

# CST<sup>TM</sup>

## TecTank<sup>TM</sup>

Bolted & Factory Welded Epoxy Coated Tanks for Liquid Storage



FLAT PANEL | CHIME PANEL | WELDED



» LIQUID STORAGE TANK SOLUTIONS



# A Storage Legacy

**The business roots for CST Industries (CST™) run deep – all the way back to 1893 following our heritage as Columbian Steel Tank Company TM, Peabody TecTank and Columbian TecTank®.**

CST introduced the first bolted steel storage tanks for the petroleum industry and initiated the widely utilized API-12B standard implemented in 1929. The API-12B standard is still featured in CST's TecTank™ storage systems today.

With a legacy of over 130 years and over 350,000 field proven storage tank installations in more than 125 countries, no other company can match CST's world-renowned brands, premium engineered designs, world-class manufacturing or construction experience.

## **Highest Quality – Promised and Delivered – in Tanks for Liquid Applications**

Our commitment to performance is delivered through time-proven design and engineering, our precision manufacturing technologies, and our commitment to excellence in installation. All CST operations are ISO 9001 Certified.

# Proven Engineering Capabilities and Design Standards

Exceptional design capabilities have given CST a reputation as the most innovative storage manufacturer in the world. With our proven engineering capabilities and design standards, CST offers unrivaled expertise as the world's first manufacturer of bolted liquid and dry bulk storage tanks and silos to:

- > Received API-12B Monogram (Parsons, KS Facility - License No. 12B-0004)
- > Design Factory Mutual Approved and composite elevated bolted tanks
- > Provide a proof load tested jacking system designed by licensed engineers to ensure construction safety
- > Apply bolted technology to large scale quick assembly frac water tanks
- > Apply bolted tanks to SAGD oil field applications
- > Apply bolted tanks to slurry applications
- > Design and build the world's largest externally supported bolted pressurized roof
- > Apply build gaskets to bolted tanks
- > Suspended aluminum decks for cryogenic service per API 620 and EN 14620

In the 1940s, CST initiated jacking tanks on grain bins and silos for the agriculture market. Additionally, CST has designed silos with drive-through skirts for railcar loadout and tanks with unique hoppers. We have even designed tanks with office space under the hopper bottom. CST is the world's leading and largest dome manufacturer and has installed the longest clear-span aluminum truss in the world at 291 ft. (89 m) long and the largest clear-span aluminum dome in the world at 443 ft. (135 m) diameter. CST has installed over 18,000 aluminum covers worldwide. The company developed the center tower erection methodology for safe, efficient assembly and lifting of large domes.

Our integrated project team works with you to ensure your tank is designed to yield the best lifelong value for your application. Factors such as capacity, seismic conditions, specific gravity and wind loading vary widely from one application to the next. The draftsmen and licensed professional engineers in our Engineering and Design Department give individual consideration to every tank and silo. With our staff and consultants, drawings can be supplied with the PE seal from any state, territory or province. CST offers more FM pre-approved models than any other storage provider.

CST is an expert and committee participant in the following committees:

- |            |                 |           |
|------------|-----------------|-----------|
| > API-12B  | > AWWA D103     | > NFPA 22 |
| > API-650  | > AWWA D108     | > NFPA 68 |
| > ASME SBS | > EN (Eurocode) | > NFPA 69 |
|            | > ISO 28765     |           |





# CST OptiBond Epoxy Coating Process

## OptiBond™

### » Maximum Performance. Lasting Protection.

CST created its first-rate epoxy coating technology to provide excellent adhesion, maximum corrosion resistance and long tank life. Decades of experience have led to continuous technology and process improvements which have resulted in the finest epoxy coating available in the storage tank industry. The OptiBond™ Epoxy Coating Process is derived from years of in-field experience and performance data.

### » Benefits of Factory-Applied Coatings

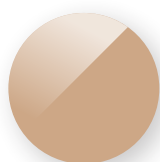
- Eliminates the weather factors incurred when applying a coating in the field after constructing a welded tank. With factory-applied coatings, there is no waiting for the weather to be within specific parameters in order to apply the coatings and trust in the environmental conditions to properly cure the coating.
- Each step in our factory-applied coating process can be carefully monitored so that inconsistencies in the coating can be detected in the earliest possible stage of the process prior to tank construction.
- Completion of the tank can be performed in as little as 1/3 the time as alternative materials and methods. On-site delays due to weather are greatly eliminated, service can commence earlier and ROI begins sooner.



