

ESTABLISHED
1873

Today's ideas –
for tomorrow's
world



MORE SUSTAINABLE. CLEANER. LIGHTER.



Since 1873, OSSBERGER has been concerned about the world's development and what can be done to make it a good one. From the beginning, the management's focus had been on innovative and environmentally friendly technologies in the field of engineering. This has made OSSBERGER to what it is today: a modern and development oriented family-owned company. With its three business units Hydropower Technology, Plastics Technology and Surface Technology it contributes to improving the quality of life all over the world.

1873

company foundation

>60

patents worldwide

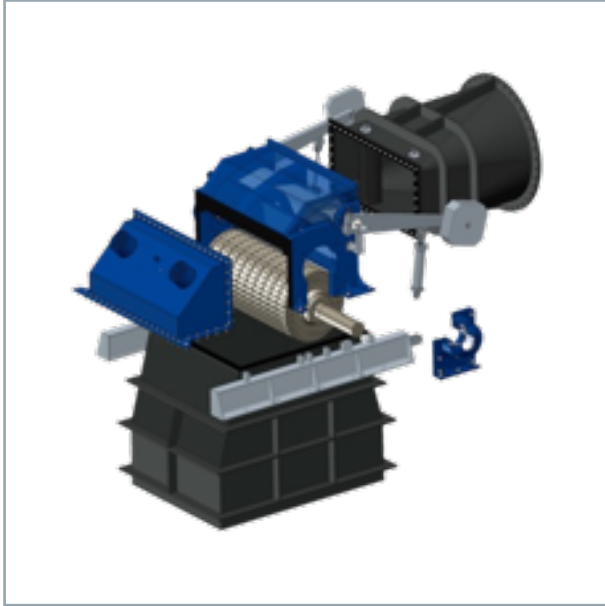
>100

countries with our
installations

>12.500

installations on every
continent

3 business units – 1 company



**HYDROPOWER
TECHNOLOGY**



**PLASTICS
TECHNOLOGY**



**SURFACE
TECHNOLOGY**



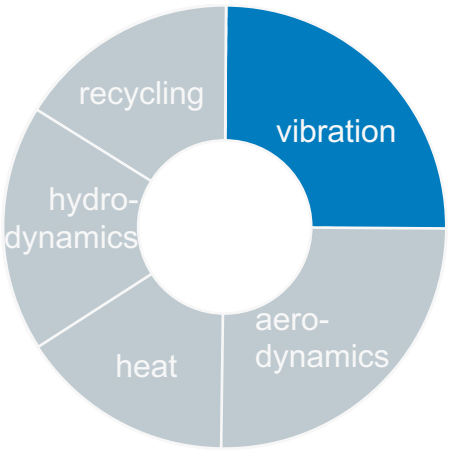
Surface Technology

cleaning technology in a smart factory

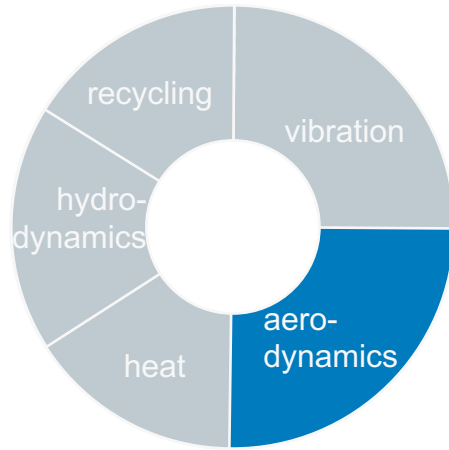
**revolutionary
cleaning**

...it is our ambition to think things in a new way. In our Surface Technology this has led to a procedure that is both efficient and simple. The OSSBERGER technology is the solution for line integrated parts cleaning on the market...

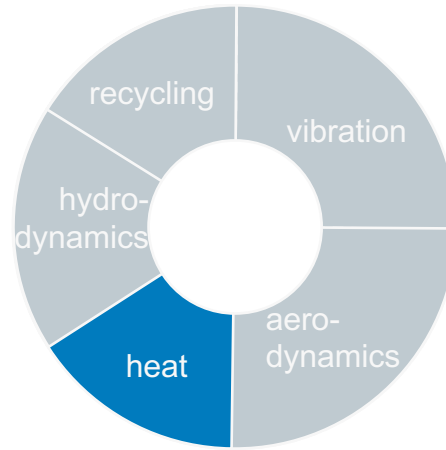
cleaning effects & mechanism



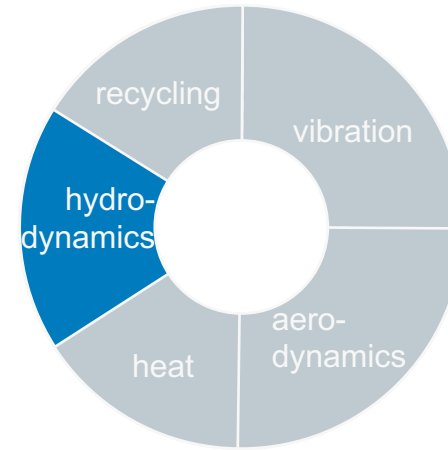
accelerates dirt off
moves part
changes contact



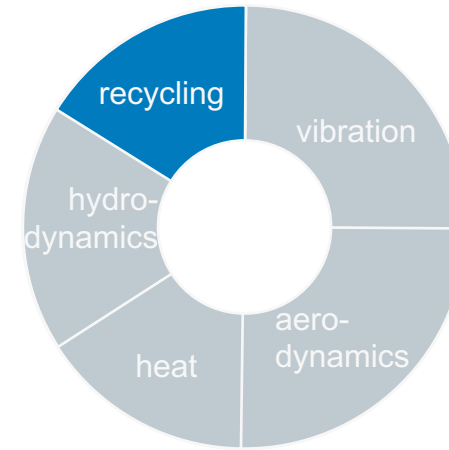
vacuum air stream
dirt evacuation
workpiece cooling



