

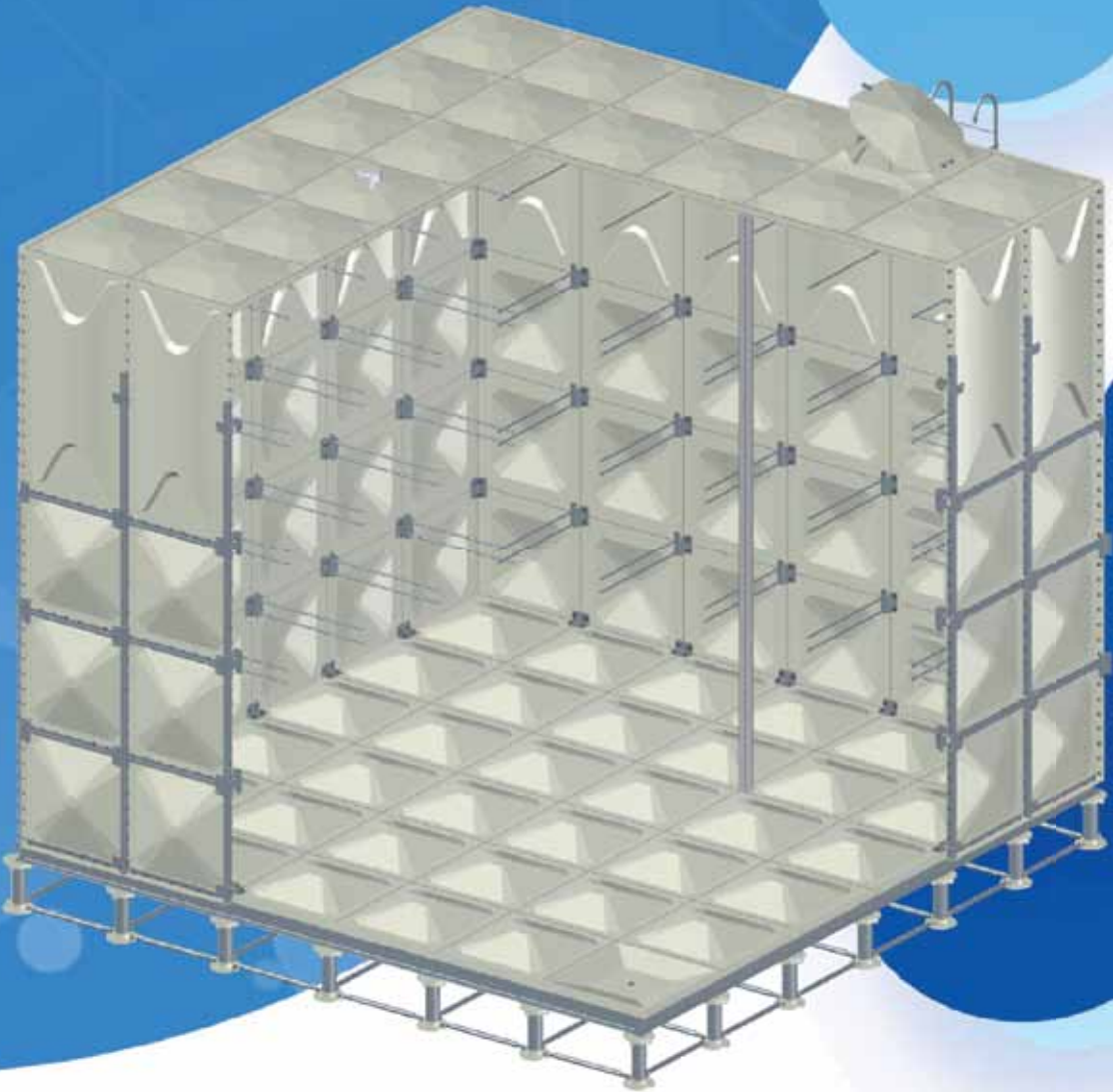


POLY EMIRATES

PLASTIC INDUSTRIES

بولي الإمارات لصناعات البلاستيكية

SR KOREA **GRP SECTIONAL** **WATER TANKS**



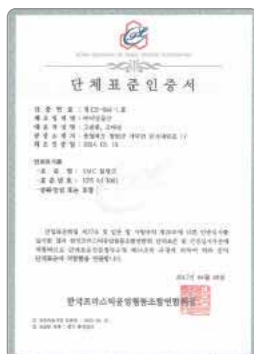
WORLD'S BEST
QUALITY AND SERVICE

SR KOREA headquartered in Korea, has studied for people, environment and safety since 1970. We are made up of business division of Technology Development Division and Commercial Division

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Certification

SR Tank has highly acclaimed technology with Singapore PSB, UK WARS, US NSF and ISO9001: 2010 certification. We will satisfy our customers with world-class quality and supply the best products in customer's eyes and mind.



SR KOREA

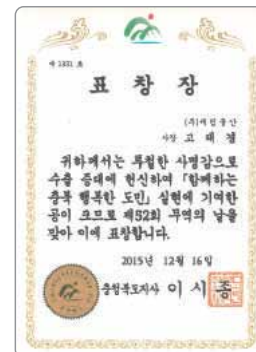
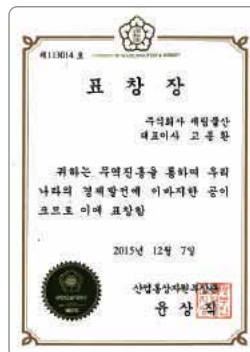
SR KOREA headquartered in Korea, has studied for people, environment and safety since 1970. We are made up of business division of Technology Development Division and Commercial Division.

Technology Development Division is a water-related technology company that develops and operates water treatment expertise such as water tank design technology, water tank system development, water purification system development and waste water treatment technology development.

SR KOREA is specialized in water treatment and management like water purification system, microbial seeds(HIGHLY ACTIVATED MICROBIAL SEEDS FOR WASTE WATER), GRP WATER TANK and STS WATER TANK. We will continue to strive to realize the philosophy of our business through the development of new products and technologies.

SR KOREA Co, Ltd., is challenging to become the world's leading water treatment company. We are making a new environmental culture based on various technologies and "customer first" philosophy.

