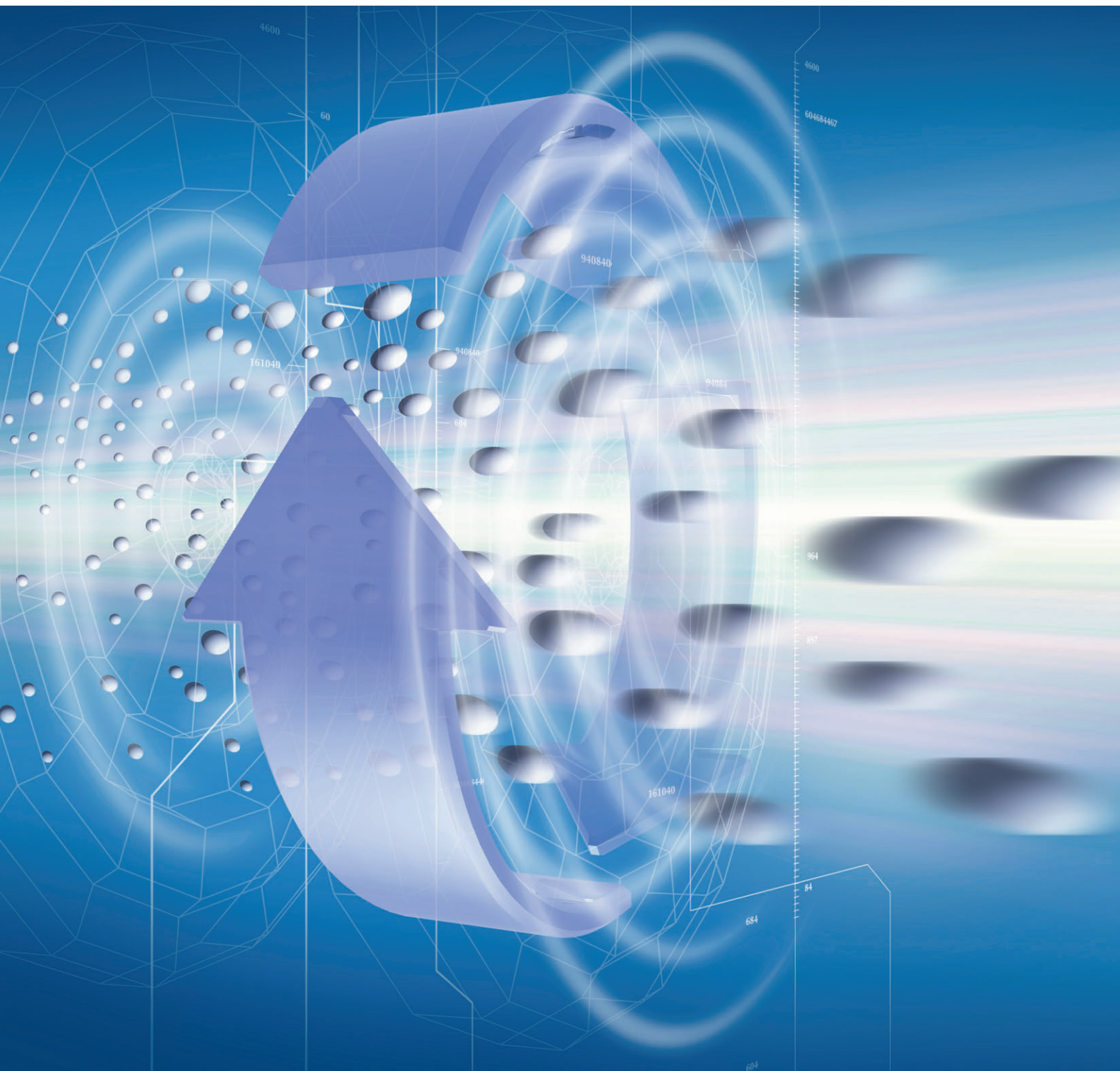




JQA-0663

POWDER & GRANULE TECHNOLOGY GUIDE

Equipment / Product Catalogue



 **NIPPON COKE &
ENGINEERING CO., LTD.**

Chemical Machinery Department

Creating prosperous future through

Your ideal partner in powder processing operations, from planning to after-purchase

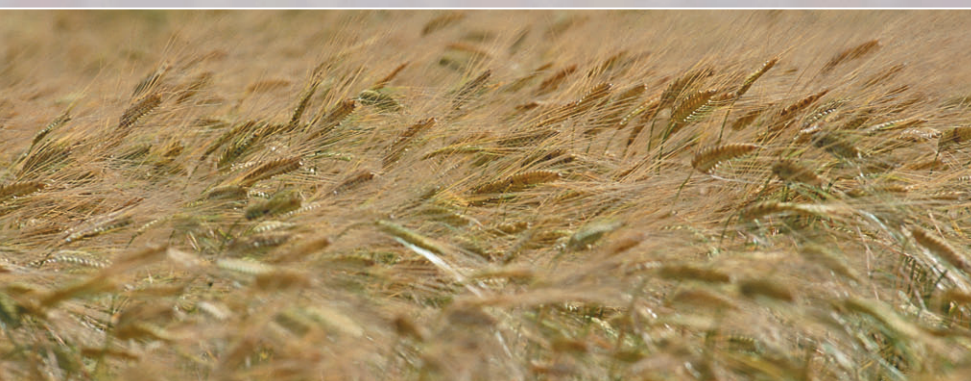


As an integrated manufacturer of powder and granule machines and plants, we draw on our extensive technology and know-how accumulated over many years to create the optimal conditions for all types of powder processing.

We offer effective solutions to the various requests from our clients through our highly advanced equipment and accurate service, from carry-in tests at our Powder Treatment Technical Center, to our response for commissioned manufacturing and maintenance services.

Particulate Technology

services.



Powder and Granule Machines

Category	Machine Model Name	Functions														Page
		MIX: Mixing	DSP: Dispersing	DRY: Drying	GRA: Granulation	RCT: Reaction	KND: Kneading	COO: Cooling	CTM: Coating	CPX: Coating and modification	UFG: Ultrafine grinding	FNG: Fine grinding	CMG: Coarse and medium grinding	DSL: Dissolution	CLS: Classifying	
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Category	Machine Model Name	Functions													Page	
		MIX: Mixing	DSP: Dispersing	KND: Kneading	UFG: Ultrafine grinding	FNG: Fine grinding	CMG: Coarse and medium grinding	CRS: Crushing	EML: Emulsification	DSL: Dissolution	COO: Cooling	SLD: Solidification	WGF: Weighing & feeding	STR: Storage		TRS: Transportation
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	Tea Leaf Grinding Equipment															
	Chocolate Manufacturing Equipment															
	Cosmetics, Surface MSodification and Drying Equipment															
	Cosmetics Mixing Equipment															

Delivered more than 10,000 Machines, “FM

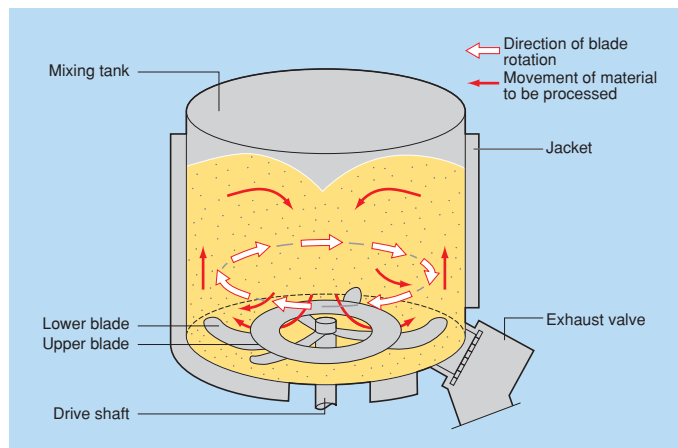
High-speed mixing blade generates strong mixing capacity and Ideal (Toner external additive processing, surface coating treatment, highly

Mixers & Granulators Series

FM Mixer (Model FM)

High-performance fluid mixer

- 10 liters - 1,000 liters
- 2.2KW - 190KW
- Plastics, pharmaceuticals, foodstuffs, cosmetics, ceramics, etc.



MIX DSP CRS DRY GRA RCT KND CMG COO CTM CPX DSL

Big Mixer (Model FM)

High-performance fluid mixer

- 1,500 liters - 8,000 liters
- 55KW - 300KW
- Simple mixing, heating and mixing, pellet coloring, granulating, drying, degassing, defoaming



MIX KND DRY RCT GRA

Cooler Mixer (Model FD)

Cooling mixer

- 40 liters - 4,700 liters
- 3.7KW - 55KW
- For cooling in combination with Model FM, or for simple mixing as a single unit

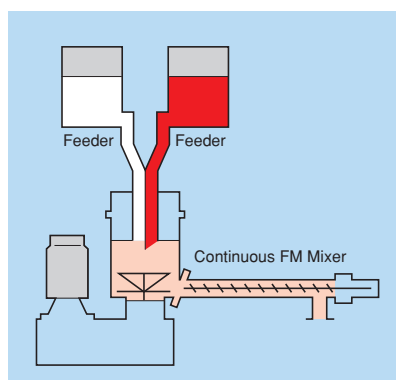


COO MIX GRA

Continuous FM Mixer (Model FM-C)

Continuous mixer

- 20 liters - 500 liters
- 3.7KW - 37KW
- Large treatment capacity from small unit
- Directly connectable extruder



MIX DSP CTM

Mechano Hybrid (Model MH)

Complex equipment to create new powders

- 20 liters - 600 liters
- 5.5KW - 190KW
- Ultrahigh-speed dispersion grinding complexation unit



MIX DSP CPX FNG CTM CRS

Mixer” is a partner of Your Particle Design

for high-performance processing.
distributed processing etc.)

