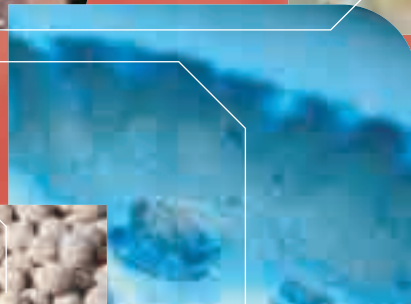
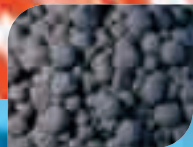


ENGINEERING – MANUFACTURER – PROCESS

*Customizable technologies  
adapted to each industry*



**GRELBeX**  
Technologies



**GREL BEX®**

## **A WORLDWIDE RECOGNITION IN THE GYPSUM, FERTILIZERS AND CHEMICAL INDUSTRIES.**

GREL BEX® represents today more than one century of experience in the fields of design and manufacture of turn-key plaster plants and rotating equipment. The GREL BEX® technologies accreditation by worldwide well-known producers is the result of the continuous combination of:

- the understanding and the capacity to adapt to the range of needs,
- a continuous innovation,
- the continuous development of design and manufacturing skills,
- the control of the construction techniques of reliable and profitable industrial units.

**GREL BEX**  
Technologies

## **REALIZATION OF EQUIPMENT FOR THE POWDERY PRODUCTS PROCESSING.**

The reliability of the technologies strengthened by an experience in new fields of activities determine GREL BEX TECHNOLOGIES to propose its overall offer to manufacturers operating in the following industries:

- minerals processing
- fertilizers producers
- metallurgical industry
- chemistry
- agribusiness / food industry
- environment.

## **TECHNOLOGIES ADAPTED TO EACH INDUSTRY**

In the field of powdery products processing, GREL BEX TECHNOLOGIES gathers today specific technologies and high-performance equipment in the following areas of expertise:

- drying
- calcinations and melting
- granulation and coating
- mixing
- milling and clods breaking

## **SOLUTIONS ADAPTED TO THE PROCESSES**

Strongly associated to the engineering department, the technicians team designs customized and competitive answers based on:

- a continuous monitoring of the technical, industrial and economical objectives,
- the statutory and normative context,
- technical solutions which are complementary and flexible, developed on the range of standardized equipment.

## **A CONTRIBUTION OF ADDED-VALUE**

GREL BEX TECHNOLOGIES brings a real added-value to the projects by organizing its interventions around 3 axis:

- the combination of rotary thermal equipment, granulation equipment, mixing equipment, milling equipment, from a GREL BEX TECHNOLOGIES design and manufacture.
- the integration of a services range – from the designing phase up to the operational level – with notably a trials platform which is put at the client's disposal.
- the guarantee of the construction quality thanks to the continuous dialogue between the engineers team and the production teams.

Thanks to its reliability and rigor, GREL BEX TECHNOLOGIES personifies today the know-how of a great manufacturer attentive to the satisfaction level of its principals.

### **SUMMARY**

Rotary thermal equipment \_\_\_\_\_ 3

Granulators Coating machines \_ 4

Mixers Pug Mill \_\_\_\_\_ 5

Crushers Mills Lump breakers \_\_\_\_\_ 6

Associated services. 7

**GREL BEX**  
Technologies





Turn-key plaster plant for the production of high quality  $\beta$  plaster.

## TECHNICAL SPECIFICATIONS

### OPERATING MODE

- Continuous / discontinuous
- Direct / indirect fired
- Heavy oil / gas fuel
- Co-current / countercurrent

### DESIGN

- Specific shoveling
- Specific inner lining (*clogging-proof, abrasion-proof, corrosion-resistant, refractory*)
- Specific construction material (*stainless steel, nickel alloy, different kinds of steel*)
- European and ATEX standards

### TECHNICALITY

- Complete units
- Filtration and smoke processing
- Patented calcinations processes
- Computerized controlling and operating systems
- Energy recovery systems (*heat exchanger, casing, double envelop*)

## GRELBEX TECHNOLOGIES : MEASURABLE ADVANTAGES

### 1 - A COMPLETE RANGE

GRELBEX TECHNOLOGIES parades a complete range of rotary drums dedicated to the thermal processing of organic, vegetable and mineral materials.

