Interreg North-West Europe
COTEMACO
European Regional Development Fund

Success Story

Cobot cell design for Schoeller Allibert

Automation of skid welding process for the construction of a plastic pallet, BEL

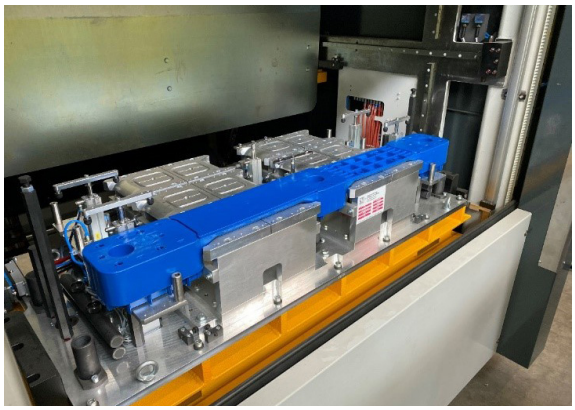
Automation of skid welding process

Company description

Schoeller Allibert is a Belgian company and European market leader in reusable industrial solutions for **plastic packaging** including **plastic pallets**. The company headquarters resides in Hoofddorp (Netherlands). Their facilities are spread world-wide, including the facility in Beringen (Belgium). The company offers with an **eco-friendly** and **innovative** mindset high-quality and sustainable products and services for a customer group of different industries. Customers reside in ten core segments, namely agriculture, automotive, food and food processing, (r)e-tail, chemical industry, pharmaceutical & cosmetic industry, beverage, system integrators, industrial production and pooling.

Motivation and challenges

Schoeller Allibert applied to the SME support programme in aim to find an automated solution for the manual operations done in the production line of their plastic pallets. The pallets are injection mold and delivered with the use of a robot work cell. The skids of a pallet are retrieved from this cell and placed on a conveyor belt. An operators task is retrieving the different skid strengthening plates and skid parts before placing them in a weld machine.



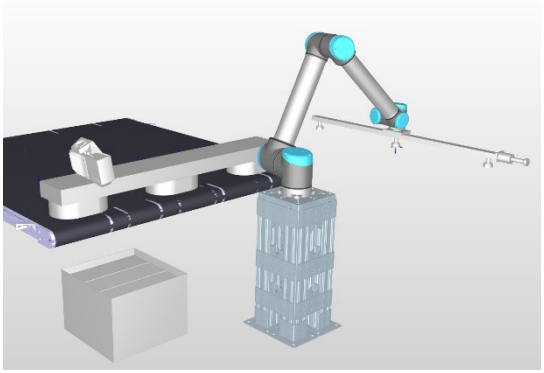
This manual process requires intensive and repetitive labor from operators. This motivated Schoeller Allibert to consider an automated, flexible assembly solution. This in order to ease the labor intensity but also to allow a more spread out operator task division.

The challenge lies in the **robustness** of the pick and place operations of the assembly parts in combination with a **vision system**. The work cell is required to be **flexible** enough to support different kinds of product assemblies. The products come in **large varieties** including different sizes, shapes, colors and extrusion tolerances. The cell needs to be flexible and robust enough to support this product variety while reducing the **complexity** and **changeover time**. It needs to provide a safe work environment in order to allow operators to intervene, change and adapt the work cell in a flexible manner.

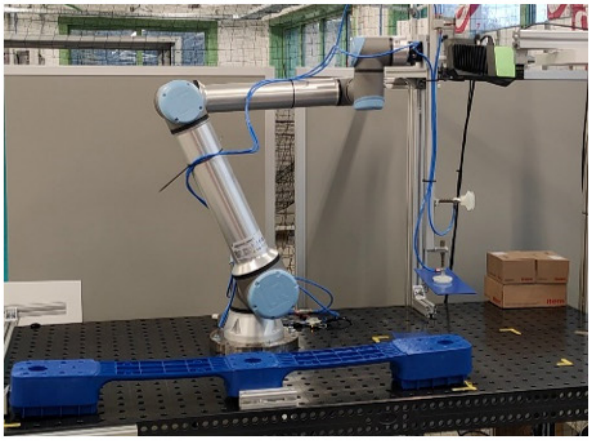
Technical solution

Flanders Make performed a feasibility study on the **bayopal 1210** assembly line. The objectives and requirements of this production line led to the use of a **vision system** in combination with a **cobot** work cell for detection and manipulation of the different assembly parts.

The proposed solution retains the conveyor system from the robot cell as input where the skids are presented in the reach of a cobot. The plates are stored externally and can be placed in bulk at a designated area. This area will form the region of interest for the vision system that determines the pick poses from the plate filled box.



The cobot will place the detected plates on a presented skid and place the assembly in the weld machine. The cobot is installed with a pneumatic gripper containing 2 suction cups for the skid gripping and 1 suction cup for the plate gripping.



Result

The feasibility study shows that it is possible to automate the skid weld process using a cobot (UR10e). The plates can be placed flexible in a box and are detectable by using the PickIt system. This information is able to position the robot for picking and placing the plates on the skids. The skids are pickable using a vacuum tool and can be placed in the weld machine using a shear based movement. The automation solution has a cycle time of 105 seconds for the assembly welding of three skids. Based on the performed feasibility study and the requirements of the project, a combination of the UR10e and the PickIt system has been proposed for the automation of the scoop insertion for the Schoeller Allibert skid weld production line. Further robustness studies are in order for the plate placement and tests for a tool adaption with three skids for future reduction of cycle time. The proposed work-cell also offers a safe environment for the operators, thanks to the safety features of the cobot.

