



**CLEANING SYSTEMS**  
for the plastics industry

**Product cleaning**

# ENGINEERING YOUR SUCCESS



Zeppelin Systems, the world leading plant manufacturer for high quality bulk material handling, has remarkably grown over the past 60 years. We cover the demands of a wide range of industries and supply all plant manufacturing services from one single source, whether basic engineering, in-house production of components, final assembly or comprehensive customer service. Thanks to our financial strength and our global network, we have long been a reliable partner for our customers.

Every Zeppelin plant is developed according to the clients' specific requirements, and realized, thanks to our customized innovative processes and technologies.

The knowledge we have acquired over more than 60 years of plant manufacturing and the world's largest network for bulk material handling is the key to providing ideal solutions, whatever the challenge; after all, your success is our goal.

## Zeppelin plant engineering – business fields

### **Polyolefin Plants**

Plants for plastics producers and forwarders

### **Plastics & Rubber Plants**

Plants for the plastics processors and rubber industry

### **Food Processing Plants**

Plants for the food, confectionery and baking industry

### **Mixing Technology**

HENSCHEL-Mixers®, mixing systems

### **Silos**

Storage silos, mixing silos, process silos

### **Components**

Rotary feeders, diverter valves, discharge and dosing units, sifters, filters ...

### **Service**

Spare parts, customer service and consulting

### **Modernization/Revamping**

Optimization of production lines and plant controls

# PRODUCT QUALITY IS YOUR TRADEMARK

Zeppelin's successful and proven technology has been used in the plastics industry for many years. The applications range from polymers and soft elastomers to technical plastics.

Zeppelin's full range of components for product cleaning covers the most varied requirements and provides you with the basis for your plant's corresponding system module in order to achieve maximum product quality.

Other components that ensure your product quality are Zeppelin's **filters** and **samplers**.

Products which go through the manufacturing process and downstream logistics are subject to mechanical wear. The product-oriented selection of the conveying process does reduce the effects (generation of dust and streamers), but it does not eliminate them. An essential part of the end product's quality is the so-called bulk material purity.



Pellet cleaning systems



Drum screen systems



Cyclone separators

# MAXIMUM PRODUCT QUALITY CAN BE PLANNED!

The diversity of plastics with most varied characteristics has exploded due to the ever-increasing market requirements. The proper selection of suitable product cleaning systems is therefore a decisive factor for the success of plastics producers and processors as they handle large quantities daily. Whether PE, PP, glass fiber reinforced pellets or particularly soft plastics such as LDPE with EVA – for every specific conveying task there's a perfectly matching solution.

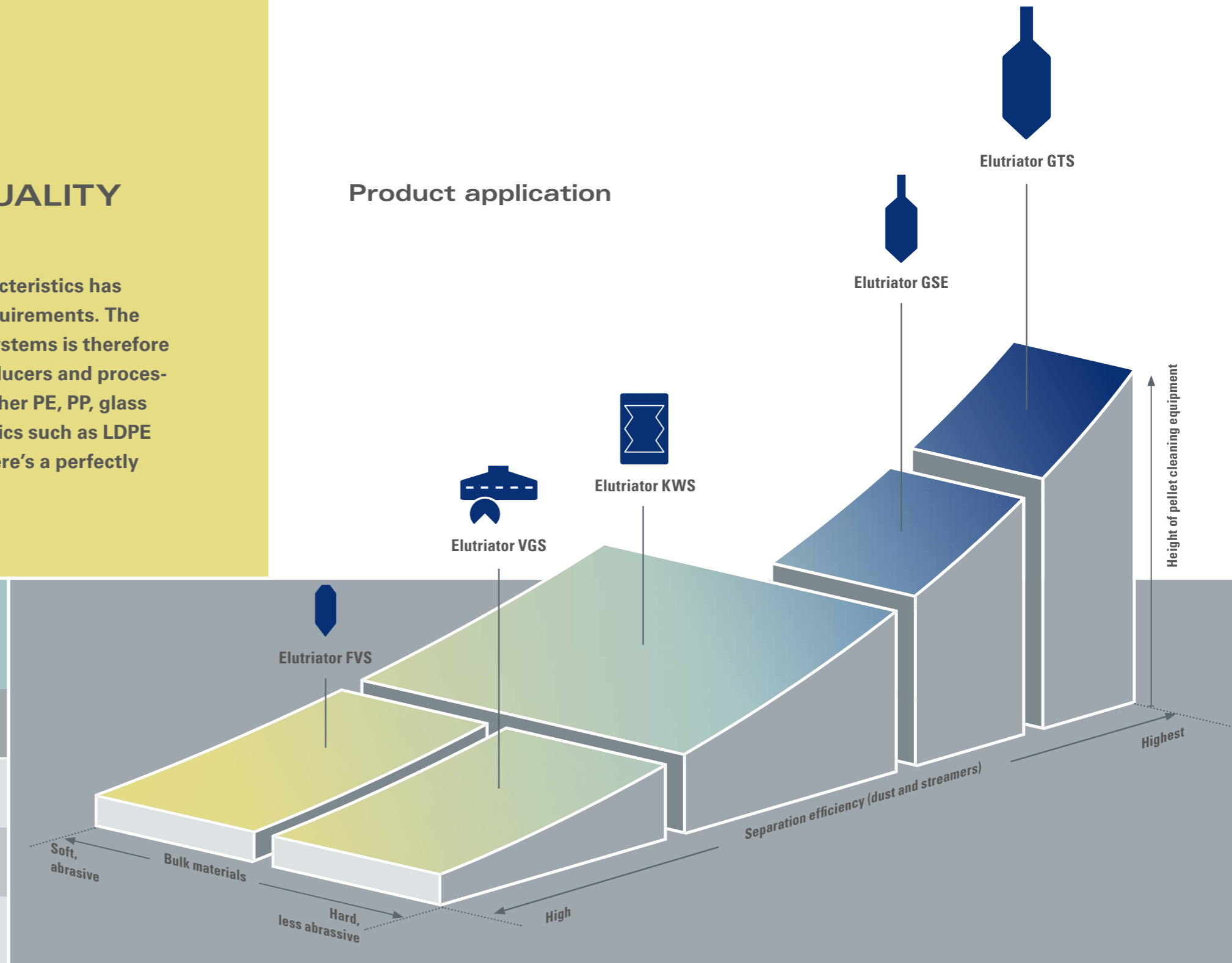
## Zeppelin's proven 3 x 3 planning template

	Product/bulk material	Performance/throughput	Application/installation
Dust separation	Polymer creates dust?	Dust content before and after cleaning?	Cleaning before bagging?
Streamer separation	Polymer creates streamers?	Streamers before and after cleaning?	Cleaning before loading truck?
Product and system parameters	Soft? Hard? Others?	Conveying capacity/throughput?	Clean room conditions? Feeding by gravity or conveying?

The timely assessment and definition of all existing parameters by Zeppelin experts is the guarantee you will receive an optimal product cleaning system.

This is why the specialists at Zeppelin rely on a planning process when designing your product cleaning system which not only comprises suitable components out of the Zeppelin range, but also includes decades of experience of the leading plant manufacturer.

