

POWER OF POWDER TECHNOLOGY



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POWER OF POWDER TECHNOLOGY
TSUKASA

Power of powder Technology

**Merging "powders" into technologies,
we will create new value that contributes
to customers and society.**

From familiar products which include food and medicine, to cutting-edge fields like electronics and rockets. As a leading company in powder technologies, TSUKASA aims to provide new value for a wide range of markets. Never satisfied with the status quo, we are always placing our efforts towards persistent technical innovations. Offering multi-function powder devices that innovate production processes and designing plants with artistic quality, we, together with customers, seek to create new value to open the way to the future.



Tsukasa's strengths come from the integration of the creative engineers who possess advanced powder technologies, and the unrivaled technicians with sheet-metal and machining skills. By firmly combining customers' needs with the craftsmanship of TSUKASA INDUSTRY cultivated since its establishment, we promise to create new products and services that will be appreciated not only in Japan but all over the world. Our corporate vision is a commitment to all stake holders, including customers, shareholders, and employees.

A Diverse Lineup of Machines Covering a Whole Plant

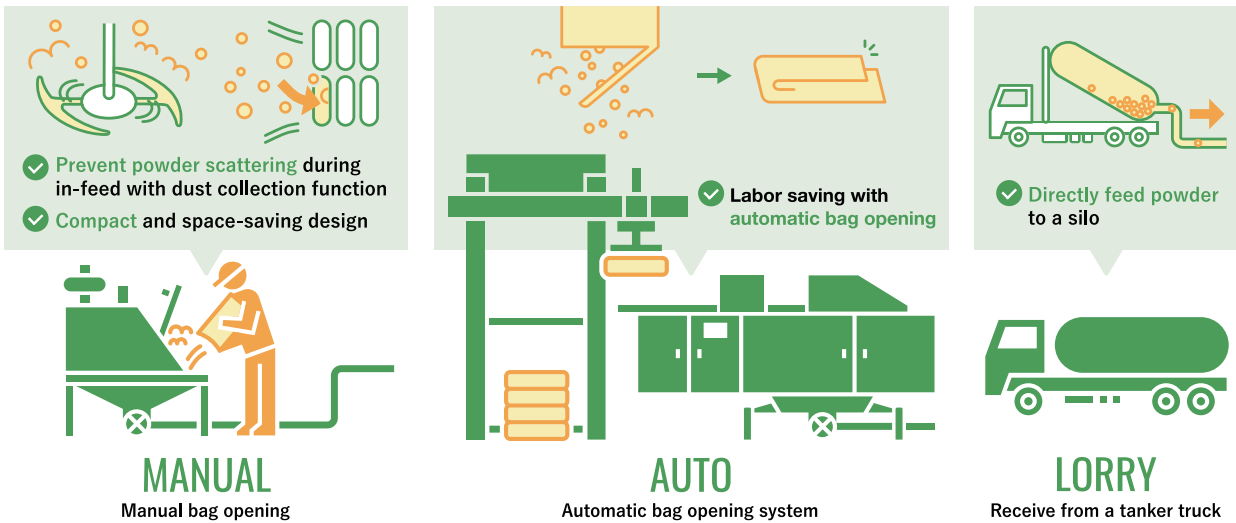
In food plants, there are many processes including material receiving, powder feeding, weighing, dust collecting, crushing, milling, mixing and drying. Each of them plays a part, and all of them function as a whole. TSUKASA provides a variety of powder devices that come with our unique technologies. Each of our devices has superior performance, and thanks to our advanced engineering, they can be arranged in appropriate places and function suitably, making the whole plant operate in harmony as a system and carrying it to its full potential. TSUKASA meets the various needs of customers in food plants.



	Material Receiving and Powder Feeding Process	5
	Weighing Process	7
	Storage Process	9
	Dust Collecting Process	11
	Mixing Process	13
	Sifting and Foreign-material Removal Process	15
	Crushing and Milling Process	17
	Drying and Controlling Temperature Process	19
	Handling Process	21
	Valves and Piping Parts	23
	Maintenance response(CS center)	24
	Traceability System	25
	As a system integrator	26
DX	TSUKASA DX	27
	Case Examples	29
	Testing Environment	33
	Website	34

Material Receiving and Powder Feeding Process

Achieved Speedy and efficient reception and supply of materials



There are many types of powder material receptions, but they can be roughly divided to three types: paper bags, flexible containers, tanker trucks. For each type, materials are received automatically or manually, and conveyed to the next process.

Automatic bag-opening equipment

The automatic bag-opening equipment opens material bags received as paper bags, and conveys the materials to the next process. We can offer "Depalletizer Robo" which lifts up and transfers paper bags stacked on a pallet, and "PowOpener" which takes out powder inside paper bags and automatically folds and discharges empty bags.



Flexible container bag opening equipment

This is a bag opening equipment for flexible containers. It has a built-in dust collector, so it can prevent dust from scattering and keep working space clean. There are two types of the equipment: "stock model" and "small hopper model".



Manual in-feed equipment

With this equipment manually open bags and feed materials. Its built-in dust collector prevents powder scattering during in-feed and also improves material yield.



Product



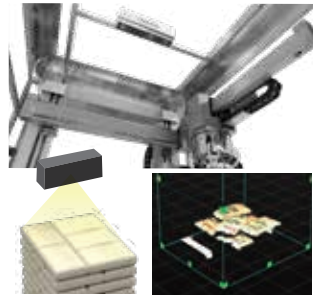
Automatic bag opening System

A system with functions including bag feeding, bag opening, and foreign material removal.



Depalletizer Robo (Articulated robot specifications)

Adoption of an articulated robot enables material transfer from multiple pallets



Depalletizer Robo PV(PowVision)

During supplying raw material bags to the automatic opening system, the position, height and orientation of the bags on a pallet are accurately recognized by the 3D vision camera



PowOpener Disassembly Washing Type

Automatic bag opening equipment for frequent cleaning and hygiene



Pow Breaker (Solidified powder crusher)

Coarse crushing of raw materials in the paper bag solves the problem of conveyance



PV Checker

Captures a design of the bag surface with a camera and determines whether the material is correct or not. By incorporating PV Checker into the Automatic Bag-opening Systems, it prevent erroneous feeding of powder raw materials.



FleconOpener Stock Model

Bag-opening equipment for flexible container bags which can deal with powder that easily scatters
Small hopper type for grain is also on the lined up



Dumping Server and LINESIFTER Integrated Model

Manual in-feed equipment that can remove foreign materials and crush material clumps at the same time
Hopper type is also on the line-up

