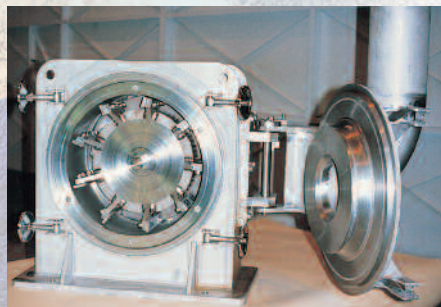
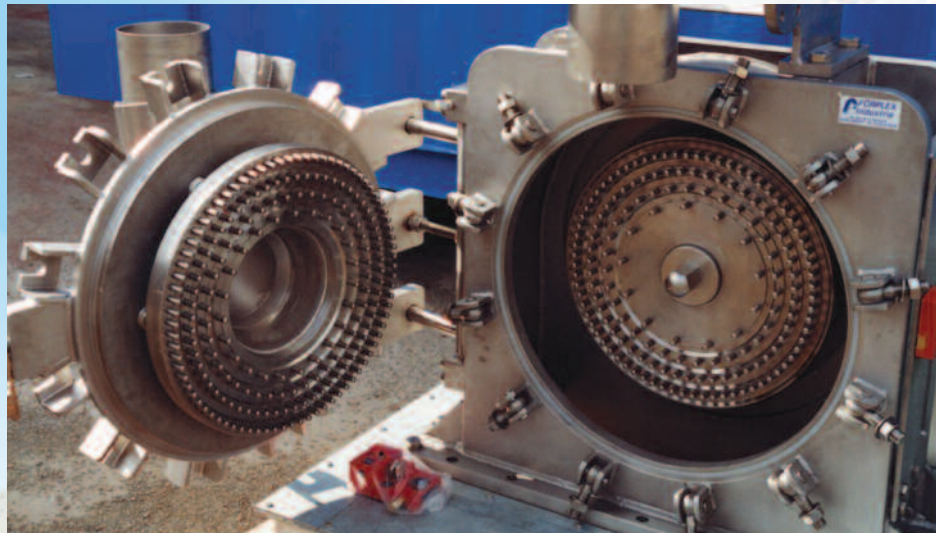




40, Boulevard de la Beaujoire
44300 Nantes Cedex - FRANCE
Tél. : +33 (0)2 28 01 08 28 - Fax : +33 (0)2 28 01 08 22
<http://www.poittemill.com> - E-mail : contact@forplex.fr



UNIVERSAL MILLS

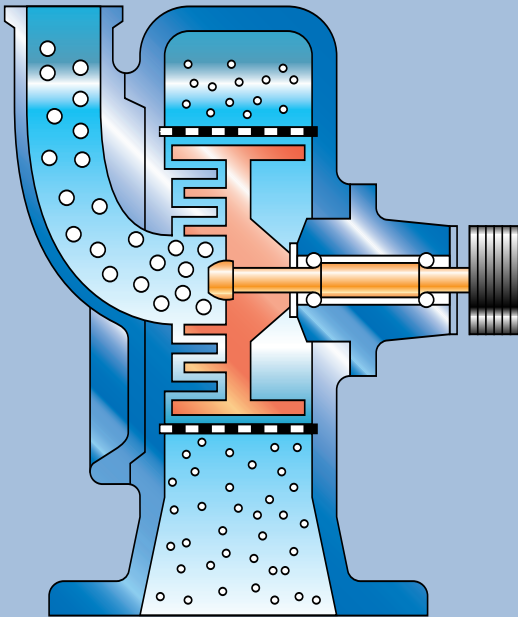


POITTEMILL / FORPLEX
G R O U P E
POITTEMILL INGENIERIE



FORPLEX INDUSTRIE

OPERATING PRINCIPLE OF FORPLEX GRINDER



The product is fed at the centre of the grinding machine. Grinding is achieved by impact and by projection between the rotating tools in the rotor, which rotate at a high speed, and fixed tools.

The fineness of the material to be ground is adjusted by:

- Selecting the grinding equipment,
- Type and dimensions of the holes in the sieving screen.
- Feeding rate
- Airflow rate.

Changing one of these factors will alter the particle size distribution of the final product.

