



Farm lighting

HSB, a Munich Re company, is a technology-driven company built on a foundation of specialty insurance, engineering, and technology, all working together to drive innovation in a modern world.

Equipment description

Lighting systems on farms have many different applications. They provide security, a safe working environment, assist in creating a stable environment for livestock, and can be used to support the growth of plants. Most lighting systems require connections to the farm electrical system. Independent solar lights may be used along driveways and walking paths. Conventional fixtures will accommodate standard light bulbs which are sized to provide the appropriate level of light (measured in foot-candles) for the specific location and use. The available lighting technologies include incandescent, fluorescent, high-intensity discharge (HID) such as metal halide, high-pressure sodium, low-pressure sodium, and light emitting diodes (LEDs).

Although incandescent bulbs are generally less expensive, fluorescent, HID, and LEDs use significantly less energy to operate. Over the lifetime of the bulbs, money saved on electricity will more than cover the cost of the more expensive bulbs. Typically, the power savings from fluorescent and LED technologies will quickly pay back the increased initial cost of the bulbs.

Proper design and installation of any electrical system are critical to safety and equipment failure prevention. As with any electrical system, wiring and power distribution devices and materials for all lighting systems should always be designed and installed by licensed professional engineers or contractors.

Maintenance tips

- Over time, dust will collect on the lamps and the fixture reflectors, and diminish output by a significant amount. In dusty environments such as farms, it is important to clean lighting fixtures and lamps when dirt causes a noticeable depreciation of the light output.
- Regularly observe the condition of electrical cords used to power portable lights. If a cord becomes frayed, or bare electrical conductors are visible, repair or replace the cord.

Failure reasons/Loss prevention tips

1. Lamp sockets are worn out from age or have burned contacts from replacing lamps while energized

- Prevent burned lamp sockets by always de-energizing the lighting circuit when changing the lamps.
- Avoid shock hazards and electrical arcing by always replacing lamp sockets that have broken housings or shells.
- Prevent loss of light by verifying that the spring contact pressure of the socket-to-pin connection feels strong. Replace sockets with weak spring contact pressure.

2. Lamp ballasts burn out due to old-age

- Prevent continued unexpected loss of light on older populations of fixtures by considering full fixture replacements rather than ballast replacements.
- Prevent long delays in getting the lights back on by keeping a supply of spare ballasts on the premises for each type of critical fixture used.
- Extend ballast life by converting older magnetic ballasts to newer electronic ballasts.

3. Lighting circuits are overloaded and trip the circuit breaker or blow fuses

- Prevent loss of light output from fixtures due to lower supply voltage by not allowing more than 50% loading of the circuit breaker capacity.
- Prevent light output flickering or dips by keeping lighting circuits separate from farm power circuits.
- Lighting circuits are considered continuous loads by the National Electric Code (NEC) and therefore generate more heat in the wire and conduit. Prevent shortened conductor insulation life by never overfilling the lighting conduits with wires beyond the NEC maximum fill tables.

4. Light switches or controls become worn from frequent use

- Avoid arcing at switch locations by replacing old, worn out light switches when “arcing noise” or flashes are experienced.
- Avoid constant nuisance switch replacements in older establishments by “group replacing” all switches of similar age and frequency of use.
- Prevent wasted energy and security issues by inspecting, maintaining, and/or replacing defective photocell, motion switch, and timeclock-activated lighting equipment.

5. Underground lighting circuits, splices, and conduits are compromised

- Avoid loss of lighting power from digging and site work damage by maintaining a record of where underground lighting conduits are located and traverse the property.
- Prevent underground lighting short-circuits by always using proper NEC burial depths, wiring methods, and materials for water-resistant underground lighting wiring.
- Maintain the exterior pole site-lighting installations to ensure effective grounding by following all NEC grounding and bonding requirements for pole-mounted fixtures.

6. Never exceed the wattage rating of the fixture

7. Replace broken light fixture guards or domes to prevent nesting birds or insects from entering the space directly around the light bulb (potential ignition source).

8. Areas for hay or similar combustibles should have proper rated NEC light fixtures with protective domes around all bulbs.

9. The use of extension cords for lighting circuits that will be on the ground in walkways or that penetrate walls or doorways must be avoided. Extension cords are intended for temporary applications.

10. Lighting circuit conductors should be routed in NEC-approved wiring methods based on the conditions of use and occupancy.

11. Light fixtures must be properly supported based on the fixture weight of the manufacturer's recommendations.

Energy savings/Conservation tips

- The amount of energy required for lighting is primarily dependent on the type of bulb used. On average, an incandescent light bulb will use about six times the energy used by a similar light output LED bulb. Additionally, the use of incandescent bulbs will result in the production of six times the carbon dioxide emissions per year.
- Although initially more expensive, using LED light fixtures is significantly more efficient than using comparable light output standard incandescent lights. LED bulbs can last many times longer than incandescent bulbs. Their durability makes them a great choice for outdoor lighting in regions with extreme temperatures. LED bulbs have very good color quality and produce instant full light output in cold temperatures.

Good engineering practices

- Incandescent and HID lamps run very hot. Be sure to let the lamps cool down before re-lamping the fixtures, to avoid serious burns.
- Fluorescent lamps contain a small amount of mercury which is poisonous. Do not break fluorescent lamps when removing them.
- Dispose of bulbs properly using community or retail disposal facilities to prevent environmental or health hazards.
- Bulbs have a very thin shell of glass surrounding them. Be careful not to break the glass. Falling glass can injure personnel during careless work or maintenance practices. Avoid fires and personal injury by becoming aware of the unique dangers of metal halide lamps and fixtures.