GRP WATER TANK		
STS WATER TANK	SRTANK	
	CLEAN UP	BIO DOCTOR



GRP SECTIONAL WATER TANKS

HIGH QUALITY

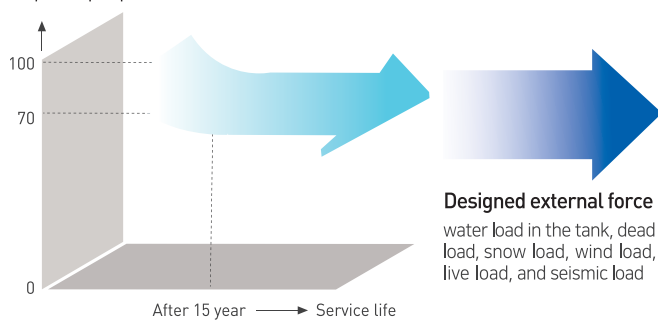
SR Tank pursues an optimal system through quality management with strict design standard and reliable structural stress analysis.

A critical aspect in structural analysis is the design according to safety factor at a threshold level. SR KOREA's expertise lies in the design of optimal safety factor considering the expected external force based on the physical properties of the SMC material after long-term use of more than 15 years.

Since SR Tank does not take account of the initial value (100%) of the SMC properties but only considers the minimum value (70%) and safety factor while designing, SR Tank guarantees long-term durability.

SMC DEGRADATION PROCESS

Physical properties



Design standards :

Designed external force < Threshold level + Safety factor

Item	Guaranteed Load Conditions
Earthquake	Horizontal seismic intensity $K_h=2/3G$
Hydrostatic pressure	Water Level([Height in Meters] X 0.1kgf/cm^2 [0.01MPa])
Snow load	60kg/m^2
Wind load	Below 60m/sec
Illumination	Less than 0.1%
Water temperature	Cold and hot water is used up to 50°C

※ Overseas quality certificates : Singapore(PSB), UK(WRAS)

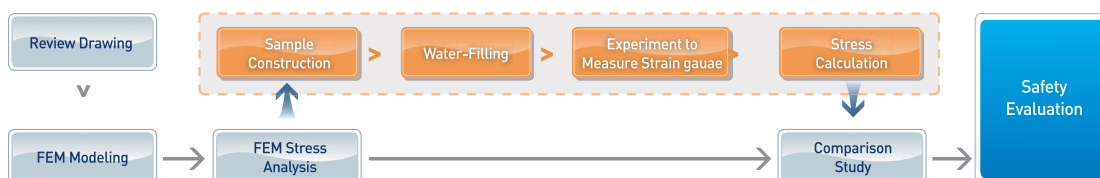
※ Domestic quality certificates : GQ(Good Quality) Mark

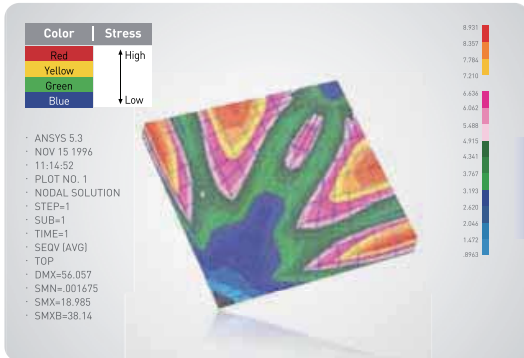
OPTIMAL STRUCTURE DESIGN

With years of expertise in structure design, we provide perfect structure safety.

We performed structure analysis by the Finite Element Method to secure reliability on a reinforcement system, the strength of panels and pursue the optimal design. By inputting all possible factors such as hydrostatic pressure, seismic load, snow load, wind load, etc., We estimated the stress and distortion level. Through intensive reinforcement on the part with maximum stress, we aimed to design the best stable system.

STRUCTURAL ANALYSIS FLOW CHART





STRESS ANALYSIS OF THE PANEL(FEM)

By modeling the four-direction symmetric panel to 1/4 of the size, we evaluate the level of stress by area when inputting loads. As for the part where the intensive stress is given, we reset the shape or increase the thickness for ideal model. By doing so, we realize the development of high-strength panel.

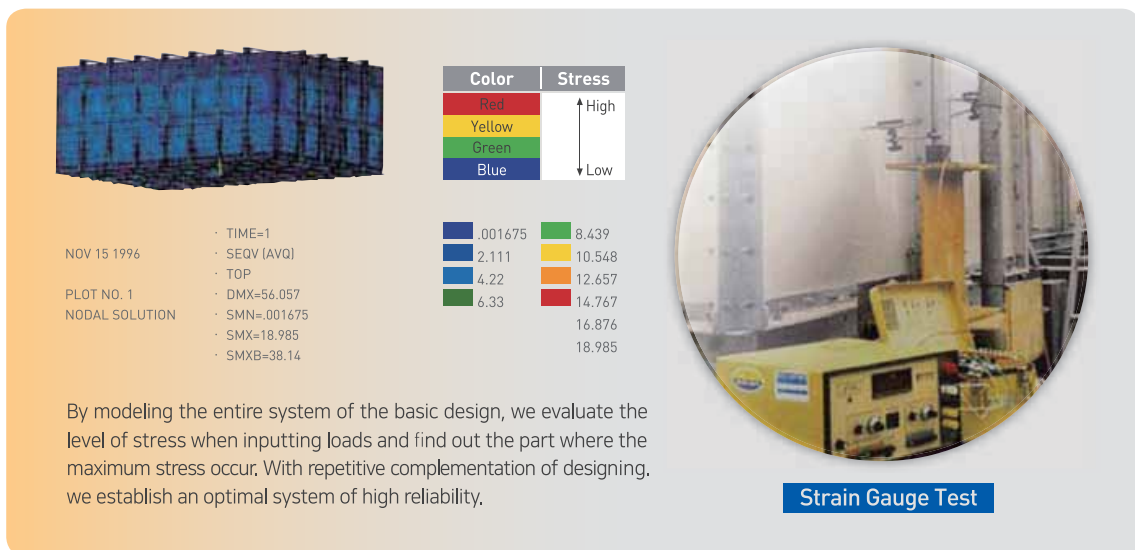
Test for verification



HYDROSTATIC PRESSURE TEST

We fill the hydrostatic pressure tester with water and increase the pressure by 0.05 kgf/cm per minute and check the cracking pressure of the panel. Based on the pressure, we decide the grade(thickness/weight) applicable to each height.

STRESS ANALYSIS OF THE PANEL(FEM)



By modeling the entire system of the basic design, we evaluate the level of stress when inputting loads and find out the part where the maximum stress occur. With repetitive complementation of designing, we establish an optimal system of high reliability.



Strain Gauge Test

LONG-TERM DURABILITY TEST(FIELD TEST)

Generally, there is more than one water depletion and filling up a water tank per day on the average. Therefore, if the tank is used for 15 years, approximately 4000 times of water circulation would occur and the tank would sustain about 4000 repetitive loads.

Before launching new product into the market, SR Tank undergoes field tests to check for water leakage and other defects by applying the expected repetitive loads of water circulation to two tanks every day and night for about 6months. Such tests make us possible to guarantee the safety and durability of SR Tank.

