3D Printing: What You Must Know

They're not your grandfather's daisy-wheel printer, or your mother's dot matrix. They're actually quite different from modern photo and document printers that can only print in two dimensions. As their name suggests, 3D printers can build three-dimensional objects out of a variety of materials. They're making a splash, popping in stores like Staples, Best Buy, and Pick3DPrinter, and you can buy numerous 3D printers as well as their accessories on Amazon.com as well as through other online outlets. Though they're still predominantly found in shops, schools, design studios, community centers, as well as the hand of amateurs, 3D printers are now found in kitchens, rec rooms, and even on the floors of shops.

What is 3D Printing?

3D printing is, in essence, is a manufacturing process that involves layering material to create a three-dimensional object. (This is termed an additive process since the object is constructed from scratch, in contrast to subtractive processes, where materials are cut and drilled, milled or removed.) While 3D printers make use of different types of materials (such as plastic or metal) and techniques (see "How Does 3D Printing Work?" below), they can turn digital files containing three-dimensional data--whether made using a computer-aided design (CAD) or computer-aided manufacturing (CAM) software, or from the 3D scanner -- into physical objects.

3D printing is possible?

3D printing is feasible but it is not in the traditional sense. The Webster's definitions of "printing" are based on the creation of printed materials, publications, or photographs as well as the production of printed matter by means of impression (the application of pressure). This definition is not really applicable to 3D printing. However, 3d printing service can be thought of as an outcome of conventional printing. In which the layer (usually ink) is applied to the material, 3D printing can be seen as a technological outgrowth. It's typically so thin that it does not appear to have any noticeable in height. However, solid ink printers can create a thicker layer. The application of multiple layers to 3D printing may significantly increase the height. Therefore, it makes sense to expand the concept of printing to include production of three-dimensional objects this way.

How Does 3D Printing Work?

Like traditional printers 3D printers make use of a variety of different technologies. Fused deposition modeling (FDM) is the most popular, and is also referred to as fused filament fabrication (FFF). It is the process of melting a filament made of acrylonitrile, butadiene styrene (BLA) or butadiene (PLA) and then laying it down using an extrusion tube heated in layers. The very first 3D printers to come to market, made in the late 1990s by Stratasys with the help of IBM made use of FDM (a name trademarked by Stratasys) and most 3D printers designed for the consumer, hobbyists, and schools.

Another technology used for 3D printing is stereolithography. In it, a UV laser is shined into a vat of ultraviolet-sensitive photopolymer, tracing the object to be created on its surface. The

beam solidifies the polymer where it comes into contact with it, and "prints" it layer-by-layer according to the directions contained in the CAD/CAM files.

There is also a digital light projection (DLP) or 3D printing or an alternative of that. This technique exposes a liquid polymer to the light produced by a digital processing projector. This causes the polymer to become harder layer by layer, until the final object is created. The remaining liquid polymer will then be removed.

Multi-jet modeling is a 3D inkjet printing device that sprays a colored, glue-like binder onto successive layers of the powder on which the object is made. This method is fast and can support multicolor printing.

It is possible to alter a standard inkjet to print using other materials than ink. Entrepreneurs and DIYers have built or modified print heads (generally piezoelectric) to work with different types of materials. In some cases they've even printed the heads on their own 3D printers. MicroFab Technologies, a company that sells 3D-capable printer heads (aswell as printing systems that are complete), is one example.