Second to none Feeding Accuracy with the DIW and DBW Gravimetric Feeding Systems

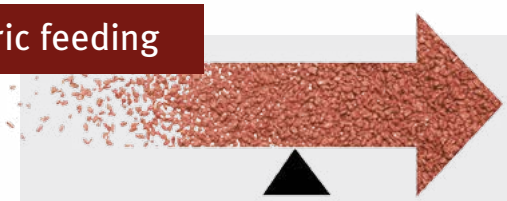
Gericke

Powder Processing Equipment and Systems

Brochure no. 646/2_uk

Precision, continuous and by batch

Gravimetric feeding

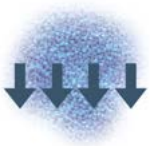


The feeding flow or the batch is captured and controlled by weight.

The gravimetric feeding method involves either weighing a requested quantity as a batch or feeding a constant mass flow over time. The feeding process selected depends on the process configuration. Gericke feeding solutions provide flexibility with regard to adjustment to the required specifications.

The DIW and DBW loss-in-weight feeders are designed to meet the following requirements:

- Highly precise feeding concentrating on feeding accuracy and consistent metering
- Exact reproducibility of the feed flow
- The modular design makes disassembly quick and easy
- Resistance to external influences such as shocks and oscillation
- Specialised hygiene model in accordance with EHEDG
- ATEX-compatible models
- Fast integration of Gericke Easydos Pro Controller in a wide range of controller environments
- Optimum adjustment of interfaces to upstream or downstream process
- Perfect integration with Gericke Continuous Mixers



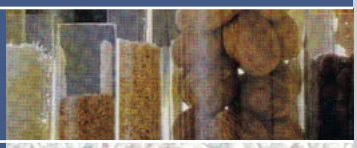
Batch feeding

Continuous feeding

Combination

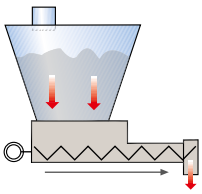
Flexibility with modular configuration

Operating areas and applications:

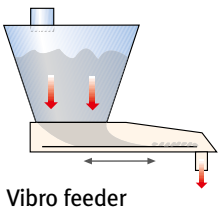
Industry	Examples of applications	
Food industry	Cereals, muesli bars, sugar mixtures, milk powder, diet breakfast drinks, salt iodisation, fluoridation, aromatisation	
Chemical industry	Premixes for extrusion, detergents, pesticides, fertilisers, building materials	
Pharmaceutical industry	Production of vitamins and active ingredients	
Plastics industry	Processing of plastic, films, coatings	
Environment	Flue gas cleaning, water processing, diesel particle filters	

A gravimetric feeding system consists of the volumetric accuracy feeder, a weighing system and a controller.

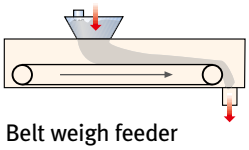
Feeders



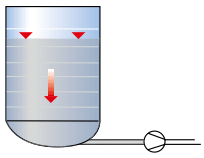
Screw and helix weigh feeder



Vibro feeder

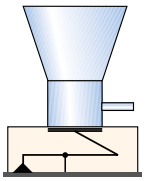


Belt weigh feeder

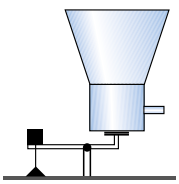


Liquid pump

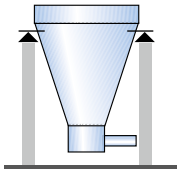
Weighing units



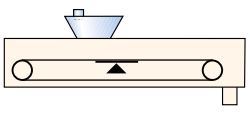
Platform weigh feeder
(with or without tare compensation)



Hybrid weigh feeder
(with tare compensation)



Batch feeder



Belt weigh feeder

The right system for every process

Platform weigh feeders

Function: The feeders are mounted on stable platforms fitted with high-performance weighing technology.
Application: Small to medium feed rates.
Advantages: Compact devices, easily installed, protected electronics.
Specifications: Feed rate 0.2 – 400 l/h (depending on bulk density)

Type: DIW-KE-GLD – as economical single-screw feeder with agitator, optionally available as special model for very small quantities with wind deflector.

Type: DIW-PE-GZD – twin-screw feeder – a hygiene unit which can be completely disassembled for maximum process requirements, with specially treated surfaces, highly flexible sleeves and connecting cables with a filter unit optimised for very accurate feeding.

