



Automatic handling of raw materials

receiving, feeding, converting, storing, filtering, indicating levels, discharging, dosing, conveying, weighing, emptying, filling, operating, controlling, monitoring, documenting

**from innovative single systems
to turnkey solutions**

...

The No. 1 in mixer feeding

AZO.[®]



AZO automates handling of large, medium and small components in granular, powder and liquid form

AZO is the specialist for automated handling of raw materials and of processes.

We provide everything as a single supplier – from the initial concept, from innovative individual components for storage, discharge, screening, conveying, dosing and weighing of raw materials right through to a turnkey solution, namely an entire plant ready for operation: **plant engineering and construction, process engineering and process IT dovetail seamlessly.**

Our success is based first and foremost on the **quality and reliability** of our solutions and the **accumulated experience of 65 years** in building automatic material handling systems.

The AZO Group provides support for successful companies all over the world in implementing innovative projects by using the technologies of the future and through its extensive network of production and sales companies.

Make sure you have that competitive edge with AZO's innovative and efficient concepts for automation!



**The AZO Group: three specialists with one goal:
to optimise your processes**

AZO SOLIDS is the expert for reliable storage, discharge, screening, conveying, dosing and weighing of raw materials within fully automated processes. From the major ingredient down to micro quantities, from the initial study concerning safety concepts and risk assessments through to the turnkey plant in its entirety: we combine what belongs together.

The right product in the right quantity –
at just the right time and in just the right place.

We are the world leader in feeding for mixing processes.
Automated handling of raw materials is our domain.
And has been for over 65 years!

AZO LIQUIDS is the expert when it comes to mixing, dispersing and homogenising liquid and semi-solid products. Whether you need planning and completion of projects, process design, engineering or maintenance and repair of existing plants: AZO LIQUIDS works alongside you to provide reliable support in every stage of the process.

AZO CONTROLS is the expert for innovative process IT in developing automation solutions in the production environment. From consulting to implementation, from sensor technology to the commercial production planning level: this is where we will provide you with reliable, joined-up solutions at each stage.



Solutions from AZO: sustainable and fully integrated

- **Extensive, individual consulting on site**

We allow plenty of time to advise our customers on an individual basis, since close contact helps us develop the best solutions for automating your processes. We listen carefully, think things through and plan ahead when we draw up sustainable concepts which will guarantee you a technological advantage. You will be accompanied throughout the entire project by one of our experienced sales staff together with AZO's project team.

- **Solution-oriented planning and design**

The goal is often achieved through various solutions. Choices such as whether to use batch or continuous systems, pneumatic conveying systems or container solutions are made depending

on your particular process. For, only when we examine your requirements closely, are we able to reach an efficient, fully integrated solution, which conforms 100% with your expectations.

- **Extensive know-how and synergies**

In the food and pharmaceuticals sectors and in the plastics and chemical industries, AZO is known throughout the world for its extremely reliable, well-engineered and energy-efficient automatic materials handling systems. Extensive know-how, decades of experience in different business sectors and active involvement in international bodies deliver synergy effects that all customers profit from.



- **Innovative AZO technology centre**

The AZO technology centre makes it possible to conduct conclusive tests for critical processing steps and, in close collaboration with our bulk materials lab, it improves reliability when designing the plants.

- **State-of-the-art production technologies**

State-of-the-art production technologies allow us to achieve a high-standard of design, dimensional accuracy and ensure excellent quality. This is how we deliver long-lasting process units that offer maximum availability and that satisfy our clients' requirements.

- **After-sales service, setting the benchmark**

Our after-sales service is provided by a team of permanent staff who have been trained to supervise assembly and installation. They work all over the world and ensure that our high-tech plants are tailored to fit factory buildings and are integrated perfectly into existing production processes. After commissioning, you will be able to depend on AZO's customer service at any time thanks to remote diagnosis and maintenance. At AZO our after-sales department is staffed by experienced experts who provide rapid assistance without red tape and using state-of-the-art document management systems. This guarantees fast delivery of spare and wearing parts.