## Product application



## The important thing is what you make from them ...

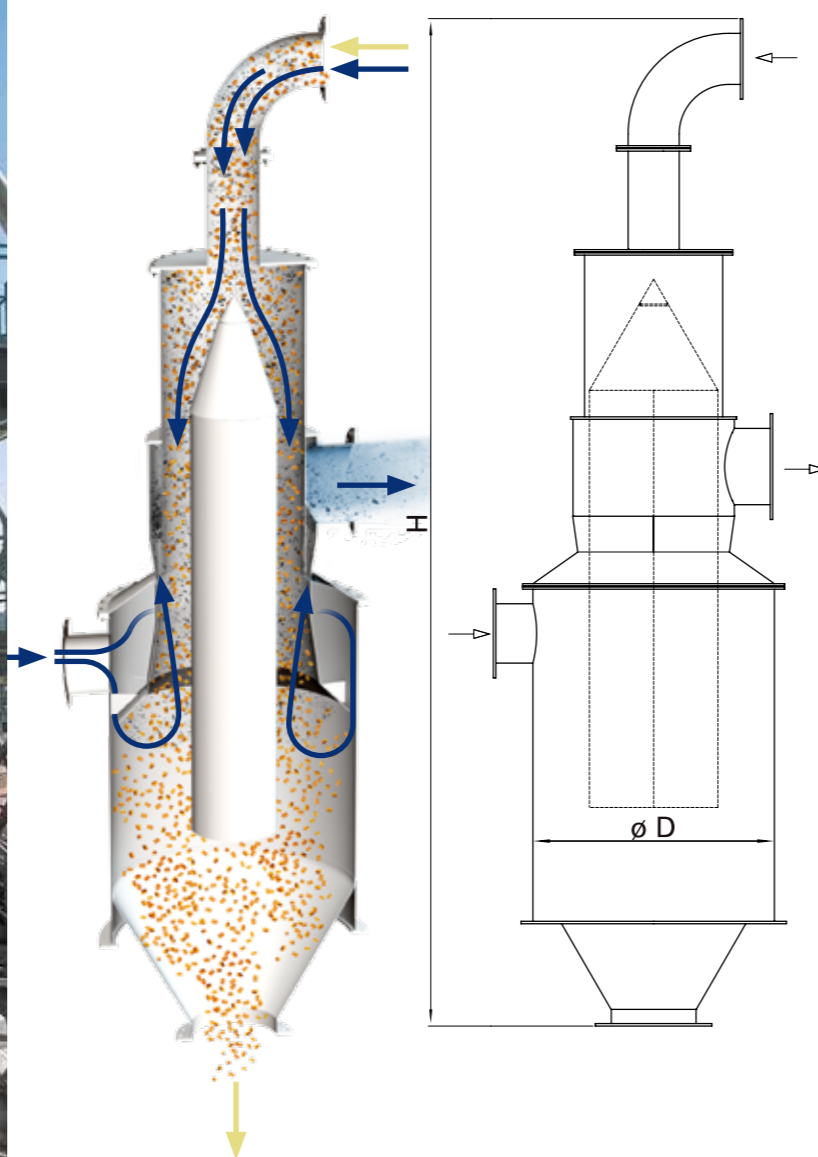
... and of course to consider all relevant parameters. In the end, it's all about developing the ideal system in order to obtain maximum product purity.

Regardless of the engineering process stage of your plant (PDP, FEED or BASIC), the unchangeable parameters are assessed in a planning template in an additional stage. In this step it is

particularly important to insure that the plastics characteristics are taken into account in the same extent as economical and technical specifications.

# MAXIMUM PRODUCT PURITY IN CONTINUOUS OPERATION

Elutriators are used for cleaning plastic pellets and separating dust particles such as streamers and angel hair. This cleaning method ensures the highest possible product quality before packing or loading. Zeppelin offers a range of separators designed to provide optimal solutions for your applications



## Elutriator GTS

### Design characteristics

- Separation of fine dust particles from pellets
- Reliable separation of long streamers
- High degree of separation due to particle acceleration and 180° deflection of air stream
- Constant separation efficiency over the whole lifecycle
- Gravimetric feeding possible
- Individual design acc. to product requirements and throughput
- Easy discharge of the cleaned product by a downstream rotary feeder

### Benefits

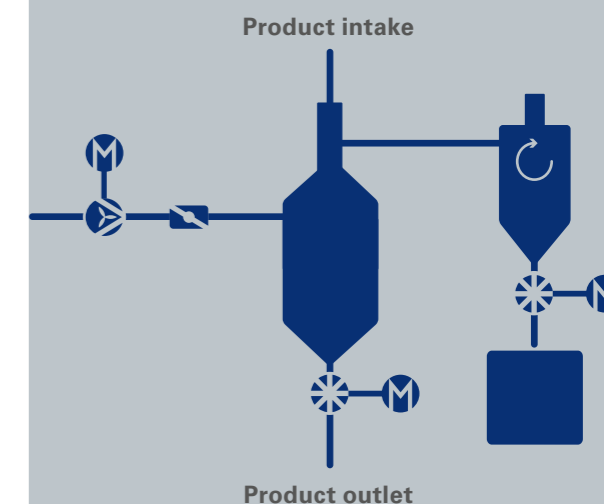
- Maintenance-free since there are no rotating elements or wear parts
- Effective operation with outstanding separation efficiency
- Direct feeding through pneumatic conveying
- Worldwide references
- Easy installation and assembly

### Applications

- Separation unit for direct connection in pneumatic conveying systems up to 120 t/h
- Separation unit also suitable for closed loop systems
- Outstanding separation efficiency
- Separation even of long streamers
- Primarily used for polymers

### Operating principle

The pellets are accelerated inside the elutriator using in part the kinetic energy of the pneumatic conveying and then blown into a counter flow gas stream. Due to the resulting high relative velocity between the pellets and the counterflow, finest dust particles as well as streamers and angel hair are separated effectively and economically from the product, achieving excellent cleaning results.

