coperion Confidence through partnershin

INNOVATIONS IN PLASTICS RECYCLING ROADSHOW VIETNAM NOV 2024

Roadshow Vietnam November 2024

Peter von Hoffmann

Business Unit Manager







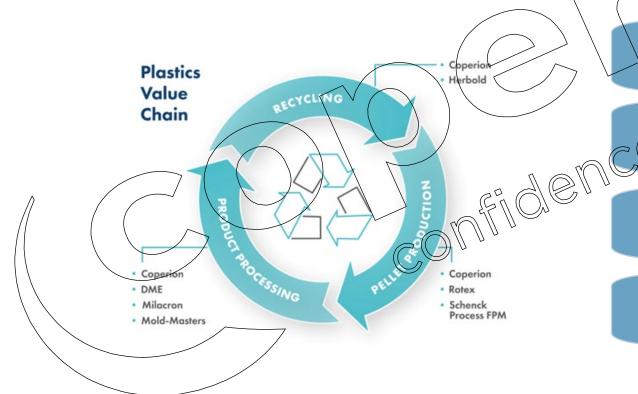
Optimized and Closed Plastic Value Chain

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Key words: Circular Economy, Sustainability, Energy Savings

A circular economy keeps materials and products in circulation as long as possible.

Coperion has a system-focused approach starting with the design of our equipment to maintain their dighest value for as long as possible and aims for the elimination of waste during operation for high quality products.

