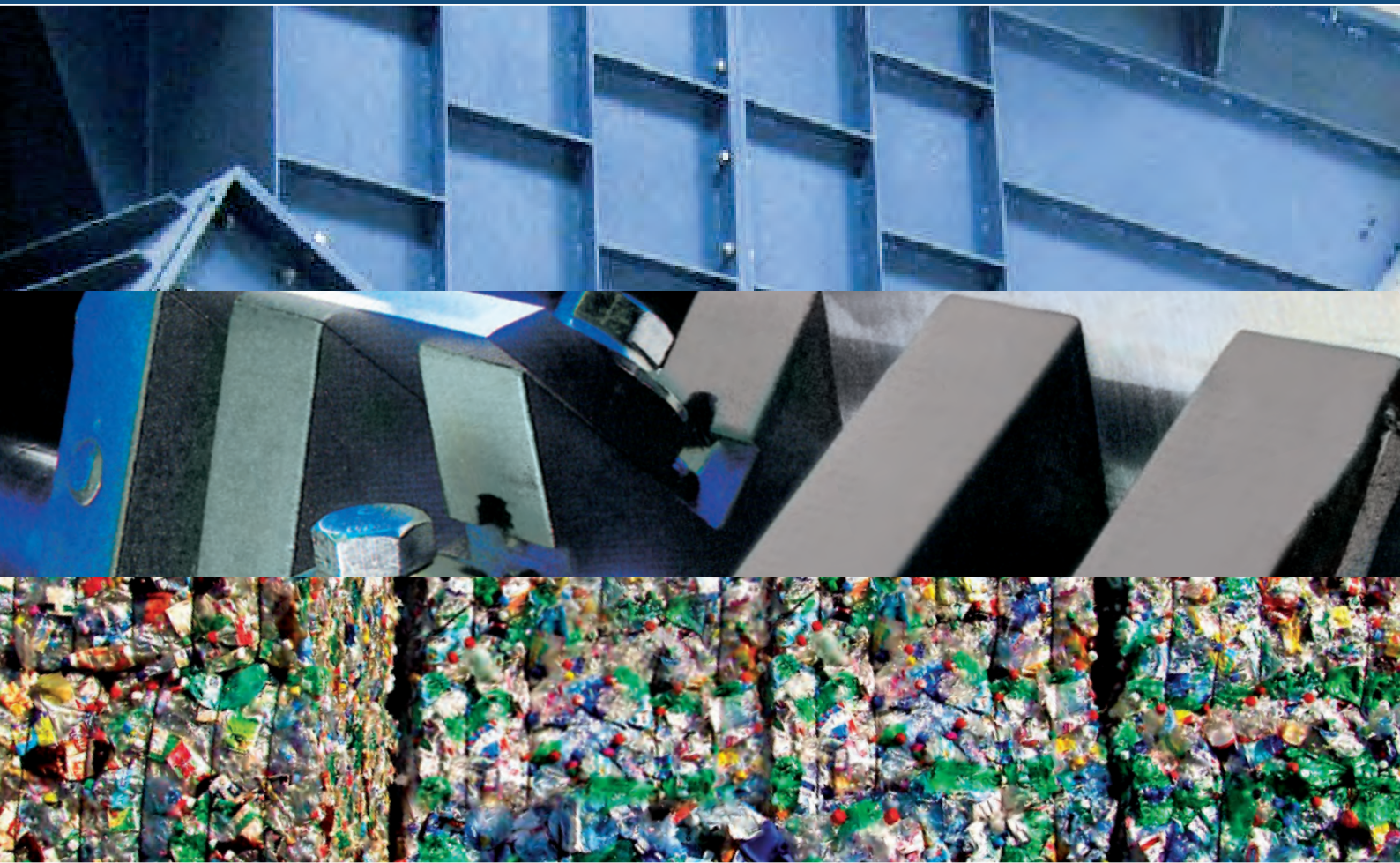


# WASHING SYSTEMS/PLANTS

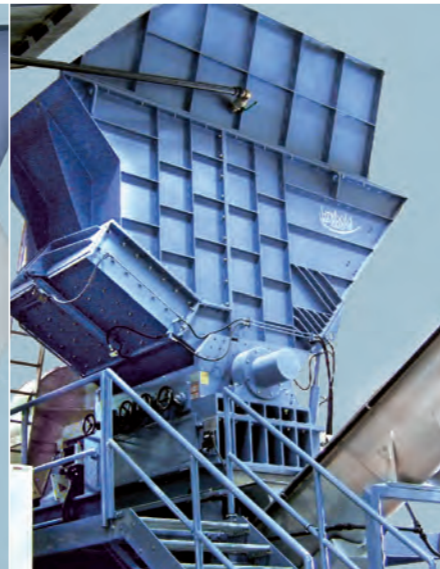
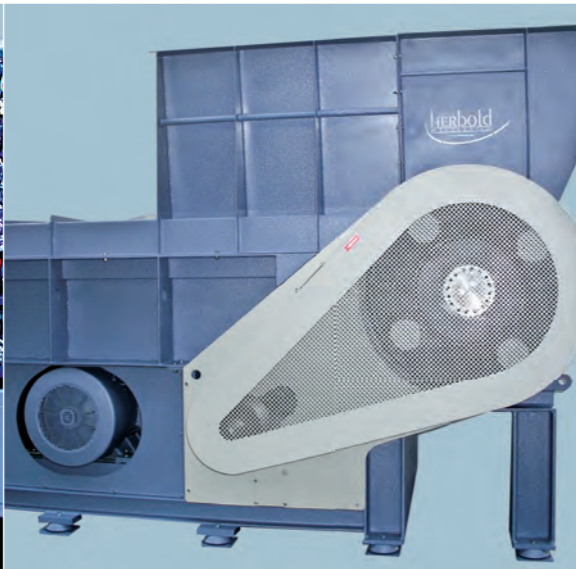


Washing systems

## MODULAR AND FLEXIBLE

- With a modular system from a simple wet granulator to a turnkey industrial washing line
- Components for the optimization of existing washing plants
- Wear resistant dry or wet shredders for highly contaminated materials with foreign bodies
