



GRP/FRP SECTIONAL WATERTANK



**PIPECO
INDUSTRIES**





Pipeco GRP Sectional Water Tank

PIPECO TANKS (KOREA) is a company that specializes in the development and production of GRP Water tanks. Located in Gimhae, Korea our large-scale plant and research center are dedicated to ongoing development and production to lead the industry.

We are specialized in manufacturing and installing GRP tanks and other GRP Products. Our advanced technology has received ISO, WARAS (UK), PSB (SINGAPORE) quality certificates. we have expanded our presence in more than 35 countries and 1 Tank getting completely installed every 24 hours

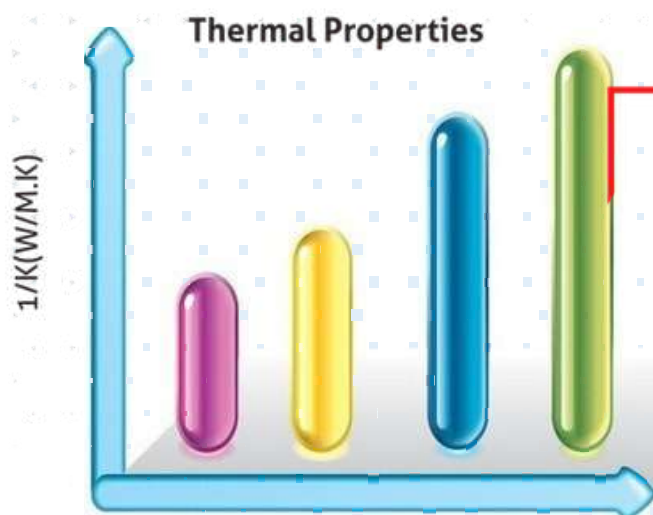
In addition, with a corporate ideology rooted in placing our customers first, we base our Management and Product Development upon this the foundation of trust, contributing to technological innovation, quality improvement, and added enhancement.

To carry out such customer-oriented management, we constantly keep in mind the priorities of stringent quality management and environmental protection. In the following, we adopted ISO product quality and environmental management standards from the very beginning, and our efforts to Growth as an environmentally friendly company along with our customers are never-ending.

We ask for your continuing interest and support kindly share your requirements via email at sales@pipecogroup.com

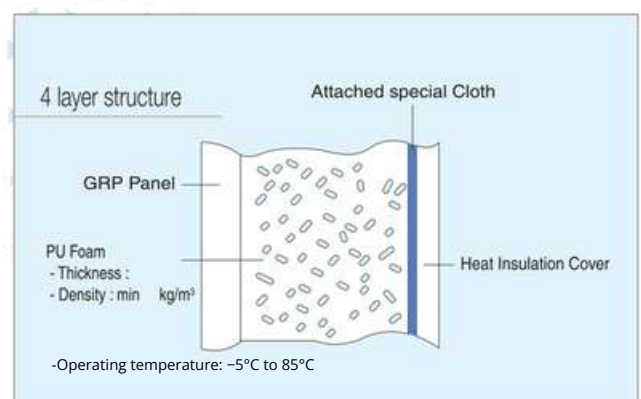
THERMAL CONDUCTIVITY, EXPANSION AND CONTRACTION

Non-insulated panels have 240 times less thermal conductivity than metal, ensuring stable temperature. Modular panels with low thermal coefficient and flexible food grade sealant ensure a leak-free design



PROTECTION AGAINST UV RAYS

Excellent ultraviolet (UV) resistant characteristics and performance ensures high mechanical properties and weather resistance even after 35 years of use



During the time when the water temperature decrease from 85°C to -5°C

General Specifications

STANDARD:

BS EN 13280:2001 and British Standard BS 7491 Part 3:1994

01

MATERIALS:

Sheet Moulding Compound (SMC) consists of below specification Resin - PU Form Conforming to BS 3532 specification Fiber Glass - Low alkali fiberglass conforming to JIS R3411 to R3417 or BS 3396, BS 3496, and BS 3749 specifications.

02

TESTING METHOD:

BS2782

03

MANUFACTURING PROCESS:

Hot pressed SMC compression moulding

04

TANK STRUCTURAL SUPPORT:

External : Hot Dipped Galvanised Steel
Internal : SS316
Roof Support : GRP Pipes

05

SEALANT:

Non-toxic PVC Foam

06

BOLT, NUTS, WASHERS:

External Standard : SS316 / SS304/HDG
Internal Standard : SS316
(In-contact with water)
Roof : Standard : SS316 / SS304

07

LADDER :

External Standard : Hot Dipped Galvanised Steel, 300mm width
Internal : Standard GRP
Optional : SS 304 and 316, 300mm width

08

WATER LEVEL INDICATOR :

Standard : Direct Reading Clear Tube Type
Optional : Reversed Reading Mechanical Ball Float Type (Cat & Mouse)

09

NOZZLE PANEL :

Flat Panels will be provided on request

10

EXTERNAL BRACED SYSTEM :

External : Hot Dipped Galvanized Steel Internal None
(metal free inside, non-partitioned tank only)
Roof Support : GRP Poles

