

Receiver Tank / Elevated Water Tank

HISHITANK™ G Panel Type
Bolt Assembly Model



Easy to Assemble

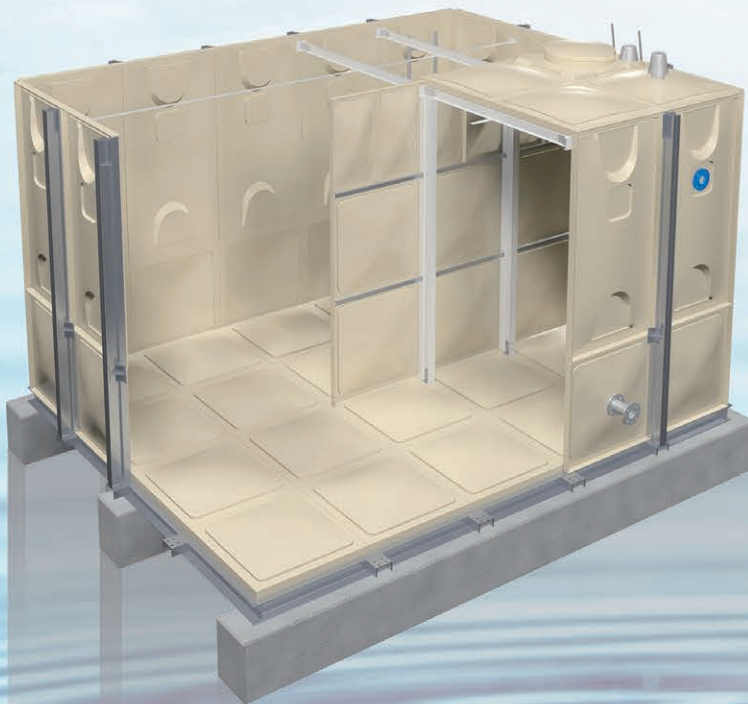
Bolt-on panels are easy to assemble without heavy machinery

Maintain clean water

GRP Panel prevents rust and it's easy to clean inside the tank

Easy to Transport

It comes in compact panels to fit any tight space



HISHITANK™ G Panel Type



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We at Mitsubishi Chemical Infratec

Preface

HISHITANK™ is a masterpiece water tank developed by MITSUBISHI CHEMICAL INFRATEC CO., LTD., a comprehensive plastic manufacturer, through tireless basic research and by combining its technologies.

With supplying water safely, securely, and hygienically as the top priority, we ensure strict and consistent quality control in design, purchasing materials, manufacturing, and shipping HISHITANK™ tanks.

To ensure the reliability of HISHITANK™ as a water storage tank, we use only parts and components that meet all applicable standards.

Through more than 55 years of experience in studying and improving HISHITANK™ in Japan, one of the world's most earthquake-prone countries, we make every effort to prove ourselves worthy of the trust of customers.

The History of HISHITANK™

1962

Sales of GRP water tanks began.

1978

GRP panel assembly-type tanks were released.

1981

Overseas tank sales began (in Singapore).

1987

GRP panel-type heat-resistant tanks were released.

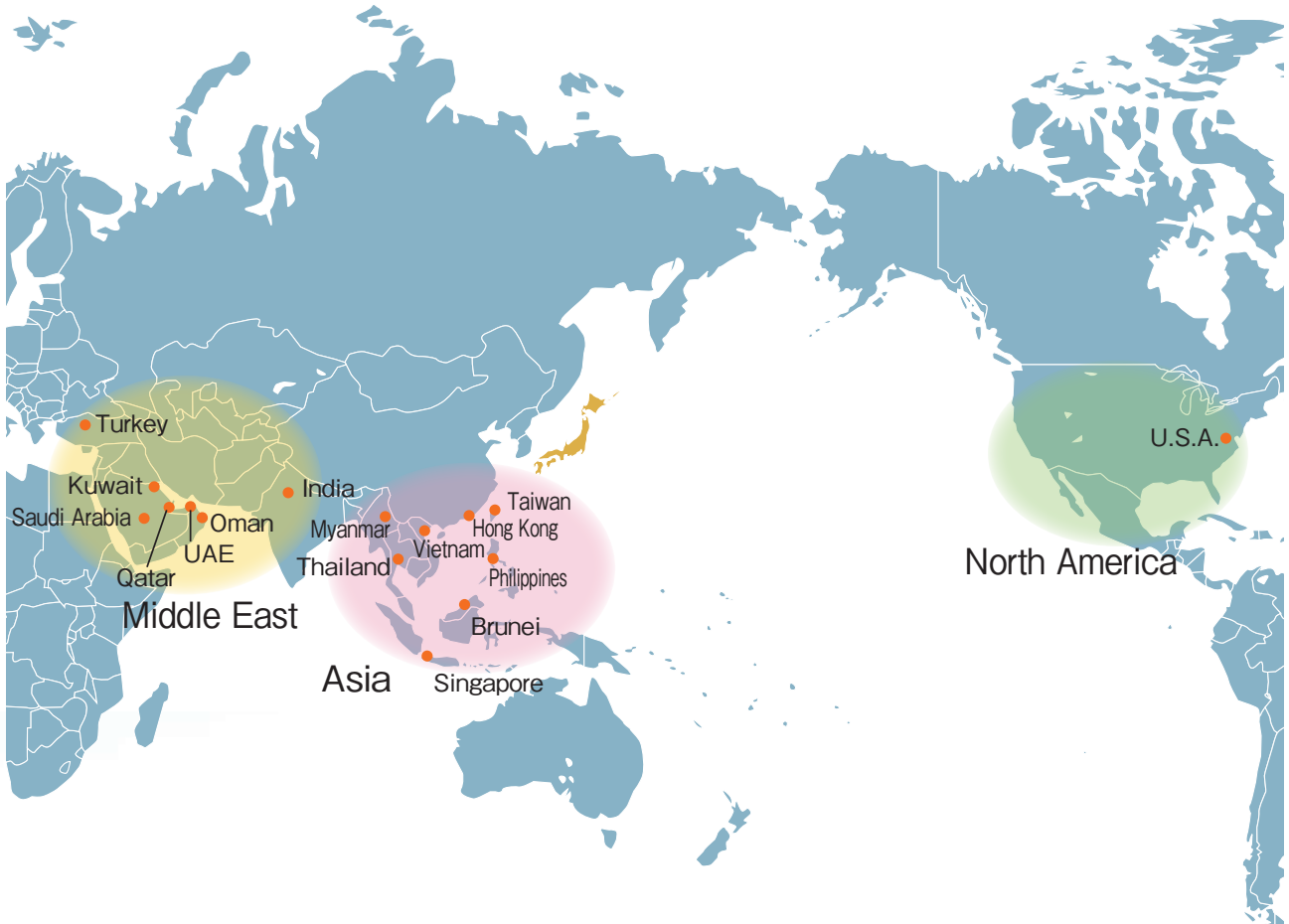
1997

New earthquake-resistant panel-type tanks were released.

2005

Seawater tanks and hot water tanks were released.

HISHITANK™ Overseas Expansion



MCIT has been marketing to more than 30 countries over 35 years, which are: China, Taiwan, Hong Kong, Macao, Mongolia, Morocco, Singapore, Brunei, Myanmar, Laos, Philippines, Thailand, Cambodia, Vietnam, Saint Vincent and the Grenadines, Grenada, Palau, UAE, Oman, Qatar, Kuwait, Saudi Arabia, Algeria, Turkey, Djibouti, Egypt, Tuvalu, Seychelles, Mauritania, Rwanda, Antigua and Barbuda and USA.



Roles of Water Tanks

Water tanks provide a steady supply of drinking water and domestic water, which are a crucial component of comfortable living.



Feeling Secure with Water Tanks

Feeling secure with water tanks—the importance of this has not changed over time. Reservoirs carved out of rock have turned into distribution reservoirs for waterworks, and the water vessels where water is stored have transformed into water tanks in office buildings and condominiums. These enable us to use water daily with a sense of security. Water tanks that have water storage functionality have become part of today's water supply systems. From behind the scenes, they help enhance our everyday lives by serving as emergency water supply tanks during disasters as well as in various other ways.



Materials Used in Various Types of Water Tanks



PE



Deterioration over time



GRP



Weight problems



Concrete



Stainless



Steel



Metal corrosion



GRP panel tanks solve these problems.

Sanitation

Keeping the water clean

Keeping water clean is first and foremost function as well as its primary mission for HISHITANK™.

HISHITANK™ meets the standards for water tank structures. Moreover, it uses the external reinforcement frame method to preserve water quality, which facilitates maintenance and inspections.

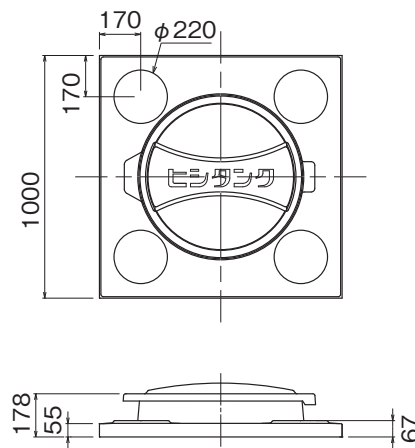


Manhole panel & Cover

The manhole can be opened and closed by hinge.

The manhole can also be attached and detached.

A 100 mm lip prevents the entry of rainwater and trash.



Ventilation

The vents have 18 × 16 mesh insect nets to prevent insect infestation.

Their height of 100 mm prevents rainwater inflow.



