

Global Bolted Tank and Cover Solutions



CENTER ENAMEL

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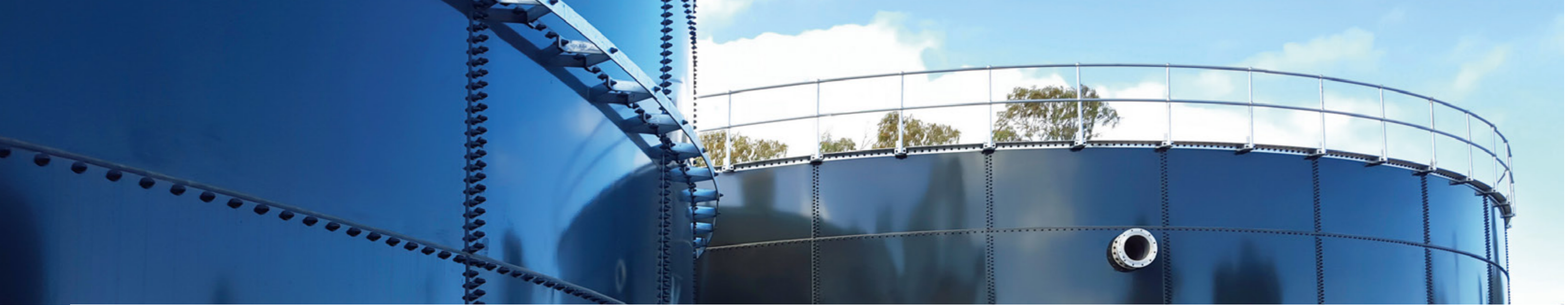
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Shijiazhuang Zhengzhong Technology Co.,Ltd



CENTER ENAMEL



About Our Company



Center Enamel Glass-Fused-to-Steel Tanks

Shijiazhuang Zhengzhong Technology Co.,Ltd is a professional manufacturer dedicated to the design and fabrication of bolted storage tanks since 1989. Our products range includes Glass-Fused-to-Steel (GFS) tanks, fusion bonded epoxy tanks, stainless steel tanks, galvanized steel tanks and aluminum geodesic dome roofs. With professional enameling R&D team and more than 20 enameling patents, Shijiazhuang Zhengzhong Technology Co.,Ltd has become the leader in bolted tanks industry of Asia. Our products are certified to ISO 9001, NSF/ANSI 61, WRAS, ISO 28765, LFGB, BSCI, ISO 45001 and other international standards.

Main Applications

- Drinking Water
- Industrial Effluents
- Municipal Sewage
- Bio-energy
- Landfill Leachate
- Agriculture



Shijiazhuang Zhengzhong Technology Co., Ltd is not only the first manufacturer in China which produces Glass-Fused-to-Steel tanks, but also the most experienced professional bolted tanks manufacturer in Asia. The engineering & design, product testing and quality system of Center Enamel Glass-Fused-to-Steel tanks is in strict accordance with AWWA D103-09, OSHA, ISO 28765, NSF/ANSI 61, NFPA and other international standards. Center Enamel Glass-Fused-to-Steel tanks are widely used in drinking / potable water, industrial effluents, municipal sewage, bio-energy, landfill leachate, agriculture and other applications. Until 2023, Center Enamel bolted tanks have been exported to more than 90 countries including USA, Australia, Canada, Malaysia, Indonesia, Russia, UAE, Panama, Brazil and South Africa etc., the superior tank quality and prompt service gains us worldwide recognition.

As an outstanding containment and cover system provider with more than 30 years of experience, Shijiazhuang Zhengzhong Technology Co., Ltd sincerely expects to establish long-term cooperation with the local partners throughout the world and make continuous contribution to the development of the industry.



▶ Glass-Fused-to-Steel Tanks

Advantages:

- Short construction period, cost effective tank solution;
- Superior corrosion resistance, service life is more than 30 years;
- Easy to install, no need for big installation equipment and/or very skilled labors;
- Tank volume is easily expanded;
- It can be dismantled, removed and relocated;
- Elegant appearance, tank color can be customized;

Leader of GFS / Enamel Tanks Industry

▶ GFS Tanks Application Fields



Power and Energy

| | | |
|----------------|--------------|-----------------------|
| Biogas | Fly ash silo | Boiler feedwater |
| Biomass energy | DI water | Reverse osmosis water |
| Process water | Coal storage | Fermentation tank |



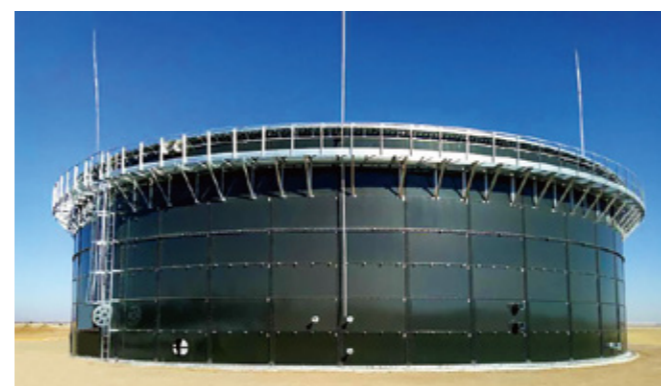
Waste Water Treatment

| | | |
|----------------------|-------------------------|-------------------|
| Buffer pool | Aerobic reactor | Biological filter |
| Regulation tank | Anaerobic reactor | Leachate storage |
| Water purifying tank | Sedimentation container | Sludge tank |
| Effluent treatment | Irrigation water | Animal wastes |



