



# 3D Printing Basics

## How 3D Printing apply to medical devices

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# Agenda

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- ▶ 3D Printing Flow
- ▶ 3D Printers
- ▶ 3D Printer Technology
- ▶ 3D Scanners
- ▶ 3D Printing Materials
- ▶ Why 3D Printing?
- ▶ 3D Printed Products for Health
- ▶ Scanners
- ▶ Videos from 3D Printer Manufacturers



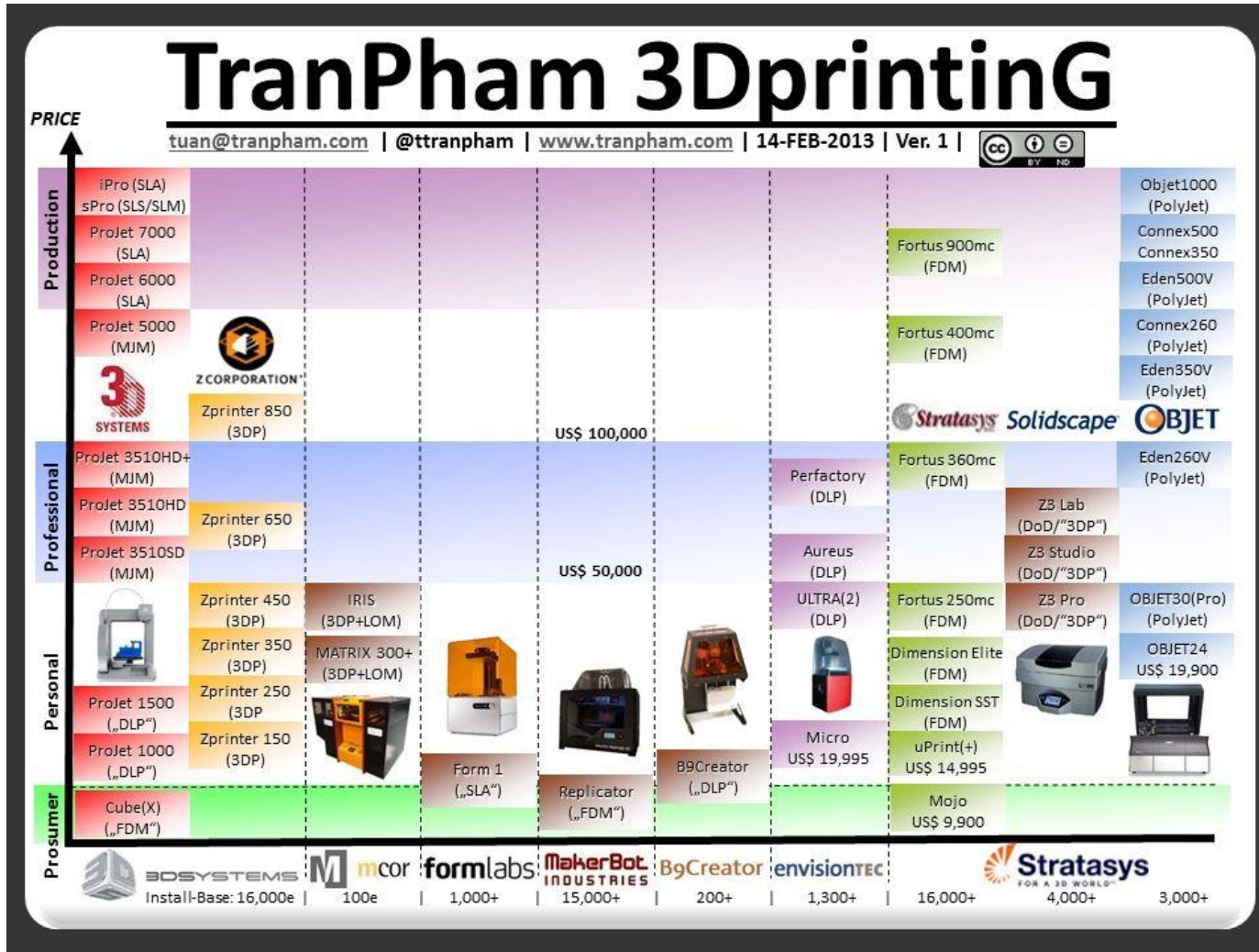
# 3D Printing - Flow

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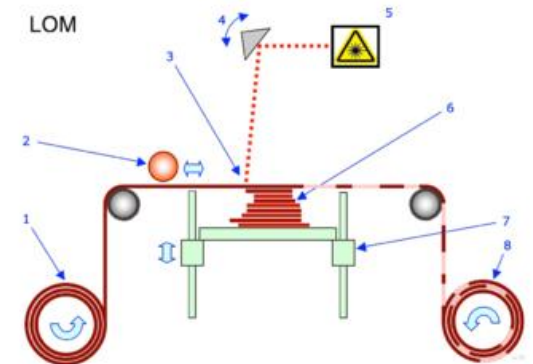
