

MK1

EXPERIMENTAL



Liquid Metal 3D Printer

The Mk1 Experimental by Vader Systems represents a revolutionary advancement in metal manufacturing. Centered on Vader's patent-pending MagnetoJet technology, the Mk1 liquifies metal in a 750°C chamber encased in an electromagnetic field and propels it through print nozzles similar to an inkjet printer—allowing full control of the Earth's most abundant metal, Aluminum. This technology is delivered through a 19" touchscreen user interface, unlocking the potential of its Siemens motion controller and creating an intuitive operator experience.

VADER

MagnetoJet Technology



VADER'S PATENT-PENDING MAGNETOJET TECHNOLOGY is based on the field of MagnetoHydrodynamics (MHD), or more simply: the manipulation of liquid metal through magnetism. MagnetoJet's physics are accomplished by feeding Aluminum wire through a 1200°C heated chamber, where it becomes molten. This molten media is then electromagnetically propelled from a ceramic nozzle. Aluminum was an intentional first step, but MagnetoJet will evolve to printing higher temperature metals from potentially thousands of printing heads and multi-metals, all within one machine.

Mk1 Experimental Ownership Benefits



Early adopters of the Mk1 Experimental gain best pricing on current and future orders, one year of regular upgrades and normal wear items on first unit at no extra charge, priority access to Mk1/Mk2 production schedule, direct connection to the product development team for feature upgrades and input into Mk2 product specification—not to mention early access to ground-breaking MagnetoJet technology.



Mk1 Specifications

Material	Aluminum 4043, 6061, 7075
Input Material Form	0.035 in. (0.9 mm) wire
Material Packaging	16 lb. spools
Droplet Range	300 μ m to 500 μ m
Droplet Rate	1000 Hz
Envelope (x,y,z)	12 in. x 12 in. x 12 in. (300 mm x 300 mm x 300 mm)
Max. Part Mass	80 lbs. (40 kg)
Deposition Rate	1 lb. per hour based on 500 μ m droplet size
Shield Gas	Argon
Motion Controller	Siemens Flagship 840D-SL with 19 in. touchscreen
Max Feed Rate	39.4 in./sec (1000 mm/sec)
Machine Weight	2500 lbs.
Floor Space	41.57 in. x 113.52 in. (includes 12 in. additional for Argon tank)
Electrical	480 VAC, 3 ph. 4 wire, 40 Amp

Software

Converts standard STL object files from CAD software to Siemens standard G-Code

Printhead Heating System

Max Operating Temp.	900 ° C
Power	2 kW
Cooling System	Custom Liquid Cooling

Key Differentiators

-  **Material Type:** Low cost commodity wire
-  **Material Capability:** Aluminum and its alloys
-  **Minimum Droplet Size:** 300 micron
-  **Build Rate:** Up to 1lb. per hour
-  **Total Printed Part Cost:** 90% part cost reduction vs. Powder Bed Fusion

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