Products

1. Nylon powder reinforcing materials

Vapor phase areas inside the water tank have steel members that are susceptible to rust due to the influence of free chlorine. The HISHITANK™ enhances antirust performance by using reinforcing materials in a protective coating.



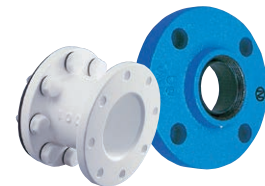
2. Resin lining bolts

The HISHITANK™ employs a resin coating in order to enhance the antirust performance of bolts and nuts in vapor phase areas.



3. Nylon Coated flange / Core flange

As optional parts for enhancing antirust performance, nylon coated flanges and epoxy coated core flanges are available.



● Application areas inside tanks

Part	Metal material	Bolt type
Liquid phase	Stainless steel	Stainless steel
Vapor phase	Resin coating on steel	Resin coating on steel bolts



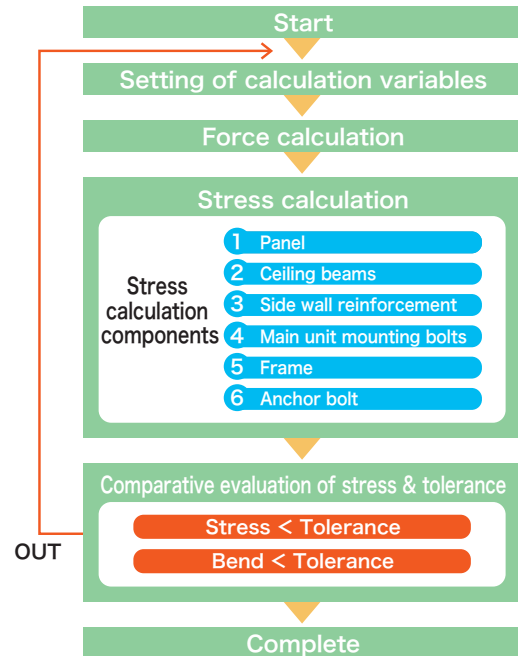
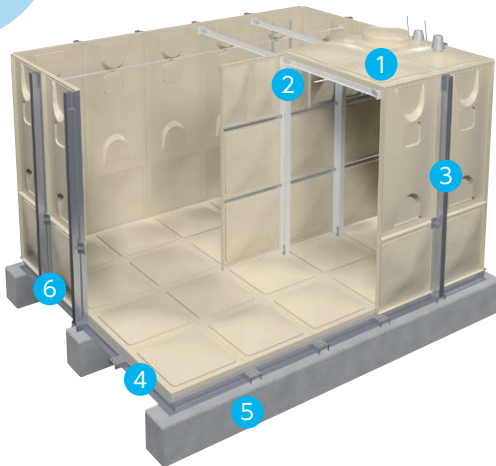
(Resin-coated reinforcement material used in the vapor phase area)

Designed to prevent algae

The illuminance ratio inside the HISHITANK™ is designed to achieve 0.05% or less, thereby clearing the requirement for an illuminance ratio of 0.1% at which algae occurs.

Safety

Structure calculation procedure and water tank components

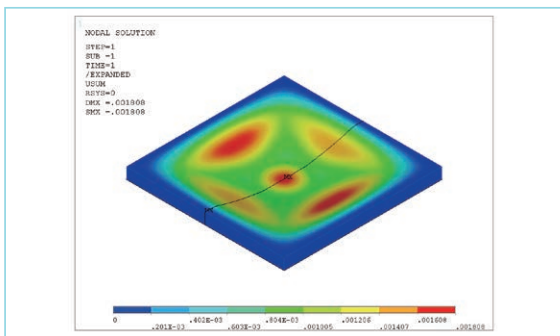


Panel strength design

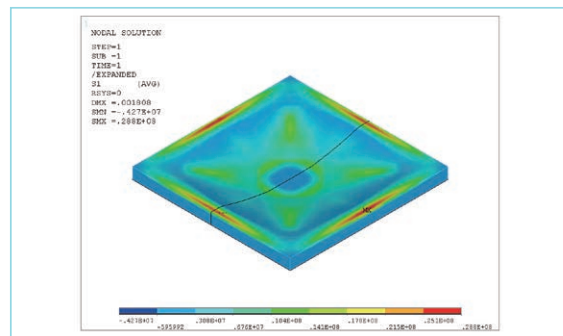
This panel has been created with the finite element method.

GRP panels that achieve both workability and strength are realized through SCM, our proprietary design.

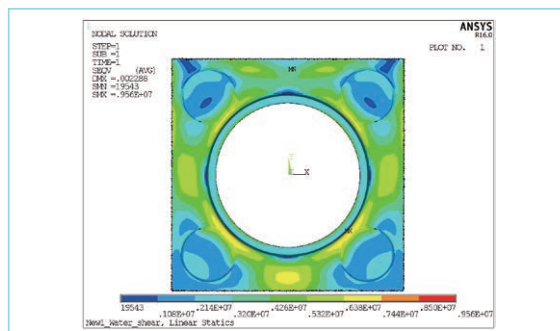
● Displacement diagram



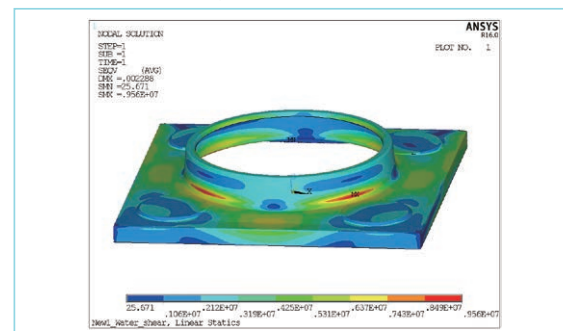
● Stress diagram



● Stress corresponding to water shear stress View from above



View from a diagonal

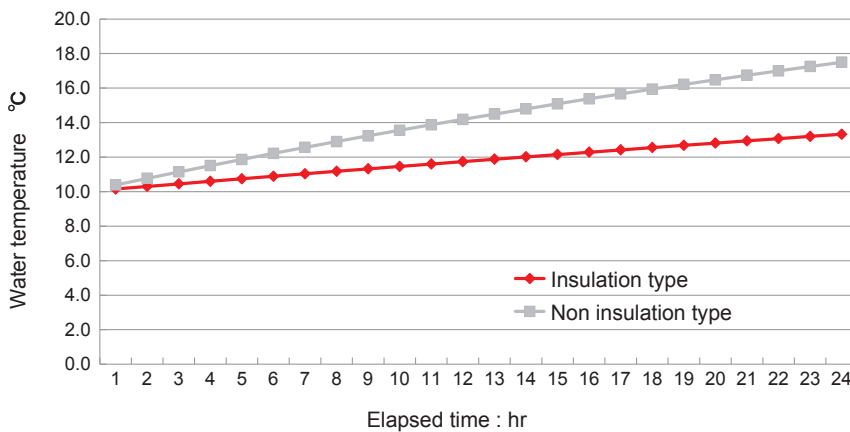


Functionality

Insulation design

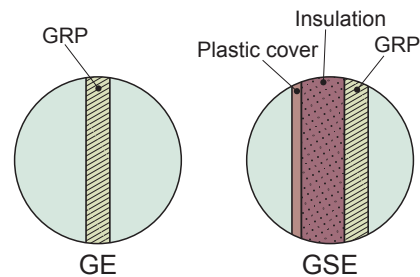
The GRP composite panel structure type is a panel-structured water tank that features a three-layered structure: a GRP panel layer, which has excellent insulation properties; a synthetic resin foam layer; and a synthetic resin exterior panel with strong weather resistance and an aesthetically pleasing appearance. It also has strong insulation to prevent condensation.

● Changes in tank water temperature

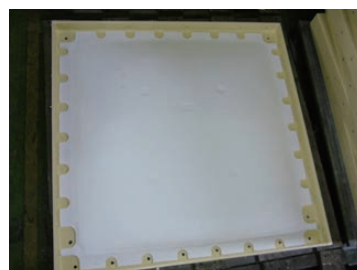


Condition
 Outside temperature : °C 30°C
 Initial water temperature : °C 10°C
 wind speed : m 0m
 The data posted here is calculation
 It is not a guaranteed value

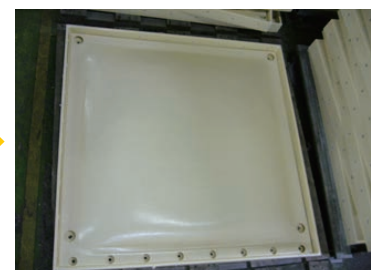
TYPE	PANEL
GE	GRP
GSE	GRP with insulation



Decorative cover



① Set the insulation material (styrene).



② Place the decorative cover.

General Descriptions

Design Conditions

The design conditions of HISHITANK™ G Panel Type are as follows:

Hydrostatic pressure	Water level (m) × 0.01 Mpa {0.1 kgf/cm ² }
Design water level	Tank height (nominal height) × 0.9
Snow accumulation	0.6 × 10 ⁻³ Mpa {60 kgf/m ² }
Wind pressure	1160 N/m ²
Roof load	Short term central load per panel : 80 kg
Inlet water temperature	Ordinary temperature
Water quality	pH : 5.8 to 8.6
Illumination factor	0.1% or less
Weatherability	Since the roof is exposed to ultraviolet light when installed outdoors, better weatherability is provided by inserting non-woven fabric into the roof panel.

