



E.B. Horsman & Son
The Electrical Distributor of Choice!

HAZARDOUS LOCATIONS PRODUCT GUIDE

Choose E.B. Horsman & Son - Your one stop shop for intrinsic safety, automation and controls, connectivity, motors, process instrumentation, video cameras, hazardous area mobile devices, purge and pressurization systems, enclosures, signaling, heating, and lighting solutions for hazardous locations.



Platinum member

HAZARDOUS LOCATIONS CLASSIFICATION

The classification for hazardous locations or areas applies to environments where fire or explosion risks are possible due to explosive atmospheres/mixtures. Traditionally, North America operates on a Class/Division system while Europe and the rest of the world utilizes the Zone system. More recently the Zone system has gained traction in North America leading to a more unified standard across the world.

Installing electrical equipment in environments where flammable gases/vapours/liquids or combustible dusts/ignitable fibers are present (or possibly present) creates risk for fires and explosions.

The classification system for hazardous locations determines the standards and requirements for protection techniques and installation methods of electrical equipment operating in these areas.

Class/Division/Group System

The Class/Division/Group system is based on Article 500 of the National Electrical Code (NEC) where:

Classes – defines the general nature of the hazardous material in the surrounding atmosphere

Divisions – defines the probability of hazardous material being present in the surrounding atmosphere

Groups – defines the type of the hazardous material in the surrounding atmosphere



Class	Nature of Hazardous Material
Class I	Hazardous because flammable gases or vapours are present (or may be present) in quantities sufficient to produce explosive or ignitable mixtures.
Class II	Hazardous because combustible or conductive dusts are present (or may be present) in quantities sufficient to produce explosive or ignitable mixtures.
Class III	Hazardous because ignitable fibers or flyings are present (or may be present) in quantities sufficient to produce explosive or ignitable mixtures.

Division	Probability of Hazardous Material
Division 1	High probability of producing an explosive or ignitable mixture under normal operating conditions for a long period of time.
Division 2	Low probability of producing an explosive or ignitable mixture under abnormal operating conditions for a short period of time.

Group	Type of Hazardous Material - Atmosphere Containing:	
Group A	<ul style="list-style-type: none"> Acetylene 	
Group B	<ul style="list-style-type: none"> Flammable gas Flammable liquid produced vapour Combustible liquid produced vapour MESG value is less than or equal to 0.45 mm MIC ratio is less than or equal to 0.40 	Hydrogen or fuel and combustible process gases containing more than 30% hydrogen by volume - or gases of equivalent hazard such as butadiene, ethylene, oxide, propylene oxide and acrolein.
Group C	<ul style="list-style-type: none"> Flammable gas Flammable liquid produced vapour Combustible liquid produced vapour MESG is greater than 0.75 mm MIC ratio is greater than 0.40 and less than 0.80 	Carbon monoxide, ether, hydrogen sulfide, morphline, cyclopropane, ethyl and ethylene or gases of equivalent hazard.
Group D	<ul style="list-style-type: none"> Flammable gas Flammable liquid produced vapour Combustible liquid produced vapour MESG value greater than 0.75 mm MIC ratio greater than 0.80 	Gasoline, acetone, ammonia, benzene, butane, cyclopropane, ethanol, hexane, methanol, methane, vinyl chloride, natural gas, naphtha, propane or gases of equivalent hazard.
Group E	<ul style="list-style-type: none"> Combustible metal dusts 	Aluminum, magnesium and their commercial alloys or other combustible dusts whose particle size, abrasiveness and conductivity present similar hazards in connection with electrical equipment.
Group F	<ul style="list-style-type: none"> Carbonaceous dusts Dusts with more than 8% total entrapped volatiles Dusts that have been sensitized by other materials so they present an explosion hazard 	Carbon black, coal black, charcoal, coal or coke dusts.
Group G	<ul style="list-style-type: none"> Combustible dust not included in Group E & F 	Flour, grain, starch, sugar, wood, plastics, and chemicals.

