

Powder Processing Equipment

General Catalog

<https://www.nisshineng.co.jp>

Nisshin Engineering Inc.

Powder Business Department
5-3-77 Tsurugaoka, Fujimino-City, Saitama, Japan 356-0045
Tel: +81-49-264-3049 Fax: +81-49-264-9367



Nisshin Engineering is a leader in developing powder technology and project engineering applied equipments.

Nisshin Engineering's world-class equipment, including the world's first classifier capable of submicron classification, pulverizers, mixers, and feeders, has contributed to manufacturing by applying the Nisshin Seifun Group's powder processing technology, and enhancing its functionality while reflecting the needs of our users. As a leading company in the powder industry, we will continue to provide high quality and high performance powder equipment to both society and the world by making full use of our advanced technologies and state-of-the-art equipment.

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- P04 Fine type swirling airflow-driven air classifier
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- P08 Precision powder mixer
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Turbo Classifier



The controlled air flow based on turbo theory improves classification accuracy and efficiency.

The lineup includes special models such as an abrasion resistance model, adhesion prevention model, and inert gas circulation model.

Continuous and accurate classification operation is possible by the feedback control of rotor speed and air flow rate.

Fully automatic operation is possible with a control system incorporating unique operation know-how.

The fine powder recycling mechanism enables classification to be carried out multiple times, increasing the product yield and processing capacity.

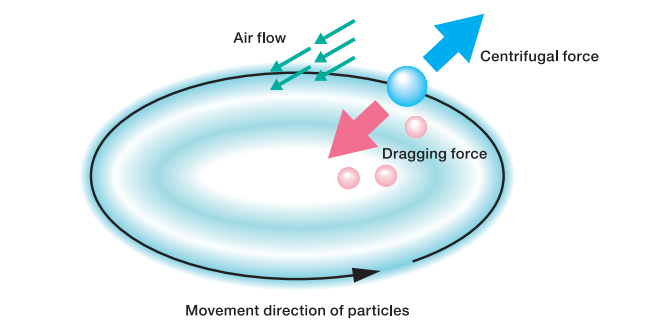
Arranging the dispersion mechanism at multiple locations accelerates the dispersal of raw material, and realizes high-accuracy classification.

The cut point can be easily adjusted by changing the classification rotor speed.

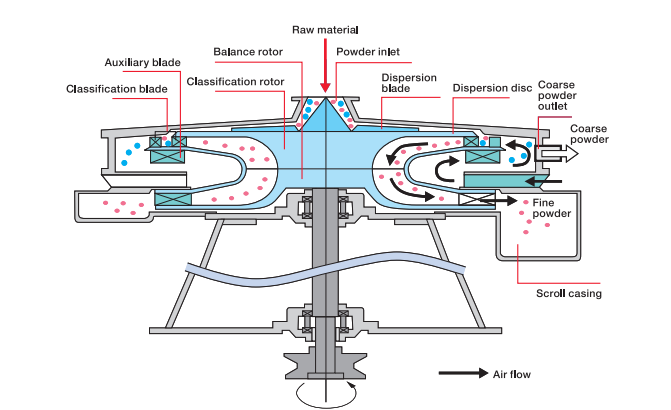
The compact design makes it easy to draw up equipment installation plans, regardless of location.

Submicron classification has been realized for the first time in the world. Powders in a diverse range of fields demanding high quality are accurately and efficiently classified over a wide range (0.5 to 100 μm).

Powder fed to the raw material inlet is sucked into the classifier and then uniformly distributed by the dispersion blades and dispersion disk, before being fed to the classification zone. Each particle is then subjected to centrifugal force generated by the rotation of the rotor, and the drag force of air flowing toward the center. Classification involves moving coarse particles to the outside with centrifugal force, and moving fine particles to the inside with drag.



