Improving hygiene in food-grade plastics through automation

Tekplas are plastic engineering specialists who supply a global market from facilities in Canterbury and Waikato. From there they deliver highly engineered moulding products for food packaging, human health and industrial use – their Waikato plant is the only New Zealand facility to offer plastic moulding inside an ISO Class 7 clean-room environment.

THE CHALLENGE

Looking to solve problems of labour shortages and product contamination in one of their production lines, Tekplas tasked us with creating an efficient and hygienic robotic solution.

The original production line was set to produce two-part moulded lids for cans of infant formula, requiring twelve operators across three shifts. The demands of finding enough workers, along with a single instance of contamination in one of the products, led Tekplas to consider automating the line.

THE SOLUTION

We began by analysing the plant parameters and the specifics of the product. After some detailed consultation with Tekplas, we made initial designs for a Robotic Assembly System feed from two injection-moulding machines, using two overhead gantry robots to place formed parts into transfer mechanisms.

The two moulding machines supply the base and the cap to the new Assembly System, the guiding parameters for which were the reduction of labour units, high operating efficiency and extreme levels of hygiene. We created a custom solution within these parameters.

The Robotic Assembly System receives the two components of the assembly from the moulding machines and places them onto shuttles. The parts are then picked using precision-constructed pick heads mounted on two ABB IRB120 robots; they are then accurately assembled within a rotating jig, where they are pressed to lock together, and ejected onto a conveyor.

The optimal operating speed of the machine is 2.5 second cycles, equating to 25 lids per minute. The automated solution meant they'd be able to deliver their product efficiently without disrupting existing capacity. The time frame for the project was 20 weeks from brief to install and commissioning.

CLEAN & SAFE

The new automation completely removes human labour from the assembly process. The production line is housed within a clean-room environment which meets ISO Class 7 standards. Apart from specialist operators, the only part workers play is in bagging and boxing the finished product.

For safety, the machinery is enclosed within a sealed steel and safety-glass box with locking doors which conforms to AS/NZS 4024 machine safety guarding standards. The doors are automatically closed and locked when the machine is running; a 'hold' button allows the machine to stop in a safe place before unlocking the doors.

Once the concept and initial design were completed, we conducted regular design reviews, supplying Tekplas with 3D drawings modelling the machine that they could rotate and pull apart to analyse its sub-assemblies and their operation.

We also provided an analysis of the annual labour-saving costs of the system, projected at about half a million dollars per year. After sign-off, the machine was constructed from powder-coated mild steel using trusted components from Beckhoff Automation, ABB Robotics and SMC Pneumatics.

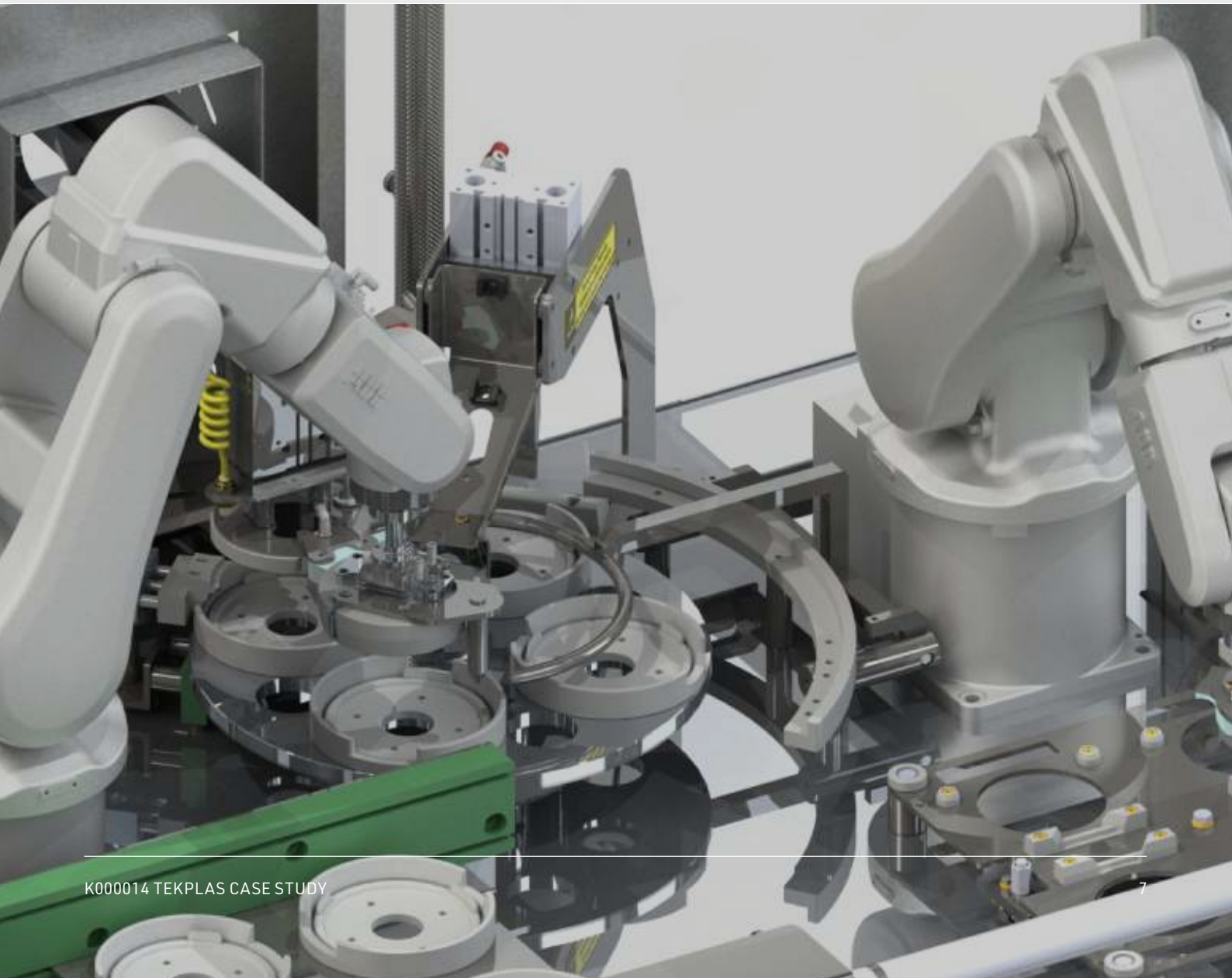
CONTINUING TO WORK TOGETHER

Tekplas was a new customer for RML, and they were very happy with the results. 'We've been so impressed by the level of service and quality of machinery that they have built for us.

With such an efficient machine, we've had no problem keeping up with production times and demands,' says Tekplas Project Manager Sefton Pease, who also commented on the smooth collaboration. 'Throughout the whole process, from the start right up to today, the RML team kept us up to date.'

For Sefton, positive feedback has further validated the project's success. 'We've had multiple suppliers come through our plant and see the machine in action. They've all said how impressed they are with the quality design and commented that it looks as good as anything they could buy overseas, which just goes to show the world-class standard that RML is at.'

Since then, Tekplas has commissioned further automation projects, and we have supplied them with another seven machines of a similar design, further reducing labour costs and ensuring that their plant performs to the global market standard.



If you have a production challenge, we'd love to solve it.

NEW ZEALAND

Call +64 7 849 3215
Email sales@rmlnz.com

66 Norris Avenue
Te Rapa, Hamilton 3200

AUSTRALIA

Call 1300 060 407
Email sales@rmlau.com.au

PO Box 281,
Chirnside Park, VIC 3116