film heating
reducing viscosity
thermal energy

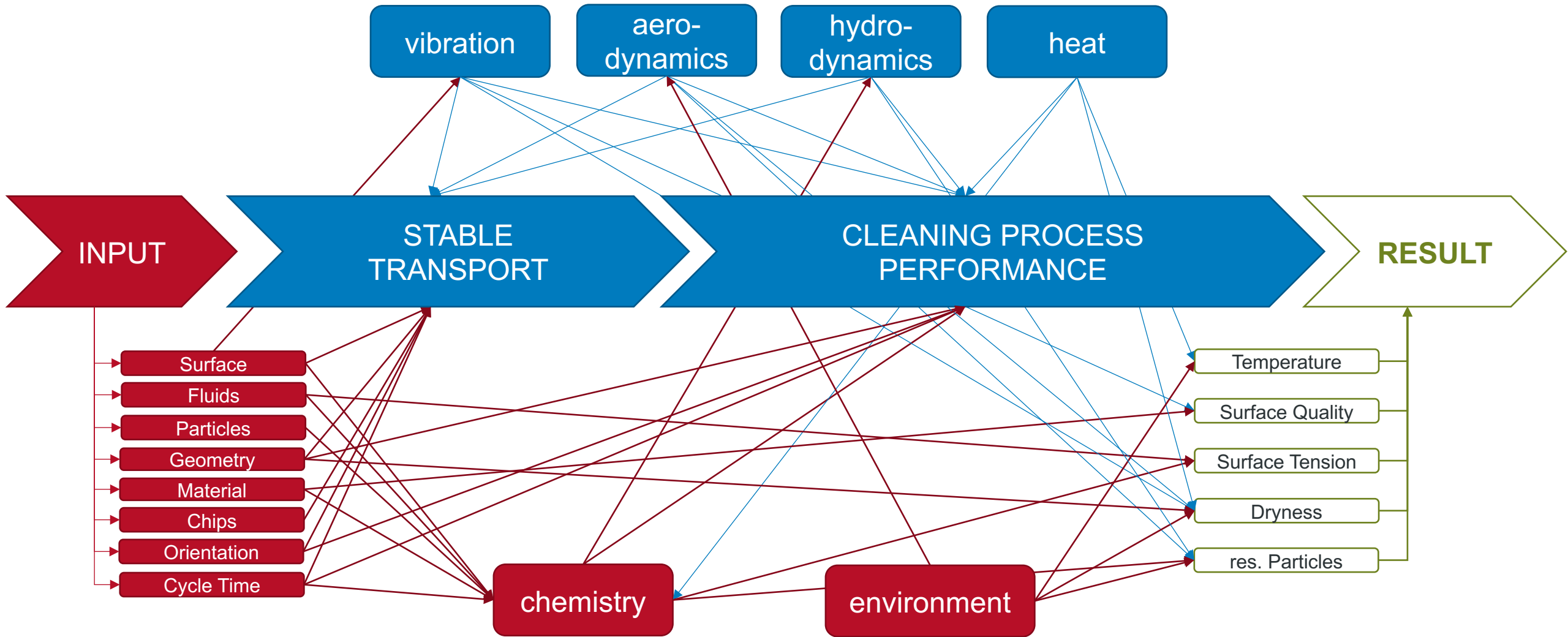


fluid mechanics
kinetic energy
chemistry



reuse of fluids
avoid bath
contamination

cleaning challenge





platform LINE
Industrial automated inline cleaning



platform FINISH
Industrial unpacking & depowdering



Platform LINE

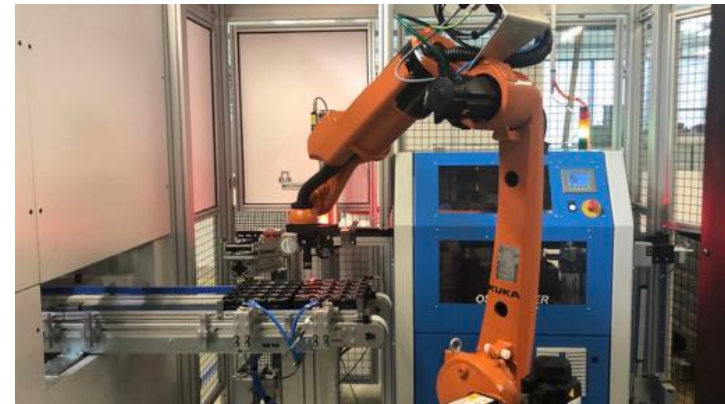
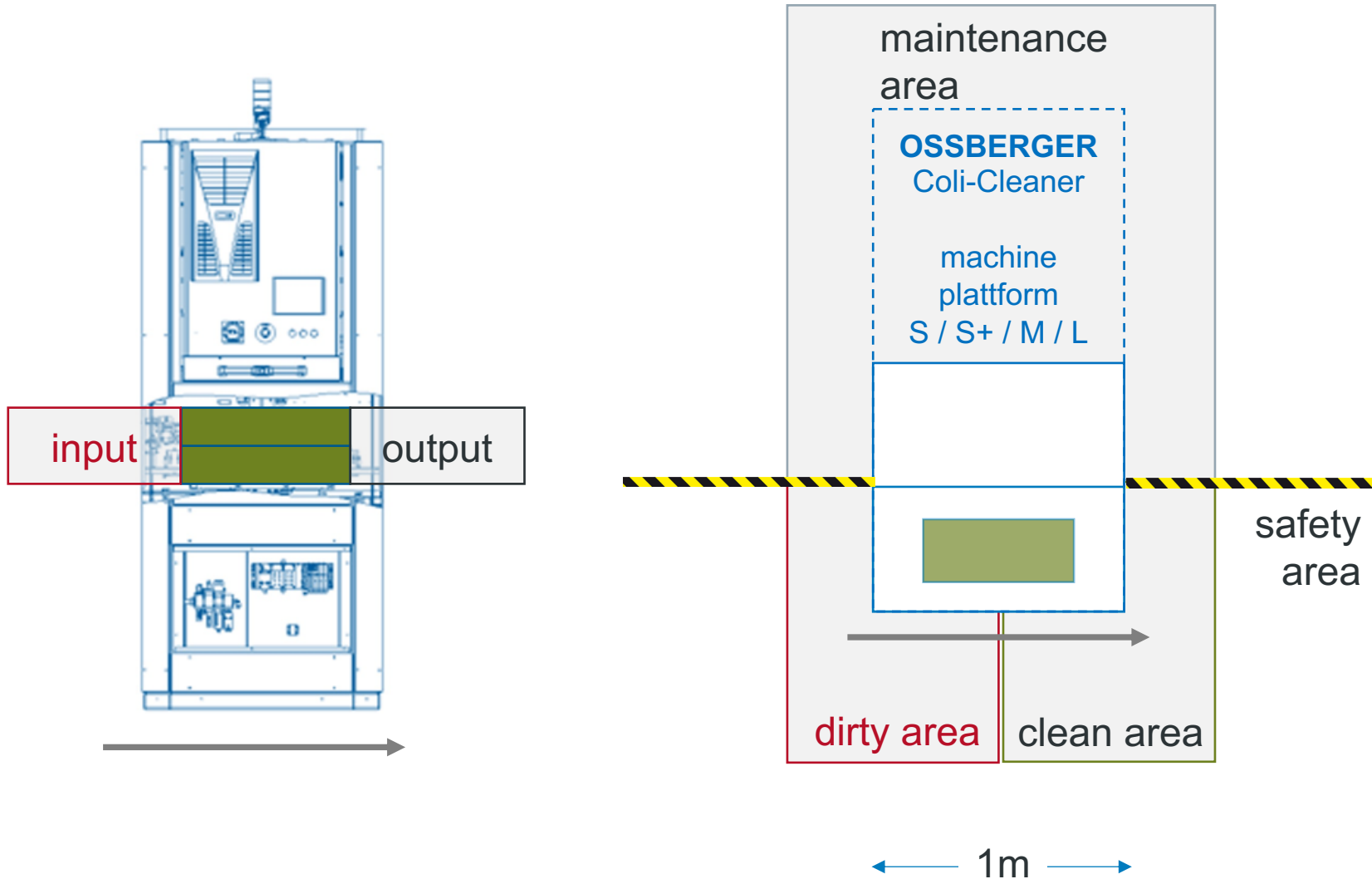
Enabling industrial manufacturing with
automated cleaning solutions

one platform – scalable cleaning



	Coli-Cleaner S	Coli-Cleaner S+	Coli-Cleaner M	Coli-Cleaner L
footprint	1,0m x 1,2m	1,0m x 1,5m	1,0m x 2,0m	1,0 x 2,0m
power	4kW	6 – 8kW	6 – 12kW	8 – 18kW
vibration	●	●	●	●
aerodynamics	●	●	●	●
heat	○	●	●	●
hydrodynamics	○	○	●	●
recycling / precleaning	●	●	○	●

design segments



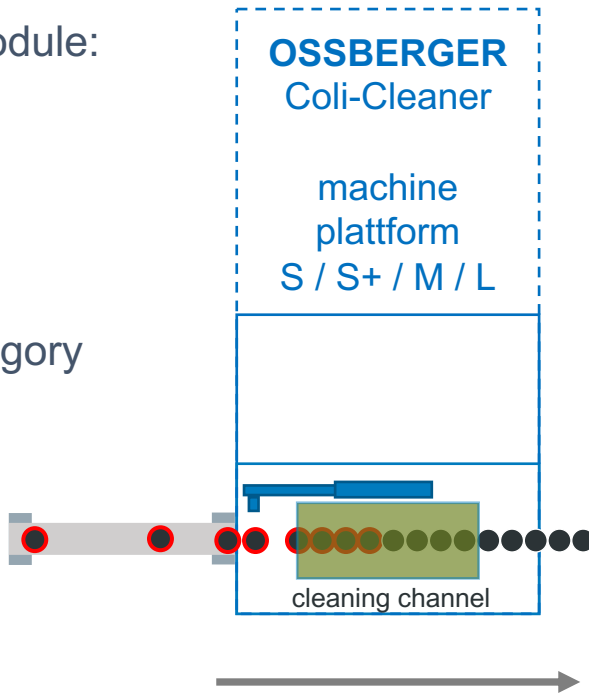
one platform - all flows

closed

actuator module:

**horizontal
workpiece
movement**

tooling category
A/B/D

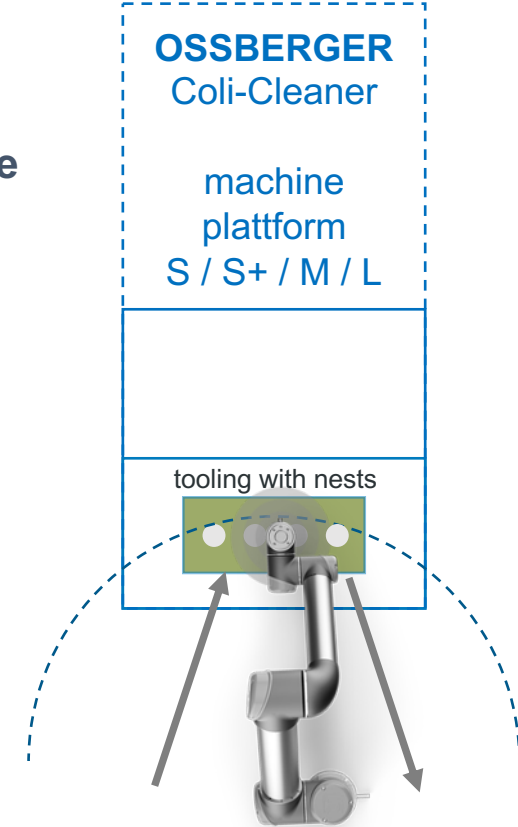


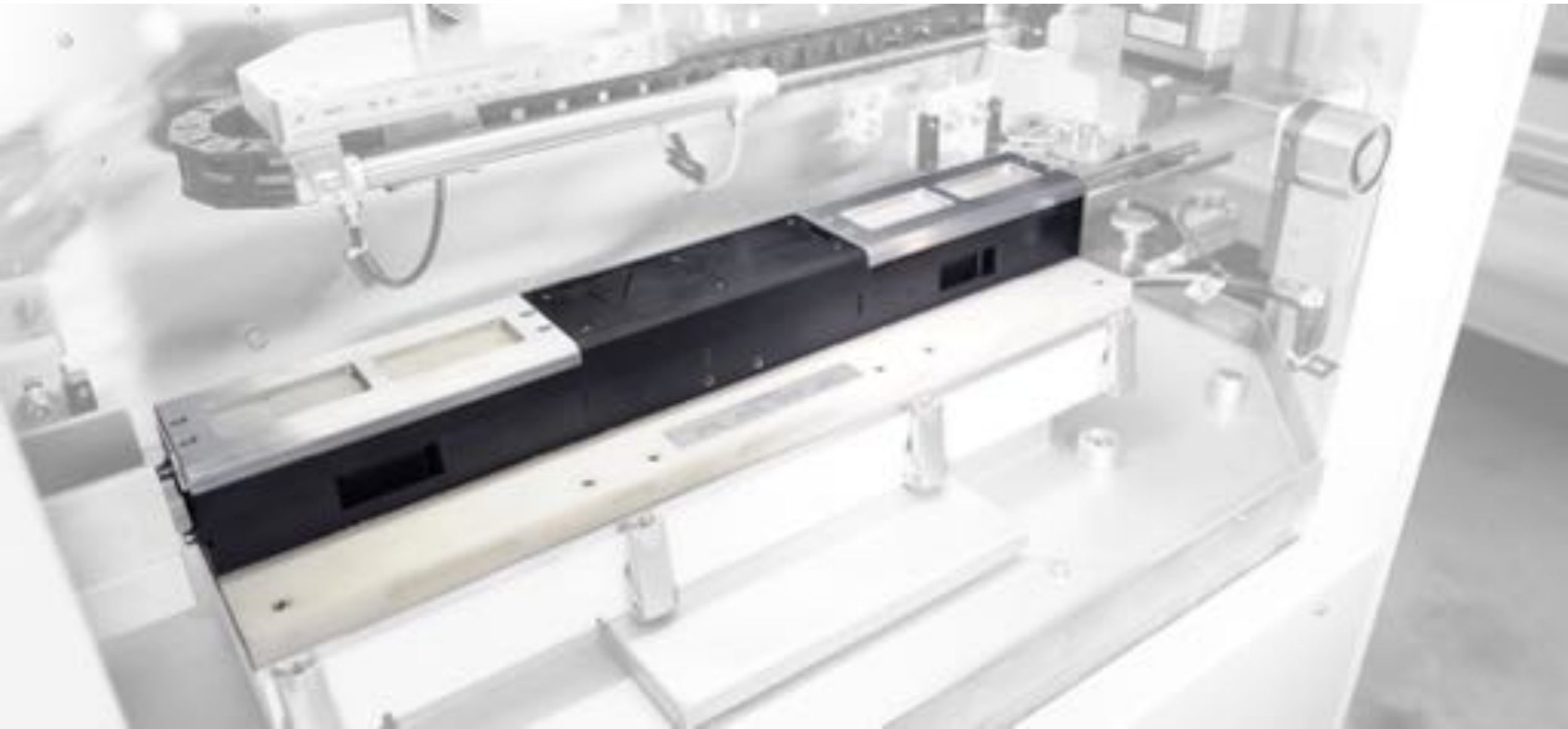
open

actuator module:

**pick & place
vertical open/close
tool lid**

tooling category
C





tooling categories

A / B

shaped channel

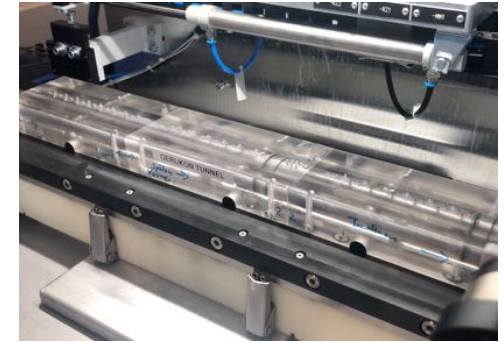
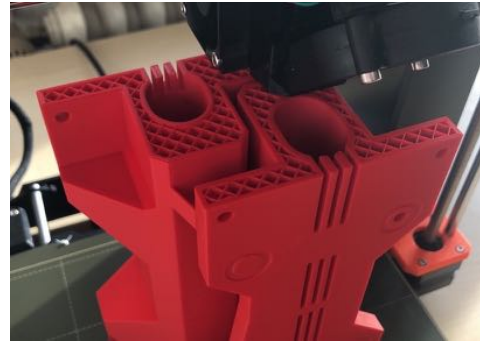
C

shaped cavity
pod & lid

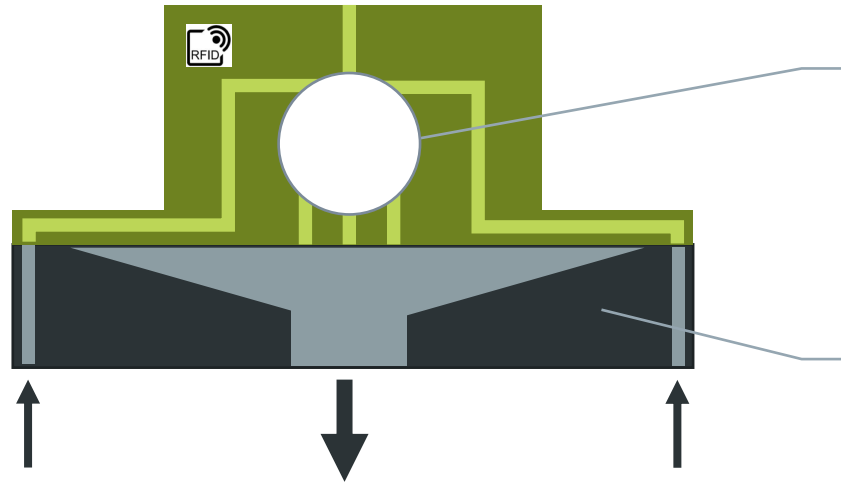
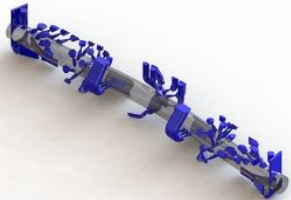
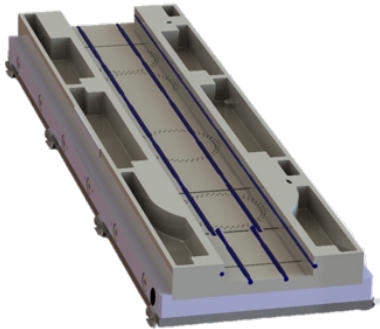
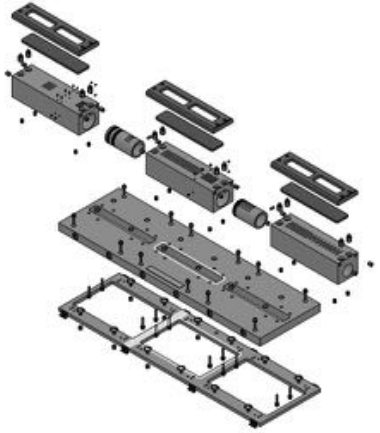
D

moving shuttles
& channel

tooling – big picture



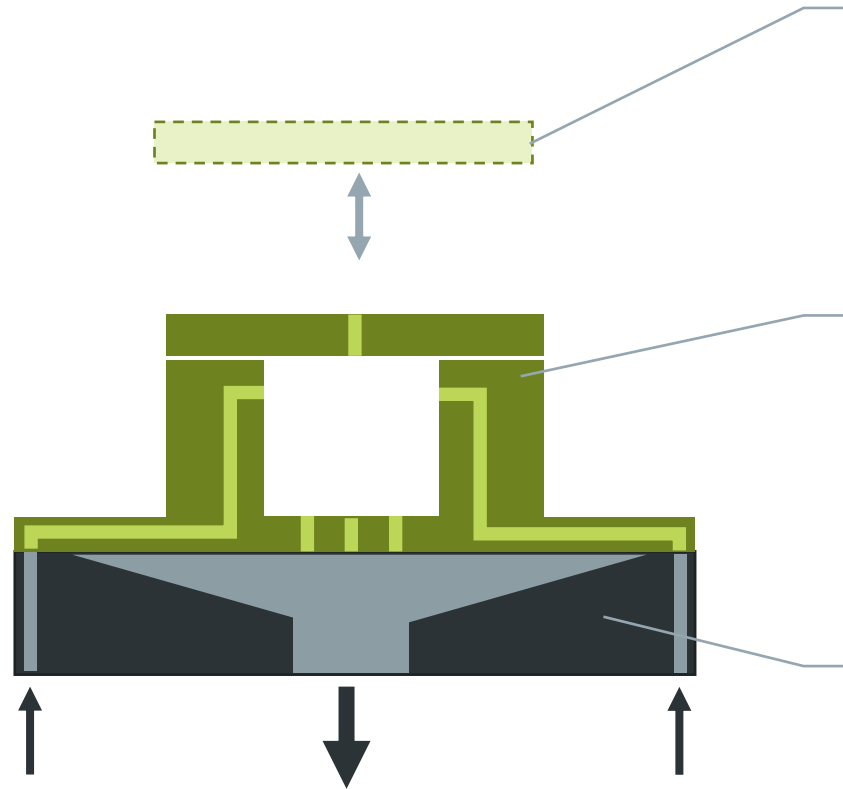
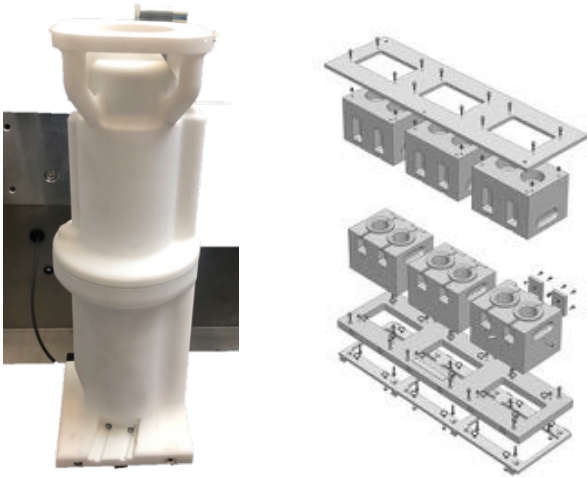
tooling A/B: channel



Channel: 3D nozzle and
RFID (optional) mounted
on machine

machine **mounting plate**
under vibration with
integrated tube system

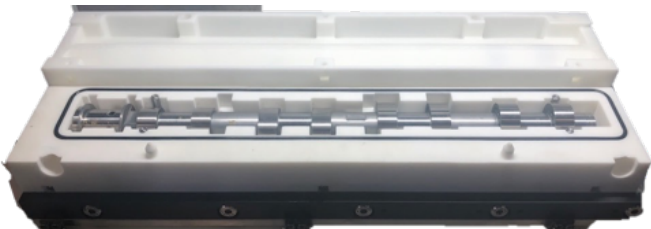
tooling C: nest & lid



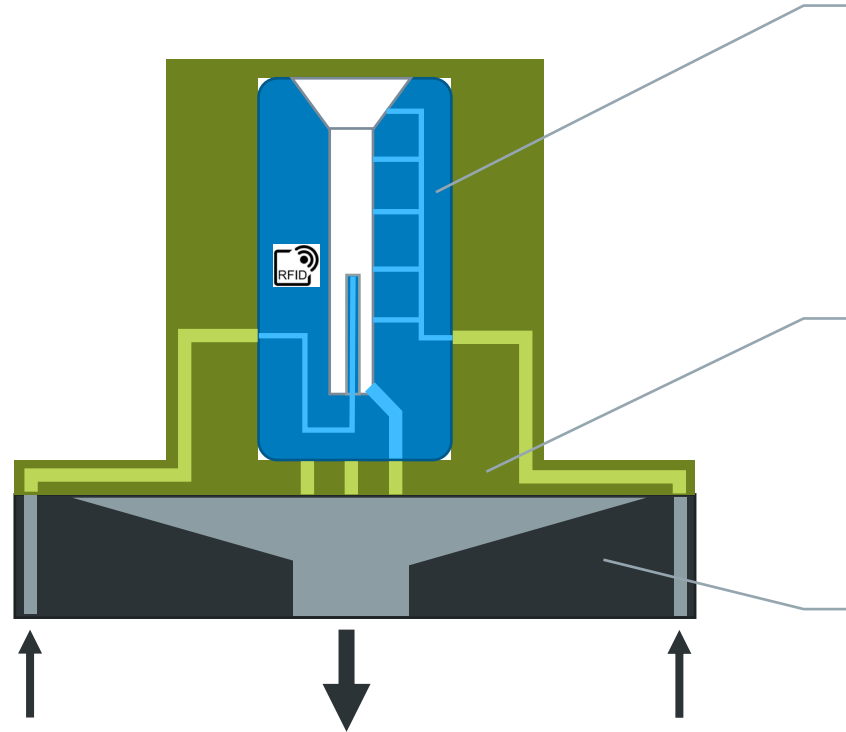
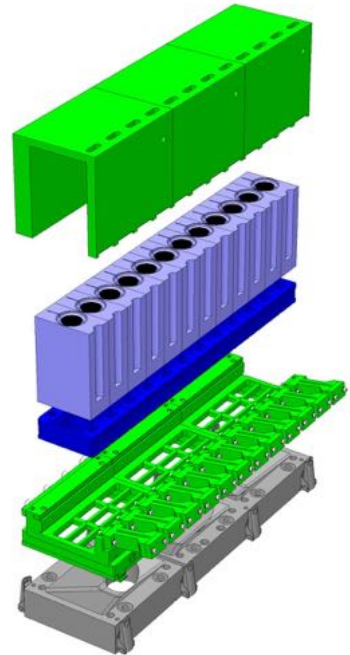
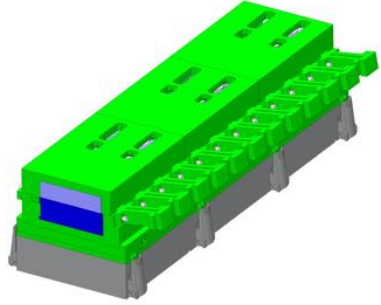
tool cover: mounted on machine, open on loading close at cleaning

nested tool with cover:
3D nozzle and RFID
(optional) mounted on machine, machine moves cover

machine **mounting plate**
under vibration with
integrated tube system



tooling D: shuttle & channel

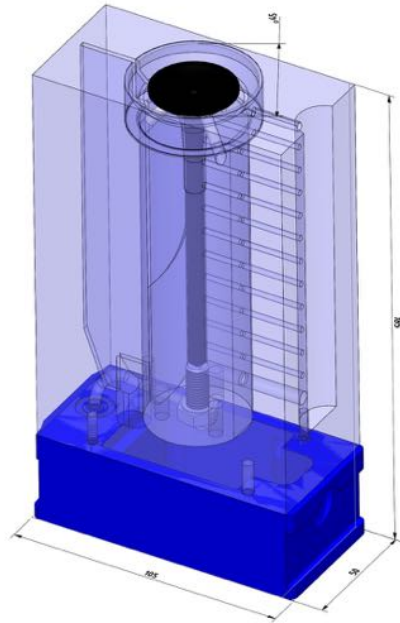


Shuttle: moving carrier, 3D nozzle and RFID (optional)

