

# Batch and Minor Quantity Automation from AZO®

## Mixer Feeding from the Market Leader

8700 SYSTEMS



Automatic,  
highly accurate dosing,  
weighing, collecting  
and preparing  
of batches for  
mixer feeding





## Right to the point! Highly precise batch and minor quantity automation from the market leader

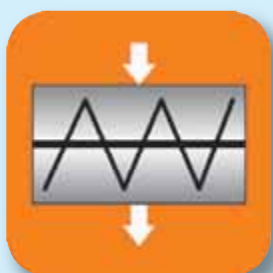
During the manufacture of food, pharmaceuticals, chemical and plastic products, precise adherence to the recipes is decisive for the product quality. As the producer, you must have absolute confidence in the exact supply of your raw materials. Each ingredient must be meticulously documented.

With around 7,500 vacuum weighing systems already delivered, AZO has been Number One in mixer feeding of main components for quite some time. Over 650 installed systems, from ManDos through AZO COM-PONENTER® in various designs and DosiBox® up to ShuttleDos® solutions, now also make AZO market leader in small and minor quantity automation throughout the world.

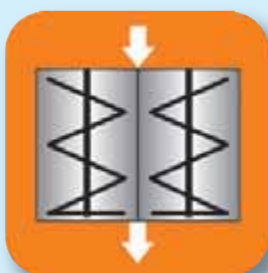
### This makes AZO market leader:

- Sustainable, economic solutions with high energy efficiency
- Safety thanks to experience and fully developed technology
- Great flexibility, meaning weighing various weights from 10 grams up to several hundred kilograms, variable design possible, simple to expand, easy to change recipes
- High precision for small and large weight units
- Minimised non-productive times, e.g. through process-optimised collection of components results in high speed
- Product and operator protection through contamination-free solutions
- User-friendly control and visualisation
- Reliable batch traceability and permanent documentation
- Global service

Horizontal mixer



Vertical mixer



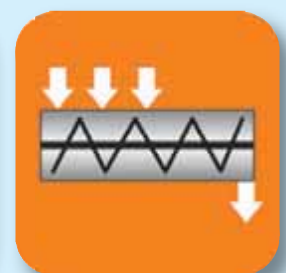
Cone mixer



Kneader



Continuous mixer







## All solutions at a glance

### Computer-controlled manual weighing station – ManDos

ManDos stand-alone manual weighing station	4
ManDos mobil	5
ManDos with automatic small component storage (AKL)	5

### Automatic weighing of small quantities to the gram – AZO COMPONENTER®

AZO COMPONENTER® indexing mode	6
AZO®AutoDos: Online dosing and weighing of small quantities	7
AZO COMPONENTER® circular arrangement	8
AZO COMPONENTER® linear arrangement with mobile scale	9
AZO COMPONENTER® linear with mobile container	10
AZO COMPONENTER® with automated guided vehicles (AGV)	11

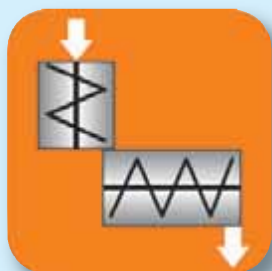
### Frequently changing minor components – DosiBox®, DosiLogistic®, AZO DOSITAINER®

DosiBox®, DosiLogistic®	12
AZO DOSITAINER®	13

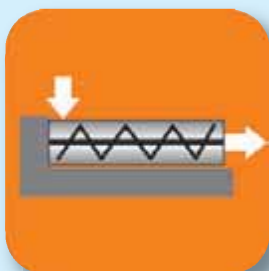
### Super fast batch automation – AZO ShuttleDos®

AZO ShuttleDos®	14
AZO CleanDock®	15

Heater/cooler mixer



Extruder



Dissolver



Vacuum processing system



Container mixer





Manual weighing station for colours, additives and aggregates at a compound manufacturer



Operator-guided weighing of colours and additives

## ManDos – Computer-controlled weighing from manual to semi-automatic: Ideal for handling your small and minor quantities

### Small quantity handling with ManDos

Small and minor quantities have a major influence on the recipes. Yet full automation is often impractical; the required weighing accuracy for sensitive recipe components such as additives, aromas, pigments, spices and colourings cannot be economically achieved. In this case, the manual weighing station ManDos presents the ideal solution. With this system, small and minor quantities are manually and exactly

weighed with computer support and then added to the recipes. Hereby, functions such as raw material identification, selection of the optimal scale for the recipe step, provision of entire sacks, and weighing of remaining residual quantities support the operator. Incorrect dosages are a thing of the past. The intuitive handling allows online, offline and serial weighing.

