Desktop Metal

At Desktop Metal, our mission is to make 3D printing accessible for all engineers, designers and manufacturers.

Desktop Metal

2015 –

Founded by leaders in advanced manufacturing, metallurgy, and robotics, the company set out to address the unmet challenges of speed, cost, and quality to make 3D printing indispensable for engineers and manufacturers around the world.

Since its inception, the company has raised $438 million in financing and shipped two revolutionary 3D printing technologies

NEA BMW KPCB Google Ford

Studio System™

The world’s first office-friendly metal 3D printing system.

Production System™

The world’s fastest metal 3D printer.

Desktop Metal

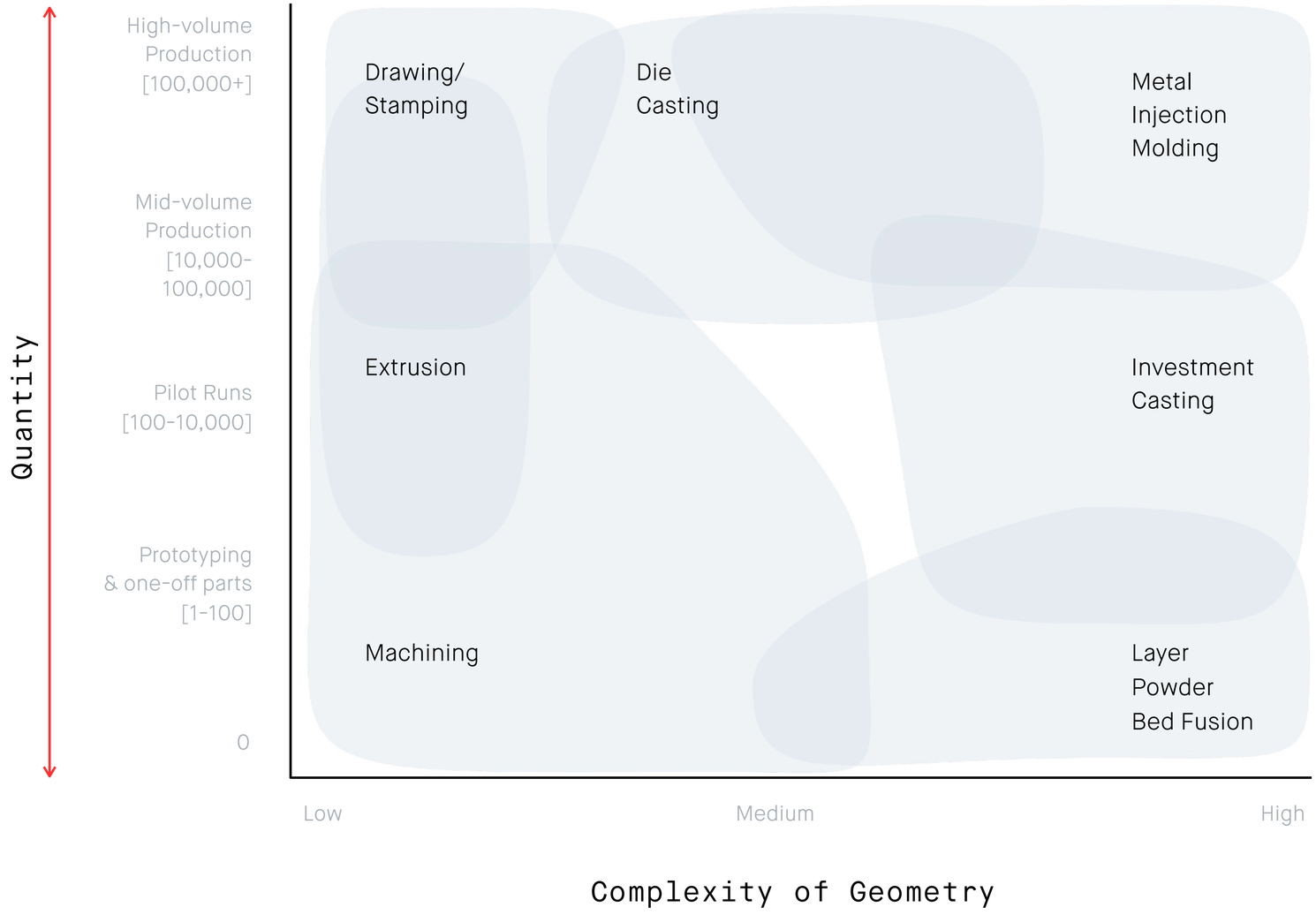
2019 -

We are now expanding our metal 3D printing offer to enable machine shops to efficiently batch produce mid-volume runs of high-quality metal parts.

Metal manufacturing landscape

01

There is no single process that can deliver the same quality and cost from low volume to high volume production.



Desktop Metal

Metal manufacturing landscape

01

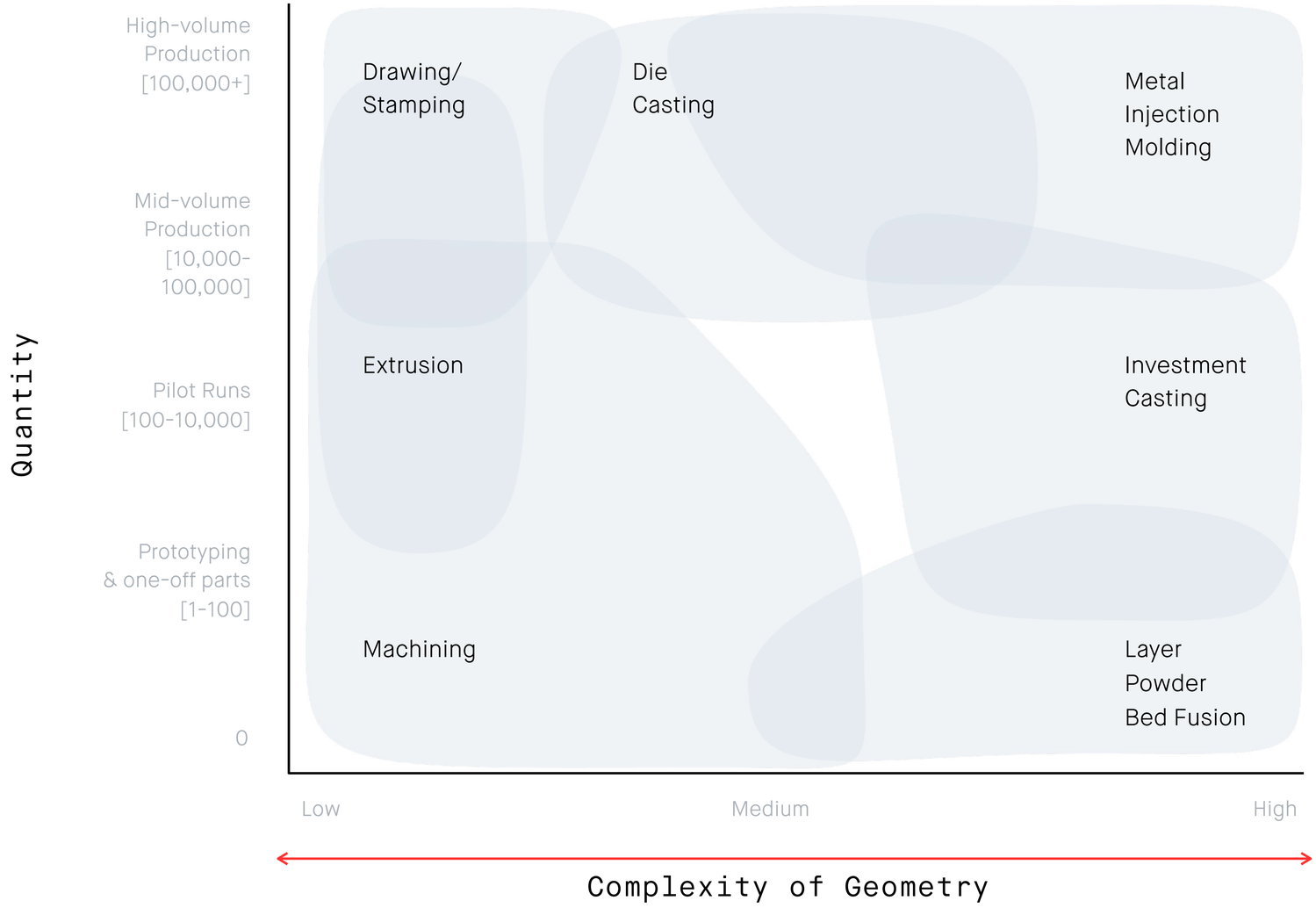
–

There is no single process that can deliver the same quality and cost from low volume to high volume production.