### 2 - EFFICIENCY OF THE TECHNOLOGICAL CHOICES

The equipment of GRELBEX TECHNOLOGIES get their performance from:

- the automatization of the production system,
- the operating system software developed in-house,
- the mastery of a wide range of temperatures up to more than  $1300^{\circ}\text{C}$  ( $2372^{\circ}\text{F}$ ) according to the identified needs.

### 3 - COMPETITIVENESS OF THE SOLUTIONS

It's because GRELBEX TECHNOLOGIES defines and adapts solutions relating to the thermal processes on the basis of its standard equipment, that it is in a position to show additional factors of competitiveness.

### 4 - CUSTOMIZATION OF THE SOLUTIONS

In order to perfectly answer to environmental and energetic requirements, handling and safety constraints, the whole standard equipment are controlled by several options.

### 5 - EVOLUTION / INNOVATION

GRELBEX TECHNOLOGIES brings a constant evolution of the mastery of the different processes thanks to the technological improvements preliminary validated with the trials platform.

### 6 - EXPERIMENTATIONS TRACKING

GRELBEX TECHNOLOGIES enriches each year its knowledge and expertise thanks to the lead, the follow-up, and the archiving of its calcinations experimentations on a panel of more and more various materials.



Cooler



Dryer



Calcining furnace



Calcining kiln



Incineration furnace



Melting furnace



Coating drum



Granulating drum



Granulating plate



Laboratory granulating plate



## TECHNICAL SPECIFICATIONS

### OPERATING MODE

- Continuous with an adjustable flow
- Intensive operation 24h/24

### DESIGN

- Specific inner lining (*clogging-proof, abrasion-proof, corrosion-resistant*)
- Specific construction material (*stainless steel, different kinds of steel*)
- European standards

### TECHNICALITY

- Upstream and downstream handling system included
- Tightness and filtration included
- Suitable spraying systems
- Computerized controlling and operating systems
- Measurement devices

## GRELBEX TECHNOLOGIES : MEASURABLE ADVANTAGES

### 1 - THREE TYPES OF STANDARDIZED EQUIPMENT

GRELBEX TECHNOLOGIES proposes three types of standardized equipment:

- *the granulating plate, well-known for its configuration flexibility,*
- *the granulating drum, prioritized for its important production capacities,*
- *the coating drum, recommended in the case of the granulation process finishing.*

### 2 - SOLUTIONS GENERATING VALUE

The solutions recommended by GRELBEX TECHNOLOGIES enable to:

- *increase the value of co-products in order to yield new sources of profitability,*
- *improve the storage and handling characteristics – cost saving factors,*
- *finish off the products appearance in order to generate an extra added-value,*
- *answer to environmental constraints and therefore respect the regulations context.*

### 3 - A RELIABLE AND WELL-TRIED PROCESS

The granulation method proposed by GRELBEX TECHNOLOGIES is based on the agitation process. The addition of a binding agent (water, organic materials, mineral materials, lubricant) to the powdery product in a humid environment enables:

- *the strengths of interaction between the particles,*
- *the creation of binding agent bridge.*

A drying phase enables besides to solidify the agglomerates.

### 4 - TESTED SOLUTIONS ON THE TRIALS PLATFORM

GRELBEX TECHNOLOGIES is equipped with a trials platform that mainly enables to:

- *test the different kinds of binding agents on several types of material,*
- *validate the choice of the spraying system.*

### 5 - EXPERIMENTATIONS TRACKING

GRELBEX TECHNOLOGIES enriches each year its knowledge and expertise thanks to the lead, the follow-up, and the archiving of its granulation experimentations on a panel of more and more various materials.





