

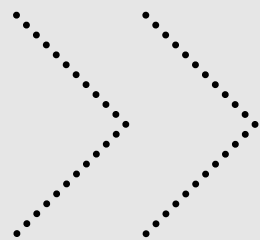


Polyolefin Recycling

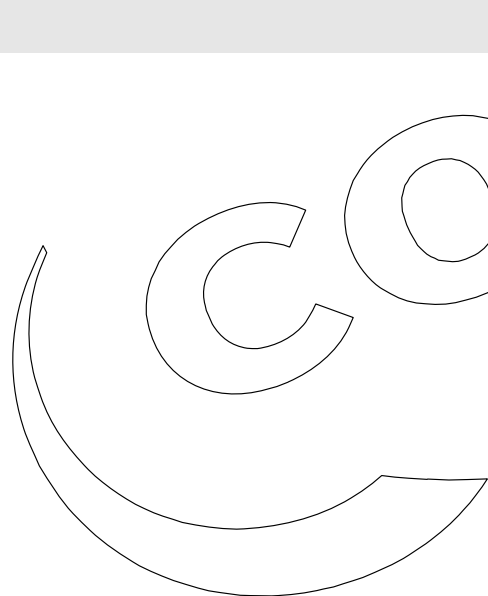
Claus Hermann - General Manager Extrusion Systems Large



Coperion Technology Update 2025



Closing the Process Chain for Recycling



confidence through partnership

1



Motivation

Why recycling?



1. Pollution of the environment is not acceptable

2. Plastic is a valuable material which can be reused

3. Preserve natural resources

4. Energy savings and reduce carbon emissions



Coperion's NEW Product Range

Herbold Meckesheim part of Coperion since 2022



Coperion Key Components for Recycling



Advantages and Benefits for the Customer – For Efficient Performance

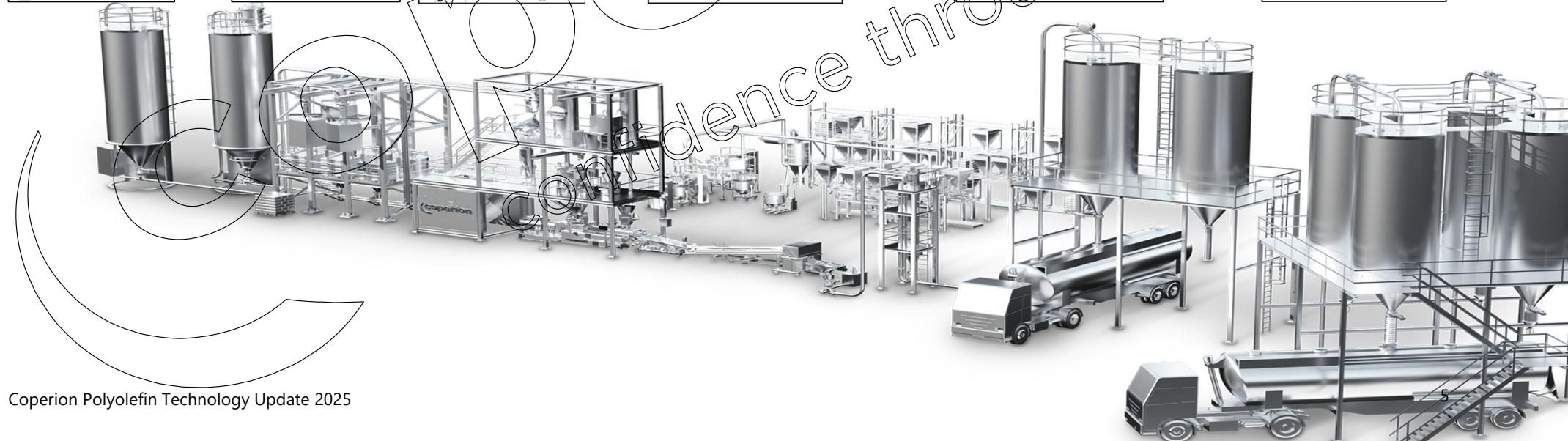
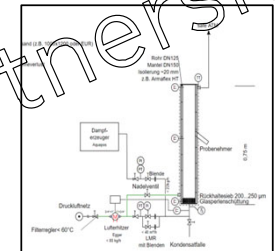
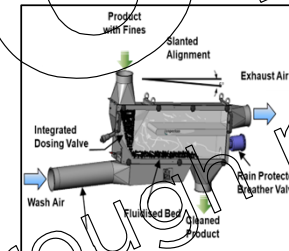
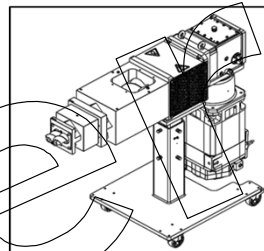
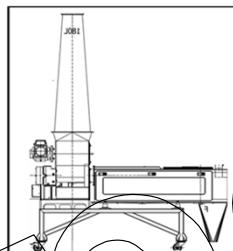
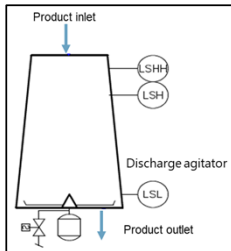
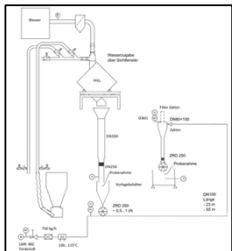
Material Handling
Flat Bottom Discharge
Stream Dryer

