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# Plastcompactors –
## continuous and fully automatic operation

herbold

# Herbold plastcompactors of the HV series process plastics gently into agglomerates with a high bulk density.

**Materials Suitable for Processing**

- → Thermoplastic materials such as fibers, tapes, foams, films, stretch films or thin films, fines, powders, or shavings
- → Plastics with low bulk density that are difficult to convey, store and blend
- → Input material that is too damp or wet can be dried with the HV, eliminating the need for mechanical or thermal drying
- → Low-bulk-density plastic regrind that cannot be transported economically

**Typical Input Materials:**

→ Foams

→ Carpet/Carpet fibers

→ Plastic fibers/Monofilaments

→ PET flakes

→ Films

→ Powders/Fines

→ Polyester/Polyamide fiber waste

→ Textiles

→ Plastic shavings

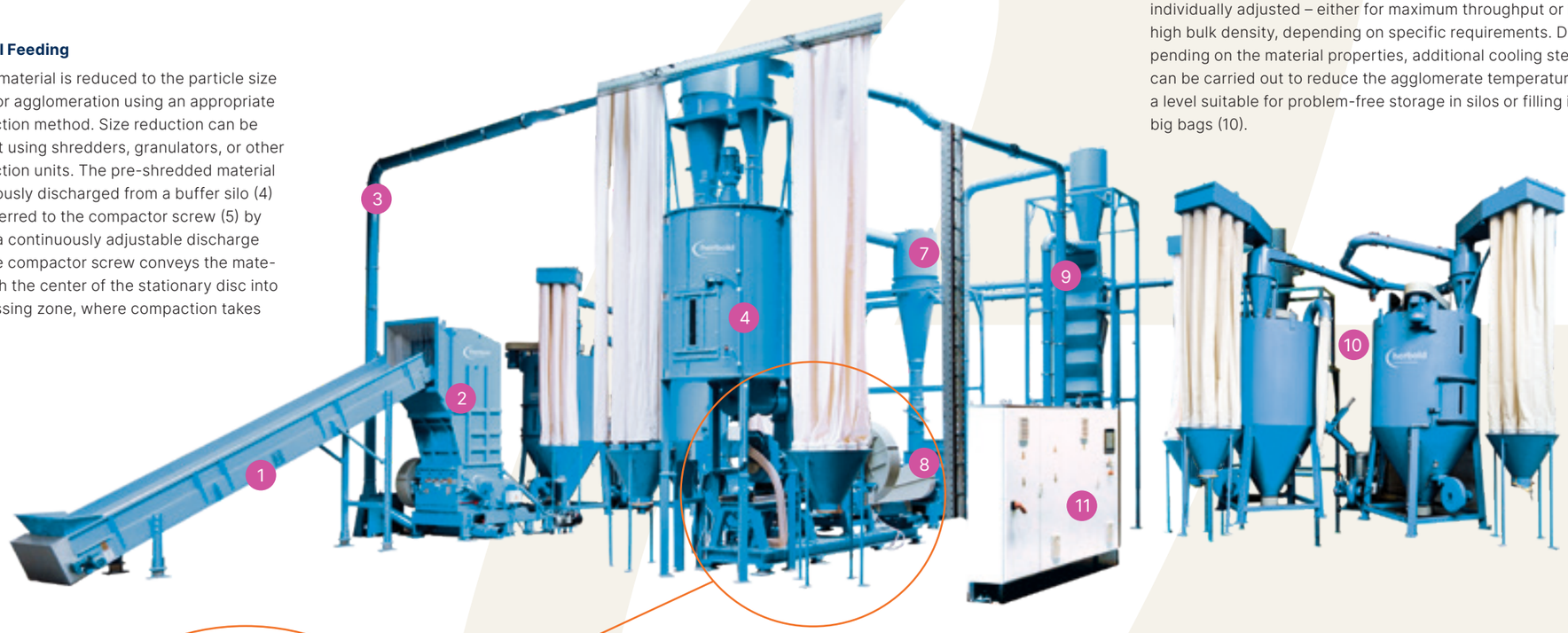
# Process – from Material Feeding to Agglomerate

