



# Shijiazhuang Center Enamel Co., Ltd



## Shijiazhuang Center Enamel Co.,Ltd.

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The Leader of GFS/Enamel Tank in China

The Largest and Most Professional GFS/Enamel Tank Manufacturer in China







# Certifications



## GFS Tanks

About Our Company

Shijiazhuang Center Enamel Co., Ltd is a manufacturer dedicated in glass-fused-to-steel tank design and fabrication since 1989. Glass-fused-to-steel tanks are widely applied in such as but not limited to bio-energy, waste water treatment, potable water storage and dry bulk storage , ect.

With nearly 30 years experience in enameling industry and more than 200 enamel formula patents, Shijiazhuang Center Enamel Co., Ltd is not only the largest enamel products fabrication base in China, but also the first one in China to produce double -sides hot-rolled enameled sheets. Our enamel tanks have already been exported to USA, Australia, Canada, Singapore, Malaysia, Thailand, South Africa , Panama and other 39 countries.

Center Enamel Co., Ltd occupies the most advanced enamel sheet automatic production line in China. It is a ISO9001:2008 approved company. The tank design conforms to standards of AWWA D-103/09 , OSHA and EN28765 . We provide customized tank upon your specific technical or operating requirements.





# Glass Fused to Steel Tanks

## Advantage :

- 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 can be easily expanded ;
- It can be dismantled , removed and relocated
- Elegant appearance , tank color can be customized ;

**GFS / Enamel Tank**  
**Leader of Industry**

## GFS Tanks Application Fields

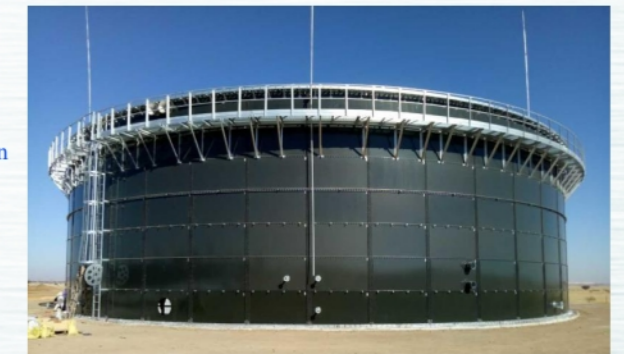


### Power and Energy

Biogas biomass	Fuel oil	Diesel
Aviation oil	Kerosene	Drilling mud
Process water	DI water	Reverse osmosis water
Boiler feedwater	Coal storage	Fly ash silo

### Water Supply and Treatment

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



### Waste Water Treatment

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

### Industrial Dry Bulk Storage

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





## Center Enamel Technology Advantages



Shijiazhuang Center Enamel Co., Ltd has been engaged in enamel industry for nearly 30 years . It is the most professional enamel product enterprise in China . It occupies more than 200 patents of enamel frit formulas. The professional R&D department consists of more than 30 engineers that possessing independent ability of enamel formulas research . We are able to provide glass-fused-to-steel tank for various applications .

### Professional R&D Team:

Technical consultant---1 person  
Professor Senior Engineer, national famous expert with more than 50 years experience of enamel researching.  
Technical experts-- 8 persons  
Master degree, more than 10 years' enamel researching experience  
Bachelor degree, possess technical skills on different aspects -23 persons  
Experiment, testing equipments- more than 100 sets

### Quality Control:

Raw material test: ingredient analysis, impurities test;  
Recipe finalizing small sample test: enamel fluidity test, chromatic difference analysis; enamel burning experiment, acid and alkali resistance test, glossy, adhesion test etc. ;  
Middle stage product test: magnify experiment simulated operation environment;  
Destructive testing: impact test, holiday test, sliced electric microscope analysis.



## GFS/Enamel Bolted Tank Introduction

Consist of enamel sheet, special sealant, self-locking bolts



Double Membrane Roof



Glass-Fused-to-Steel Roof



Aluminum Trough Deck Roof

## Glass-Fused-To-Steel Tanks Production Introduction

GFS tanks combine the strength and engineering flexibility of steel with the impermeable and corrosion resistant properties of glass.