Structural cross section



Lineup

| Models | Cut point [μm] | | Feed rate [kg/h] | Rotor speed [min ⁻¹] | Airflow rate [m ³ /min] | Power consumption [kW] | Weight [kg] |
|-----------|----------------|-------------|------------------|----------------------------------|------------------------------------|------------------------|-------------|
| | Fine type | Coarse type | | | | | |
| TC-15* | 0.5~20 | 2~100 | 10 | 700 ~ 11,000 | 1 ~ 3 | 1.5 / 3.4 | 400 |
| TC-25* | 0.6~30 | 2~100 | 50 | 500 ~ 7,000 | 3 ~ 9 | 2.2 / 12.5 | 750 |
| TC-40 | 1~50 | 3~120 | 200 | 300 ~ 6,000 | 15 ~ 35 | 3.7 ~ 15 | 1,000 |
| TC-60 | 1.5~50 | 5~120 | 1,000 | 300 ~ 5,000 | 30 ~ 100 | 7.5 ~ 75 | 2,000 |
| TC-100 II | 2~50 | 5~120 | 4,000 | 300 ~ 2,500 | 70 ~ 120 | 22 ~ 37 | 3,000 |
| TC-100 IV | 2~50 | 5~120 | 8,000 | 200 ~ 2,000 | 150 ~ 300 | 45 ~ 75 | 5,000 |

*As TC-15,25, there are automatic operation N type and manual operation M type.

Aerofine Classifier



Even low density powder, which is relatively difficult to classify, can be classified with high accuracy by applying centrifugal force to the rotational flow.

Since there are no moving parts, and only compressed air and suction air flow are used, operation is possible with only negligible levels of contamination.

The ease of disassembly and cleaning, and reproducibility of classification accuracy make this product suitable for pharmaceutical processes.

High-accuracy nano and submicron classification is possible with a powerful dispersion mechanism.

Its outstanding airflow control technology means it is also suitable for the classification of non-spherical particles and flaky powder.

Operation with a high level of abrasion resistance and no contamination is possible with the use of a ceramic lining.

The elimination of dead space and ease of disassembly and cleaning make this product suitable for high-mix, low-volume production.

Submicron to single-micron classification is possible with a powerful centrifugal force.

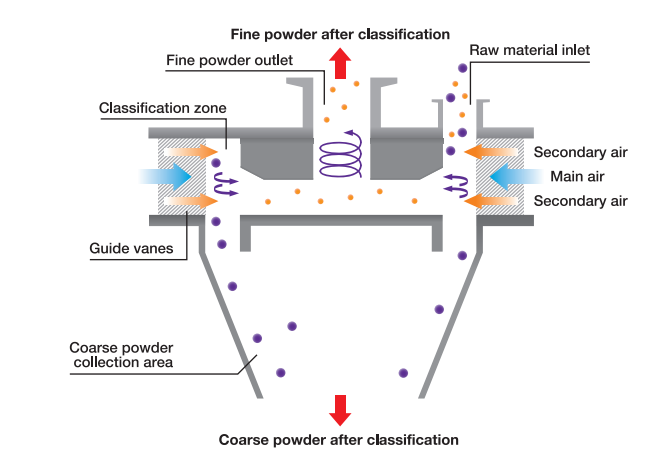
High-accuracy classification by the use of a twin air system

The Equipment uses the twin air system based on the “main air” taken in through the guide vanes and the “secondary air” blown into the upper and lower parts of the classification zone. Stable high-accuracy classification has been realized in a submicron region as well by uniforming and accelerating a swirling flow generated by the main air, by means of the secondary air.

Effects of secondary air introduction

- Adjustment of a cut point
To make big adjustment, change the installation angle of the guide vanes. To make small slight adjustment, increase/decrease a flow rate of the secondary air to be shot. The cut point can be adjusted while maintaining high classification accuracy.
- Dispersion of the raw material
The upper secondary air in the classification zone promotes dispersion of the raw material powder, feeding it into a classification field in the state close to single particles.
- Reclassification
The lower secondary air in the classification zone promotes reclassification. Particularly, a collection rate of 2 to 3 μm or smaller fine powder has been considerably improved.

