

UNMATCHED COATING SYSTEMS

TANK CONNECTION



THE COATING

THE ULTIMATE TANK COATING SYSTEMS FOR LIQUID, WATER & WASTEWATER STORAGE

LIQ Fusion 7000 FBE™ is the ultimate powder coating system ever developed for bolted storage tanks storing water, wastewater and industrial liquids. This coating was developed by Akzo Nobel, the largest powder coat supplier worldwide. It is offered exclusively through Tank Connection, a global leader in bolted storage tank systems. LIQ Fusion 7000 FBE™ performance exceeds all powder coatings, liquid coatings and glass/vitreous enamel coatings offered today in bolted tank construction.

Tank Connection's fusion powder coating systems are formulated from thermosetting resins, binder, pigments and additives to meet today's storage requirements of durability, chemical resistance, chip resistance, flexibility, heat resistance and UV protection. Tank Connection's fusion powder coating formulations are created by blending the various components and processing them through an extruder into a continuous mass with a completely uniform composition. This homogenous mass is then cooled and broken down into small chips, which are then ground into a fine powder. Each particle of powder contains within it the necessary components for reforming into the finished coating after fusion application and oven baking. LIQ Fusion 7000 FBE™, EXT Fusion 5000 FBE™ and EXT Fusion SDP™ powder coating systems are electrostatically applied from an automated state-of-the-art, fusion powder coating line. Tank Connection maintains the only fusion powder coat line "certified" to apply these coating systems to bolted steel panels for liquid storage applications.

The pre-stages of the LIQ Fusion 7000 FBE™ application are critical to provide the best substrate surface and anchor profile. All bolted steel panels are chemically washed and blasted to an SSPC-SP-10 near white finish. LIQ fusion powder is fed pneumatically from a reservoir into automated spray guns where a low amperage, high voltage charge is imparted to the particles. The bolted panels to be coated are grounded, so that the charged particles will seek the opposite charged metal surfaces. **By utilizing the latest in today's technology, this coating process can produce a uniform, monolithic, fusion-bonded surface with superior edge and bolt-hole coverage.** In comparison, this coating system is a stronger system than vitreous enamel/glass in liquid storage applications. It addresses all deficiencies in glass coated bolted panels. Additionally, a bolted storage tank coated with LIQ Fusion 7000 FBE™ can be recoated in the future, increasing the expected service life by up to 1.5 to 2 times over glass coated tanks. LIQ Fusion 7000 FBE™ is today's premier coating technology.

The proprietary fusion powder coating systems offered by Tank Connection are thermoset powders that utilize low-molecular-weight solids that go through a fusion and chemical reaction to form higher-molecular-weight polymers. Once the powder is applied, the bolted steel panels enter an oven where the resins, pigments and other reactive agents crosslink to produce a high molecular weight binder system, resulting with a tough, durable coating system designed for high chemical resistance, corrosion resistance, flexibility, chip resistance, weatherability and UV protection.



Tank Connection, LLC

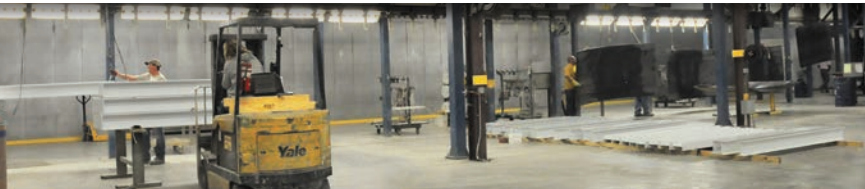
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Tank Connection's thermoset processes are irreversible. Once curing and crosslink takes place, the powder coating cannot be returned to its original form by any means. Testing data by Akzo Nobel clearly shows that LIQ Fusion performance is unmatched in liquid storage applications.

THE APPLICATION PROCESS



Did you know that Tank Connection's specialized powder coating line runs the length of an NFL football field and back?