FORPLEX INDUSTRIE AT YOUR DISPOSAL

A technology tailored to the requirements of each installations and customers.
A reliable technology: since 1911, FORPLEX Industrie had made the demonstration of the reliability of its systems both regards to productivity and sturdiness, by setting up numerous units in companies operating at the cutting edge of their trade.

A comprehensive service consisting in:

- Preliminary tests
- Customs grinding
- Unit design, studies and drawings
- Manufacturing
- On site supply and erection
- Starting up
- Staff training
- Industrial technical assistance
- Maintenance and spare parts' supply
- Audit and improvement of existing plants, to answer to new safety or production standards



The spare parts' service of FORPLEX Industrie remains at your disposal a large stock of parts for each kind of machine, and guarantees the replacement in the shortest delays.
Contact: + 33.2.28.01.08.28

UNIVERSAL GRINDERS FORPLEX

What is true today may be not tomorrow, and according to your requests the change of the grinding tools of the FORPLEX grinder, allows to meet a new particle size specification.

UNIVERSAL MILLS

One universal mill can be declined in two different ranges, to meet your precise requirements in terms of quality and safety.

A - CAST STEEL RANGE – FL TYPE

General construction:

- Body, door and yoke in moulded cast iron
- Front bearing protected by spacer cone
- Shaft based on widely dimensioned and ball bearings.

Nota: on request, FL mill can be delivered in 316L cast stainless steel.

Application fields:

Minerals – Building materials – Foodstuff industry – Chemicals – Recycling ...



(1) - FL type mill

B - WELDED RANGE: FNG TYPE

General construction:

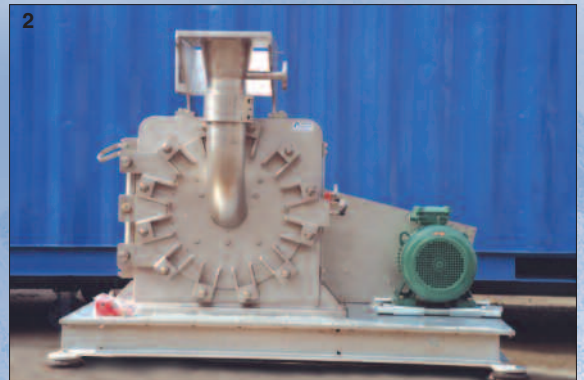
- Body, door and yoke in welded steel
- Door on hinge with several closing points, insuring an optimal tightness
- Shaft line under sleeve
- Insufflation on the front bearing avoiding all pollution risks
- Bigger body in comparison with FL range

Option:

- 304L or 316L stainless steel (or other material on request)
- Pressure shock resistant design up to 10 bars
- Mirror polished $Ra \leq 0.2$ maxi, for parts in contact with the product
- Connection for temperature probe
- Internal interchangeable lining
- Locking of the shaft for easy dismounting of grinding tools (FPX and FNG.1)
- Design according to GMP pharmaceutical criteria
- Linear rotation speed: maxi 150m/s

Application fields:

- Foodstuff industry – Fine chemical and pharmaceutical industries – Cosmetics.
- Products with explosion risks
- Thermo sensitive products (cryogenic or controlled temperature).



(2) - FNG type mill

Construction: 10 bars (version PSR 10) on plat form

Motor: 22kW

Product: méthionine

C- COMPLETE RANGE OF UNIVERSAL MILLS

RANGE	FPX FL.0	FNG.1 FL.1	FNG.2 FL.2	FNG.3 FL.3	FNG.4 FL.4	FNG. 5	FNG. 6	FNG.7
Flow rate (Kg/h)*	5 - 200	25 - 500	40 - 900	100 - 3 000	200 - 9 000	600 - 16 000	1000 - 25 000	2000 - 40 000
Installed power (Kw)	2 - 3	5,5 - 9	9 - 22	22 - 37	37 - 75	75 - 160	160 - 250	250 - 315

* according to product and requested fineness

FORPLEX GRINDING EQUIPMENTS

FORPLEX Industrie offers a multi purpose equipment,
Offering different type of interchangeable grinding tools and designed to be used for several applications.

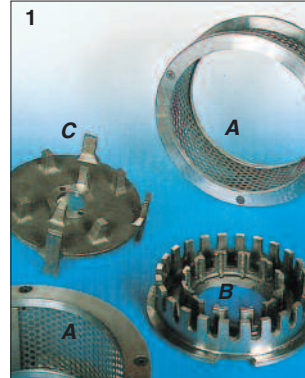
HAMMER PLATES

Use:

Fine, medium, coarse and preliminary grinding, lump breaking and defibration of crumbly to medium hard, crystalline, breakable, fatty and fibrous materials.

