

# MoldJet – Die Technologiepopularisierung des Metall-3D-Drucks

von

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# Transform your digital file into a physical part

Together, we bring your idea to reality. There is no such thing as impossible for our application engineering team. Reach out and we'll get back to you within 24 hours.

[Get started](#)

AM World in 2024:

Image rights: AMEXCI AB

# IMTS Chicago 2024



# Reality 2024



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# Tritone<sup>®</sup> Dominant AM system

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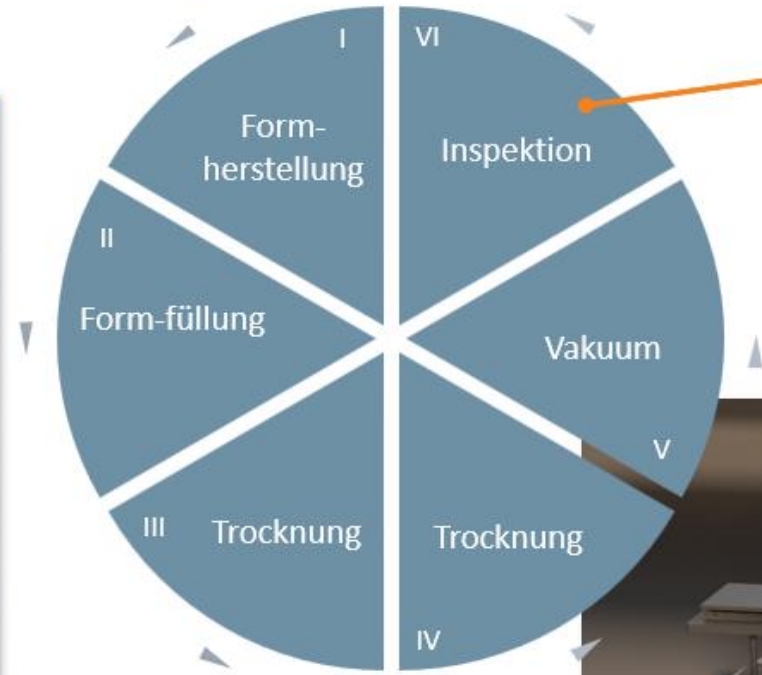
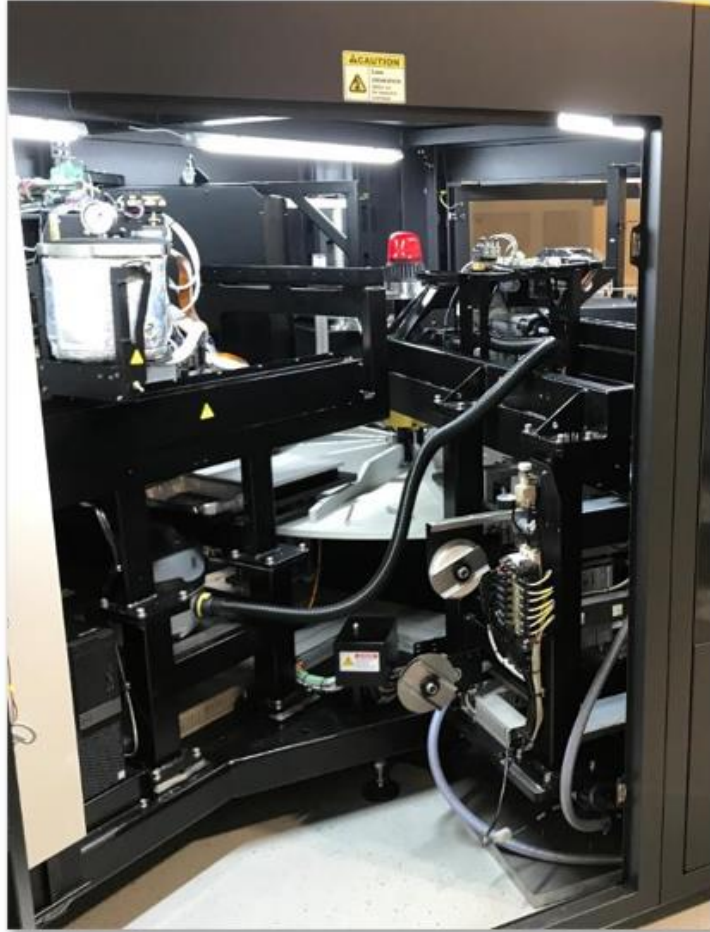
## System specifications

