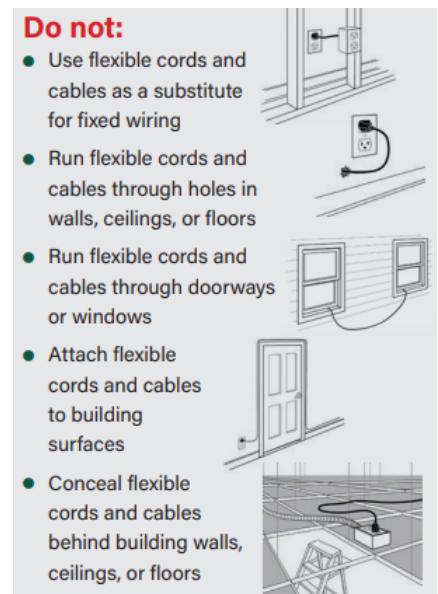


The Ubiquitous Orange Extension Cord

Improper use of extension cords can present a serious fire and life safety hazard in the workplace. The National Fire Protection Association routinely highlights how electrical fires, electrical failures, or malfunctions result in over 50,000 structure fires each year. These fires cause injury, loss of life, and tremendous property damage. The Bureau of Labor Statistics of the U.S. Department of Labor reports that during 2007, workers suffered 2580 electrical injuries. Since 2007, the number has increased to equate to one on-the-job electrical death (electrocution) every day. It only takes about 30 milli-amps of current to cause respiratory paralysis; as a comparison, corded drills use 30 times as much current as what can kill. This month's article will discuss extension cord usage outside of the construction industry.

Death, Shocks, and Burns: An electrical shock is received when an electrical current passes through the body. In most non-industrial wiring, the black and red wires are at 120 volts. The white wires are at 0 volts because they are connected to a "ground," ultimately ending in a rod driven into the earth. If you come in contact with an energized black wire and also with the neutral white wire, another grounded device, or act as the pathway back to the ground, a current will pass through your body. The extent of injury depends on the entry and exit point as the current flows through your body and the amplitude of the current. Your skin is a mild insulator, resisting the flow of current; wet skin or standing in a damp location will readily allow current to flow through the body. Three simple methods to avoid contact with current are: Keep the round or ground prong in place on the male end of the cord (don't cut it off), use Ground Fault Circuit Interrupters (GFCI) in damp or wet locations, and replace damaged extension cords. The green ground on electrical cords is a backup neutral if the white neutral fails to provide a path. A GFCI instantaneously switches off the current if a five-milli-amp difference is detected in the circuit, protecting the user from electrical shock. The outer sleeve of extension cords is one of many insulators designed to isolate the user for electrical pathways. By using a damaged or "shop-repaired" cord, users run the risk of becoming an active participant in the electrical path.

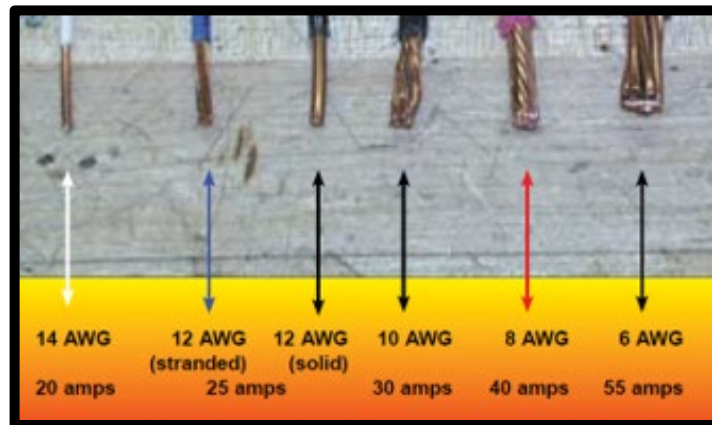
Temporary Use Only: Extension cords cannot be used as a substitute for fixed wiring structures according to 1910.305(g)(1)(iv). OSHA's 1910.305(a)(2) standard limits the use of extension cords for remodeling, maintenance or repair and for decorative events, such as holiday lights and carnivals, for no more than 90 days. Power strips/surge protection used to protect low power source electronics are not considered extension cords unless they are daisy-chained (interconnecting extension cords and power strips) or installed without access, per an OSHA letter of interpretation. All temporary wiring must be accessible. It cannot run through structure openings, be attached to surfaces, or be concealed or run through raceways. If an extension cord is supplying power to a device outside of temporary use, an outlet must be installed to power the device permanently. OSHA has carved out exceptions for window displays and showcases with specific cord types allowed per 1910.305(g)(1)(v). In addition to fire and electrical hazards, extension cords pose a slip, trip, and fall hazard when strung along walking paths.



Credit: Oregon OSHA

The Right Cord for the Job: Extension cords vary from light to heavy duty based on intended use. OSHA's 1910.505(g)(2)(i) standard requires usage markings approximately every two feet along the length of the cord. Examples of these codes are S, ST, SO, and STO for hard service and SJ, SJO, SJT, and SJTO for junior hard service. The gauge of wire in an extension cord must be compatible with the amount of current the cord will be expected to carry. A tool plugged into the extension cord may use more current than the cord can handle without tripping the circuit breaker. If the current flow is more than the cord is designed to carry, the wire will overheat and could cause a fire. Current ratings (how much current a device needs to operate) are often printed on the devices' nameplate. If a power rating is given, it is necessary to divide the power rating in watts by the voltage to find the current rating. For example, a 1,000-watt heater plugged into a 120-volt circuit will need almost 10 amps of current.

Employers who fail to understand and follow the above guidance could be liable under OSHA's 1910.303(a) standard for failing to use electrical equipment as approved.



Credit: NIOSH Electrical Safety Student

Improper use of extension cords poses significant fire and safety hazards. OSHA regulates the use of extension cords, permitting them only for temporary purposes and mandating that they not replace permanent wiring. Additionally, choosing the correct type of extension cord based on its current ratings is essential to prevent overheating and potential fires.

The Illinois On-Site Safety and Health Consultation Program can be an invaluable resource for employers to review workplace practices to look for hidden and open electrical hazards. The Illinois Department of Labor will work with employers to provide recognized industry best practices, sample programs and proven safety management methods to small and medium-sized businesses. Consultation services include on-site visits, air and noise sampling, and program assistance and training, all of which can contribute to creating a safer and healthier work environment while also potentially lowering your worker's compensation insurance premiums. This program, brought to you at no cost by the State of Illinois*, can provide the support and guidance you need to identify hazards, develop a hierarchy of controls for those hazards, and create an enduring safety and health program. Visit <https://worksafe.illinois.gov/> or contact Harry (Hap) Hileman with the Illinois Department of Labor at 217-993-2111 or harry.hileman@illinois.gov for more information.



* The 21(d) On-Site Consultation Cooperative Agreement is funded by a federal grant, constituting ninety percent of the overall budget. State funds finance ten percent.

1. <https://www.osha.gov/laws-regs/standardinterpretations/1993-06-11-0> - surge protections