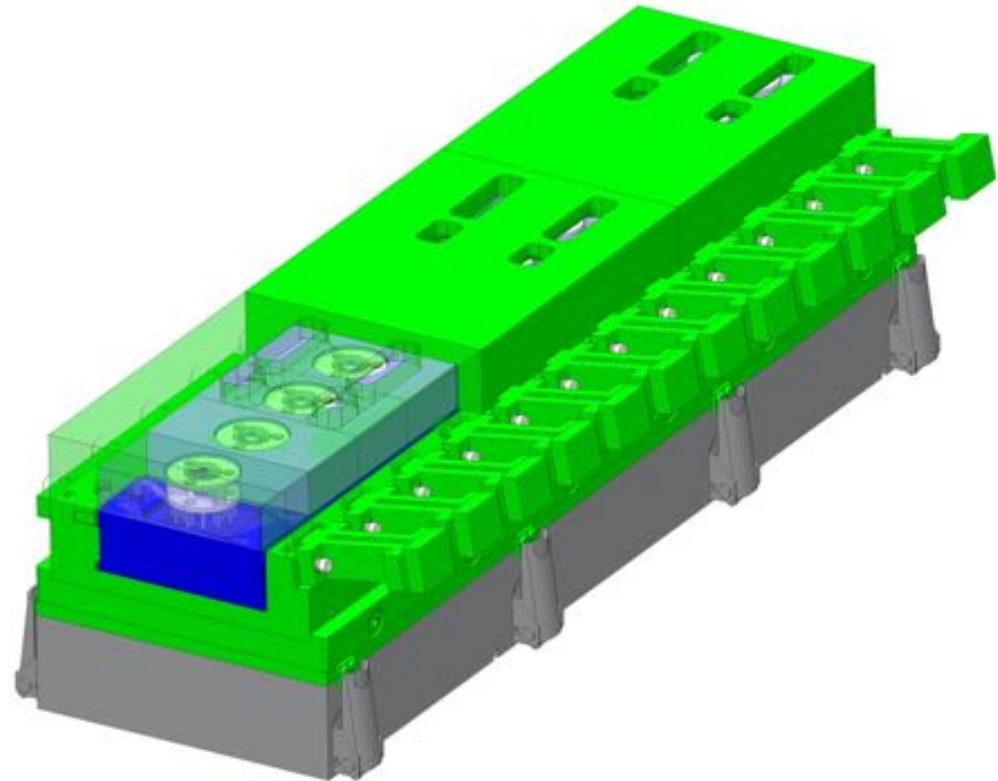
Channel: connects shuttles, integrated tube system, mounted on machine

machine **mounting plate** under vibration with integrated tube system

Examples – open loop



single shuttle with workpiece



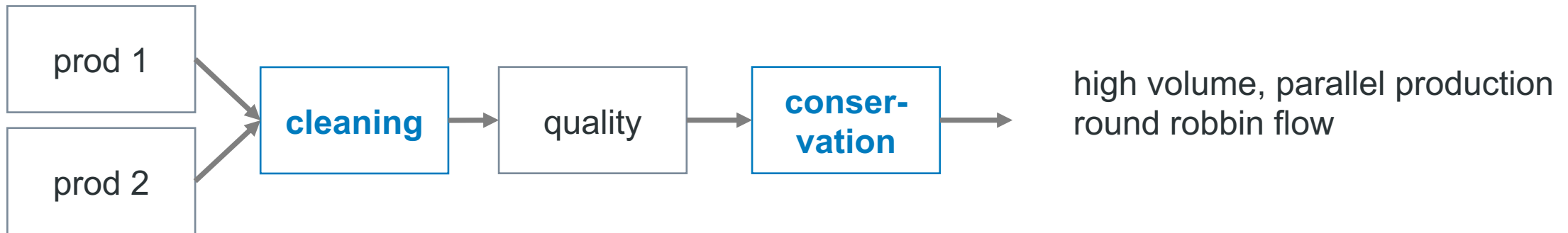
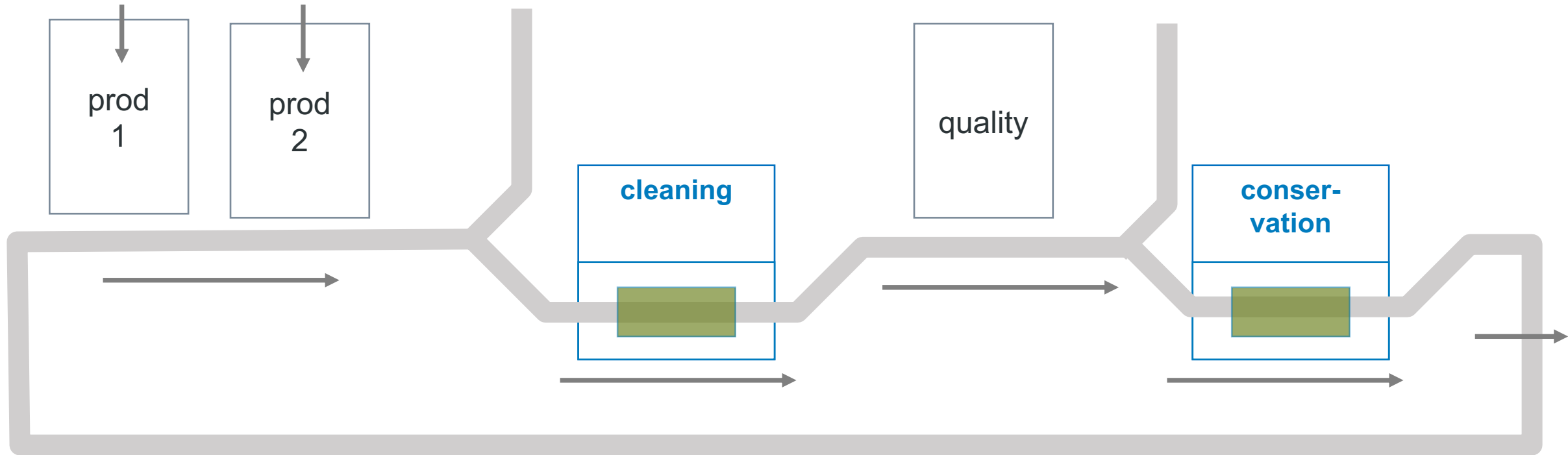
shuttle system with workpieces

tooling overview

category	automation	cycle / throughput	workpiece variants	tooling costs*
A / B channel	horizontal workpiece mover	3,0 seconds 6,0 meter / minute	dual channel	3k – 6k
C cavities	vertical open/close	10,0 seconds	multiple shaped cavities	5k – 10k
D shuttles	horizontal shuttle mover	3,0 seconds	shuttles with RFID tag	7k – 15k

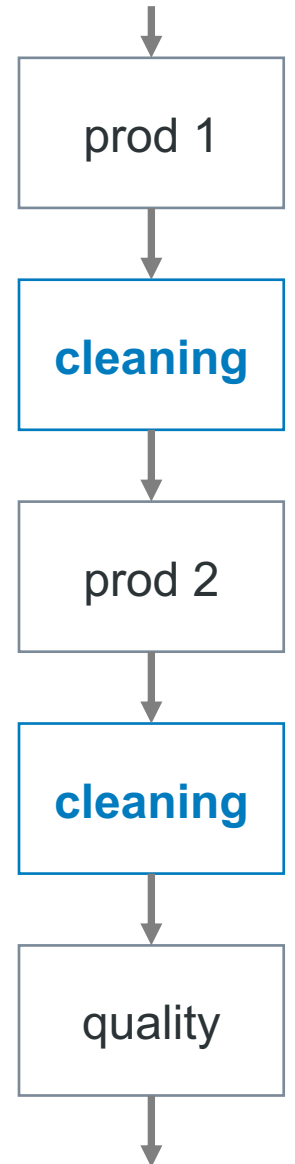
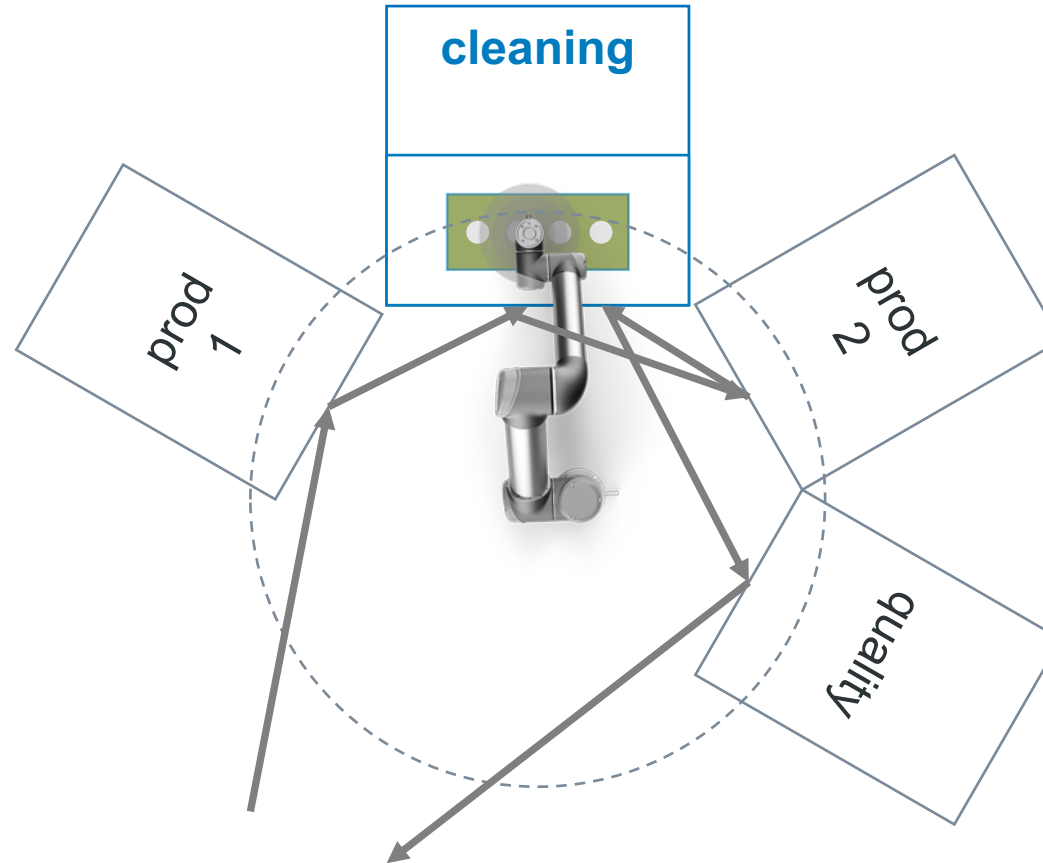
*the price varies according to complexity and quantity

line production flow



cell production flow

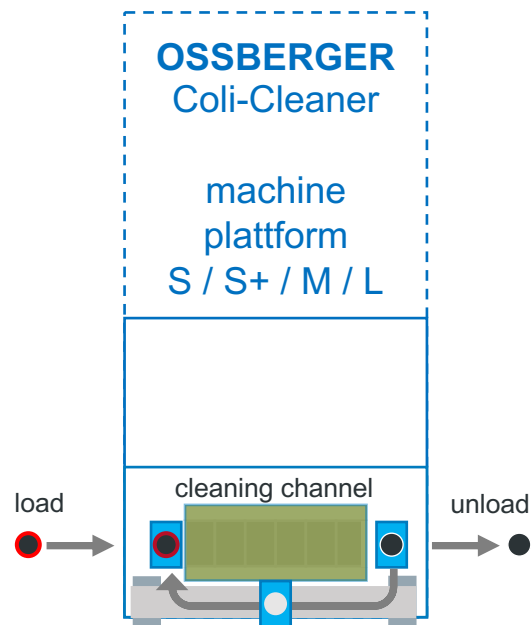
- pick & place workpiece flow
- 1 machine, clean twice