Ask about upgrading to our  
Trico Bond SD™ coating  
or go online to download a copy of  
the Coatings Competitive Report.

### Exterior Color Options

TecTank tanks are available in seven standard exterior colors. Inquire for custom colors.



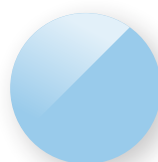
Tan



Gray



Green



Blue



White



Forest Green



Cobalt Blue



# ➤ Trust the Coating and Manufacturing Experts

## World-Class Coating

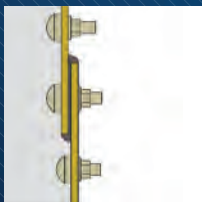
- Trico Bond EP® – Proven, industrial grade high performance, factory-applied epoxy
- Trico Bond SD™ – A proven enhanced performance epoxy that provides additional protection and longer life for Severe Duty applications
- CST OptiBond proprietary coating process utilized on every sheet
- Factory coated ensures best quality
- Third party tested and verified

## Tank Construction

Every CST tank is factory engineered to customer specifications. Since all tank panels are manufactured in the factory and easily assembled, CST's tanks can be installed in many types of situations where field welded steel and concrete applications cannot. CST and its authorized dealer network have dedicated factory-trained crews who are experts in bolted panel construction. A quality tank is not only coated sheets of steel, it is also the expertise applied during construction and the service that follows.

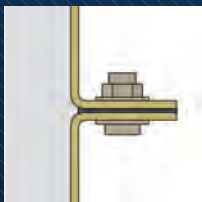
- ISO quality system certified by third party registrar
- Bolted tanks can be constructed up to three times faster than field welded designs
- Versatility for in-field modification and expansion
- Factory-applied proprietary powder coating lasts longer reducing maintenance costs
- Easily constructed in remote locations
- No on-site welding required during construction
- Reduced need for heavy equipment on construction site
- 1/2 the building crew of traditional field welded tanks
- Minimum lay down area required

## Tank Design Options



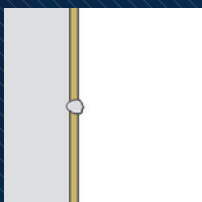
### Flat Panel Bolted:

- Fastest construction for tanks greater than 24 ft. (7 m) tall
- Leading design for bolted steel tanks around the world
- Mastic joints
- Manufactured, erected and in operation up to three times faster than field welded or concrete applications
- Largest capacity, capable of storing up to 6,000,000 gal. (22,712m<sup>3</sup>) or more



### Chime Panel Bolted:

- Fastest construction time for tanks 24 ft. (7 m) or less in height
- Best choice for oil field service and industrial applications
- API-12B monogram available
- Gasketed joints allow for a broad application range
- Features factory formed flanges at horizontal seams for added structural strength
- Special gaskets and sealants allow for a broader range of applications



### Factory Welded Design:

- Shortest install time
- Available in sizes 6 ft. (2 m) to 15 ft. (5 m) in diameter and up to 85 ft. (26 m) tall
- Taller units available in multi-piece designs
- Shipped as one unit or multi-piece units
- Can be specified with internal and/or external factory coating
- Arrives on-site fully assembled and ready to stand