- Fabricated sheets are grit blasted to a uniform, near-white surface
- A proprietary glass formulation is applied that chemically bonds to each steel panel
- Dry and firing in tunnel oven at 820°C -930°C high temperature
- All enameled sheets are inspected and conduct 1500V holiday test

Plate CNC Cutting



Step 1

Enamel Spraying



Step 2

High Temperature Burning



Step 3

Quality Inspection



Step 4

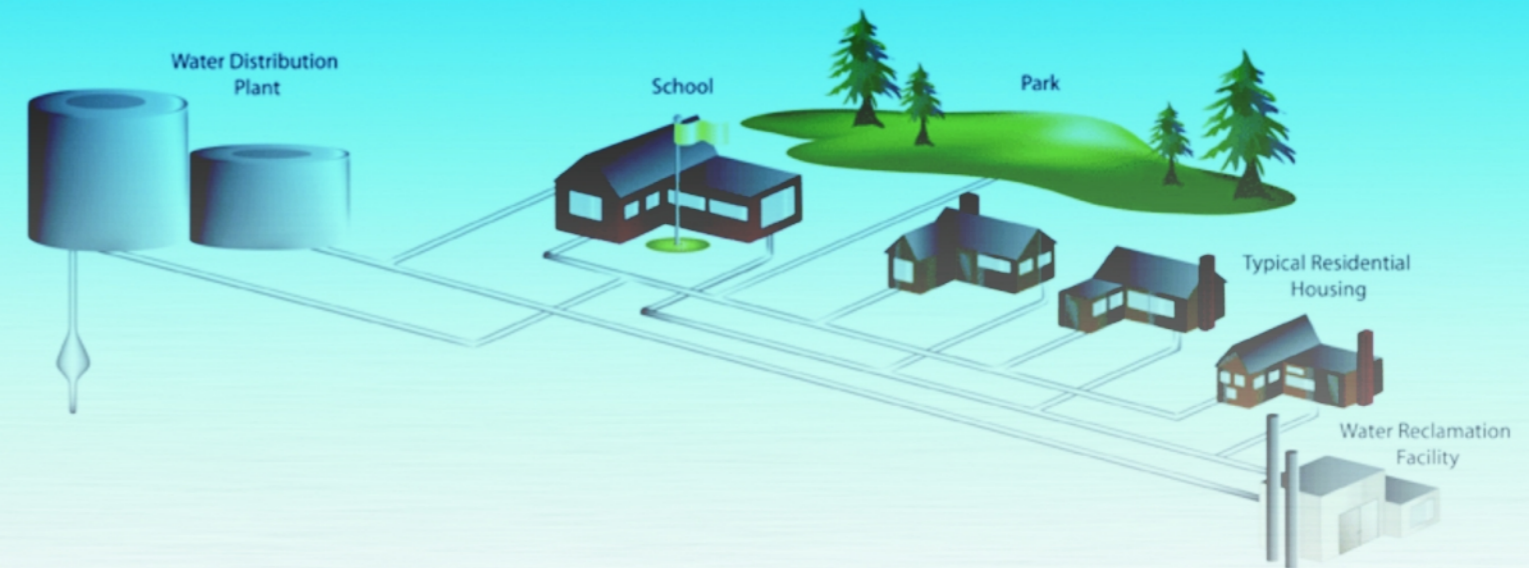


## What is Glass-Fused-to-Steel Tank ?

After firing at 820°C -930°C high temperature, the molten glass reacts with the profiled steel surface to form an inert, inorganic bond, which combines the outstanding chemical and physical resistant properties of glass with a highly engineered ultra-fine glass structure surface. As the superior corrosion resistance performance, Glass-Fused-To-Steel technology is the premium coating technology in the storage tank market, is widely used for biogas energy, municipal and industrial liquid applications.