Upper-Drive Mixer (Model UM)

Upper drive fluid mixer

- 2 liters - 500 liters
- 0.75KW - 90KW
- Faultless sealing
- Kneadable materials, hazardous materials such as radioactive wastes
- Multiple tank sharable



MIX

DSP

DRY

RCT

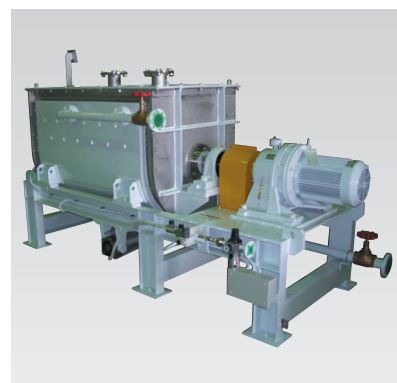
GRA

KND

Cooling Blender (Model RM)

Cooling blender

- 40 liters - 4,000 liters
- 0.75KW - 37KW
- For cooling in combination with Model FM



COO

MIX

GRA

Multi-Purpose Mixer (Model MP)

Multi-purpose compact mixing grinder

- 2 liters - 6.5 liters
- 2.2KW
- 10,000min⁻¹
- Multi-purpose Experimental Equipment



Lab equipment

Complex treatment (Spherical tank)



General Mixing / Disposal Processing (Standard Tank)



Grinding Processing (Tank for Pin rotor)



MIX

DSP

CRS

CTM

CPX

CMG

FM Mixer RC Type (Model RC)

Applicable for Pharmaceuticals, Cosmetics and Food

- 5 liters - 20 liters
- 1.5KW - 2.2KW
- Easy disassembly type
- Pharmaceuticals, Cosmetics, Food, etc.



Lab equipment

MIX

DSP

DRY

GRA

RCT

KND

CTM

CPX

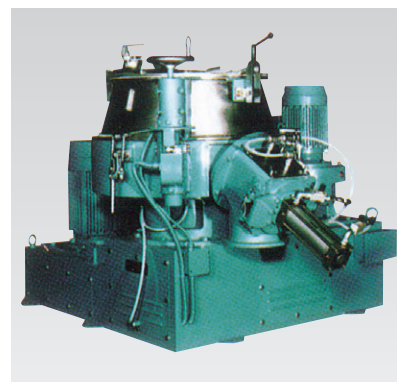
CMG

CRS

Granule Mixer “Ryu-O” (Model TM)

Spherical granulation from dry powder

- 25 liters - 1,900 liters
- 2.2/0.75KW - 150/37KW
- Ceramics, metallic powder, ferrite, pigment, pharmaceuticals, food



GRA

MIX

CTM

We meet your requirements for ultra fine range of machines and extensive accu

Wet-type media grinding machine series

SC Mill (Model SC)

Wet-type large volume circulation type grinding mill

Large volume circulation grinding and dispersion using small media

- 2 liters - 1,000 liters
- 3.7KW - 55KW
- Paint, ink, toner, ceramics, pigments, etc.



UFG FNG DSP

SC Mill (Model SC-L)

Wet-type large volume circulation type grinding mill

- SC100L-SC650L Model
- Grinding and heating of long-wearing materials (alumina, silica, carbide, etc) that are preferred in low speed operations
- Dispersion, etc, of paint, light calcium carbonate, high-performance pigments, various nanoparticles
- High-capacity treatment such as calcium carbonate grinding



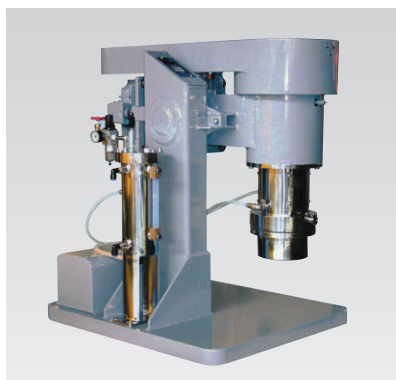
UFG FNG DSP

MSC Mill (Model MSC)

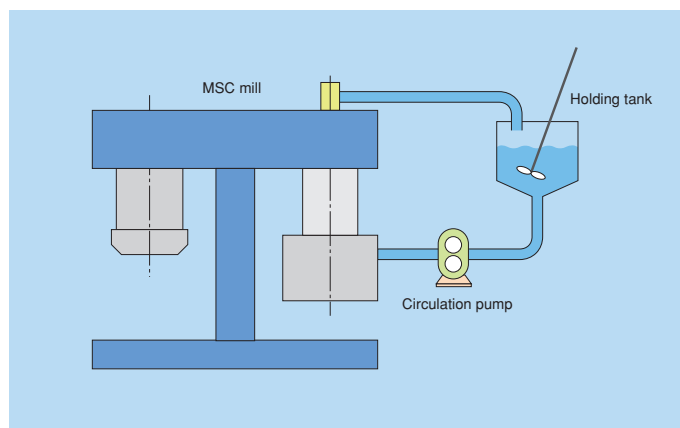
Media agitation wet-type ultrafine grinding mill

High-performance grinding and dispersion mill achieving nano-level grinding and dispersion performance.

- 0.32 liters
- 3.7KW
- Grinding and dispersion at the submicron and nano level for various types of inks, specialized ink, paint, pigment, color toner, PZT, ITO, titanium oxide, various metal oxides, and glass.



UFG FNG DSP



SC Mill (Model SC50/16)

Large volume circulation-type grinding mill

- Grinding and dispersion of pigments, ink, paint, ceramics, inorganic materials, etc.

Lab equipment



UFG FNG DSP

MSC Mill (Model MSC50)

Media-agitation, wet-type ultrafine grinding and dispersion machine

- Grinding and dispersion of various types of inks, specialized ink, paint, pigment, color toner, PZT, ITO, titanium oxide, barium titanate, calcium carbonate, various metal oxides, various metals, glass, etc.

Lab equipment



UFG FNG DSP

e grinding and dispersing with a broad mulated technological know-how.

Wet Attritor (Model S)

Wet-type media agitation batch system (Thin Shaft)

- 0.75 liters - 1,200 liters
- 0.2KW - 37KW
- Wet-type ultrafine grinding and dispersion of ceramics, ferrite, carbide, ink, paints, etc.

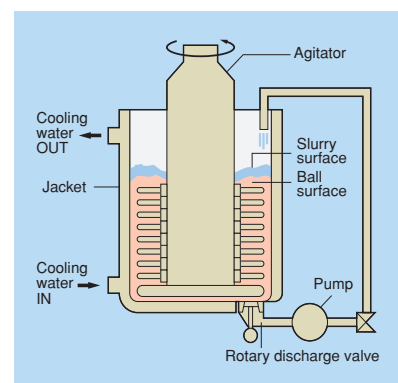


UFG FNG DSP RCT

Wet Attritor (Model NS)

Wet-type media agitation batch system (Thick Shaft)

- 5.3 liters - 1,200 liters
- 0.75KW - 55KW
- Wet-type ultrafine grinding and dispersion of ceramics, ferrite, carbide, ink, paints, etc.
- The shaft can be cooled down



UFG FNG DSP RCT

Wet Attritor (Model SA)

Wet-type media agitation batch system

- Lift-up type

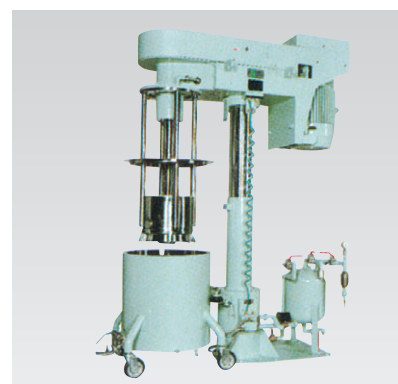


UFG FNG DSP RCT

Handy Mill (Model HM)

Color change is easy. Wet-type media agitation batch system

- 5 liters - 500 liters
- 0.75KW - 37KW
- Various kinds of ink, paint, ceramics, pharmaceuticals, etc.
- Ideal for producing a wide variety in small lots
- Dedicated vessel not required
- Premixing, dispersing and preparation can be performed in same vessel.
- Temperature can be easily controlled.
- Rapid and uniform dispersing process is possible.

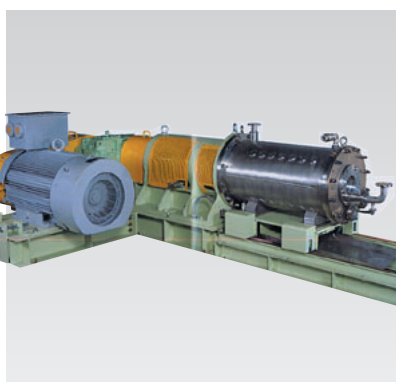


UFG FNG DSP RCT

MY Mill (Model MY)

Wet-type horizontal continuous grinding mill

- 10 liters/h - 2,000 liters/h
- 2.2KW - 90KW
- Small balls of 0.3mm diameter can be used and larger sizes are possible.



UFG FNG DSP

Attritor (Model MA01SC)

Wet-type media agitation grinding mill

- Pharmaceuticals, food, ceramics, metal powder, ferrite, pigments, pesticides, etc.