GRP SECTIONAL WATER TANKS

FREE CAPACITY DESIGN

The tank is suitable for large-sized underground reservoirs as its structure utilizes horizontal and vertical spaces at the maximum through the use of diverse sizes of panels.

Allowable height for installation of the tank	Allowable capacity for installation of the tank
1.0~5.0min height	1~5,000 tons (A tank with a capacity exceeding 5,000 tons may be installed through individual design)



General square type



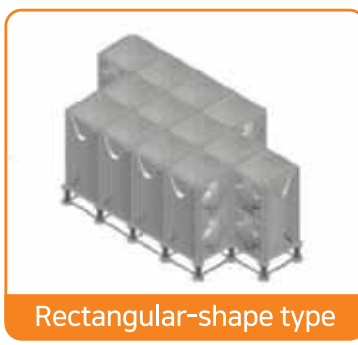
L-shape type



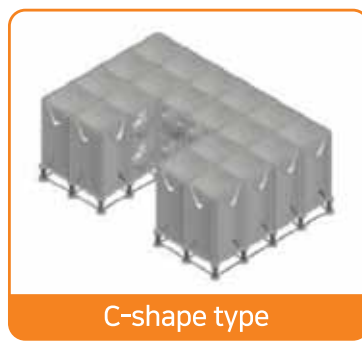
Center-vacant square type



inside



Rectangular-shape type



C-shape type



outside

- ※ The corner-usage type system creates maintenance space due to the fact that the tank is installed apart from the pillar, regardless of the location of the pillar.
- ※ When installing the tank through lining-processing with FRP, if the pillar takes the role of a wall, it may cause inferiority in the structure intensity of the body and the reinforcement system.

BEST HYGIENIC PROPERTIES

With the use of excellent corrosion-resistant panels, the surface of the tank is uniformly smooth without any moss growth and enables long-term use as the panels inhibit the proliferation of bacteria and other various germs by perfectly blocking all the light from outside.

MATERIALS FOR REINFORCED COMPONENTS

INSIDE	for Liquid part	Stainless Steel[STS]
	for Air part	Plastic or corrosion-resistant material
OUTSIDE		Steel+hot galvanizing

As chlorine gas remains in the air area and this may corrupt the SUS and other metals, it is critical that anti-corrosion materials are selected.

PRODUCT WITH INFERIOR HYGIENIC PROPERTIES



When light penetrates in the tank :
Moss and microorganism grow.



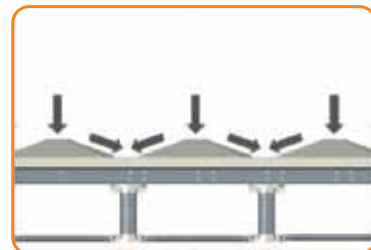
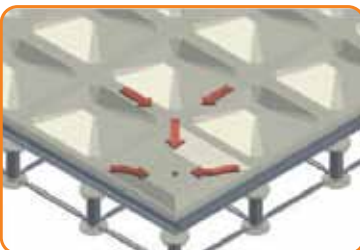
When general STS bolts are used in the air area :
Corrosion occurs due to chloride gas.



Welded type air area of the STS tank :
Corrosion occurs due to chloride gas.

ADVANTAGES OF SR-TANK GRP WATER TANK

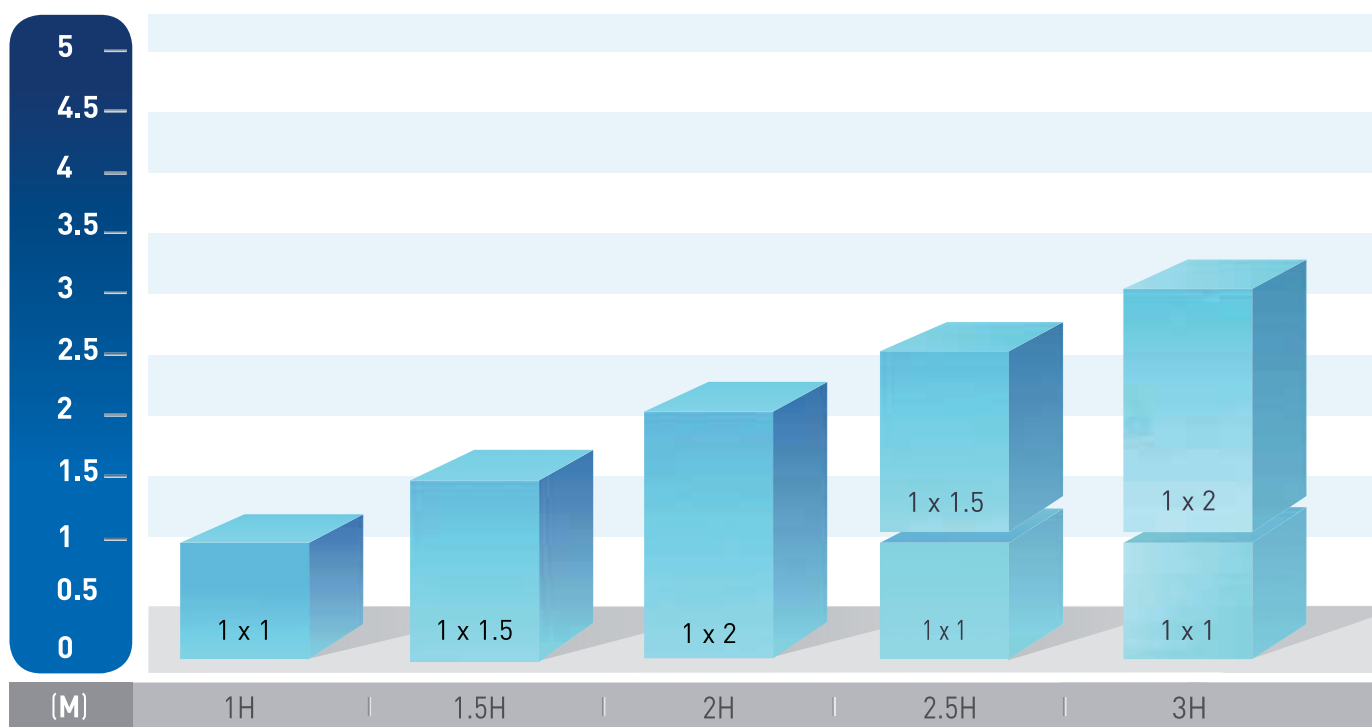
SR TANK GRP water tank uses convex type panels for the base. The convex type panel is designed that any increase in water pressure closes the bottom panels joints and the joints are sealed with a special rubber sealant. And the combination of convex type panels with a concave type drain panel ensures complete and faster drainage and the drain panel was specially designed to facilitate periodic water tank cleaning and inspection