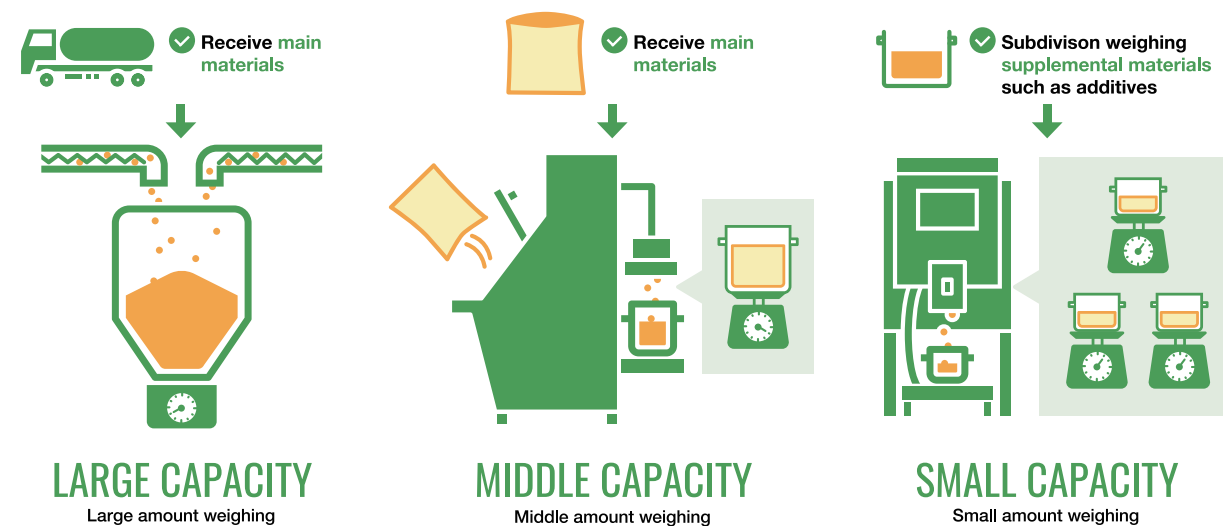


Dumping Server Premixing Model

Manual in-feed equipment for pre-mixing materials with four paddles

Weighing Process

Precisely weigh large amount of main materials and small amount of additives



A process for weighing materials in stock. Weighs necessary amount in accordance with recipes before processing (mixing, kneading, melting, etc.) various materials. Furthermore, we offer equipment which divides and weighs processed (mixed, etc.) powder as a regular product or intermediate product. It can handle various patterns such as weighing small amount of secondary materials or additives which are small enough to be carried by hands, and large amount of main materials.

Weighing equipment

We can offer products optimal for your purposes, including "Divider Scale (automatic dividing and weighing equipment)" which combines functions such as dust collecting, sieving, and magnetic foreign matter removal with weighing functions, and the Hopper Model "PowScale" for a large amount of main materials.



Control system

This is a control system for easy precise weighing with a touch panel. Synchronization with the traceability system "PowTrace" makes it possible to communicate recipes and production instructions, record weighing history, and the like.



Product



Divider Scale Dumping Model (200L)

Weighing equipment which supplies materials with manual feeding and divides stocked materials



Divider Scale Dumping Model (300L)

Weighing equipment which supplies materials with manual feeding and divides stocked materials



Divider Scale Simple

Automatic dividing/weighing equipment appropriate for measuring and dividing supplemental materials and additives



Divider Scale Receiver Model

Weighing equipment which stocks and automatically supplies materials conveyed with air



Divider Scale Equipment-mounted Model

Weighing equipment attachable to the discharge port of a silo or mixer



Divider Scale Terminal Detachable Model

Automatic dividing and weighing equipment that can handle multiple raw materials using a stocker detachable model



Divider Scale Simple (Combination Model)

Automatic dividing/weighing equipment which can automatically weigh a wide variety of materials



PowScale Mobile Robot

Automated processes by AMR with weighing function: Raw material weighing → conveyance

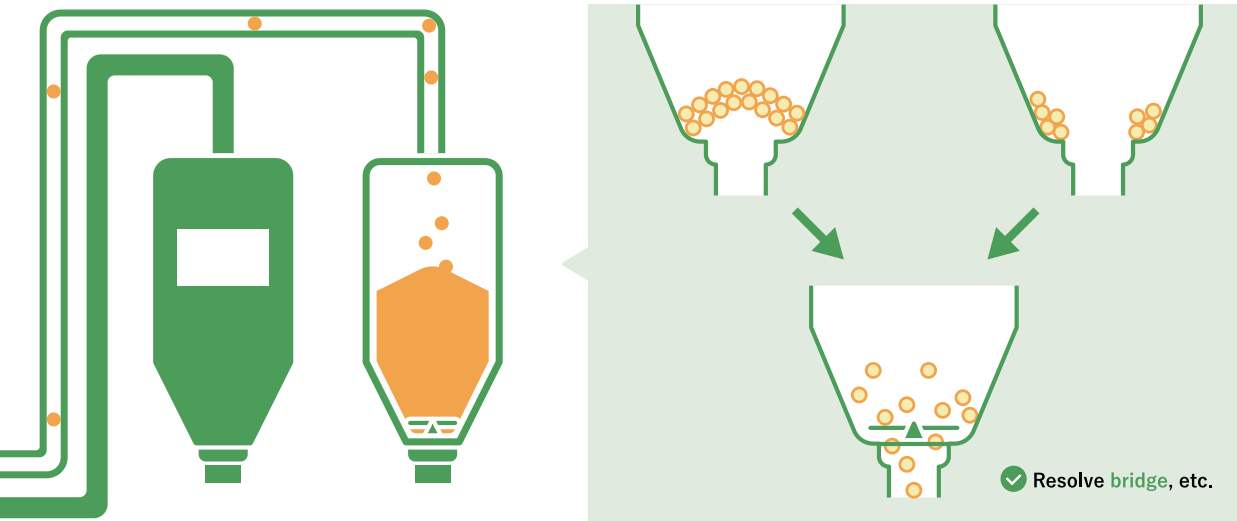


PowScale Hopper Model

Hopper model weighing equipment with a simple and efficient design

Storage Process

We propose optimal stock and discharge methods depending on the material and process.



This process stores received materials, processed intermediate products and regular products, in production processes. TSUKASA's storage process equipment makes it possible to do stable continuous discharge of powder and maintains product quality.

Storage tank equipment

PowSilo

Small-size tanks of some hundred kilograms for indoor installation to large-size silos that receive a large amount of power from tanker trucks can be manufactured according to usage.



Discharge equipment

This is discharge equipment installed under the silo. Depending on the purpose, we can also offer "Table Feeder" which prevents bridging problem and "PowDischarger" which can perform stable, continuous discharge using vibration.



Product



PowSilo

Storage tank equipment for a wide range of use conditions, from small tanks to large silos



PowSilo Fabric Model

High safety fabric silo that conforms to the positive list of the Food Sanitation Act



Table Feeder

Anti-bridge discharge equipment to install under a silo.



PowDischarger

Vibration type discharge equipment installed under the silo.



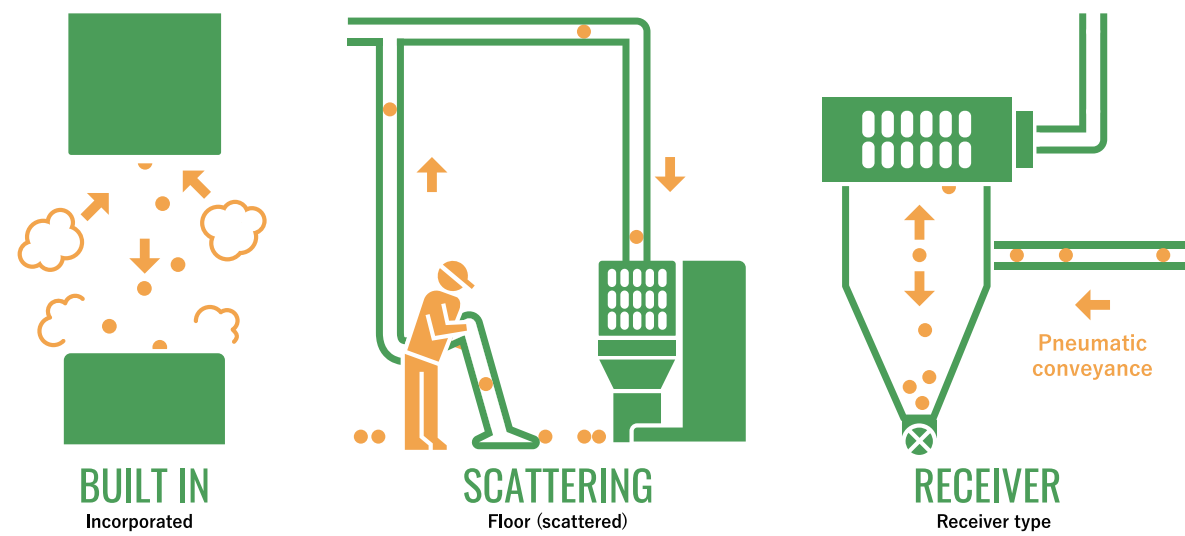
PowSilo (Large Outdoor)



PowSilo (Large Indoor)

Dust Collecting Process

Achieved high efficiency in dust collection and space-saving



This process separates powder and air on the material receiving side during pneumatic conveyance and collects scattering powder. In TSUKASA's dust collectors, space saving feature and high efficiency in dust collection are realized with elliptical retainer and envelope-type filter fabric (bug filter).

