



*Pneumatic conveyors*

**for powders and granules**

made in Italy





## RGS Vacuum Systems

RGS Vacuum Systems, since 1997, is one of the few companies specialized in the production of *Pneumatic Conveyors for powders and granules, Industrial Vacuum Cleaners and Centralized Suction and Ventilation Systems.*

RGS Vacuum Systems is the only one that manages technologies in the **diluted phase, high vacuum** and **dense phase**, choosing together with the customer the solution suitable for his problems and his specific needs, following him from design to maintenance.

RGS Vacuum Systems realizes **“turnkey” projects** with innovative solutions, according to the customer’s needs.

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# I What is pneumatic conveyor?

In industrial applications it is increasingly necessary to **transport granular or powder materials in fluid suspension** through numerous stages of the production process. In this regard, RGS has been developing *innovative pneumatic transport solutions for all industrial realities*.

Pneumatic conveyors **transfer solid powdered or granular substances into pipes**, usually circular, **by means of a stream of air of adequate speed**.

The fundamental distinction between the various types of pneumatic transport derives from the way in which the motion of the material is realized, through a current of air that can be:

**IN VACUUM**  
(aspiration)

**IN PRESSION**  
(thrust)



# I How pneumatic conveyors works?

Pneumatic conveyor is a system widely used in industry to **transfer materials at different points through closed pipelines**. Material transfer is the combination of a difference in depression or pressure and the flow of air or gas within the pipes.

Depending on the needs, a different gas can be used, such as nitrogen, which being inert lends itself to the transport of **potentially explosive materials**, or for products of easy oxidation.

The purpose of a pneumatic conveying system is to **transfer materials from one or more points to a final destination or to a further production process**; among these we can find the *processes of mixing, granulation, concentration, processing and packaging*.

\* These different technologies will be explained in specific applications.

## I Advantages



### Small Foot Print

**Very small dimensions**, extreme flexibility of positioning and management, no external pollution, speed in the internal sanitization of the components.



### Dust Free

The basic idea is to maintain **high standards of cleanliness and hygiene** in all production departments. In this regard, the use of a closed-circuit pneumatic transport system using vacuum is the best solution for the elimination of annoying dust emission points.

**All our systems can also be ATEX certified.**



### Food Grade

RGS pneumatic transfer systems are used in the **food industry where high quality standards must be met**. Thanks to our long experience in this field we are able to produce a wide range of conveyors and systems, both standard and customized, all in accordance with the regulations regarding materials and articles intended to come into contact with food products: **1935/2004**, as well as the **USA FDA regulations**.

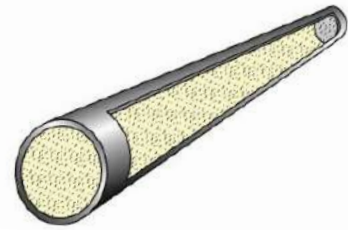


### Think safe, Work safe, Work easy

Our conveyors are designed with features to make them **easy to use, install and maintain**. You can easily access the filters for inspection or change. The ease of disassembly allows you to remove filters without the use of tools, **reducing the time needed to perform the reclamation for material change and ordinary maintenance**.

# How pneumatic conveyors works IN A VACUUM AND IN PRESSURE?

## VACUUM DILUTE PHASE PNEUMATIC CONVEYORS



Normally *fans* (much air and little depression or pressure) or side *channel impellers* (good depression or pressure and good amount of air) are used. In some applications also the lobe pumps (excellent depression or pressure and air).

These applications are ideal for **medium-range and distance** pneumatic transfers, maintaining an excellent price performance ratio. With these systems **one or more discharge points can be served** starting from a single sampling point and using a single pump.

In this system the material floats in the air at a speed of about 30/40 m/s.

## HIGH VACUUM - SEMI-DENSE PNEUMATIC CONVEYORS



For this particular type of pneumatic transfer, where **the product must not be de-mixed or even laminated** on arrival, normally used by pharmaceutical and food companies to serve packaging machines, vacuum pumps or hooks are used (little air and a lot of depression or pressure).

In this system the material travels at a speed of about 20 m/s.

## VACUUM DENSE PHASE PNEUMATIC CONVEYORS



Dense phase transport is ideal for transporting **fragile products, abrasives and mixtures**. It is then used for **long distances** and/or **large volumes**.

