

FORG3D

The Physical AI infrastructure for critical metal manufacturing.
Software-defined Digital Forges that manufacture and repair critical metal components.

THE PROBLEM • THE BOTTLENECK NO ONE TALKS ABOUT

America can't reindustrialize with the manufacturing stack it inherited.

Demand for ships, aircraft, missiles and reactors is surging. The capacity to make their hardest metal parts is not.

~70%

of US foundries lost since 2000

5–10 yr

and \$50–100M to build one new plant

30+ wks

lead time for one critical forging
— often offshore

Retiring

skilled trades — skills we no longer teach

Sources: American Foundry Society; US Navy (NAVSEA), 2025; industry surveys 2024–25.

Customers don't just pay for the part — they pay for tooling, inventory, scrap, downtime and delay.
Unit price is the wrong metric. Availability is the product.

A NEW WAY TO MAKE METAL PARTS

For large structural parts, industry still relies on forging and casting. **Now there is a third route.**

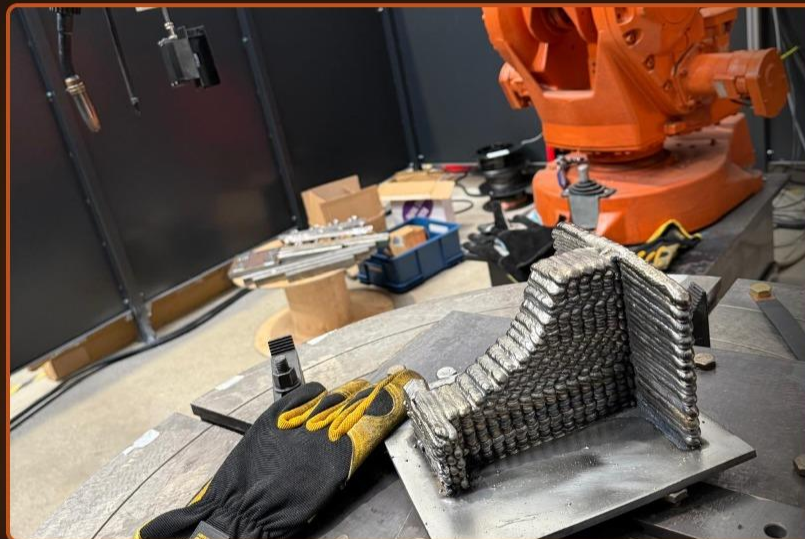
Forging

- ✓ Immense strength
- ✗ A die per part — months of tooling

Casting

- ✓ Complex shapes
- ✗ Tooling, defect risk and long lead times.

Both then wait weeks in a machine shop — and most of the metal is cut away.



◆ **DIGITAL FORGING** | WIRE-DED • WIRE-ARC DIRECTED ENERGY DEPOSITION

No dies. Any shape. Days, not months.

Our beachhead: the parts neither one serves well — complex, strong, low volume, needed fast.

Pictured: titanium bracket — **made in hours, not months.**

| The beachhead is what neither can make. **The prize is everything they make slowly.**

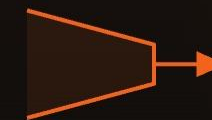
THE SOLUTION • THE DIGITAL FORGE

We shrank the foundry **into a digital cell.**

We don't sell printers. We operate Digital Forges — software-driven cells that produce and repair near-net-shape critical metal components, onshore, in days.



THE FORGE / FOUNDRY — YEARS & \$50-100M



SHRUNK
INTO
A CELL



THE DIGITAL FORGE — ONE COMPACT CELL

Days

not 30+ weeks — no dies, no tooling queue

~60%

less raw metal — deposited, not machined to chips

Months

to stand up a cell — not years to build a plant

| Software-defined — **designed so qualified capability replicates like a product.**

THE TECHNICAL BARRIER

Wire-DED can deposit metal. It has not become repeatable industrial capacity.

WHY THE INDUSTRY HASN'T SCALED

- ◆ Material outcomes vary with thermal history.
- ◆ Machine settings don't prove what the material experienced.
- ◆ Production depends on specialist operators.
- ◆ Each new cell, part or site requires extensive revalidation.

THE FORG3D ARCHITECTURE

FORM – **SOLIDUS**

Controls heat input and how the metal solidifies.

Operating today

SENSE & ACT – **HAMMER**

Deposits, measures, shields and repairs at the process interface.

