

# Spray Drying



## From a Single Source: Explosion Protection for Spray Dryers

Spray drying processes are considered potentially explosive procedures, as hazardous amounts of raised, dried and combustible dusts occur within the drying chamber as well as within the downstream installations. As the occurrence of explosive atmospheres and effective sources of ignition can in many cases not be avoided with absolute certainty, mitigating explosion protection measures are mandatory.

Protective measures such as "explosion venting" are of major importance due to the cost advantages in this regard. There are additional requirements with respect to sanitary and vacuum-resistant properties that manufacturers of explosion venting systems need to adhere to.

To address this requirement, the flat bursting panel EX-GO-VENT-HYP **1** has been especially developed for

hygienically demanding applications found in the industries of food processing and pharmaceuticals. The smooth surface, in connection with the patented, full surface and tapered sealing concept, enable the implementation of these special bursting panels in previously critical plants such as spray dryers with/without wet cleaning, fluidized bed dryers, filters and mixers. To ensure a wide-spread acceptance of the application in operational practice, the design of the EX-GO-VENT-HYP is based on the strict criteria of EHEDG (European Hygienic Engineering & Design Group).

In case when the interior pressure relief cannot be realised by means of bursting panels and ducting to the exterior, flameless venting can be achieved by means of the Q-Rohr®-3 **2** or Q-BOX II, **3** which are economical alternatives.

### FEATURES

- one-of-a-kind know-how in the calculation of explosion protection
- legally sound application of latest rules and regulations
- comprehensive product portfolio
- products specifically developed for spray dryers
- sanitary, EHEDG-compliant design
- reduced costs due to optimized protection concepts

### APPLICATIONS

- single-step or multistage spray dryers
- cyclones
- filters
- fluidized bed dryers
- mixers
- in all industries

**1 2 3** see fig.1 on page 2



## New, groundbreaking methods of calculation

# Less volume means smaller venting areas

The widespread misconception that flameless explosion venting systems are too expensive should be clarified with the aid of VDI guideline 2263-7.1, which was released only recently. The guideline now takes into account that various influential operating factors during spray drying may reduce the violence of the explosion compared to other dust plants.

In view of the typical spray drying procedures, the total volume does not have to be taken into account for dimensioning the venting area in most cases of single-stage installations, e.g. due to the amount of slurys sprayed out in the upper area.

For the purposes of calculation, the positive impact of the explosion

characteristic values  $p_{max}$  and  $K_{St}$  will be taken additionally into consideration. These vary according to temperature and concentration.

The high temperatures and low concentrations within the spray drying device accordingly lead to significant reductions in the venting area required, that means smaller or

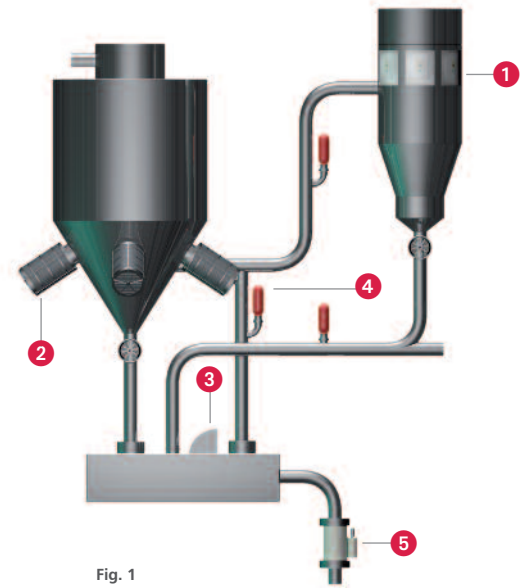
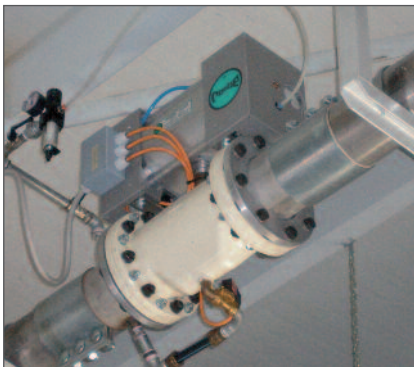


Fig. 1

a lower number of (conventional as well as flameless) explosion venting.



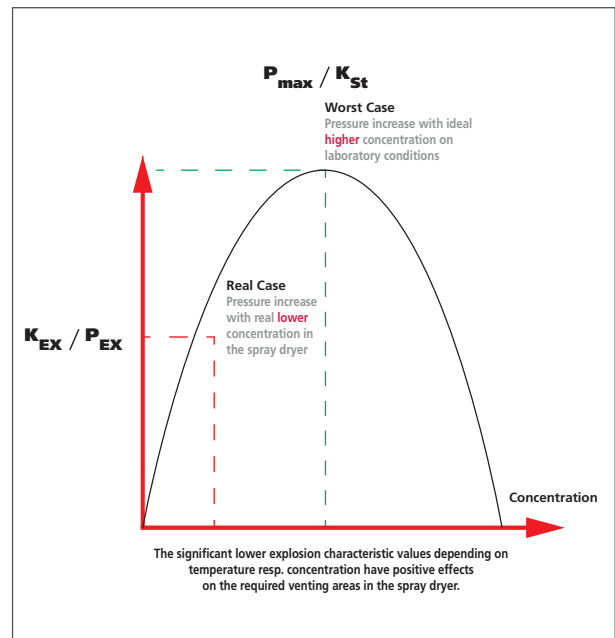
Q-Box application in the food industry with optional sanitary cover: Keeps the Q-Box ③ clean!



Performance proven isolation of piping with EXKOP II ⑤ (quench valve and controller): Permanent system availability

## Comprehensive explosion protection

In addition the Q-Bic suppression system ④ offers the possibility of suppressing explosions, for instance in case of toxic products and the usually mandatory decoupling. The cost efficiency is uncontested with regard to large installations. The EXKOP®-/QV II ⑤ isolation system offers hygienic as well as cost-optimised isolation after any available fluidized bed dryers.



The customer profits from our know-how and our unique experience in the field of explosion protection concepts, gained over several decades, as well as from a full product portfolio in the area of constructive explosion protection. Our knowledge is based inter alia on dedicated committee work performed over many years within the framework of developing VDI guideline 2263-7.1 as well as on extensive application experience in all industries worldwide.