Zone System

The Zone system is based on Article 505/506 of the National Electrical Code (NEC) and follows the international method of area classification using zones and groups as developed by the International Electrotechnical Commission (IEC).

Zones - defines the general nature (or properties) of the hazardous material - if it is gas or dust, and the probability of the hazardous material in the surrounding atmosphere

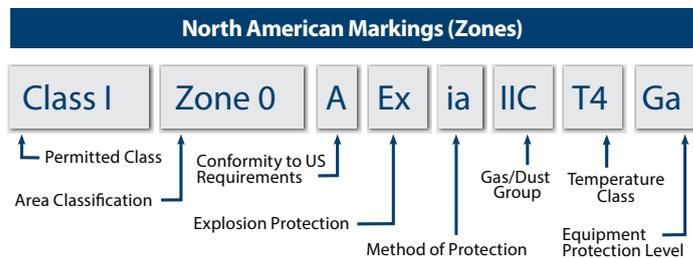
Groups - defines the type of the hazardous material and (partly) the location of the surrounding atmosphere

Zone	Nature and Probability of Hazard Material- GAS
Zone 0	Ignitable concentrations of flammable gases or vapours which are present continuously or for long periods of time.
Zone 1	Ignitable concentrations of flammable gases or vapours which are likely to occur under normal operating conditions.
Zone 2	Ignitable concentrations of flammable gases or vapours which are not likely to occur under normal operating conditions and do so only for a short period of time.

Zone	Nature and Probability of Hazard Material- DUST
Zone 20	An area where combustible dusts or ignitable fibers and flyings are present continuously or for long periods of time.
Zone 21	An area where combustible dusts or ignitable fibers and flyings are likely to occur under normal operating conditions.
Zone 22	An area where combustible dusts or ignitable fibers and flyings are not likely to occur under normal operating conditions and do so only for a short period of time.

Group	Type of Hazardous Material and Location of Atmosphere
Group I	Mines
	Susceptible to firedamp (flammable mixture of gases naturally occurring in a mine).
Group II	Explosive Gas
	A Contains propane, acetone, benzene, butane, methane, petrol, hexane, paint solvents or gases and vapours of equivalent hazard.
	B Contains ethylene, propylene oxide, ethylene oxide, butadiene, cyclopropane, ethyl ether, or gases and vapours of equivalent hazard.
	C Contains acetylene, hydrogen, carbon disulphide or gases and vapours of equivalent hazard.
Group III	Explosive Dust
	A Contains combustible flyings.
	B Contains non-conductive dust.
	C Contains conductive dust.

Ignition Temperature - The ignition temperature is the minimum temperature of a surface at which an explosive atmosphere ignites.



Maximum Surface Temperature		IEC/CENELEC/NEC 505 Temperature Classes	North American Temperature Codes
C	F		
450	842	T1	T1
300	572	T2	T2
280	536	-	T2A
260	500	-	T2B
230	446	-	T2C
215	419	-	T2D
200	392	T3	T3
180	356	-	T3A
165	329	-	T3B
160	320	-	T3C
135	275	T4	T4
120	248	-	T4A
100	212	T5	T5
85	185	T6	T6

HAZARDOUS LOCATION PRODUCTS AVAILABLE AT E.B. HORSMAN & SON

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WHAT ARE HAZARDOUS LOCATIONS?

Hazardous locations are defined as areas where dangerous concentrations of flammable gases, vapours or dusts may occur. Products designed for hazardous locations have to meet the ever increasing CSA and ULC standards and regulations.

Hazardous area products fall into two categories:

1. **Intrinsically Safe:** Prevents an explosion by restricting the amount of energy entering the device typically by a barrier or isolator
2. **Explosion Proof:** They have a strong housing to contain an internal explosion or survive in a harsh external environment.



