

Professional Fire and Explosion Protection in Plants and Manufacturing Facilities

Finding the ideal degree of protection for employees and production

More and more, fire and explosion protection measures are being developed for the sake of safety and are assuming an increasingly more important role in the manufacturing industry, in companies as well as in public institutions. In doing so, the primary objective is to avoid fires and explosions altogether, to reduce the amount of damage to a minimum in the event of a catastrophe and to thus optimally protect people and their surroundings. A safety analysis that uncovers fire and explosion hazards creates the basis for individually coordinated solutions and with it, a constructive protection concept can be developed. "A coherent degree of safety can only be achieved with a thoroughly holistic plan that combines the aspects efficiency and feasibility of protection measures," explains Detlev Mengis, graduate engineer and authorized officer at Kidde Brand- und Explosionsschutz (KBE) and he adds: "Any disruption, loss or damage to sensitive data may go as far as blocking entire company units and cause quite a bit of harm to business activities. So, an adequate protection concept must therefore take individual risks and customer requirements into account." As such, a coordinated concept with specifically defined solutions is thus of great importance for the purpose of protecting the various different kinds of areas in an operation. In this context, of critical importance are both fire protection measures as well as such for explosion protection that, depending on needs and the area within a company, can also be combined to interact with each other. Crucial in any event is that deficits in safety are eliminated by incorporating appropriate systems and that damage is prevented altogether.

Environmentally friendly fire protection for sensitive areas in an operation

For sensitive products such as IT components or for file storage content, specific extinguishing agents must be used so that these are not paralyzed or fully destroyed. While water is the method of choice for fighting fires of fire class A (substances that create embers) and extinguishing foam is an ideal method for fighting conventional fires, an alternative is needed for sensitive areas in an operation. In this regard, KBE offers a solution with its extinguishing system KD-1230. The system is equipped with the extinguishing agent Novec 1230 and represents a method that is friendly to both the environment and to humans. The extinguishing agent is a colourless, almost odourless fluid that contains carbon, fluorine and oxygen. Because of its extinguishing properties and short flooding times of a maximum of 10 seconds, a fire can be extinguished within the shortest amount of time. KD-1230 offers fast and safe fire protection, can be stored without taking up too much space and offers the highest amount of reliability when it comes to the safety of persons. The non-corrosive and non-electrically conductive properties cause no damage nor do they leave behind any residue to sensitive components.

Explosion suppression setting the trend for safety measures

While the use of the right extinguishing agent or preventing a fire altogether are the most crucial aspects in fire protection, when it comes to explosion protection, the suppression or even absolute avoidance of an explosion combined with an ideally suitable technology is the best solution available. In the pharmaceuticals and chemical industries, various different kinds of technologies are

used ranging from nebulizers to spray driers. The specific manufacturing processes used to produce various different powdery products are the cause of an increased amount of explosion hazardous dust air mixtures. Most nebulizers taper out to the lower areas at the exit. The risk that this poses is explained in the following manner by Rudi Post, graduate engineer at KBE: "If a product dissolves exothermically and if caking or a film forms on the dryer walls, these can heat up to smouldering temperatures and as a result of the high air entrance temperature, pockets of embers may form in the nebulizer. Depending on fire and flammability behaviour, pockets of embers can lead to a fire or even to a dust explosion." Taking action instead of reacting is thus the motto to assure this does not happen in the first place. Explosion suppression systems offer reliable, future-oriented and environmentally friendly safety equipment as a means to protect persons and production machinery in the chemical and pharmaceuticals industry. As opposed to explosion pressure release systems, explosion suppression can also be used for toxic dust and the system does not depend on its set-up location in the manufacturing plant. In doing so, the devices and pipelines are designed not for the maximum, but instead for the reduced explosion excess pressure of a specific fuel type. This way, the effects of an explosion are reduced to an acceptable level. In practical terms, what this means is: An oncoming explosion is detected by explosion pressure sensors and the flame from the explosion is extinguished using extinguishing powder in fractions of a second. This way, the expected maximum explosion excess pressure is significantly reduced at ideal concentration levels to an explosion excess pressure reduced to a maximum. The goal of explosion suppression is to limit the explosion excess pressure to the lowest value possible. Neither product, combustion residue nor flame leak from the device that is being protected in the event of an explosion suppression. Thus, there is no danger to humans nor to the surrounding area.

On the safe side

In order to adhere to legal regulations and to take environmental issues into account, it is still advisable to keep a close eye on existing machines and equipment. Evalua-

tions of fire and explosion hazards should therefore be carried out regularly so that any defects can be detected at an early stage and alleviated. Another important issue are the risk prevention measures that should be taken. This might involve certain kinds of technical devices, such as making use of a gas warning system. But, organisational measures should also be taken into consideration, which might, for example, include training sessions.

To allow for the safety and long-term use of the various different areas within an operation, the experts at KBE from Ratingen offer careful planning and coordinate measures between buyer, designer, authorities and system provider. A coherent overall concept should include, along with the itemised system costs, also the installation, interfaces, maintenance and services. Because only the right combination and properly calculated interplay between the various different measures can assure that fire and explosion safety is not only reliable, but also cost efficient.

About the company:

Kidde Brand- und Explosionsschutz (KBE) is part of UTC Fire & Security, which provides fire safety and security solutions to more than one million customers around the world. Headquartered in Connecticut, UTC Fire & Security is a business unit of United Technologies Corp., which provides high technology products and services to the building and aerospace industries worldwide. More information can be found at www.utcfireandsecurity.com.

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