K-TANK

David Aqua System

K-TANK

GRP & Steel Tank

K-Smart TANK

smart monitoring system

David Aqua System

01 SMC HOT PRESS

02 PANEL STORAGE

03 INSULATION PRESS

04 AUTO DRILLING MACHINE

05 MECHANICAL PRESS

Characteristics Feature of K-TANK

Embo SMC Panel

Embo is K-TANK's signature surface technology which improves adhesiveness of SMC panels. Non-slip and Prevent insulation covering.

Easy Installation, Free Capacity design

Easy to install anywhere. And the capacity is free with various shape panel.

Excellent Hygiene and Durability

The GRP panel is made by HOT PRESS method.
This prevents algae, germs growth and high hygiene.
And Blocks external lighting completely, thereby preventing the bacteria inside of water tank.

Perfect Watertightness

Prevent leakage perfectly by using
special sealing tape with excellent recovery.

Simple Assembling

K-TANK panel can be easily assembled and relocated wherever you want. It can be shifted by limited space with pallet wrapping by exact size and quantity.

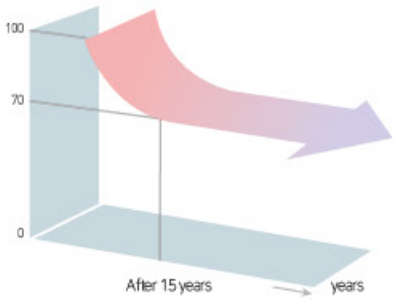
High Quality

We pursue the system superiority via sophisticated interpretation of hygiene, durability, rigorous design criteria, quality management, and reliable structure strength.
The basis of structure interpretation ensures safety design for tolerance value. The finest safety rating, considering design-external comparison expected based on property after a long-term use of SMC materials for over 15 years (life is 40 years) is achieved through expertise of the K-TANK(DAVID AQUA SYSTEM)

Structural Analysis of K-TANK

K-WATER TANKS are designed to be the safest panels through optimized design.

If the panels are reliable, the cost of reinforcement can be reduced and the best water tanks can be made at the most economic cost.



(Deterioration degree of SMC)

Extermal forces in the design:
load of water in the tank, dead load, snow load, wind load, live load, seismic load

Item	Design Condition
Seismic load	Horizontal Seismic Kh = 2/3 Vertical Kv = 1/3 Designed bases on Kh = 1/3G. Horizontal seismic load
Hydrostatic Pressure	Water Level(Height in Meters) x 0.1KGF/㎠ [0.01MPa] Designed to stand against hydrostatic pressure enough. The max change of side wall is less than 1.0% of total height left in Water for 48 hours.
Snow Load	60 kgf/㎡ [at the base of 30㎝ of snow depth] Designed to stand under 200kg/㎡ enough
Wind Load	Wind Load 255 kgf/㎡ [2.55 x 10^3 Mpa] Designed to stand under max. 60m/sec even in case the tank dose not include water
Ilumination	Ilumination- Under 0.1%
Water Temperature	Under 30℃(normal) / Under 55℃(maximum) (Special making in case of thermal spring)

Performance evaluation criteria of the panel

	Item	Performance Criteria	K-TANK
Mechanical strength	1) Tensile strength	More than 60 Mpa	94Mpa
	2) Flexural strength	More than 80 Mpa	199Mpa
	3) Flexural modulus	More than 6000 Mpa	13727Mpa
	4) Barcol hardness	More than 30	52
	5) Absorption	Less than 1%	0.1
	6) Glassfiber content	More than 25%	31
	7) Panel gravity	1.8	1.8
	8) Impact strength	More than 80 Kj/㎡	97 Kj/㎡
	9) Light transmission	Less than 0.1%	0.00%
	10) Thermal conductivity	Less than 0.02 kcal/m-hr.℃	0.02 kcal/m-hr.℃
Elution of toxic substances	1) Heavy metals	Less than 0.1% ppm	Not detected
	2) Consumption of KMn	Less than 10 ppm	0.3 ppm
	3) pH	5.8-8.6	7.6
	4) Phenol	Less than 0.005 ppm	Not detected
	5) Odor & Taste	No defects	No defects

Free capacity design Using panels of various sizes, K-TANK utilizes horizontal and vertical space at the maximum and those are suitable for an underground reserve tank of large capacity.

Possible height to install tank : 1.0mH~5.0mH

Possible capacity to install tank : 1㎥(Ton) ~ 5,000㎥(Ton)
[The capacity exceeding 5000㎥ can be installed by separate design]

Large capacity type

Cube – type / Corner-type / Odd-type (□, ⊏, ㄴ shape)

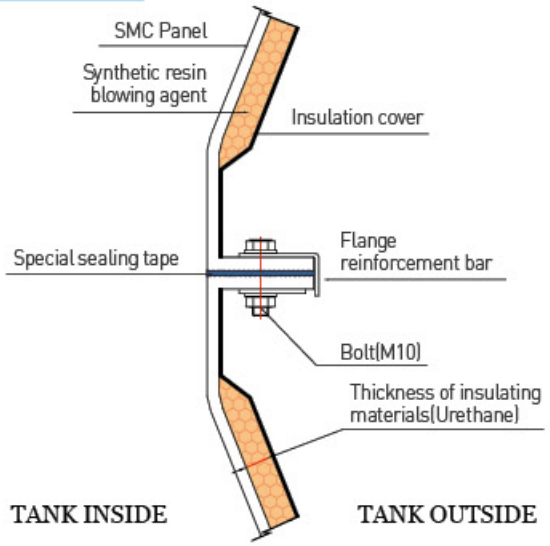
[Corner : real example of □-type tank]