Physical Properties

The physical properties of the GRP panels of HISHITANK™ G Panel Type tanks are as follows:

Item	Test value	Testing standard
Tensile strength	113MPa	JIS K 6911
Tensile elastic modulus	13.9GPa	JIS K 7161
Bending strength	180Mpa	JIS K 6911
Bending elastic modulus	14.5GPa	JIS K 6911
Barcol hardness	52	JIS K 7060
Glass fiber content	37.7%	JIS K 7052
Specific gravity	1.87	JIS K 6911
Water absorption rate	0.078%	JIS K 7209
Compressive strength	340MPa	JIS K 6911
Interlaminar shearing stress	20.2MPa	JIS K 7057
Transverse shear strength	85.0MPa	JIS K 7058
Poisson ratio	0.41	JIS K 7161

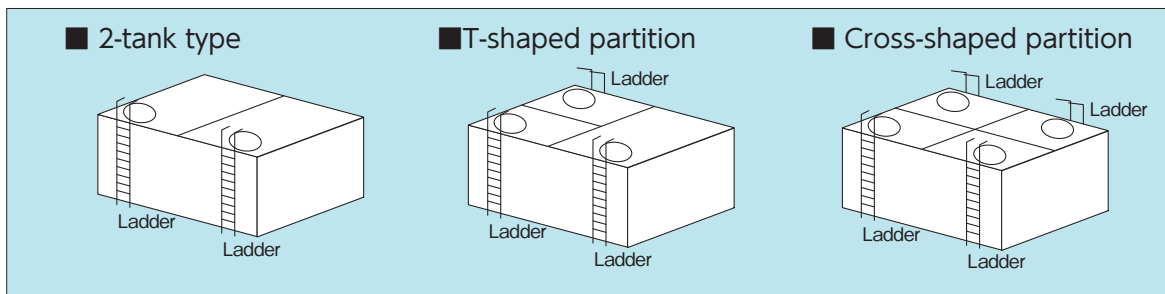
* The data are actual values of the samples and are not a guarantee level.

Optional Designs

Special Order Specifications

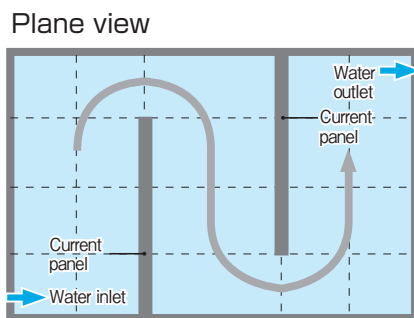
A tank separated into two or more sections allows users to perform internal inspections and cleaning of the tank without stopping the water supply.

Note: When cleaning the inside of one section of a tank that is separated into two sections, lower the water level of the other section to half or less. If you will only use one section of the tank for more than 1 week, you will need to take additional measures.



*Current panels

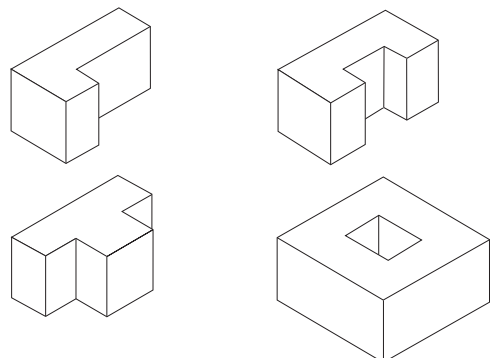
You can set up Current panels to avoid the occurrence of stagnant water in a large tank. Note, however, that the current panels will be set up parallel to the partitions if the tank has partitions.



*shape tanks

Note that we cannot produce some shape tanks depending on the height, size, and shape of the tank.

● Since it is not possible for us to produce some shape tanks depending on its height, contact us when you wish to order shape tanks.



Panel Types

① Side wall panels

1×1m (for single levels and the upper levels in multi-level stacking)	1×1m (for the middle and lower levels in multi-level stacking)	1×1m (for piping)	0.5×1m
1×1.5m	0.5×1.5m	1×2m	0.5×2m

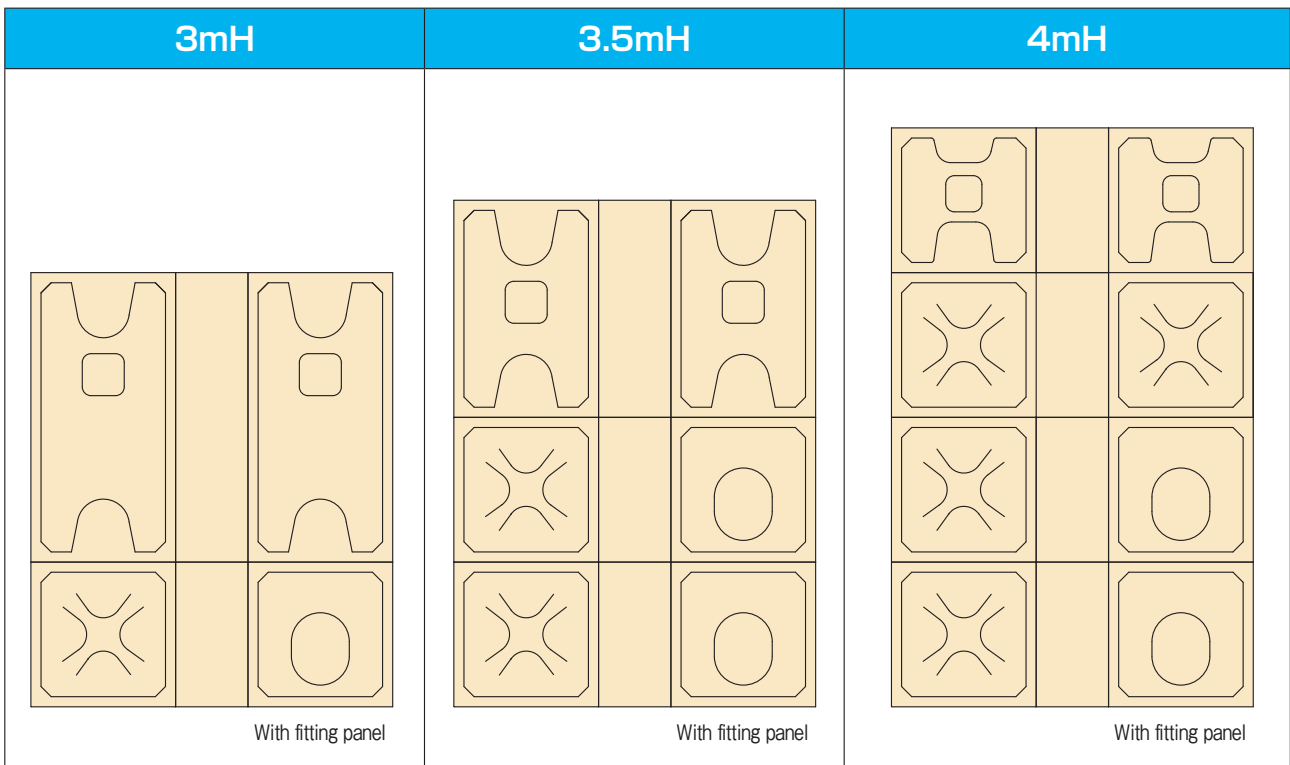
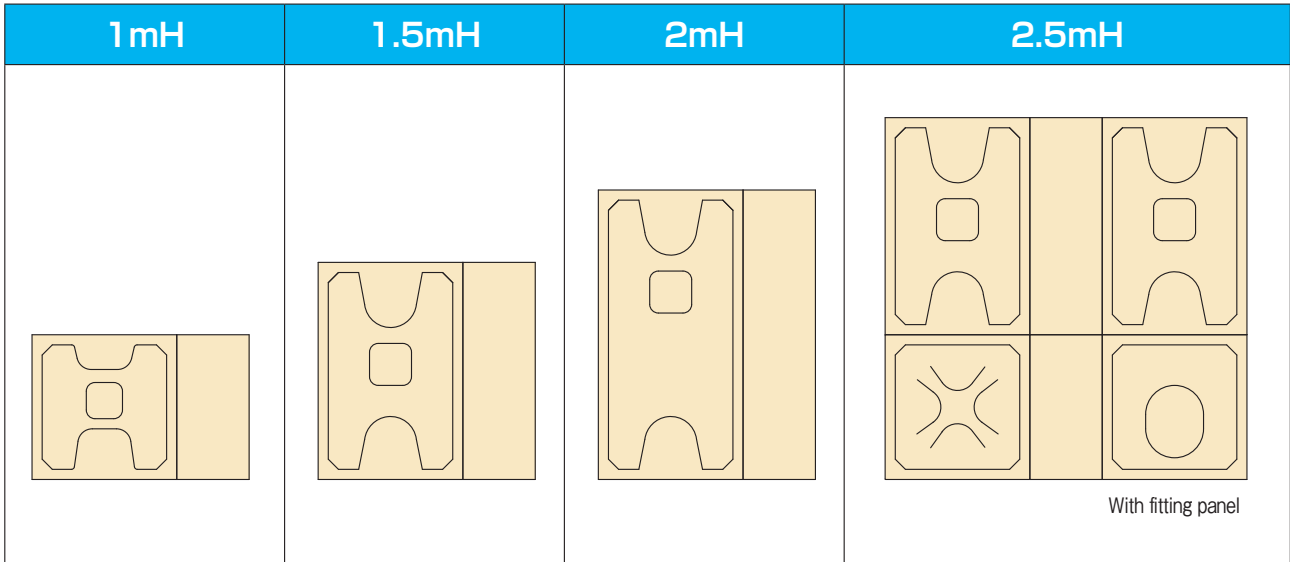
② Roof panels