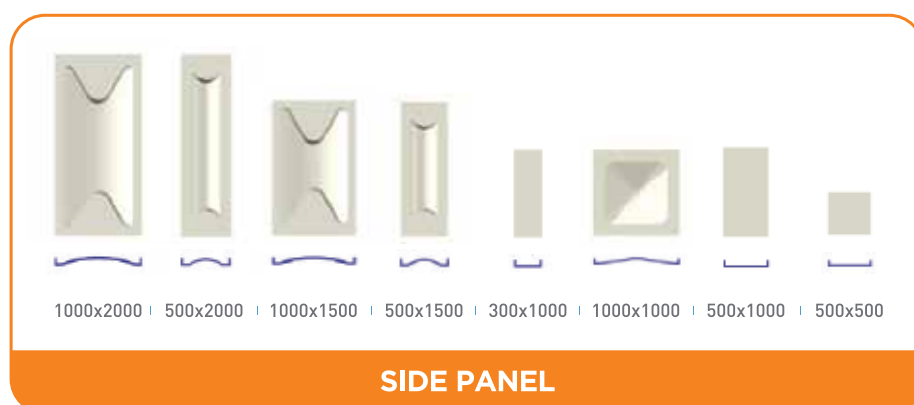
GRP SECTIONAL WATER TANKS

COMPOSITION OF THE PANELS

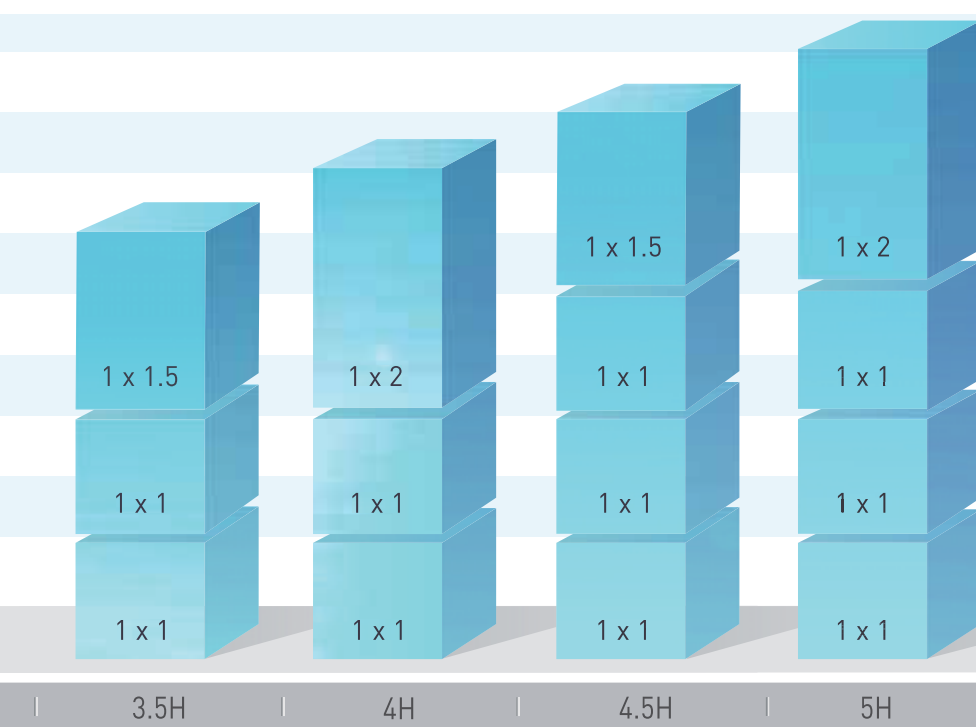
■ SIDE PANEL COMPOSITION STANDARDS BY HRIGHT



■ TYPES AND SHAPES



Provides effective utilization of space through the use of panels of various sizes.



Actual size

W

Size No. + 150 mm

L

Size No. + 150 mm

H

Size No. + 100 mm

Note

- 1) Besides the heights noted above, it is possible to install the tank at 1.3H, 1.8H, 2.8H, 4.3H and 4.8H
- 2) Composition may vary depending on the field situation.



1000x1000 | 500x1000 | 500x500

BOTTOM PANEL



1000x1000 | 500x1000 | 500x500

CELLING PANEL

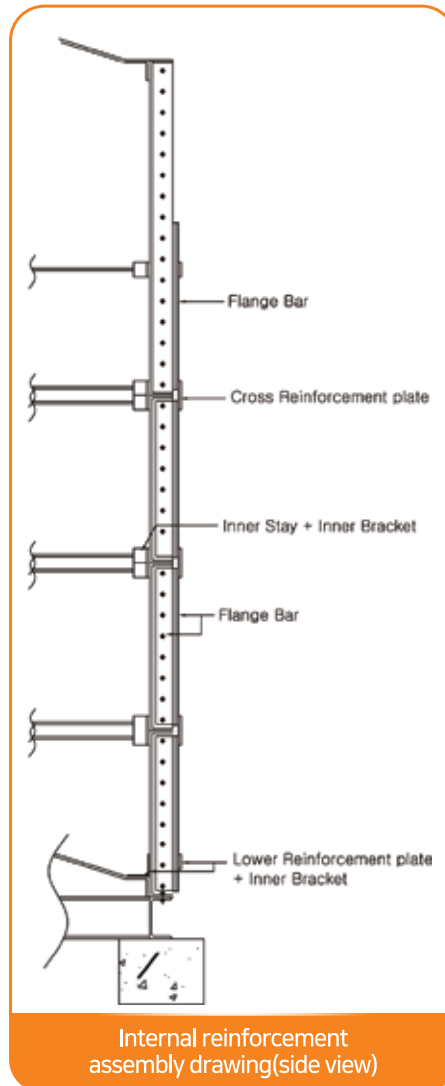
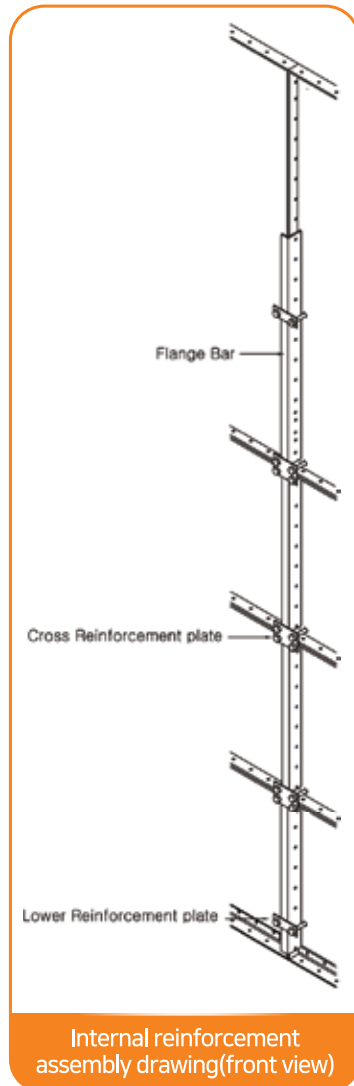