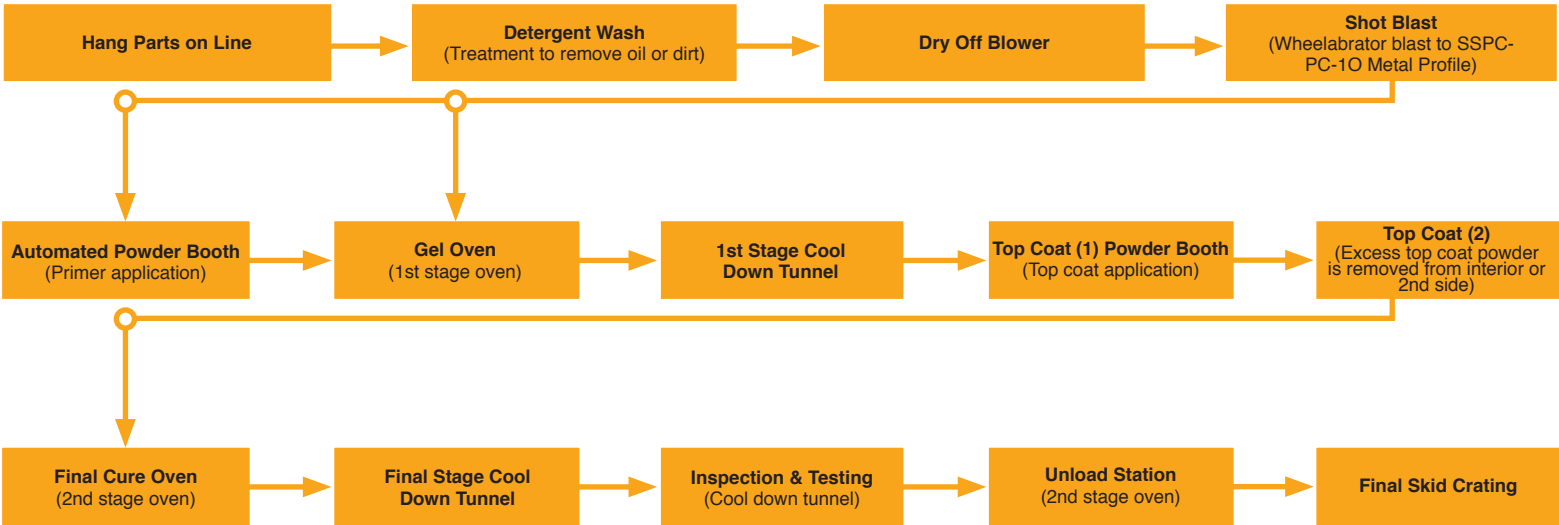


Our coating process line is the BEST system available in the bolted storage tank industry worldwide.



Based on our significant volume of production, the best premier LIQ Fusion 7000 FBE™ coating system is competitive even against low-tech coating lines used by competitors. Yes, the BEST is available for less.

Tank Connection's coating process includes the most extensive powder coating line ever developed for bolted steel panels utilized in liquid immersion service. Our coating process line is over twice the length of a football field and includes 14 stations, 21 stages and over 110 application processes, checks and inspections. This line requires an operations team of 13 people to maintain its automated processes. It is simply unmatched in the bolted tank industry. This is also one of the reasons Akzo Nobel, the largest powder coat supplier worldwide, provided TC with an exclusive agreement on the LIQ Fusion 7000 FBE™ coating system. Not only is this coating system exclusive and proprietary for TC, but our application processes are as well. Tank Connection maintains the only powder coating line certified by Akzo Nobel to provide this system on bolted steel panels for water immersion service.



Holiday Inspection Criteria - Liquid Tanks Only

Frequency of Holiday Testing:

1. Holiday pinhole testing is to be performed on **Liquid Tanks Only**, unless sales order requirements specify otherwise.
2. Additional testing may be required at the discretion of the coating operator, coating supervisor or quality control.
3. Results from every 5th part tested will be recorded.

Holiday Inspection of Internal Storage Tank Part Surfaces of the Following:

1. **100% Holiday** testing is required for areas submerged in the product zone of liquid tanks on sidewall panels, decks, man-way, covers and both sides of bottom (floor) panels.
2. Holiday testing will be performed on the entire lot quantity of parts meeting the inspection criteria.
3. Holiday test results will be recorded on the Powder Coating Line Inspection Report.

