日清エンジニアリング

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Powder Technology &
Project Engineering

Coarse type swirling airflow-driven air classifier

Eddy Classifier

For coarse particles including plastics, foods, metals and ceramics

EC-32

EC-20

https://www.nisshineng.co.jp

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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.

Important role of Eddy Classifier

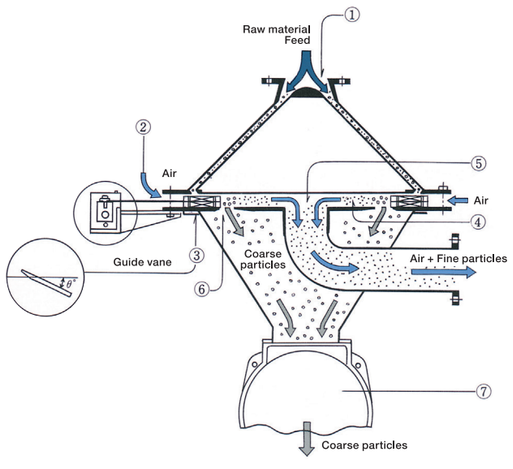
- Classification of highly adhesive and highly cohesive powder prone to clogging of a sieve
- Classification of highly abrasive powders that frequently cause mesh breakage of a sieve
- Removal of fine powder in products (improved quality and handling)
- Removal of coarse particles that cannot be removed with classification mechanism built into a pulverizer
- Classification of highly abrasive powders such as ceramic powders
- Classification with low production cost (mass production)

Overview

Eddy Classifier is an air classifier developed for the purpose of classifying relatively coarse powders such as plastics, foods, metals, and ceramics. By adopting a semi-free vortex type classifier, it has achieved outstanding precision at a coarse cut point of 30 to 300 µm, which is difficult to achieve with a compact forced vortex type classifier with rotor.

Structure and features

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



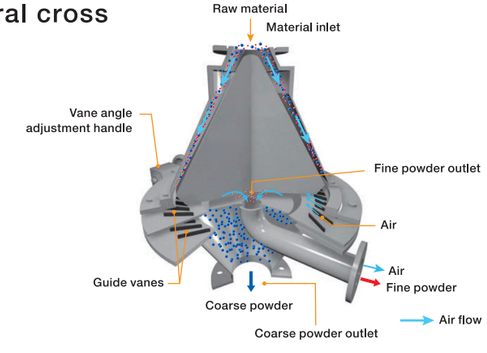
Excellent operability	Large capacity despite compact size
Easy maintenance	Abrasion resistance compatible
High dispersibility	Energy savings
High production stability	Rotorless and screenless

Uniformly fed material enters at the top center of the machine 1 by gravity. Suction, applied on the fine particle discharge port 5, causes air to enter the perimeter of the machine 2 passing through the adjustable Guide vanes 3. As air is sucked into the machine, eddies are formed creating a classification field 4. The in-rush of air through the Guide vanes accelerates the particles so that they are shot into the classification field along the spiraling eddy currents. The particle paths vary depending on the particle diameters.

Fine particles move to the inner circumference 4 of the classification field and are sucked out from a fine particles discharge port 5 and are collected by a cyclone separator or a bag filter.

Coarse particles move to the outer circumference 6, then fall to the lower cone and discharged from the classifier through Rotary valve 7.

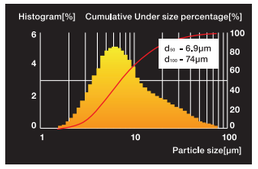
Structural cross section



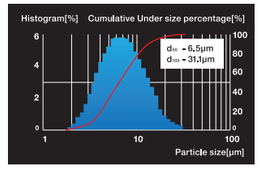
Classification examples

Ceramics powder

Clogging and sieve mesh breakage eliminated with structure without rotor or sieve mesh.



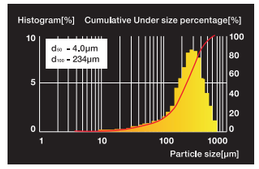
Raw material



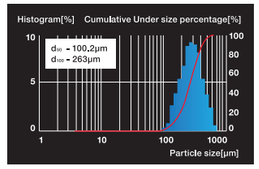
Product

Inorganic matter(solt)

Large volume processing up to 1 ton/hr now possible for classification around 100 µm level, which often results in sieve clogging.



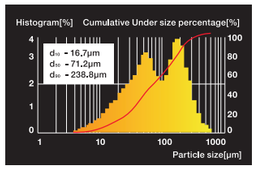
Raw material



Product

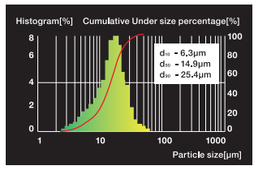
Stainless steel powder for 3D printers

Fine powder cut with Turbo Classifier (TC) after coarse powder cut with Eddy Classifier (EC). Classification at 1 to 100 µm level of high-density powder results in narrow particle size distribution with high yield by combining EC and TC.



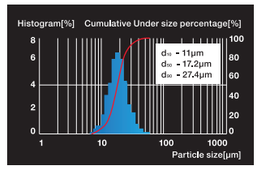
Raw material

Cut coarse powder (EC)



Intermediate product

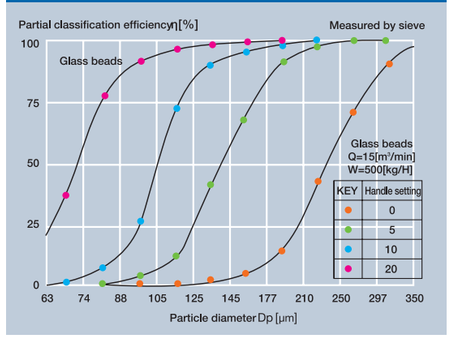
Cut fine powder (TC)



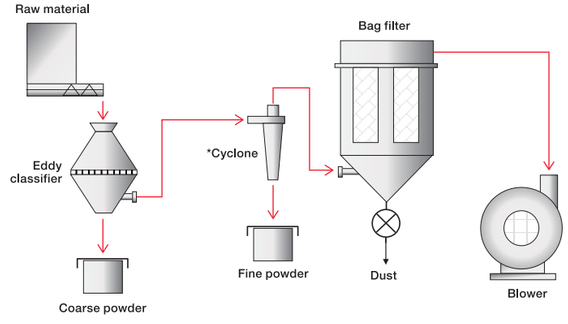
Product

Cut point can be easily adjusted using vane angle adjustment handle.

The relationship between Vane angles and Partial classification efficiency



System Flow



* It can be omitted.

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 × 1,500
EC-32	60 ~ 300	300 ~ 1,000	~ 30	~ 15	800 × 800 × 2,000