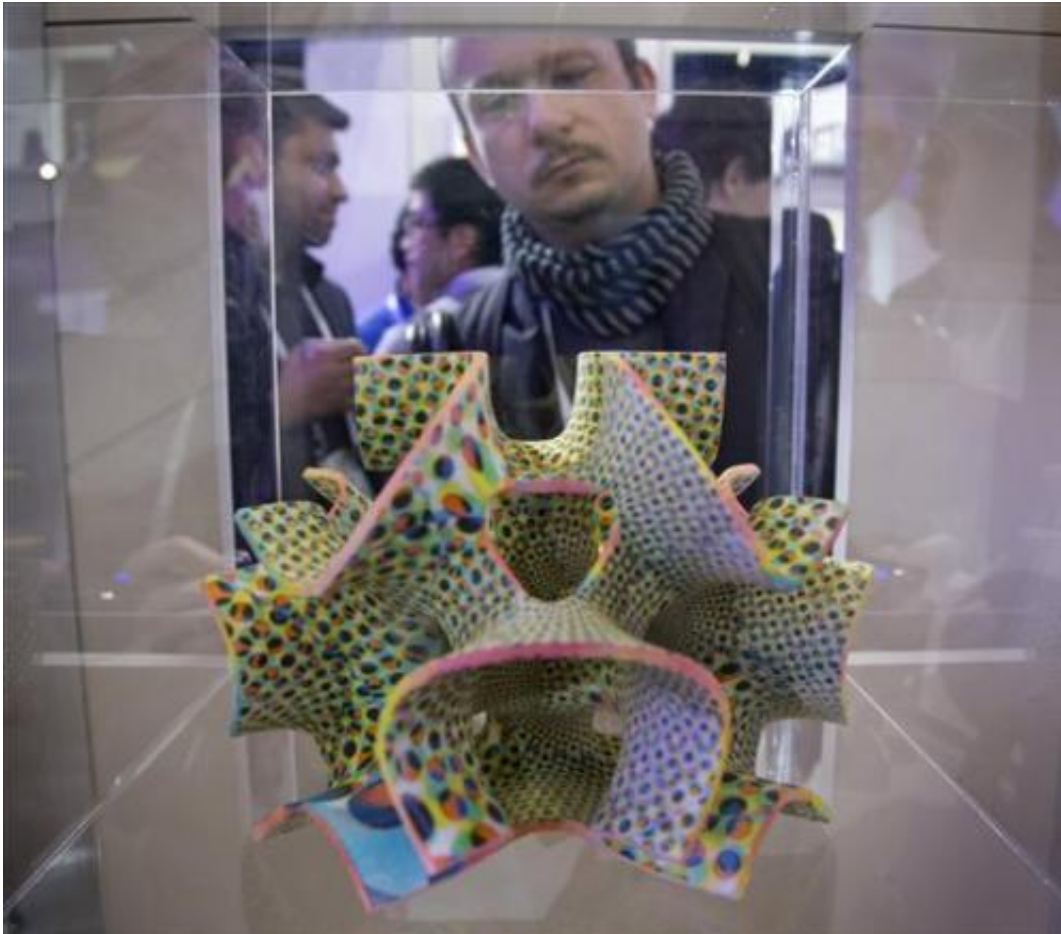


3-D printing set to break out of niche

January 12 2014, by Peter Svensson



A trade show attendee examines a centerpiece confection made with a ChefJet Pro 3D food printer on display at the International Consumer Electronics Show, Thursday, Jan. 9, 2014, in Las Vegas. The candies are made with sugar, food coloring and a single flavor. (AP Photo/Julie Jacobson)

Some of the oddest items on display this week at the International CES

gadget show were edible, origami-like sculptures made of sugar, their shapes so convoluted as to baffle the eye.

The treats are one of many signs that we'll all be getting a taste of 3-D printing soon —and the phenomenon won't be relegated to the realm of engineers and tech enthusiasts.

The sugar sculptures are the output of the ChefJet Pro, the first commercial, kitchen-ready food printer. It looks like an oven, and deposits sugar layer by layer in a tray, then melts the parts intended for the sculpture with water so they solidify much like sugar in a bowl will harden with moisture.

Ink can be selectively added to the water so the sculptures come out in full color—a feature sure to set the minds of wedding and party planners spinning. Next to the geometric sculptures was a wedding cake supported by a delicate lattice-work tower of sugar that would be nearly impossible to make by conventional means.

Oh, and the printer can print in chocolate too.

