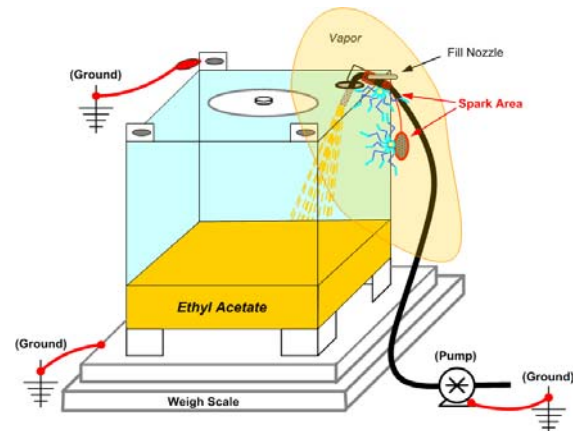


## Static Electric Discharge Causes Fire

December 2008

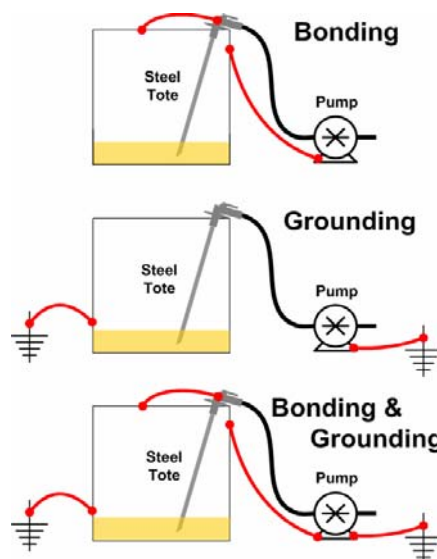
A fire and series of explosions occurred in a chemical distribution facility. The fire started in a packaging area while a 300-gallon portable steel tank (a "tote") was being filled with ethyl acetate, a flammable material (figure). An operator placed the fill nozzle in the opening on top of the tote and suspended a steel weight on the nozzle to keep it in place. As the tote was filling, the operator heard a "popping" sound and saw the tote engulfed in flames. The fill nozzle was laying on the floor spilling ethyl acetate. Employees tried unsuccessfully to extinguish the fire with a fire extinguisher, and then evacuated the area. The fire spread to a warehouse, igniting other stored flammable and combustible liquids. One employee received minor injuries and a firefighter was treated for a heat-related illness. Because of the smoke and rocketing barrels and debris, nearby businesses were evacuated. The warehouse was destroyed and business was interrupted.

It was determined that an ignitable vapor-air mixture formed near the tote fill opening. While the body of the tote, the weigh scale, and the pump were grounded, the steel parts of the fill nozzle and hose assembly (and the steel weight) were not bonded and grounded, and were isolated by the synthetic rubber fill hose. Static electricity likely accumulated on these parts and sparked to the stainless steel tote body, igniting the vapor that accumulated around the fill opening during filling.



### Do you know?

- Static electricity is generated when liquid flows through pipes, valves, and other equipment
- Correct bonding and grounding ensures that static electricity does not accumulate and cause a spark.
- Static sparks can ignite many flammable vapor-air mixtures.
- **Bonding** is electrically connecting conductive objects to equalize electrical potential and prevent sparks.
- **Grounding** is connecting a conductive object to the earth to dissipate electricity from accumulated static, or other sources.



### What can you do?

- Ensure that conductive piping and equipment is bonded and grounded, and properly designed for flammable service. This includes vessels, pumps, pipe, valves, nozzles, instrument probes, filling pipes and nozzles, drums and other portable containers, and any other conductive equipment.
- Make sure that ground connections in your plant are regularly checked to ensure that they are working properly.
- When filling containers with flammable liquids, minimize the amount of free fall that can create static in the liquid.

***Always ground all conductive components of a flammable material handling system!***

AIChE © 2008. All rights reserved. Reproduction for non-commercial, educational purposes is encouraged. However, reproduction for the purpose of resale by anyone other than CCPS is strictly prohibited. Contact us at [ccps\\_beacon@aiiche.org](mailto:ccps_beacon@aiiche.org) or 212-591-7319

The Beacon is usually available in Afrikaans, Arabic, Chinese, Danish, Dutch, English, French, German, Gujarati, Hebrew, Hindi, Hungarian, Indonesian, Italian, Japanese, Korean, Malay, Marathi, Persian, Portuguese, Russian, Spanish, Swedish, Tamil, Thai, Turkish, and Vietnamese.