

A 3D rendering of a multi-roller extrusion system. The rollers are grey and arranged in a line, with a stream of material being extruded from the right. The stream is composed of many small, overlapping spheres in shades of blue, pink, and purple, creating a vibrant, multi-colored effect. The background is white.

EXTRUSION DAYS EFFICIENCY IN COMPOUNDING

Coperion – Complete Solutions from a Single Source

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Coperion – Extruder Modernization Driving Factors

EXTRUSION DAYS
EFFICIENCY
IN COMPOUNDING



Rate increase or
Energy saving

New polymer
grades

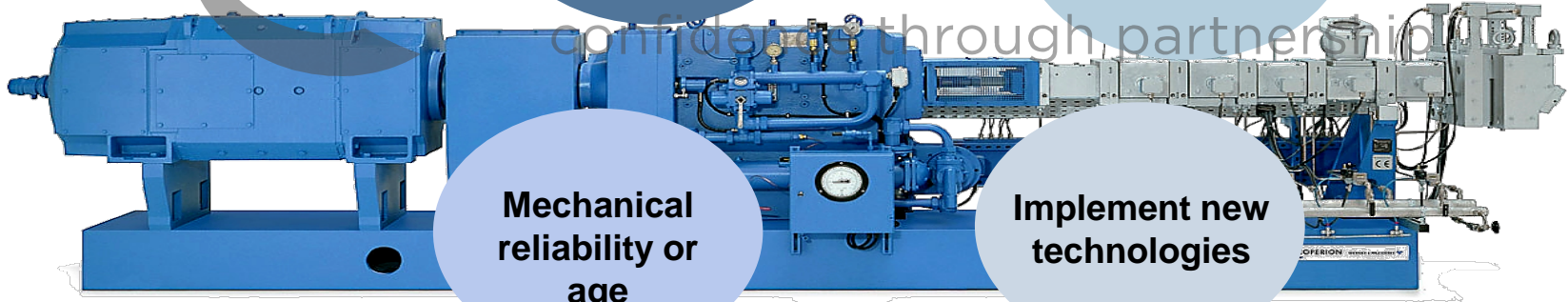
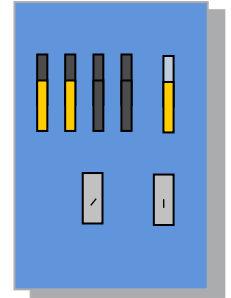
Spare part
availability

