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## How 3-D Printing Figures To Turn Web Worlds Real

By ROBERT A. GUTH  
December 12, 2007; Page B1

Last year, Alias was just a videogame character known for stabbing monsters in the back. Today the bald-headed rogue has come to life on a bookshelf near Seattle as a four-inch-tall figurine with emerald dagger in hand.

Bringing such fantasy characters to life is possible thanks to the technology of 3-D printers, which turn three-dimensional computer images into three-dimensional objects. The statue of Alias was created courtesy of a start-up called FigurePrints LLC, which is opening for business this week. The company was founded by Ed Fries, a former Microsoft Corp. executive who is taking advantage of a shift in the 3-D printing industry to populate the world with trolls, gnomes and other fantastical creatures from the online game World of Warcraft.



Richard Brown Photography  
World of Warcraft figure made with a 3-D printer.

The 3-D technology combines computer software and specialized "printers," which are copier-size machines that sculpt objects using a tool akin to a set of high-tech glue guns. Following a 3-D design on a computer, the gun nozzles squirt layers of material that harden into a porcelain-like object.

For 20 years, 3-D printers have primarily been used in labs and research groups at auto makers, aerospace companies and other design-intensive businesses. But during the next 12 months, 3-D printing will move closer to the mainstream, thanks to some entrepreneurs and consumer-focused companies like FigurePrints that are building businesses around the machines.

In Redmond, Wash., a start-up called 3D Outlook Corp. this month will begin using software from NASA to sell 3-D models of mountains and other terrain priced at under \$100, says Tom Gaskins, the company's chief executive officer. Mr. Gaskins says hikers, resorts and real-estate firms are likely customers for 3-D maps and models that show the topographic contours of ski slopes, golf courses and other landscapes.

Meanwhile, in Singapore, a National University of Singapore spinoff called Genometri Pte. Ltd. this week is opening an online service for people to find and swap designs that can be 3-D printed.

In Virginia Beach, Va., start-up Fabjectory LLC offers to make figures from the online world Second Life. And videogame publisher Electronic Arts Inc., Redwood City, Calif., sometime next year may begin offering characters from its forthcoming online game Spore, says Patrick Buechner, vice president of EA's Maxis studio.

The expansion by 3-D printers into manufacturing is happening thanks to a steady drop in the price of printers, improvements in the materials they can handle and a proliferation in the amount of 3-D data that can be turned into objects.



Z Corp.  
Lower-price 3-D printers like this one from Z Corp. are spawning new businesses.

Historically, the printers cost hundreds of thousands of dollars and were made by a handful of small companies including Z Corp. and Stratasys Inc. But now those and other new companies are producing more-affordable machines priced below \$20,000, a change that has radically expanded sales.

The 3-D printing industry is about 20 years old, and in the past two years alone, it has sold around 8,000 machines, or 36% of the industry's two-decade world-wide sales total of 22,000, according to consulting firm Wohlers Associates.

And sales are likely to increase further: A Pasadena, Calif., venture called Desktop Factory Inc. has already taken 350 pre-orders for a \$5,000 3-D printer it plans to roll out next year, says Cathy Lewis, CEO of the company. About 40% of those

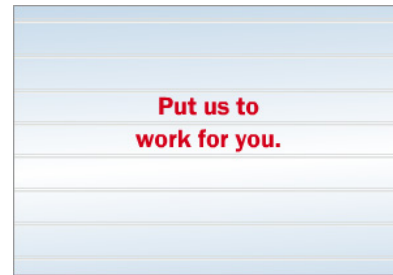
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orders are from universities and 35% from small businesses, she says. The company predicts printers could start finding their way into homes in five years or so.

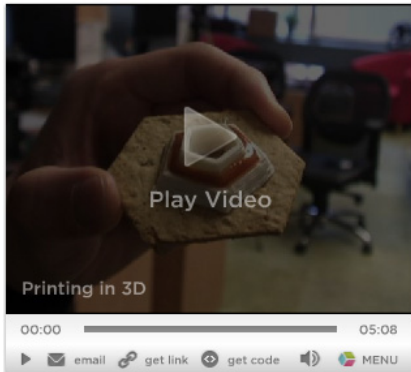
"The costs have come down and the technology is much more stable and reliable now," says Sivam Krish, chief executive of Genometri, which will use Z Corp. printers to make picture frames; he later hopes to expand to custom toys and jewelry. "We're looking at new product possibilities that are manufactured quickly according to customer requirements."

FigurePrints shows the trend. The company is the brainchild of Mr. Fries, an 18-year Microsoft veteran who once headed the company's videogame studios. After leaving the company in 2004, Mr. Fries invested in start-ups and joined several company boards. He also played more of World of Warcraft, a medieval game from [Blizzard Entertainment Inc.](#) in which players spend hours expanding skills and armories for exotic creatures, from druids to warlocks.

On a 2006 visit to a big videogame convention in Los Angeles, Mr. Fries saw EA show off sample figurines it had made for its Spore game, which is still under development. Spore will have software for combining any number of different bodies, arms, legs, wings and other parts to form characters. Mr. Fries built a character at the show, and a month later, EA sent him the finished figure.

That got Mr. Fries thinking about doing his own business. World of Warcraft was rapidly growing in popularity -- some 9.3 million people world-wide now play it -- and that meant a lot of potential characters to print.

In late 2006, he and a former Microsoft colleague started researching printers and talking with World of Warcraft maker Blizzard about working together. Early this year, Mr. Fries plopped down \$50,000 for a Z Corp. printer, set it up in the kitchen of one of his venture companies and started experimenting with characters.



Printing a cocktail snack from your desktop? WSJ.com's Andy Jordan explores how that is possible with a cheaper form of 3D printing.

A programmer friend wrote some software to help rejigger the characters in the game into images that could be printed. Later, Mr. Fries moved his operation to a friend's print shop in Vancouver, British Columbia, named his business FigurePrints and now has four Z Corp. printers.

Under an exclusive deal with Blizzard, Mr. Fries set up a Web site tied to World of Warcraft. Starting this week, players can enter a drawing on the Web site to have their character printed. Over time, players will be able to click a print button and receive the colored plaster-and-plastic figures in the mail. The figurines cost about \$100 each.

The service is also being marketed with [Dell Inc.](#) as part of a World of Warcraft-themed high-end notebook PC. Buyers of the PC get a voucher for a free FigurePrints figurine.

The 3-D printing technology still has limits. Making 3-D objects requires a relatively high level of oversight that limits the speed a company can pump out custom objects. One issue is that certain details on designs -- such as a flowing cape -- that look fine on a computer screen are tricky for printers to handle. The materials -- Z Corp. printers use a combination of polymer and plaster -- are also fragile.

EA, for one, is now trying to iron out these issues as it prepares to launch its Spore game next year, Mr. Buechner says. The game and its creator tool could spawn a huge population of new creatures. Such a service is now "absolutely viable," he says.

Mr. Fries and his partners have so far invested \$400,000 and are talking to other videogame makers about handling prints for other games. They expect for now to be working overtime to meet demand from just World of Warcraft, Mr. Fries says. "I wasn't looking to start a new company, but it was hard for me to ignore," he says.

Write to Robert A. Guth at [rob.guth@wsj.com](mailto:rob.guth@wsj.com)

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