

## 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.

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



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## The Poly Processing Sulfuric Acid System

Through a combination of innovative features, Poly Processing creates 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 Poly Processing 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         |

» See our website for a complete Chemical Resistance Chart.

**NOTE:** To meet NSF-61 certification, use Viton® GF.

## 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 offered by Poly Processing. See our website or talk to your Poly Processing representative to find out more.



# TECHNICAL OVERVIEW:

## Sulfuric Acid Storage Tanks

### 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 chart on [www.polyprocessing.com/pdf/technical/Venting.pdf](http://www.polyprocessing.com/pdf/technical/Venting.pdf)

### 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

### OPTIONS

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

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