16 110	1 1100	10 100	3 100
11 000 x 11 000	253	363 000	17 300	11 100	11 100	3 100
12 000 x 11 000	270	396 000	18 490	12 100	11 100	3 100
12 000 x 12 000	288	432 000	19 740	12 100	12 100	3 100
13 000 x 12 000	306	468 000	20 990	13 100	12 100	3 100
13 000 x 13 000	325	507 000	22 300	13 100	13 100	3 100

Note 1. Approximate total weights include plats, stays, cleats, nuts, washers and jointing material.

Note 2. Nominal capacities are without allowance for freeboard.

Table 9 — Typical sizes, approximate weights and nominal capacities of tanks

Tanks 4000 mm deep. Plates 4 mm and 5 mm thick

Nominal tank Size	No. of panels in tank	Nominal capacity (Litres)	Approximate total weight when empty (Kg)	Approximate outside dimensions		
Length x breadth (mm)				Length (mm)	Breadth (mm)	Depth (mm)
3 000 x 3 000	57	36 000	3 700	3 100	3 100	3 100
4 000 x 3 000	68	48 000	4 460	4 100	3 100	3 100
4 000 x 4 000	80	64 000	5 450	4 100	4 100	4 100
5 000 x 4 000	92	80 000	6 290	5 100	4 100	4 100
5 000 x 5 000	105	100 000	7 290	5 100	5 100	4 100
6 000 x 5 000	118	120 000	8 140	6 100	5 100	4 100
6 000 x 6 000	132	144 000	9 270	6 100	6 100	4 100
7 000 x 6 000	146	168 000	10 340	7 100	6 100	4 100
8 000 x 6 000	160	192 000	11 440	8 100	6 100	4 100
7 000 x 7 000	161	196 000	11 200	7 100	7 100	4 100

8 000 x 7 000	176	224 000	12 350	8 100	7 100	4 100
9 000 x 7 000	191	252 000	13 490	9 100	7 100	4 100
8 000 x 8 000	. 192	256 000	13 600	8 100	8 100	4 100
9 000 x 8 000	208	288 000	14 800	9 100	8 100	4 100
10 000 x 8 000	224	320 000	16 040	10 100	8 100	4 100
9 000 x 9 000	225	324 000	16 180	9 100	9 100	4 100
10 000 x 10 000	260	400 000	18 850	10 100	10 100	4 100
11 000 x 10 000	278	440 000	20 210	11 100	10 100	4 100
11 000 x 11 000	297	484 000	21 620	11 100	11 100	4 100
12 000 x 11 000	316	528 000	22 920	12 100	11 100	4 100
12 000 x 12 000	336	576 000	24 540	12 100	12 100	4 100
13 000 x 12 000	356	624 000	26 040	13 100	12 100	3 100
13 000 x 13 000	377	676 000	27 600	13 100	13 100	3 100
Note 1. Approximate total weights include plates, stays, cleats, nuts, washers and jointing material. Note 2. Nominal capacities are without allowance for freeboard.						

Bibliography

[1] IS 804: 1967, Specification for rectangular pressed steel tanks

[2] KS 761:2010, Pressed steel tanks — Specifications

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