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More proof: E15 compatible with steel

E15 has been the hot topic in the press of late. Even before EPA issued its partial approval for E15, opinions were flying as to whether or not allowing a higher percentage of alcohol in gasoline was a good idea. Many reasons have been stated on both sides of this issue, ranging from compatibility concerns if ethanol levels are increased to concerns about oil supplies if alternative fuel supplies are not utilized more fully.

While STI can't be an expert on all the issues related to E15, we *do* know steel tanks, and we can safely say that *steel tanks are compatible with higher blends of ethanol*. STI stated this fact in a letter to federal EPA in response to a request for comment they issued. See STI's Blog, [STI Letter to EPA](#), to view the complete letter.

The compatibility of E15 with steel tanks was recently proven yet again by the internationally known company, DNV (Det Norske Veritas). DNV is an independent foundation with the purpose of safeguarding life, property, and the environment. DNV conducted testing on steel with gasolines ranging from 5% ethanol to 95% ethanol. In all cases, the corrosion rate was at or below acceptable limits. For more details, see [DNV ethanol test results](#).

The Department of Energy also conducted testing, with Underwriters Laboratories coordinating the study on mid-level blends of ethanol. One of the conclusions of the study was, "there was no noted effect on metallic parts or equipment." In other words, there was no visible or measurable corrosion. See [UL ethanol testing of dispensers](#).



In a letter to Tennessee regarding proposed regulations, STI stated, "Steel tanks have been constructed with the same material since Underwriters Laboratories first published standards for the storage of flammable liquid storage tanks over 80 years ago. UL offers a general listing on steel tanks that store flammable liquids, such as E85. Mechanical properties of steel tanks, such as tensile strength and yield strength, do not change when exposed to ethanol fuel blends. Steel will not soften in the presence of ethanol, nor can ethanol permeate through the steel material." To see the complete letter, go to [STI response to TN](#).

STICO, the insurance company holding the warranty insurance for the majority of all steel tank manufacturers, has stated, "We have not seen failures in steel tanks that could be attributed to ethanol storage." interest.

Fire Code Requirements for Venting of Flammable and Combustible Liquid Storage Tanks:

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Industry Calendar

[EGSA Spring Convention](#)

March 13-15
New Orleans LA

[NACE CORROSION 2011 Conference & Expo](#)

March 13-17

Houston TX

[Petroleum Institute for CE, ASME Pressure Vessel Code](#)

March 14-16
Houston TX

[Midwest Petroleum & Convenience Trade Show](#)

Indianapolis IN

[STI-SPFA SP001 AST Inspector Training](#)

March 21-25
Jacksonville FL

[The Convenience U CARWACS Show](#)

March 23-24
Toronto Canada

[STI-SPFA Annual Meeting](#)

March 26-29
Orlando FL

[2011 Design-Build for Water/Wastewater Conference](#)

March 28-30
Kansas City MO

[PVMA Spring Meeting](#)

April 3-5
Henderson NV

[STI-SPFA Cathodic Protection Testing Training Course](#)

April 5-6
Des Moines IA

[Natl Assn of Fleet Administrators Institute & Expo](#)

April 9-12
Charlotte NC

[Tank Storage Symposium](#)

April 12-13

Vent openings are required by fire codes to limit internal pressure and vacuum conditions that might threaten the structural integrity of tanks used for storing flammable or combustible liquids. Such pressure changes may occur for a variety of reasons; however, fire code requirements focus on two, product transfer (the introduction or removal of liquid) and fire exposure.



Jeff Shapiro, PE, ICC
FSFPE

The two predominant model fire codes in the United States are the *International Fire Code (IFC)*, published by the International Code Council (ICC) and *NFPA 1*, published by the National Fire Protection Association (NFPA). Both of these codes contain regulations that govern the storage of flammable and combustible liquids. In the case of NFPA 1, the regulations are copied from NFPA's *Flammable and Combustible Liquids Code*, NFPA 30, and in the case of the IFC, the regulations are developed by the ICC but tend to be consistent with NFPA codes, which in turn rely heavily on nationally recognized standards that govern tank construction and tank venting including:

- ANSI/UL 142, *Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids*
- ANSI/UL 58, *Standard for Steel Underground Tanks for Flammable and Combustible Liquids*
- API Standard 650, *Welded Steel Tanks for Oil Storage*
- API Standard 2000, *Venting Atmospheric and Low-Pressure Storage Tanks*

Tank venting is a complex subject that relies on the expertise of tank and vent manufacturers, testing laboratories, mechanical engineers who may be charged with designing vent piping extensions, product specialists who must be familiar with the properties of stored liquids, and the local authority having jurisdiction who is charged with interpretation and enforcement of code requirements. Accordingly, the answers offered in this article are general in nature and should not be used in the absence of qualified experts responsible for overseeing the design and installation of tank vents.