Structural cross section



Lineup

| Models | Cut point [μm] | Feed rate [kg/h] | Suction air flow rate [m ³ /min] | Compressed air flow rate @ 0.8MPa [m ³ /min] | Dimensions [mm] | Weight [kg] |
|--------|----------------|------------------|---|---|-----------------|-------------|
| AC-20 | 0.3 ~ 20 | 1 ~ 20 | 1.5 ~ 3.0 | ~ 0.5 | Φ300 × H400 | 50 |
| AC-30 | 0.5 ~ 25 | 2 ~ 40 | 3.0 ~ 6.0 | ~ 1.0 | Φ400 × H600 | 100 |
| AC-40 | 1.0 ~ 30 | 4 ~ 80 | 8 ~ 12 | ~ 1.5 | Φ500 × H800 | 200 |
| AC-60 | 1.0 ~ 30 | 8 ~ 160 | 20 ~ 30 | ~ 4.0 | Φ800 × H1,100 | 400 |
| AC-80 | 1.5 ~ 30 | 16 ~ 320 | 32 ~ 48 | ~ 8 | Φ1,000 × H1,200 | 500 |

Eddy Classifier



Employing an exclusive design for the coarse powder area demonstrates excellent classification accuracy in this area.

This product is also suitable for adhesive powders that are difficult to process with a vibrating sieve or ultrasonic sieve.

The cut point can be easily set by rotating the handle.

The structure has no rotor, allowing maintenance to be carried out with ease.

Stable manufacturing is possible because of minimal cut point movement relative to changes in air flow rate.

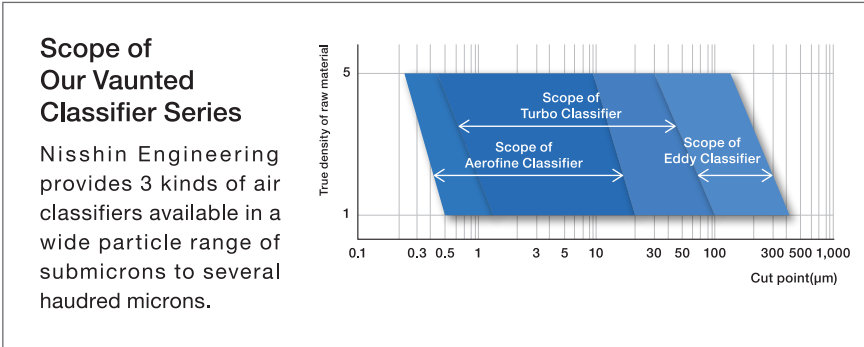
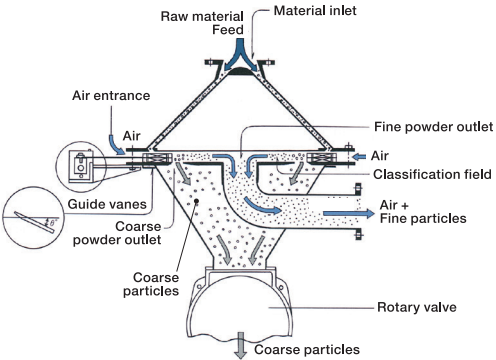
The abrasion resistance model can also be used for abrasion-resistant particulate.

Demonstrates high-classification accuracy in the 30 to 300 μm range. Structure that requires no screen. Dedicated coarse powder type ideally suited to the classification of a variety of industrial raw materials.

θ degree inclined Guide vanes form the semi-free vortex, which best fit the coarse classification.

Lineup

| Models | Cut point Dp[μm] | Feed rate W[kg/H] | Air flow rate Q[m³/min] | Pressure drop P[kPa] | External dimensions W×D×H[mm] |
|--------|---------------------|----------------------|----------------------------|-------------------------|----------------------------------|
| EC-20 | 30 ~ 150 | 50 ~ 300 | ~15 | ~25 | 700 × 700 × 1500 |
| EC-32 | 60 ~ 300 | 300 ~ 1,000 | ~30 | ~15 | 800 × 800 × 2000 |



Super Jet Mill



Adopting a wall structure with classification effect makes it difficult for coarse particles to move toward the center, making it possible to obtain uniform product without coarse particles.

Even low volumes (several tens of grams) of raw material can be processed, facilitating operation with high recovery rate.

Abrasive-resistant, contamination-free pulverization is possible using ceramics. Standard material is Si₃N₄, while other materials including ZrO₂, Al₂O₃, and SiC can be selected.

