Producing Customer-Ready Parts:

Navigating the Leap from Prototyping to Production

Florian J. Künne

fkuenne@postprocess.com

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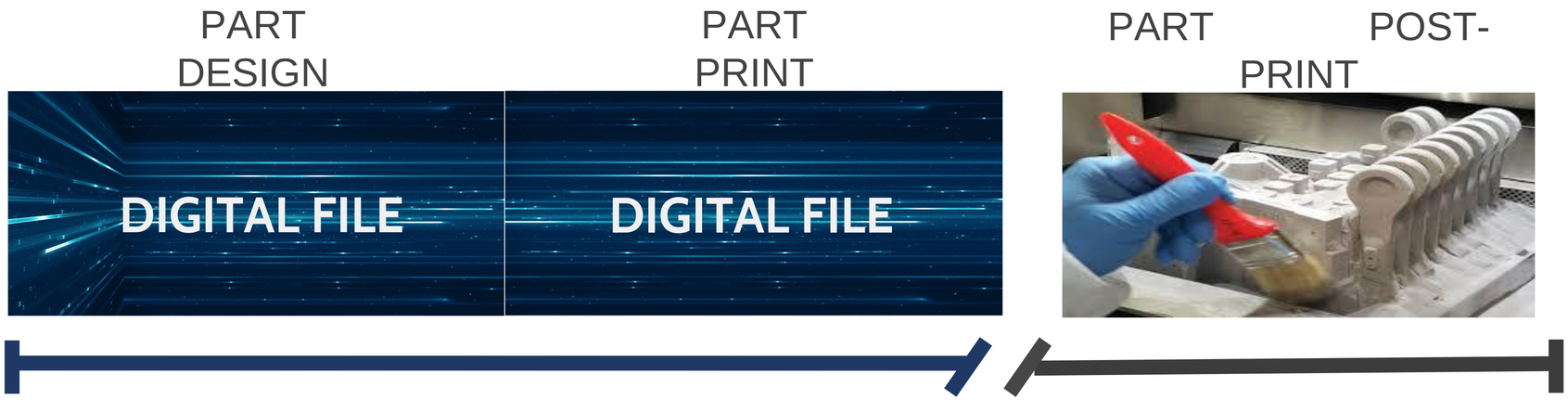
Today's Agenda

- Today's Additive Manufacturing Workflow
- The Leap from Prototyping to Production: Driving Cost & Efficiency Improvements
- Additive's Future: The Digital Thread
- Real life Example: Production Cell

Today’s Additive Workflow

Today's Additive Workflow



Post-printing is often an afterthought; design optimization is usually focused on printing.

A Major Opportunity For Improvement Awaits

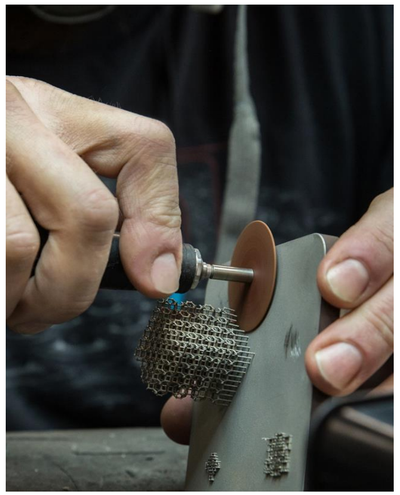
Service providers attribute **26%** of part cost to post-printing*

*SOURCE: 2021 Wohlers Report, Averaged

Today's Workflow Scale-up Problem

Manual Labor And **Traditional Manufacturing** Systems Are In Use.

