



Kek

FINE GRINDING MILLS

UNIVERSAL MILLS FOR
FINE GRINDING OF SOFT
TO MEDIUM HARD
PHARMACEUTICAL
CHEMICAL AND
FOOD PRODUCTS



Kemutec



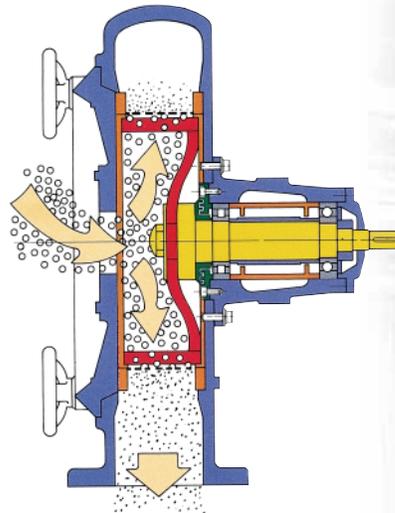
Kek Fine Grinding Mills

UNIVERSAL FINE GRINDING MILLS

Kek fine grinding Universal Mills are designed and constructed for high performance, robustness, easy maintenance and safety in use.

These mills have been developed to meet the specific requirements of the food, pharmaceutical and chemical industries.

A range of models is available to suit a variety of process and throughput requirements, e.g. from a few kgs to several tons per hour.



Product Range

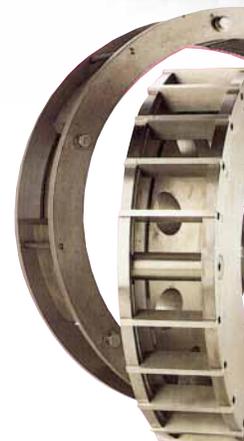
Model	Diameter mm	Motor Power h.p.	Max. Speed rpm
6H	100	2	26,000
5H	133	4	19,000
4H	250	10 to 15	10,000
3H	370	22 to 30	8,000
2H	570	45 to 100	5,000
1H	800	100 to 200	3,000

Features

- Fine Grinding 30 - 500 μ
- Easily accessible and interchangeable grinding media
- Adjustable mill speed
- Choice of bottom or involute discharge
- Option of explosion proof design

Benefits

- Flexibility - caters to differing products and particle size requirements
- Easy and efficient cleaning between batches
- Choice of discharge process overcomes limitations of plant size or layout
- Hygienic / easy clean





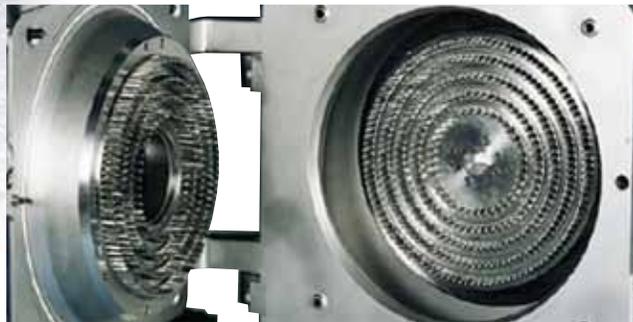
Quality and Performance

Universal mills ensure a controlled size reduction with a high degree of fineness achieved. Typical requirements are to grind materials of up to 3 Moh hardness to within the ranges of 30 to 50 μ mean particle size.

Mills are available in fabricated stainless steel or carbon steel with a variety of finishes such as bead blast or mirror polish.

CIP/WIP

CIP (clean in place) and WIP (wash in place) are typical requirements for fine grinding applications particularly in the Food and Pharmaceutical industries and Kek Universal Mills can be custom designed to suit a specific application, layout or material.



Grinding Media

Turbine And Screen

Developed for fine grinding of soft to medium hard materials, particularly those that are fibrous. The turbine develops high airflows which help to reduce grinding temperatures. This also makes the system ideal for harder crystalline products, such as sugar, which is heat sensitive.

Pinned Disc

Designed for fine to very fine grinding of dry, brittle materials. The size and throughput of the ground product is controlled by varying the pin and disc configurations and the rotor speed

Design specifications include:

- Designed and tested to seal up to 1.2 Bar hydrostatic loads for full flush capabilities.
- Designs for retractable, flush mounting or tri-clover type mounting for nozzles or spray balls.
- Cleanable sintered filter elements.

