



ABECO TANKS

(Pty) LTD

Reg No.: 2009/016732/07

Specialists In: Pressed Sectional Steel Tanks •
Structural Steel • Supporting Towers • Water Storage



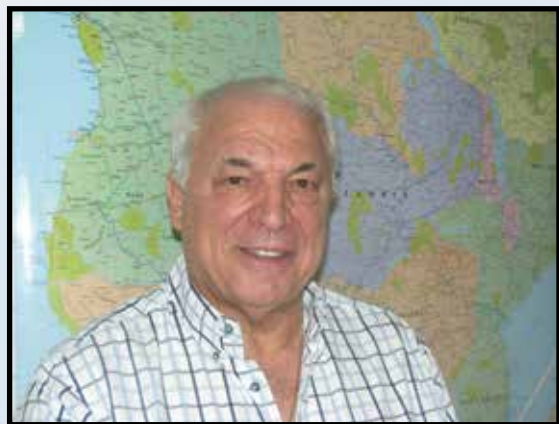
THE NAME THAT REALLY HOLDS WATER

Est. 1983

Manufactured in South Africa



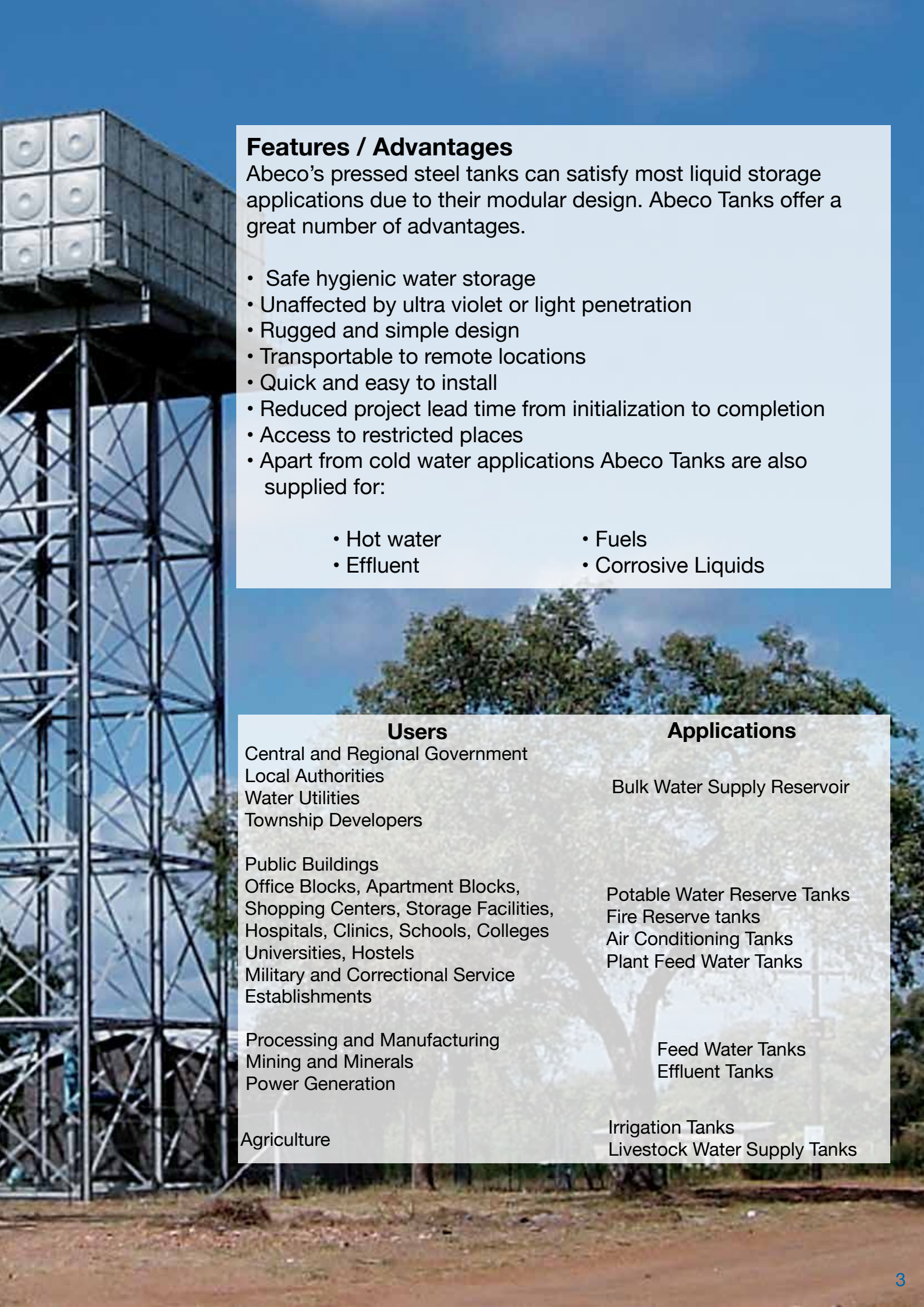
Abeco was established in 1983 with the aim of satisfying the ever increasing need for hygienic storage of life's essential: water. Abeco realized that the greatest need for sanitary water supply lay in the communities with limited resources. It adopted as its guiding principle the aim of developing the most cost effective solutions to water storage needs without compromise to safety,



