

# 3D printers bring hi-tech manufacturing to the home

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Not so long ago, harried moms and dads would brave the holiday season crowds at the mall to buy those Lego accessories or that Star Wars battle cruiser.

Now, with increasingly cheap and easy-to-use three-dimensional printers, they can turn out such gifts in the comfort of the family living room or garage.

3D printers -- which use a process called additive manufacturing to make objects from a digital model by laying down layers of material -- aren't new. They've been used to make manufacturing and engineering prototypes for more than 25 years.

But printer makers are now turning their attention to the consumer market, and have been rewarded with soaring sales and stock prices -- as well as the prospect of lucrative buyouts.

Some printers capable of churning out simple items such as keychains, wine bottle holders and missing board game pieces are already selling for as little as \$350. That's cheaper than a high-end version of Microsoft's Xbox 360 with Kinect.

"The consumer segment in the next few years will potentially devour everything else that we do," said Abe Reichental, chief executive of 3D Systems Corp, the biggest listed U.S. 3D printer maker.

Shares of Rock Hill, South Carolina-based 3D Systems, now trading around \$38, have more than doubled since it launched its first printer for home use, the Cube 3D, in January.

Demand is three times more than expected, Reichental said, although he declined to give exact numbers.

Shares of Stratasys Inc, the other major listed 3D printer maker, have more than doubled since the start of the year, to around \$65 as investors sense the next big thing.

Privately held MakerBot, which released its first plug-and-play 3D printer, the Replicator, for \$1,749 at the start of the year, faces a problem of too much demand, CEO Bre Pettis said.

"We expected our orders to double from our previous machine, Thing-A-Matic, and instead orders quadrupled," Pettis said.

Brooklyn, New York-based MakerBot, founded in 2009, has shipped 13,000 printers

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so far.

About 80,000 3D printers of all sizes have been sold in the United States since 2007, research firm Wohlers Associates Inc says.

"If someone develops a very inexpensive and safe 3D printer for children, then I could envision maybe more than half of homes having 3D printers in them, as a toy," said Wohlers President Terry Wohlers.

### BUYOUT POTENTIAL

Part of the reason for the elevated share prices is speculation that traditional printer makers such as Hewlett-Packard Co and Lexmark International Inc may see 3D as the way forward and seek to buy out a listed 3D printer maker, said Paul Meeks of Saturna Capital.

"Somebody may come in over the top to boost the prospects of their own printing groups," said Meeks, whose firm holds a small stake in 3D Systems.

Michael Puryear, managing director at Howard Capital Management, said fundamentals are very strong.

"And in this economic environment, a small company that's growing top and bottom line somewhere between 50 and 60 percent should be rewarded a premium," said Puryear, whose firm holds stakes of about 1.5 percent in both 3D Systems and Stratasys.

But how much investor enthusiasm is too much? The rapid growth in the share prices worries some analysts.

With a market value of about \$2.1 billion, 3D Systems stock trades at 30.2 times its 12-month forward [earnings](#) [1] while Stratasys, with a market value of \$1.4 billion trades at 42.6 times.

"I worry as it (3D Systems) continues to rise, that at some point, the valuation gets ahead of the hype," Meeks said.

Grandeur Peak Global Advisors LLC, which sold its stake in 3D Systems in June, said the company's acquisition spree could be dangerous. 3D Systems has made six acquisitions this year, and eight in the last 12 months.

The company's revenue rose 52 percent to \$83.6 million in the second quarter but organic revenue growth -- stripping out the acquisitions -- was just 20 percent.

"My honest belief is that they're going to have a misstep," Grandeur's Spencer Stewart said.

3D Systems reported a net profit of \$8.3 million for the quarter ended June 30, a fall of 38 percent from the same period year earlier. But the company's market value

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jumped to \$2.6 billion from \$1.68 billion over the same period.

Net profit at Stratasys, which is based in Eden Prairie, Minnesota, fell 24 percent to \$3 million for the quarter ended June 30, but its market value grew 51 percent to \$1.08 billion.

Others see market growth bringing the valuations into line.

End-markets are opening up so growth will continue in the near future, said Dougherty & Co analyst Andrea James.

There are those who think 3D printers may even be able to someday produce food -- or, more worryingly, guns.

### BIG PLASTIC HEART

Worries about stock valuations are of little concern to consumers like Tom Nardone of Birmingham, Michigan who bought a MakerBot Replicator for \$2,000.

Nardone, who runs a marketing company, believes these printers hold great potential for making homemade toys, or as toys themselves.

"Some company will launch this device and it'll be \$199 and your kids will be begging you to buy them."

3D Systems operates an online design platform, Cubify.com ([cubify.com](http://cubify.com) [2]), that works like Apple Inc's iTunes and Google Inc's Android app store.

The owner of a printer can download patterns for jewelry, toys, lamp shades and more -- many of them created by independent developers.

Taking a cut of those sales generate recurring revenue for 3D Systems, as does the sale of consumables and a service where users can order a printed product and get it delivered.

Others have gone a more open route. MakerBot offers open source design and software downloads for free on its Thingiverse online platform ([www.thingiverse.com](http://www.thingiverse.com)) as it focuses on sales of printers and printing materials.

Copyright holders will cringe, but people are already using printers to make Star Wars battle cruisers or a cheaper alternative to Lego or Mattel Inc toys.

One thing Nardone realized right away, though, is that the process is slow -- about 45 minutes to make something the size of an egg, and about four hours to create an item the size of a soft drink can.

Items he has made so far include shoe lifts for his young daughter and a back scratcher.

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"The longest it took to make something was nine hours, it was a big plastic heart I made for my wife," he said. "When we woke up in the morning it was still printing."

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