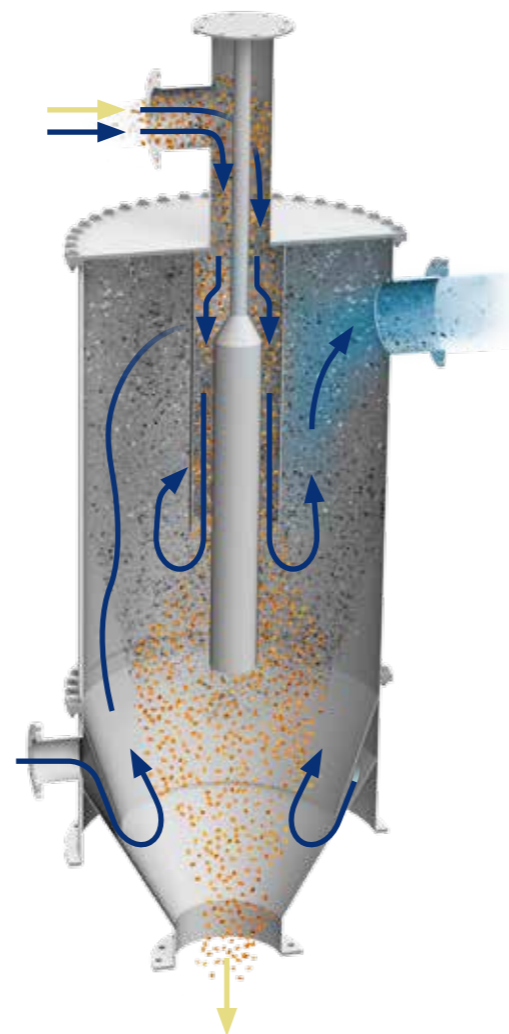
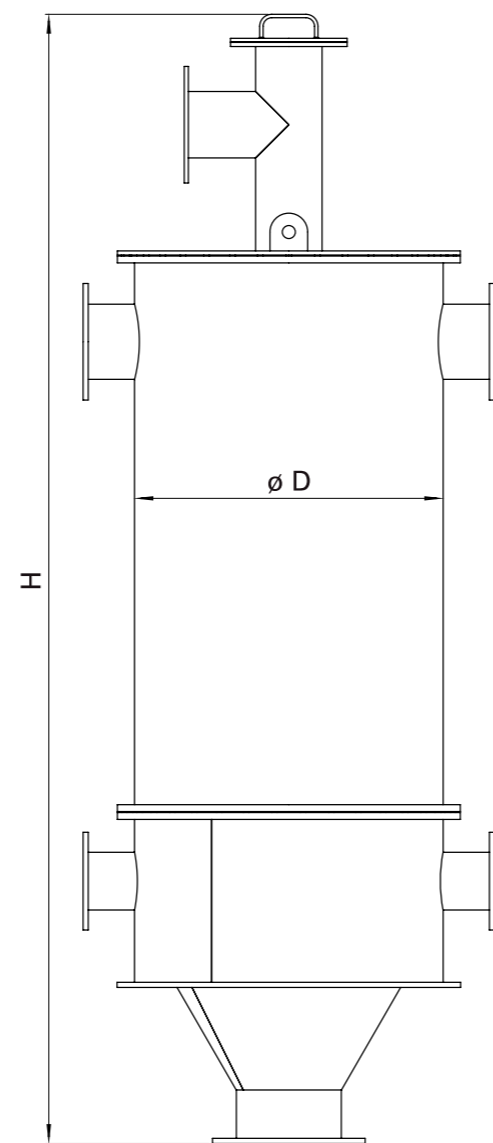
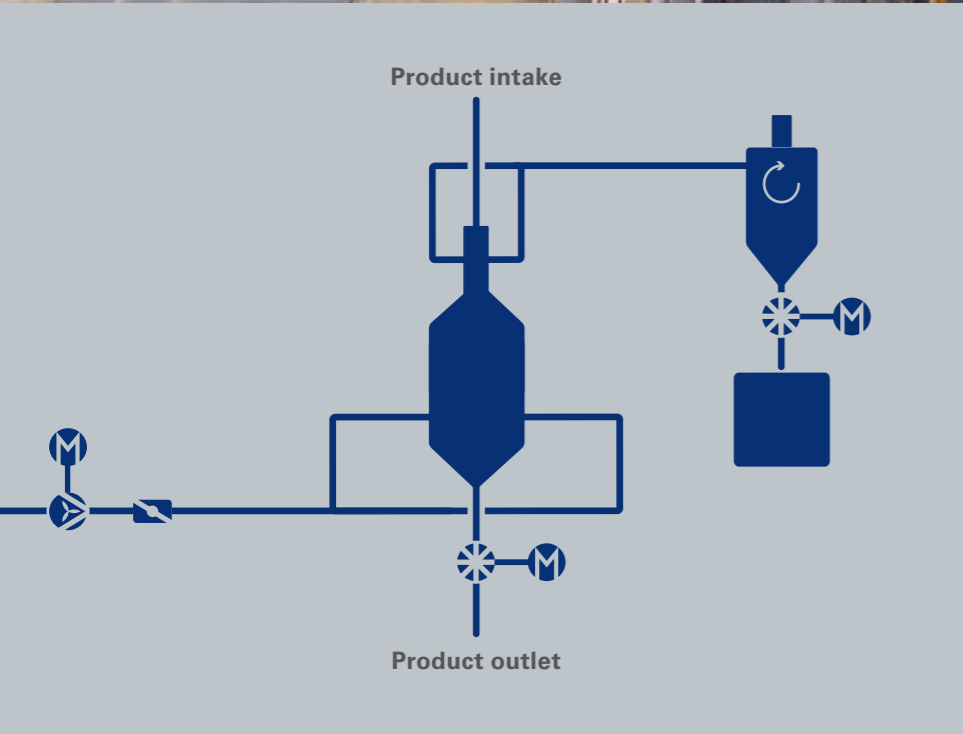


### Technical data

Type/performance [t/h]	Diameter D [mm]	Height H [mm]	Weight* [kg]
GTS 3,5	400	2750	600
GTS 5	430	2900	650
GTS 6	445	3000	700
GTS 8	470	3100	750
GTS 10	515	3700	850
GTS 15	640	4200	950
GTS 20	750	4600	1000
GTS 25	830	4700	1050
GTS 30	945	5200	1100
GTS 35	1040	5400	1150
GTS 40	1140	5600	1200
GTS 45	1265	5700	1250
GTS 50	1330	5900	1800
GTS 60	1535	6400	2300
GTS 70	1730	7000	2500
GTS 80	2015	7400	2900
GTS 90	2130	7700	3400
GTS 100	2340	8000	4000
GTS 120	2550	8400	4800

Subject to modifications without notice

\*Empty weight



## Elutriator GSE

### Design characteristics

- Separation of fine dust particles from pellets
- Reliable separation of long streamers
- High degree of separation due to particle acceleration and 180° deflection of air stream
- Constant separation efficiency over the whole lifecycle
- Gravimetric feeding possible
- Direct feeding, without pre-hopper, from dense phase conveying possible
- Higher load than existing designs
- Reduced pressure drop due to improved design
- Individual design acc. to product requirements and throughput
- Easy discharge of the cleaned product by a downstream rotary feeder

### Benefits

- Maintenance-free since there are no rotating elements or wear parts
- Effective operation with high separation efficiency
- Direct feeding through pneumatic conveying
- Worldwide references
- Integrated multi-elutriation

### Applications

- Separation unit for direct integration in pneumatic conveying systems up to 120 t/h
- Separation unit also suitable for closed loop systems
- High separation efficiency
- Separation even of long streamers
- Primarily used for polymers

### Operating principle

The pellets are accelerated inside the elutriator using in part the kinetic energy of the pneumatic conveying and then blown into a counter flow gas stream. Due to the resulting high relative velocity between the pellets and the counterflow, finest dust particles as well as streamers and angel hair are separated effectively and economically from the product, achieving excellent cleaning results.

### Technical data

Type/performance [t/h]	Diameter D [mm]	Height H [mm]	Weight* [kg]
GSE 10	600	2900	350
GSE 20	800	3100	500
GSE 30	900	3300	650
GSE 40	1100	3650	800
GSE 50	1200	3800	1100
GSE 70	1300	4400	1400
GSE 90	1500	4900	1700
GSE 120	1700	5300	2000