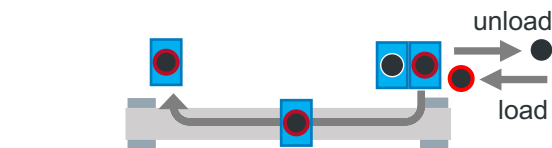
open/closed shuttle systems

closed loop

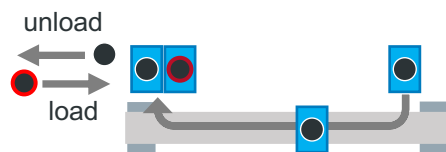
shuttles stay in the machine



split un-/loading position



right paired un-/loading



left paired un-/loading

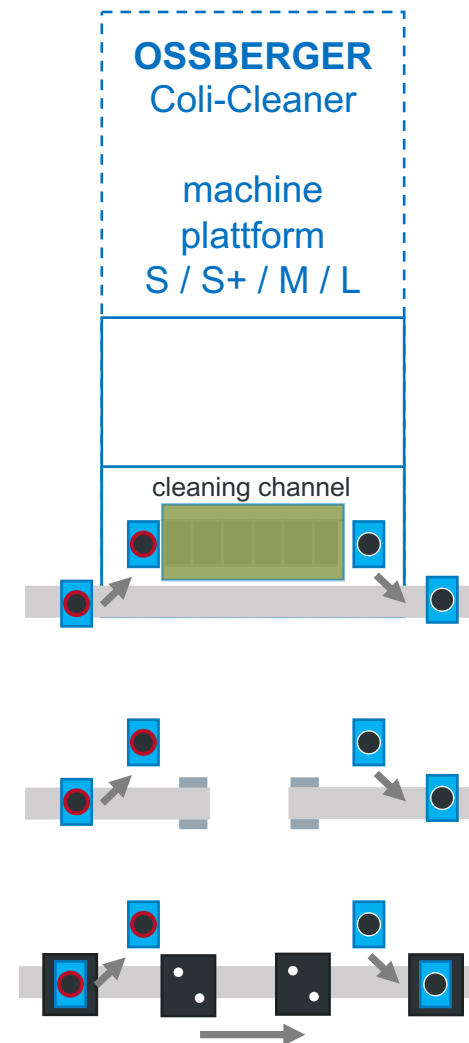
open loop

shuttles are used for production wide transport, too

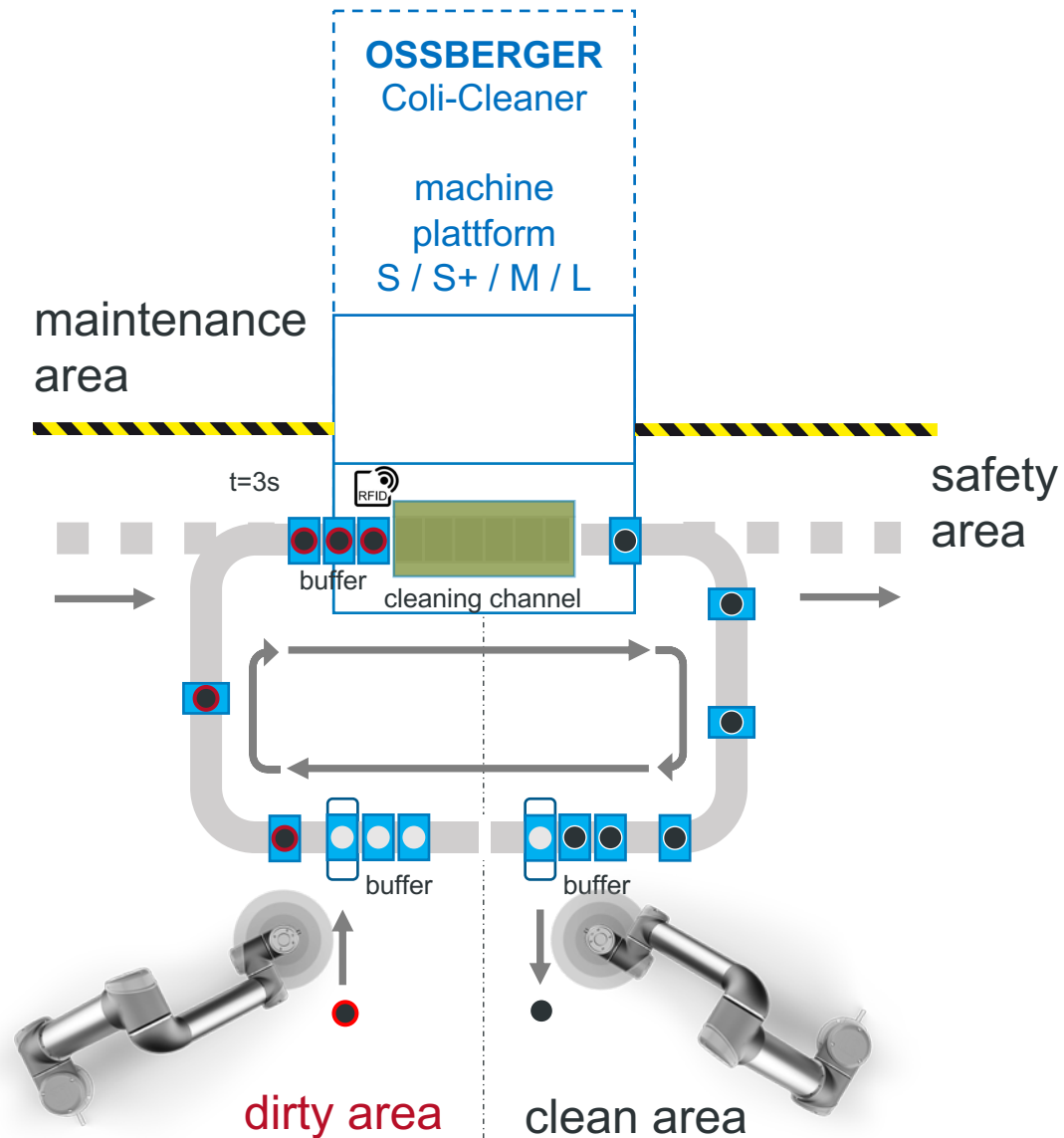
bypass conveyer

split conveyer

backpack system



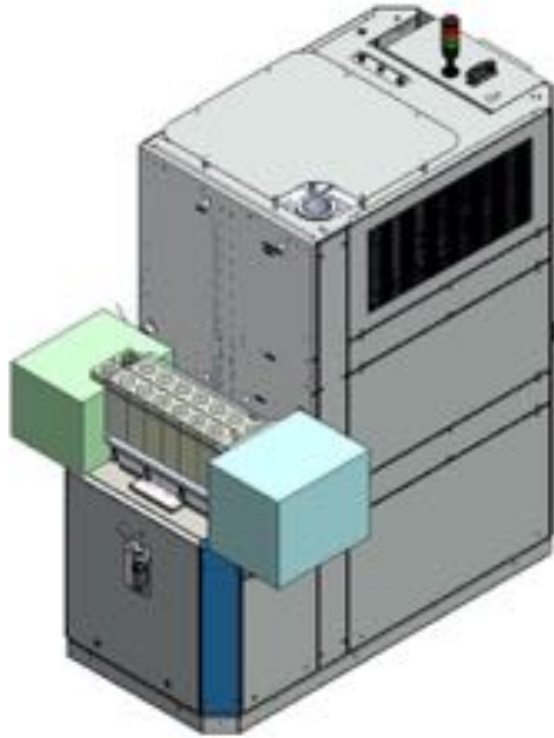
smart factory flow



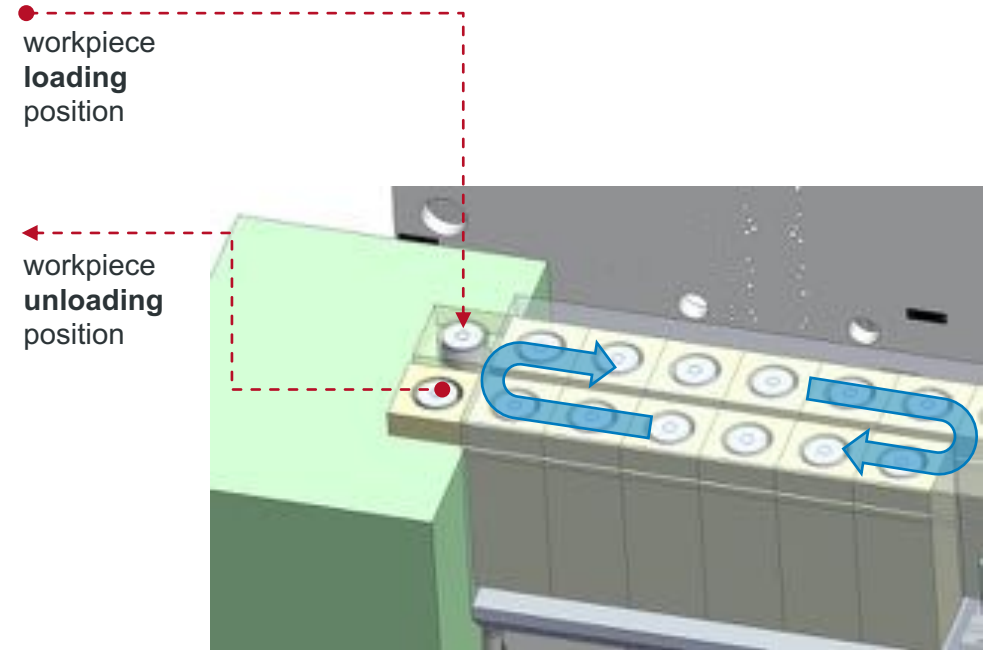
- single piece flow
- mixed geometries – one process
- material loops

- workpiece
- empty shuttle
- with workpiece & dirt
- with clean workpiece
- (un-)loading station
- flow of material
- RFID Reader
- transfer system

Examples – closed loop



Machine equipped with shuttle system



Closed loop shuttle system with workpieces

Overview of advantages

Standard cleaning machine

- 1-2 m² of floor space in preferred direction – all have 1m width
- Machine scalable according to cleaning process requirements
- Cleaning processes can be combined

Shuttle Channel

- Shuttles are clustered in different sizes
- 12, 6 or 3 cleaning stages
- 100% of time vibration and flow, no loss of cleaning time

shuttle

- Nozzle geometry and workpiece/information carrier
- Integrated 13.56 MHz ISO 15693, RFID transponder
- No moving cleaning elements (e.g. lances)
- Wear inserts on workpiece contact surfaces
- Ability to move as a backpack on a standard carrier system

handling

- Suitable for short cycle times of approx. 3 seconds
- RFID reader can be integrated

