SCHWEDES + SCHULZE

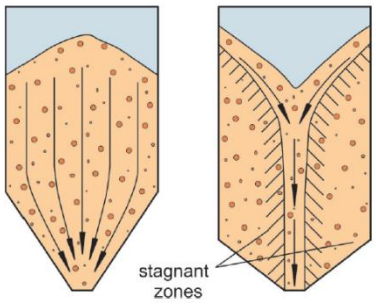
SCHÜTTGUTTECHNIK - SILO - PNEUMATIK

About us: Silo technology

Schwedes + Schulze Schüttguttechnik is an **engineering** company. We carry out bulk solids investigations and work on tasks in the fields of bulk solids and silo technology.

The main focus of our work is the process-engineering silo design, i.e. the design of silos and other bins to achieve a reliable function. Reliable function means avoiding, for example, the following problems:

- Discharge disturbances due to arching and piping,
- stagnant zones,
- wide residence time distribution,
- segregation,
- unsteady flow, flooding,
- problems according to insufficient interaction of silos, feeders, and conveying and dosage systems.



A second important part of our work is the measurement of flow properties of powders and bulk solids, e.g. flowability, internal friction, compressibility, consolidation or caking during storage at rest, sensitivity to attrition, influence of temperature or humidity, etc. These tests are important, for example, for comparative testing, product optimization (e.g. optimum percentage and type of flow agent, influence of variations of the production process), quality control and static silo design (bulk solids parameters for DIN EN 1991-4).

The philosophy of "Schwedes + Schulze Schüttguttechnik" is to solve practical problems in the field of bulk solids handling (silo design, measurement of flow properties) on the basis of the mechanical properties of the bulk solid under consideration. Only this way reliable solutions can be achieved. Even at the measurement of flow properties we concentrate on well-defined, physical quantities, which can only be measured with appropriate shear testers.

In our bulk solids investigations, we focus on precisely defined, physical quantities that can only be measured with suitable shear equipment.

In the past, we have examined more than 3500 different powders and bulk solids. This provides us with extensive experience to target future problems. Some examples of products investigated in the past are: Gypsum, pulverized coal, lignite, sugar, mixed feeds and components, metal powders, clay, ore, wood chips, plastic granules, plastic chips, shredded material, glass powder, cement, silica, salt, sewage sludge, and food products such as prepared soup powders containing fat.

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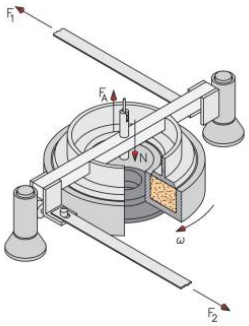
Despite this experience, it is still necessary to examine bulk solids in order to find the optimum solution in each individual case. The name of a bulk solid alone is not a sufficient characterization, because even products with the same name differ, for example, in particle size, particle shape and moisture, and thus naturally in their flow properties.



Our services in the field of silo technology include:

- Silo design for flow: Determination of the silo geometry (slope of hopper walls, outlet size, wall materials, inserts, feeders, discharge aids) which will avoid flow problems like arching, piping, irregular flow, flooding, segregation, or product degradation.
- On-site analysis of existing silos and related equipment, e.g., in case of problems with segregation or poor flow, and elaboration of concepts for reconstruction (retrofits) or optimization.
- Troubleshooting.
- Measurement of flow properties of powders and bulk solids with shear testers (e.g. Ring Shear Tester, Jenike Shear Tester, uniaxial compression test) for silo design, comparative tests etc.
- Measurement of the stress ratio at uniaxial compression (Lambdameter), wall friction coefficient and bulk density for silo design for strength, e.g. according to EN 1991-4.
- Development and optimization of feeders, dosing and conveying equipment, etc. which have to be suited to special boundary conditions (e.g. uniform withdrawal and feeding of bulk solid, mixing).
- Seminars and courses.

