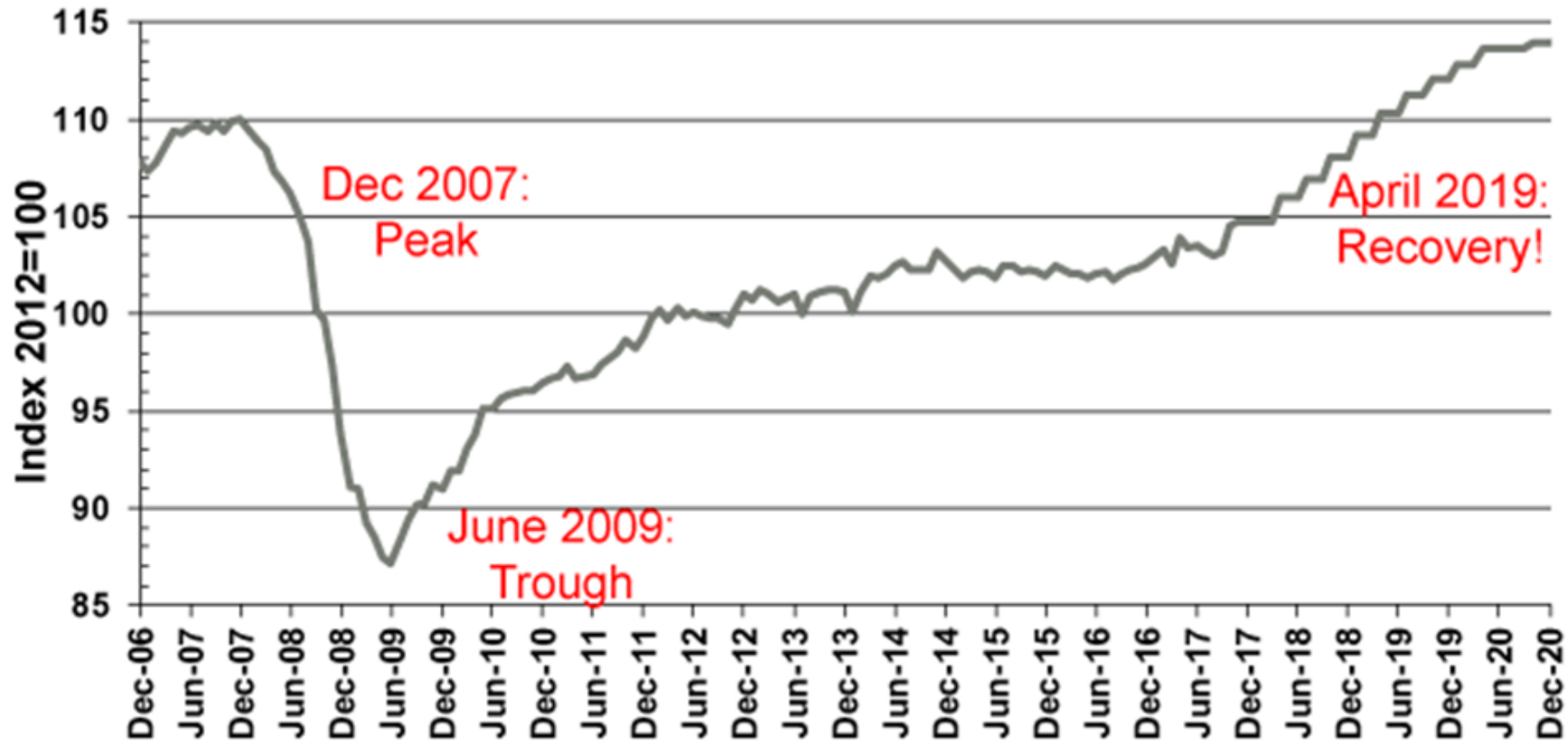




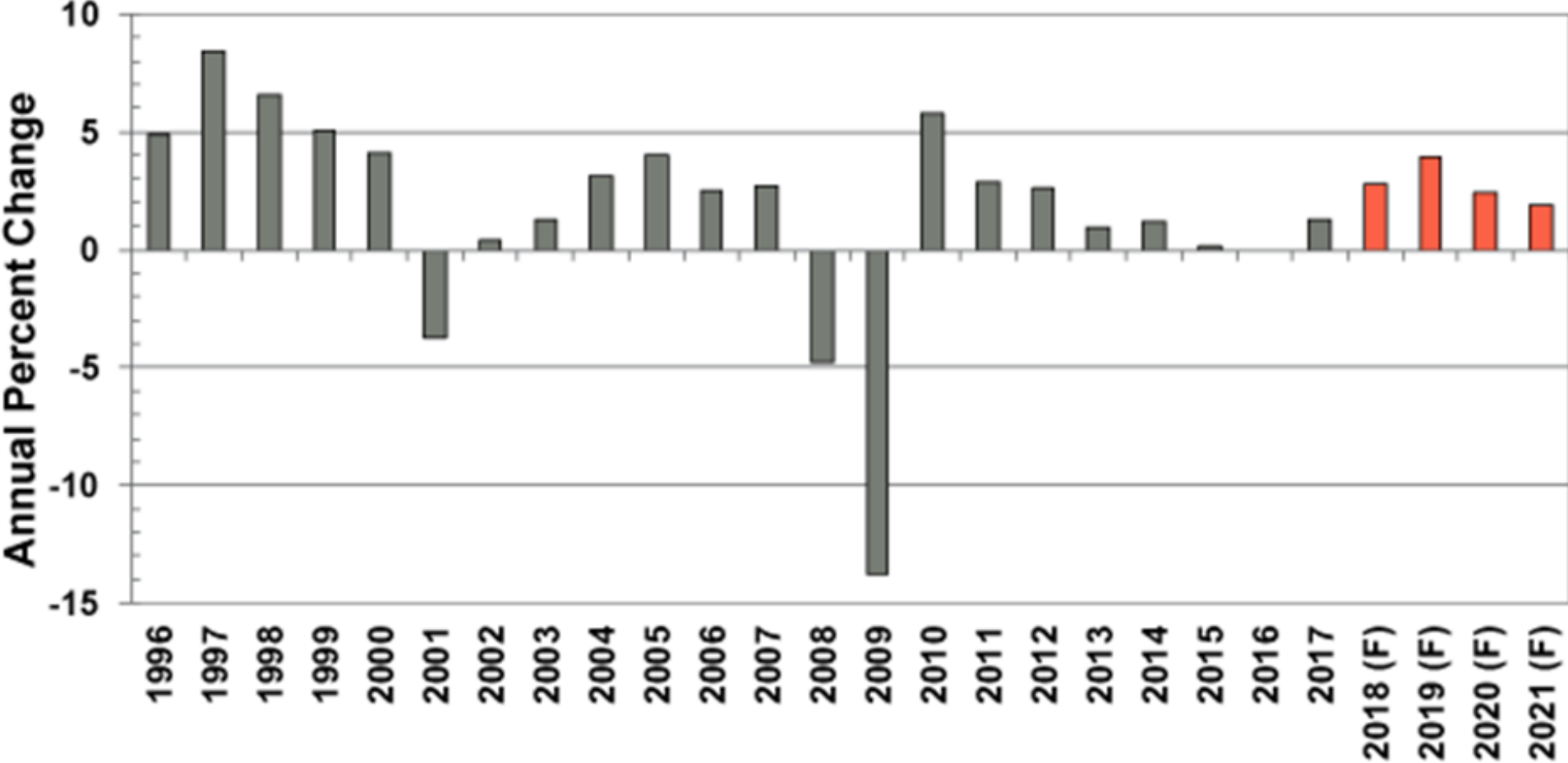
Manufacturers Alliance for Productivity and Innovation  
DOMESTIC OUTLOOK, FORECAST  
MARCH 22, 2018

