Η τρισδιάστατη (3D) εκτύπωση στη βιομηχανική παραγωγή

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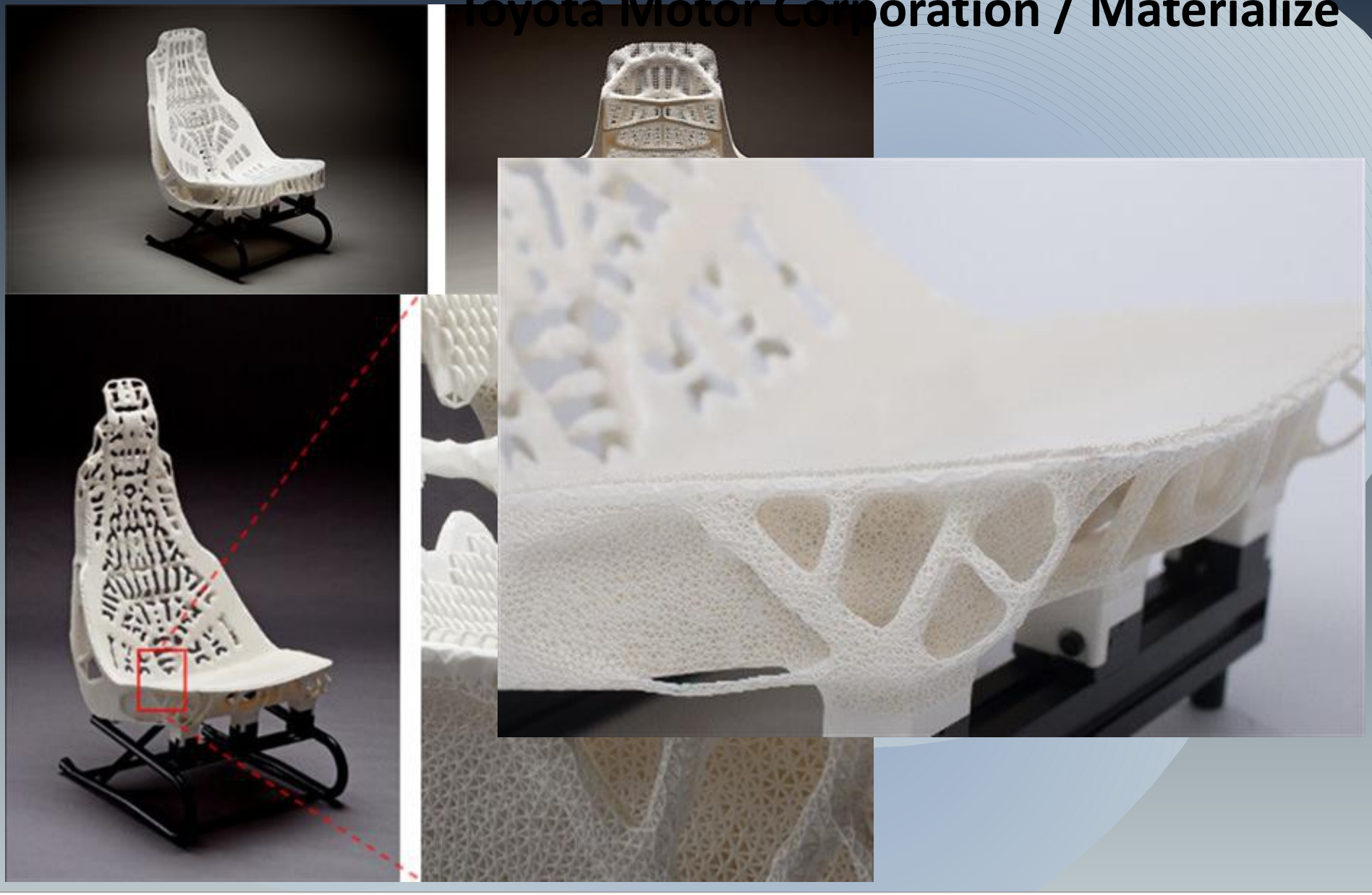
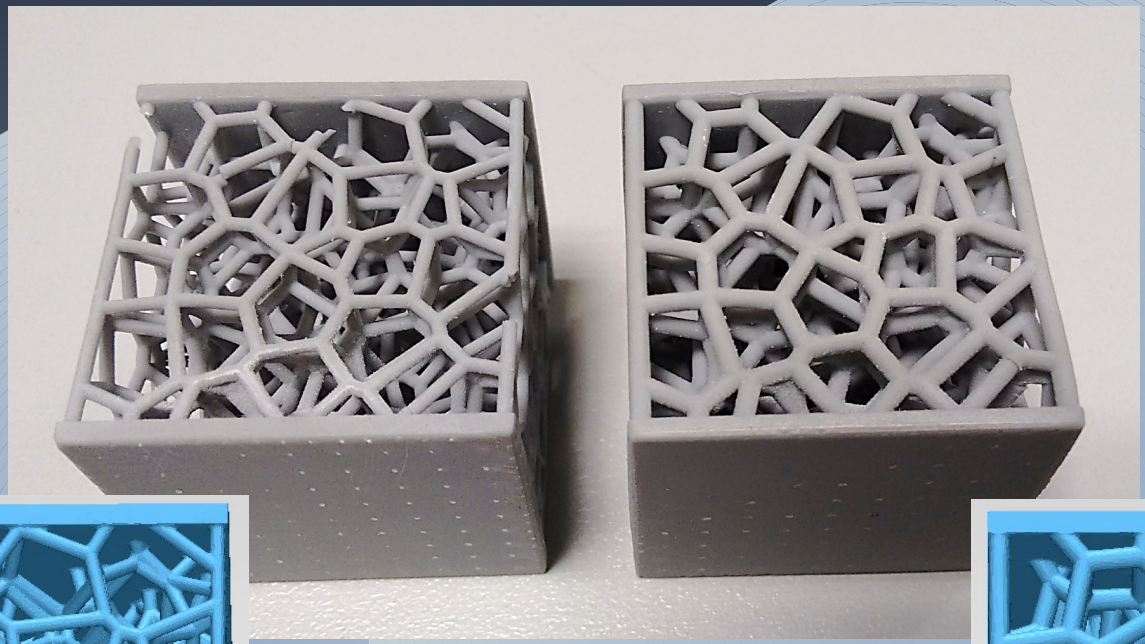
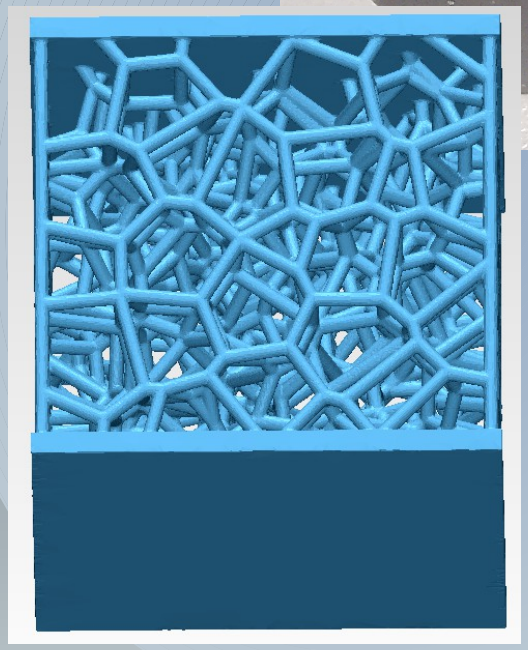
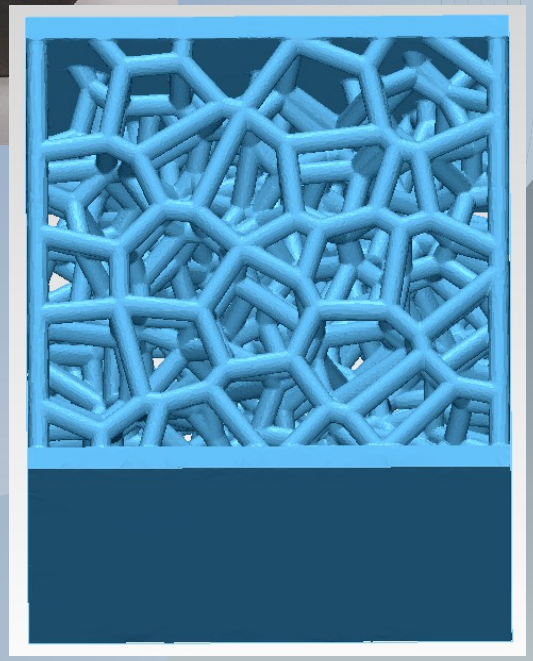
Τμήμα Ηλεκτρολόγων Μηχανικών & Μηχανικών Υπολογιστών, ΔΠ. Θράκης