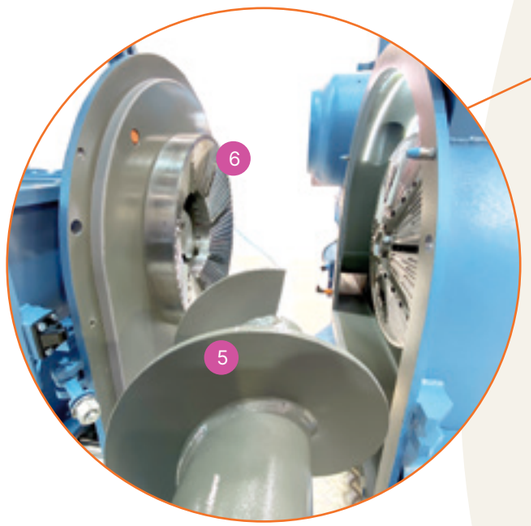
### 1) Material Feeding

The input material is reduced to the particle size required for agglomeration using an appropriate size-reduction method. Size reduction can be carried out using shredders, granulators, or other size-reduction units. The pre-shredded material is continuously discharged from a buffer silo (4) and transferred to the compactor screw (5) by means of a continuously adjustable discharge screw. The compactor screw conveys the material through the center of the stationary disc into the processing zone, where compaction takes place.

### 2) Agglomeration

The compaction of the feed material is carried out in continuous operation between a rotating and a stationary compactor disc (6), both equipped with bolted, replaceable kneading bars.




### 3) Densification by Friction

Due to friction at and between the compactor discs (6), whose gap is adjustable, the material is rapidly heated, expelled with an adjustable gap, and conveyed by the airflow generated by the downstream central blower (7) to the downstream granulator (8). Since the feed material leaves the compaction zone within seconds, thermal stress on the material is minimal compared to extruders or batch agglomerators.

### 4) Post Size-Reduction and Bagging

The size of the screen inserted in the downstream granulator (8) determines the agglomerate size. Before filling into big bags, octabins, or a silo, the agglomerate passes through a classifier unit (9), which simultaneously provides cooling and separates fine particles. The fines are pneumatically returned to the buffer silo (4). The final product is a dust-free, free-flowing agglomerate with high bulk density. The agglomeration process allows the input material to be individually adjusted – either for maximum throughput or for high bulk density, depending on specific requirements. Depending on the material properties, additional cooling steps can be carried out to reduce the agglomerate temperature to a level suitable for problem-free storage in silos or filling into big bags (10).

### 5) Fully Automatic Control

A fully automatic PLC control system (11) with power and temperature monitoring as well as visualization supervises the operating process and reduces personnel requirements to a minimum. For feed materials with differing properties, recipes can be stored in the control system, enabling automatic start-up and process parameters.

1. Belt conveyor
2. Primary granulator
3. Suction blower
4. Buffer silo
5. Feeding device
6. Plastcompactor
7. Cyclone of the central blower
8. Secondary granulator
9. Fines separation
10. Mixing and cooling silo
11. Control unit

# Versatile in use to meet different application requirements.

### Drying/Agglomeration

Herbold plastcompactors are increasingly used as downstream components in washing lines for contaminated plastics. These systems eliminate the need for additional drying processes, such as thermal drying. The moist material is heated in the compaction zone until the moisture evaporates. Simultaneous agglomeration reduces residual moisture to well below one percent. This enables direct downstream processing in injection molding machines or extruders. Within the preparation for chemical recycling, the Herbold plastcompactor is used to increase bulk density and to improve flowability and dosing characteristics.

### Incorporation of Additives

The pre-shredded material, optionally prepared in a mixer, absorbs additives or fillers in the compaction zone due to the heating of the material. Using special dosing units on the feed screw, additives such as lubricants, plasticizers, and color pigments can be precisely fed in and intensively incorporated into the material within the compaction zone.

### Crystallization

PET flakes are crystallized after degradative hot-washing processes. Softening of the shredded material between the compactor discs causes molecular alignment and crystallization of the polyester. The melting point is not reached. The IV value (viscosity) remains largely unchanged.