Dust Collector

A workplace that handles powder needs a dust collector in various scenes. We can offer products tailored to a wide variety of purposes, including the "Built-in Model" which can be incorporated into devices such as a tank, or a dust collector that functions as a receiver from pneumatic conveyance.



Product



PowFilter Built-in Model

Dust collectors which can be incorporated directly into equipment including tanks



PowFilter Receiver Model

Dust collector used as a receiver from pneumatic conveyance



PowFilter Compact Model

Usable for a wide variety of uses as a general-purpose small dust collector



PowFilter Central Cleaner Type

Can collect dust on several floors through piping from the main dust collector

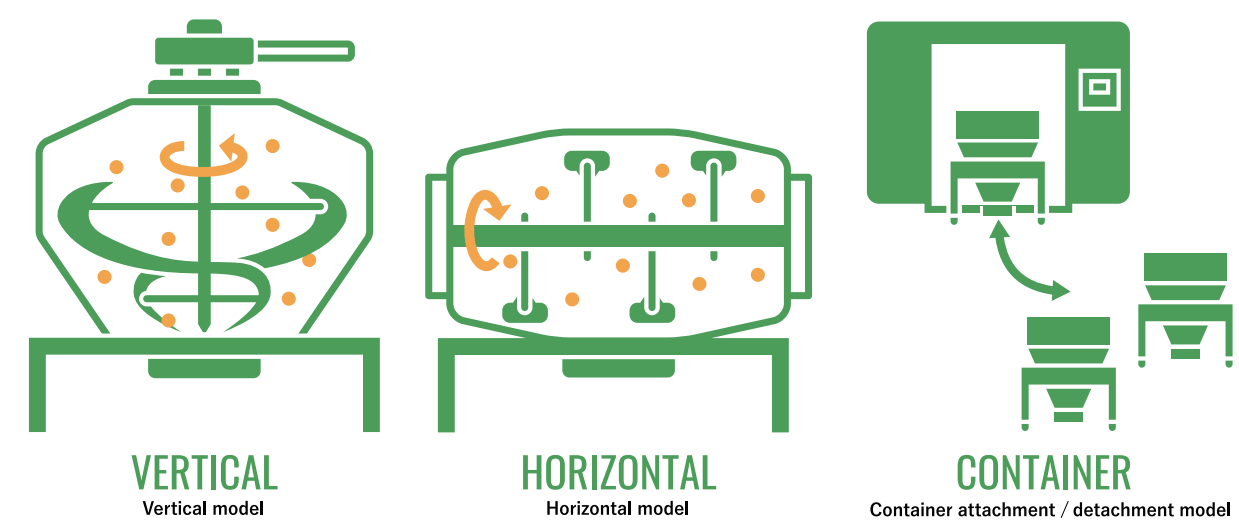


Suction Model

Medium- or large-sized filters for centralized dust collection

Mixing Process

Quick mixing is possible with the special shape unique to TSUKASA.



This process mixes powder materials. In order to mix several types of powder into an uniform state, you need to select a mixing method appropriate for characteristics of the powder. TSUKASA proposes mixing process equipment suitable for a wide variety of powder materials.

Mixer

We can offer two types of mixers: "PowMixer" which can mix powder and granular materials, and "Batter Mixer" for mixing powder and liquid. We propose a mixer optimal for your materials and purposes.



Product



PowMixer Conical & Horizontal Model
Paddle mixer for mixing materials with high accuracy in a short period of time



PowMixer Conical & Vertical Model
Mixer with little adhesion to paddles, achieving soft mixing



PowMixer Rotary Model Container Detachable System
Detachable containers can be used for mixing, transportation, and storage



PowMixer Cross-rotary Model
Mixer with for dispersion and uniform mixing of small and very small quantities



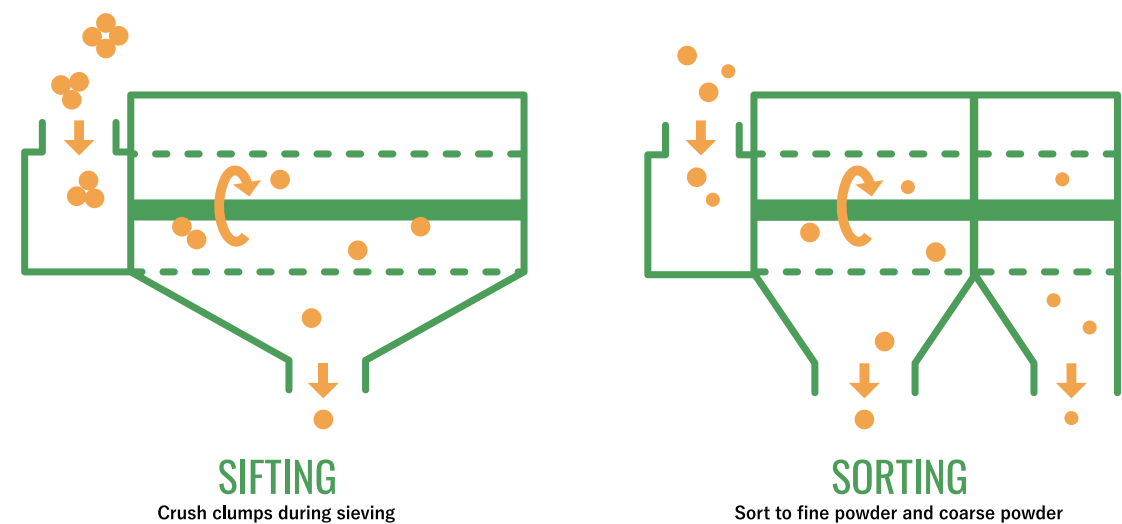
PowMixer Cross-rotary Model Laboratory Specifications
Small cross rotary mixer suitable for experiments and research



Batter Mixer
Batter manufacturing mixer for mixing powder and liquid

Sifting and Foreign-material Removal Process

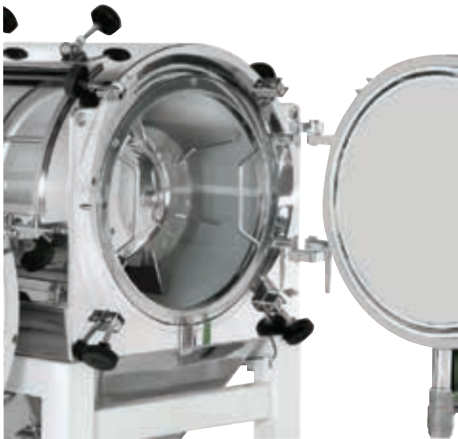
Performs efficient sieving and foreign material removal.



The process sifts after receiving products or after processing (mixing, etc.), removes foreign metal objects such as iron using magnets, and sorts grain sizes.

Sifter

The sifters realize low-noise and highly-efficient sifting by adopting the cylindrical-sieve (net) internal stirring system. We can offer a wide range of lineup for various purposes.