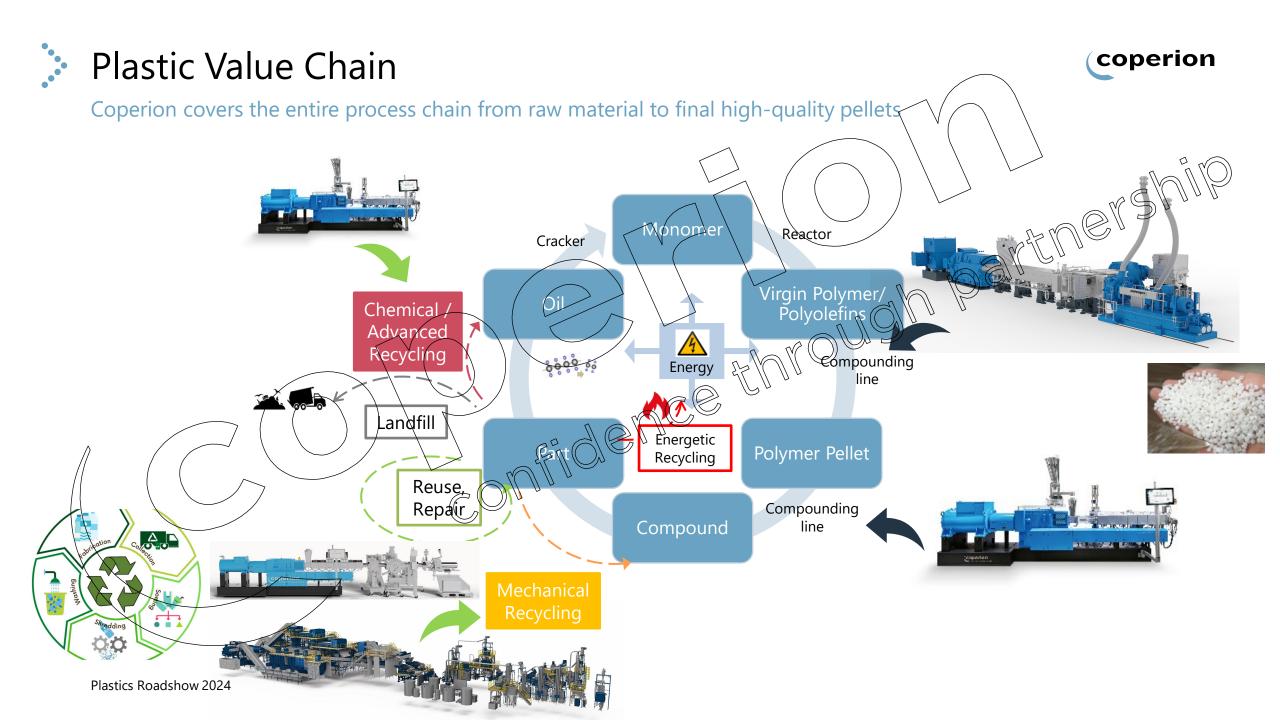


Design for Value with optimized CO₂ Footprint

www Energy Consumption during Operation

Zero Waste Strategy during Operation

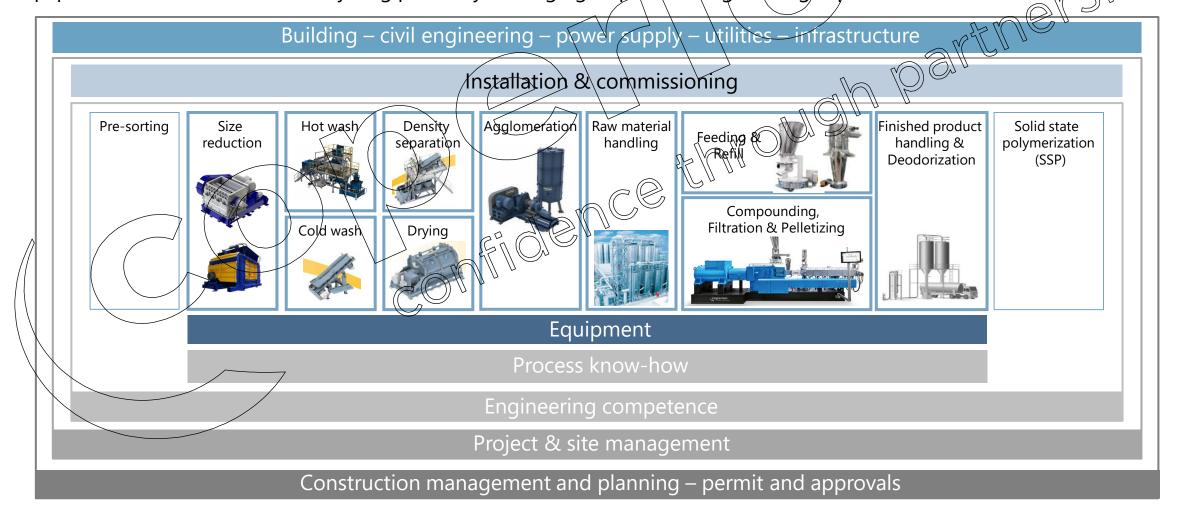
Optimized Process Chain from PCR to Pellets



Recycling Business Unit – New common product range

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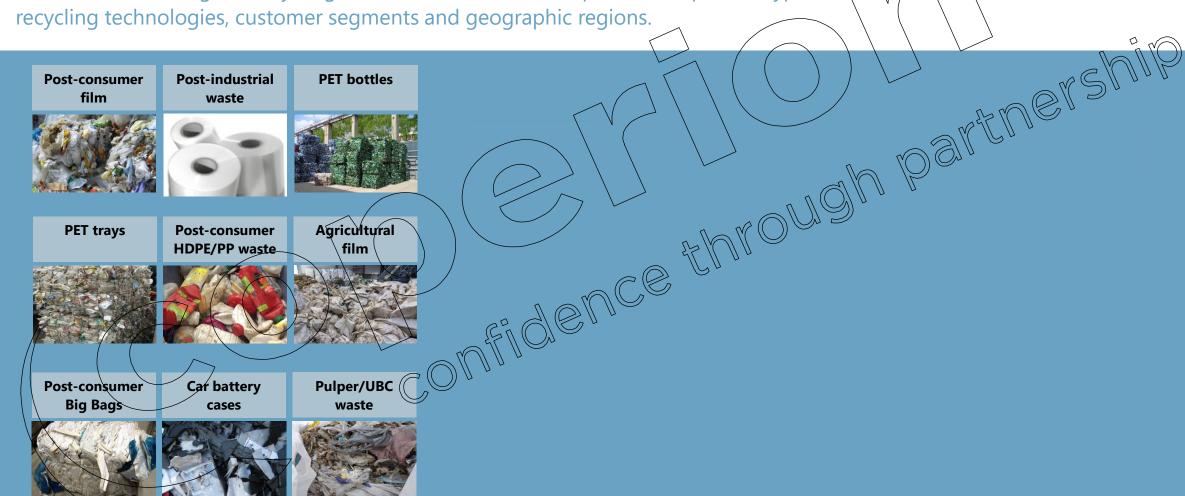
The integration of Herbold and former Schenck Process FPM allow us to offer the Recycling industry best in class equipment as well as full scale Recycling plants by leveraging Coperion's engineering capabilities.