Feeding System
Belt Feeder
New Feeder Project

High throughput
extrusion
ZS-B MEGAfeed
Filtration

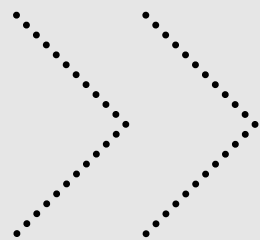
Cleaning drying
separating steps
Pellet Cleaner Horizontal
Fluidbed Separator HFS

Odor reduction
Silo Degassing
Mobile Degassing
Unit

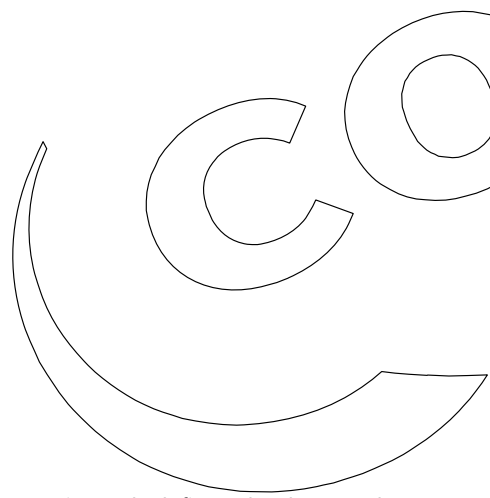




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Polyolefin Applications



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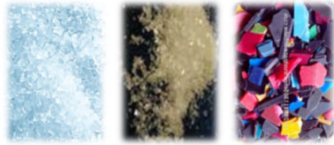
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Integration of Recycling into the Polyolefin Value Stream