Lab equipment



UFG FNG DSP Mechano-chemical RCT

Optimal for the mechanical alloying and mechano-chemical processing

Dry-type media grinding machine series

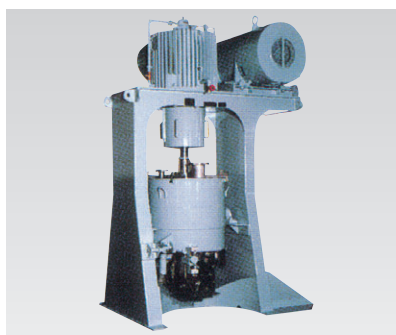
Dry Attritor (Model D)

Dry-type media agitation batch system

Has a powerful impact force exceeding grinding and is suitable for treating new materials.

Alloys and amorphous substances can also be produced mechanically.

- 0.75 liters - 1,000 liters
- 0.4KW - 150KW
- Processable with pressure reduction and displacement system in an inert gas environment
- Manufacturing of dispersible enforced alloys, grinding of metals, ceramics and pigments, etc.



UFG

FNG

DSP

CPX

Mechanical Alloying

RCT

Dynamic Mill (Model MYD)

Dry-type horizontal continuous ultrafine grinding mill

- 2 kg/h - 2,000 kg/h
- 5.5KW - 400KW
- Ceramics, ferrite, ores, metallic powder, foodstuffs, fertilizers, livestock feeds
- Sub-micron grinding is possible
- Small size with large grinding capacity
- Grain size and distribution can be controlled.
- Mechano-chemical effect can be obtained.
- Easy maintenance
- Contamination resistant -type is available.



UFG

FNG

DSP

Mechano-chemical

RCT

Attritor (Model MA01D)

Dry-type media agitation grinding mill

- Laboratory Machine specification for Dry Attritor

Lab equipment



UFG

FNG

DSP

CPX

Mechanical Alloying

RCT

Dynamic Mill (Model MYD5-XA)

Dry-type continuous ultrafine grinding mill

- Dry-type grinding processing of high-purity alumina, fused-alumina, barium titanate, ferric oxide, ferrite, silicon nitride, silicon carbide, siliceous sand, carbon, baddeleyite, perlite, metallic powder, chalk, PZT, silicon-boron, mineral stone, etc.



Lab equipment

UFG

FNG

DSP

Mechano-chemical

RCT

Dry-type fine grinding mill, applicable up to sub-micron particle size

Fine Mill (Model SF)

Dry-type media agitation grinding mill with classification function

- 2kg/h - 100kg/h
- 22KW - 30KW
- Easy to control grain size, and sharp grinding.
- Various glass, alumina, nitriding silicon, ceramics, silica, and inorganic materials

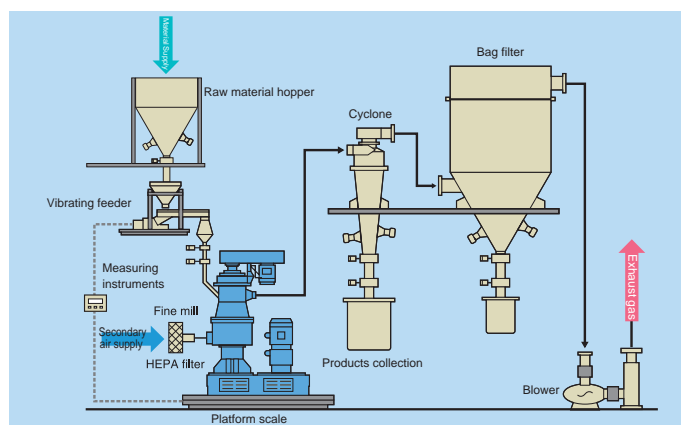


UFG

FNG

DSP

CLS



Optimal equipment for the fine grinding of temperature and contamination sensitive materials

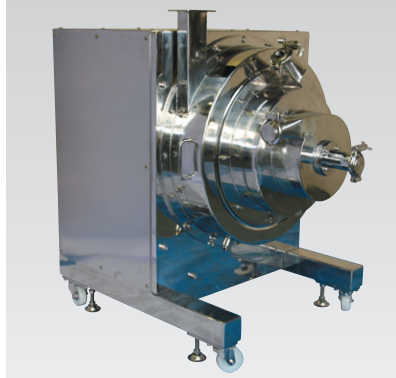
Dry-type no-media grinding machine series

Stream Mill (Model ST)

Airflow system fine grinding mill

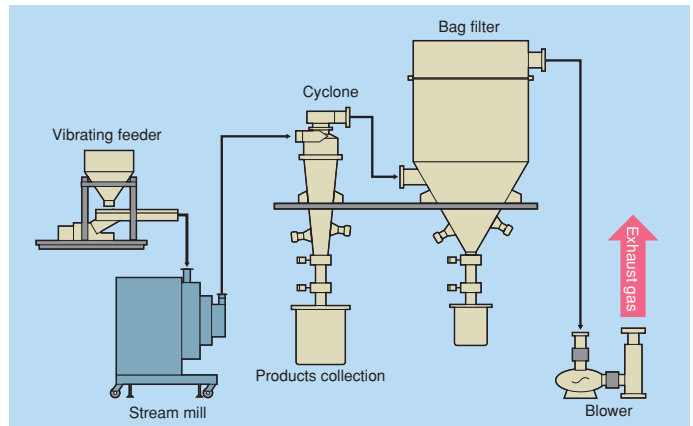
Strong swirling flow generating collision between the raw material, autogenous grinding machine

- Rice, tea leaf, soy, wheat, barley, coffee beans, food, pharmaceuticals, vitamine, herbal medicine, glass, polyethylene, talc, wood chips, toner etc.



CRS

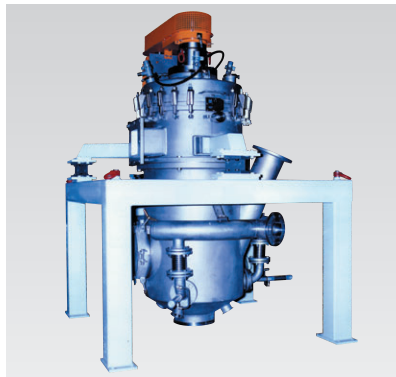
FNG



Fluidized-Bed Jet Mill (Model CGS)

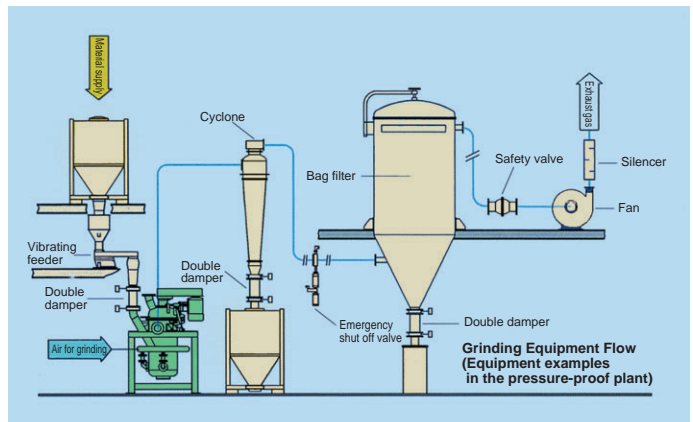
High performance jet mill with built-in classifier

- $2\ \mu\text{m}$ - $70\ \mu\text{m}$
- $50\ \text{m}^3/\text{h}$ - $5,100\ \text{m}^3/\text{h}$
- Highly sensitive raw material resin, wax, toner, etc.
- High purity materials, rare earths, ceramics, etc.
- Abrasive materials
- Graphite, talc, etc.



CRS

FNG



Classifier Mill (Model CSM)

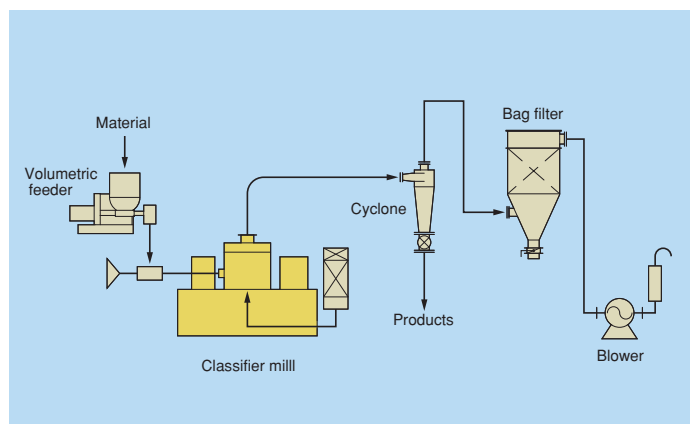
Percussion fine grinding mill with built-in classifier

- $8\ \mu\text{m}$ - $180\ \mu\text{m}$
- 5.5KW - 160KW
- Heat sensitive raw material resin, wax, toner, powdery paint, etc.
- Mineral materials and stones, limestone, siliceous, carbonaceous stones
- Lactose, starch, ammonium phosphates, etc.