hygiene, quality or durability. Using modern technology it has become a leading innovator in the development of water storage solutions. Product evaluation and development is an on going activity in the organization. Abeco Tanks are very rugged but can be transported and installed using basic equipment and manual labour. Several thousand tanks have been supplied throughout the Southern African region. As a result of dedication and commitment to its stated aims Abeco is now one of the major participants in this market and is continually establishing its presence in other regions.

Mission Statement

- To work together with water storage users and their service providers to satisfy their needs effectively. In so doing to establish lasting relationships.
- To strive through innovation and modern technology in design, manufacture and installation to continually improve the quality of our end product in the most cost effective manner.
- To work together with our suppliers and service providers equitably in pursuit of our primary aim.



Features / Advantages

Abeco's pressed steel tanks can satisfy most liquid storage applications due to their modular design. Abeco Tanks offer a great number of advantages.

- Safe hygienic water storage
- Unaffected by ultra violet or light penetration
- Rugged and simple design
- Transportable to remote locations
- Quick and easy to install
- Reduced project lead time from initialization to completion
- Access to restricted places
- Apart from cold water applications Abeco Tanks are also supplied for:

- Hot water
- Effluent

- Fuels
- Corrosive Liquids

Users

Central and Regional Government
Local Authorities
Water Utilities
Township Developers

Public Buildings
Office Blocks, Apartment Blocks,
Shopping Centers, Storage Facilities,
Hospitals, Clinics, Schools, Colleges
Universities, Hostels
Military and Correctional Service
Establishments

Processing and Manufacturing
Mining and Minerals
Power Generation

Agriculture

Applications

Bulk Water Supply Reservoir

Potable Water Reserve Tanks
Fire Reserve tanks
Air Conditioning Tanks
Plant Feed Water Tanks

Feed Water Tanks
Effluent Tanks

Irrigation Tanks
Livestock Water Supply Tanks



Technical Information Tank Plates

Design: The water pressure applied to it determines the stress that a tank panel needs to withstand. Consequently the design panel thickness is solely dependent on the depth of the tank. The maximum depth of the standard tank is 4 panels (4.88m). Tanks of 5 panels (6.1m) deep can be supplied. The life span of a water tank is dependent on the effectiveness of the corrosion protection applied to the tank. The life span of the hot dip galvanized tank is almost entirely determined by the thickness of the zinc coating. The thickness of the steel has insignificant influence.

Dimensions: Panel sizes are 1220 x1220mm. Three standard thicknesses are produced - 3mm, 4.5mm and 6mm.

Abeco recommends the thickness shown in the following table for optimum cost benefit effect.

Tanks following this recommendation have stood the ultimate test- the test of time.

• Maximum water pressure on panel (m head)	1.22	2.44	3.66	4.88
• Panel Thickness (mm)	3.0	3.0	4.5	4.5

Manufacture: Abeco evaluated alternative methods of production, in particular hot pressing verses cold pressing and selected the optimum cost benefit method. Panels are cold pressed using high yield stress drawing quality steel. Bolt holes are punched in purpose built machines with fixed punches to ensure dimensional accuracy.

