



Battery and Batch to Conti

Technology Update

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Coperion Performance Materials



For high-quality end products: From single components to complete systems

Target Markets

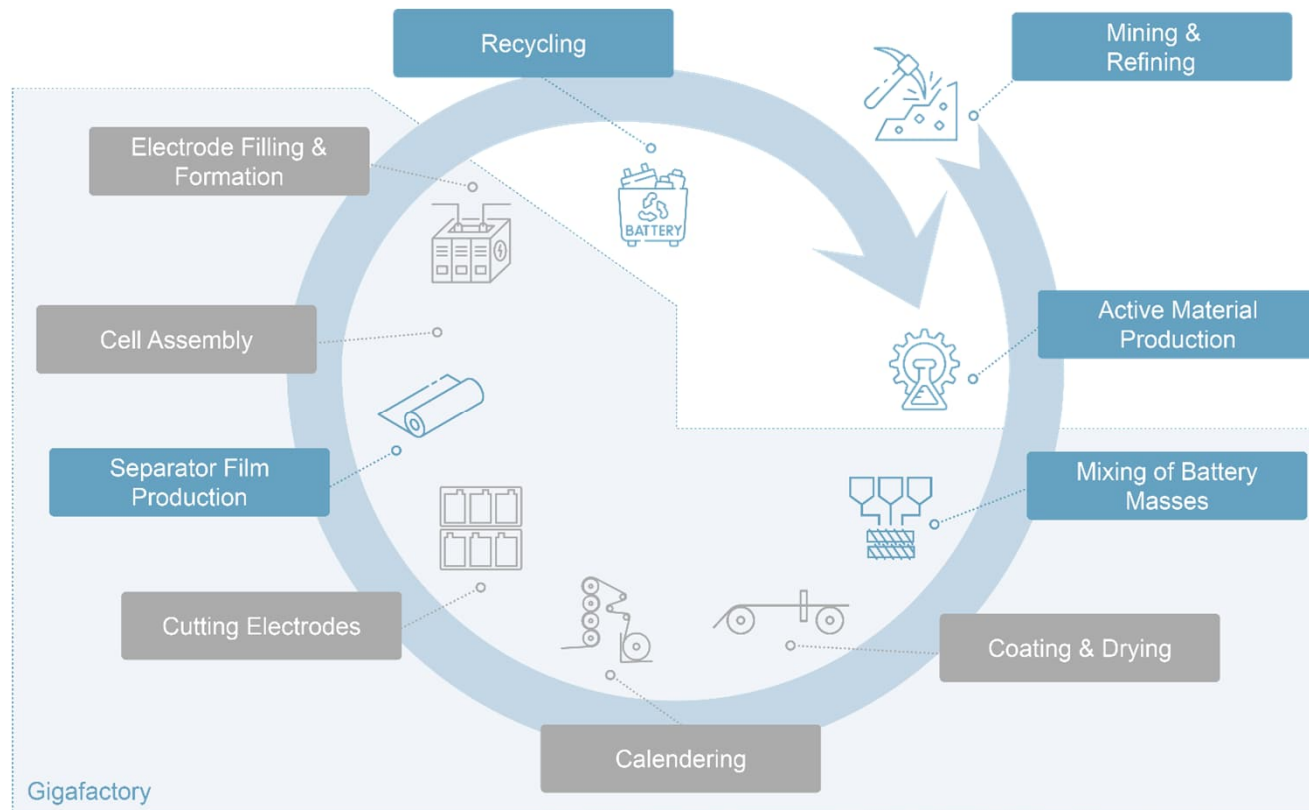
- Polyolefin Industry
- Engineering Plastics
- Masterbatch
- PVC/HFFR
- Plastics Recycling
- Bio Plastics
- Direct Extrusion
- Battery Industry → Business Unit Battery
- Chemical Applications
- Minerals
- Nonwovens