No moving parts and applying pulverization principle of particle-particle collisions, particle-wall collisions allows pulverization to be performed without contamination.

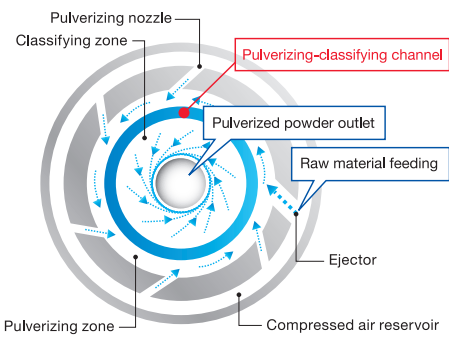
Since adiabatic expansion is employed, no heat is generated, making it suitable for the pulverization of heat-sensitive powders.

The simple structure makes disassembly and cleaning easy. Suitable for high-mix, low-volume production and pharmaceutical applications.

Particle size distribution.Simple structure inhibits contamination and enables pulverization into single micron size without heat generation.

“Super Jet Mill” pulverizes powders only by compressed air with no moving parts. Fine powders are produced by mutual collision and friction with the wall using the high speed compressed air injected from the multiple nozzles arranged on the circumference. The regulated air flow prepared through analysis of cyclone air turbulence inside the machine produces particles having narrow particle size distribution with only a limited amount of coarse powder mingled.

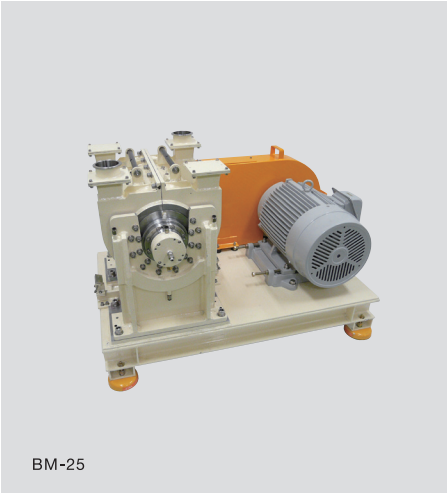
Structural cross section



Lineup

| Models | Air consumption @ 0.8MPa[m³/min] | Feed rate [kg/h] | Dimensions D×H[mm] | Weight [kg] | Compressor [kW] |
|------------|-------------------------------------|---------------------|---------------------------------------|---------------------|--------------------|
| SJ-100 | 0.2 ~ 0.3 | 0.05~ 0.3 | Φ160 × 140 | 5 | 2.2~ 3.7 |
| SJ-100GMP | 0.2 ~ 0.3 | 0.05~ 0.3 | L720 × W370 × H600(System size) | 50 (System weight) | 2.2~ 3.7 |
| SJ-500 | 0.8~ 1.2 | 0.5~ 10 | Φ320 × 180 | 27 | 7.5~ 15 |
| SJ-1500GMP | 0.8~ 1.2 | 0.5~ 10 | L2,000 × W1,000 × H2,000(System size) | 250 (System weight) | 7.5~ 15 |
| SJ-1500 | 2.0~ 3.0 | 2.0~ 30 | Φ400 × 180 | 45 | 15~ 30 |
| SJ-1500GMP | 2.0~ 3.0 | 2.0~ 30 | L2,500 × W2,000 × H2,500(System size) | 400 (System weight) | 15~ 30 |
| SJ-2500 | 3.0~ 4.5 | 3.0~ 50 | Φ500 × 180 | 65 | 22~ 37 |
| SJ-5000 | 6.0~ 9.0 | 5.0~150 | Φ600 × 350 | 120 | 45~ 75 |
| SJ-10K | 12.0~18.0 | 10~300 | Φ700 × 350 | 180 | 75~110 |

Super Rotor / Blade Mill



Because of a unique rotor blade structure, raw material, diameter at the micron level of up to several centimeters can be pulverized into powder with diameter of micron level.

The high speed of the air flowing through the equipment ensures minimal powder adhesion, and stable product particle size in a short time.

When a cold air generator is used, this product can also be used for the fine pulverization of heat-sensitive powders (toner, powder paint, etc.)

