

Meeting the Needs of Atmospheric Steel Storage Tank Manufacturers

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During the past thirty years, there has been a massive change in the storage of hazardous and flammable liquids. Corrosion control, secondary containment, leak detection, and fire protection are common design elements of tanks today. One organization, the Steel Tank Institute, has been helping manufacturers to promote the safety and strength of steel as the best choice for petroleum and hazardous materials storage during this time span.

"To dependably and sensibly address the common needs of steel storage tank manufacturers through any legal, ethical and co-operative actions which elevate the industry."

That is the mission of Steel Tank Institute (STI), an international trade association formed in the United States in 1916. Recognized as a leader in the storage tank industry, STI develops standards for the fabrication and installation of state-of-the-art steel underground (UST) and aboveground (AST) storage tanks. STI represents more than 90 companies fabricating atmospheric steel storage tanks throughout the world. Affiliate Member companies provide materials and services to the tank fabricating industry.

A Board of Directors governs the not-for-profit trade association, which approves the recommendations of committees charged with responsibility for developing standards. Standards are upgraded annually, to capture knowledge gleaned through research studies and field testing, to incorporate the manufacturing expertise of STI members and industry experts, and to reflect knowledge gained by examination of the real-world performance of steel tank technologies. Changes in the needs of tank buyers, development of new materials and new methods for tank manufacture, and new regulations for environmental protection and fire safety are all important additional drivers for the development of new STI standards and the enhancement of existing storage tank technologies.

Often, STI technology tank standards incorporate a minimum requirement of compliance with the standards developed by 3rd party testing organizations. STI standards then mandate additional protective designs and quality control measures. Independent consultants hired by STI, visit member manufacturing facilities to examine fabrication and testing techniques, and quality control procedures, for compliance with STI standards requirements.

Another important role for STI is service to environmental regulatory agencies and fire code organizations. STI serves on advisory committees, and makes recommendations for enhancements to regulations and standards on issues concerning tank construction, design, installation, testing, cathodic protection monitoring, leak detection and

prevention, safety procedures, inspection, and fire prevention.

Involvement in research & development, field testing, quality assurance inspection and field performance evaluation, uniquely qualifies STI to serve as an authority on environmental protection and fire safety in the design and construction of shop-fabricated steel storage tanks. To increase industry knowledge concerning these issues, STI offers various educational tools and presentations covering requirements for design, construction, installation, inspection, testing and maintenance of storage tanks, including cathodic protection monitoring.

TANK TALK, the industry journal of STI, provides information on issues and new developments for tank owners, specifiers and regulators. STI's web site, www.steeltank.com provides tank buyers with a decision-making process that examines the important questions behind selection of the appropriate tank technology for a particular site or purpose. The site includes an examination of relevant United States codes and regulations related to each tank technology, research studies and technical papers, and links to more than 100 other organizations including steel producers, regulatory and code bodies, testing organizations and tank appurtenance suppliers. The STI QuickSpec CD-ROM, a complete tool for developing bid specifications, including CAD drawings and materials lists, is available through the web site. Complete information on the Association and direct links to STI member fabricators are also available.

Since 1970, STI members have built and installed approximately 250,000 sti-P3® tanks. The sti-P3® tank is a cathodically protected underground steel storage tank designed to prevent corrosion. In 1969, STI members developed the first standard in the United States for this particular method of corrosion protection of steel underground storage tanks, the *sti-P3® Specification and Manual for External Corrosion Protection of Underground Steel Storage Tanks (STI-P3-00)*. The sti-P3® tank still enjoys one of the best performance records in the underground storage tank industry.

During the 1980's new underground storage tank technologies proliferated, giving the marketplace the strength of steel with various corrosion control and secondary containment design options. In the early 1980's, STI developed the first North American standard for double-skin (wall) steel underground storage tanks. STI members developed standards for composite tanks, incorporating a steel inner tank and an integral glass fiber reinforced plastic (FRP) coating. The *ACT100® Specification for External Corrosion Protection of FRP Composite Steel Underground Storage Tanks (F894-00)* was published in 1989. Another new technology, the jacketed tank, utilized a secondary containment that provided both corrosion resistance and secondary containment by an FRP jacket over a monitorable interstitial space. In 1992, STI members published the *Specification for Permatank® Jacketed Tanks (F922-00)*. An enhancement to the composite tank utilizing urethane coatings without fiberglass, was introduced by STI members in 1996 with the *ACT-100-U® Specification for External Corrosion Protection of Composite Steel Underground Storage Tanks (F961-00)*. More than 50,000 tanks built

to these standards have been installed worldwide.

Due to environmental concerns of soil and water pollution during the past decade, tank buyers sought alternative options to safe storage of fuels dispensed into motor vehicles. As a result, new aboveground storage tank technologies fulfilled this niche with designs incorporating secondary containment and fire protection. Tank owners now had options to purchase the double-wall (skin) F921® fire-resistant tanks, banded or dike tanks, and the ultimate fire-protected Fireguard® thermally insulated tank. STI members developed the *F921® Standard for Aboveground Tanks with Integral Secondary Containment (F921-00)* in 1992 adding the *Fireguard® Standard for Thermally Insulated Aboveground Storage Tanks (F941-99)* in 1994. In 1999, fire resistance was added to the *F921® Standard* with the development of the Flameshield™ tank. Since 1992, more than 17,000 tanks built to these standards have been installed.

For more information about the Steel Tank Institute, visit STI's website at www.steeltank.com.