11



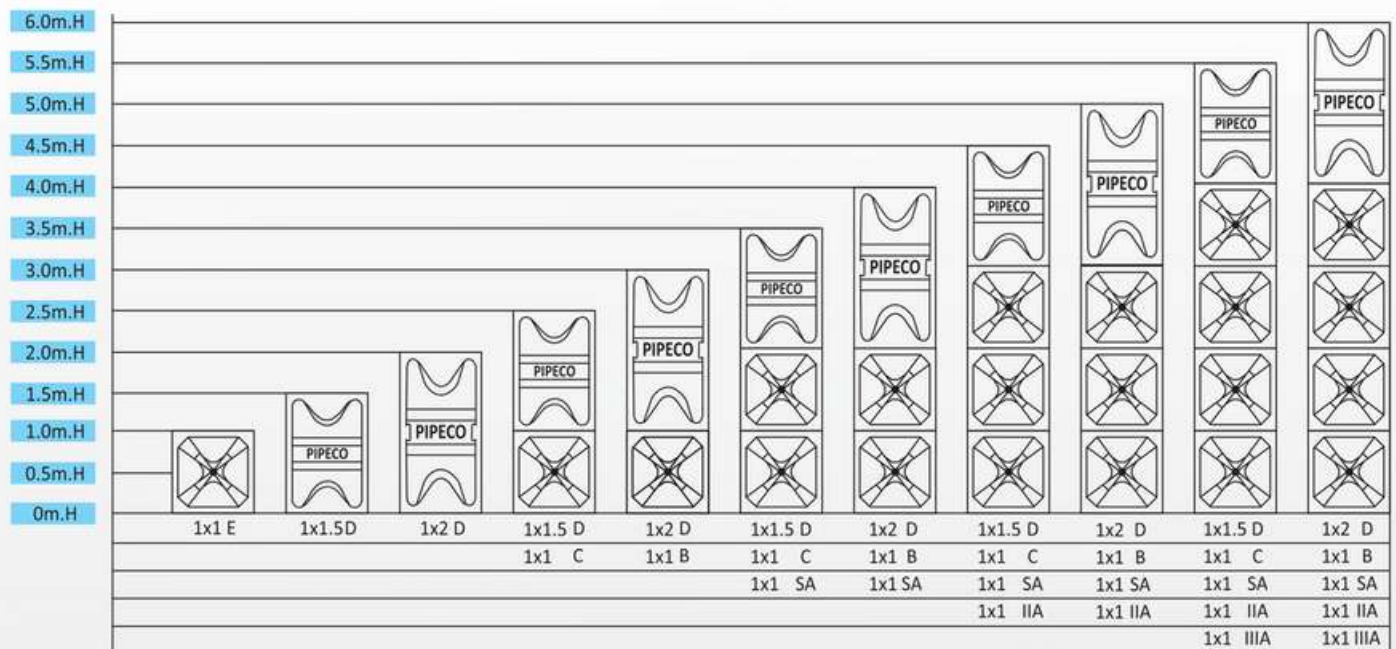
GRP Panel Type and Size

Wall Panel									
1Mx2M	0.5Mx2M	1Mx1.5M	0.5Mx1.5M	1Mx1M	1Mx1M	0.5Mx1M	0.5Mx1M	0.3Mx1M	0.5Mx0.5M

Drain Panel	Base Panel			Roof Panel				Manway Panel
1Mx1M	1Mx1M	0.5Mx1M	0.5Mx0.5M	1Mx2M	1Mx1M	0.5Mx1M	0.5Mx0.5M	1Mx1M

