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Design of equipment for operation in hazardous locations

THE MARATEK ADVANTAGE

SAFETY COMPLIANT EQUIPMENT

HAZARDOUS LOCATIONS

Hazardous locations are defined as premises, buildings or parts thereof where fire or explosion hazards may exist due to the presence of flammable gases or vapors, flammable liquids, combustible dusts, or easily ignitable fibers or flyings.

GLOBAL CLASSIFICATIONS

The evolution of hazardous location electrical codes and standards throughout the world has taken two distinct paths.

In North America, a “Class, Division” System has been used for decades as the basis for area classification of hazardous (classified) locations. hazardous locations are divided into three Classes, and two Divisions. The Classes are based on the type of hazard and the explosive characteristics of the material with the Divisions being based on the occurrence or risk of fire or explosion that the material presents.

In other parts of the world, areas containing potentially explosive atmospheres are dealt with using a **“Zone System”**. Zones are based predominantly on the International Electrotechnical Commission (IEC) and European Committee for Electrotechnical Standardization (CENELEC) standards.

The most significant difference in the “Class, Division” and “Zone system” is that the level of hazard probability in the prior system has two Divisions while the later is divided into three Zones.

HAZARDOUS MATERIALS	CLASS, DIVISION SYSTEM	ZONE SYSTEM
Gasses or Vapors	Class I, Division 1 Class I, Division 2	Zone 0 Zone 1 Zone 2
Combustible Dusts	Class II, Division 1 Class II, Division 2	Zone 20 Zone 21 Zone 22
Fibers or Flyings	Class III, Division 1 Class III, Division 2	No Equivalent

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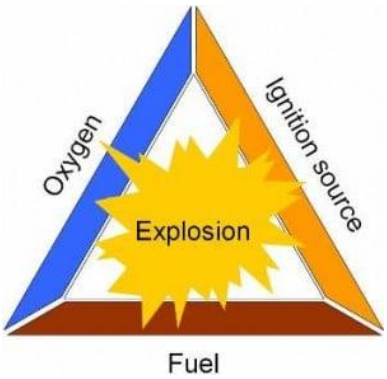
EQUIPMENT DESIGN PRINCIPLES



The most common North American methods of protection are explosion proof equipment for Class I locations, and dust-ignition proof equipment for Class II locations.

Equipment which is operated in environments likely containing ignitable concentration of flammable gases or vapours, must be designed to a Class 1 Division 1 standard.

In situations where the presence of ignitable concentrations of flammable gases or vapours would only occur with the failure of processing equipment, be highly intermittent, or be directly adjacent to a Class 1, Division 1 area, it is possible to design to a Class 1, Division 2 standard.

The area classification is key to proper equipment selection. A trained professional with expertise in the design and implementation of equipment in flammable environments, and has experience interpreting the myriad of international codes, standards and regulations should be consulted **before** process equipment is selected.

Operating machinery that is not suitable for a given environment is hazardous, and can expose user to considerable liability for non-compliance.

Maratek equipment is designed and built by professional, expertly trained staff to Class I Division 1 standards, with a remotely located main control panel. An optional integrated panel can be supplied using certified purging technology. Optional Class I Division 2 and Class I Zone 2 systems can be supplied.

Maratek engineers can also assist potential users in reviewing process and make recommendations on the proper equipment and process to use.

Certification of Maratek equipment is currently provided by Metlab, a world recognized Inspection Lab.

All our Metlab certified equipment comply to UL2208 Standard for Safety Solvent Distillation Units, NFPA496-2013 Purge and Pressurized Enclosures for Electrical Equipment and UL698A Industrial Control Panels relating to (Classified) Hazardous locations.

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