Prototype / in development

INTERPRET & CONTROL – **ANVIL**

Converts process data into predictions, control decisions and production evidence.

Foundations built

SCALE – **DIGITAL FORGE**

Turns proven capability into repeatable, deployable production capacity.

Funded by this round

| The breakthrough is not making one good part. It's repeating the material outcome across cells, parts and sites.

THE TEAM

Six full-time, building the forge.

Metallurgy, robotics, and software under one roof — the disciplines a Digital Forge demands.



Richard Mincher

Founder / CEO

15 years in advanced manufacturing — lived the forging supply-chain problem from the inside, then built the company to fix it. Founded Forg3D and stood up Factory ALPHA to revenue.



Dr. James Wainwright

Head of Additive Manufacturing

Award-winning engineer; PhD in Titanium WAAM, Cranfield.

◆ Worked together in industry



Dr. William James

Senior Additive Engineer

PhD; defense programs & critical metals.

◆ Worked together in industry



Hassan Esmaeili

Senior Additive Engineer

Senior WAAM & welding engineer, deployed in industry.

◆ Worked together in industry



Dr. Ali Alireza

Software / Thermal Modeling

WAAM and thermal-modeling software engineer.

◆ Worked together in industry



Justin Lott

Robotics Integrator & AM Engineer

Robotic integration, welding, WAAM, industrial HSE and programming.

Ex-Cranfield. The core four — three WAAM engineers and our lead software engineer — have built and deployed this in industry together before. Recognized experts and leaders in wire-arc additive manufacturing.

We're not planning a Digital Forge. **We're already running one.**

Sheffield

UNITED KINGDOM

3 systems

WAAM RUNNING • 4TH ON ORDER

\$500k

REVENUE COMPLETE & PAID

\$400k

QUALIFIED PIPELINE

WHAT CUSTOMERS PAY US FOR

AEROSPACE & SPACE

Paid tooling & material demonstrations

ENERGY & FUSION

Paid process-development & repair programmes

DEFENSE & MARITIME

Sustainment & replacement-part programmes

OPERATIONAL

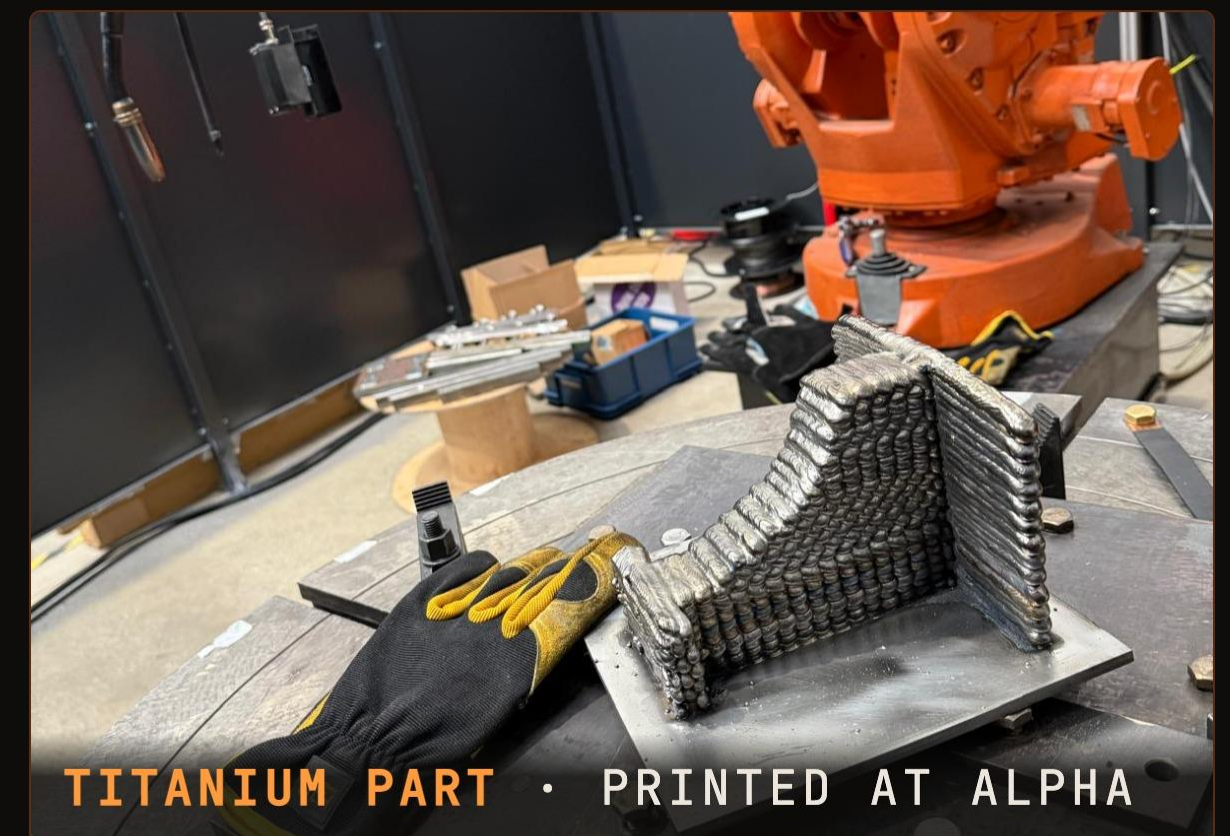
- ✓ 3 systems running — multi-alloy capability proven
- ✓ Live customer projects across critical sectors
- ✓ Plasma / PTA capability coming online