02

–

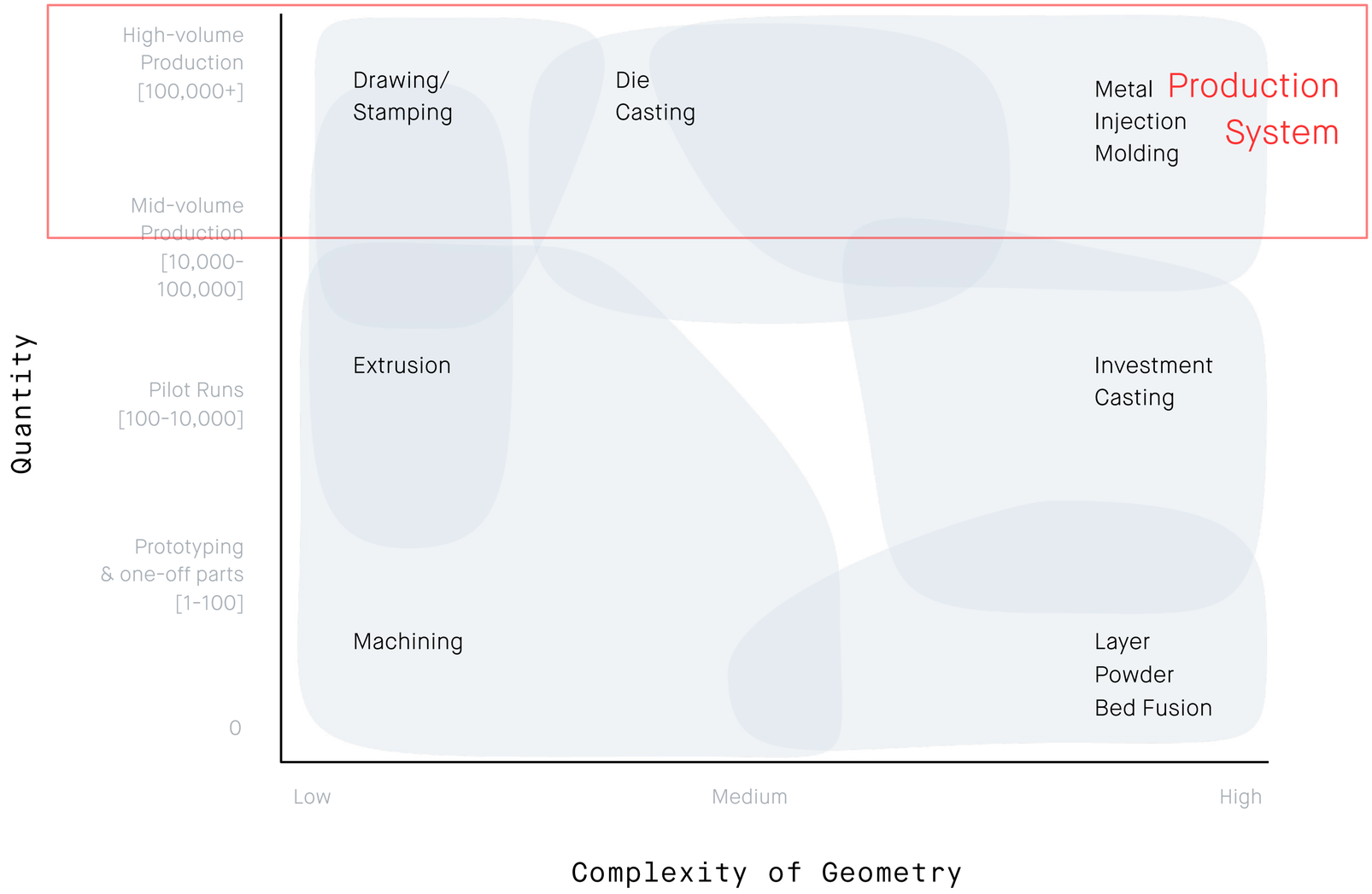
There is no single process that can deliver across the broad spectrum of part requirements



Desktop Metal

Metal manufacturing landscape

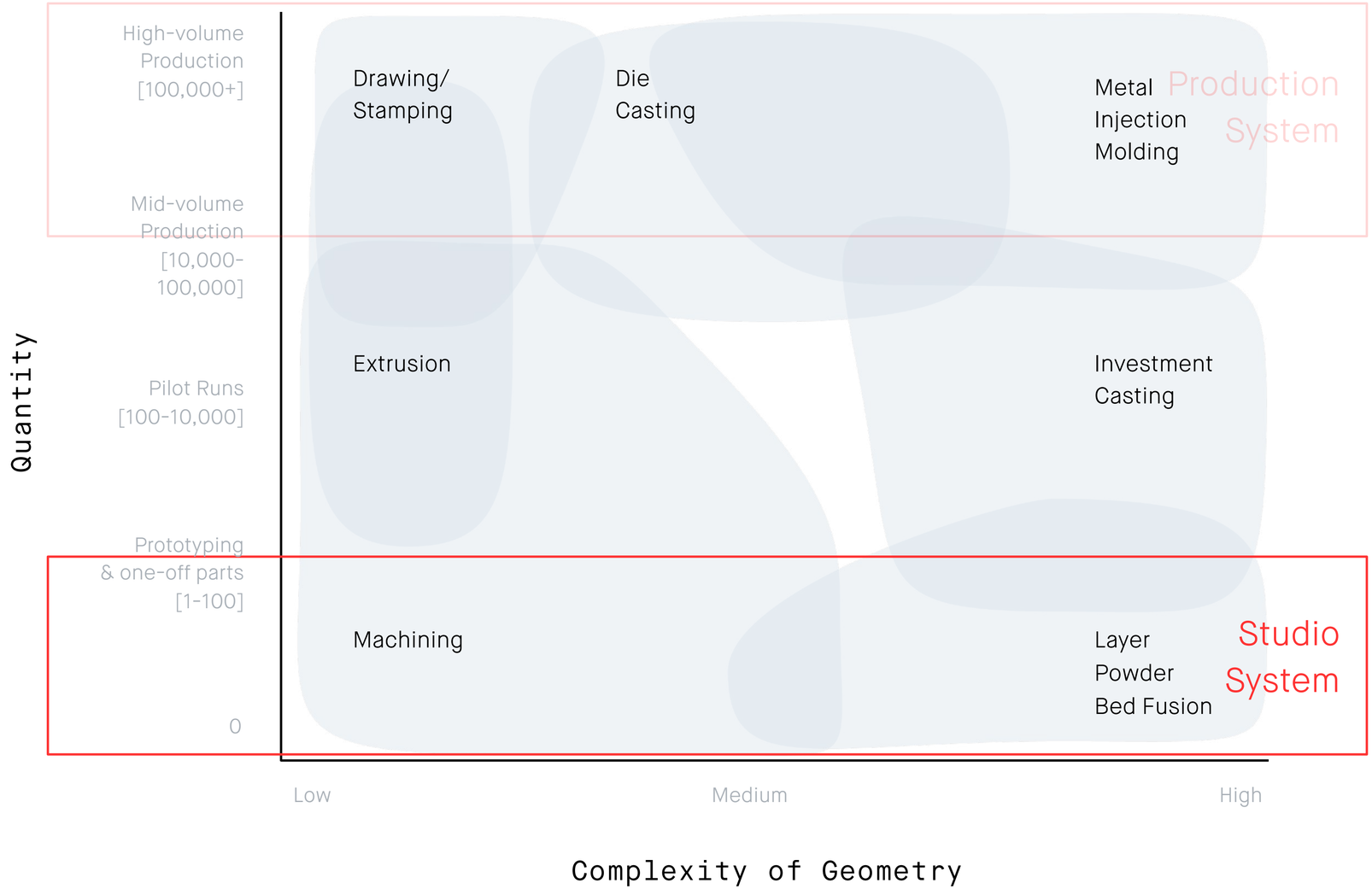
The Production System disrupted [high-volume production] by introducing the fastest, most cost effective way to manufacture metal parts of all levels of complexity.