Manufacturing Industrial Production

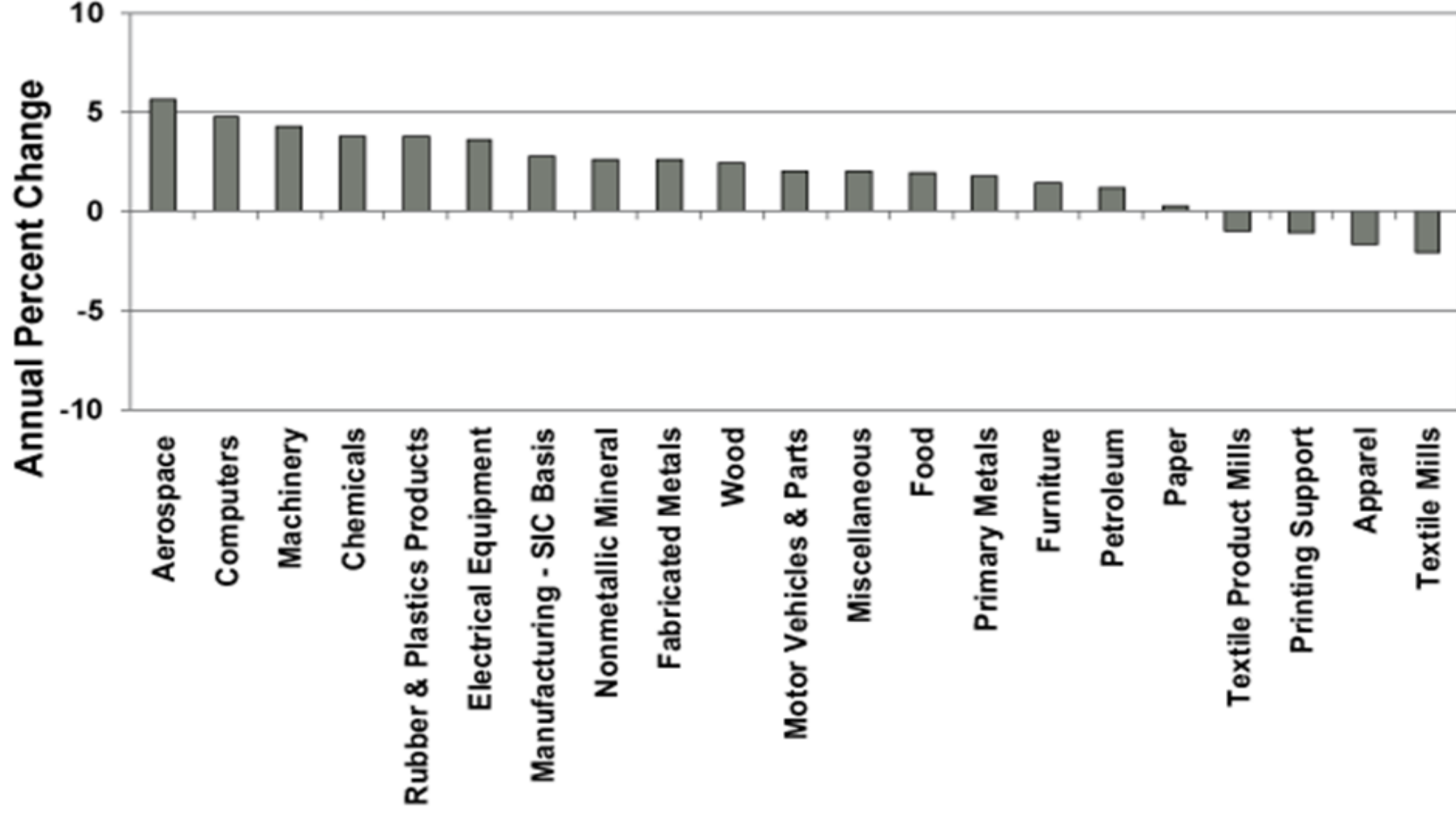


Manufacturers Alliance for Productivity and Innovation  
DOMESTIC OUTLOOK, FORECAST  
MARCH 22, 2018

U.S. Manufacturing Production Growth



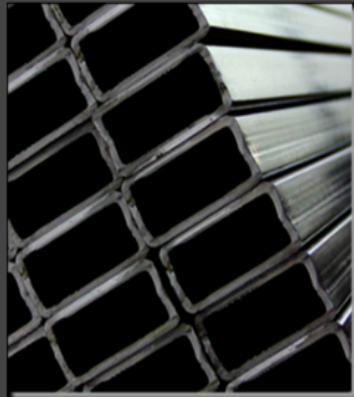
## MAPI Foundation Forecast of Output Growth in Manufacturing Subsectors, Average Growth, 2018-2021



# RadTech Market Research 2018



IT'S A HOME RUN FOR LITTLE PAPI



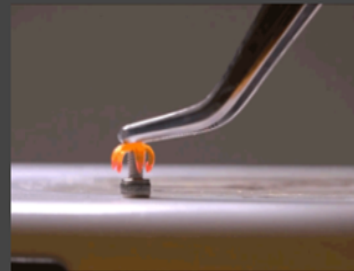
NORTH CAROLINA STEEL TUBING MANUFACTURER, STEEL TUBE INC. COMPLETES PROPOSED EXPANSION



GRIFFON VAULT VODKA ROCKS THE BOX



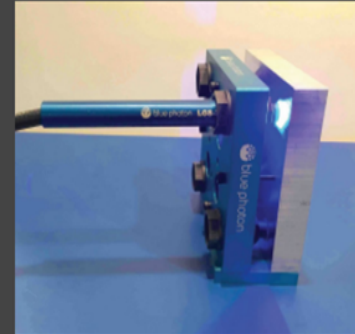
SPOILER ALERT! GAME OF THRONES SEASON 6 PREMIERE FEATURES 3D PRINTED DAGGER FROM SHAPEWAYS



3-D PRINTED STRUCTURES "REMEMBER" THEIR SHAPES



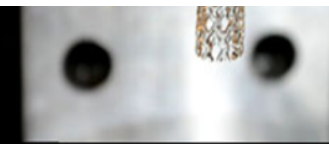
PRINTED LIVER, FUNCTIONAL BLOOD VESSEL NETWORK THAT COULD PAVE THE WAY TOWARD ARTIFICIAL ORGANS



WHAT'S PHOTO-ACTIVATED ADHESIVE WORKHOLDING?



