



North American UV+EB Market Overview



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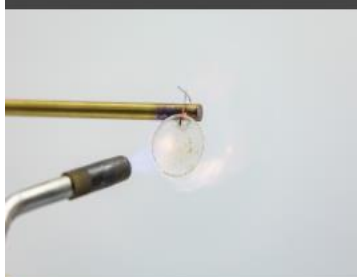
RadTech Market Research 2020

UV+EB Emerging Applications

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Could this extra squishy new material mean safer bike helmets?



JOHNS HOPKINS APL'S
BREAKTHROUGH FLEXIBLE,
CUTTABLE LITHIUM-ION
BATTERY NOW WON'T
CATCH FIRE



MAJOR IKEA SUPPLIER IN
EUROPE USES UV LED
CURING IN FURNITURE
FINISHING



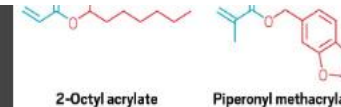
WASTE COOKING OIL
TURNED INTO 3D
PRINTING RESIN



NAIL ENAMEL GETS
GREENER



GETTING FLOORED FOR
ALL THE RIGHT REASONS



SELF-STICK ADHESIVE
MADE WITH BLACK PEPPER
DERIVATIVE ADJUSTS TO
MANY TASTES



WORKHOLDING
ADHESIVES FOR OPTICAL
AND CERAMIC
COMPONENTS



EVERYTHING THAT GOES
INTO MAKING A NEW
BALANCE SNEAKER



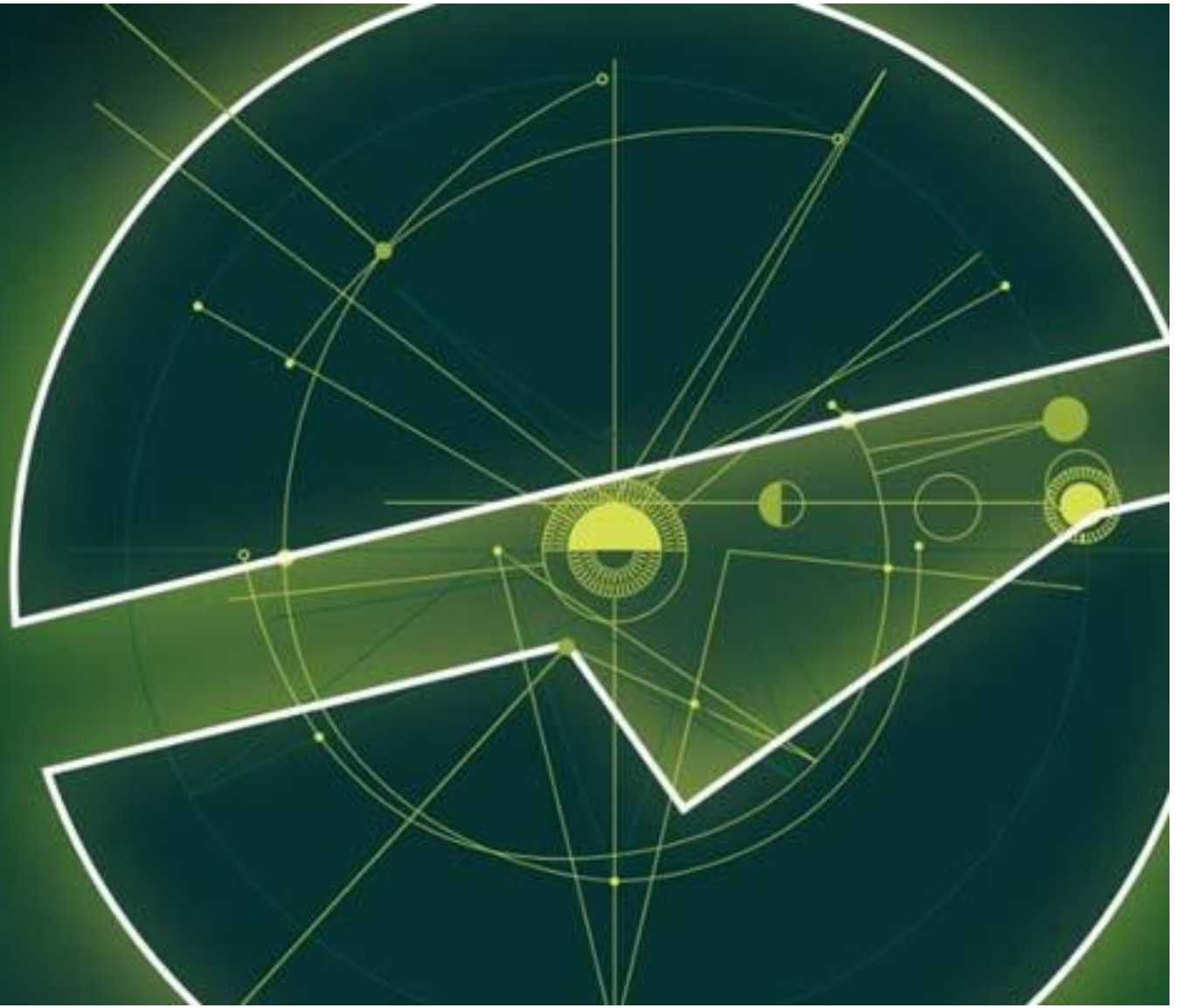
