




Additive Manufacturing at BASF Chances and Perspectives

Munich Technology Conference on Additive Manufacturing

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 **BASF**
We create chemistry

Classical BASF's segments are very relevant for 3D-P



Oil & Gas

Oil & Gas



Chemicals

Petrochemicals
Monomers
Intermediates



Performance Products

Dispersions & Pigments
Care Chemicals
Nutrition & Health
Performance Chemicals



Functional Materials & Solutions

Catalysts
Construction Chemicals
Coatings
Performance Materials



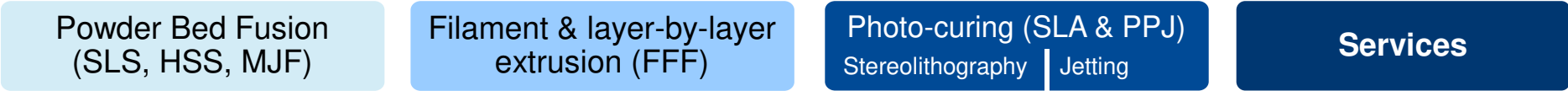
Agricultural Solutions

Crop Protection

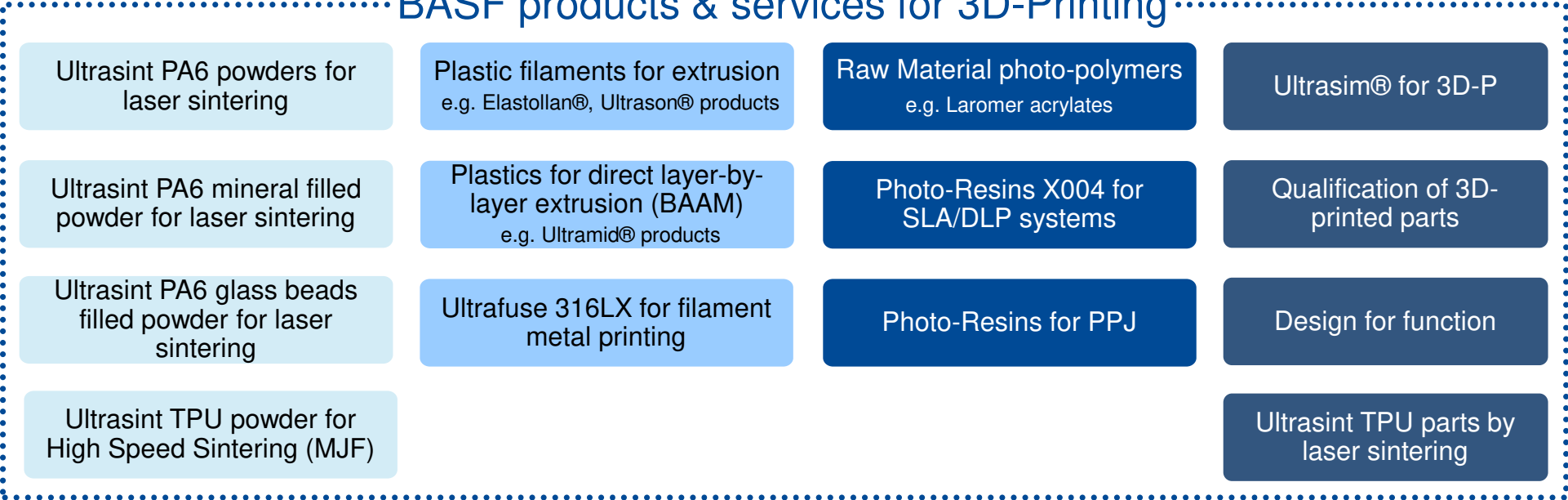
Materials for 3D-Printing in BASF portfolio

- Metals and ceramic powders
- Catamold
- Acrylates
- Solvents
- Resins
- Photo-reactive chemicals
- Dispersants
- Dyes & pigments
- Stabilizers
- Plastics
- UV-curing formulations
- Coatings

Portfolio of products for all main 3D-P technologies complemented with offering high quality services