Loss-in-weight feeder with three load cells

Function: The weighing hopper and the feeder are mounted in a frame. Weight calculation is carried out by three robust load cells, which are also optionally available in a hygienic design.
Application: Multi-component feeding systems in the food industry and chemical applications.
Advantages: Compact installation options, any hopper size available, hygienic design.
Specifications: 200 – 36 000 l/h
Type: DIW 3-E

Hybrid feeders with tare-compensated weighing system

Function: The weight of the hopper and feeder is compensated by a spring or a counterbalance which ensures that only the bulk material in the hopper is weighed. This means that the complete resolution of the load cell is available (see diagram on following page).

Application: The hybrid feeder, which can be fitted with a screw feeder or vibrating trough, is available for a wide range of applications that demand maximum accuracy and robustness. The hybrid feeder is particularly suitable for very light bulk materials, such as Aerosil (d < 0.2 kg/l). Thanks to adjustable dashpots the system is very resistant to external sources of interference. The vibro feeders are particularly suitable for conveying lumpy products such as cereal flakes, sweets, pellets and granular bulk materials. Hybrid feeders can also be fitted with liquid containers for highly precise liquid feeding.

Advantages: Weight of unit is balanced out, protected measuring cell, robust, resistant to disturbances.

Specifications: 30 – 50 000 l/h

Types: DIW-50, DIW-200, DIWE, DIW-V, DIW-L

Belt weigh feeders

Function: The transported bulk material is continuously weighed and conveyed on the belt.

Application: Lumpy, brittle products, bulk materials making a minimum amount of product dust during feeding, good free-flowing particles, high feeding performance.

Advantages: The belt feeder does not require refilling, because the product feed can be continuous. Belt weigh feeders are particularly suitable for gentle feeding of bulk materials. Stable and secure belt guidance, smooth and flat surfaces for easy cleaning, belt material conforms to FDA requirements, parts in contact with the product are made of stainless steel.

Specifications: 30 – 65 000 l/h

A pull-out belt design is available for easy cleaning and fast belt replacement. Belt weigh feeders can be used to control the feeding flow as well as to record the flow throughput.

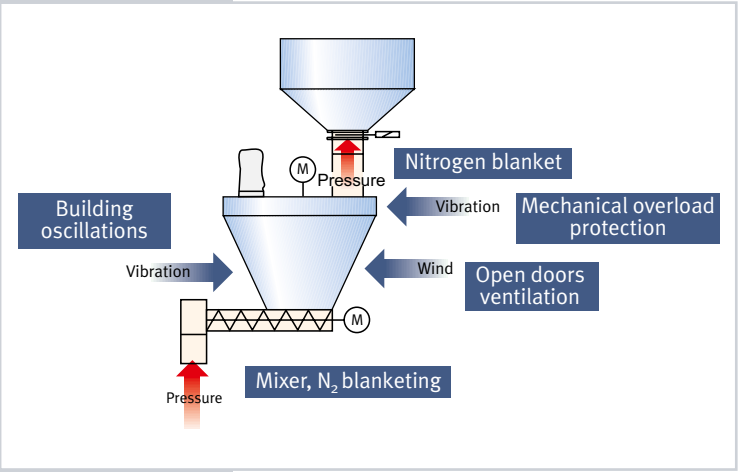
Types: DBW/MBW 280, 400, 650

Feeding precision

The accuracy of the loss-in-weight feeder depends on the bulk material and external influences in the area surrounding the weigh feeder.

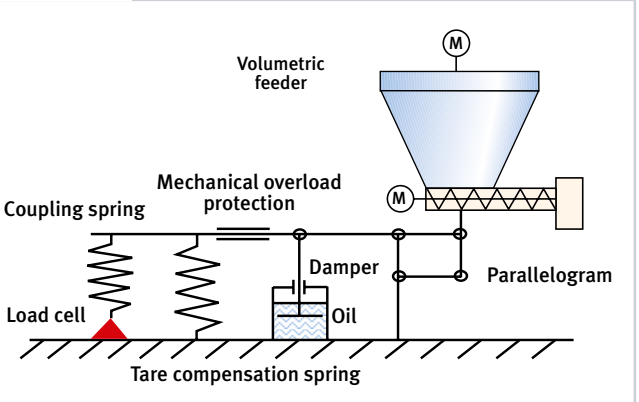
Various influences can occur:

- Overload:
  ⇨ Prevented by mechanical stop thanks to hybrid mechanics
- Oscillations, contact, shock:
  ⇨ prevented by mechanical damping and electronic software filter
- N_2-blanketing, pressure:
  ⇨ Pressure compensation system at inflow and outflow
- Variations in the hopper:
  ⇨ Trendtec algorithm, agitator
- Flow problems in the hopper, fluctuations in bulk density possible:
  ⇨ Feeder with homogenisation chamber and homogeniser or intromitter
- Product jams in metering tube:
  ⇨ Helixes with increasing pitch or full flight screws provide a solution
- Short-term accuracy:
  ⇨ Improved by multiple tube, high speed, special tube ends and outlets



The Gericke hybrid system with tare compensation

The weight of the hopper and feeder is compensated by a spring or counterbalance with only the bulk material itself being weighed. This means that the full resolution of the load cell is available. The mechanical overload protection mechanism prevents damage being done to the sensitive load cell.



Effective control of gravimetric feeders with Easydos Pro

Easydos is an innovative feeding and weighing system that can be used with batch applications, continuous gravimetric feeders (loss-in-weight) and in connection with the controlling weigh belt feeders.

User-friendly:

The explicit menu navigation makes operation simple, the self-optimising controls simplify commissioning and ensure maximum metering accuracy. Easydos Pro follows on from the older Easydos version and now comes with an integrated Ethernet/IP and/or Profibus DP interface.

The new controller has many other advantages:

- The housing size and plug connectors are identical to those of the previous model. This simplifies the changeover to the new controller generation.
- User programs and configuration can be downloaded from a computer
- Programs and data can be downloaded from a USB memory stick
- Modern controller housing with aluminium frame and steel casing is compatible with hygienic requirements

Configuration types:

a) Single loss-in-weight feeder with Easydos Pro
b) Several loss-in-weight feeders with Easydos and bus connection to PLC
c) Remote access with Easydos.net
d) Controller without display in control cabinet, can be remote controlled via field bus or computer

Technical specifications:

- 24 VDC power supply, power consumption max. 40 VA, protection class IP65, 0 – 45 °C ambient temperature, illuminated graphics display, membrane keyboard
- Load cell input for up to 6 load cells, accuracy 10000 graduations in accordance with BSEN 45501:1994, analogue-digital converter with 16 million resolution, 102 dB signal-to-noise ratio, 50 measurements per second
- 6 digital 24 VDC inputs, 11 digital outputs optionally with relay 250 VAC/1 A
- 2 serial RS232/RS485 ports for fieldbus interface (ModBus), digital load cells and frequency inverter, USB port for data transfer and updates
- Optional: 1 analogue input card for load cell/4-20 mA/0-10 V, 2 analogue output cards 4-20 mA/0-10 V, Ethernet/IP interface to Allen-Bradley PLC, Profibus interface to Siemens PLC

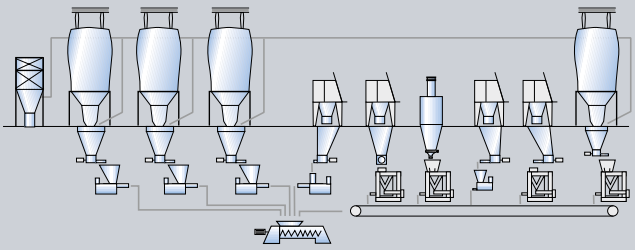
Feeding and mixing: 2 combined processes

Applications:

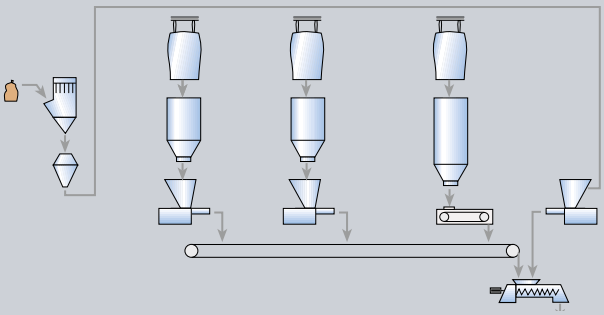
Gravimetric loss-in-weight feeders are often used for the loading of extruders and continuous mixers.

Examples for this can be found in the production of cream cheese, gelifying sugar, cereal bars, instant beverages, milk powder, muesli, cosmetics and hygiene products, building materials (gypsum board and plaster) as well as refining salt (fluoride, iodine etc.), feeding liquids and despersing powder with belt weighers.

Examples of installations:



Continuous feeding-mixing plant for the production of mueslis, powder mixtures and cream cheese



Production of gelifying sugar and salt refinement

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