Fineness adjustment:

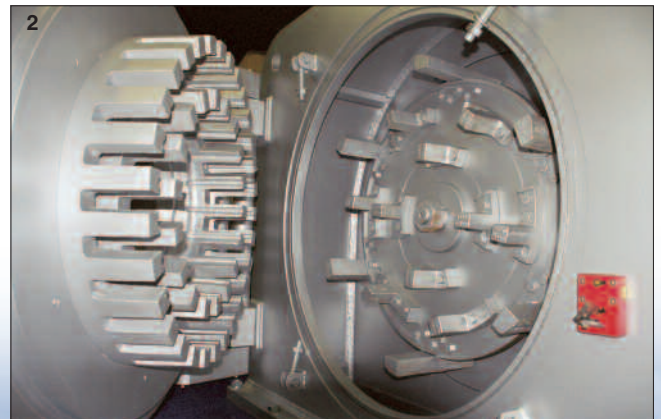
The particle size of the product is controlled by means of the speed of the rotor, the size of the holes and the design of the sieving screen.



(1) - Grinding equipment
A: Sieving screen holes from 0.1 to 20 mm.
B: Stator
C: Hammer plate



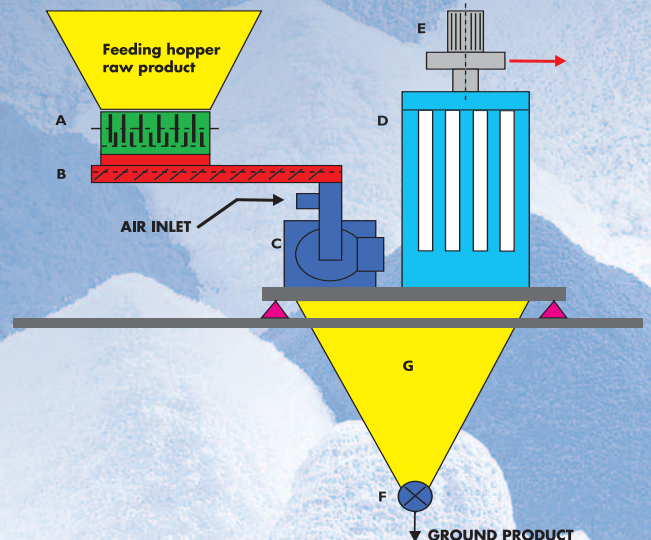
(3) - FNG.7 Grinder – Hammer Plate
Ø rotor : 1500 mm
Installed power: 315 KW
Flow rate: 37 T/h
Product: plaster



(2) - FNG.5 Grinder with hammer plate
Installed power: 90 KW
Flow rate: 15 to 20 T/h
Product: sodium tripolyphosphate

Operation principle of a standard unit compact design including grinder and a dedusting filter on a common reception hopper

- A: Lump breaker
- B: Transport Screw
- C: Universal mill
- D: De-clogging filter
- E: Fan
- F: Rotary valve
- G: Collecting hopper



FORPLEX GRINDING EQUIPMENTS

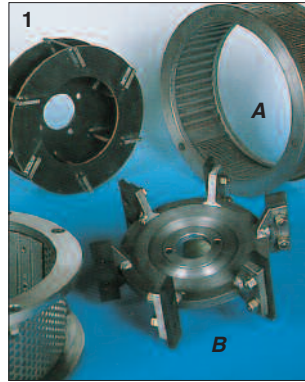
BLADE PLATES

Use:

Fine to ultra fine grinding of soft to medium hard, fibrous, slightly clogging materials heat sensitive. Dispersion of agglomerates fine particles.

