

Sulfuric Acid

Challenging a storage tank's strength and design safety



SULFURIC ACID

Sulfuric acid is used in a huge array of industrial applications, for everything from water and wastewater treatment to the manufacture of chemicals, fertilizer and car batteries. But this highly exothermic acid presents serious storage challenges, for a number of reasons.

- Sulfuric acid is an extremely heavy chemical that will test the mechanical integrity of any material.
- The addition of water to concentrated sulfuric acid leads to the dispersal of a sulfuric acid aerosol – or worse yet, an explosion.
- If sulfuric acid is spilled on metals, it can create highly flammable hydrogen gas.
- Skin and other bodily burns from sulfuric acid are potentially more serious than burns from other strong acids. Sulfuric acid dehydrates whatever it touches, and the heat caused by that reaction with water can create secondary thermal damage.

These tanks and fittings can be combined specifically to contain sulfuric acid, reducing the risks presented by this highly acidic chemical.

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Sulfuric Acid Systems

Through a combination of innovative features, these tank designs create the ideal system for sulfuric acid storage. With their robust load tolerance, crosslinked polyethylene tanks can more than handle the chemical’s heavy weight.

The molecular bonding of XLPE and tank wall thickness is particularly important in the bottom third of the tank, where high levels of load are concentrated. If secondary containment is not present, the SAFE-Tank® is a smart choice. Along with containing the chemical from its surrounding environment, this double-walled tank greatly lowers the risk for hazardous contact of sulfuric acid with

water. SAFE-Tank® systems are designed with OR-1000™.

If secondary containment* is present, the IMFO® tank is recommended. With the use of an IMFO® system instead of mechanical fittings, the tank’s structural integrity is maximized.

Combine this tank design with the OR-1000™ system, and oxidation is reduced dramatically. All of these features lead to a safer tank – designed to reduce safety risks and improve the longevity of the system.

*Containment tank is required with this chemical in all applications.

CHEMICAL	RESIN TYPE	SPECIFIC GRAVITY RATING	FITTING MATERIAL	GASKET MATERIAL	BOLT MATERIAL
Sulfuric Acid ≥ 93%	XLPE with OR-1000™	2.2	PVC	Viton®	316SS
Sulfuric Acid 80%–92%	XLPE with OR-1000™	2.2	PVC	Viton®	C-276
Sulfuric Acid < 80%	XLPE	1.9	PVC	Viton®	C-276

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** See our website for a complete Chemical Resistance Chart -

www.PlasticTankSuperStore.com



SULFURIC ACID

Tank Specifications



- **High-density crosslinked polyethylene (XLPE)** accommodates the heavy weight of sulfuric acid.
- **OR-1000™** bonds the XLPE with an antioxidant inner surface, minimizing oxidation, reducing the potential for fault and maximizing life span.
- **SAFE-Tank® design** creates a “tank within a tank,” ensuring that water will not enter the containment area. (Recommended where secondary containment is not available)
- **IMFO® tank is molded as a single unit.** This maintains hoop stress rating, adding to the strength of the tank. (Recommended for situations with existing secondary containment)
- **B.O.S.S.® fitting provides bolted one-piece** sure-seal design, limiting the seal point to a single gasket for major leak prevention.

Recommended System Components



Venting:
SAFE-Surge® manway cover is recommended on pneumatically loaded systems to support tank longevity.



Fittings:
Recommend bellows transition fitting for bottom sidewall discharge



Fittings:
B.O.S.S.® fitting also recommended to prevent leaks
Note : For concentrations less than 93%, DO NOT use stainless steel.



Plumbing:
Reverse float gauge recommended to ensure proper tank leveling

The above components are just a few of the many options we offer. See our [website](#) or talk to your Water Tanks and Chemical Tanks representative to find out more.

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Tank

SAFE-Tank® of XLPE with OR-1000™:

- 3,150–8,700 gallons
2.2 spg rating with OR-1000™ for primary tank
1.9 spg rating for secondary tank
- 1,550–2,500 gallons
2.2 spg rating with OR-1000™ for primary tank
2.2 spg rating for secondary tank
- 55–1,000 gallons
1.9 spg primary and secondary tanks

NOTE: 55–1,000 gallons do not require OR-1000™.

Non-SAFE-Tank® alternatives:

IMFO® Vertical Flat Bottom of XLPE with OR-1000™:

- 1,150–6,600 gallons
2.2 spg rating

IMFO® Vertical Flat Bottom of XLPE:

- 230–905 gallons
1.9 spg rating

NOTE: Limit one IMFO® per tank

Standard Vertical Flat Bottom of XLPE with OR-1000™:

- 1,050–6,600 gallons
2.2 spg rating

Standard Vertical Flat Bottom of XLPE:

- 30–1,000 gallons
1.9 spg rating

Secondary containment

Non-SAFE-Tank® alternatives:

- PPC secondary containment basin
- Other secondary containment suitable for sulfuric acid, of adequate size for use

Fittings

Sidewall: Recommend 3" maximum B.O.S.S.® fitting

Dome: No restrictions

Plumbing to the tank

- Required use of **flexible** connections with fittings on lower third of sidewall
Allows for lateral and vertical expansion and contraction of the tank
Reduces pump and piping vibration stress on the tank
- Expansion joints must meet the following minimum requirements:
 - Axial Compression $\geq 1.5''$
 - Axial Extension $\geq 0.625''$
 - Lateral Deflection $\geq 0.750''$
 - Angular Deflection $\geq 14^\circ$
 - Torsional Rotation $\geq 4^\circ$

VENTING

Please refer to the [Venting Technical Bulletin](#)

downloaded at:

http://watertankschemicaltanks.com/Technical_Information.php

FOUNDATION AND RESTRAINTS

- Smooth concrete, asphalt or steel foundation designed to accommodate IMFO®, SAFE-Tank® or vertical tank
- No restraint or ladder attachment bands circumscribing the tank are allowed. Cable restraint systems must pass cables over the top of the tank.

Temperature

Product should not exceed 100°F at delivery or during storage to maintain ASTM D1998 design parameters.

Lid

SAFE-Surge® manway cover for pneumatically loaded tanks; bolted manway cover for all other applications

OPTION S

Restraint systems for wind and seismic, level gauges, ladders, heating pads, insulation, fume-tight manway cover, NSF-61 certification and engineering stamp