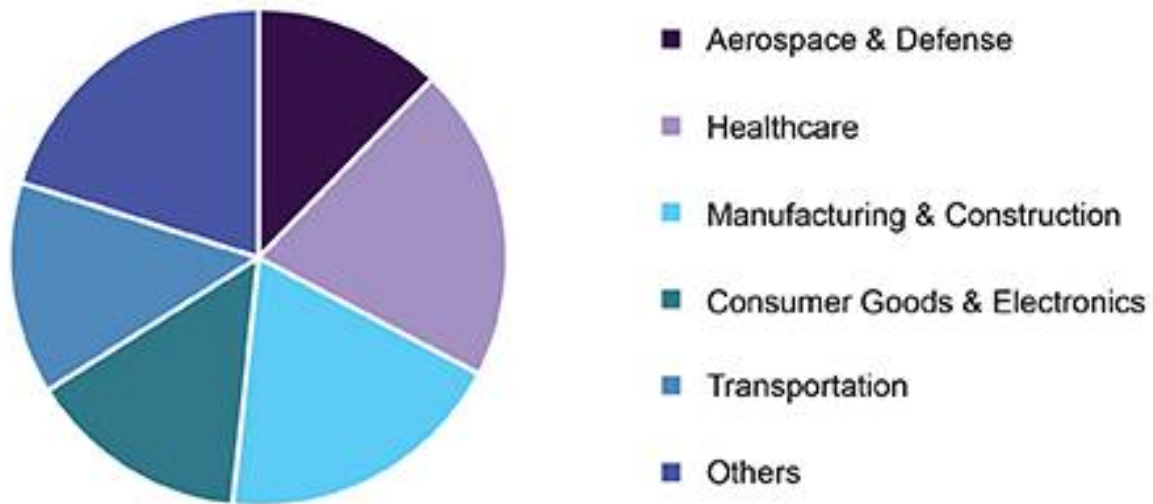




# USE OF 3D PRINTING





# APPLICATIONS OF 3D PRINTING

## Design:

- Improve the part geometry
- Early detection design errors

## Engineering Analysis:

- Stress analysis of physical model

## Tooling and manufacture Applications:

- Pattern making
- Reduced mfg lead times



# HISTORICAL DEVELOPMENT

The development of Rapid Prototyping is closely tied in with the development of applications of computers in the industry.

<b>Year of inception</b>	<b>Technology</b>
1770	Mechanization
1946	First Computer
1952	NC/CNC machine tool
1960	Commercial Laser
1961	Commercial Robot
1961	CAD
1988	Rapid prototyping system/3D Printing



# A BRIEF HISTORY OF 3D PRINTING

- Clarke, was the first to **describe the basic functions of a 3D printer** in 1964.
- The first 3D printer was released in **1987 by Chuck Hull** of 3D Systems and it was using the "**stereolithography**" (**SLA**) process.
- In the 90's and 00's other 3D printing technologies were released, including **FDM** by Stratasys and **SLS** by 3D Systems.
- **These printers (FDM and SLS)** were expensive and mainly used for industrial prototyping.
- **3D ink-jet printers were introduced** by the RepRap project. According to Wohlers the adoption of 3D printing keeps growing.
- In 2009, the ASTM Committee published a document containing the **standard terminology on Additiv Manufacturing**.



# PROCESS CHAIN/BASIC STEPS IN 3D PRINTING