# > Tank Comparison Chart

| DESIGN FEATURES                            | TECTANK FLAT PANEL   |
|--|--|
| PANEL DESIGN                               | Flat Panel 105 in. (267 cm) wide by 55 in. (140 cm) tall<br>premium grade cold rolled steel, convex-shaped/cut tapered panel.  |
| SEAM BETWEEN PANELS                        | Mastic joints  |
| PANEL COATING INTERIOR                     | Trico Bond EP® – 5 mil (130 µm) to 9 mil (225 µm) average<br>dry film thickness precision-applied powder coating.<br>Trico Bond SD™ – 4 mil (100 µm) to 10 mil (250 µm) average<br>dry film thickness precision-applied powder coating.        |
| PANEL COATING EXTERIOR                     | Trico Bond EP® precision-applied powder coating with high<br>performance urethane topcoat for additional protection and UV<br>resistance at 3.5 mil (85 µm) to 5 mil (130 µm) average dry film<br>thickness. (Unlimited topcoat color options) |
| OPERATING TEMPERATURES                     | Trico Bond EP® up to 140° F (60° C)<br>Trico Bond SD™ up to 200° F (93° C)<br>NSF 61 Approved  |
| FIELD INSTALLATION                         | 18,000 lb (8164.66 kg) hydraulic actuated, synchronized jack<br>system third party proof load tested and PE stamped. Fastest<br>bolted installation for tanks greater than 24 ft. (7 m).   |
| MODULARITY                                 |  |
| MAINTENANCE                                |  |
| LICENSED PROFESSIONAL<br>ENGINEERING STAFF |  |
| AGE OF COMPANY & “YEARS<br>OF EXPERIENCE”  |  |
| FIELD CONSTRUCTION                         | CST employed or exclusive subcontract crews using third<br>party safety certified & PE stamped scaffold design.<br>*Most experienced crews.  |
| PLATE THICKNESS                            | Up to 1/2 in. (1 cm) thick. Available in carbon steel, aluminum<br>and 304/316 grades of stainless steel.  |



| TECTANK CHIME PANEL  | TECTANK WELDED   |
|--|--|
| Chime panel 56 in. (142 cm) to 58 in. (147 cm) wide by 96 in. (244 cm) tall with 2 in. (5 cm) external top and bottom flange, each ring as a stiffener.  | Panel design not applicable. Full welded construction, from 6 ft. (2 m) to 15 ft. (5 m) in diameter and 85 ft. (26 m) in a single piece. Larger heights available with splice. 15 ft. (5 m) by 185 ft. (56 m) largest-to-date. |
| Compression seal formed between chimes with EPDM/NBR/Viton gasket depending on the application.  | Seam between panels not applicable. Robotic, sub-arch welds produce exceptionally consistent “smooth/not flush” horizontal seams.  |
| Trico Bond EP® – 5 mil (130 µm) to 9 mil (225 µm) average dry film thickness precision-applied powder coating. Trico Bond SD™ – 4 mil (100 µm) to 10 mil (250 µm) average dry film thickness precision-applied powder coating.               | Panel coating not applicable. Interior coated pieces have 2.5 mil (60µm) to 5 mil (130 µm) standard epoxy coating. (Special coatings available)  |
| Trico Bond EP®, precision-applied powder coating with high performance urethane topcoat for additional protection and UV resistance at 3.5 mil (85 µm) to 5 mil (130 µm) average dry film thickness. (Unlimited topcoat color options)       | Panel coating not applicable. Exterior coated pieces are 2 mil (50 µm) to 3 mil (75 µm) standard epoxy coating. 1.5 mil (35 µm) to 3 mil (75 µm) high performance urethane for additional protection and UV resistance.        |
| Trico Bond EP® up to 140° F (60° C)<br>Trico Bond SD™ up to 200° F (93° C)<br>NSF 61 Approved  | Standard coating up to 140° F (60° C)  |
| Third party safety PE stamped scaffold system. Fastest bolted installation for tanks 24 ft. (7 m) tall or less.  | Delivered in one piece on specialized equipment, ready for lift and place on prepared foundation (by others). Fastest installation.  |
| Tanks can be modified – contact your local sales representative for more information.  |  |
| Norlly scheduled PM inspections by site maintenance group or CST provided maintenance.   |  |
| Professional Engineers on staff that are capable of stamping in all states, territories and provinces. Includes voting member of NFPA 22Committee chair for AWWA, API, NFPA a EN (Eurocode). Assisted with API-12B and other AWWA standards. |  |
| Established in 1893. More tank and employee experience than the next two competitors combined.   |  |
| CST employed or exclusive subcontract crews using third party safety certified & PE stamped scaffold .<br>*Most experienced crews.   | Typically by others - Ask your CST Manufacturers' Representative for recommendations.  |
| Up to 5/16 in. (0.8 cm) thick. Available in carbon steel, aluminum and 304/316 grades of stainless steel.  | Up to 1/2 in. (1 cm) thick. Available in carbon steel, aluminum and 304/316 grades of stainless steel.   |

# World-Renowned TecTank Storage Tank Systems

The design, manufacture and erection of TecTank guarantees our customers a worry-free, hands-off installation of a long-lasting, high-quality liquid storage tank.

