CST STORAGE

FRAC SAND STORAGE SOLUTIONS









THE PREMIUM CHOICE FOR FRAC SAND STORAGE

CST Storage (formerly Columbian TecTank®) frac sand storage tanks do not require in-field welding, painting or a large construction team. CST's tank systems can be built up to three times faster than other tanks. This saves the end user in construction and lifecycle costs. All tank panels are fabricated and coated in the factory and shipped complete to the building site in a timely manner. CST designs, fabricates and installs above deck and interior located platforms for support and access of conveying and truck/rail load-out equipment. Storage capacity with hoppers can reach upward of 7,000 tons. Our modular panels allow us to fabricate and ship even our largest tanks faster than anyone in the industry. An example would be receiving an order for (12) 47' x 75' on October 31st and shipping all the tanks by end of year. This was 2.5 million pounds of steel to store 75,000 tons of various grades of sand. Experience, professionalism and efficiency make CST the best option for storing frac sand.

- Fast construction with the least environmental footprint
- Flexible designs with expandability options through dedicated, in-house engineering staff
- Truck-through and train-through silos make logistics easy
- Bolted panels and welded tanks manufactured out of carbon steel, stainless steel or aluminum

WELDED TANKS

CST's welded tanks for frac sand are manufactured in our 9001:2015 ISO Certified manufacturing facility with epoxy coated steel, AR plate hopper upgrade as well as aluminum and stainless steel.



(3) 400 ton tanks added to an existing 5000 ton CST bolted tank facility. 1200 addition tons added in 8 weeks from order to delivery.

CST's reputation as the world leader in factory-coated tanks goes beyond just field-assembled tanks. CST Storage also manufactures the highest quality, longest lasting welded tanks in the industry. CST utilizes the industry leading factory-applied coating technology in which our “standard” coating extends the life of CST Storage’s Frac Sand tanks well beyond the “top-line” coating offered by other manufacturers.

CST’s proprietary high solids epoxy coating is specially formulated to provide an unmatched resistance to abrasion and corrosion as seen in the storage of frac sand, which will dramatically reduce the lifecycle maintenance costs. This makes our factory-applied coatings far superior to field-welded tanks as well as other shop-welded/field-bolted tank suppliers.

- Tanks can be designed with 30, 45, 50, 55, 60, 65, and 70 degree hopper bottoms (or flat bottom)
- Standard One-Piece Designs are available up to 15' x 85' multi-piece tanks designed and fabricated in sizes up to 150’
- Up to 10,000 CU.ft per tank (500 tons of frac sand) standard 6 pack arraignments provide 3,000 tons with the option to install additional capacity at 500 tons per tank if needed
- Support designs include skirt, short skirt, leg, lug and/or separate structural support



Truck load-out system designed by LECORP, Paducah, KY for BGMU Water.



(3) 12’ x 48’ Factory-welded and epoxy coated tanks for portable Frac Sand storage.

ABRASION RESISTANCE

CST frac sand storage systems are engineered to withstand abrasive materials and provide the longest service of any tank. With decades of field-tested applications, CST frac sand storage systems are built under the highest process control of any dry bulk storage tank on the market.

Each application is cured with CST's Trico Bond EP® epoxy formulation.

- Each tank designed for material flow efficiency and reliability
  - Mass flow designs
  - Funnel flow designs
  - Expanded and fluidized flow designs
- Flow analysis available to improve reliability and productivity

Understanding Funnel Flow vs. Mass Flow

Funnel Flow: Stored material is released through a flow channel that forms within the center of the tank or silo. The last material that enters is typically the first material out (last-in/first-out flow sequence). Due to the centralized flow of the material it is more susceptible to segregation issues.

Mass Flow: All stored material is in motion during discharge. The first material in is the first material out (first-in/first-out flow sequence). Due to constant flow of material this minimizes the effects of segregation.

Frac Sand Anti-Segregation Assistance

The use of various internal flow "diverters" to reduce the natural segregation through use of funnel flow, which provides minimal abrasion on hopper. Each grade of sand to be stored can be tested to create a specific solution that can reduce segregation up to 90%. Internal cones and/or pipes can be added based on results of testing.

Please speak with your CST representative for more information.