Battery

Activities in Battery

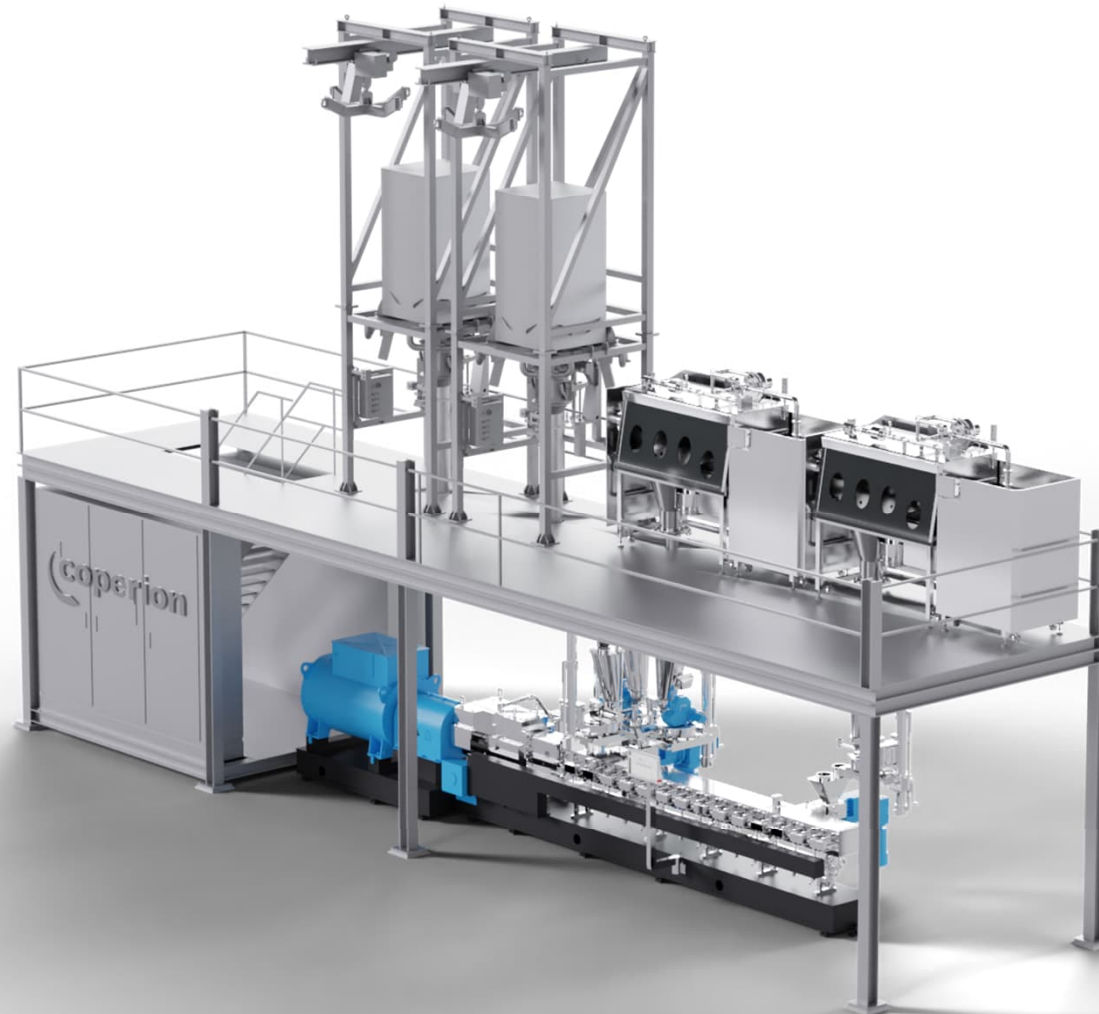
Along the battery production chain



- Mining & Refining
 - Feeding solutions
 - Material handling solutions
- Active Material Production
 - Feeding solutions
 - Material handling solutions
- Separator Film Production
 - Direct extrusion of battery separator films
- Mixing of Battery Masses
 - Extrusion: continuous mixing of slurries and dry coating mass
- Battery Recycling
 - Feeding solutions
 - Material handling solutions
- GIGA Factory – Components of chain expected to be included