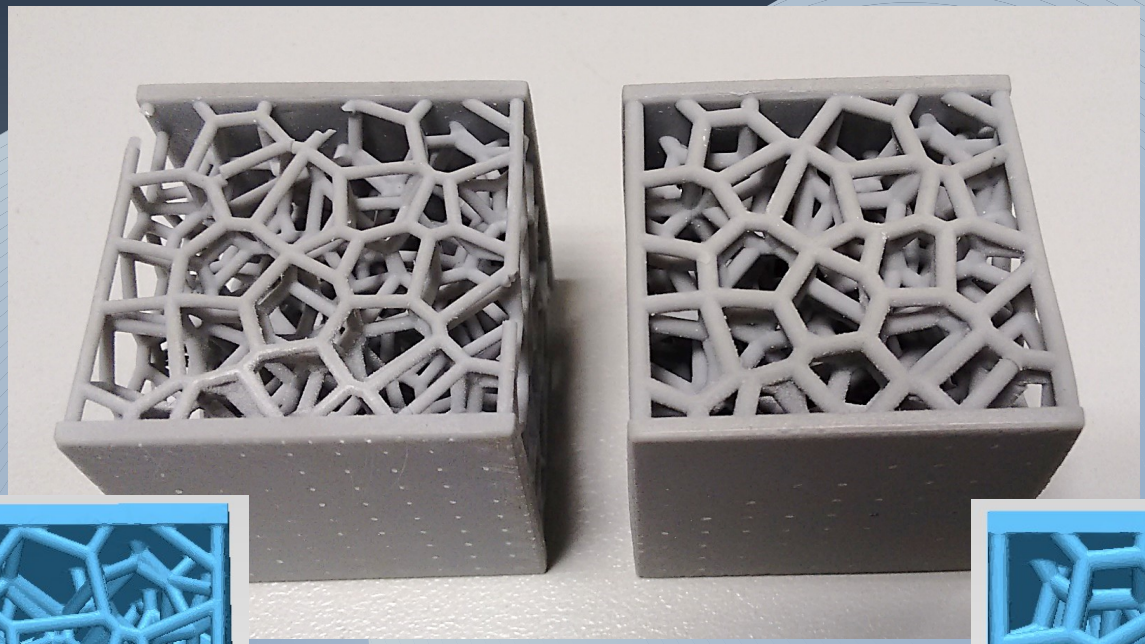
Toyota Motor Corporation / Materialize

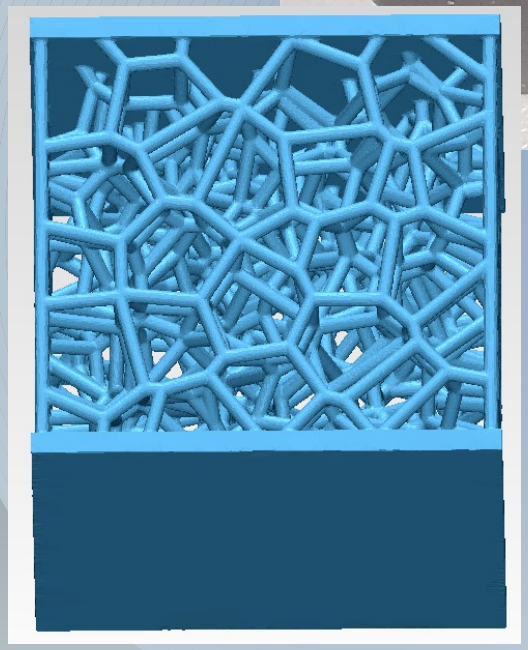


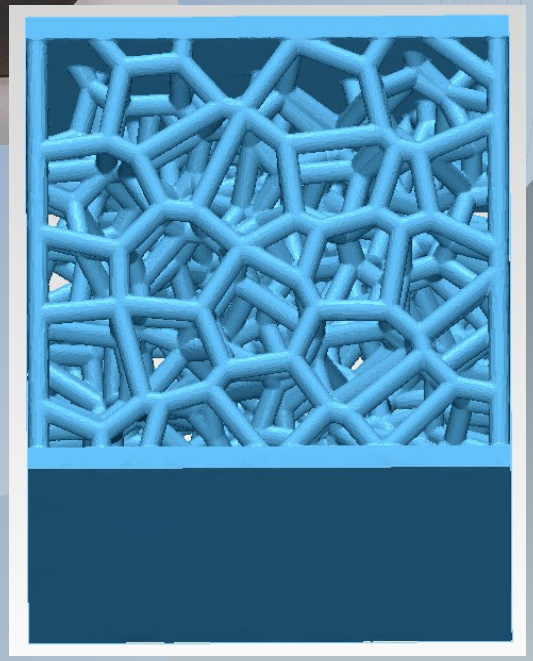






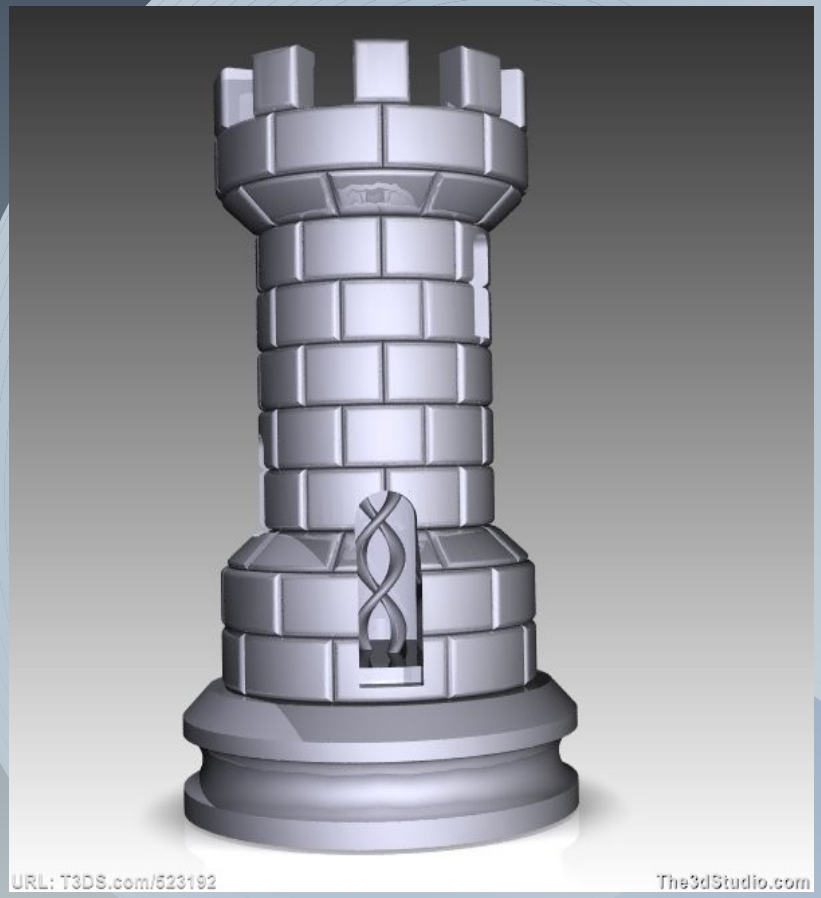