Interview

How could COTEMACO support you?

Via the SME support programme, COTEMACO engages with SMEs from the automotive and food sectors through field labs. These regional field labs in the Netherlands, the UK, Belgium and Germany are showcasing key production steps in the automotive and food industries, in order to tackle current low sectorial awareness and knowledge gaps. The field labs will exchange knowledge on different manufacturing tasks, such as handling and (un)loading.

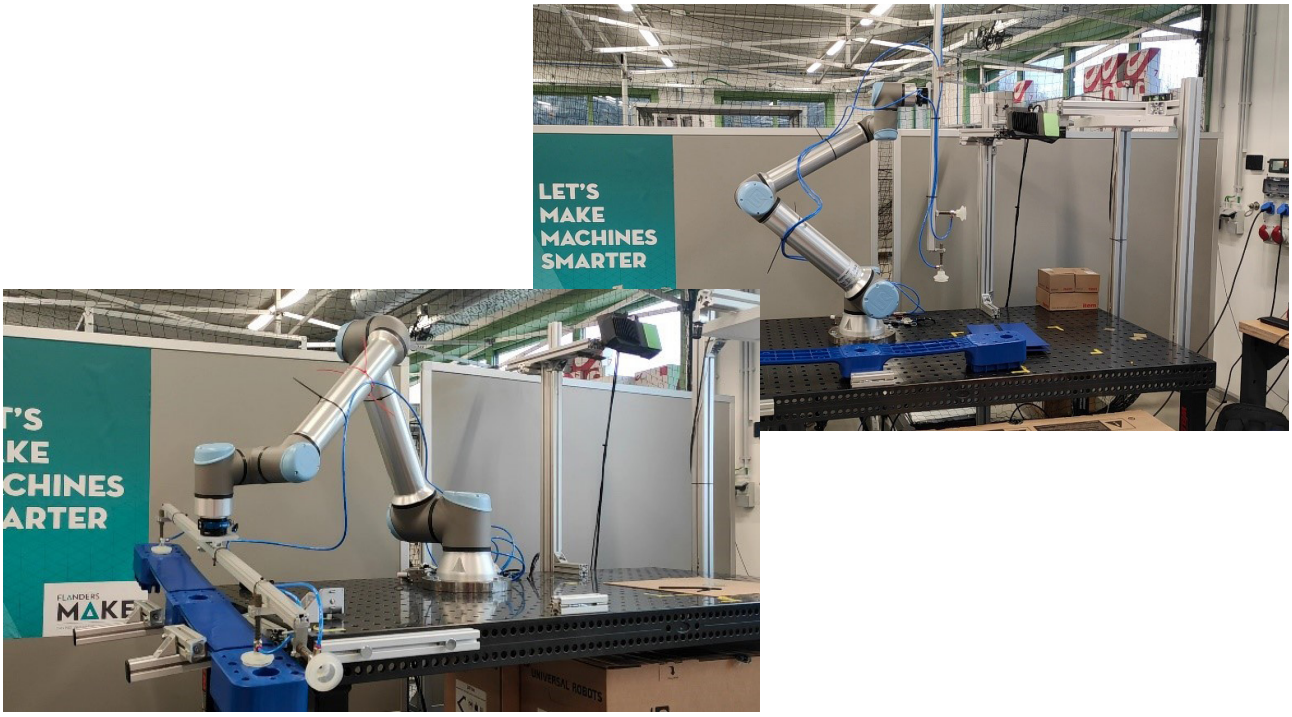
With the COTEMACO programme, manufacturing SMEs are guided through the process of adopting collaborative robotic and shop floor digitalisation technologies, from the exploration of technological opportunities to the detailed definition of a business plan.

What was implemented and what are the benefits?

A technical solution for the Schoeller Allibert case was identified in order to automate the manual steps for the skid assembly. The identified solution was based on a combination of a vision system, able to detect the skid plates, and a cobot for flexible, automatic skid assembly and insertion.

The analysis showed that it is possible to construct an automated production line where cobots can be used in a **flexible**, **robust**, **efficient** and **operator friendly** process. The proposed solution is flexible enough to handle the the skid plates with a variety in sizes, colors, extrusion tolerances and shapes. The cobot safety features makes the work-cell a **safe environment** for the operators to work in. The intuitive robot programming of the proposed cobot and the intrinsic features of the work-cell minimizes the product changeover and makes it possible to easily switch to a different product.

A feasibility study on the proposed solution was performed. This includes the conceptual design of the work-cell, technical feasibility with validation testing, cycle time estimation, an overview of the estimated costs and a return on investment estimate.



Were your expectations fulfilled - technical implementation and support through COTEMACO?

Jochen Geurts, Production Manager, Schoeller Allibert Belgium:

"The feasibility study performed by Flanders Make showed in a clear analysis what automation solutions are possible and currently available on the market. Definitely an aid in guiding further automation investments. The cooperation with Flanders Make under the Cotemaco project gave a clear view on what automation solutions are possible in the field of industry 4.0."

What is COTEMACO?

The project, which is an initiative of Interreg North-West Europe, aims to support around 60 SMEs in the automotive and food manufacturing industries with so-called „test environments“ and to encourage them to integrate collaborative robotic systems and digital technologies into their business. Accordingly, in addition to increasing production flexibility, the relocation of production abroad will be curbed and the number of jobs in manufacturing increased, which will generally lead to an improvement in the competitiveness of the companies involved.
In the project new technologies are implemented in application examples - the aim is to move from the prototype in the laboratory environment to the transfer to production, taking into account the legal situation and certifications.

You want to become part of COTEMACO too?

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www.robot-hub.org/cotemaco

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