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Complete Health Environmental and Safety Services

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## It's Shocking

Electrical fires are no longer common at work. But electrical problems are still a major cause of home fires. Why? Because you can get away with things at home that both OSHA and fire inspectors (and your insurer) prohibit at work. Even so, electrical issues are some of the most common fire code and OSHA violations found.

Faulty wiring, overloaded circuits, and damaged equipment are fire hazards and shock hazards. The fault usually isn't your electrician's. Instead, it's your own, for not using a qualified electrician when you should have done so, letting equipment wear out, and using the wrong equipment for the job.

A rundown of the most common electrical problems we see:

**Missing grounding prongs:** If equipment used in your shop has a plug, it needs to be grounded or double-insulated. Extension cords also have to be grounded. Unfortunately, grounding prongs break off easily. The equipment still works, so many people just ignore the damage. But once that third prong is gone, you're the easiest path to ground if there's a short. The shock has been enough to kill people, even with equipment as light-weight as portable drills or box fans.

**Damaged cords:** Cords take a lot of abuse. There's a requirement that they be as short as feasible, for just that reason. Each time you pull one out of an outlet, or pull it along the edge of a tool cart, the cord wears. Eventually, the outer jacket may wear out, or the cord starts pulling away from its plug. The very wrong easy answer: just wrap it with lots of tape. But that doesn't restore the original capacity of the insulation, and it doesn't provide the same flexibility as the original jacket. So electrical tape isn't the answer. Take the cord out of service. If you want to repair it, you can use splices designed for that purpose, or have a qualified person cut out the damaged area and make two shorter extension cords from the remainder. One caution about that, though: anyone who fabricates cords has to be competent to do so. It's very easy to mix up the wires, reversing the hot and neutral. The cord might work, but the chance of a shock becomes high.

**A shortage of outlets:** The electrical code usually requires at least one outlet on each wall. With the amount of electrical equipment we have, that's rarely enough. And getting an electrician in to add more outlets is expensive. So what's often done? People add power taps, multioutlet strips or surge protectors that allow as many as six items to be fed off of one outlet. Those actually are allowed, with some caveats. They have to have an internal circuit breaker and be UL-certified or equivalent. Watch out for counterfeits; a number of those have been found on the market. To check, see <http://www.cpsc.gov/cgi-bin/prod.aspx>.

The power tap is meant for only about 15 amps total. Don't use it for space heaters or any equipment rated at more than 600 volts.

Power taps can extend the capacity of an outlet, but they aren't intended to extend the outlet's reach. Don't plug one power tap into another, or even an extension cord into a power tap (or vice versa). Both should be plugged directly into a wall outlet only. Daisy-chaining, plugging one power tap into another, increases the likelihood of overloading, and of fire. Even if you were careful enough to check the total load, there's increased resistance and increased vulnerability when the cords are linked together.

What if you do need to extend the reach of an outlet? A heavy duty extension cord can be used temporarily, but it's not designed for long term use. Again, flexible cords take a beating. They have to be inspected before each use. If you run that extension cord up over the rafters, to keep it out of the way, you can't check it each time. The rafters themselves can damage the cord, by abrading it each time there's a slight pull on the cord. Don't run cords through walls, ceilings, or doorways.

**Unsuitable for the Environment:** If you wash vehicles, you have wet areas. If you spray paint or could have a gasoline leak, you have potentially explosive areas. Use equipment designed for those areas, or keep electricity away. The fans in spray booths are designed to handle flammable vapors and lights are covered to keep the vapors away. In wet areas, outlets need to be weather resistant, and protected by ground fault circuit interrupters. One area that tends to be neglected: near the floor and in pits in areas where vehicles are stored or operated. Many flammable vapors accumulate near the floor.

There are other electrical requirements that are routinely violated. People keep forgetting that the area in front of electrical panels has to be kept clear. Electricians sometimes leave unguarded openings in the panels (sloppy, potentially very dangerous, but very easily corrected). People remove covers from panelboards, junction boxes, or outlets, and forget to replace them.

You don't need to memorize the electrical code or OSHA's electrical standard to comply with the rules. Check equipment and cords often, to make sure they're in good shape. Use temporary wiring on a temporary basis. And hire a qualified electrician when you need electrical work done.

This article is intended to provide general information (not advice) about current safety topics. To discuss your specific concerns and how CHESS may help, please contact CHESS at [CHESS@CHESS-safety.com](mailto:CHESS@CHESS-safety.com) or 651-481-9787.