

DIRECTED ENERGY DEPOSITION

# MAGIC 800



Our flagship DED solution to build large parts, repair, and add features, with the industry leading process stability.



**AddUp**  
THINK SMART. MANUFACTURE DIFFERENT.

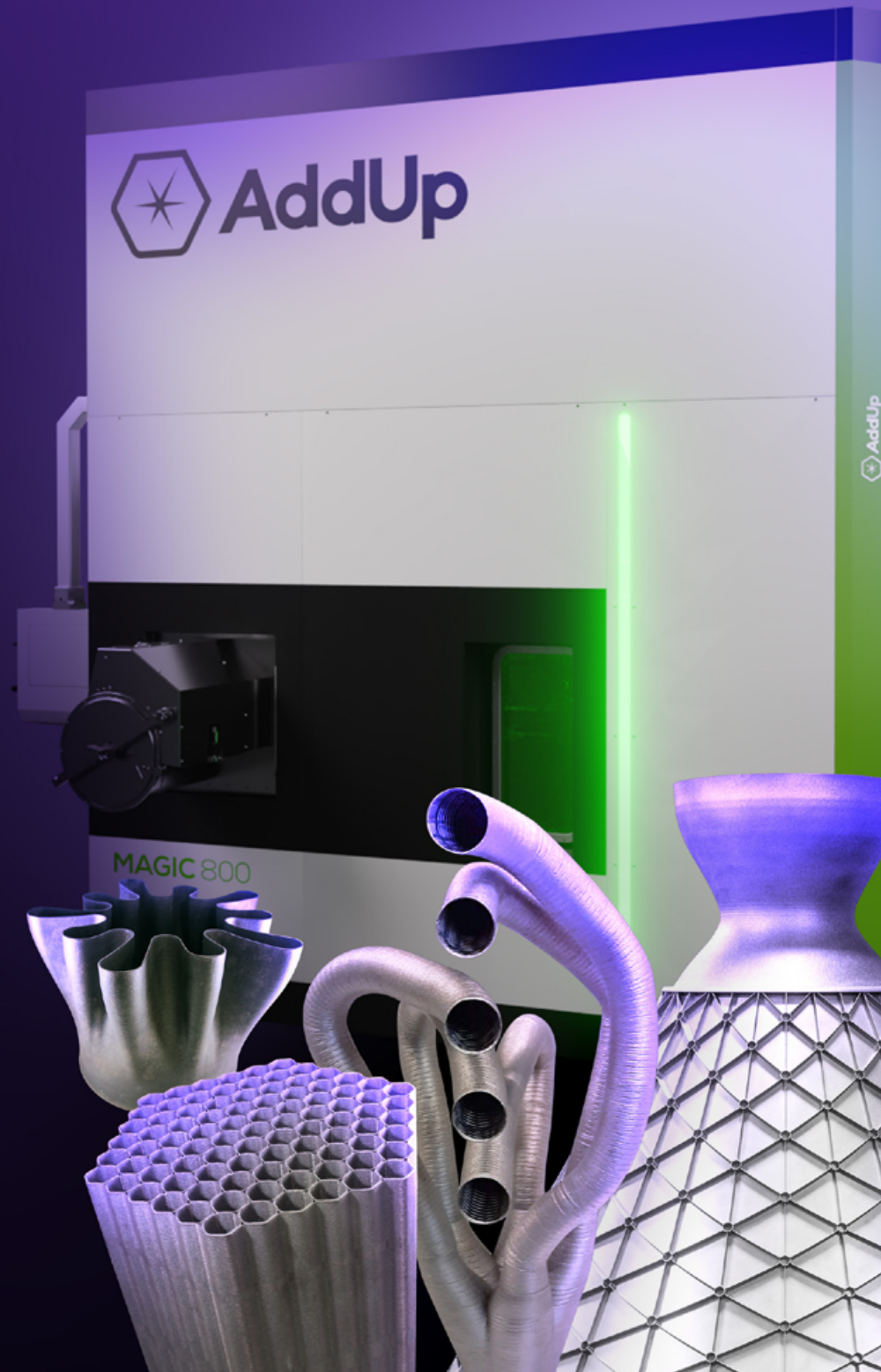
# MODULO 800

## HIGH-VOLUME, HIGH-POWER PRODUCTION

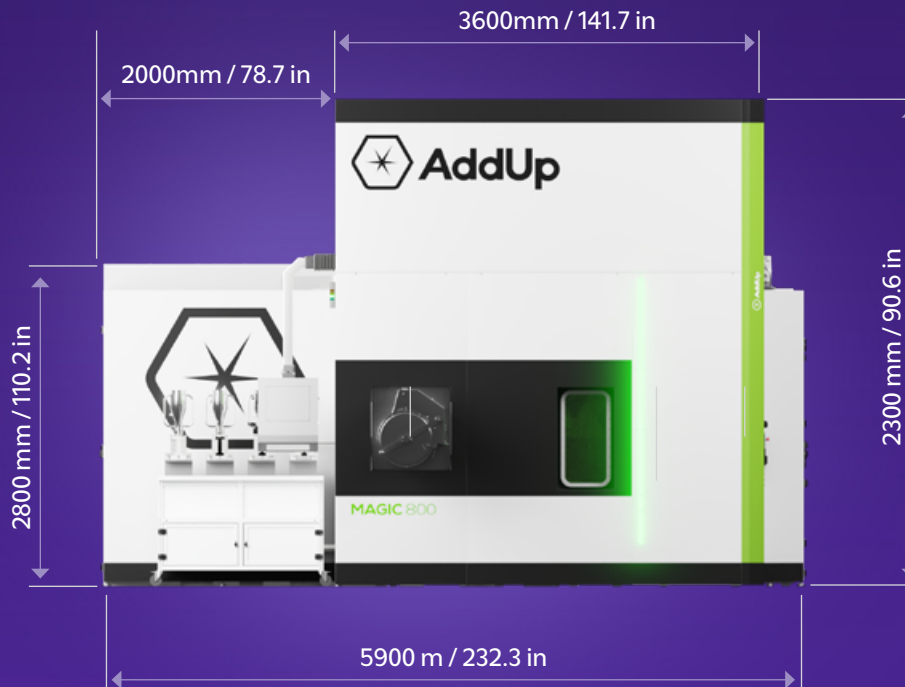
AddUp is an Additive Manufacturing OEM, built from the legacy of industry leaders Michelin and Fives. We bring the latest multi-technology production systems, but we also come from the world of manufacturing.

Born from the needs of the manufacturing world, we possess an intimate understanding of its nuances and challenges, having personally experienced them. We not only comprehend how to leverage it but also possess the capability to qualify and scale.

The Magic 800 is suitable for medium and large metal part rate production and repair without the need for support structures. Add additional features to preexisting structures to optimize cost, quality, and time.



