



SERTON

enginy

Engineering business

**DEDICATED TO PRODUCT
INNOVATION FOR FOOD
PROCESSING,
AGRICULTURAL,
CHEMICAL, MINING AND
RE-ENGINEERING SECTORS.**



The development of sophisticated and innovative machinery in the industrial world has been a constant challenge due to global demand from sectors such as the metallurgical, agricultural, mining, chemical and food processing industries. Serton Enginy has been matching these demands by developing a wide range of industrial plant and equipment that feature high technology applications and unmatched quality.

We welcome you to Serton Enginy.



Vegetable Residue Recycling Plant

Based on a mechanical and thermal drying process. Volume and weight of this organic matter is reduced by a factor of up to 10. **Great capacity. Economical, and totally controllable, programmable and automat-able.** Treats all fruits and vegetables residues (except banana which requires different treatment).

The product obtained from the process is **chemically and microbiologically stable**, without the presence of pathogens, with a pleasant smell and colour, and with a **maximum humidity of 10%**. Product can be stored for long periods of time and employed as fertilizer, animal feed ingredient or as low ash solid fuel.



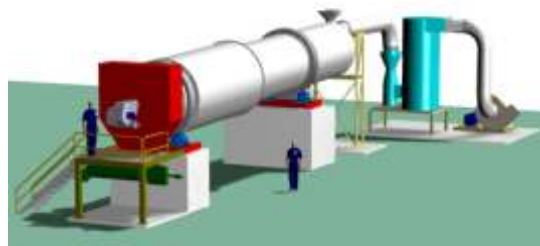
Mussel Shell Recycling Plant

For drying and calcinating the residue from the mussel canning industry, this plant converts mussel shells into **calcium carbonate of 96% purity**, which can then be used in the chemical industry, as fertilizer or in construction. It can also be used to make any organic residue inert.

The process is controlled using **SCADA software**, allowing the flows of gases and the temperature to be monitored at **five key points**, including inside the revolving drum, as well as the speed, power and consumption.

Specifications:

- Maximum calcination temperature: 600°C;
- Production capacity: 20 tonnes per hour;
- Low power consumption: 3000 therms/hour.
- Smaller versions: down to 500kg per hour.



Fish Residue Recycling Plant

Fish waste is highly perishable and, as with all organic residues, large quantities of pathogenic microorganisms rapidly accumulate when it is stored. Landfill is not a good solution, nor is it acceptable in European regulations, and incineration has other implications.

Serton Fish Residue Recycling Plant offer a solution for recycling this material that not only deals with the disposal of this waste product, but **produces two useful and marketable products**. The first is a **high quality fish oil**, and the second is a dry and stable product which can be used as a **high protein ingredient** in animal feed or even as fertiliser. Furthermore, being dry and stable it can be stored.





Fertiliser Plant

The plant takes inputs of a range of organic and mineral input products and outputs **small spherical fertiliser pellets**. The fertilizer may have many ingredient components. These are dosified according to the formula of the fertilizer and fed into a large rotary flat bed pellet granulator.

Any additives can be added, such as colour or binding agents. This machine uses the Serton SER heat generator-dryer. The use of rotary type dryers and coolers actually helps to create a correct and uniform shape in the pellets.



Animal Feed Plant

This plant offers a solution for recycling waste food products into a **chemically and microbiologically stable end product** for sale as animal feed or fertilizer. Includes:

Large capacity feed bin - with built in cutters;

Serton SER energy efficient dryer - incorporates a Serton designed cellular internal structure to ensure **even material distribution** throughout the dryer. This maximises exposed material surface area and balances the cylinder, both helping to **reduce fuel consumption**.

Multi fuel options - fuel oil, diesel or gas/ solid fuel / heat from co-generation.



Bio-Diesel

The current situation of the fossil fuel market is one of exorbitant prices. We are faced with an uncertain future both in terms of availability of supply and of price, and alarm bells have been ringing throughout the world.

Serton bio-diesel plants make it possible to produce bio-diesel on a **small or large scale** with a high degree of efficiency.

