

3D Printing

3D printing is an additive manufacturing process that creates a physical object from a digital design. There are different 3D printing technologies and materials you can print with, but all are based on the same principle: a digital model is turned into a solid three-dimensional physical object by adding material layer by layer.

How does 3D printing work?

Every 3D print starts as a digital 3D design file – like a blueprint – for a physical object. Trying to print without a design file is like trying to print a document on a sheet of paper without a text file. This design file is sliced into thin layers which is then sent to the 3D printer.

From here on the printing process varies by technology, starting from desktop printers that melt a plastic material and lay it down onto a print platform to large industrial machines that use a laser to selectively melt metal powder at high temperatures. The printing can take hours to complete depending on the size, and the printed objects are often post-processed to reach the desired finish.

Available materials also vary by printer type, ranging from plastics to rubber, sandstone, metals and alloys - with more and more materials appearing on the market every year.

The pros and cons of 3D printing

It's crucial to understand that 3D printing is a rapidly developing technology, which comes with its set of inherent benefits, but also lags behind traditional manufacturing processes in some aspects.

Pros

- Create complex designs
- Customize each and every product
- No need for tools and molds, lower fixed costs
- Speed and ease of prototyping
- Less waste

Cons

- Higher cost for large production runs
- Less material choices, colours, finishes
- Limited strength and endurance
- Lower precision

Uses of 3D printing

- Car manufacturers
- Doctors
- Dentists
- Prosthetics
- Aircraft manufacturers
- Aerospace companies
- Prop makers
- Product designers
- Architects
- Students
- Engineers
- Drone enthusiasts
- Shoe manufacturers
- Consumer product makers