

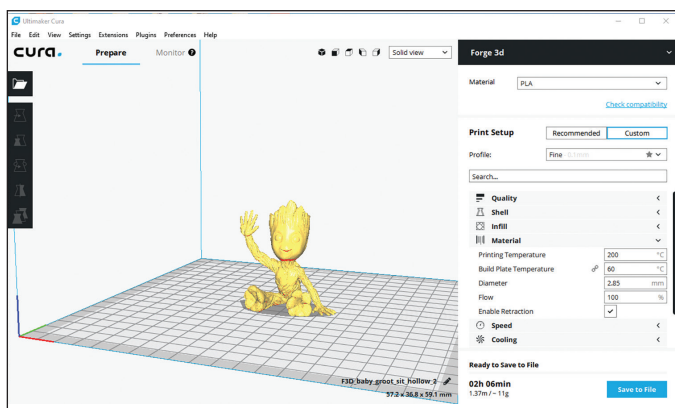
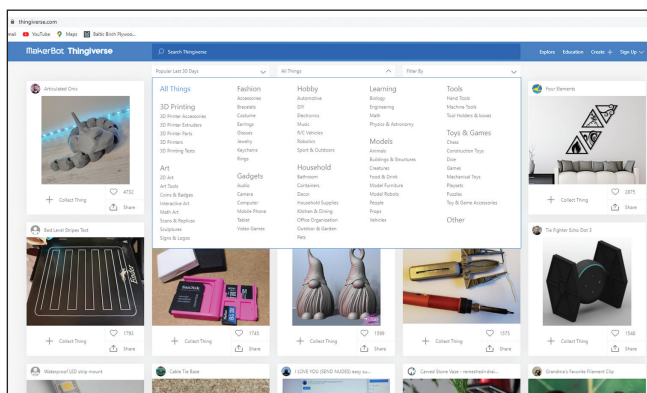
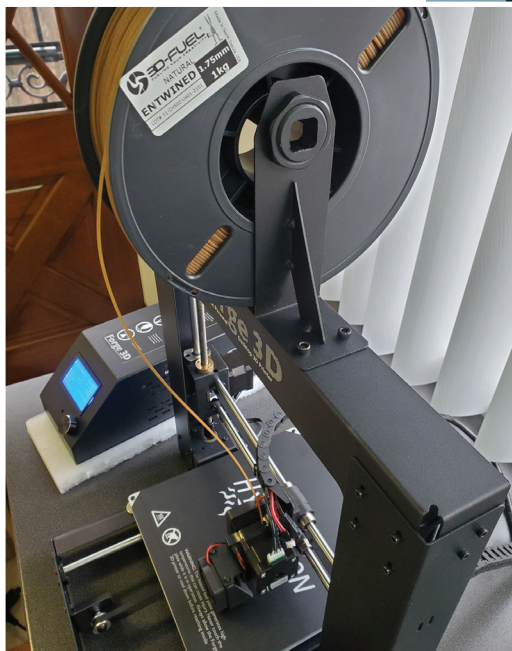
3D PRINTING STACKS UP TO A NEW PRODUCT CATEGORY

By Dennis Andreas

This month we highlight a new entrant in the hobby market, 3D-Fuel. They manufacture high-quality 3D printer filaments in the US and Ireland. If you aren't stocking 3D printer filaments yet, hopefully you'll think about it after reading this.

Let's start with a brief intro to 3D printing or its technical name, FDM for Fused Deposition Modeling. Basically, it's extruding very thin melted plastic in a precise pattern to build a 3D object from the bottom up. There are other types of printing, but we will stick with this type for now. Think of the process like applying icing to a cake, squeezing out thin layers row by row to build up a shape.

To start, you need to use a 3D-modeling software package to digitally create the object you want to print. I use AutoCad 123Design. However, there are many free and paid software packages available online. In most software packages, you build objects using basic shapes like a sphere, box or rods that can be stacked. Or you can create a shape freehand and then grow or extrude it in the direction you want to shape the object.