Holiday Pinhole Testing Rework:

Holiday Repair/Rework: If a holiday is detected, it will be repaired according to internal methods.

Holiday Pinhole Operator Instructions:

1. Holiday Pinhole Testing shall be performed at the designated location by a trained coating line operator.
2. Electronic holiday tester is used to test the ASTM-G62 standard for electronic holiday testing. This is over and above the industry standard for M-1 liquid holiday testing.
3. In the event that a pin hole is detected, TC's holiday repair procedure will be followed.



HOLIDAY/PIN HOLE TESTING

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CROSS HATCH TESTING

18

1. The following destructive testing will be conducted. Testing will be limited to the first part following a metal thickness changeover.
2. Test will be Initiated on 1st part after oven setting changes.
3. Test will be Initiated on 1st part of a part number lot quantity. Testing will be initiated on 1st and last part of gauge thickness change.
4. For long continuous part lot quantity, the operator shall take additional readings.
5. At the discretion of quality control, coating supervisor and/or the sales order, additional testing may be requested.
6. Test results will be documented on the Powder Coating Inspection Report.
7. (The testing of the adhesion resistance of the coating of separation from the substrate.) Cross hatch test results shall fall under guidelines ASTM Class 5B – “edges of the cuts are completely smooth and none of the squares in the lattice are detached.”
8. Due to part size or configuration, some parts may not have Cross Hatch Testing.
9. Operator shall use a cross hatch cutter on interior and exterior coated surfaces.
10. Coating operator shall select an area that will not interfere with the product area.
11. Operator will cut cross links into the material forming a “square-like” pattern.
12. Adhesive tape shall be applied over the cross cut sections, rubbing the adhesive tape over the test area. Operator shall then remove the adhesive tape with a swift and rapid removal.
13. Operator shall then inspect the test area per ASTM Class 5B.
14. After test results have been observed, the operator will apply touch-up paint.
15. Operator shall identify and notify the coating supervisor and/or quality control of any testing that has failed. A “red rejected tag” shall be applied to the rejected part.



“DFT” DRY FILM THICKNESS COATING TEST

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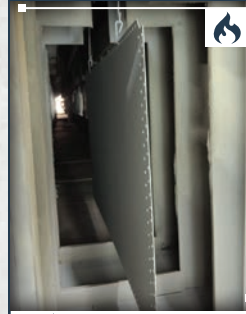
1. Testing will be conducted on the total thickness (mils) applied on final cure.
2. Testing will be performed utilizing an electronic coating thickness gauge.
3. The coating operator shall be informed by the coating supervisor on specification requirements for all sales orders during operation.
4. The coating operator will randomly take 6 external and internal readings on selected component parts.
5. All coating readings will be documented on the Powder Coating Inspection Report.
6. Readings will be calculated to determine the average recorded readings.
7. Test will be initiated on 1st part of part number change and/or gauge thickness change.
8. Test will be initiated on every 5th part of a lot quantity.
9. The average DFT must be equal to or above the coating specification specified in the sales order.
10. Readings shall be taken on parts described, including sidewall panels, bottoms, decks, column, hoppers, manway, covers, rafters, etc.
11. If a test part fails, it will be identified with a “red tag” and MOP/2 will be implemented for disposition.
12. When a part fails DFT test, the next 5 parts will be checked.
13. In the event of additional failures, parts will be checked until 5 consecutive parts are tested within tolerance.



- As components leave the “final cure oven,” they continue on the system conveyor into the final cool down tunnel.
- In the final segment of the tunnel, final inspection processes are initiated.