1×1m	Manhole	0.5×1m	0.5×1m	0.5×0.5m

③ Bottom panels

1×1m <small>*Differs depending on the specifications.</small>	Drainage panel	0.5×1m	0.5×1m	0.5×0.5m

Panel Assembly


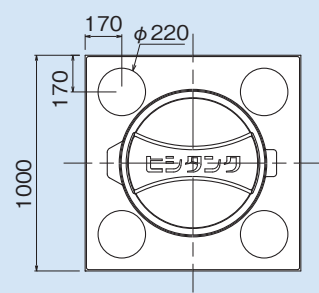
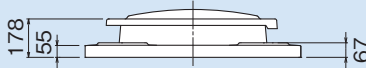
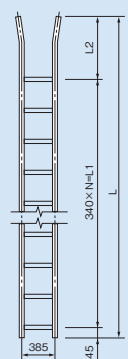

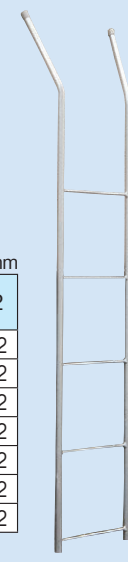
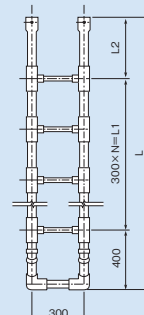



Precautions


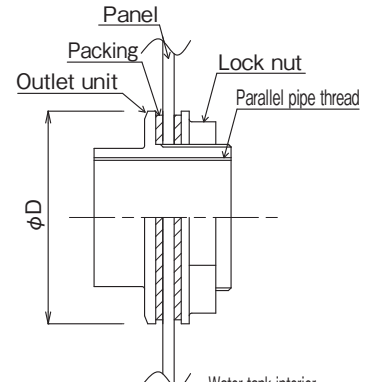
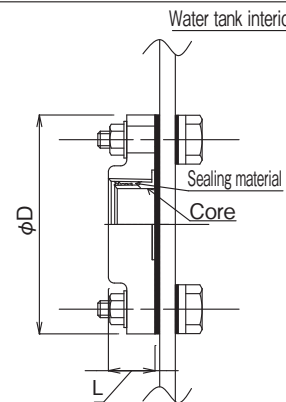
This shows the basic side wall panel assembly.
The panels and reinforcement material used may change depending on the specifications.

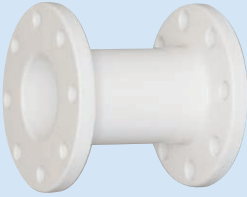
Standard Parts

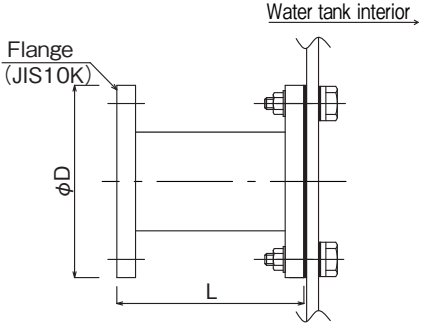
Note: Specifications and shapes may change without prior notice for improvement purposes.


Manhole	External ladder	Internal ladder																																																																																
<p>Unit: mm</p>   	<p>Unit: mm</p>    <table border="1"> <thead> <tr> <th>Tank height</th> <th>L</th> <th>N</th> <th>L1</th> <th>L2</th> </tr> </thead> <tbody> <tr><td>1.0</td><td>1597</td><td>2</td><td>680</td><td>872</td></tr> <tr><td>1.5</td><td>2097</td><td>4</td><td>1360</td><td>692</td></tr> <tr><td>2.0</td><td>2597</td><td>5</td><td>1700</td><td>852</td></tr> <tr><td>2.5</td><td>3117</td><td>7</td><td>2380</td><td>692</td></tr> <tr><td>3.0</td><td>3617</td><td>8</td><td>2720</td><td>852</td></tr> <tr><td>3.5</td><td>4137</td><td>10</td><td>3400</td><td>692</td></tr> <tr><td>4.0</td><td>4637</td><td>11</td><td>3740</td><td>852</td></tr> </tbody> </table> <p>Material: SS hot-dip galvanized *A tank height of 1 m is available as an option. *Stainless steel material is available as an option.</p>	Tank height	L	N	L1	L2	1.0	1597	2	680	872	1.5	2097	4	1360	692	2.0	2597	5	1700	852	2.5	3117	7	2380	692	3.0	3617	8	2720	852	3.5	4137	10	3400	692	4.0	4637	11	3740	852	<p>Unit: mm</p>   <table border="1"> <thead> <tr> <th>Tank height</th> <th>L</th> <th>N</th> <th>L1</th> <th>L2</th> </tr> </thead> <tbody> <tr><td>1.0</td><td>965</td><td>1</td><td>300</td><td>265</td></tr> <tr><td>1.5</td><td>1465</td><td>2</td><td>600</td><td>465</td></tr> <tr><td>2.0</td><td>1965</td><td>4</td><td>1200</td><td>365</td></tr> <tr><td>2.5</td><td>2467</td><td>6</td><td>1800</td><td>267</td></tr> <tr><td>3.0</td><td>2967</td><td>7</td><td>2100</td><td>467</td></tr> <tr><td>3.5</td><td>3467</td><td>9</td><td>2700</td><td>367</td></tr> <tr><td>4.0</td><td>3967</td><td>11</td><td>3300</td><td>267</td></tr> </tbody> </table> <p>Material: Polyvinyl chloride *A tank height of 1 m is available as an option.</p>	Tank height	L	N	L1	L2	1.0	965	1	300	265	1.5	1465	2	600	465	2.0	1965	4	1200	365	2.5	2467	6	1800	267	3.0	2967	7	2100	467	3.5	3467	9	2700	367	4.0	3967	11	3300	267
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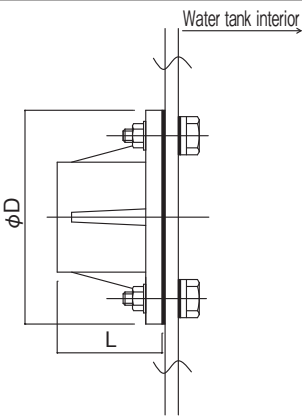
Note: Specifications and shapes may change without prior notice for improvement purposes.

Socket	With PVC core																
 <p>Material: Copper alloy casting (CAC) Size: 15 A to 65 A A ball valve (screw-type) can be attached.</p> <table border="1"> <thead> <tr> <th>Nominal diameter</th> <th>φD</th> </tr> </thead> <tbody> <tr><td>15</td><td>40</td></tr> <tr><td>20</td><td>50</td></tr> <tr><td>25</td><td>60</td></tr> <tr><td>32</td><td>70</td></tr> <tr><td>40</td><td>80</td></tr> <tr><td>50</td><td>90</td></tr> <tr><td>65</td><td>120</td></tr> </tbody> </table>	Nominal diameter	φD	15	40	20	50	25	60	32	70	40	80	50	90	65	120	 
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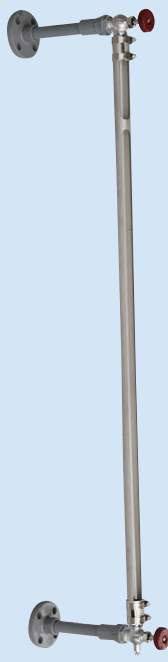

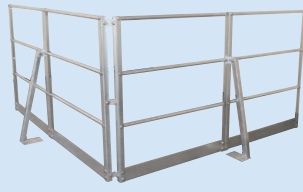

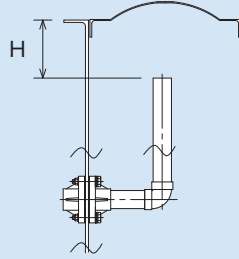
Both end flange			
 <p>Water inlet, water outlet, overflow outlet, drainage outlet Material : Cast iron nylon powder coating Size : 20 A to 200 A</p>	Unit: mm		
	Nominal diameter	φD	L
	20	100	150
	25	125	
	32	135	
	40	140	
	50	155	
	65	175	180
	80	185	
	100	210	
125	250		
150	280		
200	330	250	



TS flange						
 <p>Material : Polyvinyl chloride Size : 15 A to 300 A</p>	Unit: mm					
	Nominal diameter	φD	L	Nominal diameter	φD	L
	15	95	35	80	185	73
	20	100	40	100	210	93
	25	125	46	125	250	114
	32	135	50.5	150	280	142
	40	140	61.5	200	330	161
	50	155	71	250	400	167
	65	175	70	300	445	167



Optional parts

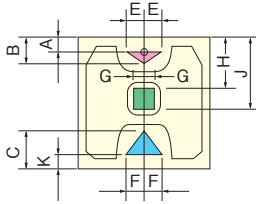
Water Level Indicator	Hoop guard (outer ladder with backrest)	Ceiling handrail
 <p>With protective pipe</p>	 <p>Material : SS hot-dip galvanized</p>	 <p>Material: SS hot-dip galvanized *Available in different sizes depending on the combination.</p>
		<div style="background-color: #00a0e3; color: white; padding: 5px; text-align: center;">TS flange with up pipe</div>  <p>Material: Polyvinyl chloride Size: 15 A to 300 A</p> <p>*When gauging the overflow side height of the overflow outlet riser, refer to the table below (differs by water tank height.)</p> 

Pipe Fitting Positions

Side wall panels

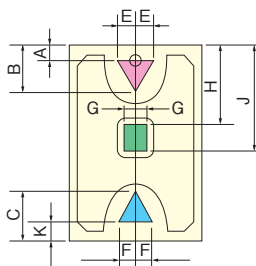
* All measurements below are to the fitting pipe center.