EXCELLENT HEAT INSULATION

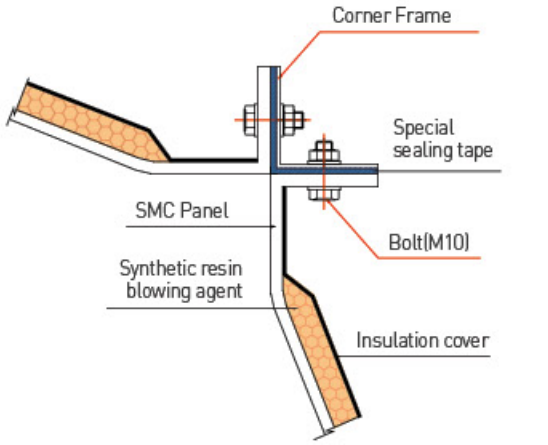
K-TANK is

SMC insulation panels utilize urethane blowing agent that has excellent insulation materials for single-structure panels: the exterior is made of sandwiched-structure panels using vacuumed-molded covers with special synthetic resin for high insulation.

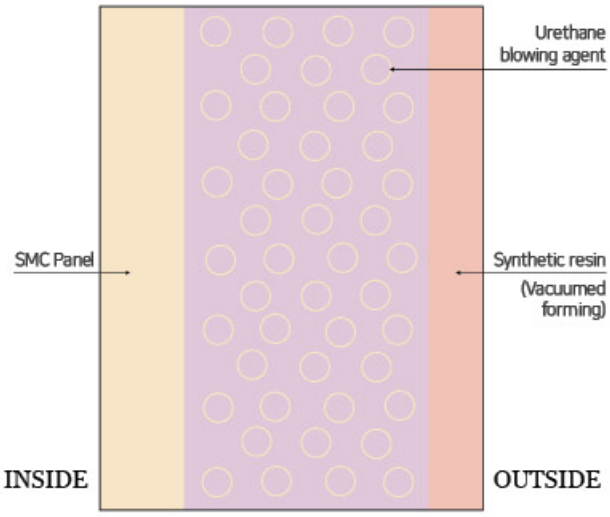
Wall Section

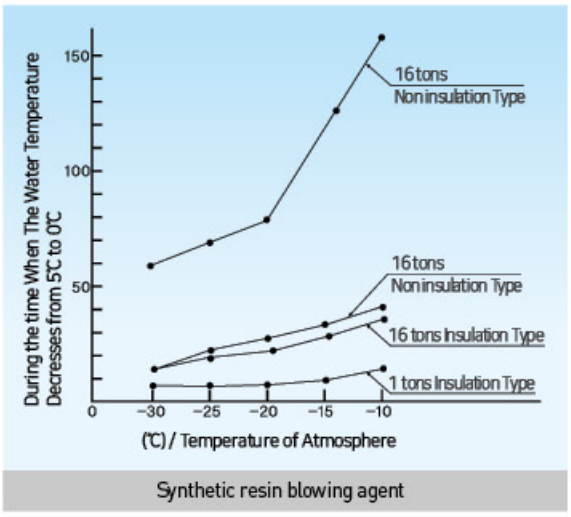


Corner Section



Insulation panel section

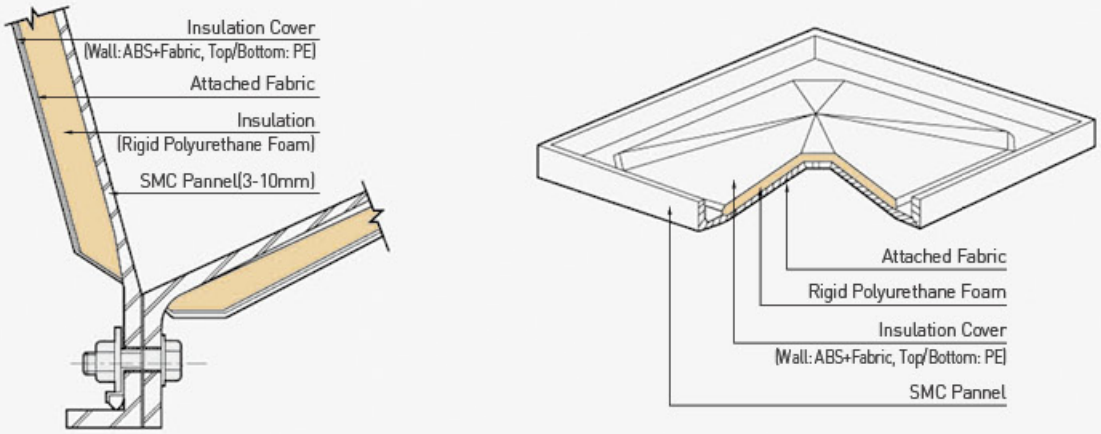




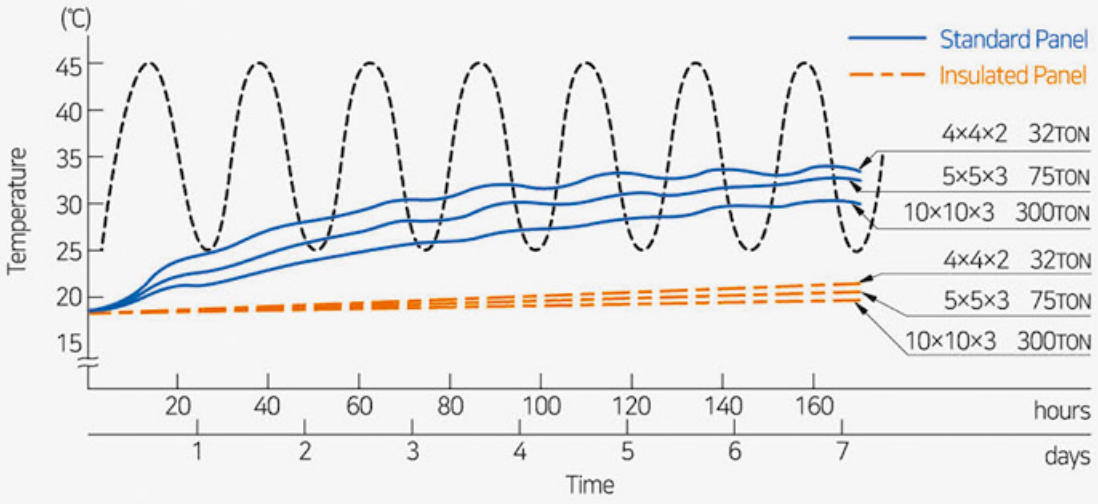
CAPACITY	CLASSIFICATION	TEMPERATURE OF ATMOSPHERE		
		-10	-20	-30
16 tons	Non insulation Type	35	20	13.5
	Insulation Type	164	81	58.5
1 tons	Non insulation Type	11	6	4
	Insulation Type	37.5	23	13.5