BASF products & services for 3D-Printing



BAAM: Big Area Additive Manufacturing; DLP: Digital Light Processing

AM positioning in BASF

Functional parts, materials & solutions

BASF Engineering & Maintenance



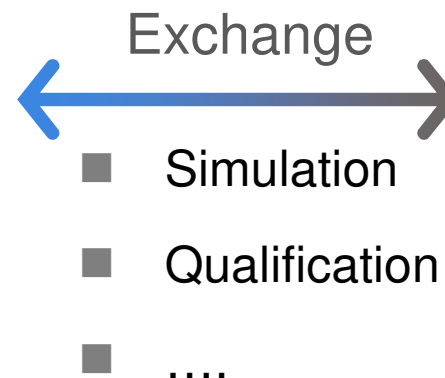
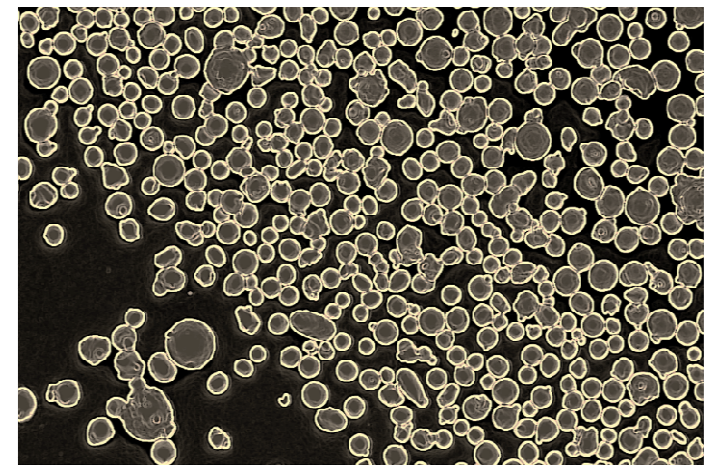
Parts for internal use



