

# **AYS METAL PRODUCTS & ENGINEERING SDN BHD (AYSMPE) SPECIFICATIONS**

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# AYSMPE FRP SECTIONAL WATER TANK

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## INTRODUCTION

AYSMPE FRP (Fibre Reinforced Polyester) sectional water storage tank provides solution to your clean water storage requirement.

AYSMPE FRP an assured high quality FRP product made in Malaysia in combination with Japanese state-of-the-art technology, design, machine and even materials.

AYSMPE FRP tank panel is made from high pressure moulding of SMC (Sheet Moulding Compound) thermosetting material reinforced with layer of glass fibre woven cloth using 600 metric tonnes hydraulic press and very high precision mould. The technology guarantees product qualities in dimension and structural uniformity, aesthetic finishing, anti leak property and added strengths ( tensile, flexural, impact, compressive and shear).

## FEATURES OF AYSMPE FRP TANK

- Strong & durable.
- Easy cleaning & maintenance.
- Drains completely at roof and bottom as it uses specially designed roof panel and drainage panel.
- Prevent leakage completely by using special sealing material. (PVC Foam Sealant)
- Prevent algae growth in the tank. AYSMPE FRP tank panels are made by SMC hot press method, which has high opaque quality. This opaque quality prevent the evaporation of sterilizer, and stop the algae growth.
- Safety factor of 6 design structure are realized by using strong panels and reinforcement material.
- Various shape tanks are available by combination of strong panels.

## AUTHORITY CERTIFICATION

- SPAN - SURUHANJAYA PERKHIDMATAN AIR NEGARA
- SIRIM QAS SDN. BHD. (BS SS 245 : 1995)
- TECHNICAL PRINCIPLE CERTIFICATION "HIRATA PTE. LTD. OSAKA, JAPAN"
- CIVIL DEFENCE DEPARTMENT OF QATAR PRODUCT APPROVAL

## PRE-INSTALLATION ADVICE

For tank to be well installed without any uneven structural load problem, the tank supporting R.C. or steel structure plinth foundation must be:

- Appropriate and adequate:
- All the top surfaces are evenly flat and smooth for tank supporting skid base to be placed on well without any gap.

Also ensure there is sufficient overhead space clearance between tank roof and building structure. (e.g. R.C. beam or Slab) The maximum distance between centre to centre of all plinths shall not be more than 2,002mm.

It is always advisable to construct plinths, especially the R.C. type, with height of not less than 600mm to facilitate future maintenance. .

If in doubt, contact our sales and marketing personnel for assistance.

## POST-INSTALLATION PROCEDURE

To avoid damage to your prestige tank and ensure quality work, please:

- Begin plumbing pipe connection works from the FRP tank panel and then to other connections.
- Do not exert pressure or force on FRP tank panel during piping works such as pipe connecting, valve fixing or any other jobs that may cause damage to the panel;
- Use proper impact wrench or equivalent of not exceeding 50kg/cmz force for all bolt fastening jobs;
- Do not try using extra extension handle such as pipe to your pipe wrench;
- Do not perform any heating activities such as flame-torch cutting, welding, etc. next to the tank. FRP material is flammable;
- Do not use metal brush or equivalent. Use only soft material brush or equivalent to prevent scratch damage.

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# AYSMPE FRP SECTIONAL WATER TANK