DAVID AQUA SYSTEM- K-TANK PANEL

TYPICAL CROSS SECTION



EFFECT OF HEAT

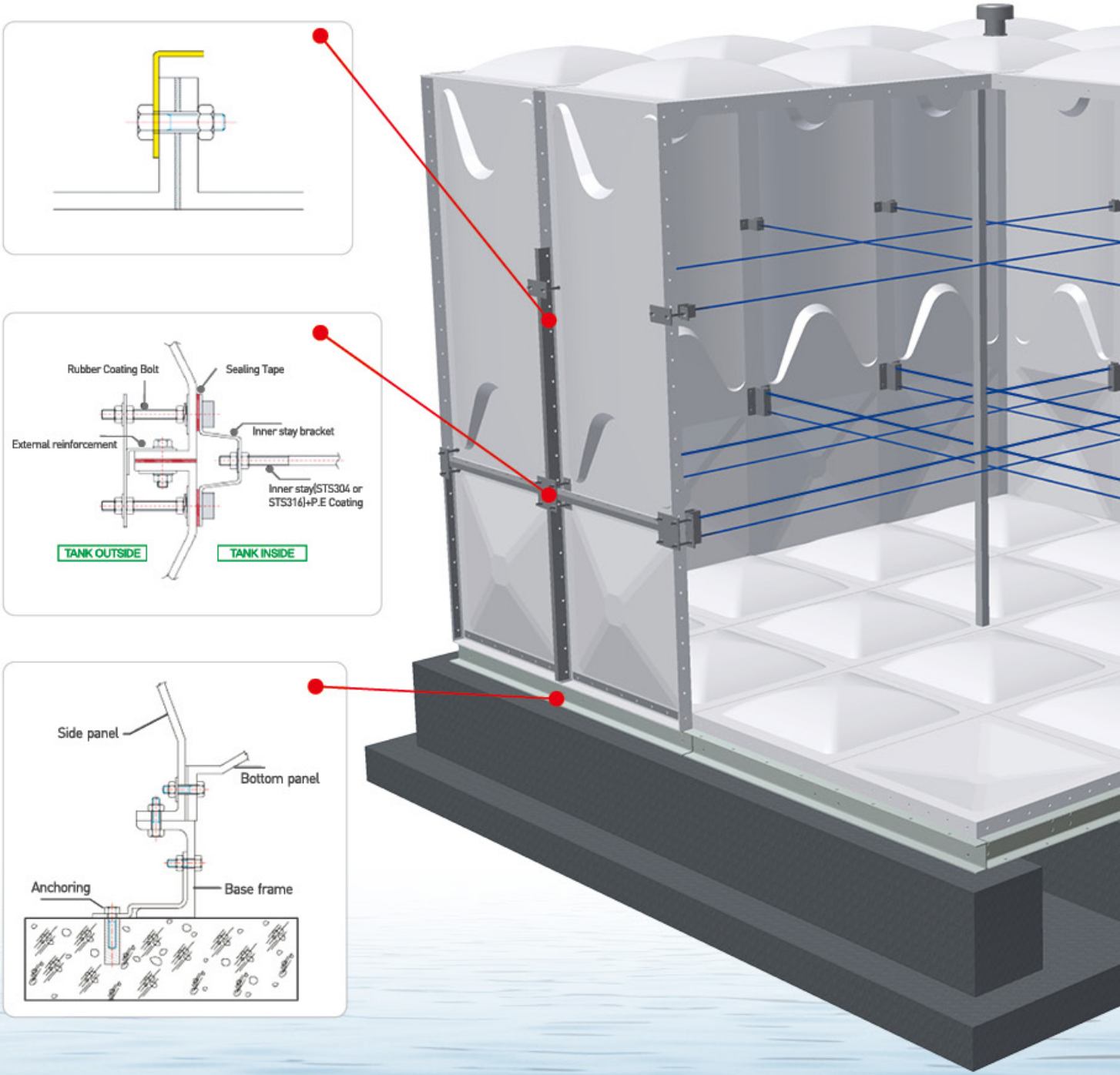


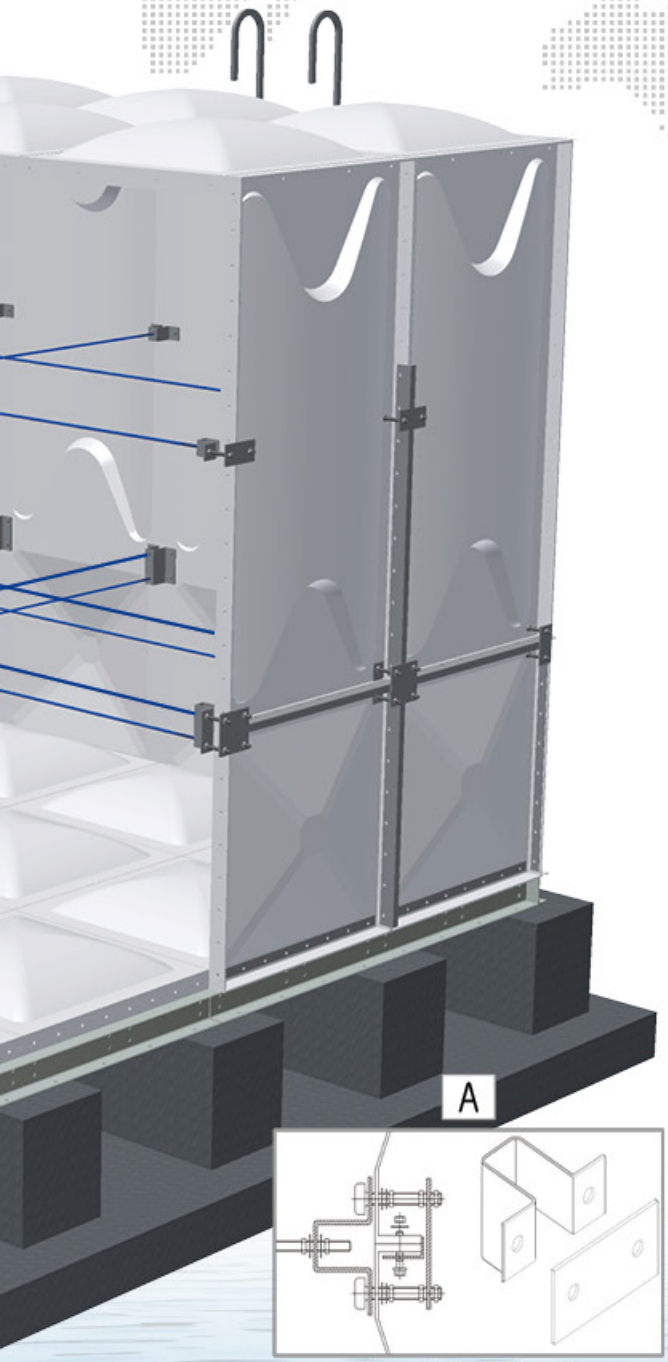
THERMAL CONDUCTIVITY

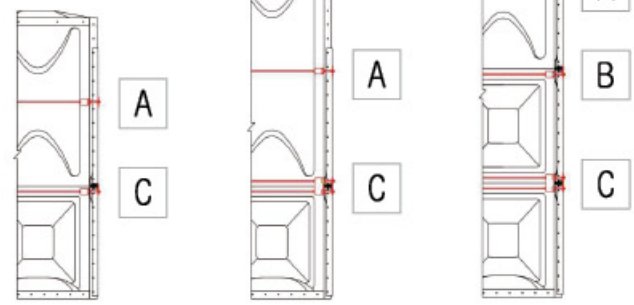
	Thermal Conductivity Kcal/m.hr.℃(J/m.hr. ℃)
STEEL	37.0(1.55X10)
SMC(Standard)	0.15(630)
SMC(Insulated)	0.02(84)

Internal reinforcement system provides the followings

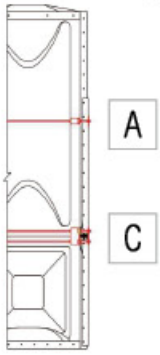
- In the event that the space for installing a tank is narrow, a proper reinforcement system enhances the utility of the installation space.
- By applying a PE coating the the inner stay rust generation is minimized on the stainless steel part on the top part.



