

SPECIFICATION

SEJIN GRP Sectional Water Tank



SEJIN SMC Co., Ltd.

45 Yeouido-dong Yeongdeungpo-gu Seoul, Korea

Tel : +82-2-780 8330 Fax: +82-2-780 1212

E-mail : info@sejinsmc.co.kr

URL : <http://www.sejinsmc.co.kr>

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1. General

A. Scope

This specification describes the hot pressed moulded GRP Sectional Tank which is consist of GRP panels (roof, wall, bottom, drain), steel reinforcements, bolts/nut and sealant.

The GRP panel is being made by processing SMC (Sheet Molding Compound which is made from the unsaturated polyester resin mixed with filler, a catalyzer, a parting material, etc. and reinforced with chopped fiberglass.) with glassfiber mat in press moldings by high pressure and heat.

The GRP panels assembled with bolts and steel reinforcement materials in any sizes from 0.5m3 to indefinite capacity on the job site.

All materials including GRP panels, internal steel materials and sealant in contact with contained water shall be non-toxic and suitable for potable water.

B. Product Requirements

This tank, used for storing drinking water, should be manufactured by ISO certified companies. (ISO certificate: see Annex #1)

C. Scope of Construction

Assembly of SEJIN GRP panels, steel skid, reinforcing members, internal & external ladders and fitting nozzles for piping.

D. Structure

- 1) Modular panels shall be assembled with bolts and reinforced with steel members internally or externally.
- 2) GRP panels and reinforcing members shall have enough strength to withstand the expected load including hydrostatic pressure.
- 3) The combination of convex base panels and a concave sump panel ensures complete drainage.
- 4) Tank shall be equipped with partition panels inside to have more than 2 compartments to enable maintenance of the tank to take place without interruption of water supply.
- 5) Each tank shall have at least 1 sealed access manway with lockable cover (min. dia 600mm).

2. Products and Specifications

A. GRP panel

The performance of panel shall comply with KS F 4811.

Category	Item	Performance	Test Method
1. Physical property test	Tensile strength	6.12 Kgf/mm ² or higher	KS F 4811
	Flexural strength	8.16 Kgf/mm ² or higher	KS M 3305
	Flexural modulus	612.24 Kgf/mm ² or higher	(Additional manufacture of samples)
	Glass content	25 % or higher	
	Barcol Hardness	30 or higher	
	Water Absorption Rate	1.0 % or below	
2. Dissolution test	Odor & Taste	No defects	KS F 4811
	Turbidity	2 or below	KS M 3401
	Color	5 or below	(Fusibility resistance test)
	Heavy metal (Pb)	0.1 ppm or below	
	KMnO ₄ Consumption	10 ppm or below	
	pH	5.8~8.6	
	Phenol	0.005 ppm or below	
	Evaporated residual	30 ppm or below	
	Loss of residual chlorine	0.2 ppm or below	

B. Manhole

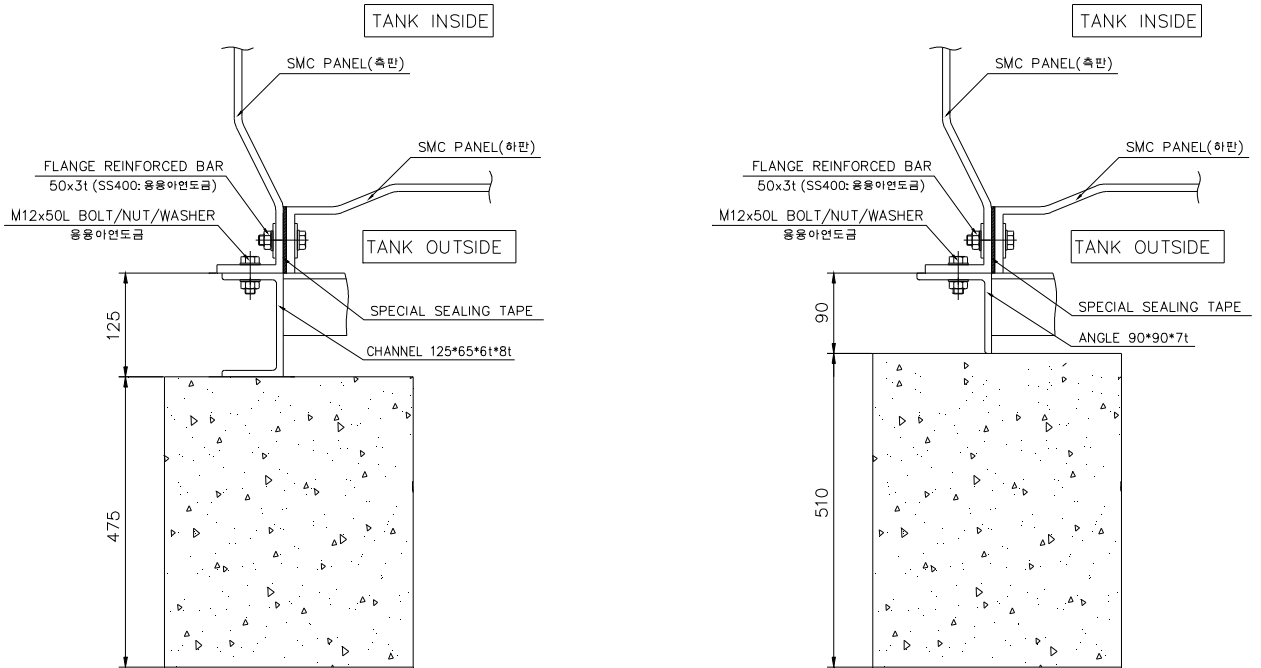
- 1) The access manhole should have a stainless steel hinged cover and be sealed to prevent the indraft of rain water and dust into tank.
- 2) The size should be minimum dia. 600mm.