Excessive pulverization can be prevented while performing fine pulverization, resulting in products with sharp particle size distribution.

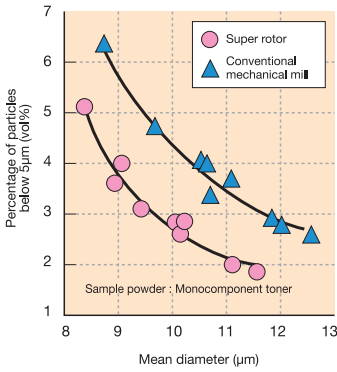
Suitable for pulverization of raw material for foods containing elastic material or fibrous material.

The adoption of a mechanical system allows pulverization to be performed with minimum running costs.

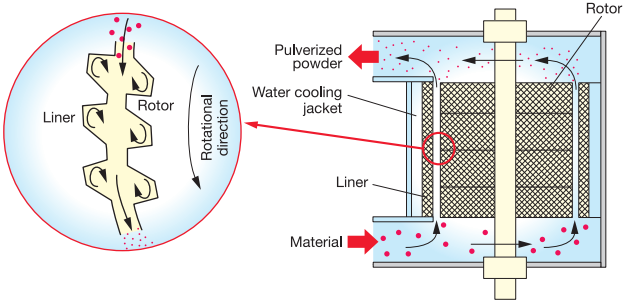
The pulverizers are used in various fields including inorganic materials, organic materials, spices and foods. High-efficiency fine pulverization is realized with a powerful vortex generated in the narrow gap between the fixed liner and the rotor.

Raw material loaded into the equipment through the gap between the liner and the rotor (blade), or pulverization zone. The high-speed vortex generated by the rotor and the liner with unique groove shapes draws in raw material powder and pulverizes it. The vortex forms a flow in which the powder remains in the pulverization zone for a long period of time, accelerating fine particles production.

Super Rotor is equipped with a unique pulverizing rotor, which enables long-term stable and low-cost operation. Fine powder pulverization can be achieved without excessive pulverization. The pulverized particle distribution is very narrow.



Cross-sectional drawing of structure



Lineup

| Models | Throughput [kg/h] | Dimensions W×D×H[mm] | Weight [kg] | Revolutions [min ⁻¹] | Air Flow Rate [m ³ /min] | Motor Horse Power [kW] |
|----------------|-------------------|-----------------------|-------------|----------------------------------|-------------------------------------|------------------------|
| SR-15 BM-15 | 1 ~ 25 | 850 × 400 × 480 | 165 | ~ 15,000 | 0.5 ~ 3 | 3.7 ~ 5.5 |
| SR-25 BM-25 | 10 ~ 250 | 1,295 × 835 × 845 | 800 | ~ 12,000 | 4 ~ 8 | 11 ~ 18.5 |
| SR-50 BM-50 | 25 ~ 500 | 2,090 × 1,160 × 1,340 | 3,000 | ~ 5,500 | 8 ~ 20 | 30 ~ 45 |
| SR-75 BM-75 | 50 ~ 1,000 | 2,870 × 1,430 × 1,613 | 5,000 | ~ 4,000 | 15 ~ 30 | 55 ~ 75 |

Hi-X



The jacket structure allows mixing to be performed while heating or cooling. (Option)

A spherical mixing tank eliminates dead space for powder to accumulate.

The product is equipped with safety devices, and disassembly and cleaning can be carried out with ease.

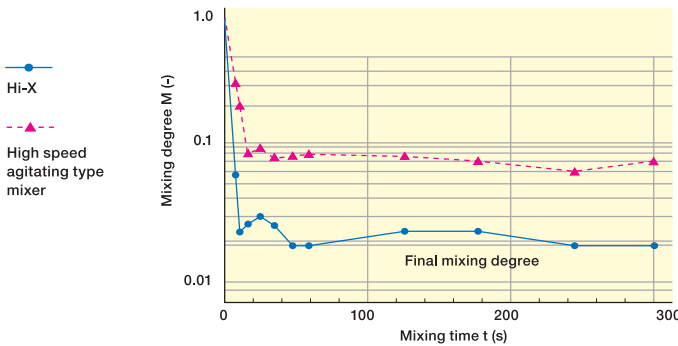
By changing the inclination angle of the mixing tank, mixed material heat generation and damage can be controlled.

