



# PAXAA Pin Mill-Pinpaxx

Product Catalog



## **AT A GLANCE**

PAXAA Pin Mills are able to apply varying degrees of impact and agitation to process feed materials. Pinpaxx is among the most versatile equipment available in the materials processing industry. From high impact grinding to controlled, slower mixing and blending, Pinpaxx is easy to operate, highly reliable, safe and simple to adapt for your application.

- Various internal components are available to custom-design Pinpaxx to your specific process.
- Multiple sealing options can accommodate your controlled atmosphere.
- Different materials of construction and finishes allow Pinpaxx to meet your hygienic standards.
- Grinding components can be provided with special wear-resistant or corrosion resistant surfaces to process abrasive or corrosive liquids or solids.

## **PINPAXX ...**

- Is Suitable for materials up to a Mohs' hardness of 3, maximum 0.1% permissible fraction of abrasive components
- Can handle dry crystalline and brittle feeds
- Can achieve extremely high end-product fineness values
- With one rotating disk can achieve a final average particle size of less than 50 microns
- In counter rotation may need cryogenic cooling
- Is suitable for drug and food applications
- Has relatively low energy consumption

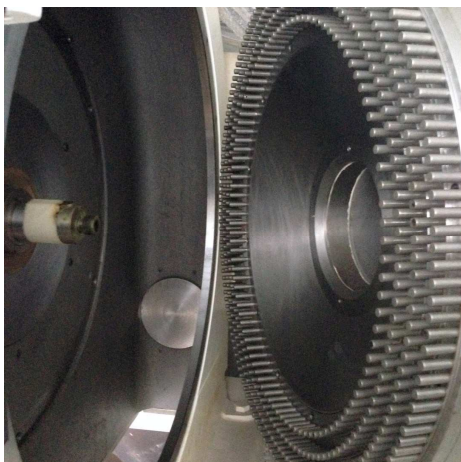




## **FEATURES**

PAXAA Pin Mills combine simple design and dependability, applying centrifugal force to generate the energy for impact. These mills allow uniform size reduction, greater energy-efficiency, less wear and tear of equipment, along with these distinct features:

- Free impact, no attrition
- No screen to clog
- High throughput per H.P.
- Handles liquids or solids
- Simple construction
- Easy to clean
- Blow-through capability
- Low temperature rise
- Compact installation dimensions



## **BENEFITS**

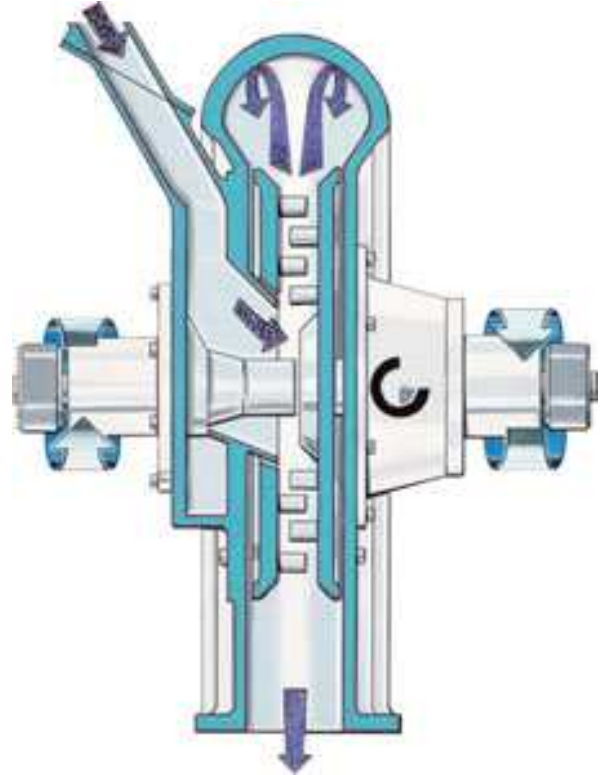
Adaptable to a variety of applications and materials, PAXAA Pin Mills provide specific processing solutions for a wide range of needs:

- Robust design
- Gives you longer equipment life, reducing maintenance and replacement costs
- No internal screens
- No blinding, so your machine runs continuously
- No need to shut down machine to clean screen, saving you maintenance time and money
- Completely sealed construction
- Allows in-line controlled atmosphere grinding or mixing, so you don't need extraordinary, expensive separate processing steps
- Kind to operating environment, no dust
- Makes product homogeneous
- Improves your product quality



## COMPONENTS

The PAXAA Pin Mill consists of a vertically oriented housing with a large door. Inside the housing, mounted on a motor-driven rotating shaft, is a grinding tool –rotating disk (called a rotor disk) fitted with pins. When the mill is fitted with a pin rotor disc, a second disc is mounted inside the mill's door so that its pin or teeth intermesh with those on the rotor disc, the door's disc can remain stationary or rotate; in the latter case, the door is fitted with a drive assembly that turns the disc counter to the rotor disc's rotational direction. It should be noted that no stator is required with a pin rotor disc.