The entire weighing process is documented by ManDos and so can be traced at any time. All data

relevant to tracing such as actual quantity, raw material batch used and assignment to production order and production batch are recorded automatically.

Thanks to its modular construction, ManDos achieves the greatest degree of flexibility. From the single station solution to integrated complete solutions with interface to host systems and integration into company-internal IT, all elements can be combined and whenever necessary, upgraded and extended.

The advantages of ManDos are evident: increased production reliability, prevention of incorrect batches, saving data for accounting as well as tracking, tracing and connection to the ERP system. Ultimately, the automatic transfer of production orders and feedback of consumption also facilitates the booking of completed mixtures.



ManDos stand-alone manual weighing station



Highly precise weighing of ingredients



ManDos weighing station with barcode recording and label printer for weighing of active ingredients



## Your AZO advantages

- Exact weighing of additives, flavours, spices, pigments, colourings etc.
- Modular design for easy expansion
- Computer-supported, more reliable weighing process
- Explicit identification and traceability of batches



Weighing small quantities in the chemical industry

### This is where ManDos makes sense

- Low usage frequency
- Raw materials not suited to automation
- Frequent component change
- High component variety
- Limited investment means
- Where consistent documentation is required
- When complete solutions with integrated conversion, supply and handling are demanded

### Multifunctional versions

#### ManDos stand-alone manual weighing station

On this system, all the necessary components are grouped at the weighing station. Small amounts are manually transported to the ManDos by the operator. The modular, flexible system allows miscellaneous configurations for optimal adaptation to your needs. Thus, depending on requirements, this solution maintains an independent master data management or

can be connected to a superior IT system such as SAP for transfer of recipe and order data.

#### ManDos mobil

With this flexible and efficient version, the mobile weighing station is used exactly where it is needed at any given time. Weighing and removal are done directly in the warehouse; unnecessary transport of raw materials is avoided. This mobility greatly reduces hardware costs.

### ManDos with automatic minor component storage (AKL)

Here, minor components are automatically transported from minor component storage (AKL) to the stationary ManDos weighing station for weighing. Then the batch is either filled directly into the mixer or transported back to the AKL for intermediate storage. Where manually weighed raw materials are concerned, this attains an unrivalled degree of automation.



ManDos mobile: Highly flexible due to movable scale and mobile terminal with WLAN connection

ManDos with automatic minor component storage

## Your AZO advantages

- Extremely high accuracy
- Very high batch frequency with over 100 batches per hour
- No contamination, no crosscontamination
- High production reliability through explicit identification
- Optionally expandable



Highly precise weighing in vessels

## The AZO COMPONENTER® indexing mode: Fully automatic weighing in vessels

The AZO COMPONENTER® indexing mode makes sense wherever plenty of components with very high batch frequency and accuracy need to be weighed. It has proven particularly well where difficult products such as colourings, additives and highly active ingredients are automated. Instead of a linear arrangement with mobile collection vessel, in this

system coded vessels standing on an indexing belt are applied. In this way the small components, weighed to the gram according to recipe, are obtained. Each hopper can be assigned to a different recipe. The weighing process takes place in parallel. The exact identification of the filled small container guarantees that the right components are transported

to the right mixer at all times. This increases production reliability enormously. At the same time, contamination is impossible. This version of the AZO COMPONENTER® can also be integrated as a system assembly into the AZO process management and visualisation system.