TECHNICAL

- ✓ SOLIDUS — our patented deposition process
- ✓ HAMMER — proprietary print head prototype operational
- ✓ ANVIL OS — data-capture foundations in place

TEAM

- ✓ Industry-leading WAAM team (ex-Cranfield)
- ✓ Built and deployed WAAM in industry together before



Physical AI needs a body, a brain and a physics it can trust.
We are building all three as one integrated system.

01 • THE PHYSICS

OPERATING TODAY

SOLIDUS

Our granted-patent process — operating today, the physics the models are built on

02 • THE BODY

IN DEVELOPMENT

HAMMER

The print head — in development today

03 • THE BRAIN

FOUNDATIONS OPERATING

ANVIL OS

Manufacturing intelligence — data-capture foundations operating, platform in development

SOLIDUS

+

HAMMER

+

ANVIL

=

THE DIGITAL FORGE

■ Operating today □ In development — funded by this round [] Foundations operating — platform in build

HAMMER acts. ANVIL understands. SOLIDUS controls the metal.

Independently tested **Ti-6Al-4V** properties. No HIP.

Operating capability at Factory ALPHA today — not a roadmap.

ROBOTIC CELLS	3 running · 4th on order
PROCESSES	Wire-arc deposition · plasma coming online
ALLOYS	Titanium Ti-6Al-4V · nickel 625, 718 · NAB Aluminums · steels: low-alloy, carbon, tool Refractory and high-temperature alloys in development
BUILD ENVELOPE	2 m³ — expanding
WORK TYPES	New build · repair · tooling

