Trends: Underground Storage Tank Systems

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Steel Tank Institute

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Who is STI/SPFA?

- Trade Association of Steel Fabricators
- Steel Tank Institute & Steel Plate Fabricators Association Merged in 2004
- Recognized authority on steel tanks
- 113 fabrication shops in NA
STI Labeled UST’s
Before we can establish new trends, what is the history?

- 1859 – Oil Discovered in PA
- 1904 – Flammable Liquids Code
- 1916 - 1919 – STI & API Formed
- 1922 – 1925 – UL 142 & UL 58
- 1930’s & 1940’s – Welded Tanks
- 1960’s – Non-Metallic Tanks
- 1984 – Interim Prohibition
Tank Transportation!

There were present yesterday at an informal gathering and luncheon at the La Salle Hotel, representatives of the Leader Iron Works, Decatur, Illinois.

Kewanee Boiler Company
Steel Heating and Power Boilers
Garbage Burners and Radiators

Kewanee, Ill., March 24, 1910.

Gentlemen:

There were present yesterday at an informal gathering and luncheon at the La Salle Hotel, representatives of the Leader Iron Works, Decatur, Illinois:


Morsey & Reih, Rockford, Ill.

Hodgson Bros., Dubuque, Iowa.

Milwaukee Milwaukee Roller & Tank Co., Milwaukee, Wis.

S. Milke Mfg. Company, Chicago, Ill.

Fell Brothers, Indianapolis, Ind.

C. P. McDaniel, Ottumwa, Ia.

Chicago Boiler Works, Chicago, Ill.

Kewanee Boiler Company, Kewanee, Ill.

National Boiler & Sheet Iron Works, Indianapolis, Ind.

It developed that some of the manufacturers were not enjoying any very great increase in tank business, while business with some of the others was greater than at times in the past.

We all enjoyed having with us Mr. J. V. Smale, President of the K. E. Smale & Sons Co., tank manufacturers of Pittsburgh, Pa., who gave us very valuable information about some of the Eastern tank manufacturers, only in a general way, and expressed a desire to join our Association, if it is intended to become more than a local organization. It was the opinion of everyone present that we should organize formally and employ Mr. J. V. Smale of Chicago as Secretary of the organization of Tank manufacturers, details of which are to be worked out by your permanent committee, Drs. E. F. Mote of Kewanee and Mr. McDaniel, prior to the next meeting, the latter part of April, a notice of which will be called to all who have attended any of our informal gatherings, at which time we hope everyone at all interested will be present.

Yours truly,

Kewanee Boiler Company.
Pictures from the 1950’s & 1960’s
Pictures from the late 1960’s
1984 -1985

- STI Dual Wall Tank
- Tank Tightness Tests
- NFPA 329
- Overfill tightness tests
  - Kent Moore
  - PetroTight
  - Ainlay
1985 - 1990

- 40 CFR Part 280
- Corrosion Protection
  - Cathodic Protection
  - UL 1746 (1989)
- Inventory Control
- Leak Detection
- Sumps (STI 86)
- FRP Pipe
- Flex Connectors
- Contaminated Soil

Sti-P3 Tank Created in 1969, in 1988 UST Regulations and NFPA 30 Fire Code, w/30,000+ Built in 88-89
Early 1990’s: AST Acceptance
1988 – 1998
New forms of corrosion protection

- Composite Tanks
- Jacketed Steel Tanks
- UL Listings for Ethanol Fuel Blends
- Flexible Pipe
- Non-metallic sumps
- Tank Upgrades to meet EPA
  - Internal Linings
  - Field Installed Impressed Current
Thick Coatings Can Provide Corrosion Protection

ACT-100 and ACT-100-U
FRP Jacketed Steel Tanks
2000 to the Present

- Energy Act
- 48 States Mandate Secondary Containment
- Biofuels
  - E10, E85, and Biodiesel
- Ultra Low Sulfur Diesel
- EPA OUST Proposes Revisions
Secondary Containment UST’s
TRENDS OF THE CURRENT AGE
Bigger Underground Tanks

- 1985: 8000 Gallons
- 1992: 10,000 – 12,000 Gallons
- Today: 20,000 – 30,000 Gallons

- Tank Talk Article
Secondary Containment

Aboveground Tanks

Underground Tanks
Leak Detection

- As the population of secondary containment tanks, pipes, sumps, and overfill containment expands, new regulations will assure the need for continued service
- Monthly monitoring of secondary containment
- Annual verification of equipment operations
Tanks with Compartments

Aboveground Tanks

Underground Tanks
AST’s with 2-Hr Fire Test Ratings
Tank Compatibility
• 20 Years Proven Performance

The Steel Tank Institute has researched compatibility issues concerning the storage of ethanol based fuels. STI labeled steel underground and aboveground storage tanks, when used for the storage of ethanol based fuels, have exhibited no detrimental structural or permeation issues. As with all fuels, STI recommends that tank owners implement a maintenance program for all tanks and associated equipment.
STI Website for more Information on Biofuel Compatibility


- Ethanol and Biodiesel Information
- Links to State Regulatory Web Sites
- Access to Steel Tank Manufacturers’ Statement of Compatibility
- Statements from UL, EPA, & ASTM Fuels
- Ongoing Research
Fuel Cleanliness
Inspection and Maintenance

Keeping Water Out of Your Storage System

SP001 AST Inspection
## Compatibility Chart

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Dates Manufactured</th>
<th>Type of UST Construction</th>
<th>Applicable for use with 10% ethanol (E10)</th>
<th>Applicable for use with 30% ethanol (E30)</th>
<th>Applicable for use with 100% ethanol (E100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All STI Technologies</td>
<td>1969 - Present</td>
<td>Sti-P3®, SW &amp; DW</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>All STI Technologies</td>
<td>1991 - Present</td>
<td>ACT-100®, SW &amp; DW</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>All STI Technologies</td>
<td>1992 - Present</td>
<td>Permatank®, DW</td>
<td>×</td>
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</tbody>
</table>
Sustainability

- Steel is “green” due to recyclability
- Structural Integrity
- Ductility
- Versatility and ease in fabricating to customer specification & installation needs
The Versatility of Steel

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