Subject to modifications without notice

\*Empty weight

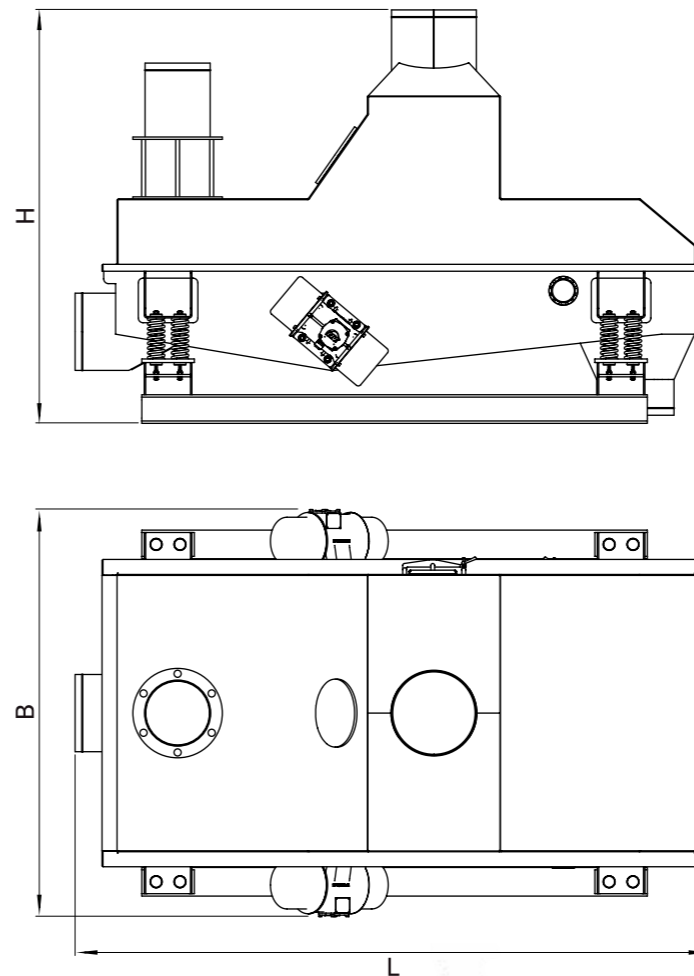
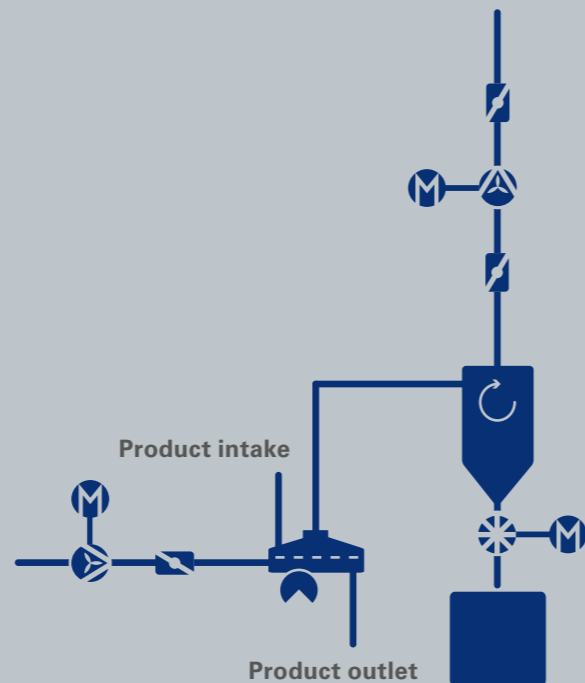


### Technical data

Type/performance [t/h]	Length L [mm]	Width B [mm]	Height H [mm]	Weight* [kg]
VGS 5	1300	950	1000	500
VGS 10	1800	1350	1250	650
VGS 15	2200	1550	1500	800
VGS 25	2700	1750	1750	950
VGS 40	3300	2100	2050	1600
VGS 50	3600	2350	2250	2000
VGS 60	3800	2600	2450	2250

Subject to modifications without notice

\*Empty weight



## Elutriator VGS

### Design characteristics

- Separation of fine dust particles from pellets
- Reliable separation of long streamers
- High efficiency thanks to combination of vibration and gas stream
- Constant separation efficiency over the whole lifecycle
- Feeding primarily gravimetric, but pneumatic also possible with pre-hopper
- Individual design acc. to product requirements and throughput
- No feeding or discharge valves required for operation

### Benefits

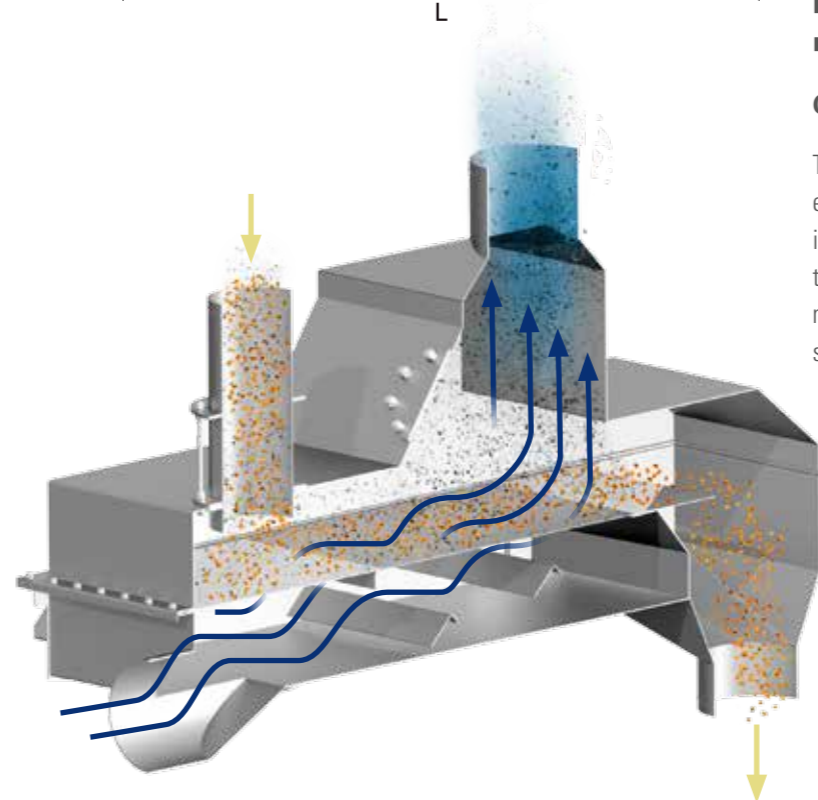
- Compact design and overall height
- High separation efficiency with gentle product cleaning
- Simple dosing and discharge
- Very easy installation and assembly
- Integrated multi-elutriation

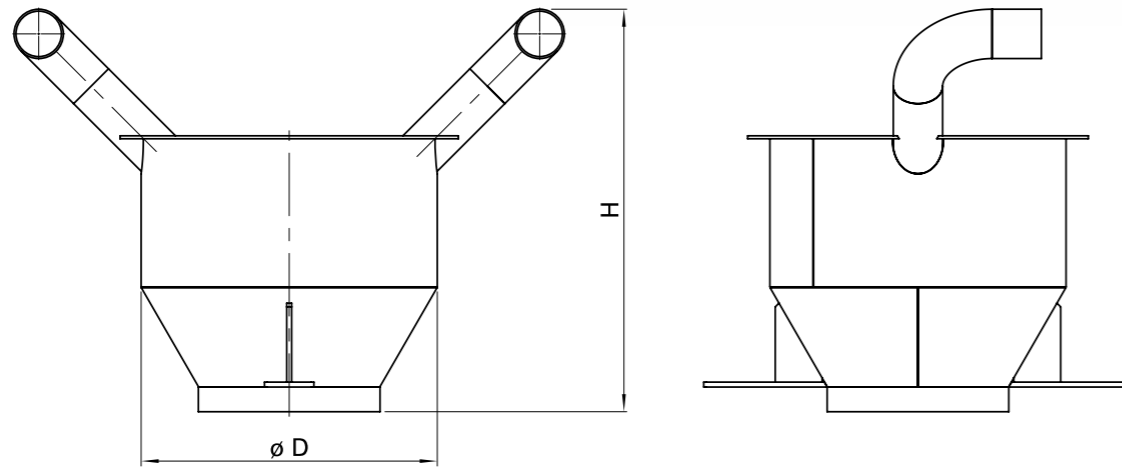
### Applications

- Separation unit for gravimetric feeding up to 60 t/h
- High separation efficiency
- Installation directly before packing and loading
- Application for polymers as well as complex plastics

### Operating principle

The product is fed gravimetrically into the elutriator and then evenly distributed on a vibrating chute on the inside. Separation is achieved through a gas stream directed through the product on the perforated chute. The combination of horizontal pellet movement and the directed gas stream ensures outstanding results in separating dust particles and streamers from the good product.





