

## Pneumatic Conveying 17<sup>th</sup> + 18<sup>th</sup> of September 2025

A practice-orientated overview of the basics of silo technology with practical examples.

### Date / Location

17<sup>th</sup> of September 2025, 8:30 a.m. – 5:00 p.m. and 18<sup>th</sup> of September 2025, 9:00 a.m. – 4:30 p.m.  
MADISON HOTEL, Schaarsteinweg 4, 20459 Hamburg

### Speaker

Dipl.-Ing. Mario Dikty, Schwedes + Schulze Schüttguttechnik GmbH

### Participants

The seminar is aimed at anyone involved in the planning, construction or operation of pneumatic conveying systems.

### Content

Bulk materials are usually transported mechanically or pneumatically, occasionally hydraulically. If the bulk material transport requires the consideration of a complicated conveying routing or if the transport must be inert or dust-free, pneumatic conveying is chosen. As it generally contributes little to value creation through the refinement or production of a product, too little emphasis is often placed on the correct selection of the "best" conveyor system during the planning phase. If the system is not designed correctly, plant throughput or product quality can be negatively affected. Unfortunately, operating costs due to costly maintenance or high energy requirements are subordinated to investment costs in the awarding phase of such systems. The seminar begins with an introduction to the necessary terminology, such as Solid loading ratio or Froude number. It then takes a closer look at "the bulk material". The bulk material properties relevant for pneumatic conveying are presented. In a live measurement, we will get to know the fluidisability and assign it to dense-phase and lean-phase conveying in connection with the Geldart diagram. Based on this knowledge, the basics of dimensioning pneumatic conveying systems will be presented. Using a detailed calculation example, we deepen the calculation principles. The calculation results will be used to dimension a suitable pressure generator, and an overview of common pressure generators and their application limits will be provided. We will draw up an energy comparison between an optimised pressure generator and the compressed air network. Furthermore, the seminar will explain the usual feeding devices in detail and, where necessary, show the corresponding design principles. We will link this with the bulk solids properties we have already learnt. We will then develop a decision matrix on the basis of which a choice can be made for the best conveying system. We will evaluate and prioritise the decision criteria, such as installation costs, operating costs, user-friendliness and flexibility. You can freely adjust the weighting of the decision criteria based on your operational requirements. In the last part of the seminar, we will look at the usual "diseases" of pneumatic conveying systems and learn how to systematically analyse and, if possible, optimise existing systems in order to save energy costs or maintenance costs or to identify potential performance improvements.

## Day 1 – Wednesday, 17<sup>th</sup> of September 2025

8:30 a.m. Registration

9:00 a.m. Welcome, presentation Schwedes + Schulze Schüttguttechnik GmbH

9:15 a.m. Definitions & bulk solids properties

- Introduction to the terminology of pneumatic conveying (PF), e.g. dilute-, dense phase conveying, pressure, powder vs. granulate, voidage
- Properties of bulk materials such as bulk vs. particle density, particle size distribution, final velocity Geldart diagram (original and PF-optimised)

11:00 a.m. Coffee break

11:15 a.m. Basic principles for dimensioning pneumatic conveyor systems

- State diagram and flow forms (dilute, strand, dune & plug conveying)
- Basic equations (ideal gas law, continuity equation, mixing temperature, final velocity)
- Calculation approaches and calculation flow chart
- Large calculation example

12:00 p.m. Lunch

1:00 p.m. Exercise - small calculation example

2:00 p.m. Pipe staggering

2:10 p.m. Feeding devices part 1

- Jet feeder (design, function, areas of application, performance limits)
- Screw pump (design, function, drive power, areas of application, performance limits)

3:15 p.m. Coffee break

3:30 p.m. Feeding devices part 2

Rotary valve (design, function, leakage air, areas of application, performance limits)  
Airlift, the infeed device for vertical transport (design, function, areas of application)

4:00 p.m. End of day 1

5:30 p.m. Harbour tour

## Day 2 – Thursday, 18<sup>th</sup> of September 2025

9:00 a.m. Feeding device Pressure Vessel System

- Variants (single, twin, double, multiple-pressure vessel)
- Design principles (cycles, load times and effective conveying times)
- Example calculation

10:45 a.m. Coffee break

11:00 a.m. Airslides

- Function and structure (sizes, areas of application, performance)
- Process engineering dimensioning
- Sample calculation

11:30 a.m. Pressure generator

- Design and function of fans, side channel blowers, blowers, compressors
- Additional equipment: dryer, cooler, dehumidifier
- Energy comparison of pressure generators incl. compressed air network

12:00 p.m. Influence of plant altitude

12:15 p.m. Decision matrix for the bulk solids transport

- Which conveying method is most suitable for my application?
- Which criteria are important when selecting the conveyor system?
- Presentation and evaluation of the results in a decision matrix

12:30 p.m. Lunch

1:30 p.m. Live Fluidisation test

2:00 p.m. Troubleshooting

- How do I identify performance problems in my existing system? Is it the pressure generator, the feeding device or the conveying line the bottle neck?
- How do I recognise optimisation potential and weak points in my existing system?
- Analysis plan for minimising wear, reducing energy consumption and increasing performance depending on the feeding system and conveying line.

2:45 p.m. Coffee break

3:00 p.m. The Schwedes + Schulze Design Tool for pneumatic conveying

3:30 p.m. Questions

4:00 p.m. End of Seminar



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