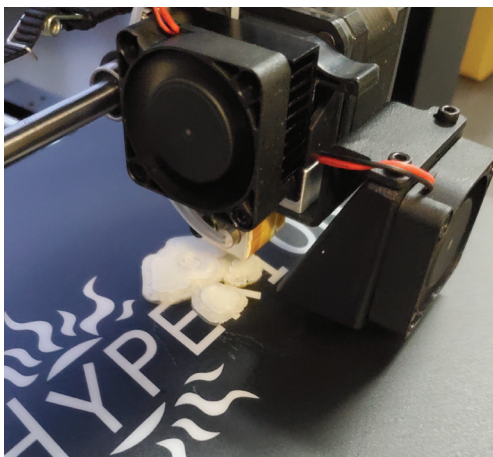


If you don't want to design an object yourself, there are many free and paid sites, where you can find files created by other hobbyists in the community. One free site is Thingiverse.com, where you can search for files. Printable files are usually in the STL (Stereo Lithography) file format, which you'll see as "thingtoprint.stl." This format is the most popular that Slicer programs understand. The most popular Slicer program is called CURA and is also available free on the Web.

The Slicer software takes your object and cuts it into super thin horizontal slices to build it from bottom to top. The Slicer has to know which 3D printer you're using and then creates code to tell the printer how to move in the X, Y and Z planes and when and how much plastic to melt to build the object.

If you're asking, why should I get involved with this? The answer is 3D printing is used everywhere. It's great for building prototypes of practically everything or one-off or small production runs. Gaming folks make their own pieces, for example. It's widely used in STEM classes, school labs, engineering and architecture firms. I got into it to make scale pieces for my RC aircraft and that morphed into many end-user items I regularly sell at RC events. I'm not the only one making parts either. Check scale model forums, and there will be many examples. RC aircraft manufacturers have made cockpit files available for their models. Just like wood and glue, these modelers need materials to work with, and there's a lot of crossover with other products in your store.

Hobbyists need a 3D printer and some free software to drive it to get started. With that in place, let's look at the process for printing an object. We'll use the plastic filament supplied by 3D Fuel. Like many hobby projects, quality materials and equipment are critical. You need high-quality plastic and a properly set up printer. A perfect printer will not make up for mediocre plastic or 3D fuel! I have used many brands and types of plastic, and there are significant differences. Also, note that 3D plastic or filament as it is known is only readily available online or at a few DIY stores. Hobbyists will be thrilled to find a source of quality filament at their local hobby shop. The quality of the filament will make or break a print.



As the name implies, 3D-Fuel makes the filaments or the "fuel" for printing. Note that there are multiple types of filament for different applications. The most popular is PLA, which is easier to print and great for the newbie and everyday modeling. As for various brands, the PLA can be very different. The melting temperature and texture can vary, and some are more brittle than others. Quality and consistency are essential for production and long, time-consuming prints,

I used three of my four printers to test 3D-Fuel. The fourth printer is set up for TPU, a flexible filament that 3D-Fuel will provide soon. Two of the three printers use the standard 0.4 mm print nozzle, while the third uses a 0.5 mm nozzle. I ran the 3D Fuel PLA through them without changing my settings and had perfect prints. I print with 1.75 mm diameter filament and 3D Fuel has 19 products available and just as many in the larger 2.85 mm diameter filaments. Their color palette is extensive, and they offer a keychain display of the colors for your store.



3D-Fuel offers the Pro-PLA line, which has advantages over the standard PLA, including higher-end use temperature range. Their Re-Fuel line is made from leftover, out-of-spec filaments that are reground into reels. This filament has no color choice as it mixes all the colors in various types. It is less expensive, and in my opinion, it is excellent for quality prints that will get painted or for prototypes. They even have a glow-in-the-dark filament. It is nice to see there is no waste in production.



The filament I was most excited about was 3D-Fuel's Entwined, which is a bio-based PLA infused with hemp fibers, which takes on a wood appearance. This is one of four bio-friendly filaments available. The first thing that came to my mind for the Entwined filament was Groot from the Guardians of the Galaxy! I found a printable file on Thingiverse and ran it through the Slicer before sending it to my printer with the 0.5 mm nozzle. The Entwined ran easily through the larger nozzle, and I ended up with a small and large Groot.

I have used many brands and types of plastic and other brands do not always seem consistent in their specs. 3D-Fuel exceeds expectations there. Information on their website and packaging is clear and accurate. Their packaging is also attractive, adding to more appeal to your customers.

3D-Fuel also provides filament in other types, including PETG, nylon, glass-filled PLA, ABS, ASA and more to come. From the effort shown and the data available on their website, they put a lot of work and pride into their product. When I have used other brands of filament, the first prints were not always what I expected. I can say that my first impressions of 3D-Fuel are very high, and personally, I will be using 3D-Fuel. I want to thank Dirk from 3D-Fuel for the test filament and yes, look for an order from me! Check out their website or visit Facebook and learn about adding 3D filaments to your store. **HM**