RadLaunch 2020

Connecting Technology Start-Ups to UV+EB Industry Leaders

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



 **NAI**
NATIONAL ACADEMY OF INVENTORS

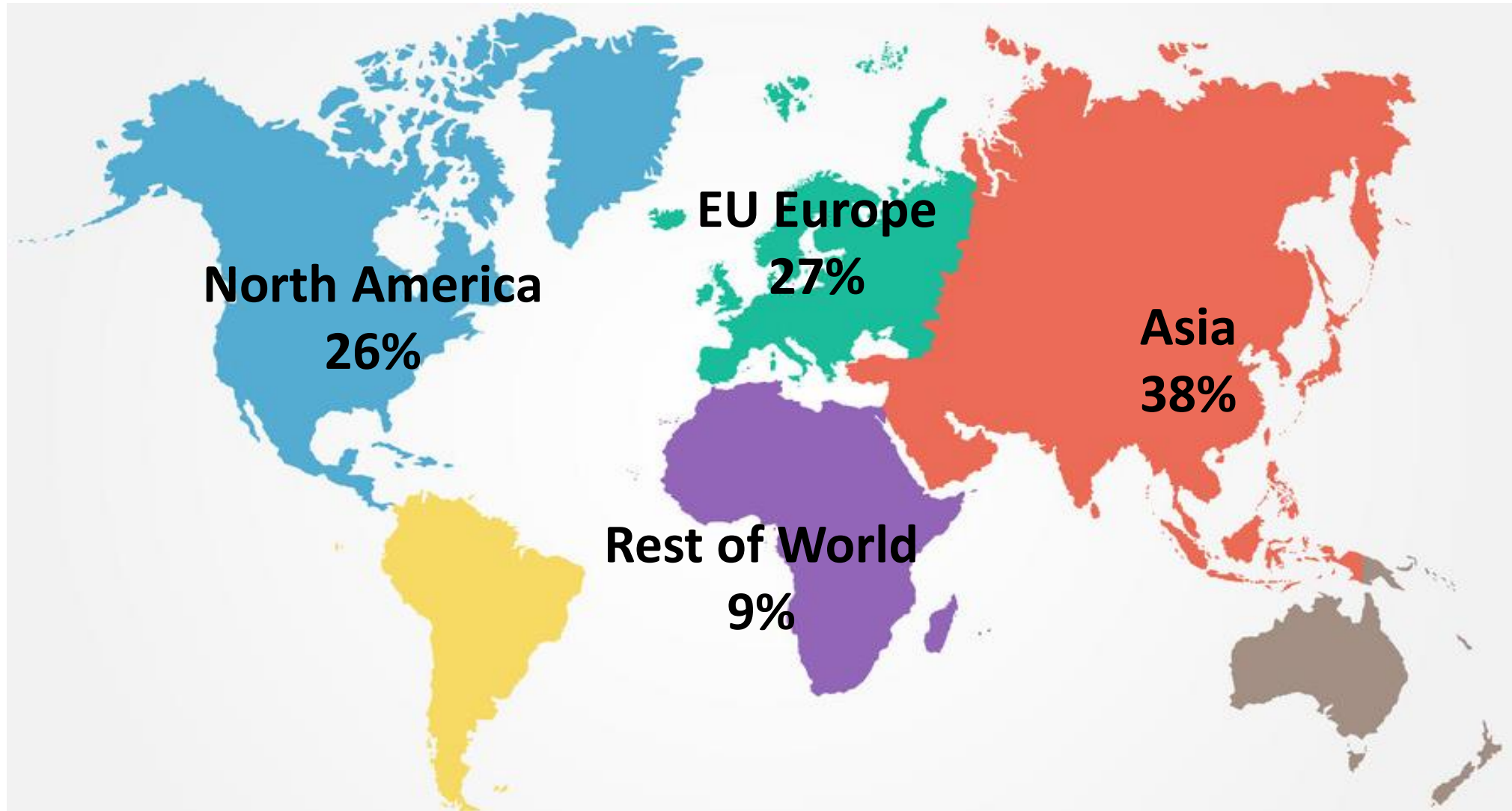


UV+EB Formulated Product Sales Growth in North America, by Volume (percent change from previous year)

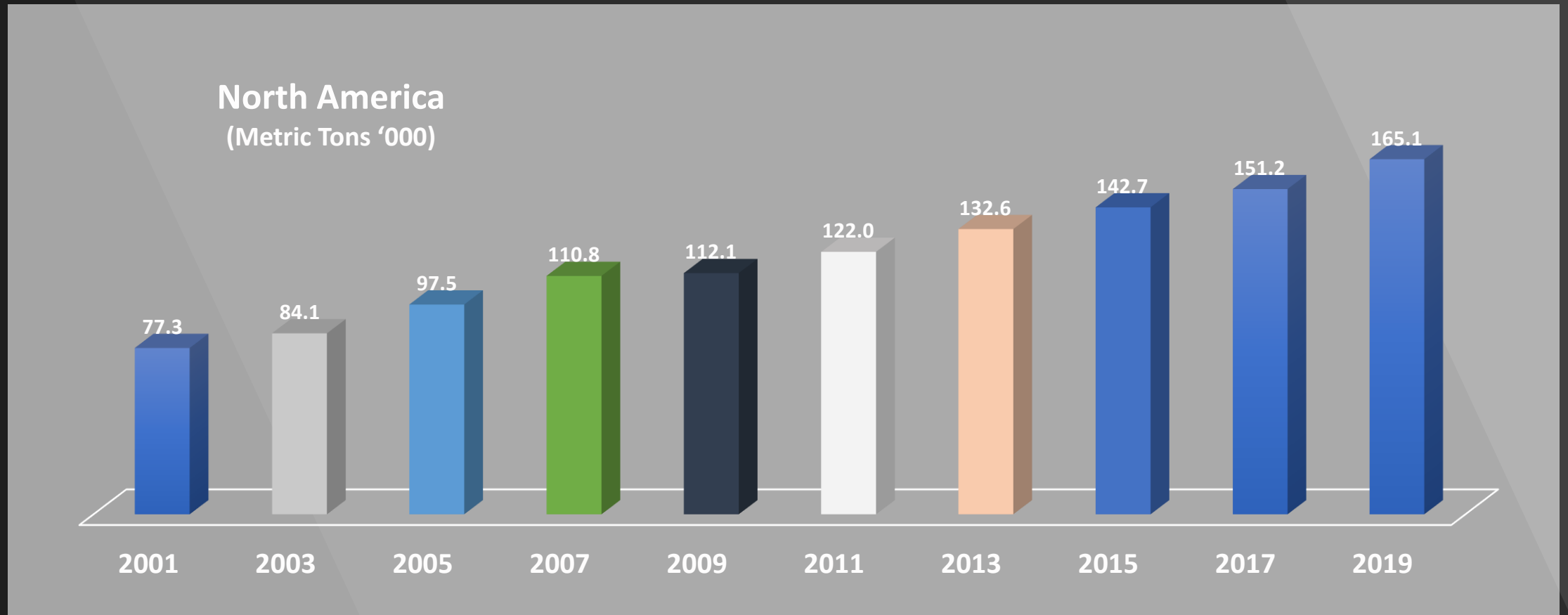
2019 (e)	3.7%
2020 (f)	4.6%
Next 3 year Annual Avg (f)	5.0%

