

STI SPFA
Advancing the World

SP001 6th Edition SP031 5th Edition

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Advancing the World

Trade association of
steel fabricators
www.steeltank.com

Advocacy
Informational resource
◦ Education and certification
Standards and recommended practices
◦ Research and development

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Edition of Standard	Date Issued
SP001-00	September 2000
SP001-03	January 2003
SP001 3 rd Edition	July 2005
SP001 4 th Edition	July 2006
SP001 5 th Edition	September 2011
SP001 6 th Edition	January 2018
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SP031-04	February 2004
SP031-06	January 2006
SP031 4 th Edition	November 2008
SP031 5 th Edition	January 2018

AST Inspection Standards Review Committee

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Thomas	Eckardt	Kevin	Kupitz	Darren	Painter	Ric	Young
Xavier	Ferrier	David	Kwasny	David	Piercey		

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Facilities with a mix of tanks

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SP001 Scope

- Storing flammable and combustible liquids
- Atmospheric pressure
- Ambient temperature to 200 degrees F

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SAFETY THROUGH PROGRESS

SP001 Scope

- Heated thermoplastics up to 500 degrees F in Appendix D
- Standard applies to other liquids **NEW!**
Individual with the appropriate training, education, and/or experience has evaluated such use and approved the application of this Standard or a modification of the Standard, including assessing the compatibility of the liquid with the AST materials to address potential failure mechanisms. **NEW!**

At a minimum...

INSPECTION OF:

- Primary tank
- Secondary tank
- Tank supports
- Tank anchors
- Tank foundation and external supports
- Tank gauges and alarms
- Insulation covering
- Tank appurtenances
- Normal vents
- Emergency vents
- Release Prevention Barriers
- Spill Control Systems

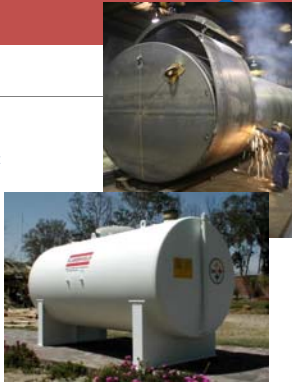
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SAFETY THROUGH PROGRESS

New and Important Definitions

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SAFETY THROUGH PROGRESS

Double Wall AST

An AST manufactured as a "tank within a tank."
Second tank provides containment
Interstitial space allows for testing of both tanks for tightness



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SAFETY THROUGH PROGRESS

Concrete Exterior Aboveground Storage Tank (CE-AST) **NEW!**

- A shop-fabricated aboveground storage tank that includes a concrete exterior.
- With a UL 2085 label
- integral secondary containment
- allows monitoring for leakage in the interstice



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SAFETY THROUGH PROGRESS

Steel Diked AST **NEW!**

An AST with an integral steel secondary containment dike.

- Pans, boxes, or containers, and are designed to contain the contents of the primary tank if it fails. Sized to contain tank volume, plus freeboard to contain precipitation
- Closed-top steel dike ASTs have welded covers to keep precipitation from collecting in the dike
- Open-top dike ASTs do not have such covers.



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Standard 112.1

Thermoplastic NEW!

- Liquids, such as **asphalt cement**, that are solid at ambient temperature and become molten upon heating.

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Standard 112.1

Release Prevention Barrier (RPB)

Liquid containment barrier

- Under the AST

Diverts leaks toward the perimeter of the AST where they can be easily detected

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Standard 112.1

Continuous Release Detection Method (CRDM)

- A means of **detecting a release of liquid through inherent design**. It is **passive** because it does not require sensors or power to operate. Liquid releases are visually detected by facility operators.
 - Release prevention barrier (RPB)
 - Double-wall AST or double-bottom AST
 - Elevated AST, with or without release prevention barrier
 - **Steel diked AST, open or closed top**
 - **Concrete exterior AST (CE-AST) with an integral secondary containment and interstitial monitoring opening**

REVISED!

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Standard 112.1


Spill Control

- A means of preventing a release of liquid to the environment, including adjoining property and waterways. Spill control methods include:
 - Remote impounding
 - Secondary containment system
 - Secondary containment dike/berm
 - **Open top steel diked AST**
 - **Closed top steel diked AST with overfill prevention**
 - **Double-wall AST with overfill prevention**
 - **CE-AST with overfill prevention**

REVISED!

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Standard 112.1

Capacity NEW!



The amount of liquid that the AST is capable of holding.