Roofs

Individual roof sheets span 1, 2 or 3 tank panels depending on the tank's width. If the tank's width is greater than 3 panels, roof sheets will overlap each other. The edges of the roof sheets are bent up to provide an overlap designed for optimum sealing. Two alternative roof sheet configurations are available: 2.5mm thick 610mm wide or 1mm thick 305mm wide. The 1mm alternative offers cost effective saving.

Internal Members

Standard tanks have internal bracing consisting of angle iron welded to base plates. Base plates are bolted to the tank panels. These items are jig assembled to ensure dimensional accuracy. Roofs are fixed to cold rolled lipped channel purlins supported by tubular posts.

Fasteners

All bolts and nuts are of high tensile grade.

Sealants

All sealants and rubber components used are non-toxic and non-tainting. EPDM grade rubber gasket extruded with a profile specially developed to achieve optimum sealing, ease and speed of installation is used between tank panel flanges. Rubber bungs are used at specified points. Silicone and mastic are used in conjunction with rubber bungs and to seal bolts protruding through the tank.

Corrosion Protection

Tanks: All steel components including bolts, nuts and washers are hot dip galvanized. For storage of potable water at ambient temperature the durable life of a hot dip galvanized tank can be expected to equal or exceed it's economically useful life. Specialized coatings to specification can be applied for other applications.

Support Towers: Hot dip galvanizing is recommended for optimum cost effectiveness.

Standard Accessories

- Caged external access ladder
- Internal access ladder
- Hinged lockable manhole
- Float and pointer type water level indicator
- Screened ventilator

Other accessories that can be supplied on request are: Valve boxes fixed to roof sheets to accommodate inlet float shut off valves. Sump boxes welded into tank floor plates.



Pipe Connection Points

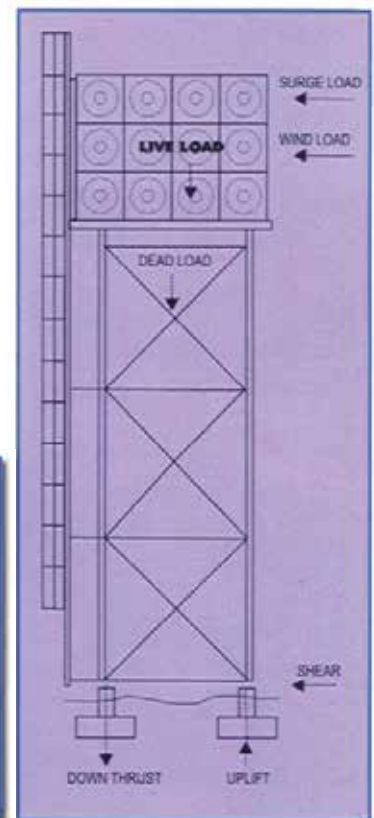
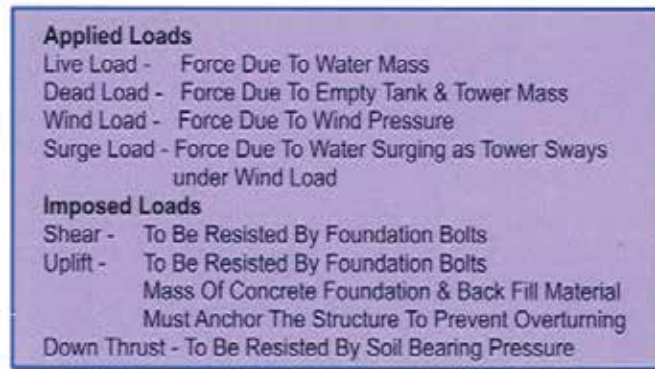
Pipe connection points are positioned at points selected by the purchaser. Manufacture doesn't start until this information is supplied. Designers should take care in selecting the pipe connection points to ensure that piping will not foul tank supports or internal members.

Standard fittings

- BSP sockets
- Flanges to BS 4504 10 bar or SABS 1123 1000kPa welded to stub pipes
- Inlet connection flanged inside and outside, otherwise flanged outside only.