Giga-Factories

Typical Plant Layout



Battery

Giga-Factories

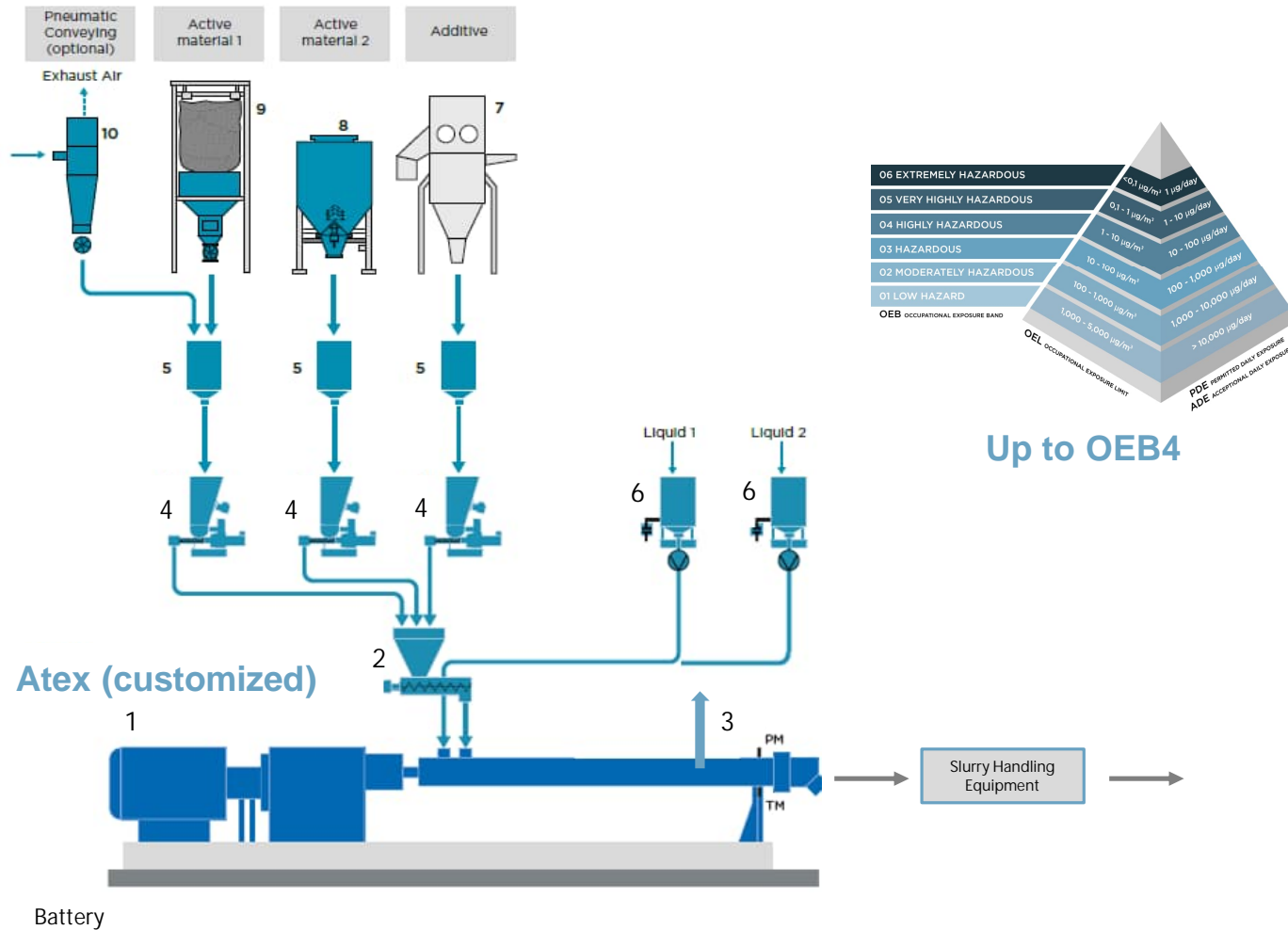
Typical Plant Layout



Battery

Continuous Mixing System

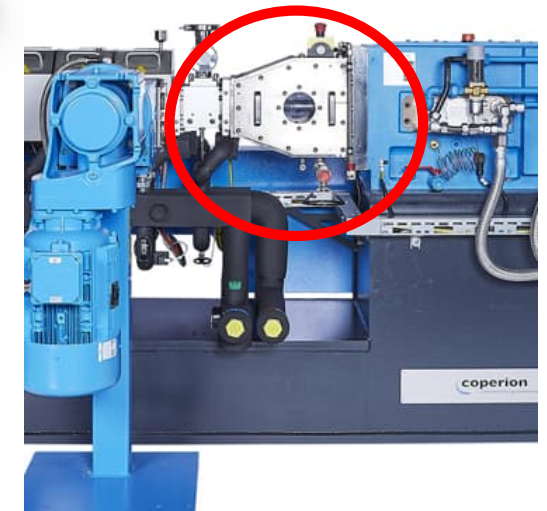
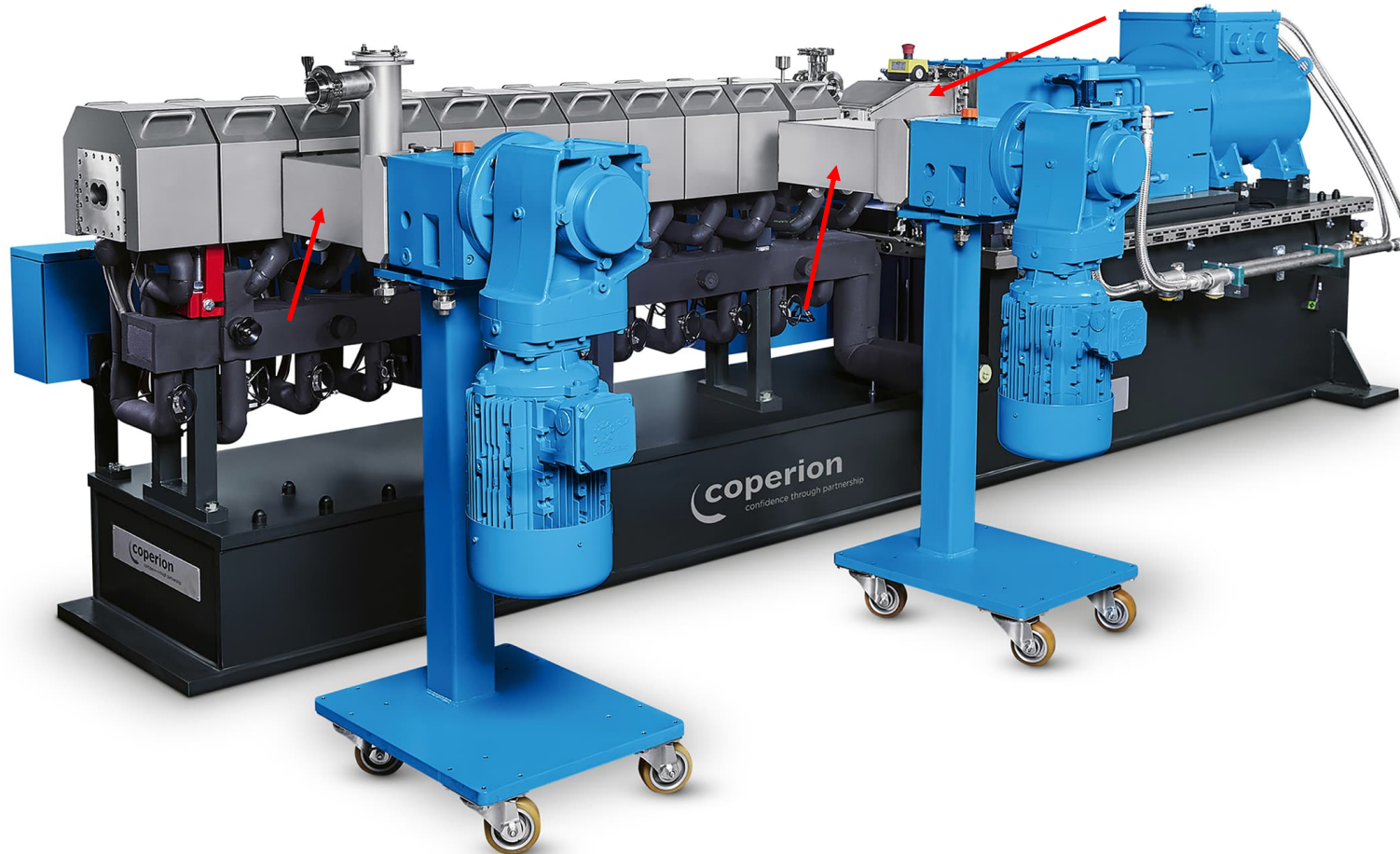
Schematic Flow Diagram and Concept for Giga Factory



- 1 Coperion ZSK Mc¹⁸ Extruder
- 2 Coperion ZS-B Side Feeder
- 3 Degassing
- 4 Coperion K-Tron Solid Feeders
- 5 Storage Tank
- 6 Liquid Feeder
- 7 Glovebox for Sack Unloading
- 8 Hopper Discharge Station
- 9 BigBag Unloading Station
- 10 Separator

