

Filling and weighing station for small packages delivers reliable and flexible filling of various-shaped receptacles

Suitable for small to medium filling capacities

Can be configured on a custom basis thanks to the modular design

Versatile thanks to rapid retooling

Weighing device can be calibrated

Preferred applications

High fill rates are less of a priority whenever mixtures of bulk materials need to be produced and filled in relatively small batches in a flexible manner. It is far more important to be able to use a compact, versatile system that satisfies customer requirements in a practical way. The final process step prior to the transfer for despatch is also a crucial step where quality assurance is concerned.

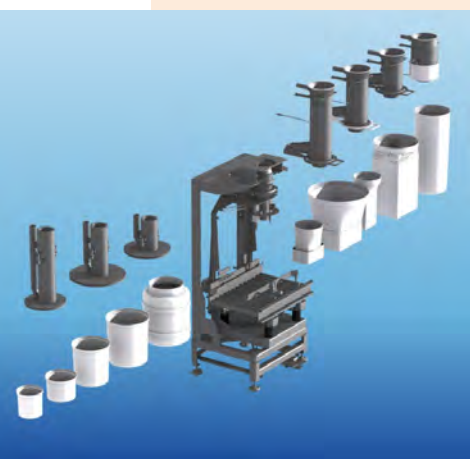
Specific advantages

- When combined with the DA cyclone screener, the functions of dosing, screening and filling are integrated in one system.
- Affordable basic version as a stand-alone solution for just the weighing process
- Versatile thanks to rapid retooling to accommodate different receptacles (sacks, tubs, boxes)
- Modular design allows customised configuration and upgrading
- Weights and measures approved scales in the 10-50 kg weighing range

System description

The filling and weighing station for small receptacles can be positioned directly under mixers or buffer hoppers or can be fed from containers and big bags. Either a dosing screw or a cyclone screener type DA is used as the dosing unit. The screener has the advantage that foreign particles can be eliminated and small agglomerates broken down at the same time during the dosing process.

SYSTEMS



Depending what form of receptacle is being filled (sacks, boxes with inliner, tubs etc.), the station can be fitted with different filling heads and functions. The machine operator enters and maintains filling and weighing parameters either locally on the operating unit (basic equipment) or sends these to a master control system.

In the case of sacks or boxes with inliners, handling of the receptacles at the station is only carried out manually. The machine operator still has both hands

free for docking the receptacle at the filling head and starts the dosing process using the foot-operated switch. Dosing is carried out automatically until the specified fill weight has been obtained. Then the receptacle can be disconnected using the foot-operated switch again. The system can also be designed for fully automatic operation when filling rigid receptacles like tubs, for example, and small drums.

There is an option to connect the system to an aspiration unit in order to vent the displaced dust-

laden air during filling. Operation is possible in compliance with ATEX depending on the defined zone.

The filling unit including accessories satisfies stringent hygiene requirements and guarantees simple handling. Bespoke solutions are available for complete inline wet cleaning.

AZO.[®]
SOLIDS

Modular system design

Feeding / dosing

Cyclone screener type DA



Cyclone screener type DA for simultaneous dosing and weighing



Filling units

Filling head with inflatable collar for flexible receptacles like sacks and pouches

The flexible receptacle is pulled over the non-pressurised collar. A dust-tight connection is created by inflating the collar. The receptacle and inflatable collar must match in terms of size.



Filling head with inflatable collar

Filling head for rigid receptacles like tubs and small drums

A dust-tight connection is created between the filling head and the receptacle with an elastic sealing surface that exerts pressure on the receptacle. Custom-fit filling heads can be supplied for different-sized receptacles (height, diameter). Receptacles can be fed either manually or, as an option, automatically.



Filling head with elastic sealing surface

Filling head with inflatable ring for flexible receptacles like inliners, sacks and pouches

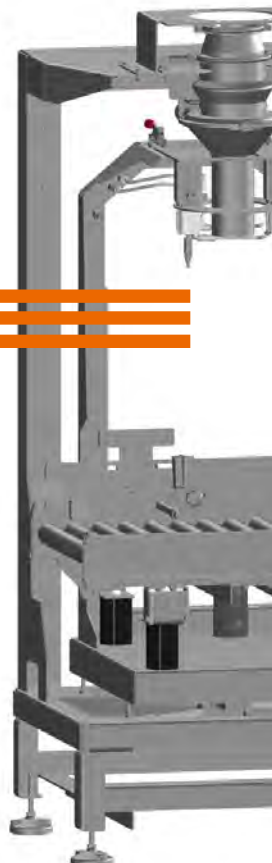
The flexible receptacle is pulled over the inflatable ring by hand. After closing the clamp, the ring is inflated and a dust-tight connection is produced. It is possible to dock different-sized receptacles.