Special Tanks

Many requirements for special tanks can be accommodated. Partitions to divide tanks into two compartments are commonly supplied for fire tanks. **L-shaped** and other odd shaped tanks or tanks with half panels to fit into restricted spaces. Tanks with external bracing.



Internally bolted floor to accommodate height restriction.



Half Panels and special cut out to accommodate obstructions.

Elevated Tanks

Abeco offers a full design manufacture and installation service for support tower steelwork. Basic towers consisting of the support steelwork with a caged access ladder to the roof of the tank will be offered in the absence of further specification. Purchases should request walkways around the base of the tank or rest platforms on access ladders if required.

Access

Access is required all around pressed steel tanks to tighten bolts. The recommended minimum space around the four sides and above the roof is 600 mm and 450 mm beneath the tank.

Foundations

The design and construction of the tank supports and foundations is critical and should only be undertaken and supervised by competent professionals. Full information on the soil conditions is essential.

Warning: Certain soils for example clay cannot support any significant load and foundations commonly used and described below are not suitable.

Ground level tanks

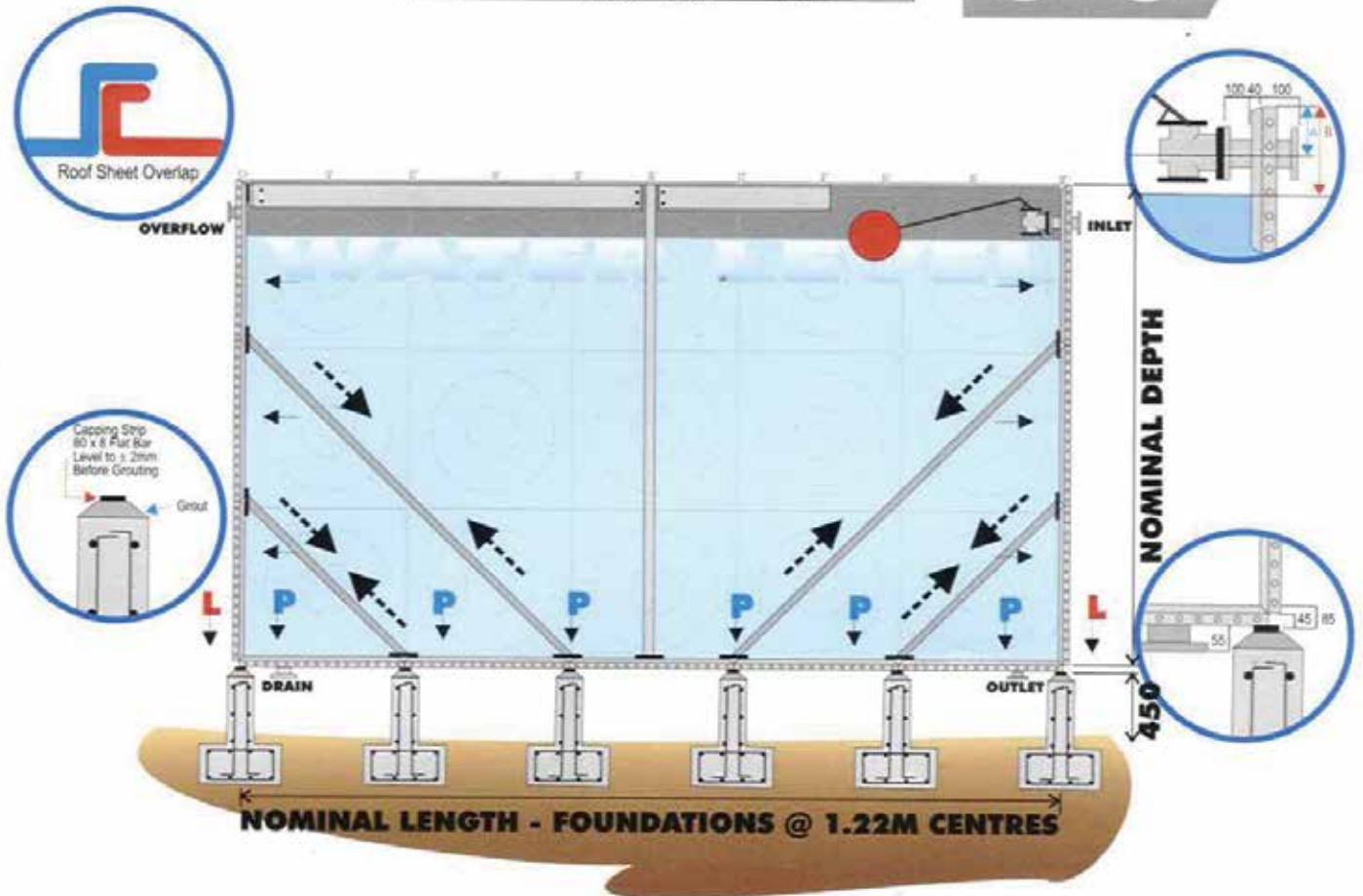
In pressed steel tanks with internal bracing the side wall pressure applied by the water is converted to downward forces in the tank side walls. Maximum loads which can be considerable occur around the perimeter of the tank.