GRP Panel Composition by Height

Height of water tank

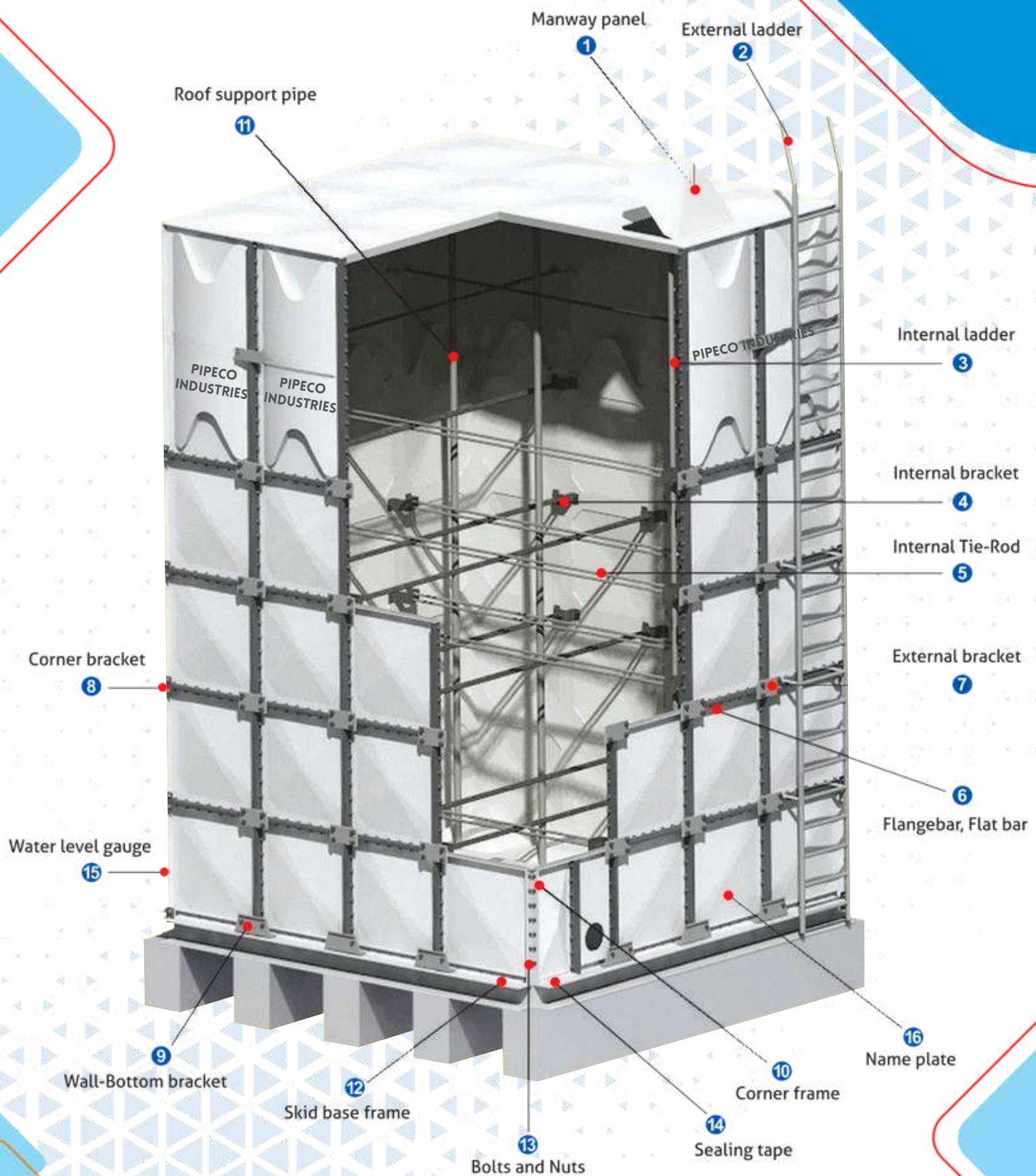


Grade of base panel	E	D	D	C	B	SA	SA	IIA	IIA	IIIA	IIIA
Grade of drain panel	C	C	C	B	SA	SA	IIA	IIA	IIA	IIIA	IIIA
Grade of wall-base panel	Flat, 0.5X1	D	B	B	B	SA	SA	IIA	IIA	IIIA	IIIA
	Flat, 1X1	D	B	B	SA	SA	IIA	IIA	IIA	IIIA	IIIA

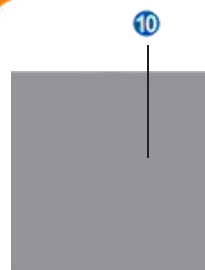
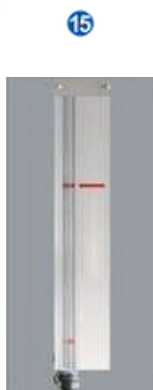
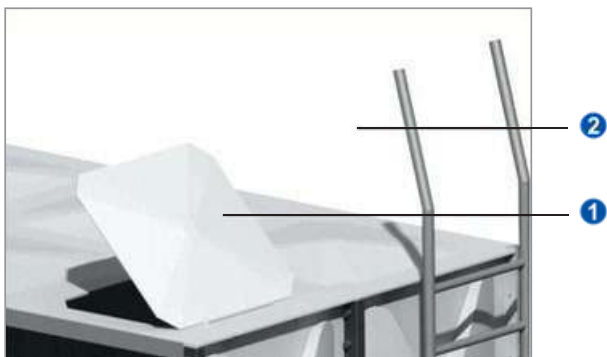
※ Current A grade→Unify to SA grade ※ Current IA grade→Unify to IIA grade

Internally Reinforced System

It is possible that various capacity design and flexible space should be used by GRP panel standardized Excellent water tightness, hygienic conditions and non-leakage applied internally reinforced stay (Stainless)



Internally Reinforced System



No.	Name	Material	No.	Name	Material
1	Manway panel		11	Roof support pipe	GRP (Pultrusion)
2	External ladder	SS400(HDG)	12	Skid base frame	SS400(HDG)
3	Internal ladder				Internal : STS 316
4	Internal bracket	STS 316			Roof : STS 316
5	Internal Tie-Rod		13	Bolts and Nuts	External : STS 316 / 304 / HDG
6	Flangebar, Flat bar				Skid Base : HDG
7	External bracket		14	Sealing tape	PVC Sealant+Butyl
8	Corner bracket	SS400(HDG)	15	Water level gauge	Aluminum Case+PC Clear Tube+Socket
9	Wall-Bottom bracket		16	Name plate	Aluminum (Water tank safety management instructions)
10	Corner frame				

Externally Reinforced System



Externally Reinforced System



No.	Name	Material	No.	Name	Material
1	Manway panel	GRP	10	Base frame	SS400(HDG)
2	External ladder	SS400(HDG)	11	Bolts and Nuts	Internal : STS 316
3	Internal ladder	GRP (Pultrusion)			Roof : STS 316
4	Internal bracket	STS 316			External : STS 316
5	Roof bar	SS400(HDG)			Skid Base : HDG
6	External main bar	SS400(HDG)	12	Sealing tape	PVC Sealant+Butyl
7	External bracket		13	Water level gauge	Aluminum Case+PC Clear Tube+Socket
8	Corner bracket		14	Name plate	Aluminum(Water tank safety management instructions)
9	Roof support pipe : GRP (Pultrusion)				

