



Case Study

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Faster satiety thanks to KUKA: KR AGILUS HM wraps Sandwiches

Assembly line work hasn't been attractive to workers for a long time – Great Britain's sandwich industry is also feeling the effects. To fill gaps and relieve teams, a British system integrator has developed an automated line with two KR AGILUS HM. They pack 50 to 60 sandwiches per minute – hygienically, precisely and cost-effectively.

Patented solution with two KR AGILUS HM

The sandwich market is growing and growing. The sale of hygienically packaged slices of bread alone generated 13 billion U.S. dollars in revenue worldwide in 2018. According to experts, this figure is set to rise to 18.2 billion U.S. dollars in 2025. Incidentally, a third of this is accounted for by the U.S., which has the world's biggest appetite for sandwiches. But even in Great Britain, which is considered the home of sandwiches, this meal still has a special significance. According to the British Sandwich Association, a total of eleven billion packaged sandwiches are bought or freshly prepared here every year. Whether it's the classic sausage and cucumber sandwich, with cheese or with bacon and egg: billions of slices of toast have to be topped, cut and packaged. For the last two steps, the British system integrator Active8 Robots has developed an automated solution in which the tasks are performed by two KR AGILUS HM, among others. The company, which has twelve employees, began the first tests back in 2017. Today its sandwich packing solution is patented.

Skills shortage and Brexit leave their marks

The biggest challenge facing the industry in the UK, especially after Brexit, is the shortage of skilled workers. "Assembly line jobs in particular are very unattractive and across all sectors it is hard to find and retain skilled workers long-term," says Michael Codd, Sales Direc-



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tor at Active8 Robots. Therefore, there was a noticeable need to provide relief and automate processes in the sandwich industry. The system integrator, which specializes in advanced robot technologies and intelligent automation, talked to various players in the industry at first. Active8 employees then built a 3D-printed model which presented the process in an automated way. This made it possible to check the adherence of speed and hygiene requirements, for example.

After all, both criteria pose challenges for companies in the food industry time and again. Not least because of the Corona pandemic, awareness of the importance of hygiene has grown. Robots that have been specially developed or adapted for hygienic environments can provide relief here. So Active8 Robots tried to mitigate the consequences of two challenges with a single automated system: the shortage of skilled workers and the pandemic.

Continuous precision and speed

After successful tests and discussions with potential customers, Active8 Robots finally looked for the right business partner to put the model into practice. Michael Codd reports: "We had already worked with KUKA on other projects. In terms of speed, precision, service and quality, their robots suited best to our system, so we decided to work together this time again." The decision was made in favor of two KR AGILUS HM, which, thanks to their robust design, deliver maximum repeatability and continuous precision. And they also work fast and can thus meet the high demand for sandwiches.

Grasping decisively and carefully at the same time, thanks to special end-of-arm tools

No sooner said than done. With the support of KUKA, the system model was replicated and optimized at Peasedown St. John, Bath at Active8 Robots. The two KR AGILUS HM were equipped with rotating end-of-arm tools made of food-safe stainless steel to meet the strict hygiene regulations. Michael Payne, Food and Beverage Sector Manager at KUKA UK, emphasizes the advantages of this robot in regard to this application area of the sandwich



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industry: "Thanks to the integrated energy supply system, the KR AGILUS HM achieves the highest precision and also requires very little space due to its compact design". This makes it the ideal robot for meeting the challenges of handling generously filled slices of white bread. Because: "The sandwiches must not be squashed or slip during the process," adds Michael Codd from Active8. After all, the lunch snack should not only taste good, but also look appetizing. This requires a repeatability of the movements in always the same strength when gripping. Only a robot can offer this – human beings can't.

Quality inspection using image sensors

This is how the robotic cell works: the square toasts spread by humans arrive on a conveyor belt. Before they arrive at the two KR AGILUS HM, the sandwiches are cut with ultrasound. Image sensors integrated into the system check the quality. "We check automatically whether the cut is good and the sandwich is still in shape," explains Michael Codd. If one of the sandwiches fails this quality check, it is immediately sorted out. The other sandwiches, now triangular, continue on the conveyor belt to the gripper arms of the KR AGILUS HM. These pick up the sandwiches, turn them 180 degrees and place them individually in paper bags provided for this purpose. Ready for lunch break.

Innovative solution for more productivity

The two KR AGILUS HM can pack between 50 and 60 sandwiches per minute, and the robust design of the six-axis robot ensures continuous work sequences. "Thanks to lifetime lubrication on the gears, the KR AGILUS HM manages completely without lubricant changes and with very little maintenance," explains Michael Payne from KUKA. The investment pays off for companies after a short time: thanks to the stable productivity, which can be increased, for example, by adding further systems, the lower costs due to the elimination of manual work, and the high product quality, a return on investment (ROI) is possible after about 16 months, depending on the size and effectiveness of the company.



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Further applications conceivable

Currently, the first robot-based sandwich packaging system from Active8 Robots is still waiting for its first commissioning in a large bakery. However, Michael Codd is already thinking about possible extensions for this application. In order to support the sandwich industry even more, the first part of the process – preparing the sandwich – could also be automated in the future. This could be done by KUKA's KR DELTA, which was designed for direct contact with food and could be integrated into the existing system. Not only for sandwiches: Active8 Robots sees numerous areas of application for similar systems that could package snacks or other foods hygienically, quickly and cost-effectively, or even completely prepare them.

Captions/Picture credits

KUKA@Active8_press (1) / Active8: The British system integrator Active8 has developed an automated line with two KR AGILUS HM that packs 50 to 60 sandwiches per minute.

KUKA@Active8_press (2) / Active8: To relieve teams and counteract the shortage of skilled workers, robots take over the monotonous assembly line work - hygienically, precisely and cost-effectively.

KUKA@Active8_press (3) / Active8: Michael Codd reports: "In terms of speed, precision, service and quality, their robots suited best to our system."