HERE'S WHAT FORMLABS'S 3D-PRINTED VIOLIN SOUNDS LIKE



SCIENTISTS USE 3-D PRINTING TO DEVELOP CUSTOMIZED BIODEGRADABLE STENTS



ONTARIO PARTNERING WITH MITCHELL PLASTICS TO CREATE JOBS



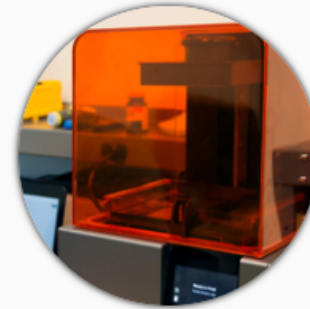
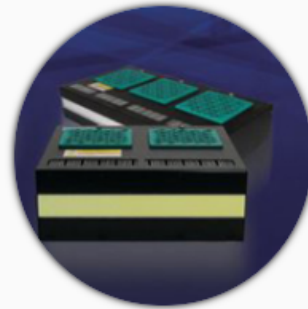
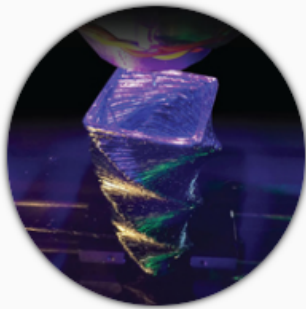
LIMITED EDITION JÄGERMEISTER BOTTLE



# RadLaunch 2018

Connecting Technology Start-Ups to UV+EB Industry Leaders

A Unique Idea Accelerator for UV+EB Start-ups, Students & Innovators



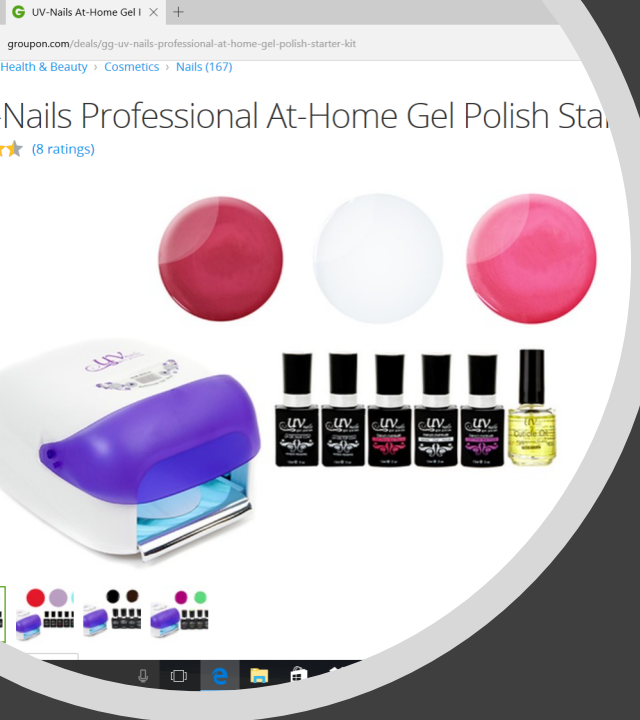
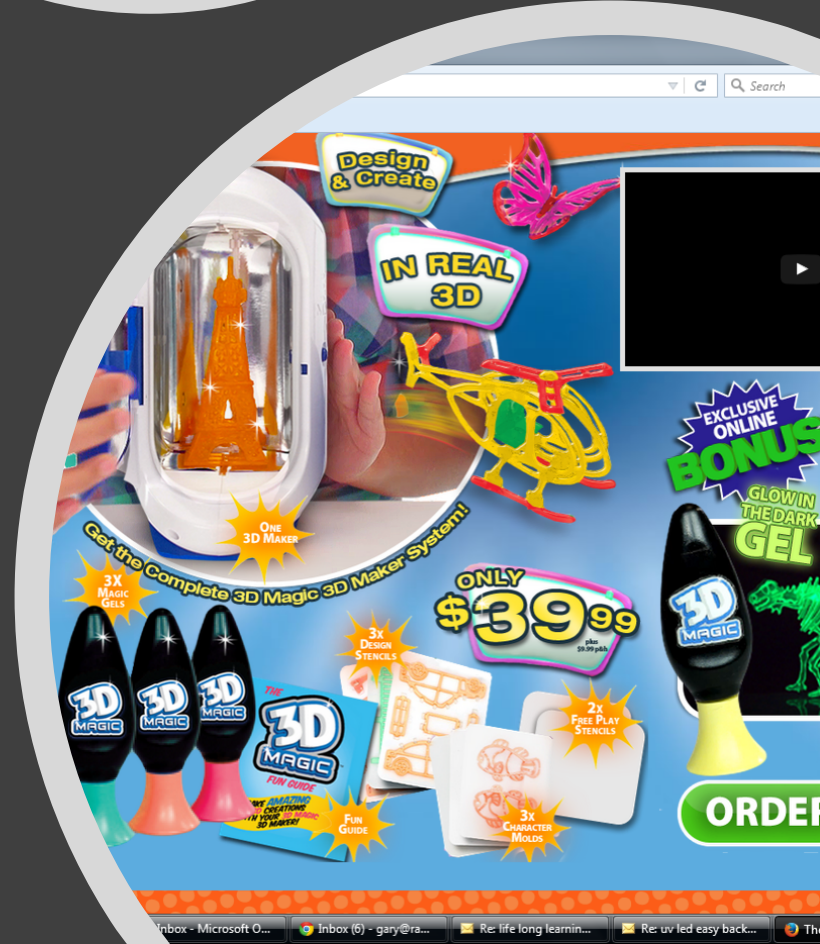