MATERIAL RESULTS • Ti-6Al-4V

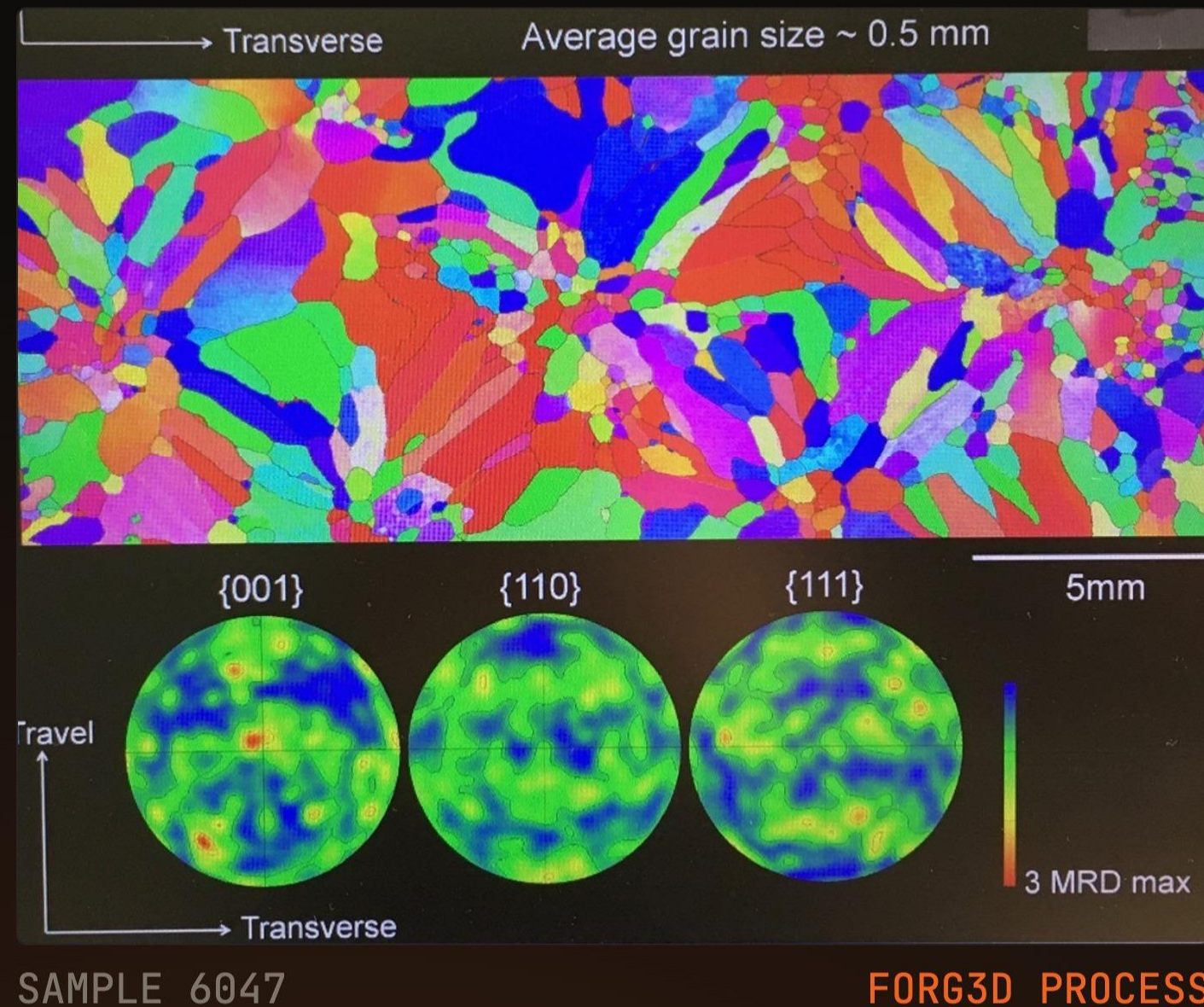
PROPERTY	RESULT	AMS 4928
0.2% proof stress	939 MPa	≥880
UTS	1,037 MPa	≥950
Elongation	11.8%	≥10
Reduction of area	28.4%	≥25

Independent tensile results shown against **AMS 4928 reference minimums** — with refined, equiaxed grain structure in place of coarse columnar growth.

SOLIDUS™ PROCESS • INDEPENDENTLY TESTED •
NO HIP POST-PROCESSING

| Material results are **third-party verified** — not our own lab.

SOLIDUS changes how the metal forms — **not just the shape deposited.**



Equiaxed, not columnar

No coarse grains running the wall height — refined structure, average grain size ~0.5 mm.

Texture peaks at 3 MRD

Close to random orientation across {001}, {110} and {111} — the measure of low anisotropy.

Low texture intensity indicates reduced anisotropy risk

Tensile results exceed AMS 4928 reference minimums without HIP.
Directional properties and repeatability are now being validated.

| One of wire-DED's persistent metallurgical limitations, **addressed in-process — not by post-processing alone.**

The structural-metal layer is fragmented. **Forg3D integrates it.**

ADJACENT LANES – DIFFERENT PROCESS DIGITIZED ✓

Hadrian

AUTOMATED MACHINING

Cuts parts from solid billet; does not create the near-net-shape metal form.

Machina Labs

ROBOTIC SHEET FORMING

Forms sheet metal rather than large deposited structural components.

Divergent

POWDER-BED AM & DIGITAL DESIGN

Focused on powder-bed components and integrated assemblies.

SAME PROCESS – FRAGMENTED OPERATING MODELS

FRAGMENTED

Norsk Titanium

CENTRALISED TITANIUM PRODUCTION

Qualified producer model focused primarily on aerospace titanium.

AML3D

WIRE-DED EQUIPMENT VENDOR

The customer owns, operates and qualifies the production process.

Monitoring software

BUILD VISIBILITY AND RECORDS

Observes the process but does not own the material outcome or production operation.