TecTank's design concept has been proven consistently as the premier choice for liquid storage. TecTank's wide range of sizes and configurations guarantee the right size is available for you. By meeting or exceeding industry standards, TecTank bolted designs can be engineered to conform to API-12B, AWWA D103, Eurocode, FM and NFPA 22 requirements. And because of our unmatched operations, tanks for special conditions such as heavy liquids, high wind factors, snow, or seismic loading can be designed with ease for maximum efficiency. The TecTank designs provide economy in freight and materials handling and allows our tanks to be built nearly anywhere including very remote locations or even inside buildings. Known for over 130 years, CST's quality shines through from design to manufacture to erection. For any application, our TecTank storage systems offer performance that is unsurpassed in quality and lifetime cost.



## » Flat Panel Tank Systems

TecTank Flat Panel was engineered and developed for higher volume needs. The flat panel design offers a significant increase in liquid storage capacity.

Like CST's chime panel design, CST's flat panel liquid storage tanks may be used in high-volume industrial, commercial, institutional, and private applications to store water, wastewater and many other liquid materials. The flat panel is a jack-built design that can accommodate capacities over 8,000,000 gal. (22,712m<sup>3</sup>) per tank.

CST flat panel tanks are processed with the OptiBond coating process featuring the Trico Bond EP or SD epoxy powder, offering the best in corrosion resistance.



## » Chime Panel Tank Systems

TecTank Chime Panel tanks offer the best solution for petroleum and industrial applications, with a max capacity of 3.6M gal (13.6K m<sup>3</sup>) per tank.

CST's chime panel tanks and silos are field constructed by CST crews utilizing our third party safety certified & PE stamped scaffold design. TecTank Chime Panel bolted storage tanks are:

- > Features factory formed flanges at horizontal seams for added panel rigidity
- > Gasketed joints allow for a broad application range
- > API-12B monogram available





## » Factory Welded Tank Systems

TecTank Factory Welded tanks are designed and manufactured to meet your specific material and coating needs.

CST's welded tanks are fabricated from epoxy factory coated steel, aluminum, stainless or black steel at our ISO Certified manufacturing facility. Tanks can be designed to meet UL-142 standards. Max capacity is 180K gal (680m3) per tank. Additionally, tanks can be designed to meet API650 and AWWA D100.



Flat panel tanks are typically assembled from the top down by using a hydraulic actuated, synchronized jacking system that is third party proof load tested and PE stamped.

These tanks are most often built by factory-trained building crews who specialize in jacking system construction.

- > First ring of panels and roof are safely constructed at ground level
- > Tank is jacked up and successive rings are constructed
- > The final ring is constructed and tank is lowered onto foundation ring



Chime panel tank assembly typically involves scaffolding methods. Special scaffolding mounts and assembly ladders increase construction efficiencies and safety.

- > First ring of panels is constructed directly on the foundation
- > Successive rings are constructed in place on lower rings
- > Roof or cover can be built in place or on the ground and placed by crane



# Tank Applications

CST's TecTank product line delivers high-quality and durability at the best value per gallon, making TecTank tank systems the best choice for liquid storage applications.

## Water

|                   |                     |                |
|-------------------|---------------------|----------------|
| Potable Water     | Fire Protection     | Salt Water     |
| Raw Water Storage | Distilled Water     | Brines Water   |
| Irrigation Water  | Deionized Water     | Brackish Water |
| Disinfection      | Demineralized Water | Desalinization |

## Wastewater

|                     |                               |                                 |
|---------------------|-------------------------------|---------------------------------|
| Landfill Leachate   | Anaerobic & Aerobic Digestion | Primary & Secondary Containment |
| Storm Water Run-off | Sludge Storage                | Sedimentation                   |
| Flocculation        | Disinfection                  | Aeration                        |
| Trickling Filters   | Flow Equalization             | Biological Oxidation            |

## Industrial Liquids and Chemicals

|                |                         |                         |
|----------------|-------------------------|-------------------------|
| Fertilizer     | Lime & Carbonate Slurry | Mining Fluids & Slurry  |
| Insecticides   | Secondary Containment   | De-Icer                 |
| Food Waste     | Edible Oils             | Dyes & Pigments         |
| Food Additives | Paints & Primers        | Pulp & Paper Processing |
| Glycols        | Detergents              |                         |