Fineness adjustment:

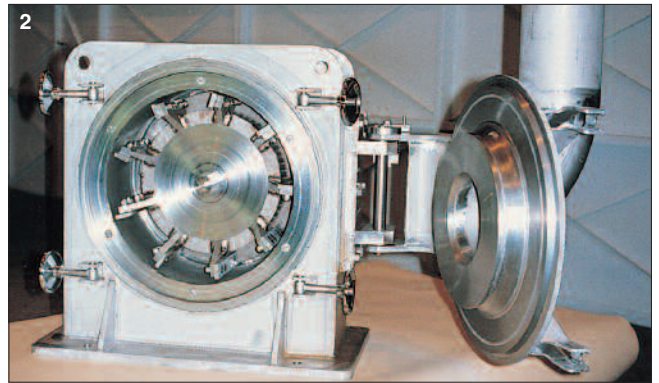
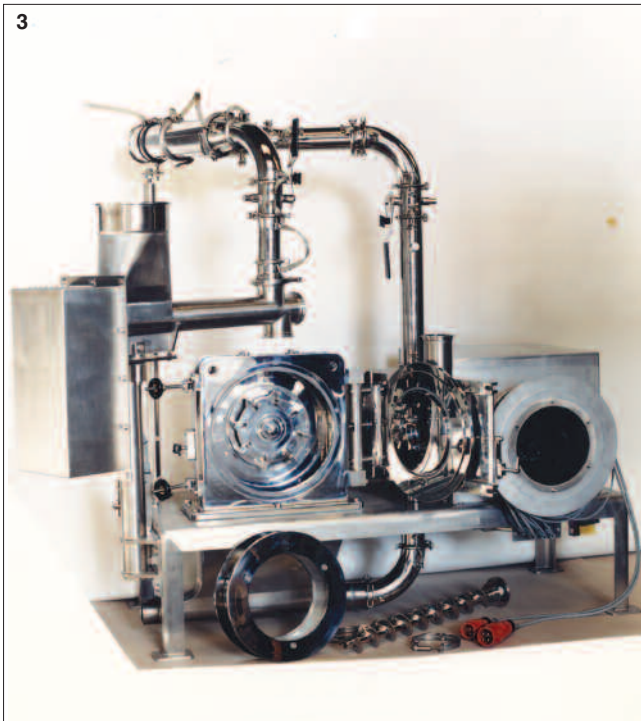
Adjustment of the grinding fineness by selection of the sieving screen and, depending on cases, by a wide or standard blades rotor. Possibility of pre-grinding by a mixed equipment with hammers on the rotor in addition to blades and toothed ring on the stator.