The entire process in overview



High cycle times through single scales



## Your AZO advantages

- Modular design, expandable at any time
- Provision accurate to the gram
- Closed system
- Transparent inventory
- Prevention of incorrect batches
- Optional with interchangeable components and single scale
- Extreme performance capability thanks to parallel weighing



Online weighing in pneumatic conveying systems

## AZO® AutoDos

### Dosing and weighing of small and minor quantities

#### Online dosing in conveying line

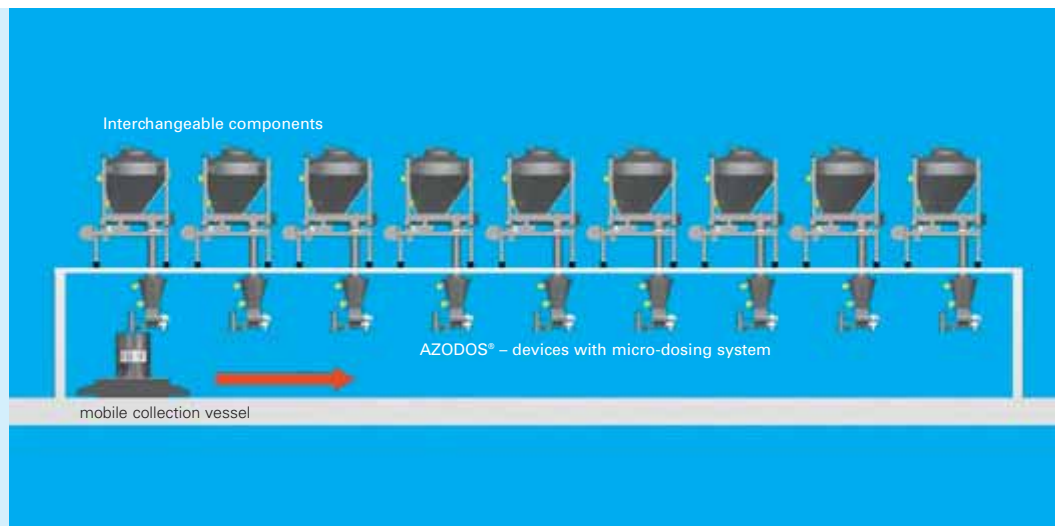
This version is ideal when small amounts need to be weighed to the gram online and fully automated at various consumers (mixers). The small amounts are stored in buffer bins dimensioned according to turnover frequency. When required, these hoppers can be equipped with a discharge aid. As an option, dosing can take place directly with an AZO screener of the DA series. The AZODOS® dosing devices employed with this

version work as negative weighing systems. They dose ingredients in a conveying line online and in parallel, in accordance with the recipe, and so convey the raw materials to the correct consumer. The entire process is monitored, recorded and documented by a convenient control system.

#### Highly precise dosing in vessels

The small quantities are stored in ergonomically designed, easy to clean surge bins, each of them equipped with its own discharge and dosing device. A special AZODOS® system with two different screw geometries provides the highest dosing accuracy and reliable product transfer, even for micro quantities with poor flowing characteristics. As collection vessels, coded hoppers transported beneath the dosage points on a

indexing belt are used. The raw material transfer is non-contact and thanks to an efficient extract system, very low in dust. This eliminates contamination. Exact identification of the filled small containers guarantees that the right small components are transported to the right mixer. As an option, the surge bins can be designed as interchangeable modules. To increase throughput, a single scale can also be used.



Micro quantity automation system AZO®AutoDos with interchangeable components



AZODOS® with micro-dosing system

## Your AZO advantages

- High batch frequency through parallel weighing (up to 40 batches per hour)
- Good assignability to specific recipes, e.g. dark and light product lines
- Feeding of several mixing lines possible



AZO COMPONENTER®, circular design in climate-controlled area

## The AZO COMPONENTER® in circular design: Cost-effective solution with limited number of components

The AZO COMPONENTER® in circular design is recommended when a small number of components need to be automatically weighed. Following this principle the surge bins, such as feeding hoppers for sacks, pneumatically fed receivers or small silos are arranged in a circle above the collection vessel.