- Optimized drying steps for thin and stretch films





Debaler for bottles

Single-shaft shredder EWS 45/120

HOG-shredder HGM 60/145

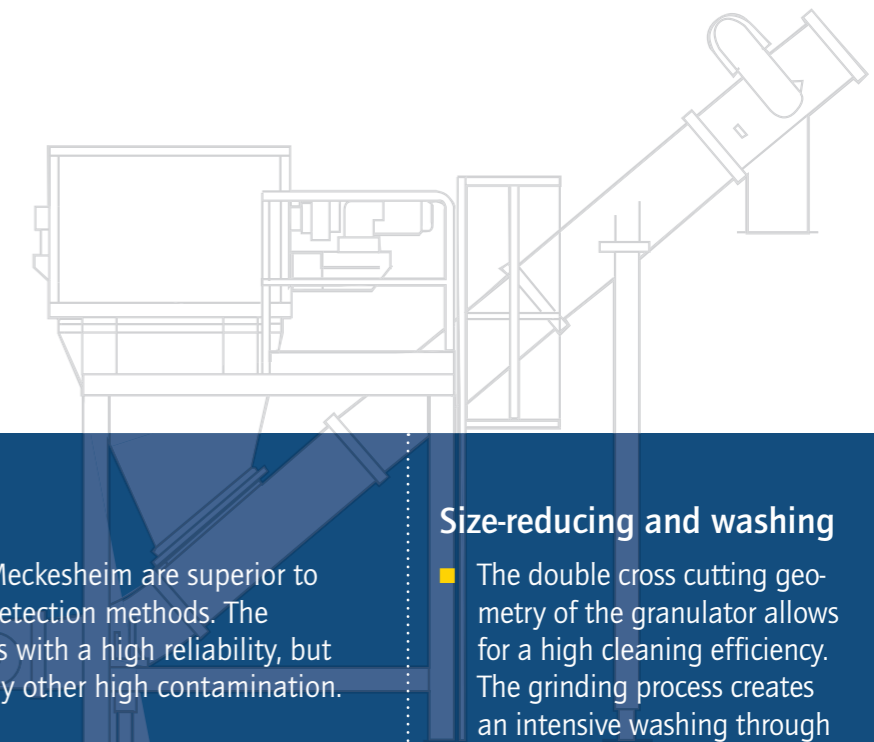
Pre-washing unit

Pre-washing drum

Wet granulator

Herbold washing lines for contaminated plastics are characterized by their modular system. This allows for a gradual expansion and optimization of existing plants.