The adhesion of powder to the vessel wall is prevented with an anti-adhesion scraper. Moreover, the mixed powder can be easily removed by rotating the scraper only.

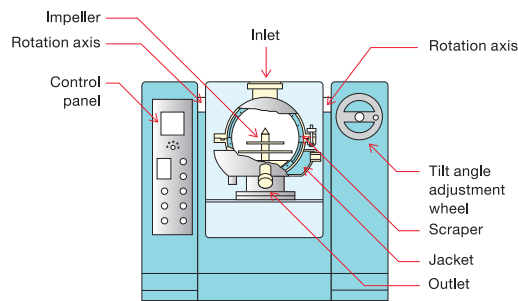
Hi-X mixers are equipped with a timer, allowing the mixing time to be automatically set.

The Hi-X, achieves high accuracy and high- speed mixing. This powerful mixer answers various and difficult requirements for powder mixing application.

Comparison chart



Structural cross section



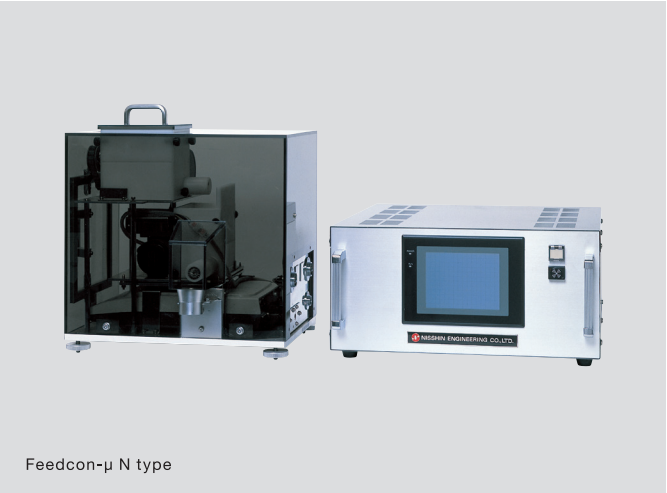
Example

| Materials | Particle diameter[µm] | Particle density[kg/m ³] | Mixing ratio[%] |
|-----------------------|-----------------------|--------------------------------------|-----------------|
| Corn starch | 17.3 | 1,450 | 80 |
| Silicon carbide #1000 | 18.0 | 3,200 | 20 |

Lineup

| Models | Dimensions W×D×H[mm] | Gross capacity[t] | Net capacity[t] | Power[kW] | | Revolution speed [min ⁻¹] | | Tilt angle [degree] | Weight[kg] |
|---------|-----------------------|-------------------|-----------------|-----------|---------|---------------------------------------|---------|---------------------|------------|
| | | | | Impeller | Scraper | Impeller | Scraper | | |
| Hi-X200 | 730 × 550 × 700 | 4.2 | 1.7 | 0.75 | 0.09 | 200 ~ 6,000 | 45 | 0°~ 90° | 130 |
| Hi-X360 | 1,250 × 700 × 1,300 | 24.4 | 9.8 | 5.5 | 0.4 | 200 ~ 4,000 | 30 | 0°~ 60° | 500 |
| Hi-X500 | 1,550 × 900 × 1,300 | 65.4 | 26.2 | 7.5 | 0.75 | 100 ~ 3,000 | 23 | 0°~ 60° | 700 |
| Hi-X750 | 1,400 × 1,825 × 2,000 | 250 | 100 | 30 | 3.7 | 100 ~ 2,000 | 30 | 30° | 2,000 |

Feedcon-μ



There are no feed pulsations due to the use of a dispersion mechanism in the discharge area.

Employing a hopper structure that is not affected by powder level ensures long-term, constant feeding.

Using a special pressure resistant feeder also allows the product to be used for atmosphere replacement feeding.

The equipment is very easy to disassemble and clean, and is lightweight.

The use of an internal agitator ensures stable feeding even for powder with poor fluidity.

Using plastic material ensures stable feeding even for adhesive powder.

