Interreg North-West Europe COTEMACO

Success Story

Opening plastic material bags

Hercorub

Opening plastic material bags

Company description

Hercorub with headquarters in Lanaken (BE) and a second production plant in Zlin (CZ), has been an international player in rubber processing for many years. Hercorub develops and produces high-quality rubber compounds and manufactures vulcanized articles by means of moulding and extrusion.

Motivation and challenges

The motivation for this collaboration was to investigate the feasibility of automatic feeding of raw materials into an existing mixer unit. The raw material concists of powder and it is packed in plastic bags. The bags weighs about 3kg and is 30x40cm in size. In the existing process, an operator picks up the bags from a conveyor, cuts it open, positions them on top of the mixer unit and pours its powder content into the hopper of the mixer unit. The bags can be supplied as knotted or sealed. The entire bag content must be emptied and nothing from the packaging may end up in the mixer. The cycle time is quite long. It is not very efficient for the operator to be present at the mixing station all the time or to come and go just to perform this operation. Therefore, Hercorub has the motivation to automate the process. The footprint of the solution has to be as small as possible due to tight available installation space. The biggest challenge is to find a good automatic process to be able to open the bags and pour the complete content of the bags without wasting material.

Feasibility study

Flanders Make performed a feasibility study to grip and open the plastic bags. Cobots are well suited for low footprint applications since they share the same environment with humans and do not usually require extra safety measures such as fencing. They are somewhat slower than industrial robots but in this application the cycle time is quite sufficient. The gripper of the cobot can be a mechanical type with fingers or vacuum type with suction cups. Tests with vacuum suction cups indicated that sealed bags which have a flat surface can be picked up easily with vacuum suction cups. However, thin plastic bags are very susceptible to tearing by the strong suction forces which is needed for a reliable grip. An alternative gripping solution with mechanical grippers that clamp the bags would be quite feasible given a proper orientation and position of the plastic bags at the pick-up position. To perform the cutting operation, a vertically oriented rotating circular knife can be used. Such a knife can be fixed right on top of the mixer unit. The plastic bag, which is guided by the cobot, can be moved over the cutting knife with a suitable motion profile. The tests indicate that knotted bags, once guided along their longitudinal axis over the rotating cutting knife, can be cut in a very clean way. After cutting, shaking the bags slightly by the cobot helps in eliminating left overs. To further increase reliability of the cutting operation, a V-shaped guiding frame can be installed in order to help orient knotted bags along their longitudinal axis.

Result

Flanders Make was able to help Hercorub with the feasibility study. Hercorub will do further investigation with the cobot implementation at the mixer position using the proposed bag opening method.

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.

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

“Thanks to this study by Flanders Make, we gained insights on automating parts of our process. We are now considering the impact and possibilities for the future”.

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.

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