Explosive Environment Equipment Policy

∆*Caution!* *The equipment contained within this Explosive Environment section requires greater attention to specification and installation guidelines. Improper specification, installation or service of these products can result in loss of equipment or serious injury.*

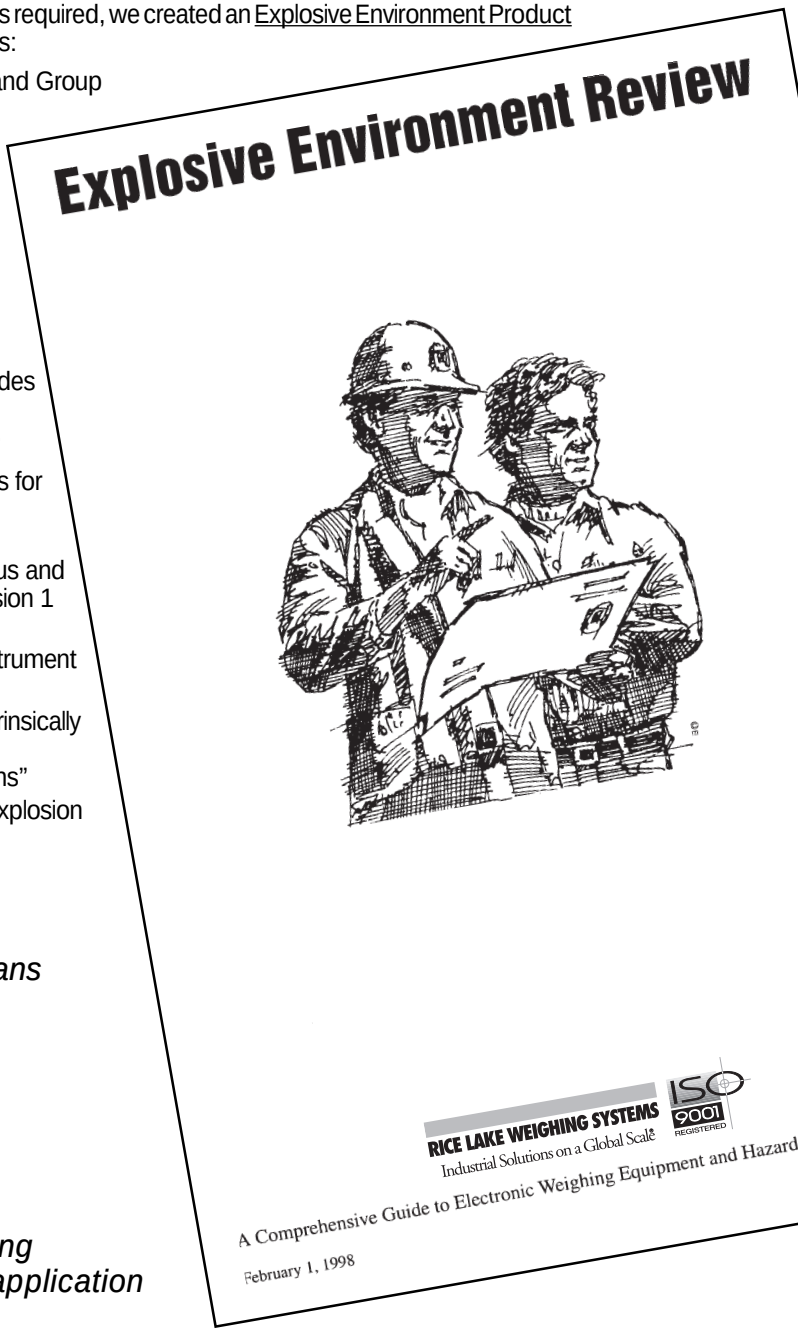
Rice Lake Weighing Systems has assembled the very best in Intrinsically Safe and Explosion Proof equipment. In order to properly specify, install and service this equipment, it is necessary that our distributors understand and appreciate the possible risks involved.

In an effort to educate our customers on some of the precautions required, we created an Explosive Environment Product Review. Available upon request, this 81-page booklet reviews:

- Explosive environment designations: Class, Division and Group
- Standards and Codes applicable to hazardous environment equipment
- Equipment liability
- Theory of Intrinsically Safe, Explosion Proof, and Purged systems
- Equipment specification guidelines
- Proper installation procedures
- Service precautions

The Explosive Environment Product Review booklet also includes resource information on:

- NFPA 70, "National Electrical Code (NEC) Handbook"
- NFPA 496, "Classification of Gases, Vapors and Dusts for Electrical Equipment in Hazardous (Classified) Locations"
- ANSI/UL 913, "Standard for Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II and III, Division 1 Hazardous Locations"
- ANSI/ISA RP 12.6, "Installation of Intrinsically Safe Instrument Systems for Hazardous (Classified) Locations"
- FM Approval Standard 3610, "Approval Standard, Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II and III, Division 1 Hazardous Locations"
- FM Approval Standard 3615, "Approval Standards, Explosion Proof Electrical Equipment"
- "Electrical Installations in Hazardous Locations"



Plant Safety Engineers and Certified Electricians should always be involved in the specification and installation of any Explosive Environment Equipment.

