

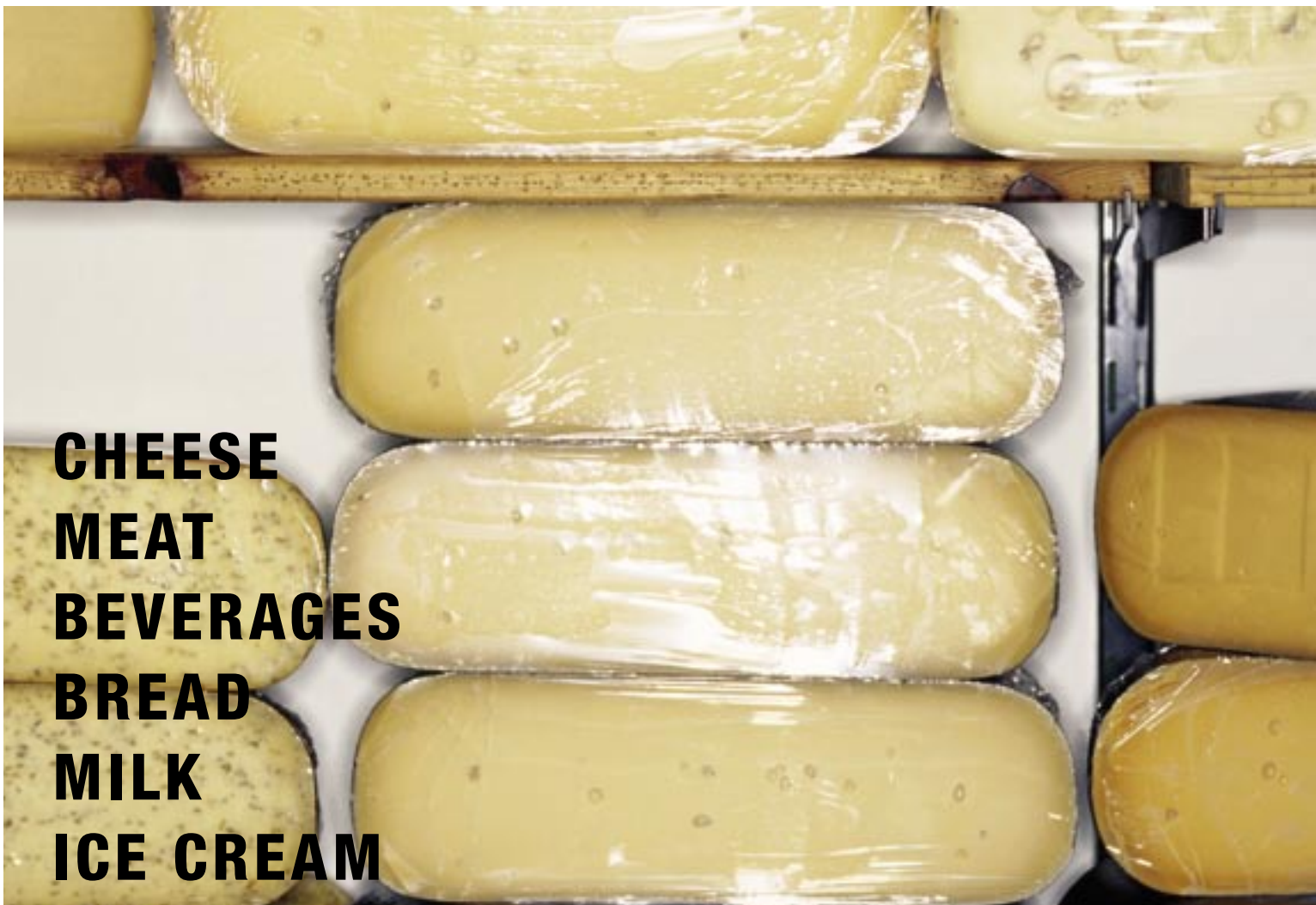


**PICK PACKAGE PALLETIZE DEPALLETIZE
TRANSFER**

**KUKA ROBOTS
FOR THE FOOD SUPPLY CHAIN**

WORKING IDEAS





**CHEESE
MEAT
BEVERAGES
BREAD
MILK
ICE CREAM**

Automation solutions with KUKA robots are setting new standards worldwide. The reasons for this are their high productivity, repeatability and reliability– as well as their great flexibility and return on investment. This is particularly true in the foodstuffs industry, where the products, production conditions and packaging are extremely varied. Together with our partners, KUKA offers complete system solutions for production and logistics to give you a decisive advantage over global competitors in terms of time and cost.