In this system the material travels at a speed of about 2/5 m/s.



## We pick up product from:

- > Hoppers / Big bags / Silos / Drums
- > Sacks / Dryers
- > Cutting machines / Floors
- > Centrifuges / Hoppers of product sockets
- > Containers / Bag breakers
- > Vibrating Channels/ Vibrating screens



## We transport directly to:

- > Mixers / Reactors
- > Filling machines
- > Hoppers with weighing systems
- > Sieves / Tablet Press Machines
- > Bag / Drum filling systems
- > Silos / Packaging machines
- > Filters
- > Lines of work

\* During the transport process we can also foresee **mixing, screening, weighing and dosing systems.**

# I What can you convey?

Our pneumatic conveyor systems are widely used in **many sectors** of which the main ones are: *food, tobacco, nutraceutical, pharmaceutical, cosmetic, mechanical engineering and many others.*



## CHEMICAL and PHARMACEUTICAL

- > Coal
- > Bentonite
- > Diatomite
- > Sodium nitrate
- > Silicon dioxide
- > Cellulose powder
- > Magnesium
- > Sodium bicarbonate
- > Plants drugs
- > Preparations of vitamins
- > Pharmaceutical powders
- > Tablets
- > Capsule
- > Resins



## FOOD

- > Aromas
- > Malt and hops
- > Legumes
- > Chocolate
- > Cacao
- > Spices
- > Sugar
- > Animal food
- > Pectin
- > Rice
- > Tea
- > Tobacco
- > Milk powder
- > Cereals
- > Roasted and wheat coffee
- > Dried fruit (hazelnuts, peanuts, pistachios...)
  
- > Flour
- > Spices (pepper, salt, paprika, garlic...)







## OENOLOGICAL and OIL

- > Perlite
- > Fossil flour
- > Bentonite
- > Coal



## MECHANIC

- > Aluminium powder
- > Iron powder
- > Metal shavings
- > Steel granules
- > Zinc powder



## PLASTIC

- > Plastic stoppers
- > PE-PP powder caoutchouc
- > Granules of polyethylene
- > Granules of polyurethane
- > Calcium carbonate



## CERAMIC

- > Colouring and decorating powders
- > Teflon powder
- > Oxides
- > Toner powder
- > Biossids
- > Pigments
- > Atomized



## PACKAGING

- > Trims of packaging lines
- > Textile cuttings

# Applications

## AGRI-FOOD Industry



The **agri-food** and **chemical-pharmaceutical** divisions are an important reality for RGS. In these years has been achieved an **excellent specialization in pneumatic loading**, both **mixers** with more products mono components (on request also dosed or weighed) **either by emptying them** with mixed products while maintaining the degree of mixing of the final product (without having separation and no stratification of the product).



*Pneumatic conveyors system for flour and processing residues in an industrial pizzeria. System realized in version ATEX for zone 22 powders.*



*Conveyor and dosing plant with recipe management (10 products) in an industrial bakery. System realized in version **ATEX** for zone 22 powders.*



*4 hoppers to receive the product on a mixer for milk, sugar and cocoa transport.*



*Loading system for vertical instant coffee packaging machines.*

# CHEMISTRY AND PHARMACEUTICALS Industry



Conveyor system for pharmaceutical blending on an capsule filling machine in a pharmaceutical industry.



Pharmaceutical mixer working in depression.



Hopper on mixer for the transport of powders pharmaceutical and nutraceutical.



Conveyor system for mixed pharmaceutical powders made of 316L AISI stainless steel with polished finishes in a pharmaceutical industry. System realized in version **ATEX** for zone 21-22.

# Applications

## OENOLOGY Industry



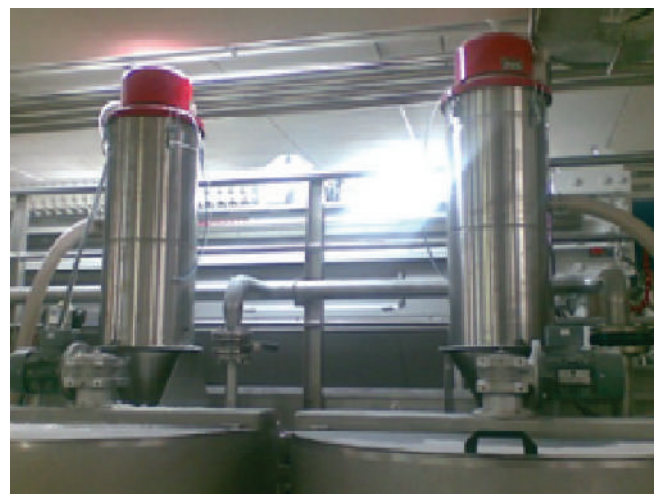
Fossil flour conveyor system with big-bags emptying system and transfer on filter in a cellar.



