

OPTIMIZATION AND USAGE OF 3D TECHNOLOGY IN
MEDICINE AND HEALTH CARE - LEARN ON EXPERIENCE



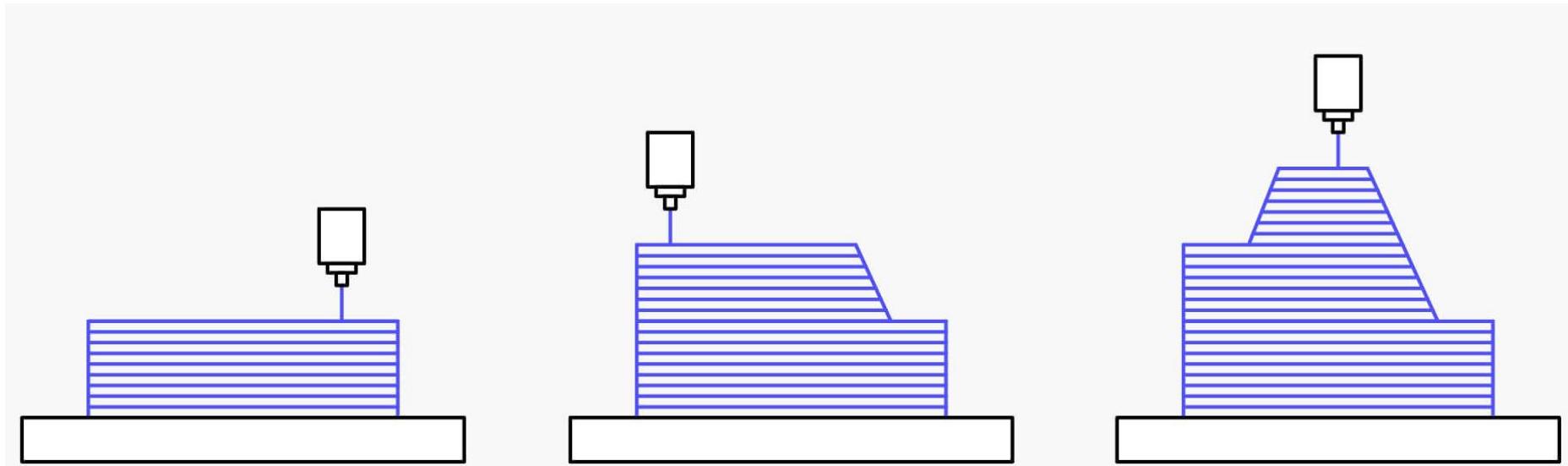
ADITIVNA PROIZVODNJA 3D PRINTANJE

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Mašinski fakultet u Zenici



Šta je 3D printanje?