Tried and tested in production ...

Their unique hygienic configuration, with easy-to-clean, sterile surfaces, makes KUKA robots, such as the Wash Down robot or the new stainless steel robot, the first choice in all branches of the foodstuffs industry. Whether cutting or packaging meat, stirring, turning or processing dairy products, or handling frozen foods – KUKA robots, sensors and software are unmatched in their versatility and flexibility.

COMPLETE SYSTEMS FROM KUKA & PARTNERS



... in the logistics of the future

Solutions that have proven their worth in production are also the future of logistics: complex tasks such as packaging, palletizing, depalletizing and order picking, that previously required vast amounts of “manpower”, are now carried out faster and more efficiently by automated KUKA systems. KUKA systems also offer unrivaled flexibility: unlike dedicated machines and systems built around a single product, KUKA robots can be freely adapted, again and again, to new or modified products.

Hardware and software components can be bundled together to create modular function packages geared towards specific tasks, providing system partners and users with customized solutions for foodstuffs, furniture, distribution, pharmaceuticals, industries. KUKA will provide you with all the components you need: from the robot and controller to the software and even end of arm tooling systems to solve your problems.

For the first time, KUKA offers you the opportunity to make complex packaging and logistical tasks more productive – in particular arduous or monotonous processes that place a heavy burden on the workforce.

FROZEN FOODS
BEER
YOGURT
PORK
CHEESE
VEGETABLES
FRUIT
BAKERY PRODUCTS

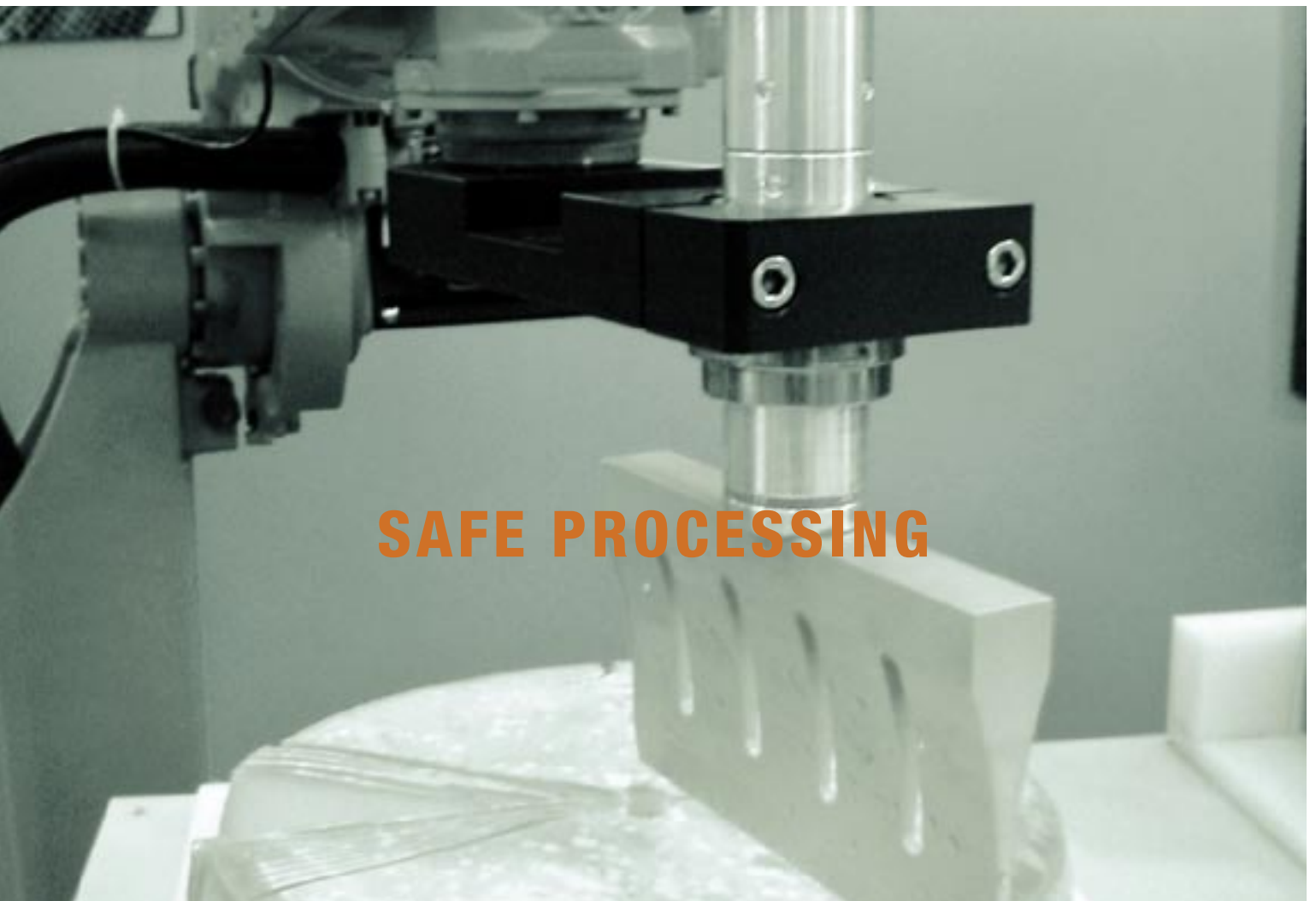
The proven advantages of KUKA industrial robots are especially valuable in the foodstuffs industry. Particularly in the unique hygienic conditions of the wash down environment, KUKA robots meet the strict cleanliness requirements placed on them in the sensitive area of food production.