Innovative AZO technology centre

Every year, around 250 tests are conducted with customers' products and analysed in detail in the AZO technology centre. The resulting data are carefully processed and supplied to our clients. The results from the tests are incorporated directly into application-oriented development of machinery and plant systems for handling bulk materials.

The bulk materials lab, which is attached to the AZO technical centre, has the very best in equipment and conducts the following measurements:

- bulk density / packed density
- sieve analysis to determine particle size distribution
- shear tests / dynamic flow energy

- measurement of fine fraction / moisture content
- analysis of various climate conditions on bulk materials
- microscopic investigation of bulk materials

All the results obtained in the AZO technical centre and the bulk materials lab are recorded and documented accurately in AZO's bulk materials database. This allows us permanent access to the most recent data. The conveying, dosing and screening tests are conducted under real-life conditions. The tests and the results from the lab are linked with the customer projects in the database. By using product, test and project data, this allows AZO to guarantee the optimum design to match the client's specific brief.



Handling of large and medium components with pneumatic conveying systems

Large components in dry or liquid form are mostly delivered in bulk tankers or tank trucks and stored in indoor or outdoor silos.

Generally, **medium components** are delivered in sacks or big bags, **liquids** are usually delivered in containers or barrels.

Dust-like, powdery or granular products are transferred into the closed system using feeding hoppers and big bag discharge bases. Intelligent docking systems and high-performance aspiration systems help prevent generation of harmful and hazardous dust.

AZO cyclone screeners prevent any contaminants from entering production. **AZO vacuum weighing systems** that generate a minimum of dust are used for conveying and feeding wherever possible.

They perform three functions in one operation: the ingredients are **conveyed, dosed and weighed precisely at the same time**. This method allows for a high degree of accuracy even with large throughputs. The horizontal flow of material means that many components can be transported to mixers or other processing operations while saving space and height.

In the case of liquids, **AZO liquid weighing systems** are used that operate according to the gain-in-weight or loss-in-weight method, depending on the process.



Handling of large, medium and small components with AZO container systems

Container systems are primarily used when the requirement is for batch preparation free of contamination and with strict separation of lines. Generally, the raw materials are delivered in containers, big bags or sacks and introduced into the system using appropriate discharge systems.

The innovative **AZO®ShuttleDos** ensures that a **large number of components and recipes** are supplied in fully automated processes at high throughputs and free of contamination. The raised system is extremely easy-to-clean and is very energy-efficient to run.

CleanDock® provides a docking system that combines two important functions: dust-free docking with simultaneous decoupling of the scales. Even when the container has been disconnected, it always remains sealed thanks to the **CleanDock®** passive element. This reliably prevents contamination through product entrainment of different raw materials.

By taking the **DosiBox®** as basis, individual concepts with different degrees of automation can be implemented with the **AZO DOSINENTER®** ranging from automatic dosing of components through to fully automated component logistics.



The **AZO COMPONENTER®** is a time-tested system with numerous variations for automatic weighing to the exact gram of **small and micro quantities**, as is often the case when feeding mixers. It is in use in over 650 plants worldwide.

The **circular AZO COMPONENTER®** is the most affordable solution when there is a limited number of components. Weighing in parallel allows a high batch figure to be reached and it is also possible to feed several mixing lines.

If a large number of components are being processed automatically, we recommend planning a **linear design for the AZO COMPONENTER®**. Automatic weighing of batches is carried out into mobile scales or directly into containers, which are placed on mobile floor scales.

It is also possible to design transport using **automatic guided vehicles**. Other systems are available depending on the requirements.

Efficient solutions for **small components that have to be changed over frequently** can be obtained using the **DosiBox®** and the **DOSITAINERS®**. Short retooling times, a compact design and ease of cleaning are crucial factors here. The integrated screw feeders allow extremely precise, automatic access to the contents.

All AZO systems for handling small components deliver consistently high product quality, eliminate contamination and incorrect dosing, accurate measurement repeatability and reliable batch tracing.



Safe handling of micro quantities

Small is beautiful! Micro quantities often play a crucial role in recipes. However, a fully automated system is not worthwhile in many cases.

ManDos is the perfect solution. With this system, which **guides the operator, micro quantities are weighed accurately, added to the recipes** or fed directly into downstream processing steps – mainly mixing processes. Incorrect dosages are therefore a thing of the past.

