

Canadian Storage Tank Market  
Witnesses Globalization of Standards

Taylor Leon  
Steel Tank Institute

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The shop-fabricated storage tank industry, which not too long ago was strictly regional in focus, continues to go global.

Spurred by several developments during the 1990s, the Canadian and U.S. tank markets are becoming more similar with each day – especially because of fabrication standards.

An active participant in these changes is Steel Tank Institute (STI), a trade association and standards-setting body that represents worldwide more than 90 manufacturers of atmospheric steel storage tanks (including seven in Canada). Based in Lake Zurich, Ill., USA – an hour's drive northwest of Chicago – STI helps manufacturers promote the safety and strength of steel as the premier choice for petroleum and hazardous materials storage.

Why have STI standards become important? For starters, the North American Free Trade Agreement (NAFTA) has been part of the reason – changing the commercial landscape on both sides of the border. Related to NAFTA's changes is the harmonization of tank standards developed by Underwriters' Laboratories of Canada and Underwriters Laboratories in the U.S. Tank manufacturers in both countries for years have worked closely with their respective UL organizations on product safety issues.

STI's aboveground and underground storage technologies meet both UL and ULC standards, which gives Canadian and U.S. tank specifiers the peace of mind that licensed fabricators are satisfying the end user's needs for quality and long-term reliability.

In addition, STI for years has played an active role as liaison to key environmental and fire-code regulators, which assures that new technologies – or enhancements to existing tank designs – will meet future governmental mandates. The Institute's role in working with Canadian officials was strengthened in 1997 when the Steel Tank Association of Canada (STAC) merged with STI and formed an official STAC committee within STI's governing structure.

Further, STI staff members are actively involved in the harmonization of U.S. and Canadian third-party testing lab requirements, such as ULC-S655 (a Canadian standard) with UL 2085 (an American document). Another example is the effort to update steel UST corrosion control options in the Canadian ULC-S603.1 using the American UL 1746 as a reference guideline document.

**Market impact**

STI members account for nearly 80% of the total shop-fabricated atmospheric steel

storage tank production capacity in the United States. Steel tanks represent 2/3 of the market for shop-fabricated underground storage tanks and nearly all of the market for shop-built aboveground tanks that store petroleum and other hazardous liquids.

#### **What does STI do?**

STI has evolved into an association that delivers assistance to members with the design and quality of manufactured products -- and the market in which storage tanks are sold.

During the 1960s a concern in the U.S. about unprotected steel tanks led the members of STI to develop a standard for corrosion protection of underground storage tanks (USTs). Since then, more than 250,000 environmentally safe and structurally sound sti-P3® storage tanks have been built and installed across the United States. The sti-P3® technology is known for the three levels of corrosion prevention pre-engineered in each tank: a durable coating, galvanic anodes of magnesium or zinc, and electrical isolation of the tank from any piping attachments or other appurtenances.

However, during the last decade, in particular, STI has led the industry in developing a broad array of underground and aboveground storage tank (AST) designs with capacities of 50,000 or fewer gallons (189,200 or fewer litres).

Here's a list of UST and AST technologies developed and supported by the Institute:

#### Underground storage

STI F894 (ACT-100 Specification for External Corrosion Protection of FRP Composite Steel Underground Storage Tanks)  
STI F922 (Permatank Specification)  
STI-P3 (STI-P3 Specification and Manual for External Corrosion Protection of Underground Steel Storage Tanks)  
STI F961 (ACT-100U Specification for External Corrosion Protection of Composite Steel Underground Storage Tanks)

#### Aboveground storage

STI F921 (Standard for Aboveground Tanks with Integral Secondary Containment)  
STI F941 (Fireguard Thermally Insulated Aboveground Storage Tank Standard)

#### **The technologies**

ACT-100 is a composite tank featuring a thick cladding of fiberglass-reinforced plastic that adheres to the tank's exterior to create a reliable corrosion barrier. The FRP coating is tested at the factory with a special high-voltage coating-pinhole detector that emits sparks if it discovers bare steel during pre-shipment inspection.

Permatank is a unique secondary containment technology that employs a primary tank of steel contained by an outer wall of FRP. The tank is shipped with a vacuum on the

interstice to assure that the outer wall is performing as designed.

A newer version of the ACT-100 technology is the ACT-100-U tank, which features a thick film urethane coating that completely isolates the steel tank from the soil -- thus protecting the tank from corrosion. The coating used in ACT-100-U is a polyurethane base

The Fireguard system, the newest aboveground storage technology offered by STI members, uses two walls of steel and a lightweight insulating material on tanks installed where potential fire-risk concerns must be addressed. The Fireguard technology also has been adapted in the U.S. to meet the requirements of UL 2244, which provides a listing for a complete system that includes the storage and dispensing of aviation and motor vehicle fuels. All components of the system have been investigated by UL as being acceptable.

A similar AST system concept is evolving with ULC today.

In addition, STI has developed several widely recognized recommended practices that cover the installation and testing of tank systems and corrosion control. More information about the recommended practices is available on the Institute's web site, <http://www.steeltank.com>.

Recommended practices on the installation of tank systems close the loop for tank manufacturers. A properly engineered tank will not serve a customer well if the installer follows inferior installation procedures in the field.

### **Quality control**

It's one thing to develop standards, but the enforcement of quality control truly adds value to the process. STI's quality control inspectors average more than 1,500 tank inspections annually as they visit manufacturing facilities throughout North America and on other continents.

Inspectors randomly show up at plants' unannounced to evaluate any tanks under manufacture, or vessels already completed and awaiting shipment to customers.

Fabricators can use the information gleaned from inspections to improve their in-house quality efforts. Information gathered from the inspections also is shared with STI's Technical Committee, which is a primary channel for recommendations on improvements to manufacturing specifications for the Institute's members.

The quality program also includes requirements for licensees to send personnel to training sessions that address fabrication issues. In some cases, STI members open their facilities to competitors so that personnel from across the industry can get hands-on experience in the proper fabrication of new technologies.

### **Other industry information**

STI provides a variety of informational tools used by the storage tank industry. From the Quik Spec, an interactive CD-ROM that enables specifiers to easily create a tank specification for a particular technology, to tank capacity charts to a periodic newsletter available in print or online to regulatory documents, STI recognizes its obligation to serve as an information clearinghouse on shop-fabricated storage tank issues.

The Institute also develops articles and studies on issues of interest to the tank industry, such as the growth of alternative fuels, the trends associated with aboveground storage tank use, and how new technologies are addressing the concerns of specifiers, tank owners and regulators.

Much of this information is also available through STI's web site.

During the last two years, the Institute's web site has added features that enable tank buyers to bid a job electronically. Because of the web site's enhancements, STI members regularly receive sales leads from all parts of North America and overseas inquiries. The Internet presence has added to STI's global reach.

How does society gain from standardization? Development of standards by a trade association implies that a significant majority of its members support the standard. Regulators, code authorities, and legislators continue to look for these types of standards to reference within their own rules and codes. In the U.S., the National Technology Transfer and Advancement Act of 1996 is a law requiring federal agencies to use voluntary consensus standards.

Standardization gives the authorities having jurisdiction a greater comfort level. It enables specifying engineers to focus on more design-intensive issues. And it enables tank buyers to purchase storage systems that meet minimum performance requirements.

STI, like many other trade associations, simply fills a role in promoting the development of products that provide long-term benefits for North America and many other parts of the world.

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