- Tank height : 1mH



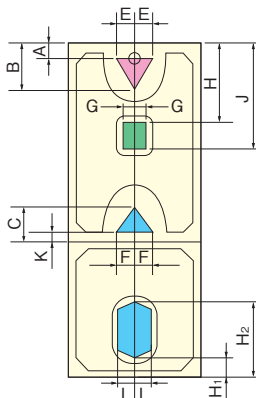
Outlet type	Pipe outlet for ball valves			Double-sided flange, TS flange, screw flange with core									
	Water inlet			Water inlet, overflow outlet, etc.			Overflow inlet (with riser), etc.			Water outlet etc.			
fitting position	A	B	E	A	B	E	G	H	J	K	C	F	
Pipe diameter (A)	15	100	215	130	120	190	105	75	380	530	120	300	105
	20	105	210	125	120	190	105	75	380	530	120	300	105
	25	110	205	120	135	175	90	60	390	515	135	285	90
	32	115	200	115	140	170	85	55	400	510	140	280	85
	40	120	195	110	140	170	85	55	400	510	140	280	85
	50	125	190	105	150	160	75	45	410	500	150	270	75
	65	130	185	100				35	420	490	160	260	65
	80							30	425	485	165	255	60
	100							20	435	475	175	245	50
	125							0	455	455	195	225	30
	150										210	210	15
200													

- Tank height : 1.5mH
- Tank height : 2mH



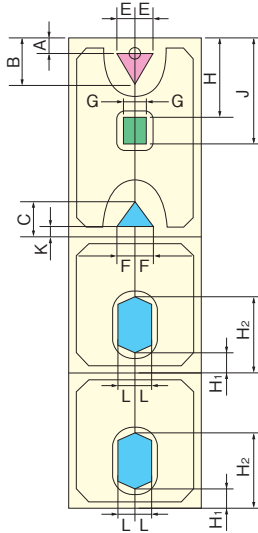
Outlet type	Pipe outlet for ball valves			Double-sided flange, TS flange, screw flange with core									
	Water inlet			Water inlet, overflow outlet, etc.			Overflow inlet (with riser), etc.			Water outlet etc.			
fitting position	A	B	E	A	B	E	G	H	J	K	C	F	
Pipe diameter (A)	15	100	425	185	120	385	160	95	610	800	120	385	160
	20	105	420	180	120	385	160	95	610	800	120	385	160
	25	110	415	175	135	370	145	80	620	790	135	370	145
	32	115	410	170	140	365	140	75	630	780	140	365	140
	40	120	405	165	140	365	140	75	630	780	140	365	140
	50	125	400	160	150	355	130	65	640	770	150	355	130
	65	130	395	155	160	345	120	55	650	760	160	345	120
	80				165	340	115	50	655	755	165	340	115
	100				175	330	105	40	665	745	175	330	105
	125				195	310	85	20	685	725	195	310	85
	150				210	295	60	0	700	710	210	295	60
200													

- Tank height : 2.5mH
- Tank height : 3mH



Outlet type	Pipe outlet for ball valves			Double-sided flange, TS flange, screw flange with core												
	Water inlet			Water inlet, overflow outlet, etc.			Overflow inlet (with riser), etc.			Water outlet etc.						
fitting position	A	B	E	A	B	E	G	H	J	K	C	F	H ₁	H ₂	L	
Pipe diameter (A)	15	100	425	185	120	385	160	95	610	800	120	385	160	200	600	150
	20	105	420	180	120	385	160	95	610	800	120	385	160	200	600	150
	25	110	415	175	135	370	145	80	620	790	135	370	145	215	585	135
	32	115	410	170	140	365	140	75	630	780	140	365	140	220	580	130
	40	120	405	165	140	365	140	75	630	780	140	365	140	220	580	130
	50	125	400	160	150	355	130	65	640	770	150	355	130	230	570	120
	65	130	395	155	160	345	120	55	650	760	160	345	120	240	560	110
	80				165	340	115	50	655	755	165	340	115	245	555	105
	100				175	330	105	40	665	745	175	330	105	255	545	95
	125				195	310	85	20	685	725	195	310	85	275	525	75
	150				210	295	70	0	700	710	210	295	60	290	510	60
200													315	485	35	
250													350	450	0	

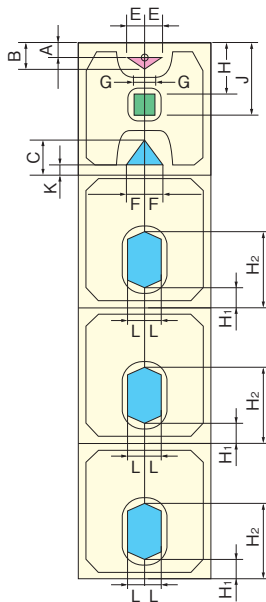
● Tank height : 3.5mH



unit:mm

Outlet type	Double-sided flange, TS flange, screw flange with core															
	Pipe outlet for ball valves			Water inlet			Water inlet, overflow outlet, etc.			Overflow inlet (with riser), etc.			Water outlet etc.			
fitting position	A	B	E	A	B	E	G	H	J	K	C	F	H ₁	H ₂	L	
Pipe diameter (A)	15	100	425	185	120	385	160	95	610	800	120	385	160	200	600	150
	20	105	420	180	120	385	160	95	610	800	120	385	160	200	600	150
	25	110	415	175	135	370	145	80	620	790	135	370	145	215	585	135
	32	115	410	170	140	365	140	75	630	780	140	365	140	220	580	130
	40	120	405	165	140	365	140	75	630	780	140	365	140	220	580	130
	50	125	400	160	150	355	130	65	640	770	150	355	130	230	570	120
	65	130	395	155	160	345	120	55	650	760	160	345	120	240	560	110
	80				165	340	115	50	655	755	165	340	115	245	555	105
	100				175	330	105	40	665	745	175	330	105	255	545	95
	125				195	310	85	20	685	725	195	310	85	275	525	75
150				210	295	60	0	700	710	210	295	60	290	510	60	
200				Does not fit. Use a flat panel.									315	485	35	
250				Does not fit. Use a flat panel.									350	450	0	

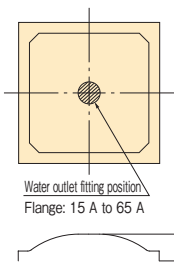
● Tank height : 4.0mH



unit:mm

Outlet type	Double-sided flange, TS flange, screw flange with core															
	Pipe outlet for ball valves			Water inlet			Water inlet, overflow outlet, etc.			Overflow inlet (with riser), etc.			Water outlet etc.			
fitting position	A	B	E	A	B	E	G	H	J	K	C	F	H ₁	H ₂	L	
Pipe diameter (A)	15	100	215	130	120	190	105	75	380	530	120	300	105	200	600	150
	20	105	210	125	120	190	105	75	380	530	120	300	105	200	600	150
	25	110	205	120	135	175	90	60	390	515	135	285	90	215	585	135
	32	115	200	115	140	170	85	55	400	510	140	280	85	220	580	130
	40	120	195	110	140	170	85	55	400	510	140	280	85	220	580	130
	50	125	190	105	150	160	75	45	410	500	150	270	75	230	570	120
	65	130	185	100				35	420	490	160	260	65	240	560	110
	80							30	425	485	165	255	60	245	555	105
	100							20	435	475	175	245	50	255	545	95
	125							0	455	455	195	225	30	275	525	75
150										210	210	15	290	510	60	
200													315	485	35	
250													350	450	0	

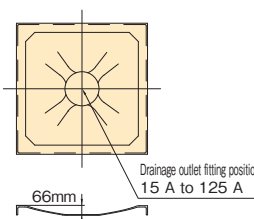
● Bottom panel (1 × 1 m)



Double-sided flange: 20 A to 65 A,
TS flange: 15 A to 65 A,
screw flange with core: 20 A to 65 A

*Please note that the panel center part has a bulge.
*It can only be attached to bottom panels, drainage panel sets, and panel centers. Panel partition is required if attaching to parts other than panel centers, or if attaching flanges with diameters other than those listed above.

● Drainage panel (1 × 1 m)



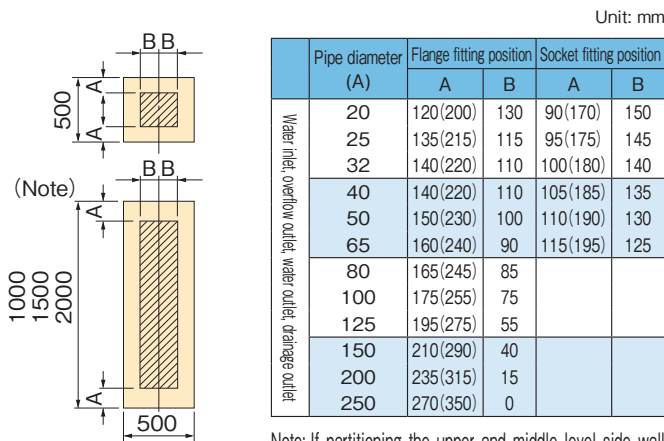
Double-sided flange: 20 A to 125 A,
TS flange: 15 A to 125 A,
screw flange with core: 20 A to 125 A

*Water tanks with a tank height of 3 mH horizontal seismic intensity 2.0 G specification, 3.5 mH, and 4 mH water tanks cannot use drainage panels, so panel partition is required and flat panels must be attached.