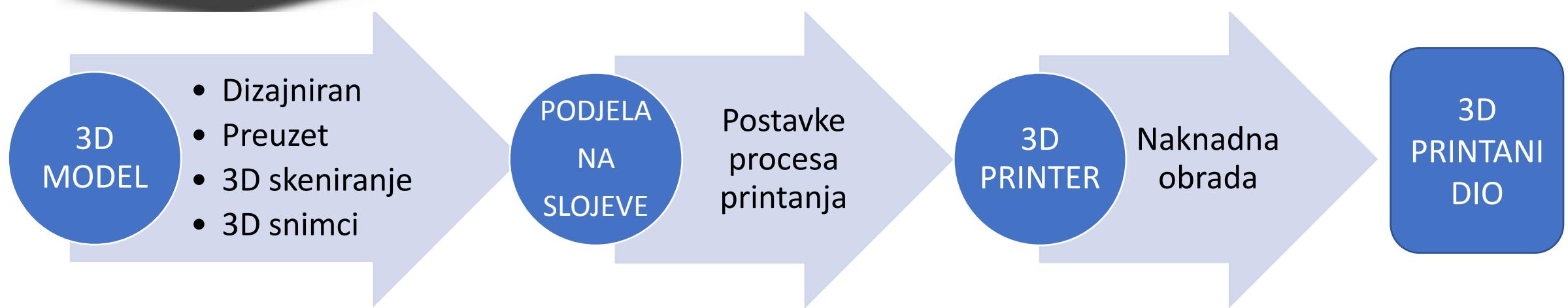
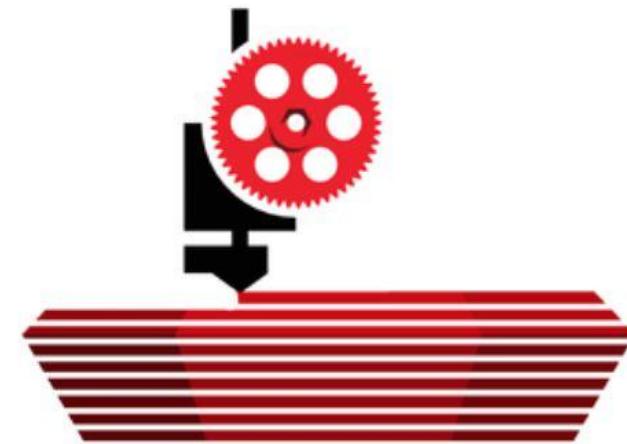
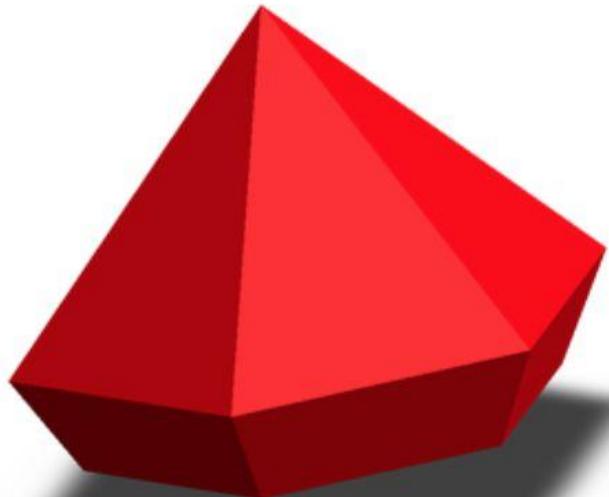
- Aditivni proces proizvodnje u kojem se kreira fizički model na osnovu digitalnih podataka (3D modela).
- Različite tehnologije