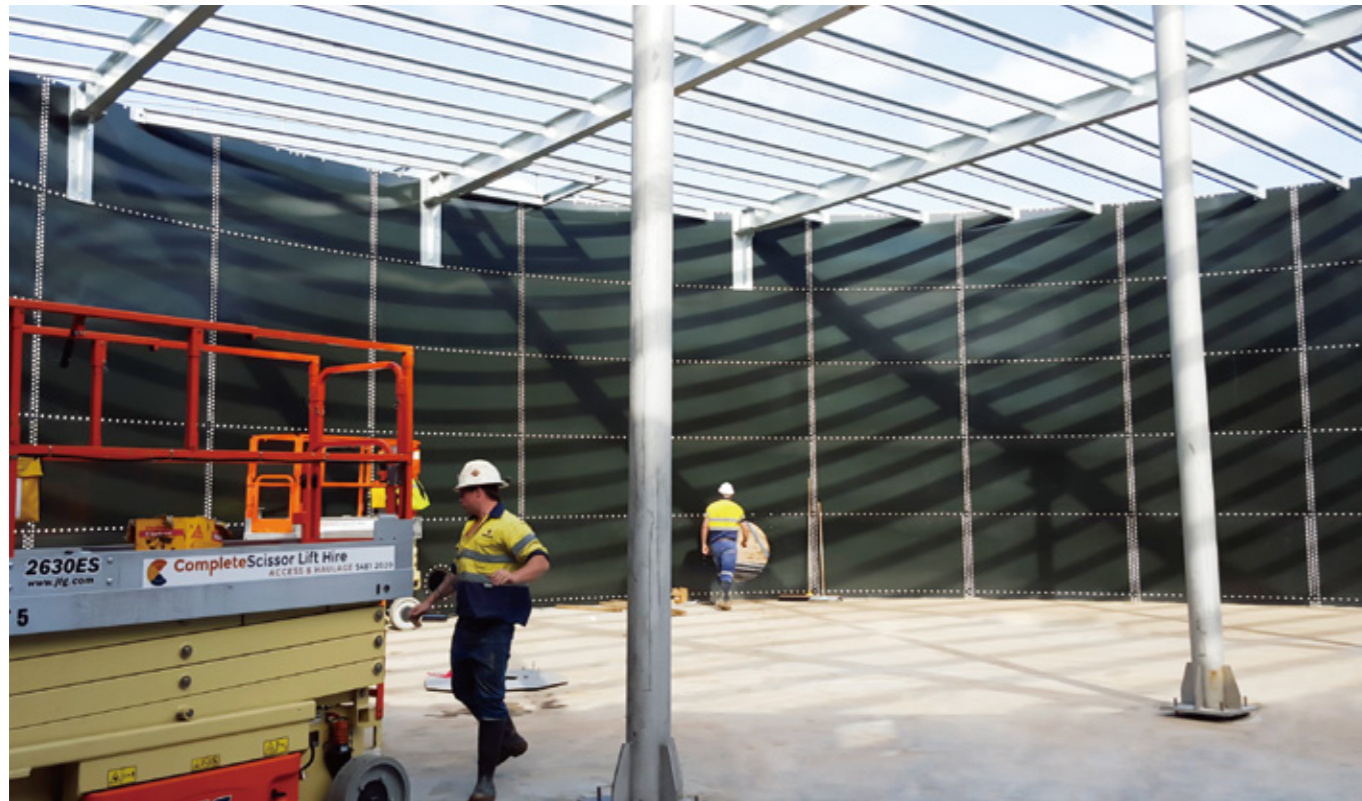
Water Supply and Treatment

| | | |
|----------------------|--------------------------|-------------------------|
| Potable water | Bitter-brackish water | Biological filter |
| Water purifying tank | Disinfecting water | Sedimentation container |
| RO water | Sea water desalinization | Raw water/fresh water |
| Fire-fighting water | Irrigation water | Clarification pool |
| Lime silo | Saline water/brine water | Aeration tank |



Industrial Dry Bulk Storage

| | | |
|-----------|----------------|----------------------|
| Mineral | Wood product | Stone / clay / glass |
| Chemicals | Petrochemicals | Mining Industry |
| Foods | Plasthetics | Grain / seeds |



► Center Enamel Technology Advantages

Why Choose Center Enamel Glass-Fused-to-Steel Tanks:

01

More than 30 years experience in Enameling Technology R&D

The only GFS tanks manufacturer which has ability to produce enamel frit as well

02

Our GFS tanks Strict Engineering Design Standard: AWWA D103, OSHA, NSF61, ISO28765 etc.