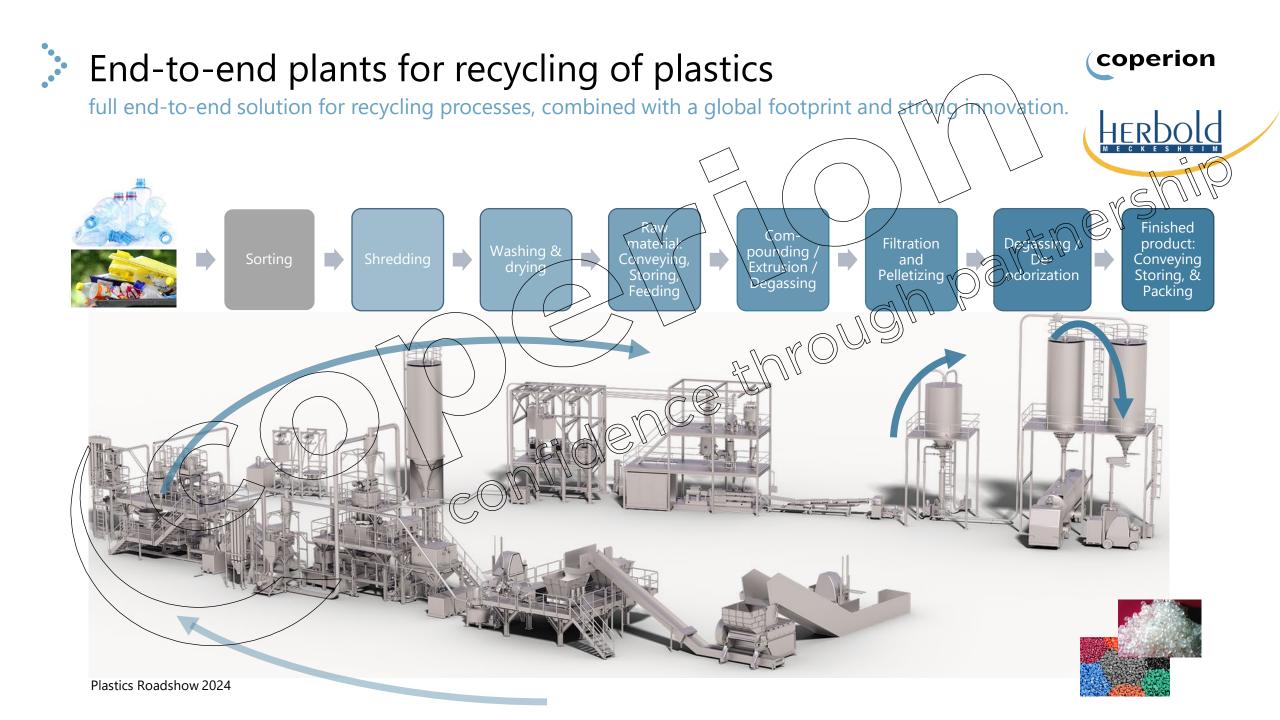


Coperion Recycling – activity spectrum

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We offer a wide range of recycling solutions accross a wide spectrum of plastics types, recycling technologies, customer segments and geographic regions.