Higher availability

- Shuttle/lance exchange during operation (faults, workpiece change)
- failover or production ramp-up: manual un-/loading

flexibility

- Locking in/out shuttles (e.g. exotics) during operation
- Robust against malfunctions (e.g. machine failure)
- Handling does not have to be adapted to workpiece geometry

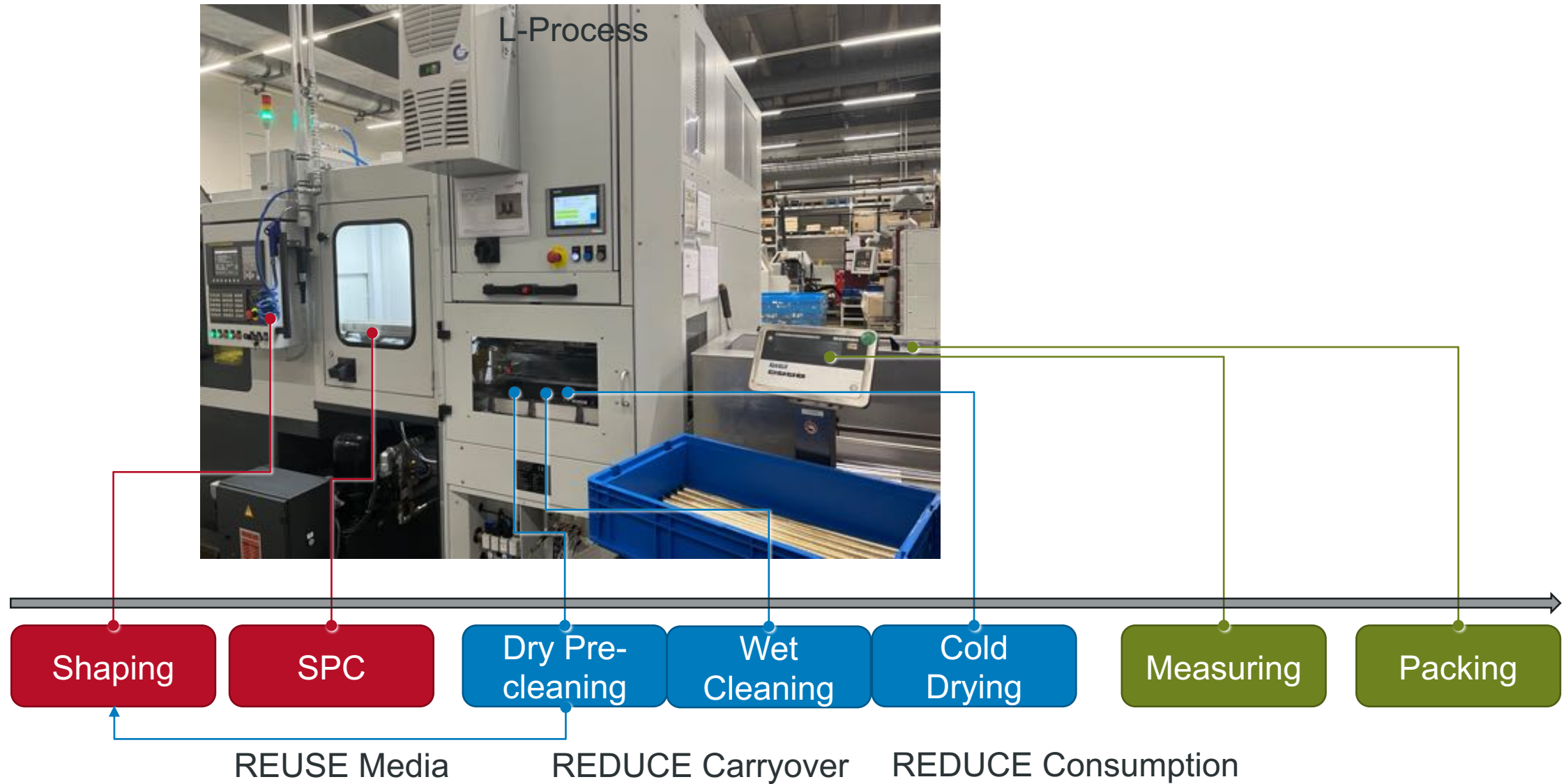
Industry 4.0 – smart factory

- Mixed shuttles - batch size 1 - workpiece variants
Shuttles can be equipped with RFID
- "dry clean" e.g. temporarily deactivated wet zone
- "clean again" with changed parameters (e.g. extended cleaning time)

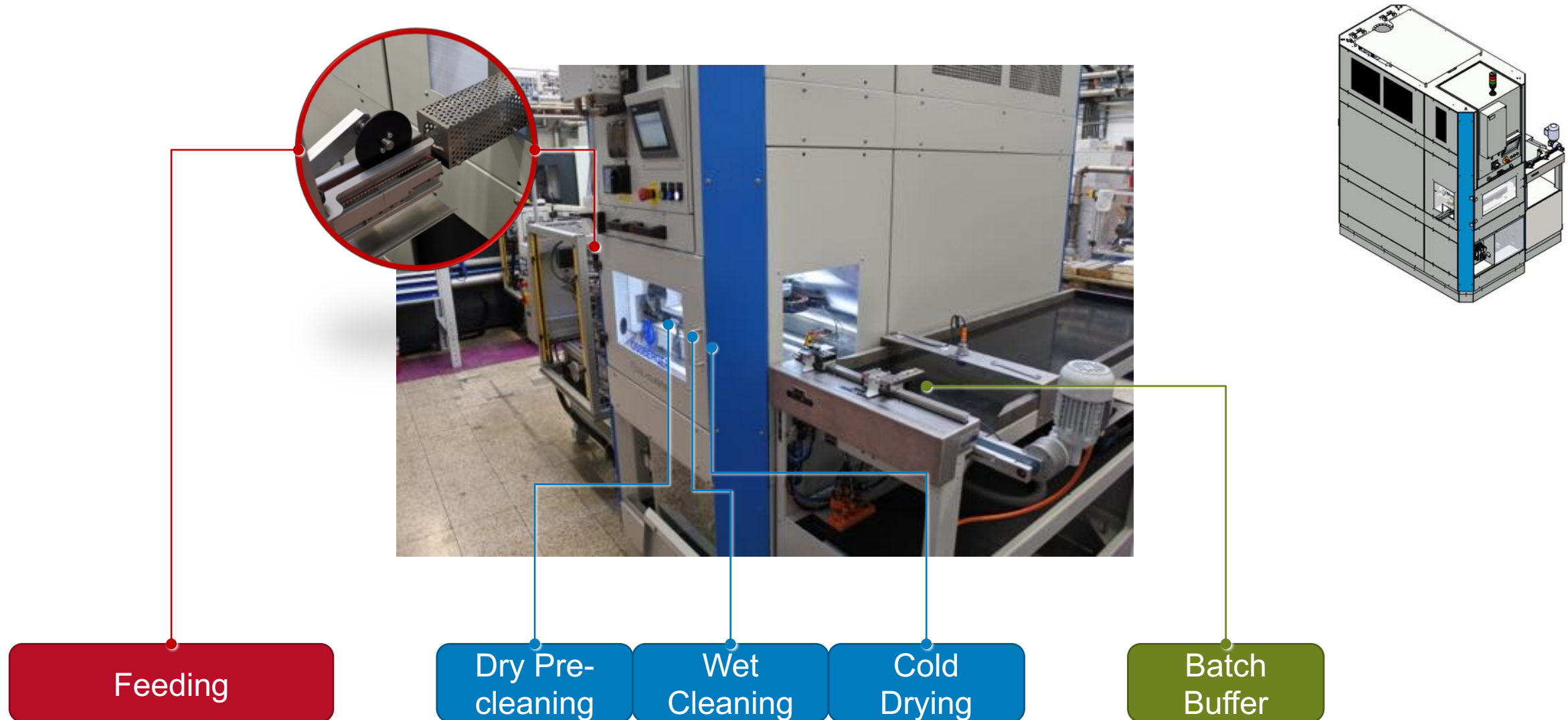
process reliability

- Nozzle flow test in first shuttle station
- Monitoring of production/storage times
- no workpiece surface contact