C. Steel base frame

- 1) Material : To ease the assembly on site, hot dip galvanized (min. 60 μ m) angles and channels shall be used. (Silver dust spray or paint coatings are not applicable due to lack of durability)

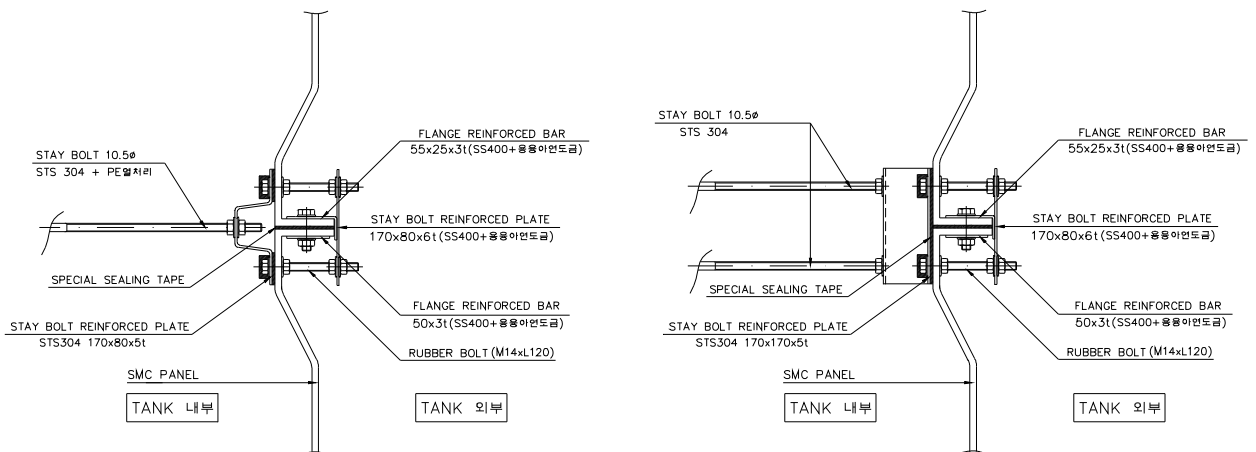
Tank Size	Base frame (Main)	Base frame (Sub)	Assembly
Height in 2.8m or less	Angle 90*90*7t	Angle 75*75*6t	Bolting assembly
Height in 3.0m~4.8m	Channel 125*65*6t*8t	Angle 75*75*6t	Bolting assembly
Height in 5.0m or above	Channel 150*75*6.5t*10t	Angle 75*75*6t	Bolting assembly

- 2) Configuration : Bolting assembly - Fix the base frame and the tank body with bolts on concrete foundation to prevent tank vibration and breakaway by earthquake or wind-pressure, etc.



D. Reinforcement (Shell Reinforced)

Parts name	Position	Material	Dimension
Tie-rods	Air part	STS304+PE coating	Φ10.5
	Water contained part	STS304+PE coating	Φ10.5
Reinforcements	Wall	GRP pipe	50x50x5t (at 3m intervals)
Roof support	Cross part of roof	GRP pipe	Φ50x5t



For tank in height 2m
For tank in height 3m or over - Upper position

For tank in height 3m or over - Lower position

E. Bracket

Parts name	Position	Material	Dimension	Remark
Plate	Wall panel joint	SS400 + HDG	Angle : 55x25x3t	External
	Partition	STS-304	Plate : 50x3t	Internal
Corner frame	Wall-corner	SS400 + HDG	Angle : 75x75x3t	External
Tie-rod	Wall panel	SS400 + HDG	170x170x6t (for 3mH or above)	External-Lower position
		SS400 + HDG	170x80x6t (for 3mH or above)	External-Upper position
		SS400 + HDG	120x120x6t (for 2.5mH or above)	External
		STS-304	170x170x5t (for 3mH or above)	Internal-Lower position
		STS-304	170x80x5t (3mH or above)	Internal-Upper position
		STS-304	120x120x3t (for 2.5mH or below)	Internal

F. Sealant

- 1) Sealant material used should be non-toxic, flexible and resistant to the change of weather.
Sealant preserve these qualities for the expected life duration of the tank.
- 2) The rubber packing which is used on the joints of bolts and internal tie-rods should comply with the regulation KS M 6613 regarding the rubber for public water.