Greater productivity, higher availability, more applications

KUKA robots work with greater speed, precision and productivity than conventional equipment – and with higher quality. Their highly flexibility range of applications means that KUKA robots can be optimally integrated into existing manufacturing or processing operations.

The foodstuffs industry offers a wide range of potential applications: in the meat industry, KUKA robots work in cutting, sorting and packaging applications. In cheese production they stir curds, transfer cheese molds, and turn, cut, portion, package and palletize cheeses. Integrated sensors and measuring systems enable the simple implementation of complex processes.



SAFE PROCESSING



Compared with conventional solutions KUKA robots offer numerous advantages

- High repeatability and precision in continuous operation
- Round the clock operation, 365 days a year
- Higher processing speed than semi-automated or manual processes
- Greater output per hour with consistently high quality
- Higher quality compared with traditional methods
- Flexible adaptation to changing processes and seasonal variations
- Simple reprogramming and operation
- Reduced workload for employees and lowers risk of injuries
- Integrated sensors and measuring systems enable complex work processes
- Standard robot sizes for use in the most varied of applications
- Broad product range to cover an extremely wide range of requirements, payloads and reaches

KUKA WASH DOWN AND STAINLESS STEEL THE ULTIMATE IN CLEANLINESS

KUKA Wash Down robot*

In order to be able to perform hygienically sensitive tasks, KUKA has developed robots that are able to meet these special requirements. The maintenance-friendly, easy-to-clean KUKA Wash Down robot, with its hygienic configuration, is one of a kind. With its protective suit, the robot is superbly equipped for operation in compliance with strict hygiene requirements – and that includes all of the components for the controller and the electrical system. It thus greatly enhances not only your product safety, but also your flexibility and cost-effectiveness.