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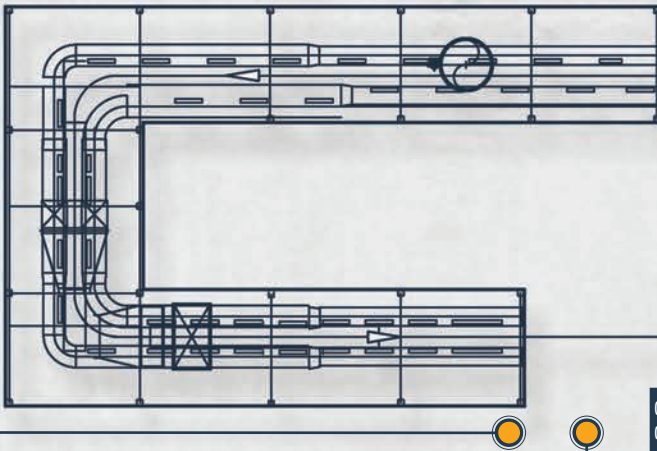
EXCLUSIVE & PROPRIETARY AUTOMATION
FINAL COOL DOWN TUNNEL



- As components continue on the system conveyor, they enter the final cure ovens.
- System “data packs” are ran daily on the line to ensure that an optimum cure time is obtained.
- Oven settings are preset. Line spacing must be determined by the department lead person, coating line specialist and manifest operator.

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EXCLUSIVE & PROPRIETARY AUTOMATION
FINAL CURE OVEN



VISUAL INSPECTION/UNLOADING

20

- All tank component parts are to be inspected as removed from the conveyor system.
- A protective paper barrier is to be used between panel components to protect against damage during handling and transportation.

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SKID CRATING



- Skids are loaded from the line and moved to the crating process.
- Tank components on skids are protected by plastic barrier material.
- Skids are to be clearly marked. Information concerning quantity and number of crates, skids, etc. are to be indicated on the shipping manifest.

- Export items will be crated for container loading.
- Crates will be clearly marked for easy identification.
- The shipping manifest information will be provided to the shipping clerk, with an electronic version saved in the main job file in the “shipping” folder.
- The original shipping manifest is to be scanned and saved in the job file in the “shipping” folder.
- A printed version of the electronic shipping manifest is to be provided with the shipment.
- Refer to MOP-10 for further details concerning shipping requirements.

OUTPUT

1

COMPONENT STAGING

- Tank components are staged at the “powder line” according to material thickness and required date of completion.

2

MANIFEST OPERATOR

- Manifest operator provides direction concerning the sequenced order of part/components to be coated.

3

COATING LINE OVEN TEMP SETTING CHANGES

EXCLUSIVE & PROPRIETARY AUTOMATION

- The coating line specialist and department lead person coordinates oven temperature and line spacing requirements with manifest operator.

4

COATING LINE COLOR REQUIREMENTS

- Color requirements are communicated to the department lead and coating specialist by manifest operator to ensure any color change-over can be made as required.
- The manifest operator is responsible to hang the “target” indicating a color change.
- The manifest operator will also indicate coating thickness requirements at this time by hanging an additional “target” on the conveyor.

INPUT

- As components leave the first booth, they continue on the system conveyor into the 2nd powder process booth.
- Based on customer requirements; either the interior side of parts are wiped down, or the remaining side of the parts are sprayed by the operator.
- Gun cleaning and maintenance is monitored by the operator and the coating line specialist.