Foreign material removal equipment

This is foreign material removal equipment which can be installed in the pneumatic conveyance line, etc. Products with a magnet function can remove magnetic foreign matters.



Product



LINESIFTER® Standard Model

In-line model sifter installed in the pneumatic conveyance line



PowSifter Standard Model

In-line model sifter which is installed in chute conveyance lines



PowSifter Special Specification Example

Special specifications optimal for researching, developing and prototyping medical products and food materials



PowSifter Special Specification Example

Easiness to clean and visibility of the inside of the equipment improved by adding a side inspection port



PowMagnet Inline Model

Magnetic foreign matter removal device which can be installed in the pneumatic conveyance line, etc.



PowMagnet Rotary Model

Magnetic foreign matter removal device which can deal with highly adhesive powder



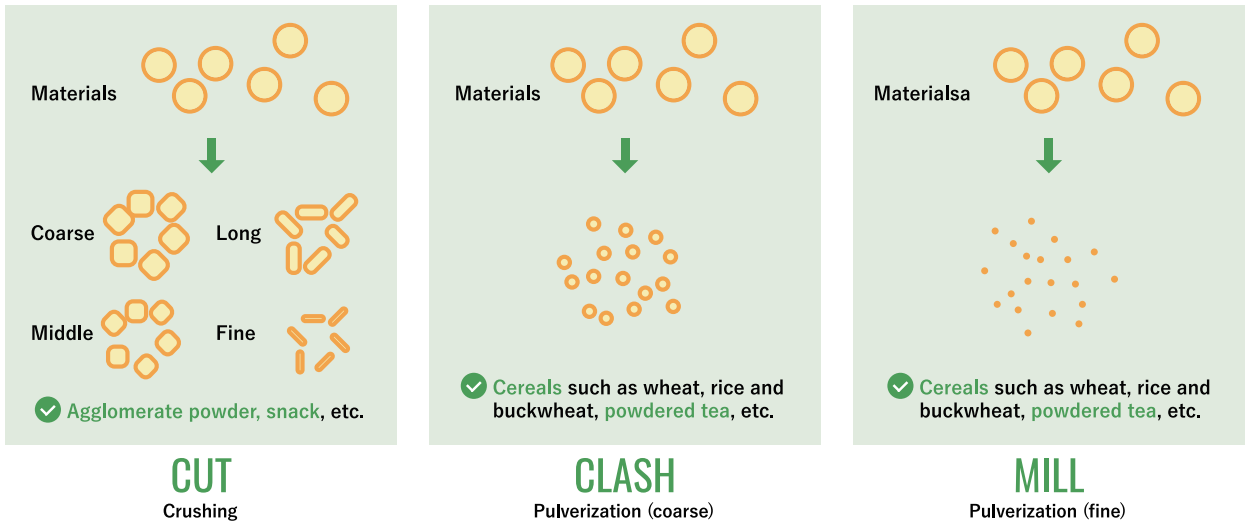
Magnet Spout

Magnetic foreign matter removal device which can be installed in chute conveyance pipes



Magnetic foreign matter removal device which can be installed at the inspection port of chute conveyance pipes

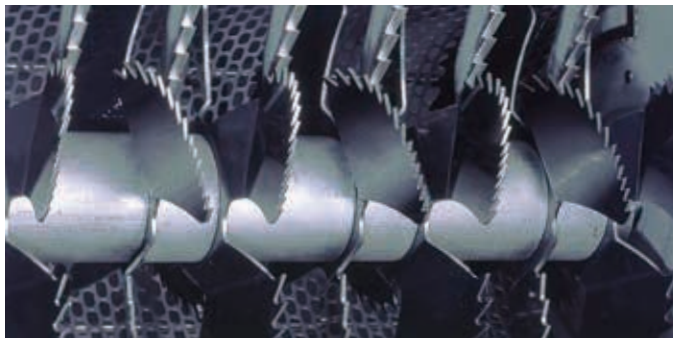
We propose equipment optimal for purposes and materials.



This process roughly crushes large materials such as bread and biscuits (crushing) and makes powder diameters of materials (sugar, salt, etc.) small (pulverization). We can handle various purposes from ultra-fine pulverization (microns) to coarse crushing (millimeters).

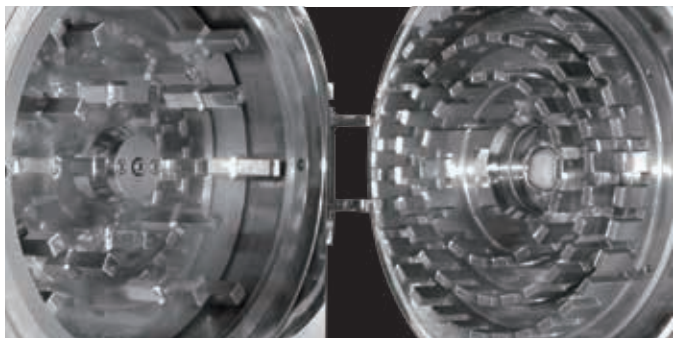
Crushing equipment

We can offer crushing equipment which can handle crushing of various grain sizes and shapes by changing screens.



Mill

We offer a wide variety of lineup depending on the material and purpose, including Line Mill, which can be installed in the pneumatic conveyance line, Wave Mill, which can perform highly accurate grinding, PowJet, which can handle fine pulverization.



Product

PowCutter

Crusher for handling materials with a wide variety of grain sizes and shapes

PowCrusher

Crusher optimal for crushing powder clumps and snack

Line Mill

Mill for easy adjustment of grain sizes

Wave Mill Horizontal Model

Pneumatic mill with high capacity

Wave Mill Vertical Model

Pneumatic mill for highly accurate fine pulverization

PowJet Horizontal Model

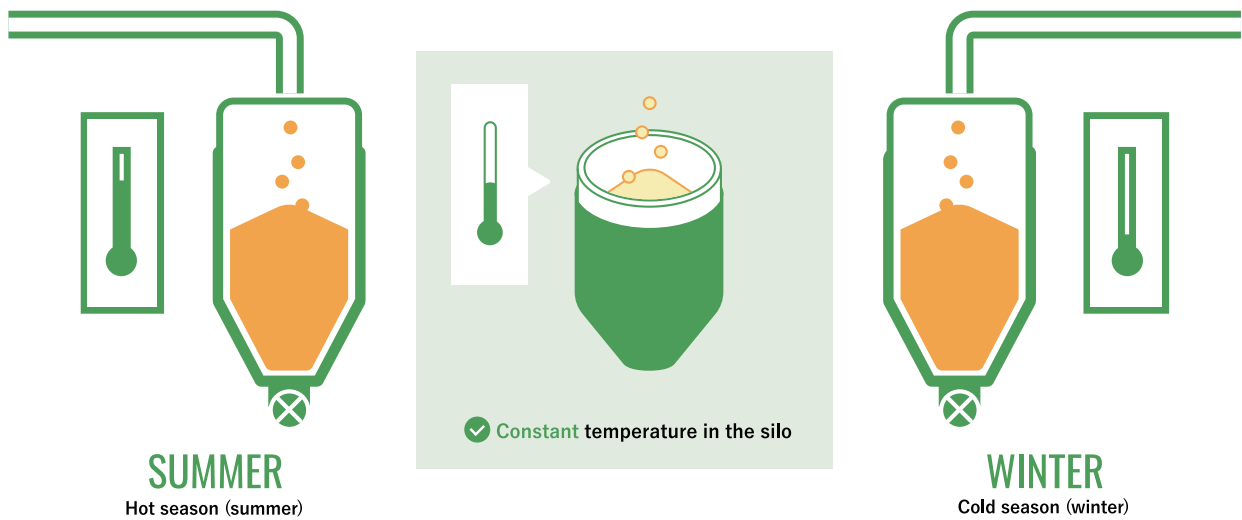
Dry mill using high performance, high capacity air current energy

PowJet Vertical Model

Dry mill using air current energy for highly accurate fine pulverization

Drying and Controlling Temperature Process

Drying and temperature adjustment for stable quality throughout the year



The drying process removes water content in powder with hot air. The temperature adjustment process performs cooling in summer and heating in winter in an efficient manner and adjusts powder temperature, stabilizing quality in later processes throughout the year. Capable of adjusting temperature arbitrarily depending on characteristics of raw materials and dough manufacturing processes.