Panel physical Properties

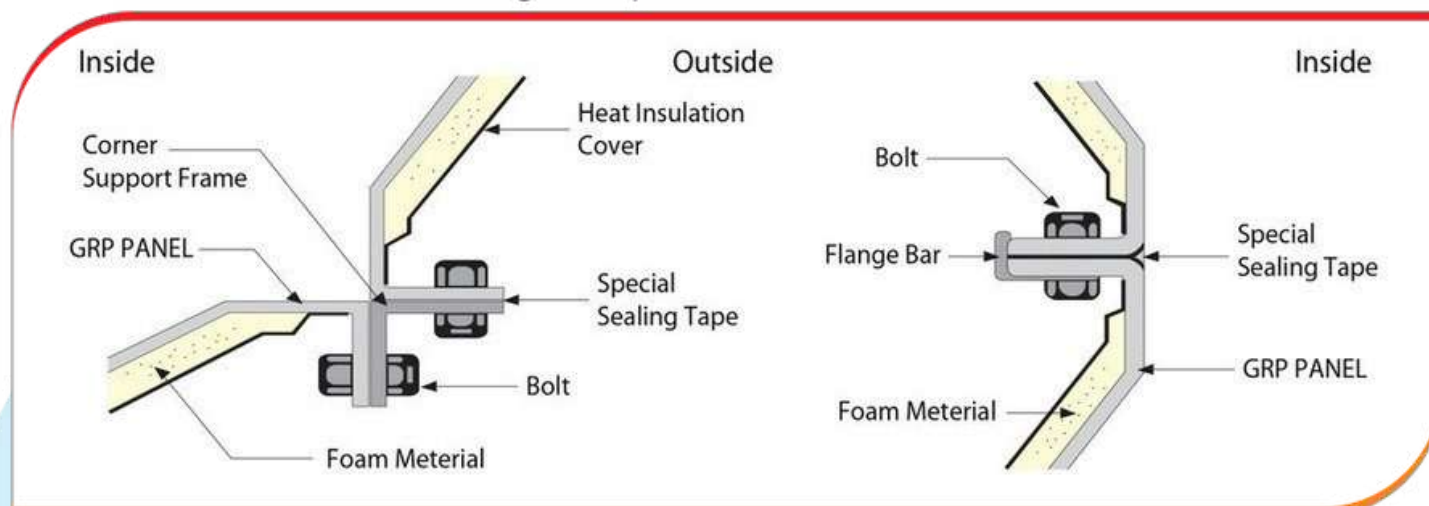
TEST ITEM	UNIT	SAMPLE	RESULT	TEST METHOD
Specific Gravity (23°C/23°C)	-	-	1,806	ASTM D792-13(Test Method A)
Water Absorption	%	-	0.02	ASTM D570-98(2010)e1 (24 h Immersion)
Tensile Strength	MPa	-	115	ASTM D638-14(*)
Tensile Elastic Modulus	GPa	-	17.5	ASTM D638-14(*)
Flexural Strength	MPa	-	213	ASTM D790-17(Procedure A)
Flexural Elastic Modulus	GPa	-	15.9	ASTM D790-17(Procedure A)
Shear Strength	MPa	-	114	ASTM D732-17
Izod Impact Strength	J/m	-	923	ASTM D256-10e1(Test Method A)
Compressive Strength	MPa	-	234	ASTM D695-15(**)
Thermal Conductivity [Mean Temperature 20°C]	W/(m.k)	-	0.115	KS L 9016 : 2010 (By means of the Heat Flow Meter Apparatus)
Thermal Conductivity [Mean Temperature 20°C]	W/(m.k)	-	0.024	KS L 9016 : 2010 (By means of the Heat Flow Meter Apparatus)
Barcol Hardness	-	-	53	ASTM D2583-13a
Glass content	%	-	over 42.9%	ASTM D2584-11

Stress Analysis of GRP Panel

GRP Water Tank panel is designed with special shape for maximizing safety against stress and deformation, so it has better structural strength than normal circle designed panel As GRP Water panel is manufactured by oil-hydraulic press under high temperature and high pressure, it maintains top water pressure strength and there is no dimensional deviation by temperature change.

Excellent Heat Insulation

Drawing of the panel Joint Part / Corner Part



Composition of Insulation Panel

Excellent insulation of GRP Material itself with Eco-friendly Polyurethane heat insulating material prevents freeze & water condensation.

There is non-woven fabric with excellent adhesion inside GRP insulated panel, ensuring shape stability of panel throughout longer time periods.

GRP insulated panel with 4 layer structure ensure excellent insulating effect

Thickness of insulated panel : 40 - 50 mm

Strength & Durability

Section	Design Standard
Hydrostatic Pressure	Water pressure reinforcement 6 times standard Transformation rate in filled with water : Less than 1% from water tank height
Wind Force	60 m / sec
Earthquake Force	Stable and safe till magnitude 5.0 (Over magnitude 5.0, it need additional reinforcement)
Snow Load	60 Kg/m ² , snow fall less than 30cm
Illumination Rate	Less than 0.1%
Out-fit-Force	No leakage under condition of vertical 100kg after install of 100A fitting with 70mm span support
Water Temperature	Usable temperature : Less than 30° / Limited temperature : Max 70°
Water Quality	Tap Water, Well Water : Chlorine below 50mg/L Seawater : application Externally Reinforced water tank (max 3m height)
Man Load	120 KGF

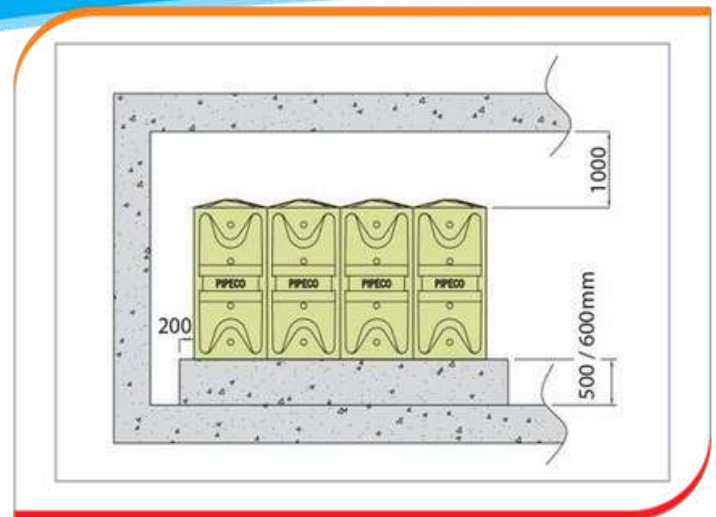
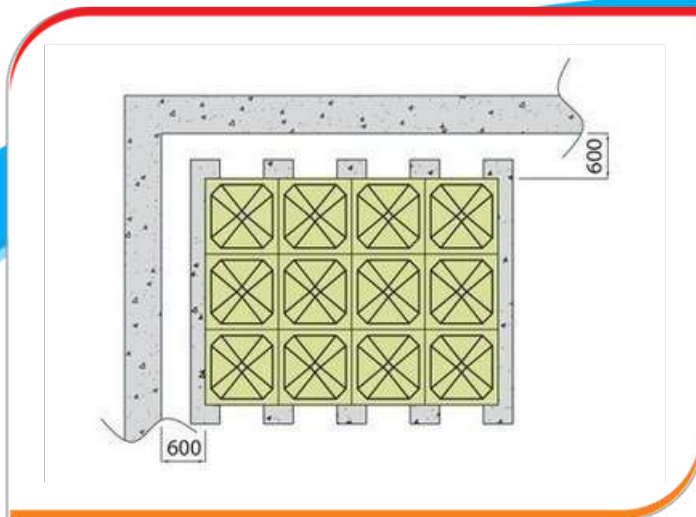
Comparison with Other Types of Tanks