Global Market for UV+EB

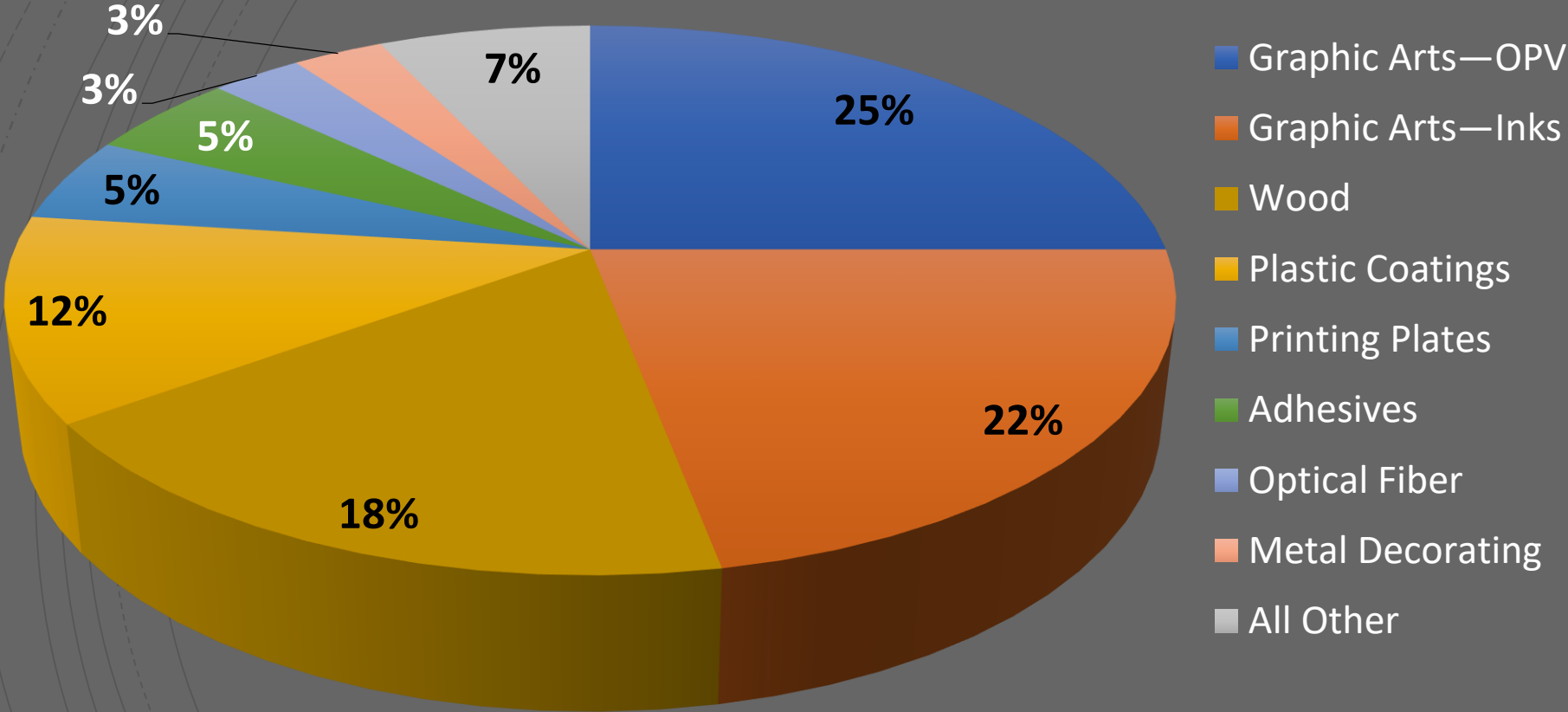
RadTech NA Survey 2020



UV+EB Formulated Product Usage 2019, By Volume