Contra Rotating Mill

Constructed with two sets of pinned disc grinding media facing each other within the mill. The two rotors are operated by separate motors and rotate in opposite directions. By setting the rotors at similar speeds, the actual grinding power is increased which enables to mill to grind tougher particles to a finerspecification.





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CUSTOMISED DESIGN

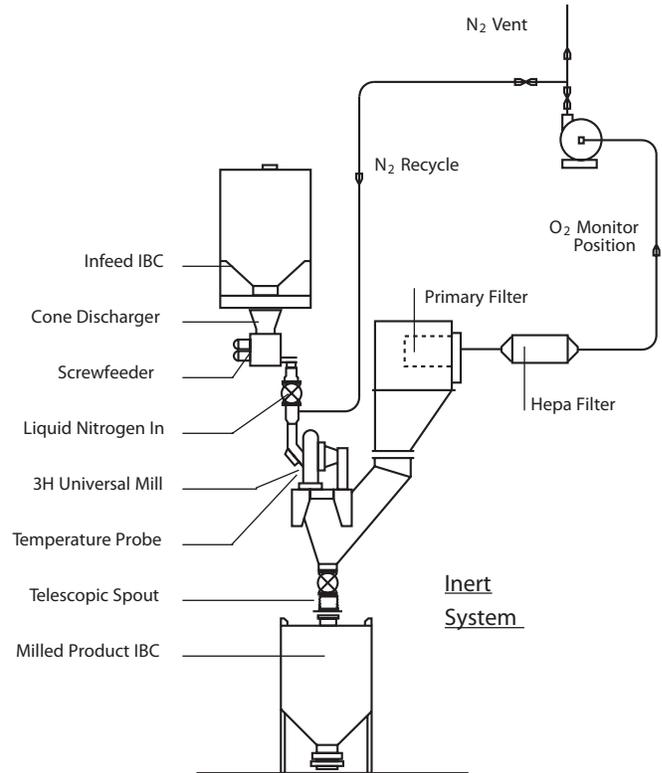
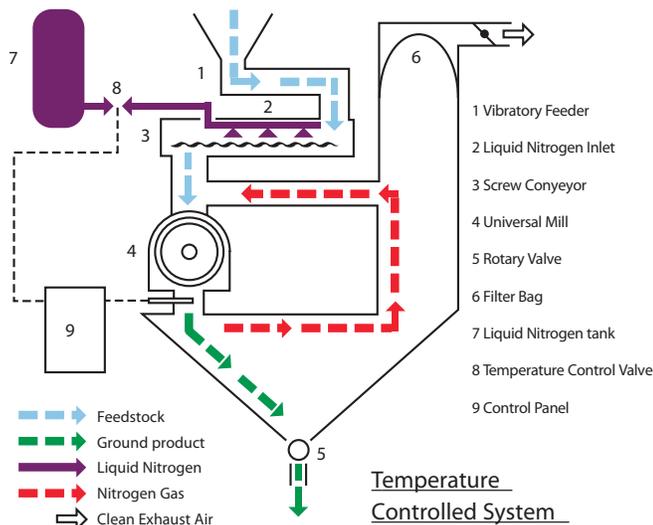
Nitrogen Assisted Milling

Inerting

Use of inert gas to reduce oxygen level below combustion limit thus preventing an explosion taking place within the mill. This method offers protection against dust explosions and is advantageous when processing low / minimum emission energy materials. A further advantage is the low moisture content of the mill atmosphere which is a benefit when grinding hygroscopic materials.

Temperature Controlled

Temperature controlled milling involves the use of liquid nitrogen as a cooling agent which is applied to the mill and collection system. This system is often employed to either improve processing properties of heat sensitive materials or give a specified milled product output from the mill where it is essential to eliminate temperature pick up during normal milling, i.e. control of mill temperature from ambient mill temperature to -5°C .