Photo-poly for Consumers



# UV+EB Formulated Product Sales Growth in North America, by Volume (percent change from previous year)

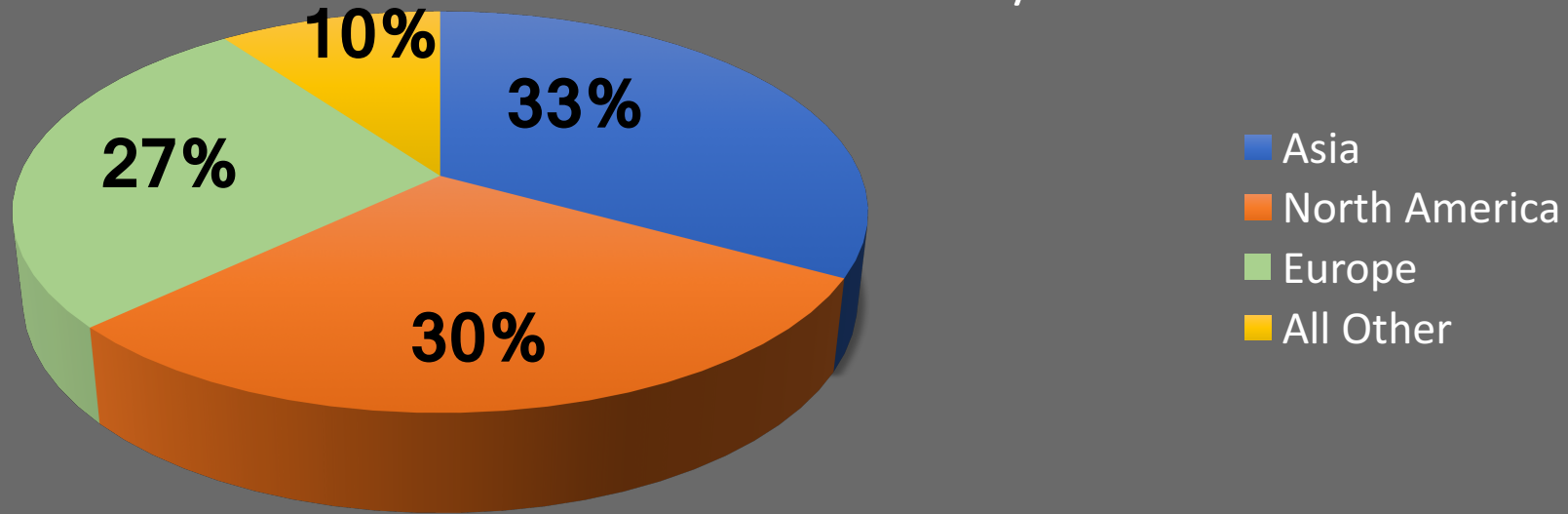
<b>2017</b>	<b>5.7%</b>
<b>2018</b>	<b>6.4%</b>
<b>Next 3 yr. Annual Avg</b>	<b>6.6%</b>