(1) - Grinding equipment

A: Bars sieving screen

B: Blade plates



(2) - FNG.3 Mill – Blade plates

Installed power: 37 KW

Flow rate: 400 kg/h - 300 µm

Product: medicinal plants

(3) - FNG.1 Grinder - Bright polished

inerted with nitrogen and with recycling

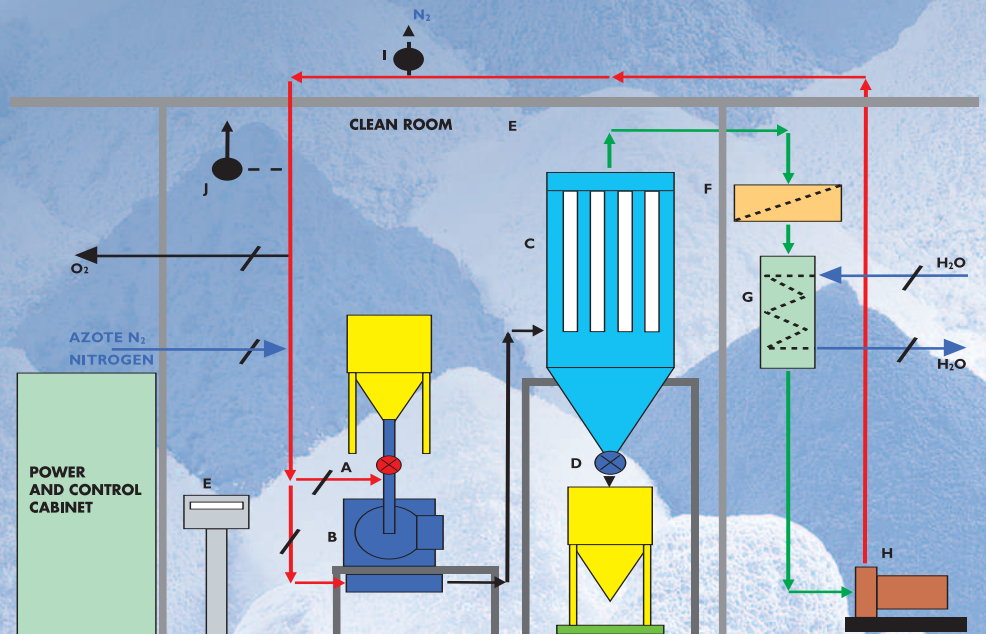
Installed power: 7,5 KW

Flow rate: 120 kg/h - d50 = 17 µm

Product: pharmaceutical principles

Operation of a grinding unit inerted with nitrogen and with recycling

- A: Rotary Valve
- B: Universal mill
- C: Filter with sleeves
- D: Rotary Valve
- E: Control panel
- F: Submicronic filter
- G: Cooler
- H: Fan
- I/J: Oxygen sensor



FORPLEX GRINDING EQUIPMENTS

PIN PLATES

Use:

Fine and ultrafine grinding of dry, non-clogging, breakable, materials easy to grind. Dispersion of fine agglomerated particles. Intensive mixing of different component by simultaneous grinding.

Fineness adjustment:

This device does not require a sieving screen, thus eliminating clogging risks. The fineness of grinding is mainly controlled by the rotation speed.



(1) - Grinding equipment
Static and rotating plate



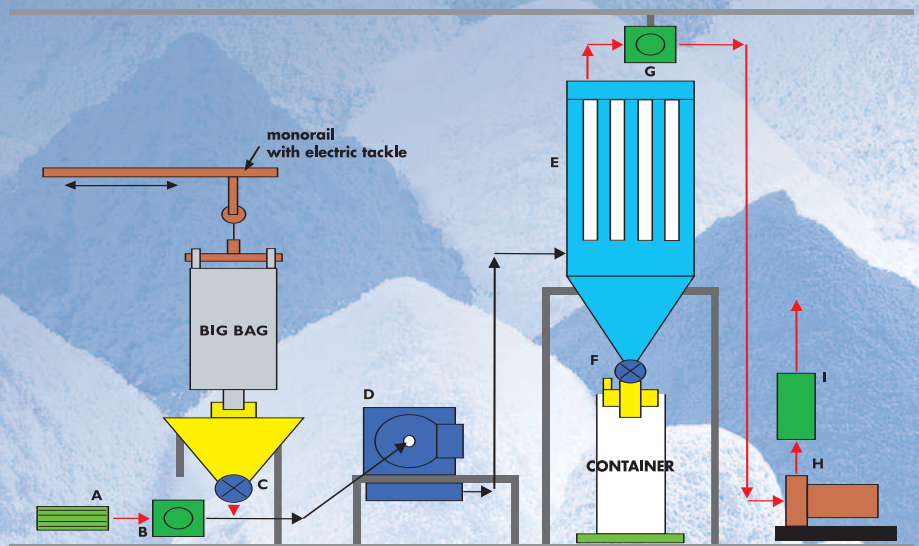
(3) - FNG.3 Grinder on pneumatic transport box
Installed power: 37 KW
Flow rate: 1T/h
Product: casein



(2) - FPX Mill – Pharma design
with easy dismantable pin stator
Installed power: 3 KW
Flow rate: 50 kg/h - < 100 µm
Product: pharmaceutical principles

Operation principle of a grinding plant resisting to dust explosions construction: pressure shock resistance to 10 bars.

- A: Admission filter
- B: Quick clothing valve
- C: Rotary valve 10 bars
- D: Grinder 10 bars
- E: Sleeve filter 10 bars
- F: Rotary Valve 10 bars
- G: Quick clothing valve
- H: Fan
- I: Noise reducer



OUR APPLICATION RANGES

APPLICATION RANGE

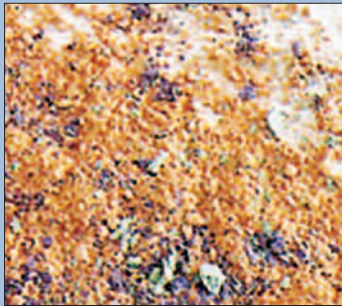
The flexibility of the FORPLEX grinder considerably extends its application ranges. For example, we take care of the economic problem of processing of material with an hardness up to 4 Mohs and without more than 1% of hard and abrasive impurities in certain cases. Using specific materials allows to widely go over these values.