## Elutriator FVS

### Design characteristics

- Separation of fine dust particles from pellets
- Reliable separation of long streamers
- Constant separation efficiency over the whole lifecycle
- Gravimetric feeding
- No feeding or discharge valves required for operation

### Benefits

- Very compact design and overall height
- High separation efficiency with gentle product cleaning
- Cost-effective design
- Easy to retrofit
- Ideal as secondary or auxiliary sifter
- Perfectly suited to eliminate dust that accumulates in the silo
- Easy integration and assembly
- No compromises on loading capacity

### Applications

- Separation unit for gravimetric feeding up to 500 t/h
- High separation efficiency
- Installation directly before packing and loading
- Application for polymers as well as complex plastics
- Can also be used as closed system

### Operating principle

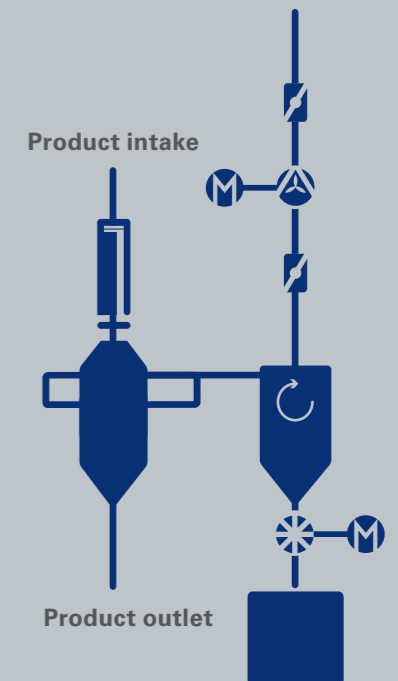
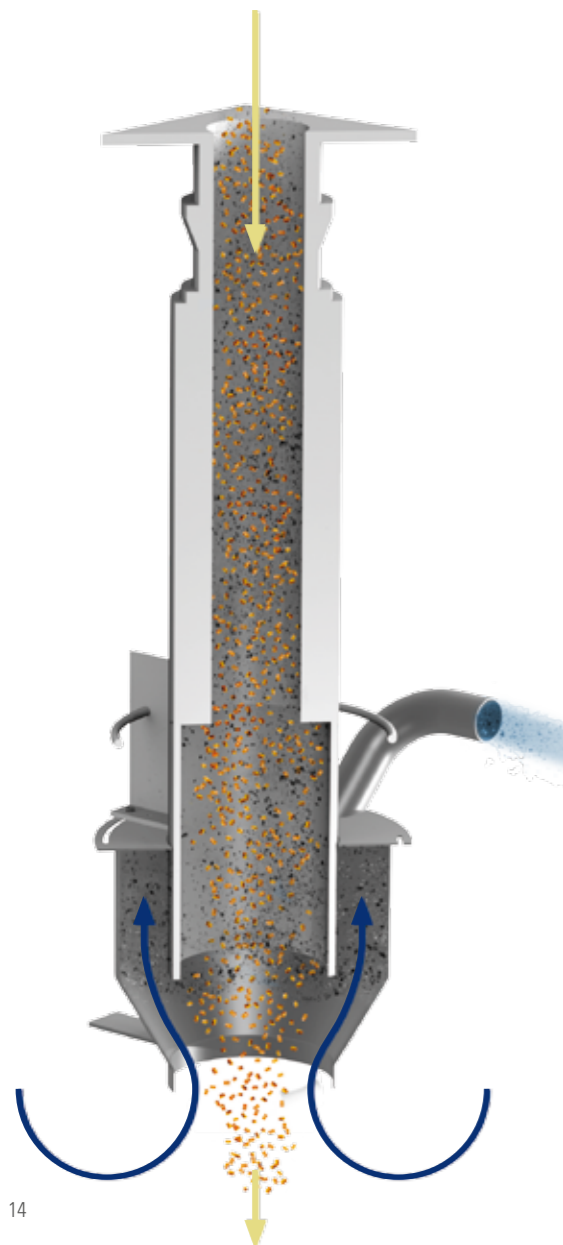
This elutriator is generally integrated into a telescoping loading pipe. The product falls gravimetrically from a silo through the loading pipe and through the elutriator where it is dispersed. The applied counterflow principle reliably separates dust from pellets. The separated dust is then sucked out at the top of the elutriator.

### Technical data

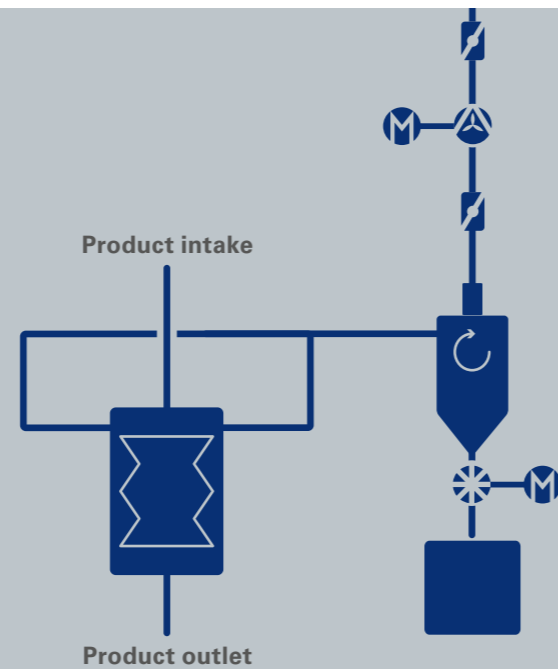
Type/performance [t/h]	Diameter D [mm]	Height H [mm]	Weight* [kg]
FVS 150	400	725	15
FVS 200	500	775	18
FVS 250	600	850	20
FVS 300	650	900	25
FVS 350	730	950	30

Subject to modifications without notice

\*Empty weight







### Technical data

Type/performance [t/h]	Diameter D [mm]	Height H [mm]	Weight* [kg]
KWS 5	500	1000	250
KWS 10	700	1300	300
KWS 15	860	1600	400
KWS 20	1000	1850	600
KWS 30	1250	2350	800
KWS 45	1600	3000	1000

\*Empty weight

Subject to modifications without notice

## Elutriator KWS

### Design characteristics

- Separation of fine dust particles from pellets
- Reliable separation of long streamers
- Constant separation efficiency over the whole lifecycle
- Gravimetric feeding
- No feeding or discharge valves required for operation
- Circular cross-section

