



PROVIDING LIQUID STORAGE SOLUTIONS SINCE 1966





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# IN 2016, **SOLICO** CELEBRATED ITS **GOLDEN JUBILEE** COMMEMORATING **50 YEARS** OF GREAT **SUCCESS AND GROWTH**



## SOLICO Success Story

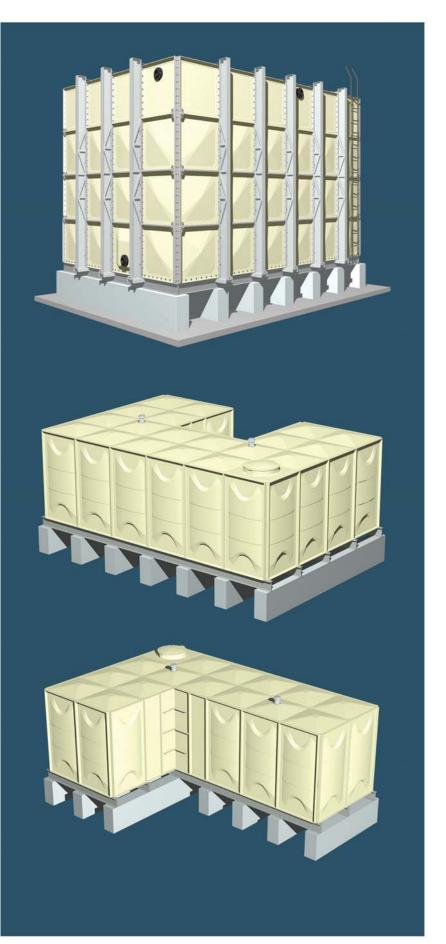
SOLICO was established in the U.A.E. in 1966, a company with international presence in the Middle East, Europe, Australia and Asia specialized in Manufacturing, Trading, Contracting and Investments; offering expertise to governments, corporations and individuals to achieve their objectives. SOLICO has completed many prestigious projects for Private, Commercial, Industrial and Governmental sectors throughout the world, including projects such as Airports, Hospitals, Laboratories, Schools, Palaces, Hotels, High Rise Buildings, Water Networks and Residential Connections.

For nearly five decades SOLICO has continuously provided value, quality and service to our customers earning us the reputation of market leaders in our sphere of specialization.

SOLICO is committed to the pursuit of excellence and therefore invests in each of its businesses to provide the best technologies, materials, innovation and people to ensure quality results for our customers.

Years of innovation, R & D and continuous provision of added value into our products and services above all else, has earned SOLICO its reputation of market leader which we continue to protect by "Delivering on our Promises".

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## Solico GRP Panel Type Water Tank

Since 1966 SOLICO has been known as a reputed supplier of GRP water storage solutions in the UAE and GCC countries.

In 1984, SOLICO pioneered the introduction of groundbreaking technology, Hot Pressed GRP Panel Type Water Tanks, gaining market share by offering the top of the range Japanese Bridgestone Brand with high levels of service and reliability.

This innovation, coupled with SOLICO's awareness and continuous marketing efforts for clean water storage systems resulted in a paradigm shift, from the conventional storage means to a cleaner and healthier solution.

In 2012, SOLICO inaugurated its own Hot Pressed SMC state of the art GRP Panel Type Water Tanks; the Solico Panel Tank Brand developed in partnership with BASF.

With this new Brand, the company continues to offer the same high quality product complying with numerous international standards, combined with our enhanced service level and competitiveness.

This decision was taken to capitalize on the company's extensive composite manufacturing experience as well as SOLICO's excellent reputation for their service and quality in the Hot Pressed GRP tank business for 50 years.

## **Design Standards**

Solico Panel Tanks are NSF 61. (USA), WRAS (UK) & Dubai Municipality (DCLD-UAE) approved and designed to the most relevant international GRP panel type water tank's standards such as BS 7491 (UK), SS245 (Singapore) and the latest AWWA D121-12 (USA).

The panel shapes are designed using Finite Element Analysis to allow optimization and ensure the required panel and tank safety factor.

Solico Panels are manufactured using State of the Art SMC Hot Press Molding Process combining Japanese



Panel Strength: Hydrostatic Pressure x6 (Safety Factor)

Wind Velocity: 60 m/secRoof Load:  $120 \text{ Kgf/m}^2$ Ambient Temperature: 55 °C (Max)Water Temperature: 65 °C (Max)

Seismic Load: Peak Ground Acceleration PGA = 0.25 (Group A)

Seismic Zone: B2

Upgraded Design Available for Higher Seismic Zones:

(Group B) 0.25 < PGA < 0.40

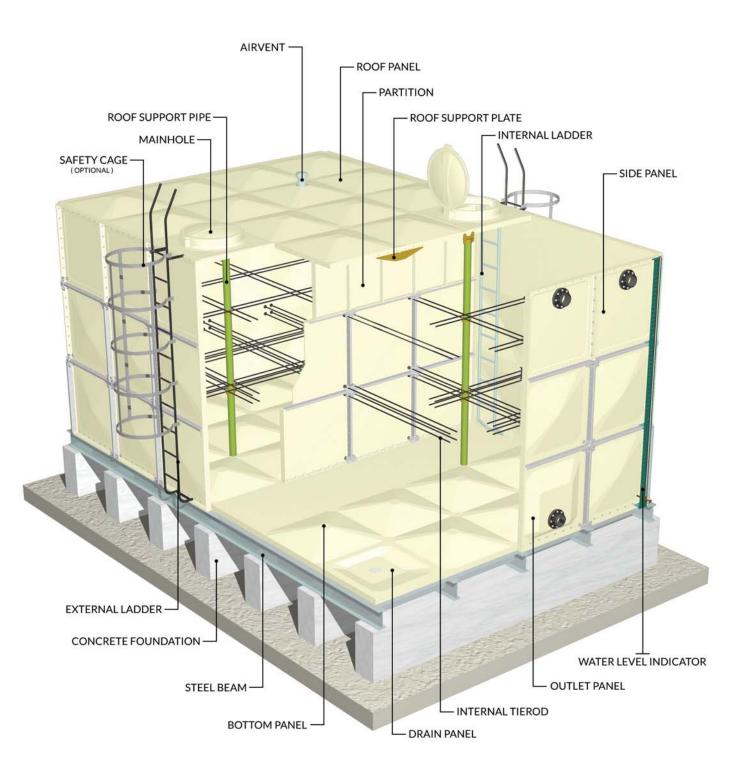
(Group C) PGA ≥ 0.40



## **Technical Characteristics**

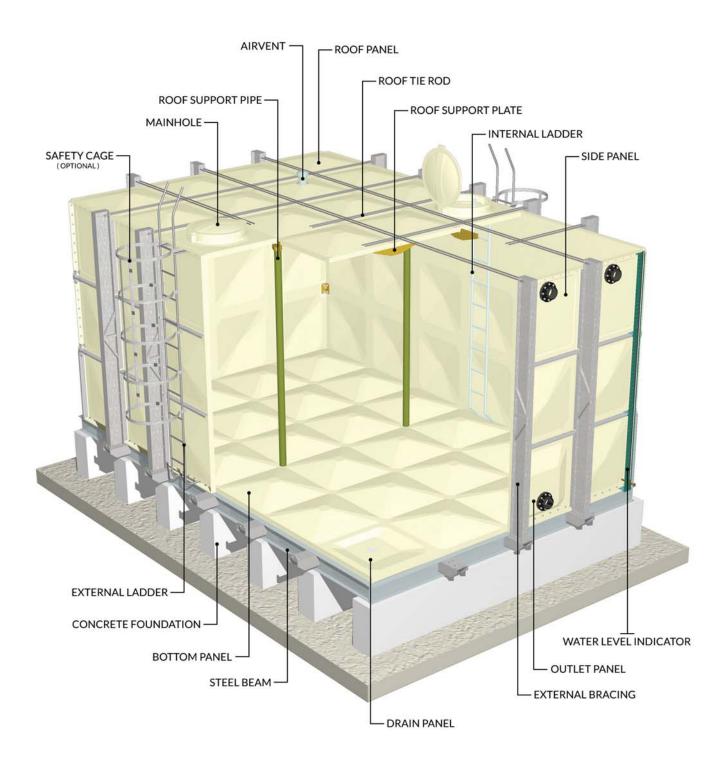
DESCRIPTION	GRP	DESCRIPTION		GRP	
Specific Gravity	1.75		(Single Panel)	0.10w/mK	
Glass Content	30%	Thermal Conductivity	(Insulated Panel 25mm)	0.036w/mK	
Tensile Strength	110 MPa		(Insulated Panel 50mm)	0.029w/mK	
Young's Modulus	13 GPa	Coeff. of Overall	(Single Panel)	14w/m²K	
Flexural Strength	230MPa	Heat Transmission	(Insulated Panel 25mm)	1w/m²K	
Impact Strength	80Kgf.cm/cm <sup>2</sup>	(Thermal Conductance)	(Insulated Panel 50mm)	0.5w/m <sup>2</sup> K	
Compressive Strength	160MPa	Thermal Expansion		1.66×10⁻⁵/℃	
Shear Strength	100 MPa	Water Absorption		Less than 0.1%	
Barcol Hardness	66	Light Transmission	Ivory	0.0%	
Flame Spread (FSI)	60	Fi Pti Cl			
Smoke Development (SD)	40	Fire Rating Class	B/2		

## Internal Tie Rod Reinforcement



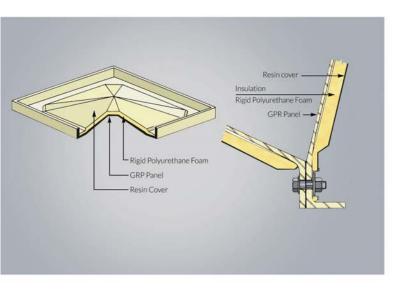
ALL INTERNAL METALS ARE OF STAINLESS STEEL GRADE A4 / 316

## **External Bracing Reinforcement**



NO METALS ARE IN CONTACT WITH WATER

## **Materials of Construction**



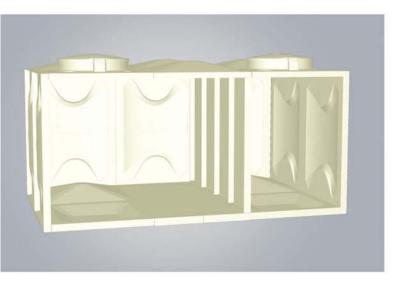


#### Insulation

Rigid Polyurethane: Density 40 Kg/m3 Thickness: 25mm (Optional 50mm thick) Insulation Cover: 2mm ASA Sheet U.V. Resistant

#### Sealant

SEBS material Strong, Durable and U.V. Resistant "O" Ring Shaped for added security



#### **Panel**

SMC Hot Pressed Glass Reinforced Polyester (GRP or FRP) with Reinforced Roving Mesh

#### Reinforcements

External: HDG Structural Steel Beams, Angles & Brackets Internal: S/S Grade A4/316 Tie Rods or Diagonal Struts



**Steel Skid** 

Hot Dipped Galvanized Steel, Upstand supports, Beams and Skids



#### **Bolts & Nuts**

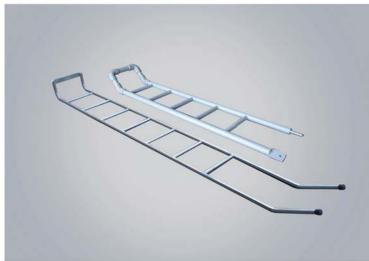
External: HDG Grade 8.8 (Optional S/S Grade A4/316) Internal: S/S Grade A2/304 (Optional S/S Grade A4/316)





#### **Roof Supports**

PVC/GRP roof support pipes Hard Polyurethane Brackets



#### **Ladders**

External: HDG Steel (Optional S/S or GRP) Internal: GRP (Optional S/S)

#### **Airvents**

PVC4"DIA with Nylon mesh#22

Properties: Light, Dust, Insect Proof Add Water level indicator also to keep in a sequence

## Delivery and Installation

Solico Panel Tanks are delivered by Solico's transport within UAE and using authorized shipping companies in the Middle East and across the world.



Solico provides highly specialized trained teams for the installation of their tanks within the UAE and Technical Supervisors for installation around the world. Solico Technicians are trained to ensure all works to be fully compliant with current legislative and safety standards.