Powder temperature adjustment equipment

PowConditioner

This equipment adjusts temperature of powder materials. It performs cooling in summer and heating in winter. Mixing function enables pre-mixing of raw material simultaneously with temperature adjustment.



Dryer

PowDryer

This is a compact fluidized dryer integrated with a dust collector (PowFilter built-in model). It removes water content in powder with hot air.



Product



Conical Horizontal Model
Air-blending System

Conical Vertical Model
Jacket System

PowConditioner

Powder temperature adjuster for enables pre-mixing of raw material at the same time of warming or cooling.



PowConditioner CHB type(Vacuum rapid cooling system)

Vacuum rapid cooling system implements high efficient cooling

The technology for this product has been licensed to Sodick Co., Ltd.

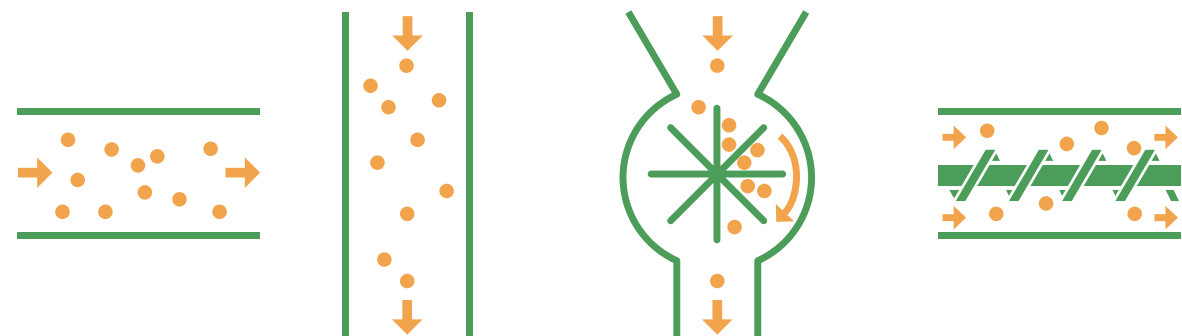


PowDryer

Compact fluidized dryer integrated with a dust collector

Handling Process

Constant conveyance and constant supply, realizing stable discharge



AIR
Pneumatic conveyance

CHUTE
Chute conveyance

HANDLING
Constant discharge

SCREW
Screw

This process conveys powder to the next process by means of pneumatic conveyance, chute conveyance by self-weight fall, or horizontal conveyance by Screw Feeder etc. Quantitative conveyance/quantitative feeding and stable discharge are possible, and the equipment also responds to the bridging problem during discharge.

Constant supply equipment

This equipment conveys powder the with air and supplies powder in a constant amount. It is sometimes called a rotary feeder in general.



Conveyance equipment

This equipment conveys powder (food, chemical products, medical products, etc.) in high density by using air.



Product



PowRotor Light-weight Sanitary Specifications
Constant discharge device manufactured with our unique precision sheet metal processing



PowRotor Light-weight, Blow-through, Sanitary Specifications
Constant discharge device which functions exclusively as the feed source for pneumatic conveyance



PowRotor FC model
Quantitative discharge equipment that allows the rotor to be washed on the spot



PowRotor FCH model
Lightweight quantitative discharge equipment that allows the rotor to be removed without tools



Rotary Valve Quantitative Discharge Model
Constant discharge device for places with no vertical pressure differences



Rotary Valve Air-lock Model
Constant discharge device under a receiver or cyclone in pneumatic conveyance



Rotary Valve Cyclone Direct-coupled Model
Special model directly connected to a cyclone for suction-type pneumatic conveyance



Screw Feeder
Feeder optimal for the constant supply of materials



Pulse Feeder
Conveyance device optimal for conveying fragile powder such as granulation products

Valves and piping parts

A wide variety of valve and piping parts that have superior compatibility

As for the Pneumatic parts and Dacton parts of the TSUKASA, all items are standardized and are products superior in compatibility. In addition, putting on and taking off is easy and can shorten maintenance management and term of works by assembling mechanism in one-touch.



Pneumatic Parts

These parts are used for pneumatic conveyance piping.



Dacton Parts

These parts are used for chute conveyance piping.



Two-way Valves

These parts switch the powder flow direction with a damper, and changes destinations.



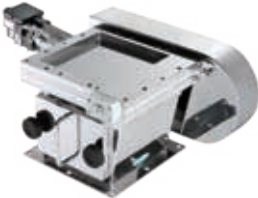
Multi-directional Distributor

This parts distribute powder to discharge ports if there are a multiple number of them.



Powder Slide Gate

This slide gate is for powder. We offer the motor type and manual type.



Powder Flap Gate

This flap gate is installed in the discharge port of dust collectors, bottom of cyclones, tanks, bottom of silos, screw feeders, mixers, etc.



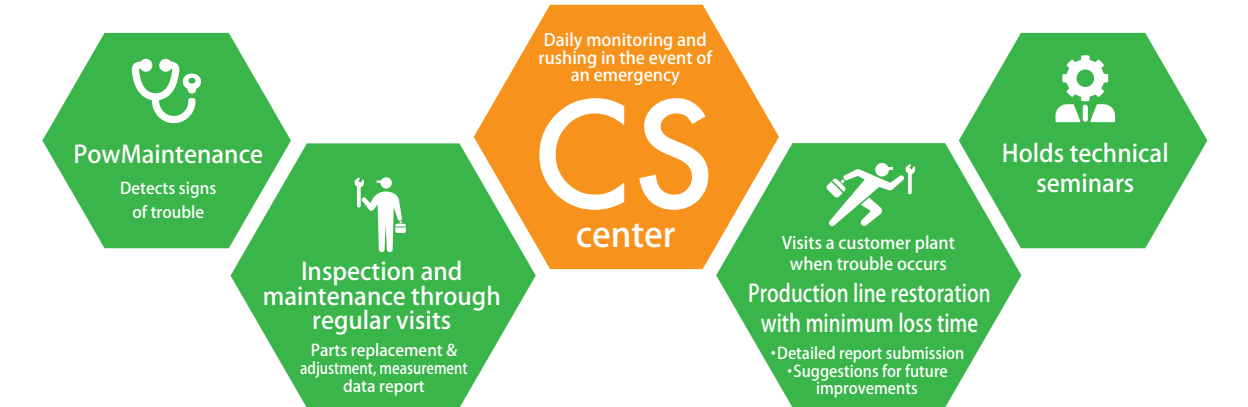
Sampling Equipment

This is a device installed on pneumatic conveyance piping to sample powder flowing inside the pipe.

Maintenance response (CS center)

Maintenance service by dedicated staff

This department is dedicated to performing periodic and temporary inspections and maintenance at the request of customers. Engineers who can respond resourcefully and flexibly will protect your plant for a long time.



Benefits of regular inspections



Gets a good understanding of the condition of the equipment

Accurately grasps the condition of the equipment in use, knows the status of deterioration over time, consequently knows the timing of parts replacement and repair, and prevents failures before they occur.