Circular Economy

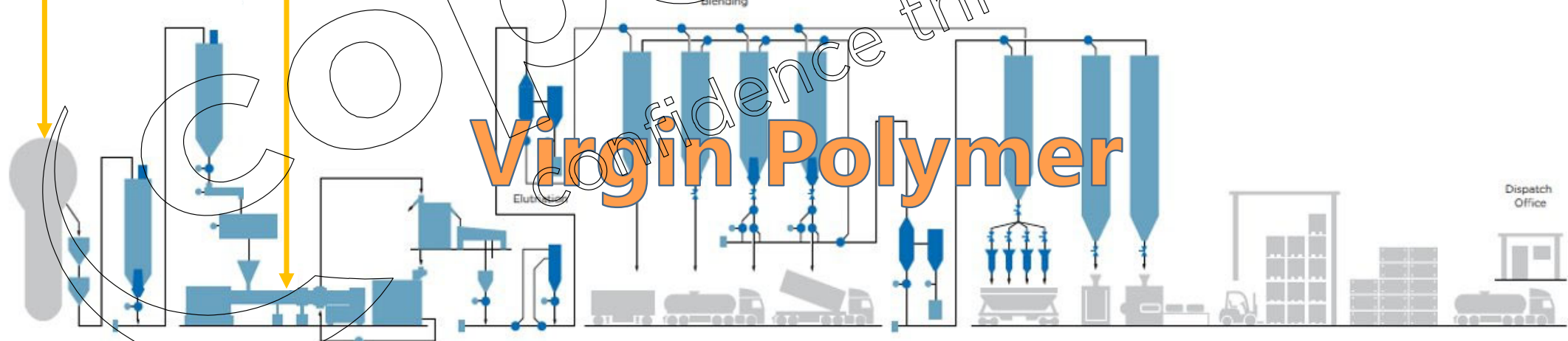
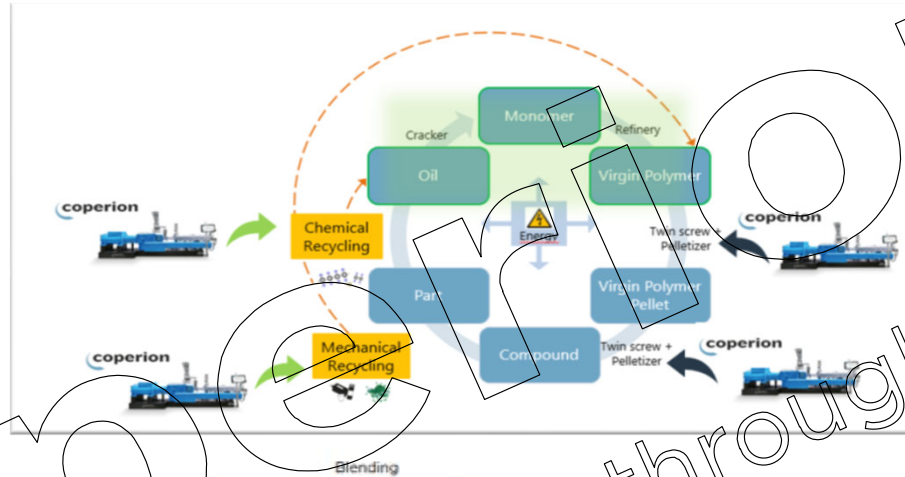