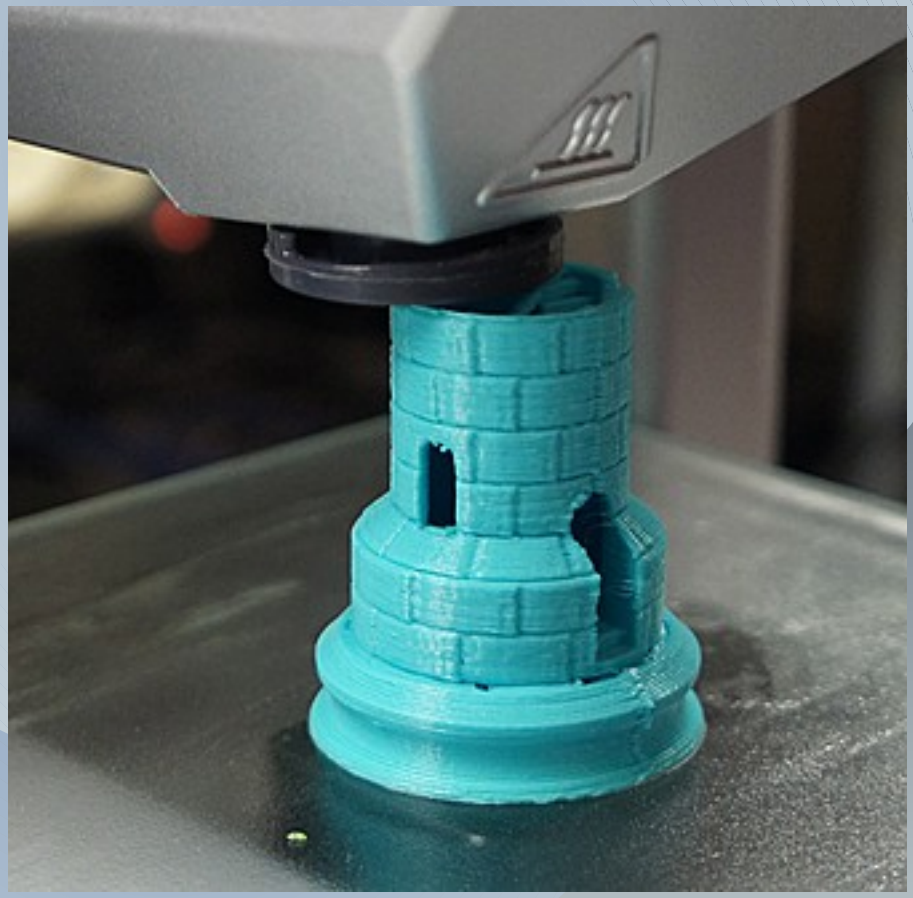


www.3dhubs.com

Η τρισδιάστατη εκτύπωση (3D printing) είναι μια μέθοδος προσθετικής κατασκευής στην οποία εφαρμόζεται η διαδοχική εναπόθεση επάλληλων στρώσεων υλικού για την αναπαραγωγή αντικειμένων.