The only Asian GFS Tanks manufacturer which can be widely accepted in USA Market

03

Cooperate with Well-known International Corporations

Paques, Veolia, Coca-Cola, Sabesp, Wilmar, PetroChina, Heineken, AbInBev, Porsche, Sinopec etc.

04

Professional Experience with International Market

Successful GFS tanks projects references in more than 90 countries worldwide

Professional R&D team:

Technical consultant: 1 professor senior engineer, national famous expert with more than 50 years' experience in enamel researching.

Technical experts: 8 persons, more than 10 years'

enamel researching experience

Technical researcher: 23 persons



1

Professor senior engineer
(person)

8

Technical experts
(persons)

23

Technical researchers
(persons)

Quality Control:

Raw Material Test: raw materials ingredient analysis, impurity test etc.

Enamel Formula Test: enamel fluidity test, color difference analysis, acid and alkali resistance test, adherence / impact test, slice microscope analysis

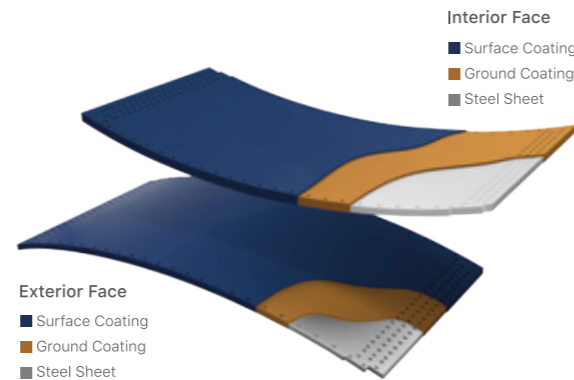
Inspection During Production: magnify experiment simulated operation environment

Final Quality Test: impact test, 1500V holiday test, coating thickness test



▶ What is Glass-Fused-to-Steel Tanks?

After firing at 820 ° C-930 ° C high temperature, the molten glass reacts with the steel plate surface to form an inert and inorganic bond, which combines the strength & flexibility of steel and outstanding corrosion resistance of glass, therefore GFS tanks can provide many advantages over standard epoxy or welded painted storage tanks. Glass-Fused-to-Steel technology is the premium coating technology in the storage tanks market, and GFS tanks are widely used in bio-energy, municipal sewage, landfill leachate, industrial wastewater treatment and other applications.



▶ GFS/Enamel Sheet Specifications

| CATEGORY | SPECIFICATION |
|---------------------------|--|
| Coating Color | Black blue, Grey olive, Forest green, Cobalt blue, Desert tan etc. |
| Coating Thickness | 10-18 mils, 250-450 microns |
| Acid and Alkalinity Proof | Standard PH: 3~11, Special PH: 1~14 |
| Adhesion | 3,450N / cm ² |
| Elastic | 7.9*10 ⁴ MPA |
| Hardness | 6.0 Mohs |
| Service Life | ≥ 30 Years |
| Holiday Test | > 1500V |
| Easy to Clean | Smooth, Glossy, Inert, Anti-adhesion |
| Corrosion Resistance | Excellent, Suitable for harsh environment |

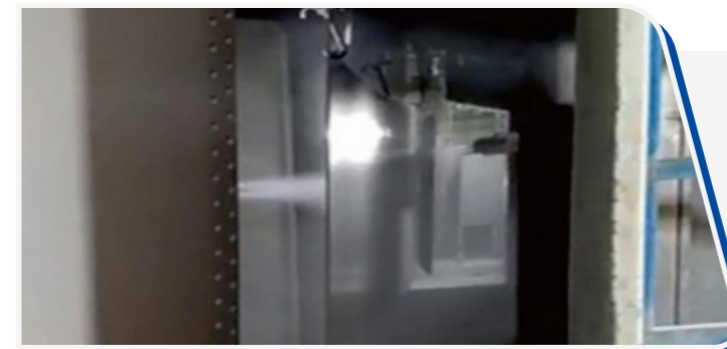


▶ Glass-Fused-to-Steel Tanks Production Introduction



Plate CNC Cutting

Inputting the confirmed drawing into the computer, bolt holes and openings will be cut by CNC laser cutting machine automatically.



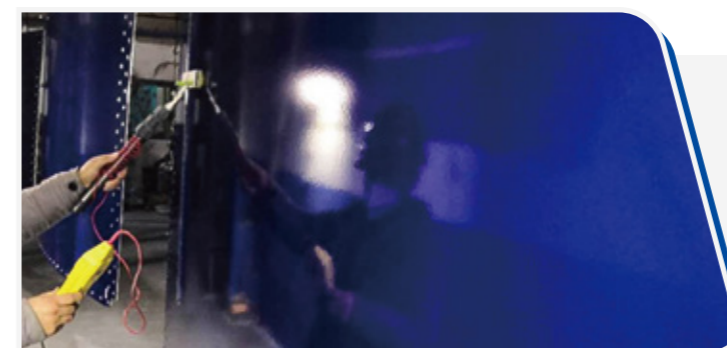
Automatic Enamel Spraying

Spray the glass coating on both sides of the steel panels automatically.
Coating thickness is controlled within 250 microns to 450 microns.