Serton Enginy can supply **small plants with output capacities of 10,000 litres per day, or larger plants with an output of 5,000 litres per hour.**

Raw materials needed for producing bio-diesel are:

A base raw material that can be one of the following kinds:
Refined vegetable oil.

Virgin unrefined vegetable oil
Vegetable oils used in restaurant fryers

Fatty acids
Oleins
Animal fats

Other secondary raw materials are:

Anhydrous methyl alcohol, or methanol

Potassium hydroxide in pellets or flakes

Concentrated sulphuric acid
Anti-oxidant



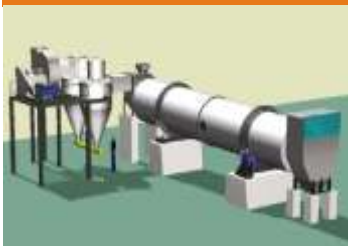


SER Rotary Dryer

The **Rotary Dryer** is used for the **drying of loose, bulk products of varying size**: organic materials such as crushed olives, alfalfa, chopped bread, seeds, grains, etc, or **minerals** such as various chemical products, sludge and slurry cake, etc.

The internal cellular structure ensures that the product is **uniformly distributed**. This not only increases the surface area of the product but also balances the cylinder, which consequently **reduces the input of power** needed to operate the process.

The heat flow can be air heated by an electric heater, by a mixture of air and combustion gases produced by a hot air generator or, when possible, by steam generation or co-generation, this according to the product to be treated. A **wide variety of fuels** can be burnt including diesel, fuel oil, or even by-products such as wood offcuts, sawdust, olive cake, shells and husks, etc.



RDP Rotating Double Pass Dryer

One of the biggest advantages of the Serton **RDP Rotary Double Pass Dryer** is the **considerable saving in space** both in drum size and external auxiliary components that it offers while maintaining full output.

The drum incorporates as standard the **Serton SCS cellular distribution system** and a **regulable combustion chamber** to maintain maximum flexibility and **fuel efficiency**.

The **RDP dryer** is used extensively in the Serton Compact Breadcrumb Plants where its compact size makes it ideal for **integrating** with established bread lines. It is suitable for the drying of loose materials of varying size such as vegetable matter (dried olive cake, alfalfa, bread or seeds) and mineral matter (chemical products, slurry cakes, etc).

A variety of gas liquid fuels can be used, depending on availability and the material to be dried.



FBD Fluid Bed Dryer

This machine is used for the **drying of powdery, crystalline or granulated products**, such as salts, hydrates, acetates, cryolites and silica, etc. Product characteristics will determine the most suitable method of drying to be carried out.

The product could be dried, dried and cooled, or cooled with or without drying fluid recovery. Other aspects are a combination of super imposed layers and modular division to vary drying parameters such as speed, temperature and recirculation of air, etc.

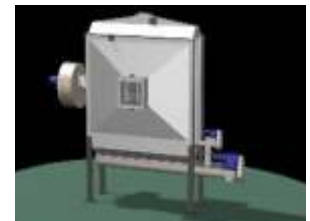


FLV Laminar Flow Dryer

This machine is suitable for **drying coarse materials** such as seeds and extruded products, plastic raw material pellets, etc.

This machine functions as a **dryer and/or as a continuous and automatic vertical cooler** with **adjustable speed** and with a predetermined thickness of layer.

Speed and temperature are regulable, which reduces volume and high output, making it a very applicable addition to an existing system or production line.





H2 Indirect Fired Paddle Dryer

For drying a variety of materials including various types of flours, crystalline chemical products and sludge and slurry cake.

The equipment is indirect fired, and so the product to be dried is not contaminated by the heat source gases. It is a high output continuous dryer and/or sterilizer, designed for a wide range of operating temperatures. It can operate with pressure or vacuum, due to its special sealing system.

This machine is suitable for drying and homogenising products with one or more constituent parts.

Characteristics:

- Can be used for many products
- Has a high thermal yield
- Can operate with pressure or vacuum
- Can use many heat transfer fluids
- Provides an even heat throughout
- It can have drying and sterilising functions

Cabinet Dryer

The Serton Cabinet Dryer is an off-line dryer that allows complete control over programming both in terms of time and temperature.