Ψηφιακό μοντέλο

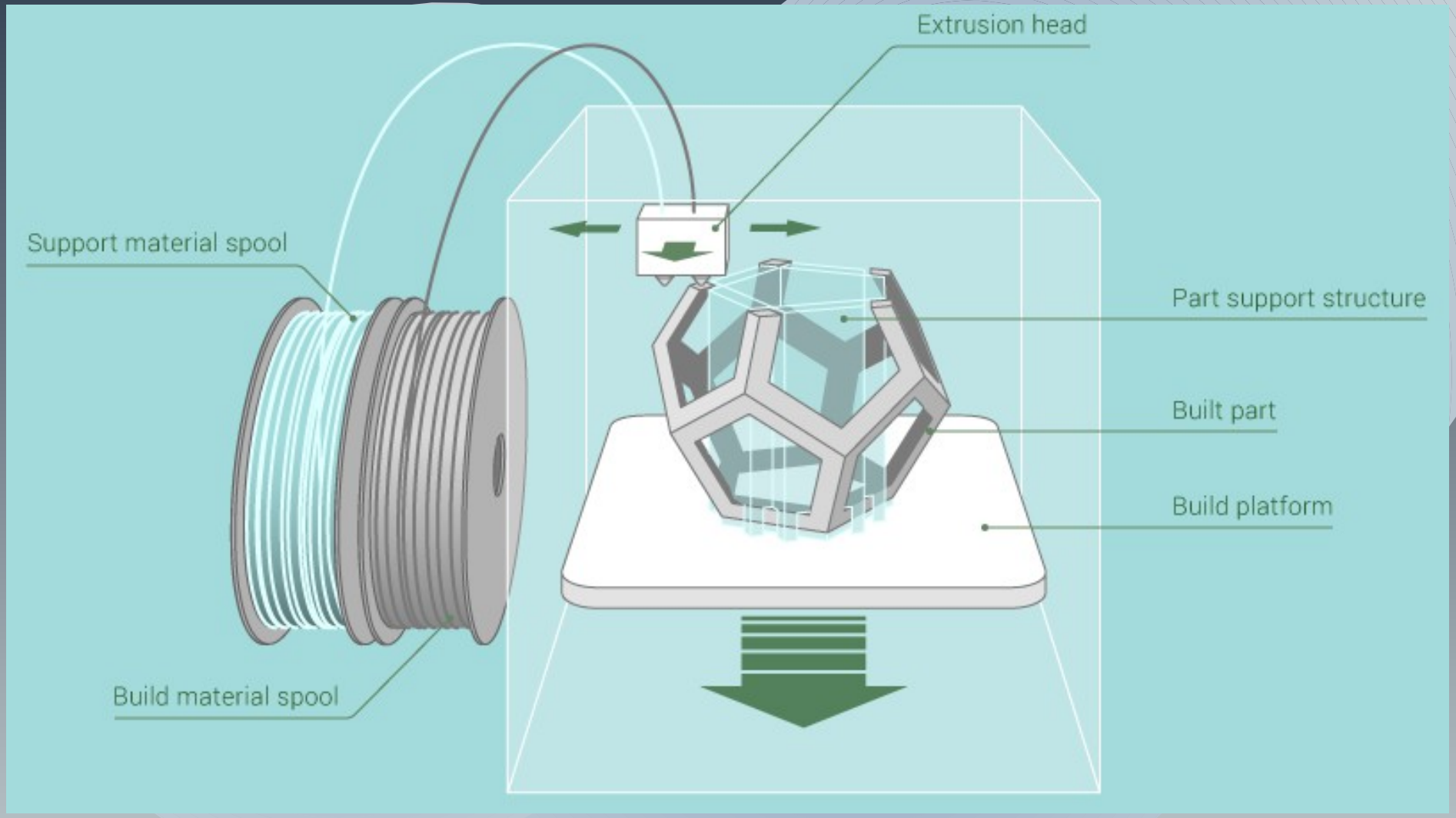


Φυσικό αντικείμενο

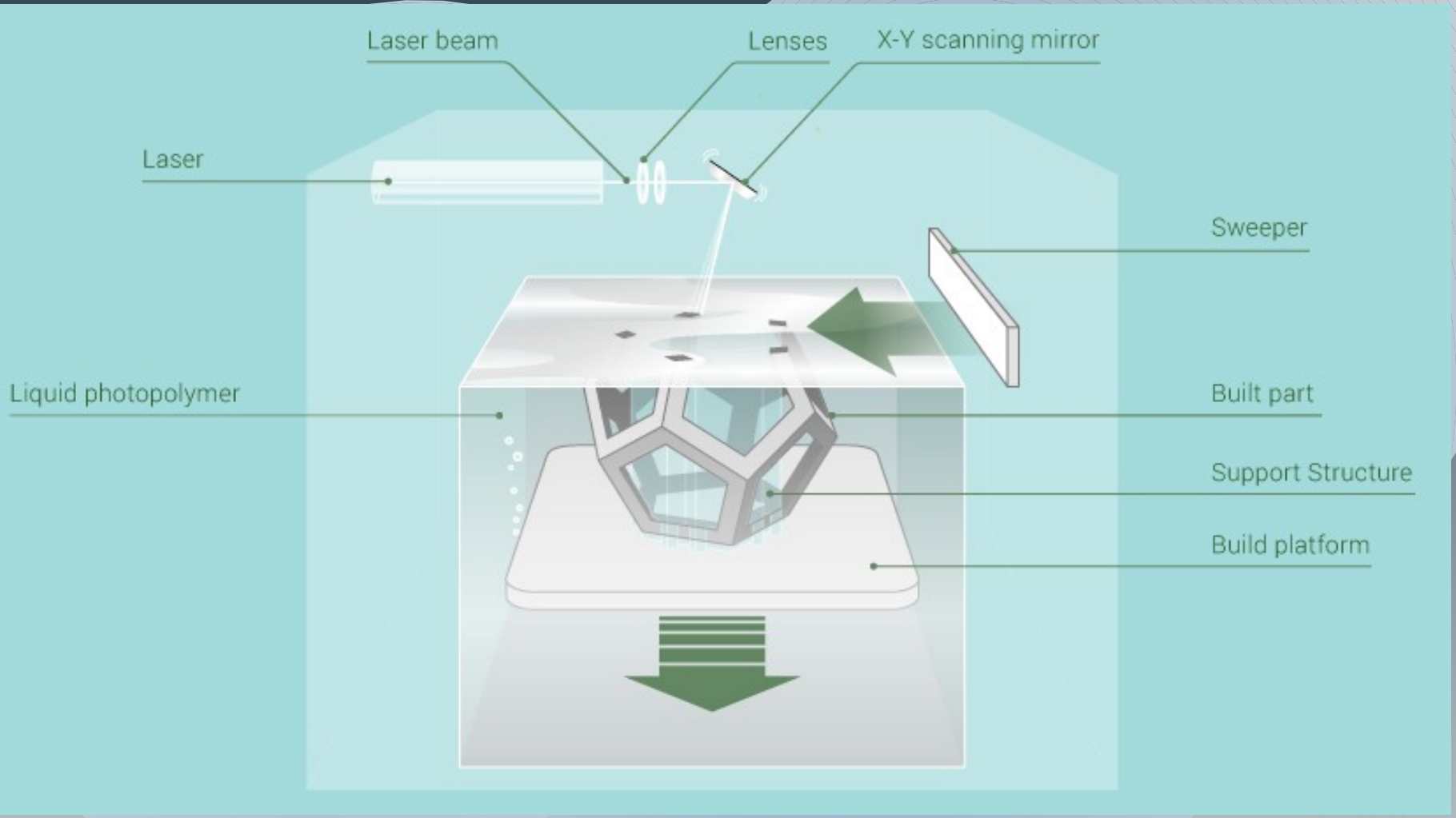
CAD Model - - - - - - -- -3D Object
3D Cad Model
.STL File
Slicing Software
Layer Slices & Tool Path
3D Printer
3D Object


