

## Lamps in the Damp

by *Mark C. Ode*

Article 410 in the National Electrical Code (NEC) covers the installation of the wiring and the equipment forming the parts of lamps, luminaires (fixtures) and lampholders. There are both general requirements for luminaire installations as well as specific requirements found in this article and it covers a variety of luminaires. Surface-mounted and recessed incandescent, fluorescent and high-intensity discharge (HID) luminaires are covered, as are track lights.

Each type of luminaire can be installed in a variety of specific locations, but special consideration is often necessary to ensure proper and safe operation of the illuminating system.

If illumination is necessary under a commercial cooking hood, then 410.4(C) permits luminaires that are identified for use within the hood as long as the temperature limitations of the luminaire, the conductors and the wiring method connected to the luminaire are not exceeded. The luminaire must be designed and constructed so that all exhaust and/or cooking vapors, grease and oil are excluded from the lamp and wiring compartment of the luminaire. It also must be corrosion-resistant or protected against corrosion. The luminaire must have an outside surface that is smooth so that it can be easily cleaned and will not collect deposits of foreign materials on the surface. Finally, the wiring methods and materials supplying the luminaire must not be exposed within the cooking hood.

A dry-location luminaire must be installed in a location that is not normally subject to dampness but may be subjected to temporary dampness. Ventilation is often used to prevent an accumulation of moisture at the luminaire, but the proper amount of ventilation is critical in extracting the moisture from the area. A very common application of this concept would be a dry-location luminaire installed above a mirror or vanity in a bathroom. A luminaire installed in a shower, where it is in close proximity to steam and water splash must be a damp- or wet-location luminaire and marked "Suitable for Damp Locations" or "Suitable for Wet Locations."

A damp location is a location, either exterior or interior, that is normally or periodically subject to condensation of moisture in, on or adjacent to the luminaire. Article 100 states these are locations often protected from weather and not subject to saturation with water or other liquids but may be subject to moderate degrees of moisture. These could include partially protected locations under canopies, marquees, roofed open porches and some basements, barns and cold-storage facilities, such as walk-in coolers, freezers and warehouses.

A wet location is one where the luminaire is subject to saturation with water or other liquids, such as in a vehicle washing area, or where the luminaire is mounted in an unprotected location and directly subjected to the weather. Underground installations and installations where concrete slabs or masonry are in direct contact with the earth are also considered to be wet locations.

While it would seem very convenient to follow all of the pertinent requirements in Article 410 for the installation of luminaires, there are other parts of the NEC that also apply. For example, Section 110.3(B) requires that listed or labeled equipment be installed and used in accordance with any instructions included in the listing or labeling of the equipment.

A wet-location luminaire is one that is listed and marked as suitable for use in a wet location. These luminaires are tested to withstand water and other liquids that may drip, splash or flow on or against the luminaire. However, a luminaire marked as "Covered Ceiling Mount Only" is intended for wet locations where the luminaire is not subjected

to water and precipitation from the back of the luminaire, such as in a vehicle washing area. Conversely, a wet location ceiling luminaire that does not have this marking can be mounted where it is subjected to moisture from the back, such as on a metal-grate catwalk.

Luminaires marked "Suitable For Wet Locations" are intended to be installed at least 4 feet above the ground since the luminaire has not been tested for water intrusion from the ground, such as from a lawn or garden sprinkler system. A wall-mounted or post-mounted luminaire may be installed within 4 feet from ground level where the luminaire is marked "Suitable For Mounting Within 4 Feet of Ground." This same rule holds true for a luminaire with an integral post (such as a bollard-type luminaire) and must also have this same marking.

A recessed luminaire may be installed at or below ground level where the luminaire is marked "Suitable For Ground-Mounted Recessing." Infrequent immersion in water may occur during heavy rains but all instructions included with the luminaire must be followed.

Follow the NEC installation requirements but ensure the luminaire has been tested for the application where it will be installed.

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