It is a low cost solution for specific drying processes though it is primarily designed for smaller products and for longer drying processes such as for vegetables and ingredients for soup making, etc.



FAC Ascending Flow Cyclone Dryer

The Serton FAC Ascending Flow Cyclone Dryer is designed for use with flours and powdered products. Any impalpable materials are filtered out.

Our exclusive drying process facilitates uniformity of drying of the different particles, given that those with most humidity stay in the drying chamber longest

DS Dryer/ Digester

The Serton DS Dryer Anaerobic Digester was conceived to solve the by-product recycling needs of avian abattoir and similar installations.

This solution does not need any complementary investment in supply of heating fluid. It is an independent machine that needs simply an electrical connection and fuel.

The control panel of the plant maintains the whole process in operation, although the grade of automation can be designed according to the wishes of the client.

As it is not an in-line product, a drying / digesting program can be keyed in for each batch of product. It is suitable for recycling of abattoir by products.

SBM Belt Dryer

Used for products whose characteristics such as flavour, smell, appearance and permeability must remain unchanged, such as for some granulated and extruded products. This dryer is mainly used in the alimentary and chemical industries.

Its modular construction based on uniform units means that the dryer can easily be enlarged or made smaller to adapt it to changes in required capacity.





SERTON 's Hot Generators are the result of 25 years experience in the design of burners of solids, liquids or gases.

CCDM Direct Fired Hot Air Generator

The Serton CCDM Direct Fired Heat Generator is appropriate for any process requiring direct heat derived from air and combustion gases, such as industrial dryers.

The design is practical, economic and robust. As it is a direct fired heat generator, use is made of 100% of the gases in the system. It normally uses clean gas, although other burners are possible.

- Direct, instant heat;
- No wastage as all gases are used;
- Incorporates heat recovery sleeve;
- Simple, robust design;
- Burns clean gas.



Simun Indirect Fired Hot Air Generator

Specially designed to obtain maximum output of heat generated in the combustion chamber. High coefficient of heat transmission.

It is also able to use any conventional fuel such as fuel oil, diesel, natural gas or propane. The thermal output is around 90%, and operating temperatures are in excess of 300°C.

The Simun generator has been conceived for foodstuffs or those products where high temperature air free from pollutants is necessary.

Characteristics:

- Many models to suit your needs
 - Different fuel options available
 - Insulated to minimise heat loss
 - 90% efficient thermal output
 - Operating temperature of over 300°C



CCVA Direct Fired Multi Flame Hot Air Generator

The CCVA is Highly regulable, with a modulation ratio of 12:1 to 16:1, or even higher for special orders, thus allowing it to be used with a wide range of programs. A regulable burner from the range that is rated at 400 therms/hr can operate in the range 33 to 400 therms/hour.

It can operate safely at up to 600°C when coupled with a Serton dryer. Secure air flow system integrated, ensuring no over heating. As a further safety feature, it incorporates a flame anti jump system.

Characteristics:

- Wide scope of output levels
 - Continuous even burn
 - Safely operates at up to 600°C
 - Air flow system
 - Anti jump flame system
 - Flame ionisation system
 - Venturi laminar flow gas air mixing



Electric Hot Air Generator

This machine generates supplies of clean air at temperatures of up to 400°C. It is regulated by thyristor solid state switching devices.

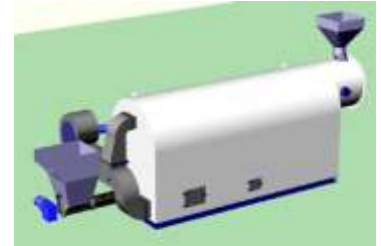
This heat generator is suitable for any thermal process where the use of electrical energy is preferred.



Solid Fuel Hot Air Generator

This machine produces a source of heat using waste biomass by-products from variety of agro-industrial processes that would otherwise go to landfill. It can save the operator money in two ways: first by eliminating or reducing waste disposal costs, secondly by reducing heat energy costs.