1000x1000

1000x1000

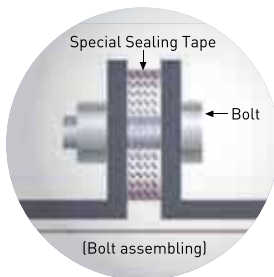
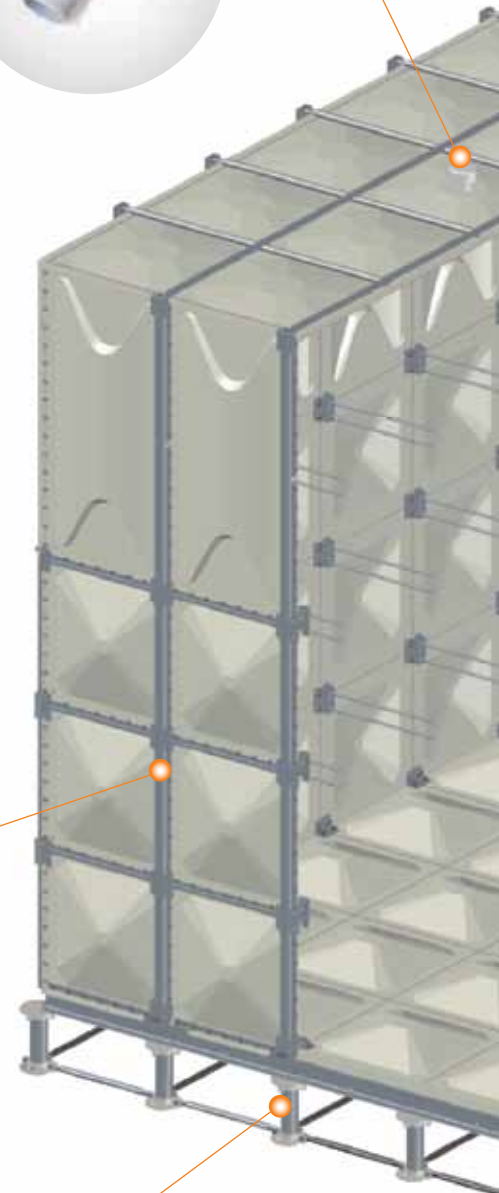
DRAINAGE / MANHOLE PANEL

GRP SECTIONAL WATER TANKS



Air-Vent(ABS)

With PE-mesh insect-guard



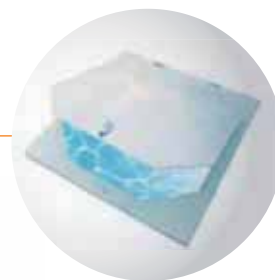
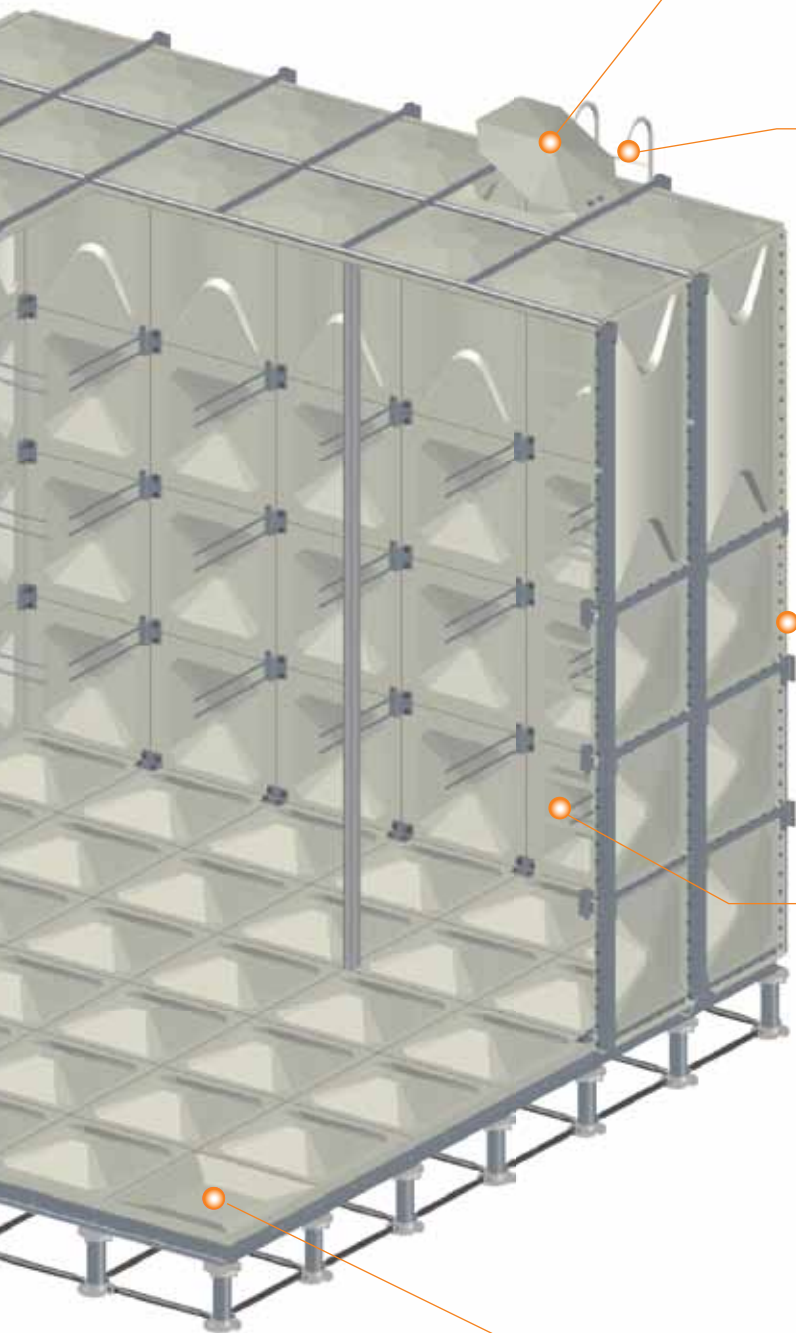
Watertightness

Maintains perfect watertightness by using PVC foam sealing tape which is excellent for inhibiting the effects of weathering and for its restorative ability.



