

Subject: Mechanical Accessories Safety in Ex d Systems

1) Why Ex is not only about electrical equipment

In many industrial plants, different areas are classified as **hazardous areas**. In such zones, the presence of flammable gases, vapours or dust clouds significantly increases the risk of explosion.

According to current standards and good engineering practice, **it is not only electrical equipment** that must be assessed and certified; even so-called **simple mechanical components** can, under certain conditions, become potential sources of ignition (sparks, hot surfaces, electrostatic discharge, friction, impact, etc.).

Therefore, wherever such components are used in hazardous areas, they must be evaluated in line with **ATEX / IECEx** requirements and, where applicable, be properly certified.

2) Main standards (IEC/EN 60079 and ATEX)

The main reference documents in this field include:

- **IEC/EN 60079-0**: General requirements for electrical and non-electrical equipment intended for use in explosive atmospheres.
- **IEC/EN 60079-1**: Requirements for the **Ex d (Flameproof Enclosure)** type of protection.
- **Directive 2014/34/EU (ATEX)**: The European directive for equipment and protective systems intended for use in potentially explosive atmospheres.

According to these standards, any component mounted on an **Ex d enclosure** (electrical or mechanical)

must not introduce a new path for flame propagation, gas leakage or ignition, and must not compromise the integrity and performance of the flameproof housing.

3) Consequences of using non-Ex components in an Ex d loop

Using non-compliant accessories in an Ex d loop can lead to several serious consequences:

- **Loss of validity of the Ex certificate** of the complete assembly,
- Increased risk of explosion in the event of an internal fault or ignition,
- Potential **legal and insurance consequences** for both the end user and the supplier in case of an incident,
- Rejection of the equipment during HSE, insurance or regulatory inspections.

Although accessories and components with Ex d certification are usually more expensive than standard parts, this additional cost is fully justified when compared with the potential technical, safety and legal risks.

4) Engineering recommendations for projects

To minimize risk and ensure compliance with the standards, the following engineering practices are recommended:

1. Whenever the main equipment is certified **Ex d / ATEX**, **all accessories connected to it** (plugs, cable glands, adapters and similar items) must be selected according to the same safety philosophy.
2. Before final approval of any purchase, the **Ex certificates of all accessories** should be checked and recorded in the **Vendor Document List**.
3. Project documentation should clearly state that **replacing Ex d components with standard (non-Ex) components is not permitted**.
4. In commercial offers, the cost difference between Ex-certified accessories and standard items should be presented as an **investment in safety and risk reduction**, not merely as a price increase.

5) Examples of incidents and technical references

In recent years, various technical and expert reports related to process safety and **hazardous areas** have repeatedly emphasized that:

- Even a **small mechanical or electrical component** that is not designed in accordance with ATEX / Ex principles can, under certain conditions, become an ignition source and contribute to an explosion.
- In some post-incident investigations in industrial plants, improper selection of equipment for use in explosive atmospheres (for example, not using equipment with valid **Ex d / ATEX** certification) has been identified as one of the factors increasing the overall risk.
- These experiences have led standards and guidelines to place greater emphasis on **evaluating all components** in an Ex system (including the main equipment and its accessories such as plugs, glands, adapters, etc.).

For a deeper understanding of the philosophy and requirements of ATEX / Ex d, the following types of technical and standard references can be consulted (without mentioning any specific accident or company):

- Guides and publications related to **ATEX Directive 2014/34/EU** and **IEC/EN 60079** standards,

- Bulletins and application notes published by reputable manufacturers of pressure and instrumentation equipment (for example, documents on “process gauges and seals approved for use in hazardous areas”),
- Technical articles on **dust explosions** and risk management in silos, filters and other units where flammable gases or combustible dust clouds may be present.

These references show that full compliance with Ex requirements is not merely a matter of “standard conformity”, but a **key measure to reduce technical, safety and legal risks** in industrial projects.



For technical assistance or guidance in selecting a magnetic flow meter please contact:

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