MANUAL LABOR:
PICKS, SANDING

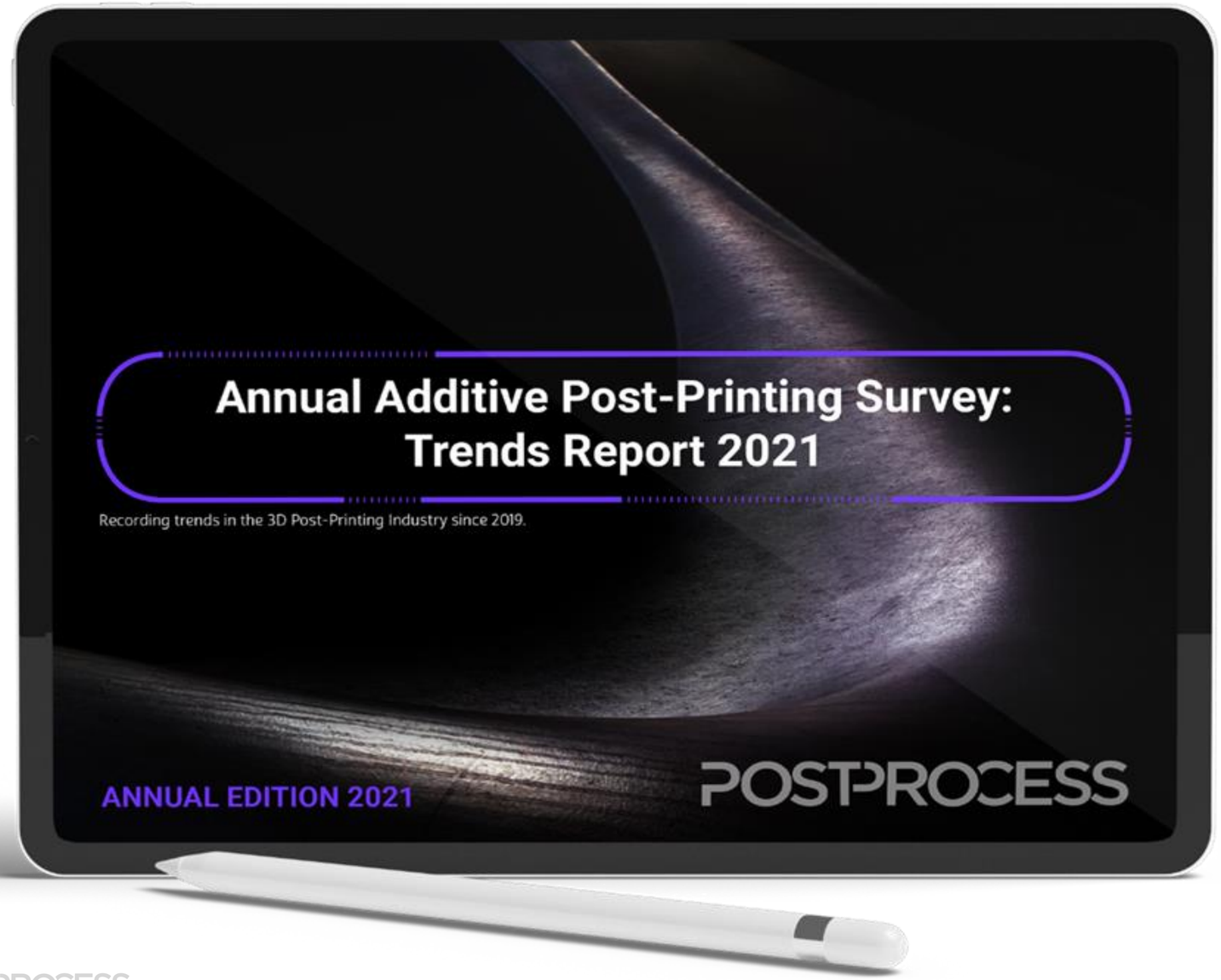


TRADITIONAL MFG:
SPRAYS, TUMBLERS

This Approach Cannot Scale To Maximize Your 3D Printing Investment

- TIME CONSUMING
- INCONSISTENT RESULTS
- HIGH BREAKAGE RATES
- EXPENSIVE
- HSE ISSUES