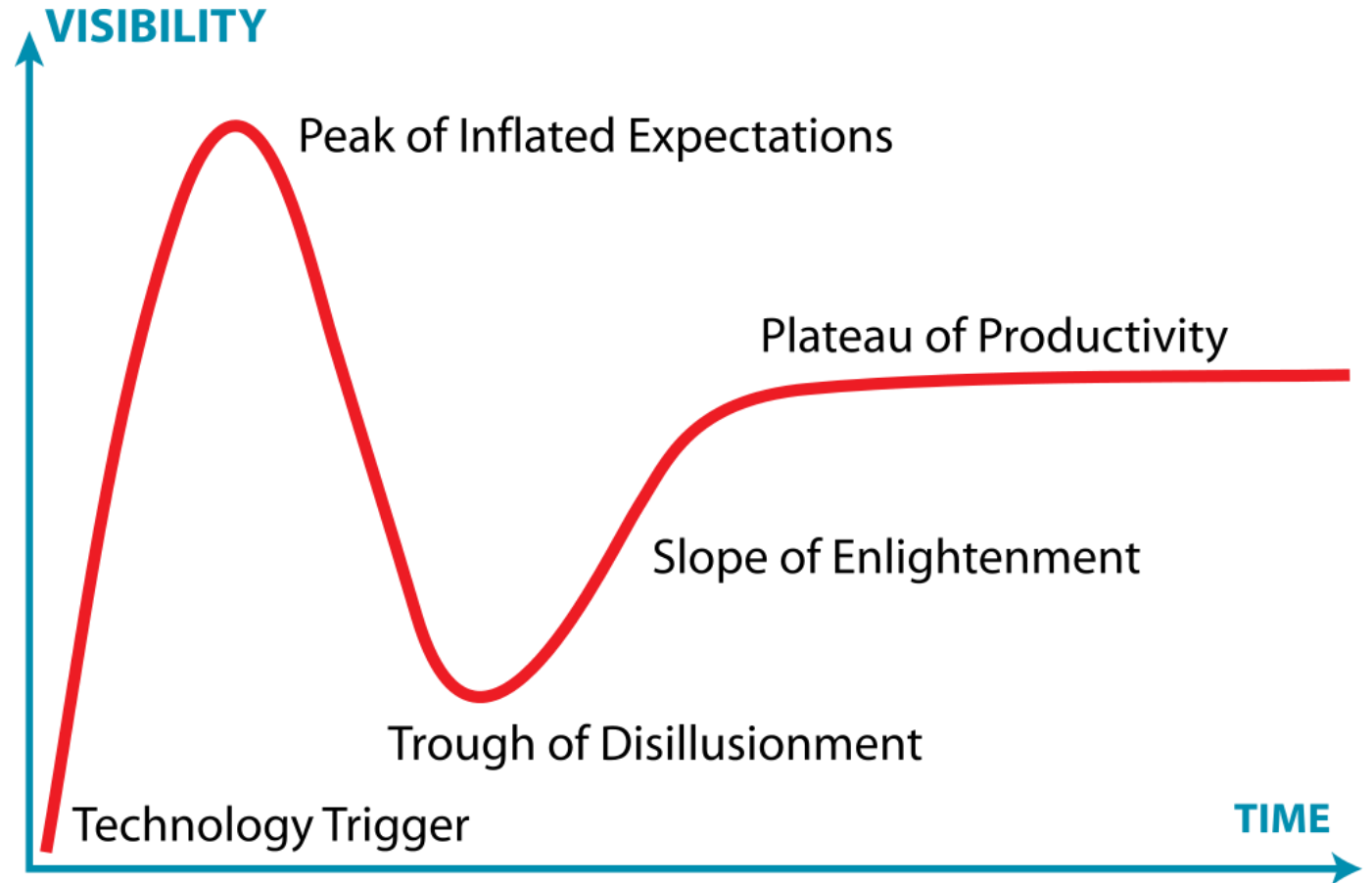


2019 UV+EB Formulated Product Usage by Volume (percent of total)



3D Printing?