High Temperature Firing

After enameling and drying, then firing steel panels in the oven at the temperatures ranging from 820 °C - 930 °C, which facilitates the interfacial fusion reactions that combine the two materials.



Quality Inspection

Quality inspection is conducted during and after fabrication, including coating thickness test, 1500V holiday test, anti-acid test and color consistency test etc.



In Europe, USA and many other countries, enamel bolted tanks have been used for more than 100 years history, they are commonly used in waste water treatment, potable water, dry bulk storage, etc.

Anti-microbial Enamel Technology

After years of research and development, the anti-microbial enamel produced by Center Enamel got approved by China building materials industry environmental testing center. The test report shows that the anti-microbial enamel steel has excellent performance with mold resistance. It suppresses all kinds of composite mold. The anti-microbial enamel steel conforms to standard JC / T897-2002 «antibacterial capabilities of antibacterial enamel» .

Composite mold includes: aspergillus niger (AS3. 4463), aspergillus (AS3. 3935), penicillium (AS3.4253), penicillium funiculosum (AS3. 3875), ureobasidium pullulans AS3. 3984), chaetomium globosum (AS3. 4254)

Glass-Fused-to-Steel Tanks Color Options



Grey Olive



Black Blue



White



Forest Green



Red



Sky Blue



Evening Haze



Cobalt Blue



Desert Tan



Mist Green

More optional colors can be customized according to project request

Anti-microbial Enamel Applications

Drinking water plant, medical enamel and commodity enamel, etc.

Test Report



▶ Stainless Steel Tanks



Center Enamel offers AISI 304/316 stainless steel tank as a good containment solution to meet the clients' special requirement with high purity pharmaceutical water or extremely harsh environments. Stainless steel tanks can be provided as complete tank kit, we can also design and engineer hybrid tank with glass fused to steel in the lower rings and stainless steel in the upper rings, which provides best cost effective combination of various materials according to the process design requirement.

| | | | |
|------------------|--------------------|-----------------------|----------------------|
| Municipal Sewage | Anaerobic Digester | Industrial Wastewater | Pharmaceutical water |
| Biogas Tanks | Landfill leachate | Brine Water | Dry Bulk Storage |

Advantages

01

02

03

04

05

Friendly to the environment, no painting, no rust, and no solvents

Natural corrosion resistance, provides longer service life

Virtually maintenance free, does not require coating / painting

Green materials and can be recyclable

Hygienic materials - maintains drinking / food process water quality and purity

▶ Aluminum Geodesic Dome Roofs



Aluminum geodesic dome roof is an innovative self-supporting cover solution which is widely utilized on bolted, welded and concrete tanks. Manufactured in state of the art facilities and engineered with cutting-edge 3D computer modeling, Center Enamel domes have superior structure strength, fabrication precision and aluminum inherently corrosion resistance, no need to paint or repaint after construction, and its clear-span design, fast construction, little-to-no maintenance cost, making Center Enamel domes very popular choice in many project applications worldwide.

Design Standards

AWWA D108, API 650 Standards, ADM2015, ASCE7-10, IBC 2012

Unique Batten Bar Design

Our aluminum geodesic dome roofs beam are designed for maximum beam strength and the silicone gaskets will not deteriorate under ultra-violet light or elevated temperatures. The unique batten bar design of an aluminum dome is a real asset, which is not only the foundation of the leak-free dome structure, but also increases the structural strength of the dome roof.

Node Design

Note detail utilizes proprietary extrusion design.
Spun aluminum gusset cover provides precision seal.



▶ Fusion Bonded Epoxy Tanks



With more than 30 years engineering, fabrication and construction experiences of GFS modular tanks, Center Enamel have jointly developed innovative and optimum Fusion Bonded Epoxy coating technology with AkzoNobel, the world leading producer of paints and coatings. Center Enamel epoxy tanks quickly get the clients' acceptance after its launch because of its cost-effective performance and advanced electrostatic spraying technology. Same as our superior high-quality commitment to GFS tanks, Center Enamel also give the clients best quality assurance of Fusion Bonded Epoxy modular tanks, which meet or exceed the requirement of AWWA D103-09 and ISO 9227 / ASTM B117 etc.