The 3rd Annual AM Industry Post-Printing Survey

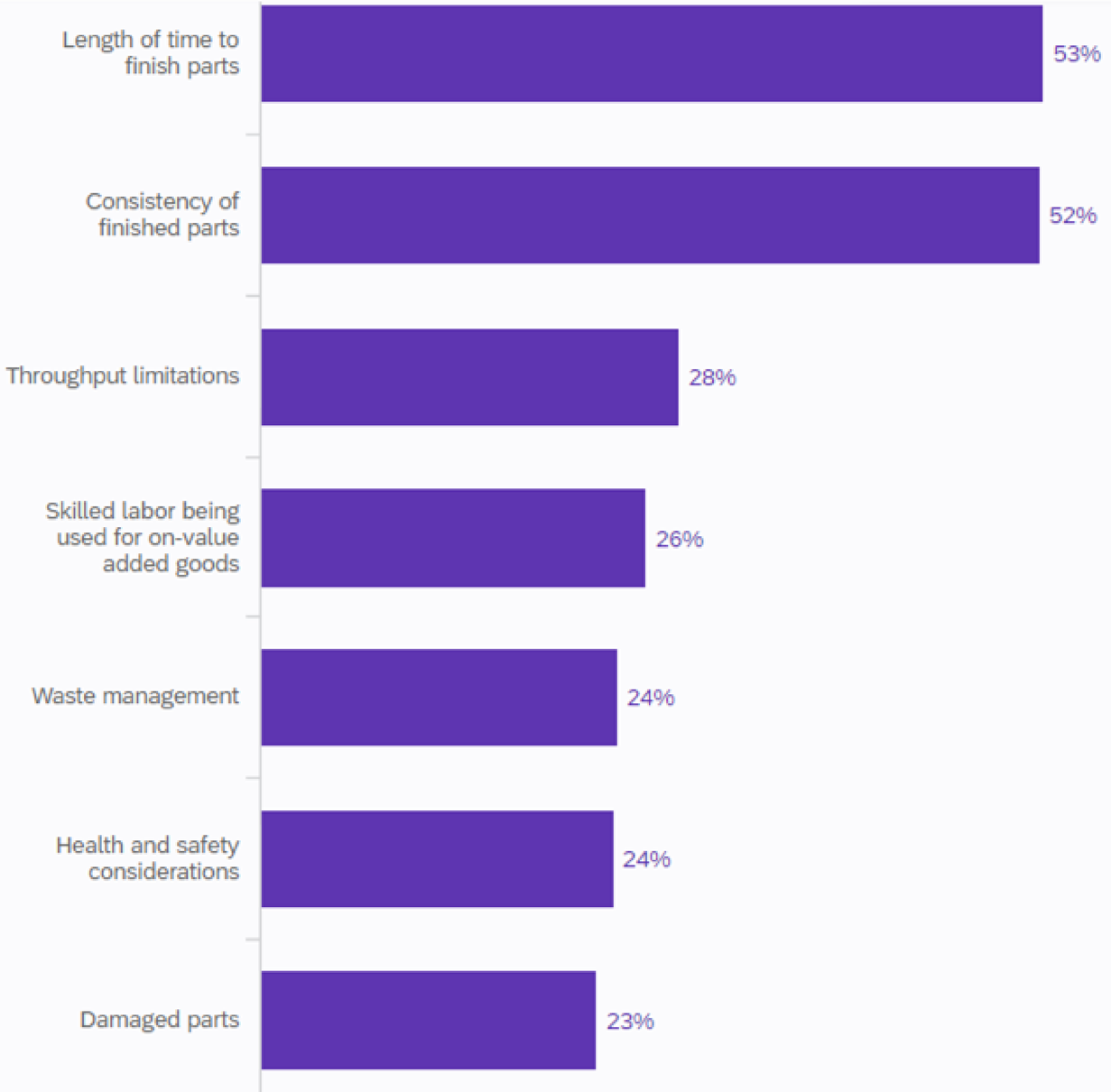


Survey results are currently being tabulated and will be released via a report and webinar on Thursday November 4th.

The following slides contain a preview of key points of the data analysis.