Level Adjustable Foundation

Replaces concrete foundation
Allows to make easy and speedy construction
Allows to adjust a very fine tolerance

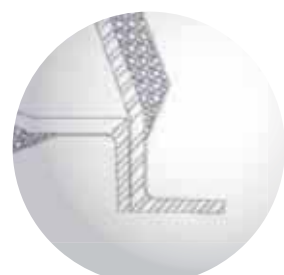
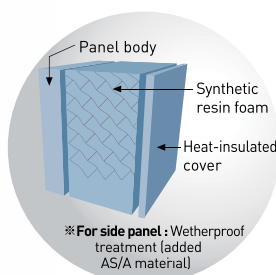


Manhole

Convenient & close structure
Special lock mounted

External Ladder

(Aluminum)

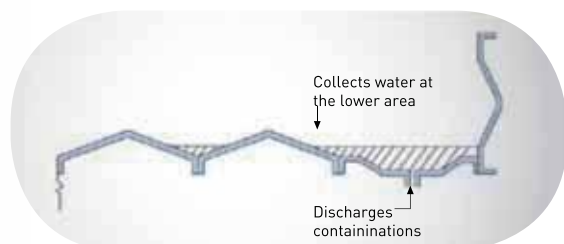


Outstanding Thermal Effect

Prevents freezing and dew condensation as it demonstrates outstanding thermal effect due to the inherent thermal resistance of the SMC material and polyurethane heat-insulating materials.

Internal Ladder

(UPVC)



Lower Water-discharging Panel Structure at the Bottom Area

Uses lowered drainage panel on bottom so that can collect and discharge the water

GRP SECTIONAL WATER TANKS

COMPARTMENT-TYPE SR TANK

CHARACTERISTICS



Can be installed in Maximum Capacity of a Same-Sized Place

When installing tanks for different usage in a narrow space such as underground rooms, partitions can be installed for the maximum capacity.



Diversification of Usage

By installing partitions, you can use one tank for drinking and the other for other purposes (e.g. fire hydrant, etc.)



Easy Maintenance

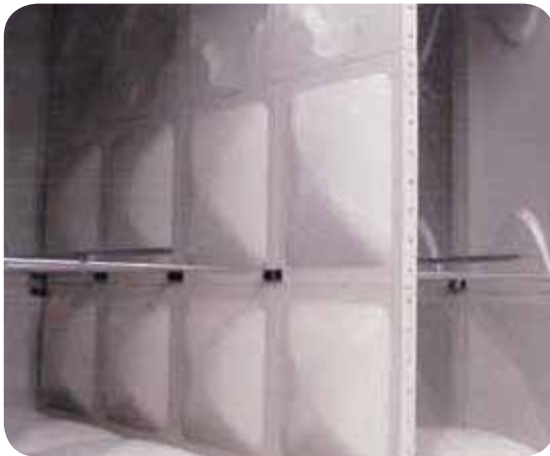
As two tanks are installed in one-piece, it is easy to maintain the tank. Even during cleaning, suspension of water supply can be avoided owing to the use of compartments.



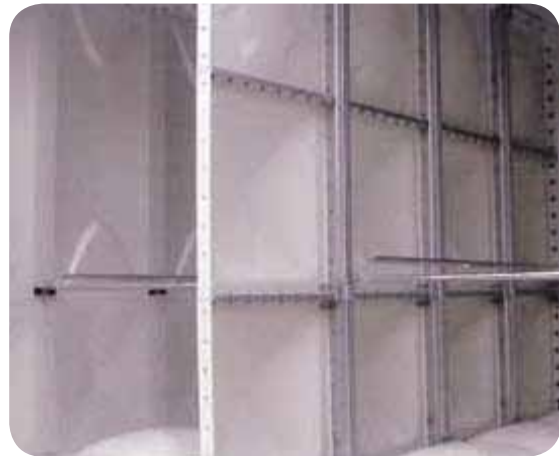
Low Price

Compared with installing each tank for a different usage, the entire price is lower, including installation expenses.

INSTALLATION EXAMPLE



Front view of the partition



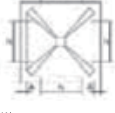
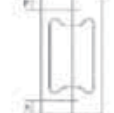
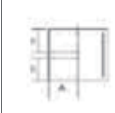
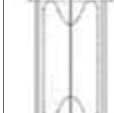
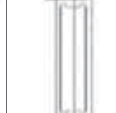
Rear view of the partition

※ Since partition panels receive repetitive loads from both the front and back, when installing the panels that are under water pressure, we use the same designed panel that are used for the bottom panels. Also, a compartment tank is structurally safe due to the fact that the bottom part and the ceiling part are mutually connected and fixed onto partition.

SPECIFICATION FOR SR TANK

SIZE AND NUMBER OF ATTACHABLE FITTINGS BY PANELS

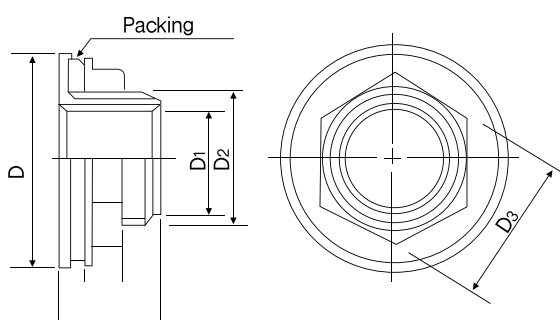
Fitting Location

Wall Panel (1000X2000)	Wall Panel (500X2000)	Wall Panel (500X500)	Wall Panel (1000X2000)	Wall Panel (500X2000)	Section	Size of the panel	Fitting size	Number of fittings
65A~125A	20A~100A	20A~200A	20A~200A	20A~100A	Side panels	1000 X 2000	up to 200A	2
 * Female Flange Applied						500 X 2000	up to 150A	2
						1000 X 1300	up to 125A	4
						500 X 1300	up to 125A	2
						1000 X 1000	up to 125A	4
						500 X 1000	up to 100A	2
						500 X 500	up to 300A	1
* As a substantial action for preventing corrosion due to chlorine gas, the air area is designed without any internal					Exclusive -fit panels	500 X 1000	up to 300A	1

* As a substantial action for preventing corrosion due to chlorine gas, the air area is designed without any internal reinforcing materials.

