The result: Clean and high-quality ground material

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.

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 offer special units:

- Sorting cables
- Automatic color and material separation plants
- Pre-washing units
- Post-washing steps with filtering of dissolved glues
- Air separation units like zigzag sifters and centrifugal sifters

For the recycling of PET bottles ask for our brochure Modular Washing Lines for post-consumer bottles out of polyester (PET)!
Herbold washing lines for contaminated plastics are characterized by their modular system. This allows for a gradual expansion and optimization of existing plants.

**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 unit**
- 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.

**Pre-washing drum**
- 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.

**Debaler for bottles**
**Single-shaft shredder EWS 45/120**
**HOG-shredder HGM 60/145**
**Prewashing unit**
**Prewashing drum**
**Wet granulator**

**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

1. Feeding conveyor
2. Inclined conveyor belt
3. Wet shredder
4. Discharge and dewatering screw
5. Wash and conveying screw
6. Pre-washing unit and heavy material separation
7. Wet granulator
8. Friction washer
9. High-performance separation unit with hydrocyclone
10. Mechanical dryer
11. Thermal dryer
12. Silo
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.

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.

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

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 to reduce any residual moisture on the material surface. To ensure minimum energy consumption the unit is equipped with a multistage 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 the material, 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 recirculated. This significantly reduces the amount of fresh water that would have been needed.

Customer and material oriented Solutions

Single components or complete plants

Storing
- An essential part of a complete treatment system for plastic wastes 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 10 m³ rectangular silos and for smaller amounts of up to 20 m³ round silos are available.
The result: Clean and high-quality ground material

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**Our product range**
- Guillotines
- Shredders
- Hammer mills
- Granulators
- Pulverizing systems
- Washing systems & components
- Plastcompactors/agglomerators

**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 offer special units:
- Sorting cables
- Automatic color and material separation plants
- Pre-washing units
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**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

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