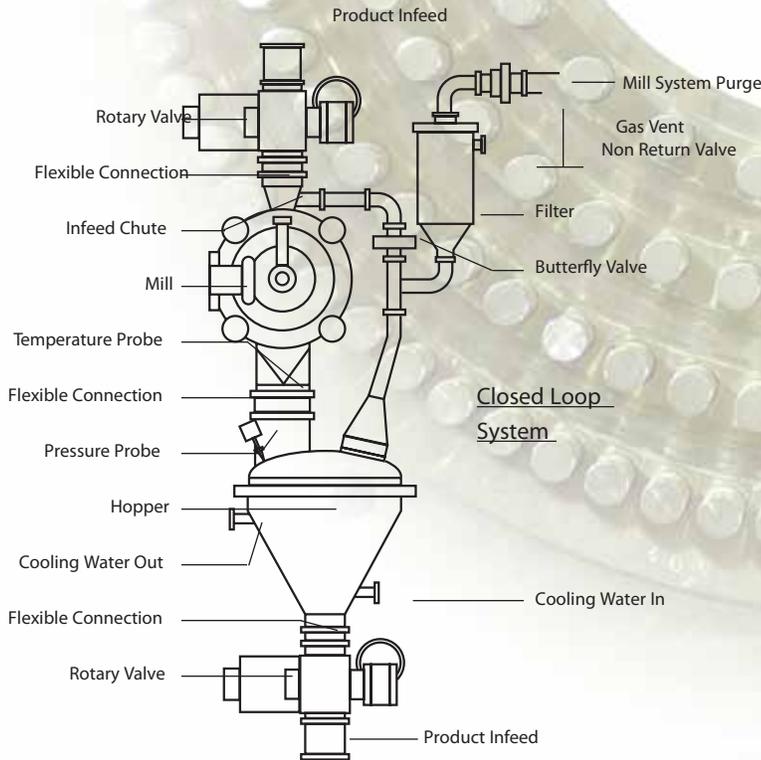
Cryogenic Grinding

Cryogenic grinding systems also involve the addition of nitrogen but the temperatures are much lower and cooling is applied to the mill system and the feed product. The object is to embrittle products that are impossible to impact mill at ambient temperatures. By cooling them to temperatures of -150°C , it is possible to grind problem materials finely.

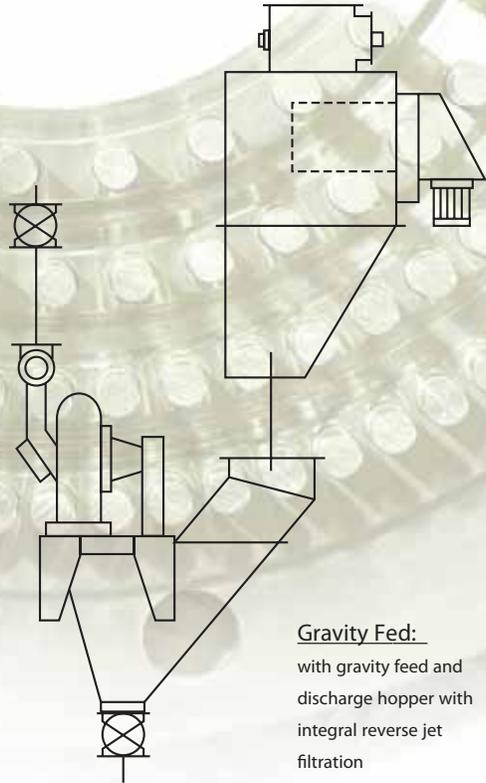
Cool and Cryogenic grinding will also provide the added benefit of inert explosion protection.

10 Bar Mill Systems

This is applied to systems which are rated to 10 bar pressure shock containment to offer protection against potential dust explosion.



Closed Loop System



Gravity Fed:
with gravity feed and discharge hopper with integral reverse jet filtration

Closed Loop Milling Systems

Closed loop milling involves a process in which the mill airflow is totally recycled around the system back to the mill air intake. As there is no net airflow through the system, there is no requirement to provide filtration to handle the mill process air. This makes the system much more cost effective to design as a pressure shock resistant 'containment' system and leads to a more compact installation.

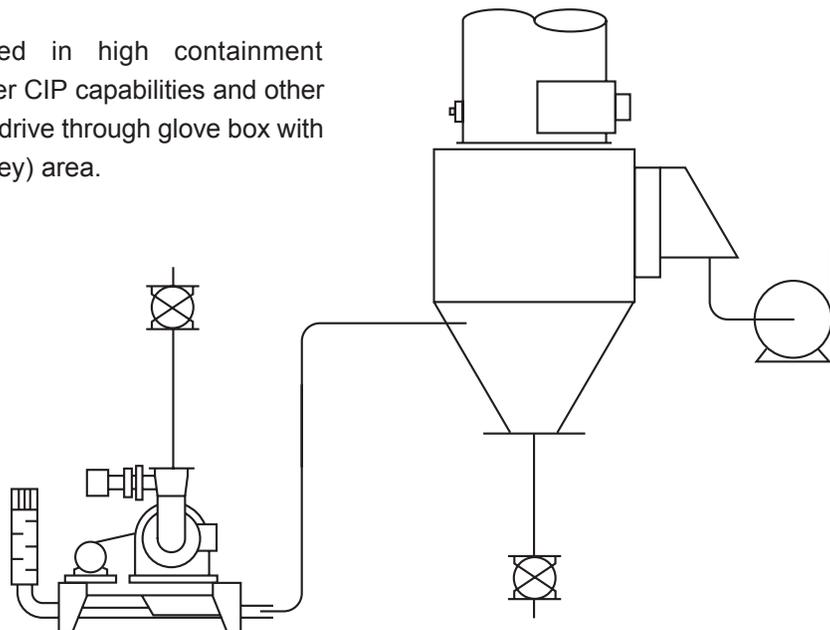
Closed Loop (filterless) and Inerted Closed Loop systems are suited to use within Glove Boxes as the compact design enables use of a smaller enclosure with fewer penetrations needed through the walls.