FORG3D

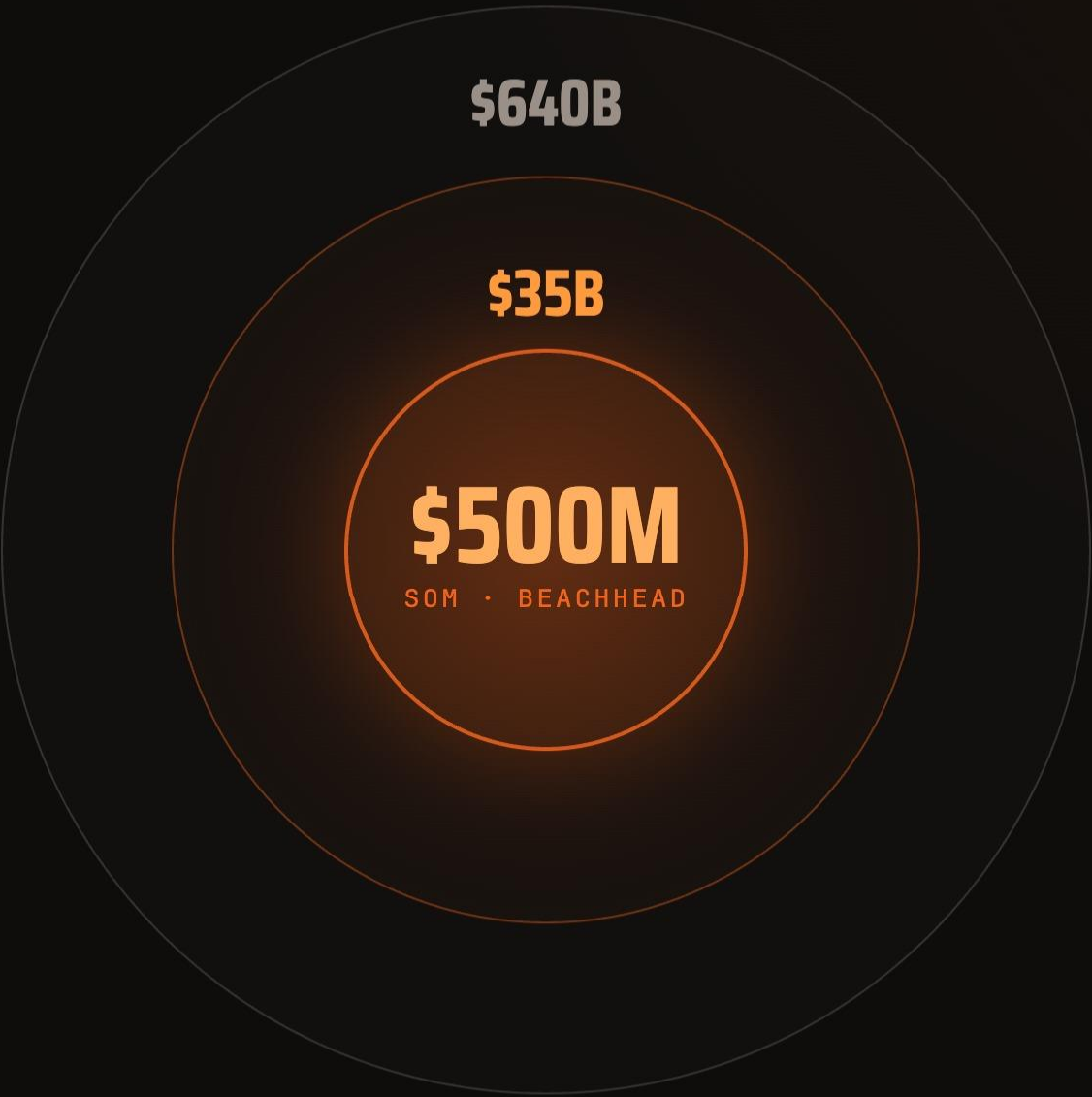
◆ THE MISSING INTEGRATED LAYER

Wire-DED for large, near-net-shape, high-value structural components.

Process, production, material evidence and manufacturing intelligence under one operating model.

MARKET • NESTED, AND EVERY RING IS GROWING

Metal 3D printing is not our market. Qualified metal capacity is.



TAM **\$640B+**

High-value metal parts across every critical sector — defense, space, energy, aerospace — that America must reshore.

SAM **\$35B**

Critical castings & forgings in our alloys & sectors — where supply is most fragile.

SOM **~\$500M** BEACHHEAD

The parts we win first — repair, tooling & spares. Revenue now, no qualification gate.

