EPA United States Environmental Protection Agency

Underground Storage Tanks (USTs)

Alternative Fuels and Underground Storage Tanks (USTs)

Corrosion of Metal Components in USTs Storing Diesel and Gasoline-Ethanol Blends

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Corrosion has been commonly reported in USTs storing diesel fuel and gasoline-ethanol blended fuels. The corrosion generally appears in different areas of the UST system for each fuel. When storing diesel fuel, corrosion generally appears on metal components inside USTs. When storing ethanol blended fuels, corrosion generally appears in sumps. Instances of this corrosion began appearing about a decade ago.

The corrosion in USTs storing emerging fuels discussed here does not violate federal UST requirements. The federal UST regulation requires UST owners have corrosion protection for their UST system metal components in contact with the ground. But corrosion protection is not required for metal components inside USTs or in sumps.

However, UST owners and operators must ensure corrosion does not affect the functionality of their equipment. If UST equipment does not function as intended, it may violate the federal UST regulation or lead to releases into the environment. Owners and operators should contact their state UST implementing agencies because they may impose requirements more stringent than the federal regulation.

Corrosion of Internal Components in USTs Storing Diesel Fuel

EPA conducted research on 42 actively operating underground tanks storing diesel fuel at facilities all across the United States and found that 83 percent (or 35 USTs) exhibited moderate or severe corrosion of metal components inside the tank system. EPA's July 2016 report discusses that research. Industry provided invaluable assistance to EPA in research design, operational coordination, and report reviews over the course of the research effort. EPA will continue to coordinate with industry to understand the corrosion issue and identify solutions.

EPA cannot project the actual percentage of USTs storing diesel that are affected by corrosion nationwide. However, this could be a widespread and potentially significant problem for owners of underground tanks storing diesel fuel.

The corrosion may cause metal components inside both steel and fiberglass UST systems to corrode. This can possibly shorten the lifespan or affect the serviceability of components, including limiting the movement of floats on automatic tank gauging systems, operability of mechanical devices designed to prevent the chance of overfilling the tank, or ability of valves to shut off flow of product in the event of a release. Corrosion may cause dispenser filters to clog and be replaced more frequently. Corrosion could potentially limit the proper functionality of sheer valves or equipment designed to test for leaks in fuel product lines. EPA recommends UST owners check for corrosion in their tank systems storing diesel fuel, and if they find corrosion, repair or replace equipment as necessary to ensure proper functionality.

- EPA's July 2016 research report, Investigation of Corrosion-Influencing Factors in Underground Storage Tanks with Diesel Service (EPA 510-R-16-001). July 2016.
- EPA's July 2016 Notice of Corrosion Risks in Underground Storage Tanks Storing Diesel Fuel
- EPA's questions and answers about corrosion in underground tanks storing diesel fuel

Other Resources

- Industry documents containing practices, technologies, or treatments to minimize the risk of release of diesel fuel from underground tanks The following links exit the site Exit
  - Coordinating Research Council (CRC)
    - *Report 672 - Preventive Maintenance Guide for Diesel Storage and Dispensing Systems (PDF)* (2 pp, 959 K)
    - *Report 667 - Diesel Fuel Storage and Handling Guide (PDF)* (32 pp, 1.0 MB)
  - Clean Diesel Fuel Alliance – *Guidance For Underground Storage Tank Management at ULSD Dispensing Facilities (PDF)* (10 pp, 562 K)
  - Steel Tank Institute – *Recommended Practice for Storage Tank Maintenance R111 Revision (PDF)* (21 pp, 564 K)

- ASTM D6469 – *Standard Guide for Microbial Contamination in Fuels and Fuel Systems* (available for purchase)

Corrosion in Submersible Turbine Pump Spaces in USTs Storing Ethanol Blended Fuels

External corrosion is commonly found coating metal components in the submersible turbine pump spaces (sumps) of USTs storing gasoline blended with ethanol. This type of corrosion can be caused by bacteria through a process called microbiologically-influenced corrosion and may impact the serviceability or functionality of equipment in the sumps. The information below may be helpful to minimize corrosion in sumps storing ethanol blended fuels.

- EPA's research on possible causes of corrosion: Corrosion in STP Sumps: What Causes it and What Can Be Done About It? (9 pp, 779 K)
- Research by National Institute of Standards and Technology on potential equipment impacts: Corrosion of copper and steel alloys in a simulated underground storage-tank sump environment containing acid-producing bacteria Exit

Last updated on July 20, 2016