

What's New in 3D Printing and Additive Manufacturing

NMTC 3D Printing Peer Group

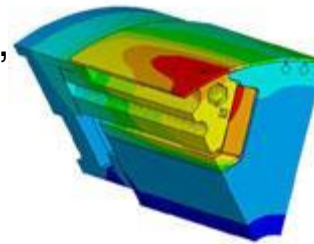
June 22, 2017

Rey Chu

PADT Inc.

About PADT

- Products and Services for Physical Product Development
- Founded in 1994
- Three Areas of Focus:
 - Simulation, Product Development, 3D Printing
- Services
 - Product Development, Medical Devices, Simulation, 3D Printing, Manufacturing R&D and Consulting
- Sales
 - ANSYS, Stratasys, Flownex, Zeiss, Geomagic, Concept Laser
- Products
 - Support Cleaning Apparatus, CUBE HPC Computers
- 75 Employees
 - Based in Tempe, Arizona
 - Albuquerque NM, Denver CO, Salt Lake City UT, Torrance CA



Top News

- XJet demonstrated its proprietary liquid metal 3D printing technology, known as NanoParticle Jetting
- Carbon unveiled its first commercial CLIP based 3D printer
- Stratasys' introduced multi-material full color PolyJet technology J750 printer.
- HP begins selling Multi Jet Fusion 3D printer
- Nano Dimension ships first DragonFly 2020 PCB 3D printer
- Stratasys debuts Infinite-Build and Robotic Composite 3D printers
- Ultimaker unveils Ultimaker 3
- Markforged introduces powerful Mark X 3D printer for strong carbon fiber reinforced parts
- GE Additive acquired Concept Laser, ARCAM, AP&C powder (Canada), DiSanto Technology (Medical AM)
- Desktop Metal launches the “Studio”, office-friendly metal 3D printing

Some Big Numbers

- Growing number of equipment manufacturers: 49 in 2014 versus 97 in 2016
- Double digit revenue growth: \$6.06B in 2016: up 17.4% over 2015
- Record attendance at AMUG: over 1600 registered
- 3DPRINTINGFORBEGINNERS.COM lists 86 3D printing conferences
- GE Additive announced the development of the “Atlas” laser powder bed 3D printer to print parts up to 1000mm x 1000mm x 1000mm



Carbon's Digital Light Synthesis CLIP Technology

- **M1 Build Volume** Featuring a 5.6" x 3.1" x 12.8" (141mm x 79mm x 326mm) build volume and high resolution 75 μ m pixels, the M1 is good for functional prototyping and low volume manufacturing.
- **M2 Printer** With a build volume measuring 7.4" x 4.6" x 12.8" (189mm x 118mm x 326mm), high resolution 75 μ m pixels.