~\$500M beachhead = ~20 mature Digital Forge sites × ~\$25M revenue per site.

SAME THREE LAYERS, EVERY SECTOR:

DEFENSE

AEROSPACE

SPACE

NUCLEAR

ENGAGED TODAY

We earn in the beachhead today — and every ring above is being reshored.

Reshoring isn't a trend — it's a mandate.

Sources: A&D MRO est. 2025; DoD FY24; Grand View 2026; VMR 2025.

Prove the cell. Deploy with customers. Scale into Digital Forges.

01 PROVE

FACTORY ALPHA · SHEFFIELD

Operating today

- ◆ Paid customer parts, tooling, repairs
- ◆ Process & qualification evidence
- ◆ Every build captured through ANVIL

3 systems operating · 4th on order
· revenue generating

02 DEPLOY

CUSTOMER-SITE DIGITAL FORGE
CELLS

Capital-efficient market validation

- ◆ Forged3D-owned and operated cells inside customer sites — we retain our process IP and manufacturing intelligence.
- ◆ Validates willingness to pay & real demand
- ◆ Proves deployment, utilisation & gross margin

1 forward-deployed pilot · 4 more
in pipeline

03 SCALE

MULTI-CELL DIGITAL FORGES

Scale proven capacity

- ◆ Proven cells + proven demand + qualified process
- ◆ Dedicated regional critical-metal capacity
- ◆ Replicates a proven model, not speculative plants

Early conversations with primes &
end-users underway

↪ EVERY DEPLOYED CELL FEEDS ANVIL

Production data · process learning · qualification evidence — every site makes the next one faster to stand up.

ILLUSTRATIVE
MATURE FORGE 8 cells × 4,000 hrs × ~\$800 /cell-hr = ~\$25.6m /site/yr

4 sites × ~\$25m = \$100m+

| Customer-site cells are the capital-efficient proof layer — not the end-state business model.

We sell critical metal output. **We own the learning loop.**

Not a job shop — a software-defined manufacturing network. Every forge runs ANVIL, so each new forge is faster to stand up.

And as a network, it compounds.

NOW • BEACHHEAD

Tooling & repair

Per-part production revenue, no qualification gate. Invar tooling: a 6-month wait, printed in 4 weeks.

Already selling.



NEXT

Spare & new-build parts

Per-part, priced on value vs. the incumbent's lead time — under multi-year supply agreements.

Priced on value.



SCALE

Dedicated Digital Forges

Recurring regional or customer-site capacity for qualified parts. Forg3D retains its process IP, derived manufacturing intelligence and learning layer.

Recurring + share.

CUSTOMER EXPANSION **Paid project** → Repeat part family → Production agreement → **Dedicated Digital Forge capacity**

THE FLYWHEEL **More production** → More evidence → Wider qualified capability → **More valuable capacity**

The moat is not data alone. **It is production data connected to accepted material outcomes.**

FINANCIALS

Revenue today — and a clear path to scale.