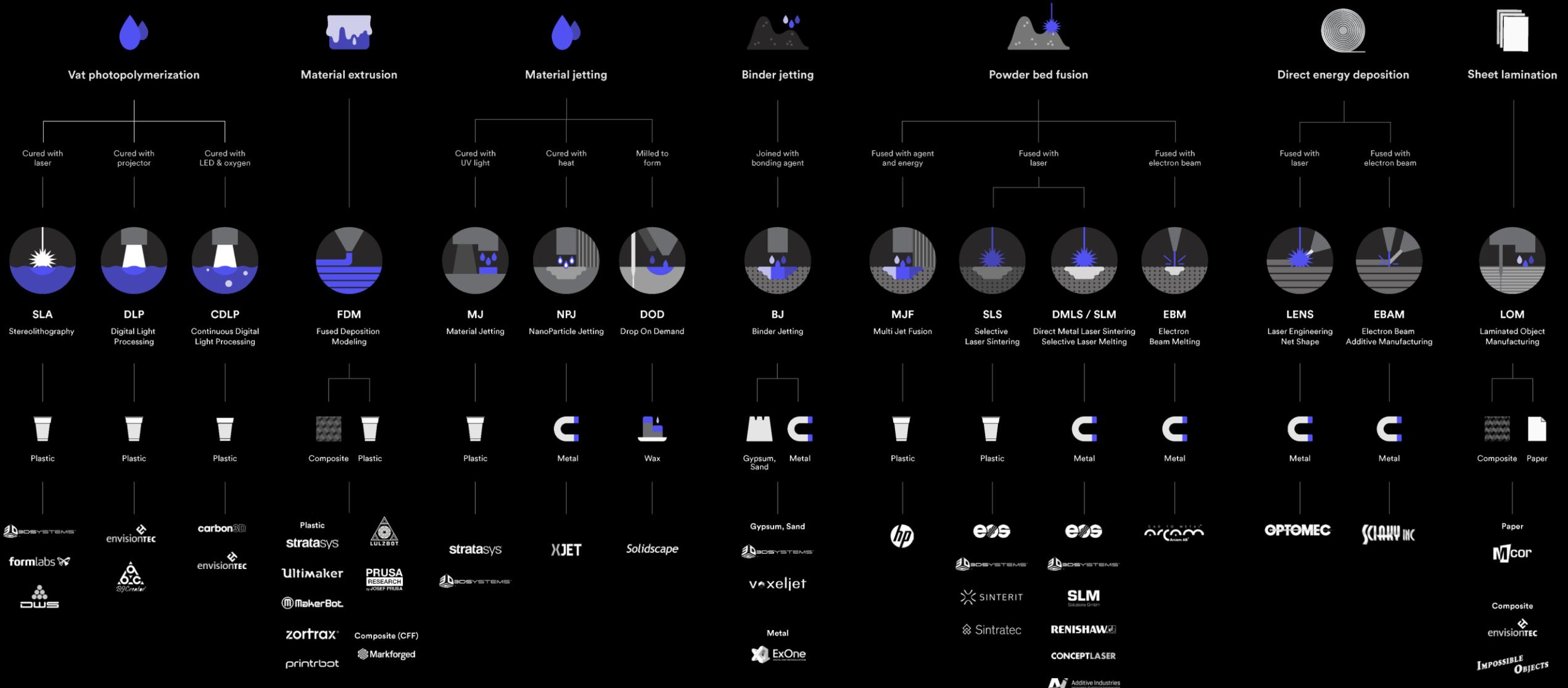
Historija i primjena 3D printanja

- Razvoj 3D printanja počeo u 80-tim godinama prošlog stoljeća kao tehnologije za brzu izradu prototipa (rapid prototyping)
- Stalni razvoj 3D printerja i materijala za printanje doveo do velike i brze ekspanzije primjene 3D printanja u raznim djelatnostima.
- Široki opseg cijena mašina za različite primjene, besplatno dostupne baze znanja i modela

Proces 3D printanja



TEHNOLOGIJE 3D PRINTANJA (ISO/ASTM 52900)



TEHNOLOGIJE 3D PRINTANJA (ISO/ASTM 52900)



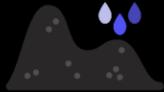
Vat
Photopolymerization



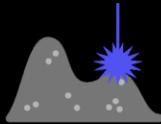
Material
Extrusion



Material
Jetting



Binder
Jetting



Powder
Bed Fusion



Direct Energy
Deposition



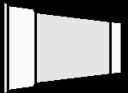
Sheet
Lamination



Material extrusion



FDM
Fused Deposition
Modeling



Plastic



Composite

Plastic

stratasys



Ultimaker

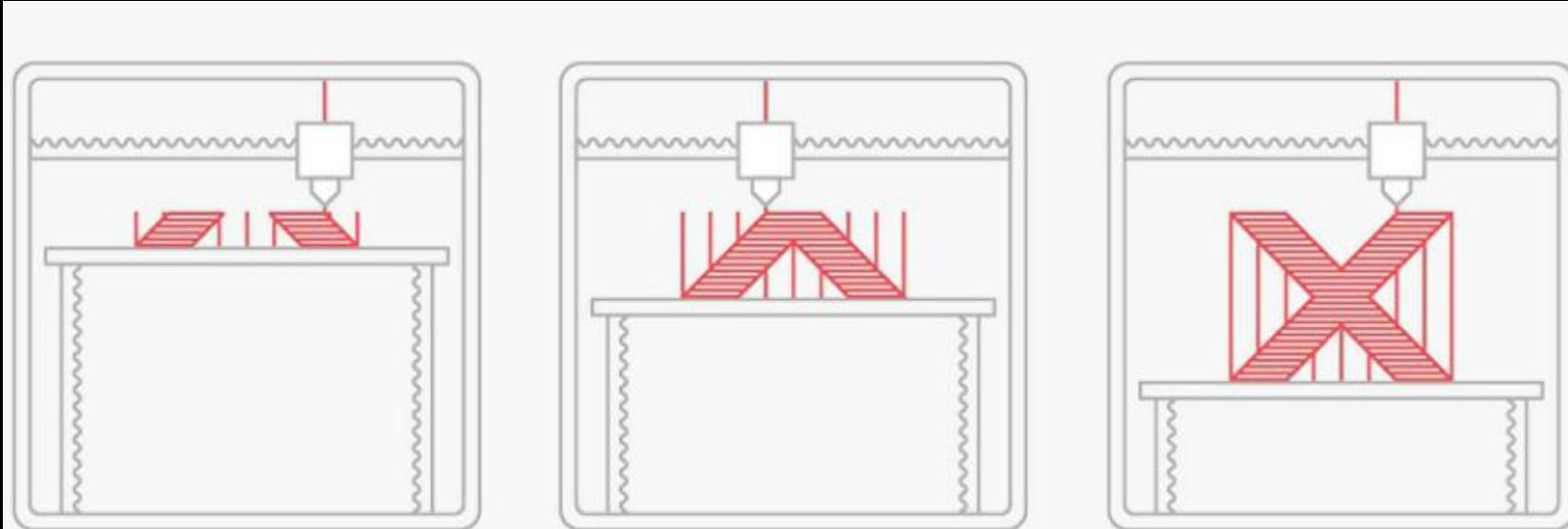
MakerBot

zortrax®

printrbot

PRUSA
RESEARCH
by JOSEF PRUSA

Composite (CFF)