Raw Material Handling

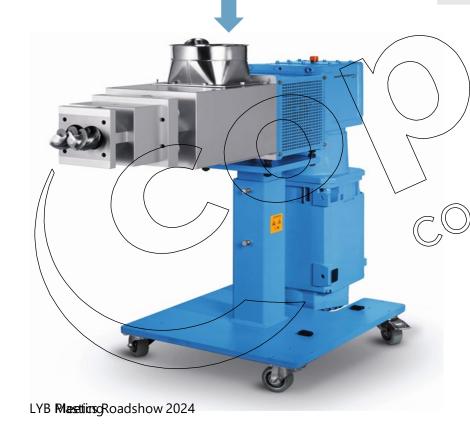
Raw Material Properties and Challenges

New innovative feeding device

NEW side feeder, higher throughputs can be achieved with very fluffy materials



Throughout increase x 10 -1





FilCo – Energy Efficient – High Quality – Less Space

Filco = Filtration Compounder

Plastics Roadshow 2024

Filtration and **Co**mpounding of pre-washed and sorted PCR streams in **one** process step

 Melting and blending of different polymers, discharging the melt from the twin screw and returning the filtered melt

Adding of coarse fillers, fibers or cross-linking additives such as peroxide after filtration







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FilCo – Energy Efficient – High Quality – Less Space

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Process setup

Filtration

 Installation of filters with different fineness and manufacturers

Discharge and **return** of the melt

MegaFeed

Addition of flakes and fiber with and fiber with sizes, bulk differentials and moisture contents

First degassing

• of moisture, VOC etc.

Final **degassing**

• of moisture, reaction components, VOCs etc.

Addition and **incorporation** of

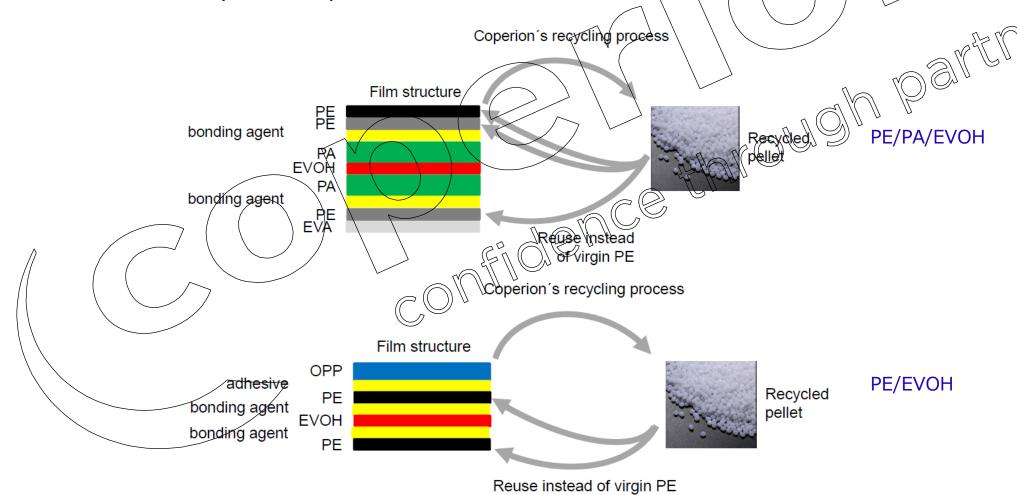
- Cross-linked additives (PEX, rubber)
- Additives
- Fiber (wood/glass/carbon fiber)
- Fillers