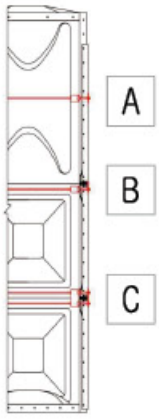




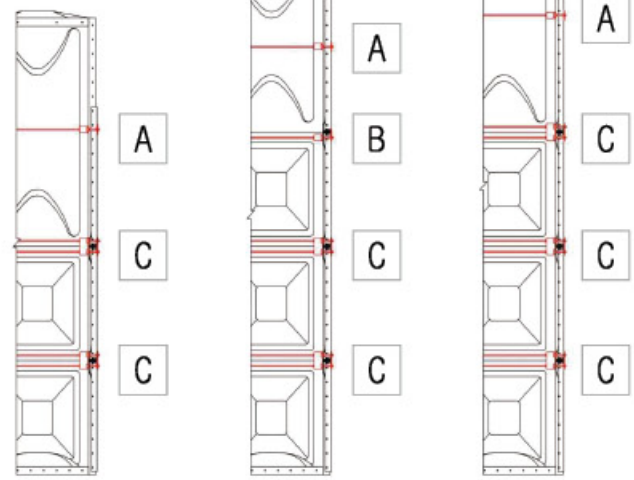
2.5m Height



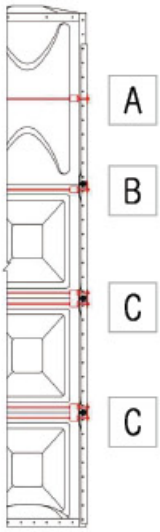
3m Height



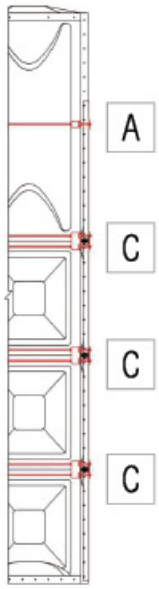
3.5m Height



4m Height



4.5m Height

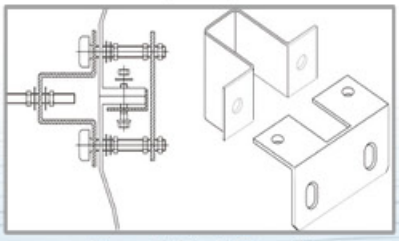


5m Height

A

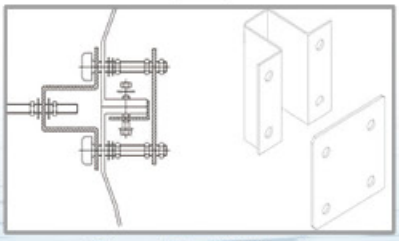
Tie-rod: Single(A type)
(Internal Bracket 1760S(STS) +
External Bracket 1780Z(HDG)

B



Tie-rod: Single(B type)
(Internal Bracket 1760S(STS) +
External Bracket 17120Z(HDG)

C



Tie-rod: Double(C type)
(Internal Bracket 17160S(STS) +
External Bracket 1616Z(HDG)

K-Smart TANK
smart monitoring system

David Aqua System High efficiency, low cost management solution

- Low power / long life (8~10 years) saving 5~15% of energy cost
- 40% reduction in field work 30% reduction in labor costs
- 1/10 cost compared to other solutions
- Over 80 sensor types secure data transmission
- Signal range basic 300m 16 stories coverage

Wireless Sensor

More than 80 kinds of wireless sensors specialized in fields such as temperature, pressure and air quality.

※ Easy installation / multipurpose sensor / ultra low power battery consumption (8~10 years) / long distance communication

Gateway

Sending data from the sensor to the server to the central management platform of the sensor.

※ Built-in emergency power / small data consumption / large data handling / strong signal range (up to 300m or more)

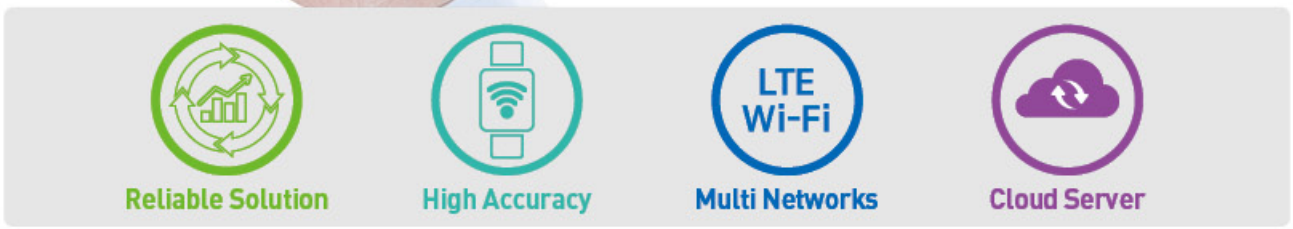
Cloud

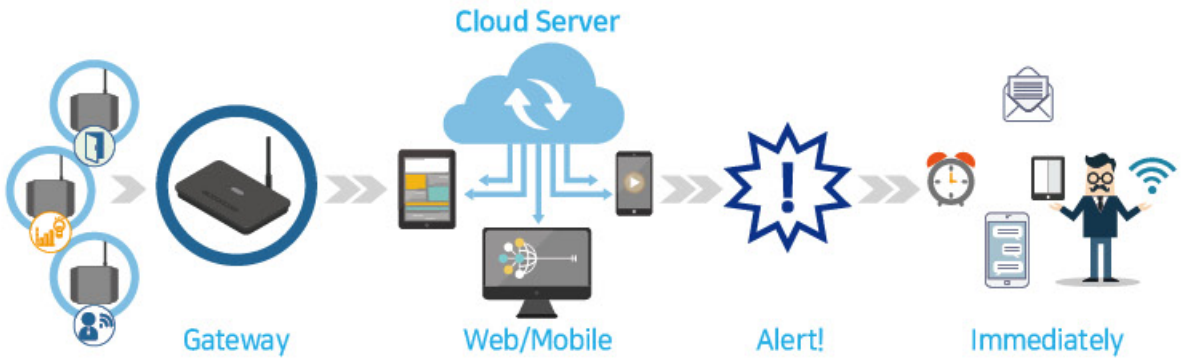
With its own cloud platform, you can check the data in real time regardless of PC and mobile.

Overall Operational way of IoT Solution by K-Sensor

Applications

1. Water level monitoring
2. Water leakage monitoring(Panels, In & Outlet etc)
3. Deformation or External damage monitoring.
4. Internal reinforcement damage monitoring.





Certifications

Industry Canada

Gateway

- Protocol support : UDP, DHCP,TCP,SNMP,MODBUS
- Sensor and communication method : Frequency Hopping Spread Spectrum
- Double Cryptographic Financial Security(256bit key Exchange and AES-128 CTR)
- Device memory : Save 16,000 Sensor Messages
- Online firmware update support

Sensor(General, AA type)

- 50 types of sensors available
- Communication frequency: 940 MHz band
- Antenna: 100 mm wire antenna
- Self storage of 512 messages
- External exposure temperature: -40 ° to 55 ° C
- Signal effective distance between gateways: approx. 300 m on exposed plains
- Power supply: 1.5 V alkaline AA batteries (replaceable)
- Power source: 1.5 V Battery life: 8 to 10 years (AA) / Heartbeat 10 minutes

Selecting the Right Radio Frequency for your Wireless Sensor Network

1 HVAC

AC Current Meter
Track energy usage &
prevent malfunctions by monitoring

Air Particulate Meter
Improve indoor environmental conditions by
checking air quality