SLA
FDM
DMLS
SLS
PolyJet
EBM
LOM
WDM
SLM

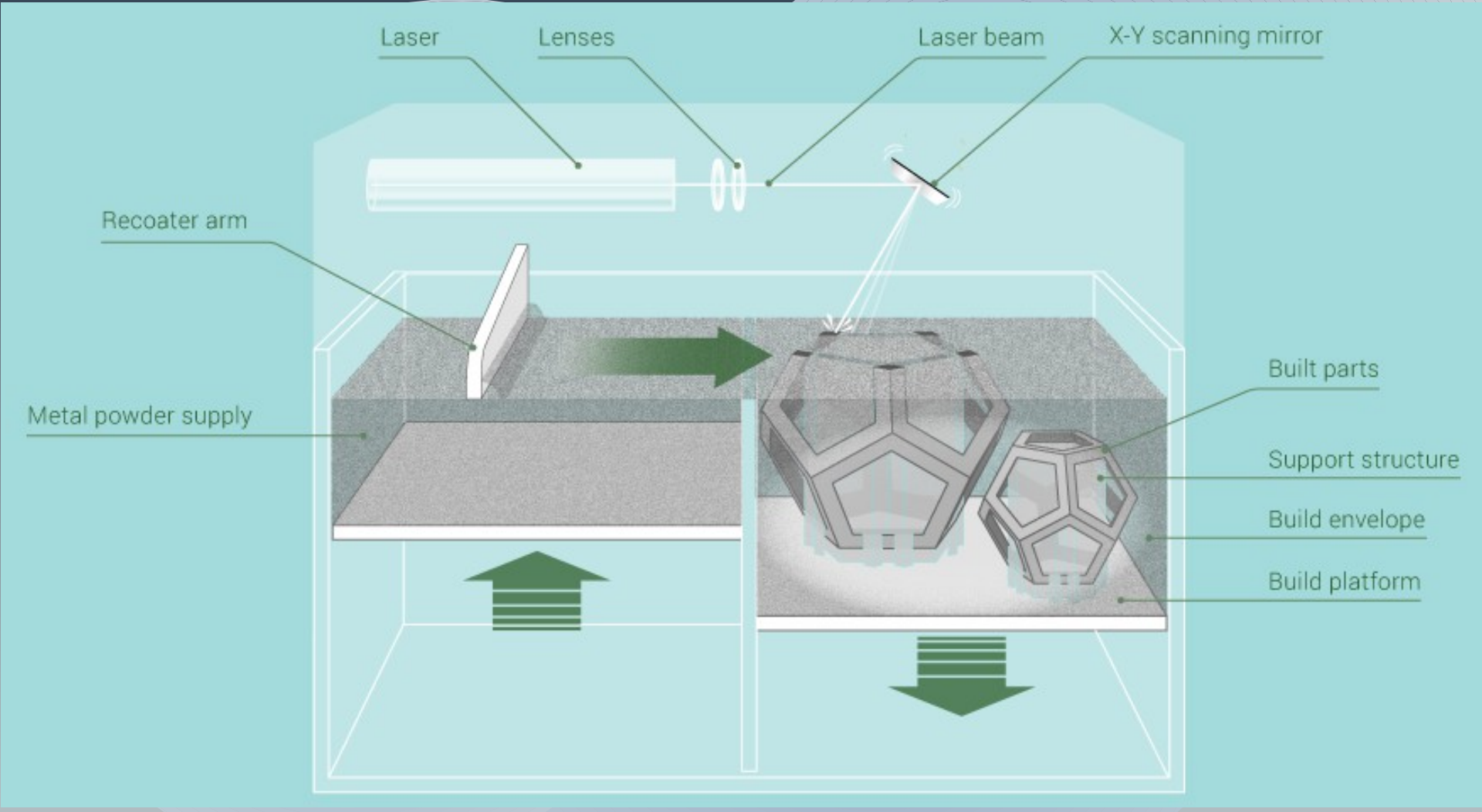
FDM – Fused Deposition Modeling



STL - Stereolithography



SLM – Selective Laser Melting

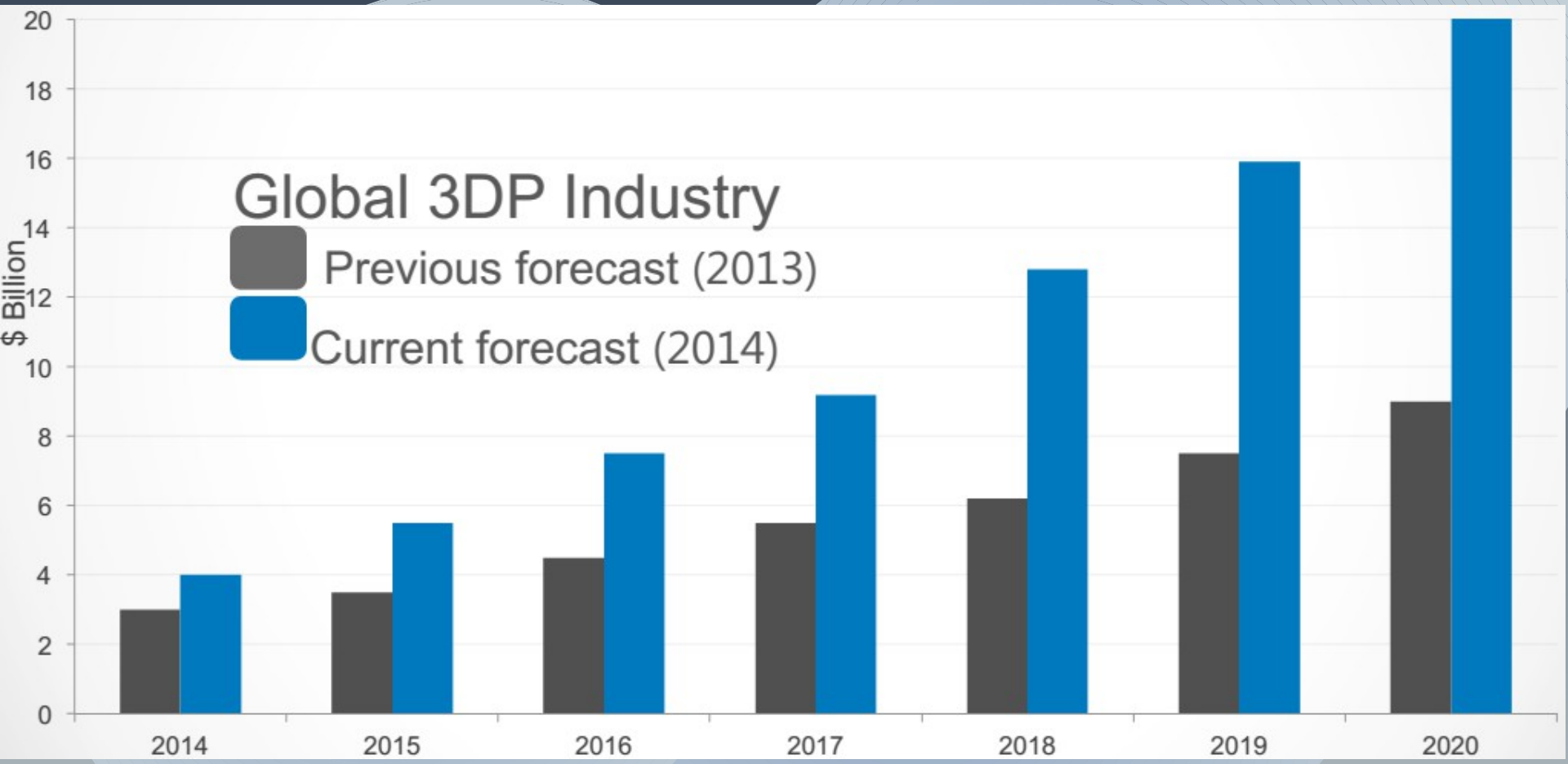


Materials	Technologies		
	Parts built through polymerization	Parts built through bonding agent	Parts built through melting
Ceramic		BJ	LM
Metal			EBM
Sand			
Plastic	SL, PJ		FDM, LS
Wax			MJ *