- Printing System: Tritone<sup>®</sup> DOMINANT industrial additive manufacturing machine
- Technology: MoldJet<sup>®</sup> – digital mold fabrication
- Build volume: 400 x 240 x 120 mm (L x W x H) over 6 trays
- Throughput: Up to 1,600 cc/h
- Density: Up to 99%
- Nominal layer thickness: Versatile 50 – 100  $\mu\text{m}$
- Support material: Tritone Mold proprietary material
- Number of trays: 6, simultaneous and independent
- Machine footprint: 3200 x 2200 x 1900 mm (L x W x H)
- Weight: 2,300 kg

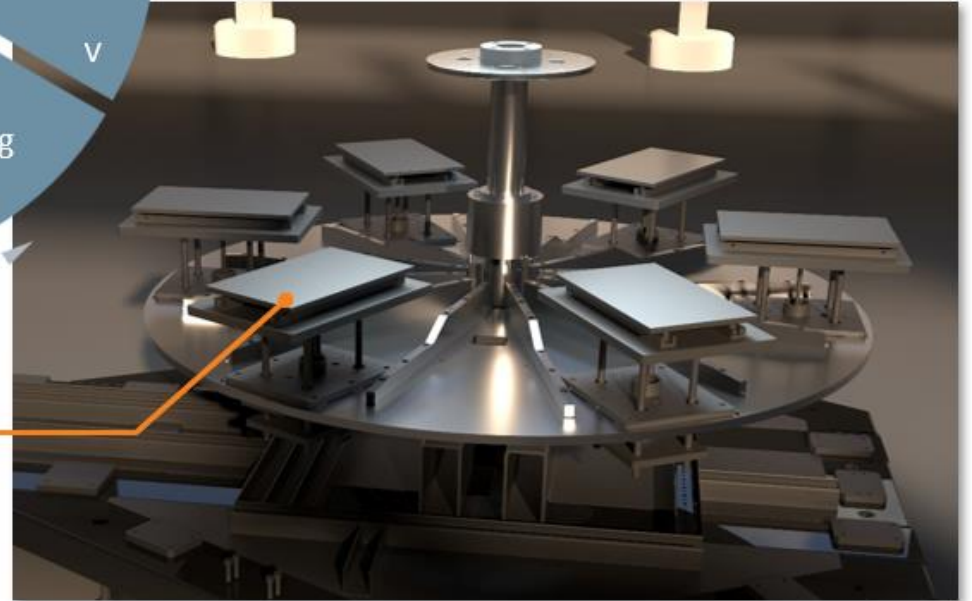


# Tritone DOMINANT

## Anlagenkonzept



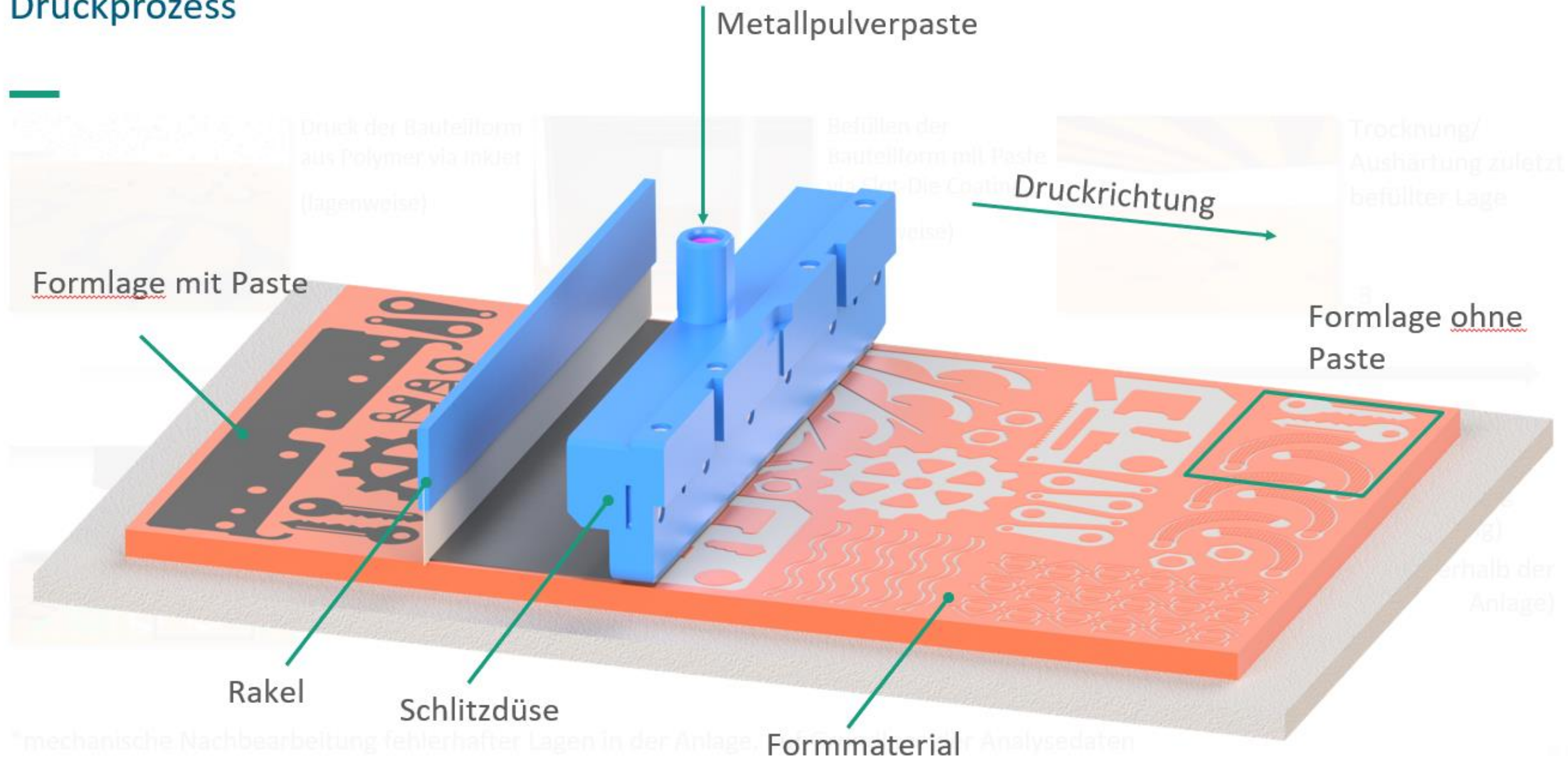
Arbeitsstation



Tray

© Tritone

# Druckprozess



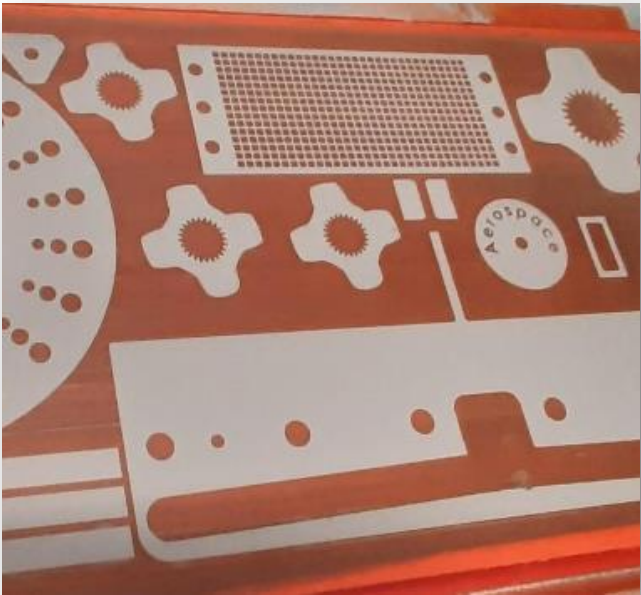
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# MoldJet® Process Images