Ground level tanks are commonly supported on reinforced concrete dwarf walls fitted with steel capping strips. The purpose of the capping strip is to spread the load over the full width of the support wall and to provide a level platform on which to erect the tank. For practical reasons concrete cannot be cast with sufficient accuracy of level. The capping strips should be grouted in place before installation of the tank starts. Recommended tolerance on level is $\pm 2\text{mm}$. Care should be taken to ensure that foundation walls are parallel and square to each other. Foundation walls must protrude beyond the edge of the tank by a recommended distance of 150mm. The tapered top section of the wall assists in providing access for tools to fasten the tank panel flange bolts.



Equilibrium Float Valve Roof Clearance & Water Level		
Valve Size	A	B
50 NB	150	290
80NB	200	350
100NB	250	440
150NB	300	550
200NB	200	610

Tank Support Loads			
P - Distributed load applied by water in the tank			
L - Point load imposed by stays at the side wall seams			
Tank Depth (Panels)	L kN	P	
		End Supp kN/m	Inner Supp kN/m
1	0	7,3	14,6
2	17,8	14,6	29,2
3	53,4	21,9	43,8
4	106,2	29,2	58,4



Brick wall supports on concrete foundations can be used. Purchasers must ensure that bricks used have sufficient strength to withstand the loads imposed. Brick walls are not recommended for tanks exceeding 2.44m depth. In sloping or rocky situations where earthwork costs are significant steel beams mounted on concrete bases are often an economically viable alternative.

Elevated Tanks

Elevated tanks are commonly founded on reinforced concrete bases with stub columns cast into excavations which are back filled after construction. The determining loads in elevated tank foundation design are dependent on the height of the tower. The determining load for low level tanks is the down thrust and thus foundation size is governed by the soil bearing pressure. The determining load for high level tanks will be the up lift and thus the anchor effect of foundation and back fill mass will determine foundation size. Maximum up lift occurs when the tank is empty. Abeco supplies full foundation load information for each elevated tank purchased to its design.

Load Terminology

Dead Load- The load created by the mass of the steel tower and an empty tank.

Live Load- The load created by the mass of the water stored.

Wind Load- The vertical loads (uplift and down thrust) created by the over tuning effect of wind pressure on the tank and support tower.

Surge Load- The vertical loads similar to wind load created by water surging as the tower sways under wind load.

Useful Information

Water Volume and Mass:

1000 litres = 1m³ = 1000 kg = 1 Ton

Pressure:

1m head water = .098 bar = 9.8kPa = 1.47 psi

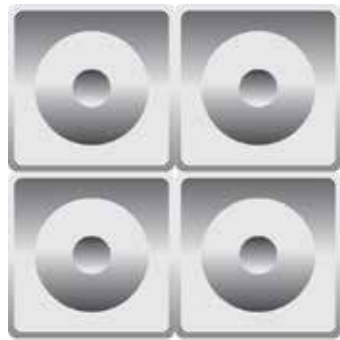
Force:

1kgf = 9.81N

Standard Pipes & Flanges						
Pipe			Flanges (BS 4504 10 bar) (SABS 1123 1000 kPa)			
Nominal Bore (NB)		OD	OD	Holes	Dia	PCD
Ins	mm	mm	mm	no	mm	mm
0.50	15	21.3				
0.25	20	26.9				
1	25	33.7				
1.50	40	48.3	150	4	18	110
2	50	60.3	165	4	18	125
2.50	65	76.1	185	4	18	145
3	80	88.9	200	8	18	160
4	100	114.3	220	8	18	180
6	150	165.1	285	8	22	240
8	200	219.1	340	8	22	295
10	250	273	395	12	22	350
12	300	323.9	445	12	22	400

Tank Capacity Chart - (Selected Sizes) - Capacity in Litres

Length m	Width m	Depth			
		1Panel 1.22m	2Panels 2.44m	3Panels 3.66m	4Panels 4.88m
1.22	1.22	1.816	3.632	5.448	7.263
2.44	1.22	3.632	7.263	10.895	14.527
3.66	1.22	5.448	10.895	16.343	21.790
4.88	1.22	7.263	14.527	21.790	29.054
6.10	1.22	9.079	18.158	27.238	36.317
2.44	2.44	7.263	14.527	21.790	29.054
3.66	2.44	10.895	21.790	32.685	43.580
4.88	2.44	14.527	29.054	43.580	58.107
6.10	2.44	18.158	36.317	54.475	72.634
7.32	2.44	21.790	43.580	65.371	87.161
3.66	3.66	16.343	32.685	49.028	65.371
4.88	3.66	21.790	43.580	65.371	87.161
6.10	3.66	27.238	54.475	81.713	108.951
7.32	3.66	32.685	65.371	98.056	130.741
8.54	3.66	38.133	76.266	114.398	152.531
4.88	4.88	29.054	58.107	87.161	116.214
6.10	4.88	36.317	72.634	108.951	145.268
7.32	4.88	43.580	87.161	130.741	174.321
8.54	4.88	50.844	101.687	152.531	203.375
9.76	4.88	58.107	116.214	174.321	232.429
6.10	6.10	45.396	90.792	136.189	181.585
7.32	6.10	54.475	108.951	163.426	217.902
8.54	6.10	63.555	127.109	190.664	254.219
9.76	6.10	72.634	145.268	217.902	290.536
10.98	6.10	81.713	163.426	245.139	326.853
7.32	7.32	65.371	130.741	196.112	261.482
8.54	7.32	76.266	152.531	228.797	305.062
9.76	7.32	87.161	174.321	261.482	348.643
10.98	7.32	98.056	196.112	294.167	392.223
12.20	7.32	108.951	217.902	326.853	435.804
8.54	8.54	88.977	177.953	266.930	355.906
9.76	8.54	101.687	203.375	305.062	406.750
10.98	8.54	114.398	228.797	343.195	457.594
12.20	8.54	127.109	254.219	381.328	508.437
13.42	8.54	139.820	279.820	419.641	559.281
9.76	9.76	116.214	232.429	348.643	464.857
10.98	9.76	130.741	261.482	392.223	522.964
12.20	9.76	145.268	290.536	435.804	581.071
13.42	9.76	159.795	319.589	479.384	639.178
14.64	9.76	174.321	348.643	522.964	697.286
10.98	10.98	147.084	294.167	441.251	588.335
12.20	10.98	163.426	326.853	490.279	653.705
13.42	10.98	179.769	359.538	539.307	719.076
14.64	10.98	196.112	392.223	588.335	784.446
15.86	10.98	212.454	424.908	637.363	849.817
12.20	12.20	181.585	363.170	544.754	726.339
13.42	12.20	199.743	399.487	599.230	798.973
14.64	12.20	217.902	435.804	653.705	871.607
15.86	12.20	236.060	472.120	708.181	944.241
17.08	12.20	254.219	508.437	762.656	1.016.875
13.42	13.42	219.718	439.435	659.153	878.870
14.64	13.42	239.692	479.384	719.076	958.768
15.86	13.42	259.666	519.333	778.999	1.038.665
17.08	13.42	279.641	559.281	838.922	1.118.562
18.30	13.42	299.615	599.230	898.845	1.198.460
14.64	14.64	261.482	522.964	784.446	1.045.928
15.86	14.64	283.272	566.545	849.817	1.133.089
17.08	14.64	305.062	610.125	915.187	1.220.250
18.30	14.65	326.853	653.705	980.558	1.307.411
19.52	14.65	348.643	697.286	1.045.928	1.394.571