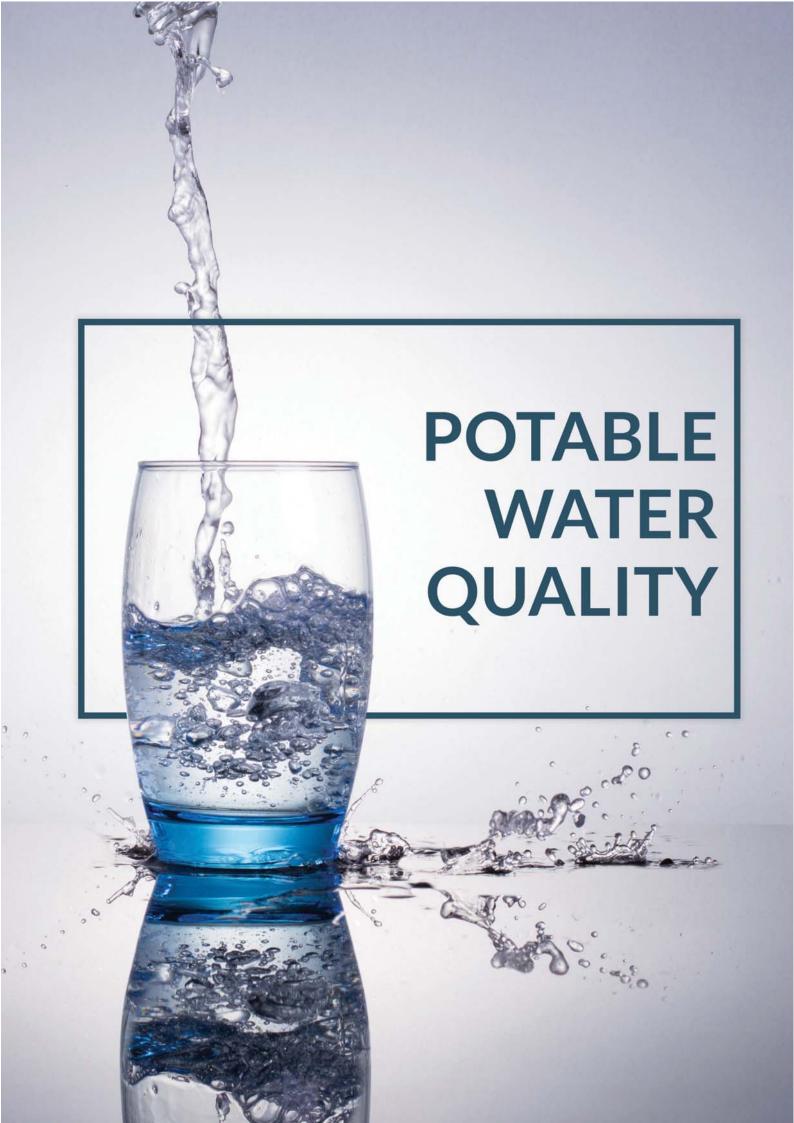






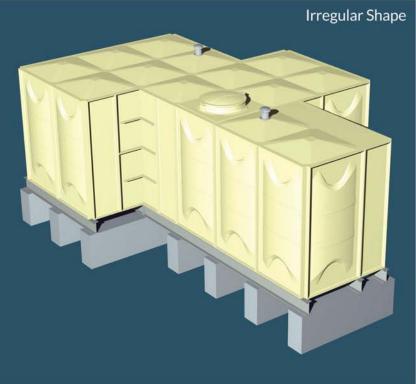


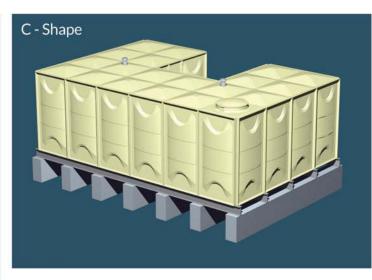


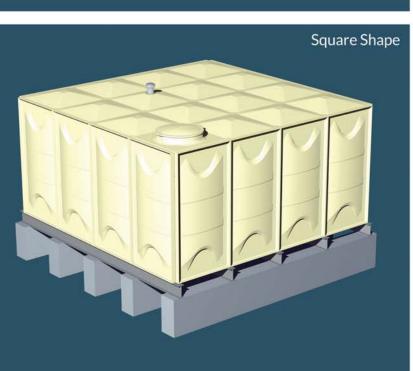


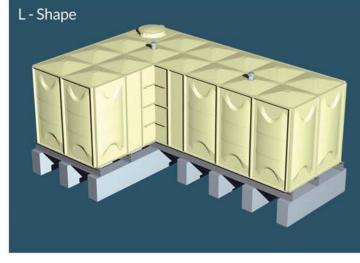
#### 1. Flexible and Customized Shapes

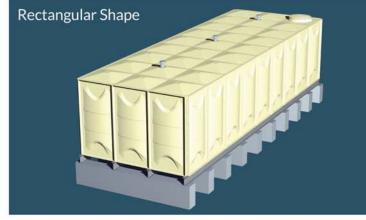
Solico Panel Tanks can be made in square, rectangular, L, T, U or other customized complex shapes using an array of standard panels.