Wash Down robot*



* Wash Down versions are available for the following robot types: KR 16, KR 60, KR 140 comp

Advantages of the Wash Down robot

- Easily washable and exchangeable hygienic protective suits
- Easy-to-clean stainless steel booth for control and programming unit
- Optional: sensors, measuring and vision systems can be integrated



	Carrying capacity	Reach
KR 16	16 kg	1,600 mm
KR 60	60 kg	2,000 mm
KR 140 comp	140 kg	2,400 mm

ROBOT –

Stainless steel robot

KUKA's compact stainless steel robot, the KR 15 SL, with a carrying capacity of 15 kg, enjoys a "gleaming" record in the foodstuffs industry thanks to its stainless steel surface allowing germ-free contact with food without being sensitive to cleaning acids or alkalis. With its integrated energy supply system, it is also highly suitable for use in cleanroom conditions without the need for an additional protective suit.

KR 15 SL stainless steel robot



Advantages of the KR 15 SL stainless steel robot

- Hermetically sealed design provides no niches for bacteria
- Stainless steel is an approved material for use in the foodstuffs industry
- The surface can be cleaned with acids and alkalis
- Protection classification IP 67
- Compact design for small floor space requirements
- No additional hygienic protective suit required
- Integrated energy supply system and interfaces to vision systems and field bus systems
- Simple reprogramming possible
- Optional: synchronization with conveyor systems using KUKA.Conveyortech software
- Optional: Soft PLC functionality



	Carrying capacity	Reach
KR 15 SL	15 kg	1,500 mm



CARDBOARD BOX
SACK
FOLDING CARTON
BAG
LAMINATED PACKAGING
BOTTLE
PLASTIC BOX

No other sector combines such a wide variety of products, packaging types and handling variants as the foodstuffs industry. Be it mixed or unmixed, cartons, plastic boxes, styrofoam trays or plastic bags, when it comes to packaging, palletizing, depalletizing or order picking, KUKA robots exploit their strength and flexibility to the fullest.

Using flexible end of arm tooling that operates via suction, clamping or lifting, along with individually configurable palletizing software, and special sensors that distinguish between different products by size, weight, material or appearance, KUKA gets to “grips” with even the most difficult tasks.

Pooling our expertise with that of our partners, KUKA offers innovative logistics solutions and application-related services from a single source. Thanks to the modular nature of the hardware and software components and the use of standardized interfaces, KUKA function packages can be customized to meet your exact requirements.

KUKA can handle whatever comes its way

Four things are required for mastering complex logistical tasks: optical or tactile sensors that detect the position and orientation of the object, a multi-function gripper system, adaptable software solutions – and, of course, the right robot.

Palletizing robot KR 40 PA





KUKA offers an extensive range of packaging and palletizing robots – from the small and agile KR 40 PA to the powerful KR 500 570 PA. Built using carbon composite materials, the KR 40 PA, KR 100-2 PA and the KR 180-2 PA stand out because of their low weight and high stiffness. The KR 180-2 PA Arctic variant is designed for use in deep-freeze environments.

		KR 40 PA	KR 40 PA	KR 40 PA	KR 100-2 PA KR 180-2 PA KR 180-2 PA Arctic	KR 240-2 PA	KR 500 L420 PA/1	KR 500 L480 PA/1	KR 500 L570 PA/1
Max. load height if workspace to	corners	1,800 mm	1,325 mm	1,550 mm	2,500 mm	2,100 mm	3,425 mm	2,750 mm	1,800 mm
	center of pallet	–	–	–	–	2,875 mm	4,000 mm	3,600 mm	2,935 mm
Number of pallets		1	2	1	2	2	2	2	2
Pallet size	in mm	600 x 800	600 x 800	800 x 1,200	800 x 1,200	800 x 1,200	800 x 1,200	800 x 1,200	800 x 1,200
	in inches	24 x 32	24 x 32	32 x 48	32 x 48	32 x 48	32 x 48	32 x 48	32 x 48
Distance between pallets	in mm	–	400	–	400	400	400	400	400
	in inches	–	16	–	16	16	16	16	16

THAT'S ONE COOL PALLETIZER – THE KUKA KR 180-2 PA ARCTIC



Pizza, ice cream and frozen meals are a growing market. However, frozen products are associated with more demanding conditions and higher costs. As the cold chain must not be broken, special cold-resistant equipment must be used at every stage in the logistics chain. The KUKA KR 180 PA Arctic robot offers you decisive advantages in this respect.

