Superior Tanknologies

FTC Bridgestone Panel Type Water Tanks

Agenda

- What is FRP Panel Tanks
- FRP Panel Tanks Features & Benefits
- Applications
- How is it made
- How is it assembled
- Codes & Certifications
- Physical Properties
- Product Comparisons

What is FRP (SMC)

- **Fiberglass Reinforced Plastic (FRP) SMC**
- **(FRP) Polyester Resin and Chopped Glass Fiber Reinforcement**

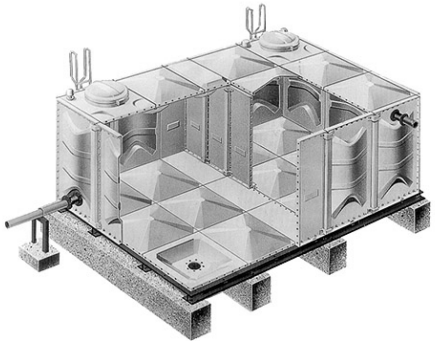
  Thermoset plastic is a plastic material that undergoes a chemical reaction in which it is formed into a solid and cannot be reformed
- **(SMC) Sheet Mold Compound**

  Sheet Mold Compound is a pre pregnated theromoset that forms under high heat and pressure to eliminate styrene emissions and have a uniform strength and smooth finish.

FRP Tanks Features & Benefits

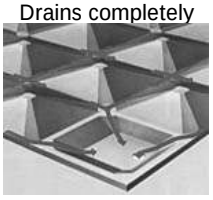
- Quick & Easy to install
- Minimal maintenance required
- Drains completely
- Extremely strong
- Keeps clean water clean (no algae or bacterial growth)
- Can be extended or relocated
- Long life (design life 40 years)
- Excellent resistance to ultra violet light
- Flexible size and configuration

Sectional Design

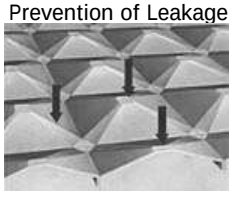


Unique Features

Drains completely



Prevention of Leakage



Principal Cause of Contamination

- **Light transmission.** Growth of algae will occur if light is permitted to enter the tank, this will adversely affect the water taste, and can lead to disease such as gastroenteritis.

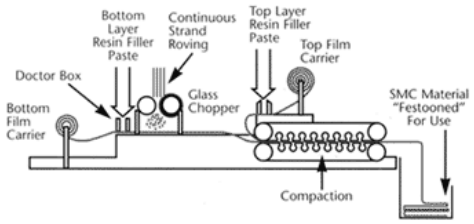
- **Rough internal surface of the tank.** The cavities in the internal surface allow bacteria to nest and proliferate. Bacteria protect itself from the effect of Chlorine by creating a bio-film. Chlorinated water also loses its bactericidal properties after a few hours, if not constantly replenished. At one point in time, this bio-film breaks and the bacteria is killed by the chlorine. The bio-product in presence with the algae and Chlorine, will produce Tri-Halo methane. Studies at John Hopkins and Stanford universities show that Tri-Halo methane is a potential carcinogenic agent.

- **Incomplete or poor drainage.** If the tank design does not ensure complete free-flow drainage, a build-up of residual static water will result. This will harbor contaminants referred to above, as well as particles from internal corrosion or introduced externally.

Applications

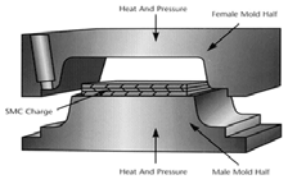
- Municipal water storage, reservoirs
- Industrial and commercial:
  Construction, Fire water storage, fisheries, breweries, climate control tanks, refrigerated processing tanks, clean room laboratories, etc.
- Agricultural and Farming

SMC Manufacturing Process



How is it made

- SMC is pressed in heated matched metal mold at 1500 tons and 300 degrees Fahrenheit.
- This process allows the FRP to cure without styrene emissions
- Panels are predrilled and quality tested
- Palletized and ready for shipment



Palletized and ready for shipment

FTC F.R.P Panel Tanks Assembly

Excavation works

Shuttering for Concrete Foundations

Concrete Foundation Ready (10 Jan. 03)

Steel Skid preparation works off-site.

Steel Skid Assembly

Alignment & Pre-tank assembly works

Laying up Bottom Panels on Steel Skid

Side & Baffle walls construction

Roof Construction

Finishing works

(Tie Rods, Air Vents, Ladders, Flanges)

Completed Tanks (17 Feb. 03)

A Panoramic View

The Biggest FRP Panel Tanks in the world

Capacity : USG 2,500,000

Codes & Certifications


Physical Properties

Specific Gravity	1.8
Glass content	More than 30%
Tensile strength	1,020kgf/cm² (9.996KN/cm²)
Young's modulus	1.40×10^5 kgf/cm² (13.7Gpa)
Flexural strength	1,650 kgf/cm² (16.17 KN/ cm²)
Impact strength	52.5 kgf/cm² (0.515KN/ cm²)
Compressive strength	3,010 kgf/cm² (29.50 KN/ cm²)
Shear strength	960 kgf/cm² (9.41 KN/ cm²)
Thermal expansion	2.16×10^{-5}/°C
Thermal conductivity (single panel)	0.15 Kcal/m hr°C (630 J/ m hr°C)
(insulated panel)	0.02 Kcal/m hr°C (84 J/ m hr°C)
Coef. of overall heat transmission (single panel)	5.0 Kcal/m hr°C (21 KJ/ m hr°C)
(insulated panel)	1.0 Kcal/m hr°C (42 KJ/ m hr°C)
Water absorption	Less than 0.2%
Cavity	Less than 2%
Light transmittance (grey panels)	0.00%

Product Comparisons

Comparison between FTC-Bridgestone Panel Type Water Tank & other Tanks

Characteristics	FTC-Bridgestone	Traditional fiber glass	Welded Steel	Steel Panels	Concrete	Polyurethane
Clean Water	✓	★	★	★	✖	□
Water Tightness	✓	□	□	□	★	□
Strong & Durable	□	★	□	□	★	✖
Drains Completely	✓	★	★	□	★	★
Flexible Shape	□	✖	□	□	□	✖
Thermal Insulation	□	□	✖	✖	★	★
Easy Installation	✓	★	★	✖	★	★
Easy to Relocate	□	★	✖	★	✖	★
Easy to Maintain	✓	★	✖	★	✖	✖

✓ EXCELLENT □ GOOD ★ FAIR ✖ BAD

FTC BRIDGESTONE

20 Year old tank next to the sea