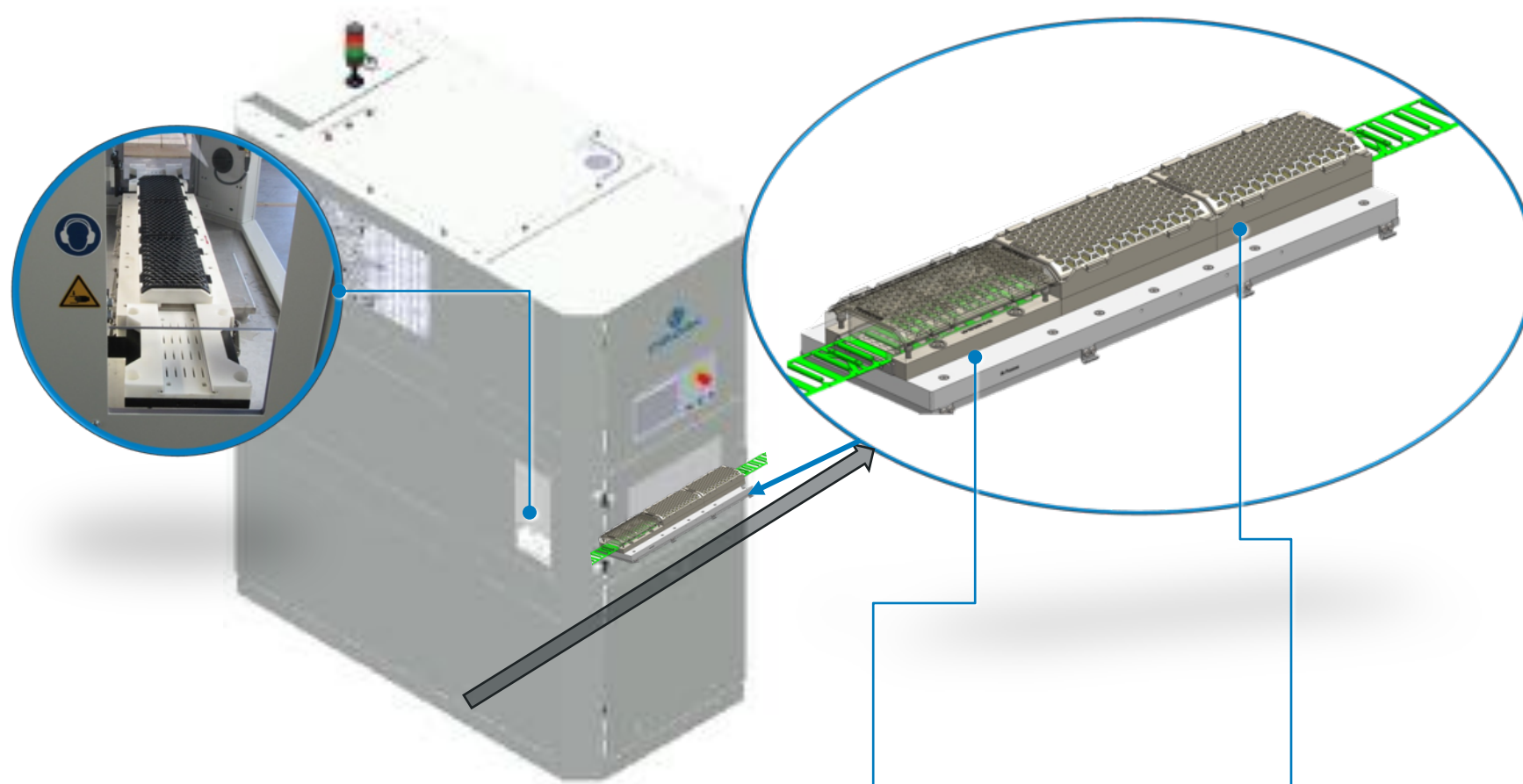
Use case: Loose Piece Flow



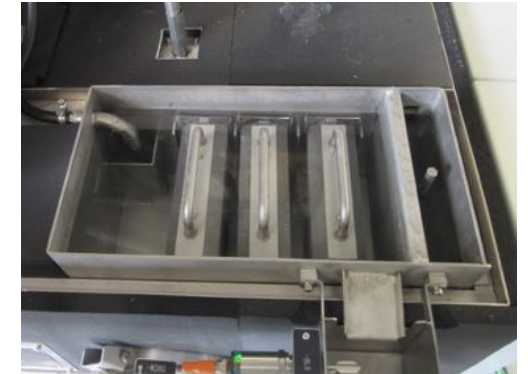
Use case: Cellular cleaning



Use case: Continuous belt



Integrated Option:
Coalescence separator



Punching & Shaping

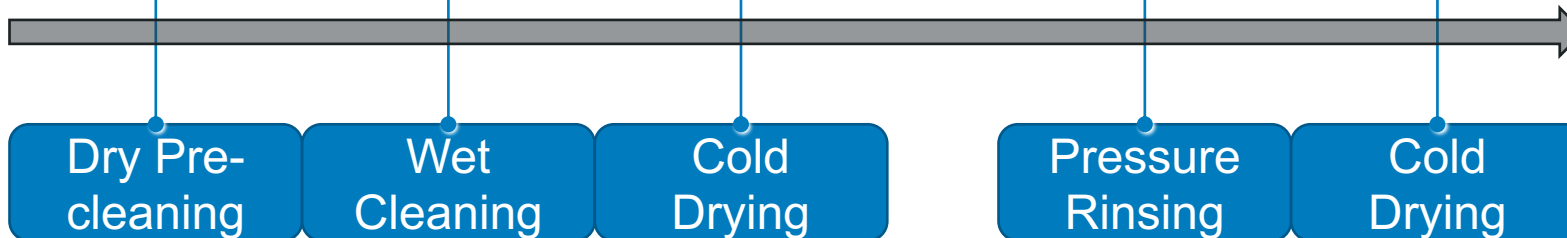
Wet
Cleaning

Cold Drying

Measuring

Overmolding

Use case: 2 Machines



dry pre-cleaning

- Recycling of Media
- Reducing bath contamination

cold drying after cleaning

- Reuse cleanser
- Reducing media carryover
- Increase bath life

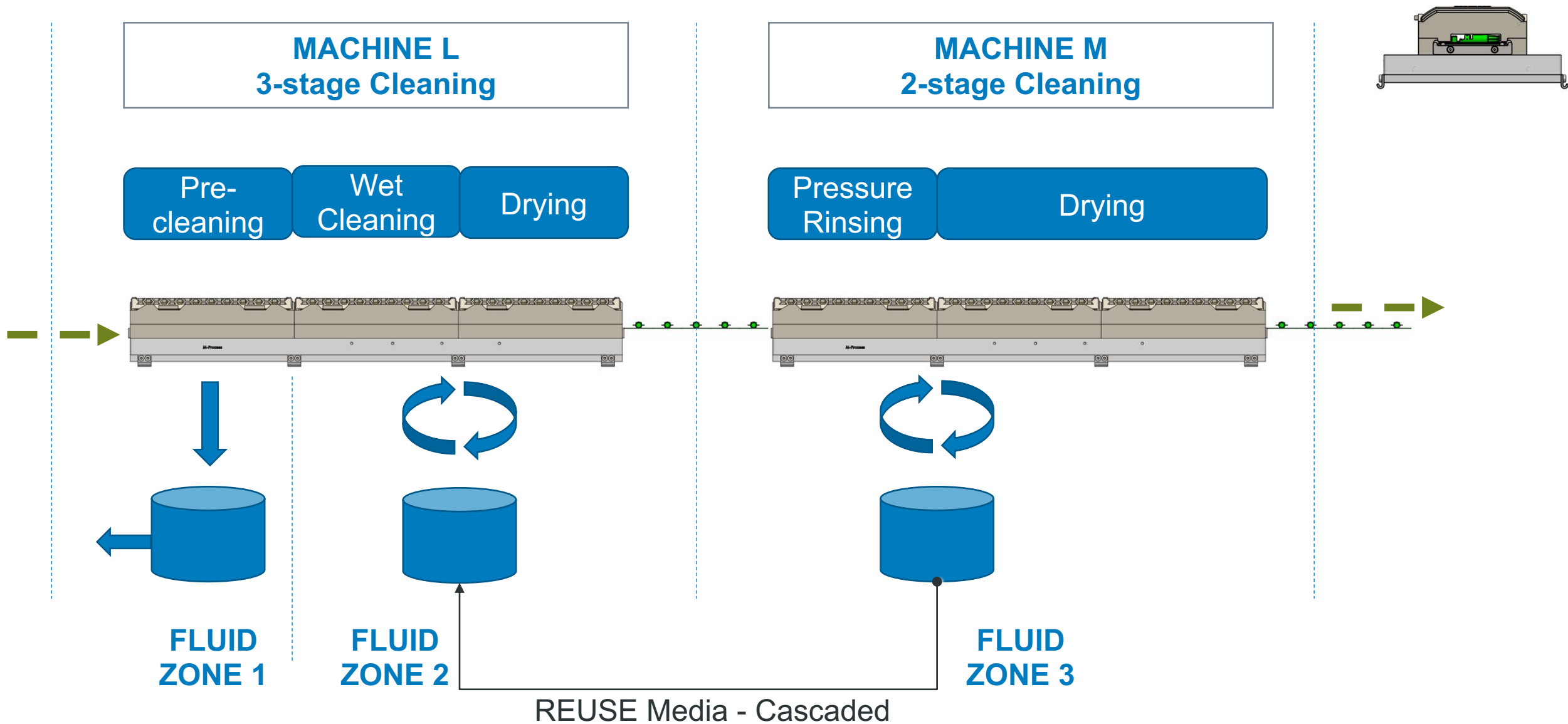
high efficiency

- 3D printed tools / nozzles
- lossless hydrodynamics
- low energy consumption
- avoid compressed air

high reproducibility

- Piece by piece
- Stable Cleaning Process

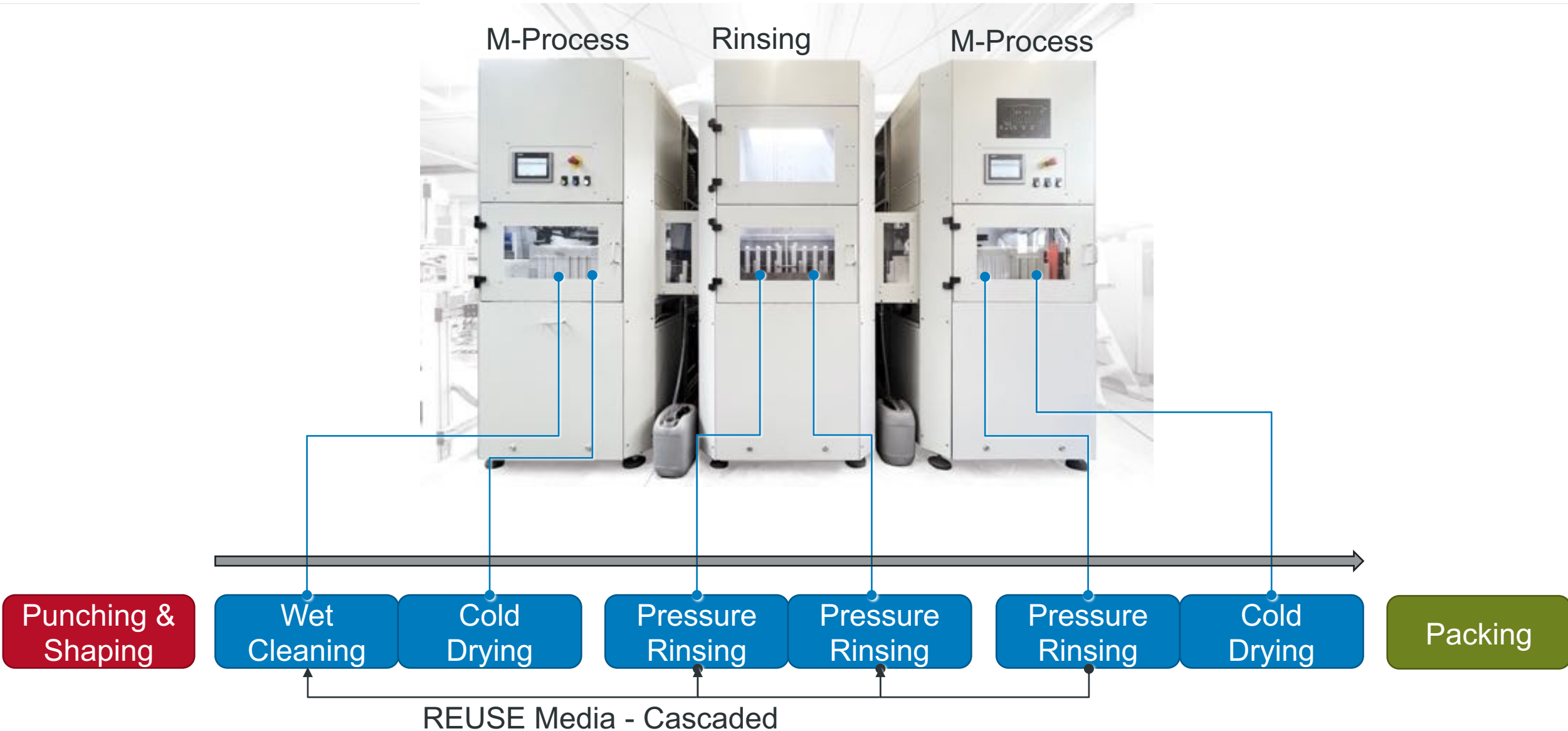
Use case: 2 Machines



Benchmark: 2 Machines

OSSBERGER						OSSBERGER Advantages:
	fluid free Aerodynamic cold air suction oil reuse or recycling High bath service lifetime	High nozzle performance Pressure flooding Low surface distance Functional surface area cleaning	Aerodynamic cold air suction. Reuse of cleaner fluid No heat, no evaporation Low Fluid carryover	High nozzle performance Pressure flooding, Surface covering Low surface distance Functional surface area cleaning	Aerodynamics with vibration and cold air suction. Reuse of rinsing fluid No heat, no evaporation, no spots	
	Pre-cleaning	Wet Cleaning	Drying	Pressure Rinsing	Drying	
OTHER	Fluid washing Air blow Contaminated oil High waste disposal costs	High surface distance Ineffective spray washing Large Tank, High space & energy consumption	expensive pressure blow nozzles Use of high energy evaporation Fluid carryover, rinse water contamination	High surface distance Ineffective spray washing No flooding, no entire surface wetting	Hot Air Use evaporation	High CLEANING efficiency High REPRODUCIBILITY Low COSTS Low ENERGY consumption Low SPACE Consumption MODULARITY in Machine & Tooling Short setup time, FAST workpiece CHANGE