## HOW IT WORKS

The feed flows from a volumetric feeder by gravity through the PAXAA Pin Mill's inlet, which directs the feed into the grinding chamber's center. The grinding tool (pin disk) rotates at high speed, creating centrifugal force that accelerates the feed particles out to the periphery of the rotor plate. The particles' high-speed outward flow hurls them against the pins at the tool's periphery. In this zone, the material is subjected to multiple impacts as it passes through the maze of pins or blocks which results in size reduction, or high-intensity mixing. The force imparted to the material is controlled by the speed of the rotor. For maximum energy, the rotor speed would be high; for more gentle handling, low rotational speeds are selected. With disc grinding tools, desired-size particles exit the disc periphery and flow toward the mill's bottom outlet. After exiting the mill, the particles fall by gravity or are drawn by a pneumatic conveying system to downstream processing or storage.



## **DESIGNS**

PAXAA Pin Mills are available in carbon steel, stainless steel and many other materials of construction. These proven performers provide specific processing solutions for a wide range of needs in the chemical, food, pharmaceutical, grain milling and mineral industries. Available design features include:

- Welded housing with either standard or tangential discharge
- Cast housing with standard discharge
- Mild steel or stainless steel for all machine sizes
- Pin discs and pins made of special steel
- Bearing unit protected against dust
- Safety interlock
- Pharmaceutical design
- Wear-proof pins
- Explosion-pressure-shock-proof design for a maximum explosion overpressure of 10 bar (g)

## **ROTORS TYPES**

At the “heart” of the PAXAA Pin Mill is the rotor to which the pins or blocks are affixed. Factors affecting performance of the PAXAA Pin Mill include:

- Rotational speed, which directly relates to tip speed
- Diameter, which also affects tip speed and therefore impacts energy
- The number and orientation of pins or blocks

The intermeshing pin design subjects material for size reduction to multiple shattering blows as material negotiates the maze of pins. The block rotor reduces the number of blows, but creates high-exit velocity for shattering materials against the impact wall liner.

For mixing, the speed of the rotor may be reduced, and a smooth impact wall liner employed to avoid product degradation, while creating sufficient turbulence to produce a homogeneous blend. In this way, controlled energy is directly and efficiently applied to the product.



## **CHOOSING THE RIGHT MILL**

Optimum milling solutions begin with choosing the right mill. Selecting the right mill involves careful consideration of the application parameters (in this case, materials generally in the 2 to 4 mohs hardness range and up to 500 t/ h capacity) and the various mill types available with particular attention to all the wear part options.

In selecting a mill for a specific application four key factors should be considered:

- the initial capital investment
- internal wear part needs
- milling duration time requirements
- power consumption

The PAXAA Pin Mill is a choice that hits all four key factors optimally. Importantly, the PAXAA Pin Mill offers a relatively low capital cost. PAXAA Pin Mills can easily be fitted with fully interchangeable and replaceable wear parts with surfaces hardened to 60 RC. Also, the PAXAA Pin Mill grinds very quickly as a once through operation. Its energy consumption (2 to 5 kWh/ t depending upon application) is easily justified if milling a medium-value material. Generally, a PAXAA Pin Mill is a sensible choice in

applications with a 5 to 8 percent silica content, and with maximum wear protection installed.

Dry crystalline and brittle feeds, such as sugar, aspirin, sodium bicarbonate, kaolin, and carbon, can be handled by a mill equipped with *pin disc*. When only one disk rotates, the pin disks can typically achieve a final average particle size of less than 50 microns. Fineness is controlled by the rotor disc's speed (which controls the disc's peripheral speed) and the number and arrangement of pins on the discs. When both discs rotate, the peripheral speed is much higher, and the final average particle size can be less than 30 microns. The higher energy applied during this operation, called counter rotation, generates more heat and can require cryogenic cooling.

Pin discs are often the best option for drug and food applications because they require no stator, eliminating stator screen blinding problems and the need for grinding-track cleaning. The pin discs are also easier to access for good manufacturing practice (GMP) clean-in-place applications.



## **PAXAA PIN MILL WITH DOUBLE DRIVEN DISKS**

A PAXAA Pin Mill can be design with two driven pin discs call Counterpaxx. In counter-rotating mode, much higher relative speeds are possible than with the mill which has only one driven pin disc. The highest relative speed develops at the outermost pin rows and can be up to 250 m/s. The feed material should be brittle with a maximum Mohs' hardness of 3. The fineness can be adjusted by altering the pin disc speeds. The centrifugal forces acting on both discs ensure that even moist, greasy and sticky products can be processed. The design with the wide chamber housing is ideal for processing these kinds of products. The feed material is often embrittled by intensive mixing with liquid nitrogen. The mill door can be opened wide to permit easy cleaning.

### ■ **Wide selection of pins**

Besides the standard head pin made of special steel, there is a wide selection of special pins available which make it possible to meet the highest demands regarding hygiene as well as freedom from wear and contamination.

### ■ **Higher grinding fineness**

Dependent on the type, the maximum relative speed of both discs is up to approx. 250 m/s. Single-rotor pin mills are unable to reach this high speed. The PAXAA Pin Mill with double driven disks therefore produces higher grinding fineness values, especially with all brittle and crystalline materials.

### ■ **Trouble-free continuous operation**

Products which cannot be ground in sieve mills due to their tendency to clog the sieve perforations, especially fine-mesh sieves, can be ground to high fineness values.

### ■ **Individual adaptation of the grinding conditions to suit the feed material**

The wealth of possibilities available in setting the rotational direction and disc speed combinations ensures that each and every product, especially heat-sensitive ones, is ground to an optimal fineness, is handled gently and that the pin discs remain free from deposits.

## PAXAA

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