Continuous Mixing System

Twin Screw Extruder



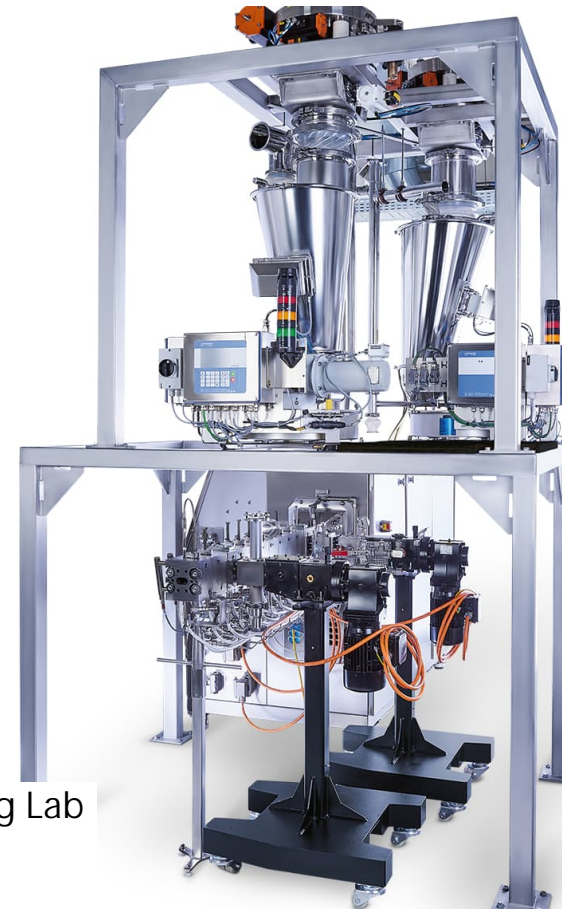
Battery

Lab Lines

Continuous Mixing of Battery Masses in a Containment-secure Lab System



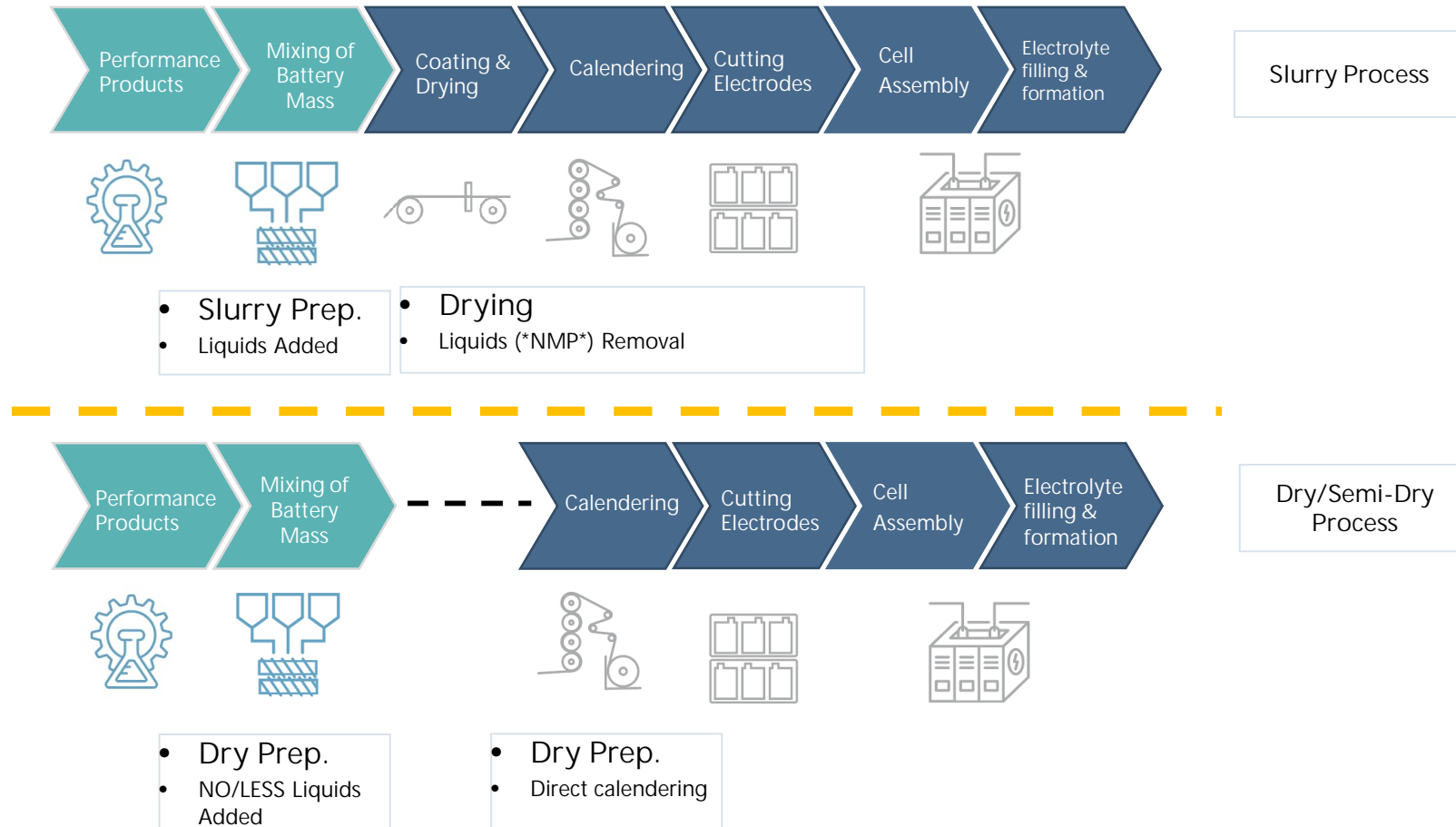
Upcoming video of running Lab line in Stuttgart!