Optional extras include sound insulation, dust filtration and systems to vent, suppress or contain risks of explosion and excess pressure of up to 10 Bar.

Glove Boxes

Glove boxes are used in high containment applications and also offer CIP capabilities and other features such as remote drive through glove box with motor in non-isolated (grey) area.

Remote Collection:
with bottom discharge into "blowing boot" for vacuum transfer to a remote collection hopper





Kek Fine Grinding Mills

APPLICATIONS

Food Industry Applications

Kek Universal and Air Classifier Mills are designed with hygiene and easy cleaning very much in mind and are therefore ideal for a wide variety of food applications, from hard crystalline products such as sugar or salt to soft, fibrous products such as wheat, barley and oats.

Sugar Grinding

- Different grades of sugar can be achieved by varying the feed rate, the mill speed or the grinding medium.
- Minor ingredients such as tri-calcium phosphate or cornstarch to ground sugar can be easily added as the intense milling action ensures a homogeneous distribution.
- Sugar is a Group A explosion risk therefore appropriate explosion precautions must be taken. Kemutec engineers have an in-depth understanding of explosion prevention, relief suppression and containment. Milling systems can be designed to meet not only your needs, but also those imposed by health and safety legislation.

Some use of milled sugar	TYPICAL GRADES USED		Particle Size Distribution
	UK Specification	USA Specification	
General Baking	Pulverising	6x	98% below 150µ
Biscuit manufacture	Fine icing	10x	97.0% below 75µ
Confectionery making & dusting	Superfine icing	12x	98% below 45µ

Air Classifier Mills are capable of achieving even finer grades of sugar. Please refer to our Technical Sales Department for more information.

Spices

- Aromatic food products require special handling, as volatile oils are often lost during conventional grinding at room temperature.
- Product is cooled to -150°C and below using liquid nitrogen to preserve its quality.

Cereals

- Kek mills are ideal for grinding maize grits, oats, barley, wheat, rice and other cereals.
- Feedstock can be either whole grain or de-hulled, allowing production of bran or flour.
- The mill feed, speed and grinding media can be varied to obtain a limitless range of end-product specifications, from coarse brans to fine flours.