FNG.4 Grinder
Pin plate made in Tungsten carbide

Field: metallurgy
Product: very abrasive metallic powder
Installed power: 75 kW

The examples mentioned hereafter are not exhaustive and can only give you a general view of our possibilities.



Mineral industry

FORPLEX realizes turn-key projects involving grinding, micronization, grinding-drying, and classifying for minerals of all kinds.

Products:

Limestone, clays, baryta, talcum, coal, plaster, quartz, bentonite, carbonate, kaolin, ...



Foodstuff industry

The infinite variety of materials and the diversity of their physical characteristics require size reduction and classifying processes. Regarding its conception, the FORPLEX grinder meets to the needs of both human and animal food.

Products:

Grain and flours (wheat, corn, peas, rice...), starch, spices (pepper, coriander, cloves, curcuma...), fruit powders and dried vegetables, milk powder, lactose, caseins, caseinates, sugar, cacao, biscuit, jeelying agents, seaweed, guar, etc.



Pharmaceutical and cosmetic industry

Equipment and complete grinding lines especially designed for pharmaceutical and/or special application according GMP, FDA,... standards. FORPLEX Industrie is specialised in gas inerted plants with control of the oxygen rate in close and open circuit (recycling).

Products:

Active principles, antibiotics, medicinal plants, skin care products, creams and shampoos, toothpaste, make-up.



Chemicals / Fine chemicals - Plastics

FORPLEX is active in all fields of the chemical industry, before or after the chemical reaction.

Products:

Fertilizers, inorganics salts, fire extinguishing powders, resins, plastics, rubbers, wax, fats, ...

FORPLEX TURN KEY PLANTS

COMPLETE UNITS



(1) - Grinding plant FL.3 for pure icing sugar with agitated buffer hopper with capacity 1000 l. Crystal sugar feeding by vacuum extraction.

FORPLEX Industrie takes into account your requests and all the economic, industrial and environmental parameters for a plant adapted to your image.

Specific installations:

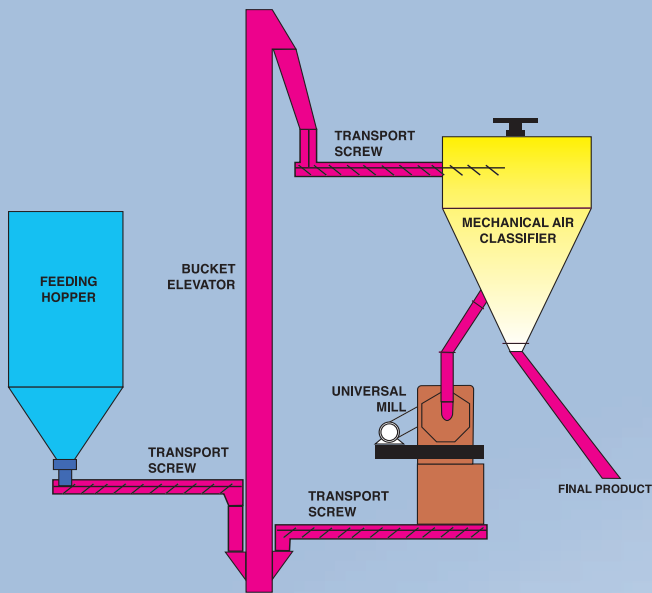
- Inerted installations with control of oxygen rate in open and close circuit (recycling)
- Installation resisting to a dust explosion over pressure without external discharge (PSR 10)
- Installation resisting to pressure with external discharge (vents, flame suppression ...)
- Installation following pharmaceutical criteria (FDA, GMP, ...)
- Soundproof installations