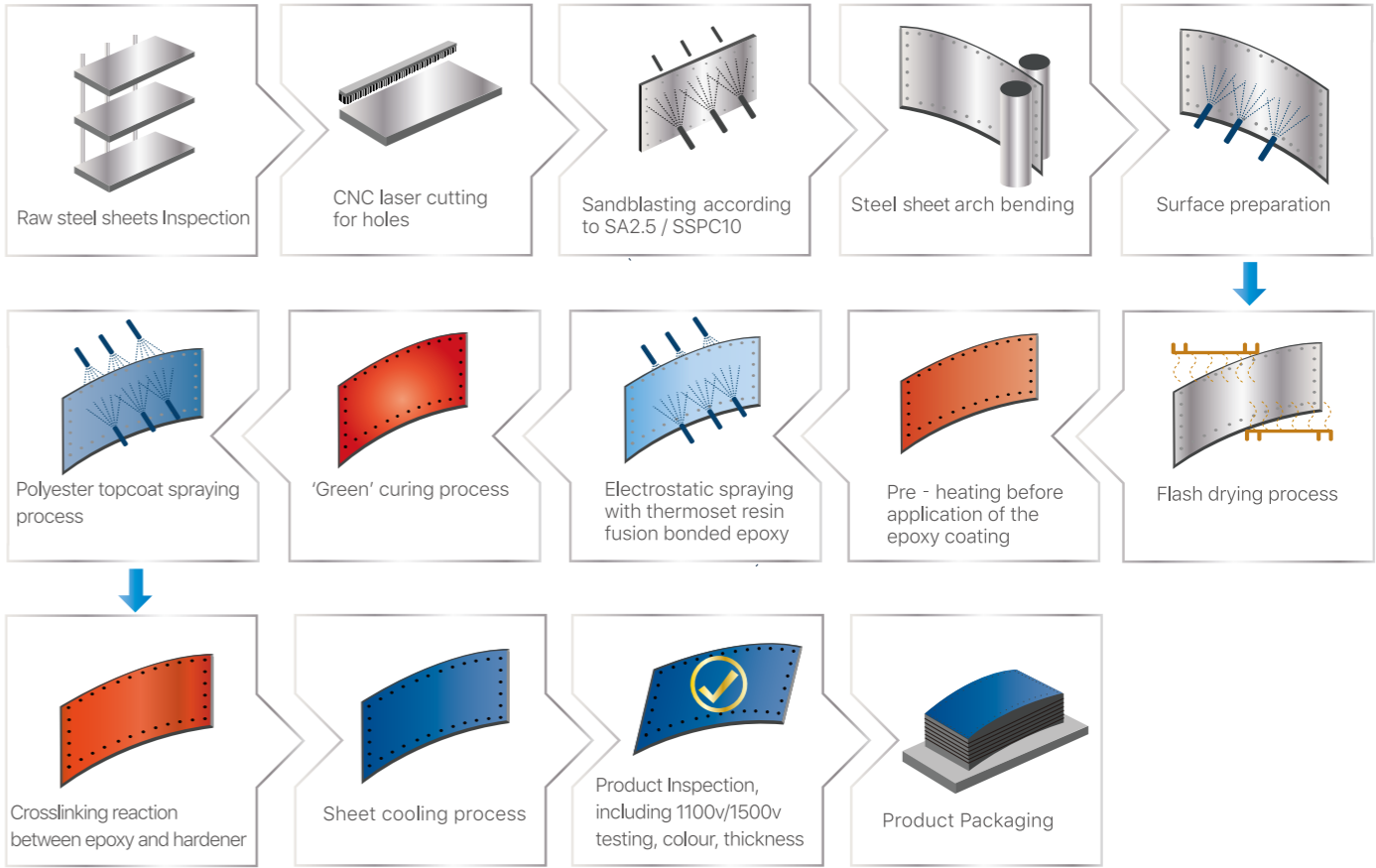
Fusion Bonded Epoxy Tanks Advantages

- Installation requires less field equipment and less labor
- No cathodic protection required due to excellent edge coverage of panel edges and bolt holes
- Provides excellent corrosion resistance and long-term performance due to leak-free coating
- Can be repainted after service life to extend the life of the product
- Better mechanical resistance (shock and flexibility), which helps reduce damage to the coating during shipping and handling
- Easily repaired in the field if damaged
- UV resistance in the harshest sun conditions and durability and consistency of color and gloss.

Applications

Epoxy bolted steel tanks are excellent in many applications
Drinking water storage, fire water, wastewater, crude oil, refinery distillates, drilling fluids, brines, acids, alkalis, ethanol, biofuels, vegetable oils, harvested rainwater, etc.