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**Printed Cavities**



**Paste Filled Cavities**



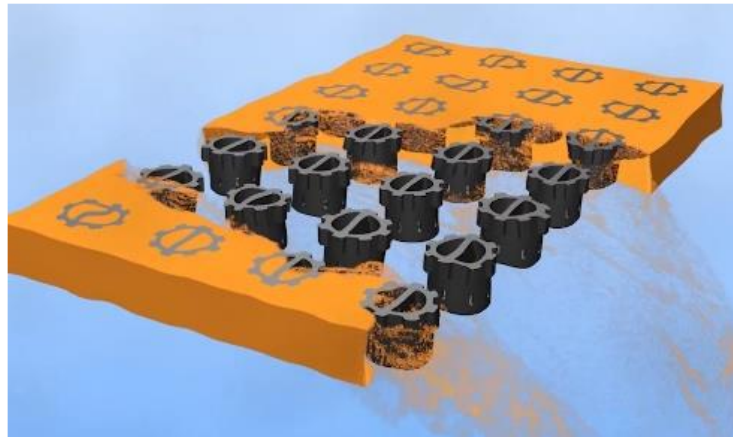
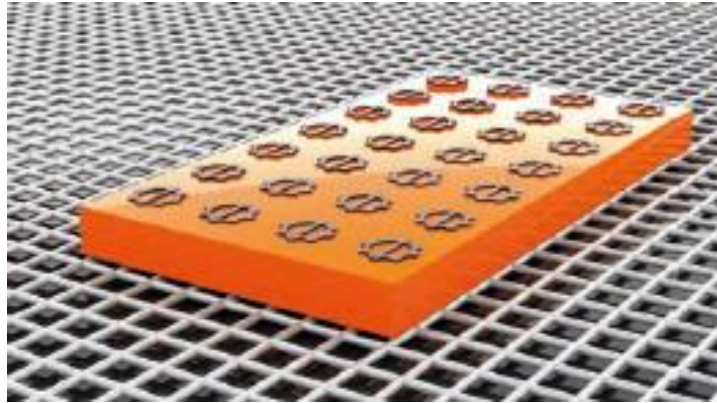
No need to "dig out" components