The weighing process is integrated into the overall control system, it is documented by ManDos, thereby allowing traceability.

When combined with an automatic small components storage system, it is possible to achieve a level of automation that is unrivalled when it comes to manual weighing.





Flexible filling of containers

After the mixing process, the batches are fed carefully and without segregation to downstream processing and filling using systems that are chosen for feeding precisely these mixtures. For example, these may be bagging lines, big bag filling equipment or systems for loading bulk tankers and packaging machines.

Both **volumetric and gravimetric systems** are available for filling **big bags**. Whether floor scales, upstream scales or scales integrated into the suspension, we provide the optimum solution for every requirement.

Semi-automatic systems for **hygienic filling of big bags with reduced oxygen** mean that products will keep longer. This also allows for longer transport times for delicate goods in big bags.



Accumulated expertise for mixing processes

Thanks to cooperation with different manufacturers, which conform to AZO's level of quality and standards, **the AZO Group can cover the entire value chain relating to all aspects of automation of raw materials, both as regards bulk materials and liquid and semi-solid processes.** This avoids problems at the interfaces of process engineering and system control, **guaranteeing smooth operation.** Process engineering is mainly involved in the mixing processes, apart

from procedures such as milling, drying, cooling and filling.

The quality of each mixture is primarily determined by supplying the correct raw materials in the right composition at the right time.

Depending on the operation and the raw materials involved, very different systems are used in mixing processes.

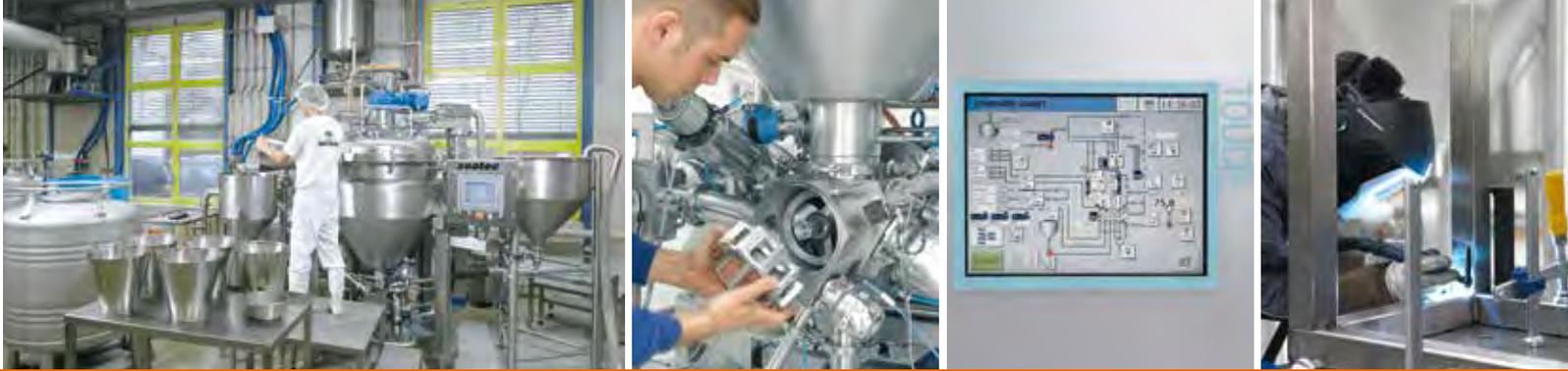
AZO is the specialist and the number 1 for mixer feeding in batch or continuous operation:

AZO®Food: kneading machines, vertical and horizontal mixers, agitators, extruders, continuous kneading machines

AZO®Vital: vertical and horizontal mixers, container mixing systems, batching tanks, reactors

AZO®Chem: vertical and horizontal mixers, kneading machines, dissolvers, reactors, continuous mixers

AZO®Poly: vertical and horizontal mixers, primarily heater/cooler mixers, extruders, dissolvers



Mixing, dispersing and homogenising: Innovative solutions for your liquid and semi-solid processes

Decades of experience went into developing the new generation of AZO LIQUIDS batch vacuum processing plants, zoatec® BG type, for liquid and semi-solid products with fully automatic feeding of raw materials.