Loading system of barley and malt on a kettle in a craft brewery.



Perlite transport system, compressed air for **ATEX** 1-2 zone on a filtering unit in a distillery.



System consisting of two single-phase conveyors that load two tanks for the preparation of the fossil flour filtration compound.

# PACKAGING Industry



Seed conveyor system on packaging machine, made with single-phase loader equipped with anti-shutter tangential inlet.



High vacuum conveyor system of pharmaceutical powders with pneumatic lifter to facilitate the positioning of the hopper over the packaging machine.



Loading hoppers for conveying of sugar.



Pneumatic transport system on a total of 9 packaging machines with 4 big-bags removal in a sugar packaging industry. System realized in version **ATEX** for zone 22.

# Applications

**CERAMICS**  
Industry



*Conveying and dosing system for dry coloring. Battery of 4 dosing systems in line on the same press.*



*Conveying and dosing system for dry coloring. Battery of 6 dosing systems.*



*Multiple pump unit.*



*Conveying and dosing system for dry coloring. Battery of 6 dosing systems.*

# TOBACCO Industry



*Lobe compressors for the conveyor of tobacco powders.*



*Conveyor system for tobacco powders.*



*Pneumatic conveying system for tobacco powders, storage in silos and dosage on mixer.*



*Pneumatic conveying system for tobacco powders, storage in silos and dosage on mixer.*

# I Range of products

To design and build the most suitable and economical transport system to solve customer problems, based on the type of product and the needs of the industry.

## COMPACT SINGLE PHASE pneumatic conveyors

With reduced dimensions for easy installation for the **transport of granular and dusty products**.



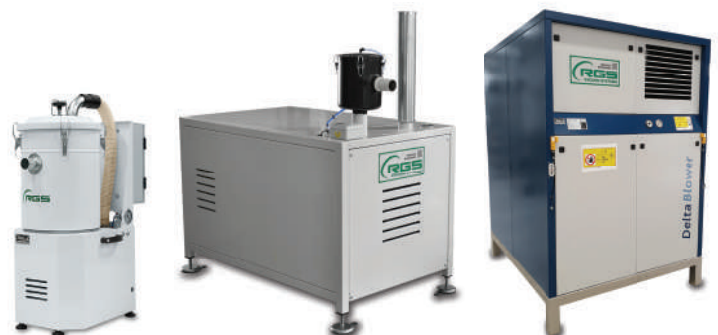
## Compact HIGH VACUUM CONVEYORS and COMPRESSED AIR

Ideal for the transport of **mixed powders** in semi-dense phase: taking advantage of a high depression and a very low air flow rate, you can use both **vacuum pumps with electric motor**, both **systems with pneumatic ejectors** (Venturi) the homogeneity of the product is maintained in both cases.

## Suction units

Three-phase suction units starting from 1,5kw up to 40kw.

Models with **side channel turbine**, with **high vacuum pump**, with hook and lobe pump, can be in mobile version (wheeled up to 15kw) or fixed, also some models working with **compressed air**.





## LOADING hoppers

Loading hoppers in painted iron or stainless steel, of various capacities and diameters, with discharge systems with butterfly valve, clapet (tilting) and rotary valves.

All models are available in **ATEX** version.



## FOOD and PHARMACEUTICALS hoppers

Load hoppers for **BT-H** (Blue Tech-Hopper) RGS pneumatic conveyors allow the handling of different types of materials such as powders, granules and particles of irregular shape.



## Electrical panels

Custom electrical panels interfaced with loading cell weighing systems with **PC** or **PLC systems** for recipe management.