Software
upgrade

Wear
resistance

Mechanical
reliability or
age

Implement new
technologies



Extruder Line – Value Ratio



Motor ~ 10%



Gear box ~ 30%

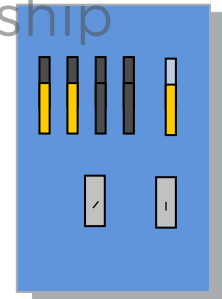


Process part ~30%



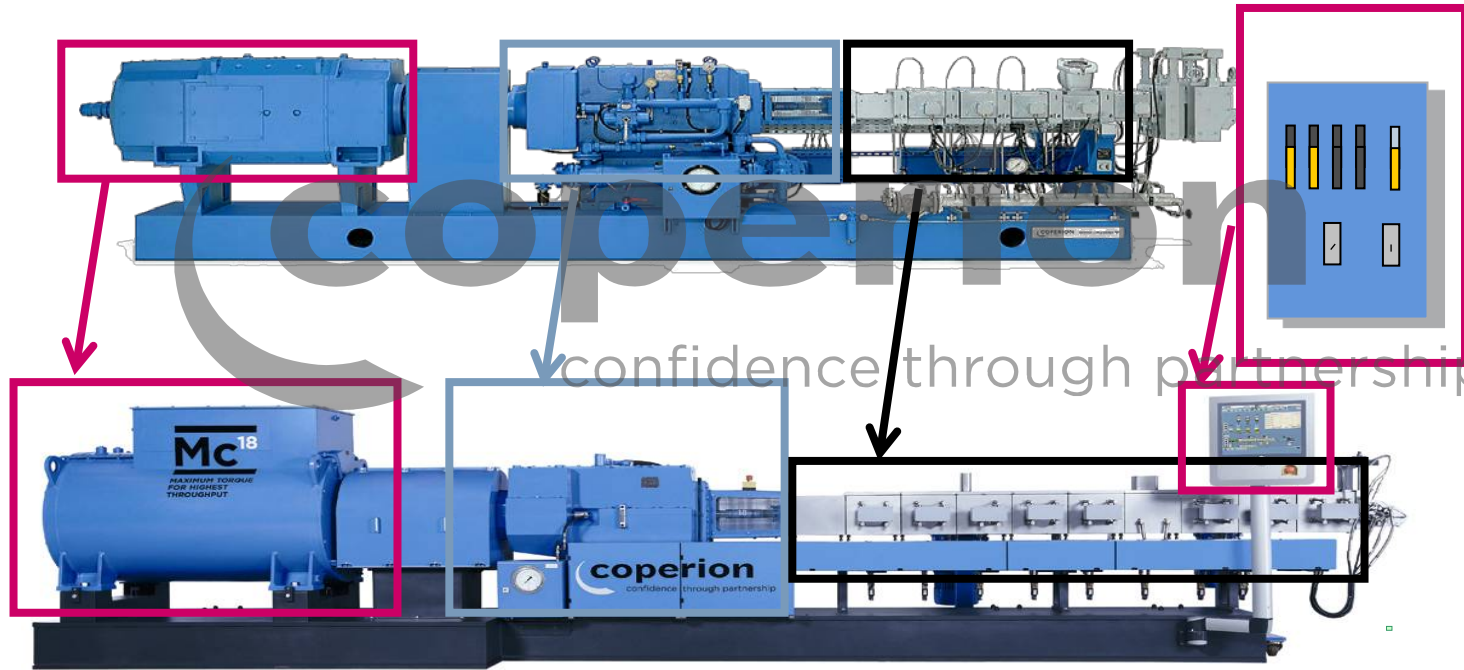
» Identify components for improvement through partnership

Electrical &
controls ~ 30%



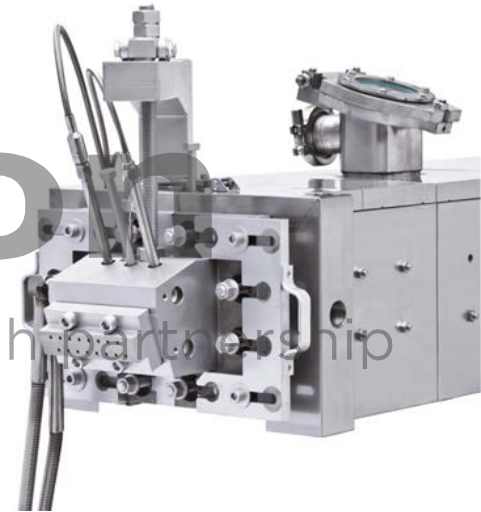
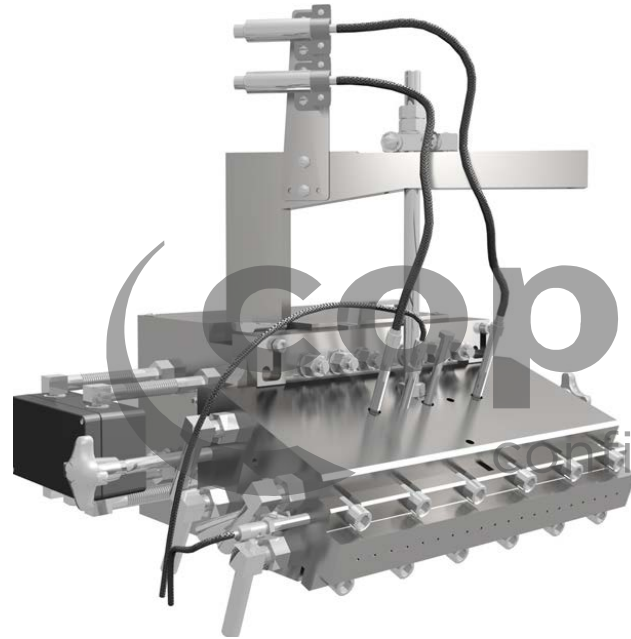
Single Component Change Possible

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New Die Head Design Features