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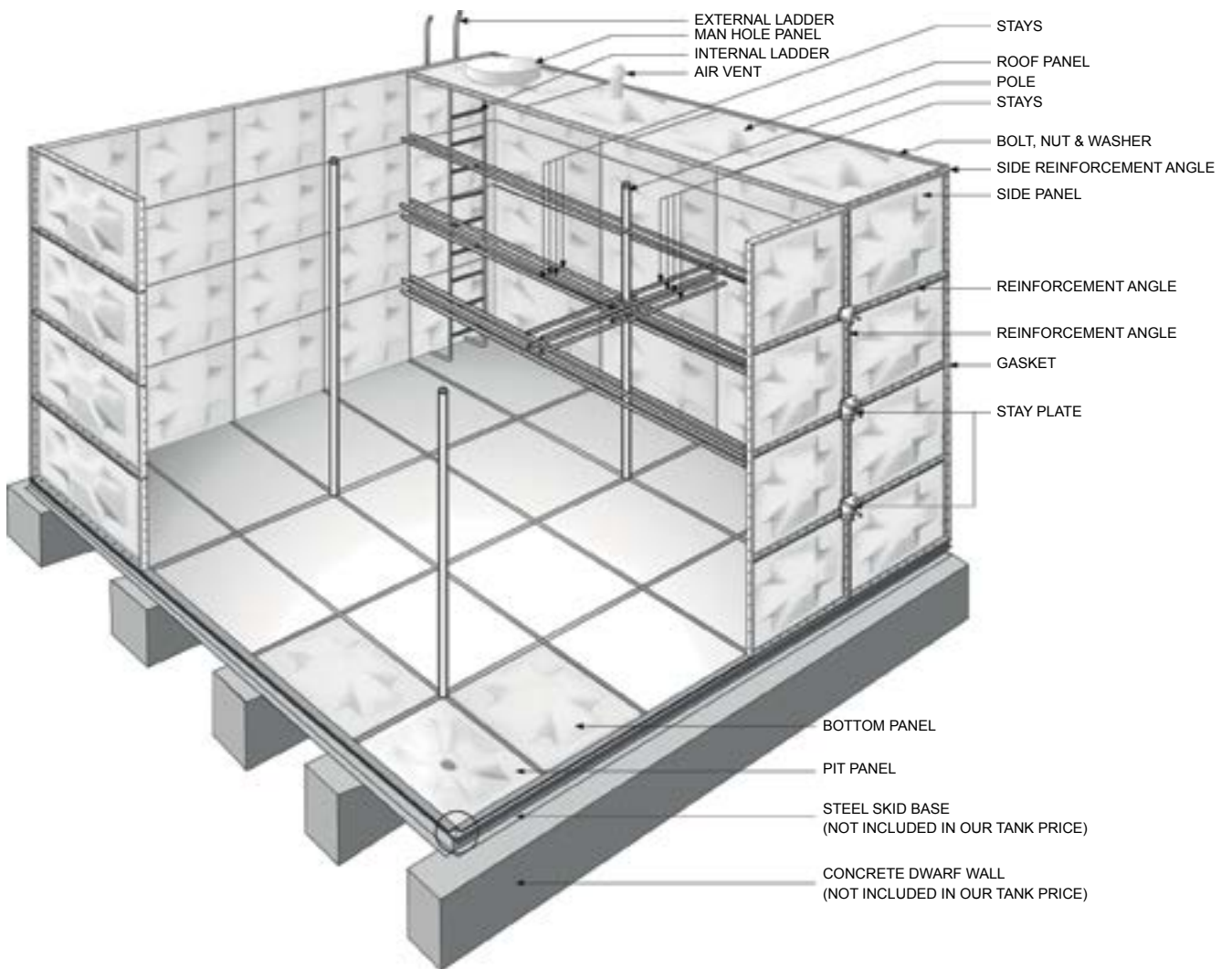
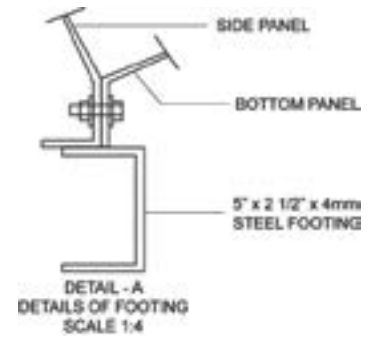


State-of-the-art 600 metric tonnes hydraulic press, one of the country's biggest units for FRP water tank panel moulding.