CRS

FNG



Dry-type no-media grinding machine series

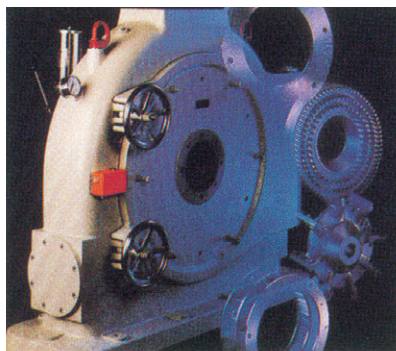
Centrifugal Mill (Model CUM)

Dry-type grinding mill that can perform cold grinding

- 3.7KW - 200KW
- Various types of resin and pellets (LDPE, PS, Nylon, etc.), aromatics, cocoa, pigments, wood, bamboo, carbon fiber

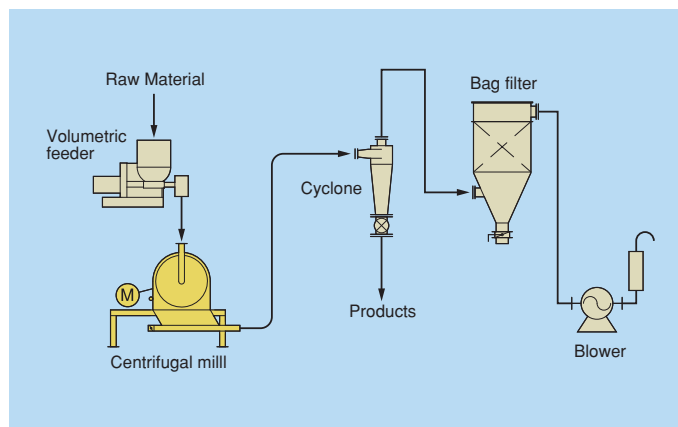


Grinding disc



FNG

CMG



Ultra Centrifugal Mill (Model UCM)

Dry-type compact continuous grinding machine

Ultra Centrifugal mill is a continuous grinding machine that supplies materials from an electromagnetic feeder to a cyclone that collects ground matter, developed into a compact unit.

- Plastic (PP, LDPE, HDPE, PS, PA, etc.) food, spices, medicinal agent, wood powder, rubber, inorganic materials



Lab equipment

FNG

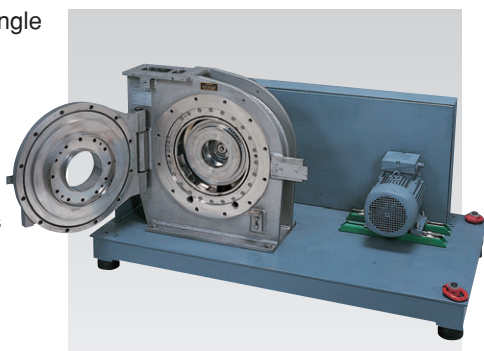
CMG

Dry-type Classifier

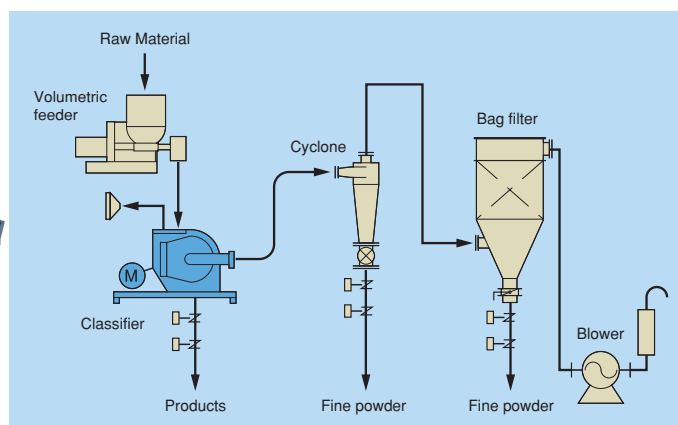
Classifier (Model CFS)

State-of-the-art single roter horizontal classifier

- 30kg/h - 14,000kg/h
- 4KW - 90KW
- Classification 2 μ m - 60 μ m
- Toner, powder paints



CLS



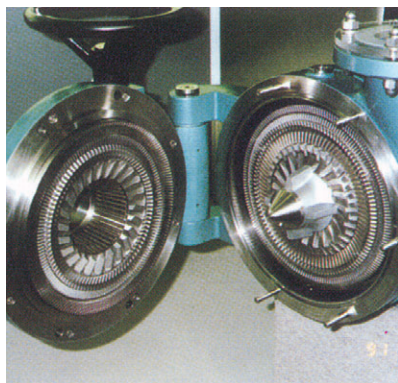
High-speed in-line processing Emulsifier-dissolver with a pump-like properties

Wet-type no-media grinding machine series

Trigonal (Model SM)

Wet-type fine grinding mill not requiring media

- 1m³/h - 100m³/h
- 7.5KW - 250KW
- Rubber, asphalt, paper, fiber, chemicals, foodstuffs, wastes



DSP EML DSL FNG

Slasher (Model SR)

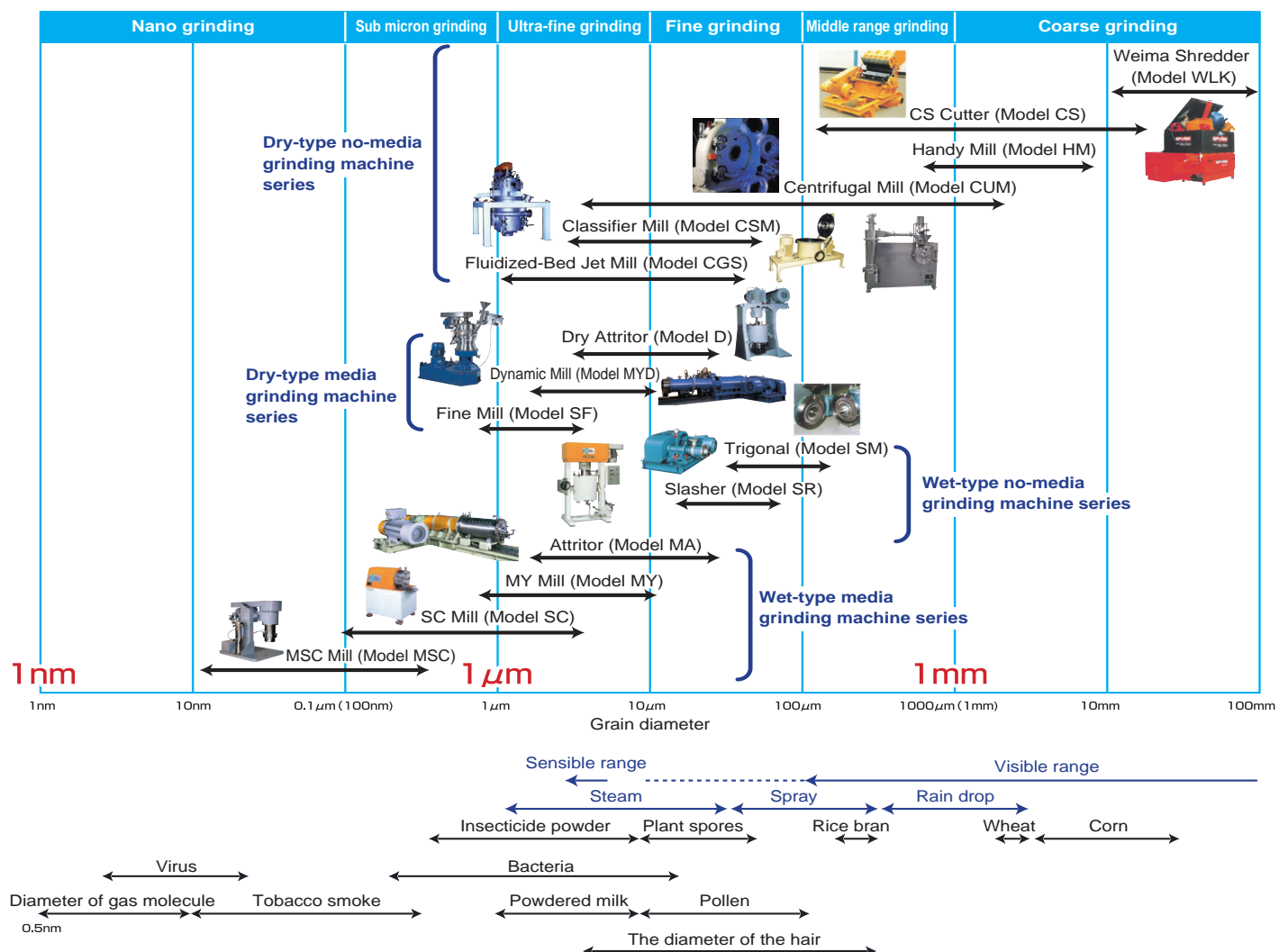
High-speed disperser not requiring media

- 1.2m³/h - 30m³/h
- 1.5KW - 45KW
- Emulsification and dispersion of foodstuffs, cosmetics, pharmaceuticals and chemicals



DSP EML DSL CRS

Classification List of Grinder series



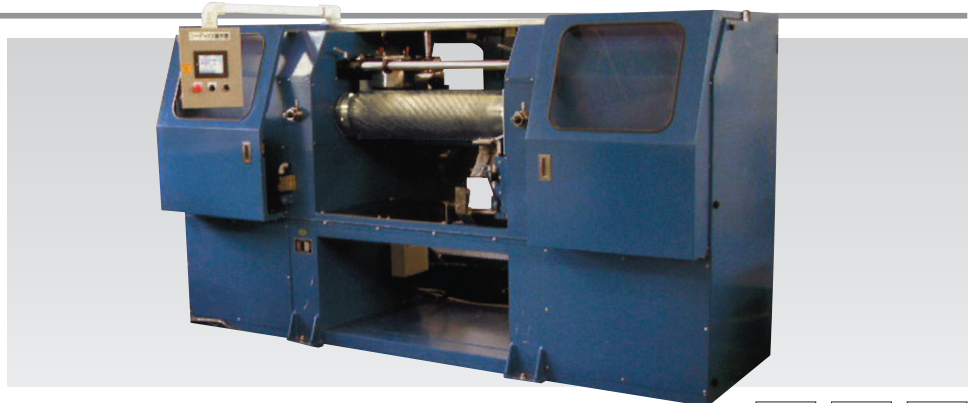
The advantages of rolling and extruding have been integrated in this kneader-pelletizer