With this background in mind, the following is a collection of commonly asked questions and answers associated with fire code requirements for venting of flammable and combustible liquid storage tanks.

[Click here to read Jeff Shapiro's venting Q and A...](#)

Urban water scarcity nears

According to an investment blog, water availability in urban areas is a bigger problem than most people think. There are already several large cities that have run low on water occasionally in recent years. If global weather patterns continue to alter rainfall patterns, the scarcity will trickle down to smaller cities, as well.

According to the blog 247wallst.com, these are the ten largest urban areas that are running out of water:

- | | |
|----------------------------|----------------|
| Los Angeles, CA | Fort Worth, TX |
| Houston, TX | Las Vegas, NV |
| Phoenix, AZ | Tucson, AZ |
| San Antonio, TX | Atlanta, GA |
| San Francisco Bay Area, CA | Orlando, FL |

Water scarcity could make living in a city with scarcity of

[STI-SPFA Steel Water Storage Tank Seminar](#)

April 14
Riverside CA

[STI-SPFA Cathodic Protection Testing Training Course](#)

April 20-21
Pittsburg PA

More industry events:

[2010 - 2011 Industry Calendar of Meetings, Seminars & Conferences](#)

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and competition for water uncomfortable, if not downright scary. Many industries require constant water supplies for their manufacturing processes. Loss of those businesses could mean lost jobs locally, and economic impact across the nation.

Municipal governments are already trying to deal with water shortages in these urban areas, but they may not have thought of a dire problem: cities sell bonds to support of infrastructure development of water storage, movement and supply. If rating agencies have missed this critical forecast for water scarcity, it could cause serious financial consequences.

See more [steel infrastructure projects here](#).



Tank and Petroleum Mishaps

Fines levied in Indiana township explosion that killed 2

The *Valley View Dispatch* newspaper reported that "The U.S. Department of Labor announced Tuesday that it has fined two companies involved in an oil tank explosion that killed two workers at an Indiana Township natural gas well in July."

The report said that "Northeast Energy was cited for two 'willful violations' involving:

- Failure to ensure workers were welding on a thoroughly cleaned tank that did not contain flammable materials.
- Failure to determine whether flammable/combustible or other hazardous materials were present."

Man's clothes ignite in car

The Tri-City Herald reports that, "A Kennewick (Washington) man is being treated at Harborview Medical Center in Seattle after his shirt caught on fire while he was driving.

K.J. Glenn, 52, spilled a small amount of gasoline on his shirt when he filled his vehicle at 3:44 p.m. Wednesday at the SunMart on 27th Avenue in Kennewick, according to Kennewick police reports. As he drove off, he lit a cigarette, which ignited the gasoline on his shirt, according to police. Glenn and two men riding in the vehicle climbed out of it while it still was moving, according to police. The driverless vehicle hit another car and then a flagpole in the SunMart parking lot, according to police. Glenn, who was the only one injured, had first- and second-degree burns."

Cannon had role in oil tank firefighting

Jan Larson reported in the *Sentinel-Tribune* (Bowling Green, OH) that "The cannon was used when a storage tank for oil caught on fire, often when touched off by lightning or by sparks from passing steam engines. The fires were often impossible to extinguish and raged on until all the oil burned. So, the cannon was used to shoot gaping holes in the side of the tanks for the oil to drain out."

For more Mishaps, [click here](#).

ICC: Significant Changes to 2009 IFC

In April 2010, the ICC published [Significant Changes to the 2009 International Fire Code](#) edited by Scott Stookey. Examples of significant changes in the 2009 IFC include:

- Pressure vessels storing hazardous materials must comply with the ASME Boiler & Pressure Vessel Code.
- Existing AST's shall be maintained in accordance with the requirements applicable at the time of installation. If not made code compliant, the tanks shall be removed.
- Periodic inspections of liquid fuel dispensing and containment equipment to verify it is in proper working order. The local authority is authorized to require damaged or unsafe equipment to be repaired in an approved manner. (STI SP001 and SP031, and PEI RP500 and PEI RP900 are several industry practices available to assist fire code officials.)

Editor Scott Stookey said that supplements like the ICC's *Significant Changes to the 2009 International Fire Code* "help local officials better understand why code changes were made." He also noted that the IFC will publish a 2012 IFC changes edition in the next month or two. See www.iccsafe.org for information.

Two prominent safety codes assure safe storage of flammable and combustible liquids: they are [*NFPA 30, Flammable and Combustible Liquids Code*](#), published by the National Fire Protection Association, and the [*International Fire Code*](#), published by the International Code Council. Both NFPA and ICC publish supplements to assist users of their codes. NFPA publishes the [*Flammable and Combustible Liquids Codes Handbook*](#), edited by Robert Benedetti.

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