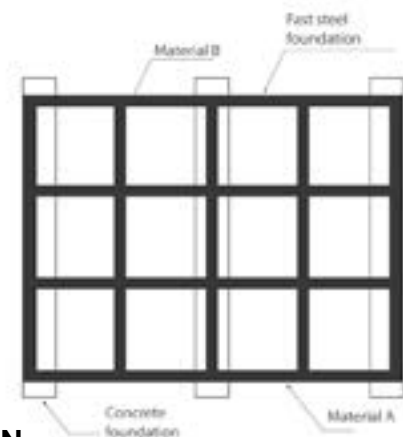


An installed FRP tank

# CROSS SECTIONAL OF FRP TANK



# MATERIALS USED FOR FLAT STEEL FOUNDATION

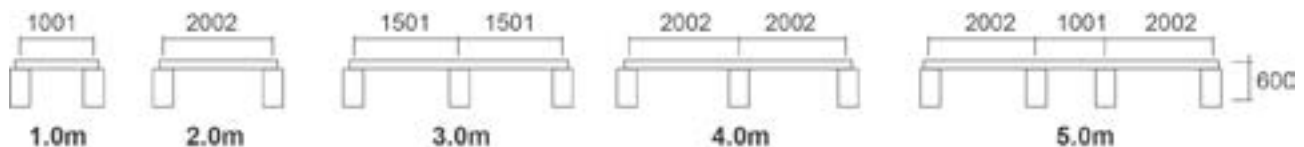


## AYSMP E FRP SECTIONAL WATER TANK SPECIFICATION

Components	Specification
Panel Material	Sheet Molding Compound
Maximum Height	4 meter
Air Ventilation	ABS Plastic, Prevention of rain water, insects, or any foreign materials entering the tank
Flange of Panel	Single Flange at an Angle of 90 Degree
External Reinforcement	Hot Dip Galvanized
Internal Reinforcement	SS 304 or SS 316 (optional)
Jointing Material	PVC Foam Sealant
Cover	FRP Hot Pressed Molding
Internal Ladder	Aluminium
External Ladder	GI
Fasteners (External)	GI
Fasteners (Internal)	SS 304
Steel Skid Base	Painted
Water Level Indicator	GI

Height (m)	Plinth Distance (m)	Material A	Material B
1.0m	1	3" x 1.5" x C	3" x 1.5" x C
	2	5" x 3.0" x C	
2.0m	1	3" x 1.5" x C	3" x 1.5" x C
	2	5" x 3.0" x C	
3.0m	1	4" x 2.0" x C	3" x 1.5" x C
	2	6" x 3.0" x C	
4.0m	1	4" x 2.0" x C	3" x 1.5" x C
	2	7" x 3.0" x C	

## STANDARD PLINTH DISTANCE



## PANEL MATERIAL CHARACTERISTICS

Description	FRP
Specific Gravity	1.8
Glass Content	more than 30%
Tensile Strength	1,050 kg/cm <sup>2</sup>
Young's Modulus	1.40 x 10 <sup>5</sup> kg/cm <sup>2</sup>
Flexural Strength	1,670 kg/cm <sup>2</sup>
Impact Strength	56.0 kg-cm/cm <sup>2</sup>
Compressive Strength	3,000 kg/cm <sup>2</sup>

Description	FRP
Shear Strength	1,000 kg/cm <sup>2</sup>
Thermal Expansion	2.16 x 10 <sup>-5</sup> /°C
Coef. of Overall Heat Transmission	5.0 Kcal/m <sup>2</sup> hr °C
Thermal Conductivity	0.15 Kcal/m <sup>2</sup> hr °C
Water Absorption	less than 0.1%
Cavity	less than 1%
Light Transmittance (Grey)	<0.01%

# WEIGHT TABLES

Nominal Tank Size, Length by Breadth	1-meter Height			
	Panels In Tank	Nominal Capacity	Approx. Wt.water	Approx. Wt. Panels
Meter	Pcs	Gallons	Tons	Tons
1 x 1	6	220	0.98	0.09
1 x 2	10	440	1.96	0.15
1 x 3	14	660	2.94	0.22
1 x 4	18	880	3.92	0.28
1 x 5	22	1100	4.90	0.34
2 x 2	16	880	3.92	0.25
2 x 3	22	1320	5.87	0.34
2 x 4	28	1760	7.83	0.43
2 x 5	34	2200	9.79	0.52
2 x 6	40	2640	11.75	0.62
3 x 3	30	1980	8.81	0.46
3 x 4	38	2640	11.75	0.59
3 x 5	46	3300	14.69	0.71
3 x 6	54	3960	17.62	0.83
3 x 7	62	4620	20.56	0.95
4 x 4	48	3520	15.66	0.74
4 x 5	58	4400	19.58	0.89
4 x 6	68	5280	23.50	1.05
4 x 7	78	6160	27.41	1.20
4 x 8	88	7040	31.33	1.36
5 x 5	70	5500	24.48	1.08
5 x 6	82	6600	29.37	1.26
5 x 7	94	7700	34.27	1.45
5 x 8	106	8800	39.16	1.63
5 x 9	118	9900	44.06	1.82
6 x 6	96	7920	35.24	1.48
6 x 8	124	10560	46.99	1.91
6 x 9	138	11880	52.87	2.13
7 x 7	126	10780	47.97	1.94
7 x 8	142	12320	54.82	2.19
7 x 9	158	13860	61.68	2.43
8 x 8	160	14080	62.66	2.46
8 x 9	178	15840	70.49	2.74
9 x 9	198	17820	79.30	3.05