Fusion-Boned Epoxy Coating Process



Properties of Center Enamel Fusion-Boned Epoxy Steel Tanks

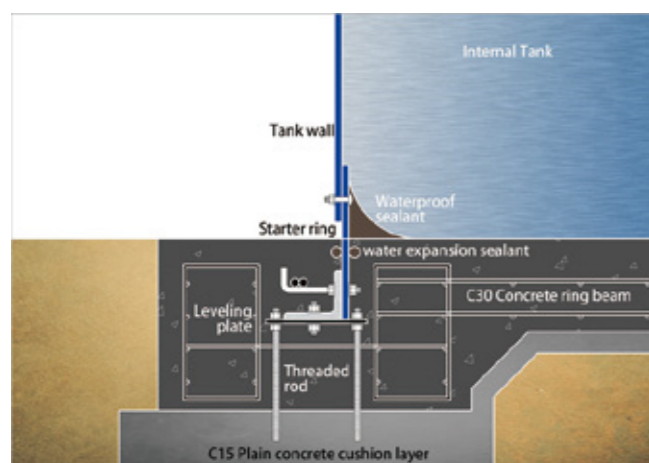
| Application | Test Standard | Result |
|----------------------------------|-------------------------------|---|
| Coating Color | Standard RAL 5015 sky blue | Other colors are available |
| Dry Film Thickness | Average Dry Thickness | 5~10 miles /125 ~250 microns(internal) 5~10 miles /125 ~250 microns(epoxy primer+ topcoat) |
| Holiday Test | ≥1100V (all panels) | Zero-discontinuity at test voltage |
| Hot water immersion 90 days, 70° | AWWA C550-05 | Meets/exceeds standard |
| Corrosion Resistance | Salt Spray ISO 9227/ASTM B117 | Pass |
| Impact Resistance | ASTM D2794 | Pass 160 in-ibs direct & reverse impact |
| PH Range | 3~12 | |
| Abrasion Resistance | Adhesion ASTM D3359 | Adhesion ASTM D3359 |
| Hardness | ISO15184 / ASTM D3363 | 2H |
| Chemical Immersion test | 50% NaOH, 50% H2SO4 | Meets/exceeds industry standard |
| UV Resistance | outdoor exposure testing | 5 years |
| Color Stability | outdoor exposure testing | 5 years |

▶ Galvanized Steel Tanks

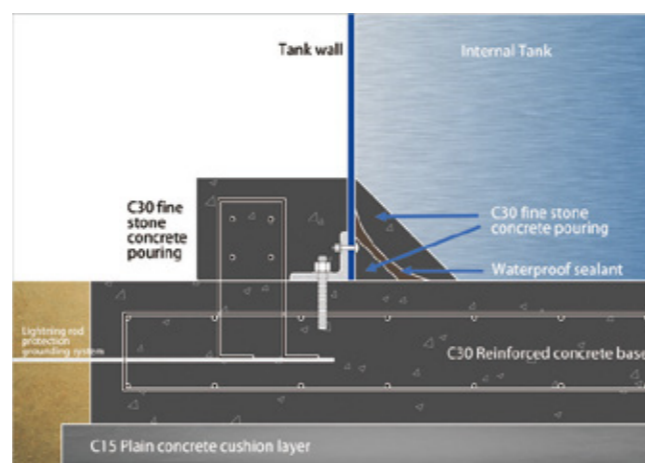
Galvanized steel tanks are an economical way of storing liquids and are primarily used for the storage of fire water, drinking water, and irrigation water applications. These tanks are designed strictly to comply with AWWA D103-09 standards and galvanized according to GBT13912-2020 standards. Meanwhile, it is fabricated with galvanized steel panels bolted together making them economical, easy to transport to the project site, easy to erect, and have a long-lasting interior and exterior finish.



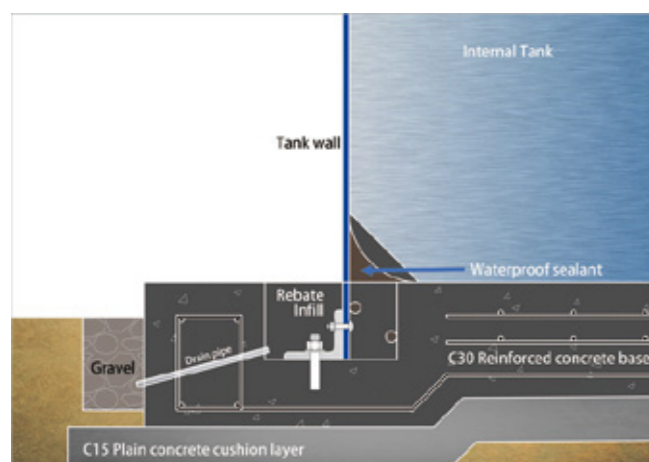
▶ Tank Foundations



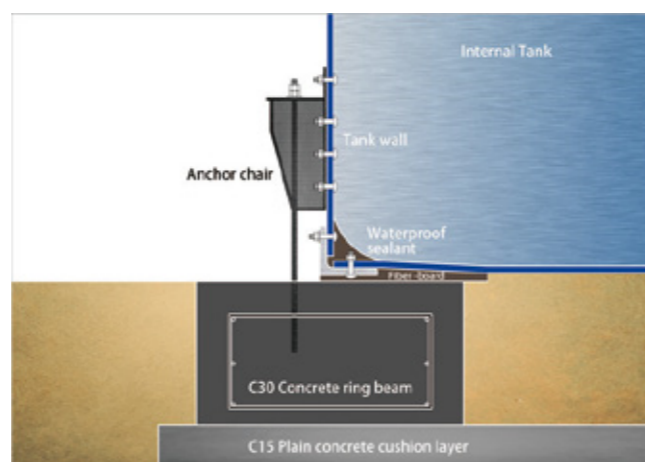
Starter Ring Foundation



Above-Floor Foundation



Embedded Foundation



Enamel Floor Foundation

▶ GFS / SS Tank Roof Options



Glass-Fused-to-Steel Roof

- air-tightness, often utilized for pressurized structures and provide a suitable option for odour control
- cone shape roof with external / internal beams
- viable solution for demanding applications