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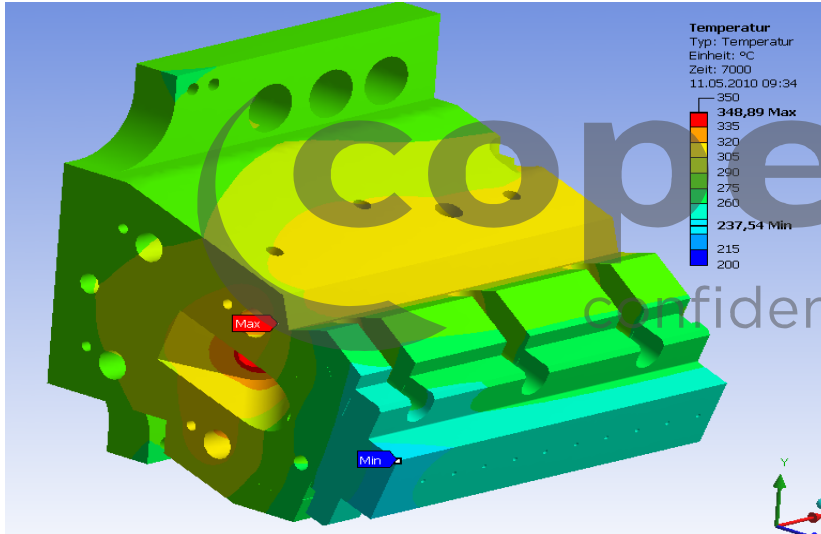
»» Increased heater power

