

# High-Mix Low-Volume in End-Of-Line Packaging

ONLINE  
KENNISWEEK

**FOOD & BEVERAGE**

9-13 november 2020

Technische innovaties en ontwikkelingen



# Introducing



John van Hooijdonk

Industry Marketing Manager  
Omron Europe

31 years of experience in Industrial Automation

10 year in Process Automation

Joined Omron Europe 1999

- Product Marketing Manager
- Leading Product Marketing & Support team
- Set up Industry Marketing

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# Agenda

## High-Mix Low-Volume webinar

- Why High-Mix Low-Volume
- Typical process
- Some solution examples addressing:
  - Mixing Products in Packaging
  - Collaborative Palletizing
  - Intralogistics
- Integrated example

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# Variety in products

Modern consumer makes individual choices



# Variety in products

Modern consumer makes individual choices



COVID-19 boosted some trends regarding the versatility of consumer behaviour!

# Variety in Packaging

implications in every phase of packaging



In primary packaging



In secondary packaging



In final packaging

# Variety in Packaging

implications in every phase of packaging



In primary packaging



In secondary packaging



In final packaging

End-Of-Line Packaging

# Why High-Mix, Low-Volume (HMLV)

Especially in the high end of FMCG products there is an increasing consumer demand for more variations.

Examples:

- Personalised versions
- Mix different products or variations in a pack
- Handle seasonable or regional variations
- ...

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# Why High-Mix, Low-Volume (HMLV)

High-Mix Low-Volume manufacturing refers to **a large variety of products packed in small quantities.**

This results in constantly changing routings of material, quick and frequent changeovers.... Idle capacity and an increased risk for errors.



# Typical packaging line

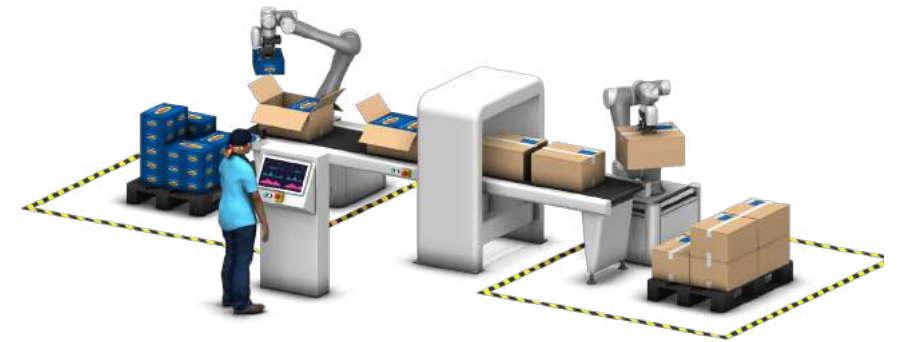
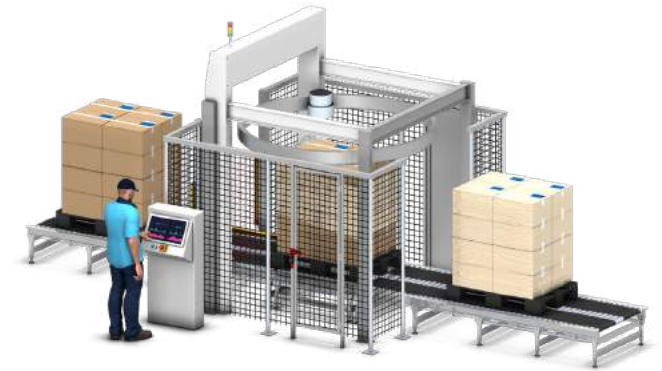
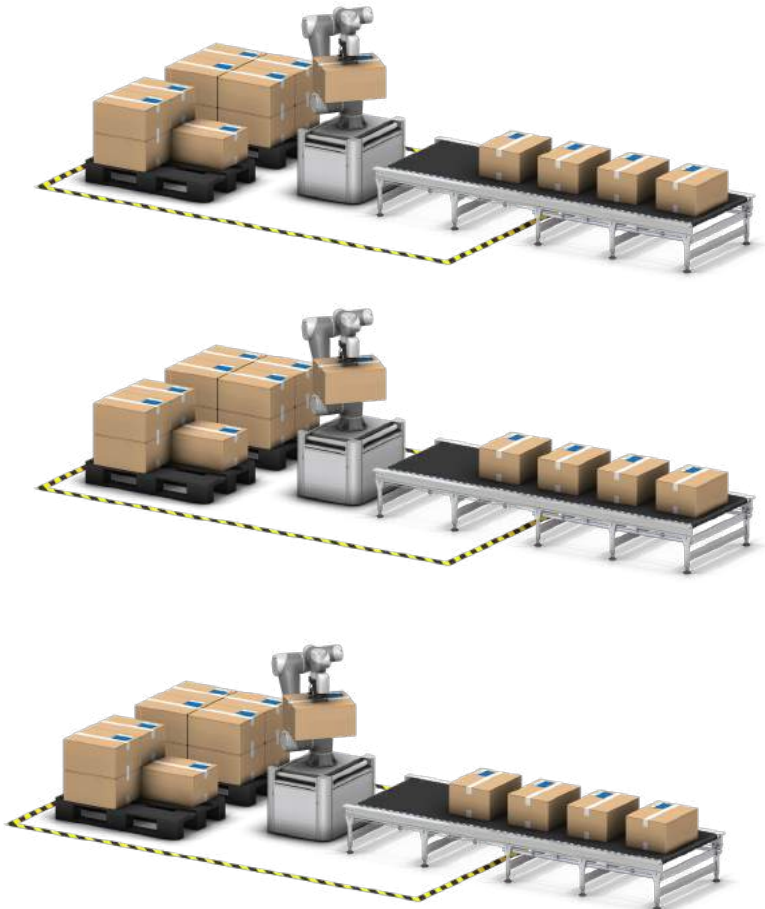