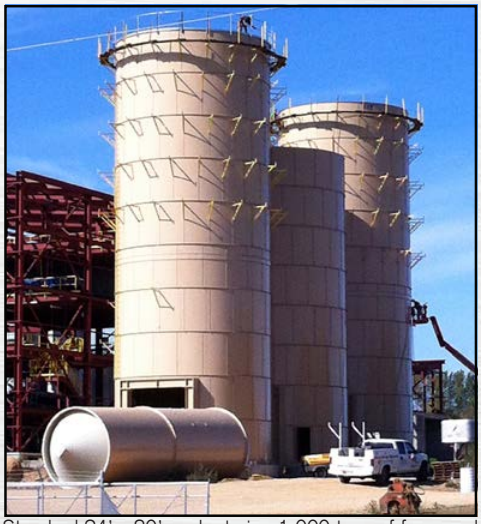
Problems with Segregation?

CST has resources to test and design solutions that can reduce or eliminate segregation in new or retrofit storage tanks.

CST's Trico Bond EP® coating yields exceptional flow promotion. Results from independent testing show that with CST's proprietary OptiBond™ coating system, functional mass flow discharge can be achieved with reduced hopper slopes. Reduced hopper slopes mean our customers save both time and money.

CST designed anti-segregation tubes in a funnel flow hopper to reduce wear and material segregation via mass flow.





Standard 24' x 80' each storing 1,000 tons of frac sand.







21' x 56' - 500 ton truck load-out silos (6 & 8 pack configurations)

STANDARD TANK SIZE OFFERINGS

2,000 TON TANK

32.680' nominal inside diameter

88.66' nominal eave height from base of support

47.90' approximate straight wall storage height

- 45 degree hopper with 14" diameter flanged outlet
- Outlet elevated inside of skirt to provide a clearance of 25.00' from base of tank
- Hopper attached to sidewall at approximately 40.76' from base of tank
- 12.00'W x 17.00'H openings in skirt for truck drive-through
- 1:12 deck slope
- Level full capacity of 44,749 cubic feet
- Estimated working capacity of 40,489 cubic feet with 25 degree angle of repose

3,000 TON TANK

38.620' nominal inside diameter

96.52' nominal eave height from base of support

50.79' approximate straight wall storage height

- 45 degree hopper with 14" diameter flanged outlet
- Outlet elevated inside of skirt to provide a clearance of 27.00' from base of tank
- Hopper attached to sidewall at approximately 45.73' from base of tank
- 12.00'W x 17.00'H openings in skirt for truck drive-through
- 1:12 desk slope
- Level full capacity of 67,038 cubic feet
- Estimated working capacity of 60,006 cubic feet with 25 degree angle of repose

5,000 TON TANK

41.592' nominal inside diameter

120.90' nominal eave height from base of support

75.69' approximate straight wall storage height

- 45 degree hopper with 14" diameter flanged outlet
- Outlet elevated inside of skirt to provide a clearance of 25.00' from base of tank
- Hopper attached to sidewall at approximately 45.21' from base of tank
- 12.00'W x 17.00'H openings in skirt for truck drive-through
- 1:12 deck slope
- Level full capacity of 109,536 cubic feet
- Estimated working capacity of 100,753 cubic feet with 25 degree angle of repose

STANDARD TANK ACCESSORIES

- Anchor bolts and nuts
- 1 - 20" Roof combination manway pressure relief value, 2.0 oz. pressure, 0.5 oz. vacuum
- 1 - 3'-0" x 6'-8" Industrial walk-in door (white) in skirt
- 3 - Level indicator flanged nozzle
- 1 - Set of Bucket elevator clips from 8.0' above grade to eave of silo - 5,000# lateral load max (2) clips per stave
- 1- 10' W x 38' L interior bar grate work platform at the 19' elevation with caged ladder access to grade - 100psf - OSHA - HDG - CST standard construction
- 1 - Set of (4) wide flanged notched column supports at eave of silo for customer supplied above deck structure or equipment - 5,000# max load per support - 1.00' rise above eave of silo
- 1 - Deck perimeter guardrail - two pipe guardrails with angle posts - bolted - OSHA - HDG (CTT standard construction)
- 1 - Bolted outside ladder with safety cage and lockable hoop - OSHA - HDG (CTT standard construction)

WHY CST STORAGE?

A Global Manufacturer with Presence

We design, fabricate and erect tanks for discerning customers all over the world. With offices on every continent and facilities around the world, we are many times the size of others in our market.

A Rapidly Growing, Financially Healthy Company

We lead the industry in value, innovation, quality and size. We continually invest in the very best equipment, processes and people to raise the standard for excellence.

