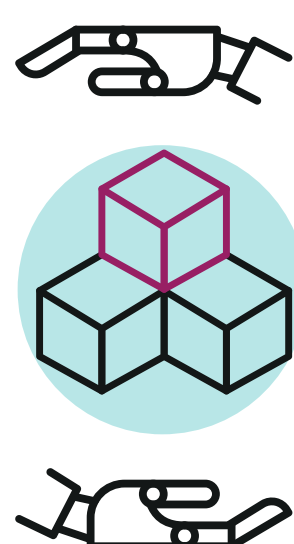


# A TIMELINE OF 3D PRINTING TECHNOLOGY

Today, additive manufacturing, also known as **3D printing** or rapid prototyping, seems commonplace. However, **3D printing** is a technology with an elaborate history.

In the early days of **3D printing** tech, only a few companies were able to carve themselves a space in the industry.



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But now, as the technology has become more open and available, several companies are making a name for themselves and making **3D printing** an everyday engineering tool.

Here is a timeline of important moments in the history of **3D printing technology**, from its very first patent to the industry giant it is today.

## 1980

Hideo Kodama files the first 3D printing patent application, describing a photopolymer rapid prototyping system that uses UV light to harden the material. The idea is never commercialized.

## 1983



Charles Hull invents the first stereolithography apparatus (SLA) machine.

## 1986

Charles Hull is granted the first patent in 3D printing for an SLA machine. Hull goes on to co-found 3D Systems Corporation.

## 1987

Carl Deckard files a patent for a selective laser sintering (SLS) process. The patent was issued in 1989 to DTM, Inc., a company later acquired by 3D Systems.

## 1988

3D Systems sells the first commercial rapid prototyping printer—the “SLA-1”.

## 1989

Scott and Lisa Crump file for a patent for fused deposition modeling (FDM). Scott Crump would go on to co-found Stratasys, Inc.

Hans Langer establishes EOS GmbH in Germany and becomes an industry leader in laser sintering research.

## 1997

AeroMat produces the first 3D printed metal process using laser additive manufacturing (LAM) that utilize using high-powered lasers to fuse powdered titanium alloys.

## 1999

Wake Forest Institute of Regenerative Medicine grows the first 3D printed organ for transplant surgery—a lab-grown urinary bladder.

## 2005

Dr. Adrian Bowyer invents the RepRap open-source concept to create a self-replicating 3D printer process. This opened the doors for the creation of several new 3D printers.

## 2008

“Darwin” becomes the first commercially available 3D printer that was designed under the RepRap concept.

Shapeways launches a 3D printing service that allows users to submit their own files for personal fabrication.

## 2009

The FDM patent previously held by Stratasys expires. The average FDM 3D printer price drops from \$10,000 to under \$1,000.

Micro, a consumer 3D printer that supported PLA and ABS materials, launches a successful Kickstarter campaign becoming the most funded 3D printer project ever on the platform.

Makerbot launches and brings 3D printing into the mainstream by introducing do-it-yourself kits for people that want to build their own 3D printers.

Makerbot introduces the Thingiverse file library that allows users to submit and download 3D printable files, becoming the largest online 3D printing community and file repository.

## 2011

In the United Kingdom, the University of Southampton designs and 3D prints the first unmanned 3D printed aircraft.

Kor Ecologic unveils the Urbee, a prototype car with a 3D printed body, at the TEDXWinnipeg conference.

## 2012

B9Creator and Form 1 launch successful Kickstarter campaigns, introducing into the entry-level market, alternative 3D printing process: DLP technology and stereolithography, respectively.

## 2013

Stratasys acquires Makerbot for around \$400 million.

## 2015

Cellink, a Swedish company, introduces the first standardized commercial bio-ink to the market, derived from a seaweed material called non-cellulose alginate. The bio-ink can be used for printing tissue cartilage.

Later in the year, Cellink releases the INKREDIBLE 3D printer for bioprinting services, creating an affordable market for bioprinting.

## 2019

With the expiration of patents and open source projects, there are over 170 3D printer system manufacturers across the world. This list includes: 3D Systems, Stratasys, Fusion3, Formlabs, Desktop Metal, Prusa, and Voxel8, among many others.