Nominal Tank Size, Length by Breadth	2-meter Height			
	Panels In Tank	Nominal Capacity	Approx. Wt.water	Approx. Wt. Panels
Meter	Pcs	Gallons	Tons	Tons
1 x 1	10	440	1.96	0.18
1 x 2	16	880	3.92	0.28
1 x 3	22	1320	5.87	0.39
1 x 4	28	1760	7.83	0.49
1 x 5	34	2200	9.79	0.60
2 x 2	24	1760	7.83	0.42
2 x 3	32	2640	11.75	0.56
2 x 4	40	3520	15.66	0.70
2 x 5	48	4400	19.58	0.84
2 x 6	56	5280	23.50	0.99
3 x 3	42	3960	17.62	0.74
3 x 4	52	5280	23.50	0.92
3 x 5	62	6600	29.37	1.09
3 x 6	72	7920	35.24	1.27
3 x 7	82	9240	41.12	1.44
4 x 4	64	7040	31.33	1.13
4 x 5	76	8800	39.16	1.34
4 x 6	88	10560	46.99	1.55
4 x 7	100	12320	54.82	1.76
4 x 8	112	14080	62.66	1.97
5 x 5	90	11000	48.95	1.58
5 x 6	104	13200	58.74	1.83
5 x 7	118	15400	68.53	2.08
5 x 8	132	17600	78.32	2.32
5 x 9	146	19800	88.11	2.57
6 x 6	120	15840	70.49	2.11
6 x 8	152	21120	93.98	2.68
6 x 9	168	23760	105.73	2.96
7 x 7	154	21560	95.94	2.71
7 x 8	172	24640	109.65	3.03
7 x 9	190	27720	123.35	3.34
8 x 8	192	28160	125.31	3.38
8 x 9	212	31680	140.98	3.73
9 x 9	234	35640	158.60	4.12

Nominal Tank Size, Length by Breadth	3-meter Height			
	Panels In Tank	Nominal Capacity	Approx. Wt.water	Approx. Wt. Panels
Meter	Pcs	Gallons	Tons	Tons
1 x 1	14	660	2.94	0.28
1 x 2	22	1320	5.87	0.44
1 x 3	30	1980	8.81	0.59
1 x 4	38	2640	11.75	0.75
1 x 5	46	3300	14.69	0.91
2 x 2	32	2640	11.75	0.63
2 x 3	42	3960	17.62	0.83
2 x 4	52	5280	23.50	1.03
2 x 5	62	6600	29.37	1.23
2 x 6	72	7920	35.24	1.43
3 x 3	54	5940	26.43	1.07
3 x 4	66	7920	35.24	1.31
3 x 5	78	9900	44.06	1.54
3 x 6	90	11880	52.87	1.78
3 x 7	102	13860	61.68	2.02
4 x 4	80	10560	46.99	1.58
4 x 5	94	13200	58.74	1.86
4 x 6	108	15840	70.49	2.14
4 x 7	122	18480	82.24	2.42
4 x 8	136	21120	93.98	2.69
5 x 5	110	16500	73.43	2.18
5 x 6	126	19800	88.11	2.49
5 x 7	142	23100	102.80	2.81
5 x 8	158	26400	117.48	3.13
5 x 9	174	29700	132.17	3.45
6 x 6	144	23760	105.73	2.85
6 x 8	180	31680	140.98	3.56
6 x 9	198	35640	158.60	3.92
7 x 7	182	32340	143.91	3.60
7 x 8	202	36960	164.47	4.00
7 x 9	222	41580	185.03	4.40
8 x 8	224	42240	187.97	4.44
8 x 9	246	47520	211.46	4.87
9 x 9	270	53460	237.90	5.35