Desktop Metal

Metal manufacturing landscape

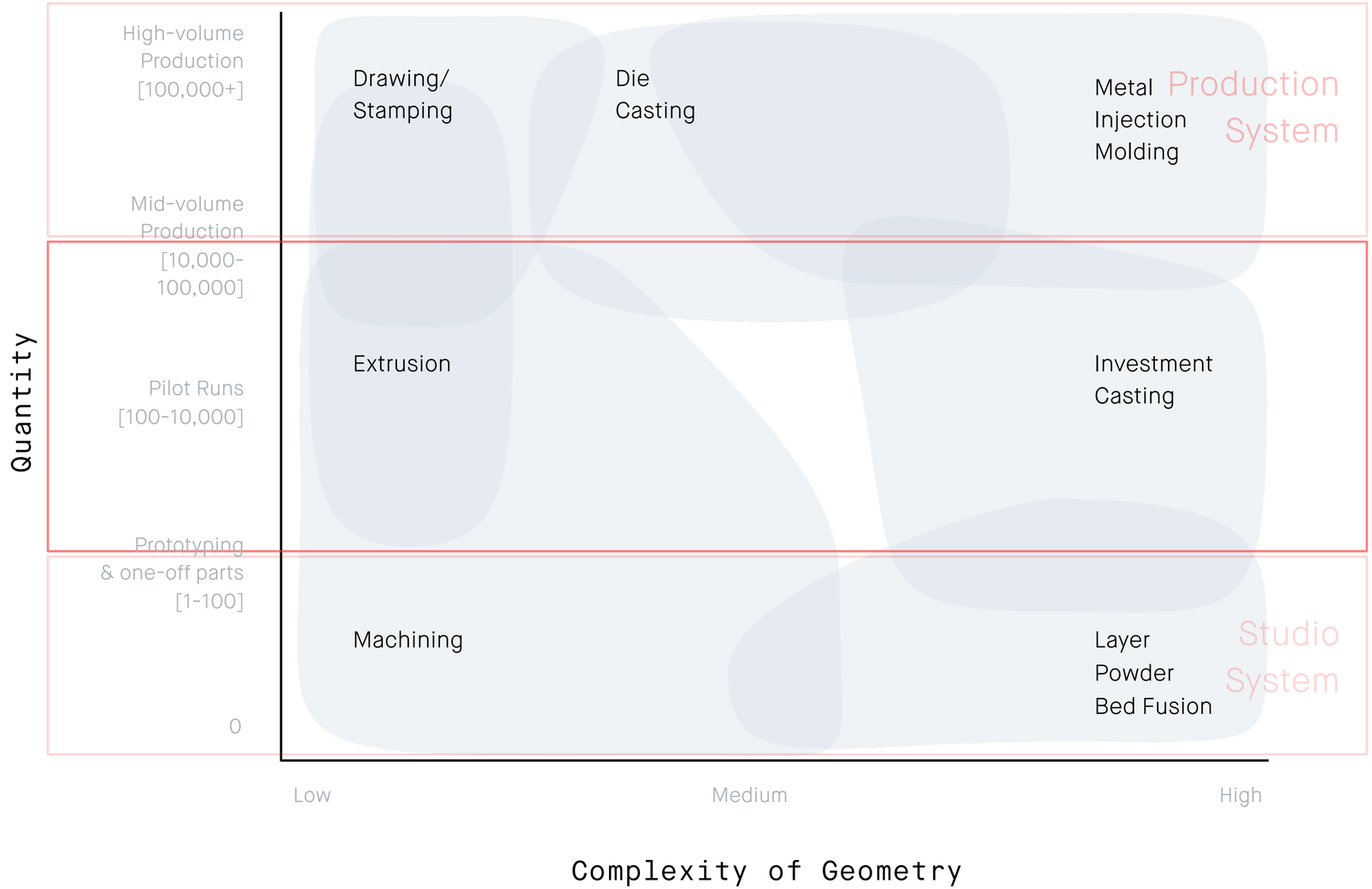
The Studio System introduced accessible [low-volume manufacturing] to office environments — improving engineers' ability to easily produce 1 to 100s of complex metal parts.



Desktop Metal

Opportunity space

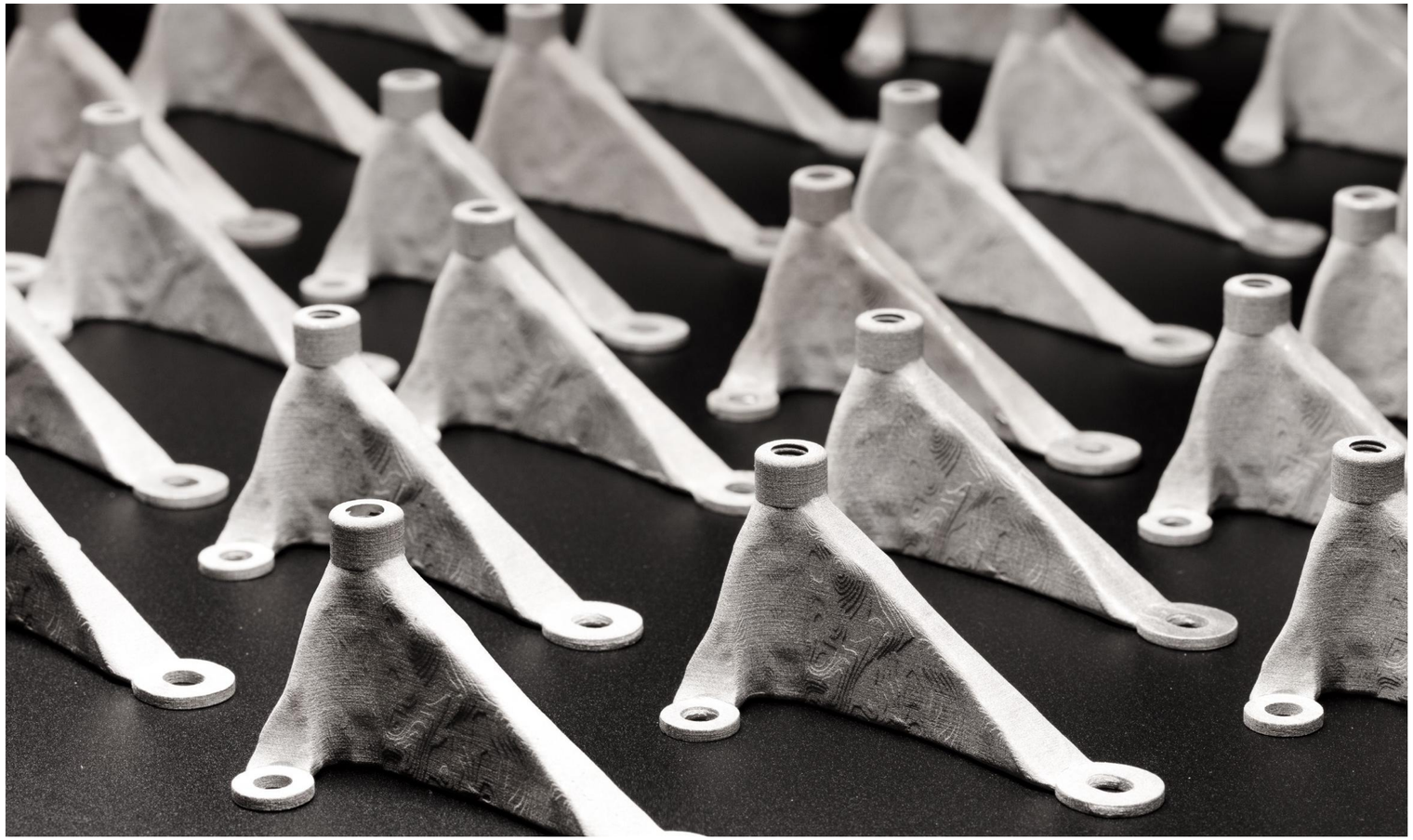
There is a need for a robust, [mid-volume] solution to enable reliable, affordable, and flexible batch production of complex parts.



