Our safety evaluations, reports and recommendations are made solely to assist your organization in reducing hazards and the potential of hazards and accidents. These recommendations were developed from conditions observed and information provided at the time of our visit. They do not attempt to identify every possible loss potential, hazard or risk, nor do they guarantee that workplace accidents will be prevented. These safety evaluations, reports and recommendations are not a substitute for ongoing, well-researched internal safety and risk management programs. This report does not warrant that the property inspected and its operations are compliant with any law, rule or regulation.

United Heartland is the marketing name for United Wisconsin Insurance Company, a member of AF Group. All policies are underwritten by a licensed insurer subsidiary of AF Group.
I. General
   A. This procedure covers the requirements for electric equipment and wiring in locations classified depending on the properties of flammable vapors, liquids, or gases, or combustible dusts or fibers which may be present and the likelihood that a flammable or combustible concentration or quantity is present. Hazardous (classified) locations include, but are not limited to:

   B. Class Division Description
      1. Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:
         a. A Class I, Division 1 location is a location:
            i. in which hazardous concentrations of flammable gases or vapors may exist under normal operating conditions; or
            ii. in which hazardous concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or
            iii. in which breakdown or faulty operation of equipment or processes might release hazardous concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

         b. A Class I, Division 2 location is a location:
            i. in which flammable liquids or liquefied flammable gases are transferred from one container to another; interiors or spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; locations containing fat and oil extraction equipment using volatile flammable solvents; portions of cleaning and dyeing plants where flammable liquids are used; gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; the interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stopped, or easily rupture containers; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

Note: This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors or spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; locations containing fat and oil extraction equipment using volatile flammable solvents; portions of cleaning and dyeing plants where flammable liquids are used; gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; the interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stopped, or easily rupture containers; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

b. A Class I, Division 2 location is a location:
   i. in which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or
   ii. in which hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or
   iii. that is adjacent to a Class I, Division 1 location, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.
Note: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location. Piping without valves, checks meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or a liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions.

Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a non-hazardous location.

2. Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

a. A Class II, Division 1 location is a location:
   i. in which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or
   ii. where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes, or
   iii. in which combustible dusts of an electrically-conductive nature may be present.

Note: This classification may include areas of grain handling in processing plants, starch plants, sugar-pulverizing plants, malting plants, hay-grinding plants, coal pulverizing plants, areas where metal dusts and powders are produced or processed, and other similar locations which contain dust producing machinery and equipment (except where the equipment is dust-tight or vented to the outside). These areas would have combustible dust in the air, under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures. Combustible dusts which are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and wood flour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

b. A Class II, Division 2 location is a location in which:
   i. combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or
   ii. dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting therefrom may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.
Note: This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II Division 1 location, as described above, into which an explosive or ignitable concentration of dust may be put into suspension under abnormal operating conditions.

3. Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:
   a. A Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured or used.

   Note: Such locations usually include some parts of rayon, cotton, and other textile mills; combustible fiber manufacturing and processing plants; cotton gins and cotton seed mills; flax-processing plants; clothing manufacturing plants; woodworking plants and establishments and industries involving similar hazardous processes or conditions.

   Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior and other materials of similar nature.

   b. A Class III, Division 2 location in which easily ignitable fibers are stored or handled, except in process of manufacture.

II. Electrical Installations

Equipment, wiring methods and installations of equipment in hazardous (classified) locations is intrinsically safe, approved for the hazardous location, or safe for the hazardous location. These requirements include:

A. Intrinsically Safe: Equipment and associated wiring approval as intrinsically safe is permitted in any hazardous (classified) location for which it is approved.

B. Approved for the Hazardous (classified) Location: Equipment is approved for the class of location and also for the ignitable or combustible properties of the specific gas, vapor, dust or fiber that is or will be present.

Note: NFPA 70 - National Electrical Code lists or defines hazardous gases, vapors and dusts by AGroups characterized by their ignitable or combustible properties. The approved equipment is marked to show the class, group and operating temperature or temperature range, based on operation in a 40 degrees C ambient, for which it is approved. The temperature marking does not exceed the ignition temperature of the specific gas or vapor to be encountered. However the following provisions modify the marking requirements:

1. Equipment of the non-heat-producing type, such as junction boxes, conduit and fittings, and equipment of the heat-producing type having a maximum temperature not more than 100 degrees C (212 degrees F) need not have a marked operating temperature or temperature range.

2. Fixed lighting fixtures marked for use in Class I, Division 2 locations only, need not be marked to indicate the group.
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3. Fixed general-purpose equipment in Class I locations, other than lighting fixtures, which is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

4. Fixed dust-tight equipment, other than lighting fixtures, which is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

C. Safe for the Hazardous (classified) Location: Equipment which is safe for the location is of a type and design which has been demonstrated to provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers.

**Note:** The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations which will meet this requirement. The guidelines of this document address electric wiring, equipment, and systems installed in hazardous (classified) locations and contain specific provisions for the following: wiring methods, wiring connections; conductor insulation, flexible cords, sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resistors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling equipment, alarm systems, signaling systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lightning surge protection, and grounding. Compliance with these guidelines will constitute one means, but not the only means, of compliance with this paragraph.

III. Conduits
   All conduits are threaded and made wrench tight. Where it is impractical to make a threaded joint tight, a bonding joiner is used.

IV. Equipment in Division 2 Locations
   Equipment that has been approved for a Division 1 location may be installed in a Division 2 location of the same class and group. General purpose equipment or equipment in general purpose enclosures may be installed in Division 2 locations if the equipment does not constitute a source of ignition under normal operating conditions.