### Benefits

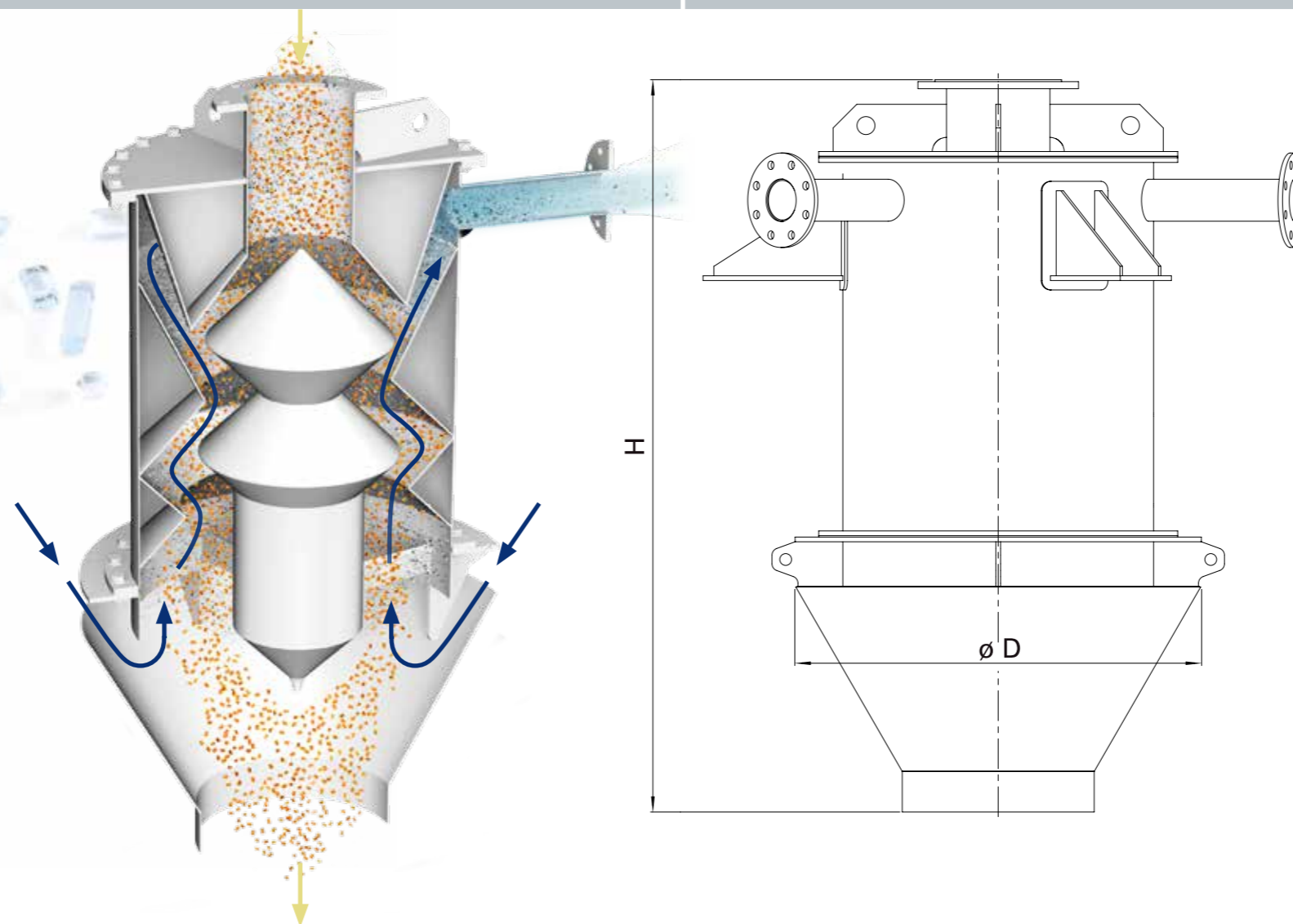
- Maintenance-free since there are no rotating elements or wear parts
- Effective operation with outstanding separation efficiency
- Gentle handling of product
- Reduced overall height
- Design free of dead space prevents product cross-contamination
- Screening directly from upstream vessel
- Easy installation and assembly

### Applications

- Separation unit for gravimetric feeding up to 200 t/h
- High separation efficiency
- Installation directly before packing and loading
- Application for polymers as well as complex plastics

### Operating principle

The product is gravimetrically fed into the elutriator from a full product column, but can also be dosed with a rotary feeder. The material cascades down into the discharge zone. The applied counterflow principle reliably separates dust from pellets. The separated dust is then sucked out at the top of the elutriator.

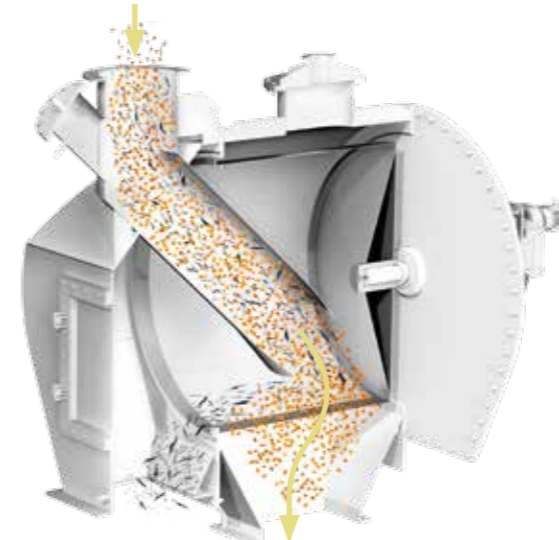
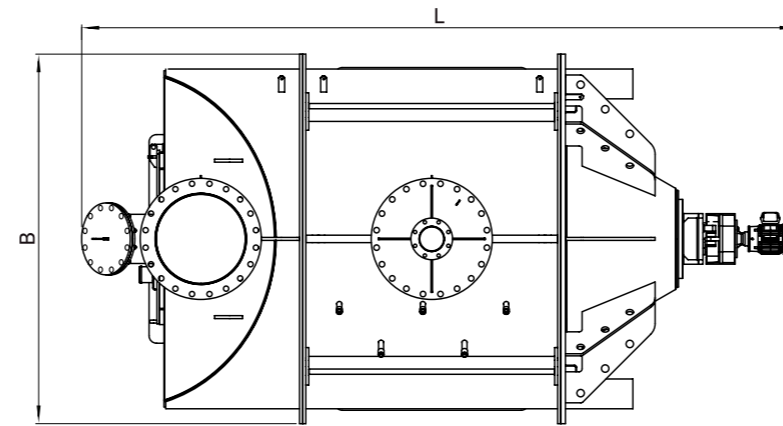
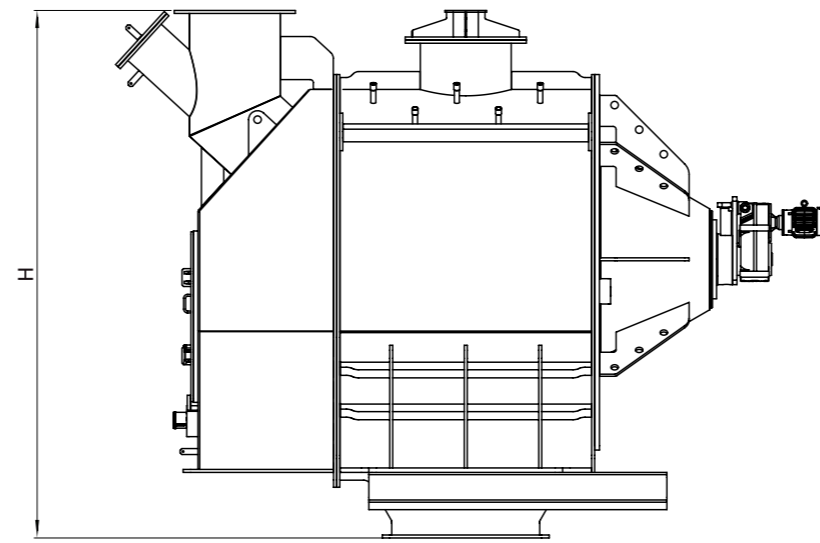


## RELIABLE SEPARATION OF STREAMERS AND BIRD NESTS

Drum screeners are used for the separation of streamers (angel hair) and bird nests from plastic pellets.