Nominal Tank Size, Length by Breadth	4-meter Height			
	Panels In Tank	Nominal Capacity	Approx. Wt.water	Approx. Wt. Panels
Meter	Pcs	Gallons	Tons	Tons
1 x 1	18	880	3.92	0.44
1 x 2	28	1760	7.83	0.68
1 x 3	38	2640	11.75	0.92
1 x 4	48	3520	15.66	1.16
1 x 5	58	4400	19.58	1.40
2 x 2	40	3520	15.66	0.97
2 x 3	52	5280	23.50	1.26
2 x 4	64	7040	31.33	1.55
2 x 5	76	8800	39.16	1.84
2 x 6	88	10560	46.99	2.13
3 x 3	66	7920	35.24	1.60
3 x 4	80	10560	46.99	1.94
3 x 5	94	13200	58.74	2.27
3 x 6	108	15840	70.49	2.61
3 x 7	122	18480	82.24	2.95
4 x 4	96	14080	62.66	2.32
4 x 5	112	17600	78.32	2.71
4 x 6	128	21120	93.98	3.10
4 x 7	144	24640	109.65	3.48
4 x 8	160	28160	125.31	3.87
5 x 5	130	22000	97.90	3.15
5 x 6	148	26400	117.48	3.58
5 x 7	166	30800	137.06	4.02
5 x 8	184	35200	156.64	4.45
5 x 9	202	39600	176.22	4.89
6 x 6	168	31680	140.98	4.07
6 x 8	208	42240	187.97	5.03
6 x 9	228	47520	211.46	5.52
7 x 7	210	43120	191.88	5.08
7 x 8	232	49280	219.30	5.61
7 x 9	254	55440	246.71	6.15
8 x 8	256	56320	250.62	6.20
8 x 9	280	63360	281.95	6.78
9 x 9	306	71280	317.20	7.41

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# AYSMPE PRESSED STEEL SECTIONAL WATER TANK

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# AYSMPPE PRESSED STEEL SECTIONAL WATER TANK

## FEATURES OF PRESSED STEEL WATER STORAGE TANK

<b>PANEL</b>	Material Specification: Hot rolled steel plate conformed to the requirement of <b>BS 4360 grade 43A, BS 1449 material HR 14 or ISO equivalents. SS 316 Hot Rolled Stainless Steel Plate (No. 1 Finishing)</b>						
<b>NOMINAL THICKNESS SPECIFICATION OF UNIT PLATE</b>	<b>1220 mm x 1220 mm</b>	<b>Tank Height</b>	<b>1220mm</b>	<b>2440mm</b>	<b>3660mm</b>	<b>4880mm</b>	
		Bottom Panels	5 mm	5 mm	5 mm	6 mm	
		1st Tier Panels	5 mm	5 mm	5 mm	6 mm	
		2nd Tier Panels		5 mm	5 mm	5 mm	
		3rd Tier Panels			5 mm	5 mm	
		4th Tier Panels				5 mm	
		Top Cover Panels					
	<b>1000 mm x 1000 mm</b>	<b>Tank Height</b>	<b>1000mm</b>	<b>2000mm</b>	<b>3000mm</b>	<b>4000mm</b>	<b>5000mm</b>
		Bottom Panels	5 mm	5 mm	5 mm	5 mm	6 mm
		1st Tier Panels	5 mm	5 mm	5 mm	5 mm	6 mm
		2nd Tier Panels		5 mm	5 mm	5 mm	5 mm
		3rd Tier Panels			5 mm	5 mm	5 mm
		4th Tier Panels				5 mm	5 mm
		5th Tier Panels					5 mm
Top Cover Panels (Pitch / Flat)	1.5/2 mm	1.5/2 mm	1.5/2 mm	1.5/2 mm	1.5/2 mm		
<b>FLANGES OF PLATE</b>	Combined double flanges at an angle of 45 degree & 90 degree to the face of the plate on all four sides.						
<b>BOLT HOLES</b>	1.5mm of hole clearance in diameter for bolt having a minimum diameter of 14mm (M14) or up to 16mm (M16). Bolt holes spacing of not exceeding 76.2mm pitch.						
<b>FREEBOARDS, STAYS, CLEATS &amp; PADS FOR CONNECTION</b>	Material Specification: Hot rolled steel plate conformed to the requirement of <b>BS 4360 grade 43A, BS 1449 material HR 14 or ISO equivalents.</b>						
<b>BOLTS, STUDS, NUTS &amp; WASHERS</b>	Material Specification: Complied with the requirement of BS 4190 or ISO 898. Dimension Specification: M14 (M16 is available upon request).						
<b>JOINTING MATERIAL</b>	Non-Toxic						
<b>COVER</b>	Manufactured to conform to the requirement of BS 449.						
<b>ACCESS LADDERS</b>	Will be provided for all tanks depth over 1000mm.						
<b>WATER LEVEL INDICATOR</b>	Standard supply with graduated mark in feet or meters.						
<b>COATING FINISHES (TWO CHOICES)</b>	1. One coat of Non-toxic priming coating on delivery of panels or prior to erection. Two coats of Black Bituminous paint coating on inner faces & Finishing paint on external faces after erection.						
	2. Hot dip galvanizing to BS 729.						
	3. SS316 Stainless steel sectional tank with No.1 Finishing available upon request in (1220mm x 1220mm x 3mm) and (1000mm x 1000mm x 3mm) dimension.						
	4. HDPE Lining (Internal)						