Feature	GRP	CONCRETE	PLASTIC	STEEL
Hygiene & Water Quality	✓ ✓	—	—	✗
Flexibility	✓ ✓	✗	✗	—
Relocation	✓ ✓	✗	✗	—
Water Tightness	✓ ✓	✗	✓	✓
Strength & Durability	✓ ✓	—	✗	—
Easy & Fast Assembly	✓ ✓	✗	—	—
Easy to Transportation	✓ ✓	✗	✗	—
Thermal Conductivity	✓ ✓	✓	✓	✗
Drainage	✓ ✓	—	—	✓
Value of Parameter	Excellent	Good	Average	Poor

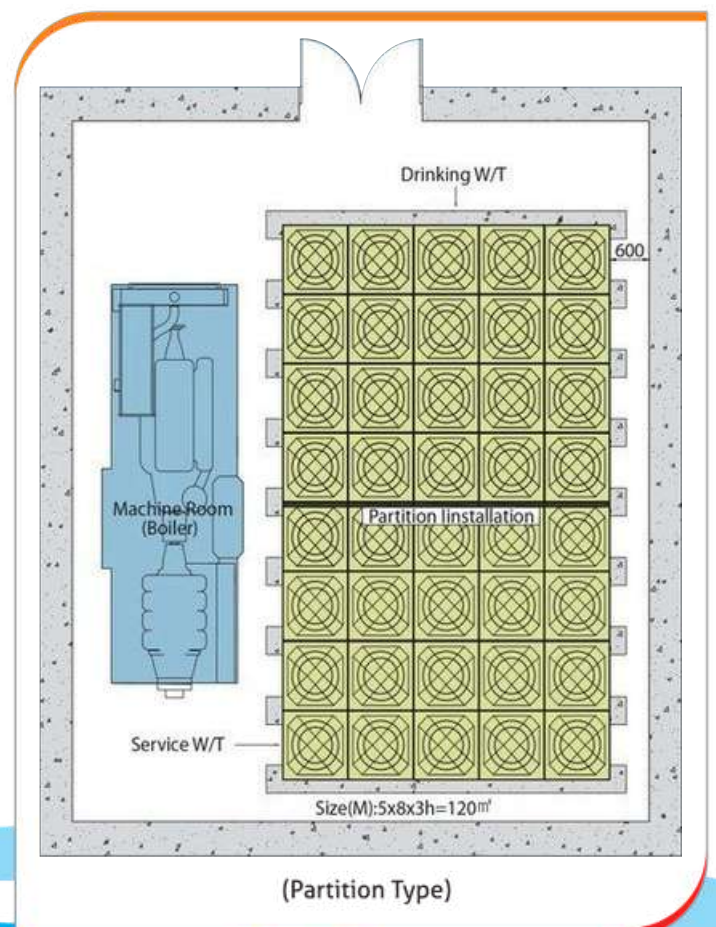
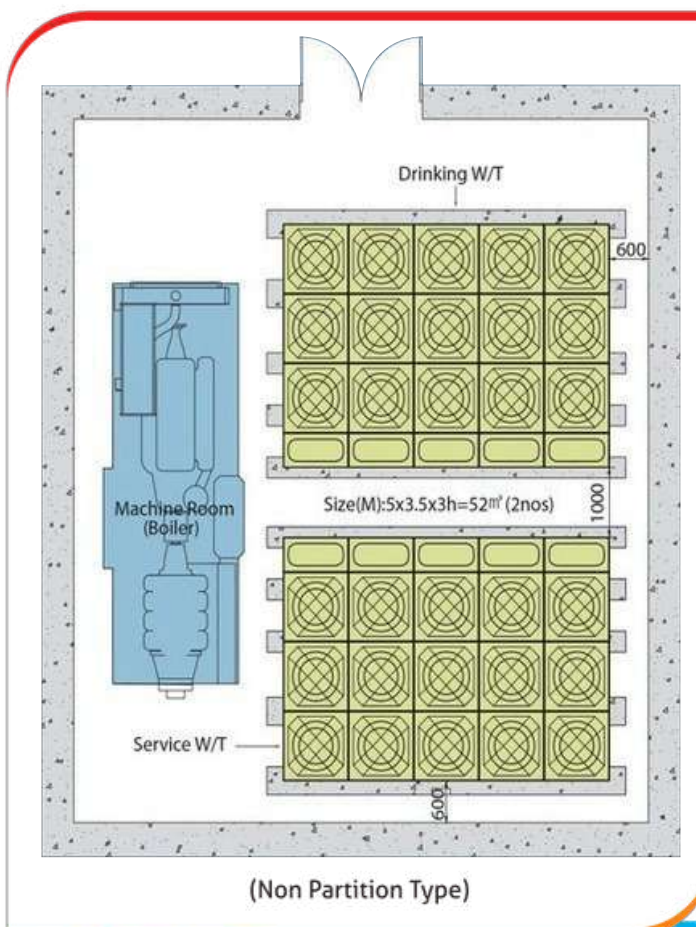
Installation Space

Standard of Base Concrete PAD Installation and Space

For maintenance of GRP tank, it need extra space at least 750mm to 1m from the wall and 1000mm from ceiling.



