

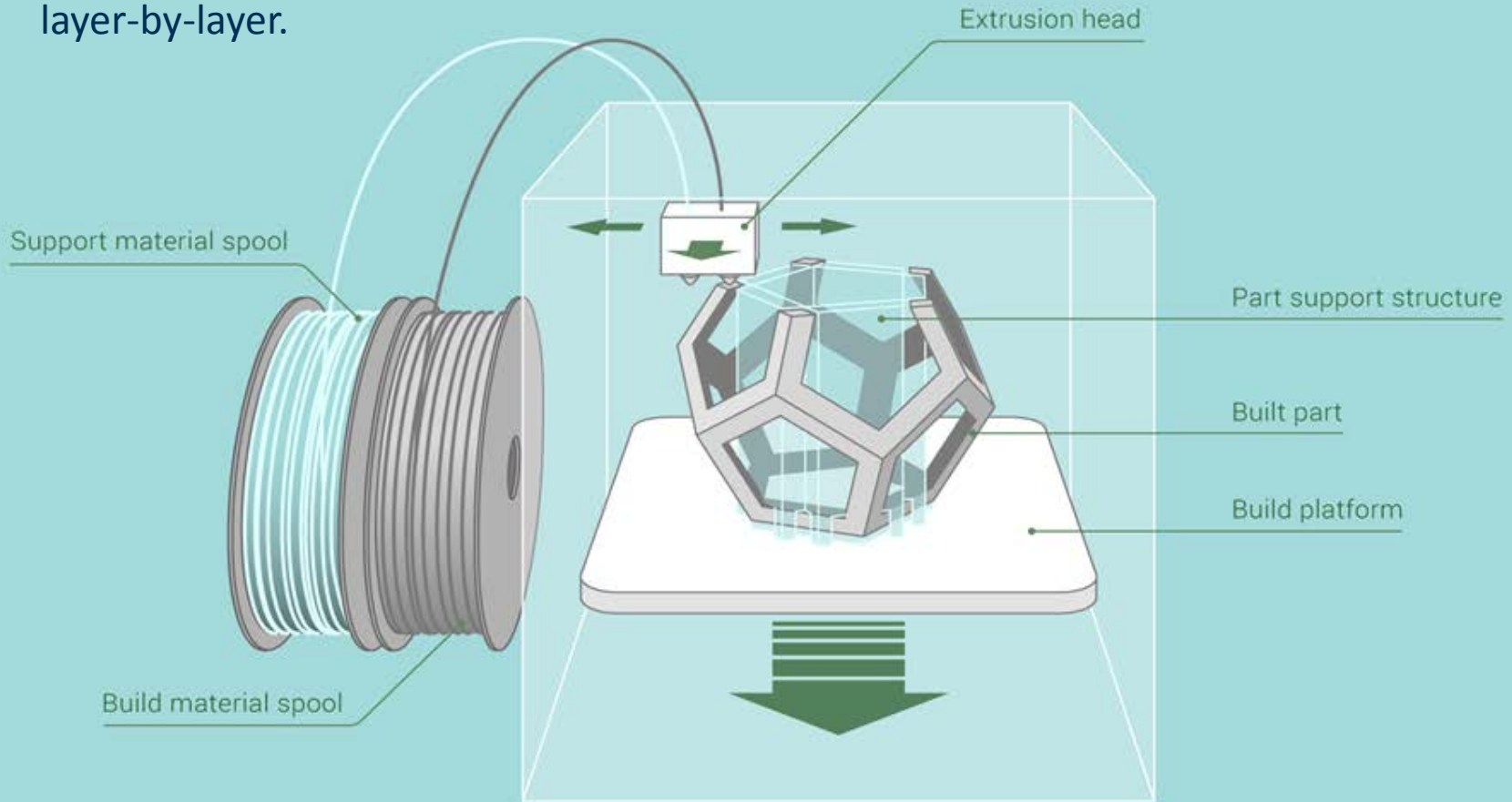
3D PRINTING

Manufacturing Technologies Part 2

FUSED-DEPOSITION-MODELING (FDM)

Process description:

A plastic filament is melted and extruded through a nozzle. Parts are built by laying down layer-by-layer.