## AUTHORITY CERTIFICATION

- **MANUFACTURING STANDARD**  
Manufactured to comply with:  
BRITISH STANDARD INSTITUTION (BS 1564 : 1975)  
SINGAPORE STANDARD (SS22 : 1994)
- **SIRIM QAS SND. BHD.** (BS 1564 : 1975) - Certification No: PA 018402

# WEIGHT TABLES

Nominal Tank Size, Length by Breadth	4' - 0' Deep Tank - 5mm Thick Plate			
	Panels In Tank	Nominal Capacity	Approx. Wt.water	Approx. Wt. Plates
Feet	Numbers	Gallons	Tons	Tons
4 x 4	5	400	1.78	0.39
4 x 8	8	800	3.56	0.62
4 x 12	11	1200	5.34	0.85
4 x 16	14	1600	7.12	1.09
4 x 20	17	2000	8.90	1.32
8 x 8	12	1600	7.12	0.90
8 x 12	16	2400	10.68	1.15
8 x 16	20	3200	14.24	1.43
8 x 20	24	4000	17.80	1.82
8 x 24	28	4800	21.36	2.21
12 x 12	21	3600	16.02	1.60
12 x 16	26	4800	21.36	2.01
12 x 20	31	6000	26.70	2.35
12 x 24	36	7200	32.04	2.74
12 x 28	41	8400	37.38	3.15
16 x 16	32	6400	28.48	2.58
16 x 20	38	8000	35.60	3.04
16 x 24	44	9600	42.72	3.49
16 x 28	50	11200	49.84	4.05
16 x 32	56	12800	56.96	4.66
20 x 20	45	10000	44.50	3.60
20 x 24	52	12000	53.40	4.15
20 x 28	59	14000	62.30	4.70
20 x 32	66	16000	71.20	5.25
20 x 36	73	18000	80.10	5.90
24 x 24	60	14400	64.08	4.71
24 x 28	68	16800	74.76	5.40
24 x 32	76	19200	85.44	6.09
24 x 36	84	21600	96.12	6.80
28 x 28	77	19600	87.22	6.13
28 x 32	86	22400	99.68	7.22
28 x 36	95	25200	112.14	7.94
32 x 32	96	25600	113.92	8.06
32 x 36	106	28800	128.16	8.88
36 x 36	117	32400	144.18	9.82

Nominal Tank Size, Length by Breadth	12' - 0' Deep Tank - 5mm Thick Plate			
	Panels In Tank	Nominal Capacity	Approx. Wt.water	Approx. Wt. Plates
Feet	Numbers	Gallons	Tons	Tons
12 x 12	45	10800	48.06	4.40
12 x 16	54	14400	64.08	5.40
12 x 20	63	18000	83.66	6.30
16 x 16	64	19200	85.44	6.40
16 x 20	74	24000	106.80	7.50
16 x 24	84	28800	128.16	8.60
16 x 28	94	33600	149.52	9.70
20 x 20	85	30000	133.50	8.50
20 x 24	96	36000	160.20	9.70
20 x 28	107	42000	186.90	10.90
20 x 32	118	48000	213.60	12.10
24 x 24	108	43200	192.24	10.90
24 x 28	120	50400	224.28	12.20
24 x 32	132	57600	256.32	13.50
28 x 28	133	58800	261.66	13.60
28 x 32	146	67200	299.04	14.90
28 x 36	159	75600	336.42	16.20
32 x 32	160	76800	341.76	16.30
32 x 36	174	86400	384.48	17.80
32 x 40	188	96000	427.20	19.20
36 x 36	189	97200	432.54	19.30
36 x 40	204	108000	480.60	21.34
40 x 40	220	120000	534.00	22.35
40 x 44	236	132000	587.40	24.79
40 x 48	252	144000	640.80	27.23
44 x 44	253	145200	646.14	26.72
44 x 48	270	158400	704.88	28.49
44 x 52	287	171600	763.62	30.26
48 x 48	288	172800	768.96	30.47
48 x 52	306	187200	833.04	32.35
52 x 52	325	202800	902.46	34.43