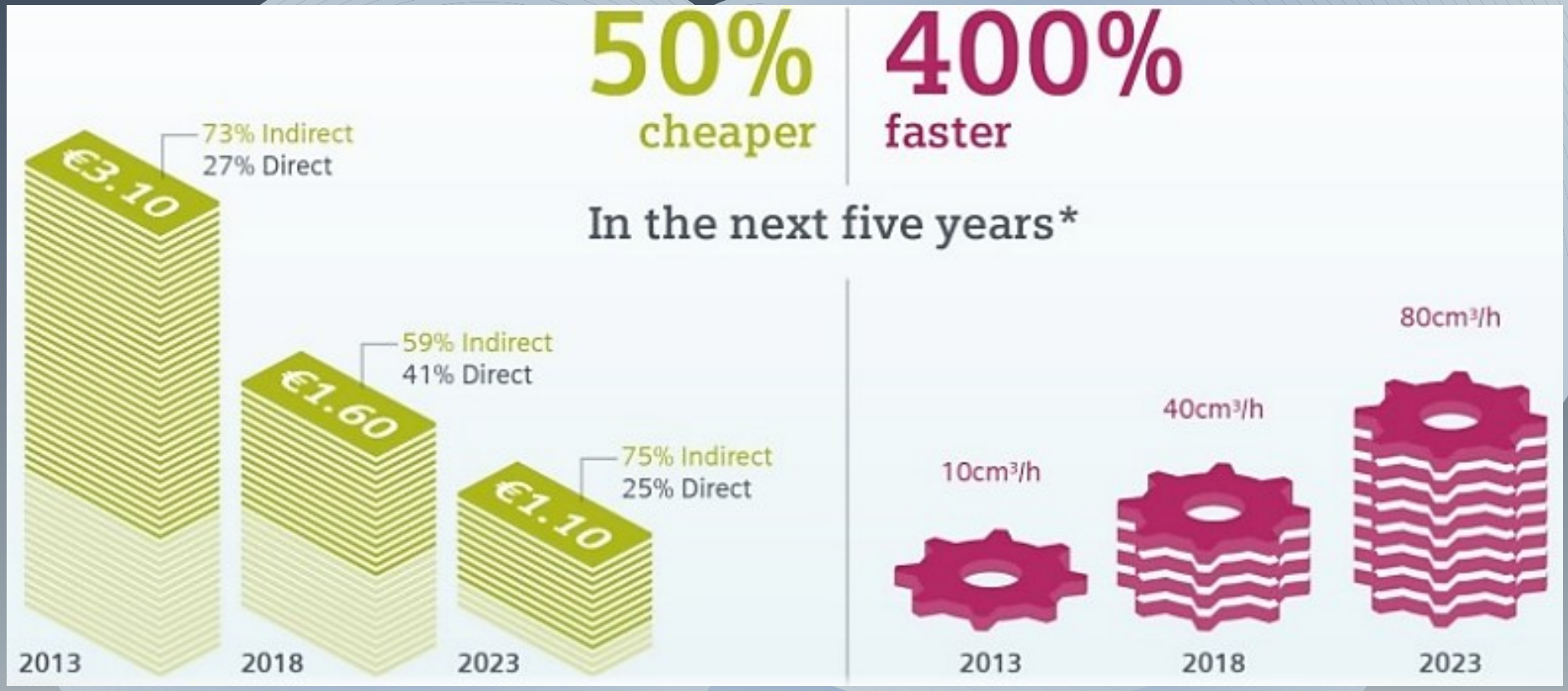
Lower	Durability	Higher
Smoother	Surface finish	Rougher
Higher	Detail	Lower
Prototypes | Indirect processes	Application	Functional parts


ABS
ASA
Nylon
Polycarbonate
PLA
Acrylic
PPSF
Ultem
Rubber
PVA
Composite polymers
Plastics
Stainless steel
Titanium
Inconel
Cobalt Chrome
Tool steel
Aluminum
Gold
Silver
Bronze
Metals
Gypsum
Wax
Ceramics
Paper
Biomaterials
Food
concrete
Other

Aerospace/Defense			Food Processing
Automotive/Motorsports			Fashion
Medical			Jewelry
Industrial Goods			Art/Sculpture
Energy			Retail
Education			Electronics


Global 3DP Industry
Previous forecast (2013)
Current forecast (2014)
$ Billion
20
18
16
14
12
10
8
6
4
2
0
2014
2015
2016
2017
2018
2019
2020


FORTUS 400mc
FORTUS
Mass Production
Stratasys

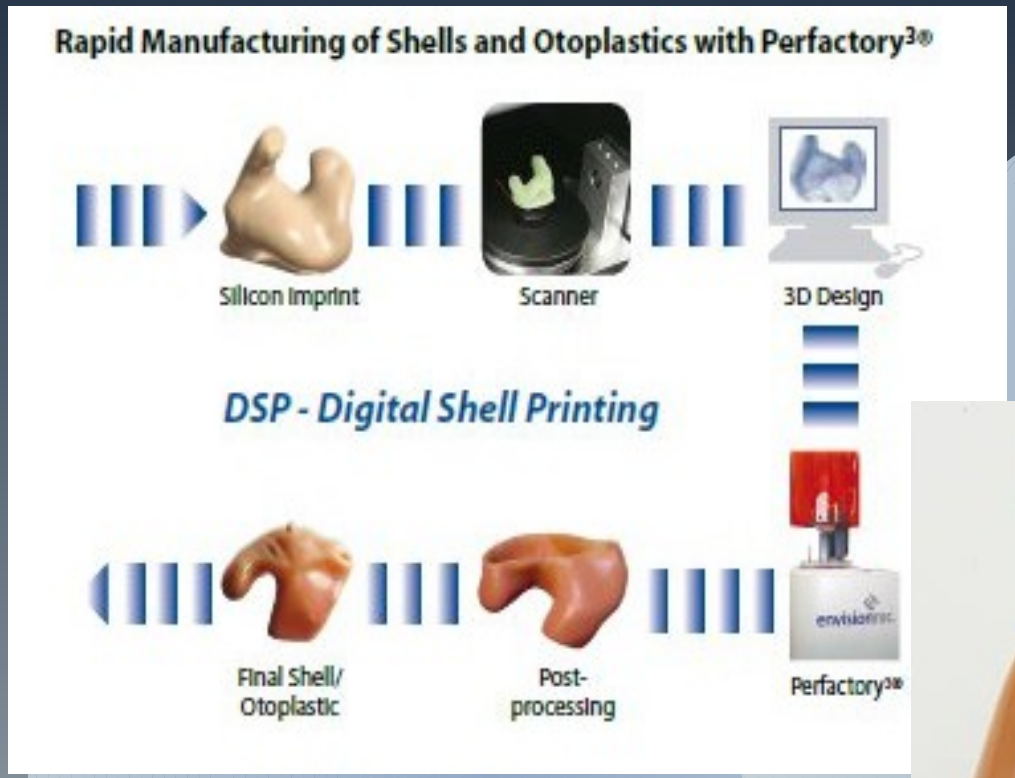

50%
cheaper
400%
faster
In the next five years*
73% Indirect
27% Direct
€3.10
59% Indirect
41% Direct
€1.60
75% Indirect
25% Direct
€1.10
2013
2018
2023
10cm³/h
40cm³/h
80cm³/h
2013
2018
2023


enablingthefuture.org
Between July 2013 to June 2015 - e-NABLE Volunteers have delivered approximately 1500 hands to children and adults in over 40 countries.