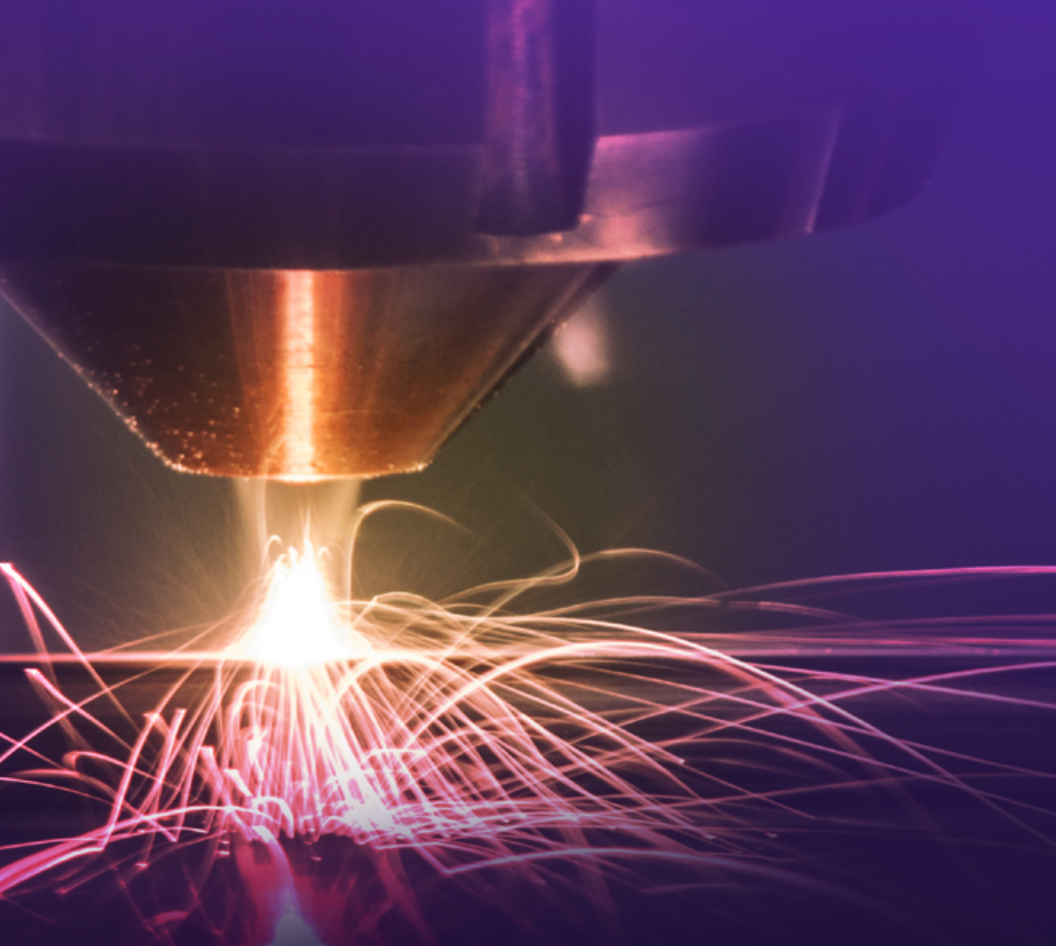
# MACHINE LAYOUT



# TECHNICAL SPECIFICATIONS

|  |  |
|--|--|
| <b>Dimensions</b>                          | L 5.9 x W 7.2 x H 4.1 m (see layout)                       |
|  | Global weight: ~ 20 T                                      |
| <b>Build volume (3 axis)</b>               | X=1000 x Y=1800 x Z=800 mm (~1440 L)                       |
| <b>Number of axis</b>                      | 5 continuous axis (X/Y/Z/A/C)                              |
|  | Ball screw actuators with asynchronous motors (AC)         |
|  | Strokes:   |
|  | X = 1000 mm  |
|  | Y = 1800 mm  |
|  | Z = 1000 mm  |
| <b>Linear axis</b>                         | Maximum speed X/Y/Z: 30 m/min                              |
|  | Precision X/Y/Z: $\pm 25 \mu\text{m}$                      |
|  | Repeatability: $25 \mu\text{m}$                            |
|  | Harmonic Drive Transmission                                |
|  | Strokes:   |
|  | A = $\pm 110^\circ$  |
|  | C = $\pm 360^\circ$  |
| <b>Rotary axis</b>                         | Maximum speeds:  |
|  | A = 50 rpm   |
|  | C = 100 rpm  |
|  | Accuracy A/C: $0.015^\circ$                                |
|  | Repeatability A/C: $0.01^\circ$                            |
|  | Circular   |
|  | $\varnothing = 700 \text{ mm}$                             |
| <b>Table</b><br>(workpiece holding system) | Clamping element fixations: 6 T-slots                      |
|  | Maximum admissible load 5 axis: 500 kg (incl. part holder) |
|  | Maximum admissible load 3 axis: 800 kg (incl. part holder) |
|  | Temperature monitoring sensor                              |
| <b>Computer Numerical Control (CNC)</b>    | Version: SIEMENS Sinumerik One                             |
|  | Touch control screen display / 19"                         |
|  | Compatibility G-code                                       |





## MATERIALS

All deposition parameters are modifiable, including the powder flow rate, deposition speed, and laser powder.

Our Directed Energy Deposition machines allow the use of many different types of metal powders. Here are some of our machine tested materials:

- Ti64
- Stainless steel 316L
- Stainless steel 17-4PH
- Maraging steel 300
- H13
- Inconel 625
- Inconel 718
- Hastelloy X
- R&D possible for other alloys

## POWDER HANDLING

|                                   |  |
|-----------------------------------|--|