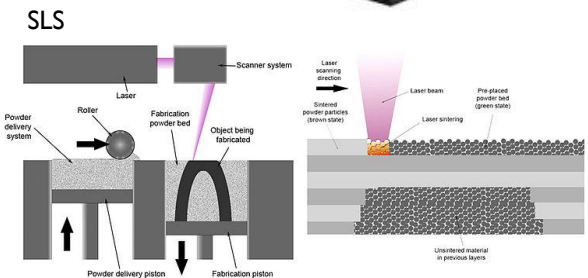
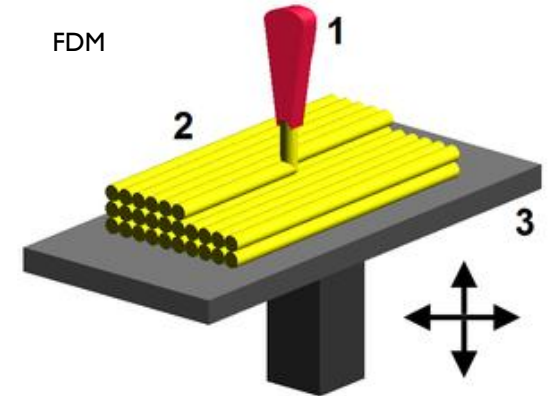


# Who makes 3D Printers?



# 3D Printer Technology

- ▶ **Melt or Soften Material**
  - ▶ SLM – Selective Laser Melting
  - ▶ DSLM – Direct Selective Laser Melting
  - ▶ SLS – Select Laser Sintering
  - ▶ FDM – Fused Deposition Modeling
  - ▶ FFF – Fused Filament Fabrication
- ▶ **Cure Liquid Materials**
  - ▶ SLA – StereoLithography
- ▶ **Layers Cut and Joined**
  - ▶ LOM – Laminated Object Manufacturing