Partition Installation





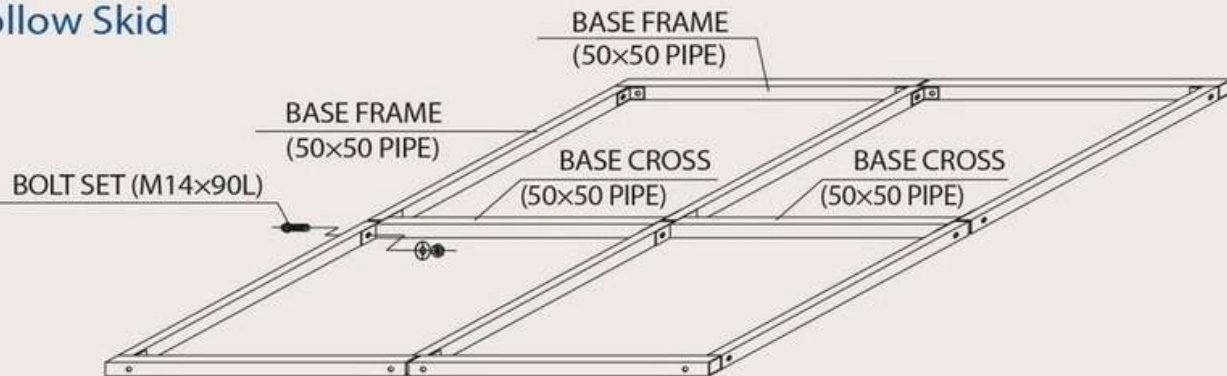
Earthquake-Proof Skid Base System

Height of water tank 2.5mH

Height of water tank 4m

GRP Sectional Panel, Putting water to 85% of water tank height, Earthquake-Proof Strength 5.0

Hollow Skid



Result of skid base strength review (Safety Factor 2.0)

Height	Contents		Bending Stress(kg/cm ²)	Result	Deflection(cm)	Result
2.5mH	Base frame	Long term	1170 < 1600(Allowable value)	O.K	0.15 < 0.25(Allowable value)	O.K
		Short term	1340 < 2400(Allowable value)	O.K	0.17 < 0.33(Allowable value)	O.K
	Base cross	Long term	1590 < 1600(Allowable value)	O.K	0.21 < 0.25(Allowable value)	O.K
		Short term	1830 < 2400(Allowable value)	O.K	0.25 < 0.33(Allowable value)	O.K
4mH	Base frame	Long term	790 < 1600(Allowable value)	O.K	0.06 < 0.25(Allowable value)	O.K
		Short term	900 < 2400(Allowable value)	O.K	0.27 < 0.33(Allowable value)	O.K
	Base cross	Long term	1540 < 1600(Allowable value)	O.K	0.15 < 0.25(Allowable value)	O.K
		Short term	1750 < 2400(Allowable value)	O.K	0.17 < 0.33(Allowable value)	O.K



Maintenance Control

User Regulation Maintenance Items

- 1) Caution the damage to the water tank from outside shock
- 2) Do not use the GRP water tank for other unapproved purpose. (For example chemical storage tank)
- 3) Do not dismantle internal components or change it to other components without official approval.
- 4) Prohibit to install unapproved components or non-consent equipment.
- 5) Keep standard water level at all times. (Uppermost tie rod is soaked in water)

Installation and Caution

- 1) The water level should be over tie rod position all the time. (Over 85% of tank height)
- 2) Check the flatness of concrete plinth. (Tolerance: 2mm)
- 3) Check water tank panel's crack.
- 4) Check deflection of wall panel. (maximum up to 1% of water tank height)
- 5) Check generally for leaks or drips.
- 6) The interior of the tank should be cleaned two or more times a year: after cleaning, you need to check whether the water quality in the tank is proper or not.
- 7) Organic solvent including thinner, acetone and chlorine bleach cannot be used to clean the exterior or interior of the tank.
- 8) When cleaning once compartment the inside of the tank, keep the water level less than 50% at the other compartment.
- 9) The tank cannot store anything except normal temperature drinking water.
- 10) All internal supports should be checked for corrosion, if corrosion is found it should be rectified immediately.
- 11) Check that all tie rod should be tightened.
- 12) Check that all pipe work connected to tank suitably braced.
- 13) Check that the structural supports under the tank are in good condition.
- 14) Check that overflows are fitted.
- 15) When Cleaning the inside of tank, do not interface with the joint seals.
- 16) If there are ladders fitted to the tanks, ensure that they have not been damaged and are securely fastened to the tank.
- 17) If overflow and / or air inlet screens are fitted, check that they have not become blocked.
- 18) Pipeco Korea will not bear the responsibility for the problems caused by your failure to follow the above mentioned recommendations, inadequate strength or uneven of concrete plinths or natural disasters.

