Shrinking Costs

3D PRINTING SAVES AXON 90% ON TOOLING COST AND TIME

"3D printing has played a major role in our success in the shrink sleeve labeling machinery business."

– Ken Nyren / Axon LLC

CASE STUDY

A typical container with shrink sleeve labeling

Axon LLC, based in Raleigh, N.C., manufactures machinery used to apply sleeve labels that shrink to fit a product's surface when heat is applied. Shrink sleeve labels are rapidly growing in popularity because they enable graphics to appear around the entire circumference of the container and also take the shape of the container.

One of the company's challenges is that almost every machine it builds requires custom tooling to shape the label to fit over the container. Hundreds of fixtures, called "pucks," are also needed for many types of containers to hold them stable while the label is applied. Increasingly, packages are being manufactured in complex shapes that require tooling and pucks with intricate geometries that, if produced with less-than-exacting precision, could jam the machine.

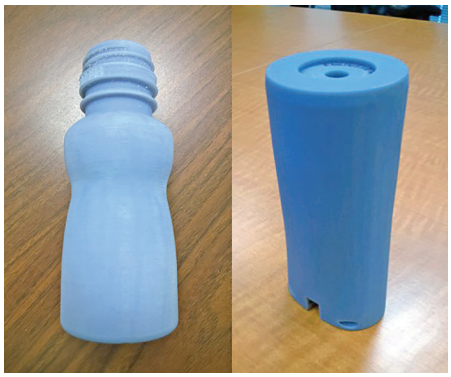
Meeting a Challenging Production Timeline

In the past, the company produced prototype tooling, production tooling and pucks by machining them from plastic. Production typically took one week for tooling, two weeks for a prototype puck and three weeks for all the pucks needed for a machine. Frequently, prototyping revealed needed changes and the process would start again. In a few particularly challenging applications, the tooling was not ready within the company's typical eight-week machine build cycle, which delayed shipment.

Ken Nyren, engineering manager for Axon, had the idea to 3D print prototypes, production tooling and pucks. The company produces a large volume of tooling and pucks, so the production capacity of the 3D printer was critical in the selection process. Nyren selected a mid-size PolyJet™ 3D Printer because of the technology's fast print speed. "We can build several models in the same amount of time it takes other technologies to produce a single model," Nyren said.

Axon shrink sleeve applicator machine

With the 3D printer, Axon now prints tooling for a shrink or stretch sleeve in one day. Engineers try out the printed part on the machine and if it doesn't work, they can make a change and print out the new tool the same day. The cost of printing the four pieces that make up the tooling is only $720, compared to $2,400 for machining the parts. "A major advantage of 3D printing is that we get immediate feedback," Nyren said. "This maintains the continuity of the design process and helps us create better tooling designs."



Tooling used to form labels

Production-Ready Parts

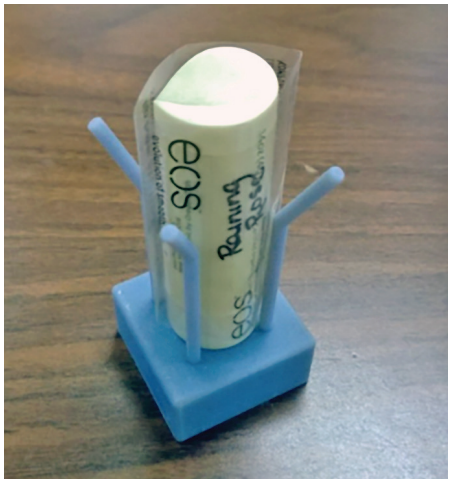
Axon uses the 3D printer to build both prototype and production pucks. 3D printing's quick results often make it possible to try additional design iterations, which frequently leads to a better design. The cost of 3D printing a single puck is $12 compared to $125 for a machined one. Additionally, Axon can 3D print production pucks in-house, instead of from a supplier, when the geometry is particularly complex or time is tight.

"Besides building tooling and pucks, we have found many other uses for 3D printing," Nyren added. "One of our customers asked us to build a machine, but did not yet have sample containers to test the machine. We printed several different iterations of prototypes so the customer could pick the one they liked best and then used the prototypes for testing the new machine."

Nyren summarized, "3D printing has played a major role in saving time, reducing costs and contributing to our overall success in the shrink sleeve labeling machinery business."

How does PolyJet compare with traditional tooling for Axon?

METHOD TO BUILD PROTOTYPE PUCK	TIME	COST
CNC Machining	14 days	$125
3D printing	1 day	$12
Savings	**13 days** **93%**	**$113** **90%**



A puck holds a container while a label is applied.

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