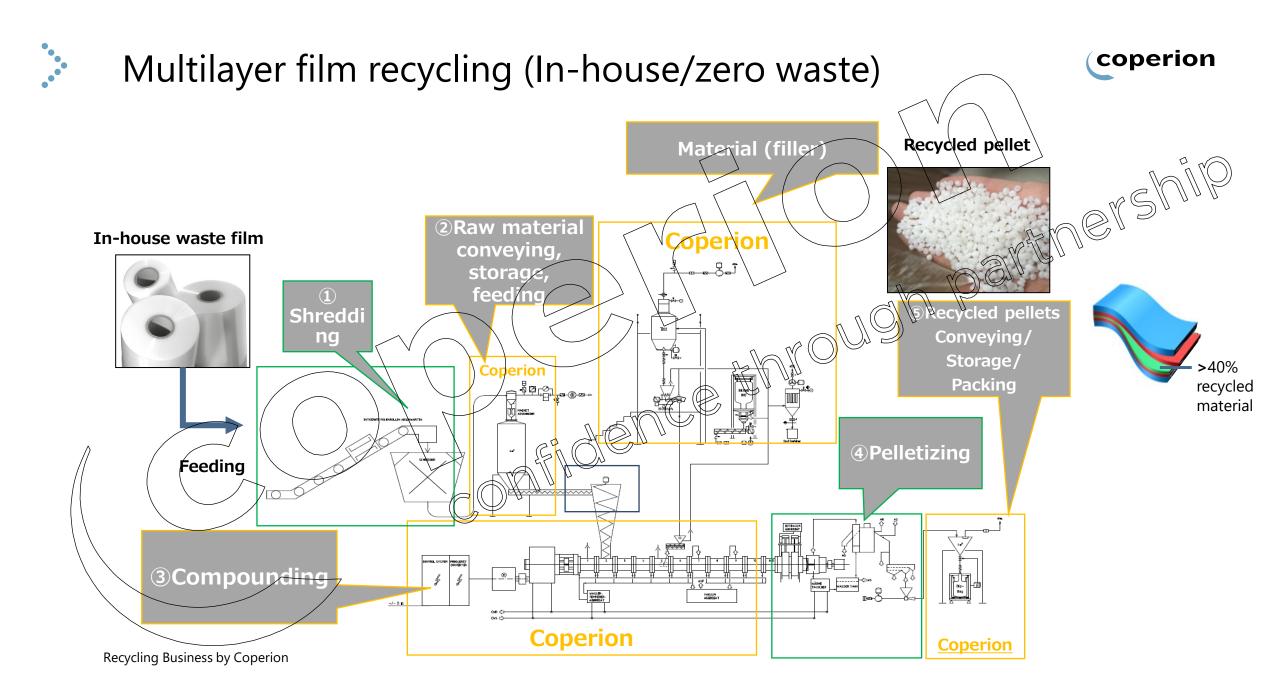
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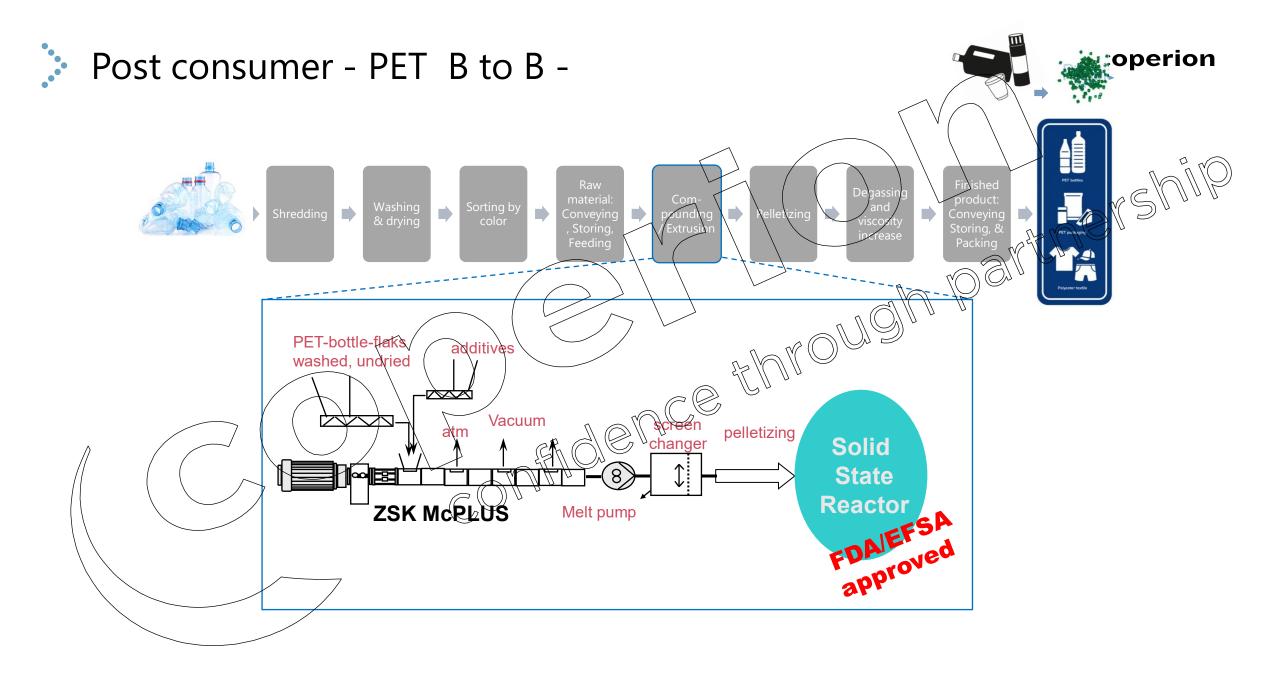
Multilayer film recycling (In-house/zero waste)

