

CASE STUDY

Fully Automated 55 Gallon Drum Fill System

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JOB OVERVIEW

Key Features

- Fully automated, hands free bulk packaging system
- Custom vision system working with integrated packaging line and controls
- Pressure check, cap removal, and defective drum reject/marketing system

Challenges

- 180° hot-fill industrial chemical that poses a potential safety risk to workers
- Varying orientation of drums within a set of four, which are strapped together
- Drums arrive with caps over both openings, which must be removed before drums can be filled

Impact

- Eliminated worker risks by automating a previously hands-on process
- Increased efficiency by allowing the four drums to remain strapped together for filling process

THE EPIC SOLUTION

EPIC managed every aspect of the project including: assessment, packaging line re-design, mechanical and structural design, applied engineering and fabrication, controls engineering, installation, plant integration, FAT testing, and start-up and support.

The final drum fill line includes a dual camera vision system that allows for a completely hands-free filling process. The set of four drums are unloaded from the truck and placed on the line strapped together. As they move towards the filler, a camera locates the four drums and uses a grid system to locate the general location of each of the openings on top of the drums. A second camera pinpoints the location of both openings on top of the individual drums.



This information is used to accomplish several tasks. First, a magnetic torque wrench is used to tighten one of the two caps over the openings, and to remove the other cap in preparation for filling. A pressure check of the drum is performed by sealing the open hole and pushing air into the drum. A pressure switch must be flipped. If the switch is not flipped, the seal is re-established and the test tried again. Two failures result in that drum not being filled and marked as defective. Pass and fail is on an individual drum basis, so if one drum in a set fails, the other drums can still pass and be filled.

Once a drum proves to be leak free, the drum is filled by moving the filling head to the exact location of the open hole. The drum sits on a scale and is filled to an exact weight. After it reaches the target weight, the cap is screwed back on mechanically to a certain torque. All four drums are filled at the same time. Then the four full drums, still strapped together, go back to the forklift and are put back on the truck.