Chemical Recycling

Mechanical Recycling

Stream 1

Stream 2

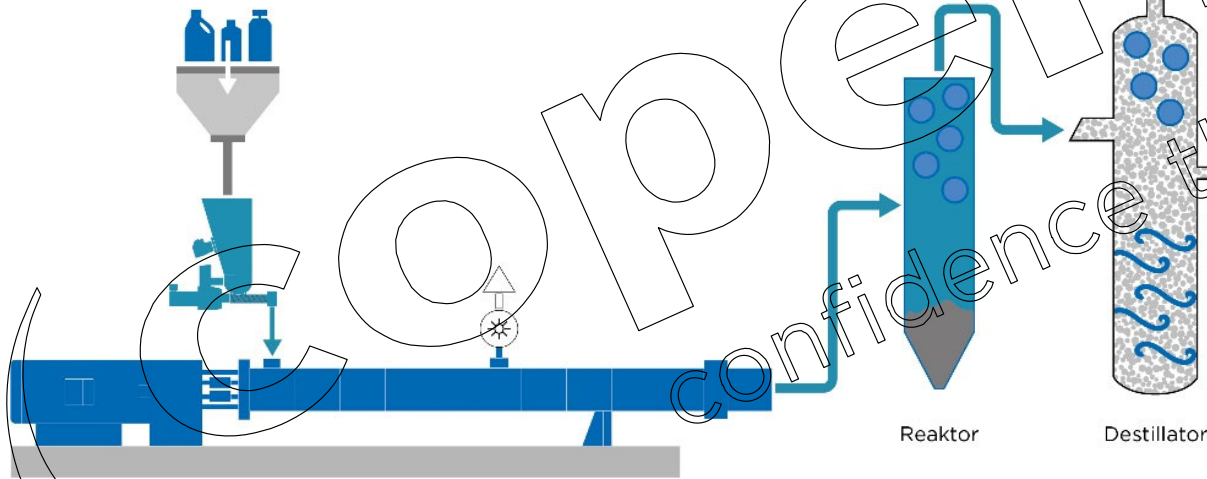


Recycling Stream 1 - Chemical Recycling

Pyrolysis



Gravimetric feeding of post consumer waste



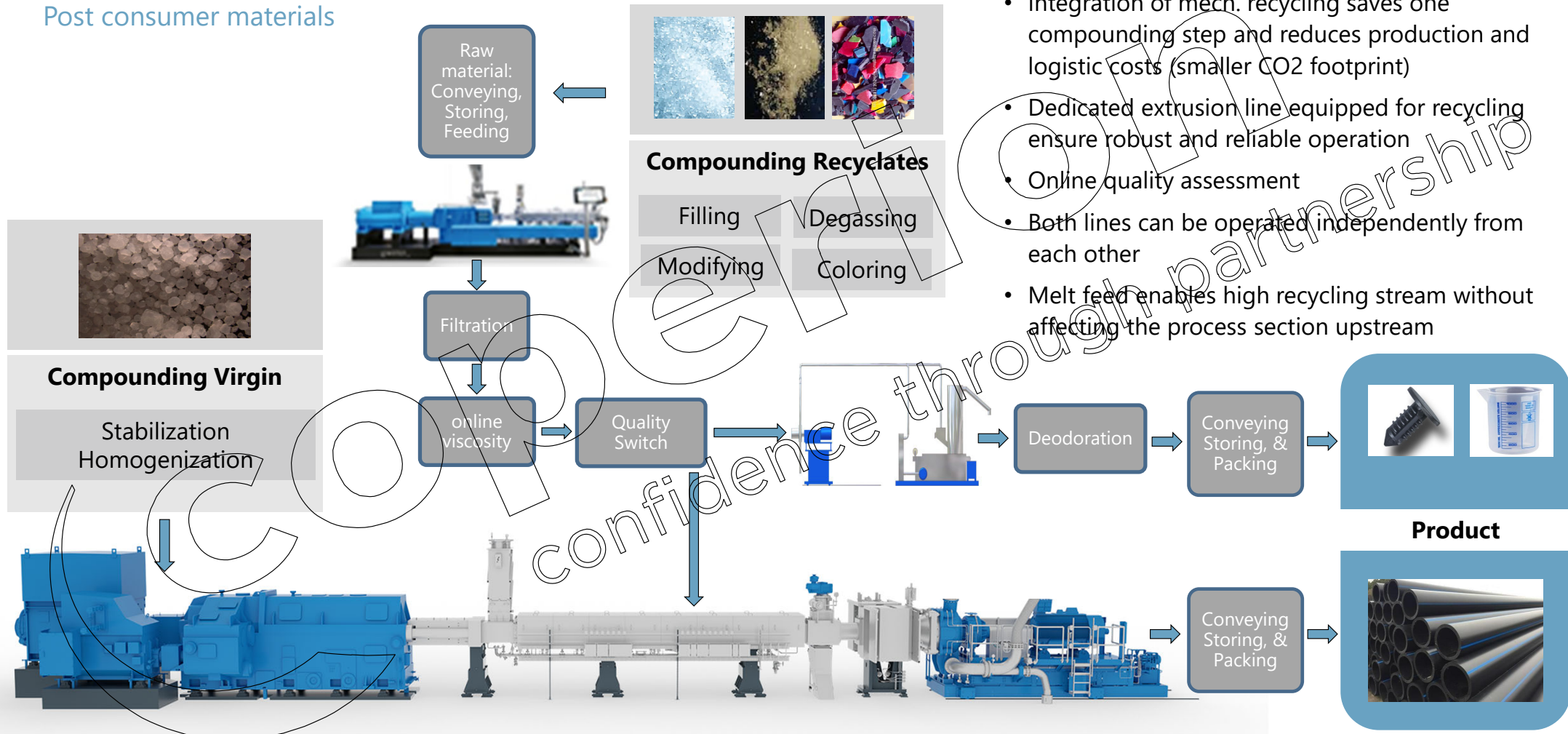
Twin screw extruder: energy supply, dispersion, degassing

- Less energy consumption (- 33%) compared to the single screw, as the energy is mainly introduced by the main engine and not by an external heater.
- Gravimetric dosing of additives (e.g. catalysts) and perfect incorporation due to the great mixing performance of the twin screw extruder
- ~ 90% reduction of the input PVC
- Depending on the material, melt temperatures of around 320-350°C can be achieved within 30 sec.
- Efficient degassing of moisture and volatiles like chlorine compounds, etc.
- Significantly higher throughput rates compared to single-screw extruders, up to 30 t/h are achievable with just one twin-screw extruder.