Complete mixing unit for the cleaning up of contaminated soil



Shoemixer /  
Paddle mixer



Double-cone  
mixer



Double spires mixer



Pug mill

## TECHNICAL SPECIFICATIONS

### OPERATING MODE

- Continuous with an adjustable flow / discontinuous with an adjustable load
- Intensive operation 24h/24

### DESIGN

- Capacities up to 15000 liters
- Specific inner lining (*clogging-proof, abrasion-proof, corrosion-resistant*)
- Specific construction material (*carbon steel, stainless steel, PVC*)
- Explosion-proof design
- Double-envelop
- European and ATEX standards

### TECHNICALITY

- Complete units
- Tightness and filtration included
- Recipe management by a computerized controlling and operating system
- Overload prevention system
- Numerous adaptable tools
- Built-in spraying ramp
- Complete emptying
- Maintainability

## GRELBEX TECHNOLOGIES : MEASURABLE ADVANTAGES

### 1 - A WIDE RANGE

In order to answer to the complexity of the mixes, their constraints of accuracy, the safety and their efficiency, GRELBEX TECHNOLOGIES proposes a complete range of mixers equipped with:

- *measurement devices,*
- *customized operating systems,*
- *adapted mechanical architectures.*

### 2 - COMPLETE UNITS

GRELBEX TECHNOLOGIES proposes complete operational units equipped with:

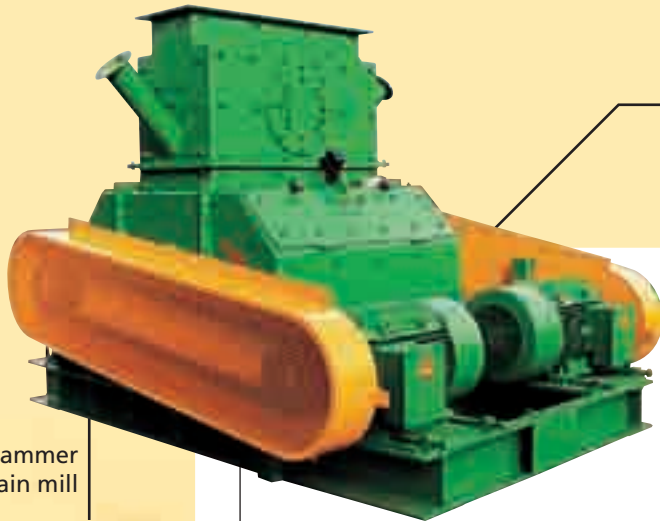
- *dosing sets*
- *handling system*
- *mixing sets*
- *storage sets*

GRELBEX TECHNOLOGIES is in a position to design turn-key units after having analyzed the production objectives and several kinds of constraints.

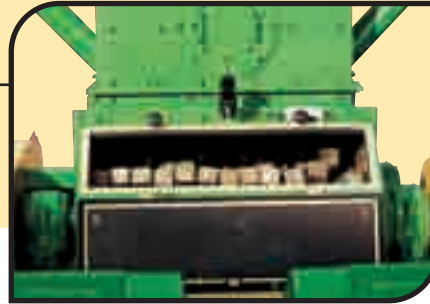
### 3 - EXPERIMENTATIONS

#### TRACKING

GRELBEX TECHNOLOGIES enriches each year its knowledge and expertise thanks to the lead, the follow-up, and the archiving of its mixing experimentations on a panel of more and more various materials.