BASF 3-D Printing Solutions GmbH



... for industrial applications



Functional parts, materials & solutions

BASF Engineering & Maintenance



Parts for internal use

Internal solutions

- Enabler for chemical production
- Mass customization
- Spare part management

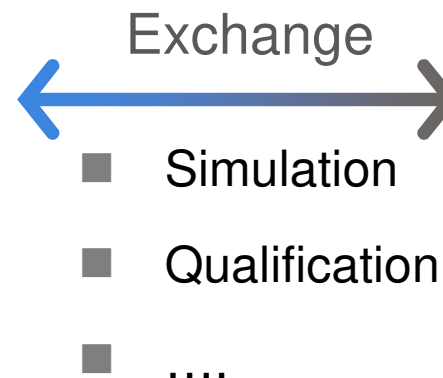
BASF 3-D Printing Solutions GmbH



... for industrial applications

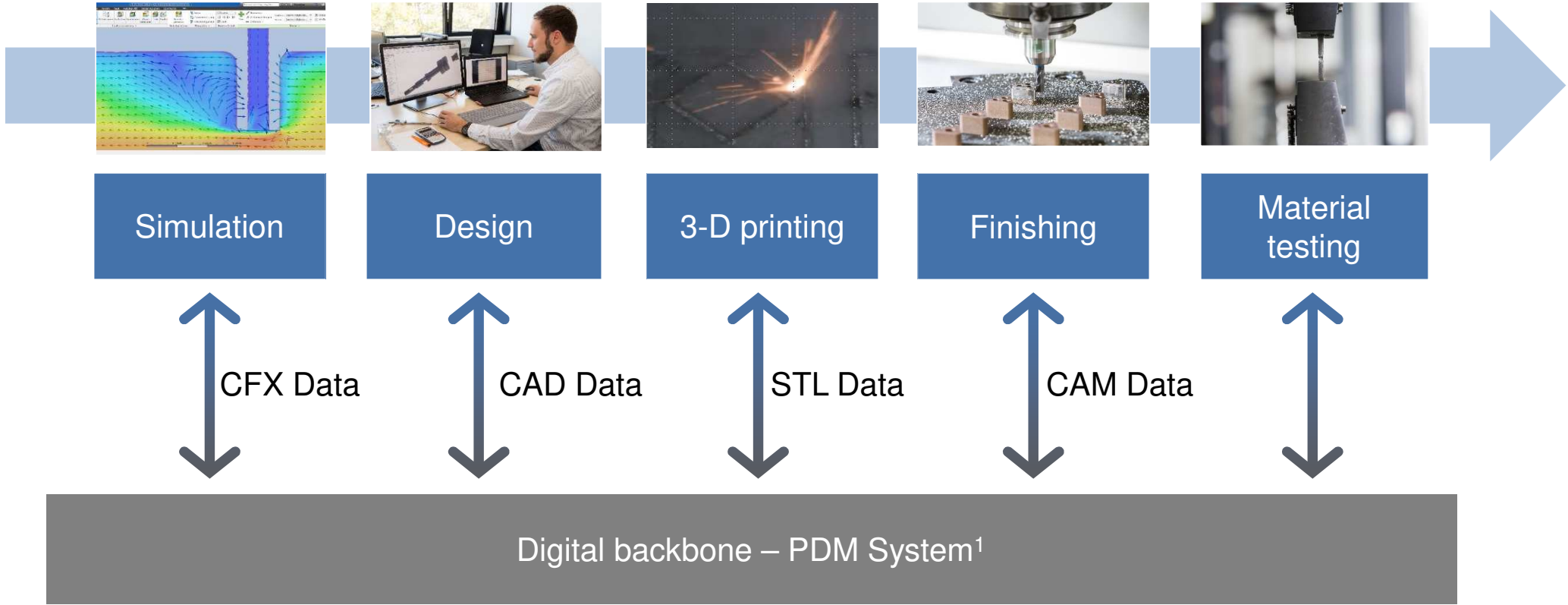