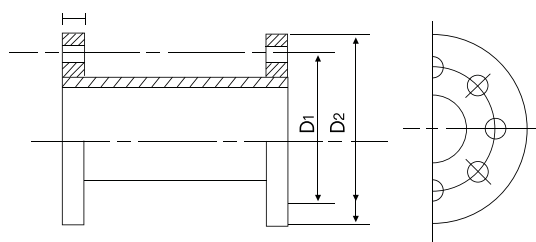
TYPE AND SIZE OF THE FITTINGS

Socket-type



	D	D ¹	D ²	D ³
20A	55	33.5	24.1	38
25A	65	40	30.3	46
30A	79	49	39	55
40A	85	55	45	61
50A	98	66.5	56.7	72
50A	98	66.5	56.7	72
65A	120	84	72.2	93
75A	132	97	85	105
100A	170	120	110	127

Flange-type



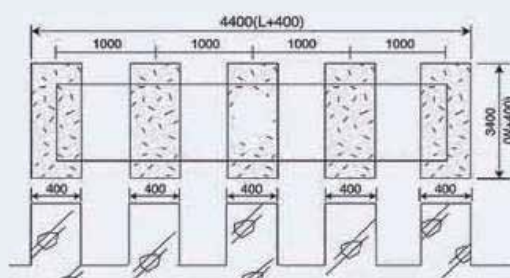
	D	D
65A	140	175
80A	150	185
100A	175	210
125A	210	250
150A	240	280
200A	290	330

GRP SECTIONAL WATER TANKS

SPECIFICATION FOR FOUNDATION CONCRETE WORK AND THE INSTALLATION SPACE

PAD MANUFACTURING STANDARD

REFERENCE PLAN e.g 3mW x 4mL x 2mH

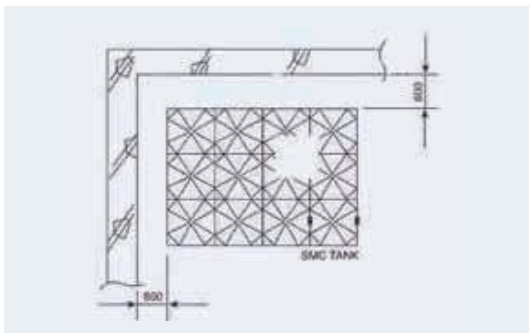


Width	More than 400 mm
Height	More than 600 mm (Including basic frame)
Interval	Less than 1 m in maximum
Size of outer part	W, L + 400 mm
Floorplan	Less than 1/500 in gardient (maintains even surface of the upper part)

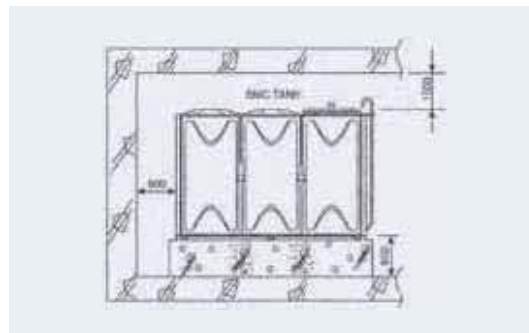
SPACE FOR INSTALLATION

600 mm in each direction(1000 mm at the top) is required for installation, con inspection, and maintenance of the tank.

FLOOR PLAN

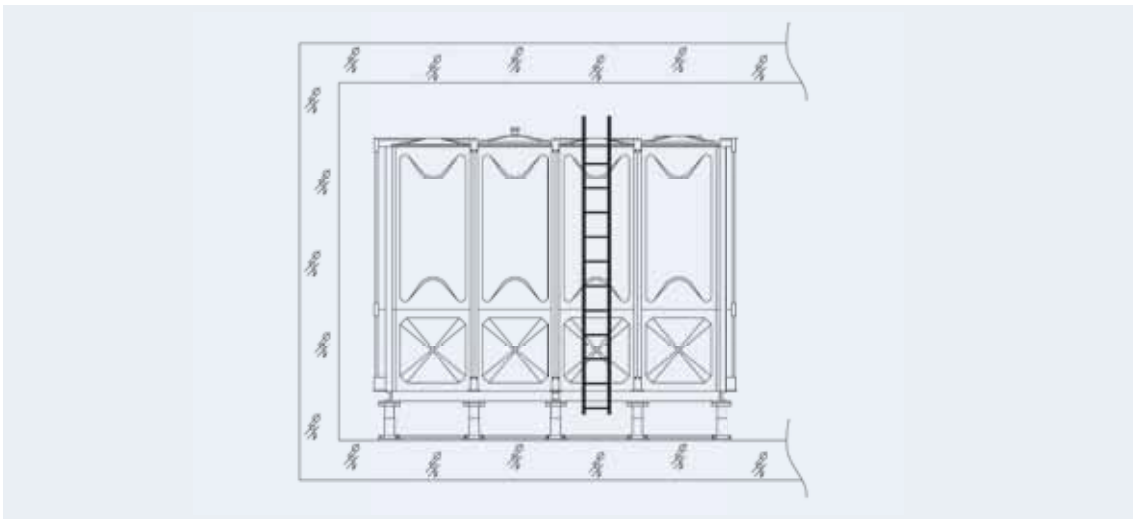


SIDE VIEW



INSTALLATION FOR SPECIFICATION AND SPACE FOR DRY BASE PAD

DRY BASE PAD PLAN



■ INSTALLATION SPACE

600mm in each direction(the upper part :1000mm) is required for installation, construction, inspection and maintenance of the tank.



GRP SECTIONAL WATER TANKS



WHAT IS HI-FOUNDATION?

It is a foundation of a systemized water tank which consists of a steel support with adjustable rotary height,

a top and a bottom plate and both ends are fixed as a linkage for each foundation



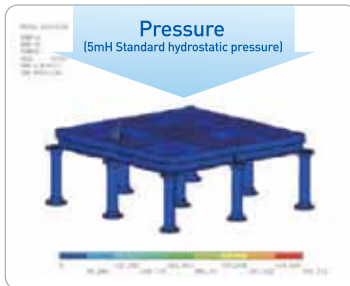
GENERAL COMPARISON BETWEEN CONCRETE FOUNDATION AND HI-FOUNDATION

Description	Concrete Foundation	Hi-Foundation
Shape		
Pad material	Plain concrete+Steel liner	STS pipe +SMC
Build	Moulding-concrete pouring -Curing-Mortar plaster-Curing	Bolt assembling
Leveling	Poor horizontality (Non-precise standing of skid base)	Precise horizontality (Precise standing of skid base)
Durability (Strength)	Good compression strength, but instabilities for curing, plastering & liner	Standardized Uniform Quality with more than 8times safety ratio (Ready made product)
Corrosion resistance	Rust on steel liner Concrete corrosion	No rust (Anti corrosion material)
Pad weight reduction / 300 places	165,600kg (100%)	3,600kg (2%)
Build time / 500 tons	More than 30days	Less than 3days

STRUCTURAL DESIGN AND STABILITY VERIFICATION

FEM ANALYSIS RESULT

HI-FOUNDATION is a proven product that has undergone a field test for a scientific design and compressive strength test by FEM and a 7 meter high water tank.