A variety of solid fuel by-products can be burnt, including amongst others sawdust, olives cake, wine production residues, woodchips and shells from nut processing.





TH2 Toasting Machine

This production line thermal processing machine can be applied to **foodstuffs for human consumption, such as seeds and flour.** Toasting temperature is between 130°C and 200°C depending on the material to be processed.

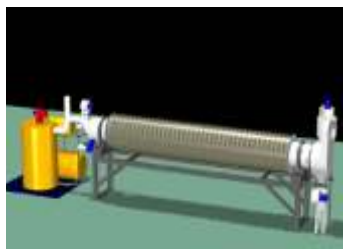
The heating fluid in the case of this Serton toaster is **thermal oil in a closed circuit.** There is a **twin-section heat transfer system.** This ensures **maximum heat transfer to the material.**



TS Rotary Toaster

This machine can be used for **toasting or drying various types of flour, seeds and cereal.**

A special rotary trommel drum toaster dryer ensures that the product is well distributed, which **maximises the contact area** and therefore the output, and balances the cylinder to **reduce the turning power needed.** Fuels can be diesel, fuel oil, gas, or by products.



SC Dryer Calciner

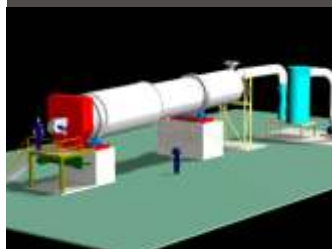
NEW CONCEPT

For drying and calcinating the organic residue from the **mussel canning industry.** It converts mussel shells into calcium carbonate of **96% purity,** which can then be used in the **chemical industry, as fertilizer or in construction.** It can also be used to make any organic residue inert.

This machine features a **continuous and controlled process** whose temperature does not exceed the calcination temperature and the heat used is reused in the first drying stage.

The process is controlled using **SCADA software,** allowing the flows of gases and the temperature to be monitored at five key points including inside the revolving drum, as well as the speed, power and consumption.

This machine, which is **unique in the world,** can process **20 tonnes of mussel shells per hour.** It can run on fuel oil, natural gas or cogeneration gases. Power consumption is low: just **3000 therms/hour.** Smaller versions are available down to 500kg per hour.



H Type Indirect Fired In-line Sterilizer

This production line thermal processing machine can be applied to **foodstuffs for human consumption, animal feed and fertilizer.** It has been successfully employed for meat residue reduction.

The machine maintains the product at a temperature of between 120°C and 150°C (depending on the nature of the product) in order to sterilize it, or between 70°C and 80°C to pasteurize it. **Designed to comply with current EU legislation.**

Heating fluid can be steam, heated water or heated oil in a closed circuit.

For higher temperatures and for humid products, the Serton H Type steriliser is equipped with a pressure sealant system. **This allows the plant to operate at higher pressure and reduces to a minimum heat energy loss through evaporation.** Thus thermal efficiency is maximised

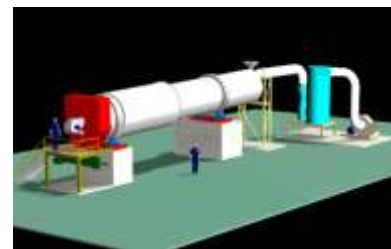


Rotary Calciner

The Serton Calciner is based around our novel rotary trommel system. The calcinating is a continuous and controlled process whose **temperature is adaptable to the material used.**

The heat for this system is supplied by one of our range of heat generators that can burn a variety of liquid/ gas fuels. **The process is controlled using SCADA software.**

This machine can process **from 500kg to 20 tonnes of material per hour.** It can run on fuel oil, natural gas or cogeneration gases. It can also be used to make any organic residue inert. **Power consumption is low.**





Product Range

Cooling Machines



H Type Indirect Cooler

This high output indirect cooler can work at pressure or with a vacuum and with products that can not come into contact with the cooling fluid.

It is suitable for drying and homogenising single component products or compound products. As a cooling fluid, either cool water or air can be used, both in closed circuit. Typical applications are various types of flour and crystallized chemical products.

