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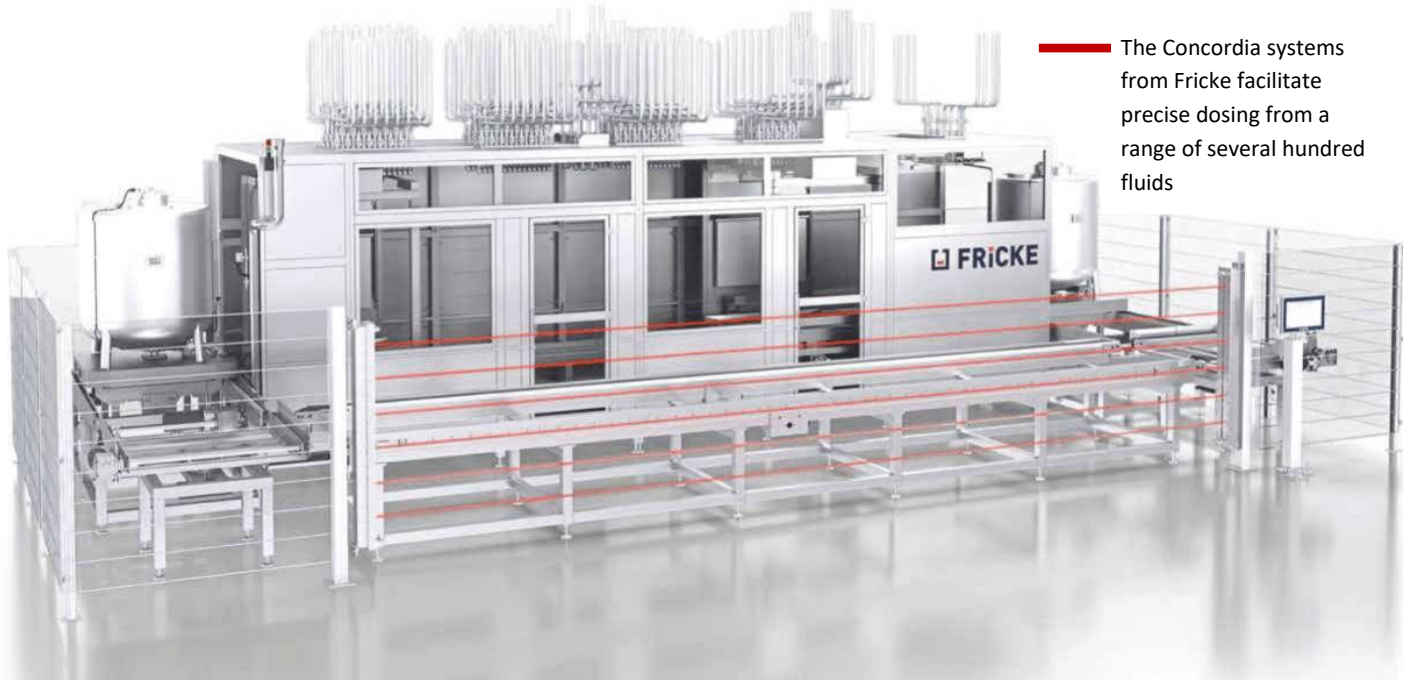
Machine safety and Ex protection at Fricke

Reliable dosing of perfumes and flavours

The systems produced by Fricke Abfülltechnik GmbH & Co. KG guarantee highly professional dosing and filling. This holds for both the precision of the processes and the quality of the several hundred fluids which can be stored by one system simultaneously. The dosing systems from Fricke are used in the manufacturing of formulations for perfumes and flavours. Ex safety switches from steute contribute significantly to the safety of staff working in the vicinity, as well as to the process safety of the plant.

When its top notes, heart notes and base notes are in perfect harmony, a perfume formulation has a good chance of success in the marketplace. And when the ingredients stipulated by the perfumer are mixed using a dosing system from Fricke – true to the motto: "the hidden power of a well-mixed scent" – then the perfume can be manufactured in the desired quantity and with reproducible quality.

This family business, currently in its fifth generation and located in Minden, is



The Concordia systems from Fricke facilitate precise dosing from a range of several hundred fluids

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globally renowned in its field – among not only perfume producers, but also manufacturers of flavours.

