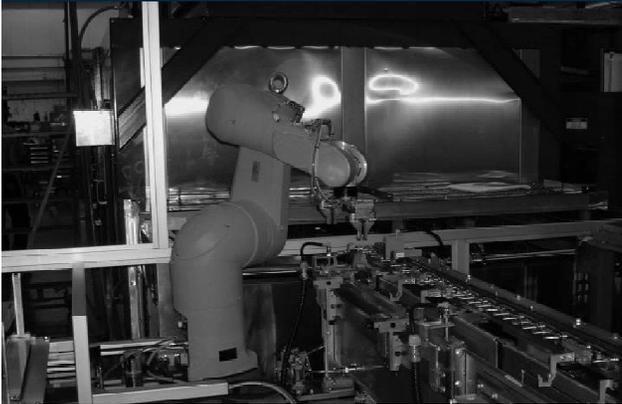


Case Study

Robotic Part Transfer Between Asynchronous Processes



Challenges

A critical part of the new process involved transferring newly coated electrodes from a slurry reservoir to a drying oven.

- Both systems used continuous motion chain conveyors to transport the electrodes through the respective processes
- The selected material handling system had to synchronize with both conveyor systems when transferring product from the reservoir to the drying oven
- Product position on the incoming reservoir chain conveyor had to be tracked
- Timing had to be precise and repeatable to ensure the next part on the continuous moving conveyor could be removed in time
- The coated parts were fragile when wet – requiring a gentle transfer motion profile



Client Overview

Belcan was contracted by its client to design and build an innovative manufacturing system for a new energy storage product line. The new system would automatically coat and dry electrodes for a new battery technology.

Belcan Solution

Belcan conducted a requirements study for the application to identify the critical performance criteria. Several competing concepts were developed. Ultimately it was determined to use a Staubli 6 axis robot solution with conveyor tracking capabilities. A simulation model was generated to verify the cycle rate and motion profiles. Encoders were designed into both conveyor systems to permit precise, repeatable conveyor and part tracking.

- Robot matches reservoir conveyor velocity
- Robot is synchronized to part entering pick up “window”
- Part is removed from conveyor to a clear position, rotated 90 degrees and moved to drying conveyor drop off position
- Robot matches velocity of drying oven conveyor and lowers part onto chain conveyor
- Robot makes high speed move to reservoir conveyor to pick up next incoming part carrier



Results & Benefits

- By employing a robust requirements definition phase the Belcan team was able to efficiently identify plausible technical concepts for consideration
- The robot based solution was efficient and cost effective, requiring minimal mechanical infrastructure and hardware
- Overall elegant solution to a difficult problem – transferring parts between two non-synchronized processes reduced overall floor space requirements and system complexity