of liquid or gas or vapor fails or the pressure is reduced to atmospheric

Totally enclosed motors of the types specified in 501.125(A)(2) or (A)(3) shall have no external surface with an operating temperature in degrees Celsius in excess of 80 percent of the autoignition temperature of the gas or vapor involved. Appropriate devices shall be provided to detect and automatically de-energize the motor or provide an adequate alarm if there is any increase in temperature of the motor beyond designed limits. Auxiliary equipment shall be of a type identified for the location in which it is installed.

Δ **(B) Class I, Division 2.** In Class I, Division 2 locations, motors, generators, and other rotating electrical machinery shall comply with (1), (2), or (3). They shall also comply with (4) and (5), if applicable.

Motors with arcing devices, such as commutators, are required to be provided with an enclosure identified for the location, such as an explosionproof enclosure. Other motor types without arcing devices, such as a squirrel-cage induction motor, are permitted without special enclosures. Additionally, indication of the maximum temperature present in a motor is critical to proper installation. Many motor heaters are de-energized automatically when the motor is running. However, the heater ratings usually are low compared with the normal heat generated during motor operation. Unless otherwise indicated on the motor wiring diagram or in instructions provided with the motor, there is no need to de-energize the heater except to save energy. The heater temperature must be marked on the motor, or the heater must be identified for the location.

(1) Be identified for Class I, Division 2 locations, or
(2) Be identified for Class I, Division 1 locations where sliding contacts, centrifugal or other types of switching mechanism (including motor overcurrent, overloading, and overtemperature devices), or integral resistance devices, either while starting or while running, are employed, or
(3) Be open or nonexplosionproof enclosed motors, such as squirrel-cage induction motors without brushes, switching mechanisms, or similar arc-producing devices that are not identified for use in a Class I, Division 2 location.
(4) The exposed surface of space heaters used to prevent condensation of moisture during shutdown periods shall not exceed 80 percent of the autoignition temperature in degrees Celsius of the gas or vapor involved when operated at rated voltage, and the maximum space heater surface temperature [based on a 40°C or higher marked ambient] shall be permanently marked on a visible nameplate mounted on the motor. Otherwise, space heaters shall be identified for Class I, Division 2 locations.
(5) A sliding contact shaft bonding device used for the purpose of maintaining the rotor at ground potential, shall be permitted where the potential discharge energy is determined to be nonincendive for the application. The shaft bonding device shall be permitted to be installed on the inside or the outside of the motor.

Informational Note No. 1: It is important to consider the temperature of internal and external surfaces that might be exposed to the flammable atmosphere.

Informational Note No. 2: It is important to consider the risk of ignition due to currents arcing across discontinuities and overheating of parts in multisection enclosures of large motors and generators. Such motors and generators might need equipotential bonding jumpers across joints in the enclosure and from enclosure to ground. Where the presence of ignitible gases or vapors is suspected, clean-air purging might be needed immediately prior to and during start-up periods.

Informational Note No. 3: See IEEE 1349, *IEEE Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations*, for information on the application of rotating electric machines including shaft bonding devices and potential discharge energy calculations.

Informational Note No. 4: See ANSI/UL 122001, *General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations*, for reciprocating engine–driven generators, compressors, and other equipment installed in Class I, Division 2 locations. Reciprocating engine–driven generators, compressors, and other equipment installed in Class I, Division 2 locations might present a risk of ignition of flammable materials associated with fuel, starting, and compression due to inadvertent release or equipment malfunction by the engine ignition system and controls.

Motor types used where flammable gases or vapors with very low ignition temperatures might be present should be carefully selected. Modern motors with high-temperature insulation systems, such as Class H [180°C (356°F)], could operate close to or above the ignition temperature of the flammable mixture.

Informational Note No. 5: See UL 1836, *Outline of Investigation for Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations*, for details of the evaluation process to determine incendivity. Refer to Annex A and Figure A1.

**501.130 Luminaires.** Luminaires shall comply with 501.130(A) or (B).

**(A) Class I, Division 1.** In Class I, Division 1 locations, luminaires shall comply with 501.130(A)(1) through (A)(4).

**(1) Luminaires.** Each luminaire shall be identified as a complete assembly for the Class I, Division 1 location and shall be clearly marked to indicate the maximum wattage of lamps for which it is identified. Luminaires intended for portable use shall be specifically listed as a complete assembly for that use.

**(2) Physical Damage.** Each luminaire shall be protected against physical damage by a suitable guard or by location.

**(3) Pendant Luminaires.** Pendant luminaires shall be suspended by and supplied through threaded rigid metal conduit stems or threaded steel intermediate conduit stems, and threaded joints shall be provided with set-screws or other effective means