Use case: 3 Machines



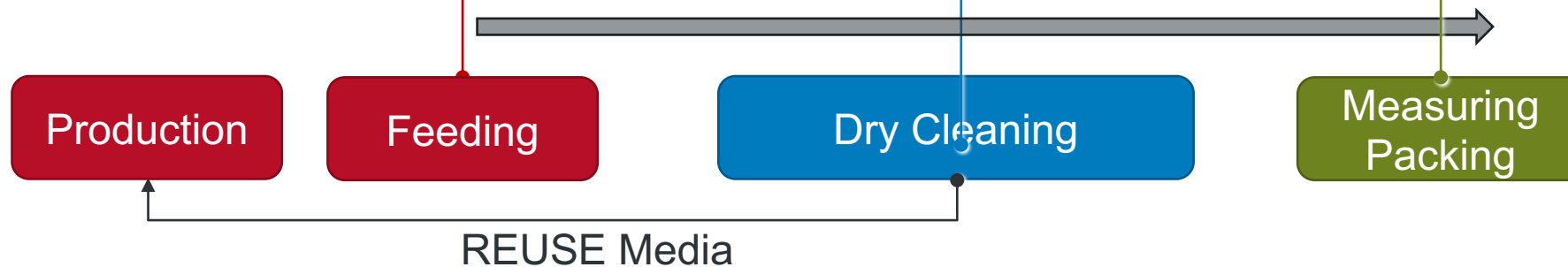
Use case: cell - 1 robot

S-Process



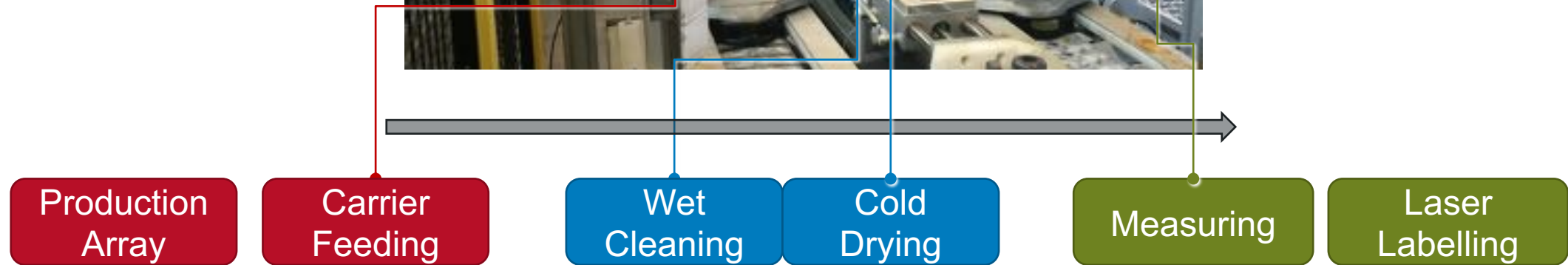
Use case: cell - 2 robots

S-Process

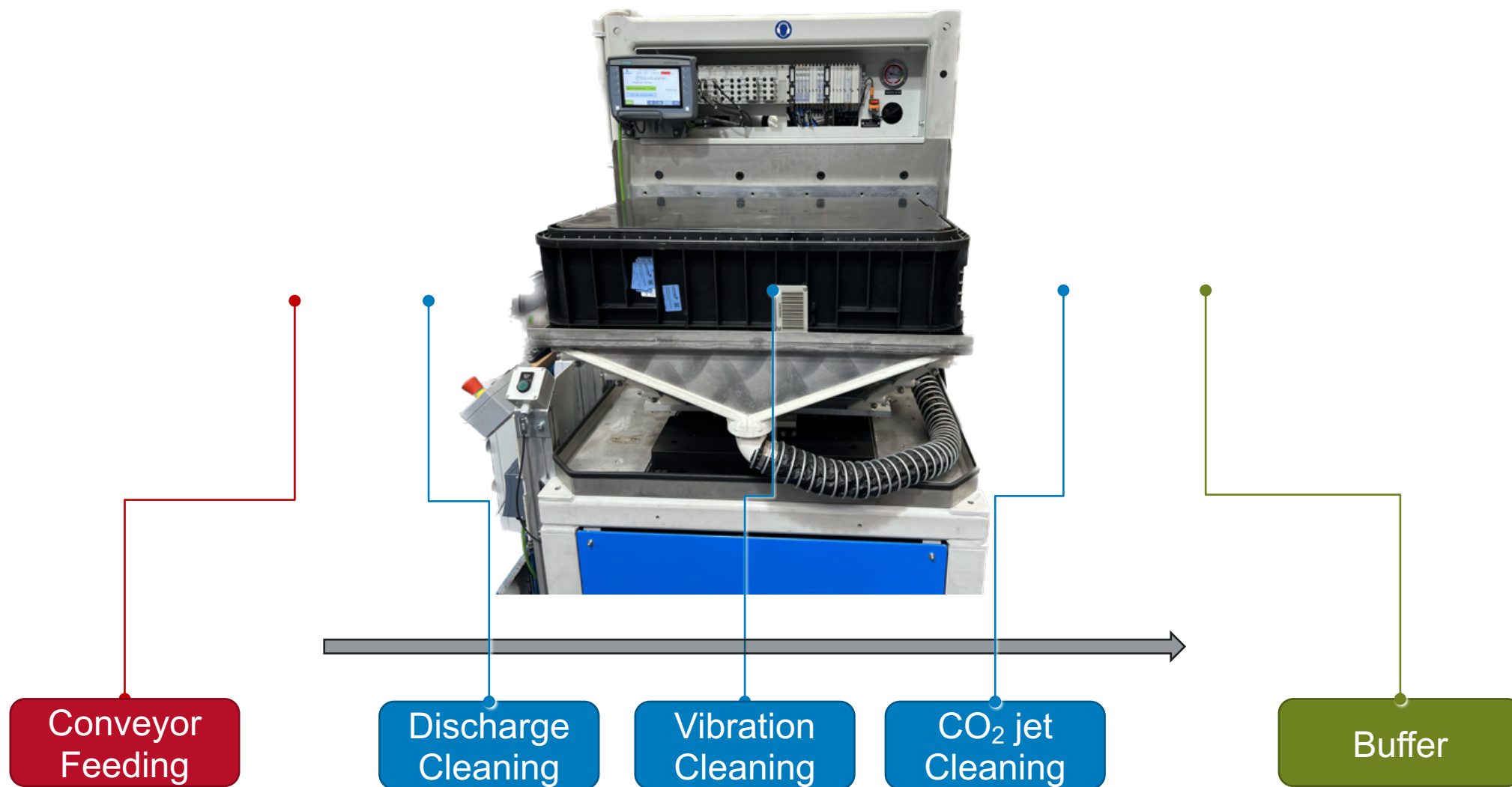


Use case: cell - 2 robots

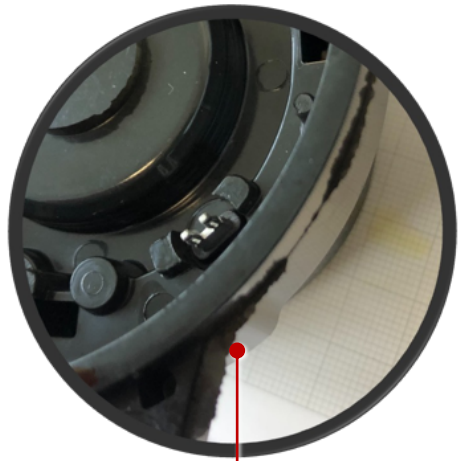
M-Process



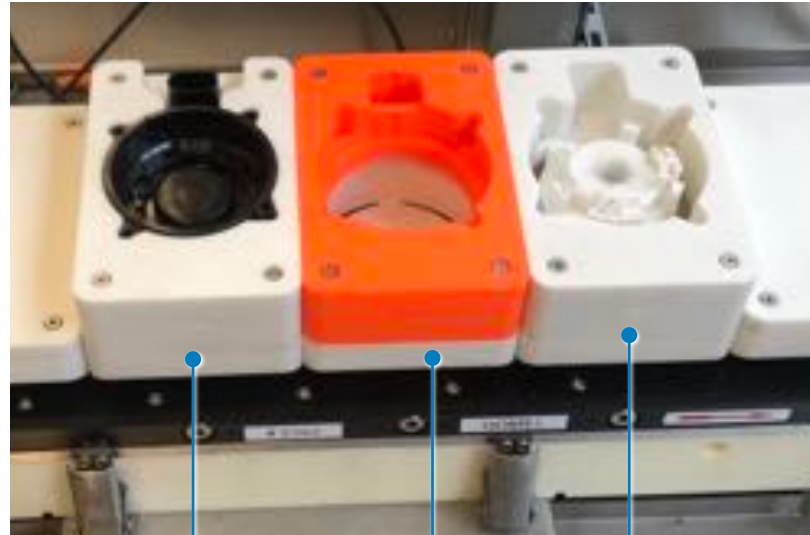
Use case: box cleaning



Use case: deburring



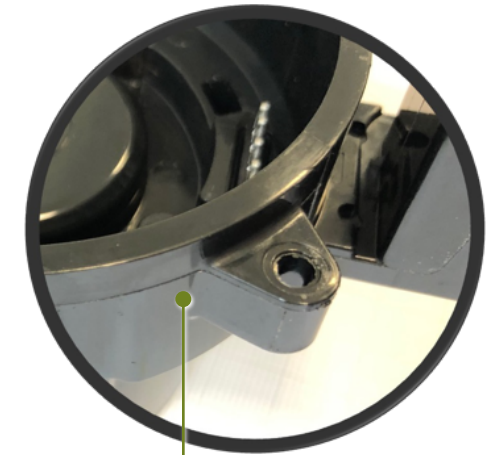
Component with burrs



Vibration Cleaning 1

Vibration Cleaning 2

Vibration Cleaning 3



Component without burrs

very short cycle time 3–5 seconds



WEBSITE

<https://ossberger.de/en/surface-technology/platform-finish-am/>



YouTube

https://www.youtube.com/channel/UCAb6KwFyL2TnO_B3mdDvuhw/featured

Linked 

<https://www.linkedin.com/showcase/68853317>

references



Volkswagen



SONCEBOZ



SCHAEFFLER



FAG



MAHLE

SIEMENS

oerlikon



Thank you very much for your attention

Vielen Dank für Ihre Aufmerksamkeit

Je vous remercie de votre attention.

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