Pipe Fitting positions

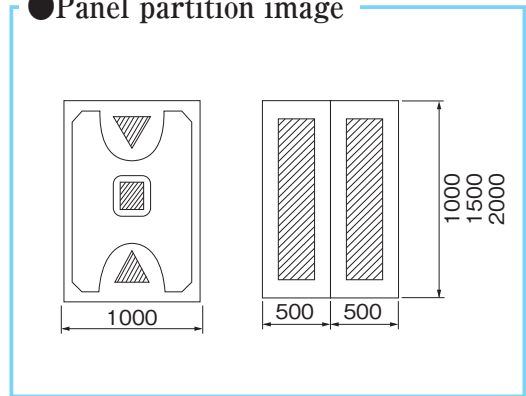
Flat panel

These are the mountable ranges for 0.5-m-width panel parts. They are the same for each side wall height, ceiling, and floor panel. With panel partition (0.5-m-width double panel specification), the mountable range increases compared to the 1-m-width single panel specification. (Additional fees apply.)



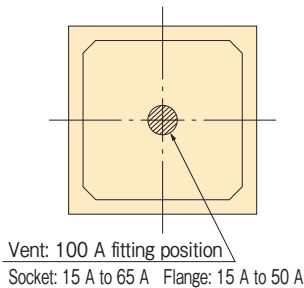
Note: If partitioning the upper and middle level side wall panels (width: 1.0 m) into two 0.5-m-width panels to attach flanges for water tanks with a height in the range of 2.0 mH to 3.0 mH, refer to the numbers in parentheses in column A in the above table.

Panel partition image



Ceiling parts

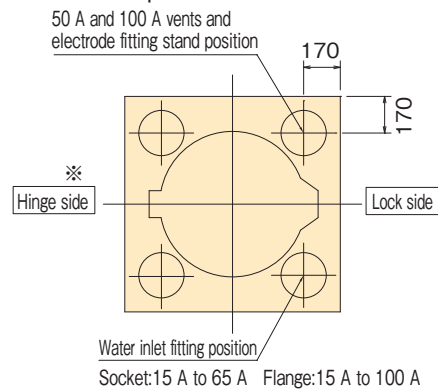
● Ceiling panel (1 × 1 m)



- Vent: 50 A and 100 A
- Electrode fitting stand
- Ball valve screw socket:15 A to 65 A
- Double-sided flange:20 A to 50 A
- TS flange:15 A to 50 A
- Screw flange with core: 20 A to 50 A

*Can only be attached to panel centers.
*Panel partition is required if attaching to parts other than panel centers, or if attaching flanges with diameters of 65 A or more.

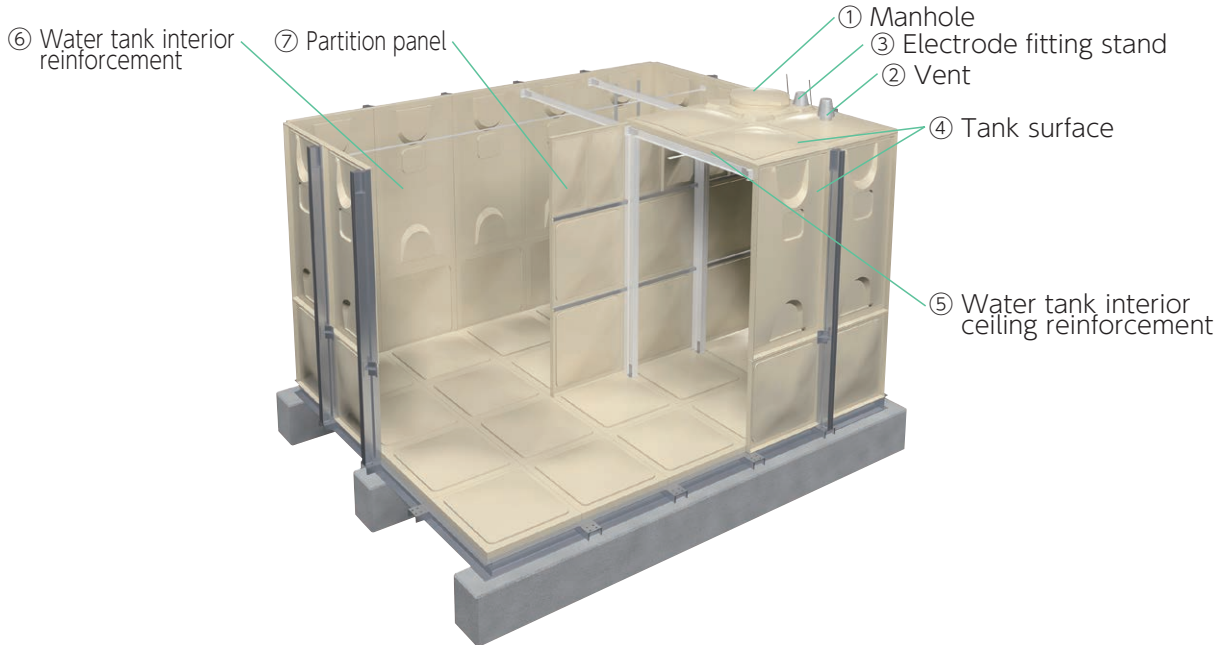
● Manhole panel (1 × 1 m)



- Ball valve screw socket:15 A to 65 A
- Double-sided flange:20 A to 100 A,
- TS flange:15 A to 100 A,
- screw flange with core:20 A to 100 A

* If you attach a flange of 80 A or more on the manhole hinge side, it becomes difficult to open the manhole. Please be aware of the manhole's opening direction.

Maintenance



	Problem to repair	Measures
① Manhole	① Deteriorated packing	① Replace the packing. *Our manhole packings come in two types: the manhole neck cover type (old type) and the lid plastered type (current model). Please carefully confirm the specifications.
	② Broken hinges	② Replace the fittings. *Depending on the extent of damage, the entire manhole may need to be replaced. Please carefully confirm the parts in the diagram. *Manhole fitting varies by manhole specifications (old type or current type). Please carefully confirm the diagram.
② Vent	Torn insect net	•Replace the vent. *There are four types in total: the 50 A type and 100 A type for each of the two models (old and current). Please carefully confirm the specifications shown in the diagram. *We do not offer replacement of insect nets only. Please replace the entire vent. *GRP water tanks require lining work. Please contact us for details.
③ Electrode	Cracked electrode stand cover	•Replace the electrode cover. *There are two models: the old model and the current model. Please carefully confirm the specifications in the diagram. For the current model, we do not accept orders of covers only.
④ Surface	Exposed, blackened glass fiber	Please consider performing coating.
⑤ Ceiling reinforcement	Rusted ceiling reinforcement	This component is crucial to maintain durability. If the rusted part is left to deteriorate, it may rupture and damage the water tank. Repair or replacement will be required, so please contact us.
⑥ Water tank interior reinforcement	Rusted internal stay and brace pipes	This component is crucial to maintain durability. If the rusted part is left to deteriorate, it may rupture and damage the water tank. Repair or replacement will be required, so please contact us.
⑦ Partition panel	•Cracking •Leakage	If you drain water in a tank and clean it when it has cracks, it may destroy the partition, which can be hazardous. The tank must be repaired before it can be used again, so please contact us. Even if there are no cracks, when cleaning a tank, ensure that the water levels of all other tanks are less than half full.

GRP water tank repair model

"Early detection of defects and early measures are crucial."

We recommend cleaning and inspecting GRP water tanks at least once a year. We also recommend replacing parts as follows.

Water tank repair model (designed service life of water tank unit: 15 years)

● : Replace (manufacturer recommendation)

Years elapsed	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Periodic inspection	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Manhole cover, packing					●					●					
Vent					●					●					
Electrode cover								●							
Emergency shut-off valve control panel battery			●			●			●			●			
Main unit coating								●							
Main unit renovation															●

* Adjust bolts, replace reinforcements, and perform other necessary repairs as needed according to inspection results.

Notes on Cleaning the Tank

- For safety purposes, when cleaning the inside of one section of a tank that is separated into two or more sections, lower the water level of the other sections to half or less.
- The elevated portion of the panels may be slippery, so be careful when walking on the roof or bottom panels for cleaning. Walk on the outer flat portion of each panel.
- Never remove the internal and external reinforcement members.
- When cleaning the tank, follow the rules and regulations of the country where the tank is located and always keep safety in mind.

Tank Diagnosis

We design our GRP water tanks with a useful life-span of 15 years based on the GRP water tank structure design calculation method. However, this useful life is based on the assumption that the user performs maintenance and inspections properly.

Since an GRP water tank may have problems such as water leakage or cracks due to age deterioration after 15 years of use, we recommend that you diagnose the level of deterioration based on the tank diagnosis checklist to promptly renovate it or replace it with a new one.

Inspection Points and Precautions

Maintenance Inspection, Renovation, and Replacement

Maintenance Inspection Items

Periodic inspection (once or twice a year)

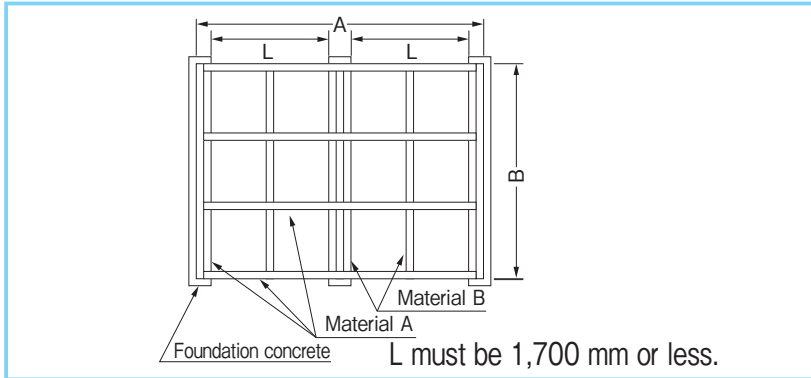
Inspection item	Remarks
Cleaning of the inside of the tank	Clean the tank with water to remove dust, foreign matter, rust, and scales, etc.
Loose or missing bolts that secure the internal reinforcement members	Tighten the bolts securely if they are loose. Replace them with new ones if necessary.
Inspection of the metal members including the external frames, outside ladder, and connecting nuts and bolts	Check for peeling paint and plating, rust, and loose bolts/nuts. Paint the relevant items in a systematic manner.