External customer

- AM materials
- Tailored AM solutions

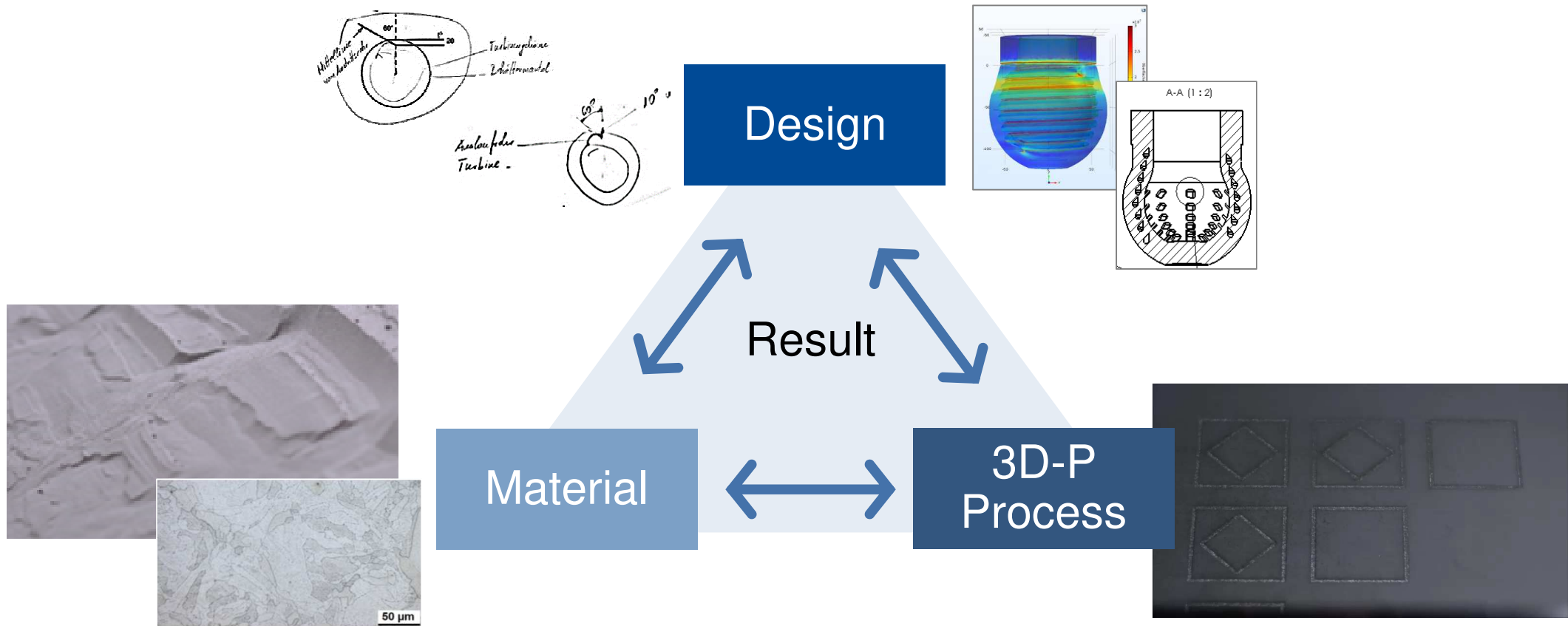


Digitalization

Smart manufacturing: Additive Manufacturing workflow

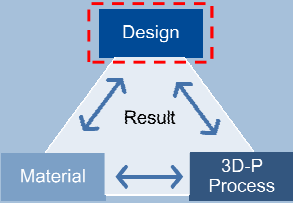


¹PDM = Product Data Management

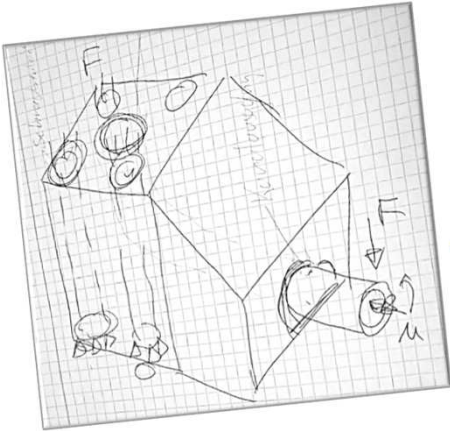


Design for AM

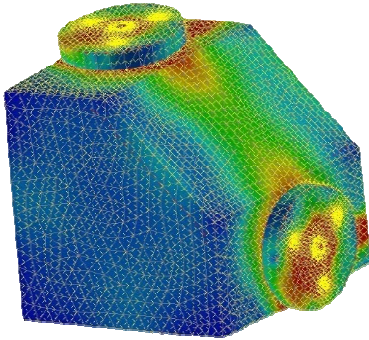
Case study high pressure heat exchanger



Idea and design