More Experience than Anyone Else in Our Market

No bolted or welded steel tank company in business today has made more tanks for a wider array of applications. We have been in business since 1893, delivering more than 250,000 tanks in over 125 countries and placing thousands of tanks in the field each year. Our facilities are filled with the industry's leading experts in their discipline – from engineering to installation. Our senior staff can be found on board and policy making committees of leading professional associations in our industry.

The Best Overall Value in the Business

Our storage solutions feature a factory-applied Trico Bond EP® coating that provides a long-lasting, superior inside surface and decades of useful life. We have many tanks in the field today performing as designed after 50+ years of service.

There is no substitute for experience. Anyone can claim to be the leading experts with long lasting high quality storage solutions...

We can prove it!



OPTIBOND™ COATING PROCESS WITH TRICO BOND EP®

Coating formulation, application process and application conditions are equally as important as selecting the right steel and coating components in order to deliver the world's best coating systems. From surface prep to coating robots to environmentally controlled chambers, CST's OptiBond™ and Trico Bond EP® coating process is state-of-the-art and unmatched in the industry. CST is the only company that manufactures all types of factory-coated solutions, so we are the only company who knows first-hand which coating is best for your particular application.

CST Storage utilizes proprietary premium coating technology that provides maximum abrasion resistance and encourages smooth material flow. Our experience has led to continuous technology and process improvements that have resulted in the finest epoxy coating available in the dry bulk tank industry. The OptiBond coating process is a next generation coating derived from years of in-field experience and performance data.

Cleaning



Stage 1:

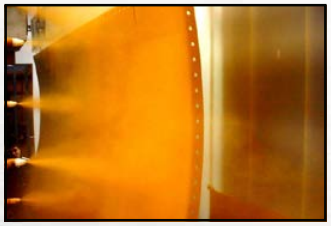
- Parts are degreased and rinsed
- Precisely controlled hot air drying and pre-heating at optimum temperature for a precision coating process

Stage 2:

- Parts surfaces are blasted with engineered grit material
- Rugged 3-D surface topography is created for better powder coating acceptance, increasing durability and long-term coating performance
- A high-velocity air curtain removes residual particulate, other companies skip this step



Panel being washed and blasted.



Laser eye directed powder-coat spray nozzles.

Coating

Stage 3:

- Parts are powder coated in our proprietary Trico Bond EP electrostatic booth within precise environmental controls
- Parts are cured at controlled temperature to maximize the cross-link bonding of the epoxy particles

Stage 4:

- Uniquely engineered Polyurethane topcoat is applied for UV protection on exterior surfaces for extra durability and longevity
- Sheets are cured at controlled temperature yielding the final product



Tank panel being conveyed through 400 degree curing oven.

Quality Control

CST is the ONLY bolted tank supplier that inspects 100% of our powder coated panels for holidays. CST uses 1100 volt holiday tester. Other companies only use random inspection with inferior testing equipment.