carbon^{3D}



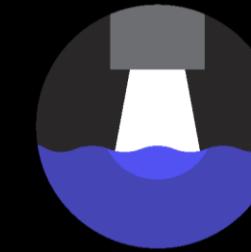
CDLP

Continuous Digital Light Processing



Vat photopolymerization

Cured with
LED & oxygen

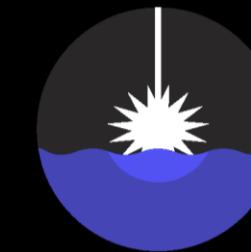


DLP

Digital Light Processing



envisionTEC



SLA

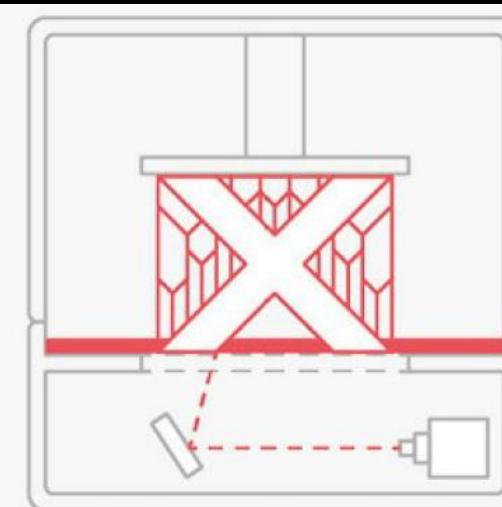
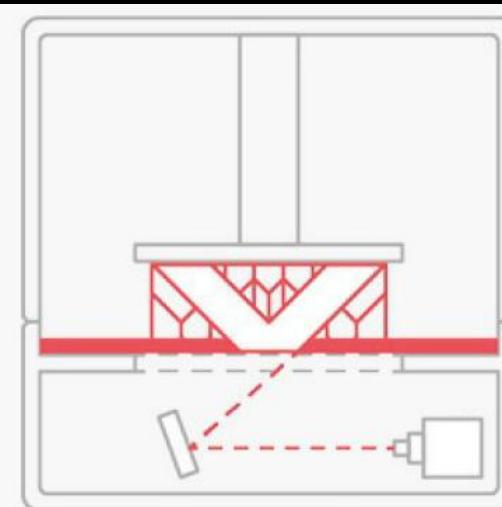
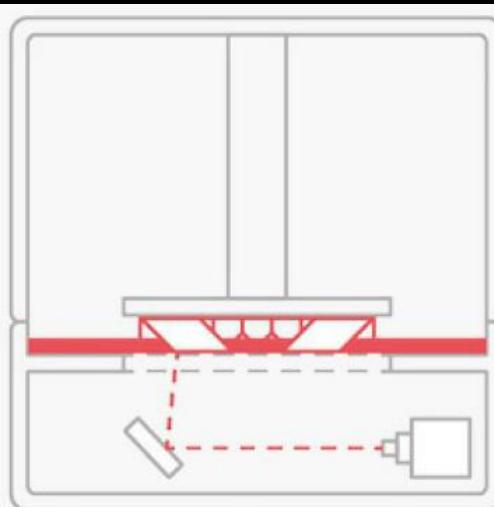
Stereolithography