Certificates of GRP Water Tanks

Getting all international certificates and Test reports for GRP Water tank
Realization of customer satisfaction through quality management system
GRP Water tank of best quality with competitive price

GRP Water Tanks Certificates and Test Reports



CERTIFICATE OF REGISTRATION

This is to certify that the Management System of

Pipeco Korea Co. Ltd
No. 675, Gomsu-ro, Jillye-Myeon, Gimhae-Si, GyeongSangnam-Do, Korea.

has been assessed and registered by Veritas System Quality Certificates as conforming to the requirements of

ISO 9001:2015
Quality Management System

The Quality Management System is applicable to:
Manufacture and Service of GRP Water Tank, Steel Reinforced Materials, Sales of Water Tank Panel and Steel Reinforced Materials.

WISA-NACE Code: 15.23.14 & 28.46.74

Certificate No.: VSQC-6405321

Issue Certificate Date: 23.05.2020 / Certificate expiry date: 23.05.2028
*Fundamental review: 23.05.2024 / PF Surveillance review: 23.05.2021
*This certificate is valid through successful completion of the annual surveillance audit.

Authorized Signatory
Veritas System
Quality Certificates Issuing U.K.
PO Box 123862, Alameda, Dublin,
United Kingdom

Business Development Office
Representative for
Veritas System Quality Certificates (UK)
Veritas System Quality Certificates (UK)
PO Box 123862, Alameda, Dublin,
United Kingdom

The certificate holder is liable for the management system in accordance with the standards above.
The certificate holder is liable for the management system in accordance with the standards above.
The certificate holder is liable for the management system in accordance with the standards above.



CERTIFICATE OF REGISTRATION

This is to certify that the Management System of

Pipeco Korea Co. Ltd
No. 675, Gomsu-ro, Jillye-Myeon, Gimhae-Si, GyeongSangnam-Do, Korea.

has been assessed and registered by Veritas System Quality Certificates as conforming to the requirements of

ISO 14001:2015
Environmental Management System

The Environmental Management System is applicable to:
Manufacture and Service of GRP Water Tank, Steel Reinforced Materials, Sales of Water Tank Panel and Steel Reinforced Materials.

WISA-NACE Code: 15.23.14 & 28.46.74

Certificate No.: VSQC-6405322

Issue Certificate Date: 23.05.2020 / Certificate expiry date: 23.05.2028
*Fundamental review: 23.05.2024 / PF Surveillance review: 23.05.2021
*This certificate is valid through successful completion of the annual surveillance audit.

Authorized Signatory
Veritas System
Quality Certificates Issuing U.K.
PO Box 123862, Alameda, Dublin,
United Kingdom

Business Development Office
Representative for
Veritas System Quality Certificates (UK)
Veritas System Quality Certificates (UK)
PO Box 123862, Alameda, Dublin,
United Kingdom

The certificate holder is liable for the management system in accordance with the standards above.
The certificate holder is liable for the management system in accordance with the standards above.
The certificate holder is liable for the management system in accordance with the standards above.



CERTIFICATE OF REGISTRATION

This is to certify that the Management System of

Pipeco Korea Co. Ltd
No. 675, Gomsu-ro, Jillye-Myeon, Gimhae-Si, GyeongSangnam-Do, Korea.

has been assessed and registered by Veritas System Quality Certificates as conforming to the requirements of

ISO 45001:2018
Occupational Health & Safety Management System

The Occupational Health & Safety Management System is applicable to:
Manufacture and Service of GRP Water Tank, Steel Reinforced Materials, Sales of Water Tank Panel and Steel Reinforced Materials.

WISA-NACE Code: 15.23.14 & 28.46.74

Certificate No.: VSQC-6405323

Issue Certificate Date: 23.05.2020 / Certificate expiry date: 23.05.2028
*Fundamental review: 23.05.2024 / PF Surveillance review: 23.05.2021
*This certificate is valid through successful completion of the annual surveillance audit.

Authorized Signatory
Veritas System
Quality Certificates Issuing U.K.
PO Box 123862, Alameda, Dublin,
United Kingdom

Business Development Office
Representative for
Veritas System Quality Certificates (UK)
Veritas System Quality Certificates (UK)
PO Box 123862, Alameda, Dublin,
United Kingdom

The certificate holder is liable for the management system in accordance with the standards above.
The certificate holder is liable for the management system in accordance with the standards above.
The certificate holder is liable for the management system in accordance with the standards above.

Approval Number: 220565

12th January 2020

Approval Number: 220565
Test Report: 6817030

12th January 2020
Pipeco Korea
43, Gomsu-ro, Jillye-Myeon,
Gimhae-Si,
GyeongSangnam-Do,
Korea, Republic of

WRAS APPROVED MATERIAL

Water Regulations Approved Scheme Ltd (WRAS)
Unit 12,
Wilsons Road,
Park & Farm Industrial Estate,
Crowthorne,
RG11 4ED

WATER REGULATIONS APPROVAL SCHEME LTD (WRAS) MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6905:1 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

GLASS REINFORCED PLASTICS (GRP) COMPONENTS **SUB**

PIPECO KOREA 2025 Premium Tank Panel (Grey/Orange) coloured, compression moulded GRP panel. For use with water up to 10°C.