Reduces the risk of unexpected accidents

Enables you to avoid the risk of production line stoppages that are anticipated to have a serious impact on short- and medium-term production plans.



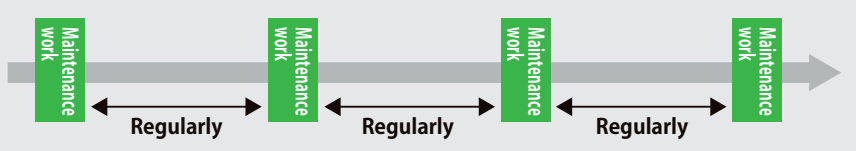
Prevents product quality deterioration

Also enables you to prevent the negative impact on the quality of the product itself caused by the continued operation of the equipment with problems.



Reduces maintenance costs

Reduces maintenance costs by responding to critical failures before they occur. Also makes it easier to budget for annual maintenance.



Extends the life of the equipment

Performs regular inspections and maintenance before failures or problems occur, and consequently allows the stable operation and long life of the equipment.

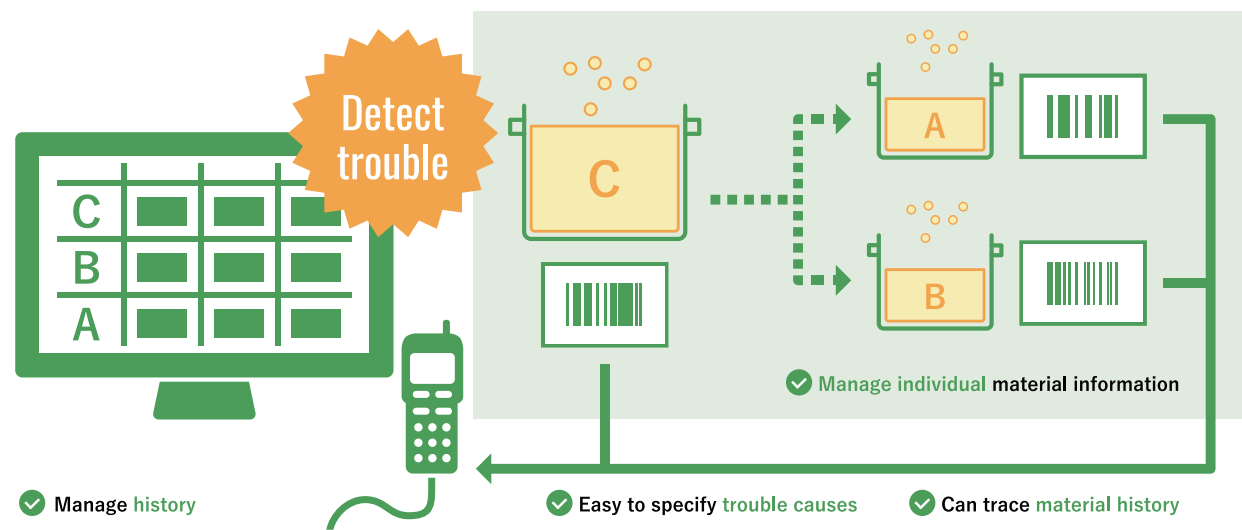
Please also consider the TSUKASA "periodic inspection contract."

We also support a "periodic inspection contract" that includes planning and implementation of efficient inspection plans and subsequent maintenance. Please contact us for details.



Traceability System

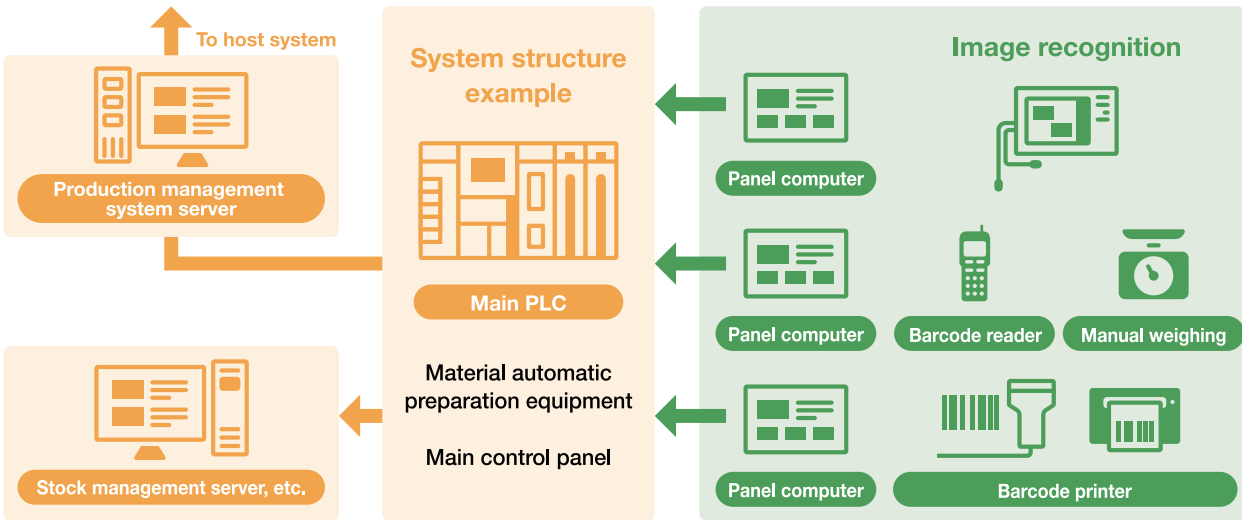
Achieve visualization in plants



This system tracks processes from product material reception to packaging, by linking with the production management system from material reception to weighing and filling. By adopting the system, it rationalizes management work in plants, improves workability, reduces manufacturing cost, and clarifies responsibility when a complaint regarding a product occurs.