Regular inspection (once a month)

Inspection item	Remarks
Operation of the water-level control equipment and the alarm system	In particular, check whether the alarm system works well.
Blocking of the ventilation holes, overflow holes, and other holes	Immediately remove any objects that are blocking the holes.
Sealing condition of the manhole lid	Lock the manhole lid.
Abnormal deformation of the tank body	Contact your local agent.
Application of pressure (internal/external) other than hydrostatic pressure	If any pressure other than hydrostatic pressure is being applied, remove it immediately.

Frame/Foundation

Level frame Select materials according to the water tank's earthquake-resistant properties.



● Table 2: Frame material list

(Standard foundation pitch with an interior distance of 1,700 mm) Unit: mm

Horizontal seismic intensity		1.0
Tank height	Material A	[100 × 50 × 5
	Material B	L65 × 65 × 6
1.0m	Material A	[125 × 65 × 6
	Material B	[75 × 40 × 5
1.5m	Material A	[125 × 65 × 6
	Material B	[75 × 40 × 5
2.0m	Material A	[150 × 75 × 6.5
	Material B	[75 × 40 × 5
2.5m	Material A	[150 × 75 × 6.5
	Material B	[75 × 40 × 5
3.0m	Material A	[150 × 75 × 6.5
	Material B	[75 × 40 × 5

Frame description

- 1.The basic frame for the HISHITANK™ G Panel Type is a grid pattern shape.
- 2.Basic frame dimensions for full-sized panels are 1,002 mm pitch, and half-sized panels are 502 mm pitch.
- 3.The concrete foundation width should be 400 mm, and the height should be 500 mm.
- 4.The frame's external dimensions are as shown in Table 1.
- 5.The standard materials used for the frame (concrete foundation pitch with an interior distance of 1,700 mm or less) are as shown in Table 2 (frame material table). Concrete foundation pitch with an interior distance of over 1,700 mm is as shown in Table 3 (frame material table).

● Table 1: External dimensions of the level frame (A or B) Unit: mm

Nominal dimensions	External dimensions (A or B)	Nominal dimensions	External dimensions (A or B)	Nominal dimensions	External dimensions (A or B)
1,000	1,104	4,500	4,612	8,000	8,118
1,500	1,606	5,000	5,112	8,500	8,620
2,000	2,106	5,500	5,614	9,000	9,120
2,500	2,608	6,000	6,114	9,500	9,622
3,000	3,108	6,500	6,616	10,000	10,122
3,500	3,610	7,000	7,116		
4,000	4,110	7,500	7,618		

Note: The external dimensions of the 1.0-mH frame are the values listed above minus 30 mm.
The external dimensions of the 2.0-mH frame are the values listed above plus 20 mm.
The external dimensions of the 2.5-mH and 3.0-mH frames are the values listed above plus 20 mm.

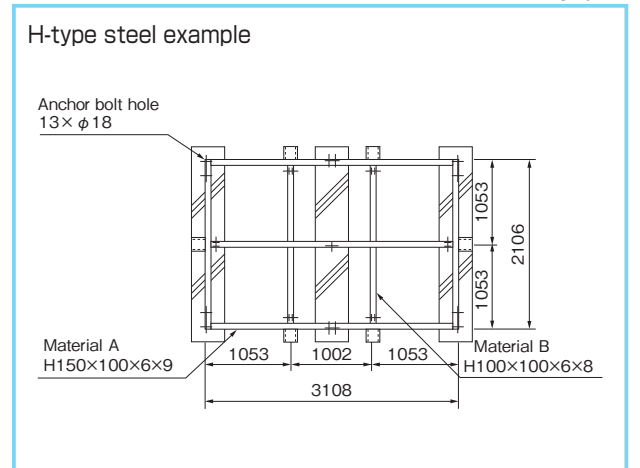
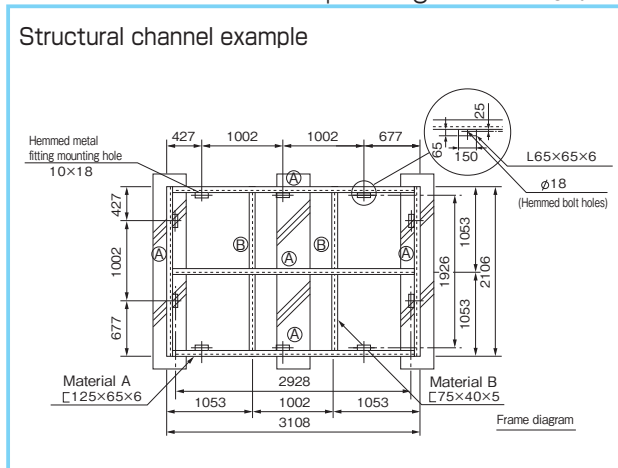
● Table 3: Frame material list

(If the interior distance of the standard foundation pitch is over 1,700 mm) Unit: mm

Tank height	Horizontal seismic intensity	1.0
	Foundation interior distance	
1.0	1700 < L ≤ 2000	[125 × 65 × 6
	2000 < L ≤ 2500	[150 × 75 × 6.5
	2500 < L ≤ 3000	[180 × 75 × 7
1.5	1700 < L ≤ 2000	[150 × 75 × 6.5
	2000 < L ≤ 2500	H150 × 100 × 6 × 9
	2500 < L ≤ 3000	H194 × 150 × 6 × 9
2.0	1700 < L ≤ 2000	[150 × 75 × 6.5
	2000 < L ≤ 2500	H200 × 100 × 5.5 × 8
	2500 < L ≤ 3000	H194 × 150 × 6 × 9
2.5	1700 < L ≤ 2000	[180 × 75 × 7
	2000 < L ≤ 2500	H200 × 100 × 5.5 × 8
	2500 < L ≤ 3000	H300 × 150 × 6.5 × 9
3.0	1700 < L ≤ 2000	[180 × 75 × 7
	2000 < L ≤ 2500	H194 × 150 × 6 × 9
	2500 < L ≤ 3000	H300 × 150 × 6.5 × 9

*Due to the anchor casting, you may need to increase the number of foundations depending on the water tank size.
Note: The above only shows Material A. For Material B, please refer to the Table 2 specifications.

● Standard frame example diagrams



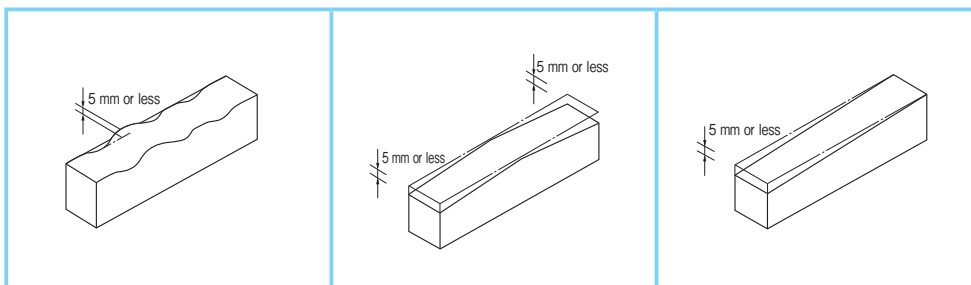
Concrete foundation intervals (Standard)

Unit: mm

Concrete Foundation	Tank length (longest)	1.0mH			1.5mH, 2.0mH			2.5mH, 3.0mH		
		L	A	B	L	A	B	L	A	B
	1000	1034	—	—	1044	—	—	1064	—	—
	1500	1536	—	—	1546	—	—	1566	—	—
	2000	2036	—	—	2046	—	—	2066	—	—
	2500	2538	1519	1019	2548	1524	1024	2568	1534	1034
	3000	2538	1519	1019	3048	1524	1524	3068	1534	1534
	3500	3540	1770	1770	3550	1775	1775	3570	1785	1785
	4000	4040	2020	2020	4050	2025	2025	4070	2035	2035
	4500	4542	1512	1518	4552	1517	1518	4572	1517	1518
	5000	5042	1679	1684	5052	1684	1684	5072	1694	1684
	5500	5544	1846	1852	5554	1851	1852	5574	1861	1852
	6000	6044	2013	2018	6054	2018	2018	6074	2028	2018
	6500	6546	1634	1639	6556	1639	1639	6576	1524	1764
	7000	7046	1759	1764	7056	1764	1764	7076	1774	1764
	7500	7548	1885	1889	7558	1890	1889	7578	1900	1889
	8000	8048	2010	2014	8058	2015	2014	8078	2025	2014
	8500	8550	1710	1710	8560	1712	1712	8580	1722	1712
	9000	9050	1807	1812	9060	1812	1812	9080	1822	1812
	9500	9552	1908	1912	9562	1913	1912	9582	1923	1912
	10000	10052	2008	2012	10062	2013	2012	10082	2023	2012

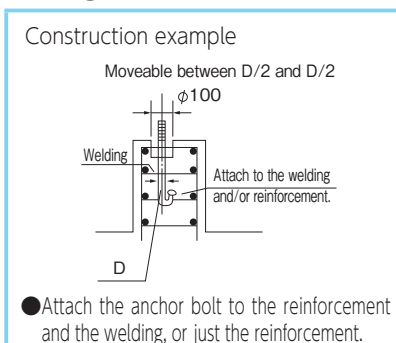
Foundation

● Precision level of finished foundation

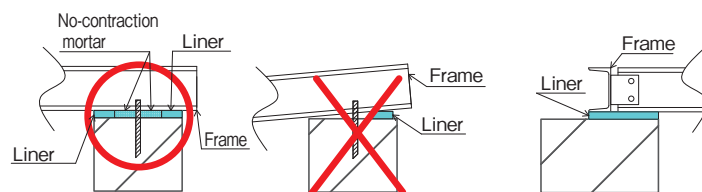


- Foundation width: 400 mm or more
- Foundation height: 500 mm or more
- Ensure the foundation's upper surface has a smooth finish.