G. Bolts and Nuts

- 1) The bolts size should comply with KS and the diameter should be min. 10mm or over.
- 2) Internal :
 - * Bolts in contact with water : STS-304 or higher grad
 - * Bolts through internal to external : Rubber capped bolts for water tightness
 - * Bolts above water (air part) ; High tensile plastic bolt
(need not to use metal bolts to avoid corrosion by chlorine gas)
- 3) External : Hot dip galvanized steel bolts

H. Ladder

- 1) It should have high durability and load resistance. For internal ladder, non-toxic material should be used.
- 2) Internal : Vertical 50x30x4t and Horizontal 35x25x4t in GRP, the non-toxic material
- 2) External ; Φ 32 & Φ 25 STS 304 PIPE

I. Air Vent

PVC moulded air-vent in dia. 50 or 100 should be equipped with insect net.

J. Fitting Nozzles

- 1) Flange or socket type nozzles which comply with KS D 5301.
- 2) Flange : For fitting nozzles in size $\Phi 650$ or over, and the material will be in GRP same as panel.
- 3) Socket : For fitting nozzles in size $\Phi 500$ or below, and the material will be in brass.

K. Level Gauge

- 1) Socket type STS304 gauge valve shall be used, and from $\Phi 20$ transparent PVC pipe with floating ball inside, water level can be seen with naked eyes.
- 2) By using STS-304 pipe or aluminum pipe, the gauge valve and PVC pipe shall be fixed firmly.

L. Checking and Testing

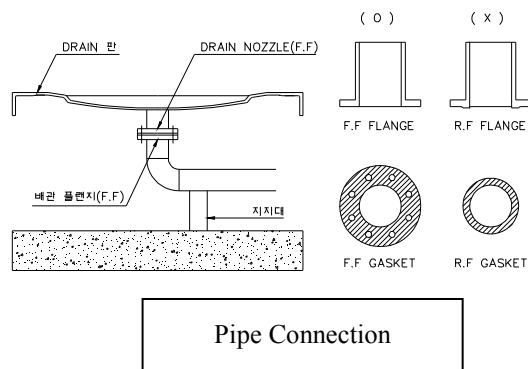
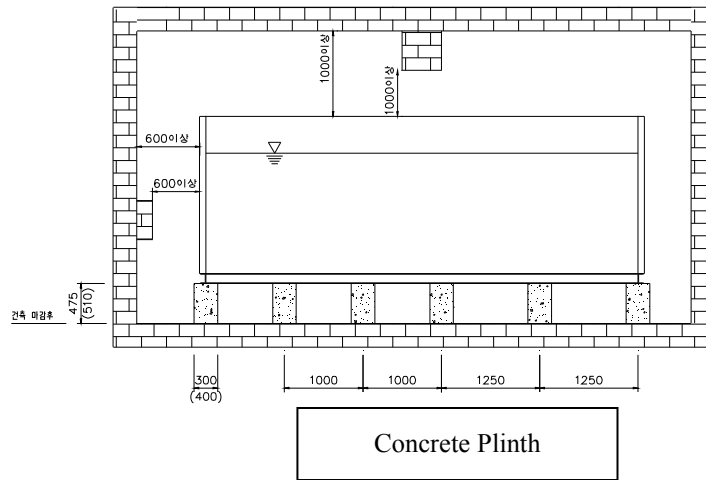
- 1) Check whether the tank and fittings have been built just according to the drawings.
- 2) For water testing, fill the tank with water for 30%, 60% and 90% stepwise, and after 24 hours check if there is any problem including deformation of panels and water leaks, etc.

M. Others (Client's scope)

- 1) Concrete foundation
 - * Concrete plinth should be placed in 1,000mm span from the center of one plinth to another.
(In case 500mm panels are used, the span can be 1,250mm.)
 - * The height should be min. 510mm for tanks in height 2.5mH or lower, min. 475mm for tanks in height 3.0mH or higher, and the surface should be even (inclination ± 3 mm or less)
 - * The width of concrete plinth : 400mm (min. 300mm)
 - * The strength : $180\text{kg}/\text{cm}^2$ or over
- 2) Free space for maintenance

It's required to have min. 600mm clear space between tank and wall in all directions for proper installation and maintenance. (Tank's roof to the ceiling : min. 1,000mm)
- 3) Piping work

At the joint between flange and pipe , F.F. type gasket should be used, and install supports to prevent excessive load at the pipe connection,



- The End -