Weighing in hazardous areas
Requirements, applications and recommendations for use

- ATEX directives and standards
- FM and CSA regulations and standards
- IECEx certification
- Comparison ATEX and FM/CSA
- Application examples for weighing solutions in hazardous areas
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1. Weighing in hazardous areas

1.1 Whitepaper objective

This paper deals with the guidelines and requirements with respect to the selection and the safe operation of weighing equipment in explosion-risk environments. It is aimed at production managers, plant engineers, project engineers, health and safety officers and buyers in manufacturing companies as well as system integrators and machine builders in the food, chemical, pharmaceutical and construction materials industries. The document is intended to give you an informative insight into the current guidelines, with a focus on ATEX and the main parameters needed to simplify the selection of components to be used. For actual planning and consideration of new projects, please always consult the latest information and regulations.

1.2 History/Background information

As a key element of industrial safety technology, explosion protection deals with the task of preventing the ignition of flammable materials in explosive areas by electrical equipment, thus preventing damage to persons and operating systems as far as possible. Originally, techniques were developed for explosion protection in the mining sector in order to prevent the explosion of combustible gases through the mine pit lamps used at that time. In 1815, the chemist Sir Humphrey Davy developed the first explosion-proof device, an ignition-proof oil lamp. During the Industrial Revolution, in the late 18th century the first electrical equipment was used in mining thanks to their advantage in terms of being a significantly reduced risk as an ignition source. Simultaneously, the first accident prevention rules were developed which with the regulations "Guidelines for the implementation of firedamp protection structures of electrical machines, transformers and apparatuses" were first written down in the VDE 170.

1.3 Variety of regulations

Around the globe there is a wide range of national standards manufacturers have to deal with when offering technologies for the use in hazardous areas. Therefore, products which are sold in different countries also have different certifications for different environments at risk of explosion.

In some countries all equipment used in areas at risk of explosion must additionally be tested and approved by a national notified body (e.g. TIIS or NEPSI).

Apart from regional approvals, there are four standards providing an international acceptance. This White Paper focuses on

- ATEX (ATmosphere EXplosible)
- International Electrotechnical Commission (IEC)
- Canadian Standards Association (CSA)
- Factory Mutual Research Corporation (FM)

1.4 ATEX Directive

ATEX consists of two EU directives describing what equipment and work environment is allowed in an environment with an explosive atmosphere.

ATEX derives its name from the French title of the 2014/34/EU directive: Appareils destinés à être utilisés en ATmosphères EXplosives. There are two ATEX directives (one for the manufacturer and one for the user of the equipment):

- The directive 2014/34/EU relating to equipment and protective systems intended for use in potentially explosive atmospheres (also referred to as ATEX 114).
- The directive 1999/92/EC on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (also referred to as ATEX 153).

The ATEX Product Directive describes rules for the design and development of products which are used in hazardous areas, and is designed to protect people who work in such areas. Through conformity assessment procedures, the manufacturer of such products must demonstrate compliance with the requirements and suitability for use in an explosion-risk area.
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