Desktop Metal

We’re expanding our offer to introduce a flexible solution for mid-volume production

- Eliminate tooling costs
- Lower lead times
- Enable flexible batch production
- Bypass laborious floor turnover
- Produce high-quality, dense parts



Desktop Metal

Shop System™

The world’s first metal binder jetting system designed for machine shops.

Accessible to all

Unparalleled productivity

Superior print quality

_Features & Benefits

Accessible

Accessible

Designed with the modern machine shop in mind, the Shop System is built to fit seamlessly into your workflow. Produce parts with superior surface finish and resolution versus laser-based systems at a fraction of the cost.*

- → Seamlessly fits into your workflow
- → Superior part quality at a fraction of the cost

Desktop Metal

*Based on list price on 11.14.2019 of comparable laser-based systems

_Accessible

Affordable turnkey solution

The Shop System contains all pieces of equipment your machine shop needs to begin binder jetting — from print through sintering. And with a range of build volume configurations (4L, 8L, 12L, and 16L), the Shop System is designed to scale to your shop's throughput.

- All inclusive system (printing through sintering)
- Range of models: 4L, 8L, 12L,16L build boxes
- Starting at $150,000

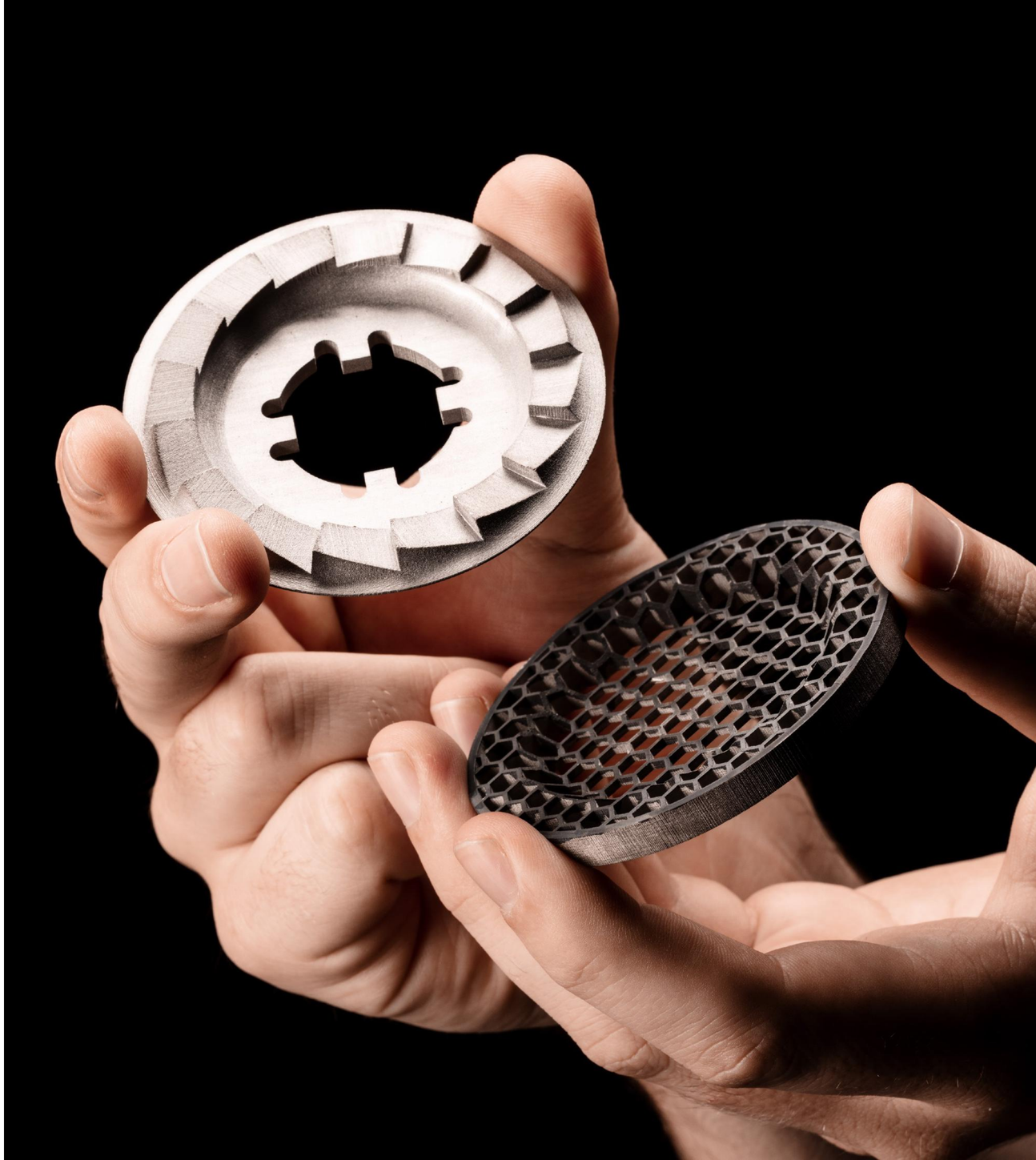
Desktop Metal

_Accessible

Simplified post-processing

Parts on the Shop System print fully supported in their powder bed, and feature hand-removable sintering setters. Avoid hours of labor machining off support structures typical to laser-based systems and instead achieve customer-ready, near-net-shape parts right out of the furnace.

- No print supports required
- No EDM’ing support structures
- Hand-removable sintering supports