Inhibitors To Workflow Maximization

Annual Additive Post-Printing Trends Survey 2021



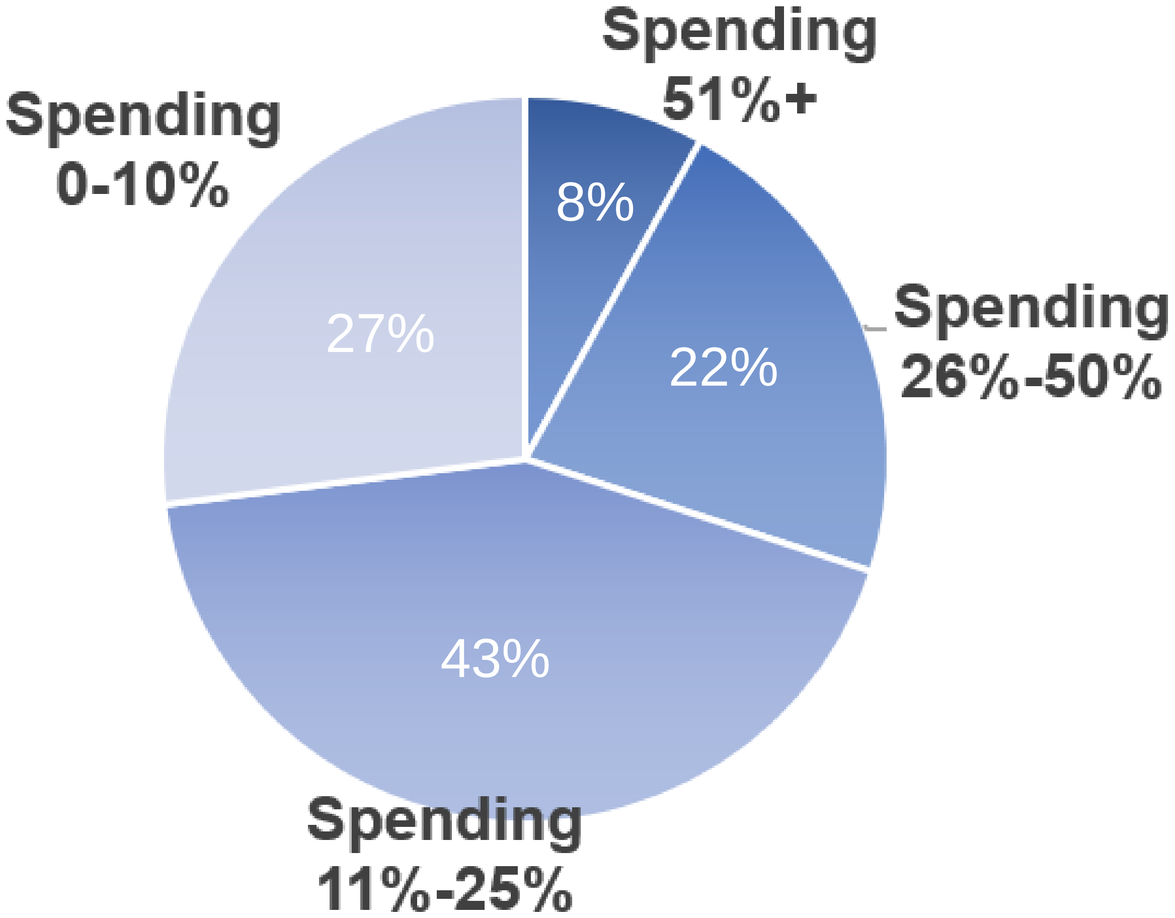
Download the full report at
postprocess.com/trends-report

***Participants were able to pick multiple choices.*

What does post-printing really cost?

Annual Additive Post-Printing Trends Survey 2021

What percentage of your additive operation expenditure is allocated to post-printing?



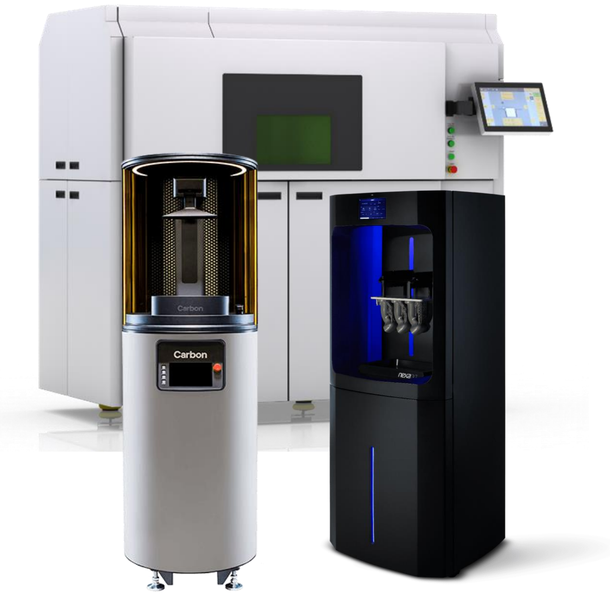
- Close to 20% of respondents don't know what they spend
- Respondents indicated this year a higher amount of their spend is on post-printing vs. last year.
- Directed Energy Deposition (DED) users are spending the most on post-printing as a percent of their overall AM budget vs. any other print technology. Material Extrusion (FDM) are spending the least.