High-precision dosing

The basic principle behind every Fricke dosing system is simple, but the technology itself is extremely complex. Ingredients stored in up to 1000 containers are dosed with extreme precision. Dosages can vary tremendously, from a few millilitres to huge volumes. Fricke develops and produces the necessary valves and sophisticated control engineering itself, including the dosing and an own MES (manufacturing execution system).

On the Fricke shop floor, construction of different dosing systems takes place in parallel, from small laboratory dosing systems to the Concordia series of very large production plants. In additional halls, the company produces filling systems for all manner of liquids, such as foodstuffs, chemicals, indirect materials, paints and lacquers, as well as cosmetics and cleaning agents.

These systems clearly provide manufacturers of perfumes and flavours with a very high degree of production safety and also increase their productivity – not least due to the extremely precise dosing processes and high level of automation. Moreover, they guarantee reliable protection from cross-contamination during the entire dosing process. It is also possible to dose highly viscous raw materials and fluids with a low flash point. As an additional option, the dosing systems can even work through the night unattended.

Twofold safety

Safe operation of the dosing systems has to be guaranteed twofold. The majority of the systems are produced to explosion protection standards – specifically: for gas

Developed especially for unfavourable ambient conditions and for use in gas and dust Ex zones: the steute Ex STM 515 solenoid interlock

With its Ex STM 515 series, steute has developed solenoid interlocks which are Atex/IECEx-approved for use in Ex zones 1 and 2 (gas Ex), as well as 21 und 22 (dust Ex).

A robust die-cast aluminium enclosure guarantees durability, even with extreme mechanical wear and tear. The very high locking force of 4000 N ensures safe locking, even for heavy guard doors, and the multiple coating of the enclosure provides excellent protection from corrosion. The effective sealing achieves protection class IP66/67.

Additional features of the Ex-STM-515 series include an actuator head which can be repositioned by 4 x 90°, flexible installation and a modular design with diverse options and functions (spring-to-lock or power-to-lock principle, auxiliary release from the outside and escape release from within the hazardous area).

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Ex zone 1 (II 2 G T4) – while machine safety standards of course also apply.

In front of the system, where the mobile batch containers arrive and leave with the perfume or flavour formulations, opto-electronic protective measures prevent entry to the hazardous area. A protective fence also ensures safety, whereby the designers always take the productivity of the system into consideration. Dirk Sandmann, Head of Electrical Engineering: "We can switch off segments of the system and enable access to individual areas, for example for maintenance. Safe, regulated shutdown is also possible."

Ex solenoid interlock in operation

Solenoid interlocks are mounted on the guard doors of the safety fence – as is usually the case with highly automated plants. The electrical engineers at Fricke were among the first to use the Ex STM 515 solenoid interlock for explosive zones, presented by steute as the follow-up product to its previous Ex AZM 415 series (originally STM 295) – and they immediately saw the benefits of this updated model. Dirk Sandmann: "The device is robust, the locking force stronger. The larger terminal compartment is advantageous for us because we often work with large cable cross-sections." The solenoid interlock is also able to assume new tasks due to its integration in the machine functions.

The users of the Fricke systems are also satisfied because the robust design of the Ex STM 515 prevents accidental activation. In their routine work, they also profit from the decision by Fricke to opt for an escape release. In the unlikely event that operators are accidentally locked inside the hazardous zone, they can activate this release mechanism and open the guard door from the inside. For Fricke, here too the principle of redundancy holds: a logout/tagout system provides additional maintenance safety.

This puts Fricke on the safe side, even when a high safety level (up to PLd) is required. This level is fundamentally "designed into" the system. For example, the designers calculate the reach-through times for optoelectronic safety systems and select the safety distances accordingly. In some applications, they opt for redundancy and use two safety switches with different principles, for example an Ex 99 safety position switch in addition to a solenoid interlock.

In other application fields – involving both dosing and filling equipment – the Fricke designers also use steute Ex switching devices for gas Ex zone 1, including not only limit switches, position switches and safety sensors, but also emergency pull-wire switches for a special use case. Dirk Sandmann: "We use these switches – with multiple deflection – as a safety element for the mobile shuttles transporting the finished goods. Because no safety bumper was available for Ex zone 1, we developed this very effective solution ourselves."

A joint approach

This example demonstrates not only the commitment and competence of the Fricke engineers, but also their creativity and proactivity with regard to machine safety in Ex zones. An important factor always incorporated into the process is a high level of productivity. Dirk Sandmann: "We have more ideas for safety products and components for Ex environments, and we look forward to developing joint solutions with steute."

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