RASCHKA

NEWSLETTER

June 2015

Cost Competitive and Safe Powder Handling Systems

When talking about powder handling in the chemical and pharmaceutical industry, one or several of the following issues need to be addressed:

- Risk of explosion (especially when charging solids into a reactor containing solvents)
- Dust free powder transfer
- Cross contamination (cGMP)
- Accurate dosing
- Final packing and sealing

For the last 15 years Lonza Engineering had to deal with these kinds of issues either isolated or in combination as part of projects for the feed, food and pharmaceutical industry.

Forced to save cost and therefore purchase as much as possible from the Chinese market but still meeting the requirements as listed above, the number of Chinese suppliers being able to meet such expectations will be reduced to less than a handful!

Raschka Engineering has taken a different route by joining force with a small but very innovative Swiss company specializing in powder handling.

BURGENER VERPACKUNGSTECHNIK

http://www.burgener-ag.ch/

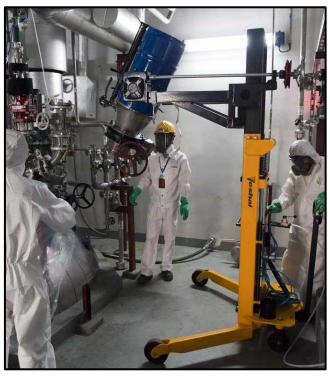
This co operation provides access to proven western design with only key components to be imported. Large part of the manufacturing for such systems is done in China under the supervision of Lonza Engineering, implementing operational experience and applying “fit for purpose” solutions in combination with BURGENER’s capability to react very fast to any specific customer requirements.

Risk of explosion

The addition of powders such as catalysts, pigments and other reactants into a reactor, hopper or large container is an extremely common operation within the chemical process industries. Frequently, the vessel into which the powder is being added will have already been charged with flammable solvents in large amounts, or contains residual levels from previous use or intermediate cleansing procedures. The presence of flammable solvents may create an explosive vapor atmosphere both within the vessel and in the immediate environment, depending on the flashpoint of the solvent, the temperature of the liquid and the ambient temperature outside the container. Equally significant are the nature of the powder and the act of transferring it.

Whatever the combustibility of the powder is, the combination of the powder's characteristics in addition to the transfer increases the potential for formation of

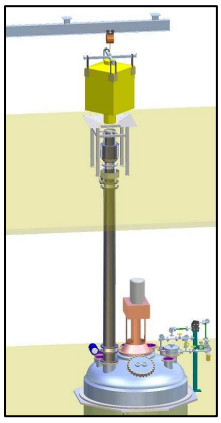
Charging reactor with solids from drum



an explosive dust/air mixture, both in the container and in the immediate surroundings.

The use of closed systems combined with inertization and proper earthing to remove potential electrical charges deriving from static electricity will solve most of the problems.

Centrifuge wet material in BigBag to be transferred into dryer or intermediate chemicals to be charged into reactor. Picture at the right side shows BigBag unloading station with dust filter situated below the support platform and transfer line to dryer or reactor



Dust free powder transfer

Formation of dust can be a serious issue not only from a safety point of view but could also form a hazardous environment for operator especially when dealing with potentially toxic material. With the installation of appropriate filter systems the problem can be addressed.

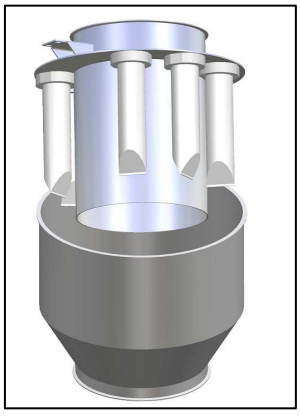
Dust filter element

Dust filter with integrated pulse air system enabling cleaning in place

Cross contamination

When talking about cross contamination in the context of powder handling it means choosing appropriate and suitable material for construction (gasket, O-rings, filter material, lubricants, etc), validate integrity of the system (leaks, functionality, etc), define and validate cleaning method.