|                                   | Cord width: 1.8 to 2.2 mm  |
|                                   | Deposition accuracy: $\pm 0.2$ mm  |
|                                   | Deposition rate: 90 to 130 cm <sup>3</sup> /h  |
|                                   | Laser power range: 400 – 2000W   |
| <b>Deposition head 24Vx</b>       | Optical fiber type: Ytterbium  |
|                                   | Fiber diameter: 600 $\mu$ m  |
|                                   | Laser wavelength: 1070 nm  |
|                                   | Laser power stability: $\pm 1\%$ (typical) / Max. $\pm 3\%$ over 4 hours                   |
|                                   | Cooling: chiller air/water   |
|                                   | Powder feeder technology: vibration  |
|                                   | Number of feeders: 2 (2 more optional)   |
| <b>Powder delivery system</b>     | Capacity: 2.5 L (~ 13 kg of standard steel)  |
|                                   | Flowrate: 1 to 30 g/min  |
|                                   | Flowrate stability: $\pm 5\%$  |
| <b>Filtration and passivation</b> | Automatic unclogging system  |
|                                   | Calcium carbonate passivation of residue   |
|                                   | For reactive material:   |
|                                   | High level safety  |
|                                   | Better material metallurgical health   |
|                                   | Purification unit: 2 reactors (columns) with automatic scan/ purification cycle management |
|                                   | Glove box on the front door  |
| <b>Controlled atmosphere</b>      | Accurate measurement and traceability of O <sub>2</sub> and H <sub>2</sub> O levels (ppm)  |
|                                   | Antechamber to load/unload small parts while maintaining the controlled atmosphere         |
|                                   | Max. concentration levels:   |
|                                   | O <sub>2</sub> : 40 ppm  |
|                                   | H <sub>2</sub> O: 50 ppm   |
|                                   | Regeneration time: 15 hours per columns  |
|                                   | Manual Door  |
| <b>Antechamber</b>                | Internal dimensions: 570 x 220 x 280mm   |
|                                   | Max. load : 12 kg  |