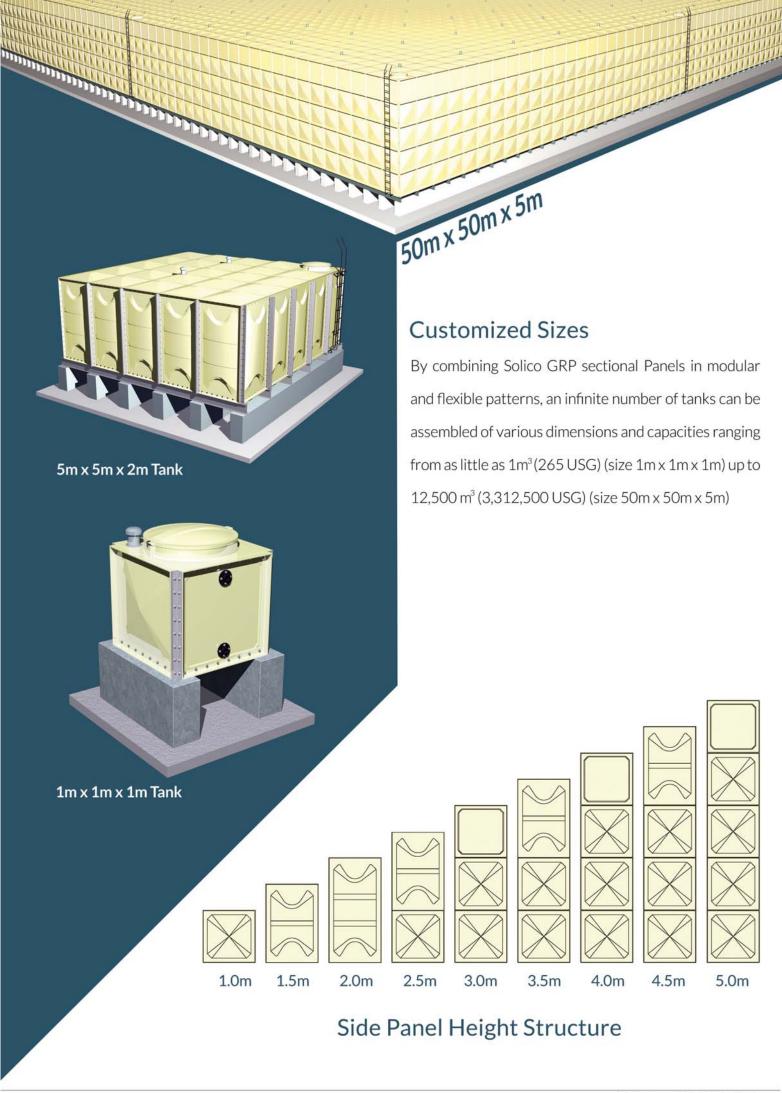






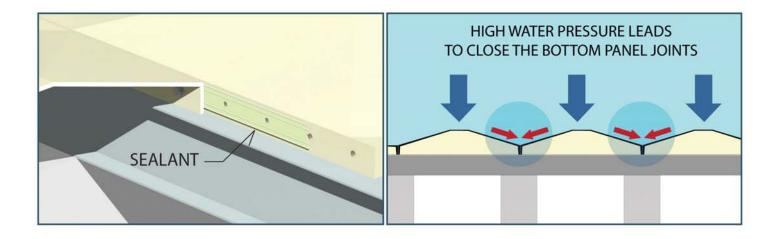






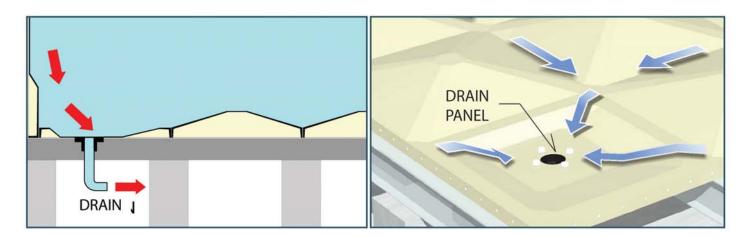
#### 2. Prevents Leakage

Solico Panel type water tank uses exclusively designed convex panels for the base. The convex panel is so designed that any increase in water pressure closes the bottom panels joints further. Joints are sealed with a special rubber sealant of patented "O Ringed" material. The combined flange thickness at the panel joints is more than sufficient to meet the stresses imposed. This "Self-Sealing" feature eliminates the possibility of separation and hence leakage of the tank.



#### 3. Drain Completely

The combination of convex base panels with a concave drain panel ensures complete and faster drainage. A unique feature of the Solico Panel Tank; the concave drain panel was especially designed to facilitate periodic tank cleaning and inspection.

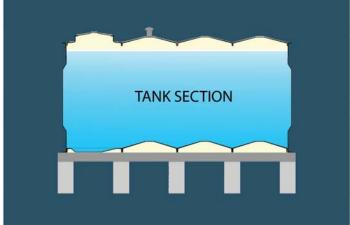


#### 4. Smooth Surface and Metal Free Inside

The hot pressing method for Solico panels produces a glass like surface which does not allow the adherence of bacteria or any organic matter and therefore does not allow algae growth.

No metal components are in contact with water. Reinforcements, bolts and nuts for assembly are on the outer side, allowing external flanging and access if bolt tightening is necessary.

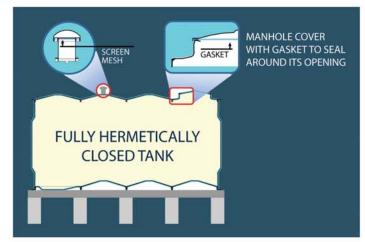




#### 5. Dust, Insect and Light Proof Design

Tanks are completely sealed, using fully hermetical manhole covers and air vents that are designed to be dust and insect proof.

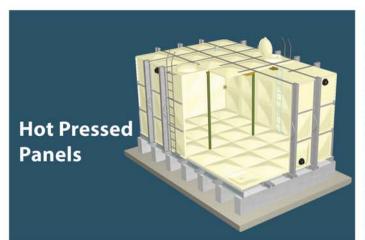
Solico GRP Panel Tanks are light proof preventing an essential element for algae growth. Light transmittance for all panels including the manhole cover is 0.00%





#### 6. Protection against Styrene emission and Algae growth

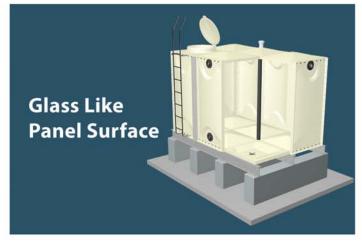
The hot pressing method for panels produces a glass like finish on the surface which does not allow algae to grow. Styrenes are liberated from the panels due to the high temperature at which they are pressed making it an ideal product to store drinking, medical process, food and beverage and manufacturing processed waters.