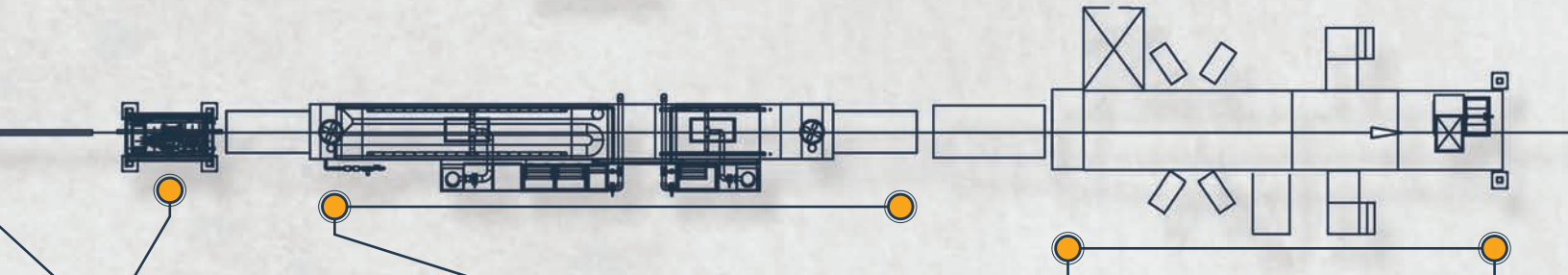
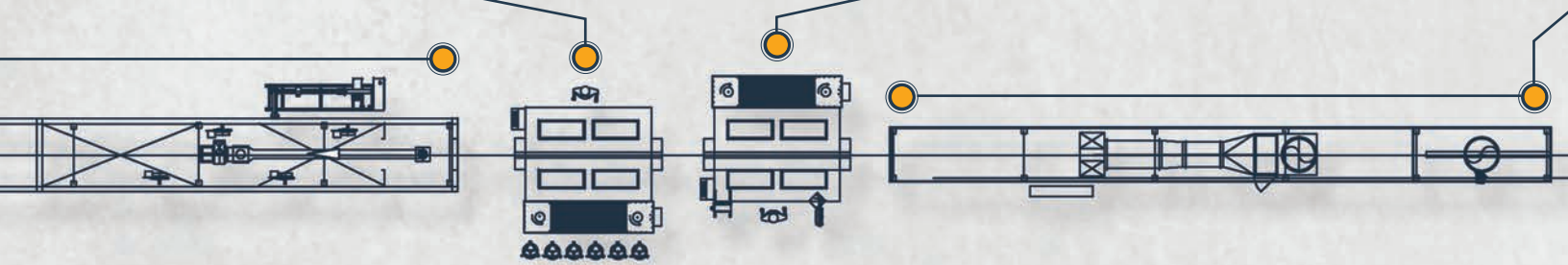
14 EXCLUSIVE & PROPRIETARY AUTOMATION
2ND POWDER PROCESS BOOTH

- As components leave the gel oven, random checks are taken with an IR temperature device to verify applicable temperature has been achieved.



- The operator changes colors to match the information target.
- Interior of component parts are coated.
- Gun cleaning and maintenance is monitored by the operator and the coating line specialist.

13 EXCLUSIVE & PROPRIETARY AUTOMATION
TOPCOAT POWDER BOOTH



6 COMPONENT WASH
EXCLUSIVE & PROPRIETARY AUTOMATION

- Components are washed in a detergent at approximately 130 °F to remove oil and other contaminants.

7 COMPONENT DRYING

- Components are force dried as they continue on the powder line.

8 SHOT BLAST METAL SURFACE PREPARATION
EXCLUSIVE & PROPRIETARY AUTOMATION

- A custom, computerized eight-wheeled Wheelabrator shot blast machine is utilized.
- The flow of shot media to each wheel is monitored to ensure the optimal mix is transmitted for maximum blast profile on the substrate surface.
- The computerized system allows for special adjustments to be made of the blast media.
- Result is a consistent SSPC-SP-10 steel surface finish.

5 HANGING TANK COMPONENTS

- Tank components and hanging hooks are given a general inspection for defects as parts are placed on coating process line.
- Manifest operator is responsible for providing coating information instructions on the line preceding the job. This will allow downstream operations to set the system limits, such as interior only, interior/exterior and required mil thickness.
- A visual inspection will be performed throughout the coating line as operators are conducting their line operation function, material handling and/or designated inspection requirements.
- Coating defects and/or flaws shall be immediately identified.
- If a coating defect/flaw is identified, Procedure MOP/2 will be implemented.

DESIGNED FOR LONG LIFE & LOW MAINTENANCE REQUIREMENTS



• As components leave the gel oven, they continue to travel on the powder line system conveyor to the next station.

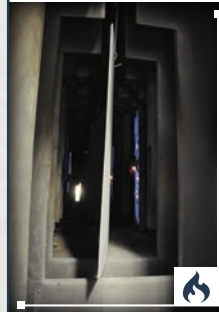
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1ST COOL DOWN TUNNEL

11

GEL OVEN

EXCLUSIVE & PROPRIETARY AUTOMATION



- Items travel along the powder line system conveyor into the gel oven, which is preset to the desired temperature by the department lead person, or the coating specialist.
- Proper line spacing between each change-over is critically maintained.
- System “data packs” are ran daily on the line to ensure an optimum cure is obtained.