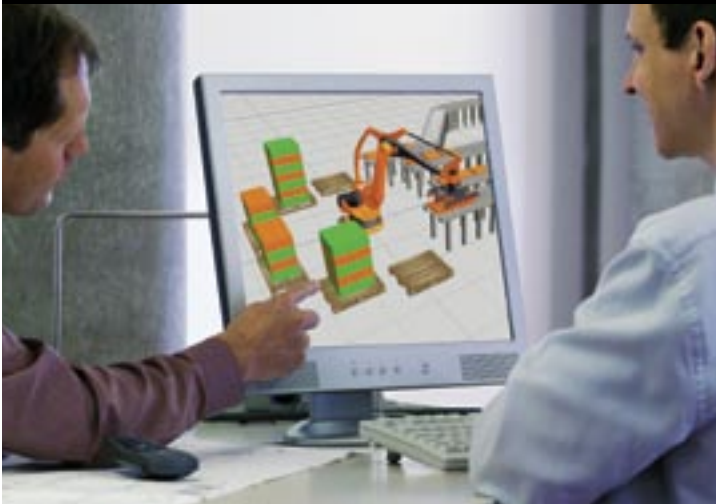
Designed for temperatures as low as -30 °C, the KR 180-2 PA Arctic is ideally suited to the palletizing of frozen foods in cold storage areas without the loss of food quality due to temperature fluctuations. Even the energy supply system is specially adapted to the deep-freeze environment.

Advantages of the KUKA KR 180-2 PA Arctic robot

- No protective suit for heating required reducing energy costs
- Simple installation and operation
- No additional maintenance-related costs
- Low risk of failure thanks to the use of proven standard components
- Optional: food-compatible oil (H1)

INDIVIDUAL INTELLIGENCE – KUKA SOFTWARE FOR ONLINE AND OFFLINE PROGRAMMING

Logistics solutions must be fast, safe and easily adapted to changing conditions. With various palletizing algorithms for mixed or homogenous palletizing (KUKA.Pallet); KUKA Sim for simulation and offline programming; sensors, such as CCD cameras and laser scanners, for depalletizing; tools for cell visualization; SoftPLC, and hardware for cell control, KUKA offers the perfect solution for every application – individually configurable, easy to program and simple to operate.



KUKA.Pallet – the software for unmixed palletizing

The graphically-supported KUKA.Pallet software enables optimized utilization of the pallet, as the sequence and orientation of the packages can be varied.

Mixed palletizing online and offline

In the case of mixed offline palletization, the pallet is planned with the ideal configuration for the specific customer order, with optimal utilization of available space.

With the online palletizing software, a limited number of articles from a dynamic buffer serve as the basis for local optimization of the pallet.

Compared with manual palletization, both software variants ensure faster, more stable, error-free results.

Offline programming and simulation

With the KUKA KR C2 robot controller, all applications can be implemented quickly and easily: control of complete lines (via field bus); integration into existing structures; Windows user interface, and standard interfaces for grippers, vision systems, sensor systems, etc.

And KUKA Sim simulation software supports you when designing the cell, measure cycle time and return on investment analyses.