#### 7. No Corrosion

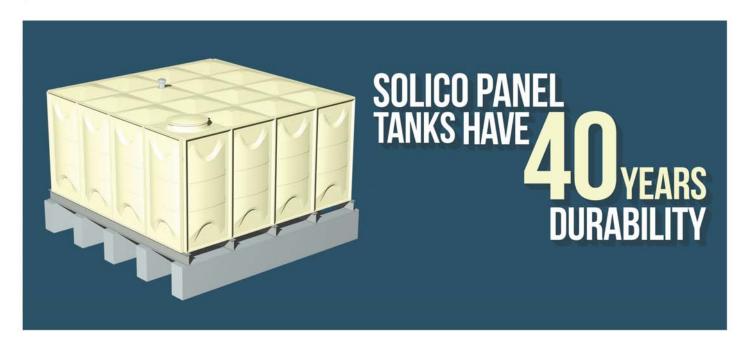
Corrosion inside Solico GRP Panel Tanks is not possible because of unique non-corrosive chemical composition of its GRP panels. Specially designed external bracing used in construction ensures that no steel comes in direct contact with water.





#### 8. Long Life Expectancy

Average serviceable life for Solico tanks in normal operating conditions without maintenance is in the range of 40 years.



#### 9. High Safety Factor

Solico Panels are individually designed using finite element analysis software for optimal performance with a safety factor of 6 times bearing strength above maximum anticipated load.

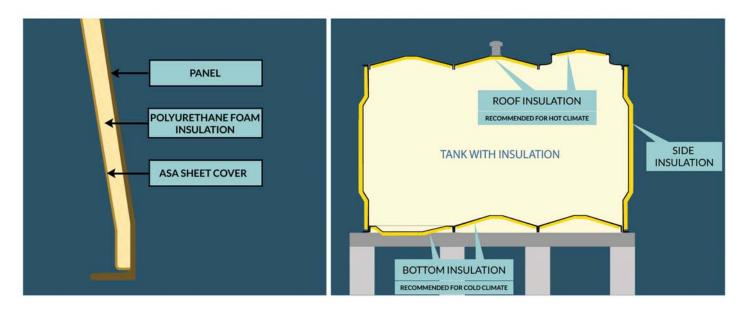
Our Tanks are designed to withstand strong winds and earthquakes.



#### 10. Heat and Cold Insulation

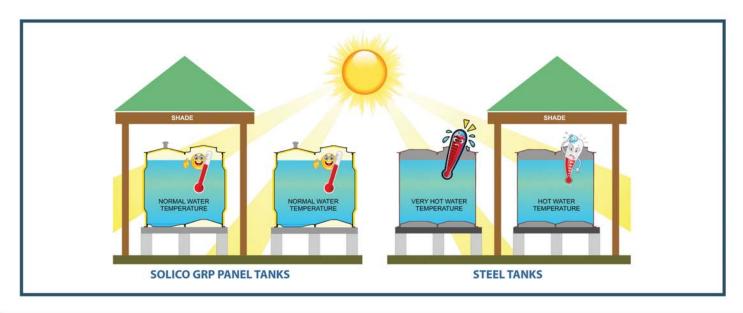
Specially designed Insulated panels with options of 25mm and 50mm insulation thickness are available for extreme weather conditions (hot or cold).

These insulated panels also prevent the water from freezing in extreme cold weather and conserve the water temperature at acceptable levels for longer periods of time.



#### 11. Constant Temperature

Temperature will remain constant inside a Solico Insulated GRP Panel Tank which is an excellent feature for industrial purposes where chilled water is required in huge volumes and production water needs to be protected from extreme heat.

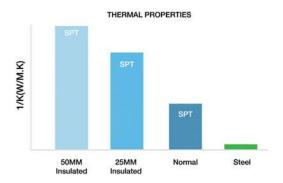


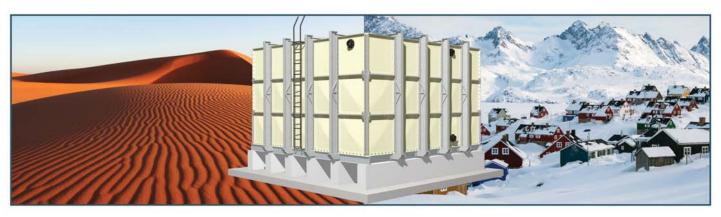
#### 12. Thermal Conductivity, Expansion and Contraction

Non-insulated Panels have 240 times less thermal conductivity than metal, ensuring stable temperature.

Modular panels with low thermal coefficient and flexible rubber sealant ensure a leak free design

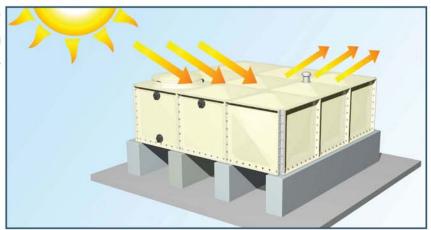






#### 13. Protection Against UV Rays

Excellent ultra violet (UV) resistant characteristics and performance ensures high mechanical properties and weather resistance even after 40 years of use.



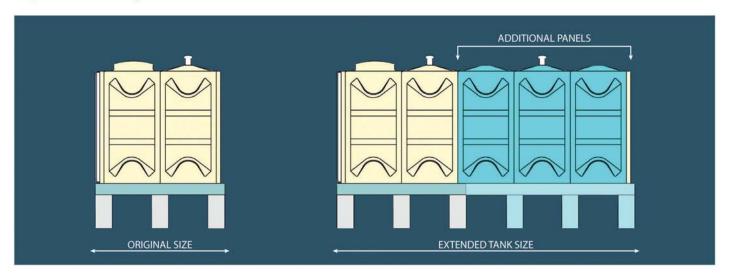






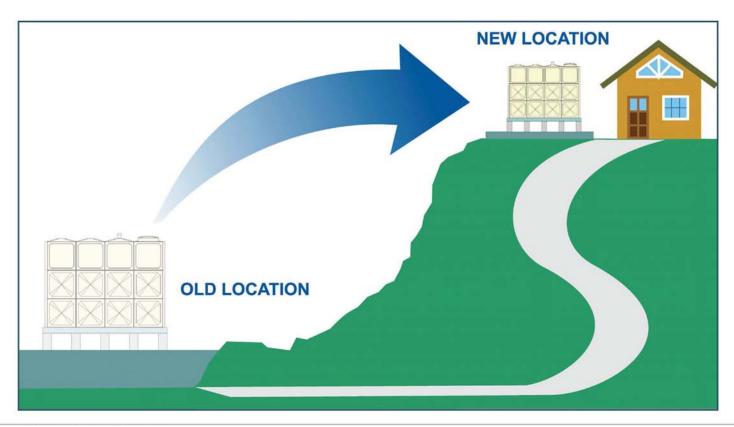
#### 14. Extendibility

Solico GRP Panel Tanks can be extended in length and width to provide increased volume as the consumption requirements change.