They can be fed by vacuum or pressure conveying. Each component has its own discharge, dosing and scale optimised to the specific raw material. Thus, parallel weighing processes and feeding of several mixing lines are possible. The AZO vibration bottom employed here ensures reliable transfer even for

small components with poor flowing characteristics. The vibration dosing screw with locking device guarantees highly accurate dosing. The rotating / tipping scales project into a common collection vessel and empty into it. From this point, the product is pneumatically transferred into the conveying scale or depending on

the application, transferred directly to the mixer.

This AZO COMPONENTER® version can be used where intermixture of related products is permitted.



AZO COMPONENTER® circular design at manufacturer of window profiles



Automatic weighing of baking ingredients accurate to the gram



## Your AZO advantages

- **Batch frequency:**  
10 batches per hour
- **Several supply points,**  
e.g. mixer or pneumatic conveying, are easily realised.
- **Micro components are pre-weighed with the highest accuracy in a special scale**



AZO COMPONENTER®, with linear mobile scale

## The AZO COMPONENTER® in linear design: Ideal for many components

Where many components are automatically processed, the linear design of AZO COMPONENTER® is recommended. Here, each of the surge bins, e.g. discharge bases for sacks and Big-Bags, pneumatically fed receivers or containers, is equipped with its own discharge and dosing unit arranged in opposing rows. Special docking possibilities

enable Big-Bags and containers to be changed quickly as called for by the recipe at any time. Depending on the arrangement, the feeding hoppers can be filled through a central aisle or from the outside with very low dust emission. The individual discharge and dosing units ensure reliable discharge and high dosing accuracy for all components. The raw materials

are typically weighed according to recipe in an additive process.

As an alternative, one scale can be used for each component. This enables a fast and efficient working method. After weighing, the recipe constituents are collected by a linearly movable collection scale and delivered to one or several drop points (e.g. mixer

or pneumatic conveying system). Small components are weighed directly in the mobile scale; for the highest accuracy, minor quantities are pre-weighed in a special rotating / tipping scale. AZODOS® negative weighing systems are often applied as well for highly accurate dosing.



Linear arrangement offers almost unlimited options



Feeding hopper and receiver can be used as surge bins

## Your AZO advantages

- Batch frequency: 10 batches per hour
- Efficient solution for difficult products
- Several supply points can be easily realised.
- No contamination or blending
- Spatial separation of product discharge and batch provision



AZO BATCHTAINER® as collecting hopper

## AZO COMPONENTER®, linear design Batches automatically weighed in container

This version of the AZO COMPONENTER® is particularly useful where contamination-free solutions are needed, such as in the pharmaceutical and chemical industries or for raw materials with difficult discharge characteristics. Components included in the recipe are buffered in raw material containers which are docked at a row of container discharge bases and kept free of dust by a patented

docking collar; here, they are automatically identified and registered. For reliable discharge and exact dosing, the container discharge stations are equipped with dosing screws. Beneath the discharge bases, a mobile, recipe-controlled floor scale is used to prepare the batch. Atop this scale is an AZO BATCHTAINER® in which frequency-controlled coarse / fine flow dosing takes place. The floor scale moves

completely automatically to the predetermined dosage points. It is also possible to bring in minor quantities with the highest accuracy through the AZODOS® negative weighing system. Raw material transfer is non-contact and because of special sealing with extraction appropriate to the specific raw material, extremely low in dust. As soon as the entire batch has been prepared, a batch report is

generated and the container transferred to the supply point for further processing. The system uses an additive weighing process; the consecutive weighing steps can be more cost-effectively realised than parallel weighing with several scales.



Collection of additives in an AZO MIXTAINER® with dynamic scales

Central weighing-in point at a pharmaceutical manufacturer



## Your AZO advantages

- Flexible system, optimally adapted to the application
- Precise weighing
- Optimal for free, non-linear arrangement of supply points
- Very easy to clean



Linear AZO COMPONENTER® combined with driverless transport system

# AZO COMPONENTER®, fully automatic Container system with automated guided vehicles (AGV)

When the supply point, such as a mixer, is not arranged linearly, the AZO COMPONENTER® with AGV is a suitable solution. Here, the dosage points are served by a laser navigation controlled AGV which gathers the weighed raw materials precisely corresponding to the recipe. Very high accuracy is achieved even for the largest batches. Smaller quantities are weighed to the gram.

