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Discover **Bulkmatology**®
The Nature of Bulk Material Handling

Leading Technology

- DeDuster® cleaning
- STRANDPHASE® conveying
- V-shape Rotary Valve
- Pellbow® pipe bends

Plastics Recycling

with Pelletron technology

Printed on recycled paper - 50% recycled, 25% post consumer fibers. The paper comes from managed forests and other controlled substances.

Flakes before cleaning

Removed contaminants

Cleaned flakes

PET resins

The cleaning process – from PET regrind to virgin PET pellets

Plastic scrap is a valuable raw material

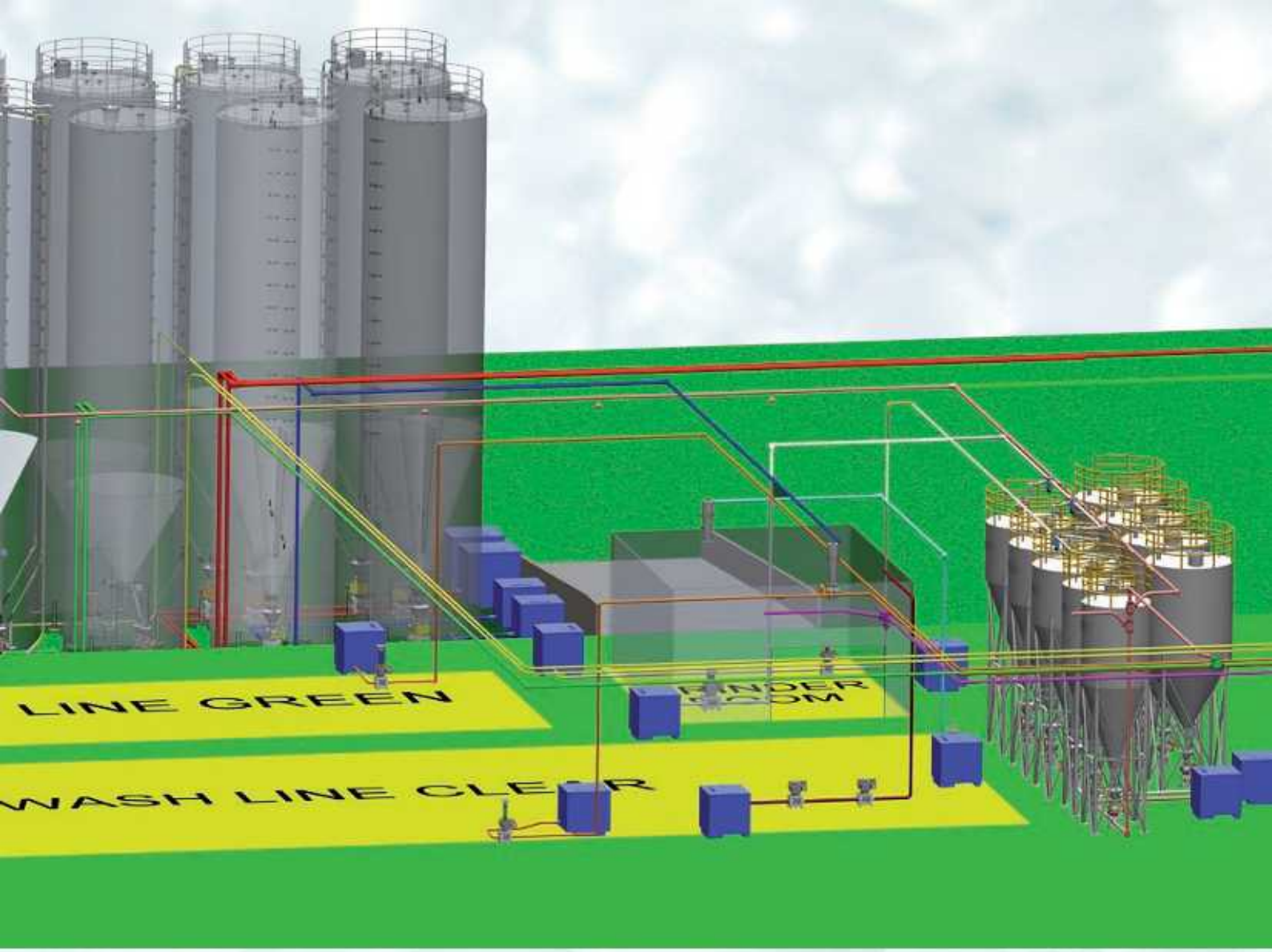
...that can be transformed into reusable material after recycling.

The PET bottle and PET recycling industries were the initiators in the development of specialized processes for the production of virgin grade PET resins made from recycled PET bottles.