3D Systems Inc., a Rock Hill, South Carolina, company, expects to sell the full-color printer for about \$100,000 in the latter half of this year, and a monochrome version for half that price.

Last year, there were only a handful of 3-D printing companies at the gadget show. This year, there were thirty, and the organizers had to turn others away because they couldn't fit them in. The 3-D printing area of the show floor drew dense crowds that gawked at the printers and their creations, which ranged from toys to tea cups to iPhone cases.

Melissa Spencer, a jewelry designer from Los Angeles, was at the show to look for a printer. 3-D printers have been used in jewelry-making for

a long time, but high prices and poor resolution have limited their use. With prices down and output quality up, it's now possible for an independent designer to buy her own printer, Spencer said.



Trade show attendees examine centerpiece confections made with a ChefJet Pro 3D food printer on display at the International Consumer Electronics Show, Thursday, Jan. 9, 2014, in Las Vegas. The candies are made with sugar, food coloring and a single flavor. (AP Photo/Julie Jacobson)

The printers focus bright ultraviolet light into liquid resin, setting it. That takes time. One printer maker cited 7 hours for a batch of five rings. The plastic pieces are then used to create molds for molten silver, gold or platinum.

Spencer is now toying with the idea of abandoning the reuse of molds, and instead using the power of a 3-D printer to make every piece a one-

off, unique design, customized to the buyer. It helps that she can show the plastic prototypes to the customer before casting.

With 3-D printing, "we're moving to a world of mass customization," said Shawn Dubravac, an analyst for the Consumer Electronics Association, which puts on the show. What started with custom-printed T-shirts a la CafePress can now happen in all kinds of industries, he added. It's still a small field, though. He expects that just under 100,000 3-D printers will be sold in 2014.

One jewelry company was at CES to demonstrate how it has taken the capabilities of the 3-D printer and made them the core of its business. American Pearl, a family-owned company founded in 1950, in November revamped its website to allow shoppers to order custom jewelry. From about 1,000 basic designs, the buyers can change metals and stones and order engravings and they can see the results rendered in 3-D on their computer screens. The company prints the orders in 3-D in its factory in New York.

The approach lets the company keep prices low while satisfying customers' demands for unique pieces, said American Pearl president Eddie Bakhsh. "If you saw the backend of our system, you'd see that every order coming in is different."

The mass customization capability is useful in unexpected fields. Bre Pettis, the CEO of New York-based printer manufacturer MakerBot, is proud that a customer, a South African carpenter who had lost four fingers in an accident, figured out how to use a printer to make a mechanical hand for himself. He distributed the blueprints to other MakerBot users, who can tweak them to fit.

"Normally, prosthetics cost tens of thousands of dollars, but with the MakerBot, they cost five dollars in materials," Pettis said.

MakerBot unveiled new models at the show, including its biggest one yet, which is the size of a mini-fridge, costs \$6,499 and can print objects the size of a human head. It also launched a smaller version, the Replicator Mini, which can create cupcake-sized objects. It will cost \$1,375 when it launches this spring.

MakerBot will be undersold, however, by XYZprinting Inc. of Taiwan, which plans to sell its Da Vinci printer starting in March in the U.S. for \$499. That's a price that's bound to attract a lot of people who would never have imagined, a year ago, that they'd have a 3-D printer in the house.

The MakerBot and Da Vinci printers take rolls of plastic wire and melt them, piece by piece, depositing tiny dots to create objects. The resulting pieces can be light and strong, but their surfaces show a characteristic banded texture and the resolution is limited; the overall impression is crude. The light-curing models used by jewelers and engineers produce smooth objects with fine detail, but they've been out of reach of consumers and tinkerers until now.

The show provided hope on that front, however: XFab, an Italian company that's made professional 3-D printers for a decade, demonstrated a \$5,000 laser-powered model at the show, and said it is looking at launching a smaller, \$2,500 model later this year. That's roughly the price of the standard MakerBot, which has been the vanguard of the consumer 3-D printing movement so far.

Elsewhere at the show, there was a "technology fashion" show that featured 3-D-printed shoes and a bag with appliques created on a consumer-level, computer-controlled cloth cutter, the Brother ScanNCut.

"The question in my mind is not 'Will we have a 3-D [printer](#) in each home?' but 'Which room will it be in?'" said Avi Reichental, the CEO of

3D Systems. "Will it be in your garage? Will it be in your kids' room, or the man cave ... Or the wardrobe?"

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Citation: 3-D printing set to break out of niche (2014, January 12) retrieved 24 April 2024 from <https://phys.org/news/2014-01-d-niche.html>

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