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 stakeholders, 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.
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 into 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 “Depalletizier 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.

- FleconOpener Stock Model
  Bag-opening equipment for flexible container bags which can deal with powder that easily scatter.

- FleconOpener Compact Hopper Model
  Bag-opening equipment for flexible containers which handles powder including granulated sugar and refined salt.

- Dumping Server Conical Model
  For this manual in-feed equipment, we painstakingly designed the height of the in-feed port, and reduced the burden on material feeding.

- Dumping Server Premixing Model
  Manual in-feed equipment for pre-mixing materials with four paddles.

- Dumping Server Hopper Model
  Manual in-feed equipment which is compact and can be installed in a limited space.

- Dumping Server and LINESIFTER Integrated Model
  Manual in-feed equipment that can remove foreign materials and crush material clumps at the same time.
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, blending, 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 Receiver Model
  - Weighing equipment which stores and automatically supplies materials conveyed with air

- Divider Scale Packer Specifications
  - Filling equipment integrated with a lifter, optimal for plastic bags, craft bags, etc.

- Divider Scale Equipment-mounted Model
  - Weighing equipment attachable to the discharge port of a silo or mixer

- 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 Terminal Detachable System
  - Automatic dividing and weighing equipment from which the material stacker can be removed

- Divider Scale Simple (Combination Model)
  - Automatic dividing/weighing equipment which can automatically weigh a wide variety of materials

- 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

- **Table Feeder**
  - Anti-bridging discharge equipment to install under a silo.

- **PowDischarger**
  - Vibration type discharge equipment installed under the silo.

- **PowSilo (Large Outdoor)**

- **PowSilo (Large Indoor)**
Achieved high efficiency in dust collection and space-saving

Dust Collecting Process

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.
Sifting and Foreign-material Removal Process

Performs efficient sieving and foreign material removal.

The process sfts 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

LINE SIFTER 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.

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.

Magcap
Magnetic foreign matter removal device which can be installed at the inspection port of chute conveyance pipes.
Crushing and Milling Process

We propose equipment optimal for purposes and materials.

- **CUT**
  - Crushing
  - Material: Coarse, Long, Middle, Fine
  - Application: Agglomerate powder, snack, etc.

- **CLASH**
  - Pulverization (coarse)
  - Material: Cereals such as wheat, rice and buckwheat, powdered tea, etc.

- **MILL**
  - Pulverization (fine)
  - Material: Cereals such as wheat, rice and buckwheat, powdered tea, etc.

**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 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.

**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 adjusting temperatures and premixing materials at the same time.
- **PowDryer**
  Compact fluidized dryer integrated with a dust collector.
Handling Process

Constant conveyance and constant supply, realizing stable discharge

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 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 Compact Type
Constant discharge device for PowFilter, storage bins, etc.

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 Eccentric Model
Constant discharge device which prevents clogging of powder with its eccentric structure

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
**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.

**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.
Case Examples
Example of automatic powder feeding equipment in confectionery production

1. Filler ports for tanker trucks
Filler ports of raw material storage tank silos 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.

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

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

2. Equipment for receiving flexible containers and conveying materials

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.

4. Equipment for in-feeding and mixing supplemental materials

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

**Testing Environment**

**TSUKASA** prepares various actual equipment used in various processes. Simulation processing that reflects the needs of customers can be experienced. This will enable 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.

**Website**

We provide detailed product information and messages about manufacturing.

**Testing**

Application from an inquiry form on the website

Contact from a representative

**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.

**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/