HP Jet Fusion 3D Printing

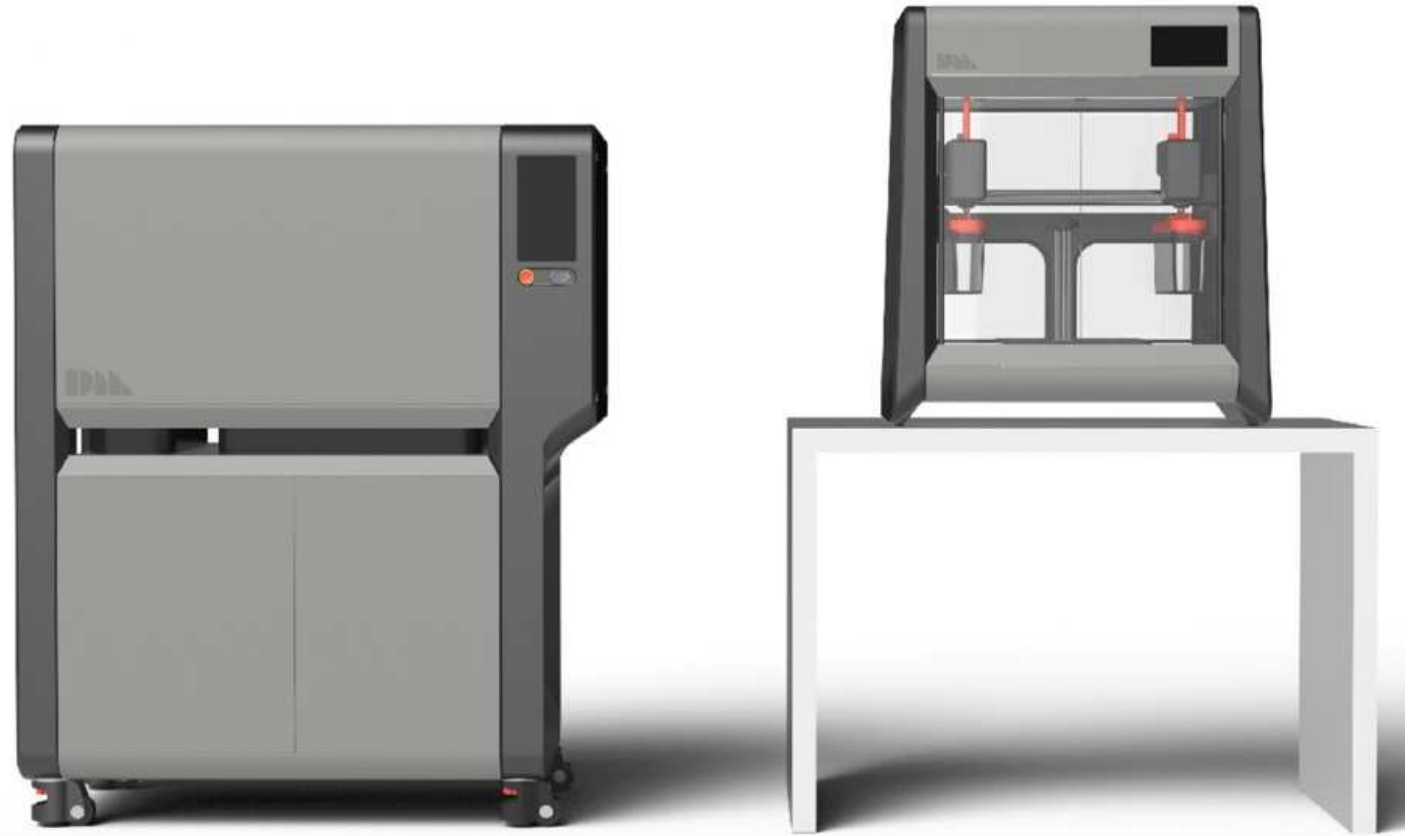
HP Jet Fusion 3D Processing Station with Fast Cooling⁶

HP Jet Fusion 3D
4200/3200 Printer



DM Desktop

- Up to 24 in³ day
- 50um resolution
- Build size: 12" x 8" x 8"
- Ceramic supports, minimal post processing.
- Uses MIM alloys: +100 metals compatible
- Office friendly metal crayon media





DM Production

- Build speed: 500 in³/hr (+9000 in³ per day)
- Pixel size: <20um in XY
- Build size: 14" x 14" x 14"
- Uses MIM alloys: +100 metals compatible
- Cost effective MIM powder media



Arizona Additive Manufacturing Committee (AZ Tech Council)

Started June 2016, with goals:

- Promote AM and **educate** potential users
 - Act as a forum to influence **local regulation**
 - Inform progress of national **certification and standards** organizations
 - Serve as a rallying point for **collaboration**
- 45 entities in AZ (and growing)
 - Monthly meeting at different sites (so far: LAI, ASU, PADT, Intel, UofA. November: Honeywell)
 - Contact dhruv.bhate@padtinc.com to learn more and/or join



Questions?