Exact positioning and secure data transfer to the control system are accomplished through the transponder and infrared interfaces. The use of two parking positions allows the AGV to avoid waiting times for transferring a full raw material container or taking on an empty one. The number of AGVs needed is determined by a simulation during the planning stage and optimally designed, as

is the navigation system deployed.



Linear collection of carrier and active agents



Automated guided vehicle with integrated scale

## Your AZO advantages

- Clean storage
- Stock control
- Safe product and user protection
- Raw material handling in a closed system
- Just in time production
- Permanent traceability of raw materials and batches
- Innovative logistics solutions



AZO DOSINENTER® in baking ingredient application

# DosiBox® and DosiLogistic®

## Economic solutions for frequently changing small quantities

DosiBox® is the best solution when high recipe variety, numerous changing components and small amounts are a topic in your production. The safe, reusable container in PE plastic, or chromium-nickel stainless steel, is available in various sizes. It meets all requirements for hygiene and cleanliness, user and product protection, batch traceability and documentation. It is food-safe

and easy to clean. The integrated dosing screw enables highly precise, automatic access to the contents. The metal frame of the DosiBox® is dimensioned to European standards and makes it easy to store and transport the DosiBoxes®. This ensures clearly arranged and clean storage. The contents of the DosiBox® can be exactly determined at any time through the identification system

and control. Raw material mistakes and incorrect dosages are things of the past. All loads are prepared within very narrow tolerances and documented to be traceable at any time.

The DosiBoxes® can be constructed in a linear arrangement as AZO DOSINENTER® with a nearly limitless number of transition stations. Connecting it with a fully automatic

high-bay warehouse results in a well conceived DosiLogistic® system. The DosiDock® unit with mobile scales head for the individual DosiBoxes® during recipe composition and docks without dust. The prepared raw material mixtures can be siphoned off for further use in DosiBoxes®. The DosiBox® can also be used as multi-path delivery unit.



Storage and removal of DosiBoxes® with automated guided vehicles



DosiBox® in metal version



Foreground: micro-dosing module



## Your AZO advantages

- Easy to clean and stable design
- Can also be used for dry bulk materials with poor flow characteristics
- Residue-free change of the AZO DOSITAINER®
- Integrated, precise dosing screw for weighing process
- Highest weighing accuracy even with very high volume throughputs



Weighing in drums from AZO DOSITAINER®

# AZO DOSITAINER®

## The patent solution for interchangeable components

When a great number of recipes requiring many components need to be prepared, but not all components are included in the respective recipe, then the patent solution is called AZO DOSITAINER®. With this system of quickly interchangeable components, the AZO DOSITAINERS® are filled in the conversion step. As soon as the raw materials are needed, the corresponding AZO DOSITAINER® is positioned

on the individual filling stations by fork truck and pneumatically fixed into place. A clever locking system with barcode ensures that each AZO DOSITAINER® ends up at the correct discharge base. Docking is accomplished by means of a patented sleeve. Even for dry good materials with poor flowing characteristics, a vibration discharge ensures reliable discharge and a constant filling ratio of the dosing

screw integrated into each AZO DOSITAINER® without drive or sensor. The frequency-controlled dosing screw drive is mounted in the discharge base so that even at very high throughputs, absolutely precise dosing in the following weighing process is accomplished. A locking device on the screw head prevents trickling. The AZO DOSITAINER® in round design with symmetric or asymmetric

outlet is extremely stable and has the best discharge characteristics.