»» Separate temperature control zone for side and top heaters



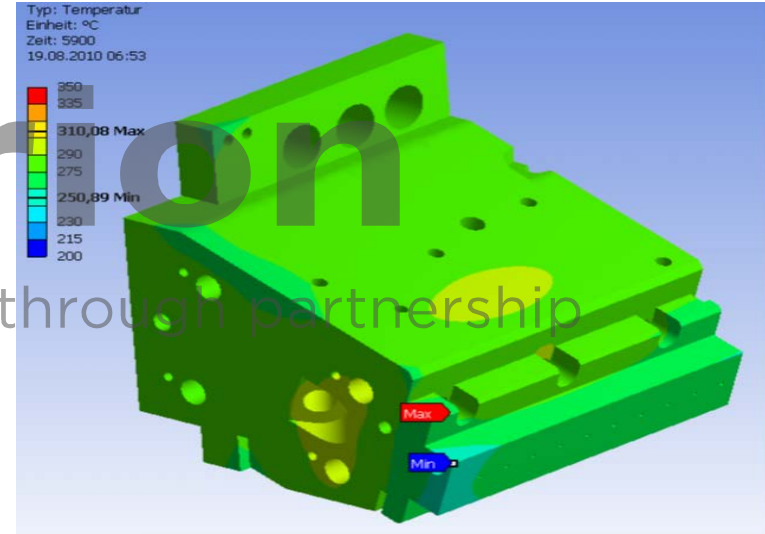
Optimization of Die Heads

Old Design



Max dt up to 40 K

Current Design



Max dt = 5 K

Example
Rate and Energy Improvements



Example for Rate Increase



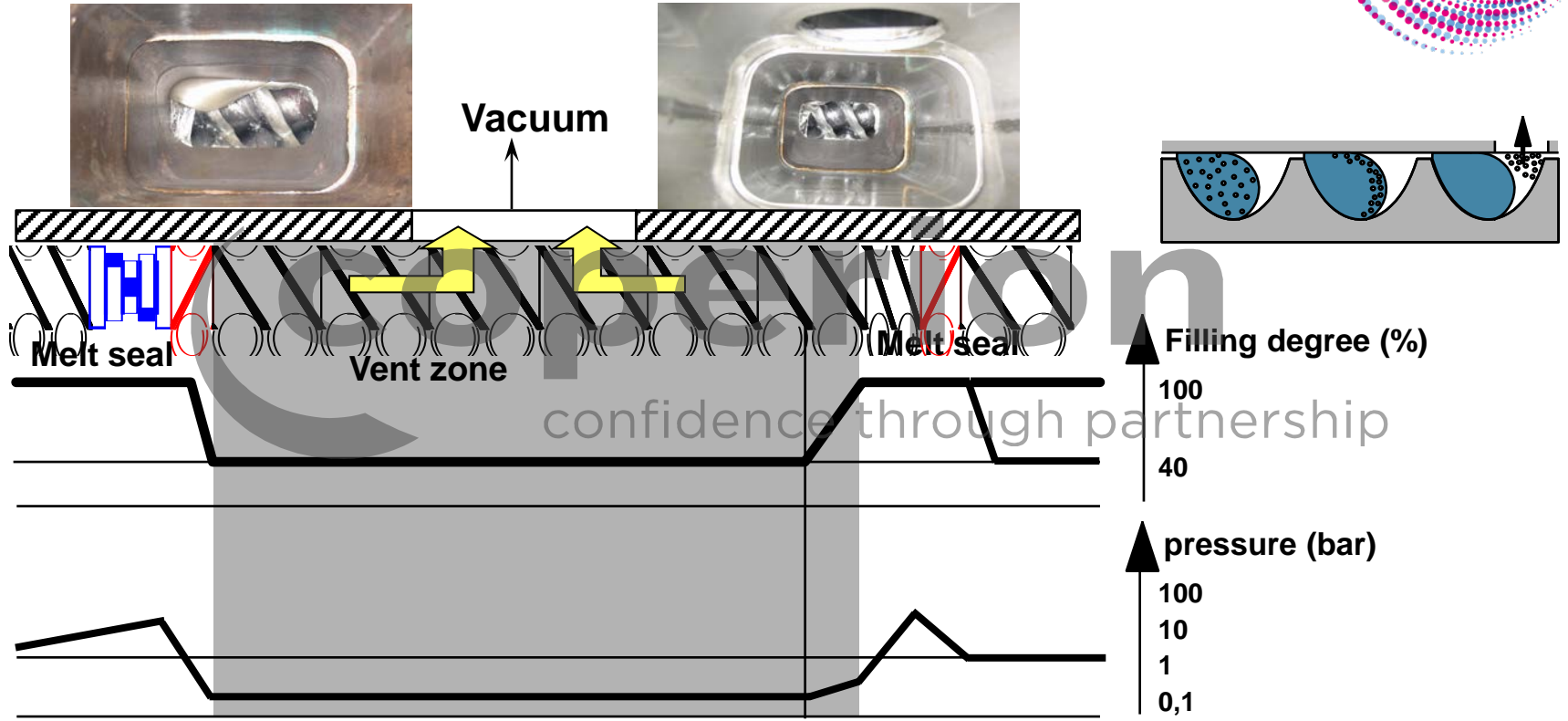
Modernization	Effect	Equipment	Gain
D_o/D_i 1.44 to 1.55	Increase of free volume	New process section	~ 15% rate / energy
Torque 11.8 to 18	Higher fill	New gearbox	~ 10% - 60% rate / energy
FET on ZS-B	Higher fill	FET side feeder	~ 10% - 100% rate
Screw technology example: involute elements	Screw efficiency	New screw	~ 15%- 100% rate / energy

»» Combination of modification can boost the benefit depending on application

Example
Degassing Improvements



Example – Degassing of melt

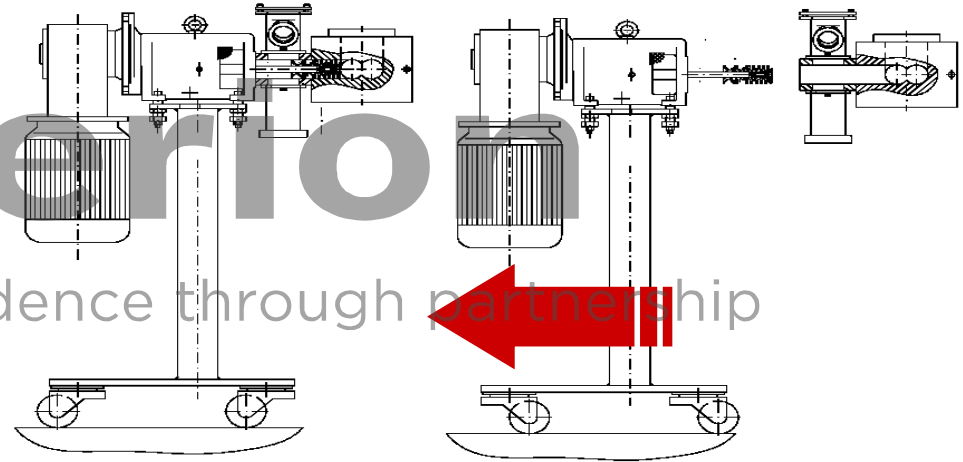
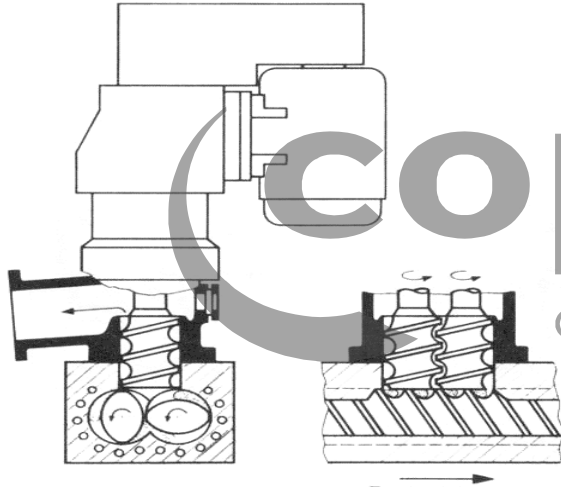