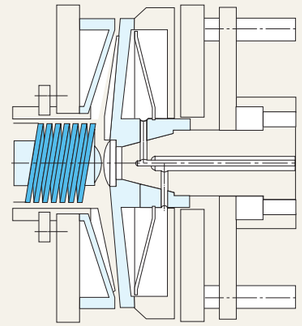
**Depending on the specific application, Herbold plastcompactor systems consist of the following components:**

→ Pre-shredding unit consisting of a single-shaft or twin-shaft shredder, a granulator, or a combination thereof
→ Pneumatic or mechanical conveying of the pre-shredded material into the plastcompactor storage and buffer silo, including level monitoring and control
→ Increased buffer capacity via an additional storage silo with discharge aid and downstream material conveying
→ Storage silo with discharge screw and transfer to the compactor screw
→ Additive dosing system
→ Compactor with manual or automated disc adjustment
→ Pneumatic material conveying with cooling function
→ Downstream granulator with customized screen perforation
→ Air classifier for cooling the agglomerate and for separation and recirculation of fine particles
→ Electrical control systems and process automation with HMI operator interface

For abrasive materials (e.g. post-consumer waste or plastics containing glass fibers, mineral fillers, or calcium carbonate), Herbold plastcompactors can be equipped or retrofitted with a wear protection package.

## Advantages of Herbold Plastcompactors

↗ A customized silo design, discharge system, screw geometry, and motor configuration ensure efficient processing of a wide variety of materials. The system operates without the need to replace conveying screws or geared motors.
↗ Continuous inline process
↗ High-precision control, as both the feed screw speed and the disc spacing are adjustable. Sensor-based control operates continuously during production.
↗ Low wear costs, even with highly abrasive materials. The bolted, easily replaceable kneading bars on the compactor discs are the primary wear parts.
↗ Bulk density increased by up to a factor of 20 compared to the input material
↗ Drying of moist or wet materials: Materials can be processed using HV-drying, eliminating the need for mechanical or thermal drying.
↗ Largely insensitive to foreign objects
↗ High throughput rates in fully automated continuous operation with minimal labor requirements
↗ The plastcompactor sinters the material without melting it: Low temperatures and short residence times ensure gentle material processing.
↗ Significantly lower energy consumption than extrusion processes for bulk density increase, combined with low overall process costs thanks to directly processable agglomerates.



→ Compressor zone with rotor and stator disc

**Performance Data - HV Series**

| Feeding material | Input bulk density g/l | Output bulk densityg/l | HV 50 90–160 kW | HV 70 200–315 kW |
|---|---|---|---|---|
| PE film 20 µm | 20 – 50 | 280 – 380 | 350 – 700 | 700 – 1.400 |
| PE foam | 20 – 50 | 280 – 380 | 350 – 700 | 700 – 1.200 |
| PP foam | 50 – 80 | 300 – 450 | 350 – 600 | 700 – 1.200 |
| PP fiber | 20 – 80 | 300 – 450 | 350 – 600 | 700 – 1.200 |
| PP film | 20 – 100 | 300 – 450 | 300 – 600 | 700 – 1.200 |
| PP fines | 250 – 450 | 300 – 450 | 250 – 600 | 500 – 1.200 |
| PS film | 18 – 35 | 350 – 450 | 350 – 700 | 600 – 1.400 |
| EPS | 16 – 30 | 350 – 450 | 350 – 700 | 600 – 1.400 |
| PVC hard film | 150 – 300 | 350 – 550 | 450 – 700 | 700 – 1.400 |
| PVC soft film | 200 – 400 | 450 – 650 | 500 – 750 | 900 – 1.400 |
| Foamed PVC | 50 – 110 | 350 – 550 | 450 – 750 | 800 – 1.400 |
| PA film | 20 – 50 | 280 – 350 | 300 – 500 | 600 – 1.000 |
| PA 6 fibers | 80 – 200 | 280 – 350 | 250 – 450 | 500 – 900 |
| PET film | 120 – 350 | 400 – 550 | 400 – 650 | 700 – 1.400 |
| Foamed PET | 120 – 150 | 400 – 550 | 350 – 600 | 700 – 1.250 |
| PET monofilaments | 150 – 350 | 400 – 550 | 400 – 650 | 700 – 1.400 |
| Polyester fiber | 100 – 300 | 400 – 550 | 350 – 600 | 700 – 1.250 |
| PET flakes (bottles) | 120 – 350 | 400 – 550 | 400 – 650 | 700 – 1.400 |

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