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About us: Pneumatic conveying

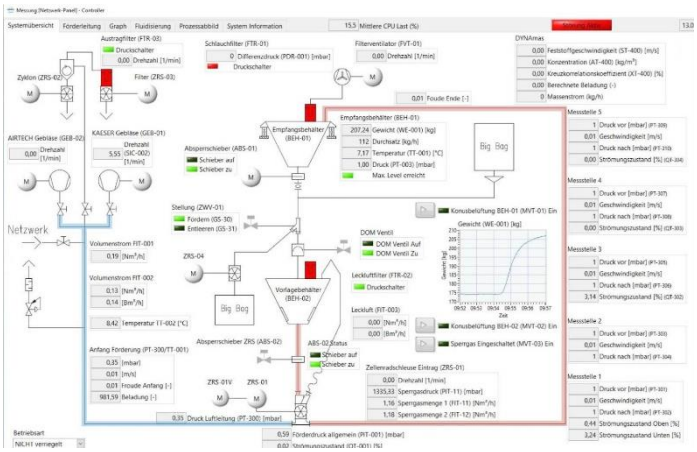
Schwedes + Schulze Schüttguttechnik is an **engineering** company. We carry out bulk solids investigations and work on tasks in the fields of bulk solids, silo technology and pneumatic conveying.

A main focus of our work is the process engineering design of pneumatic conveying systems as well as their energetic and process engineering optimization to achieve a reliable system technology. Reliable means avoiding the following problems:

- Pipe blockages
- Overload of the feeding device
- dust generation
- Performance limitations
- Unnecessarily high energy consumption
- Unnecessarily high wear
- Unnecessarily high installation costs
- Unnecessarily high operating costs

The basis for dimensioning pneumatic conveying systems is knowledge of the minimum conveying gas velocity and the drag coefficient, which determines the pressure drop. This knowledge cannot be determined based on mechanical bulk material parameters. They can only be obtained based on pneumatic conveying tests. In the past, we have dimensioned over 1100 pneumatic conveying systems. This means that we have extensive experience to approach future projects in a targeted manner. Some examples of products conveyed in the past are: Cement, lime, gypsum, coal dust, metal powder, clay, ore, sewage sludge, raw meal, fly ash, yeast powder, wax pastilles, aluminum needles, clinker dust, bypass dust, alumina, perlite, plastic granules, kaolin and many more.

If we do not have sufficient experience with your bulk material, we will carry out conveying tests in one of our partner's technical centers in order to determine the necessary dimensioning parameters, so that we can design your plant in an optimized manner in terms of energy and process technology.



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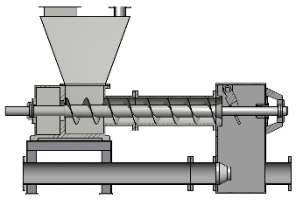
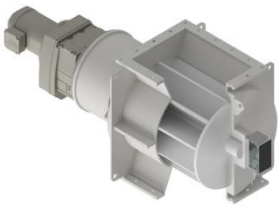
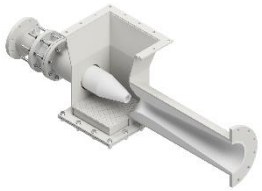
Our services in the field of pneumatic conveying include:

- Dimensioning of pneumatic conveying systems, as well as their peripherals, e.g. pressure generators, conveying line routing and dust removal.
- Analysis of existing plants, e.g. to evaluate energy requirements, process engineering or wear.
- Energetic and process engineering optimization of your conveying system.
- Development of concepts to increase the performance of your conveying system.
- Determination of the relative wear behavior of your bulk material.
- Determination of the relative abrasion behavior of your bulk material.
- Troubleshooting, rehabilitation concepts for conveying systems with unsatisfactory function.
- Consulting for bidder selection.
- Consulting during project realization.
- Support during commissioning.
- Consulting for new and further development of conveying equipment.
- Courses and training, also at your site.


Our analyses are based on assessment criteria and their respective weightings agreed with you, such as:

- space requirement
- ease of maintenance
- installation costs
- operating costs
- availability
- Pressure Equipment Directive (2014/68/EU)

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