Application Notes

Flexible feeding for cosmetic packaging

Industry Insights

In the cosmetic sector, the **variety of formats** and the **speed of product changeovers** represent increasingly pressing production challenges. Packaging manufacturers and filling lines must handle bottles, caps and internal components with different dimensions, geometries and materials, with tight tolerances and very high aesthetic standards.
The growing demand for customization — with frequent product launches and ever-smaller batch sizes — requires automation solutions capable of adapting quickly without sacrificing productivity or quality. For system integrators, this means developing flexible, scalable architectures capable of reliably managing a heterogeneous product family on a single platform.

Handled Parts

The automated system feeds and orients a family of components used in cosmetic filling lines:

- **plastic** cosmetic bottles: with **different profiles, heights and diameters**
- caps: with **variable geometries**
- **internal components**: (e.g. sealing rings, plastic protectors)

The morphological variability of the components — glossy surfaces and asymmetric shapes — makes traditional feeding systems inadequate, prone to frequent jams and requiring costly mechanical reconfigurations at every format change.

The Configuration

The solution was developed by FG Robosys and will be presented in a premiere at Interpack. It is centred on the **revolutionary RoboSorter module**: an **integrated system of flexible feeding, machine vision and advanced robotics designed for the automatic loading of cosmetic filling machines.** The architecture manages the entire product family with a configuration of 6 simultaneous FlexiBowl®, achieving rates of around 30 ppm depending on the component.

The configuration includes:

- **6 ARS FlexiBowl® 800 flexible feeding systems:** each unit combines vibration impulses and surface rotation to reliably orient and present geometrically complex components — bottles, caps and inserts — without requiring dedicated

tooling for each format. A common configuration manages all variants of the product family.

- **5-axis ABB delta robots (Codian):** the delta robots ensure high-speed picking with high repeatability. The 5-axis architecture adds a degree of freedom that allows managing complex component orientations, adapting to the positional variability presented by the FlexiBowl®.

- **ACOPOS 6D planar transport system (B&R):** the magnetic shuttles of the ACOPOS 6D system move components independently, flexibly and precisely, decoupling product flow from the fixed rates of conventional systems. This enables dynamic buffer management and smooth transitions between different formats.

- **Machine vision system**: Integrated into the picking cycle, the vision system identifies the position and orientation of components on the FlexiBowl® and guides the delta robots for precise picking. It supports recognition of all product family formats without hardware modifications.

Results

The FG Robosys RoboSorter module delivers:

- throughput of **~30 ppm** depending on the component handled
- management of a product family with a configuration of 6 simultaneous FlexiBowl® 800 units
- format changeover without mechanical interventions, managed via software
- reliable feeding of glossy cosmetic bottles, caps and protective inserts
- modular and scalable architecture, suitable for integration into new lines or upgrading existing plants
- reduction of downtime and tooling costs thanks to the intrinsic flexibility of the FlexiBowl®

Punti chiave

Cosmetics Industry

ABB Delta Robot

Pick and Place

~30 ppm