Intrinsic Safety

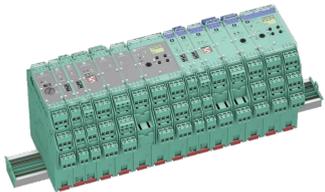
Intrinsic Safety is a protection technique which ensures safe operation of electrical equipment used in hazardous areas. These electronics are specifically designed to limit the electrical and thermal energy to ensure they stay below the point of ignition of the atmospheric mixtures present (flammable gases or dust). Employing such solutions in signal and control circuits which operate on low voltages and currents offer major benefits through simplified design and reduced installation costs compared to other protection methods.

Think of E.B. Horsman & Son when buying Intrinsic Safety products for Hazardous Locations such as (but not limited to):

- Intrinsic Safety Barriers and Isolators (IP20/IP65)
- Analog Input & Output Isolators
- Discrete Input & Output Isolators



Automation and Controls



There is a wide range of automation and control products that are suitable for use in hazardous locations. A variety of modular controllers exist depending on the complexity of your application in addition to distributed I/O systems that can help with modular designs and scalability. Communication buses such as PROFINET, PROFIBUS and AS-Interface can be used along with HMI panels for machine-level operator control and monitoring in harsh industrial environments. Whether you require Industrial Ethernet switches for line, ring or star topologies, Industrial wireless communication devices or a reliable power supply, there are a many products that have specific Hazardous location certifications.

Think of E.B. Horsman & Son when buying Hazardous Locations Automation and Control products such as (but not limited to):

- Human Machine Interface (HMI)
- Embedded Industrial PC's
- Power Supplies
- Purge and Pressurization Systems
- Programmable Logic Controllers
- Distributed I/O
- Distributed Operator Control & Monitoring



Connectivity Solutions



In recent years, the large scale adoption of connector-based solutions instead of point-to-point wiring, increased the need for specialized solutions addressing various applications and locations. Certain hazardous environments require explosion proof or ATEX-rated connectors for code compliance and to ensure safety of personnel and equipment.

Think of E.B. Horsman & Son when buying Connectivity Solutions for Hazardous Locations such as (but not limited to):

- Liquidtight Flexible Metallic Conduit Systems
- Liquidtight Hazardous Area Glands
- Couplers
- Explosion-Proof Flexible Couplings
- Enlargers, Reducers & Thread Converters
- Quick Connects
- Cordsets



Motors



Siemens rugged explosion-protected motors are certified for dust and/or gas hazardous locations according to UL and CSA requirements or ATEX requirements. Their XP hazardous rated motors have the proven quality of Siemens, can be operated with variable frequency drives and are available with a wide variety of features, modifications or designs to meet you specific motor needs. The motors have proven performance in the grain handling industry, mining, oil & gas, chemical and more.

Think of E.B. Horsman & Son when buying Motors for Hazardous Locations such as (but not limited to):

- Explosion-Protected for specific areas in the IEC type spectrum
- Flame Proof Design Ex d.

SIEMENS

Process Instrumentation



Process Instruments are often installed in areas classified as hazardous according to CSA, IEC or NEC. Such projects have certain challenges including the design phase, components selection, installation, and regular maintenance.

Think of E.B. Horsman & Son when buying Process Instrumentation products for Hazardous Locations such as (but not limited to):

- Flow Meters
- Pressure Transmitters
- Level Transmitters
- Temperature Transmitters
- Wireless Solutions
- Liquid Analysis
- Pressure and Temperature Gauges
- Toxic and Combustible Gas and Flame Detectors

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FCI FLUID COMPONENTS INTERNATIONAL LLC

TURCK

Weidmüller

TELEDYNE GAS AND FLAME DETECTION
Everywhereyoulook™

BANNER®

Video Cameras



These IP video cameras are designed for locations classified as hazardous and can be used when video surveillance is required. Explosion proof cameras are packaged in protected housings which prevent any possible internal sparks or explosions from igniting gases, vapours, or dust present in the surrounding environment. Cameras required for high corrosive environments such as continuous dry kilns, potash mills and chemical plants are manufactured with a housing made from Acetal. Acetal is a thermoplastic polymer that provides high tensile strength, creep resistance and toughness.