**Completed Build Tray**



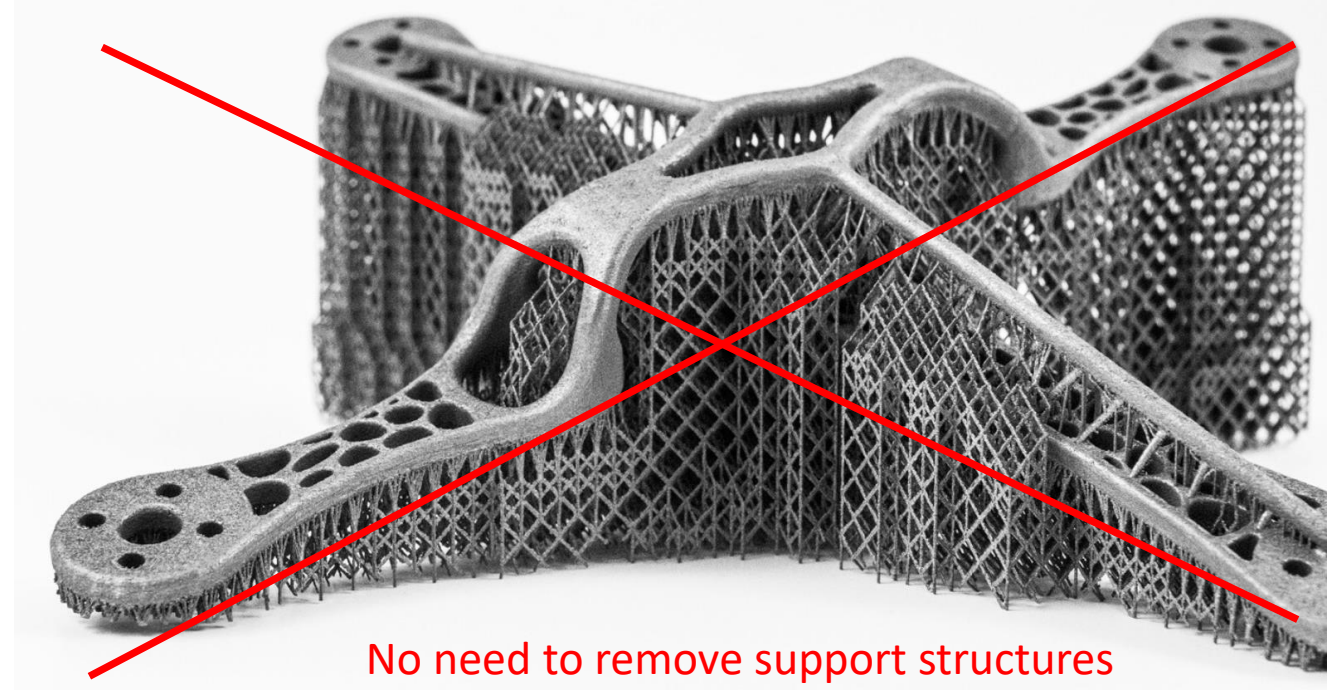
# MoldJet® Demolding



Step 1 – Bulk mold material is melted.



Mold removal is a  
Hands Free Process



No need to remove support structures

Image rights: Materialise



Step 2 – Remaining mold material is dissolved

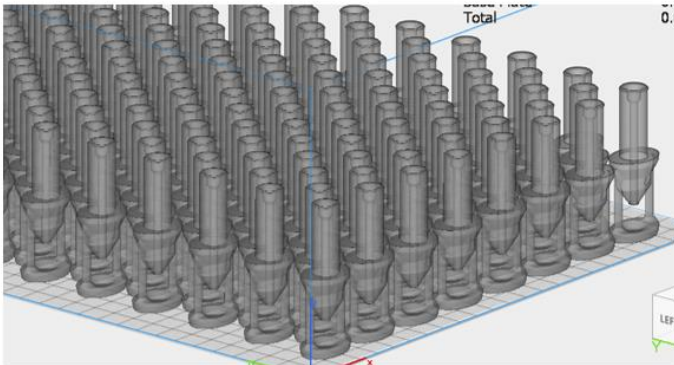
# Kosten-Vergleich

eine Wasserdüse in 316L,  
l: 56mm, b: 22mm

## Cost per-piece

- Productivity:

- Material: 316L
- Batch size: 195\*6 = 1,170 pcs
- Batch (print) time: 31 hours
- Average time per piece: 01m:36s
- Cost per piece (as-sintered): 6-7€



Beispielbild



Kosten bisher in LPBF,  
selbes Bauteil

Batch-Size LPBF	202 units
Production Time	44 hours
Cost per part:	24 €

# Data published by our customer (Fraunhofer Institute - Dresden)

Part properties in green and sintered state

Green		
Powder load paste	60 - 63	[Vol.%]
Relative density	60	[%]
Green part strength	20	[MPa]
Minimum wall thickness	200	[ $\mu\text{m}$ ]
Print tolerance range	150 - 300	[ $\mu\text{m}$ ]
Sintered		
Relative Density	> 99 - 95	[%]
Shrinkage	12 - 15	[%]
Surface quality	Ra 1.5 – 3.5 Rz 7 - 15	[ $\mu\text{m}$ ]



- No printed component layers visible after sintering

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# MoldJet Process Repeatability - A