Aluminum Alloy Trough Deck Roof

- economical option for potable water, waste water, and fire water storage etc.
- keep out rain and wind, odour control
- without air-tightness



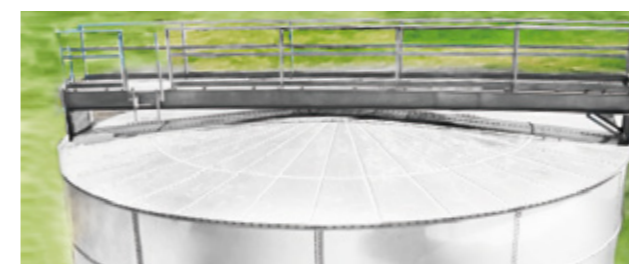
Single and Double Membrane Roof

- superior option for anaerobic digestion processes and biogas applications
- air tightness, utilized for biogas collection and odour control
- integrated AD tank with the cover on top, cost effective



FRP Roof

- suitable for no air-tightness required situation such as drinking water, agriculture, fire water, and wastewater storage
- the shape of FRP roof can be dome or flat



Stainless Steel Roof

- air-tightness, often utilized for pressurized structures and provides a suitable option for odour control
- super anti-corrosion performance and long service life
- viable solution for harsh environments

▶ Accessories

Roof Handrails

Full perimeter / partial roof handrails can be constructed on tanks according to related safety regulation.

Material Options: HDG Carbon Steel / SS304 / SS316



Access Ladders

HDG / SS ladder with step off platform is available, all the design conform to OSHA and other international safety specification.

Types: Vertical / Spiral / Rotatory



Manways and Nozzles

Center Enamel tanks include manways and nozzles, which provide access for man / liquid to enter or get out of the tanks.

Material Options: HDG carbon steel / SS304 / SS316 / FRP / Epoxy



Three-Phase Separator (GLSS)

UASB reactors are commonly equipped with Three-Phase Separator (GLSS) to separate gas, liquid and solid, the structure materials can be PP, Stainless Steel, GRP, PVC and Carbon Steel.



Mixing System and Other Systems

CSTR / AD tanks are generally equipped with mixing system like mechanical agitator or hydraulic agitator. Furthermore, Pumping System, Insulation System, Cathodic Protection, Heating System, Biogas Purification System and other equipment can be provided as requested.



▶ Worldwide Projects Reference



Coca-Cola Plant Wastewater Treatment

Location: Seremban, Malaysia

Tank Quantity: 2 sets of GFS tanks

EGSB Tank: 7.64×17.4M

Adjusting Tank : 9.17×16.8M

Roof Type: Aluminum alloy deck roof / Enamel Roof

Installation: October 2016



Distillery Anaerobic Digestion Tanks

Location: Eswathni, Swaziland

Tanks Model: 56.56×8.4M

Tank Quantity: 2 sets of GFS tanks

Tank Colour: BL04

Roof Type: Floating roof by others

Installation: November 2019



Textile Industry Parks Wastewater Treatment

Location: Adama, Dire Dawa and Addis Ababa, Ethiopia

Tank Quantity: 23 sets of GFS tanks

Total Storage Capacity: 31,000m³ at 3 sites

Tanks Model: 25.22×4.8M, 28.28×7.2M, 23.69×7.2M etc.

Roof Type: Aluminum alloy deck roof

Installation: October 2018



Singapore Poultry Farm Biogas Project

Location: Singapore

Bioreactor with Open Roof: 18.34×8.4M

Bioreactor with Open Roof: 8.41×9.0M

Raw Material Buffer Tank: 11.46×7.2M

Roof Type: Aluminum alloy flat roof / Open roof

Installation: January 2021



Worldwide Projects Reference



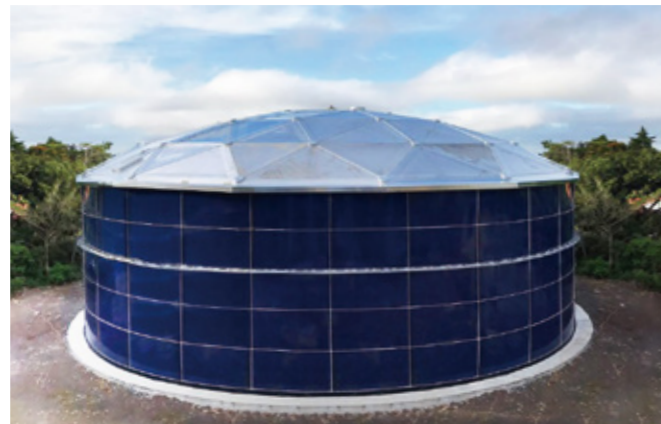
SINOPEC Petroleum WWTP

Location: Fujian, China
Tanks Model:
1 Set of GFS Tank: 13.75×20.4M
1 Set of GFS Tank: 13.75×21.6M
2 Sets of GFS Tanks: 19.11×20.4M
Roof Type: GFS Roof
Installation: June 2019