Duct Temperature
Increase efficiency of equipment by tracking
the output temperatures

Other applications

2 Boiler

Dry Contact Sensor
Receive alerts when the contacts touch or
switch is triggered

Water Detection Sensor
Be notified in case of overflow or
drain pipe leak

Pressure Sensor
Immediate notifications when pressure is
outside normal range

3 Elevators / Machine Room

Vibration Meter
- Reduce breakdowns by finding early vibration irregularities
- Extension of equipment lifespan & efficiency

Water Rope Sensor
Identify water leaks to prevent high-cost damage

4 Fire Control

Temperature Sensor
Respond immediately on
sudden temperature changes

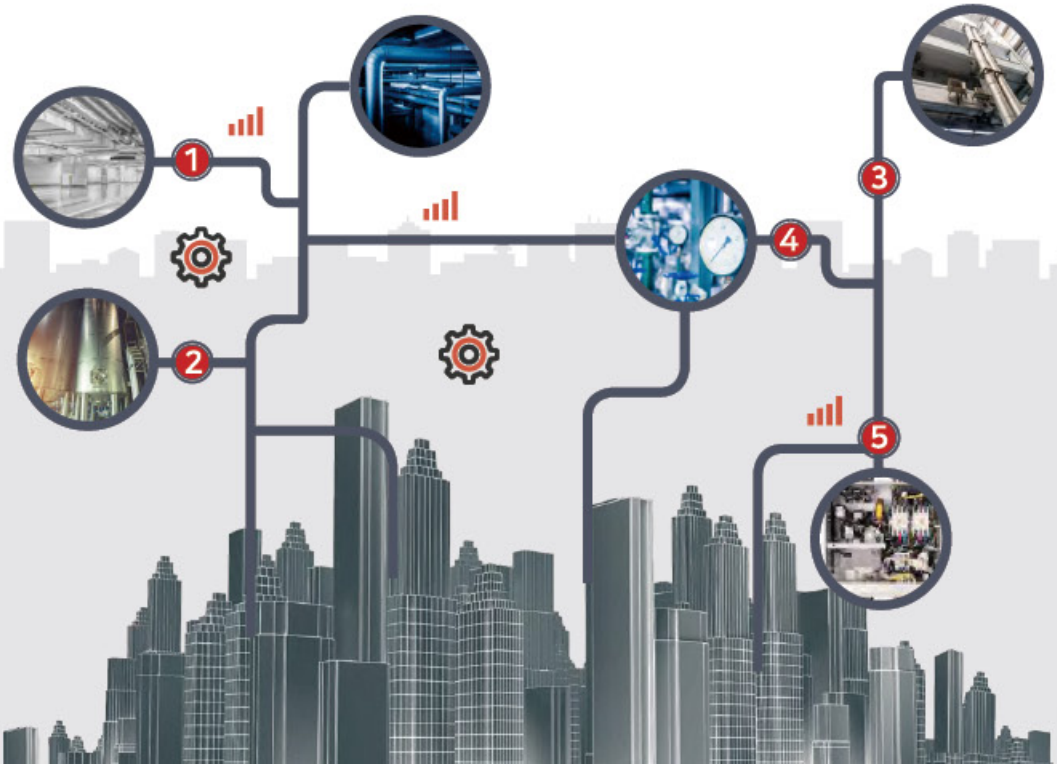
CO Gas Sensor
Identify the increasing of
CO levels caused by fire

Voltage Detection Sensor
Be notified about the fire instantly &
speed up evacuation

5 Electrical Roof

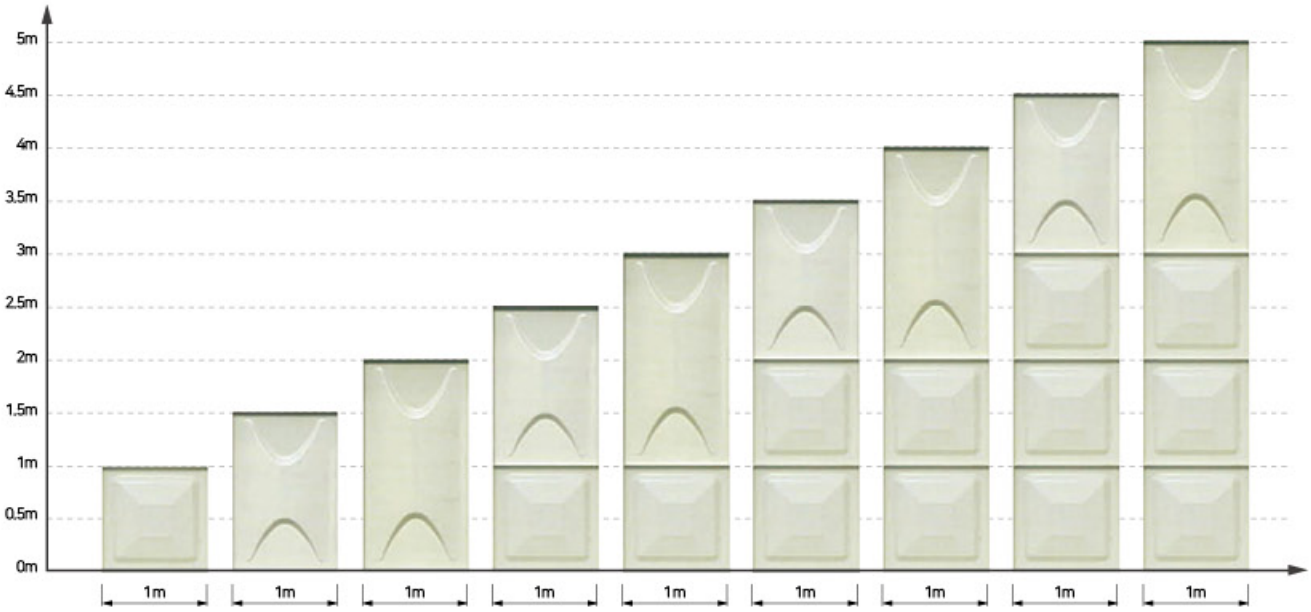
Voltage Meter Sensor
Monitor generator status &
identify power failures