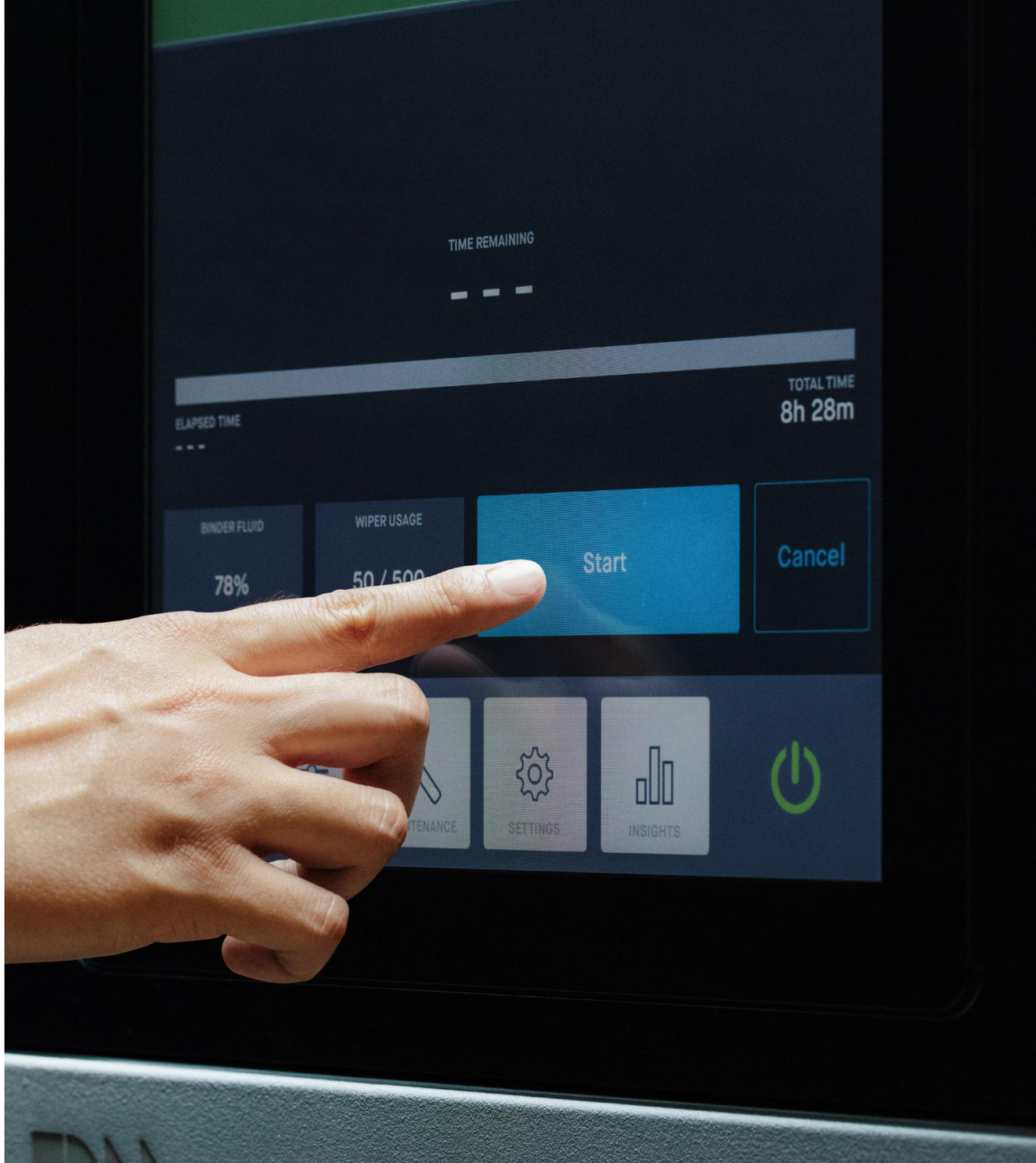
Desktop Metal

_Accessible

Optimized powders & parameters

Get started quickly with a turnkey, end-to-end solution. Shop System features Desktop Metal engineered powders and processing parameters, optimized to deliver exceptional part quality, and ensure part-to-part repeatability.

- Turnkey, end-to-end solution
- Desktop Metal engineered powders



Desktop Metal

_Features & Benefits

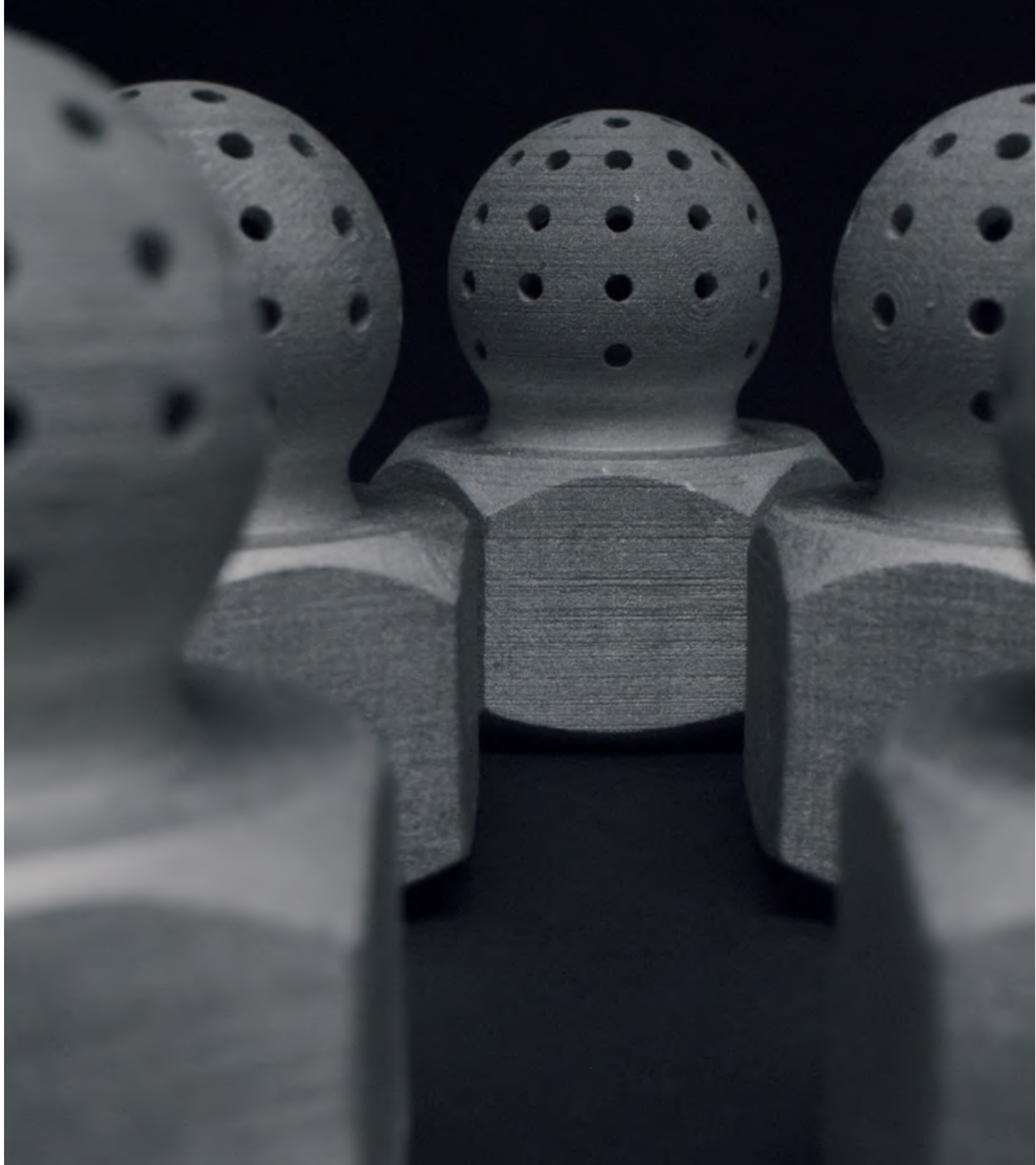
Unparalleled productivity

Unparalleled productivity

Amplify your shop’s output. Effortlessly print end- use metal parts with with the quality, surface finish and tolerances required to co-exist with machining.

- → Up to 10X faster than laser powder bed fusion
- → Effortlessly print a batch of complex parts every shift
- → Produce new designs at the press of a button

Desktop Metal



_Unparalleled Productivity

Up to 10x faster

With a high-speed, single-pass print engine, the Shop System produces high-quality metal parts up to 10x faster than laser powder bed fusion—producing up to 70kg of metal parts per day.

- → Up to 10x faster than laser-based systems
- → Print up to 70kg of parts/day

Desktop Metal

Note: All references to mass are based on steel.

_Unparalleled Productivity

Print a build/shift

Average cycle times of 6-12 hours enable a new build every shift. Print tens to hundreds of near-net shape parts each day and reserve machinist hours for refining critical features.

- 6-12 hour build time*
- Effortless productivity
- Save machinist hours with near-net-shape parts

Desktop Metal

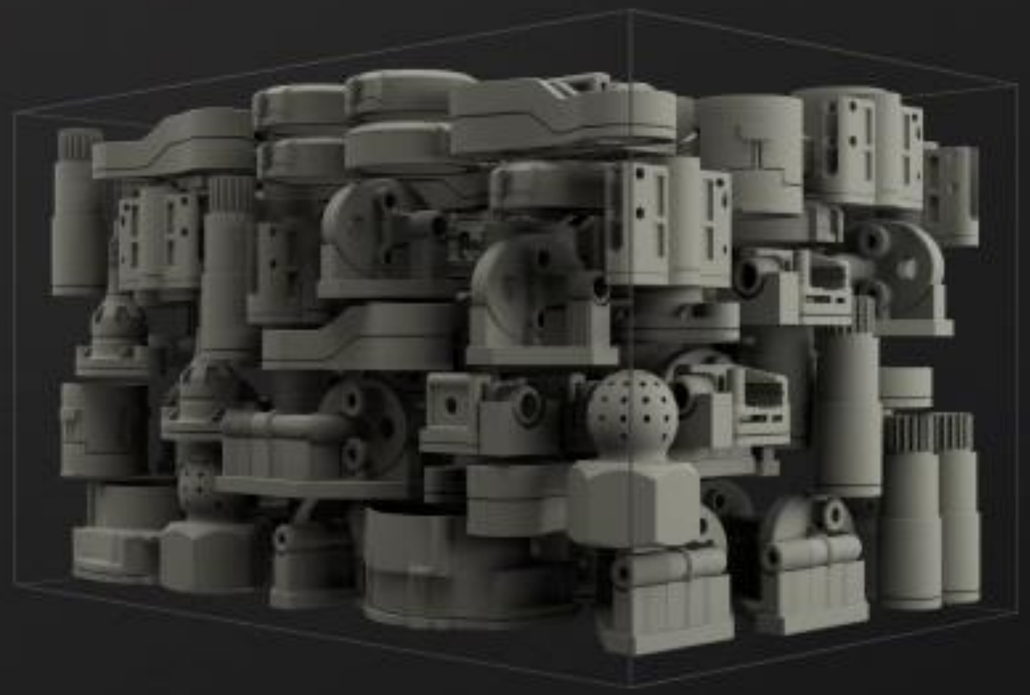
*Based on variables such as part size, part quantity, and layer thickness.

