

Electricity—Source of Ignition

A source of energy is all that is needed to touch off an explosion where flammable gases, or combustible dust, are mixed in the proper proportion with air. One prime source of energy is electricity.

Equipment such as switches, circuit breakers, motor starters, push-button stations, or plugs and receptacles can produce arcs or sparks in normal operations when contacts are opened and closed, which easily cause ignition (explosion).

Other hazards are devices that produce heat, such as lighting fixtures and motors. Here, surface temperatures may exceed the safe limits of many flammable atmospheres.

Finally, many parts of the electrical system can become potential sources of ignition in the event of insulation failure. This group would include wiring (particularly splices in the wiring), transformers, impedance coils, solenoids, and other low-temperature devices without make-or-break contacts.

Nonelectrical hazards such as sparking metal can also easily cause ignition. Thus, a hammer, a file, or another tool that is dropped on masonry or on a ferrous surface is a hazard unless the tool is made of non-sparking material.

For this reason, portable electrical equipment is usually made from aluminum or other material that will not produce sparks if the equipment is dropped.

Thus, electrical installation shall prevent accidental ignition of flammable liquids, vapors, and dusts released into the atmosphere on, or anywhere near, a construction jobsite.

What are some of the hazardous operations on or near a construction/repair/maintenance/ processing jobsite?

- Gas stations dispensing gasoline
- Automobile spray paint operations
- Repair shops
- Welding operations
- Locations where inhalation anesthetics are used (clinics/hospitals)
- Storage and handling of liquefied petroleum
- Dry cleaning plants/stores
- Grain siloes
- Farm supply outlets (grain/feed/straw/seed)
- Conveyor belt operations
- Improper disposal of solvents in storm drains

What are some areas an alert electrician, or a nearby worker, should use as day-to-day warning signals?

- Permissible exposure limits (PELs)
- Lower explosive limits (LELs)
- Dust levels
- Odors of any type
- Poor ventilation
- Engine exhaust
- Gasoline-fed generators
- Leaks of any kind (air/fluid/solvents/gases)
- Welding
- Temporary heating devices
- Sanitary sewer gases
- Drying/curing agents (concrete)
- Containers of any type (without caps/aids/closures)

Explosives of any type are hazardous enough by themselves, but around electricity they are even more hazardous. In the final analysis, good housekeeping, and proper storage of hazardous materials, will dramatically curtail explosions/ignitions. Please be safe!