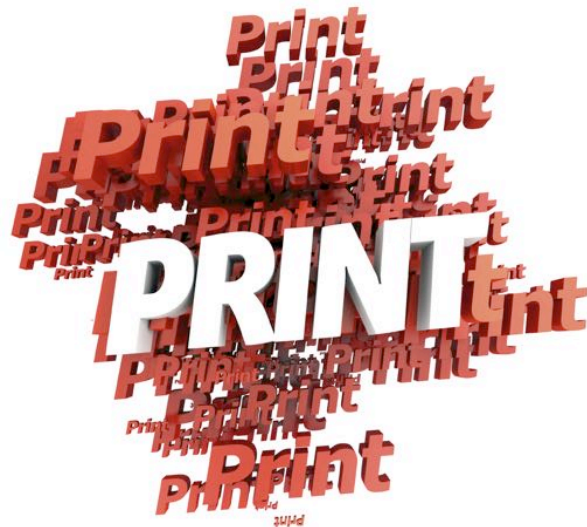# Pro-to-types

You invent it..... We'll create it!

3D printing has actually been around several decades. Rapid Prototyping using layer by layer deposition started in the 1980's, with the first commercial RP system created in 1988. The techniques were refined in the 90s as a means to produce relatively inexpensive prototype parts for industrial and automotive design work. Over the past several years, R&D and technological advances in equipment, software and materials have enabled substantial growth in this industry. Today, demand has surged in the consumer marketplace driving new business from designers and entrepreneurs, in addition to the traditional large enterprise corporations. 3D printing is finding its way into an expanding variety of industries. 3D headlines seem to be trending everywhere in business news. It has been said this technology will SAVE American manufacturing. Industry insiders are projecting 3D printers and services could generate $3.7 billion worldwide by 2015 and pass $6.5 billion by 2019

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3D Print Manufacturing takes the stage

Just as other familiar products and technologies like computers, internet, cell phones, streaming video and portable tablets rose in consumer awareness and market penetration, so too will the world of 3D printing. Soon it could be so mainstream, it will likely be a common term and technology in homes and businesses throughout the globe.

What is 3D Printing?

Also known as "Additive manufacturing" "Direct Digital Manufacturing" or "Rapid Prototyping", the term 3D Printing caught on as a recognizable brand identity for marketing. It is a digital technology or rapid prototyping process creating or forming 3D product models, patterns, tool components, or production parts, layer by layer in plastic, metal, or composite materials. There are several different processing methods used to either fuse dust particles or melt polymers into an object.

How does it work?
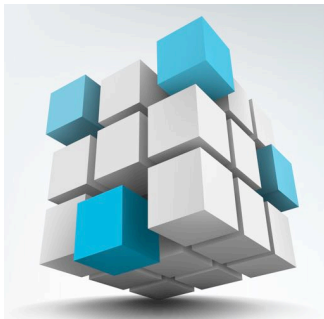
It starts with a 3D CAD data file. This file is exported to a compatible STL format for the machine to read. The software generates "tool paths" or building instructions, which will drive the extrusion head. There are a variety of different processes and materials for 3D printing or rapid prototyping "RP". The selection of process depends upon the product specifications, such as size, density, strength, and finish detailing that is required. On the highest performance machines, part accuracy or tolerance reaches as high as 0.003 inch (0.08 mm), which rivals injection molding. Other machines can simultaneously jet different types of materials, ranging in properties from rigid to rubber-like, glass-like transparency to opaque color shades, and from standard to engineering plastics.

What can you make with 3D printing?

Just about anything! Fine Arts such as jewelry and sculptures; Retail & Entertainment such as fashion, footwear, housewares and toys; Architecture & Industrial Design, Engineering and Construction (AEC), Automotive, Aerospace, Healthcare including dental and medical products like prosthetics, educational models, and hearing aids; Geographic or topological models. The list will continue to grow as prices decline and the technology becomes more available. 3D printing can reduce production from months to days and can lower the cost from thousands to hundreds.

How much does a 3D Print cost?

It really depends upon the size, design and material selection for the prototype model. The prices are usually based on the cost of material and how much is used. Plastics are less expensive than metals and solid models are more expensive than hollow. Typically, prices are based on either cubic inches or cubic centimeters (**cm**$^{3)}$). Once a CAD (Computer Aided Design) file is uploaded for review, a custom price quote can be made.