● Fixing the anchor bolt and the frame



Adjusting unevenness ● Use liner to adjust the level : fill any gaps with mortar.



- * Put liner on both edges of the foundation.
- * If the frame has a split, use liner on the split part as well.

GRP Heatwater Storage Tanks

Heat-Resistant GRP Panel-Type Thermal Storage Tank / Hot Water Tank

HISHITANK™ U Panel Type

These tanks feature a cold and heat-resistant design that can withstand a maximum temperature of 80°C. The seal packing uses EPDM rubber, which is highly resistant to heat and corrosion. Excellent heat insulation is achieved with an especially effective heat insulating material. It has been designed to have strong heat-resistant properties.



Since we began sales of thermal storage tanks in 1987, we have earned a track record of achievements and the trust of customers by answering society's needs for energy efficiency and environmental friendliness. The HISHITANK™ U Panel Type has a high reputation for its excellent heat-resistant properties, heat storage capability, and ability to store both cold and hot water.

* Standard specification according with Japan seismic type.

Specifications

Item	Thermal storage tank/hot water tank specifications
Tank height	1.0 1.5 2.0 2.5 3.0mH
Panel-fastening bolts	Hot-dip galvanized (the vapor phase part uses resin lining bolts & nuts)
Vapor phase steel material	SS 400 + nylon powder coating
Liquid phase steel material	SUS304
Hydrostatic pressure	Water level [m] × 0.01 MPa [0.1 kgf/cm ²]
Design water level	Tank height (designated height) × 0.9
Snow accumulation	0.6 × 10 ⁻³ MPa [60 kgf/m ²] (vertical snow accumulation: 30 cm)
Wind pressure	1160 N/m ² (load considering major urban area factors based on the Building Standards Act revised in 2000)
Illumination factor	0.1% or less
Max water temperature	80 °C
Water quality (pH)	5.8 to 8.6

● Precautions

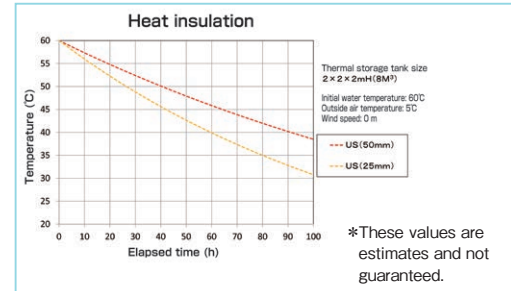
- * Heat Resistant tanks cannot be designed with partitions.
- * We cannot design water tanks exceeding 3.5mH.

Structure

Excellent heat insulation

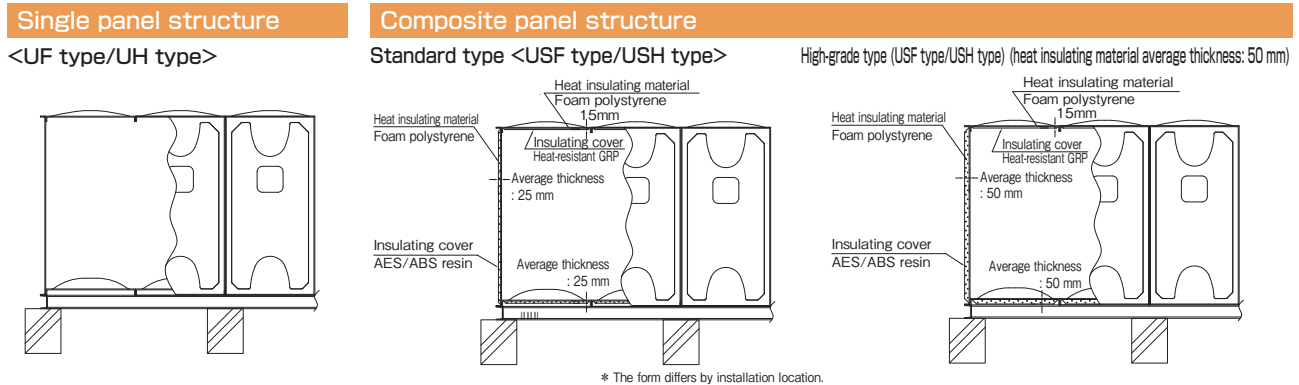
The structure employs heat-resistant panels that can withstand water temperatures of up to 80°C. Highly effective heat insulating materials are used, and two thicknesses (averages of 25 and 50 mm) are available. Heat can be insulated to match the conditions of the environments where it is used, so hot water and spring water can be supplied at all times.

● Heat insulation



Heat resistance specifications

Two types of heat insulating materials are available: 25mm average insulation and 50mm average insulation. Either can be selected depending on the usage purpose.



● Specifications

Application	Hot spring tank design specifications: GRP	Cold spring tank design specifications: GRP	Thermal storage tank/hot water tank specifications: GRP	Thermal storage tank/hot water tank specifications: SUS
Tank height	1.0 1.5 2.0 2.5 3.0mH			
Panel-fastening bolts	Hot-dip galvanized (the vapor phase part uses resin lining bolts & nuts)		Hot-dip galvanized or SUS 304 (optional) (the vapor phase part uses resin lining bolts & nuts)	SUS 304 (the vapor phase part uses resin lining bolts & nuts)
Vapor phase steel material	SS 400 + nylon powder coating			SUS 304 + nylon powder coating
Liquid phase steel material	SUS 304 + nylon powder coating		SUS304	
Hydrostatic pressure	Water level [m] × 0.01 MPa [0.1 kgf/cm ²]			
Design water level	Tank height (designated height) × 0.9			
Earthquake resistance	Horizontal seismic intensity by design: $K_H = 1.0, 1.5$ / vertical seismic intensity by design = horizontal seismic intensity by design × 1/2 Sloshing design velocity response spectrum value: $S_v = 150, 375 \text{ cm/sec}$			
Snow accumulation	$0.6 \times 10^{-3} \text{ MPa}$ [60kgf/m ²] (vertical snow accumulation: 30 cm)			
Wind pressure	1160N/m ² (load considering major urban area factors based on the Building Standards Act revised in 2000)			
Max water temperature	80°C	Room temperature (30°C)	80°C	
Illumination factor	0.1% or less			
Water quality (pH)	4 to 10 (Please consult with us if it will exceed 10.)	5.8 to 8.6		

GRP Seawater Storage Tanks

Rust-resistant with excellent sanitation properties

We began sales of GRP water tanks in 1962.

Since then, we have earned our customers' trust by constantly improving our technologies as a pioneer in GRP tank manufacturing.

We developed the Seawater HISHITANK™ using the technology and know-how we have accumulated over the past 40 years.

Please contact us to consult about your needs.



* Standard specification according with Japan seismic type.

● Specifications

Item	Seawater tank design specifications
Tank height	1.0 1.5 2.0 2.5 3.0mH
Panel-fastening bolts	Hot-dip galvanized (the vapor phase part uses resin lining bolts & nuts)
Vapor phase steel material	SS 400 + nylon powder coating
Liquid phase steel material	SUS 304 + nylon powder coating
Hydrostatic pressure	Water level [m] × 0.01 MPa [0.1 kgf/cm ²]
Design water level	Tank height (designated height) × 0.9
Snow accumulation	0.6 × 10 ⁻³ MPa [60 kgf/m ²] (vertical snow accumulation: 30 cm)
Wind pressure	1160 N/m (load considering major urban area factors based on the Building Standards Act revised in 2000)
Water temperature	Room temperature (30°C or lower)
Water quality (pH)	5.8 to 8.6
Illumination factor	0.1% or less
Chloride ion concentration	19,000 ppm or less

Enhanced anti-rust performance

In addition to the rust-resistant GRP specification, all interior steel materials use a nylon coating. Its highly rust-resistant properties make this a truly effective seawater tank.



Nylon coating



Non-nylon coating

● Precautions

- * Seawater tanks cannot be designed with partitions.
- * We cannot design water tanks exceeding 3.5mH.

* Seawater tanks cannot be designed with partitions.

memo

memo

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**CAUTION
UPON
USAGE**

- *Please read and understand “operating instruction” before using the water tank.
- *Please proceed with maintenance of water tank in accordance with “Operating Instruction” provided by our company.
- *Damage to water tank may be caused if modification or change is made to it. If any modification or change is necessary, please call upon us.
- *If any damage to the water tank is found by the periodical inspection, please be sure to contact our distributor for determining if repair is necessary, etc. If any damage or accident is caused by the continued use of water tank as it is or just by an emergency repair, it would fall into the it would not be covered by the warranty.

- The information and data contained in this brochure are as of August, 2018.
- The content of this brochure may be changed without prior notice.
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