The Leap from Prototyping to Production: Driving Cost, Safety & Efficiency Improvements

Historic Challenges When Making the "Leap"

1

Printer Speeds



2

Material Costs & Properties

Henkel

covestro

3

Post-printing Bottleneck

POSTPROCESS

4

End-to-End Connectivity

5

C-Level Support

5 Often Overlooked Production Post-Printing Costs

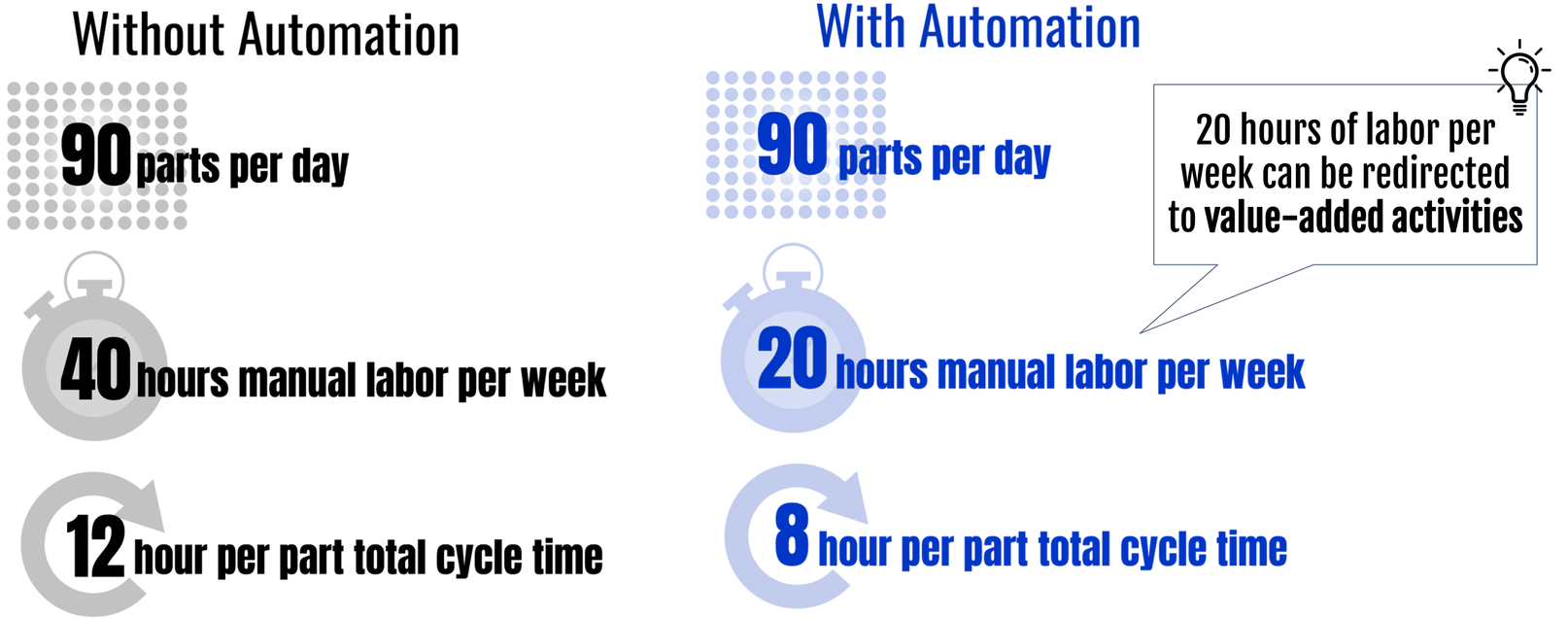
1. Health, safety and environmental impact
2. Reprints due to lack of post-print planning
3. Floor space, storage and material handling
4. Resources to train & maintain multiple processes & platforms
5. Opportunity cost of using manual labor

CASE STUDY

> “Our PostProcess software-based platform reduces labor time by 50%... freeing up 20 valuable labor hours per week.”

PROTOLABS
Manufacturing. Accelerated.