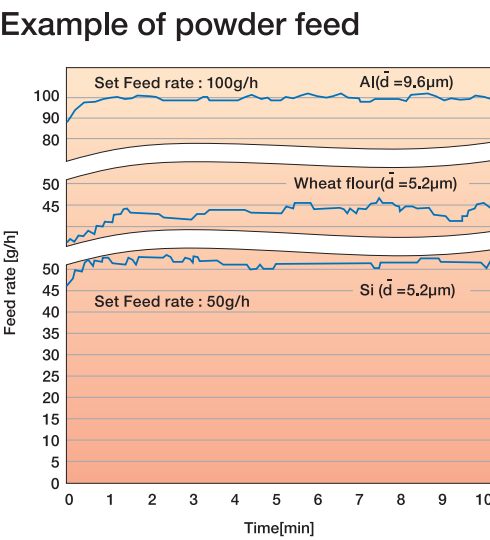
Dispersed spray feeding is possible when combined with a disperser.

The portable compact design means it can be installed anywhere with ease.

* Other feed specifications are also available.

Feedcon-μ can accurately feed small amount of powder constantly and quantitatively. It meets variety of needs for experimental and industrial uses.

Feedcon-μ is a screw feeder with compact body capable of easily micro feeding powder from standard powder to highly cohesive and highly adhesive fine powder, and is available in two models. The <M type (manual type)> is capable of micro feeding at the desired feed speed by manually adjusting the screw rotation speed. On the other hand, the <N type (feedback type)> is capable of fully-automatic and continuously stable feeding by constantly monitoring the amount of powder discharged with an electronic balance, and controlling powder flow rate feedback.



Lineup

| Models | Type | Feed rate [mℓ/h] | Weight [kg] | Dimensions W×D×H [mm] | Power consumption | Hopper capacity [ℓ] |
|-------------------------------------|------------|------------------|----------------------|----------------------------------|-----------------------------|----------------------|
| Feedcon-μ M type (Manual type) | μM030 type | 50 ~ 600 | 12 | 240 x 290 x 260 | Single-phase AC100V 25W | 1 |
| | μM200 type | 500 ~ 6,000 | | | | |
| Feedcon-μ N type (feedback type) | μN030 type | 50 ~ 600 | 25 (Mechanical part) | 400 x 300 x 415(Mechanical part) | Single-phase AC100V 300W | 0.8(Supply feeder) |
| | μN200 type | 500 ~ 6,000 | 25 (Control part) | 430 x 450 x 200(Control part) | | 0.5(Constant feeder) |

* Optional additional material hoppers (5 liter, 10 liter) are also available.

Company Overview

“Powder Technology & Project Engineering”
Creates a new world.

Nisshin Engineering was established in 1972 as an independent company from the technical division of Nisshin Flour Milling Inc. (now Nisshin Seifun Group Inc.). Since then, we have expanded our business across the three core business areas of (1) Plant Engineering, which uses powder technology as its core technology, (2) Machinery & Equipment such as pulverizers and classifiers, and (3) Powder Processing Service using our characteristic powder equipment. We will continue to open up new horizons in manufacturing with the world’s best “powder technology”, and with “project engineering”, which places importance on the connection with humans.

| | |
|--|---|
| Corporate Name | Nisshin Engineering Inc. |
| Established | April 28, 1972 |
| Capitalization | 107,500,000 yen |
| Stockholders | Nisshin Seifun Group, Inc. (Holds all outstanding shares) |
| Registration Items | Sumisei Nihonbashi Koami-cho Building, 5F, 14-1, Koami-cho, Nihonbashi, Chuo-ku, Tokyo, Japan 103-8544 Tel +81-3-3660-3425(General inquiries) Fax +81-3-3660-3845 |
| Powder Business Department | 5-3-77 Tsurugaoka, Fujimino City, Saitama, Japan 356-0045 Tel +81-49-264-3049 (General inquiries) Fax +81-49-264-9367 |
| Sales Department Osaka Sales Office | Shin-Osaka Trust Tower 8F, 3-5-36 Miyahara, Yodogawa-ku, Osaka, Japan 532-0003 Tel +81-6-6350-6011 Fax +81-6-6350-6025 |