

GFS TANKS

Glass-Fused-to-Steel Tanks

*Durable & Corrosion-Resistant Storage Solutions.
Engineered for Longevity, Designed for Performance.*



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Introduction

At **Streamindus Engineering Services Pvt. Ltd.**, we specialize in providing innovative engineering solutions, and our Glass-Fused-to-Steel (GFS) tanks are a testament to our expertise. These tanks are created by fusing two robust materials – glass and steel – at high temperatures, resulting in a durable and corrosion-resistant storage solution. With our advanced engineering design and manufacturing capabilities, we deliver GFS tanks that offer superior protection against harsh environmental conditions, making them ideal for various industrial and municipal applications.

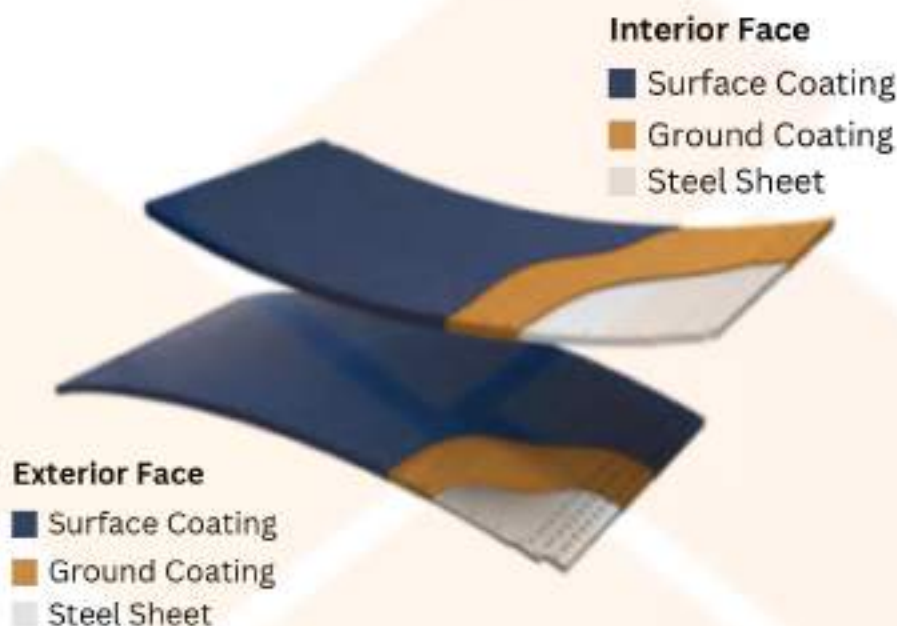


Key Benefits of GFS Tanks:

- *Corrosion resistance due to fused glass coating.*
- *High mechanical strength of steel structure.*
- *Low maintenance and long lifespan.*
- *Resistant to harsh weather and extreme pH levels.*
- *Easy transportation and modular installation.*
- *Suitable for water, wastewater, and chemical storage.*

WHAT IS GFS 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.



COATING PROPERTIES

Coating Thickness: 0.25-0.40 mm

Double Coating: 2 layer each side

Adhesive Power: 3,450 N/ cm

Coating Elasticity: 500kN/mm

Hardness: 6.0 (Moh's hardness)

Service life: > 30 years

GFS TANKS TECHNICAL SPECIFICATION

Parameter	Details
Material	Glass-Fused-to-Steel (GFS) - Steel coated with a layer of glass
Diameter	3 meters to 30 meters (customizable based on requirements)
Height	3 meters to 20 meters (customizable based on tank capacity)
Thickness	Glass coating thickness: 0.3 mm to 0.5 mm, Steel thickness: 2 mm to 10 mm
Coating/Finish	Glass coating fused to steel at high temperatures (corrosion-resistant)
Types	Bolted GFS tanks (modular, easy to assemble and transport)
Temperature Resistance	0°C to 100°C (can be designed for higher temperatures based on application)
Design Life	30 to 50 years, with low maintenance and high durability due to the corrosion resistance of the glass coating
Accessories	Inlet/outlet pipes, Manhole, Level Indicator, Overflow valve, Drain valve, Vent valve
Applications	Used for potable water, wastewater treatment, chemical storage, and other industrial liquid storage needs

Capacity	Details
Minimum Capacity	20,000 liters (20 m ³)
Maximum Capacity	10,000,000 liters (10,000 m ³)

APPLICATION OF GFS TANKS



POWER & ENERGY

<i>Biogas</i>	<i>Fly ash Silo</i>	<i>Boiler Feedwater</i>
<i>Biomass Energy</i>	<i>DI water</i>	<i>Reverse Osmosis water</i>
<i>Process Water</i>	<i>Coal Storage</i>	<i>Fermentation Tank</i>



WASTE WATER TREATMENT

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



WATER SUPPLY AND TREATMENT

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



INDUSTRIAL DRY BULK STORAGE

<i>Mineral</i>	<i>Wood product</i>	<i>Stone / clay / glass</i>
<i>Chemicals</i>	<i>Petrochemicals</i>	<i>Mining Industry</i>
<i>Foods</i>	<i>Plasthetics</i>	<i>Grain / seeds</i>

GFS Tanks Color Options



Grey Olive



Black Blue



White



Forest Green



Red



Sky Blue



Evening Haze



Cobalt Blue



Desert Tan



Mist Green

GFS Tanks 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*



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

GLS 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.



