Belcan
People-Driven Performance

Automation Case Study

Overview

Design and build a continuous processing line to thermally decorate empty plastic containers. Containers are carried on a single lane conveyor thru a feed screw. Containers mesh with upper and lower tooling and are internally pressurized for rigidity. Continuous ribbon with colored artwork is heated and brought into contact with the containers. Artwork fuses into container surface. Containers deflate and the tooling disengages. Finished product exits machine thru a feed screw and is carried away on single lane conveyor.

Client Information

Product: Decorated plastic containers
Industry: Food & Beverage, Industrial Products
Key Technologies: Thermal processes, web control, multi-axis high speed coordinated motion control

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Background Information

Client's existing equipmentexhibitedthe following problems:

- Limited range in product size capability
- Lengthy product change-over
- Production restart requires iterative adjustments
- Poor serviceability
- Non-robust equipment design

Belcan Automation Approach

To understand the current problems and learn the client's vision of success, an initial meeting was held at the client site.

- Observe existingequipment in operation and discuss existing system pros and cons
- Define desired improvements of a new machine
    - Increase range of product size capability
    - Simplify product change-over
    - Improve speed match of product & artwork ribbon
    - High reliability and ease in servicing

Belcan conducted idea generation & project planning process sessions

- "Brainstorm" concepts
- Identify Proof-of-Principle elements
- Develop implementation plan

Solution

Increase range of product size capability

- Upper tooling frame orientation was changed to permit simple adjustments to handle required product size range

Simplify product change-over

- Cantilevered spindles were designed with features to provide direct access to tooling to allow quick and consistent change over

Improve speed match of product & artwork ribbon

- Multi-axis servo motor based system was designed to provide a platform for precise speed matching of containers and label carrier system

Improve machine reliability and ease in servicing

- Designed robust welded machine frames to provide a stable base structure
- Identified heavy duty spindles, bearings & drive components to increase machine reliability
- Designed access to key areas of the machine to make maintenance and service straightforward and fast

Benefits to Client

Client benefits from implementing the Belcan solution includes :

- Increased machine versatility
  - Greater range in product size capability
  - Faster time to market for product
- Lower manufacturing costs
  - Product change-over time is greatly reduced
  - Production restart is automatic
  - Ease of access for machine maintenance
- Faster payback on capital
- More robust / consistent manufacturing process