# UV+EB Formulated Product Distribution by Country North America

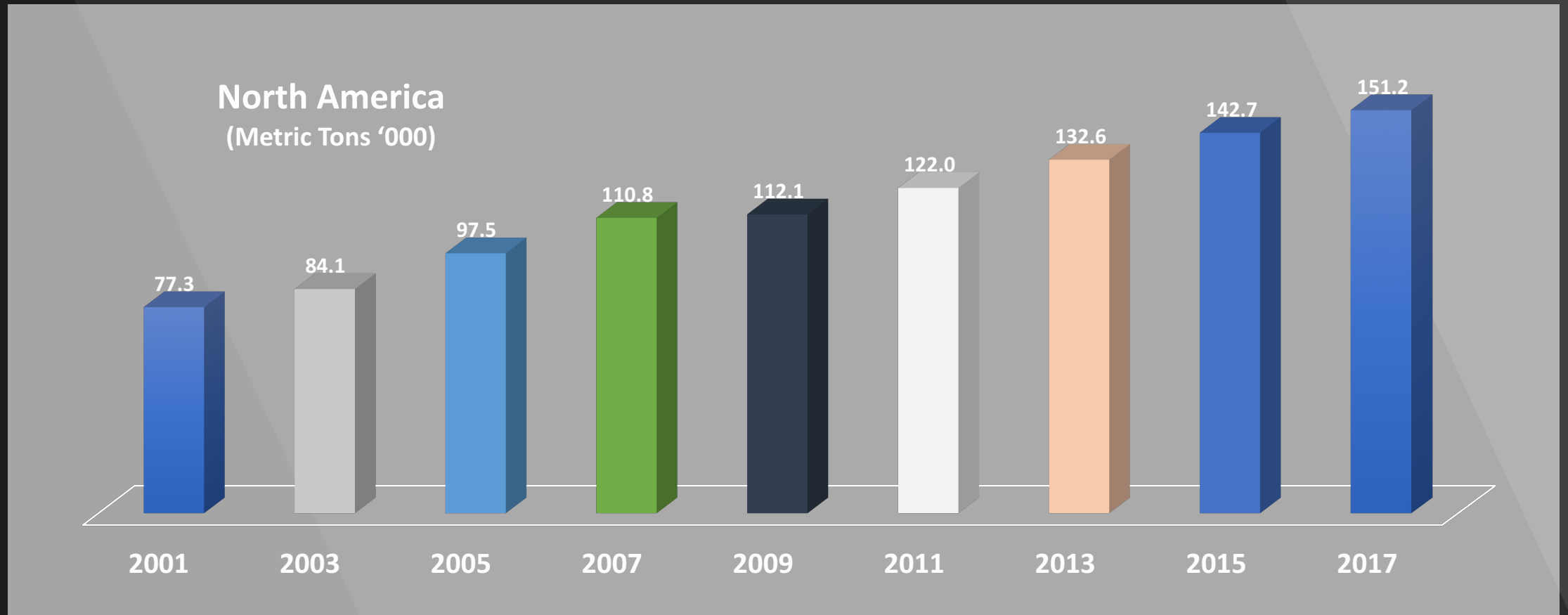
<b>United States</b>	<b>77%</b>
<b>Canada</b>	<b>11%</b>
<b>Mexico</b>	<b>12%</b>