PowTrace

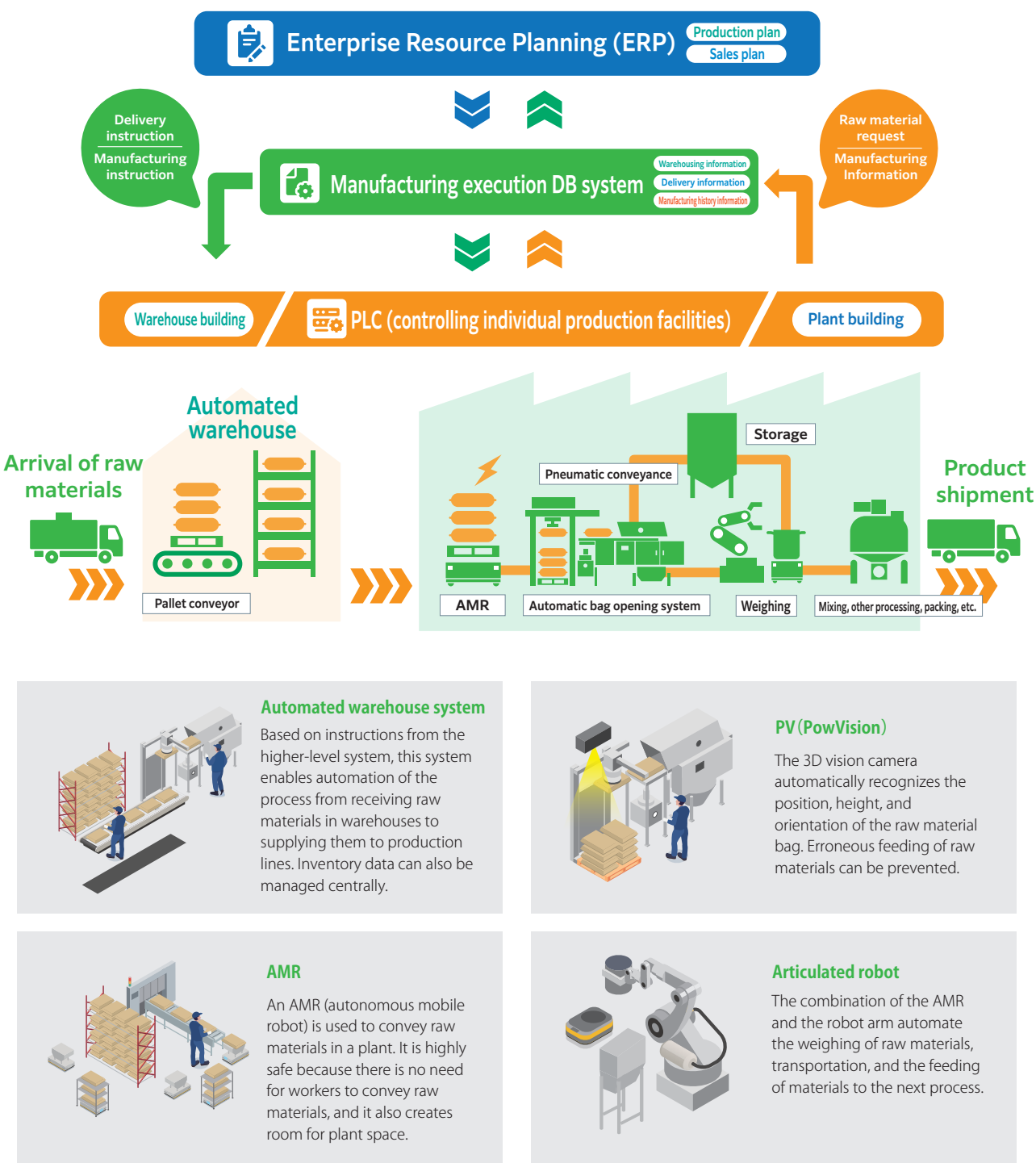
With know-how nurtured in powder plants, TSUKASA designs and develops programs that links management software and production management systems.



As a system integrator

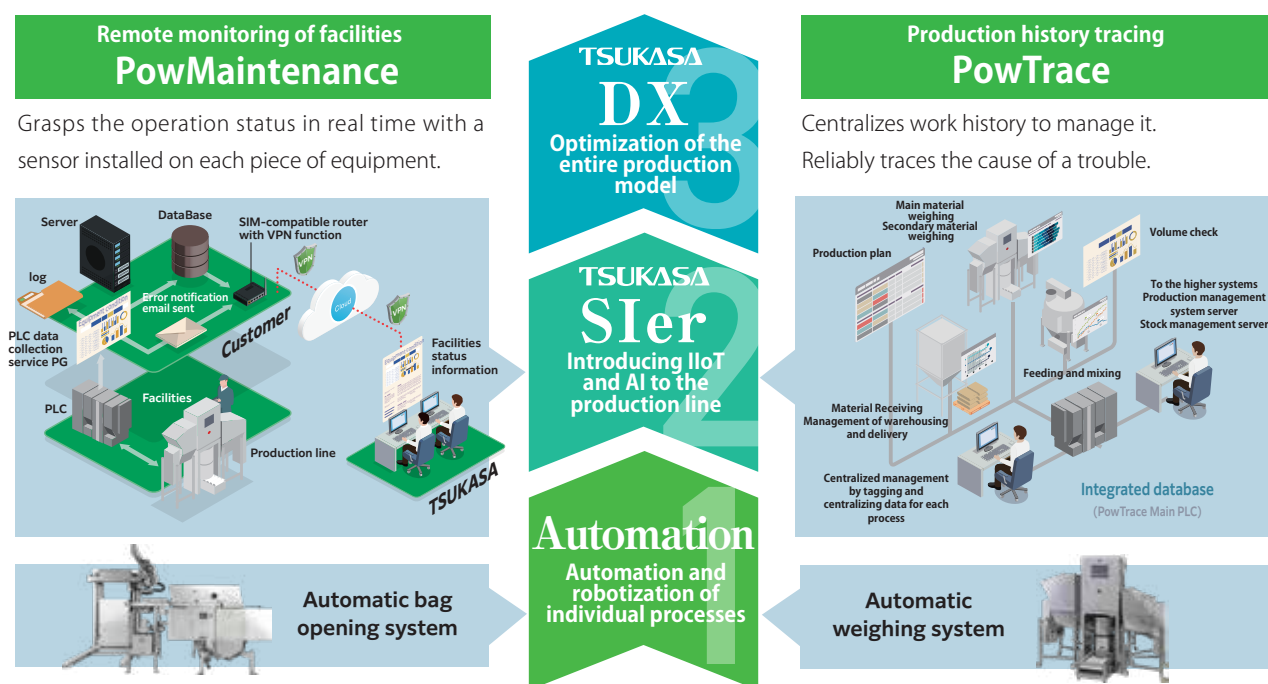
We offer integrated proposals for development and operation of production lines.

We will continue to contribute to the improvement of productivity of our customers from all angles by accumulating results as a system integrator (Sler) company, such as "smart factory" and "automated warehouse system" that connect the entire production system with a network.



Actively promote digital transformation (DX) for the new era [Three stages of evolution]

We have established a system that allows us to provide a full range of services from consulting for plant digitalization, system design, operational support, to data analysis. Full-time staff work every day to bring new ideas to practical use.



"Three stages of digitalization" and "TSUKASA's initiatives"

evolution.1

Automation and robotization of individual processes

TSUKASA's initiatives

Automating and robotizing tasks such as opening and weighing raw material bags, traditionally performed by humans. By digitizing and storing operational data, it can be utilized for subsequent management tasks (such as tracking stock levels). Significant improvements in work efficiency and personnel reduction can also be expected.

evolution.2

Introducing IIoT and AI to the production line

TSUKASA's initiatives

Typical examples are the remote monitoring system "PowMaintenance" at factories and the "PowTrace" that can track production history. By digitalizing the entire production line, we aim to achieve "total optimization" by organically connecting everything from receiving and supplying raw materials to weighing and mixing them.

evolution.3

Optimization of the entire production model

TSUKASA's initiatives

Through the linkage of TSUKASA's "automatic bag opening system" and the "automatic warehouse system," etc., we will optimize the entire production model of the plant, not just the "powder" category, and we will also consider contributing to the overall marketing of our customers' products.

Optimization from automation of individual processes to the entire production line [Present to future]

From systems that have already been achieved to new systems aimed at the ideal future. We will promote DX from a variety of perspectives.



Case Examples

Powder Soup Production Equipment



1. Equipment for receiving, milling, storing, weighing and sifting main materials



4. Equipment for in-feeding and mixing supplemental materials



2. Equipment for receiving flexible containers and conveying materials

The flexible container opener receives flexible container materials, and the stainless PowRotor Light-weight conveys the material using air to the next process.



3. Equipment for milling, storing, weighing and sifting

Mills main materials conveyed by air, and stores them in the silo that has a built-in dust collector. Then, discharges from the Table Feeder at the bottom of the silo and supplies to the measuring hopper by the Screw Feeder. After the materials have been weighed, the LINESIFTER removes foreign materials and conveys them to the receiving hopper above the mixer by air.



5. Equipment for in-feeding and conveying supplemental materials

In-feeds weighed supplemental materials to the Dumping Server, and pre-mixes it. Then, the LINESIFTER removes foreign materials, crushes clumps and conveys the materials to the mixer with its built-in dust collector.