One:1


Koenigsegg
One:1

Εξατομικευμένα βοηθήματα ακοής

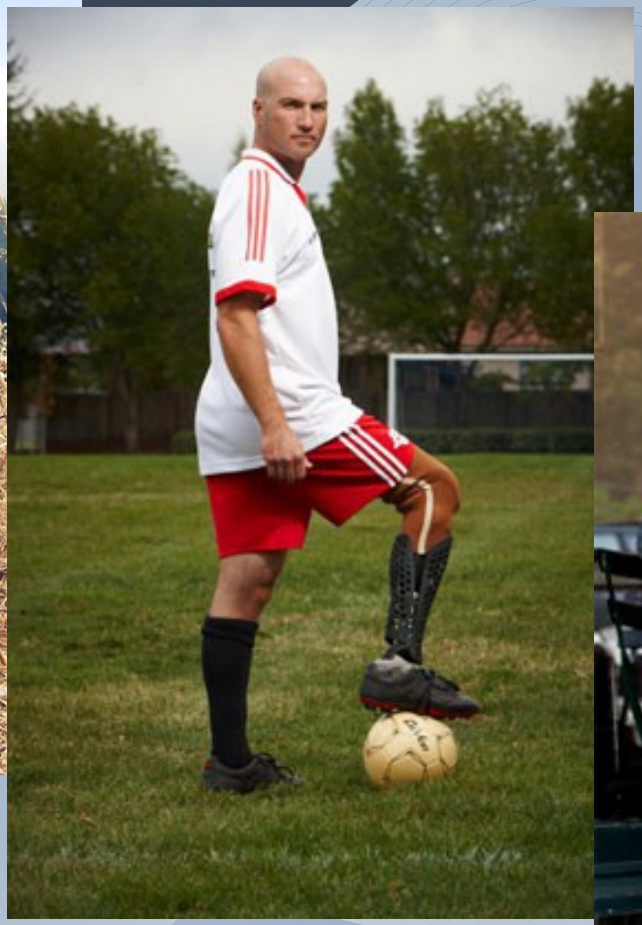


www.envisiontech.com

Οδοντιατρικές εφαρμογές

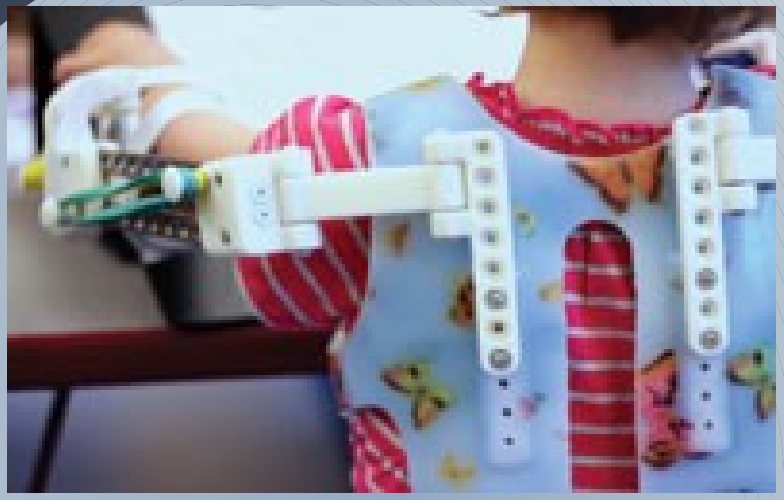
Left: 3D Systems, e-stone material on ProJet 6000 system. http://silversmilesurvival.wordpress.com/tag/3d-printing/ ; Upper right: http://3dsystems.intercept-corp.com/ProJet-DP-3500.html ; Lower : www.dentalproductsreport.com