Global market for UV/EB

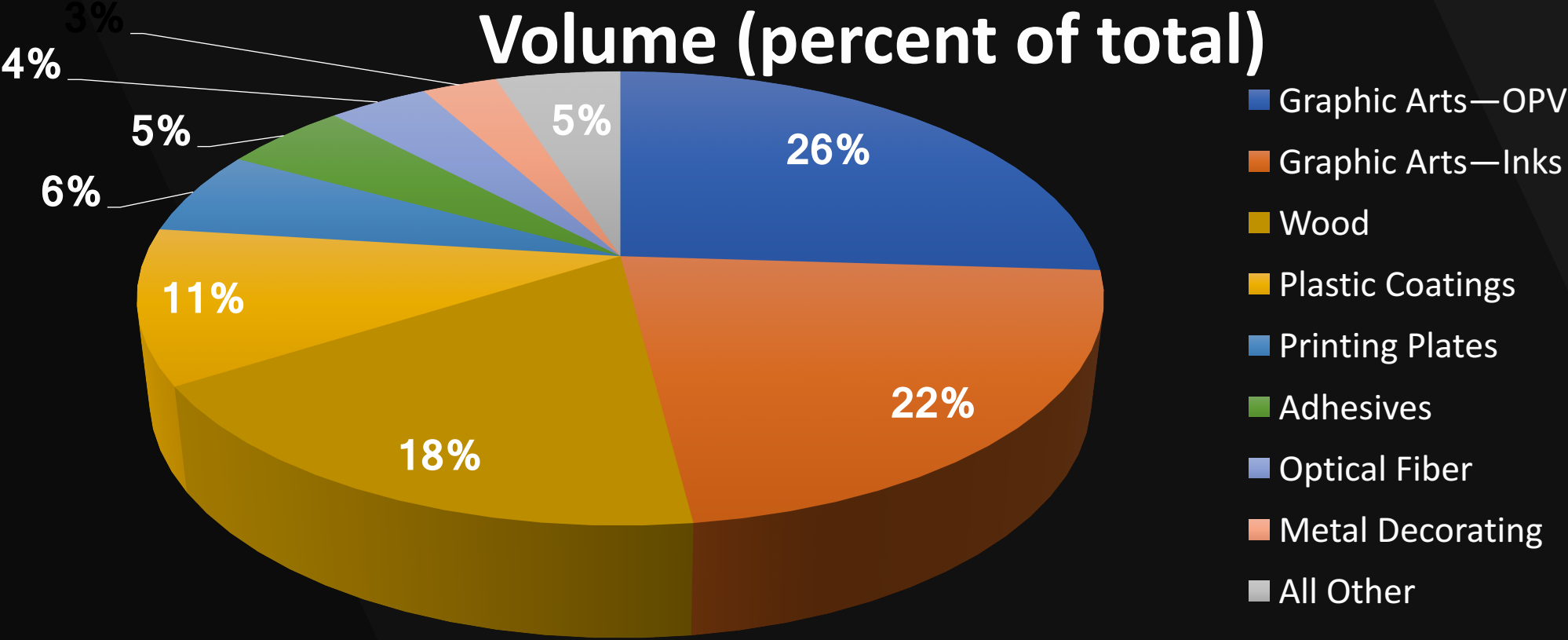


RadTech Biennial Survey

# UV+EB Formulated Product Usage 2017, By Volume

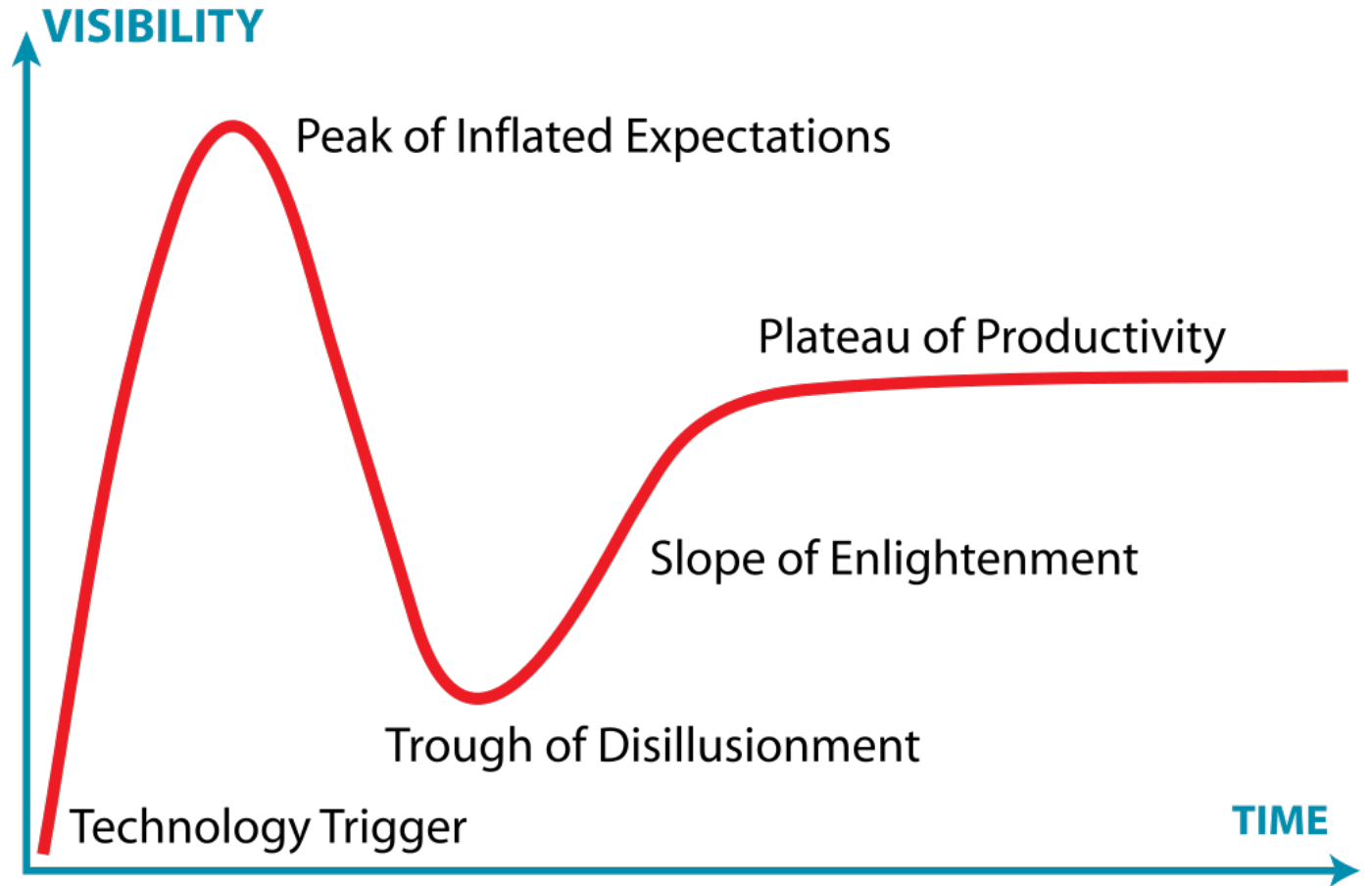


# 2017 UV+EB Formulated Product Usage by Volume (percent of total)



# 3D Printing?

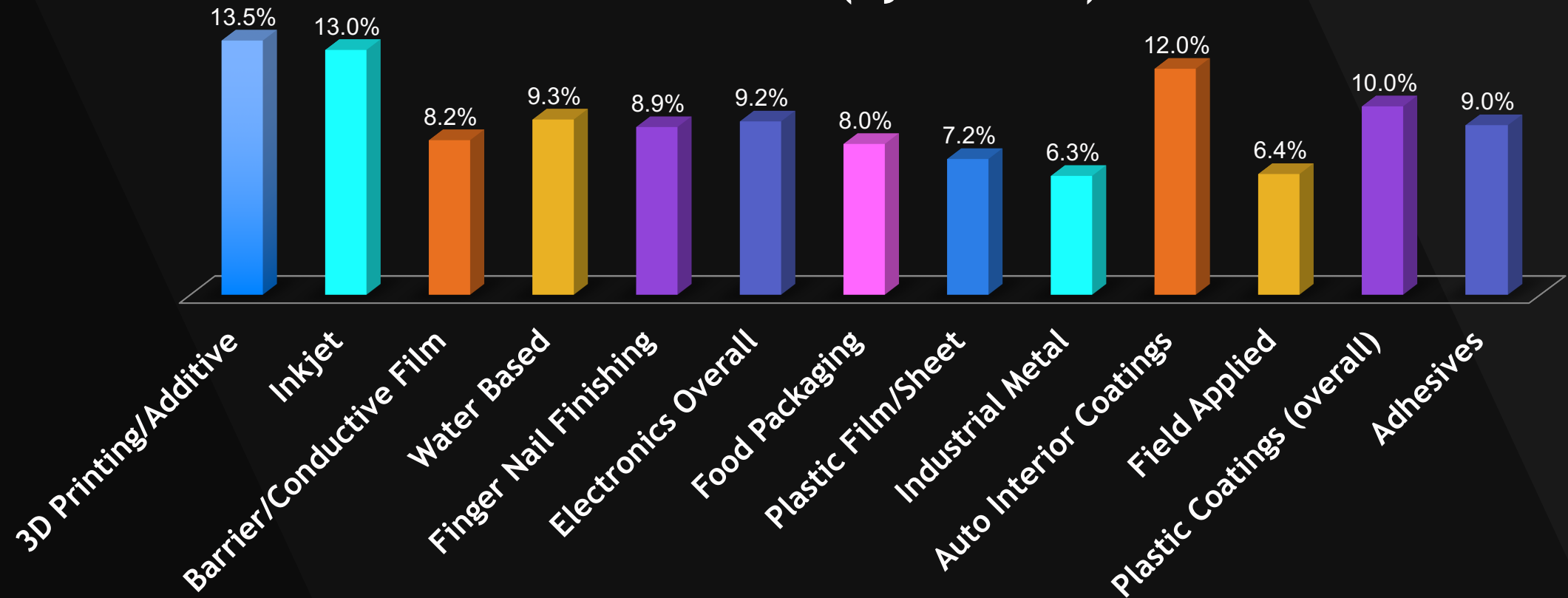
Gartner Hype Curve



# Next 2 Year Forecast

## RadTech Biennial Survey 2018

### UV+EB Products: Average Annual Growth Rate Over Next Two Years (by Volume)



# UV+EB Formulated Product Usage by Volume

## Other Categories We Track

- Graphic Arts Clear OPV
- Off-Set (Litho) Inks
- Screen Printing Inks
- Flexo Inks
- Letter Press Inks
- Inkjet Inks
- Wood Fillers
- Wood Stains and Sealers
- Wood Pigmented Coatings
- Wood Clear Finishes
- Wood Flooring (Prefinished)
- Metal Tubing & Pipe
- Metal Name Plate
- Metal Wire Coating
- Electronic Adhesives
- Electronic Photoresists
- Conformal Coatings
- Silicone Release Coatings
- Optical Fiber-Coating, inks, matrix
- Printing Plates (Flexo & Off Set)
- Stereolithography/Additive manuf.