Simulation of heat transfer



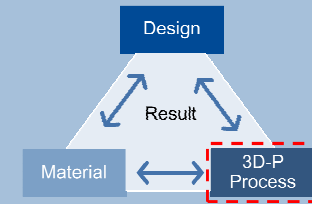
Topology optimization



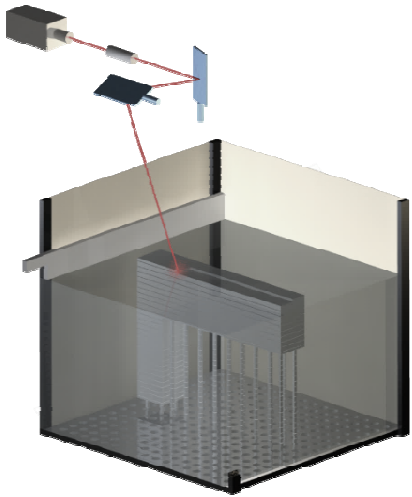
AM heat exchanger



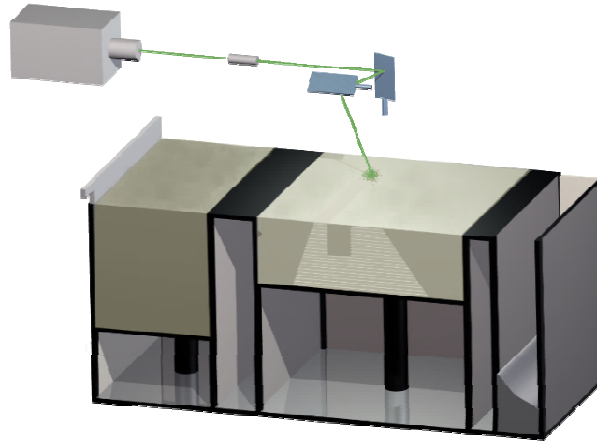
AM technologies



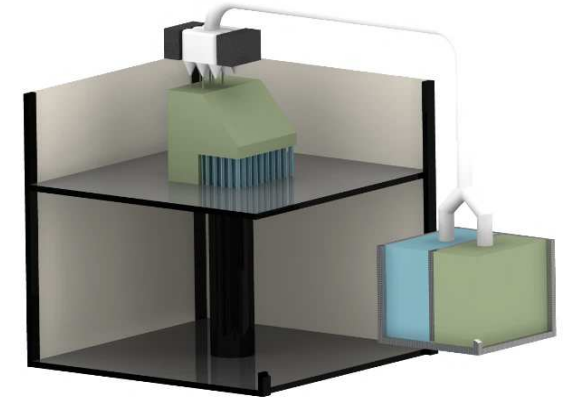
Stereolithography



Selective Laser Melting



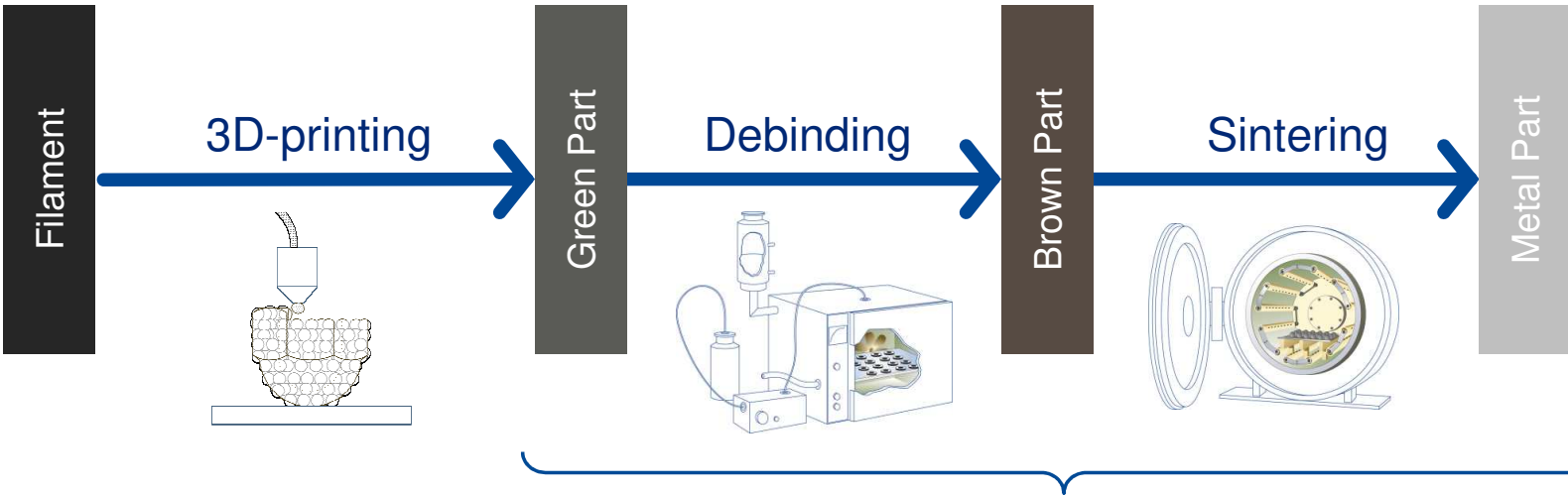
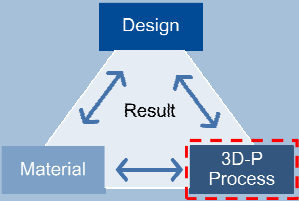
Fused Layer Modeling