Vent Stuffers – to Allow High Degree of Fill

Previous design: DSE principle

New design: ZS-EG principle



Vertical arrangement over the ZSK

Horizontal arrangement on ZSK side

Optimized ZS-EG 58

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Vacuum port and catch
pot to bottom

Screw shafts

Sealing

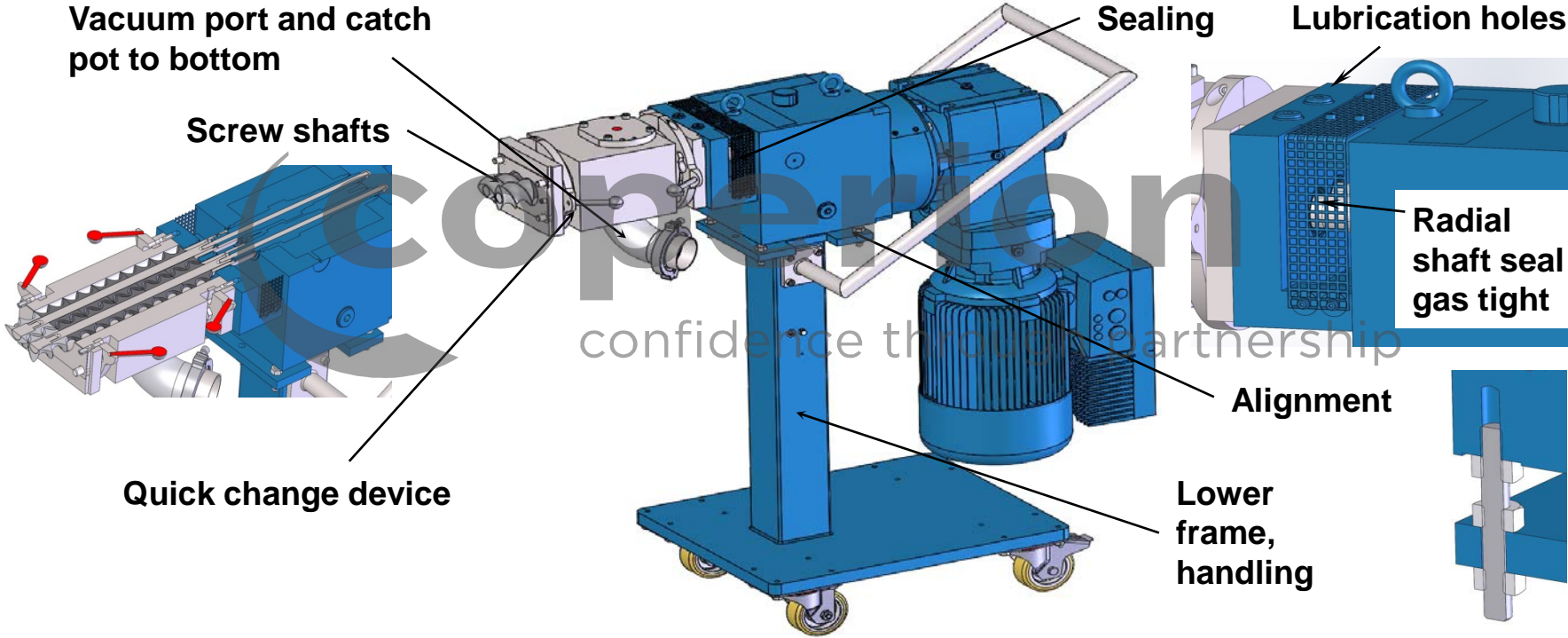
Lubrication holes

Radial
shaft seal
gas tight

Alignment

Quick change device

Lower
frame,
handling



Example
Material Improvements

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Coperion Full Service Agreements