_Unparalleled Productivity

Ultimate flexibility

The Shop System is a tooling-free manufacturing process. Change over to a new job at the press of a button and process multiple complex jobs without the need for custom setups.

- No tooling required
- No custom set-ups required per design
- Simultaneously produce multiple complex jobs
- Easily switch powders in a single shift



Desktop Metal

_Features & Benefits

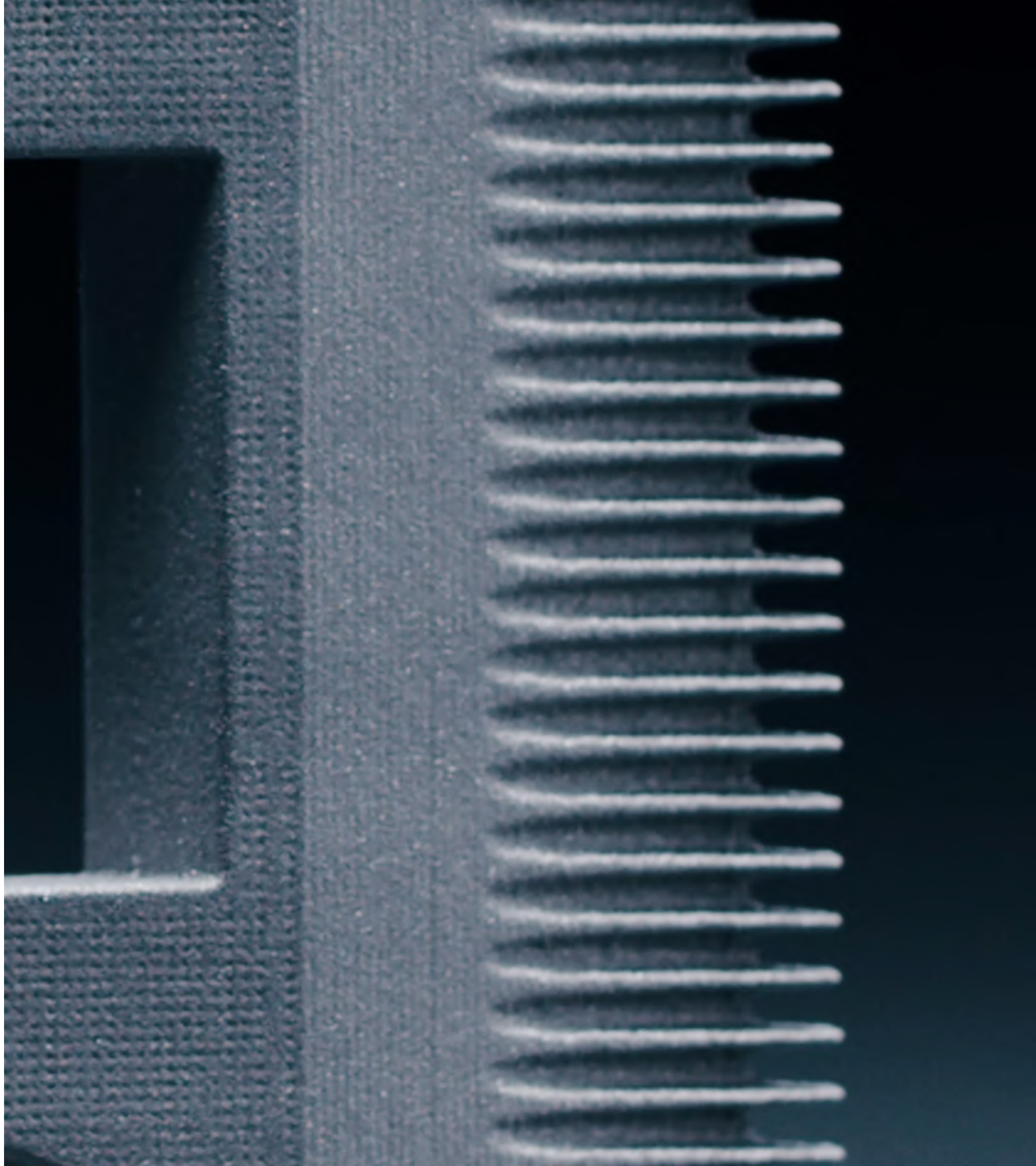
Superior print quality

Superior print quality

Print customer-ready, high-resolution parts with incredibly fine feature detail. Achieve surface finishes as low as 4µm Ra out of the furnace, and <0.1µm Ra with mass finishing. The Shop System produces fully dense, solid parts, no debind or infill required.

- → High resolution parts
- → Fine feature detail
- → Superior surface finish

Desktop Metal



_Superior print quality

High-resolution printing

The Shop System features the highest resolution single-pass binder jetting system in the market. With 1600x1600 DPI native (33% higher resolution than comparable systems), and over 670M drops per second, the Shop System delivers high-speed, high-resolution printing.

- 1600 x 1600 native DPI
- Over 670 million drops/second

Desktop Metal

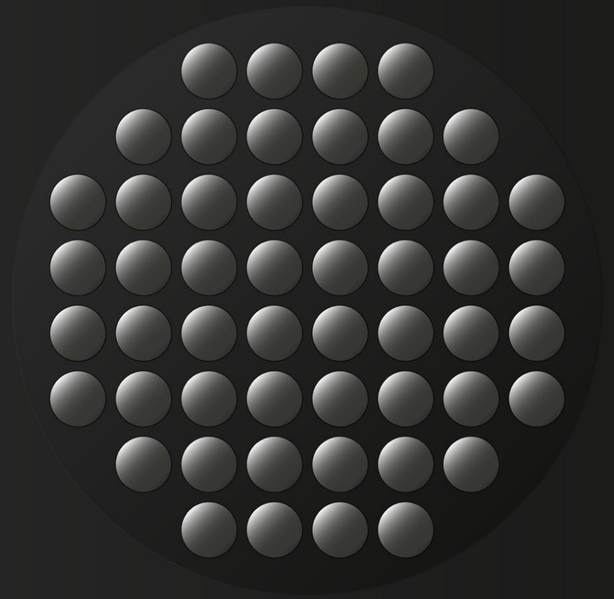
_Superior print quality

Adaptive print engine

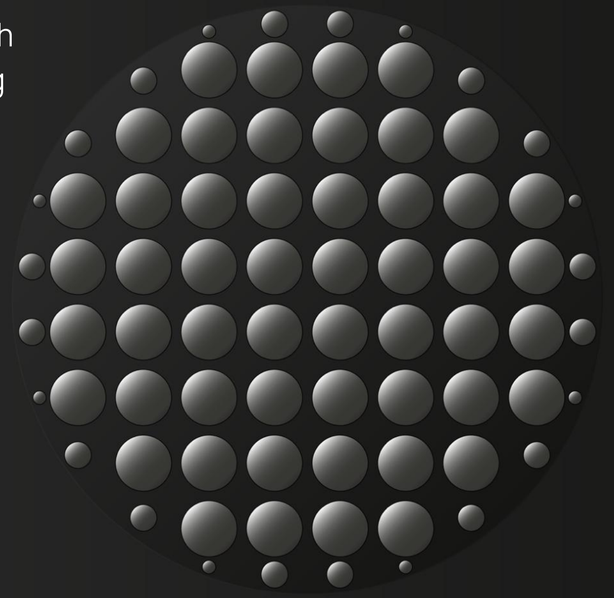
Users don’t have to sacrifice feature detail or resolution for speed. Employing the smallest droplet size of any single pass binder jetting system (~1 pL) and automated drop multiplexing up to 6 pL, the Shop System achieves superior surface finish, bleed control and rich feature detail at high speed.