This type of cleaning ensures maximum product quality before the pellets are further processed. By using drum screeners, typical problems in the downstream processes caused by streamers and bird nests can be eliminated.

In addition, drum screeners can also be used for process applications such as separating agglomerates in plastic and powder processing.



## Drum screener TS

### Design characteristics

- Reliable separation of streamers and bird nests from plastic pellets
- Suitable for continuous operation due to automatic cleaning of the screener
- Screener drum can be buffed or electropolished (optional)
- Use in different operating modes (pressure, suction and circulation)
- Easy disassembly of the screener drum
- Front inspection and cleaning opening
- Side inspection and cleaning openings (optional)
- Individual design acc. to product requirements and throughput

### Benefits

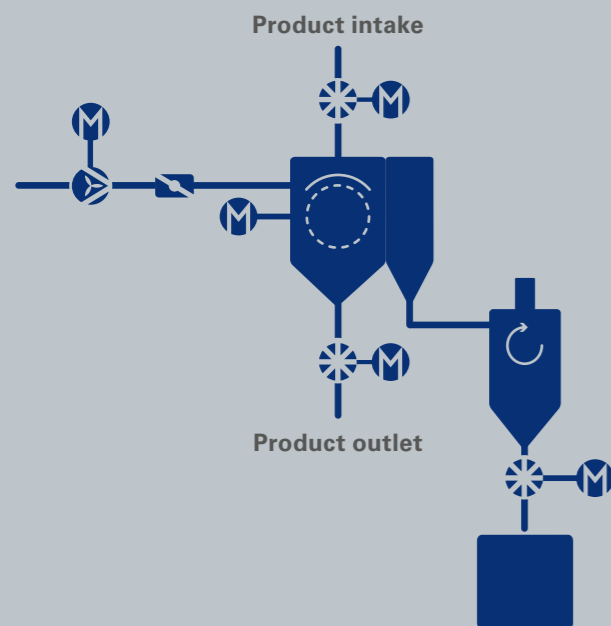
- Compact design
- High separation efficiency with gentle cleaning
- Separation of long streamers, bird nests and agglomerates

### Designs

- Throughput up to 120 t/h
- Design according to customer's requirements
- Drill patterns of flanges acc. to DIN 2501 PN10, ANSI 150# or client's standard

### Operating principle

Plastic pellets contaminated with streamers and/or bird nests are gravimetrically fed into the rotating drum screener. Due to the mesh size of the screener, the plastic pellets pass through the screener whereas the streamers and bird nests are retained. The streamers are then transported to the streamer discharge by rotation of the drum and directional air flow. This air flow is locally directed on the surface of the screener and cleans the screener apertures of adherent streamers during the operation.



### Technical data

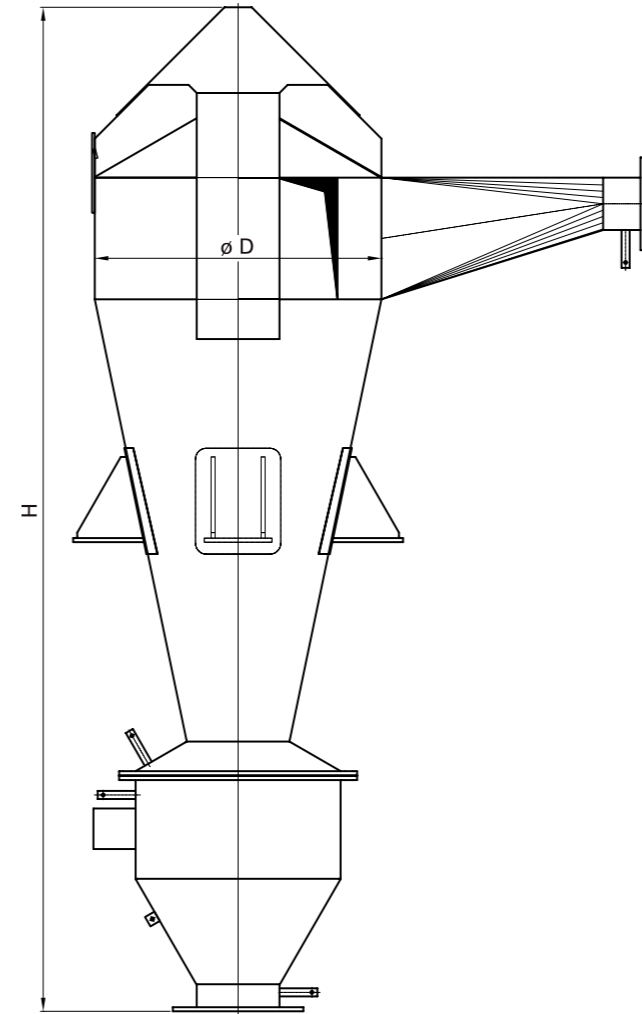
Type	Length L [mm]	Width B [mm]	Height H [mm]	Weight* [kg]
TS 1000	3300	1400	2100	1050
TS 1400	4100	1800	2750	1950
TS 2000	4800	2500	3550	4100
TS 2800	5500	3200	5200	7900

Subject to modifications without notice

\*Empty weight

# SEPARATION OF GASES AND SOLID MATERIALS

Cyclone separators are used for the separation of bulk material from a gas stream e.g. out of pneumatic conveying systems. Thanks to the individual design of the cyclone separators, maximum separation efficiency can be achieved.



## Cyclone ZAS

### Design characteristics

- Welded construction made of aluminium or stainless steel
- Design with settling chamber including deflection cone in the discharge area
- Support on brackets or on skirt (customized version)
- Venting of the clean gas into the atmosphere or via a flange connection into an aspiration system
- Individual design to match different flange connections
- Standard cyclones designed for over-pressure up to 100 mbar (g)
- Special design as pressure vessel available
- Individually designed to meet customers' special requirements

### Design

- Drill patterns of flanges acc. to DIN 2501 PN10, ANSI 150# or client's standard

### Benefits

- Maintenance-free since there are no rotating elements or wear parts
- Effective operation
- Individual design
- Easy installation and assembly

### Applications

- Suitable for pneumatic conveying systems with gas flow rates from approx. 50 m<sup>3</sup>/h up to 10,000 m<sup>3</sup>/h
- Suitable for aspiration systems
- Suitable for solids to air ratios up to approx. 6 kg/kg
- Separator in closed loop systems
- Cyclone ZAS is suitable for separation of long streamers

### Operating principle

The cyclone separates the solids from the gas by using centrifugal force inside the cyclone. The solids are separated from the gas flow by centrifugal force at the inner cyclone wall and discharged through the cone in the settling chamber at the cyclone outlet. The clean gas is vented via the dip pipe at the upper part of the cyclone into a downstream aspiration system or the atmosphere.