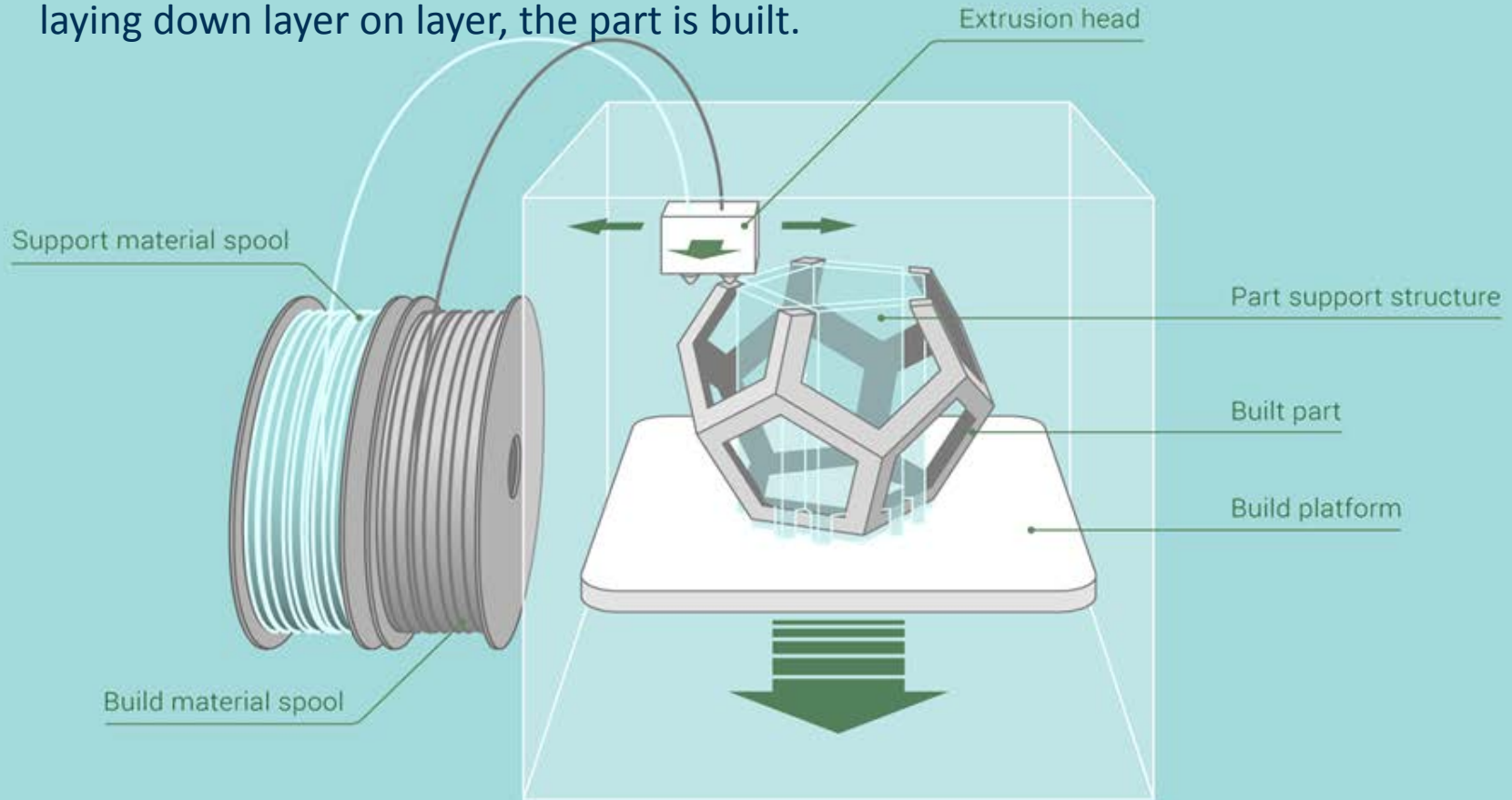


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FUSED-DEPOSITION-MODELING (FDM)

Process description:

The melted material is laid down on the build platform, where it cools and solidifies. By laying down layer on layer, the part is built.