Capacity of a compartment in a **multi-compartmented AST** shall be considered a separate and distinct capacity

- Provided that the bulkhead between compartments is fully welded around its perimeter and compartments are not manifolded.

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Standard 112.1

Owner's Responsibilities

- The Owner is responsible for:
 - Compliance with this Standard, codes, ordinances, rules and regulations.
 - Verifying persons working on ASTs understand and address the hazards associated with the contents of the tanks.
 - Performing periodic inspections and documenting the results.
 - **Assuring the tank is appropriately designed, constructed, repaired, and maintained to operate safely in the intended service conditions.**
 - Implement corrective actions recommended in inspections.

REVISED!

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Inspection Schedule

- Risk based process
 - Tanks offering greatest risk have significantly more inspections
 - Tanks with less risk have less inspections
- Owner developed inspection plan
 - AST type, capacity, installation
 - May consult with professionals – Prof. Engineer, Tank Inspector

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Tank Categories

- Category 1
 - Spill Control
 - Release Detection Method (CRDM)
- Category 2
 - Spill Control
- Category 3
 - No Spill Control

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Formal External and Formal Internal Inspections

- Performed by Qualified Tank Inspector
 - STI Trained and Certified
 - API 653 Adjunct Certified (with additional SP001 certification)

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STI Inspector Certification



- Attend 5-day seminar
- Pass exam
- Visual acuity exam
- 5 year certification
- Approx. 1500 certified STI inspectors
- STI SP001 Adjunct Certification for API 653 Inspectors
 - Online at www.steel tank.com "Education"

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STI SP001 Aboveground Tank System Inspector Training Course

- Corrosion Basics
- Inspection Techniques
- Regulatory Requirements
- Fire Codes
- Valves and Piping
- Level Monitoring
- Electrical Issues



Baltimore, MD	June 11 – 15
Atlanta, GA	August 20 – 24
Houston, TX	Sept. 17 - 21
Costa Mesa, CA	Oct. 29 – Nov. 2
Baltimore, MD	Dec. 10 - 14

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Leak Testing

- STI Recommended Practice R912, *Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable, Combustible Liquids*
- Use inert gas for tanks previously in service

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NEW!

Appendix D Thermoplastic Tank Inspections

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Standard for Industry

Tanks Containing Thermoplastics

- Liquids, such as **asphalt cement**, that are solid at ambient temperature and become molten upon heating.
- Appendix applies to thermoplastics

NEW!

STI SPFA
Standard for Industry

Insulated Tank Inspection

- Inspect the insulation material and outer jacket
 - Inspect for areas where water may be trapped behind or within the insulation.
- If any of the following conditions are identified, then remove sections of the insulation to check for corrosion:
 - Evidence that the tank may be compromised,
 - Evidence that the base of the tank is consistently in contact with standing water, or
 - Insulation is significantly compromised and has not been repaired or replaced in a timely manner
- If corrosion under the insulation is suspected, remove sections of the insulation to check for corrosion.
 - Take UTT readings of the shell

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Standard for Industry

SP031 – 4th Edition

STANDARD FOR REPAIR OF
SHOP-FABRICATED
ABOVEGROUND TANKS FOR STORAGE OF
FLAMMABLE AND COMBUSTIBLE LIQUIDS

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Standard for Industry

Repairs

- Covers shop-fabricated tanks only
- Qualified personnel for repairs
 - Facility that manufactures STI, UL, etc. tanks
 - ASME Section IX welders
 - AWS D1.1 welders

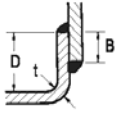
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SP031 Scope

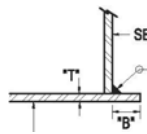
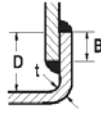
- Repairs
- Bottom replacement
- Add pipe connection
- Repair to supports
- Tightness testing of repairs and modifications
- Painting

What makes shop-fabricated tanks different?

SHOP-FABRICATED
TYPICAL BOTTOM OR HEAD



FIELD-ERECTED
TYPICAL BOTTOM



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Scope

- Aboveground Tanks
 - Flammable and Combustible
 - Atmospheric
 - Shop-fabricated carbon and stainless steel
 - Built to national standards
- What is not included?
 - Underground tanks to be used aboveground
 - Field-erected tanks
 - Bolted or riveted tanks
- Good engineering practice and experience

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SP001 and SP031 Standards

- Available in "Publications" at www.steeltank.com
- SP001 and SP031 available together at a discounted price
- Technical Questions – STI Standards Engineer and Staff Liaison
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