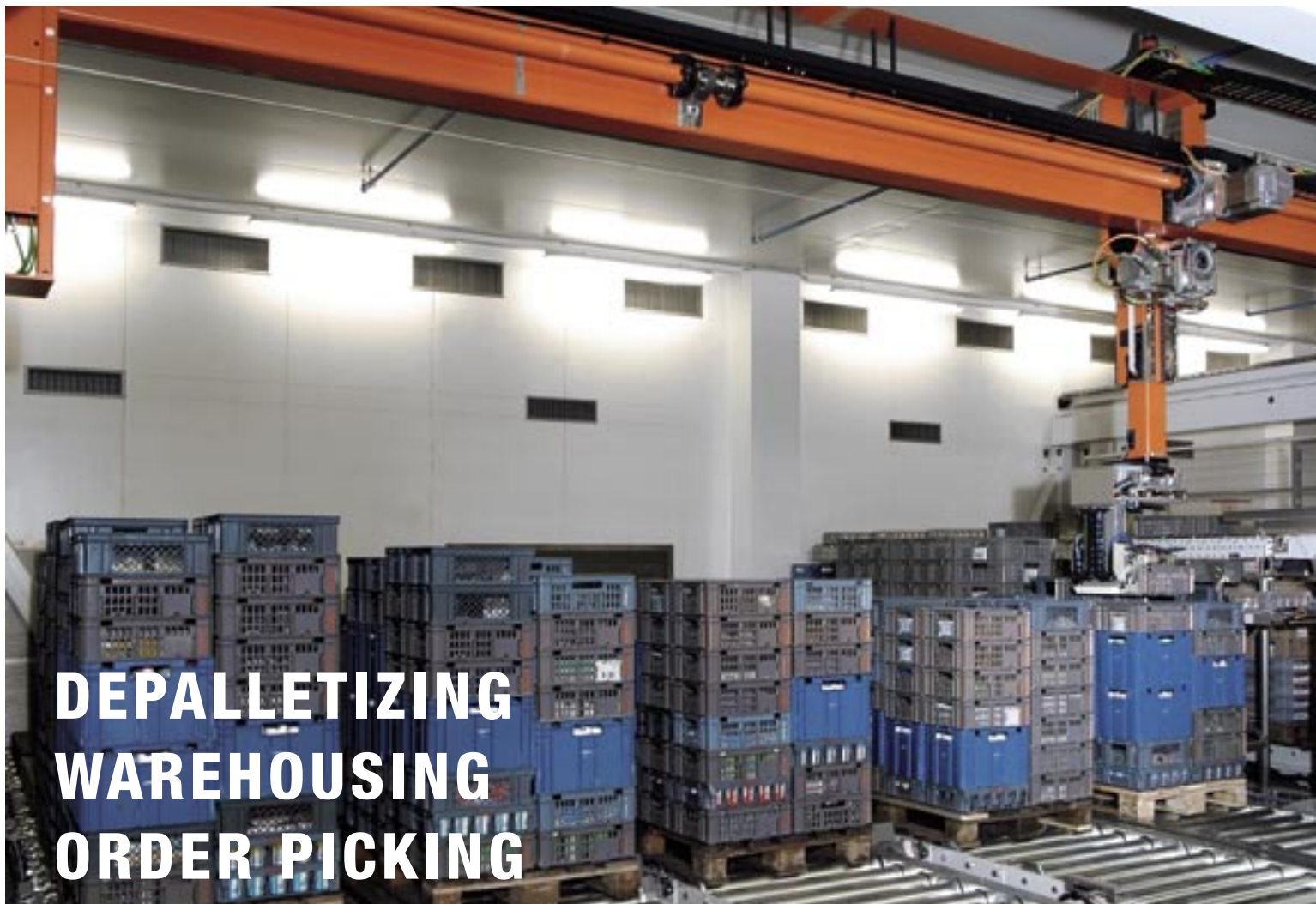
Advantages from programming with KUKA.Pallet

- Rapid and flexible configuration of up to 30 conveyor lines and pallet stations and up to 4 slipsheets or pallets
- Shorter commissioning times
- Automatic or manual product change via PLC
- Reduced gripper collision by automatically adapting to pallet heights
- Dynamic load sensing data for full and empty gripper enable improved cycle times and maximum velocity

KUKA competence does not end with palletizing

KUKA robots will also help you to meet the demands of the market with respect to depalletizing and order picking tasks. Manual order picking of up to 25 tons per day results in injury, downtime and loss of quality, due to high error rates and low packing density.

KUKA robots improves order picking conditions and, quality making it possible to document the order picking process. In this way, you reduce costs and workforce fluctuation while simultaneously increasing customer satisfaction.



DEPALLETIZING WAREHOUSING ORDER PICKING

KUKA robots are true logistics experts – not only for case packing and palletizing, but also for depalletizing and order picking in large distribution centers. The application requirements demands placed on robotic automation solutions for depalletizing tasks differ greatly from those placed on them by palletizing tasks: layer patterns may be unfamiliar or may have shifted during transportation resulting in situations where sensors or other hardware must be used.