KuibyshevAzot Chemical Plant Wastewater Treatment

Location: Russia
Tank Model: 9.17*8.4M
Tank Quantity: 2 sets of GFS tanks
Roof Type: Aluminum alloy deck roof
Installation: September 2020



Drinking / Potable Water Tanks

Location: Panama
Tanks Model: 21.4×6.0M, 19.87×5.4M, 6.88×6.6M
Tank Quantity: 3 sets of GFS tanks
Tank Color: Interior white, exterior cobalt blue
Roof Type: Aluminum dome roof by others
Installation: November 2015



Potable Water Storage Tanks in Canada

Location: Yukon, Canada
GFS Tank with Enamel Floor: 12.23×5.4M
GFS Tank with Enamel Floor: 12.23×7.8M
Tank Quantity: 2 sets of GFS tanks
Roof Type: Enamel roofs
Installation: July 2018



Worldwide Projects Reference



Municipal Sewage Treatment Project

Location: Sichuan, China
4 Sets of GFS Tanks: 37.45×7.2M
2 Sets of GFS Tanks: 28.28×4.8M
2 Sets of GFS Tanks: 29.81×4.8M
4 Sets of Steel Tanks: 24.84×7.2M
4 Sets of Steel Tanks: 10.51×7.2 M
Installation: August 2022



Veolia Landfill Leachate Treatment Project

Location: Hong Kong China
2 sets EQ Tank with GFS roof: 15.29×6M
3 sets SBR Tank: 26.75×8.4M
SBR Effluent Tank with GFS roof: 15.29×6M
2 sets Sludge Holding Tank: 9.93×4.8M
Sludge Thickener Tank with GFS roof: 11.46×6M
Thickened Sludge Holding Tank: 4.59×4.8M
Treated Effluent Tank with GFS roof: 7.64×4.8M
Installation: October 2019



Inner Mongolia Biogas Project

Location: Inner Mongolia
Tank Quantity: 4 sets of GFS tanks
Tanks Model: 25.22×8.4M
Roof Type: Double membrane roof
Installation: December 2016



Coca Cola Plant Wastewater Treatment Plant

Location: Riyadh, Saudi Arabia
Equalication Tank: 15.29×7.2M
Calamity Tank: 8.4×9M
Anaerobic Digester Tank: 12.22×8.4M
Flash Aeration Tank: 7.64×7.2M
Holding Tank: 6.88×7.2M
Installation: June 2017

Worldwide Projects Reference



Colombia Drinking Water Project

Location: Colombia
Tanks Model: 14.51×7.20M
Application: Drinking Water Tank
Roof Type: Aluminum Alloy Deck Roof
Installation: August 2022



Rosing Uranium Mine Water Reservoirs

Location: Namibia
Tanks Model:
6 Sets of GFS Tanks: 41.26×8.4M
Application: Drinking Water Tank
Roof Type: Aluminum Alloy Deck Roof
Installation: February 2021



Melbourne Drinking Water Project

Location: Australia Melbourne
Tank Model: 22.17×6M
Tank Quantity: 2 sets of GFS tanks
Tank Foundation: Embedded
Roof Type: Aluminum alloy deck roof
Installation: April 2016



Dairy Wastewater Treatment Project

Location: Gansu, China
3 Sets of GFS Tanks: 17.58×3.6M
3 Sets of GFS Tanks: 12.99×5.4M
2 Sets of GFS Tanks: 12.23×12.0M
3 Sets of GFS Tanks: 28.27×5.4M
3 Sets of GFS Tanks: 12.23×24M
Installation: June 2020

Worldwide Projects Reference



Food Processing Wastewater Treatment

Location: Shaanxi, China
2 Sets of GFS Tanks: 20.63×20.4M
2 Sets of GFS Tanks: 12.22×13.2M
1 Set of GFS Tank: 12.22×20.4M
1 Set of SS Tank: 9.93×12.6M
1 Set of GFS Tank: 5.35×5.4M
1 Set of GFS Tank: 4.58×6M
1 Set of GFS Tank: 3.06×5.4M
1 Set of GFS Tank: 3.82×5.4M
Installation: October, 2022



Turkey Food Waste Biogas Project

Location: Istanbul, Turkey
Tank Model: 16.81×16.8M
Tank Quantity: 2 sets of GFS tanks
Roof & Freeboard: SS316
Installation: December 2020



Potable Water Storage GFS tanks

Location: Cirebon, West Java, Indonesia
Tank Model: 46.62×6M
Tank Colour: BL04
Roof Type: Aluminum alloy deck roof
Installation: February 2020



AB InBev WWTP Project in Mozambique

Location: Maputo, Mozambique
Applications: EQ tank, UASB tank, Buffer tank, Calamity Tank, Anoxic tank, Aeration tank and MBR permeate tank etc.
Tanks Model: 15.29×7.2M, 19.87×9M, 9.17×4.8M, 8.4×6.6M, 4.59×7.2M, 15.29×7.2M, 4.59×3.6M, 7.64×3.6M
Roof Type: GFS or Aluminum alloy deck roof
Installation: October 2019