The AZO LIQUIDS portfolio for the pharmaceuticals, cosmetics, food and chemical industries includes construction of batch vacuum processing plants, zoatec® BG type, in various sizes as scale-up, in addition to bespoke solutions.

The properties of your products that are relevant for the processes are tested in the customer process centre, with you in attendance upon request. This is how innovative solutions are created for the manufacture of creams, ointments, gels, emulsions, toothpaste, mayonnaise, sauces, dressings, ketchup, relish and much more.

If you require, AZO LIQUIDS will also help you in process design and on other issues concerning your plant.



Converting>
Feeding hoppers for sacks
 For feeding dust-like, powdery and granular bulk materials

Discharging>
Emptying and docking systems for big bags For optimum discharge of big bags in closed, automatic materials handling systems

Indicators>
Level indicators
 For constant monitoring and indicating levels in silos, hoppers, etc.

Discharging>
Vibration bottoms
 For safe discharge of powdery, crystalline, fatty and granular bulk materials

Discharging>
Aeration floor
 For safe discharge of powdery bulk solids which can be fluidised

Innovative individual machines and systems ●●●

Dosing>
Screw feeders
 For continuous or non-continuous conveying and dosing of bulk solids in conveying lines, scales, etc.

Feeding>
Conveyors and handling systems For feeding processing machines with powdery, crystalline and granular bulk solids

Conveying>
Filters, receivers
 For feeding of processing machines with low attrition of materials using pneumatic conveying systems

Transporting>
DosiBox® For automating small components, which have to be changed over frequently and which are delivered in barrels, big bags and sacks

Transporting>
AZO DOSITAINER® Storage bins with integrated screw feeder for components that have to be changed over frequently, with average throughputs





Screening>
Cyclone screeners
 For control screening and deagglomeration of lumps in bulk materials



Screening>
Cyclone screeners
Type FLF for liquids
 For continuous elimination of solid matter from liquids



Crushing>
Lump breakers
 For crushing and breaking up bulk materials which have a tendency to agglomerate, to form lumps and to cake



Dosing>
AZODOS® dosing units
 For continuous gravimetric dosing of powdery products in weighing and processing



Dosing>
Dosing rotary valves
 For dosing or shutting hopper outlets for dust-like, powdery and granular bulk materials

for automated handling of raw materials

Transporting>
AZO BATCHTAINER®
 Transport and storage hoppers for medium throughputs



Filling>
Big bag filling lines
 For volumetric or gravimetric filling of big bags



Filling>
Filling lines for sacks
 For filling of sacks with bulk solids without generating dust



Filling>
Filling lines for boxes
 For straightforward filling of boxes with bulk materials



Filling>
Loading systems for bulk tankers
 For safe filling of bulk tankers





AZO® Food



AZO® Vital



AZO® Chem



AZO® Poly

AZO has specialised in four business sectors:

AZO®Food, AZO®Vital, AZO®Chem, AZO®Poly.

Each division derives mutual benefits from the others.

Innovations are shared, synergies are exploited.

Technology transfer is the norm.

Whenever your need is for: maximum safety and hygiene, high product quality, accurate weighing and dosing in fully automatic production lines, high throughputs, full documentation and batch tracing, extreme ease of cleaning, sturdy construction, uninterrupted

plant availability, continuous monitoring of processes, sustainability and energy efficiency. **Your priorities will be our priorities.**

Thanks to its experience in the food, pharmaceuticals, chemicals and plastics sectors with their varying requirements, AZO has very extensive knowledge of the fundamentals in the field of raw materials handling.

- AZO®Food:**
- ready meals
 - baked goods
 - baking agents/mixes
 - spices/aromas
 - pet food

- AZO®Vital:**
- pharmaceuticals
 - dairy products
 - beverages
 - confectionery
 - luxury foodstuffs

- AZO®Chem:**
- hygiene/cosmetics
 - paints/varnishes/building chemicals
 - cleaning agents/preservatives
 - fine chemicals/end products
 - basic chemicals

- AZO®Poly:**
- PVC dry blend/extrusion
 - compounding/refining
 - PVC paste preparation
 - additives/master batches
 - polymer processing



AZO®Service

Bespoke AZO®Service ensures that your production processes will run smoothly for the entire life of your automatic materials handling systems.