- A typical day of support removal for 90 **PolyJet** parts would require about **8 hours** of manual labor plus **4 hours** of soaking
- In one week, that’s **40 hours of labor** required to finish parts one by one



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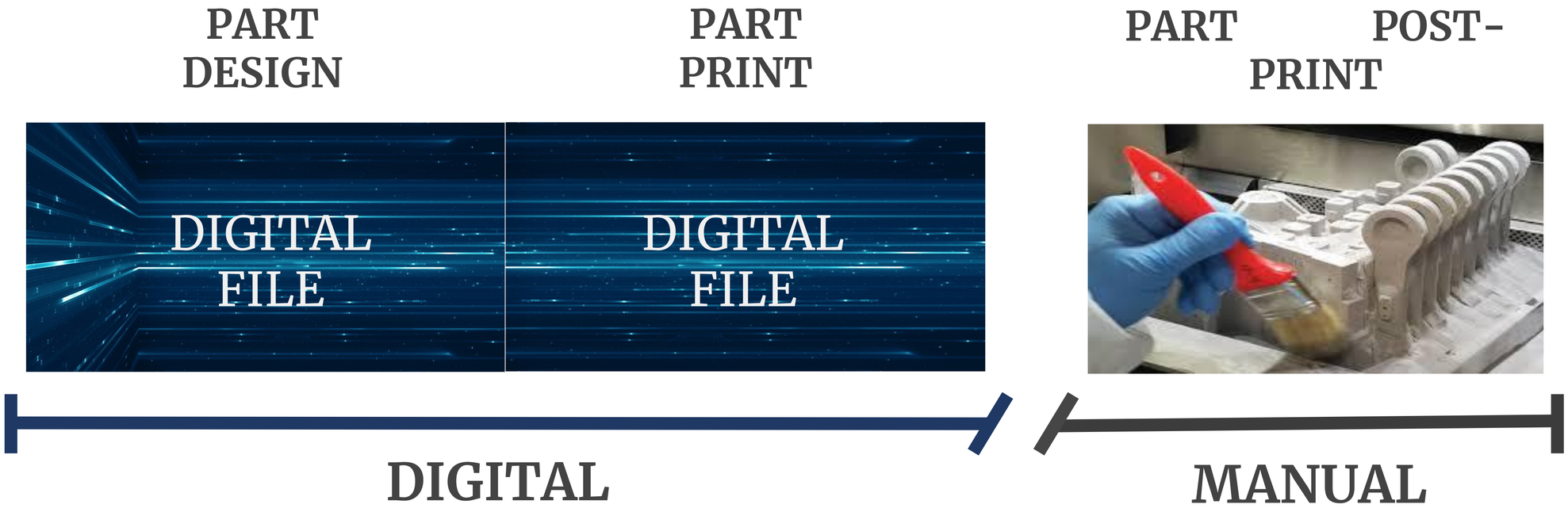
ADDITIVE'S FUTURE: THE DIGITAL THREAD

Production Problem For Industry 4.0



Breaking The Digital Thread Limits Or Prevents

- Scalability
- Traceability
- Digital Inventory
- Sustainability

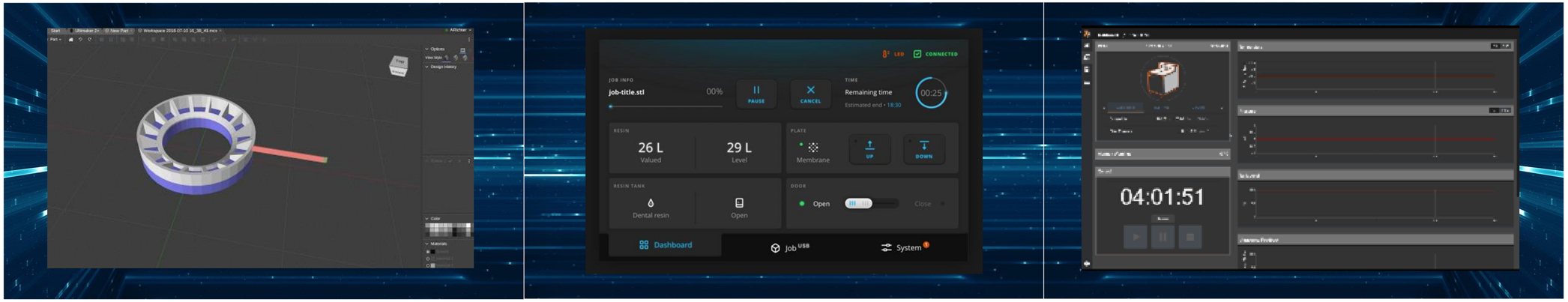
Production Solution For Industry 4.0

Connecting Data Across Smart Systems Will Be Transformative For Additive Manufacturing