Powerful compression and shear enable highly distributed processing

KNEADEX (Model MOS)

Open roll continuous kneader-pelletizer

- Roll diameter 120φmm - 500φmm
- 22KW - 97KW
- Color toner, phenol resin forming material, powder paint, thermoplastic resin, magnetic powder, thermoplastic elastomer, ceramics
- Continuous roll kneading reduces labor requirements
- The easy-to-clean open roll type unit improves productivity (with rear roll open and shut device)
- Pelletizing and sheet lifting
- Thorough safety measures (Emergency stop, roll opening)



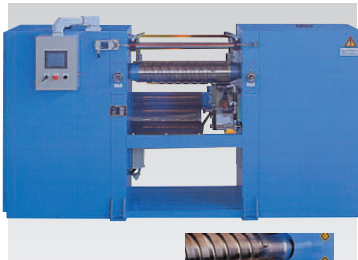
KND DSP GRA

Surfer Kneader (Model MS)

Open high-shear two-shaft screw kneader-pelletizer

Continuous kneader-pelletizer that achieves high-capacity and high dispersion

- Screw diameter
Front φ111mm - φ333mm,
Back φ89mm - φ267mm
- 5.5KW - 90KW
- Toner, powder paint, heat-hardening resin compounds, thermoplastic compounds, magnetic material, rubber, woody resin, special adhesive material, etc.
- Reliable processing performance comparable to an extruder.
Doubled value by increased capacity and cost-reduction.
- Increased carrying capacity by the screw, and over-flow on the bank part has been eliminated.
- Pelletizing and sheet lifting.
- The easy-to-clean open roll type unit improves productivity.



KND DSP

GRA

KNEADEX (Model MOS100-500)

Open roll continuous kneader

- Heat-kneading of monochrome toner, color toner, thermoplastic resin, heat-hardening resin, plastic magnets, powdered paint, magnetic materials, natural/synthetic rubber, woody material, special adhesive agents, etc.



Lab
equipment

DSP KND

Compact cooling and solidification equipment

Optimal for after treatment of Kneadex and Extruder

Belt Drum Flaker (Model MBD)

Cooling, solidification and destruction of molten materials

- Diameter of cooling drum
400φmm or over
- 20kg/h - 400kg/h
- Powdery paint, toner, ink, paint, resin, foodstuffs, etc.
- Molten materials in a sheet-like state are securely placed on the belt. This gives very high cooling efficiency and the unit is compact.



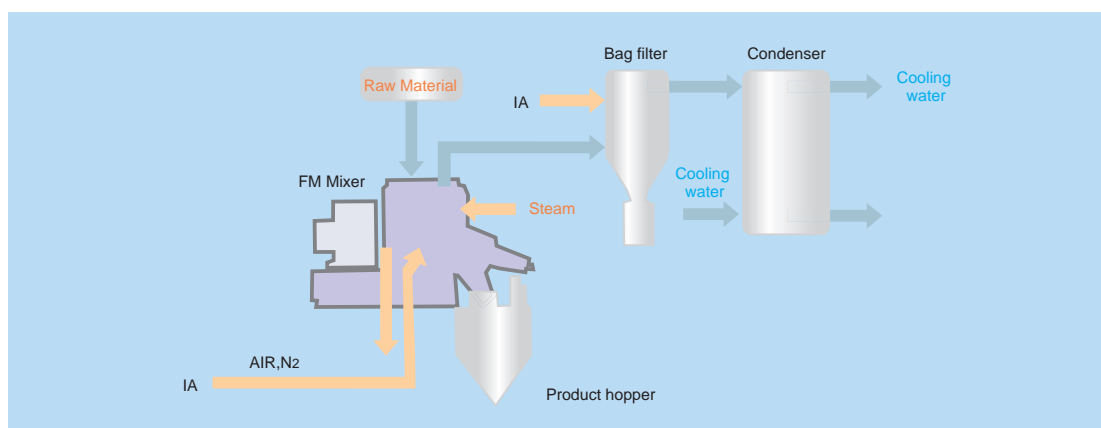
COO SLD CMG

High performance drying system utilizing the capability of “FM Mixer”

Normal Pressure Drying System

Drying system in normal pressure

- Simple system
- By using inert gas, measures to prevent oxidation is possible
- The sterilization is possible by high-temperature drying
- Easy collection of solvent

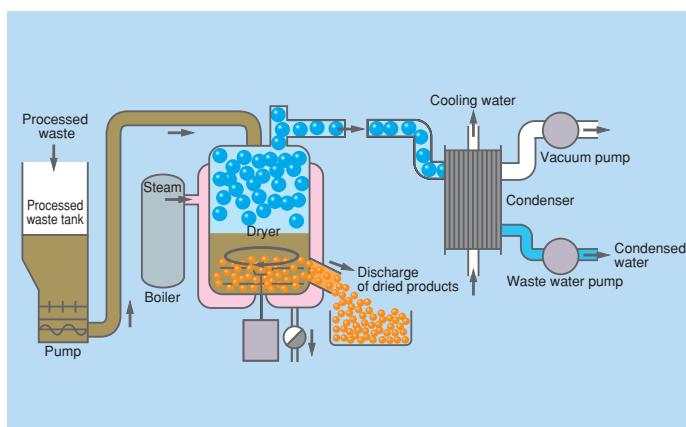


MIX DSP DRY GRA

Vacuum Drying System

Flow type mixer and condenser combined into vacuum drying equipment unit

- 20Torr- 760Torr liters
- Suitable for low temperature drying
- Effective for temperature-sensitive materials
- The greater heat transfer enable to save time

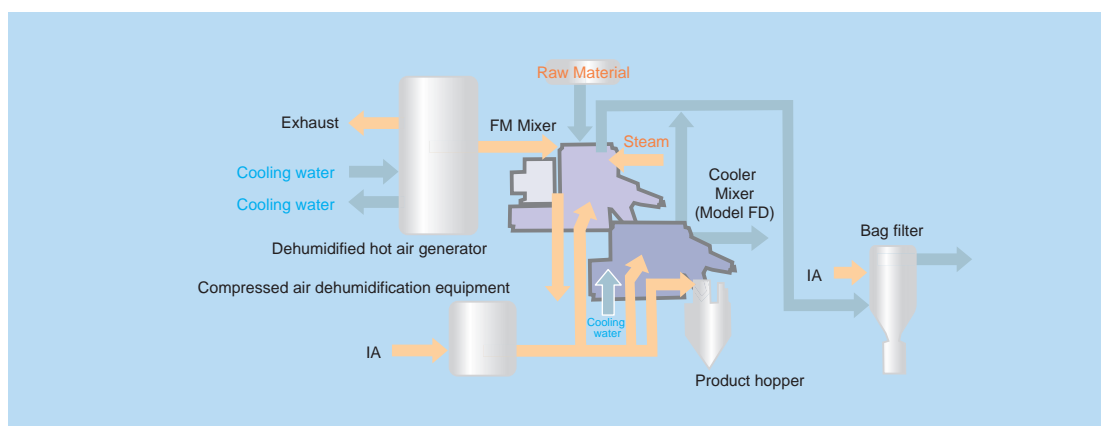


MIX DSP DRY GRA

Dehumidified Air Drying System

Drying system using the dehumidified air

- Blowing the dehumidified air of low dew point (-30℃) enable to dry up to 50ppm
- Drying crystal of PET resin etc.



MIX DSP DRY

Plant equipment contributing to efficient automated production lines and labor-sa

Large Silo

- Storage of PVC, calcium carbonate, etc



STR

Non-Bridge Tank

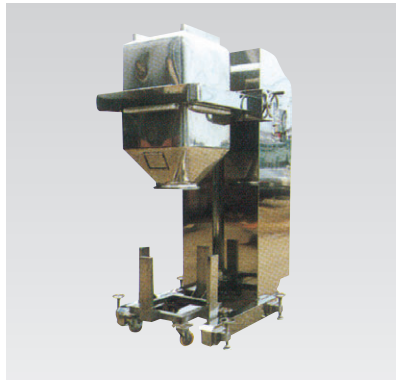
- Storage of bridge-prone powder
- Forced discharge by agitator



STR

Vessel Reverser

- Storage and transportation of pharmaceuticals, foodstuffs and cosmetics



TRS

Swing Lifter

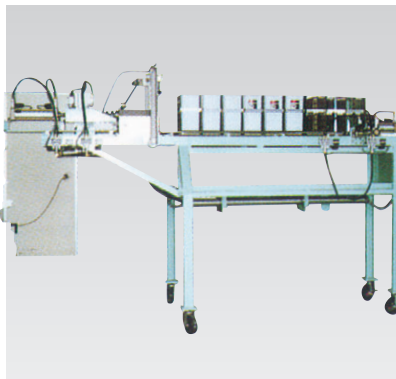
- Washing is easy, classification goes smoothly
- Batch vessel, lifting, swinging, attachment and detachment



TRS

Pigment Feeder

- Automatic feeding of a small quantity of additive

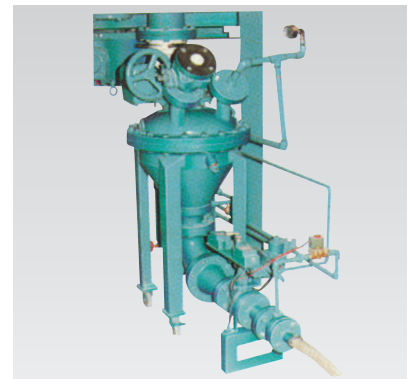


TRS

DST

High-Density PAC Feeder

- High-density plug conveying of PVC, calcium carbonate, ferrite, zinc, iron oxide, etc.