Durable, efficient and economic



### Debaling

- Herbold Meckesheim offers debalers to break up compressed bales and briquettes to allow for mechanical or automatic separation of coarse foreign bodies. Material is placed on a horizontal feed belt and is transported forward by the feed force of the belt, and then broken up and separated by the two separately driven rollers, which are equipped with replaceable teeth. The pressed bales can be composed of different materials such as bottles or post-consumer plastic waste.

### Pre-size reduction

- Herbold Meckesheim utilizes a range of high-quality machines depending on the type of feed material and its degree of contamination. Our products for pre-size reduction systems comprise of guillotines, two-shaft or single-shaft shredders.

### HOG-shredder HGM series

- Herbold Meckesheim has developed a new machine, part of the HGM series, for the processing of highly contaminated materials with an extreme content of foreign substance. This machine has proven insensitive to foreign matters due to an integrated shear pin coupling and is a smooth running machine due to the massive full-steel rotor and V-Belt drive. The HOG-shredder has a long knife life and is the most inexpensive knife design. The low speed operation is ideal to create fewer fines and dust and reduce the noise level in the plant. The material is prepared by the simultaneous addition of recycled water and the coarsest impurities already washed off during the first wash stage.

### Pre-washing step

- The pre-washing steps used by Herbold Meckesheim are superior to every conventional metal separation or detection methods. The pre-washing steps not only remove metals with a high reliability, but also have been successful in removing any other high contamination.

### Pre-washing drum

- The pre-washing drum cleans the light fraction of the feed material by intensive spraying and rinsing of the contaminated feed material. At the same time, the material is discharged to the next unit of the recycling plant.

### Size-reducing and washing

- The double cross cutting geometry of the granulator allows for a high cleaning efficiency. The grinding process creates an intensive washing through friction once water has been added to the cutting chamber. Wet granulation provides an added benefit of protecting the material and works to avoid any screen blockage during the cutting process.