FBC Fluid Bed Cooler

The Serton Fluid Bed Cooler can be used for the cooling of powdery, crystalline or granulated products, such as salts, hydrates, acetates, cryolites, silica and of foodstuffs. It is often employed in Serton breadcrumb plants to cool the crumb after drying and before the final milling process.

Uniform distribution and ultimate cooling of the product..

Product characteristics will determine the most suitable method of cooling to be carried out. The product could be cooled, or cooled with or without drying fluid recovery. It is often designed as a combination drying cooling installation.

The product is first treated with heated air, then with cooling air. Other possible configurations are a combination of super imposed layers and modular divisions to vary drying parameters such as speed, temperature and recirculation of air, etc.



FLV Laminar Flow Cooler

This is a fully automatic vertical flow in-line cooler.

This cooler is designed to occupy a minimum floor area yet to have a high yield, thus making it ideal for fitting into an existing plant or production line.

It can be employed for cooling coarse products such as extruded products, pellets or seeds.



Rotary Cooler

This Rotary cooler is based on the Serton SER trommel drum model, designed and refined over 30 years.

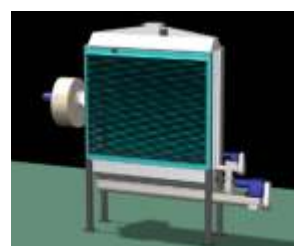
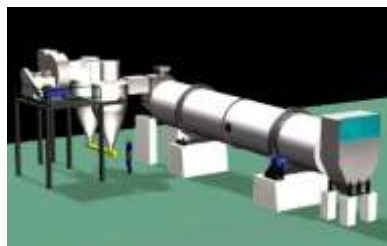
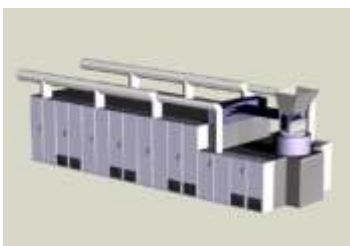
It is fitted as standard with an internal cellular distribution system that ensures that the material is evenly spread throughout the drum. This means the drum is perfectly balanced thus reducing energy costs and wear, and allows maximum contact of the material with the cooling fluid to aid the cooling process.

This rotary cooler is used particularly for fragile granulated products, such as in a fertilizer plant, where the pellets of material even improve in their uniformity of size during the drying process.

EBM Belt Cooler

This cooler has a feed system that can be fully regulated in terms of layer depth and width of material to be dried. Furthermore, its sectional, modular design means that its overall size and capacity can be reconfigured relatively simply.

This cooler is primarily employed in the foodstuff and chemical industries for extruded or granulated products. It is used for drying those products whose characteristics are to be conserved. These characteristics could be appearance, aroma, flavour or permeability.





MTV *Shredder Mill*

The Serton Engine range of **MTV shredder mills** have been designed and refined over 30 years of production.

Robust construction - The mill is robustly constructed and **built to last**. Both cutting stages are designed around the same axis to minimise moving parts. All blades are made of **anti-wear materials** and the axis has **special bearings**.

Large feed mouths - Due to its wide conical upper body design and generously designed feed mouth, large pieces of product material can be introduced either manually or with automatic feed.

Hygiene - The conical cylindrical design allows a smooth crevice free internal surface to give **vitally important hygiene benefits**. All parts in contact with foodstuffs are made of **stainless steel** and there are two doors for easy interior access.

Applications - As well as for **foodstuffs**, the mill can be employed for shredding **various industrial by-products, filter cakes and organic or inorganic fertilisers**. It can also be used for humid or fatty materials and other binding agents.



MTY *Shredder Mill*

The Serton Engine range of **MTY shredder / mixer mills** have a **robust cylindrical design** which additionally allows for a smooth internal surface to give **vitally important hygiene benefits**.

The vertical axis has **anti wear cutting elements and special bearings** to maximise its output and reliability. Due to the generously designed feed mouths, large pieces can be introduced which are rapidly reduced and shredded by the spinning tines in the cylindrical body.