WGF

TRS

handling of diverse powders, ving

Auto-Blender

- Coloring mixer with automatic weighing
- Automatic weighing of a small quantity of additive



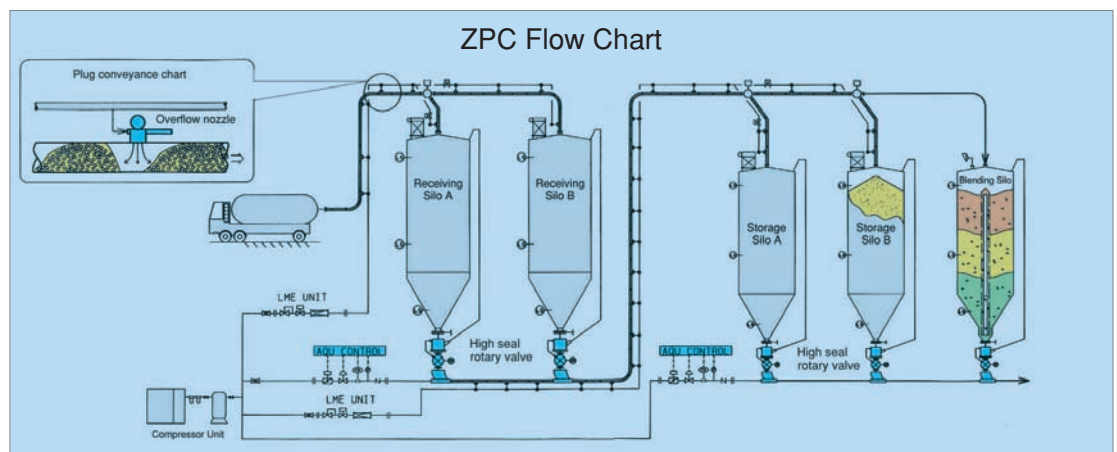
MIX

WGF

Continuous Concentrated Low-speed Conveyor System

ZPC System

- Conveyor equipment of pellet powder by continuous low-speed conveyance



TRS

MAS Feeder

High-performance measuring feeder

- 60 liters - 1,800 liters
- Conveying and weighing of PVC, calcium carbonate, talc, titanium, iron powder, carbon, ABS, etc.



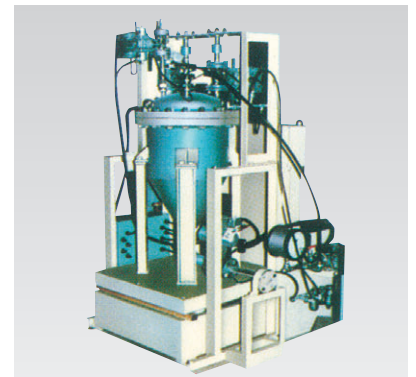
WGF

TRS

Weighing Pressure Feeder

High-performance measuring feeder

- Weighing pressure feeding of powders and liquids



WGF

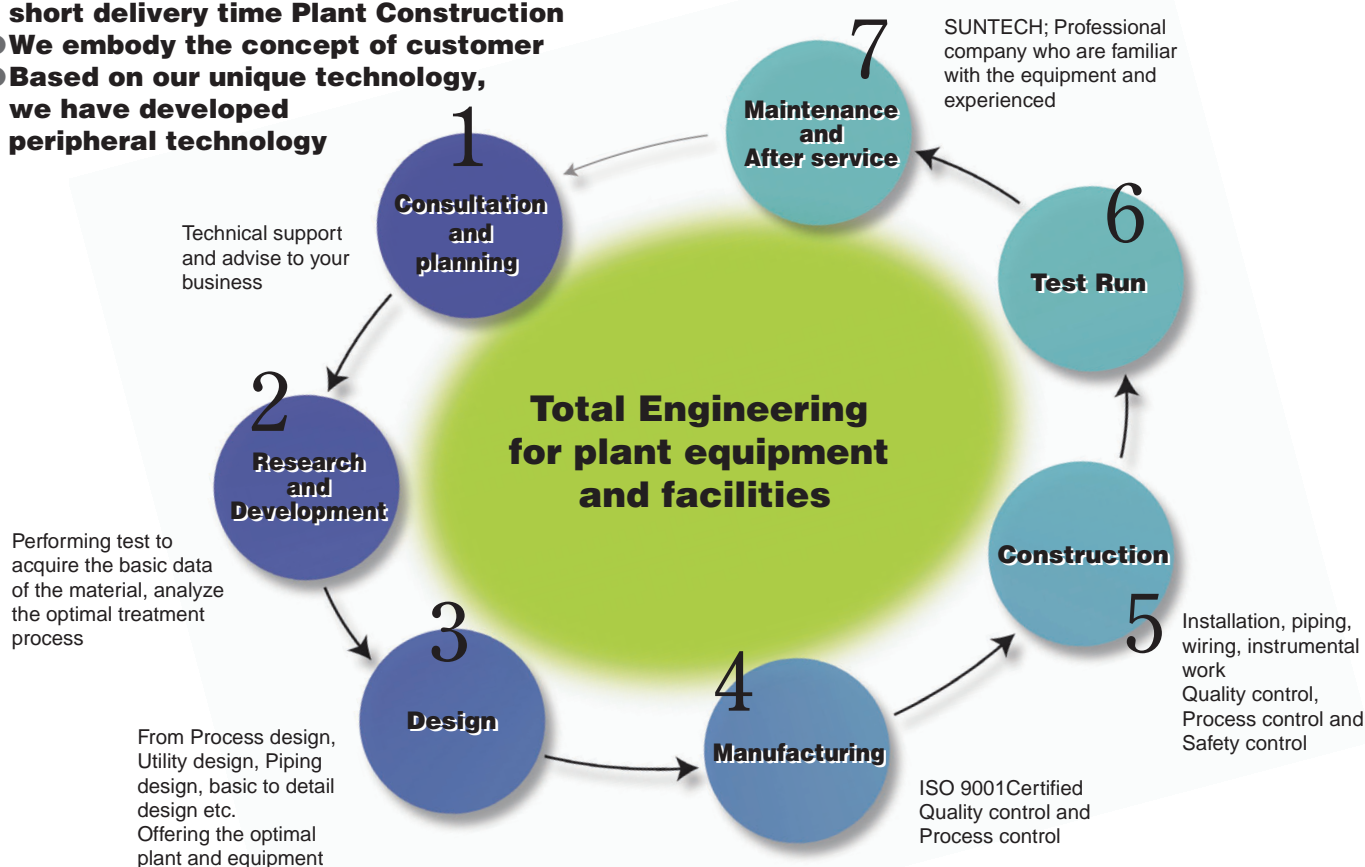
TRS



Powder and granule plants with proven track records supported by extensive Models and accumulated technology

Our engineering can propose a lot of things

- Confident in our high quality, low cost, short delivery time Plant Construction
- We embody the concept of customer
- Based on our unique technology, we have developed peripheral technology



Case Examples of System Proposal

<Electronic Components / Batteries>

- Electronic materials grinding equipment
- Battery production facilities
- PDP, Glass grinding equipment for solar cells

<Pigment / toner>

- Black toner manufacturing equipment
- Color resist grinding system

<Paper>

- Coating solution for paper manufacturing facilities

<Resin>

- Engineering Plastics manufacturing facilities
- EVA Resin blending equipment
- Wood plastic compound production
- PVC compound production

<Catalyst>

- Raw material grinding equipment

<Working Machine>

- Carbide grinding and drying facilities

<Pharmaceuticals / food>

- Herbal medicine manufacturing facilities
- Plaster manufacturing facilities
- Bath powder manufacturing facilities
- Portable body warmer manufacturing facilities
- Tea leaf grinding facilities
- Chocolate manufacturing facilities

<Cosmetics>

- Powder surface modification / Dry / Solvent recollection equipment
- Materials mixing facility

Examples of System Proposal

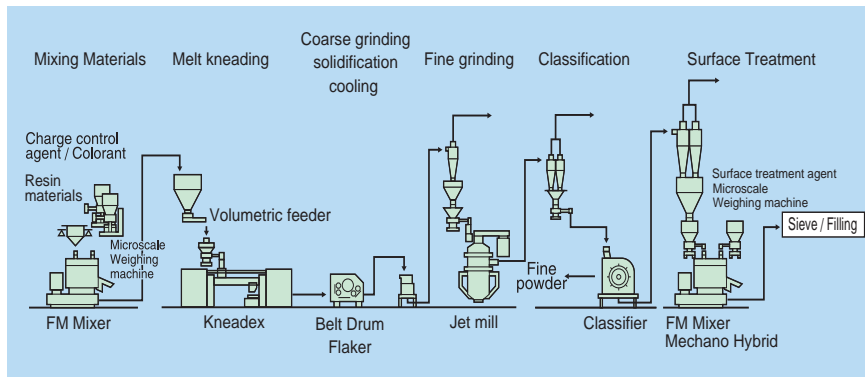
Color Toner Manufacturing System

Generally, color toner is made using the same manufacturing process as black toner. However, in the case of color toner a higher degree of kneading dispersion and finer granule size are required.