Accessories

Mixing System and Other Systems

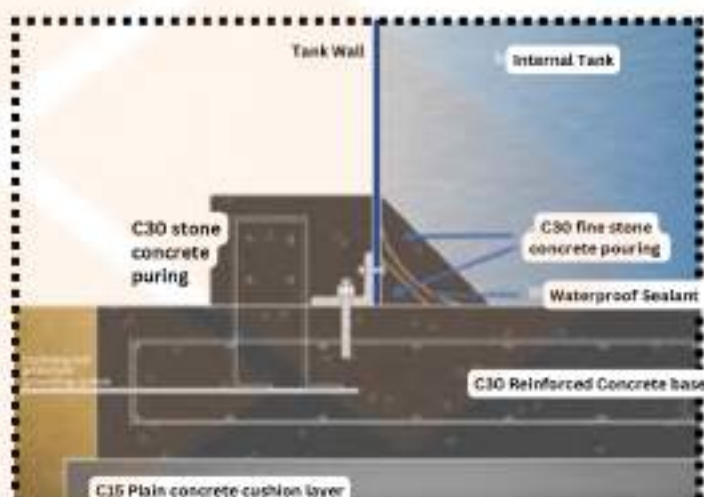
CSTR / AD tanks are generally equipped with mixing system like mechanical agitator or hydraulic agitator. Furthermore, Pumping System, Insulation System, Cathodic Protection, Heating System, Biogas Purification System and other equipment can be provided as requested.



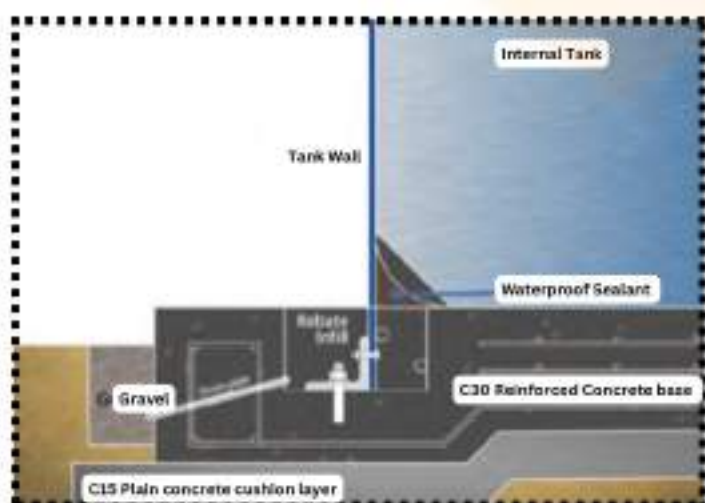
Tank Foundations



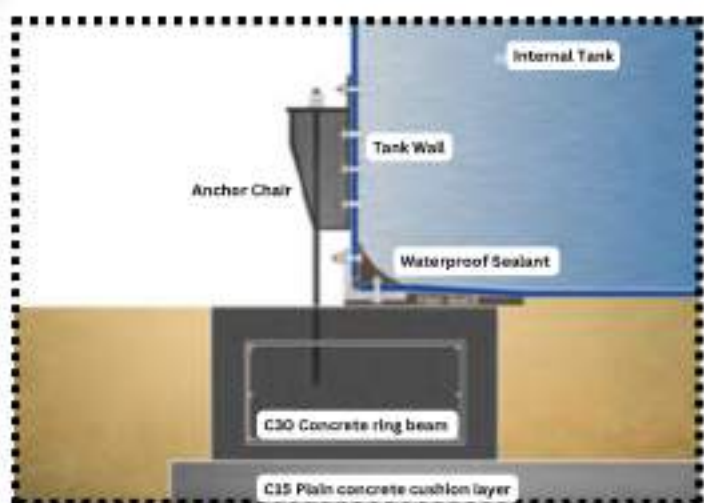
Starter Ring Foundation



Above Floor Foundation



Embedded Foundation



Enamel Floor Foundation

Technical References

Conversion Factor






Measurement/Conversion	Formula/Value
1 Cubic Meter (m ³)	1000 Liters (1 KL)
1 Gallon (US)	3.785 Liters
1 Inch	25.4 mm
1 kN/m ²	0.102 Ton/m ²