# Typical repack process for HMLV

One or more un-packing stations

Mixing the products

Re-packing



# Typical situation

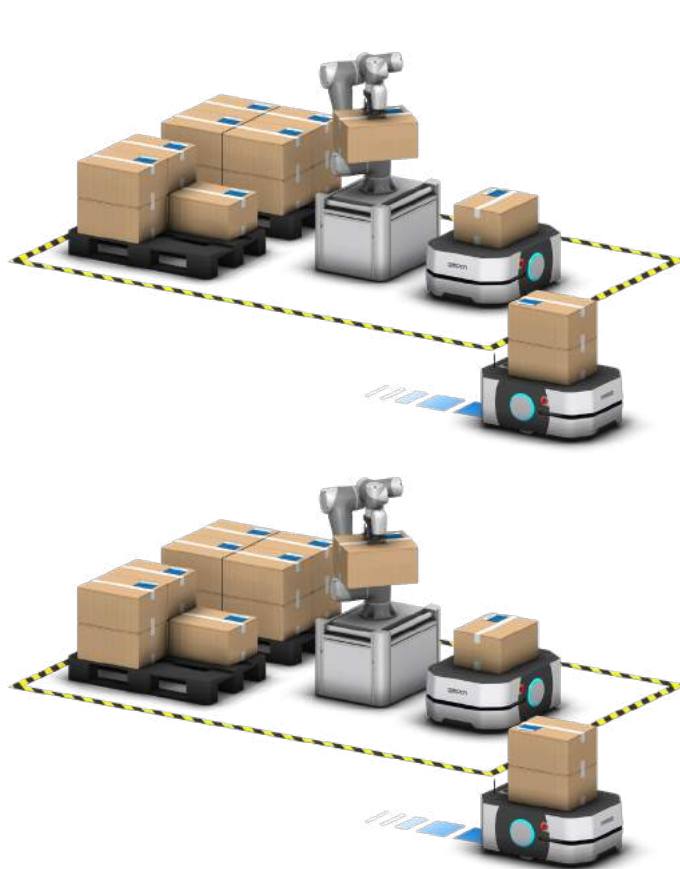


# And with no intermediate stock

One or more un-packing stations

Mixing the products

Re-packing



# Three application examples



Mixing products



Palletizing



Intralogistics



# Mixed boxes

In secondary packaging

# Repacking from single variety to mixed cases

## Challenges:

- Low quality and repeatability
- Space requirements
- Lack of staff
- Transport





# Industrial Robots



Parallel



SCARA



Articulated



Machine Automation



Robotics Automation

in an integrated environment.