### Technical data

Type	Diameter D [mm]	Height H [mm]	Weight* (Al) [kg]	Weight* (SS) [kg]
ZAS 175	190	650	15	30
ZAS 233	250	850	25	45
ZAS 350	350	1250	40	75
ZAS 525	530	1900	80	150
ZAS 1050	1050	3650	300	500
ZAS 1250	1250	4200	350	600
ZAS 1500	1500	5000	400	750
ZAS 1750	1750	7200	650	1100
ZAS 2000	2000	8250	800	1500

Subject to modifications without notice

\*Empty weight

# IT'S EVERYTHING YOU NEED!

## The complete range of accessories



### The Zeppelin range of filters

Zeppelin, the world's most successful plant manufacturer, has only one requirement for its products and filters: being at the cutting edge of technology. Thanks to the experience gathered through hundreds of manufactured plants, we know the requirements to modern filter systems best – a technology lead that will benefit our customers' success!

Whether standard filters or customized filter systems – you always get the best advice from the specialists in plant manufacturing. We will design the ideal system for you according to your specifications, without interruptions or delays but always with the unconditional Zeppelin quality standards.

#### Filters

- Bin vent filter
- Dust collector
- Safety filter
- Suction filter

### On the safe side with Zeppelin's samplers

The sampler GC can be mounted onto a vessel or directly onto the pneumatic conveying line. When on idle, the sampler is flush with the inside wall of the vessel or pipe (no protruding edges or corners). The product sample is extracted through a hollow rod.

#### Applications

- Sampling of retention samples
- Capacity: up to 2,500 kg/h
- Nominal width: DN 50, DN 100

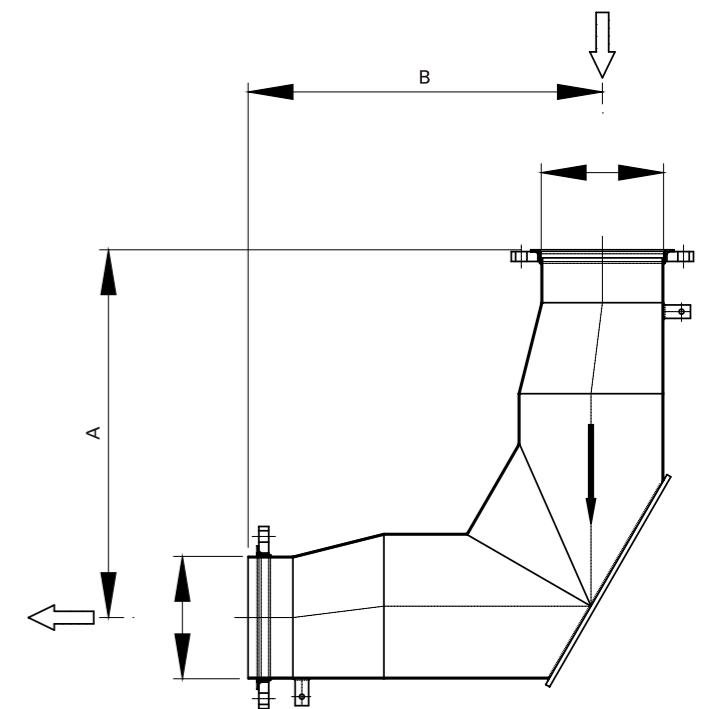


### The smart solution against dust and angel hair – the Zeppelin Polybend ZPB

The Zeppelin Polybend is used in all sectors in which angel hair and dust occur during pneumatic conveying. It is the ideal product against the formation of angel hair and dust thanks to its optimum geometry and the integration of an optional replaceable baffle plate. Furthermore, the service life of the pipe elbow increases significantly with the standard use of the baffle plate.

#### Design characteristics

- Prevention of angel hair
- Significant reduction of dust content
- Self-cleaning in all mounting positions
- No product deposits
- Minimized pressure losses
- Integrated wear plate
- Replaceable wear plate (option)
- No dead space
- Space-saving due to tight radius
- Simplified pipe support thanks to tighter bends
- Dead space free design provides extremely short plant emptying times



#### Operating principle

Thanks to the design including pipe flaring and the baffle plate, the redirection of the product flow is achieved simply by product friction and the bouncing effect on the baffle plate. Furthermore, eliminating product sliding along the pipe walls will prevent the formation of angel hair and minimize dust. This perfect design also prevents product deposits even when installed horizontally.

#### Technical data

Type	DN	A [mm]	B [mm]
ZPB 080	80	390	360
ZPB 100	100	470	430
ZPB 125	125	520	470
ZPB 200	200	740	670
ZPB 225	225	740	680
ZPB 250	250	820	780
ZPB 300	300	1030	980

Subject to modifications without notice

# THE TECHNOLOGY CENTER FOR PELLETS AND POWDERS

Customer inquiry

Our work, your advantages:



Realization

## Reliability

The Zeppelin Technology Center in Friedrichshafen is equipped with all the necessary process technology components and systems. Our customers expect us to analyze their products in detail, as only those who know their bulk material well can design plants which are characterized by reliability, optimized processes, energy efficiency and cost efficient solutions.

## Process optimization

## Energy efficiency

## Cost efficiency

We conduct full scale tests to avoid the uncertainties of scale-up calculations. Special configurations can be quickly installed. Our experts provide you with a precise performance analysis as a solid basis for your investment decision.

Numerous modern test facilities guarantee optimum results. Data is continuously recorded by state-of-the-art measuring technology. We determine the relevant design parameters and issue detailed test reports as basis for designing your plant. We advise you in detail on all possibilities. New developments and advanced technologies are tested intensively.

Zeppelin customers have direct access to our technology centers to ensure the technological leadership essential for their operational success – wherever the location of the plant.

## Our services

### Conveying technology

- Dense phase and dilute phase conveying of pellets and powders
  - Nominal width: DN 65 – 225
  - Conveying distance: 10 – 460 m
  - Throughput: up to 200 t/h
- Hydraulic conveying of pellets
- Dense phase conveying of sensitive bulk material (bypass system)
- Combined vacuum and pressure conveying of pellets and powders
- Rotary feeders available in various sizes and types (high pressure, medium pressure and blow-through types)
- Pressure vessels
- Feeding systems: Pump-Flow or Screw-Flow

### Storage, discharge, blending and dosing technology

- Storage silos and vessels with various discharge systems
- Different blender types for powders and pellets
- Small component weighing unit for additives
- Heating and cooling of bulk material
- Degassing of bulk material

### Sifting, separating, cleaning

- Various separators for cleaning of pellets
- Drum screeners or streamer separators
- Pig system for pipe cleaning
- Various filter systems and cyclones



## EVERYTHING FOR OUR CLIENTS

You can rely on Zeppelin Systems' first class service. Our job doesn't end with the design of your plant; we also carry out the assembly and commissioning – all over the world. We offer training for your personnel as well. This includes qualified instructions in process technology, proper maintenance and reliable and safe operation of the control system. You can also rely on us for the development of safety standards. Maintenance work, inspections and repair as well as spare parts delivery are naturally part of our scope of services.



## EXCEEDING TECHNOLOGY: the people at Zeppelin

Whether partner, supplier or entrepreneur – it's the people that make a difference. Zeppelin values teamwork within the global network, in collaboration with our customers or in one of many project groups that actively contribute to our common success.

We know that outstanding technology alone does not make you successful internationally. For that, you also need employees that are able to meet the local requirements and make use of our worldwide expertise.

That's why you will find Zeppelin in every corner of the world where functionality and reliable operation are highly valued.



## Presented by:

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For the complete Zeppelin Systems range please visit our website at  
[www.zeppelin-systems.com](http://www.zeppelin-systems.com)

## Global presence

- Belgium
- Brazil
- China
- France
- Germany
- India
- Italy
- Korea
- Russia
- Saudi Arabia
- Singapore
- United Kingdom
- USA