FUNDING TO DATE

~\$2M

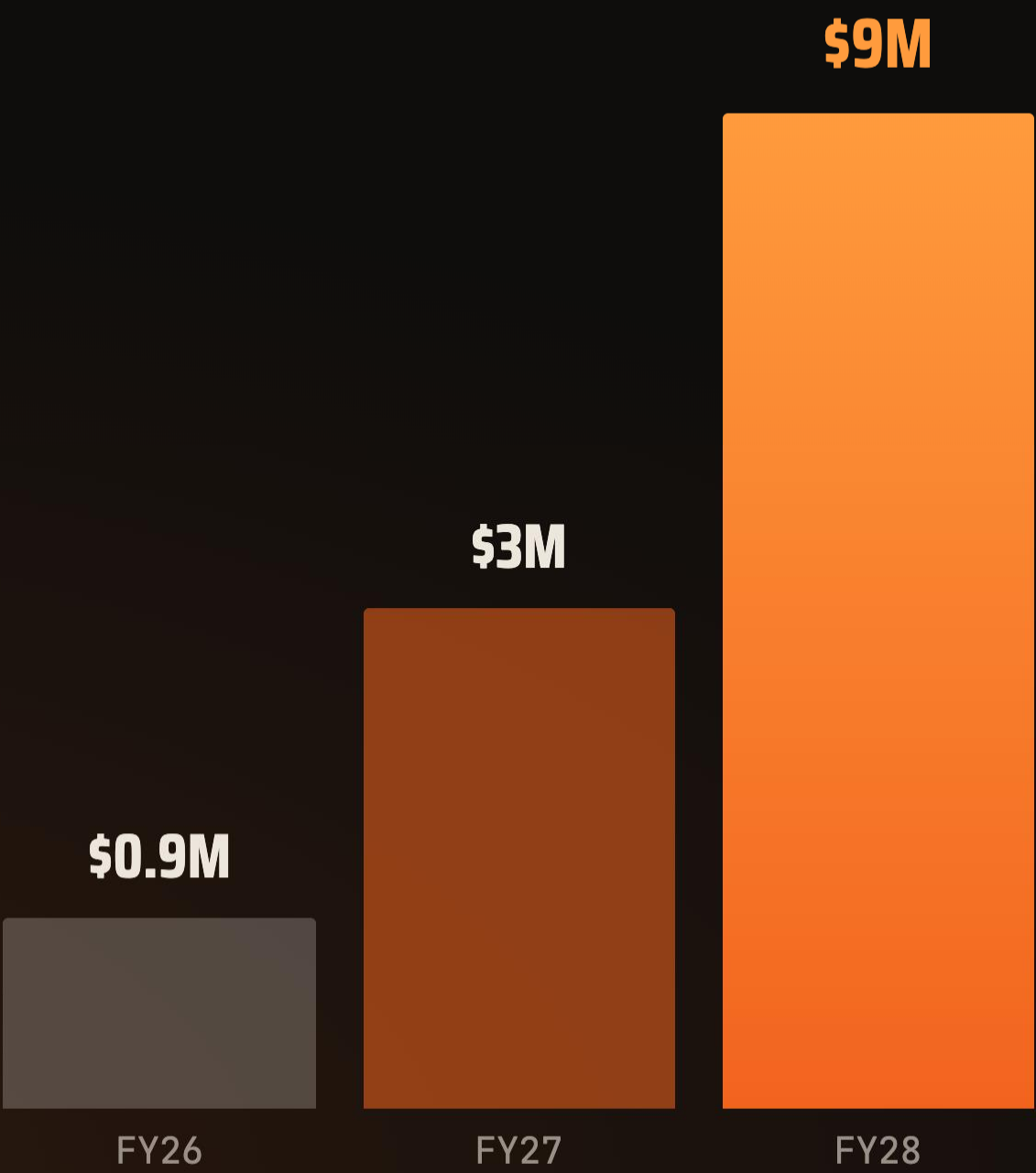
raised to date — non-dilutive + private

- \$1M Private funding
- \$1.05M Awarded funding — UK Gov aerospace, fusion energy, NATO DIANA

\$500k Revenue complete & paid

\$400k Qualified pipeline (not booked)

FORECAST REVENUE



ILLUSTRATIVE

USE OF \$2.5M RAISE

- Qualification & ANVIL 35%
- Team & runway 35%
- Capacity & HAMMER 20%
- US entity & BD 10%

| \$1.2M of the \$2.5M already committed — ~18 months of runway to a US-ready, revenue-growing company.

\$2.5m to prove the repeatable unit — and scale commercial deployment.

\$2.5M

(£2M) FINANCING ROUND
\$1.2M ALREADY COMMITTED
~18 MONTHS RUNWAY

TODAY

- ✓ Factory ALPHA operating — 3 systems, 4th ordered
- ✓ Multi-alloy operating capability
- ✓ ANVIL data-capture foundations in place

18-MONTH MILESTONES

01 Technical

Advance the integrated Digital Forge from ~TRL 5 to TRL 6-7.

Repeatability across at least two cells; third-party material validation across two priority alloys; automated production evidence.

02 Demand

\$3m in contracted or booked commercial work — signed orders, not pipeline.

Three to five anchor customers, including at least two repeat-production or multi-year agreements.

03 Economics

Prove the economics behind the \$25m mature-site model.

Deploy the first customer-site cell — measure revenue per cell-hour, gross margin and payback.

04 US entry

Secure the first paid US programme and identify the launch customer or operating partner.

US entity, America Makes participation and SBIR / DIU routes support this milestone.

NEXT-STAGE UNLOCK

This round proves the integrated forge, repeat customer demand and cell economics. The next round funds multi-site replication, qualification expansion and scaled US capacity.

TAKE BACK THE FORGE.