EXTRUSION DAYS
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Safe budget planning on operational cost for extruders

Service Contract may include wear and tear parts like:

- Screw elements/shafts
- Extruder barrels
- Gear box bearings/overhauls

Example
Control System Upgrade



Why Control System Modernization



Old control systems

MODERNIZATION

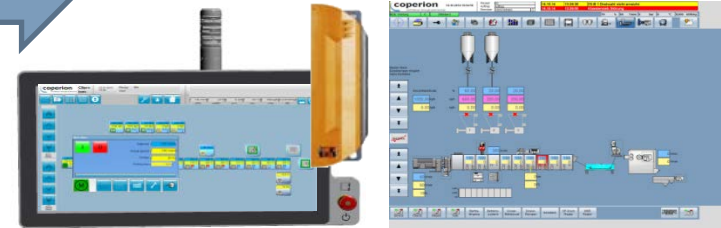
New control systems

- ›› Epc16, Epc32, ...
- ›› CScompact
- ›› Csseperate
- ›› EpcNT (old version)

- ›› CSpro basic
- ›› CSpro medium
- ›› EpcNT (new version)

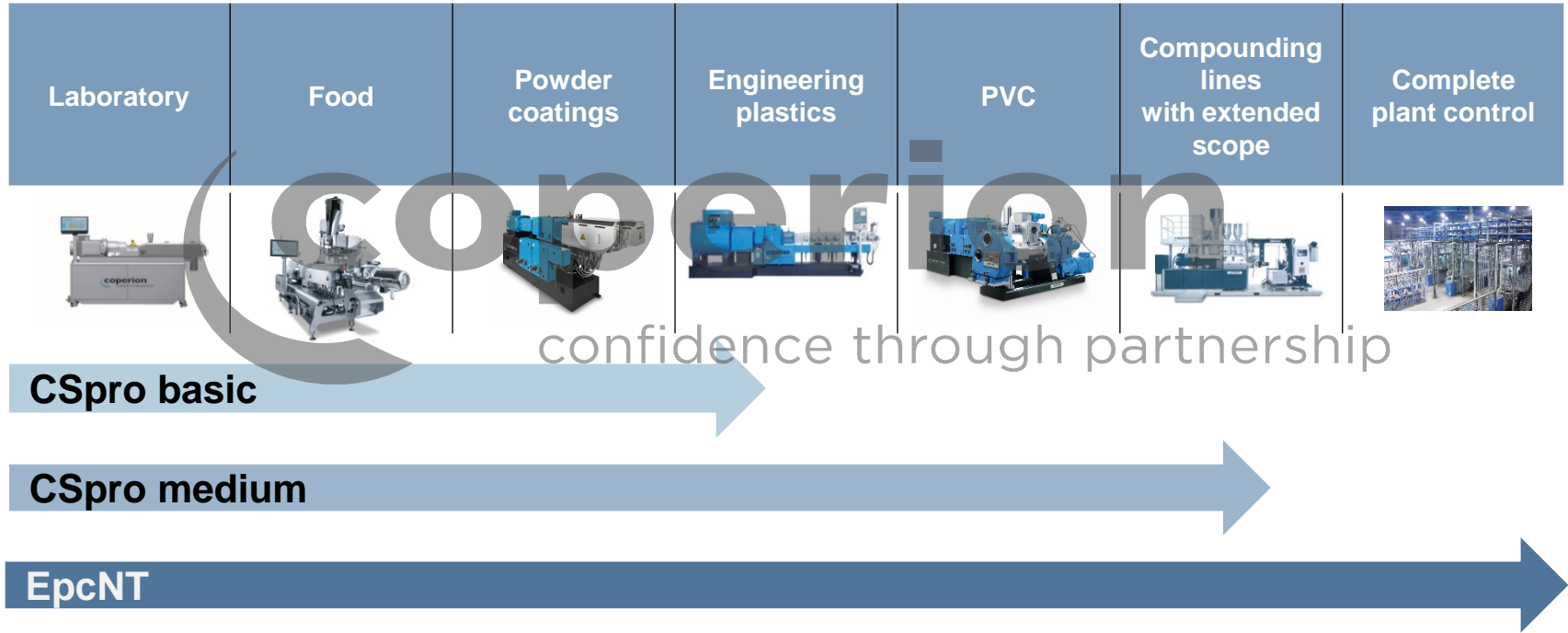


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Overview of Control Units

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Coperion ServiceBox

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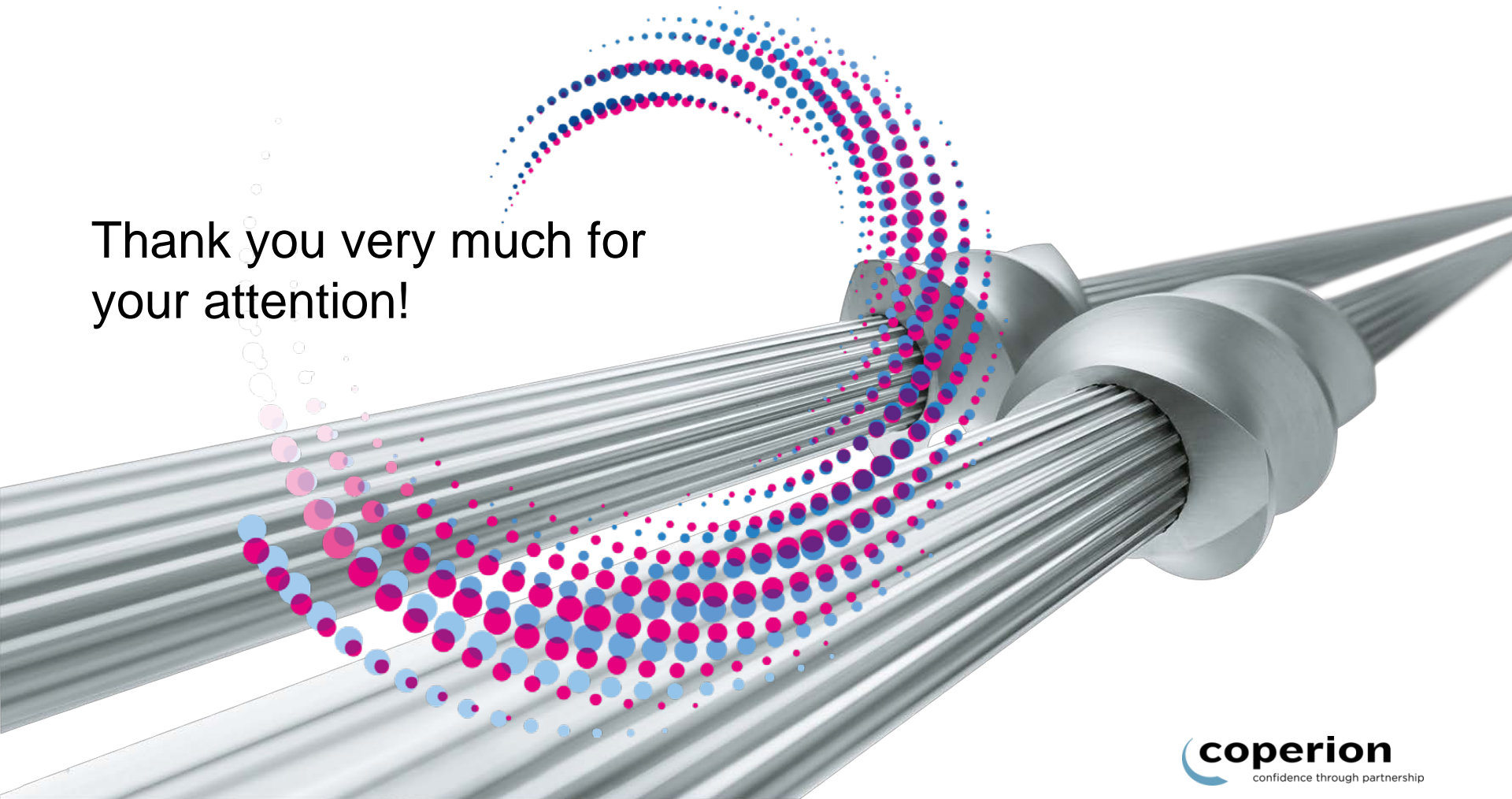