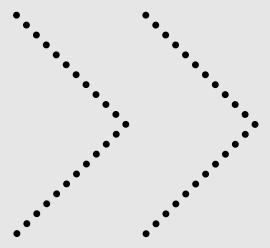
Recycling Stream 2 - Mechanical Recycling



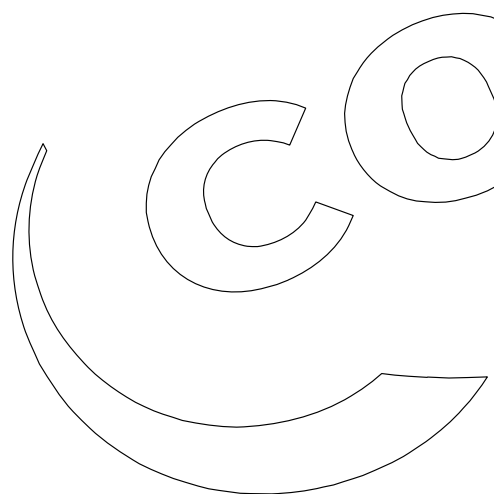
Post consumer materials



- Integration of mech. recycling saves one compounding step and reduces production and logistic costs (smaller CO2 footprint)
- Dedicated extrusion line equipped for recycling ensure robust and reliable operation
- Online quality assessment
- Both lines can be operated independently from each other
- Melt feed enables high recycling stream without affecting the process section upstream



Summary



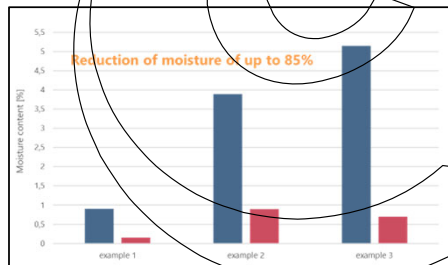
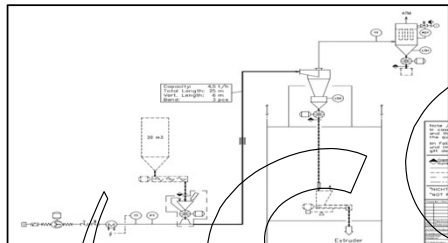
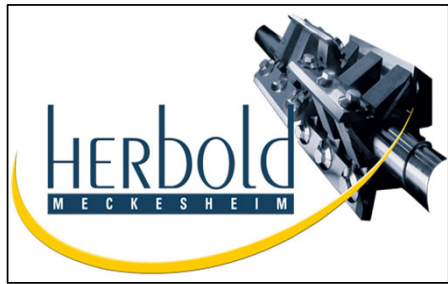
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Optimized Recycling Strategy with Coperion



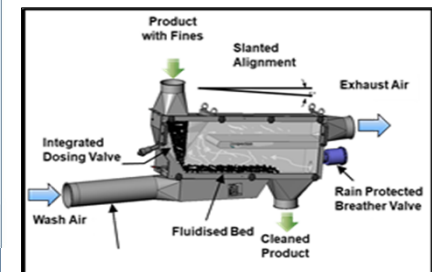
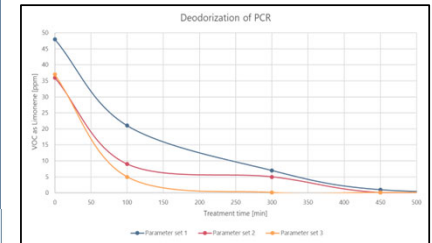
Optimization of Upstream material handling



Compounding & Extrusion – The ZSK

No Limitation in Rate	Optimized Mixing	Best Degassing
<ul style="list-style-type: none"> >> 20 t/h possible No plastification limit compared to single screw Self Cleaning ZSK 18 – ZSK420 	<ul style="list-style-type: none"> Mixing of different polymers Mixing of different viscosities Highest mixing & plastification level 	<ul style="list-style-type: none"> Maximized surface renewal Vacuum > 1 mbar Stripping agent to optimize odor

Optimization of Downstream material handling





New Coperion Recycling Innovation Center



Innovation at high level in South Germany

- Video: <https://www.youtube.com/watch?v=DqknZKXd87I>



Our test lab
is your test lab

- Modular
- Compact
- Fully equipped
- Fully automated
- Adapts to your needs
- Concentrated expertise

Leaves nothing to be desired

Win as One



IN OPERATION



Thank you very much for your attention.

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