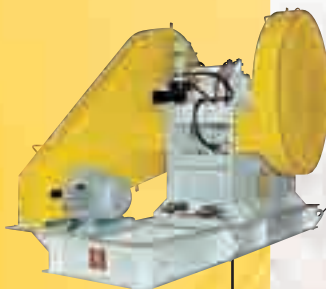
Hammer chain mill



Hammer mill (single-rotor)



Centrifugal mill



Jaw crusher



Cylinder crusher

## TECHNICAL SPECIFICATIONS

### OPERATING MODE

- Continuous with an adjustable flow
- Intensive operation 24h/24

### DESIGN

- Regular grinding size at the outlet
- Wear resisting inner lining
- Fixed or mobile units
- European standards

### TECHNICALITY

- Upstream and downstream handling system, screening unit and storage sets included
- Filtration included
- Computerized controlling and operating system
- Management system of non-crushing particles
- Numerous adaptable tools

## GRELBEX TECHNOLOGIES : MEASURABLE ADVANTAGES

### 1 - A COMPLETE RANGE

GRELBEX TECHNOLOGIES stands at its clients' disposal a complete range of fixed or mobile crushing units, milling units and lump breaking units.

These equipment become integrated within the frame of technical operations on industrial lines in the production of:

- construction materials,
- fertilizers,
- particles of various nature.

### 2 - STURDINESS

Dedicated to fields of activities subject to high constraints, GRELBEX TECHNOLOGIES range of products gathers the basic specifications essential for the crushing, milling and lump breaking operations:

- constant flow,
- regular grinding size at the outlet,
- low wear of the tools and the inner lining,
- reliability of the mechanically welded sets.

### 3 - EXPERIMENTATIONS TRACKING

GRELBEX TECHNOLOGIES enriches each year its knowledge and expertise thanks to the lead, the follow-up, and the archiving of its milling experimentations on a panel of more and more various materials.



### INSTALLATION AUDIT —

The GRELBEX TECHNOLOGIES technicians team assists its customers in the diagnosis of their needs and the design of their projects specifications thanks to the audit carried out on simple request\*.

\*The audit are subject to specific conditions.

### EXPERTISE AND TECHNICAL RECOMMENDATIONS —

The study of the projects entrusted to GRELBEX TECHNOLOGIES is going through a concrete analysis that its engineers operate on the trials platform. The GRELBEX TECHNOLOGIES trials platform includes : a pilot kiln, two mixing units, one granulating station, a set of mills and lump breakers.

The results of the multiple experimentations carried out are recorded for 15 years in the central server for storage and consultation. GRELBEX TECHNOLOGIES compiles the reaction of a panel of more than 1000 products from mineral, organic or vegetable origin during their thermal processing, mixing, granulation, or milling.

### INSTALLATION ASSISTANCE AND TECHNICAL STAFF TRAINING —

GRELBEX TECHNOLOGIES advises at least the supervision – by its own team – of the installation of the equipment from its design in order to guarantee an optimum efficiency. GRELBEX TECHNOLOGIES is also involved in the technical staff training and assure the handing on of the operational knowledge.

### ADJUSTMENT AND RENOVATION —

The technical operations of adjustment and renovation are carried out by GRELBEX TECHNOLOGIES technicians including all the range of product of its design and installations of similar technologies.

### SUBCONTRACTING —

DESIGN DEPARTMENT composed of several engineers specialized in mechanics and in automatism.

PRODUCTION WORKSHOP OF 3 000 m2 with large capacity machines:

- Center lathe, diameter 4 000 mm, length 18 000 mm
- Vertical boring and turning mill, diameter 4 500 mm, height 1 650 mm - 10 tons
- Milling machine of 8 000 mm
- Rolling machine: cones and shells rolling from a diameter of 500 mm up to more than 5000 mm with steel and stainless steel sheets with a thickness from 3 mm up to 30 mm.

### AFTER SALES SERVICE, WARRANTY, ON-SITE MAINTENANCE CONTRACT —

In addition to the manufacturer warranty, GRELBEX TECHNOLOGIES proposes, to guarantee the right operation and the installations longevity, technical interventions in order to :

- control on an ad hoc basis the state of the equipment,
- carry out, if necessary, the adjustment conform to the original conditions or adjustments to reach the optimization of the production,
- to proceed as a preventive to the replacement of used parts.

GRELBEX TECHNOLOGIES After Sales Department is also appropriate for the spare parts management.





**GRELbex**  
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