Please see next page for assistance in selecting Hazardous Area Control Equipment for your application requirements

(Specifications on back)

RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

Hazardous Area Classification

For assistance in selecting Hazardous Area Control Equipment for your application requirements, please complete this form and submit, along with a description of the application, to:

Rice Lake Weighing Systems
Attn: Hazardous Environment
230 West Coleman Street
Rice Lake, WI 54868
Telephone: 715-234-9171
Fax: 715-234-6967

RLWS File #: _____ Date: _____ Sales Order #: _____ Checked By: _____ Equipment PN#(s) & Serial Number(s): _____ Factory Mutual Not Applicable _____ (International Orders Only)	For RLWS Office Use Only

RLWS CUSTOMER INFORMATION:

RLWS Customer Name: _____ Customer Number: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: (_____) _____ Fax: (_____) _____

Contact Name: _____
(Printed name) (Signature) (Date)

Authorized Signature: _____
(Printed name) (Signature) (Date)

END USER INFORMATION:

End User Company Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: (_____) _____ Fax: (_____) _____

Contact Name: _____
(Printed name) (Signature) (Date)

Authorized Signature: _____
(Printed name) (Signature) (Date)

Title: _____

(The following information is to be defined and completed by the END USER'S Plant Safety Engineer or other authorized party)

Hazardous Area Classification: Class _____, Division _____, Group _____

Specific Hazard/Material (please print): _____

Defining Individual: _____
(Printed name) (Signature) (Date)

Defining Authority (Title): _____

Please retain a copy of this completed form for your records.

Explosive Environment Solutions

Caution! *The equipment contained within this Explosive Environment section requires greater attention to specification and installation guidelines. Improper specification, installation or service of these products can result in loss of equipment or serious injury.*

Explosion Proof, Purged, and Intrinsically Safe Systems

EXPLOSION PROOF

What is an explosion-proof indicator? It's simply a digital weight indicator enclosed in a special case. The purpose of an explosion-proof indicator is not, as the name suggests, to protect the indicator. Instead, the case prevents any explosion WITHIN the case from causing subsequent fire or explosion in the surrounding atmosphere.

For example, in a grain elevator application, combustible dusts (Class II hazardous atmosphere) may be present. A spark in a non-explosion-proof indicator could ignite an elevator-wide explosion. However, with an explosion-proof indicator, the spark (or even an explosion) is contained within the case. The hazardous atmosphere cannot be ignited, and the elevator is protected.

EXPLOSION PROOF ADVANTAGES

- Explosion containment
- Requires low maintenance
- No electronics
- No moving parts

EXPLOSION PROOF DISADVANTAGES

- Cannot indicate failure of containment capability
- Cost of protection per cubic foot increases with enclosure size
- Promotes condensation
- Cumbersome, limited access
- Causes harmful heat build up
- Limited sizes
- Bulky designs
- Excessive weight

PURGE

Purged systems are ideal for hazardous environments and use positive pressure to prevent particles, gases, and fibers from entering the controller enclosure. As an added safeguard, a differential pressure switch automatically cuts off power when the pressure falls below the acceptable level. Type X, Y, and Z purging hardware is available that meets National Fire Protection Association (NFPA) article 496 guidelines.

The three configurations are as follows:

Type X Pressurizing: Reduces the classification within the protected enclosure from Division 1 to Safe.

Type Y Pressurizing: Reduces the classification within the protected enclosure from Division 1 to Division 2.

Type Z Pressurizing: Reduces the classification within the protected enclosure from Division 2 to Safe.

PURGE ADVANTAGES

- Reduces heat build-up
- Inhibits metal corrosion
- Requires low maintenance
- Increases equipment longevity
- Allow fast access to equipment
- Reduces moisture and dust build-up
- Reduces classification within enclosure
- Continuous system status indication
- Protects enclosures up to 450 cubic feet
- Allows use of any enclosure shape
- Cost of protection per cubic foot decreases with enclosure size

PURGE DISADVANTAGES

- Contains moving parts
- Requires instrument air supply
- Some systems contain electronics
- Some systems require electrical power

INTRINSICALLY SAFE

Intrinsically safe load cells and safety barriers take the explosion proof principle a step further. Intrinsic safety ensures that the indicator's electrical wiring and components are, by design, incapable of releasing enough energy to ignite flammable or combustible atmospheric mixtures in their most easily ignitable concentrations. In short, an intrinsically safe device eliminates the conditions for an explosion no matter what the circumstances.