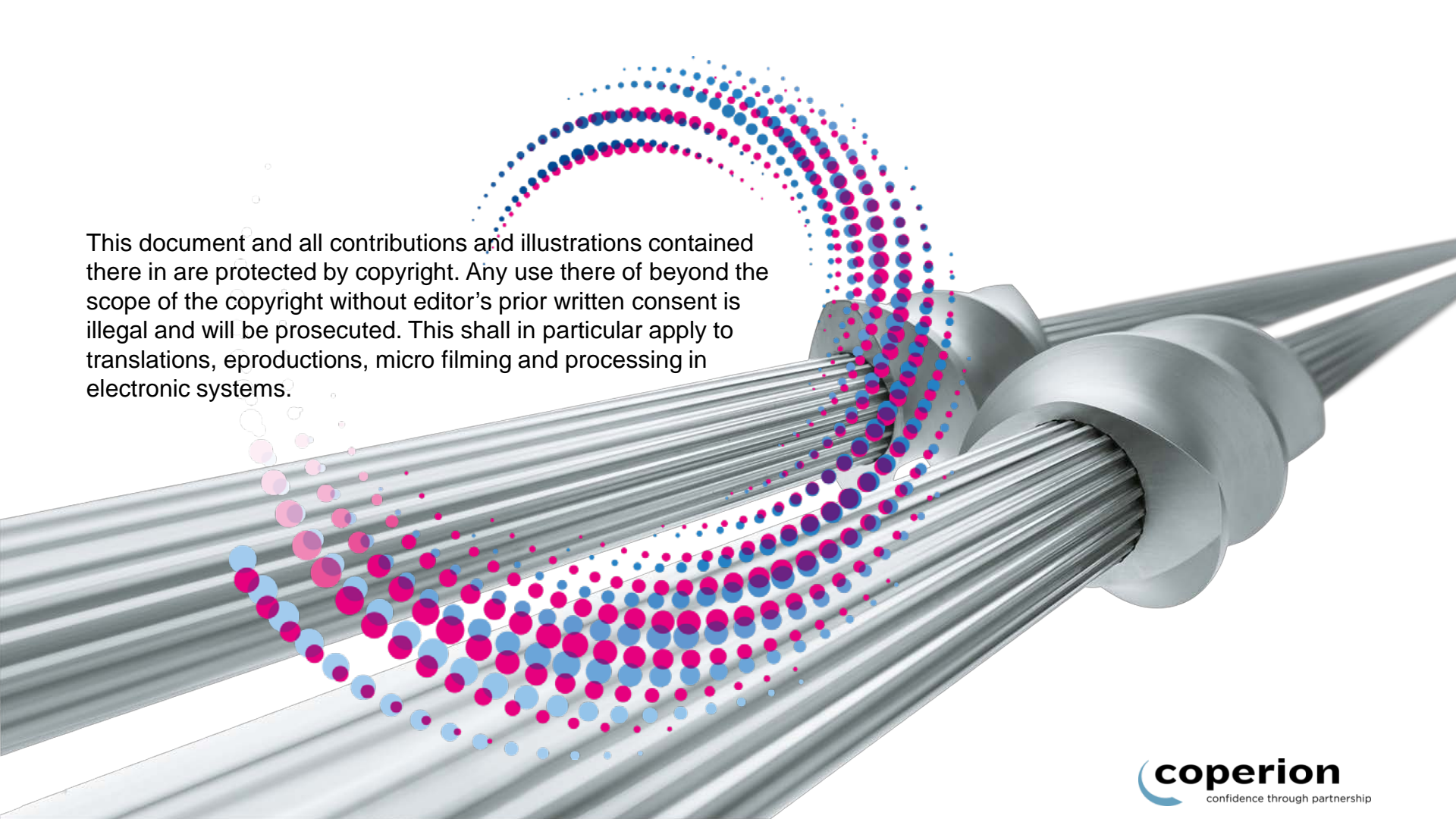
- Small size
- 11 Connection possibilities
- On/off switch
- Modern quadcore processor
- High temperature resistance



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Thank you very much for
your attention!





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