Battery

Dry Mixing – a clear Trend

Dry vs. Slurry



Solution – Dry Continuous

Dry Process

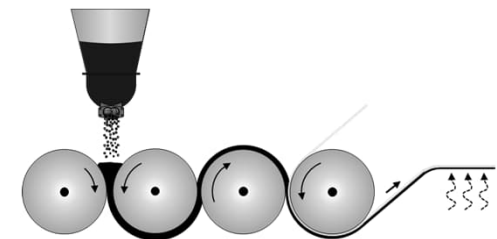
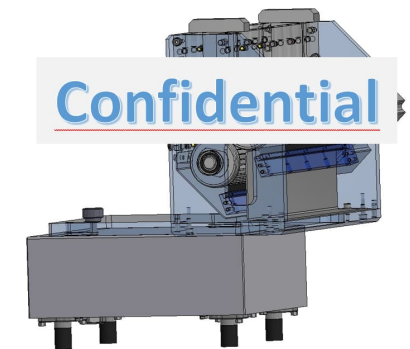
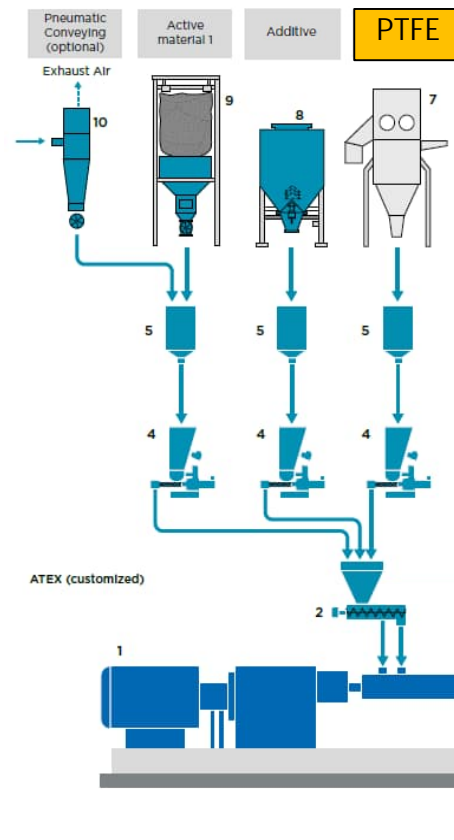


Continuous Mixing

- Continuous systems
- High accuracy
- Toxic & non-toxic material
- Similar to slurry
- ++ PTFE Handling