Metal filament

BASF innovation - Ultrafuse 316LX

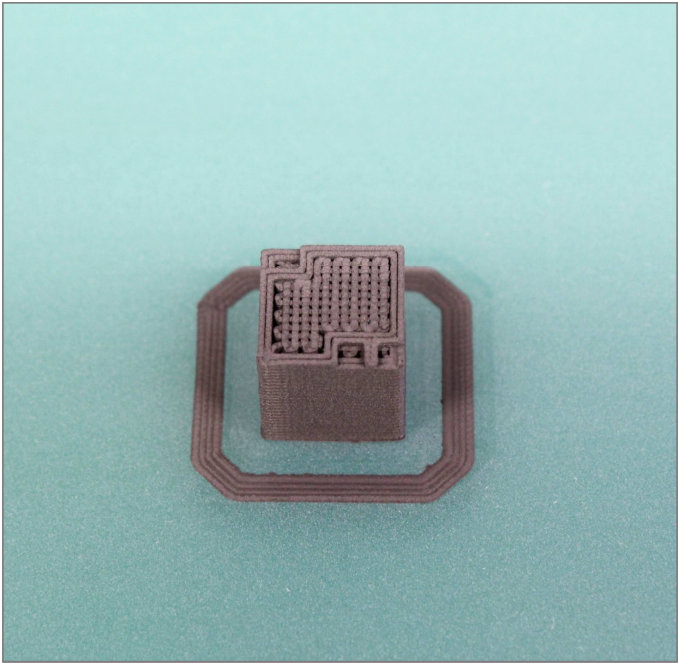
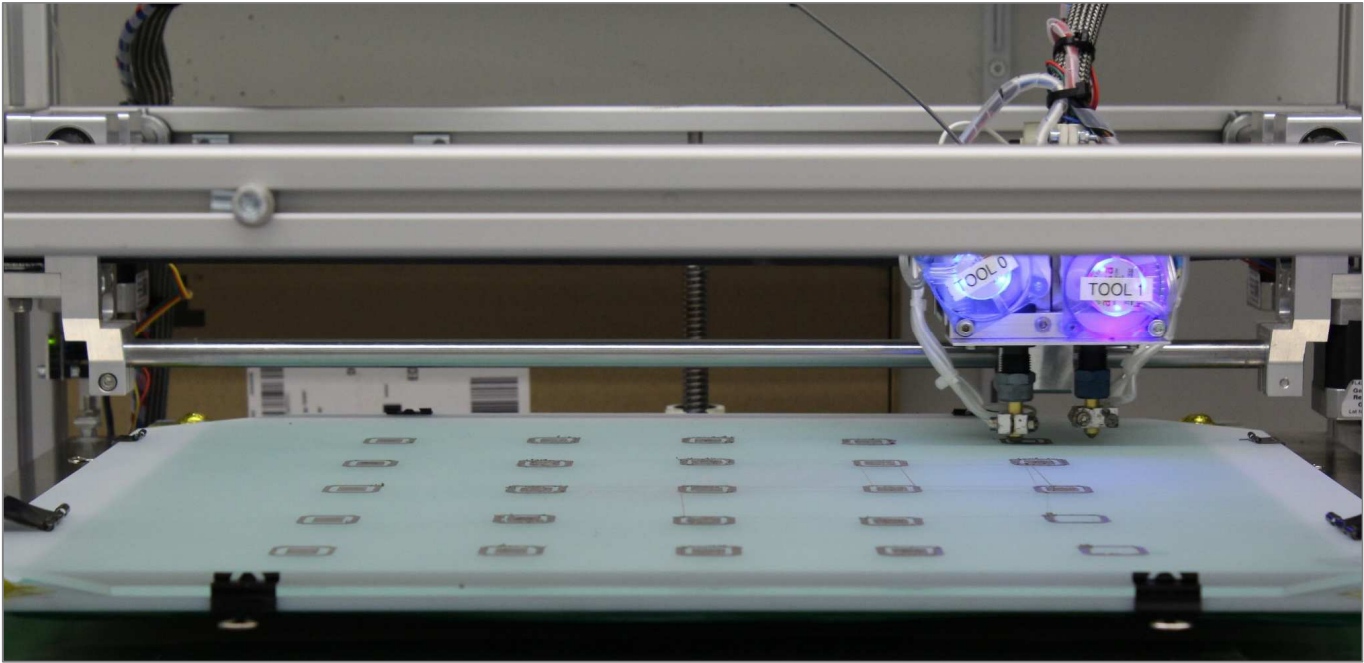
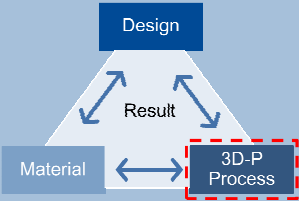
Metal composite filament for 3D - printed metal part



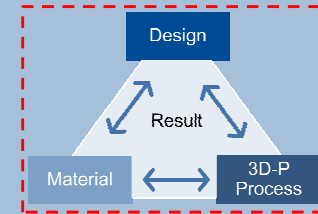
Industrial-standard process of metal injection molding technology

Metal filament 316LX

Services and solutions



Optimization of components for process engineering – static mixer



Conventional



Static mixing

- Heat exchange difficult
- Fouling in tubes
- Moderate process efficiency

→
Chemical process

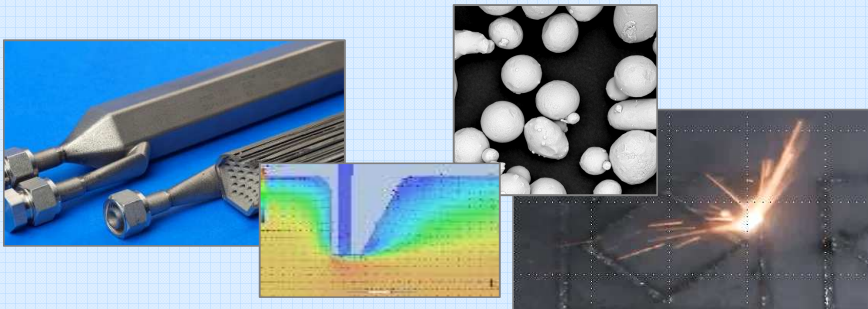
- Heat transfer
- Mixing conditions
- Form follows function
- Monolithic printing of part

AM optimization



Summary: Functional parts, materials & solutions

BASF internal solutions



Transfer 

External customer

□ ■ BASF

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