Dust filter

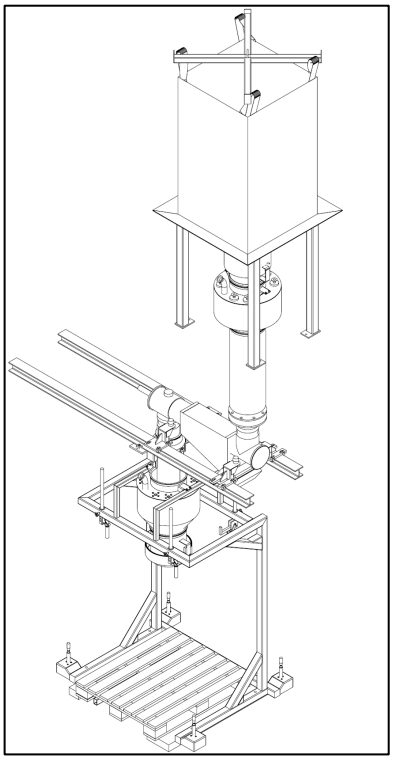


Accurate solid dosing

Some solids may need to be dosed accurately into a batch reactor or two or more intermediates need to be mixed at a certain ratio using automatic systems. Product may need to be fed into intermediate containments or final packaging systems like bags, bag-in-box, BigBag's or other form of containment.

Most loss-in-weight feeders will work well for free-flowing solids and even on some less cohesive solids. For cohesive solids, the reactor can be placed on weight cells (in some cases) or an intermediate hopper can be used, which would be on weigh cells. However, the solids flow properties need to be determined to insure proper design of the feeder and hopper.

Accurate solid dosing system with dust-filters, vibro feeding device and balance

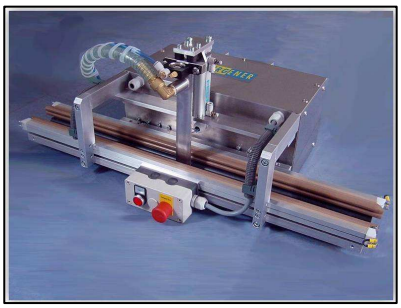


Final packing and sealing

Final packing includes very often a highly automated system which requires being very reliable with little maintenance. Packing itself will have to meet very different requirements, such as product protection against humidity and a dust free filling process with tight and mechanically stable sealing joint.

For bag or BigBag liner sealing in explosion proof areas, a special technology will need to be applied. BURGENER is one of a view reputable suppliers who successfully selling such ATEX compatible systems in the market for many years already.

Packaging welding machine with sealing capability of cellophane, polyethylene, polypropylene, polyamide, coated papers and aluminium compound foils



Manuel filling process with control scale and automated sealing machine offering an efficient packaging process for a low cost budget

Endless bag system enabling a dust free packaging process

In this context, Raschka Engineering's service could include:

- Powder handling process design
- Option evaluation
- EPC/EPCM contracting partner
- Consultancy for engineering
- Design and construction
- Powder charging/transferring/dosing system including modular fabrication
- Packaging equipment/system supply
- System Validation/Qualification
- Existing plant/system retrofitting
- Continues improvement and optimization

Please feel free to contact us to discuss your needs with Raschka Engineering's expert team, we would be very happy to share our experience in the field of powder handling process and provide successful solutions for your business.

An extensive service list is available on our website: http://www.raschka-engineering.com

Raschka Engineering Ltd

Raschka Engineering Ltd. Liestal, Switzerland (previously known as Lonza Engineering) now reflects the superior and well known Raschka FBI technology in its name together with its wholly owned subsidiary Raschka Engineering & Consulting Co., Ltd, China provides customer oriented services with a professional, experienced and highly motivated engineering team. We have 20 years of successful project management experience in China which makes us a perfect partner for the chemical, pharmaceutical and biopharmaceutical industry. A board range of services with a project reference list underlining our capabilities is available upon request.

Raschka Engineering has successful managed multiple complex projects such as continuous operating plants for the production of food and feed additives as well as active pharmaceutical ingredient plants including waste gas and liquid waste treatment facilities.

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