9

BLAST PROFILE INSPECTION

- Inspection frequency is performed randomly throughout the shift after blast sequence has been completed.
- Coating line foreman, designee or any coating line personnel shall perform visual blast profile inspection to SSPC-SP-10 “near-white” metal blast.
- All oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed from the surface by abrasive blasting, except for very light shadows, very light streaks or discolorations caused by rust resin, mill scale oxides or slight, tight residues of paint or coating. At least 95% of each square inch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discolorations mentioned above.
- If a blast defect/flaw is identified, procedure MOP/2 will be implemented.
- The coating line specialist continuously monitors the Wheelabrator for proper shot level and operation.

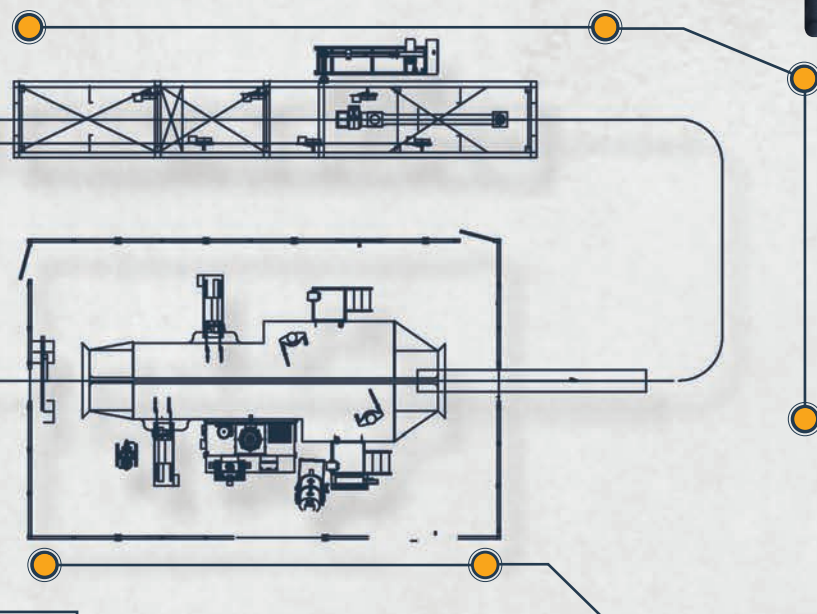
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E-ROOM

EXCLUSIVE & PROPRIETARY AUTOMATION



- The E-Room is an enclosed and environmentally controlled area where the first powder application occurs.
 - Automated booth operator processes information on “hanging target” provided by manifest operator.
 - Automated booth operator sets system performance to the desired values.
 - Powder is applied with automated systems to pre-set values.
 - Automated booth operator monitors the environmental room conditions including temperature and humidity.
 - Automated powder delivery system performance is monitored by the automated booth operator.
- Machine cleaning and maintenance is monitored by the automated booth operator.



THE PRODUCT

Best Coating + Best Application Process = Unmatched Coating Performance

Tank Connection's coating system and application processes are simply unmatched in the industry for bolted storage tanks used in liquid immersion service. TC's fusion powder coating system is **unmatched in performance compared to glass/vitreous enamel coatings**. It is unmatched in performance compared to other shop-applied liquid and powder coatings. It is unmatched in performance compared to all field-applied coatings.

The BEST Interior Coating System: For water and wastewater storage applications, LIQ Fusion 7000 FBE™ is the best internal coating system available worldwide. It is exclusively offered for bolted storage tanks through one company, Tank Connection.

The BEST Exterior Coating System: EXT Fusion 5000 FBE™ + EXT Fusion SDP™ (super durable polyester hybrid powder that demonstrates an excellent mixture of flexibility with impact, chemical and UV resistance). The advanced chemistry of this system has proven to be the best bolted steel tank exterior coating system available worldwide.

Get the Facts & Get Connected with the Industry Leader in Liquid Storage, Tank Connection!



Tank Connection is an ISO 9001 certified company. TC leads the storage industry in application expertise, storage innovation and solutions, storage tank manufacturing technology, vertical integration of operations and field construction services. When you specify Tank Connection, you have selected the top performance storage systems and field construction services available globally.

