

Application Notes

Automatic assembly of bucket handles



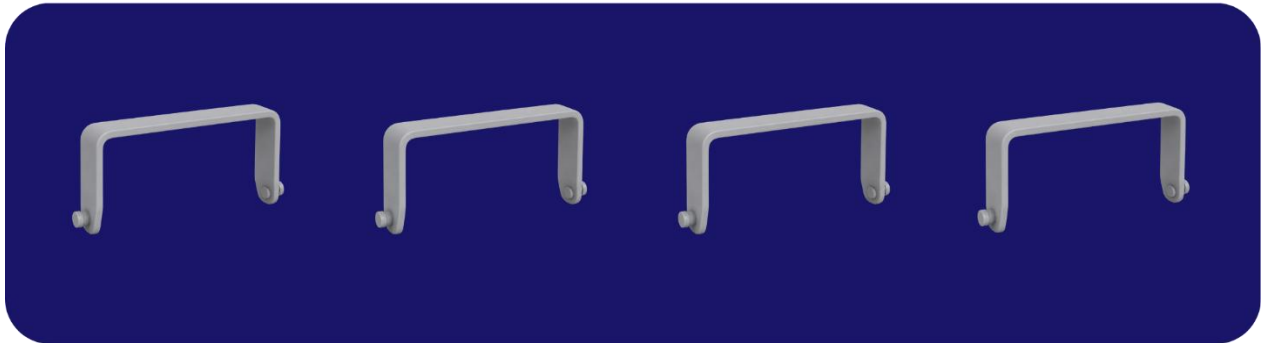
Industry Insights

In the industrial and domestic packaging sector, assembly lines must handle the automatic mounting of handles onto plastic buckets produced directly by injection moulding presses. The handle is a component with a defined shape, but with a precise assembly orientation that must be respected: installing it the wrong way compromises the finished product.

The increase in small production batches and the frequent changeover of formats require **systems capable of quickly reconfiguring the production cycle**, without long machine downtimes or manual mechanical adjustments.

The handles, randomly deposited in bulk onto the feeding system, tend to become tangled and overlap with one another, making singulation difficult. Once separated, the system must accurately identify their position and orientation to ensure correct picking and assembly in the proper direction.

Handled parts



The automated system manages the assembly of handles onto plastic buckets produced by the injection moulding press:

- single-format plastic bucket, produced directly by the injection moulding press
- handle with a defined shape, with a precise mounting orientation to be respected
- configurations with one or two handles per bucket, selectable via recipe

The components, all identical to each other, tend to tangle and overlap. Once singulated, the FlexiVision vision system must precisely determine the position and orientation of each handle to ensure correct picking and mounting.

The Configuration



The solution was developed by **LDF** and is centered on the integration of a FlexiBowl® 1200 as a flexible feeding system for the singulation and orientation of handles, combined with an ABB robot for picking, mounting and unloading the assembled bucket.

The configuration includes:

- **FlexiBowl® 1200 feeding system:** the FlexiBowl® combines vibration pulses and surface rotation to orient and singulate the handles without the need for dedicated mechanical tooling for each recipe.
- **ABB Robot:** the robot ensures a high-speed picking cycle with high repeatability. It sequentially manages the picking of the bucket from the press outfeed conveyor, the picking of the handle from the FlexiBowl® based on the coordinates provided by the vision system, mounting in the correct orientation, and finally the unloading of the assembled bucket onto the palletiser infeed conveyor.
- **FlexiVision** vision system: integrated into the picking cycle, FlexiVision identifies the position and orientation of each handle on the FlexiBowl®, returning coordinates to the robot. The system ensures coordinate updates every 4–5 seconds, compatible with the required machine cycles.
- **Outfeed conveyor and palletiser:** downstream of the assembly, the robot unloads assembled buckets onto a conveyor in line with a palletiser that manages pallet composition for warehouse storage.

Results

The LDF module offers:

- machine cycle of 16 seconds per bucket for single-handle configurations
- machine cycle of 20 seconds per bucket for double-handle configurations
- handle location rate: 12 ppm via FlexiVision
- handle management without mechanical reconfigurations
- complete integrated cycle: from the injection moulding press to the finished pallet ready for the warehouse

Key Points



Consumer Goods



ABB Robot



Assembly Process



12 ppm