Discharge bases for AZO DOSITAINER® with integrated drive



Linear arrangement of AZO DOSITAINERS®



Conversion of sacks into AZO DOSITAINERS®

## Your AZO advantages

- Unrivalled speed
- The utmost flexibility
- Easy to clean thanks to floor clearance
- Contamination free
- Highest precision
- Optimum line configuration
- Low carbon footprint production



Automatic weighing in AZO®ShuttleTainer

## AZO ShuttleDos® Super fast batch automation

When fully automatic recipe composition with numerous components in a closed system with strict line separation and avoidance of contamination is asked for, the AZO ShuttleDos® is in its element. 20 batches per hour with up to ten precisely weighed components in a weighing range from 100 grams to several hundred kilograms – this innovation from AZO is

predestined for such challenges. With the ShuttleDos®, fully automatic component dosing takes place in the mobile AZO® ShuttleTainer or AZO MIXTAINER®. These raw materials can be stored in silos, supplied in Big-Bags or in containers and/or added as goods from sacks via a feeding hopper. The storage bins are equipped with powerful discharge and dosing units. For high throughput

rates, each dosing station is equipped with its own scale. This system enables an optimal linear arrangement with separate areas for large, medium and small components. The decisive elements of this system are its mobile shuttles. While individual dosing processes are taking place, the shuttles transport other AZO®ShuttleTainers which have already been filled or need to be

brought to another dosing station onwards. This principle enormously raises cycle rates. The entire structure of the ShuttleDos® is without ground contact. Thus the fully automatic production area can be designed so unmanned operation is possible.



Transfer of an AZO MIXTAINER® in the dosing line



Highly accurate dosing in an AZO MIXTAINER®





## Your AZO advantages

- Automatic docking and undocking with no contamination
- Exact weighing results with scale isolation
- Reliable prevention of dust emission
- For universal use
- Low maintenance and easy to clean construction



Docking a AZO®ShuttleTainer

# AZO CleanDock® – dust-tight docking system, Contamination free and properly isolated weighing

With the AZO CleanDock®, AZO has succeeded in developing a low-cost docking system that combines two important functions in a single system: dust-tight docking and simultaneously scale isolation. This reliably prevents contamination by mixing different products. Both during the dosing process as well as during transport

of the containers, dust emission is a thing of the past. When undocked, the dosing device and the mobile hopper are tightly sealed off so that bulk material cannot become airborne into the atmosphere. A dust-tight connection is first established between both after the container is docked. A flexible system ensures that the scale is

isolated during the dosing and weighing process. All current dosing systems such as dosing screws, rotary feeders, vibrating chutes and the AZO DOSITAINER® can be used as dosing unit. The simple technological principle AZO CleanDock® is based on makes it a cost-effective solution even where a high number of

components are involved. Its clever construction also ensures that the AZO CleanDock® requires little maintenance and is easy to clean.



AZO CleanDock® with connection for one dosing unit



AZO CleanDock® with connection for two dosing units



1



2



3



4

AZO CleanDock® while connecting to a mobile container

# Always an economical solution – AZO, the No. 1 in mixer feeding

Whether bulk materials, ingredients in powder form, flavours, additives, minor components or liquids – reliable AZO supply and process control systems provide economical, fully automated mixer feeding and process automation for each. Here, the mixing process always determines the type of feeding – whether it be batch, continuous or hybrid process.

## Our plus points for you:

- Economical concept through competent, goal-oriented consultation on site.
- High process reliability through targeted analyses in our testing center
- Planning and implementation by experienced, engaged employees
- Own high quality production to secure your individual quality requirements
- High plant availability due to matured, proven control and operation concepts
- Up to date documentation
- Customer service from installation to commissioning up to After Sales by competent employees
- Wide process technology expertise thanks to synergies within the AZO Group

## Additional solutions for the full automation of your raw materials in the mixer feeding field



AZO vacuum weighing systems, the optimum solution for large and medium-sized components



AZO liquids handling



hsh – Process control and visualisation technology



zoatec – Batch vacuum processing plants



AZO GmbH + Co. KG  
D-74706 Osterburken  
Tel. +49 6291 92-0  
Fax +49 6291 92-9500  
info@azo.de  
www.azo.com

Additional members of the AZO Group:

hsh-systeme für prozess-IT gmbh  
www.hsh-systeme.com

zoatec GmbH  
www.zoatec.com