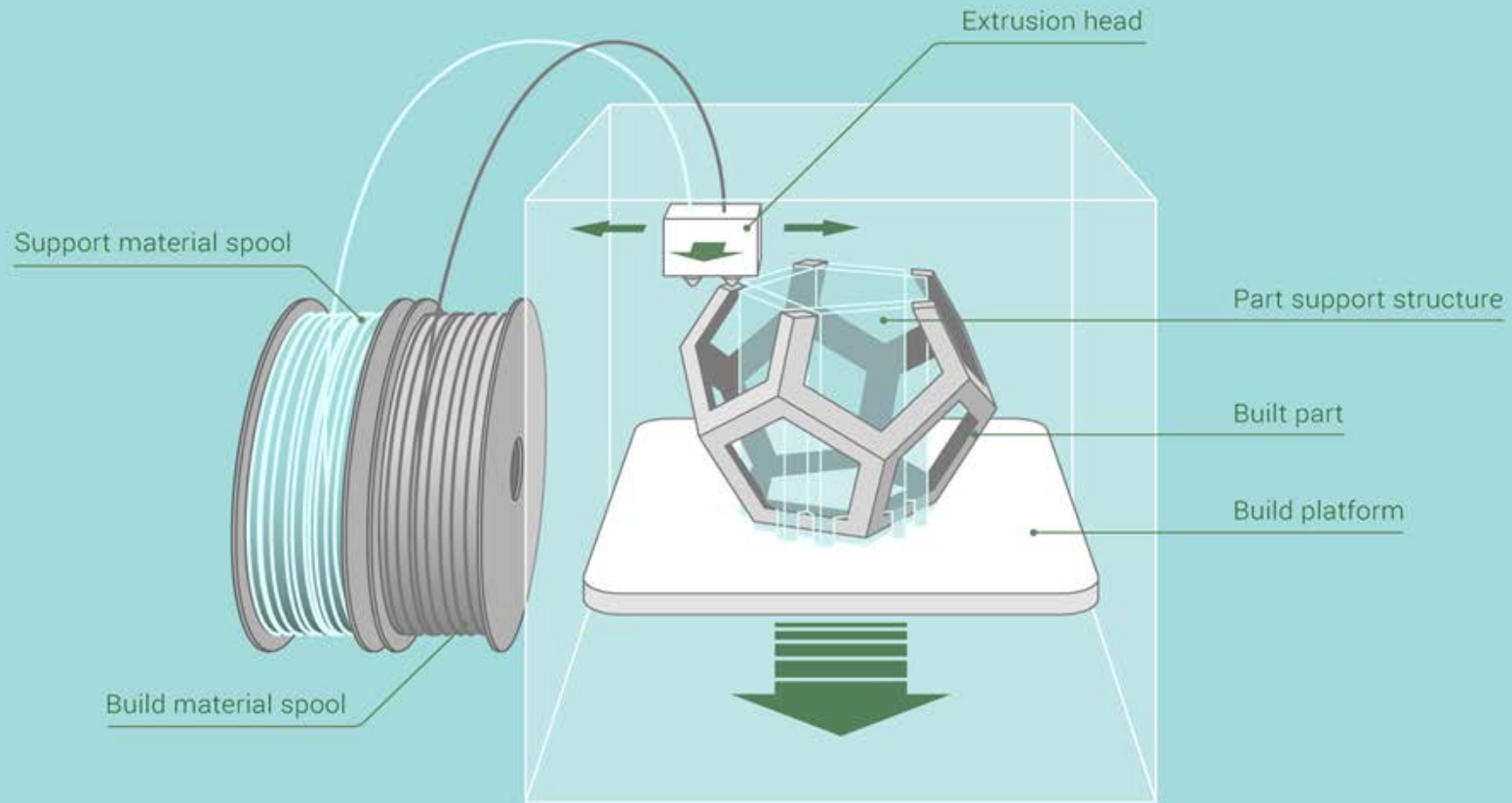


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FUSED-DEPOSITION-MODELING (FDM)

