



# founded in stoughton

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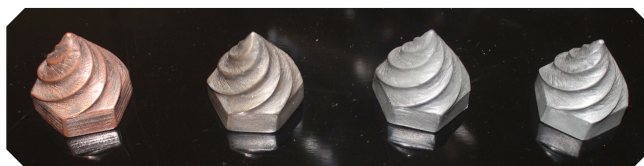
In an unassuming cranny in downtown Stoughton, local startup The Virtual Foundry is a driving force of innovation in the booming 3-D printing industry and has received international recognition. Founded three years ago by Stoughton resident Brad Woods, The Virtual Foundry resides in a nondescript building on Water St., just North of Main St. They are the world's first and only company to produce 3-D printer filament that is 90 percent metal, but can be used with any printer, from the hobby level to professional manufacturing machines.

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**- Brad Woods**

3-D printers melt a string of plastic -- called filament -- and use a moving tip to build any object, layer by layer, in three dimensions. While plastic is very versatile, many parts require the strength and durability of metal. Formerly, the cost of 3-D metal printing was immense, a key aspect that The Virtual Foundry's filament improves upon.

"The whole point is that it works on regular, off-the-shelf printers," explained Brad Woods, the inventor of the Foundry's line of products. "It's not quite the same as plastic, but very similar. This material has three and a half times more mass, so it takes quite a bit more heat to get it up to the melting point. Once you get [your printer]



**Drill bits printed out of metal filament sit on display. From left to right: copper, bronze, steel, and tungsten.**

dialed in, you can actually print it faster than plastic."

Now, any idea or object can be easily made out of metal. After his introduction to 3-D printing three years ago, Woods realized that plastic objects have little industry value, and began to experiment with metal filament. Soon after, he moved into a building in downtown Stoughton and started an online Kickstarter campaign to raise money for The Virtual Foundry. They began to deliver spools of filament in the last 18 months, and Woods continues to improve upon his line of products.

The Foundry currently has six employees and one extruder, which spits out a string of filament at thicknesses of 1.75 mm and 2.85 mm. All of the design, testing,

and manufacturing is done right here in Stoughton.

The Foundry manufactures bronze, copper, and steel blends for commercial sale and proprietary tungsten for a specific customer. The non-metal portion of each blend is a secret mix of polylactic acid (PLA) plastic and other compounds. "Filamet" is the shelf name of these filament products, which are available online through websites such as Amazon. Anything printed out of Filamet can be fired in a kiln to burn off the plastic and achieve 100 percent metal purity, or polished to look like pure metal. This process is called sintering, and can be accomplished with a small hobby kiln. Despite being geared towards the everyday 3-D printer, many industries

and research companies are taking notice of the possibilities that cheap printable metal creates.

"Aerospace has a lot of interest, college research departments, and prototyping labs," said Tricia Suess, president of The Virtual Foundry. "Expanding our line of materials is something that we're always working on. Custom development is great [ . . . ], we're young and innovative."

Woods is currently prototyping large drill bits that will be used at the IceCube neutrino laboratory at the South Pole, and one customer even uses their special tungsten filament to print parts that go inside of a nuclear reactor.

"For some users, the whole point is the density. The tungsten is a replacement for lead, and will soon be used in a hospital with radioactive materials," elaborated Woods.

"We're a startup at this point, but we want to grow at an aggressive pace. We want to bring more people in here and move more product out the door," added Woods. The Virtual Foundry is truly local, as he plans on keeping the business in his hometown of Stoughton and sources all of their materials from manufacturers in the United States. Despite being small and relatively unknown in Stoughton, the Foundry is making ripples in the international multi-billion dollar 3-D printing industry. It was nominated for three different awards at the 3-D Printing Industry Awards last year in London, England. With the ambition and innovation of a Silicon Valley startup, and the friendly, hardworking spirit of midwestern Stoughton, The Virtual Foundry is bound to find success in the technology of the future.



photos by ian bormett

**Founder Brad Woods and President Tricia Suess smile at the Virtual Foundry's design shop.**