Nominal Tank Size, Length by Breadth	8' - 0' Deep Tank - 5mm Thick Plate			
	Panels In Tank	Nominal Capacity	Approx. Wt.water	Approx. Wt. Plates
Feet	Numbers	Gallons	Tons	Tons
4 x 4	9	800	3.56	0.77
4 x 8	14	1600	7.12	1.18
4 x 12	19	2400	10.68	1.59
4 x 16	24	3200	14.24	2.01
4 x 20	29	4000	17.80	2.43
8 x 8	20	3200	14.24	1.68
8 x 12	26	4800	21.36	2.18
8 x 16	32	6400	28.48	2.69
8 x 20	38	8000	35.60	3.20
8 x 24	44	9600	42.72	3.72
12 x 12	33	7200	32.04	2.77
12 x 16	40	9600	42.72	3.36
12 x 20	47	12000	53.40	3.95
12 x 24	54	14400	64.08	4.46
12 x 28	61	16800	74.76	5.07
16 x 16	48	12800	56.96	4.03
16 x 20	56	16000	71.20	4.66
16 x 24	64	19200	85.44	5.37
16 x 28	72	22400	99.68	6.08
16 x 32	80	25600	113.92	6.79
20 x 20	65	20000	89.00	5.46
20 x 24	74	24000	106.80	6.21
20 x 28	83	28000	124.60	6.97
20 x 32	92	32000	142.40	7.73
20 x 36	101	36000	160.20	8.50
24 x 24	84	28800	128.16	7.05
24 x 28	94	33600	149.52	7.89
24 x 32	104	38400	170.88	8.74
24 x 36	114	43200	192.24	9.59
28 x 28	105	39200	174.44	8.81
28 x 32	116	44800	199.36	9.74
28 x 36	127	50400	224.28	10.67
32 x 32	128	51200	227.84	10.74
32 x 36	140	57600	256.32	11.75
36 x 36	153	64800	288.36	12.84

Nominal Tank Size, Length by Breadth	16' - 0' Deep Tank - 5mm Thick Plate			
	Panels In Tank	Nominal Capacity	Approx. Wt.water	Approx. Wt. Plates
Feet	Numbers	Gallons	Tons	Tons
5mm 6mm				
12 x 12	36 21	14400	64.08	6.20
12 x 16	42 26	19200	85.44	7.50
12 x 20	48 31	24000	106.80	8.80
16 x 16	48 32	25600	113.92	8.70
16 x 20	54 38	32000	142.40	10.90
16 x 24	60 44	38400	170.88	13.10
16 x 28	66 50	44800	199.36	15.30
20 x 20	60 45	40000	178.00	11.30
20 x 24	66 52	48000	213.60	12.80
20 x 28	72 59	56000	249.20	14.30
20 x 32	78 66	64000	284.80	15.80
24 x 24	72 60	57600	256.32	14.40
24 x 28	78 68	67200	299.04	15.90
24 x 32	84 76	76800	341.76	17.40
28 x 28	84 77	78400	348.88	17.50
28 x 32	90 86	89600	398.72	19.30
28 x 36	96 95	100800	448.56	20.90
32 x 32	96 96	102400	455.68	21.10
32 x 36	102 106	115200	512.64	23.00
32 x 40	108 116	128000	569.60	24.70
36 x 36	108 117	129600	576.72	25.10
36 x 40	114 128	144000	640.80	27.33
40 x 40	120 140	160000	712.00	29.41
40 x 44	126 152	176000	783.20	31.44
40 x 48	132 164	192000	854.40	33.47
44 x 44	132 165	193600	861.52	33.72
44 x 48	138 178	211200	939.84	35.85
44 x 52	144 191	228800	1018.16	37.98
48 x 48	144 192	230400	1025.28	38.13
48 x 52	150 206	249600	1110.72	40.46
52 x 52	156 221	270400	1203.28	42.90

Note 1 : Approximate total weight includes plates, stays, cleants. nuts, washers and jointing material.

Note 2 : Nominal capacities are WITHOUT allowance for freeboard.