# Solution Examples

## Customer advantage

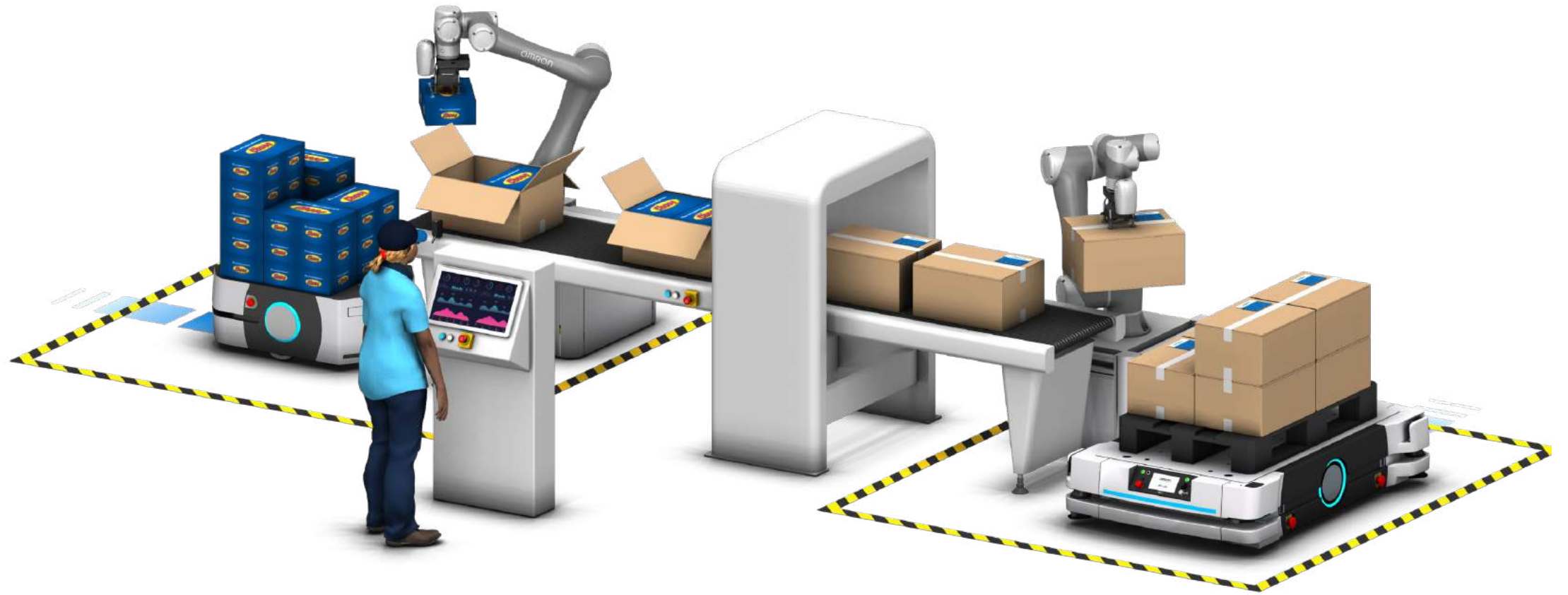
- Short cycle times
- Lean and sustainable automation design
- Simple changing between different product types
- Simple safety concept and process control
- High reliability and process stability

And prepared to address the new consumer



<https://www.youtube.com/watch?v=vTMmNVC0rCI>

12 different type chocolate picked & places according to recipes (box).



# Collaborative Palletizing

Space-saving packaging automation

# Typical challenge

- Palletizing is not appropriated for human workers since they are repetitive, high cycle, expose to muscle pain.
- Workers make mistakes such as mixing with wrong products or mispositions and missing box inside the pallet.