# I Dense phase pneumatic conveying systems - DPC

Dense phase pneumatic conveying systems are suitable for **conveying materials at very long distances by using high-pressure compressed air (> 1 Bar).**

The **tank** is therefore designed to withstand high pressures (**PED or ASME certified**) and can have a variable volume depending on the design flow rate.

The **Pressure Vessel** is the heart of dense conveying systems.

The conveyor can be made of painted **carbon steel, stainless steel AISI 304 or AISI 316**. The interior and exterior finishing can be customized according to the needs of customers. All tanks can also be equipped with suitable components for installation in **ATEX** zones.

The use of high pressure and low air flow allows you to push the material along the pipe to the destination at very low speeds (1-10 m/s), **avoiding breakage of fragile materials, segregation of mixtures and wear of abrasive materials.**



MODEL	Capacity (liters)	Load valve Ø (mm)	Dimensions (mm)	Flow rate * (kg/h)	Conveying Distance (m)	
					EMPTY PIPE	FULL PIPE
DPC-20	20	150	Ø 400 x h 700	700	10-20	100-250
DPC-50	50	150	Ø 400 x h 1.000	1.200	25-30	100-250
DPC-80	80	200	Ø 600 x h 1.300	2.000	40-50	100-250
DPC-180	180	200	Ø 800 x h 1.550	3.500	60-100	100-250
DPC-300	300	200	Ø 800 x h 1.850	7.000		
DPC-600	600	250	Ø 1.100 x h 2.150	12.500		
DPC-900	900	250	Ø 1.100 x h 2.500	20.000		

**NB:** We can realize even bigger engines depending on the customer's capacity requirements.

\* maximum approximate flow rate, considering an average number of cycles and a bulk density of 1 kg/L

## FLUIDIZATION KIT AIR-FLUYD

**Additional fluidization kit** to be installed along the transport line to **reduce the friction of the material** and consequently the energy required for its transport.

Fluidizing the material is important to **minimize pressure losses, balance the pressure inside the pipe and prevent the formation of obstructions.**

Thanks to the AIR-FLUYD kits, it is possible to achieve **greater control of the product speed**, thus managing to transport more gently fragile or abrasive materials.

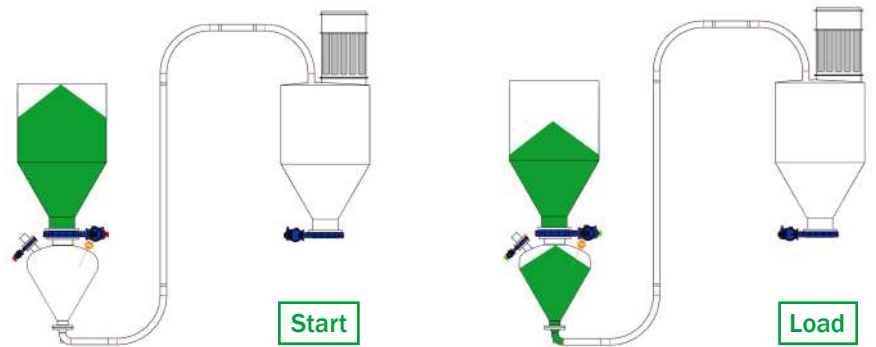
They also allow to reduce dynamic loads along the pipes and to stop and start the transport with the full pipe.

They are necessary in the case of full pipe, but can also be used in conventional transport in case of products difficult to convey (e.g. abrasive materials and/or materials with uneven grain size).



# I Ways of working (dense phase)

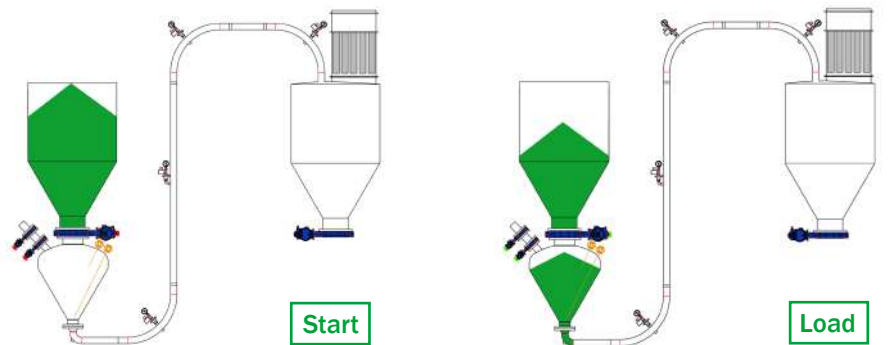
## BATCH (OR EMPTY PIPE)



It's a non-continuous functioning according to which the material, loaded into the pressure vessel, is pushed by compressed air along the pipeline till the destination; at the end of the cycle, both the pipeline and the pressure vessel are empty and all the material has been transferred in the destination.

