



Safety Matters

Cell Phones and Electrical safety

Fact Sheet

What is Static Electricity?

If you have any questions, contact us at:

SMOHIT

601 N. Fairfax St. Suite 250
Alexandria, VA 22314
Phone: 703-739-7130
Fax: 703-739-7134

www.smohit-iti.org

Everything we see is made up of tiny particles called atoms. Atoms are made of protons, electrons and neutrons. They are very different from each other in many ways. One way they are different is their "charge." Protons have a positive (+) charge and electrons have a negative (-) charge. Neutrons have no charge. Usually, electrons and protons have the same number of atoms and neutrons has atom has no charge, it is "neutral."

Static electricity is generated whenever two materials are in contact with each other. All materials are made of electrical charges in the material atoms. In the universe there are equal amounts of negative electrical charge (electrons) and positive charge (protons). These generally try to stay in balance of equal amounts.

When two materials are in contact, some of the charges redistribute by moving from one material to the other. This leaves an excess of positive charge on one material, and an equal negative charge on the other. When the materials move apart, each takes it's charge with it. One material becomes charged positively, and the other negatively.

If the materials are able to conduct electricity away the charges will dissipate and eventually recombine. In this case, static electricity effects may be too small to be noticed. However, if the charges are separated faster than the material can dissipate them, the amount of electrostatic charge builds up. Eventually a high voltage, and the effects of static electricity, may be noticed.

The increased risk mobile phones and pagers "full function type" pose to gas stations, other work environments that store fuels, chemical factories, and their users is largely due to their ability to produce sparks. These can be generated by the high-powered battery inside the phone, which is itself, a possible cause of fire. The electromagnetic waves emitted by the phone are more than sufficient to create considerable static electricity that heats the surrounding air and if the flammable vapor is concentrated enough, causes an explosion.

There is little risk attached to such electrostatic discharges. In most cases they are just a common nuisance. The biggest risk is that a shock could cause you to have an accidental injury.

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Hazards

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Static electricity may occur when a person filling their tank leaves the nozzle, gets back in their vehicle and rubs against the seats. When they return to the vehicle fill pipe when the refueling is complete the built up static may discharge at the fill point, causing a brief flash fire with gasoline refueling vapors.

No smoking, lighting matches or lighters while refueling

Never jam the refueling latch on the nozzle open

Turn off the vehicle engine while refueling; put the vehicle in park and/or set the emergency break

Do not over fill or top-off your vehicle tank, which can cause gasoline spillage.

Electronic devices installed in the gas stations are safe. "All the electronic devices in gas stations are protected with explosive containment devices, while cellular phones are not,"

Static electricity-related incidents at retail gasoline happen highest during cool or cold and dry climate conditions.

Indoors, central heating or air conditioning can give very dry conditions which promote static electricity. Heating warms the air and reduces its humidity. If the air humidity is below 40% there is an increased risk of static electricity

Static shocks are often noticed in cold dry weather, especially when in a centrally heated environment, and may disappear when the weather gets more humid. Static shocks may also be encouraged under air conditioning in hot weather.

If you experience static shocks while working in an area where flammable atmospheres, seek advice immediately. There may be a fire or explosion risk.

Today's shoes have highly insulating plastic soles. As you walk, static charges can build up on the soles of the shoes. This is especially true if the floor is also insulating. Some older nylon carpets are particularly good at generating static electricity.

When you sit in a chair the contact between your clothes and the chair can generate a lot of electrostatic charge on your clothes. While you stay in contact with the chair your body voltage stays low. If you lean forward so your back moves away from the chair back, or if you get up out of the chair, then you take the electrostatic charge with you. Your body voltage can rise very rapidly to a high voltage as the charge is separated from its counter charge on the chair.



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Control Measures

Most importantly, don't get back into their vehicles during refueling--even when using the nozzle's hold-open latch. This will greatly reduce and minimize the likelihood of any build-up of static electricity.

A build-up of static electricity can be caused by re-entering a vehicle during refueling, particularly in cool or cold and dry climate conditions. If the motorist then returns to the vehicle fill pipe when refueling is complete, the static may discharge at the fill point, causing a brief flash fire with gasoline refueling vapors.

Motorists who cannot avoid getting back into the vehicle should always first touch a metal part of the vehicle, such as the door, or some other metal surface, away from the fill point upon exiting the vehicle.

Turn off your vehicle engine while refueling. Put your vehicle in park and/or set the emergency brake. Do not smoke, light matches or lighters while refueling.

Use only the refueling latch provided on the gasoline dispenser nozzle--never jam the refueling latch on the nozzle open.

Do not over fill or top-off your vehicle tank, which can cause gasoline spillage.

In the unlikely event a static-caused fire occurs when refueling, leave the nozzle in the fill pipe and back away from the vehicle. Notify the station attendant immediately so that all dispensing devices and pumps can be shut off with emergency controls. If the facility is unattended, use the emergency shutdown button to shut off the pump and use the emergency intercom to summon help.

When dispensing gasoline into a container, use only an approved portable container and place it on the ground when refueling to avoid a possible static electricity ignition of fuel vapors. Containers should never be filled while inside a vehicle or its trunk, the bed of a pickup truck or the floor of a trailer.

Keep fuels away from ignition sources like heat, sparks, and flames.

Disable or turn off any auxiliary sources of ignition such as a camper or trailer heater, cooking units, welding equipment, pilot lights, or any sources of ignition on a worksite.

Only store gasoline or fuels in containers with approved labels as required by federal or state authorities. Never store gasoline in glass or unapproved containers.

Manually control the nozzle valve throughout the filling process. Fill a portable container slowly to decrease the chance of static electricity buildup and minimize spilling or splattering.

Fill container no more than 95 percent full to allow for expansion

Avoid prolonged breathing of gasoline or other fuel vapors. Use gasoline or other fuels only in open areas that get plenty of fresh air. Keep your face away from the nozzle or container opening.



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Never siphon gasoline by mouth nor put gasoline in your mouth for any reason. Gasoline can be harmful or fatal if swallowed. If someone swallows gasoline, do not induce vomiting. Contact a doctor immediately.

Keep gasoline away from your eyes and skin; it may cause irritation. Remove gasoline-soaked clothing immediately.

Place cap tightly on the container after filling - do not use containers that do not seal properly.

If gasoline spills on the container, make sure that it has evaporated before you place the container in your vehicle.

Report spills.

Use gasoline as a motor fuel only. Never use gasoline to wash your hands.

When transporting gasoline in a portable container make sure it is secured against tipping and sliding, and never leave it in direct sunlight or in the trunk of a vehicle.

Indoors, increase relative humidity level between 40%-50% to avoid dry conditions which increase the risk of static. Heating warms the air and reduces its humidity

Also, look for shoes with natural material soles (e.g. leather). In the electronics industry, and in areas where electrostatic sparks could cause a fire hazard, people often wear specially designed static dissipative shoes to reduce electrostatic charge build-up on the body.

It is less likely that problems will be experienced with non-polymer floors, such as cement or wood

