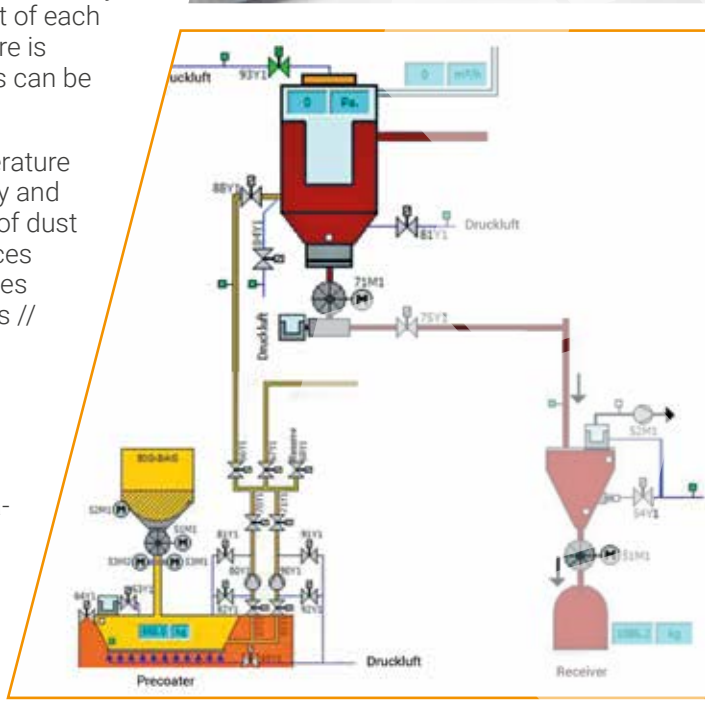
APPLICATION

THE **TASK**

For filtration of the exhaust air from fluidised bed systems which are used for granulation or coating, classic 2-stage filter devices were installed with HEPA filter cassettes previously.

This type of filter devices are pushed to their limits due to the high total dust load of up to 1 g/m³ from the process on one hand and the extremely sticky part of e.g. PVP (Polyvinyl Pyrrollidone) on the other hand.

The filter cassettes are irreversibly clogged within a single batch and they should be replaced. Therefore a substitute per fluidized bed unit of each filter apparatus was searched, with which the sticky dust mixture is deposited and at the same time significantly longer service lifes can be achieved.



Constraints were: Operating with organic solvents // gas temperature up to 90 °C // no clogging of the filter elements due to the sticky and hygroscopic properties of the dust // minimum ignition energy of dust between 1 to 3 mJ // central dust disposal of several filter devices in a BigBag with the possibility of expansion to other filter devices // minimum maintenance // high availability of the filter systems // fully automated process flow.

THE **SOLUTION**

The operation of the fluidised bed unit is carried out in three stages: **Heating phase // Spraying phase // Cooling phase.**

The 2-stage filter unit of the Herding® PROCESS series equipped with C-filter elements (up to 100 °C) is controlled already at the beginning of the heating phase.

Because of the explosiveness and combustibility of dust and the presence of organic solvents, explosion protection is carried out according to performance level d. The principle of „avoiding effective ignition sources“ and a pressure shock resistant construction with explosion suppression and explosion decoupling of the periphery are provided in the system design.

A „Sender“ for the central supply of precoating material via Herding® MULTICOATER for dosing and a „Receiver“ with Big-Bag filling station for central dust disposal are added to the filter system.

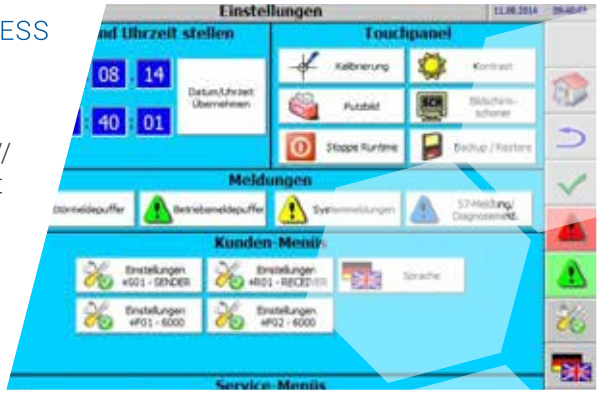
In the present case, the system is designed so that up to three fluidizing beds, each with a filter unit and a central sender and receiver, can be controlled. The individual modules of the whole system are interlocked depending on the partial process step. In principle, up to 10 fluidized beds could be operated in the largest configuration.

PROCESS // **CONTROL** OF **SEPARATION** OF **CRITICAL PHARMA DUSTS***

*IN ACCORDANCE WITH FLUID BED SYSTEMS

Anwendung NACE-Code 21.10.0

THE **SOLUTION**



Depending on the equipment used, the following PRINCIPLE PROCESS STEPS/SIGNALS will be distinguished:

» **Steps:** Switch on the filter unit // Operate the filter unit // Exit the filter unit // Sender supplies the filter unit with precoating material // Refill the sender // Receiver disposes of the dust from the filter unit in Big-Bag/hopper

» **Filter protection:** Safe supply of the filter unit with precoating material by monitoring the capacity and using a double pump Herding® MULTICOATER with redundant slurry pumps in AC circuit

» **Signals:** Release the Start // Filter ready for use (free of fault messages) // Explosion protection always active // Start Signal // Request Air Flow // Confirm Air Flow // Batch with or without precoating material

PARAMETERS of the individual Devices and Components (on Display):

» **Signals from fluidized bed apparatus:** Start heating or termination or rather interruption of the process

» **Filter device signals:** Compressed air // Ventilator Parameters // Raw gas amount // Temperature // Rotary air lock and disposal // Precoating material amount // Compressed air // Differential pressure // Cleaning intervals etc.

» **Sender** (Herding® MULTICOATER) **signals:** Availability of precoating material (BigBag) // Supply via rotary air lock // Quality via protective screening // Allocated to the filter device or Management of multiple filter devices

» **Receiver signals:** Central collection of the dust mixture // level monitoring through balance with indication

The Control System records all parameters and automatically adjusts the sequence of individual process steps depending on the requirements of the fluidized bed units. A clear display shows the respective mostly self-explanatory combination (see the illustrations). In addition, parameters and conditions can be logged and archived.

THE **ADVANTAGES** WITH THE Herding® SINTER-PLATE FILTER AND SYSTEM CONTROL **FROM A SINGLE SOURCE**

» High dust load of > 1 g/m³ can be handled safely at constant extraction
» Constant operating conditions by simple surface filtration and automatic system control
» No sticking because it is effectively dosed with the Herding® MULTICOATER precoating material and reproducibly sprayed into the filter unit
» Dust ZoneBarrier by the Herding® Sinter-plate filter
» High rate of separation and clean exhaust air
» Secondary filter only as backup filter
» Long service life, independent of dust
» Central dust disposal

A fully automatic control system ensures that the entire pharmaceutical process can be carried out without interference and the extremely critical dust is disposed. For this purpose, the input parameters are set visually and approx. 25 control devices are linked logically.

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FILTERTECHNIK

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