

# Effective Grounding & Bonding of Flammable Liquid Containers Prevents Fire Losses

## What causes static electricity

Static electricity has caused many serious fires in manufacturing plants. Static sparks will readily ignite flammable vapors. The formation of static electricity is due to the action of contact and separation of dissimilar substances. Liquids produce static when they flow through pipes or hose; when they fall through the air in drops or as a spray; when they are splashed around in tanks; and when air or other gases are bubbled through them.

## How charge builds up

If there is no way for static electricity to drain or flow away as it is formed, the charge builds up gradually. It may eventually develop a sufficiently high voltage to cause a spark to jump a gap to some nearby grounded or less highly charged object.

## Ground all containers for extra safety

In the handling of containers of flammable liquids having high electrical resistance and low flash points, possible loss of life, loss of property and interruption to business can be greatly minimized by effective grounding and bonding of the containers.

The two illustrations, on the next page, show an effective method of preventing static accumulation by grounding drums to a water pipe or other low resistance ground, and bonding the drums to small containers during filling operations.

## Suitable grounds

Grounding connections may be made to wet sprinkler or other water pipes where available; but not to dry-pipe sprinkler systems or to pipes liable to be disconnected. Metal plates buried in moist earth, or metal pipes driven into moist earth, may be used as ground electrodes if water pipes are not available.

## Plastic containers

Handling of flammable liquids in plastic containers does not eliminate the possibility of fires caused by static sparks. Electrical charges can build up on the surfaces of liquids in plastic containers, or on the surface of the plastic container. This voltage can cause a spark to jump a gap to a nearby grounded, or less highly charged object.

Because there is greater difficulty in dissipating charges from the surface of plastic containers (a conductive bond wire attached to the outside of the container will not remove this charge) metal safety cans are preferable.

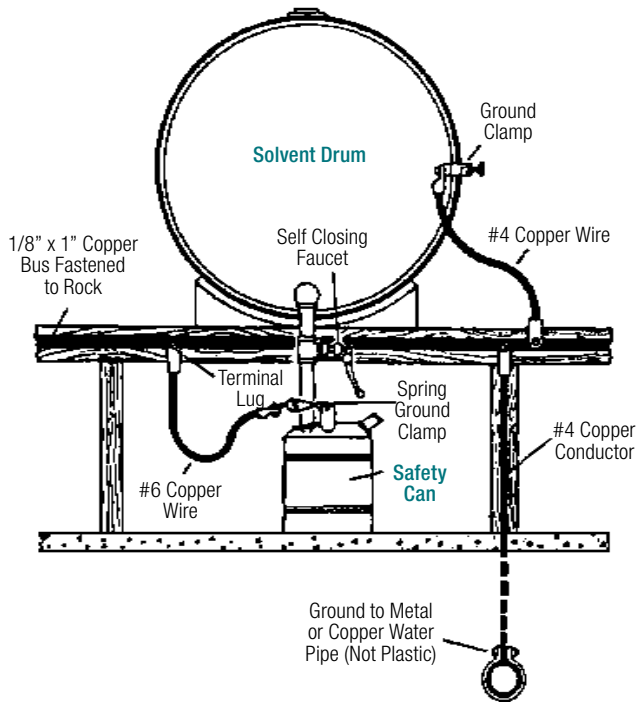
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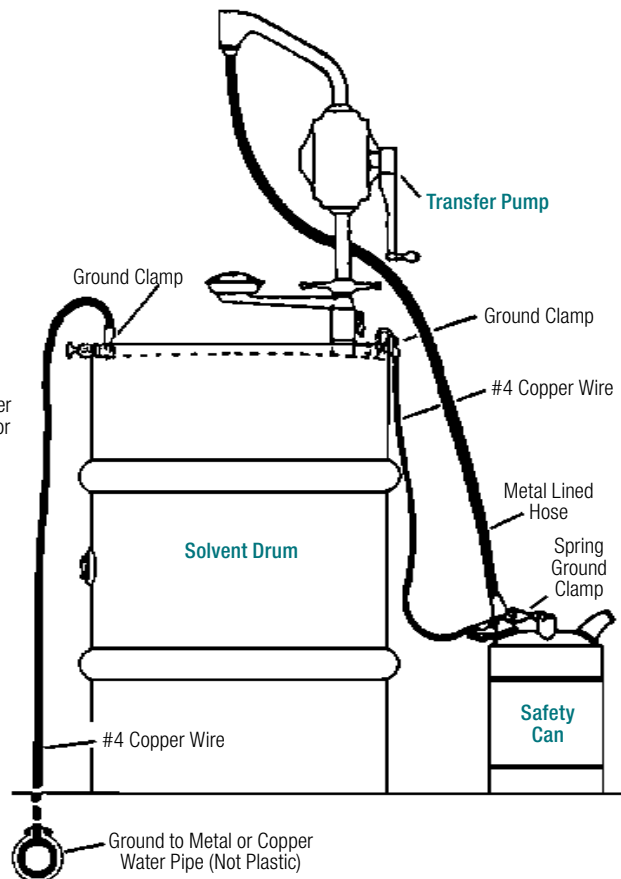
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If a nonconductive container such as plastic must be used, it should be UL listed. It is prudent to limit the size of plastic containers to one gallon capacity.

When filling plastic containers grounding and bonding procedures should be followed. A grounded conductor (fill tube or separate ground wire) should be present in the container being filled throughout the filling process. All conductive elements on the container such as metal handles, and all nearby metal such as funnels, should be grounded.



Two illustrations show grounding of solvent drums and methods of bonding drums to small containers being filled. If a good electrical connection is known to exist from the drum to the can through a metal lining and nozzle of the hose, the bonding cable between the drum and the container is not needed.



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