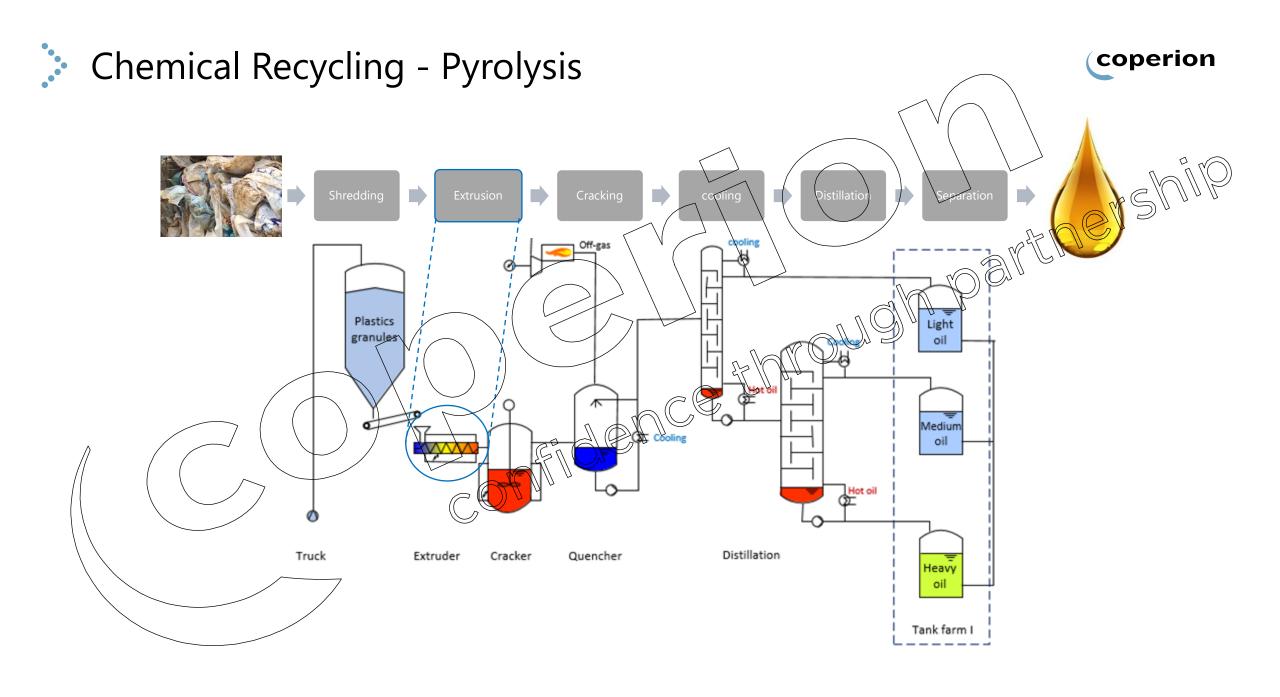
High quality of recycled pellets from multilayer film waste and reuse of the pellet as
raw material for multilayer film as a substitute for virgin PE, virgin PP materials, etc.