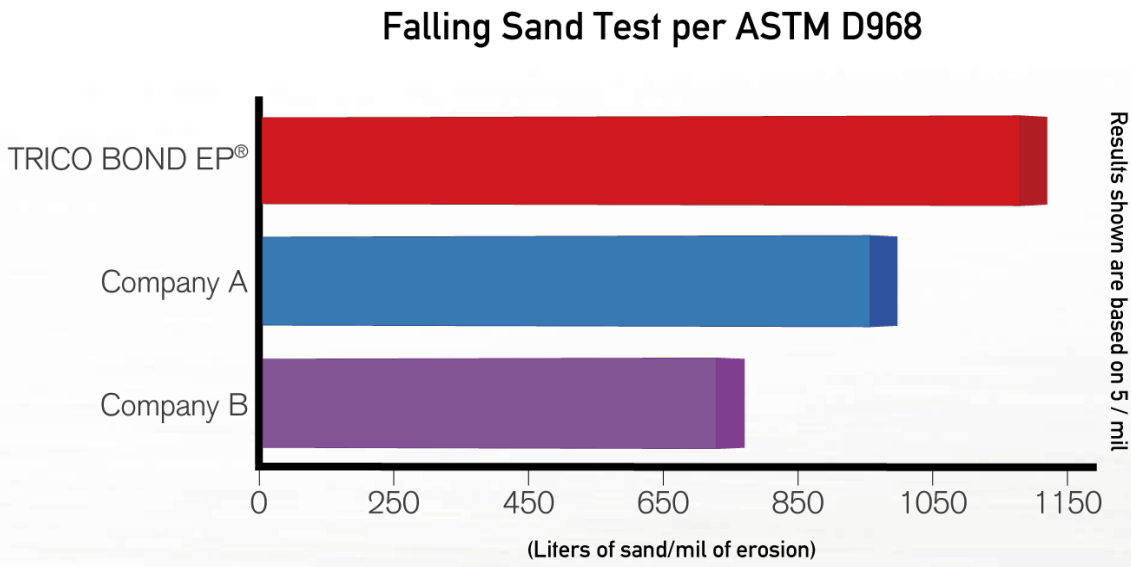


QC Specialist running an 1100 volt holiday tester over 100% of coated tank panels.

TRICO BOND EP® FLOW TEST COMPARISON

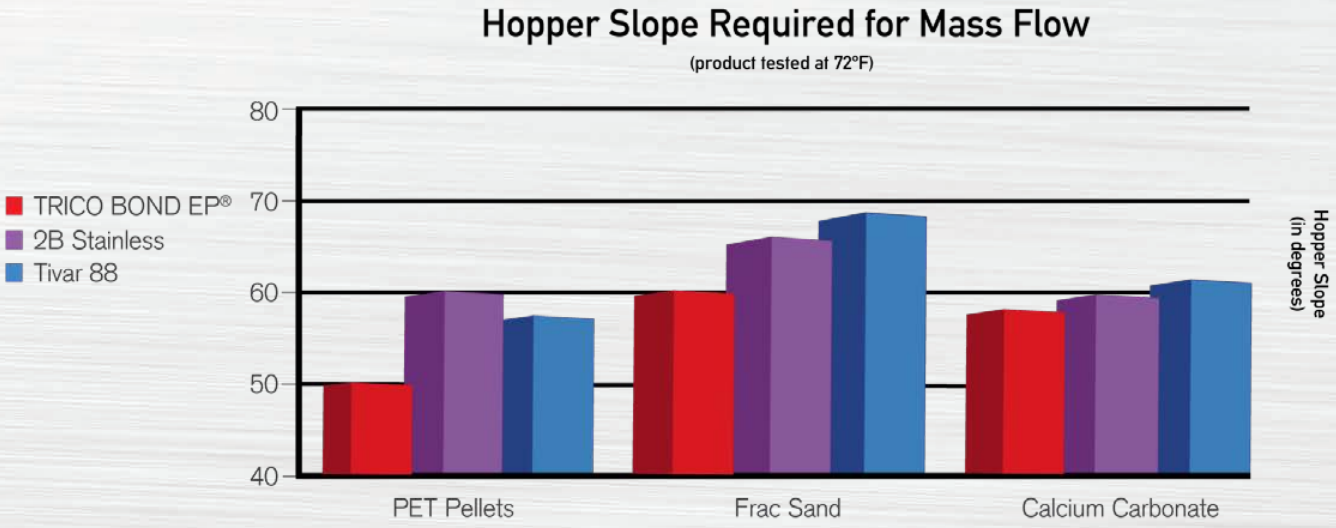
COMPARE Abrasion Resistance

Abrasion resistance is commonly tested by the Falling Sand Test. This test determines the resistance of organic coatings to abrasion generated by falling sand onto coatings applied to either metal or glass panels. Test results confirm that compared to commonly used industry coating systems, at a normal 5 mils dry film thickness, Trico Bond EP performs significantly better, requiring a massive 1135 liters of sand to wear through the coating.



COMPARE Flow Promotion

This test measures the hopper angle required to achieve mass flow of various products. Trico Bond EP results are spectacular, indicating the enhanced slickness and flow promotion of the coating system.



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 of your frac sand storage needs.

Worldwide Availability

CST Global Manufacturing and Offices



Certifications and Capabilities:

- ISO 9001: 2015
- API ISO/TS 29001: 2007
- API 12-B (Parsons Facility - License No. 12B-0004)
- UL 142 & ULC S601
- Certified Welding Inspectors (CWI)
- FM Certified Product Line (Parsons & DeKalb Facilities)
- All Facilities EPA Compliant
- NFPA-68/69
- FM Approved

FM APPROVED

API Q® Parsons, KS Facility License No. 12B-0004

CERTIFIED ISO 9001:2015 COMPANY

Go to **www.cstindustries.com** for more information on CST products and services.

CST STORAGE

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COLUMBIAN® TecTank

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