### GFS / Enamel Sheet Specifications

Category	Specification
Coating color	Standard dark green and blue color or customized
Coating thickness	0.25~0.45mm, double coating
Acid and alkalinity proof	Standard PH: 3~11, Special PH: 1 ~14
Adhesion	3,450N/cm
Elastic	7.9*104MPA
Hardness	6.0Mohs
Service life	≥30 Years
Holiday test	>1500V
Permeability	Gas liquid impermeable
Easy to clean	Smooth, glossy, inert, anti-adhesion
Corrosion resistance	Excellent, suitable for wastewater, salt water, sea water, high sulfur crude oil, salt fog, organic and inorganic compounds



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

### Various Kinds of Tanks and Applications



Water storage



Landfill leachate treatment



Water treatment



Industrial water supply



Chemical waste treatment



Community water supply



## Glass Fused to Steel Tank Application Project Cases

### Anti-microbial Enamel Technology

After several years' research and development, the anti-microbial enamel produced by Center Enamel Co., Ltd 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 mould. The anti-microbial enamel steel conforms to the standards of JC/T897-2002 《antibacterial capabilities of antibacterial enamel》.

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

### Applications:

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

### Test Report

建筑材料工业环境检测中心 检测报告	
样品名称	240-15抗菌钢板
送样日期	2014年4月17日
委托单位	石家庄三牛科技有限公司
生产单位	石家庄三牛科技有限公司
来样编号	YFW201405100098
检验依据	QB/T2981-2003《抗菌材料-抗菌性能试验方法(抗菌性能)》
检验项目	抗菌性能
检验结论	送检样品抗菌性能符合QB/T2981-2003《抗菌材料-抗菌性能试验方法(抗菌性能)》标准要求,在有效期内。
批准:	审核: 站 编制: 站

建筑材料工业环境检测中心 检测报告	
样品名称	240-15抗菌钢板
送样日期	2014年4月17日
委托单位	石家庄三牛科技有限公司
生产单位	石家庄三牛科技有限公司
来样编号	YFW201405100097
检验依据	JC/T897-2002《抗菌材料-抗菌性能》
检验项目	抗菌性能
检验结论	样品抗菌性能符合JC/T897-2002《抗菌材料-抗菌性能》标准要求。
批准:	审核: 站 编制: 站

### Project Application Cases



West Africa Niger Azelik Uranium deposits potable water project (contracted by China National Nuclear Corporation)

Anti-microbial enamel steel tank :  
Tank diameter : 19.86m  
Height : 4.8m  
Volume: 1375m<sup>3</sup>

## GFS Tank Worldwide Project Reference



### Biogas Fermentation tanks Project -Indonesia

Project Details:  
Biogas Fermentation tanks Ø19.86\*8.4M  
Tank quantity: 3 sets  
Roof type : double membrane roof  
Installation finished on 2009



### Coco-Cola Plant Wastewater Treatment – Kuala Lumpur, Malaysia

Project Details:  
EGSB tank with enamel roof : Ø 7.64\*17.4M  
Adjusting tank with aluminum deck roof : Ø9.17\*16.8M  
Installation finished: October 2016



### Portable Water Storage Tanks – Maldives

Project Details:  
Tank size : Ø 5.35\*6.6M, Ø 3.82\*3.6M,  
Total quantity : 3 sets  
Installation finish: February 2016