A whole range of tasks that until now have predominantly been carried out manually, such as depalletizing (e.g. from roll containers, lattice boxes or pallets), conveying, configuring mixed pallets to customer orders, positioning, etc., can now be fully automated using KUKA robots.

No matter whether you are using an articulated arm or gantry robot, KUKA Motion Control offers the perfect solution for all tasks. The work envelope of the articulated-arm robot can be greatly extended by mounting the robot on a KUKA linear unit or on a carriage.



KUKA – ONE FOR ALL



KUKA robot logistics advantages at a glance

- KUKA robots can perform logistical tasks significantly faster and more cost-effectively
- Greater return on investment thanks to increased flexibility
- User-friendly graphical user interfaces enable simple and safe commissioning and operation
- Highly-accurate order picking
- KUKA offers function packages that are tailored to your requirements, from the energy to the compressed air supply systems
- Programming and control of your system from a single source

ORDER PICKING WHATEVER COMES ITS WAY – KUKA SETS THE STANDARDS



Food packaging is as varied as its contents: it is not uncommon to package and transfer 20,000 or more different articles with error tolerances for the packaging of ± 5 mm. Alongside the actual end of arm tool, the associated software and sensors are critically important for handling tasks. Using standardized image processing and software components, KUKA offers simple and reliable solutions for locating the objects to be moved.

Detection and gripping

The 3D surface profile scan, specially developed by KUKA for logistics applications, helps you to locate a wide range of different articles without the need for time-consuming teaching of features. This image processing component and the software variants for mixed palletizing enables fast and cost-effective depalletizing and order picking.

KUKA offers our system partners support with the development of end of arm tooling systems for logistics applications.

The advantages of flexible logistics solutions from KUKA

- Increased throughput
- Shorter development and commissioning times
- Multiple products can be handled simultaneously to increase utilization
- No need for costly and time-consuming tool conversions due to product change

Customer Support

In addition to custom-tailored robot systems, spare parts, robot rentals and used robots, KUKA also offers a wide range of services: from planning to commissioning and production – our employees support you during every phase of your project.



Planning

Customized user interfaces, application software, offline programming, simulation, cycle time analyses, feasibility studies – even in the planning phase KUKA will provide you with whatever you need to ensure that your system will operate smoothly.



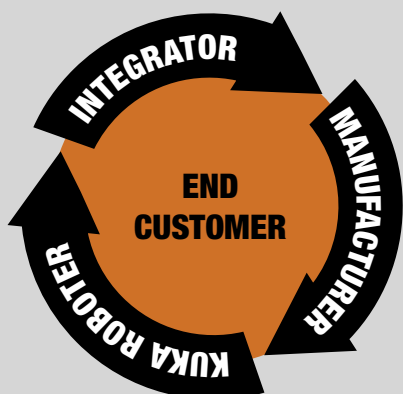
Commissioning

We optimally integrate custom software modules, sensors, vision systems and robot tools, carry out load analyses while the program is running, and give you advice, support and instruction during the commissioning process – all to help ensure that your system is cost-effective to operate right from the outset.



Production

Programming, optimization, immediate assistance from KUKA, the availability of your systems is in the best of hands. Let KUKA prove it: with remote diagnosis, a 24/7 hotline, on-site servicing, updates and upgrades, customized maintenance agreements, spare and used parts, and cutting-edge logistics...








The KUKA partner network

KUKA works together with selected specialists in various industries to implement the optimal solution for you. These system integrators are brought together in the KUKA partner network. Our close cooperation with system partners and innovative end customers is one of the cornerstones of KUKA's success – and a constant challenge to optimize our solutions still further. Thanks to this expertise in creating custom solutions, and a dense network of regional training and service centers, KUKA has earned an outstanding reputation with customers all over the world.

CONTACT INFO ADDRESSES

No liability accepted for errors or omissions.

KUKA offers a comprehensive range of products, with optimal solutions for every requirement and every industry. What can KUKA do for you?

Low payloads	Medium payloads	High payloads	Very high payloads	Special models
				
from 3 to 16 kg	from 30 to 60 kg	from 100 to 240 kg	from 360 to 570 kg	Shelf-mounted robots Palletizing robots Press-to-press robots Foundry versions

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