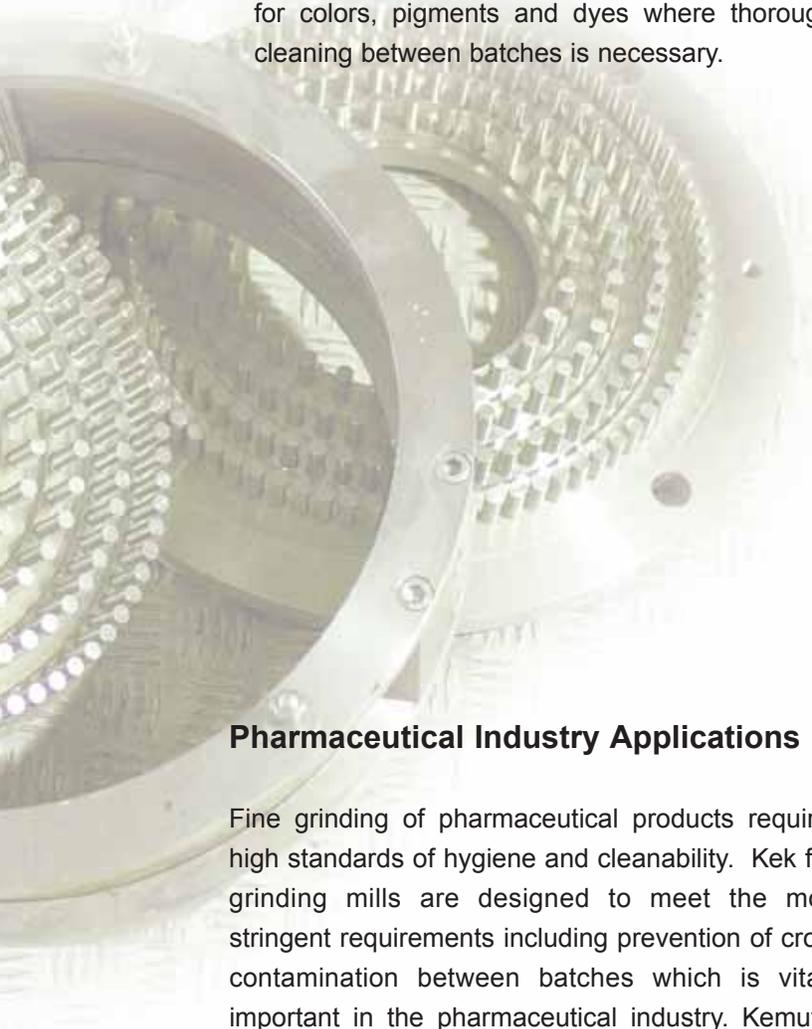
Dairy Products

- Maximum hygiene and thorough cleanability are of paramount importance in the dairy industry. These requirements are easily met by Kek fine grinding mills.
- Milled products include whey powder, casein, lactose and milk powder.



Fine Chemical Industry Applications

- Kek fine grinding mills are also used to grind some of the most obnoxious and difficult products, while giving reliable and repeatable performance under arduous conditions.
- Because they are easy to clean, Kek mills are ideal for colors, pigments and dyes where thorough cleaning between batches is necessary.



Pharmaceutical Industry Applications

Fine grinding of pharmaceutical products requires high standards of hygiene and cleanability. Kek fine grinding mills are designed to meet the most stringent requirements including prevention of cross contamination between batches which is vitally important in the pharmaceutical industry. Kemutec is happy to design a complete system specification to meet individual requirements.

- Choice of Materials of Construction and finish as required.
- Easily removable grinding media to ensure the mill can be thoroughly cleaned between batches.
- Double seal arrangement and air-purged seals prevent product ingress into the bearings and to stop lubricant from contaminating the mill chamber.

Typical fine chemical products:

- Carbonates
- Chlorates
- Chlorides
- Citric Acid
- Fertilizers
- Fungicides
- Gum Arabic
- Gypsum
- Hexamine
- Insecticides
- Metallic Salts
- Nitrates
- Oxides
- Pesticides
- Phosphates
- Stearates
- Talc
- Urea Resin



Typical pharmaceutical products:

- Analgesics
- Laxatives
- Anti-convulsants
- Gastric reflux suppressants
- Vitamins
- Cultures
- Aspirin
- Paracetamol
- Senna Flake

OUR OTHER PRODUCTS

Kemutec has its own sales office in the USA and has a comprehensive network of representatives throughout the industrialized world, all able to provide applications engineering, sales and service.

'KEK' CONE MILLS

A gentle, low energy size reduction concept for fatty, heat sensitive, sticky, moist, or fragile products. Alleviates noise, dust and heat problems of traditional milling techniques.



'KEK' KIBBLERS

Designed to accept lumps up to 150mm dia. and reduce them down to 2 or 3 mm within a narrow particle size distribution and with minimal fines at rates ranging from 2 to 25 tons/hour.



'KEK' CENTRIFUGAL SIFTERS

Compact, high efficiency sifters for throughputs up to 100 tph. Most have cantilevered drive shafts reducing the number of bearings and seals - offering major benefits for hygiene and cleaning.

Our skilled and experienced professional engineering staff are well qualified to discuss, analyze, evaluate and produce a cost effective solution to meet your powder processing and handling requirements.

'GARDNER' MIXERS & BLENDEES

We offer an extensive range comprising laboratory mixers, ribbon mixers, ploughshare mixers, continuous mixers, reactors, processors, double cone blenders and drum blenders.

Talk to us to find out how we can help you to achieve greater productivity, new processes and increased profitability.



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Representing in the USA:

Kek - Centrifugal Sifters & Mills
Gardner - Mixers and Blenders
PPS - Air Classifier Mills
Mucon - Valves and Components
°Celsius - Screw Heat Exchangers
GKM Siebtechnik - Flat Deck Screeners