6. Receiver and mixer

The mixer with its weighing function mixes main and supplemental materials conveyed by air. At the same time, liquid materials are fed through the feeding port above the mixer. With its chopper, it produces clump-free results in a short time without color irregularity.

Case Examples

Example of automatic powder feeding equipment in confectionery production

1. Filler ports for tanker trucks

Filler ports of raw material storage tank silo for main raw material such as sugar and flour delivered by tanker trucks.



2. Storage tank silo equipment for raw material

Air and main raw material such as sugar and flour that is pneumatically conveyed are separated by the dust collector and stored in the silos. By installing the silos indoors, dew condensation inside the silo can be prevented and powder temperature can be managed easily.



3. Weighing under silo and sieve equipment/magnet

The main raw material discharged by Screw Feeder from the Table Feeder at the base of the silo is automatic weighed, and transferred to receiver on the mixer by pneumatic conveyance after foreign materials are removed by LINESIFTER and magnet. By employing a table feeder, the vibrator has been eliminated and office-like silent factory environment has been realized.



Automatic weighing side



Raw material feeding side



Hand weighing equipment for small quantity raw material

4. Small quantity raw material weighing equipment

Operator performs single automatic weighing of raw materials in small quantities in accordance with traceability system displayed on the touch panel. Neat and easy-to-clean design.



5. Receiver equipment on mixer

By creating independent receivers for sugar-based and flour-based powders respectively, efficiency of powder feeding is improved and intermixing of the powders can be prevented. The exhaust fan is covered with stainless steel cover and large inspection door is installed on the main unit, improving the ease of cleaning the internal and external of the equipment.



6. Powder feeding request / mixer operation panel

In addition to requesting powder feeding and operating the mixer, measurement data such as weight (specific gravity) and temperature of the dough can also be input.

Testing Environment

TSUKASA prepares actual equipment for clear and better explanations on processes.



TSUKASA prepares various actual equipment used in various processes. Simulation processing that reflects the needs of customers can be experienced. This will enable for development while surely confirming the adequacy of the equipment's design. Furthermore, the product quality of equipment that customers are considering introducing to their production can be checked at an early stage.

Application from an inquiry form on the website

Contact from a representative

Testing

Equipment for which testing can be conducted

Material Receiving / Powder Feeding Process

The functions of supplying and opening bags and disposing of empty bags (which are necessary for the process of opening bags and feeding powder) are built into one unit. We conduct testing of the functions.

Mixing Process

We conduct testing for easy and precise mixing of powder with different grain sizes and specific gravity. The equipment can process materials without changing the mixture's grain sizes and shapes. It leaves a very small amount of adhered materials.

Crushing and Milling Process

We perform testing related to milling and crushing. We can handle processes ranging from ultra-fine milling (microns) to coarse crushing (millimeters).

Sifting and Foreign-material Removal Process

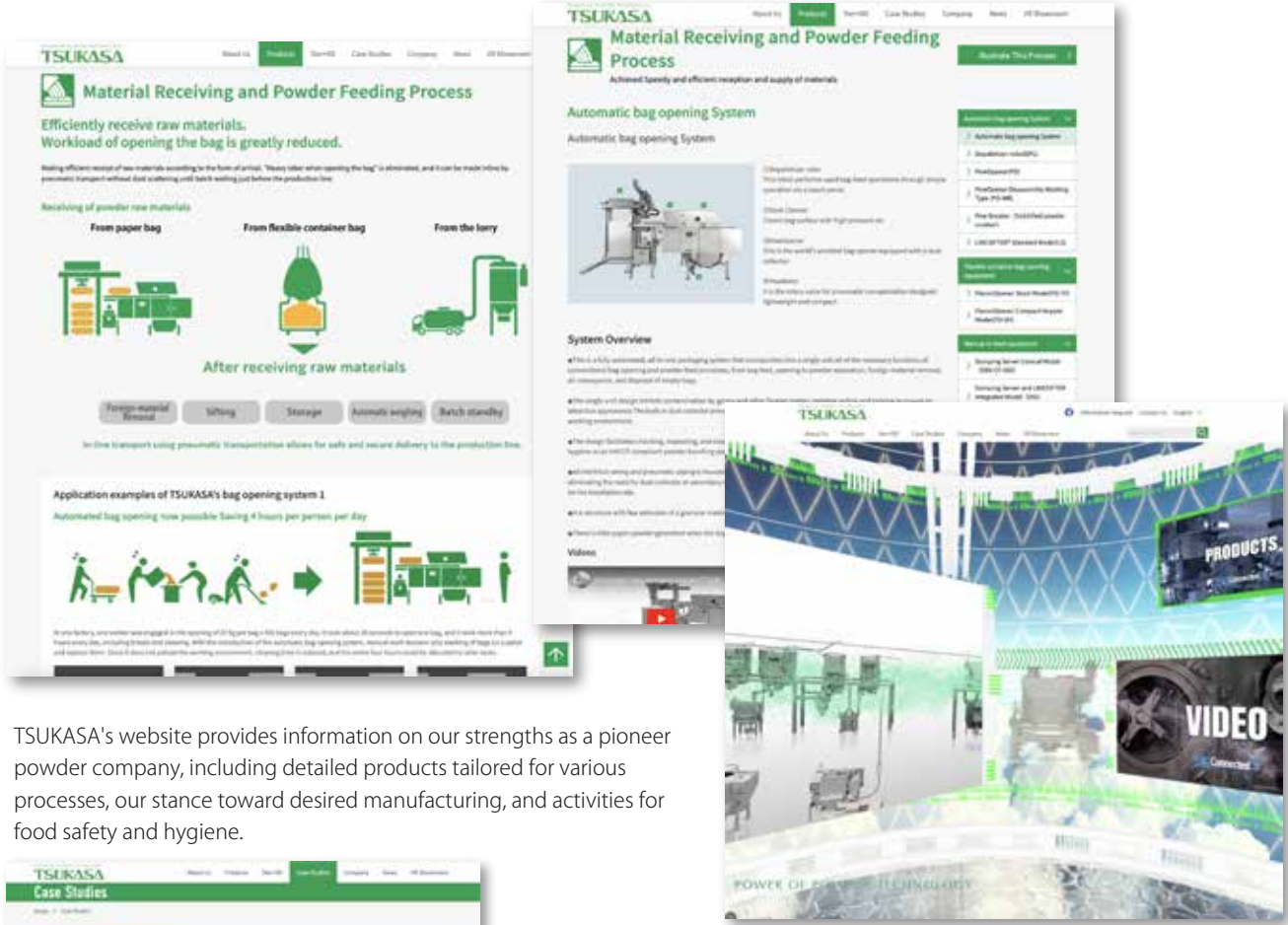
We conduct testing for sifting and foreign-material removal. Foreign metal (iron, etc.) removal using magnets, foreign material removal with a vibrating sieve, and foreign material removal by sorting, etc. are all supported.

Drying and Controlling Temperature Process

We implement testing for drying / temperature control for various objects by using ventilation type shelf drying, fluidized bed drying, vacuum drying, and superheated steam dryers. If desired, we can offer advice on fluidity, high density and remaining water content necessary for forming powder, or measure samples' grain size distribution after drying and granulation, SEM, grain fluidity, and remaining water content.

Website

We provide detailed product information and messages about manufacturing.



TSUKASA's website provides information on our strengths as a pioneer powder company, including detailed products tailored for various processes, our stance toward desired manufacturing, and activities for food safety and hygiene.



Case Examples

TSUKASA's website provides information on our strengths as a pioneer powder company, including detailed products tailored for various processes, our stance toward desired manufacturing, and activities for food safety and hygiene.

<https://www.tsukasa-ind.co.jp/en/>