This kind of convey is suitable for **short/medium distances** (up to 50-60 meters).

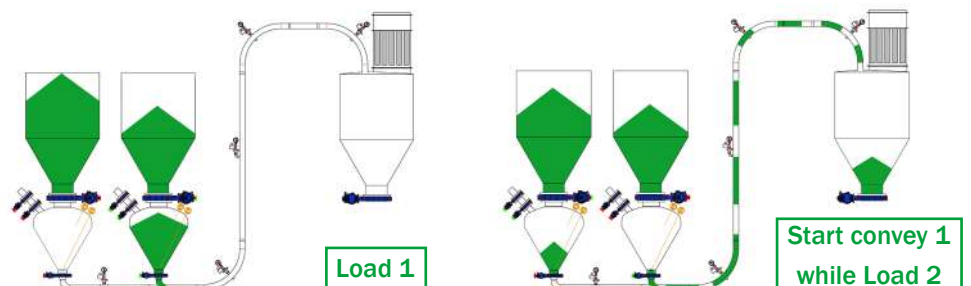
## FULL PIPE



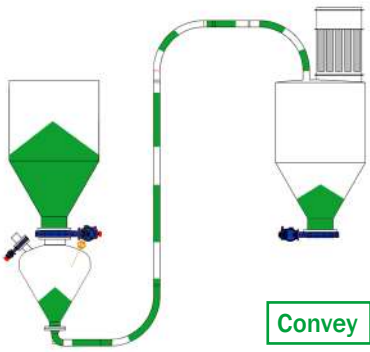
Expects functioning cycles according to which the pressure vessel is loaded and emptied, pushing the material little by little along the pipe. After having filled all the pipeline, the material begins to be discharged into the destination with very low speed.

This kind of convey is suitable for reach **very long distances (beyond 100 meters) and to convey very fragile or very abrasive materials.**

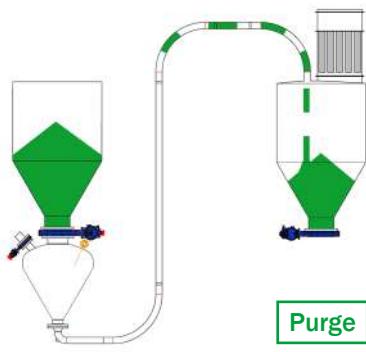
## FULL PIPE CONTINUOUS



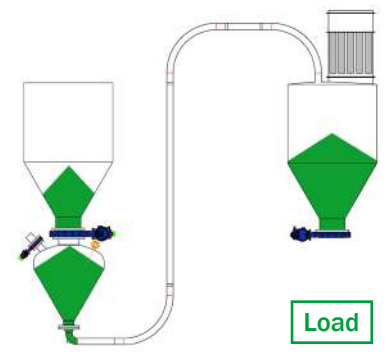
When it's required a continuous functioning, we can use a **twin system with two pressure vessels working alternatively in parallel**, pushing the material along the same pipe.