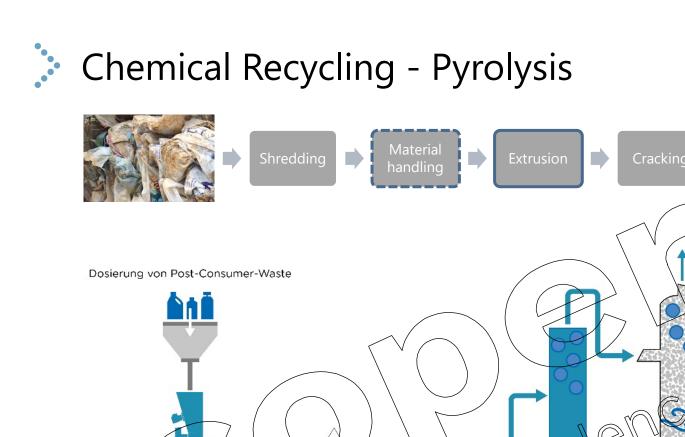
Basically no compatibilizer is used.











Roppelschneckenextrusion - Dispergierung, Entgasung, Einbringung von Energie

(1)Throughput Z\$K \$\frac{10}{20} ton/h more Single extruder : max 2 ton/h Melting temperatures about 320-350 C within 30 seconds(depends the material) (3)Energy consumption of ZSK 33% less compared to Singe extruder (4)Degassing of water and volatile material (5) Removal of organic PVC: 90% more

Destillator

Reaktor

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Silo Deodorization

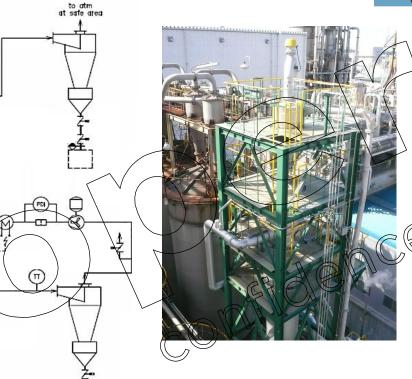
Deodorization with Gas-X-Change

< 60 °C



YOC reduction with Gas-X-Change

- The process heat from the bulk material cooler is used to preheat the supply air
- \Energy consumption **6,05 kWh/kg**
- → Continuous process



- Low energy consumption
- Energy is kept in the system
- Highest product temperatures possible

*Coperion Recycling Innovation Centers



Recycling Innovation Center for Coperion Product Line Niederbiegen, Germany



- Storage and homogenization
- Conveying and drying
- Feeding
- Compounding
- Degassing and deodorization
- Pelletizing and bagging

Niederlenz, Switzerland
Feeding & Conveying

North America

Salina, Kansas
Pneumatic Conveying
Pitman, New Jersey
Feeding & Extrusion

Nanjing, China
DExtrusion, Pneumatic
conveying &
Feeding

Test facilities for the full product line are available worldwide to prove the working principle of Coperion and Herbold equipment with our customer's products.

Recycling Innovation Center for Herbold Product Line Meckesheim, Germany



- Size reduction
- Washing
- Drying
- Separation
- Agglomeration

Business Unit Recycling – Why we are the right partner

Coperion and Herbold – A new level of expertise in plastics recycling

What makes Coperion Recycling unique and the best partner

- Bringing strong brands together Offering best in class process
- Serving you globally
- Targeted product development with high in-house production rate of C
- Decades of experience and process know-how in plastics and plastics recycling.
 Tailor mode solutions for all recycling processes.
- · Tailor made solutions for all recycling process
- Food-grade PET bottle-to-bottle references with brand approval with our SSP partner
- **Recycling Innovation Centers** in Europe and testing facilities around the world to support our customers.

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the mology offering best quality, lower opex, maximal throughput and flexibility

Best Total Cost of Ownership

Worldwide support



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THANK YOU VERY MUCH FOR YOUR ATTENTION.

You're very welcome to follow us.