The mills can be used for **foodstuffs, various industrial by-products, filter cakes and organic or inorganic fertilisers**. It can also be used for humid or fatty materials and other binding agents.



MTS *Multi Task Mill*

Used in the production of **mixed animal feeds, fertilizers and similar products**, mainly in the **agricultural and chemical industries**.

This mill is capable of chopping or pulverising bread, filter cakes, and various other compound materials. It is solidly constructed using **special steels**, with **manual or automatic feed**. The rotor has horizontal or inclined axis with **special bearings**. The blades are made from an **anti-wear material** appropriate to each product.

It is also possible to change the internal mesh sieve according to the particle diameter desired as the end product. It produces a uniform fineness with **low power consumption**. The clean lines of the internal design allows the product to pass through the system **quickly and efficiently**.

Easy access to internal elements allows for **easy cleaning and maintenance** of the mill.

It can also be used for materials containing a high percentage of humidity, fatty materials and other binding agents.





MTM
Sharp Hammer Mill

This mill is used in different configurations for alimentary and agroalimentary products and by-products, all types of feedstuff, chemical products, and organic and inorganic fertilizers. Its **exceptional output** is achieved through its configuration and other characteristics. It is direct driven with a **vertical axis** and **high quality bearings**. Its integral cyclonic design eliminates the need for further belt drives or extra moving parts. Its **power rating is low** for its output and it **operates at low temperatures**. It has a wide range of screen meshes according to the fineness desired, the screen meshes are quick and easy to change and the particle size is uniform. All impact elements are in **anti-wear materials** suitable for the product to be processed. It is designed to eliminate internal crevices and it **admits a higher percentage of greasy materials** or other binding agents and **emits minimum dust**.



MTD
Rotary Blade Mill

Different configurations are available for this mill that allow **easy adaptability** for a wide range of products. With a special design, this mill is **solidly constructed and machined with precision**.

The design of the body, rotor blades, fixed blades and internal mesh guarantee a **uniform product particle size** with **minimal noise** and a **reduction of generated heat**. The configuration of the mill can also incorporate a very effective refrigeration system of air and water.

The machines are manually operated. They have fast easy internal access for **efficient cleaning and maintenance** of the mill and incorporate **electromechanical safety devices**. This ensures that the operator can access the cutting chamber with safety.



MMS
Micronizer Mill

This micronizer mill is able to achieve a similar level of fineness of the end product as obtained with Jet Mills. However, by combining impact, cutting and friction systems, **this mill is able to achieve results using a more frugal level of consumption**.

This mill can be used to **grind a number of products**, including agar, clay, rice, sugar, sodium bicarbonate, coal, carbonates, graphite, wheat, PVC, Soya (in grain form) and many more. It is also easily accessible to allow for **quick and efficient cleaning and maintenance**.



MMH Horizontal
Micronizer Mill

This mill is a simple, tried and tested model solidly built out of cast iron and designed for **dry grinding and finishing of ultra fine products** such as castor sugar and flours.

It is **low cost and economical** to operate, and is available in **five model sizes**.





MTZ Rotary Shear Shredder

Ideal for materials volume reduction in the area of recycling and reprocessing or for breaking up lumps of a product which have been created by humidity or compaction.

It can be adapted to the needs of other processes, such as the shredding of products of a lighter consistency such as bread.

Low energy usage, reduced noise and low dust generation. It has low capital and operating costs. It can automate the volume reduction process, increase product value and maximise transportation value. It is available with a variety of hopper and feed configurations.

Pre-Cutter Feeder

This machine can also be used for cutting up products of a lighter consistency such as bread. It is particularly suitable for breaking up large blocks of a product which are impossible to process due to their large size.

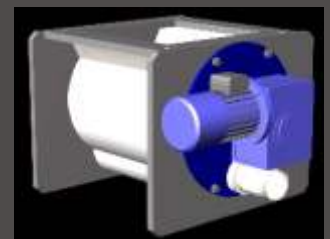
For bread and other soft products a cross shaped grill is placed where the product exits the machine. This carries out a further cutting action to reduce even more the size of the out-going product.