- Dental Applications
- Medical Apparatus
- Plastic Film & Sheet (exclude Vinyl Flooring (Tile & Sheet)), incl. display film, auto film, optical film, window film etc.
- Vinyl Flooring (Tile & Sheet)
- Plastic Auto Lens & Reflectors
- Plastic Interior Trim
- Plastic Flooring (Prefinished)
- Adhesives--Optical
- Adhesives--Pressure Sensitive
- Adhesives--Laminating
- Can Coating Inks
- Can Coating OPV
- Can End Varnishes

# UV+EB Formulated Product Curing Distribution by Equipment Type North America

<b>Conventional UV</b>	<b>78%</b>
<b>Electron Beam</b>	<b>10%</b>
<b>UV LED</b>	<b>12%</b>



# Motivations for using UV+EB

- Increase Productivity
- Enabling/New
- Improve Physical Performance
- Green Technology/Environmental Compliance

# Advances

Most Important  
In Last 2 Years

- UV LEDs
- Faster Cure Speeds
- Better Adhesion
- Improved Weatherability
- Better Overall UV Technology

# Needs

To Address

- Concerns About Migration
- PI for UV LEDs
- Regulations
- UV LEDs
- Adhesion
- Better UV Technology



Thank you!

[www.radtech.org](http://www.radtech.org)