

PET flakes und fines

Better bulk density and flow characteristics



Problem:

Do you also have problems with low bulk density and poor flow characteristics?

The continued trend towards always thinner PET packaging (trays, film, bottles) has a direct impact on the associated production processes. The production waste that will be recycled, such as stamping grids as well as purchased recycled flakes tend to have always lower bulk densities.

This confronts plast processors with new challenges in material handling and dosing. Especially single shaft extruders in operation are often not designed to cope well with these material properties:

- Throughput in extrusions goes down, up to 50% due to the higher bulk density
- Flow properties are due to the flake form often not good, which results in bridge formation and disturbances in material feeding. Lowering equipment availability.
- Specific energy demand increases

Only extruders of the latest generation with probably double screws or compression screws especially designed on material properties can well manage the task.

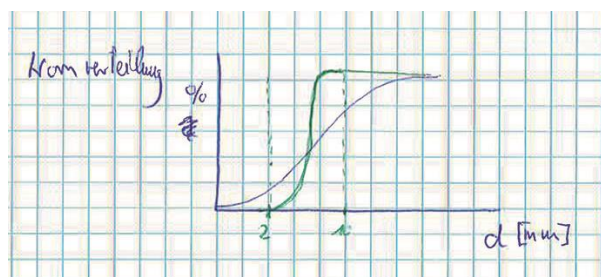
Investments into new extrusion equipment is costly and goes up to 2.2 mio. EUR for a modern double screw extruder. Therefore the Herbold Plastcompactor is an interesting economic solution, especially if existing extrusion systems need improvement.

Also for processes which are connected to extrusion, like drying, crystallization or decontamination, where bulk density can be an issue and the respective reactor capacity is limited by volume. Agglomerated material will increase it.

Solution:

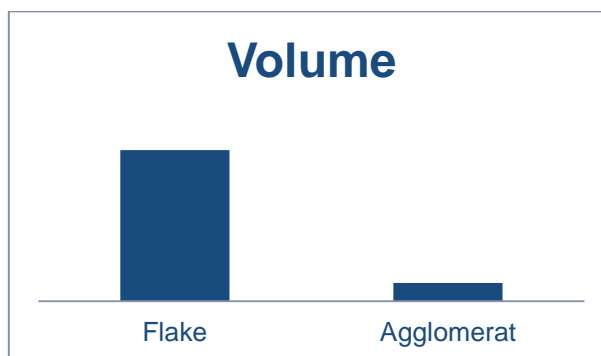
Bulk density and flow characteristics can be improved with the Herbold HV series Plastcompactor. Bulk density is increased and flow characteristics improved significantly. This results from the change of the particle form, from flat to coarsely grained agglomerate, having a particle size distribution in the range of 2-10mm.

Example size distribution



The bulk density increases up to 10-fold due to the agglomeration. At the same time a material homogenization takes place during the agglomeration.

Bulk density / Volume pre /after





Picture shows 100g PET film as flake before processing and as agglomerate afterwards.

Depending on material properties results can be different

Material	Input density	Output density	
PET Film flakes	60 g/l	550 g/l	9,1x increase of bulk density
A-PET	440 g/l	470 g/l	6% increase of bulk density – but most important improvement of flow characteristics.
A-PET	220 g/l	492 g/hl	2,2 x bulk density
A-PET	480 g/l	476 g/l	Input material was very thick and flat. Therefore no change in bulk density, but the main point was the flow characteristics which are changed tremendously due to the defined particle size after processing.

The Plastcompactor can be placed inline and offline with the extruder. As inline solution, the energy and temperature in the compacted material can be re-used in extrusion, thus less heating is required. This will improve the energy balance.

Customer benefit

- Capacity of extruders can be maximized
- The specific energy demand for extrusion is lower
- The improved flow properties of the agglomerate reduces the risk of bridge formation and thus increases availability
- Process cost and capacity of reactor processes can be improved
- The investment into a plastcompactor plant type HV70 is in the range of 350 to 500kEUR thus much more cost-effective than new extruders.