Flow sheet of a Herbold washing line  
Example: agricultural film



Wet shredder



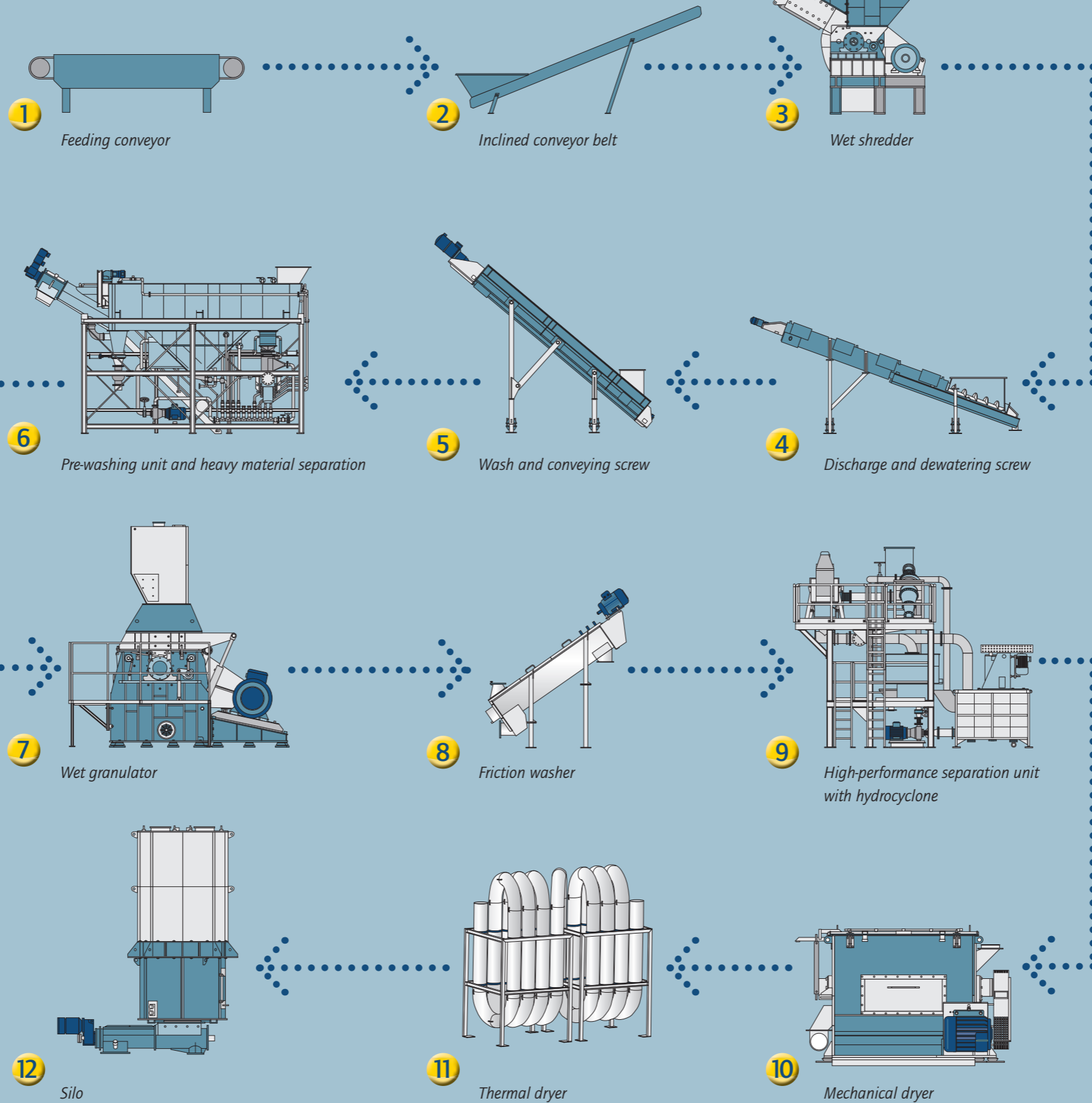
Pre-washing unit and heavy material separation