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TM  
ROBOT

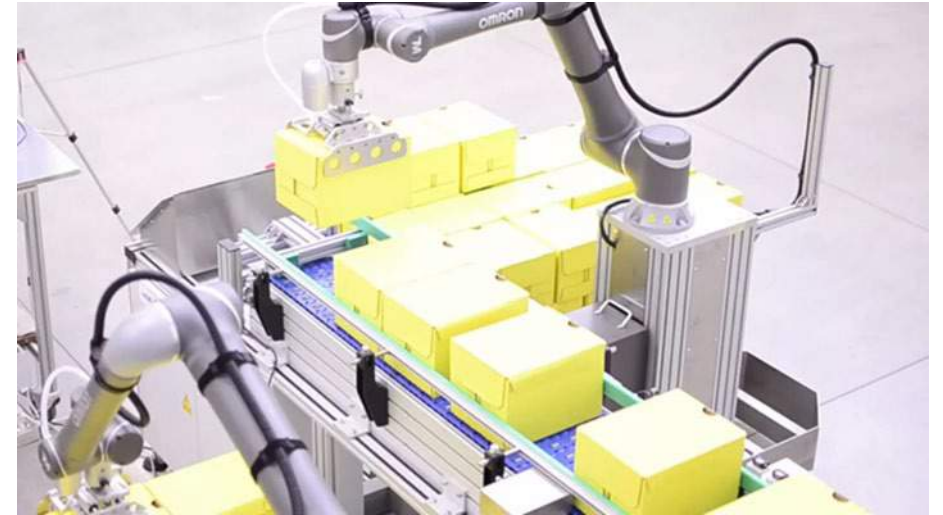
TM  
ROBOT

# Collaborative palletizing

**Space saving; simpler; faster ... more efficient**

- Supports almost any packaging configuration
- Operates safely alongside human workers
- Reduces space required
- Can be redeployed.

Fast ROI



<https://www.youtube.com/watch?v=pvxJsRCkoSw>

Packaging material



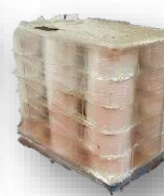
*Boxes*



*Cases*



*Film Reels*



*Cartons*



Work In Process



*Crates*



*Cart, Trolleys*



*Pallets with boxes*



*Buffer conveyor*



Waste



*Cartons*



*Pallecons*



*Cag*



*plastic*



# Intralogistics & Intermediate stock

for lineside replenishment

# Challenge: Material to be transported

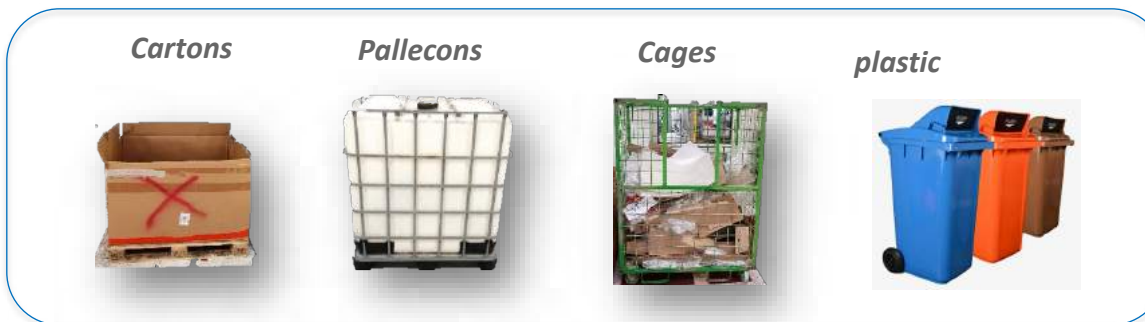
Packaging material



Work In Process



Waste



- Many plants have automated transport for the main production process.
- Replenishment however typically involves still many manual operations
- Target is 100% automation of all intralogistics process



# Autonomous Mobile Robots (AMR)



Mobile Robot to transport goods,  
or with built-on application like:

- cart transporter
- courier with lock box
- conveyor top
- or a cobot to create a Moma (Mobile Manipulator)



# Mobile Robot to transport

- Improves efficiency
  - Reduces Waste
  - No unnecessary movements
- Improved safety
  - No pallets along the line
  - No walking around or manual material handling
- Improved productivity
  - Zero waiting time:
  - No good that need to wait for the next step in the process
- Enables traceability
  - Enable controls of inventory.
  - Small-lot inventory (WIP) movement is automated.



<https://www.youtube.com/watch?v=WA5sn5hpUEo>

Consumables or WIP products

# Overall solution concept

The autonomous and reconfigurable line

- Scalable upward and downward to handle swinging demands from supply chain
  - Especially e-commerce
- Adaptable workspace on-the-fly to fits high-mix low-volume production model



***RE-THINK!* Packaging**  
**Collaborative, Scalable & Traceable**

<https://www.youtube.com/watch?v=Av4XZZ9eABA&t=35s>

# Automated & semi-automated HMLV

- Facilitates fast respond to agile market requirements
  - Solutions can be redeployed easily
- Reduced intermediate stock
  - By efficient flow of goods
- Optimal usage of floorspace
  - Eliminates intermediate stock
  - No large safety fences
- Improving machine efficiency
  - By ensuring a constant machine load
- Improves workers occupational health & safety
  - Eliminates mundane & heavy work
- Fast payback !



Thank you for your time

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