

Explosion protection in plant engineering

Explosive atmospheres can occur in industrial plants, such as in the chemical, pharmaceutical, food and energy sectors. These usually consist of a mixture of flammable substances such as gases, vapours or dusts and air. As soon as an ignition source is added, there is a risk of explosion. To prevent this, there are strict regulations on explosion protection in plant construction, such as the ATEX directives.

What does ATEX mean?

«ATEX» stands for **AT**mosphères **EX**plosibles and comprises two central European directives:

- 1. ATEX 2014/34/EU (Product Directive):** Regulates the requirements for equipment and protective systems.
- 2. ATEX 1999/92/EC (Operational Directive):** Regulates the minimum requirements for the health protection of workers.

The ATEX directive applies to equipment and protective systems intended for use in potentially explosive atmospheres. The directive defines the basic health and safety requirements and the procedures for assessing conformity. They must be applied before such products can be placed on the market.

Explosion protection has **three main objectives: prevention of explosive atmospheres, avoidance of effective ignition sources and limiting the explosion effect** if an explosion does occur.

Typical potentially explosive atmospheres are:

- Petrol stations, refineries, oil rigs,
- Chemical and pharmaceutical industry,
- Paper, textile and painting plants,
- Biogas and waste water plants,
- Wood and metal processing,
- Grain mills and filling plants for powdery substances.



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Zone categorisation - where is which danger?

Potentially explosive atmospheres are categorised into zones. A basic distinction is made between gases/vapours and dusts:

For gases/vapours (G): *zone 0*: permanently, *zone 1*: occasionally, *zone 2*: rarely

For dusts (D): *zone 20*: constantly, *zone 21*: occasionally, *zone 22*: rarely

Requirements for devices and systems

Only devices that have been tested in accordance with ATEX may be used in potentially explosive atmospheres. In addition to the CE marking, such equipment also bears the EX marking and details of the equipment group and category. CE labelling in accordance with ATEX is mandatory. It confirms compliance with the basic safety requirements.

Classification into equipment groups and categories:

- **Group I (mining) and Group II (above ground):** important for manufacturers for certification.
- **Group II (surface) applies:** category 1G (or 1D) - suitable for *zone 0* or *20*, Cat. 2 for *zone 1/21*, Cat. 3 for *zone 2/22*. Example: «II 2G» = suitable for *zone 1* (gas).

There are **three main international standards**:

- **ATEX:** Europe
- **IECEX:** internationally recognised and therefore applicable in a wider range of countries and areas such as Australia, New Zealand, parts of Asia and the Middle East.
- **NEC:** USA

Your partner for components in potentially explosive atmospheres

TRI-MATIC AG can offer a wide range of solutions for potentially explosive atmospheres. These include **manually, pneumatically or electrically actuated ball valves and shut-off valves** with various connections. **Pressure sensors, pressure switches, pressure gauges, pneumatic valves and maintenance units** are also part of our range of ATEX standard products. Scan the QR code and get a complete overview of the EX markings.



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