Wet granulator



Friction washer



High-performance separation unit with hydrocyclone



Mechanical dryer



Thermal dryer



Silo



Friction washer



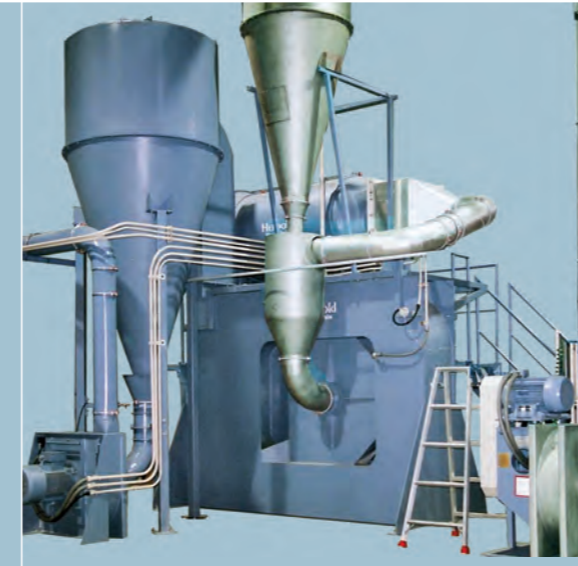
Flotation tank with scrape conveyor



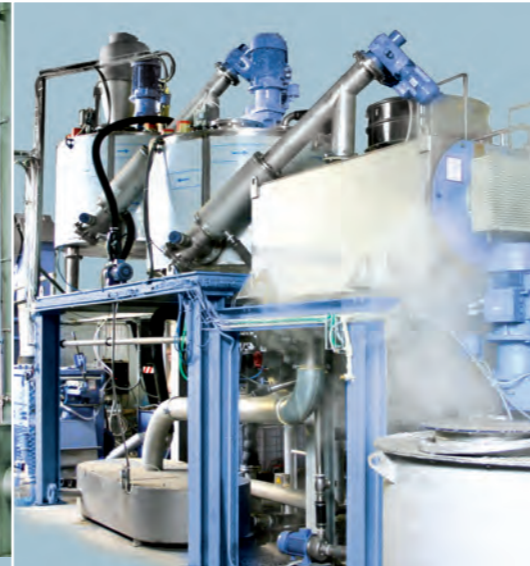
Hydrocyclone plant



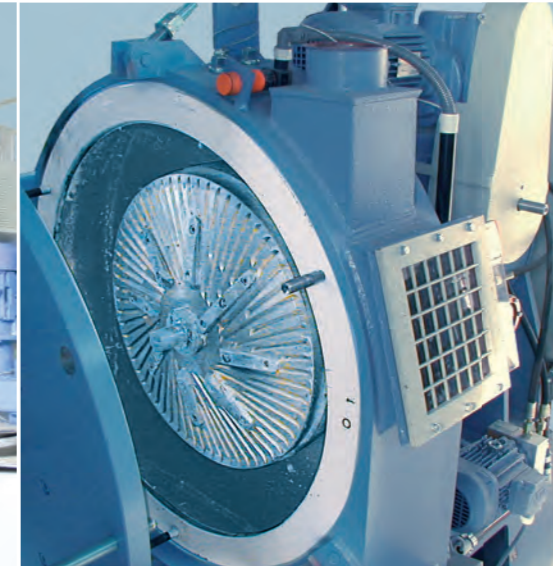
Mechanical dryer



Thermal dryer



Hot wash step



Compactor unit of a plastcompactor



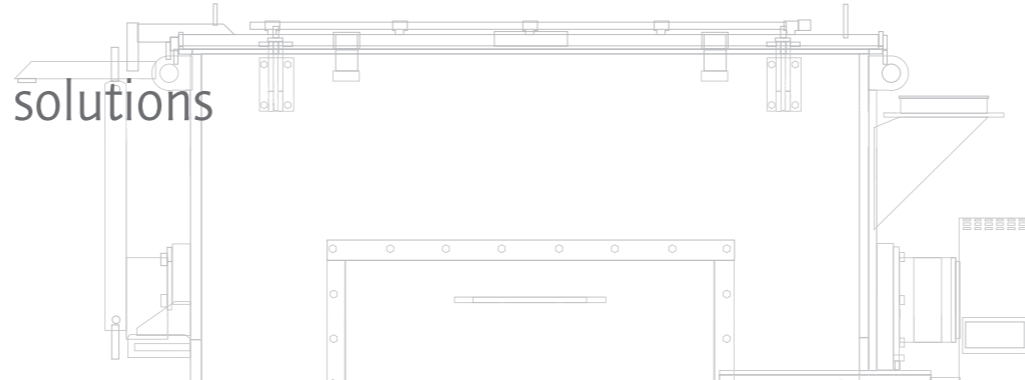
Water recycling plant



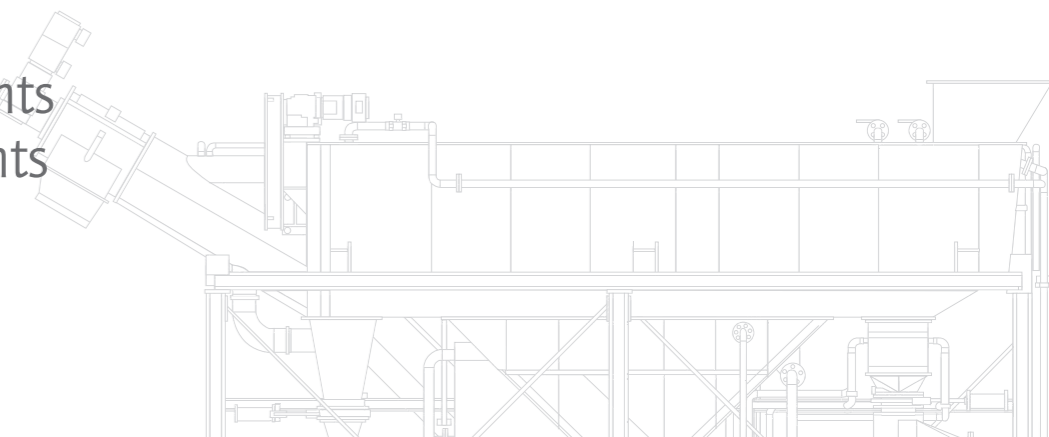
Round silos

Herbold washing plants are based on the building block principle where they can be extended step by step to the needs of the customer and to the materials. The washing plants can also be customized to meet the customer's required capacities.