Εξατομικευμένα τεχνητά μέλη



www.bespokeinnovations.com

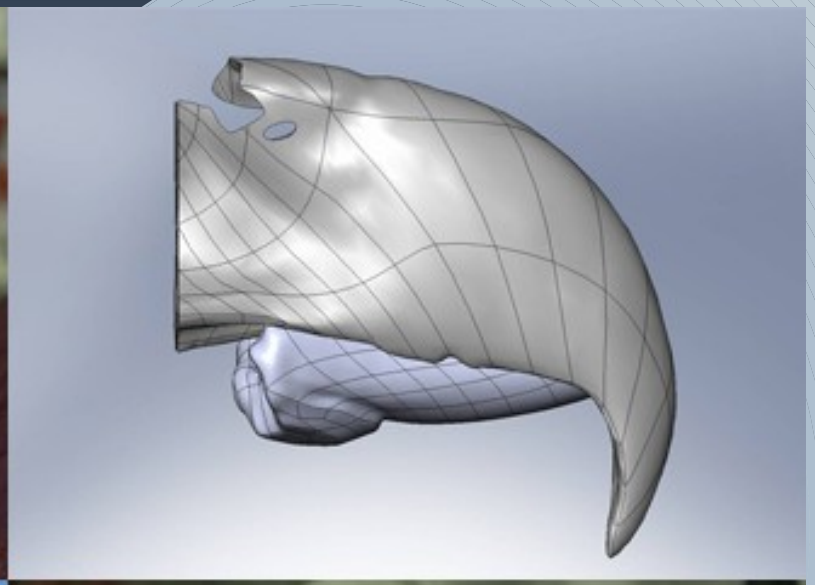
Εξατομικευμένοι εξωσκελετοί

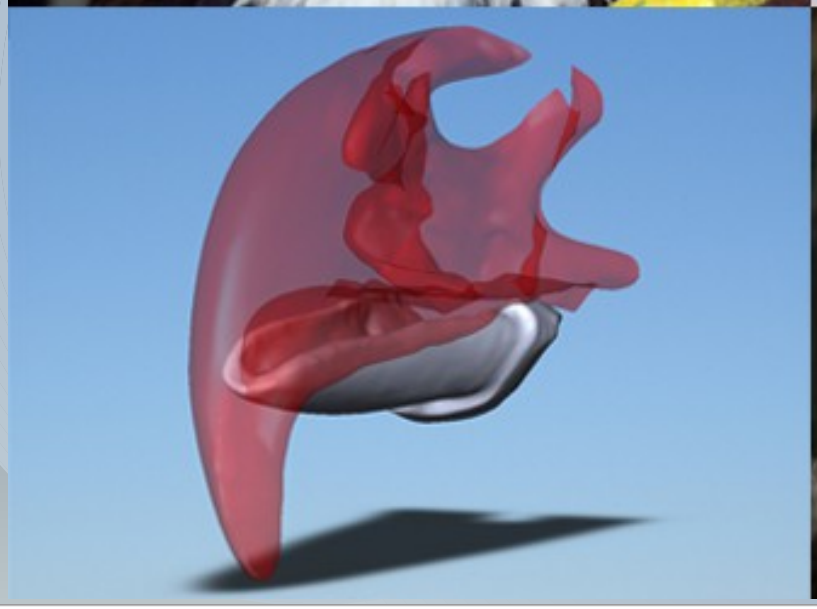


Delaware Hospital, Mfg. Stratasys Corp., LAECO Othopedics

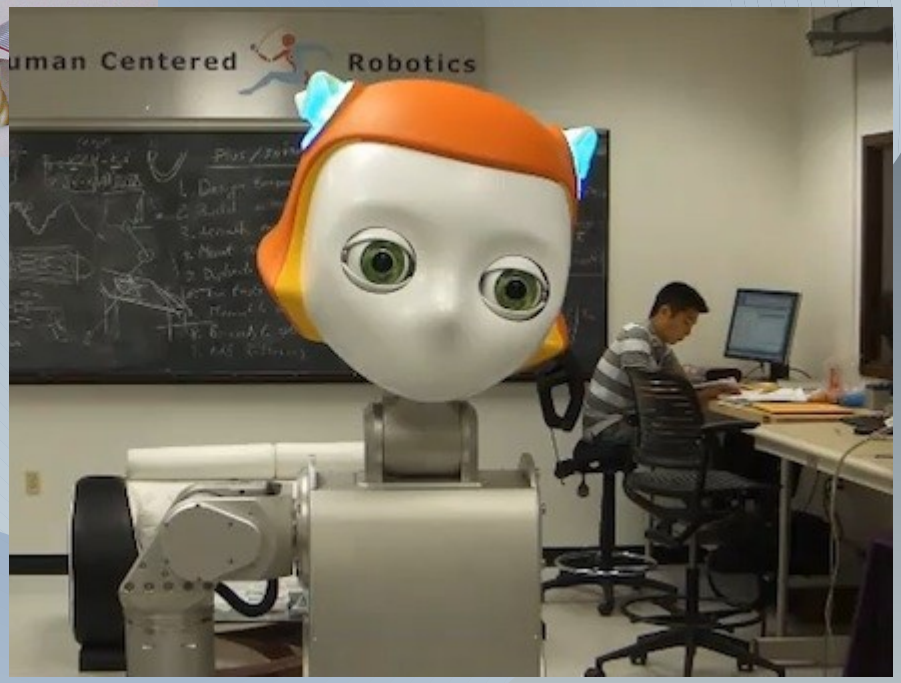
Ορθοπεδικά εξατομικευμένα εμφυτεύματα

Εξατομικευμένα πρόσθετα μέλη

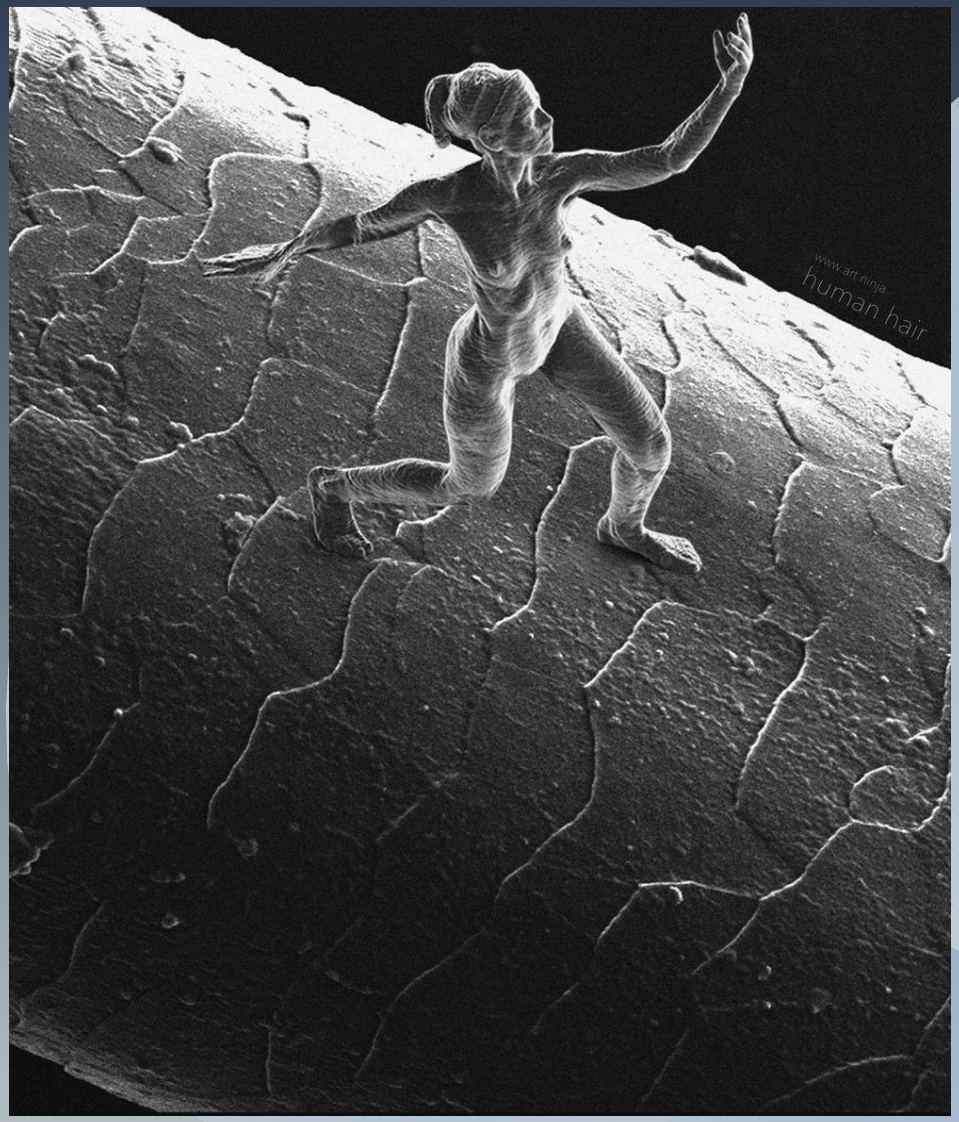




InMoove – www.inmoove.fr



Meka Robotics – Acquired by GoogleX



www.nanoscribe.de

WinSun Decoration Design Engineering Co.

Ευχαριστώ για την προσοχή σας