Serton delumpers and pre-cutter feeders can be adapted to the needs of the particular process. They can be built with steel, stainless steel or other materials, and in a range of sizes.

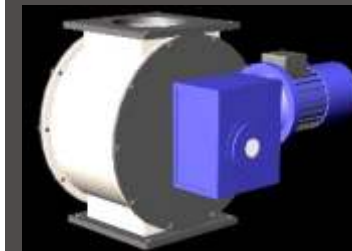
Serton have a range of three types of rotary valves and feeders designed for bulk granulated material handling and transport. The Simple Discharge Rotary Valve is designed for gravity feeding applications, the material coming from a hopper or cyclone at the end of an air conveyor. The Asymmetric Rotary Valve is designed with delicate granulated material in mind, the aim being to minimise contact of the material with the valve walls. Lastly, the Pneumatic Conveyor Rotary Valve is designed for feeding material into an air conveyor line.

Serton rotary valves are uniquely designed for a wide range of client applications and Serton Industry Solutions. They are available in various materials and are machined for close tolerances for use metering material in or out of a pressure or vacuum conveying line.

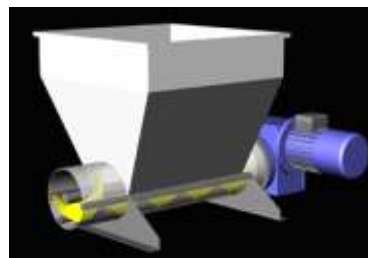
Pneumatic Conveyor Rotary Valve



Simple Discharge Rotary Valve



Asymmetric Rotary Valve



The Vibrating Sieve is a simple and cost effective solution for classifying granulated products into one or more particle grading sizes.

The finished product are screened for any foreign materials and all dust is filtered out, leaving it ready to be stored or packed. This machine can be employed for many applications.

This Serton Rotary Sieve can be made in a range of sizes from 0.5 to 2.5m diameter, adapted for a variety of products and can simultaneously sort into several different grading classifications.

It allows the separation of one or several graded particle sizes, even of products that are difficult to handle. The machine has a feeding system and a collecting system for the different grading classifications.

Rotary Sieve



Vibrating Sieve





Pre-Heating Trommel Drum

Conceived for use in thermal processes for granulated products.

The system works with heat up to 200°C.

Automatic Variable Geometry Feed Bin

The Serton Variable Geometry Feed Bin is a system for storing and delivering measured quantities of product to the production plant for treatment.

It is particularly used in Serton breadcrumb plants, where it is essential that there is a strict rotation and constant movement of the raw material, which are the loaves of bread.



KF Gas Scrubber

The Serton Venturi Scrubber removes dust and particles from air and gas exhaust streams.

Although the Serton Gas Scrubber has many applications, it is extensively used in conjunction with the Serton Rotary Dryer. When employed in the drying of salts or clays, it has the advantage that the particles of salt or clay extracted from the exhaust gases can be fed directly back into the production process in wet form.



Gas Evacuation Oven

Conceived for use in thermal processes where the ambient air must be free of contaminants and gases that could react or interfere with the industrial process to be undertaken.

It has been used successfully in the manufacture of spectacles, where successive layers of different chemicals and products need to be added to the surface of the glass under conditions of absolute cleanliness. The system works with heat up to 200°C and vacuum of 1,0⁻ bar.



Serton High Robust Trevira Silos are made in a range of sizes from 8 to 50 cubic metres capacity. For breadcrumbs, 10 cubic metres is equivalent to around 4,000kg of breadcrumbs (specific density: 0.4).

It complies with current regulations for food storage of flour and derivatives. Silo is transpirable and anti-dust. It has a special filter type ceiling and an external filter sleeve for allowing air to exit and for collecting dust during the loading/filling phase of the silo.

Features adjustable electric motor vibrator of 0/200 kg/h and a reinforcement strip. It can be supplied with nose for pneumatic transport or an exit valve for high volume discharge. Trevira silos are ideal for use with pneumatic air conveyor transport systems due to their transpirable construction material. Very economical.

Serton Standard and Trevira Silos