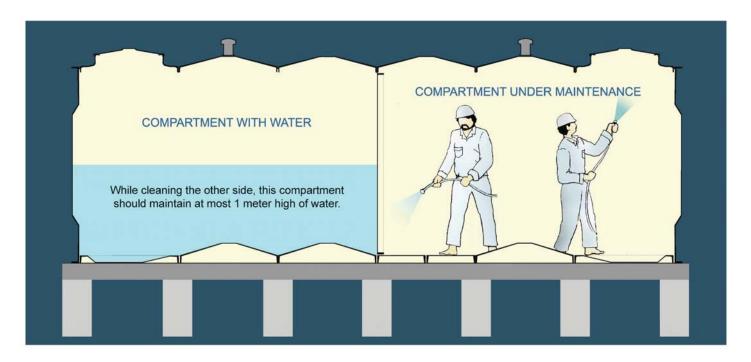
#### 15. Relocation

Can be relocated easily from one place to another several times.



#### 16. Partitioning

Partitioned Solico GRP Panel Tanks provide the facility of using one section of the tank while the other secton undergoes cleaning and maintenance while providing continuous water supply during operations.



#### 17. Cleaning

Solico GRP Panel Tanks can easily be cleaned due to the ease of full drainage using a medium water pressure hose to wash down any dirt without using any chemicals. During Cleaning, the tank should have at least 5 inches of water remaining. Check and wipe the silt from the bottom before draining the water completely.



#### 18. Easy Assembly

Solico GRP Panel Tanks can be easily assembled by technicians from the local community.



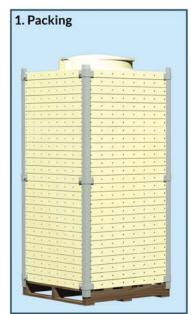
#### 19. Less Manpower Requirement

Low man-hours of labour is required for the assembly of Solico Panel Tanks. For example a tank size  $5x5x2m = 50m^3$  requires 2 days for assembly with a team of 5 technicians.



#### 20. Easy Transportation and Compact Packing

Panels are stacked on pallets with minimum loading volume . A pallet of  $1m \times 1m \times 2m$  size weighs only 400kg from which you can build a tank of  $9m^3$ . Transport volumes decrease drastically as tanks sizes increase to reach only 10% shipping volume of tank's actual capacity.





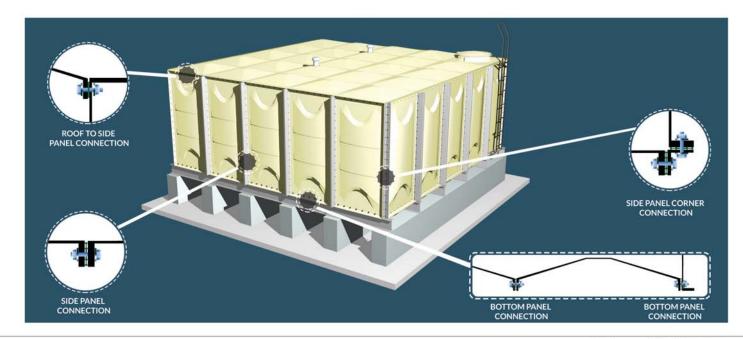






#### 21. Full Accessibility

Maintenance free. Corrosion free. Full accessibility at all times.



20,500 +

GRP PANEL TYPE WATER TANKS SUPPLIED AND INSTALLED OVER THE LAST FIVE DECADES

900 +
REGULAR CLIENTS

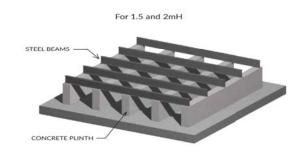
25+
QUALITY CERTIFICATION AND COMPLIANCE



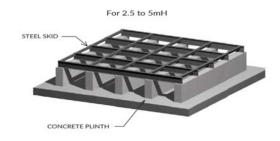
## **Steel Support Beams**

#### Steel Beams

Solico provides Structural Steel (optional: Hot Dipped Galvanized or 3 coats of Epoxy system or Red Oxide with Grey enamel) Beams and angles for more than 1mH tanks.

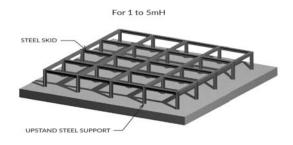


#### Steel Skid

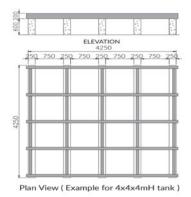


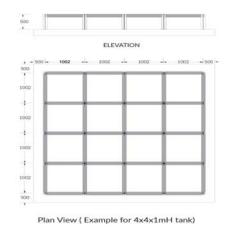
#### Steel Upstand Support

To Avoid Concrete Beams









#### **Concrete Foundation**

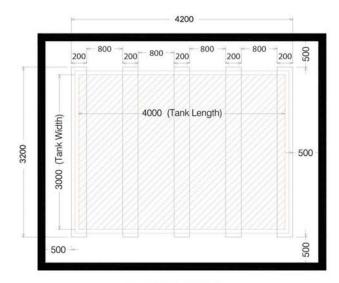
Solico provides shop drawings of the concrete foundations required for each tank to all clients. Standard size is as follow:

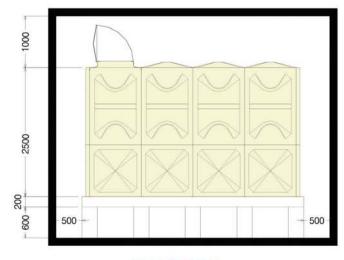
(Length of tank +250mm) x 250mm width x 600mm Height of single concrete plinth.