Regarding kneading dispersion, we employ our own Kneadex and this is very effective.

In the area of grinding and classification, we have introduced a fluid bed jet mill and a classifier, and this has led to us being able to offer even more reliable color toner manufacturing plants.

For Surface Treatment, using FM Mixer unable to attach the additives to the toner particles.



Continuous Slurry Making, Course Grinding and Fine Grinding System

Conventionally, many grinding mills are needed for calcium carbonate grinding.

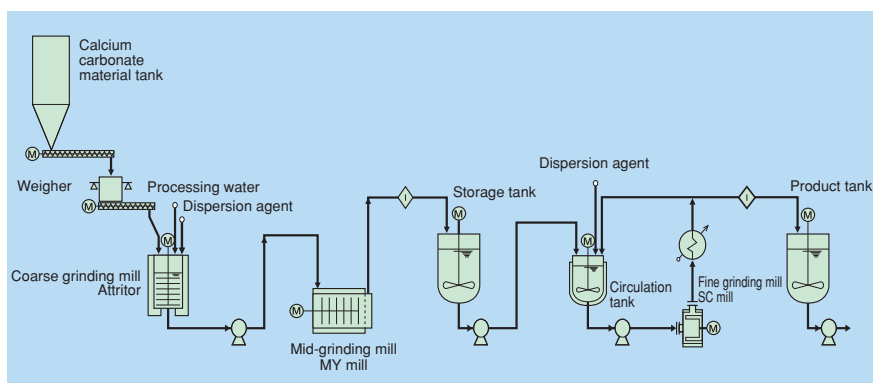
This flow uses high-efficiency grinding mills in each grinding process, so the number of grinding mills can be reduced, resulting in an energy-saving process.

The high-performance SC mill was developed by our company to be used for the fine grinding. A drastic reduction in electricity cost in comparison to conventional systems has been achieved.

Also, it is easy to adapt to changes in grain size of the grinding product.

[Applications]

Calcium carbonate, Barium titanate, Ferrite, Various metal, Oxide, various ceramics, various highly concentrated slurry etc.



Metal Powder Grinding and Drying System

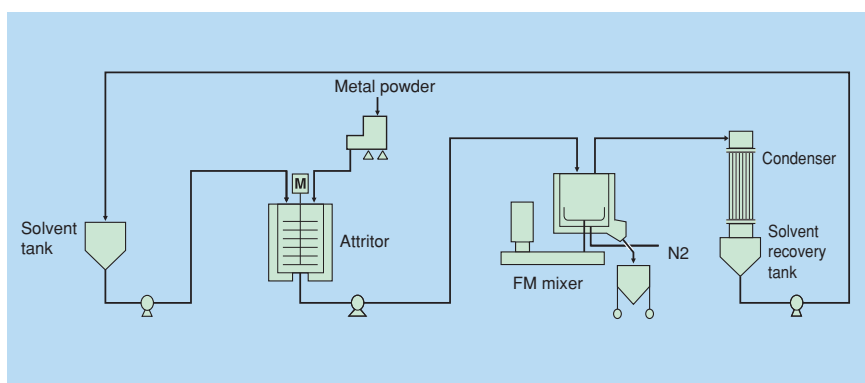
Using our company's Attritor and FM Mixer, we are proposing effective grinding and drying material system.

For the grinding of high-density metal powder, the attritor which forces to stir balls enables to grind effectively.

Strong circulation and shearing power generated by FM Mixer will promote the evaporation rate and heat transfer and enable to dry more effectively.

[Applications]

Tungsten carbide, Samarium cobalt, neodymium, Titanium carbide, various metal powder etc.



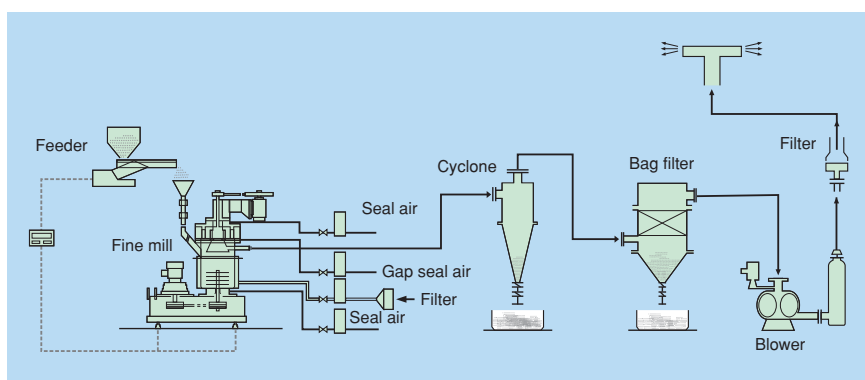
Dry-type Fine Grinding System

Using Dry-type media agitation grinding mill with classification function "Fine Mill", proposing the effective dry type fine grinding.

Integrating classifier into the mill, discharging the finely grinded low material without delay, we have achieved a significant improvement in grinding efficiency.

[Applications]

Various glass, Alumina, Nitrogen neodymium, Graphite, Silica, Battery materials, Cosmetics, Pharmaceuticals, Food, Titanium carbide, various metal powder etc.



Powder Treatment Technical Center

Equipped with the latest advanced technology, we seek out and create the next generation of products



Utilizing our state-of-the-art equipment, we respond to the needs of the new age

We focus our efforts on developing and manufacturing products for the next generation, and under the motto of “Responding to powder related needs with advanced technology” we respond to the changing structures of society and consumers.

Our R&D system in the powder and granule processing sector consists of the Development Group and the Powder Treatment Technical Center at the Tochigi Engineering Factory, and these work in close cooperation to ensure an effective and integrated response to the needs of the new age.

We collect essential data from newly developed processes and equipment to expedite the development of new applications.

A finely tuned response to all your needs

The Powder Treatment Technical Center was established in May 1987 as a vital key element in the development of powder and granule equipment and plants.

We are able to respond to bring-in tests, sample manufacturing and production on commission.

For such requests, please contact the Chemical Machinery Department of the headquarters and any operations office, or the Powder Treatment Technical Center of Nippon Coke & Engineering Co., Ltd.

Overview of the equipment installed in the Powder Treatment Technical Center

Items in parentheses () are being prepared for commissioned processing.

①Mixing, dispersing and cooling equipment

FM Mixer	FM10C/I, FM20C/I, FD20D/K, FM150J/I, FD150G/K, FM500J/I, FD500J/K, (FM300F, FD300D/K) (FM600J/I, FM1000L/I)
Continuous FM Mixer	FM-C20B
Multi-purpose Mixer	MP5
Mechano-hybrid	MH2, MH20, MH150

②Grinding, dispersing and reaction equipment

Attritor (Wet batch type)	MA01, MA1S, MA10S, MA15S, NS1, NS15, (MA60S)
MY Mill (wet continuous - horizontal-type)	MY10
Trigonal (wet medialess continuous type)	STR110
Slasher (wet medialess continuous type)	SR140
Dry attritor (Dry batch type)	MA1D, (MA30D)
Dynamic Mill (Dry type continuous)	MYD5, MYD25, (MYD50, MYD100)
Dynamic Mill (Dry, continuous, contamination-resistant)	MYD5XA, MYD25XA
SC Mill (Circulation type)	SC50, SC100, SC220, SC220L, (SC320)
MSC Mill (Circulation type)	MSC50, MSC100, MSC220
Fine Mill	SF15, SF30, (SF100)
Handy Mill	HM05

③Pelletizing and drying equipment

TM type pelletizing mixer	TM3, TM25B, TM50B, TM200B, TM500B
Vacuum Drying System	
FM Mixer Type	FM20BX
FM Dryer Type	FMD20, FMD150

④Transportation, weighing and distribution equipment

MAS feeder system	Transportation and weighing equipment
PAC feeder system	High density pressure feed device
MPC System	Concentrated low-speed conveyor system

⑤Grinding, pelletizing, and separation equipment

Centrifugal mill	CUM300
Ultra centrifugal Mill	UCM150
Jet mill	CGS16, CGS50
Classifier mill	CSM260
Classifier	CFS8
Weima	WLK10/45, WLK18/2×75SJ
(CS cutter (grinding, cutting device))	CS400/600)

⑥Kneading

KNEADEx (Open roll continuous extruder)	MOS100, MOS160, MOS240, (MOS210)
Surfer Kneader	MS100, MS160

⑦Cooling and solidificaion

Belt Drum Flaker	MBD55-70
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※A number of tests can be performed by the combination of the above equipment. For bring-in tests, please inform us of the purpose of the test so that we can prepare the optimum equipment and conditions for your test. Regarding the material to be handled, please inform us of safety precautions required in terms of hazardous and toxic materials.