## Capacity Specifications:

|  |   |  |
|--|---|--|
| <b>Standard diameters:</b><br>from 9 ft. (3 m) to 243 ft. (74 m) | <b>Standard designs:</b><br>AWWA D103-09, ASCE-7, ANSI,<br>AISC, API, IBC, ISO 28765, NFPA<br>Standard 22, NSF, Eurocode and FM | <b>Standard tank capacities range:</b><br>from 4,000 gal. (15m <sup>3</sup> ) to 6,000,000<br>gal. (22,712m <sup>3</sup> ) |
|--|---|--|

## Petrochemical

|                        |                  |           |
|------------------------|------------------|-----------|
| Crude Oil              | Bitumen          | Kerosene  |
| Drilling Fluids & Muds | Production Water | Brine     |
| Diesel Fuel            | Lubricants       | Fuel Oils |
| Asphalt                | Wastewater       |           |
| Frac Water & Flow Back | Jet Fuel         |           |

## Capacity Specifications:

|  |  |  |
|--|--|--|
| <b>Standard diameters:</b><br>Chime – 12 ft. (4 m) to 200 ft. (61 m)<br>Welded – 6 ft. (2 m) to 15 ft. (5 m)<br>Flat Panel – 9 ft. (3 m) to 243 ft. (74 m) | <b>Standard designs:</b><br>API-12B Monogram & Principles<br>AWWA D103 | <b>Standard tank capacities range:</b><br>100 bbls (16m <sup>3</sup> ) to 57,000 bbls (9,062m <sup>3</sup> )<br>90 bbls (14m <sup>3</sup> ) to 750 bbls (119m <sup>3</sup> )<br>5,000 gal. (19m <sup>3</sup> ) to 6,000,000 gal.<br>(22,712m <sup>3</sup> ) (fresh water only) |
|--|--|--|

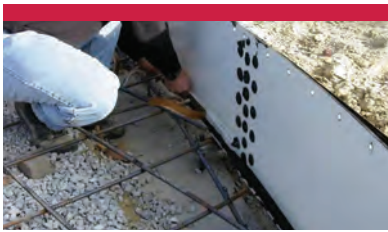


## Storage Tank Options

CST can design and build storage tanks with all the options and accessories to match specifications. Our diverse experience in building all types of tanks for different applications helps us devise practical solutions to meet operational requirements. Ordering a tank with additional integrated accessories and services drastically reduces time and expense. This allows customer management to focus on more important aspects of the project.

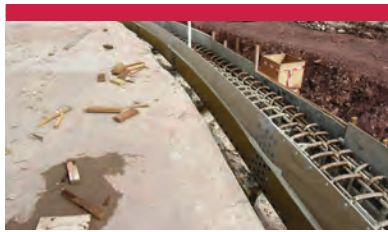
## Foundation and Floor Designs

Foundation designs are done in-house and are customized to customer needs and storage application. CST understands that different storage applications require different foundation and floor options. That is why CST offers choices for the customer depending on their needs. Customers can select floors from Coated Steel (Vitrium™ Glass or OptiBond™ Epoxy), or sealed and unsealed reinforced concrete.



### » Embedded Starter

Used for larger municipal and industrial applications and higher seismic applications



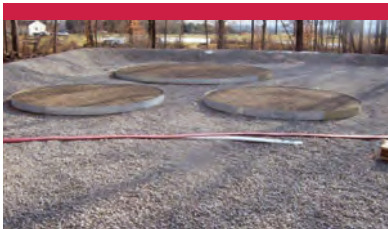
### » Modified Starter

Combines Embedded Starter for large tank and higher seismic features



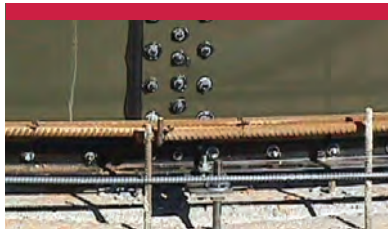
### » Anchored to Slab Foundation

Tanks are anchored to slab with anchor bolts around perimeter



### » Grade Band

Steel grade bands filled with crush rock or other compacted fill provide base for tank installation



### » Curb Mount

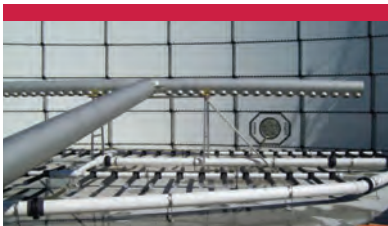
Used for lower profile tanks, well suited for tower mounted storage tanks