- → Smallest droplet size (~1 pL)
- → Automated drop multiplexing
- → Surface finish as low as 4 µm Ra

Traditional binder jetting



Shop System with drop multiplexing



Desktop Metal

_Superior print quality

5x print redundancy

Avoid jet-outs and print issues with the Shop System's five rows totaling over 70,000 nozzles. The printhead features 25% higher nozzle redundancy than comparable systems, resulting in enhanced print quality and reliability.

- Five independent channels of nozzles
- Over 70,000 nozzles across five lines
- 25% higher redundancy than comparable systems

Desktop Metal

_Technology

How it works

Process overview

Print

For each layer, the printer spreads metal powder across the build bed, and precisely jets a binding agent to bond loose powder and define part geometry. Layer by layer, metal powder and binder is deposited until the entire build volume is packed with bound parts and surrounding loose powder.

Depowder

Once an entire build is complete, the build box is removed and placed in a powder station for bulk and fine depowdering—with the help of a hand-held air pick. Loose powder is removed from the parts and recovered via a built-in powder recycling system with powder sieving.

Sinter

Depowdered parts are placed onto trays in a shop-safe, high-throughput furnace for batch sintering. With an external gas hookup, temperatures reaching 1400°C, and the ability to process high-strength binders, the Shop System furnace is able to deliver quality and reliable sintering in a shop-friendly format.

Desktop Metal

_Use cases

Amplify your shop

1. Reducing costs with the Shop System

- **Eliminate tooling**
  Print parts without a need for molds or work-holding fixtures

- **Reduce tool wear**
  Print and sinter parts to near net shape, then machine as needed for critical dimensions

- **Reduce labor cost per part**
  No need to scale machinist's time with number of parts

- **Reduce job setup costs**
  Set up an entire build in just 1-2 hrs regardless of part complexity. (Compared to hours/geometry with CNC)

- **Reduce manufacturing steps**
  Printing to near net shape in a single step drastically reduces number of total manufacturing steps.

2. Increasing revenue with the Shop System

- **Produce previously unattainable geometries**
  Achieve assembly consolidation and design optimization beyond what's possible with CNC

- **Print hard to machine metals**
  Compatible with refractory metals and tool steels, including many materials that are incompatible with LPBF.

- **Make small/medium jobs economically viable**
  Bring in new business that would have previously been "no bid" due to high mold tooling or CNC setup costs

- **Win new business**
  Win more bids via improved part cost equation due to lower setup and part costs

- **Free up CNC capacity for new jobs**
  Offloading work to the Shop System allows the CNC capacity to take on more profitable jobs

_Use cases

Scenarios

Scenarios

01 Mixed-volume production of various geometries

Produce various part geometries simultaneously without the need for multiple setups.

02 Batch production of 10s of units

Cost effectively produce low volume batches of complex parts due to elimination of tooling.

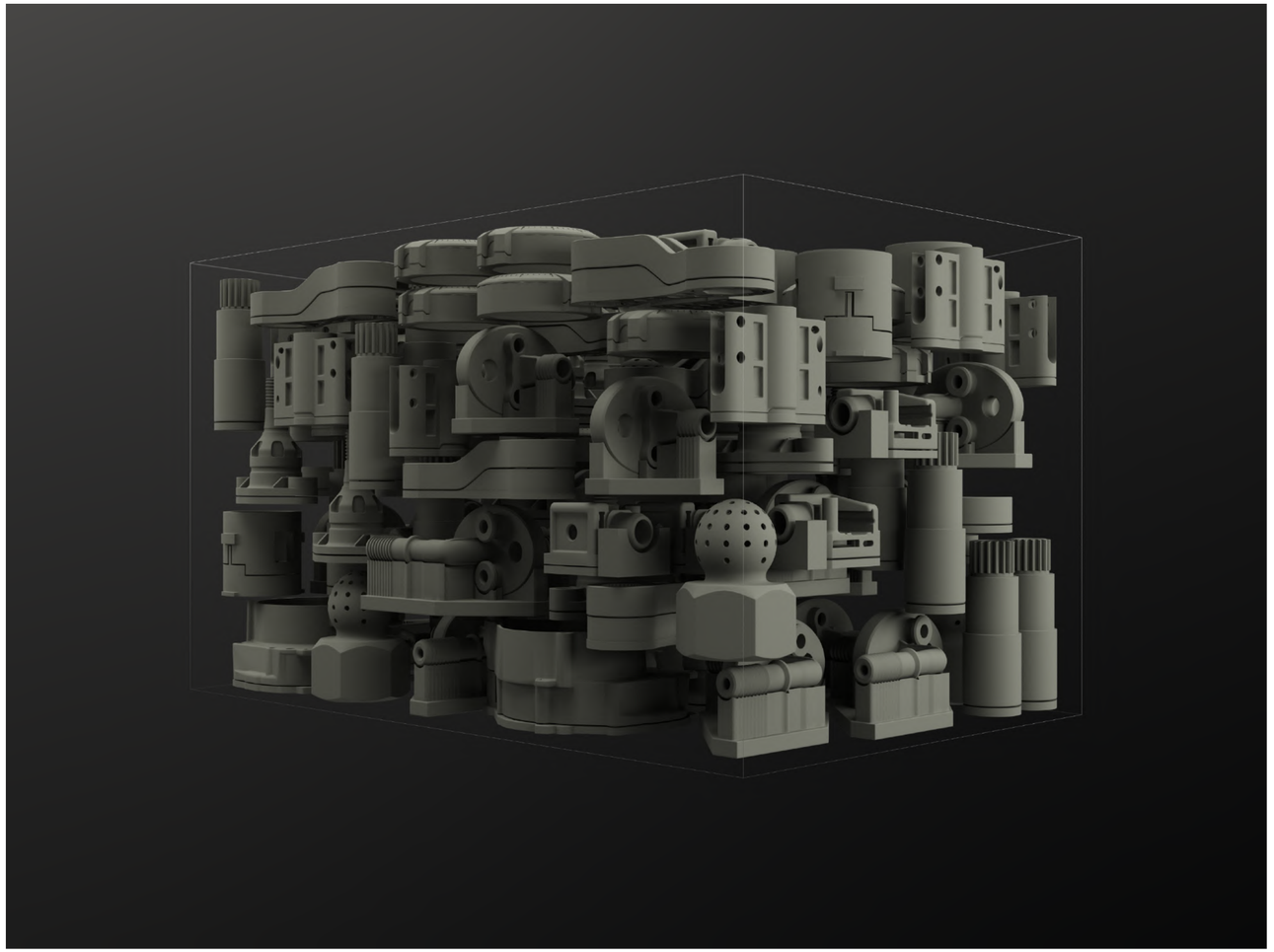
03 Mid-volume production of 100s of parts/day

Produce hundreds of near-net-shape parts every day with dramatically reduced labor costs and expanded geometric flexibility.

_Scenario 01

Mixed volume production

Produce various part geometries simultaneously without the need for multiple setups.