⑧Analysis and measurement devices and instruments

- Grain size distribution measurement device
MICROTRAC MT3000, UPA
Horiba, Co., Ltd. LA920
Otsuka Electronics Co., Ltd. ELS
- Inline Measuring Instrument AXR II M
- Coulter counter
- Electron microscope
- Micro-videoscope
- Color differentiation gauge ZE2000
- Powder tester PT-D3000VPH
- Surface area measuring instrument Flow soap 2300
- Powder tester SS-100
- Viscometer BH type, BM type
- Infrared moisture meter EE-280MOC type
- Electronic balance
- Electromagnetic screen vibration warmer

※We also offer a broad spectrum of other equipment and instruments for analysis, measurement, recording, etc. in many fields.

Mixing - Drying - Granulation - Grinding

We provide total support to all aspects

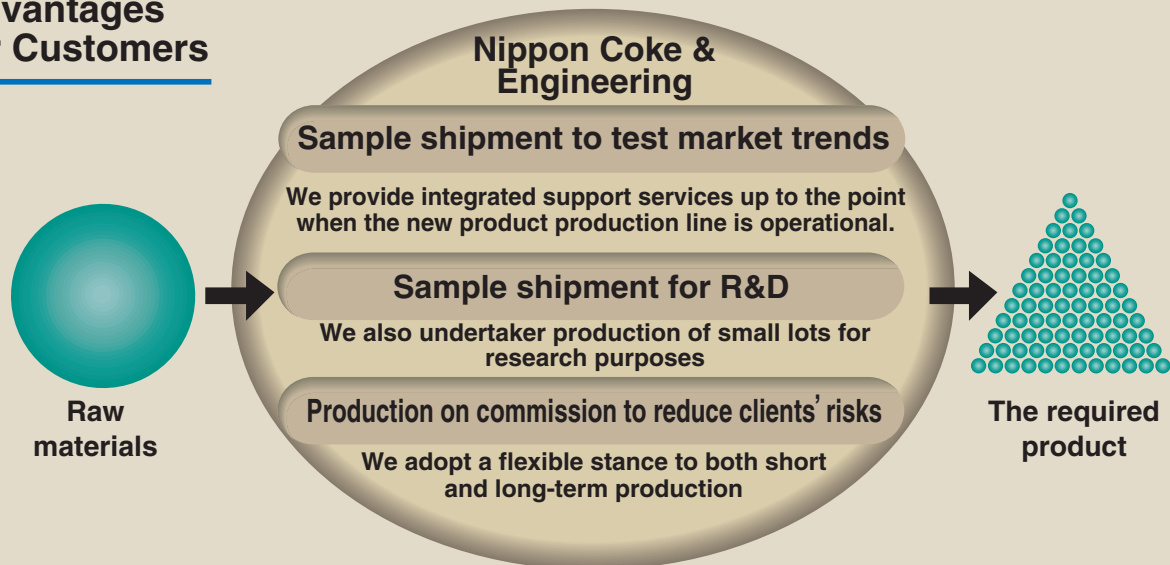
We solve all your powder problems

Nippon Coke & Engineering is an integrated powder and granule equipment and plant manufacturer with over 40 years of experience in this sector. Utilizing our extensive experience and know-how accumulated over many years, we offer a power and granule processing service on a commission basis. We offer a very flexible system able to respond to small amounts of powder from 100 to 200kg to mass production quantities of 10 to 20 tons in the areas of mixing - drying - granulation - grinding to meet the requirement of customers.

Requests by our clients are handled as the following.

- 1** A sample shipment is desired in order to gauge market response. Assistance is provided all the way through until an actual full-scale production line is established.
- 2** Small-lot production for research development is provided until the final product is obtained.
- 3** When a large capital investment risk is involved, consignment production for risk aversion can be arranged.

Advantages for Customers

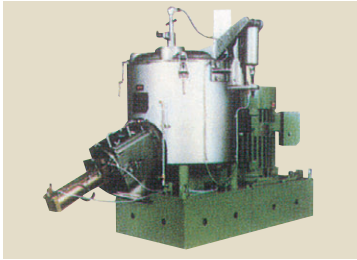


of powder processing

Applicable models

Mixing / Drying

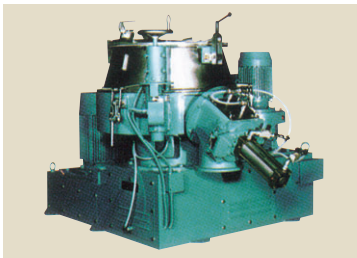
FM Mixer



This is a typical machine able to provide high quality processing of plastics, pigments, ferrite, toner etc.

Granulation

TM Mixer



This machine performs effective granulation of ceramics, hard ferrite, etc.

Grinding

SC Mill



Wet-type cyclic ultrafine grinding mill that grinds ceramics, pigment, inks, etc, into submicron sizes.

Fine Mill



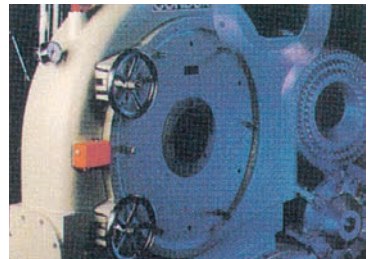
The dry-type ultrafine grinding mill which grinds various glass, ceramics, etc, into few micron unit, and classifies.

Dynamic Mill



This is a dry-type continuous fine grinding mill used to grind ceramics, pigments, ferrite, carbon, fertilizer, and animal feed down to a unit size of several microns.

Centrifugal Mill



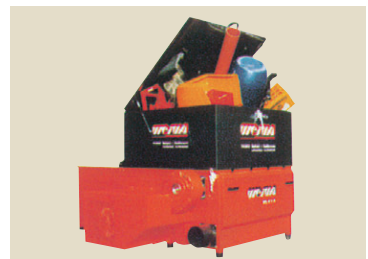
This mill grinds various resin pellets (LDPE, PS, Nylon, etc.) at ambient temperature down to several hundred microns in size.

CS Cutter



This is a high performance cutter able to grind plastic, film, sheets, pipes etc. to a powder size of several millimeters.

Weima Shredder Grinding Mill



This mill can grind a diverse range of items including large plastic objects, roll film, wood objects, etc, to a powder of 10 to 50 mm.

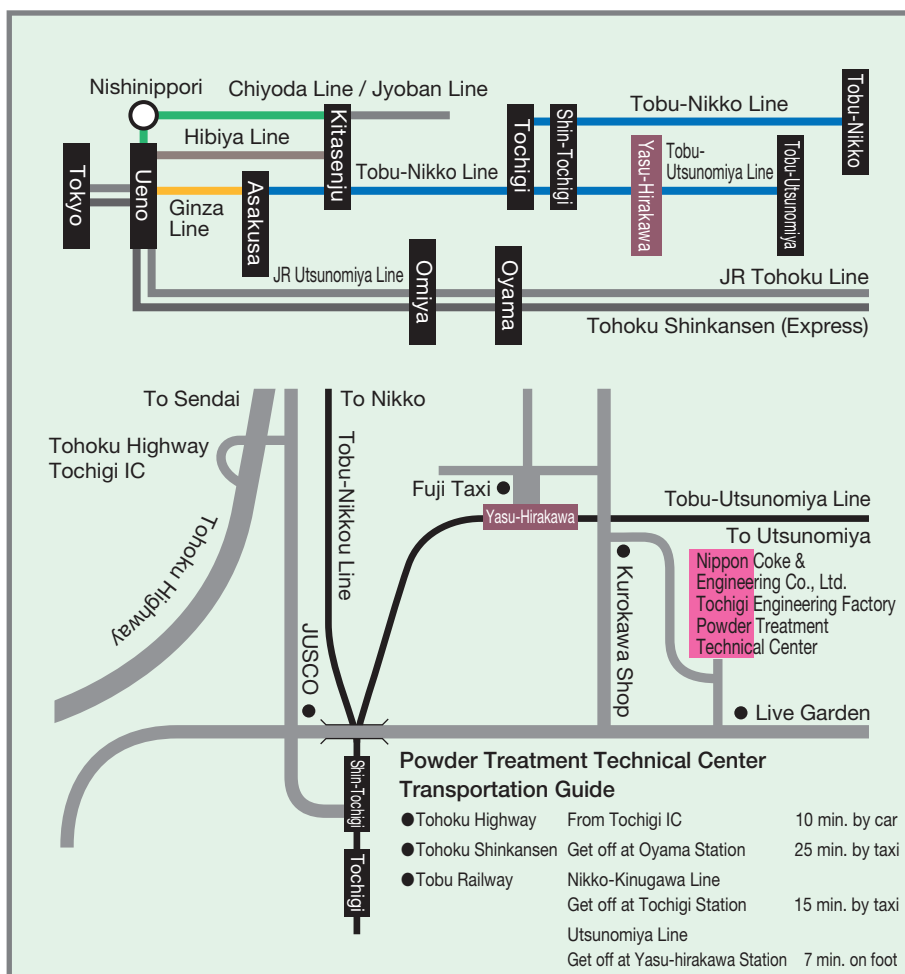
Examples of Processing

Mixing / Drying

- Coupling and drying of inorganic materials, coating processing of pigments and additives for resins
- Fatty acid processing of calcium carbonate, etc.

Granulation Grinding

- Ceramics, hard ferrite, soft ferrite, zeolite
- Ferrite, zirconia, barium titanate
- Inorganic and organic pigments
- Metal powders such as iron, nickel and copper, etc.
- Carbon, thermosetting resin



NIPPON COKE & ENGINEERING CO., LTD.

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 Osaka Branch Office (substation)
 Kyushu Branch Office
 Tochigi Engineering Factory
 Powder Treatment Technical Center

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