INTRINSICALLY SAFE ADVANTAGES

- Limits energy to device
- Requires low maintenance
- No moving parts
- Ideal for sensors

INTRINSICALLY SAFE DISADVANTAGES

- One barrier is required for each conductor
- Project cost increases with number of conductors
- Offers no protection against heat, moisture and dust
- Requires protection or installation in nonclassified area
- 24 VDC, 50 mA maximum power and signal strength limit

(Specifications on back)

Explosive Environment

Hazardous Atmospheres (for reference only)

Hazardous atmospheres are divided into three general classes and two divisions:
CLASS I: Flammable Gases or Vapors
CLASS II: Combustible Dusts
CLASS III: Ignitable Fibers or Flyings
DIVISION 1: Hazard exists under normal conditions.
DIVISION 2: Hazardous material is handled, processed or stored. Hazard is not normally present, but may be released due to accident or equipment malfunction.

CLASS I:
Flammable Gases or Vapors
CLASS I, GROUP A: (d)
acetylene

CLASS I, GROUP B: (d)
acrolein (inhibited)
arsine
butadiene
ethylene oxide
hydrogen
manufactured gases containing more than 30% hydrogen by volume
propylene oxide
propylnitrate

CLASS I, GROUP C: (c, d)
acetaldehyde
allyl alcohol
n-butyraldehyde
carbon monoxide
crotonaldeghyde
cyclopropane
diethyl ether
diethylamine
epichlorohydrin
ethylene
ethylenimine
ethyl mercaptan
ethyl sulfide
morpholine
2-nitropropane
tetrahydrofuran
unsymmetrical dimethyl hydrazine (UMDH 1, 1-dimethyl hydrazine)

CLASS I, GROUP D: (c, d)
acetic acid
acetone
acrylonitrile
ammonia
benzene
butane
1-butanol (butyl alcohol)
2-butanol (secondary butyl alcohol)
n-butyl acetate
isobutyl acetate
di-isobutylene
ethane
ethanol (ethyl alcohol)
ethyl acetate
ethyl acrylate (inhibited)
ethylene diamine (anhydrous)
ethylene dichloride
ethylene glycol monomethyl ether
gasoline
heptanes
hexanes
isoprene
isopropyl ether
mesityl oxide
methane (natural gas)
methanol (methyl alcohol)
3-methyl 1-butanol (isoamyl alcohol)
methyl ethyl ketone
2-methyl 1-propanol (isobutyl alcohol)
2-methyl 2-propanol (teriary butyl alcohol)
petroleum naptha
pyridine
octanes
pentanes
1-pentanol (amyl alcohol)
propane
1-propanol (propyl alcohol)
2-propanol (isopropyl alcohol)
propylene
styrene
toluene
vinyl acetate
vinyl chloride
xylenes

CLASS II:
Combustible Dusts (c)
CLASS II, GROUP E (c, d)
Atmospheres containing metal dust, including aluminum, magnesium and their commercial alloys, as well as other metals of similarly hazardous characteristics with a resistivity of 100 ohms per centimeter.

CLASS II, GROUP F (c, d)
Atmospheres containing carbon black, charcoal, coal or coke dusts that have more than 8% total volatile material, or atmospheres containing these dusts sensitized by other materials so that they present an explosion hazard.
They will also have a resistivity greater than 100 ohms per centimeter and equal to or less than 100 megohms per centimeter.

CLASS II, GROUP G (c, d)
Atmospheres containing flour, starch or grain as well as combustible plastics or chemical dusts having resistivity greater than 1 megohm per centimeter.

CLASS III:
Ignitable Fibers or Flyings (c, d)
Atmospheres containing parts of rayon, cotton, and other textiles. Combustible fiber manufacturing and processing plants such as cotton gins, cottonseed mills, flax processing plants, clothing manufacturing plants, sawmills and other woodworking locations.

Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton wastes), sisal or henequen, istle, jute, hemp, tow, cocoa, oakum, baled waste kapok, spanish moss, excelsior, sawdust, wood chips and other similar materials.

(b) Rice Lake Weighing Systems' purged indicators and controllers can be custom manufactured for use in Class I, Group B atmospheres.
(c) Rice Lake Weighing Systems' explosion-proof indicators with intrinsically safe load cells may be used in these atmospheres.
(d) Rice Lake Weighing Systems' intrinsically safe systems may be used in these atmospheres.