Think of E.B. Horsman & Son when buying Video Cameras for Hazardous Locations such as (but not limited to):

- IP Cameras
- Explosion Proof Cameras
- High Corrosion Resistant Cameras

PEPPERL+FUCHS



Hazardous Area Mobile Devices



Hazardous area mobile devices for explosion-hazardous areas. With solutions for mobile safety and communication, customer applications are quickly digitalized. This unlocks new potential and increases workflow safety, efficiency, and transparency—either in conventional applications or for Industry 4.0 scenarios.

Think of E.B. Horsman & Son when buying Hazardous Area Safe Mobile Devices such as (but not limited to):

- Smartphones for Division 1/2 and Zone 1/2
- Tablets for Division 1/2 and Zone 1/2



Enclosures and Signaling



These enclosures are able to contain explosions originating within and to prevent sparks from igniting vapours/gases and/or dust in the surrounding environment. They are classified as explosion proof and certified for usage in hazardous locations.

Hazardous Location Signaling Devices are designed to alert you to critical equipment and system needs on the plant floor. These alarms are available in a wide variety of light and sound functions, sizes, colors, voltages, and mounting options. The increasing use of signaling devices to enhance safety in the workplace is essential particularly in petro-chemical or oil & gas plants where the potential for serious accidents is far greater than other industrial environments.

Think of E.B. Horsman & Son when buying Hazardous Locations Explosion Proof Enclosures and Signaling products such as (but not limited to):

- Explosion Proof Visual signal
- Hazard area audible signal
- Beacons
- Strobe lights
- Heat detectors
- Fire alarms
- Speakers
- Telephones
- Explosion proof, dust ignition proof and flame enclosures
- Intrinsically Safe LED Visual Flashing or Status Signal
- Protection Relays

Crouse-Hinds
by **F.T.N.**

PEPPERL+FUCHS

ABB



Edwards Signaling

FEDERAL SIGNAL

Littelfuse STARTCO

Heating



Electric heating equipment can be safely used in hazardous areas if certain requirements are met:

- Surface temperature of the heating equipment has to be kept below the ignition temperature of environment
- Arc/spark-producing control devices must be integrated with the heater
- Equipment must be isolated from the hazardous area
- Electrical connections must conform to the local code requirements

Think of E.B. Horsman & Son when buying Heating for Hazardous Locations such as (but not limited to):

- Heaters
- Mechanical Thermostats
- Electronic Thermostats
- Electronic Monitors
- Electric Heating Cables
- Instrument Tubing Bundles
- Steam Tracing and Tank/Hopper Heating
- Instrument Tubing Accessories
- Heat Tracing



Explosion Proof Lighting



Explosion Proof Lighting is also known as Hazardous Location Lighting or Intrinsically Safe Lighting. These lights are designed for use in environments where flammable vapours and/or dust exist or have the potential to exist.

Think of E.B. Horsman & Son when buying Explosion Proof Lighting products such as (but not limited to):

- Flood Lighting
- Area Lighting
- Highbay Lighting
- Catwalk Lighting





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Crouse-Hinds
by **F&T-N**



SIEMENS



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Tel: 604.273.1981

Surrey

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Surrey, BC V3W 3B1
Tel: 604.596.7111

NORTHERN BC

Dawson Creek

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Dawson Creek, BC V1G 1N5
Tel: 250.782.4896

Prince George

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Prince George, BC V2N 2X4
Tel: 250.563.0575

Terrace

101-2915 Molitor Street
Terrace, BC V8G 3A5
Tel: 250.635.6379

Williams Lake

527E S. MacKenzie Avenue
Williams Lake, BC V2G 1C8
Tel: 250.392.7795

BC INTERIOR

Cranbrook

Unit A 800 Industrial Road # 2
Cranbrook, BC V1C 4C9
Tel: 250.489.4591

Kamloops

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Kamloops, BC V2C 6G1
Tel: 250.374.3191

Penticton

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Penticton, BC V2A 3K1
Tel: 250.492.4032

Vernon

5203 24th Street
Vernon, BC V1T 8X7
Tel: 250.545.2191

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Campbell River

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Campbell River, BC V9W 4C2
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