Density Of Material

Material	Density (kg/m ³)
Mild Steel (MS)	7,850
Stainless Steel	7,900
Zincalume Steel	7,100
FRP (Fiberglass Reinforced Plastic)	1,800 - 2,000

Tank Formula

Aspect	Formula	Description
Volume of a Cylindrical Tank	$V = \pi r^2 h$	Used to calculate the liquid storage capacity of cylindrical tanks.
Volume of a Spherical Tank	$V = (4/3)\pi r^3$	Used for spherical tanks.
Volume of a Rectangular Tank	$V = l \times w \times h$	Used for cuboidal tanks.
Surface Area of a Cylindrical Tank	$A = 2\pi rh + 2\pi r^2$	Calculates the external surface area of the tank.
Surface Area of a Spherical Tank	$A = 4\pi r^2$	Calculates the total surface area of a spherical tank.
Surface Area of a Rectangular Tank	$A = 2(lw + lh + wh)$	Determines the total external area.

Figure	Formula
Cube 	a^3
Rectangular prism 	$l \times w \times h$
Cylinder 	$\pi \times r^2 \times h$
Cone 	$\frac{1}{3} \times \pi \times r^2 \times h$
Sphere 	$\frac{4}{3} \times \pi \times r^3$

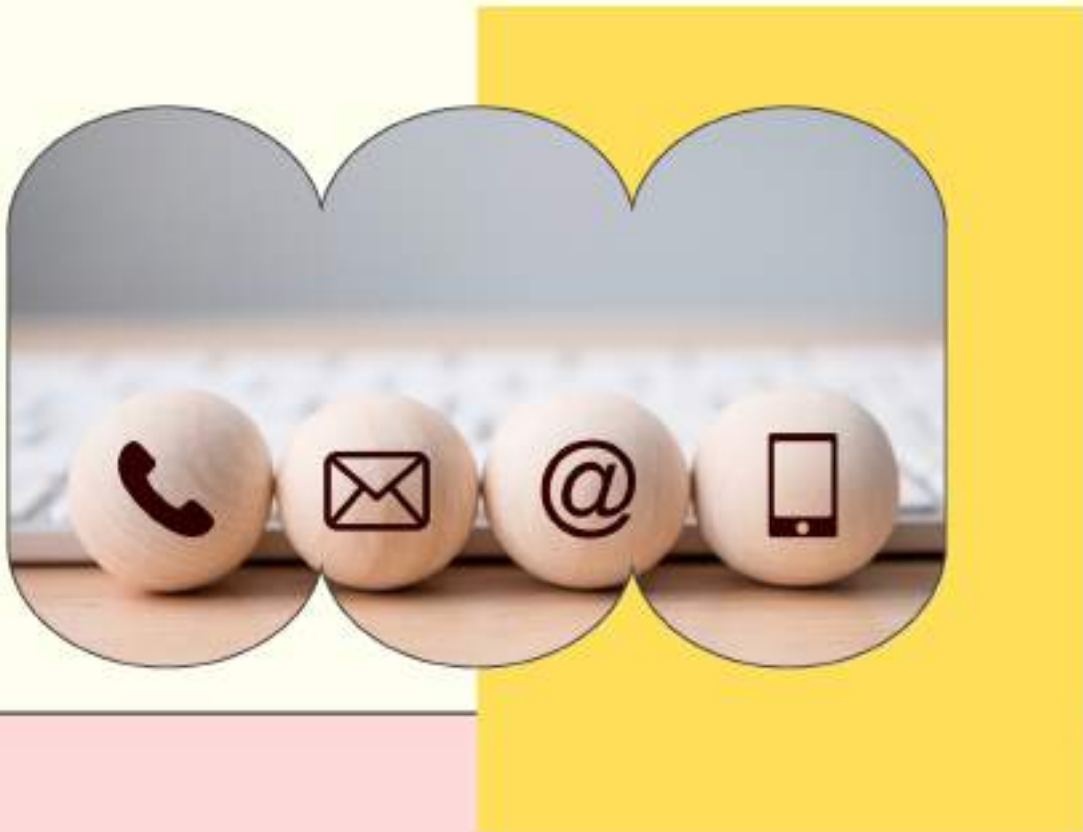
Sesmic Zone Of India

Formula	$F = Ah \times W$
Zone	Zone Factor (Z)
Zone 2 (Low Risk)	0.10
Zone 3 (Moderate Risk)	0.16
Zone 4 (High Risk)	0.24
Zone 5 (Very High Risk)	0.36

Soil Bearing Capacity

Soil Type	Bearing Capacity
Soft Clay	50-100 kN/m ²
Dense Sand	150-300 kN/m ²
Hard Rock	300+ kN/m ²

Keep In Touch



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