

## Understanding Electricity and Breaker Panels

The process of forcing electrons to move through a material creates electricity. A standard generator performs this process. The best material for carrying electricity is a conductor.

Most metals are excellent conductors and the most common material used for electrical wiring is copper. In order to provide protection from direct contact with the conductor, an "insulator" is used as a cover around the conductor. Electrons will not move easily through insulators such as most plastics and rubber. Insulators and proper grounding help to prevent electrical shocks.

Typically, electricity is provided to your building or facility by way of underground or overhead power lines originating from a nearby electrical power plant. The power lines feed into your electrical breaker panel(s). Each breaker in a panel represents a circuit supplying electricity to a designated area of your building. The majority of your electrical safety considerations begin at the breaker panel. Here are some basic safety considerations for all panels:

- The breaker panel should be readily and easily accessible at all times. Do not store any items on the floor area directly in front of the panel. Maintain an aisle in front of the panel that is at least three feet wide.
- The panel should have a closed cover. The cover should not be locked unless work is in progress requiring that the cover be locked as part of the lock out procedure.
- The panel should have a directory index identifying each individual circuit breaker. It is usually found secured to the inside face of the cover. The directory should identify the various receptacles, general area, or equipment serviced by each circuit breaker.
- There should not be any missing breakers or other openings in the breaker face plate that would allow you to contact the "hot" electrical bus at the back of the panel. Openings could also allow dust or dirt to accumulate inside the panel box interior. This dust may damage the breakers to the point where they will not trip when needed.
- Breakers should never be taped or otherwise secured in the closed (on) position. Each circuit breaker and circuit are rated for a maximum amount of amperes. An ampere is the unit for measuring the rate of flow of electricity through the circuit. If the rate of flow in the circuit exceeds the designated maximum for the breaker, the breaker trips and stops the flow of electricity. If the breaker is not allowed to trip, insulators could melt from excessive conductor heat caused by electricity flowing too fast! Fires or increased exposure to shock may also occur.
- Lastly, breakers should not be taped in the open position as a means of de-energizing the circuit during repair or maintenance activity. Open breakers should be properly tagged or locked out.

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