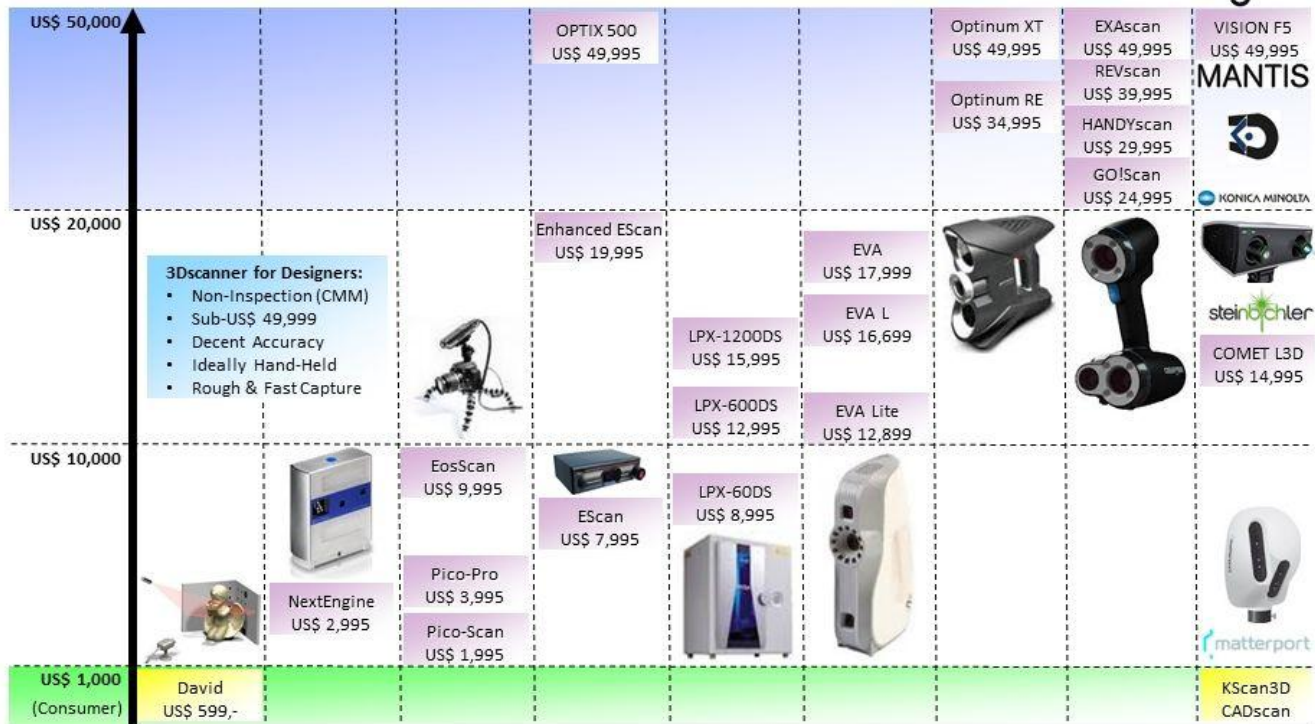




# Who makes 3D Scanners?

## TranPham 3DscanningG

tuan@tranpham.com | @ttranpham | <http://www.linkedin.com/in/ttranpham> | 14-FEB-2013 | Ver. 1



# Scanners

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- ▶ Occipital/Structure
  - ▶ <http://structure.io/#>

## **Structure Sensor – Capture the World in 3D**

3D Scanning. Augmented Reality. Instant Measurements.





# 3D Printing Materials

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- ▶ Plastic
- ▶ Metal
- ▶ Ceramic
- ▶ Sand
- ▶ Wax
- ▶ Paper
- ▶ Electrical “ink”
- ▶ Biologicals
- ▶ Glass
- ▶ Gypsum
- ▶ Foodstuffs







# Why 3D Printing?

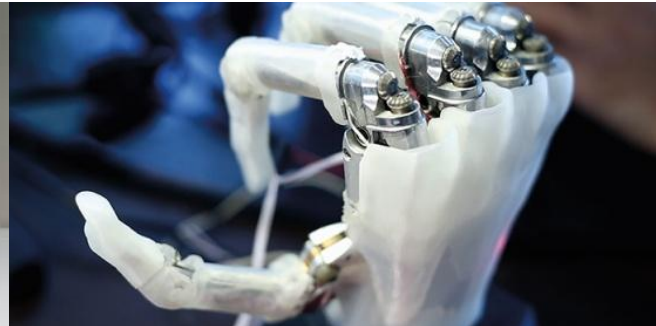
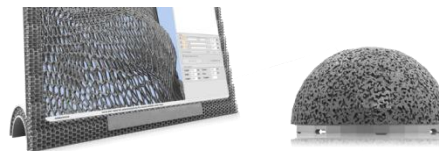
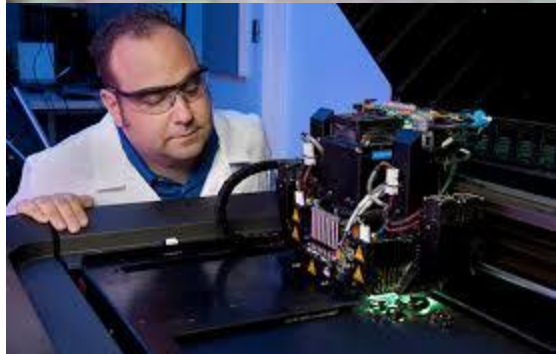
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- ▶ 3D Printing is a manufacturing process which may replace injection mold processing.
- ▶ Currently, injection mold processing requires costly production tools.
- ▶ There are no costly production tools for 3D Printing
- ▶ When to choose 3D Printing manufacturing process?
  - ▶ Low volume demand
  - ▶ Customization
  - ▶ Rapid Prototype
  - ▶ Material
    - ▶ Polymers, Wax, Metals, Ceramics, Food, etc





# 3D Printed Products for Health





# Videos

## ▶ Stratasyys

- ▶ <http://bcove.me/anc73spi>
- ▶ <http://bcove.me/nwxzuncn>



## ▶ 3D Systems

- ▶ <https://www.youtube.com/watch?v=oBI2PSkKkk0>
- ▶ <https://www.youtube.com/watch?v=5LdEI5SID10>