Cryogenic and controled temperature installations

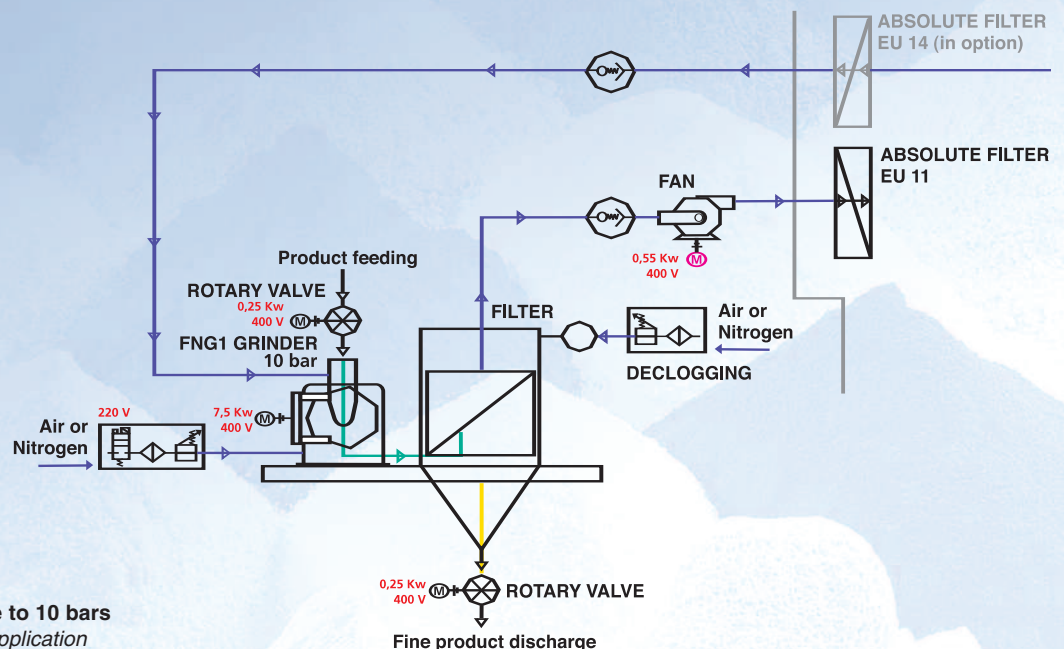
- For fine grinding of difficult materials heat sensitive products
 - . Grinding of elastic material or difficult product at ambient temperature by means of liquid nitrogen or CO₂.
 - . Cooling of material having a low softening of melting point. The temperature is consequently regulated.
 - . Cooling of the grinder air to evacuate the heat produced during the grinding operation.

Grinding/drying installations

Both the grinding/drying operations are realised in the same machine. According moisture rate this process allows money and energy savings by eliminating an additional dryer.



(2) - Plant flow sheet for plaster (100 µm) mechanical air classifier and FORPLEX grinder for oversize recycling.



(3) - PID of a FNG.1 grinding line to 10 bars overpressure for pharmaceutical application

OTHER EQUIPMENTS MANUFACTURED BY FORPLEX

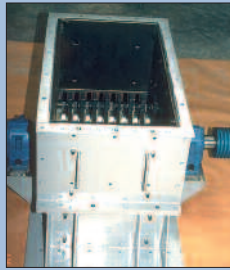
Hammer mill

Impact grinding between rotor fitted with fixed or mobile hammers and a stator fitted with a grid enable output size.

Uses: minerals, foodstuffs, chemistry, metals,...

Micron sizes: feed 0-15 cm, output down to 250 μ up to 5 cm.

Throughputs: from 500 kg/h up to 200 T/h.



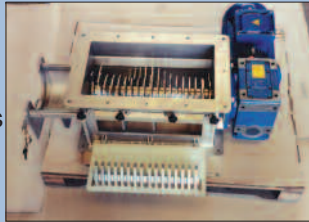
Lump breakers

Lump breaking systems with rotor and screen designed to break down crumbly products fed in form of clustered or clogged chunks or blocks.

Uses: pharmaceuticals, cosmetics, foodstuffs, chemicals,...

Particle sizes: feed blocks 10-30 cm, output from 1 mm up to 50 mm.

Throughputs: from 200 kg up to 5 T/h.



BLX mills

Impact mills especially designed to allow easy cleaning and avoiding any retention of product which could cause contamination. Design according FDA, GMP... quality standards.

Uses: research centers, pharmaceuticals, cosmetics,...

Micron sizes: feed 0-2 mm, output down to 20 μ up to 500 μ .

Throughputs: from 1 kg/h up to 200 Kg/h.



BLF: jet mill

Auto grinding of particles moved by compressed air injection inside a grinding chamber. Patented system with two nozzles levels improving grinding and dynamic classifier yield. System avoiding any contamination.

Uses: hard materials up to 9,5 Mohs scale, pharmaceuticals products that can not be contaminated.

Abrasive: aluminium oxide: silicon carbide, zircon, quartz,...