Customer and material oriented solutions



Single components or complete plants



**Separation of dirt**

- The material washed and reduced at the same time in a wet granulator falls into a dewatering screw separating the dirty water. A fast running centrifuge – the friction washer – is used for plastics contaminated with paper. It centrifuges pulped paper pieces. An intensive washer is used when a higher amount of dirt is involved.

**Separation step: separation tank**

- The Herbold separation tanks are designed in size and shape in such a way to ensure turbulences are not disrupting the separation process. Corresponding relief devices carry the material (float and sink fraction) in the downstream equipment.

**Separation step: hydrocyclone plants**

- A separation quality in the ppm range (e. g. with PET bottles) is reached by a second separation step consisting of hydrocyclone systems. Depending on the application of the separation steps, a swim/sink tank, hydrocyclone-separation-plant can be used in combination or separately.

**Mechanical drying**

- Herbold's mechanical dryers are highly efficient units based on the centrifugal principle. In many applications excellent drying results are achieved and further thermal drying is not necessary.

**Thermal drying**

- If necessary, a thermal dryer can be added after the mechanical dryer in order to reduce any residual moisture on the material surfaces. To ensure minimum energy consumption the unit is equipped with a multi-stage switch for different degrees of temperatures. As an option, the heating aggregate can be carried out by gas or electrical heating or by hot air from the customer's heating system.

**Hot wash step**

- The washing step with hot water not only serves to separate glue, but also to wash remaining contaminations off the flakes such as sugar or soda residues. This is carried out under strict control of various process parameters. The whole process and also the addition of lye and washing agents are automatically controlled.

**Drying and compacting**

- With complicated materials such as stretch film or foam materials a sufficient mechanical and/or thermal drying is not possible without the use of an enormous amount of energy. The solution to this problem is the Herbold plastcompactor. By the use of friction between the compactor discs, the material is heated, dried, and at the same time compacted.

**Water treatment**

- The dirty water from a washing process is collected, cleaned and then re-circulated. That significantly reduces the amount of fresh water that would have been needed. Herbold Meckesheim offers all elements for this circulation.

**Storing**

- An essential part of a complete treatment system for plastic waste is the storage of waste plastics. Herbold provides the appropriate storage systems for all granules, especially poorly flowing materials such as film or fractions of mono and multi-crystalline filaments. For the storage of up to 60 m<sup>3</sup> rectangular silos and for smaller amounts of up to 20 m<sup>3</sup> round silos are available.

The result:  
Clean and high-quality ground material



Battery cases



Contaminated agricultural film



Clean flakes from agricultural film

Examples for materials that can be recycled with Herbold washing lines:

- Agricultural films
- Post-consumer films from industry, commerce, households
- Thin films, stretch films
- HDPE bottles
- Oil bottles and containers
- PET bottles
- Post-consumer drums, containers from households, commerce, industry
- Containers
- Bottle crates
- Bins
- Car bumpers
- Battery cases
- Fiber materials such as big bags, fishing nets, and many other dirty plastics.



Compact washing plant for pharmaceutical containers

Special plants:

- For pharmaceutical companies
- Mobile plants
- Components and customized plants

Existing plants – also from our competitors – are replaced and optimized with components of Herbold Meckesheim washing plants.

For special applications such as the recycling of PET-bottle flakes which correspond to highest quality demands, Herbold Meckesheim additionally offers special units:

- Sorting cabins
- Automatic color and material separation plants
- Pre-washing units
- Hot washing steps with filtering of dissolved glues
- Air separation units like zig-zag sifters and whirl sifters

For the recycling of PET bottles ask for our brochure Modular Washing Lines for post-consumer bottles out of polyester (PET)!



Our product range

- Guillotines
- Shredders
- Hammer mills
- Granulators
- Pulverizing systems
- Washing systems & components
- Plastcompactors/agglomerators



For more information, please see our videos on our website [www.herbold.com](http://www.herbold.com)

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