EQUIPMENT CERTIFICATION
Equipment for use in hazardous locations must be certified to an appropriate National Standard and marked as such by an accredited third party testing organization. Follow-up inspection to ensure conformance is part of the program. Products may carry multiple markings for multiple countries. The following is a brief description of the National Requirements.

Important Listing Information
The specific requirements for product certification vary from country to country. While UL, FM and CSA are similar in their approach, subtle differences still exist. North American certifications permit conduit or cable entries to be field installed provided appropriate bonding and grounding requirements are followed.

Marking

Typical North American Marking to NEC 500
Class I, Divisions 1 or 2, Groups A, B, C & D, T4 (T-Code)
Class II, Divisions 1 or 2, Groups E, F & G, T4 (T-Code)
Class III,
Enclosure Type 3, 4, 4X

Typical U.S. Marking to NEC 505

Equivalent Canadian Marking would read
Class I, Zone 1
Ex de IIC T6

Equipment Protection Level
G for Gas followed by
a - Zone 0
b - Zone 1
c - Zone 2
**Typical U.S. Marking to NEC 506**
(Dust Zones not adopted by Canada yet)

<table>
<thead>
<tr>
<th>Zone 21,</th>
<th>AEx</th>
<th>tD</th>
<th>T120°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Permitted Zone, 20, 21 & 22
- Symbol for equipment built to U.S. Standards
- Example (see other methods on page A6)
  Protection by enclosure for Zone 21
- Surface Temperature = 120°C

**Typical European ATEX/CENELEC Marking for Dust Explosion Protection**

- Marks for indicating compliance with ATEX directive
- Equipment group I (mining)
- Equipment group II (on surface)
- Category 1D, Zone 20  
  Area where combustible dust is continuously or frequently present
- Category 2D, Zone 21  
  Area where combustible dust clouds are likely to occur during normal operation
- Category 3D, Zone 22  
  Area where combustible dust clouds may occur infrequently during normal operation
- Explosion protected according to EN 60079-0
- Example (see other methods on page A6)
  Protection by enclosure for Zone 21

- Apparatus Group
- Surface Temperature Class = 120°C
- Equipment Protection Level
  - (D for Dust)  
    a-Zone 20  
    b-Zone 21  
    c Zone 22

**INNOVATIVE EXPLOSION PROTECTION by R. STAHL 1-800-782-4357**
Typical European ATEX/CENELEC Marking for Dust Explosion Protection

<table>
<thead>
<tr>
<th>CE</th>
<th>II</th>
<th>2G</th>
<th>Ex</th>
<th>de</th>
<th>IIC</th>
<th>T6 Gb</th>
</tr>
</thead>
</table>

Marks for indicating compliance with ATEX directive

- Equipment group I (mining)
  - Category M1 and M2
- Equipment group II (on surface)

- Category 1G, Zone 0: Areas where explosive gas atmosphere is continuously present or present for long periods of time
- Category 2G, Zone 1: Areas where explosive gas atmosphere is likely to occur in normal operation or can be expected to be present frequently
- Category 3G, Zone 2: Area where explosive gas atmosphere is not likely to occur and if it does, it will only exist for a short period of time

Explosion protected according to standards EN 60079...

Methods of protection, d, e, p, i, ia, ib, ic, o, q, m, ma, mb, n

- Apparatus Group
  - I Mining - Underground (methane)
  - II Surface Industries
    - A (propane)
    - B (ethylene)
    - C (hydrogen)

- Temperature Class
  - T1 450° C
  - T2 300° C
  - T3 200° C
  - T4 135° C
  - T5 100° C
  - T6 85° C
Typical IECEx Marking for Gas Explosion Protection

Ex de IIC T6 Gb

Explosion protected according to standards EN 60079…

Methods of protection, d, e, p, i, ia, ib, ic, o, q, m, ma, mb, n

Apparatus Group
- I Mining - Underground (methane)
- II Surface Industries
  - A (propane)
  - B (ethylene)
  - C (hydrogen)

Temperature Class
- T1 450° C
- T2 300° C
- T3 200° C
- T4 135° C
- T5 100° C
- T6 85° C

*Equipment Protection Level
  - G for Gas followed by
    - a - Zone 0
    - b - Zone 1
    - c - Zone 2
ATEX DIRECTIVE

The ATEX Directive 94/9/EC is a directive adopted by the European Union (EU) to facilitate free trade in the EU by aligning the technical and legal requirements in the Member States for products intended for use in potentially explosive atmospheres.

This Directive applies to electrical and non-electrical equipment/components and protective systems. The ATEX Directive became mandatory on July 1, 2003.

Equipment located outside potentially explosive atmospheres are also covered by the ATEX Directive under the following conditions:

- The equipment is a safety device, controller or regulatory device; and
- The equipment is required for the safe function of equipment or protective systems with respect to the risk of explosion.

All equipment under its scope is required to bear the European CE Marking as verification of compliance with the Directive (the CE Marking will not appear on components defined by this Directive). The ATEX Directive specifically defines procedures for the evaluation of a product’s design and production based on Equipment Groups and Categories. This is briefly outlined below.

