



Case Study



STREAMLINING MACHINERY AND PRODUCTION LINES



Pneumatic end effector - vacuum fitting part that sticks labels on each apple.

CHALLENGE

One of the SIGMADESIGN's clients needed a fruit labeling machine. In the process of developing and improving the product SIGMADESIGN began looking for ways to use 3D technology to assist with making parts for the machine. Their goals were to save money and time while simultaneously improving the design.

OBJECTIVE

Optimise the design process & reduce costs by exploring new ways to produce parts for high-value equipment that is sold in low volumes.

APPROACH

3D printing to optimise the design and production of certain parts.

(CONT...)

"When designing and manufacturing fruit labeling machines, we'd usually use injection moulding and machining for parts" says Matt Cameron, VP of Engineering at SIGMADESIGN. "At low volumes, these traditional techniques might not be worthwhile. We wanted to reduce the cost, while also improving the speed and flexibility of our design process."

The fruit labeling machine is an industrial device. It's designed to apply labels to fruit produce in the simplest, most cost effective way. The machine applies thousands of labels per hour, yet is also precise enough to ensure no fruit is damaged.

Fruit labeling machines are compact devices, made up of thousands of moving parts. A traditional manufacturing technique like machining is expensive, especially for short runs of complex parts. There's also significant cost when parts need to be changed or modified.

SOLUTION

"Using MJF 3D printing technology, we saw an opportunity to redesign the fruit labeling machine. We could develop parts faster and produce them in short batches, pretty much on demand."

SIGMADESIGN's engineers have worked with 3D printing before but have often found it limiting. One of the parts they considered was a vacuum applicator fitting.

IMPROVED PERFORMANCE

- Part does not leak air
- Strength
- Material not porous
- Good surface finish

COST REDUCTION

- \$30,000 savings

LOW VOLUMES

- Ideal for quantities less than 1,000 units
- Design freedom



Above part is another 3D printed component within the apple label machine. Press fit with a ball bearing. It serves as a counter weight when the part is mounted to a rotary sensor.

(CONT...)

It was originally machined, but its design which included a right angle, created a design constraint for production.

The company created a more efficient design that removed the right angle, which eliminated the potential of friction with other parts. They first attempted to 3D print it using a fused deposition modeling (FDM) printer. Unfortunately the part did not meet the company's quality requirements. It was too porous and lacked strength.

Later, they printed the part using their new HP Jet Fusion technology. From a quality standpoint it was vastly superior. The part didn't leak and was strong enough for a production environment.

While the part was being qualified for production the team at SIGMADESIGN compared the economics. With the HP Jet Fusion 3D Printing Solution, they had the opportunity to reduce costs and improve a key component in the fruit labeling machine.

With the successful production of the vacuum fitting, the engineers at the company identified a total of 877 other parts which could be 3D printed.

RESULTS

With the design constraints removed, they were able to create parts that fit the available space, instead of having to design the machine to fit around certain parts. The resulting parts were also significantly less expensive to produce, especially in low quantities.



Above: MJF vacuum fitting.

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