## **Clearance and Capacities**

Minimum space requirement along all sides = 500mm

Minimum space requirement above roof panel for manhole opening = 1000mm





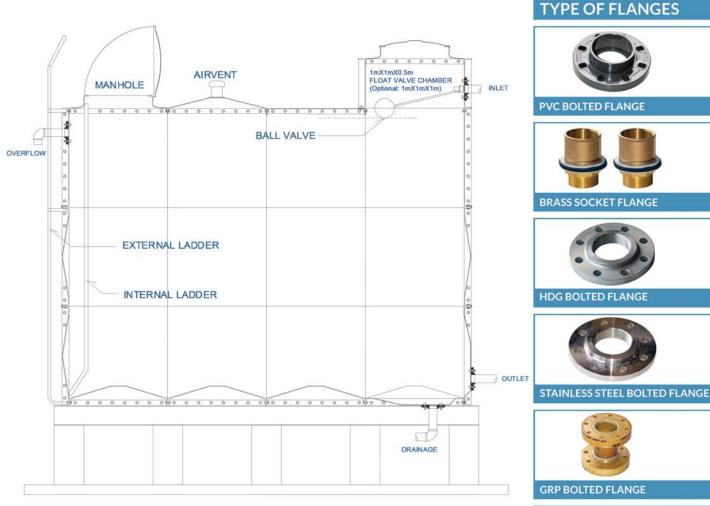
**PLAN VIEW** 

**ELEVATION** 

Typical Tank Dimensions and Capacities												
Volume	Ta	nk Si	ze	Gross Volume		Freeboard	Ne	Net Water Capacity			Tank Weight (Kgs)	
(m3)	L	w	Н	(USG)	(IMPG)	(Liters)	(mm)	(USG)	(IMPG)	(Liters)	Empty	Full
1	1	1	1	265	222	1,000	250	198	167	750	150	900
2	2	1	1	529	445	2,000	250	397	333	1,500	250	1,750
4	2	2	1	1,058	889	4,000	250	794	667	3,000	350	3,350
8	3	2	1	2,116	1,778	8,000	250	1,190	1,000	4,500	400	4,900
9	3	3	1	2,381	2,001	9,000	250	1,786	1,501	6,750	550	7,300
12	4	3	1	3,175	2,668	12,000	250	2,381	2,001	9,000	700	9,700
16	4	4	1	4,233	3,557	16,000	250	3,175	2,668	12,000	850	12,850
32	4	4	2	8,466	7,114	32,000	300	7,196	6,047	27,200	1,800	29,000
50	5	5	2	13,228	11,116	50,000	300	11,243	9,448	42,500	2,550	45,050
72	6	6	2	19,048	16,006	72,000	300	16,190	13,605	61,200	3,400	64,600
98	7	7	2	25,926	21,786	98,000	300	22,037	18,519	83,300	4,350	87,650
128	8	8	2	33,862	28,456	128,000	300	28,783	24,187	108,800	5,400	114,200
192	8	8	3	50,794	42,684	192,000	300	45,714	38,415	172,800	9,150	181,950
300	10	10	3	79,365	66,693	300,000	300	71,429	60,024	270,000	12,750	282,750
507	13	13	3	134,127	112,712	507,000	300	120,714	101,440	456,300	19,050	475,350
675	15	15	3	178,571	150,060	675,000	300	160,714	135,054	607,500	23,900	631,400
1,156	17	17	4	305,820	256,991	1,156,000	400	275,238	231,292	1,040,400	36,950	1,077,350
1,600	20	20	4	423,280	355,697	1,600,000	400	380,952	320,128	1,440,000	47,600	1,487,600
2,500	25	25	4	661,375	555,777	2,500,000	400	595,238	500,200	2,250,000	68,050	2,318,050
3,600	30	30	4	952,380	800,319	3,600,000	400	857,142	720,287	3,240,000	91,700	3,331,700
5,184	36	36	4	1,371,427	1,152,460	5,184,000	400	1,234,284	1,037,214	4,665,600	124,550	4,790,150
10,000	50	50	4	2,645,500	2,223,109	10,000,000	400	2,380,950	2,000,798	9,000,000	220,200	9,220,200
12,500	50	50	5	3,306,875	2,778,887	12,500,000	400	3,042,325	2,556,576	11,500,000	275,250	11,775,250

## Flange Connections

The specially designed piping panels provide easy and safe pipe works for tanks. Typical Tank Connections are shown below.



*Overflow should be at least twice the size of inlet and shall flow freely without obstruction.	GRP BOLTED FLANGE  RUBBER CAPPED BOLTS FOR FIXING FLANGES
RECOMMENDED FLANGE SIZES	

RECOMMENDED FLANGE SIZES									
SIZE OF TANKS		INLET		OUTLET		OVERFLOW		DRAIN	
1m'-5m'	Up to 1,300 USG	25A	1"	50A	2"	65A	11/1"	40A	11//
6m <sup>1</sup> - 10m <sup>1</sup>	Up to 2,600 USG	40A	11/2"	65A	21//*	65A	21//*	40A	11//*
11m'-20m'	Up to 5,300 USG	40A	1%	65A	21//*	65A	21//*	40A	11//."
21m'-50m'	Up to 13,200 USG	50A	2*	80A	3*	80A	3*	40A	1%"
51m²- 100m²	Up to 26,500 USG	80A	3°	100A	4*	125A	5*	50A	2*
101m'- 200m'	Up to 53,000 USG	80A	3"	150A	6*	125A	5"	50A	2*
201m²-500m²	Up to 132,000 USG	100A	4*	200A	8*	150A	6*	80A	3*
Over 500m²	Over 132,000 USG	100A	4*	200A	8*	150A	6*	80A	3"

## Comparison with Other Types of Tanks

Solico Panel Tanks have major advantages over other types of conventional tanks.