ABECO TANKS

(Pty) LTD

Circular Sectional Steel Tanks





Our manufacturing plant in Johannesburg South Africa

About Circular Sectional Tanks

In developing sectional steel tanks Abeco Recognised a need for tanks that have the following features:

- Low cost hygienic water storage
- Rugged and easily transportable
- Requires minimal site preparation and foundations
- Quick and easy to install
- Can be installed using basic equipment
- Durable and long lasting
- Can be dismantled and re-erected at a new site

Abeco Tanks are easy to install

Particular care and attention has been paid to the design of the tanks to ensure that tanks are easy to install so that they are suitable for the most remote and inaccessible places where facilities are limited.

- Abeco circular sectional steel tanks do not need concrete foundations.
- Tanks can be installed on a flat, level and stable site covered by a bed of sand.
- If a concrete base is desired, a simple slab with standard mesh reinforcing will suffice. The base diameter should be 1m larger than the tank diameter.
- Slender tanks (tanks with relatively high compared to diameter) may need to be fastened down for wind forces.
- All components are lightweight, easy to transport and easy to manhandle.
- Only simple tools are needed for installation.
- All parts and sealants needed to fully install the tanks are supplied.
- Pipe connection fittings are welded to shell side plates during manufacture before galvanizing.
- Tanks are supplied with access ladders, an access manhole and water level indicators.

About Tank Design and Materials

- Tanks are of all bolted construction.
- The tank shell panels are manufactured from carbon steel sheets.
- The shell panels are hot dip galvanized after manufacture.
- The side panel thickness is determined by the tank diameter and depth.
- The minimum thickness recommended for sidewall panels is 2.5mm.
- Specially designed extruded rubber strips seal the sidewall panel seams.
- The tank roofs are made from galvanized steel roof sheeting.
- The tank roofs are cambered for water and dust run off.
- The floor of the tank is made from a durable vinyl sheet.
- A bed of sand or other suitable backing material protects the floor.
- Bolts and Nuts are hot dip galvanized high tensile grade.
- All sealants are non-tainting, non-toxic suitable for drinking water.





Shell Panels per circle	Tank Depth					
	1 Panel 2.35m		2 Panels 4.775m		3 Panels 7.175m	
	Dia m	Capacity m ³	Dia m	Capacity m ³	Dia m	Capacity m ³
6	2.196	8.9	2.196	18.1	2.196	27.2
8	2.928	15.8	2.928	32.2	2.928	48.3
10	3.661	24.7	3.661	50.3	3.661	75.5
12	4.393	35.6	4.393	72.4	4.393	108.7
14	5.125	48.5	5.125	98.5	5.125	148.0
16	5.857	63.3	5.857	128.6	5.857	193.3
18	6.589	80.1	6.589	162.8	6.589	244.7
20	7.321	98.9	7.321	201.0	7.321	302.0
22	8.053	119.7	8.053	243.2	8.053	365.5
24	8.785	142.5	8.785	289.5	8.785	434.9
26	9.517	167.2	9.517	339.7	9.517	510.5
28	10.250	193.9	10.250	394.0	10.25	593.8
30	10.982	222.6	10.982	452.3	10.98	681.7
32	11.714	253.3	11.714	514.6	11.714	775.7
34	12.446	285.9	12.446	583.8	12.446	875.7
36	13.178	320.5	13.178	654.5	13.178	981.7
38	13.910	357.1	13.910	729.2	13.910	1093.8
40	14.642	395.7	14.642	808.0	14.642	1212.0

What can be stored in Abeco Circular Sectional Tanks

- Potable water.
- Raw water.
- Water for fire sprinklers and fire hydrants.
- Effluent.
- Chemicals.

Who uses Abeco Circular Sectional Tanks ?

Humanitarian relief organisations
 Government, local authorities and utilities
 Rural communities
 Farmers
 Mines
 Industry
 Commerce



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