### » Coated Steel Floors

Glass-fused-to-steel and epoxy coated panels are bolted and sealed to cover floor surface

## Accessories



- Baffles
- Cages
- Gravity Vents
- Launderers



- Level Indicators
- Mixer Supports
- Nozzles
- Platforms
- Railings



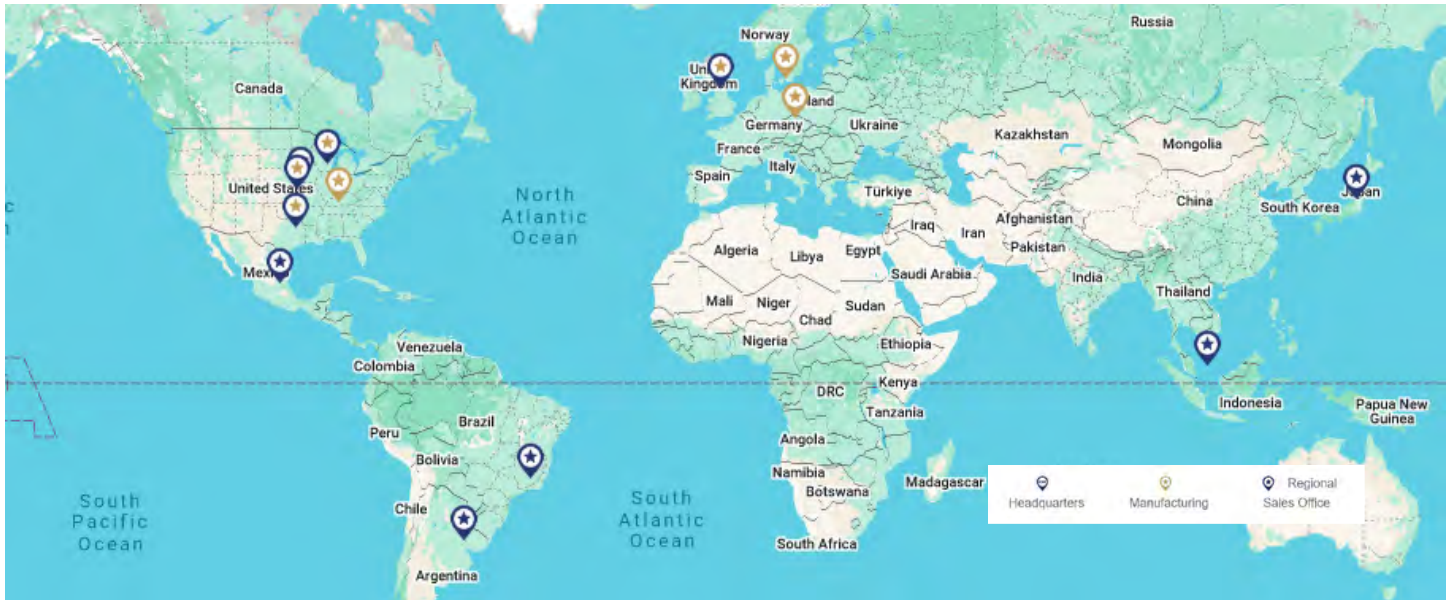
- Roof Hatches
- Sidewall Manways
- Spiral Staircases
- Walkways
- Ladders & Safety Cages



## Worldwide Availability



CST offers a variety of repairs, modification and turnkey services for liquid, dry bulk, and welded storage tanks. CST services also include ROV Water Inspection and Visual & Ultrasonic Testing.



### Certifications and Capabilities:

- ISO 9001:
- API ISO/TS 29001
- API-12B (Parsons, KS Facility - License No. 12B-0004)
- UL 142 & ULC S601
- AWWA D103
- Certified Welding Inspectors (CWI)
- FM Certified Product Line (Parsons, KS & DeKalb, IL Facilities)
- All Facilities EPA Compliant
- NFPA 22
- FM Approved
- NSF 61 Approved

CST is committed to providing its customers with the highest engineered quality, best service, longest product life and greatest value for every storage solution we supply. Contact CST for all your liquid storage needs.

For more information, call **+1 844-44-TANKS** or visit us online at [cstindustries.com](http://cstindustries.com)

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TTL-BR-2103



# TecTank™