PART DESIGN

PART PRINT

PART POST-PRINT



End-to-End Automation

Closed-Loop Intelligence

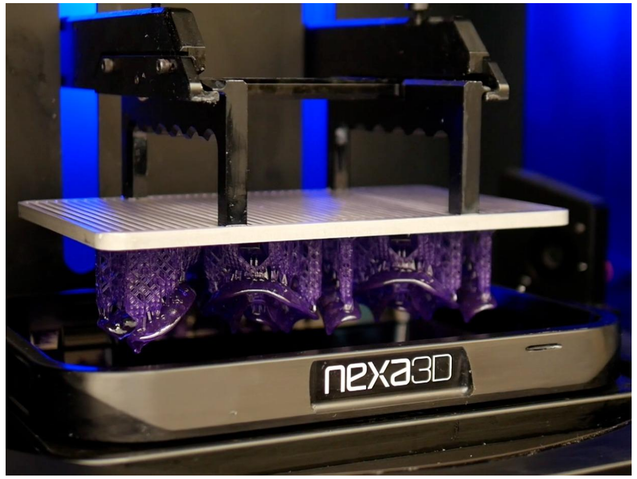
ADDITIVE AUTOMATION APPLICATION: PRODUCTION TO GO

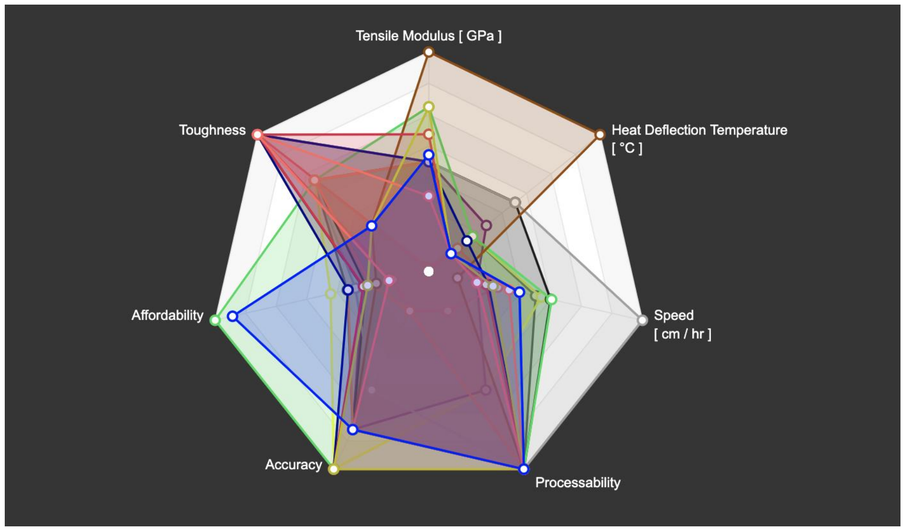
Additive Automation

Production to go

When to automate?