Comparison Chart For Different Types of Water Tanks								
FEATURE	GRP	CONCRETE	PLASTIC	STEEL				
Hygiene and Water Quality	11	~	~	x				
Flexibility	11	х	х	~				
Relocation	11	х	x	~				
Water Tightness	11	X	1	4				
Strength & Durability	11	~	x	~				
Easy and Fast Assembling	11	x	~	~				
Ease of Transportation	11	x	x	~				
Thermal Conductivity	11	4	~	x				
Drainage	11	~	~	1				
	Excellent	Good	Average	Poor				
Value Parameters	11	1	~	x				

#### **KEY CHARACTERISTICS**

- Solico Brand Existance Since 1966
- International Quality (WRAS-UK and ISO 9001:2008) Certifications
- Isophthalic Unsaturated Polyester Resins to ensure hygenically safe product
- Trained Crew with 30 years installation experience
- Bridgestone Japan Manufacturing Technology, German Machinery and Moulds
- UV Rays Protection
- Finite Elements Aided Computerized Design and extensive Structural Design Study
- World biggest GRP Tank installation award at Dubai International Airport
- Iconic huge facilities at Jebel Ali Industrial Area, United Arab Emirates
- Big Stock availability and computerized massive warehouse for immediate delivery
- Large Production Capacity of more than 6,000 tons of SMC panels per year
- Mechanically, Chemically and Bacteriologically tested panels and accessories
- Producer for many major brands around the globe.

## **Our Warranty Promise**

**Solico Panel Tanks** are fully warranted for a period of 10 years. The Solico Group of Companies standing behind the design, manufacturing, installation and product warranty have been in the market **since 1966** with **50 years** of experience in similar fields and more than **30 years** in GRP Panel Tanks.



## **PROJECTS**>



## PROJECT GALLERY

Solico has completed many prestigious projects for the Private, Commercial, Industrial and Government sectors throughout the world which includes Airports, Hospitals, Laboratories, Schools, Palaces, Hotels, High Rise Buildings, Water Treatment Plants and Residential Connections.



































## We Supply Across the World

SOLICO established in the U.A.E. in 1966 is a company with international presence in the Middle East, Europe, USA, Australia, and Asia specializing in the Manufacturing, Trading, Contracting, Investments and Philanthropy; offering our expertise to governments, corporations and individuals to achieve their objectives. Solico has completed many prestigious projects for the Private, Commercial, Industrial and Government sectors in the Emirates which include Airports, Hospitals, Laboratories, Schools, Palaces, Hotels, High Rise Buildings, Water, Networks and Residential Connections.





## Think Green

Solico emphasizes on the 3R's policy for environmental protection i.e. Reduce, Reuse and Recycle. Apart from drinking, water is used for cooking, washing, bathing and other household purposes. If the quality of storage Water tank is neglected over the years, it can be a breeding ground for bacteria, germs and polutants. Thus, paving the way for entry of water-borne diseases into your home and affecting the health of your family members.

Solico Panel Tanks are designed to be free from ChloroFluroCarbon (CFC) and HydroChoroFluro-Carbon (HCFC). Free from any Lead and asbestos content, as well as free from bacteria, corrosion, styrene and algae growth hence they reduce the chances of quality damage to stored water and reduce the chances of sickness caused by poor storage of water. Water-borne diseases like cholera, typhoid fever, diarrhea and hepatitis are preventable diseases if safe stored drinking water is provided to human kind.

Solico Panel Tank reduces the cost of ownership for storage tanks as the average life of Solico Panel Tank is 40 years. Solico Panel Tanks require less time, manpower and tools for the installation. They are light in weight hence efficient to reduce the transportation and energy consumption. Solico Panel Tanks don't require any special materials and machinery for installation hence reduce the waste of energy.

Solico Panel Tanks have a long average life as compared to other storage tanks and have the feature of relocation by simply dismantling its panels hence can be reused and recycled even after shifting to a new location. Solico Panel Tanks have the feature of extendibility means as the storage requirement increases, the size of tank can be increased by reusing the old panels instead of their disposal.

## Caution and Maintenance







- Piping

- No harm material around
- Tightening of bolts



#### Timely cleaning

water at other side. Clean with sponge, soft



#### Stick with Original Parts



**201100** 

#### Do not bury keep all sides clear



#### Max temperature

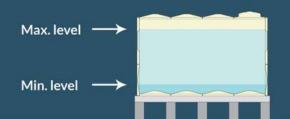




Keep manhole tightly closed and do not block airvent and overflow



#### Maintain water level

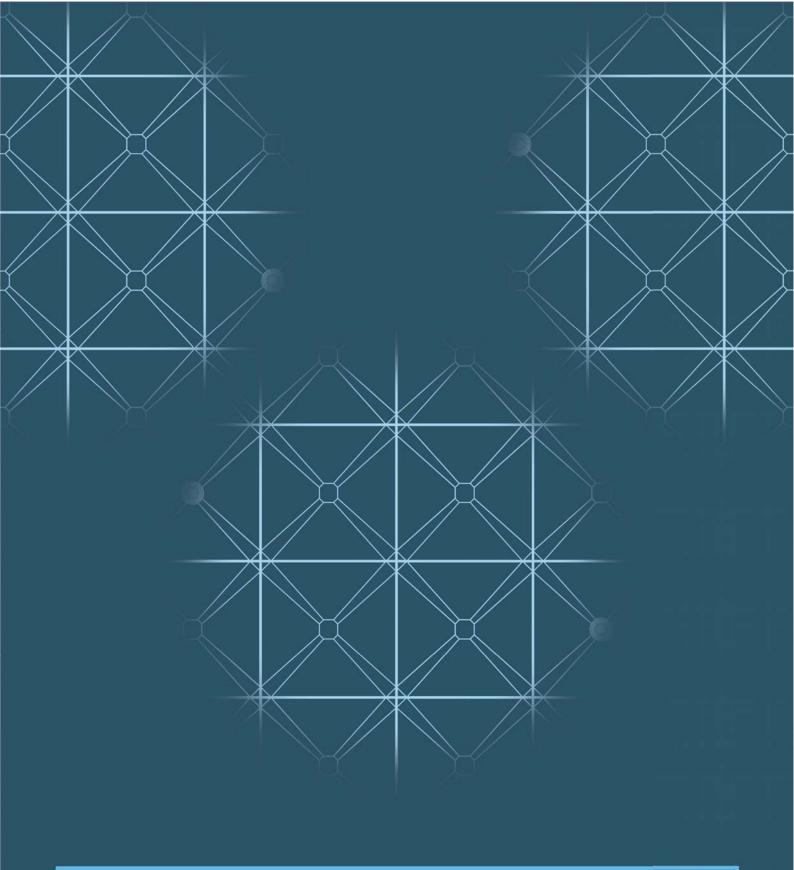


#### Use water only



# "SOLICO PANEL TANKS ARE DESIGNED TO MAKE A DIFFERENCE"





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