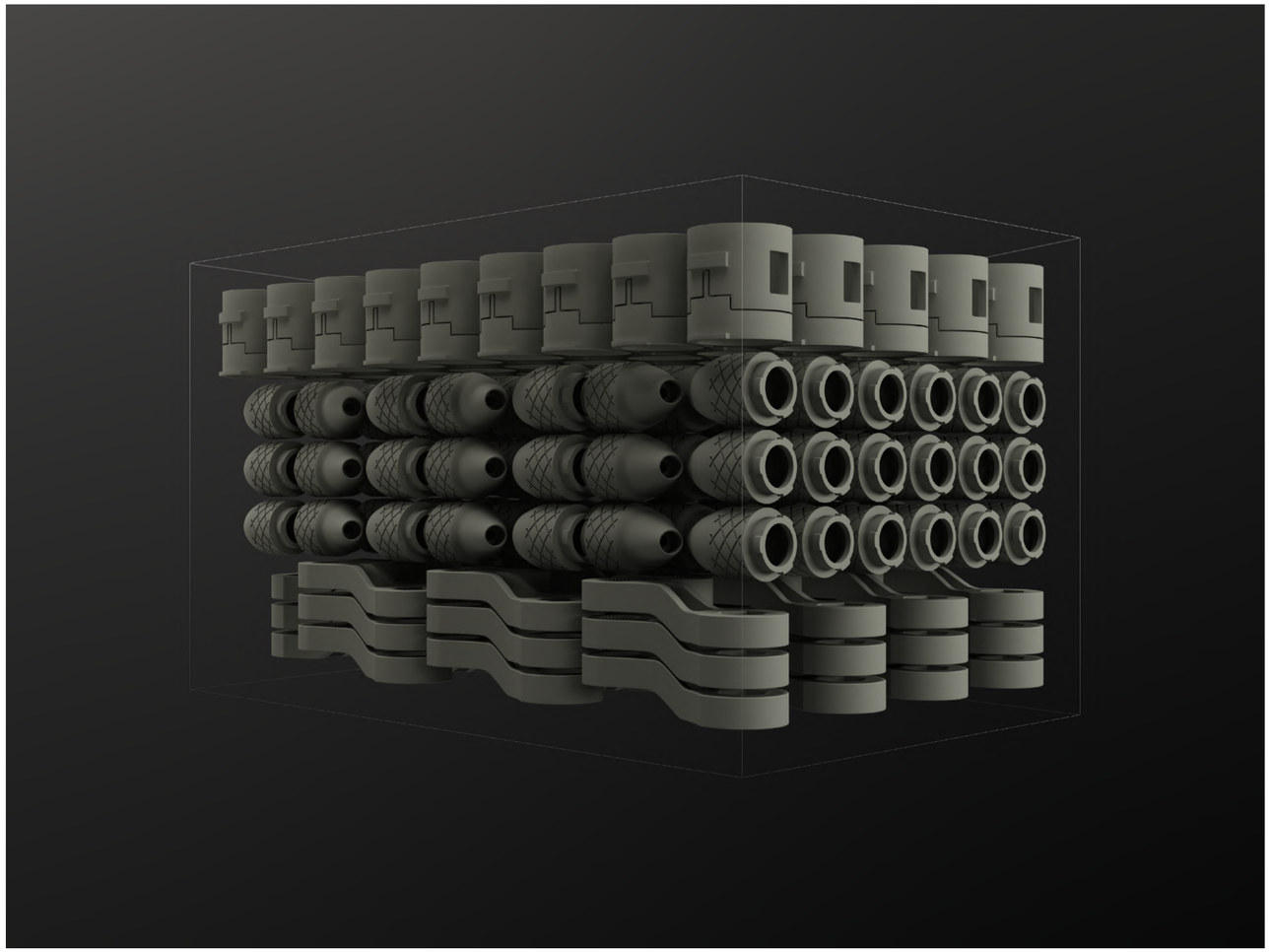


Desktop Metal

_Scenario 02

Batch production

Cost effectively produce low volume batches of complex parts due to elimination of tooling.

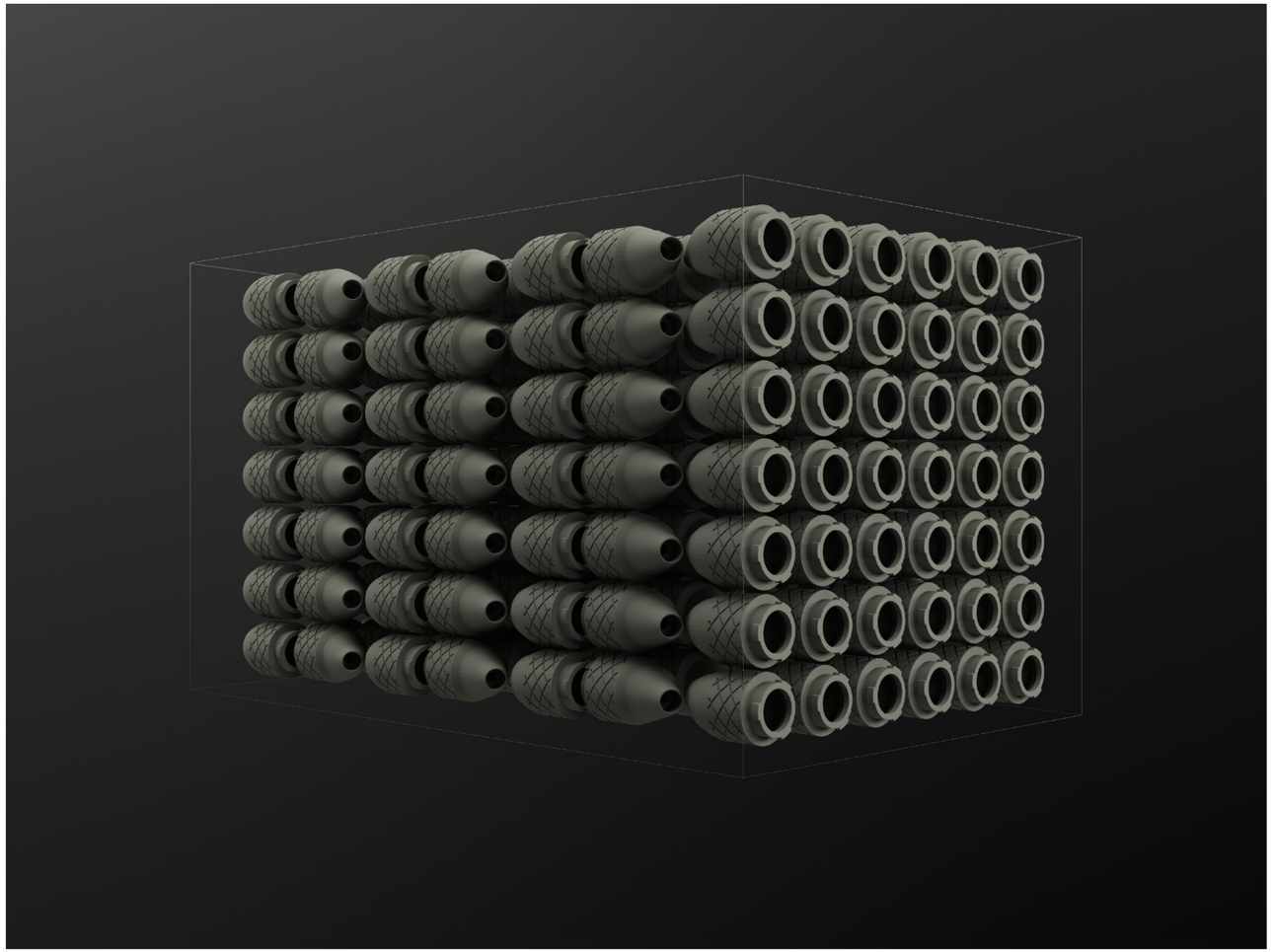


Desktop Metal

_Scenario 03

Mid-volume production

Produce hundreds of near-net-shape parts every day with dramatically reduced labor costs and expanded geometric flexibility.



Desktop Metal

_Solution overview

End-to-end solution

Solution overview

The Shop System is designed to be the easiest binder jetting system for a machine shop workflow. The entire process is facilitated by just five pieces of equipment :

01 Printer
02 Drying oven
03 Powder station
04 Furnace
05 Blender

The system is complemented by a vac for powder management.

Desktop Metal

Next Steps

Go to Market	Desktop Metal partner network [available in 48 countries]	
Timing	November 19	Public announcement @ Formnext [Frankfurt, DE]
	H2 [2020]	Shipment
Pricing	Starting at $150,000	

Desktop Metal

Desktop Metal

Metal 3D printing solutions

Desktop Metal

System comparison

	Studio System	Shop System	Production System
Throughput Parts/day	1-10	Up to 1,000	Up to 100,000
Build volume(s)	300 x 200 x 200 mm	350 x 220 x 200 mm 350 x 220 x 150 mm 350 x 220 x 100 mm 350 x 220 x 50 mm	330 x 330 x 330 mm 750 x 330 x 250 mm
Surface roughness	5-15 µm Ra <0.1 µm Ra with mass finishing	4 µm Ra <0.1 µm Ra with mass finishing	4 µm Ra <0.1 µm Ra with mass finishing
Resolution	[x/y] 250µm [z] 50µm	16µm voxel	21µm voxel
Office-friendly	Yes	No	No
Chemical debind	Yes	No	No
Part anatomy	Infill	Fully dense	Fully dense

Desktop Metal