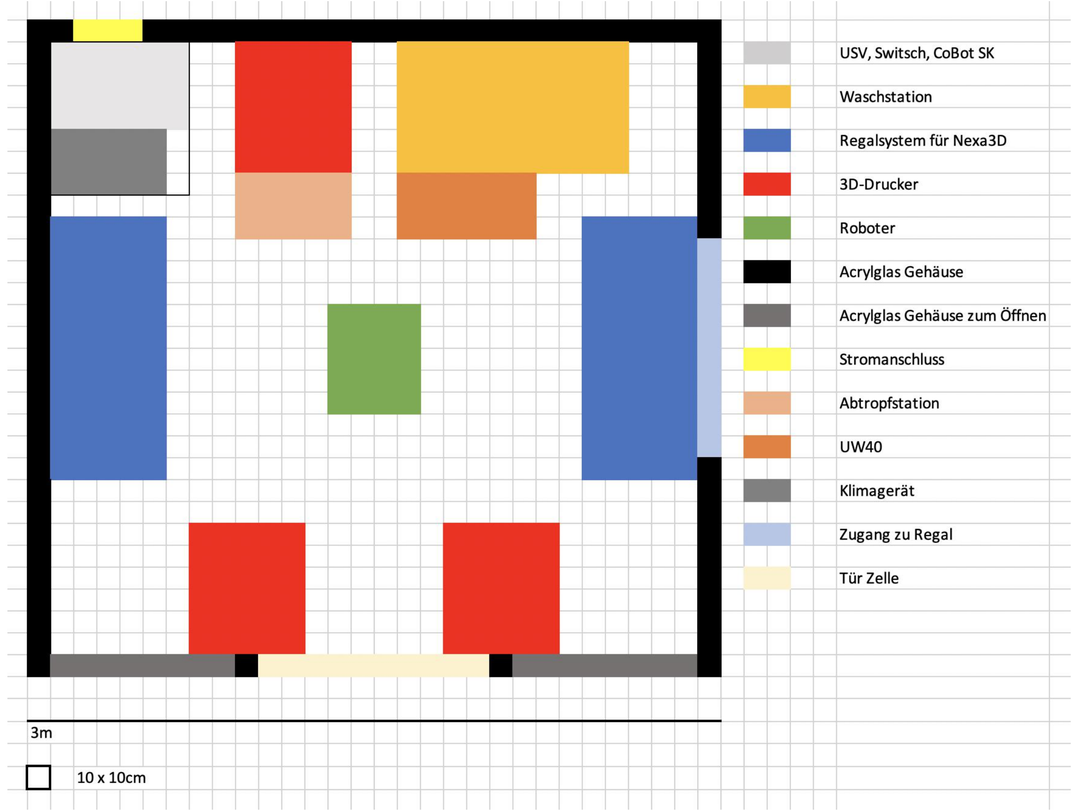
- High Number of Parts
- Complex Parts
- Small Parts
- Parts with Little Support
- Different Variants / Custom Parts
- Health & Safety Requirements
- Automatic Serialnumbering
- Parts from Different Buildmaterials





Production to go

Production Cell

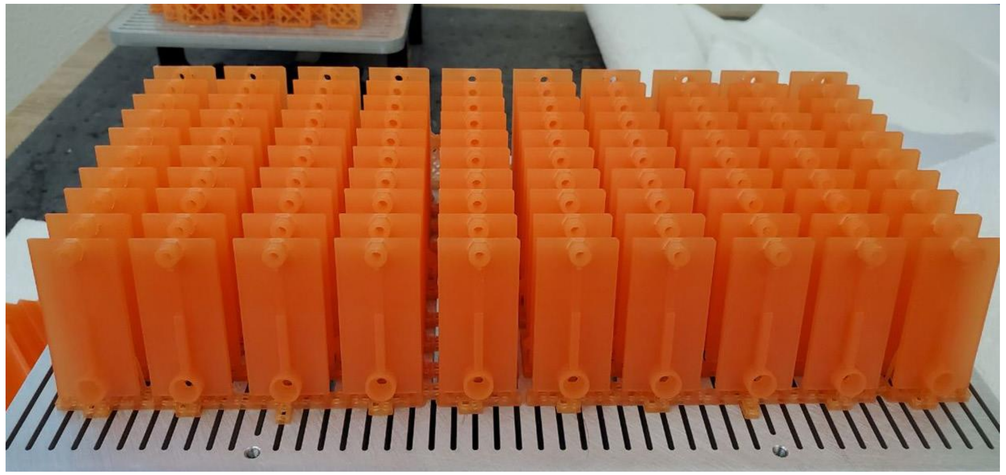


- Automation as a Service
- Flexible Layout
- Individual Configuration
- Any 3D-Printer
- Customizable
- Safe and Repeatable
- More Parts with Less Effort

Production to go

HAUX-LIFE-SUPPORT GMBH

www.hauxlifesupport.de



100 Parts in 22 Minutes

- Theoretical number of parts per year: 1.200.000
- Printjobs per year: 12.000
- Demi400 Cleaning Cycles per year: 24.000 at 2 x cleaning

Production to go

Example Application Dental

10 Parts in 12 Minutes

- Theoretical number of parts per year: 192.000
- Printjobs per year: 19.200
- Demi400 Cleaning Cycles per year: 19.200

Production to go

More Information

ProductionToGo GmbH
Maximilian Neck
+49 7248 911 771
info@Production-To-Go.com

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See you at Formnext

Hall 12.1

Thank you!

Florian J. Künne
fkuenne@postprocess.com

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