Process description:

As with many of the other 3D printing processes, FDM requires support structures which anchors the parts on the build platform and supports overhanging structures.

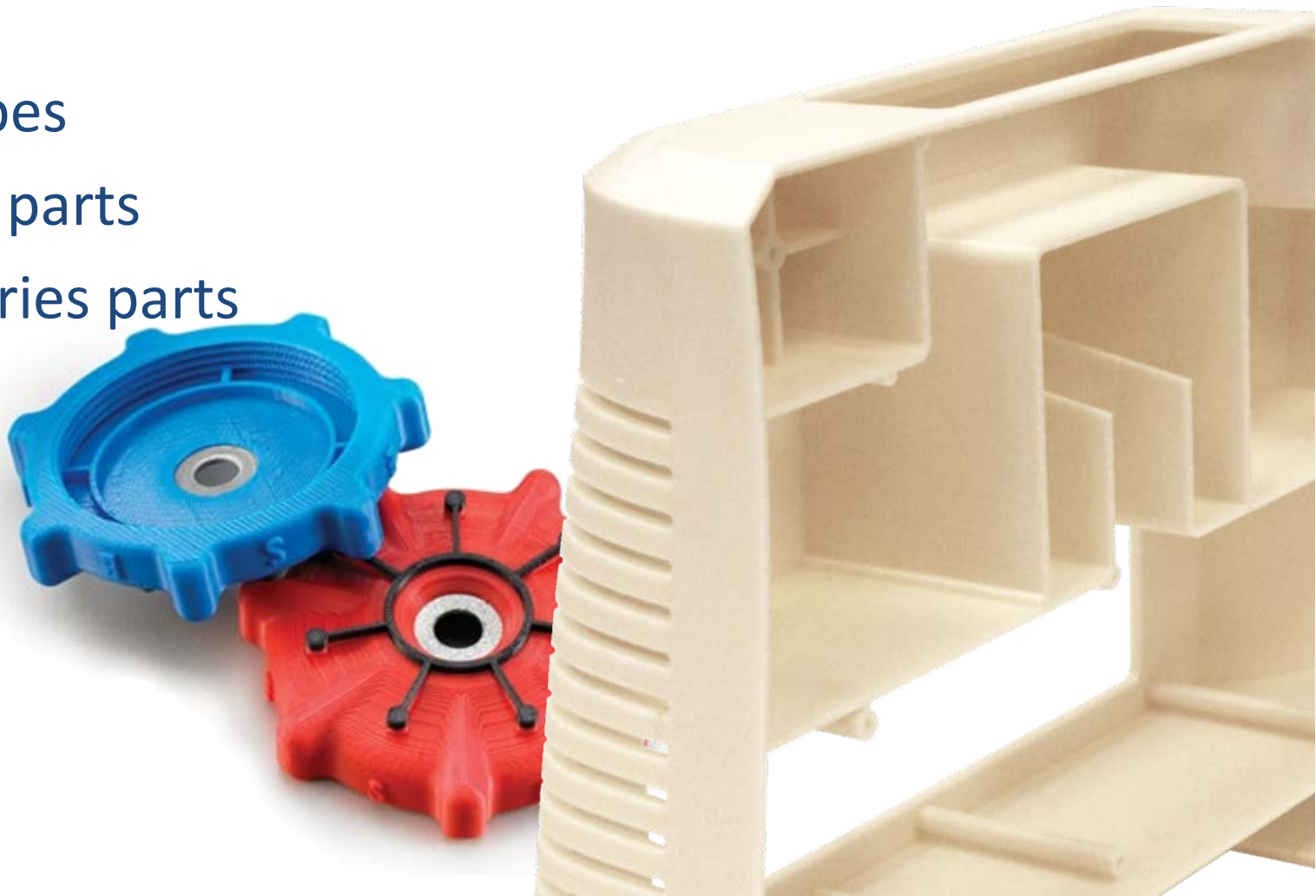


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FUSED DEPOSITION MODELING (FDM)