AC Detection Sensor
Track electric power supply & current flow



K-TANK PANEL COMPOSITION

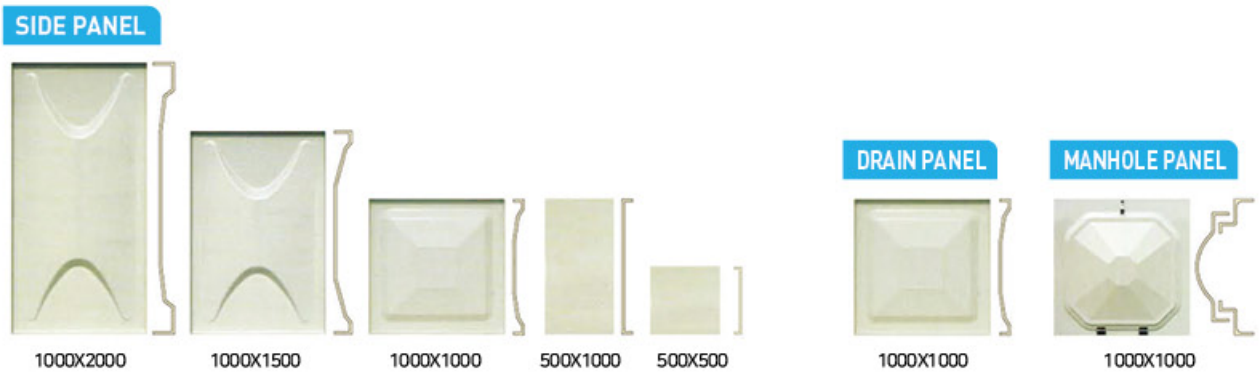
STANDARD SIDE PANEL HEIGHT



K-TANK_Panel Type and Size

DAVID AQUA SYSTEM K-TANK

DAVID AQUA SYSTEM K-TANK panels are pressure-formed with SMC press using mechanical strength, dimensional precision, heat and water resistance, offering strength, durability and aesthetics: the rectangular-shaped manhole also ensures easy maintenance and cleaning.



DAVID AQUA SYSTEM K-TANK

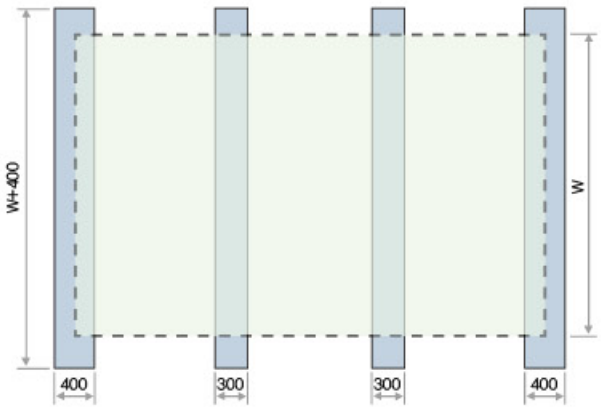
CONSTRUCTION SCOPE

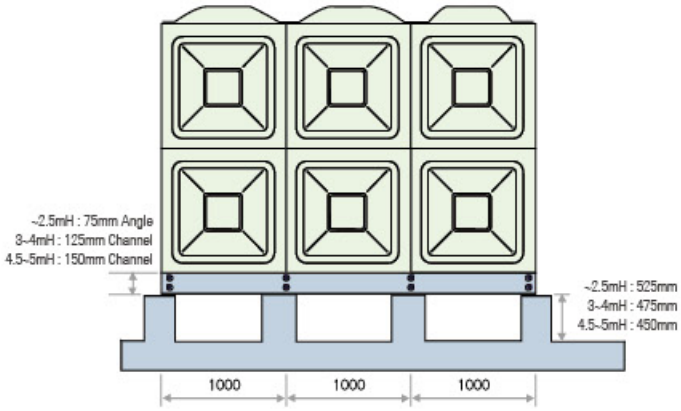
Foundation Work

Foundation work shall be carried out by the customer according to design specification, considering the soil strength of tank basic bolt location. **The concrete strength of the foundation shall has a capacity of 180kg/㎠ or more. The top of the concrete foundation shall be plastered so as to maintain leveling and finished mortar under 20mm in thickness.**

Piping Work

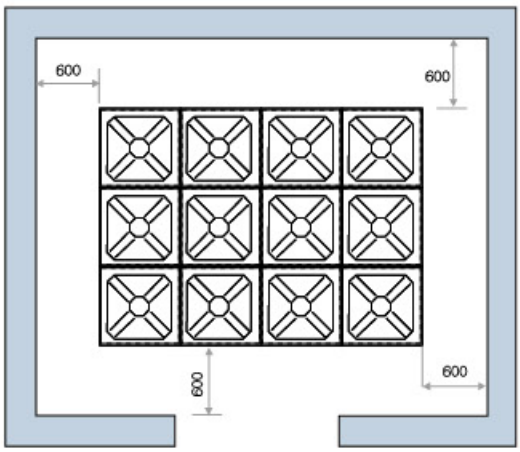
Customers shall decide inlet/outlet of water and socket dimension of drain when placing a tank order. The company assembles sockets(flanges) for piping only.
Customers shall carry out socket(flanges) connection for piping, piping work, as well as insulation.
Please install a support to prevent excessive load to the diffuser during piping work: pipes on tanks shall be installed first.