Our range of services:

- well-qualified, experienced service staff
- new installation of AZO materials handling systems
- induction training and instruction
- on-site monitoring of production
- documentation for spare parts
- preventive inspection and maintenance
- service hotline
- maintenance and inspection contracts
- original spare parts
- in-house service inventory
- global on-site service
- repairs service
- retrofit, revamp and relocation of existing plants



Intelligent process control, instrumentation and visualisation technology for automated production processes

For over 35 years, AZO CONTROLS, as a full-service provider for automation, has delivered innovative solutions in the production environment for the entire value chain.

For you as our customer, this means:
end-to-end solutions from a single supplier –
single point of contact,
few interfaces,
greater efficiency

Well-trained staff from a wide variety of specialist fields, who offer extensive experience, in-depth knowledge of products and process-oriented approaches resulting in the ideal combination of innovation and reliability.

AZO CONTROLS acts as a partner for many renowned companies and, in addition to its own developments, it offers solutions that are based on tools that are available commercially.

With sites all over the world, AZO CONTROLS is never far away from you.



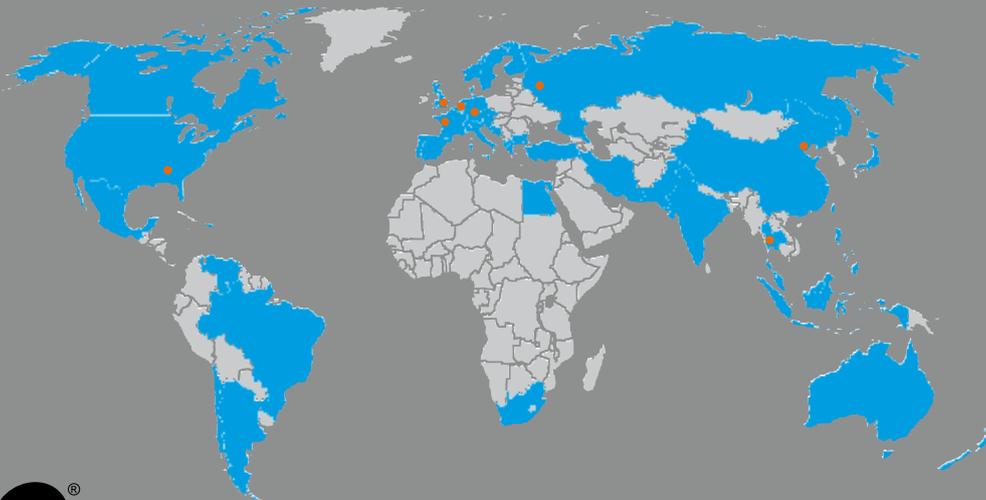
A summary of the AZO CONTROLS portfolio

- process control systems with extensive controls for recipes and production
- process-oriented production controls, both central and decentralised, and user-friendly process visualisation
- operator-guided manual weighing (ManDos) with barcode identification and labelling for quality assurance, especially in manual operations
- batch tracking and tracing – fully documented and transparent from start to finish throughout the entire production process
- integrated management functions (MES), such as:
 - detailed order planning
 - determining KPIs
 - data exchange with ERP systems
 - planning of materials
 - archiving of historic data
- plant design and operation on the basis of networked digital models – from process simulation to the digital factory
- expert advice and services, such as software training from pharmaceutical aspects
- Extensive range of services:
 - 24h hotline
 - maintenance contracts
 - remote service for online troubleshooting
 - maintenance during ongoing operation
- retrofit, revamp and modernisation of existing automation systems
- planning and construction of switchgear for use worldwide (e.g. IEC, UL, CSA)

Local to you, throughout the world ●●●

In an era of globalisation and standardisation of plant concepts in global companies, **sales offices** and **service affiliates** all over the world ensure that our international customers are given expert advice and assistance that are relevant to their markets.

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