formlabs



DWS





Material jetting

Cured with UV light

Cured with heat

Milled to form



MJ

Material Jetting



NPJ

NanoParticle Jetting



DOD

Drop On Demand



Binder jetting

Joined with bonding agent



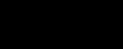
BJ

Binder Jetting

stratasys



XJET



Solidscape

Gypsum, Sand



voxeljet



Plastic



Metal



Wax

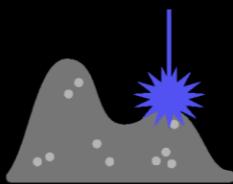


Gypsum, Sand

Metal



ExOne
DIGITAL PART MATERIALIZATION



Powder bed fusion

Fused with agent
and energy

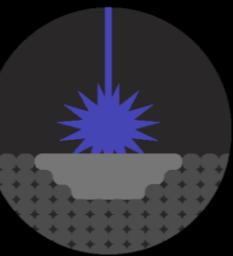
Fused with
laser

Fused with
electron beam



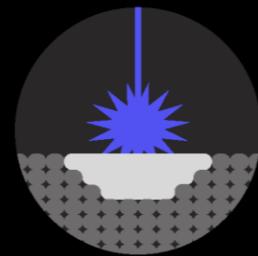
MJF

Multi Jet Fusion



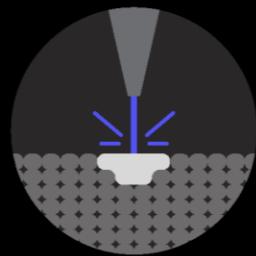
SLS

Selective
Laser Sintering



DMLS / SLM

Direct Metal Laser Sintering
Selective Laser Melting



EBM

Electron
Beam Melting



Plastic



Plastic



Metal

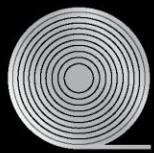


SLM
Solutions GmbH



RENISHAW
CONCEPTLASER

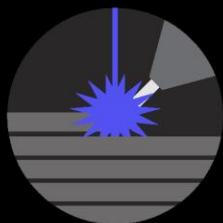




Direct energy deposition

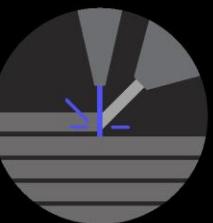
Fused with
laser

Fused with
electron beam



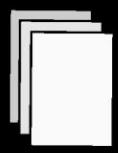
LENS

Laser Engineering
Net Shape



EBAM

Electron Beam
Additive Manufacturing



Sheet lamination



LOM

Laminated Object
Manufacturing

OPTOMECH

SCIAXY INC

Paper

MJcor

Composite

envisionTEC

**IMPOSSIBLE
OBJECTS**



Metal

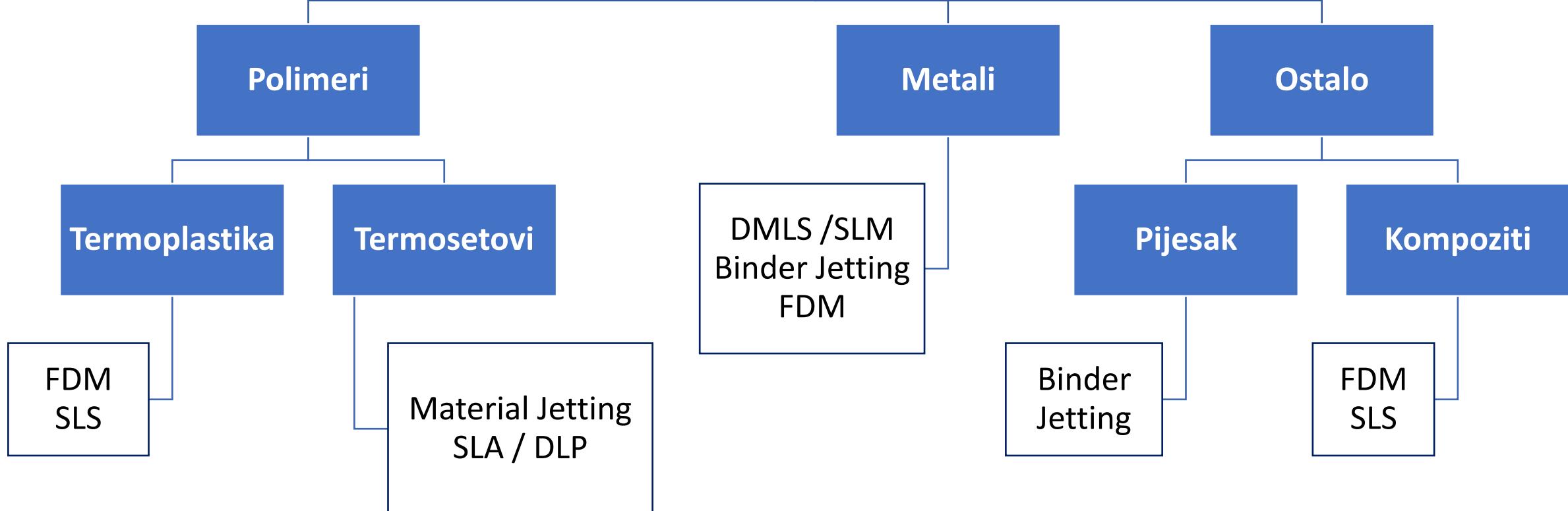


Metal



Composite Paper

Materijali za 3D printanje



Hvala za pažnju!

Pitanja i/ili komentari?

