

# KUKA

KUKA Systems Corporation North America

## LAYER FORMING IN-LINE PALLETIZING



**AURORA**  
VILKOLA  
Automated Robotic Order Assembly

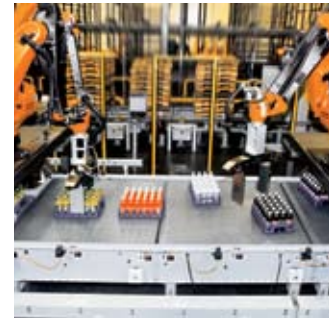
## ■ IN-LINE PALLETIZING

- ... if conventional palletizing systems are too slow or too inefficient!
- ... if system availability is very important for you!
- ... if floor space is limited and expensive!

In the past decade, the automated end of line palletizing of same package types is proven technology. The economical justification of a palletizing system is mainly driven by the achievable through put (cases per hour), the system availability, the required floor space and the utilization rate of the complete production line.

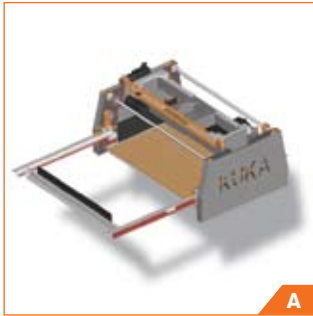
Especially for high throughput demands, e.g. in the beverage industry, KUKA sets new standards in Inline Palletizing. The use of KUKA's articulated robot enables the implementation of new innovative robot based concepts for the highspeed inline palletizing. With form fitting gripper systems, the incoming packages are moved actively and accurately in to the correct target positions on a mesh belt conveyor. Hereby the robot motion is synchronized with the conveyor speed thus allowing a reliable layer forming process. Since the packages are gripped actively, the process does not depend on friction and packaging characteristics, which is often a challenge for shrink wrapped items.

During the layer forming process, a little gap between the packages is added in order to avoid potential collisions. Once a layer has been completed, a mechanical end stop is lowered and the layer is conveyed to the pickup position of the layer picking robot. Immediately after the layer has passed the end stop, the end stop is raised again and the next layer can be assembled. The layer picking robot can pull the whole layer with an integrated puller onto the gripper. Inside this gripper the layer is finally centered, thus a compact layer can be placed accurately on to the target pallet. As an option, the layer gripper can add a slip sheet. Depending on the production line speed, the robot-based inline palletizing system can be adapted to its required system performance. E.g., by adding another layer forming robot, the throughput can be doubled.



### THE BENEFITS

- One stop shop solution, from the planning to the world wide after sales support
- High palletizing performance means a high profitability
- A scalable system concept adapted to your production needs
- Small floor space
- High reliability due to layer forming based on form fitted gripping principle
- No package damages to due gentle product handling
- Fast, easy and automated switch over to different package types and dimensions
- Safe and accurate palletizing with layer gripper and integrated centering device
- Universal KUKA control architecture
- Robot equipment can easily be re-used in case of production change
- Slip sheet handling can be simply be added to overall system concept (optional)



### MAIN SYSTEM COMPONENTS

- A** Layer Forming Table with in-feed conveyor
- B** KUKA Robot (KR 40 PA for layer forming)
- B** KUKA Robot (KR 570 PA for layer palletizing)
- C** KUKA Robot Control KRC 2
- D** Layer Picking Gripper with 3 servo drives
- E** KUKA.ConveyorTech Software for robot and conveyor synchronization
- E** KUKA.LayerTech Software for easy pallet pattern design
- F** System Controller with human machine interface and safety control

### THE GRIPPER SYSTEM

Due to the form-fitted gripping approach, the packages are actively moved and assembled to a compact layer. Therefore the process is no longer depending on friction and on the packaging quality.

### THE SYSTEM CONTROLLER

The system PLC is the communication interface for the operator and the superior line PLC. The communication method (e.g. fieldbus, Ethernet) can be customized to the customer's requirements and standards. All servo drives inside the grippers are controlled by the KUKA Robot controller.

### THE KUKA INLINE PALLETIZING SYSTEM

- 1** Incoming Package Conveyor
- 2** Break and Gap Control Belt
- 3** Layer Forming Robot (KR 40 PA with Form-Fitting Gripper)
- 4** Layer Forming Table
- 5** Layer Pick-up Position
- 6** Layer Picking Robot (KR 570 PA with Layer-Palletizing Gripper)
- 7** Empty Pallet Dispenser
- 8** Empty Pallet Buffer Position
- 9** Palletizing Position
- 10** Completed Pallet Position

TECHNICAL DATA	
■ Layer Forming Performance with 1 Forming Robot:	Up to 50 cases / minute (depending on pattern)
■ Layer Forming Performance with 2 Forming Robots:	Up to 100 cases / minute (depending on pattern)
■ Layer Picking Performance:	Up to 5 layers / minute (depending on final layout)
■ Supported Pallet Types:	43" x 18.5" (CooLift), 48" x 40", 52" x 44"
■ Maximum Layer Weight:	Up to 600 lbs
■ Energy Supply:	Local voltage and frequency



# KUKA

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