APPROVAL NUMBER: 220565
APPROVAL HOLDER: PIPECO KOREA

The Scheme reserves the right to review approval.
Approval (220565) is valid between October 2020 and October 2027.
As entry, as shown, will accordingly be included in the Water Fittings Directory on line under the section headed, 'Materials which have passed full tests of effect on water quality'.
The Directory may be found at: www.wateregulation.co.uk/legislation-directory/

Yours faithfully

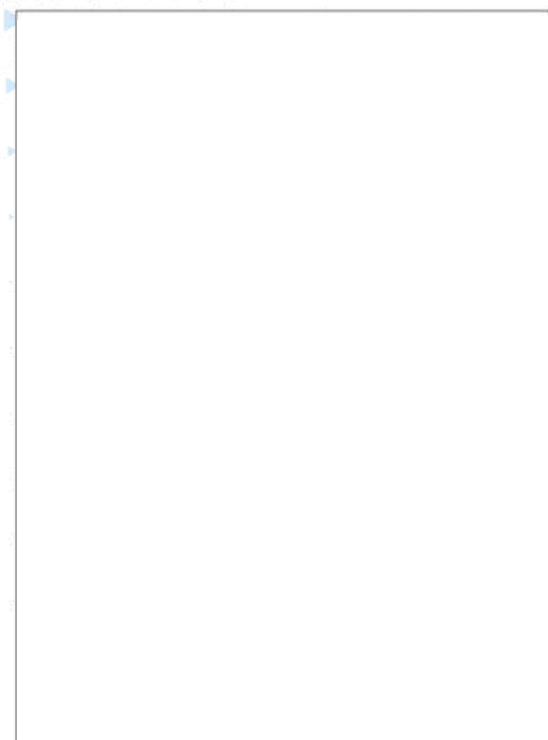
Ian Hughes
WRAS Approvals Manager

The Water Regulations Approved Scheme Ltd, Registered in England No. 020284 Registered office: 40, Leach Close, Hove, Sussex, BN1 9SD
01423 440111 Fax 01423 440112 E: info@wateregulation.co.uk W: www.wateregulation.co.uk
© 2019, April 2019, v. 2.5 Page 2 of 2

Certificates of GRP Water Tanks

Getting all international certificates and Test reports for GRP Water tank
Realization of customer satisfaction through quality management system
GRP Water tank of best quality with competitive price

GRP Water Tanks Certificates and Test Reports





PIPECO KOREA CO.
South Korea

Tel : +821058827196
www.pipecokorea.kr
sales@pipecokorea.kr

PIPECO INDUSTRIES SDN BHD
Malaysia

Tel : +60 17 786 5906
www.pipecoindustries.com.my
pipeco@pipeco.my

PIPECO GROUP
United Arab Emirates

Tel: ++9716-7459878
www.pipecogroup.com
sales@pipecogroup.com

PIPECO INDUSTRIES (S.P.S) LLC
United Arab Emirates

Tel: +971 506957993
www.pipecogroup.com
sales@pipecogroup.com

PIPECO TANK TRADING LLC
Dubai- UnitedArab Emirates

Tel: +971 506957993
www.pipecogroup.com
sales@pipecogroup.com

PIPECO TANK TRADING
Ajman
United Arab Emirates

Tel : +9716-7459878
www.pipecogroup.com
sales@pipecogroup.com

PIPECO TANKS INDUSTRY & TRADIBG LLC
SULTANATE-OF- OMAN

Tel : +968 77483888
Tel : +968 76767177
www.pipecooman.com
sales@pipecooman.com

PIPECO TANK TRADING WLL
State Of Qatar

Tel : +974 77214844
Tel : +974 77475888
www.pipecotankqatar.com
sales@pipecoqatar.com

PIPECO GROUP WATER MANAGEMENT SERVICE
PHILIPPINES

Tel : +63 9219750031
www.pipecogroup.ph
sales@pipecogroup.ph

PIPECO EGYPT

Tel : +20 1112 130408
www.pipecoegypt.com
samir@pipecoegypt.com

PIPECO INDUSTRIES (Pte) Ltd
Singapore

www.pipecoindustries.sg
sales@pipecoindustries.sg

PIPECO INDUSTRIES CO, LTD
Vietnam

Tel : +84 902148620
www.pipecovietnam.com
sales@pipecovietnam.com

PIPECO INDUSTRIES
India

Tel : +91 9884688855-9845333446
www.pipecoindustries.co.in
sales@pipecoind.com

PIPECO INDUSTRIES Pty Ltd
South Africa

Tel : +27798372913
www.pipecoafrika.com
sales@pipecosouthafrica.com

PIPECO AFRICA
Zimbabwe

Tel : +263778930454
www.pipecoafrika.com
sales@pipecozimbabwe.com

PIPECO WATER TANKS LTD (UK)

Tel : +44 7792 540913
www.pipecogroup.com
sales@pipecowatertanks.co.uk

PIPECO WEST AFRICA
Ghana

Tel : +233 273998141
www.pipecogroup.com
sales@pipecoghana.com

PIPECO KSA
Kingdom Of Saudi Arabia

Tel +966 547345295
www.pipecoksa.com
sales@pipecoksa.com

PIPECO EA WATER ENGINEERING LTD.
Nairobi, Kenya

www.pipecogroup.com
sales@pipecokenya.com

PIPECO JORDAN
Jordan

Tel : +962 79555 1750
www.pipecojordan.com
sales@pipecojordan.com

PIPECO TANK W.L.L
Kingdom of BAHRAIN

Tel : +973 3465 8055
www.pipecogroup.com
sales@pipecobahrain.com

PIPECO LIBYA WATER TANKS - Manufacturing Co.

Tel : +218912181421
www.pipecolibya.com
sales@pipecolibya.com

PIPECO INDUSTRIES (INDONESIA)

Tel : +62 81585017472
www.pipecoindonesia.id
sales@pipecoindonesia.id

PIPECO TANKS TRADING PLC
Ethiopia

Tel : 251 911206267
www.pipecgroup.com
sales@pipecotanksethiopia.com

PIPECO TANKS (PVT) LTD
Sri Lanka

Tel : +94 725000250
www.pipecogroup.com
sales@pipecotanks.com

PIPECO INDUSTRIES LLC
Tangshan (China)

Tel : +86 13180179518
www.pipecotanks.cn
sales@pipecotanks.cn