It is a common practice by plastics processing companies to grind plastic scrap for reuse. The regrind is dusty and needs to be cleaned before reprocessing in a molding machine or an extruder. The Pelletron DeDuster® is the most efficient dust removal machine on the market for this purpose. The quality of the regrind is almost as good as virgin resins after cleaning in a DeDuster®. Pelletron offers a wide range of DeDuster® systems for various applications and capacities.

Recycling of PET bottles

One of the most challenging tasks in recycling is the transformation of PET bottles to new, virgin-quality PET resins. For this purpose, more and more large scale recycling plants are being built around the world. For these plants, Pelletron developed a rotary valve with special inlet geometry and V-shaped rotor. Pelletron uses its pellcon3™ (patent pending) conveying technology for efficient transfer of the bottle regrind and the finished pellets. The DeDuster® is the ideal machine for separation of paper and labels from the PET flakes.



Typical PET recycling plant design

The collected PET bottles of all colors and shapes arrive at recycling plants typically compacted in bales. In the first step, these bales are cut open and the bottles go through an intense rinse cycle followed by several vendor-specific, proprietary processes to flatten and sort into clear and green flake lines. After this division, the bottles go through final processing steps starting with the first grinding machines, followed by the final wash cycle, and the removal of PO materials and metal contaminants. The material passes through final grinders to arrive as a uniform, sellable flake product. Before final storage, the material passes through a series of quality checks, a final sorter to assure the best color purity, and special cone blend silos for achieving homogenous product quality.
Some plants are designed to convert the flakes into high-quality virgin PET pellets. In order to achieve the required quality, the flakes go through a proprietary SSP process and a pelletizer. The pelletizer increases the IV value of the flakes and transforms them into a uniform pellet shape for easy handling. Finally, the pellets go through a series of quality checks and blend silos to ensure the best possible standards are met before reaching the storage silos.

Today, the industry standard for acceptable dust content in good quality products is well below 100ppm. Therefore, the pellets are transferred pneumatically within the plant using either slow motion conveying technology or STRANDPHASE® conveying with in-line Pellbows® and DeDusters® (pellcon3™). The shipment of flakes or pellets to the end users is typically done via truck, bigbags or railcar.

The cleaning process

In order to get high-quality PET resins, the removal of paper, labels and other contaminants is critical before extrusion of the flakes. All Pelletron DeDuster® systems are equipped with one or more electromagnetic coils. These coils, located at the inlet and/or outlet of the DeDuster®, produce a low level electromagnetic flux field that covers the entire cleaning area called the wash deck. Pressurized wash air flows over the wash deck and through the venturi chamber, and removes dust and other contaminants. This combination of electromagnetic flux and air flow effectively removes fines.
The pictures show contaminated flakes before cleaning in a DeDuster®, removed contaminants, cleaned flakes, and the finished PET resin.

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DeDuster® systems for small scale cleaning

For cleaning of small quantities, Pelletron recommends the new patented RC-1 DeDuster® (patent pending). The photo shows a RC in operation. This unit is adjustable for various capacities from 10lbs/h (5 kg/h) up to 300 lbs/h (150 kg/h). The unit can be installed directly on top of an injection molding machine or an extruder. The machine is also available as a compact unit for separate cleaning.

RC1 DeDuster® in operation

DeDuster® systems for large scale cleaning

For large scale applications, Pelletron recommends a DeDuster® from the patented XP-series. These types of DeDuster® systems are available for capacities up to 200.000 lbs/h (100.000 kg/h).

XP-DeDuster®

XP-DeDuster® in operation

The Pelletron flake conveying valve

Discharge and conveying of PET regrind flakes that contain labels requires special technologies for reliable and uninterrupted material handling. The V-shape designed rotor and the inlet roof avoid jamming of the PET flakes, which are typically irregular in shape and very thin.

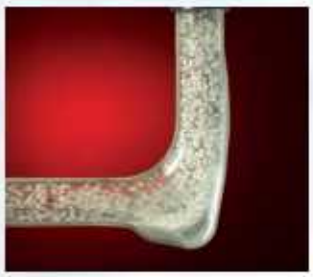
V-shaped rotor

Special inlet geometry

Pellbow® – the gentle pipe bend

A unique and patented conveying pipeline elbow, trade named the Pellbow®, is especially designed to minimize damage caused when solid particles are injected into a high velocity conveying system. The unique Pellbow® design minimizes the damage to both the elbow and the conveyed material. The Pellbow® is designed for use in conveying lines with abrasive pellets and powders.

Pellbow®



Pellbow® in operation

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