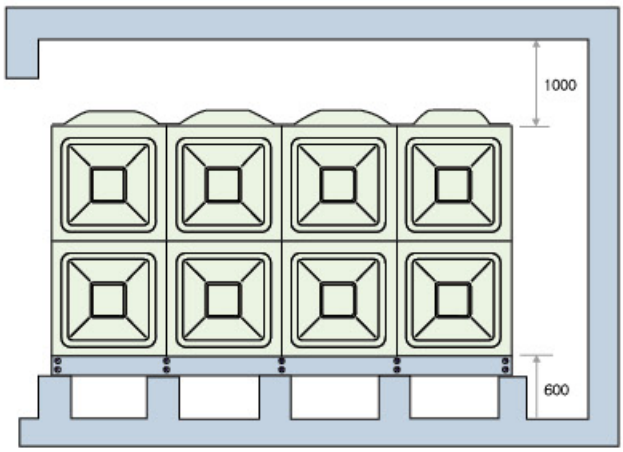


For Reference

1. Installation Space is about 600mm space in all directions is required as shown at the bottom image for maintenance and installation of tanks.
2. Regular inspection : K-TANK stores living water.
   Therefore, it requires two times regular inspections per year.



<Floor Plan>



<Side View>

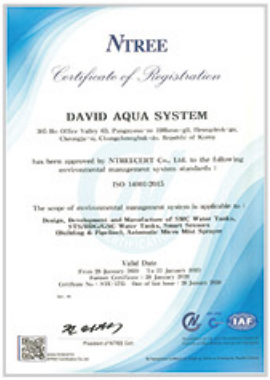
K-TANK installation site



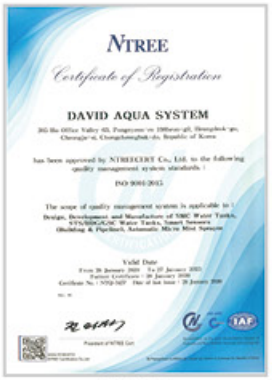



Certificates


Biz Registration



ISO14001



ISO9001

WRAS(55℃)

Test Report

Brand Registration

Certificate of Membership(KITA)


FDA Certificate of USA

For Reference

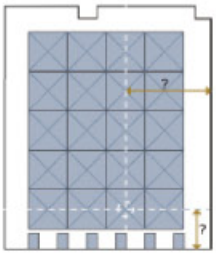
Scope of Construction

1. Foundation work

- The foundation work should be publicized by the customer with the specifications designed in consideration of ground endurance for the tank to be installed.
- Construction with anchor bolts will be done by our company.
- The concrete strength for the foundation work should be more than 180kg/㎠
- The thickness of the finishing mortar on the foundation concrete should be less than 20mm.

2. Pipe work

- Our company supplies the sockets for piping in advance to the location requested by the customer. Therefore, customers should decide on the inlet and outlet for water, the overflow, and the size and location of drainage accurately when ordering the tank.



Cautions for Handling

1. Transportation

Take precaution to avoid any partial great force such as an intensified load or shock to the tank.
Be sure to put buffering materials on the part where a rope or vehicle contacts.

2. Piping

- When doing piping work, install the support strut to prevent excessive load to inlets and outlets.
- Install the pipes beginning from the tank and take precautions to prevent a biased load.
- Avoid flammables when doing welding work.

3. Repair and maintenance

- In case of non-use for a long period of time, be sure to drain the water from the tank.
- Since the tank is for storing water for living, regular safety inspection is required. (More than twice a year)

Regulations for Installation Criteria for Construction (February 28, 1998)

Installation Criteria for Water Tanks(related to Article 3)

1. Foundation work

1. The upper part of a water tank shall be installed from more than 100cm from the construction and the other side be a distance of more than 60cm.

2. The outlet for the water shall be installed at the bottom of the opposite side from the inlet and apart from the bottom of the tank so as not to discharge the sediments on the bottom. Install the water partition in order to prevent stagnation in the tank.

3. Install more than one square manhole of which one side is more than 90cm or a round manhole of more than 90cm in diameter so that any person or equipment may enter for cleaning. Take the necessary actions to prevent any dust or foreign substances from entering into the tank through the manhole. Provided, the side or diameter of the manhole in a small tank of less than 5㎥ in size may be more than 60cm for installation.

4. The outlet for sediment shall be installed on the bottom part of the tank. The bottom of the tank shall be inclined more than 1/100 degrees toward the outlet for each discharge.

5. For cleaning, hygiene inspection, and repair, a tank shall be partitioned into more than two parts, or more than two tanks shall be installed, except for the small-size tank of less than 5㎥

6. An alarm shall be installed for warning when the water level in tank exceeds or reduces to a certain level. The alarm receiver shall be installed in the control center.

7. In the event that the tank is installed underground, it shall be installed more than 5 meters away from toxic facilities such as excretions or wastes faculties and equipment shall be installed so that people cannot access around the manhole easily. In the event of an unavoidable situation where the tank has to be installed not more than 5 meters away from toxic facilities, a blocking fence shall be installed around the tank.

8. The materials for the tank and the ladder to the tank, etc., shall be anti-corrosion such as fiber reinforced plastic, stainless steel, concrete, etc.

9. A pipe for air purification and the overflow pipe for controlling the water level shall be installed in the tank. Take actions to prevent any polluted substances such as insects from entering into the pipe.

YouTube David Aqua System

David Aqua System

GRP PANEL TANK & RELATED ITEMS
STEEL TANK(STS / HDG / GSC)
TECHNICAL CONSULTING

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