Convey

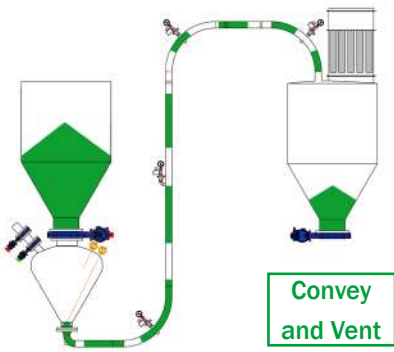


Purge

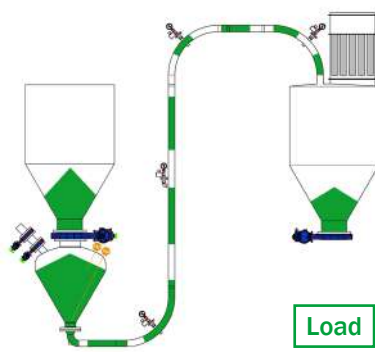


Load

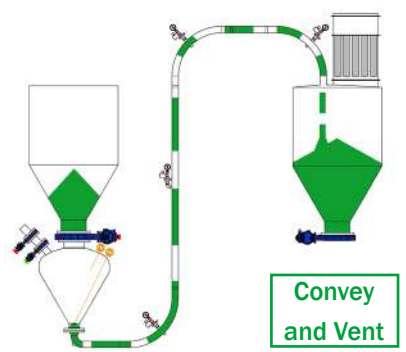
## BATCH (OR EMPTY PIPE)



Convey  
and Vent

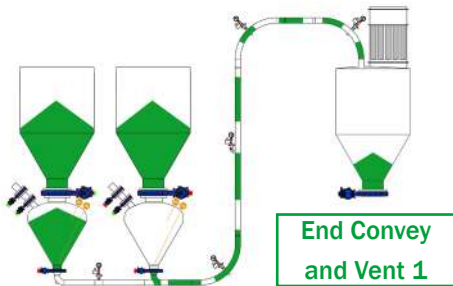


Load

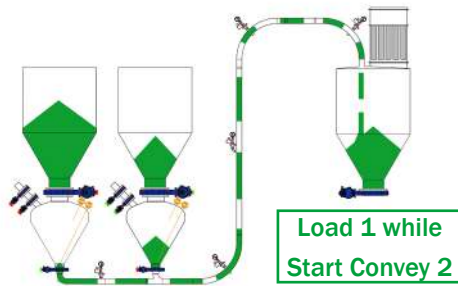


Convey  
and Vent

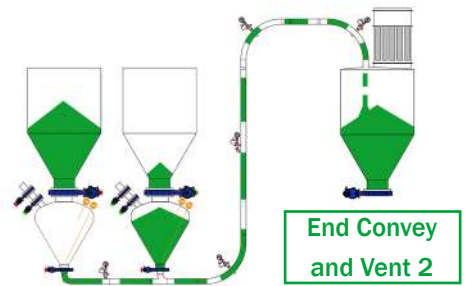
## FULL PIPE



End Convey  
and Vent 1



Load 1 while  
Start Convey 2



End Convey  
and Vent 2

## FULL PIPE CONTINUOUS

# I Accessories and Optionals

Accessories and optional for pneumatic transport systems.

## Filters

Filters made of various types of materials in stainless steel, polyester class L, M, polyamide and teflon, as well as other types. Depending on the product to be transported you can use: *star filters*, *bag filters*, *cartridge filters* or *filter sleeves* of different lengths and quantities.



## Pipes

Hoses of various types, galvanized steel and stainless steel pipes.

## Fittings

Fittings, reductions, bends, sleeves for the pipeline.



## Valves

Ball valves, diverters, proportional, product sorting systems, limiting valves, pipe emptying valves, and many other types depending on the application.

## Vibrators

Electric or pneumatic vibrators can be used to facilitate the descent of particularly aggregating products.



# I Systems and Components

## BIG-BAG emptying station

### Systems of product picking from big-bag emptying station

3 versions are available:

**SB1:** only lower structure (the big-bag needs external support to be supported).

**SB2:** composed of lower structure and upper bracket to support the big-bag (the big-bag needs a forklift to be moved).

**SB3:** composed of lower structure and prepared with rail for hoist.

In addition to these standard models, we can provide **customized versions**, both in height and in drains.

They can be made either with the **“petal” technology** or with the **vibration system**. In both versions it is possible to build in painted steel or in stainless steel, according to the needs of the sector and it is possible to realize integrated weighing systems.



“Empty big bag with petals”



“SB1”



“SB2”



“SB3”



# I Systems and Components

## BUFFER HOPPERS

Containers taken product made of **stainless steel AISI 304** to be used for the **withdrawal of the product**.

Circular, square and vertical wall models are available, with capacities from 15 to 600 lt.

All versions can be equipped with *level control, vibrator* to facilitate the descent of the product, *air fluidification valve, wheels* and possible cover.



“Buffer hoppers”



“Buffer hopper”



“Circular product hopper with vibrating channel extractor”



“Hopper of product outlet with support plan bag”





# I Systems and Components

## MANUAL BAG EMPTYING STATION

All the bag breakers are produced in stainless steel **AISI 304**, also if required the parts in contact with the product can be made of different steels depending on the products to be loaded.