**Equipment Group I Overview**

Equipment intended for use in underground parts of mines, and to those parts of surface installations of such mines, liable to be endangered by firedamp and/or combustible dust.

<table>
<thead>
<tr>
<th>Equipment Category</th>
<th>Protection</th>
<th>Comparison To Current IEC Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>2 levels of protection; or 2 independent faults</td>
<td>Group I</td>
</tr>
<tr>
<td>M2</td>
<td>1 level of protection based on normal operation</td>
<td>Group I</td>
</tr>
</tbody>
</table>

**Equipment Group II Overview**

Equipment intended for use in other than Equipment Group I places that are liable to be endangered by explosive atmospheres.

<table>
<thead>
<tr>
<th>Equipment Category</th>
<th>Protection</th>
<th>Comparison To Current IEC Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1G</td>
<td>2 levels of protection; or 2 independent faults</td>
<td>Group II, Zone 0 (gas) Zone 20 (dust)</td>
</tr>
<tr>
<td>1D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2G</td>
<td>1 level of protection based on frequent disturbances; or equipment faults Zone 21 (dust)</td>
<td>Group II, Zone 1 (gas)</td>
</tr>
<tr>
<td>2D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3G</td>
<td>1 level of protection based on normal operation</td>
<td>Group II, Zone 2 (gas) Zone 22 (dust)</td>
</tr>
<tr>
<td>3D</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ATEX Marking
The equipment for ATEX identifies the category which indicates a risk of the equipment becoming a source of ignition. The table at right shows the relationship between Categories and Zones. Note that the Zone represents only the risk of a release of flammables into the area.

NOTE: As an alternative to the relationship given in the table at right between Categories and Zones, the required Category of equipment may be selected on the basis of risk, i.e. taking into account the consequences of an ignition. This may, under circumstances, require a higher Category or permit a lower Category than defined in the table.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1G</td>
</tr>
<tr>
<td>1</td>
<td>2G</td>
</tr>
<tr>
<td>2</td>
<td>3G</td>
</tr>
<tr>
<td>20</td>
<td>1D</td>
</tr>
<tr>
<td>21</td>
<td>2D</td>
</tr>
<tr>
<td>22</td>
<td>3D</td>
</tr>
</tbody>
</table>

Differences Between the Old and New Directives
The main differences are:

- The inclusion of non-electrical equipment
- The inclusion of dust atmospheres
- Additional quality system requirements
- The need to produce a ‘Technical File’
- Requirements for safety related devices (flame arrestors, suppression systems etc) and safe area equipment

Products Covered
The Directive includes equipment and safety or control devices installed outside the potentially explosive area but having an explosion protection function. A wide range of products comes within the definition of equipment, including electric motors, compressors, diesel engines, lighting fittings, control and communication devices and monitoring and detection equipment, to name but a few. “Protective Systems” are also included, and include items that prevent an explosion that has been initiated from spreading or causing damage. They include flame arrestors, quenching systems, pressure relief panels and fast-acting shut-off valves to name but a few.

Product Exclusions
The Directive, however, does exclude the following product types:

- Medical devices
- Sea-going vessels and mobile offshore units
- Products for use in the presence of explosives
- Military equipment
- Products for domestic use
- Personal protective equipment covered by directive 89/686/EEC
- Means of transport by air or on road or rail or water networks.

Vehicles intended for use in an explosive atmospheres are not excluded.

For more info about ATEX, visit http://ec.europa.eu/enterprise/ATEX/index_en.htm

MARKING
The CE mark is a mandatory European marking for certain product groups to indicate conformity with the essential health and safety requirements set out in European Directives. The letters ‘CE’ are an abbreviation of Conformité Européenne, French for European conformity. The CE mark must be affixed to a product if it falls under the scope of the so called ‘New Approach’ Directives. Without the CE marking, and thus without complying with the provisions of the Directives, the product may not be placed in the market or put into service in the fifteen member states of the European Union and Norway, Iceland and Liechtenstein. However, if the product meets the provisions of the applicable European Directives, and the CE mark is affixed to a product, these countries may not prohibit, restrict or impede the placing in the market or putting into service of the product. Thus, CE marking can be regarded as the products trade passport for Europe. For more info about CE marking, visit www.eurunion.org/legisлат/standard/standard.htm

SCHEME
The objective of the IECEx Scheme is to facilitate global trade in electrical equipment intended for use in explosive atmospheres by eliminating the need for multiple national certification.

The IECEx Scheme provides the means for manufacturers of Ex equipment to obtain certificates of conformity that will be accepted at national level in all participating countries. A certificate of conformity may be obtained from any certification body accepted into the Scheme. The certificate will attest that the equipment design conforms to the relevant IEC Standards. The final objective of the IECEx Scheme is world-wide acceptance of one standard, one certificate and one mark.

For the IECEx Scheme to achieve its long term objective, every national Standard for which application is made by participating countries will need to be identical to the corresponding IEC Standard. For countries whose national Standards are not yet identical to the IEC Standards, a transitional period will be necessary to allow time for participating IECEx Scheme member countries to adjust their national standards to the IEC standards and work toward national acceptance of IECEx Certificates of conformity and the IECEx mark.

For more info about IECEx Scheme, visit www.IECEx.com