## GFS Tank Worldwide Project Reference



### White Glass Fused to Steel Tank - Arkansas, USA

#### Project Details:

##### 1st phase:

GFS tank with enamel roof & floor :  $\text{Ø}11.46 \times 7.8\text{M}$

GFS tank with enamel roof & floor:  $\text{Ø}10.7 \times 7.2\text{M}$

##### 2nd phase:

drinking water storage tank :  $\text{Ø}20.64 \times 7.2\text{m}$

Installation finished: December 2015



### Filtered water storage Tank - Wallan, Australia

#### Project Details :

Tank size :  $\text{Ø} 17.58 \times 3\text{M}$

Roof type : aluminum alloy trough roof

Installation finished: March, 2015



### Two bolted water storage tanks in Southern California - Porsche Speedway

#### Project Details :

Water storage tank:  $\text{Ø} 7.62 \times 8.5\text{M}$

Water storage tank:  $\text{Ø} 4.59 \times 3.6\text{M}$

Installation finished: October 2016

## GFS Tank Worldwide Project Reference



### Drinking water storage tank – Melbourne, Australia

#### Project Details :

2 sets of drinking water storage tanks  $\text{Ø} 22.17 \times 6\text{M}$

Roof type : aluminum alloy trough roof

Installation finished: April 2016



### Drinking water storage tank – Costa Rica

#### Project Details :

1 set of drinking water storage tanks  $\text{Ø} 15.29 \times 6.0\text{M}$

Roof type : aluminum alloy trough roof

Installation finished: February, 2017



### Inner Mongolia Biogas Project

#### Project Details :

3 sets of biogas digester with size  $\text{Ø} 25.22 \times 8.4\text{M}$

Volume: 4194 CBM

Roof type : double membrane roof

Installation finished: 2016



## GFS Tank Worldwide Project Reference



### Potable water storage project – Ecuador

Project Details:

Tank Qty : 6 sets

Tank size : Ø 18.34\*4.8M

Roof type : aluminum alloy trough roof

Installation finished : January , 2016



### Municipal wastewater treatment plant- Russia

Project Details:

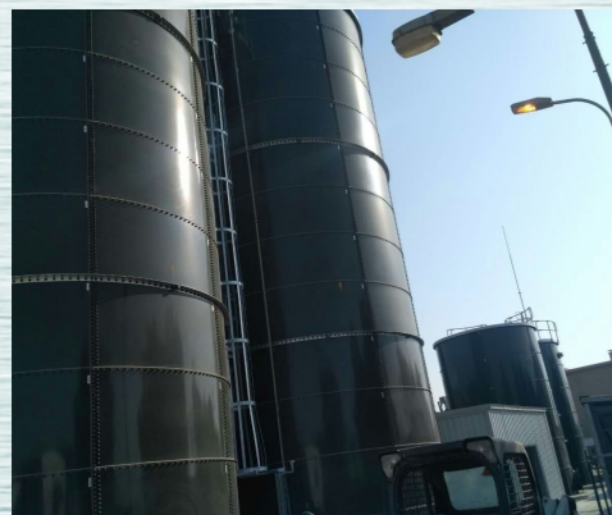
3 sets of Wastewater treatment tank

Tank Size :

2 sets Ø 5.35\*8.4M with enamel roof

1 set Ø2.32\*8.4 with enamel roof

Installation finished : May, 2016



### Soft drink plant wastewater treatment - Saudi Arabia

Project Details:

2 sets of sludge tanks: Ø4.59\*7.2M, Ø3.82\*7.2M

1 set of conditioning tank: Ø6.11\*14.4M

1 set of post aeration tank: Ø7.64\*9M

1 set of anaerobic reactor: Ø11.46\*10.2M

1 set of UASB tank: Ø5.35\*14.4M

Installation finished : September, 2016

## Characteristics Comparison with Various Tanks

Characteristic	Concrete Tank	Ss304 Tank	FRP Tank	Enamel Tank
Acid & Alkali Resistance	Normal	Normal	Special fiber	Excellent
Service Life	40 years	30 years	< 10 years	> 30 years
Pressure Standing Ability	Strong	Normal	Normal	Strong
Installation Period	> 35 days	> 20 days	> 35 days	7-10 days
Installation Difficulty	Complicated, request large professional equipment	Professional workers work high above the ground, dangerous installation	Work high above the ground, dangerous installation, highly depends on weather	Safe, easy, fast installation
Removal	Impossible	Possible but at high cost	Impossible	Possible in low cost
Out Appearance	Normal	Good but in only on color	Normal	Good looking
Abrasion Resistance	Good	Normal	Bad	Good
Corrosion Resistance	Bad	Good	Normal	Good
Insulation	Good	Bad	Good	Good
Easy to Clean	Very bad	Good	Very bad	Good
Antistatic Property	Good	Bad	Good	Good



Enamel tank is suitable for high demand on out appearance with low cost, quick installation and environmental friendly as well.



## Comparison with Various Tanks

No.	Characteristics	Concrete Tank	Carbon Steel Welded Tank	Enamel Tank
1	Construction Time	> 2 months	> 1 month	7-10 days
2	Process Technology	Strict	Welding difficult	Easy
3	Installation	Strict & complicated	Difficult	Convenient & easy
4	Removal	Impossible	Difficult	Easy
5	Appearance	Normal	Normal	Good