Filling head with inflatable ring



Metal detecting





Vibration bottom with dosing screw



Dosing screw for accurate dosing



Operator terminal for upgrade stage

Weighing controls

Affordable stand-alone version with easy-to-maintain data management in the weighing terminal and adjoining power unit for the drives for the dosing units. Fully integrated version in the upgrade stage, where the weighing function is performed by the weighing controller and data management is done in a master system (MES, PPS). The power units for the drives are then housed in a central switch cabinet.



Manually operated sack sewing machines

Sealing units

Sewing equipment

Manually operated or stationary sack sewing machines can be used to close flexible receptacles.



Bonding unit for inliners and sacks

Bonding equipment

Bonding equipment is available for sealing pouches, inliners and plastic sacks made of weldable materials. It is also possible to combine sealing methods for sacks with an inliner by first bonding the inliner and then sewing the outer sack shut.

ection/
metals

Technical specification

Basic design

The filling and weighing station for small receptacles consists of the following components in the basic version:

- frame for floor installation
- bagging stand with integrated weighing device
- inlet disconnection / filling head
- filling and weighing electronics with operating elements

Other modules

- dosing screw or cyclone screener type DA for dosing and screening
- metal detection
- various filling heads
- feeding and sealing units
- controls for integration in entire plants and/or with connection to higher-level ERP systems

Feeding / dosing

Product feeding must guarantee the required accuracy in terms

of discharge and dosing. The design of discharge and dosing units largely depends on the characteristics of the project and the requirements as to product safety and cleaning. The cyclone screener type DA is ideally suited for combining dosing, control screening and filling in one system. The screener takes on the functions of dosing and eliminating foreign particles simultaneously and also breaks up agglomerates as far as possible prior to filling. Additional protection against super-fine metallic impurities is achieved by using a sensitive pick-up coil below the screener. Here too, top results are obtained by the metered feeding and the adjusted small coil cross-section. If the products being filled have already been screened, a dosing screw can also be used for dosing with a vibration bottom.

Weighing device

As most products are filled into retail receptacles, the permissible calibration tolerances must be adhered to according to weights and measures regulations 10 class X(1). Realistic variances in the range from 20-50 g are possible depending on the flow properties of the products being filled. Insofar as there is no provision for control or correction weighing, the system can be designed as an automatic scale (SWA) for official calibration tests.

Depending on the form and size of receptacles and on the number of machine operators, it is possible to fill and seal the receptacle in 1-2 minutes. A standard throughput rate for the system is 1 receptacle per minute.

Operation and controls

The base station has a compact control unit. This is capable of managing a number of parameters and of controlling the weighing process. As an option, further custom functions can be implemented using a limited number of in/outlets. The load modules for the dosing unit, discharge aid, conveyor belts etc. are installed in a separate switch cabinet. This can be located centrally at the filling and weighing station as well as away from the centre. Alternatively, the filling station can also be integrated into entire plants, such as, for example, AZO's mixing, conveying, storage and product feeding systems. The operating concepts are agreed and planned with the customer, taking specific functional and economic aspects into consideration.

Filling units

There is a range of filling heads for the most common forms and sizes of receptacles. The heads can be customised depending on the receptacles being filled. The filling heads are designed so that they are easy to exchange without need of tools. This means it is possible to change receptacles over in 2 minutes.



Easy to replace filling heads

Filling head for flexible receptacles (sacks, pouches)

An empty sack or pouch is pulled over the non-pressurised **inflatable collar**, which is then inflated by using the foot-operated switch. This creates a dust-tight connection. Sacks and inflatable collars must match each other in terms of size. The feeding unit's shut-off device opens for filling and the product is metered into the receptacle, while the dust-laden air escapes via the connecting aspiration system. Just before reaching the target weight, dosing is switched from coarse to dribble feeding in order to achieve greater accuracy. Once the target weight has been reached, the dosing unit stops and the shut-off device closes, thereby terminating the filling process. In order to disconnect the sack, the foot-operated switch is pressed again to deflate

the inflatable collar. The full sack can then be conveyed via the roller conveyor to the sealing unit in an ergonomic operation.

Filling head for rigid receptacles (tubs, drums)

The filling head is lowered via the pneumatic cylinder and is docked on the receptacle inlet with an elastic sealing surface so that it is dust-tight. Filling of rigid receptacles is carried out similarly to filling of sacks. Once the filling process has finished, the filling head is raised pneumatically and the receptacle is released.

Filling head for flexible receptacles (inliners, sacks, pouches)

After the receptacle has been positioned correctly, the inliner is docked by pulling it over the filling head and closing the clamp. Then the **ring** is inflated using

the foot-operated switch, creating a dust-tight connection with the inliner. The rest of the filling process for flexible receptacles is carried out similarly to the sack filling process. In order to disconnect the inliner, the foot-operated switch is pressed again to deflate the inflatable ring. Then the clamp can be opened and the inliner removed.

Locking unit

Stationary or manually operated sewing machines or bonding units, for instance, are available for sealing the sacks and pouches. The receptacles are transported via a roller conveyor to the next station in an ergonomic fashion and can be sealed there.