APPLICATIONS

- Prototypes
- Support parts
- Small series parts

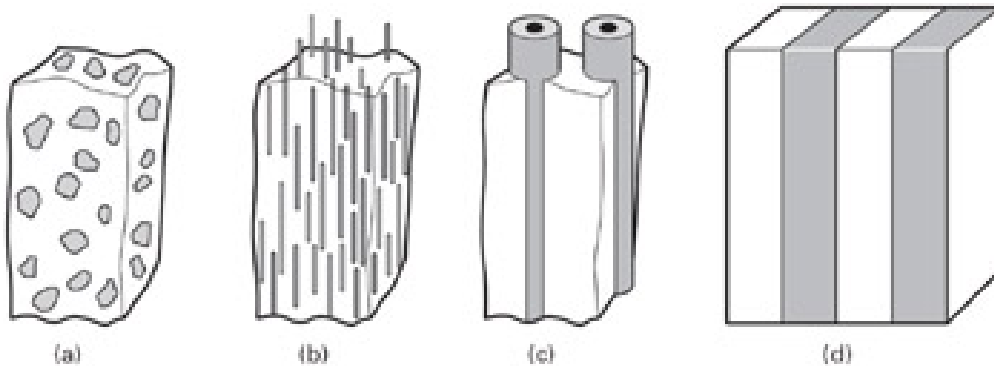


DIGITAL MATERIALS

WHAT ARE THEY?

Engineered materials manufactured from two or more different constituent materials, according to a digitally encoded three dimensional phase structure design (the DM code), and produced by an additive manufacturing process.

- Most of the technologies that we've seen use one building material in addition to a support material.
- Digital materials are composite materials produced by depositing two or more materials simultaneously in specific concentrations and structures.
 - There is no chemical mixing of the materials (except in boundaries).
 - Each drop is placed in its precise location.

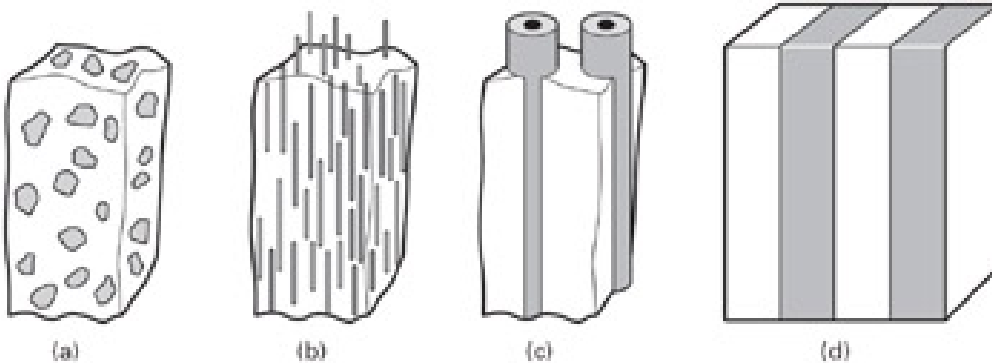


DIGITAL MATERIALS

WHAT ARE THEY?

The drawings below demonstrate possible structures:

- The spread of material B can be randomly spread inside a matrix made from material A.
- Material B can be placed in a unidirectional manner, but with random traits (such as length, thickness, location).
- Material B can be placed in an orderly unidirectional manner.
- Material B can be with an identical ratio and in an organized structure with respect to material A.