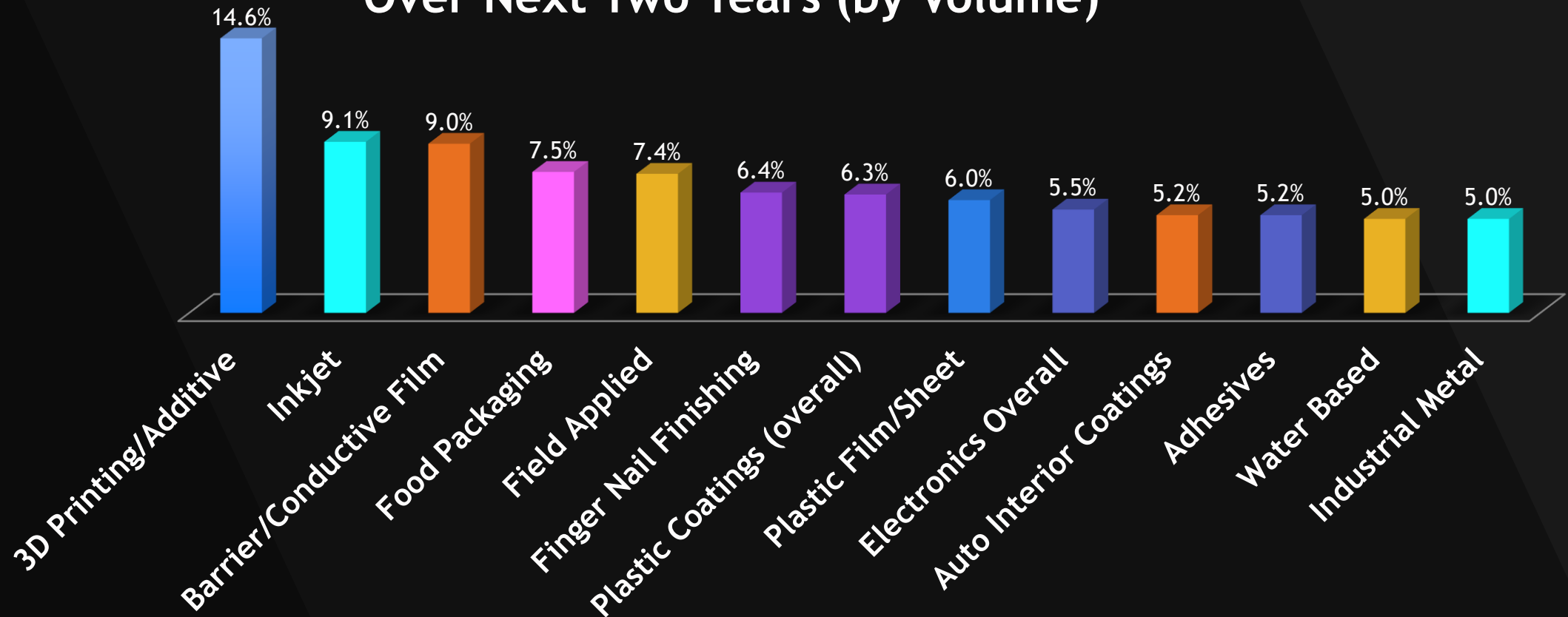
Gartner Hype
Curve



Next 2 Year Forecast

RadTech Biennial Survey 2020

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

Conventional UV	74%
UV LED	15%
Electron Beam	6%
Dual Cure/Hybrid Cure	5%

Motivations for using UV+EB

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

Advances

Most Important
In Last 2 Years

- UV LEDs
- Better UV Technology Overall
- Better Adhesion
- Sustainable Materials

Needs

To Address

- PI for UV LEDs
- Regulations
- Improved weatherability
- Sustainability
- Concerns About migration
- Adhesion



Thank you!
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