Minerals: talcum, baryta,...

Micron sizes: feed 0-250 μ , output 0 to 10 μ .

Throughputs: from 500 g/h up to 3 T/h.



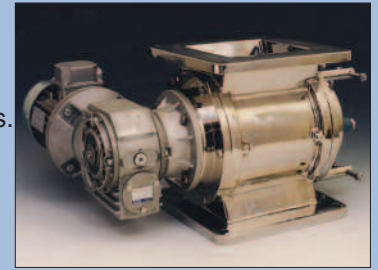
Rotary valves

Rotary valves for feeding extraction or proportioning of powders.

Uses: all industries processing powders, minerals, chemistry, foodstuffs, pharmaceuticals, cosmetics,...

Particle sizes: 0-50 mm.

Throughputs: from 1 kg up to 500 T/h.



Rotating sifters

Sieving system made of a body, a rotor and interchangeable sieves. Sifters are designed for easy access and easy cleaning.

Uses: safety sieving of powders: minerals, foodstuffs (flours, sugar) pharmaceuticals,...

Particle sizes: feed 0-20 mm, cutting point: from 100 μ up to 10 mm.

Yield: up to 95%.

Throughputs: from 50 kg up to 45 T/h.



Exchanger

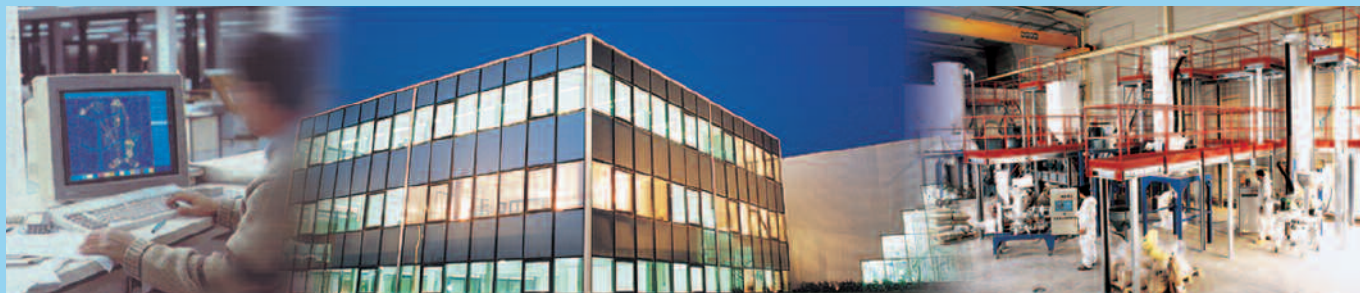
FORPLEX Industrie develops for many years, for its nitrogen inerted plant with recycling complete devices integrating a fan, a totally dismantlable flyer exchanger and a submicronic filter.



Quick dismantlable screw

To answer to our clients' requests and specifications, FORPLEX Industrie develops and proposes easy dismantlable transport screws, allowing a quick and efficient cleaning.





A SPECIFIC SOLUTION FOR YOUR FINE POWDER PROCESSING

AN INTEGRATED ENGINEERING DEPARTEMENT

The complexity of grinding operations is as the never-ending variety of products. That is why the grinding quality necessarily depends on the accuracy of final products analysis. To solve any adaptation problems and specific equipment design, FORPLEX Industrie has its own engineering department completed by a research and development centre dedicated to the improvement of powder processing plants.

A UNIQUE TEST CENTRE

FORPLEX Industrie puts at its clients' disposal a high performance test centre to be able to study any grinding problem and powder classifying. A strict procedure and a know-how based on thousand tests allow us to provide reliable results consigned in a detailed tests report with mesh size distribution analysis (laser, coulter, sedigraph ...)



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FORPLEX Industrie

40, Boulevard de la Beaujoire - 44300 Nantes Cedex - FRANCE

Tél. : +33 (0)2 28 01 08 28 - Fax : +33 (0)2 28 01 08 22

<http://www.poittemill.com> - E-mail : contact@forplex.fr

Head office : Technoparc Futura - B.P. 145 - 62403 Béthune Cedex - FRANCE

Tél. : +33 (0)3 21 57 29 87 - Fax : +33 (0)3 21 57 28 20

<http://www.poittemill.com> - E-mail : poittemill@poittemill.com