CRITERIA FOR CHOOSING A 3D PRINTER TECHNOLOGY

Your specific application

Material required for product

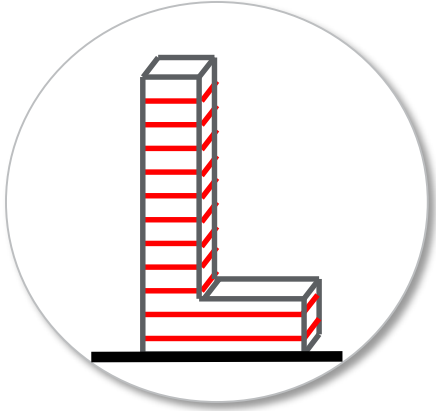
Surface finish of part

Product and printer details

Durability & maintenance requirements

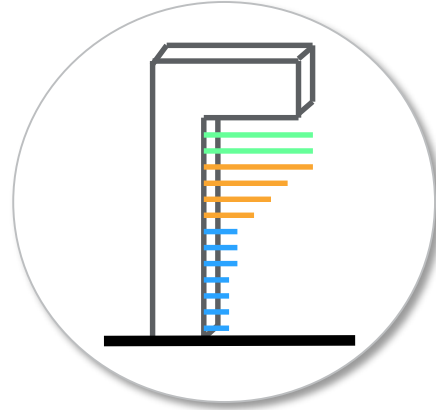


3D PRINTING TECHNOLOGIES WORKING ASPECTS



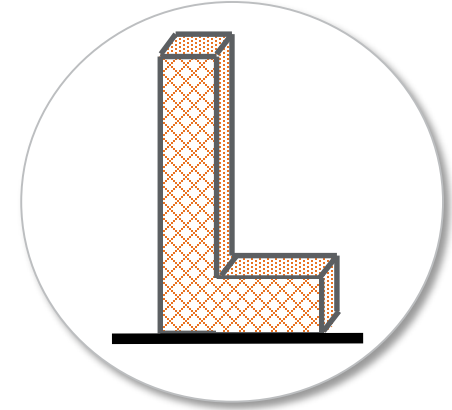
SLICING

Model is sliced into horizontal layers so tool paths can be generated.



SUPPORT

Support material is added to support overhangs and other structures.



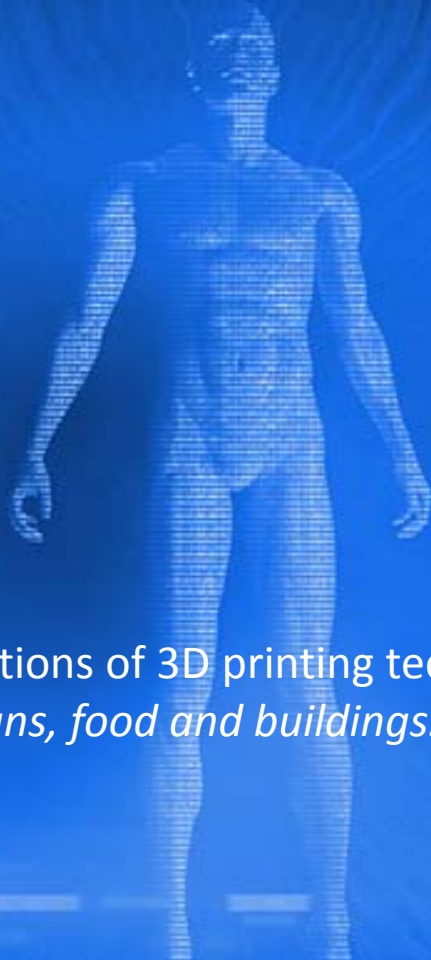
FILL

Density of the material fill influences the model's weight and strength.

All three appear with nuance in all 3D printing technologies.

ADDITIVE MANUFACTURING OF THE FUTURE

- The future holds innovative applications of 3D printing technology.
Examples may include: human organs, food and buildings.



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Thank you.