FEM analysis MODEL



Stress for each location

HI-FOUNDATION generation stress

Stiffener (Steel)	$197\text{kgf/cm}^2 < 1600\text{kgf/cm}^2$ (Allowance rate 8.1 times)
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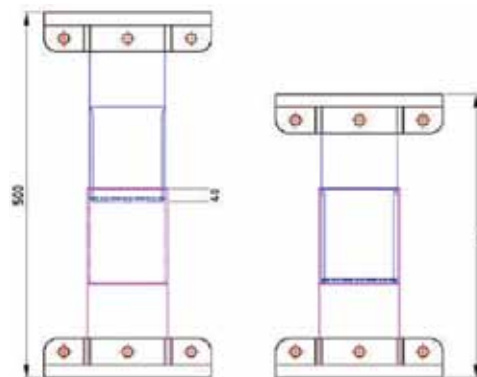
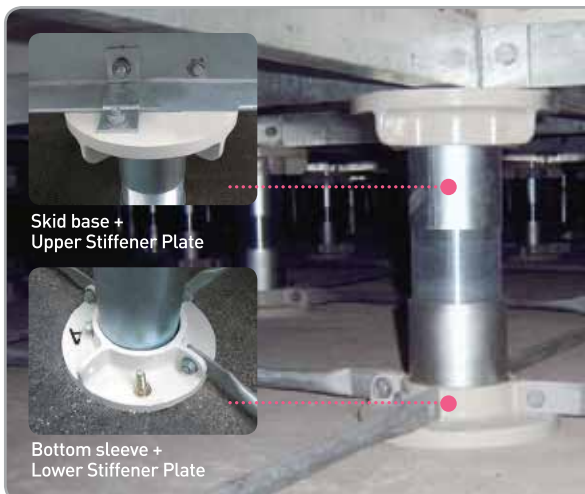
Stiffener Plate (SMC)	$17\text{kgf/cm}^2 < 212\text{kgf/cm}^2$ (Design Margin 12.5 times)
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FIELD TEST

Water height	Skid base deflection	Spec (KS Standard)
7mH	1.25mm	Less than 10.0mm
Maximum deflection 1.25mm (strain safety factor 8 times)		



HI-FOUNDATION PRE-FABRICATED STRUCTURE



SR KOREA

IDEAL OF CLEAN DRINKING

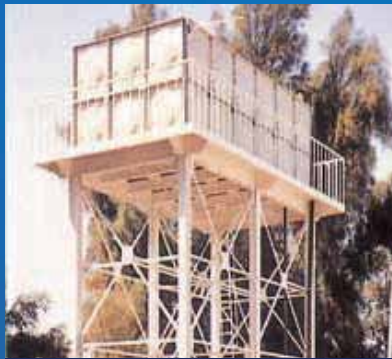
SR KOREA

WORLD-BEST QUALITY AND TECHNOLOGY

SR Tank is the most ideal water tank that is harmonized with world-class technology in water tank design and with perfect construction based on long experience. You can store clean water for a long time and be assured of the use with the SR Tank and rest assured with systematic quality management.



Singapore



Kuwait



Taiwan

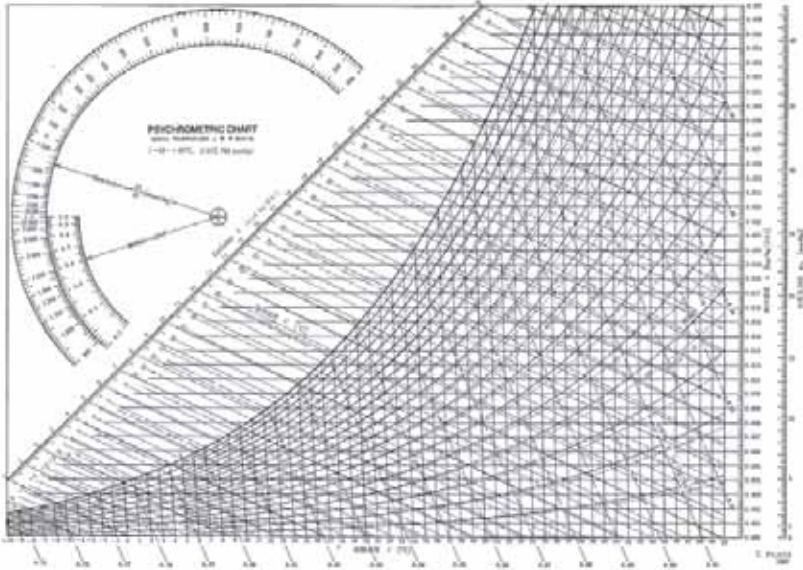
OVERSEAS DISTRIBUTIONS NETWORK



GRP SECTIONAL WATER TANKS

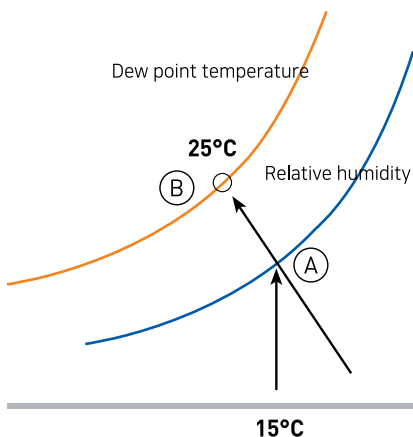
TECHNICAL HELP

To prevent dew condensation in the water tank



Checklist for checking
dew condensation
thought the calculation
of dew point temperature

To check the dew condensation in the tank, identify the difference between the inside of water temperature and the outside of tank temperature. Draw a line vertically at the point and mark the point (A) where the line meets the curve representing the relative humidity inside the tank. Draw an oblique line to the dew point temperature curve and mark it contact point (B). Point (B) is the dew point temperature at which dew condensation may occur.



OCCURRENCE OF DEW CONDENSATION

Dew point temperature < the temperature inside the tank
: Dew condensation does not occur.

Dew point temperature > the temperature inside the tank
: Dew condensation occurs.

HANDLING OF DEW CONDENSATION

It is important to lower the relative humidity in the tank.
It is important to complement the ventilation/duct system
that corresponds to the size of the tank.

THE PERFECT SOLUTION FOR ALL YOUR WATER STORAGE NEEDS



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CLARIANT



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