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Hazardous Location Classifications

If you work in the industrial controls and automation industry you've probably heard the phrase "Class I Division 2 Certified" or maybe even "Class I Division I Certified". If you work in the petrochemical, food processing, or wood milling industry then I can almost guarantee you have.

Whether you've heard of it or not you may still be wondering what exactly it means when a product carries a class and division certification. This article was written to answer that question and help you find products that meet your certification requirements.

What is a Hazardous Location?

As defined by the NEC (National Electrical Code) a hazardous area is one "where fire or explosion hazards may exist due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or flyings." In other words it's an area where a combustible gas, vapor, or material is currently or may at some time be present. It's important to know what classifies a location as "hazardous" because in industrial automation, it will define what types of electronic devices are safe to use.

1. Types of Hazardous Locations:

- a. A hazardous certification is made up of two main parts. The first is called the Class and it defines what type of airborne hazard is present. There are three Classes used in the National Electric Code to define hazardous locations:
 - i. **Class I** –
 1. A hazard is defined as Class I if flammable gases or vapors may be present in the atmosphere in quantities sufficient enough to be explosive or ignitable if an electrical or other source of ignition is present. They are most typically present at:

- a. Petroleum refineries
 - b. Aircraft hangars
 - c. Waste Water Treatment facilities
- ii. **Class II** –
1. A Class II hazardous location is defined as one where combustible dust is present in the atmosphere. The dust is usually a finely pulverized material such as flour, metals, wood, plastics, coal, or gunpowder. These substances are typically found in:
 - a. Wood or grain mills
 - b. Fireworks production facilities
 - c. Plastic recycling processing centers
 - d. Producers of starch or candies
- iii. **Class III** –
1. Class III locations are areas where easily-ignitable fibers or flyings are present. In these environments, the fibers are usually more likely to be present on the ground and around machinery than in the air due to their weight but can still ignite in the presence of sparks or a heat source. Examples of Class III hazardous locations are:
 - a. Cotton processing facilities
 - b. Seed processing plants (cotton, flax, etc...)
- b. The second part of a hazardous classification is called the Division. It signifies the conditions in which the hazard is present. There are two conditions specified in the NEC:
- i. **Division I** –
 1. A hazard is deemed Division I when it occurs under normal conditions. That means that the potential for an explosion via Class I, II, or III hazards is always present during normal operation and/or frequent repair and maintenance. An example of such a condition would be:
 - a. Near petroleum product transfer terminals
 - ii. **Division II** –
 1. A Division II circumstance would be that which is only hazardous under abnormal conditions. An example of such a situation is:
 - a. An accidental spill of gasoline at a storage facility
- c. You might also see a designation of group A, B, C, D, E, F, and G for classified areas. These represent the actual material that presents an explosive hazard. You can find a list of those groups at the first reference listed.

What makes a device certified for hazardous locations?

Products suited for hazardous locations must be certified as such by a [Nationally Recognized Testing Laboratory](#) such as UL, FM, CSA or ETL. These products must pass tests to ensure that they are protected from causing damage in their classified area. One main criteria for these products is that they must not produce a spark or sufficient heat to initiate an explosion.

What manufacturers does Quantum Automation carry that make devices suitable for hazardous locations?

You'll find a number of our major product lines are certified for Class I Division II Groups A,B,C, and D. Among them you'll find devices such as Ethernet switches, industrial monitors, power supplies, embedded computers, and media converters (copper to fiber).

- d. [Advantech](#)
- e. [AutomationDirect](#)
- f. [IDEC](#)
- g. [MOXA](#)
- h. [Pfannenberg](#)
- i. [Pro-Face](#)
- j. [SolaHD](#)

For more information on our classified product offerings, special requests, or technical help please contact us via phone or the web or drop by our office.

Check out our new certifications website!

Certifications.QuantumAutomation.com

Additional Resources:

1. <http://www.osha.gov/doc/outreachtraining/htmlfiles/hazloc.html>
2. http://en.wikipedia.org/wiki/Electrical_equipment_in_hazardous_areas
3. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10708