Stations with different capacity volumes are available. All versions can be equipped with *pneumatic vibrator* to facilitate the discharge of the material, in addition to an **electric lump breaker** for agglomerated products.

In addition, they can be equipped with *suction and filter* with automatic cleaning.



“Manual bag emptying station with dedusting system”



“Manual bag emptying station without a fan”



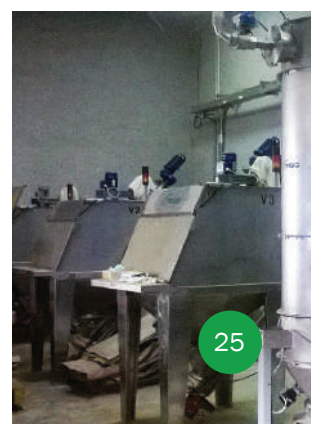
“Manual bag emptying station with filter and fan”



“Manual bag emptying station with cartridge filter and pneumatic vibrator”



“Manual bag emptying station with gloves”



# I Systems and Components

## SHREDDERS and LUMPS BREAKERS

Shredders designed to **shred** plastic or paper waste and allow the **compaction of waste** and its subsequent direct reuse in the production process.

Taking advantage of the high speed and the large cutting capacity, the shredder is therefore able to reduce the volume of sucked waste to 20 times.

**Lumps breakers** designed to **break the agglomerations of the product** created inside the bag and shred it in such a way that it is pneumatically transportable.



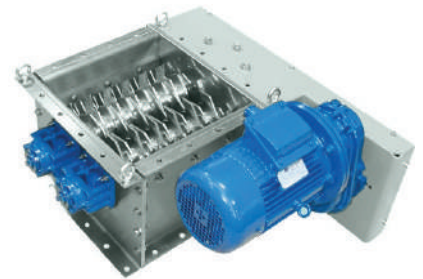
“K.TR.001X”



“K.TR.00IC  
Scrap shredder”



“Shredding unit suitable for  
all types of materials”



“Lumps breakers”



# Systems and Components

## VIBRATING SCREEN

(under vacuum and at ambient pressure)

The screens meet the needs of various industries, with the aim of separating, sieving, dedusting and filtering a wide range of materials (powders and liquids) of various sizes.



RGS after years of experience in pneumatic vacuum conveying has developed this range of screens, which can be located into a pneumatic conveying line and can operate at high vacuums down to -850 mbar. Similarly, they can also operate without vacuum, but with direct gravity feed.

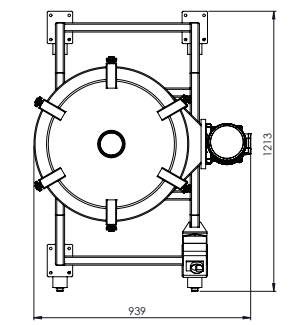
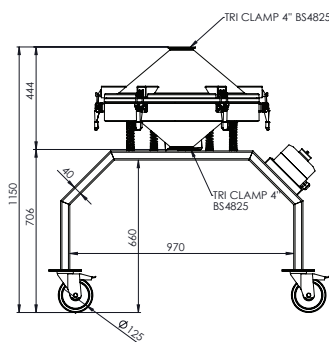
The construction characteristics of these machines allow very high flow rates, greater than traditional vibrating screens with the same diameters. Among the main prerogatives, we underline the possibility of quick disassembly of all parts, allowing for complete cleaning and sanitization.



*“Circular vacuum sieves with support frame”*

## ADVANTAGES

- reduced vertical footprint
- compact and handy
- high performance
- sieving of control with high capacity
- quick disassembly (speedy clamp)
- ease of cleaning and sanitization



# I Systems and Components

## WEIGHING SYSTEM

Pneumatic conveying **system** with **loss or sum of weight** to be combined with hoppers, product outlets or dosing systems according to the application.

Multiple systems can be created to transport different products in the desired quantities within a single user, with the possibility of **managing recipes**. All parameters can be set from the **operator panel of the electrical panel**.