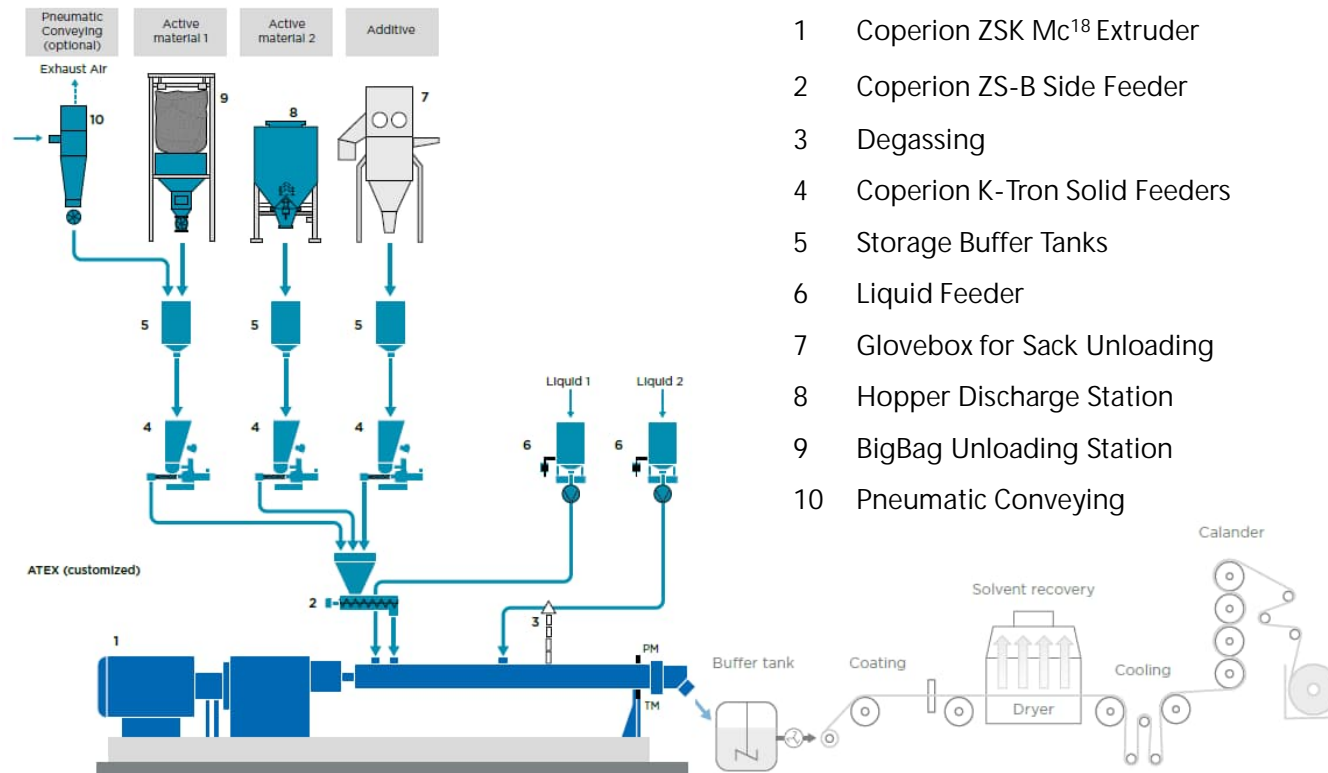
Calendering

- ++ PTFE Handling
- ++ Calender feeder
- * Prototype in development



Coperion – Continuous Mixing Process

Schematic Flow Diagram and Concept for Giga Factory



Advantages – Batch to "Coperion-Continuous":

Faster Return on Investment

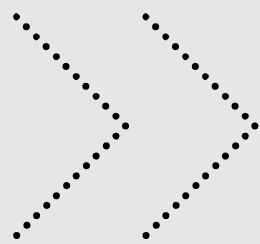
- >> Reduction of raw material cost and less wastage
- >> Margin increase at steady production volume
- >> Lower operation cost
- >> Small Footprint

First class Technology

- >> Efficiency -> Modularity and flexibility (Dry and Slurry)
- >> Quality -> low thermal stress and intense mixing
- >> Availability -> Short residence time and long machine lifespan

Coperion advantages

- >> Containment -> no material contamination and safe environment
- >> High Throughput with small machine due to FET (**Feed Enhancement Technology**)
- >> Core Process equipment developed by inhouse specialists / Direct access to specialists



We are ready for
your battery
project!