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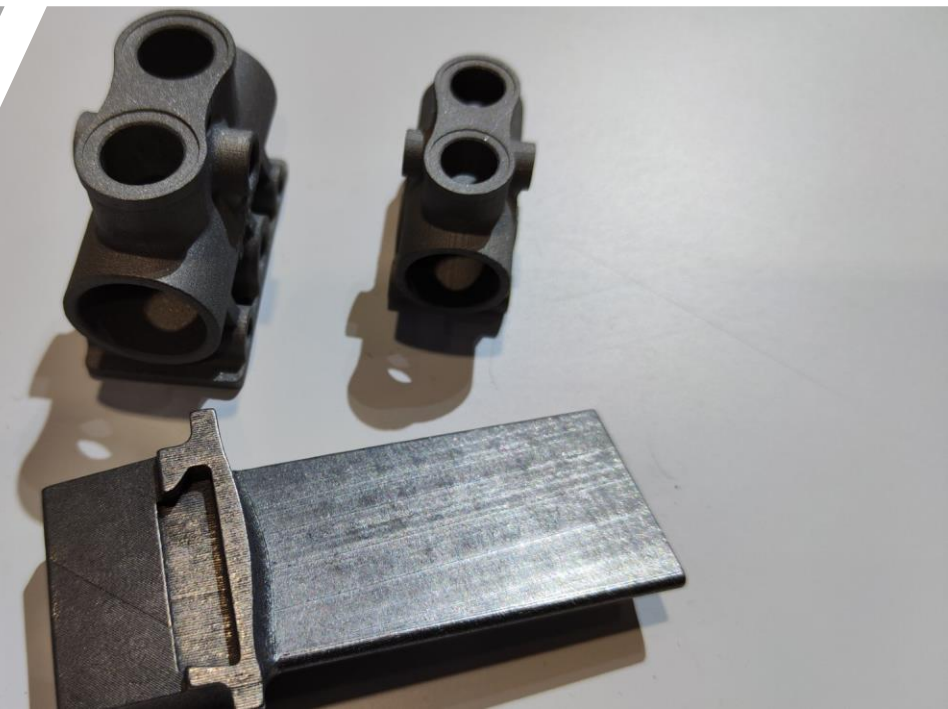
- 3<sup>rd</sup> Party Data
- MoldJet parts compared to known reference data
  - MIM
  - 2 binder jet platforms

Nominal 1.023cm

Nominal .403"	MoldJet					
	MIM	BJ A	BJ B	Total	Shipment 1	Shipment 2
Average	0.4026	0.4093	0.4172	0.4058	0.4056	0.4059
Std. Dev.	0.0007	0.002	0.0027	0.001	0.001	0.0009
CoV	0.17%	0.50%	0.65%	0.24%	0.25%	0.23%

Nominal 4.434cm

Nominal 1.748"	MoldJet					
	MIM	BJ A	BJ B	Total	Shipment 1	Shipment 2
Average	1.7697	1.7435	1.8078	1.7714	1.7711	1.7719
Std. Dev.	0.0013	0.0047	0.0041	0.002	0.0017	0.0023
CoV	0.07%	0.27%	0.23%	0.11%	0.09%	0.13%



# Materials – List and Status Q2-23

Family	Type	Status	Applications examples
Stainless Steel	316L	Released	Food, Medical, Consumer goods, marine
	17-4PH	Released	Automotive, Chemical processing, Jigs & Fixtures
	15-5PH	Released	Aerospace
Tool Steel	420	Beta	Medical
	H13	Released	Tooling, Injection molds
Low Alloy Steel	M2	Released	Tooling
	4340	Released	Gears, Automotive
Super Alloys	4140	Beta	Gears, Automotive
	Inconel718	Beta	Corrosion resistance, High temp fixtures
Titanium	6-4	Beta	Aerospace, Medical, Consumer goods
Copper based	Pure Copper	Beta	Electronics, Automotive
Ceramic	Alumina	Beta	

System is material-open and processes both metal and ceramic

# #PrinterTalk: Alles rund ums MoldJet.

#1 PrinterTalk mit Robert & Niklas am Fraunhofer IFAM Dresden

#2 MoldJet in der Theorie

#3 Baujobvorbereitung im MoldJet

#4 So einfach ist die Verarbeitung einer Paste

#5 Sonderwünsche? Pastenentwicklung am Fraunhofer IFAM Dresden

#6 Auf an die Maschine! – Formherstellung

#7 Auf an die Maschine! – Formfüllung, Trocknung

#8 Auf an die Maschine! – Automatisierte Inspektion und Lagenkorrektur

#9 Zeit zu Drucken – Ein Tag an der Maschine

#10 Der Druck ist nur die halbe Miete – Bauteilentformung

#11 Der Druck ist nur die halbe Miete – Wärmebehandlung

#12 Auch die inneren Werte zählen! – Analysemöglichkeiten

#13 Grenzen aufzeigen – Bauteilspektrum

#14 Was darf's denn kosten?

#15 Wir beantworten Eure Fragen!

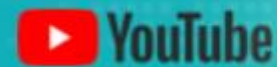


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