The **weighing** can take place by difference, weighing the silos or emptying the big-bag and transporting the amount of material needed, until reaching the pre-set weight, alternatively it is possible to carry out the weighing phase on the hopper, Batch weighing, until the set weight is reached, this technology is proprietary to RGS Vacuum Systems, as both the hardware and software part are developed within the company.



## AUGER DOSING SYSTEMS

They consist of a storage container, an extractor organ and a balance (optional) that controls the variations in weight during the unloading of the product.

The balance combined with a dedicated **software** makes the dosing machine able to operate for *weight difference* and/or as *batch* or *continuous* dosing machine.

These systems are designed to **dose powdery materials**. In this case, the recharging of the material in the container is always managed by the control panel, without interrupting the dosing.



# I Systems and Components

## DOSING AND EXTRACTION SYSTEMS WITH VIBRATING CHANNELS

The vibrating channel dosing systems are used to **handle** or **dose** different types of granular products or powders with variable flow rates, they can be made of both carbon steel and **AISI 304/316L** stainless steel.

These products are designed and built by RGS Vacuum Systems as the management software.



*“Vibrating channel dosing system”*



*“Square section hopper with vibrating channel”*



*“Circular product pick-up hopper with vibrating channel extractor”*



*“Circular product pick-up hopper with vibrating channel extractor for leaves and aggregates”*



# I Pneumatic Conveyors Systems

The purpose of a pneumatic transport system is to **transfer materials from one or more points to a final destination or to a further production process**. Among these are indicated: the *processes of mixing, granulation, concentration, transformation and packaging*.

The company realizes **“turnkey” projects** with *innovative and customized solutions*.



All conveyors systems designed and produced by RGS Vacuum Systems are dimensioned and built, following decades of experience, by the components of the sales and technical staff, and managed by dedicated software self-produced, so as to ensure that the proposed solutions correspond perfectly to the highest standards.

The RGS Vacuum Systems team works to identify the right technology for the customer’s specific needs, starting from **technical inspections** at the customer’s production facilities, to the **design and production of systems**, up to the servicing and **scheduled maintenance** of the system over time.



## I Advantages

- > **Short, medium and long distances** can be used to transfer products pneumatically.
- > The ability **to maintain a controlled atmosphere**.
- > **Closed system**, therefore there is protection against dust emissions into the atmosphere and also the protection of material transported by external contaminants.
- > May have **multiple collection and discharge points**, with dosage or weighing.
- > **Flexibility**.



# | Other RGS solutions



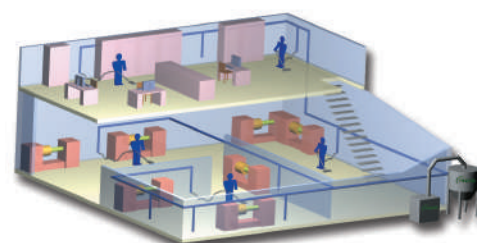
## VACUUM CLEANERS

RGS Vacuum Systems offers a wide range of industrial vacuum cleaners of **various powers and capacities**: single-phase, three-phase and compressed air industrial vacuum cleaners.

There are also specific models for the **suction of oils and shavings**, others for applications **in the food and pharmaceutical industry** as well as **special machines** made to meet the needs of the customer.

## CENTRALIZED SYSTEMS

RGS offers a wide range of components for the realization of **centralized suction systems** (such as suction units, collection silos, pre-separators, components for the duct, control systems) and **centralised ventilation systems** (such as *dust collectors, electric fans, mobile arms, electrical control panels and duct components*).



All products can be made of painted steel, stainless steel and **ATEX version** according to the needs of the customer and the application sector.

# | RGS services



**TECHNICAL INSPECTIONS  
OF CUSTOMERS' SYSTEMS  
AND PRODUCTION FACILITIES**



**ENGINEERING DESIGN  
OF COMPLETELY  
CUSTOMIZED PRODUCTS**



**MAINTENANCE**



**TECHNICAL-ECONOMIC FEASIBILITY  
ANALYSIS AND CHOICE OF  
THE BEST SOLUTION**



**INSTALLATION AND TESTING  
OF RGS MACHINERY  
AND EQUIPMENT**



**Aspiratori industriali**  
Vacuum cleaners

**Impianti centralizzati**  
Centralized systems

**Trasportatori pneumatici**  
Pneumatic conveyors

# RGS

**in the World.**



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