# OPTIONAL UPGRADES

|                               |  |
|-------------------------------|--|
|                               | Cord width: 0.8 to 1.2 mm  |
|                               | Deposition accuracy: $\pm 0.1$ mm  |
|                               | Average deposition rate: 15 to 20 cm <sup>3</sup> /h                     |
|                               | Laser power range: 200 – 500W  |
| <b>Deposition head 10Vx</b>   | Optical fiber: Ytterbium   |
|                               | Spot diameter: 200 $\mu$ m   |
|                               | Laser wavelength: 1070 nm  |
|                               | Laser power stability: $\pm 1\%$ (typical) / Max. $\pm 3\%$ over 4 hours |
|                               | Cooling: chiller air/air   |
|                               | Integration of:  |
|                               | 10Vx deposition head   |
| <b>Automatic tool changer</b> | 24Vx deposition head   |
|                               | Touch probe system   |
| <b>Touch probe</b>            | Renishaw RMP40   |

# IN-HOUSE DESIGNED NOZZLES. THE CO-AXIAL DIFFERENCE.

Our in-house designed nozzles achieve a smoother finish, with better meltpool control, and less overspray for minimal post processing. Two different nozzles can be mounted on our DED machines: the 24Vx for productivity with up to 2.2mm width, and the 10Vx, perfect for working on fine parts with a deposition 0.8 to 1.2 mm deposition width.



# CONNECTIONS

|                    |  |
|--------------------|--|
|                    | Voltage: 400 V – 50 Hz or 460 V – 60 Hz                          |
| <b>Electrical</b>  | Power: 137 kW  |
|                    | Current: 245 A   |
|                    | 3 filtration levels: prefilter, HEPA and chemical filter         |
| <b>Extraction</b>  | Flowrates:   |
|                    | Ambient: 2000 m <sup>3</sup> /h / 70629 ft <sup>3</sup> /h       |
|                    | Cont. atmos.: 250 m <sup>3</sup> /h / 8828 ft <sup>3</sup> /h    |
| <b>Environment</b> | Temperature: 15 to 25°C  |
|                    | Humidity: 30 to 60%  |
|                    | Type: Argon  |
|                    | Min. purity: > 99.95% mini                                       |
|                    | Recommended purity: > 99.998%                                    |
| <b>Gas</b>         | Consumption:   |
|                    | Purge / prod.: < 12 m <sup>3</sup> /h / 423.8 ft <sup>3</sup> /h |
|                    | Purification: 2 m <sup>3</sup> /24h / 247.2 ft <sup>3</sup> /24h |
|                    | General pressure: 6 bar / 87 psi (pressure reducer integrated)   |
|                    | Regeneration pressure: 1 bar / 14.5 psi                          |

## INERT CHAMBER

The inert chamber in our Directed Energy Deposition machines enables the use of reactive powders.

This feature makes our DED machines one of the few on the market capable of producing both titanium and aluminum parts.







## A GOLD STANDARD OF SERVICE

When you choose AddUp, you're choosing a partner who will be with you every step of your journey. Experience best in class safety on a repeatable, reliable platform, with support at every stage to realize the full potential digital manufacturing has to offer.

### BEFORE PURCHASE

- Acquire basic knowledge in metal additive manufacturing
- Optimize parts for the L-PBF or DED process
- Produce your proof of concept
- Calculate your ROI and consolidate your business model
- Evaluate with on-site inspections
- Define your future additive manufacturing workshop

### AFTER PURCHASE

- White-glove installation service to get you up and running in less than 2 weeks
- Operator training adapted to your employees
- Support services for the qualification of your application

### AFTER INSTALL

- Rapid response times
- Maintenance contracts adapted to the needs of your business
- Spare part kits that allow you to restart quickly
- Process experts and application engineers available
- Material development services
- Support as your business grows by upgrading equipment
- A pathway to fully automate your AM workshop



## OUR CERTIFICATIONS

We operate with a strong focus on quality, efficiency, and customer-centricity. Our processes and systems have been reviewed and validated for compliance to applicable ISO standards.



# CONNECT



AddUp Solutions

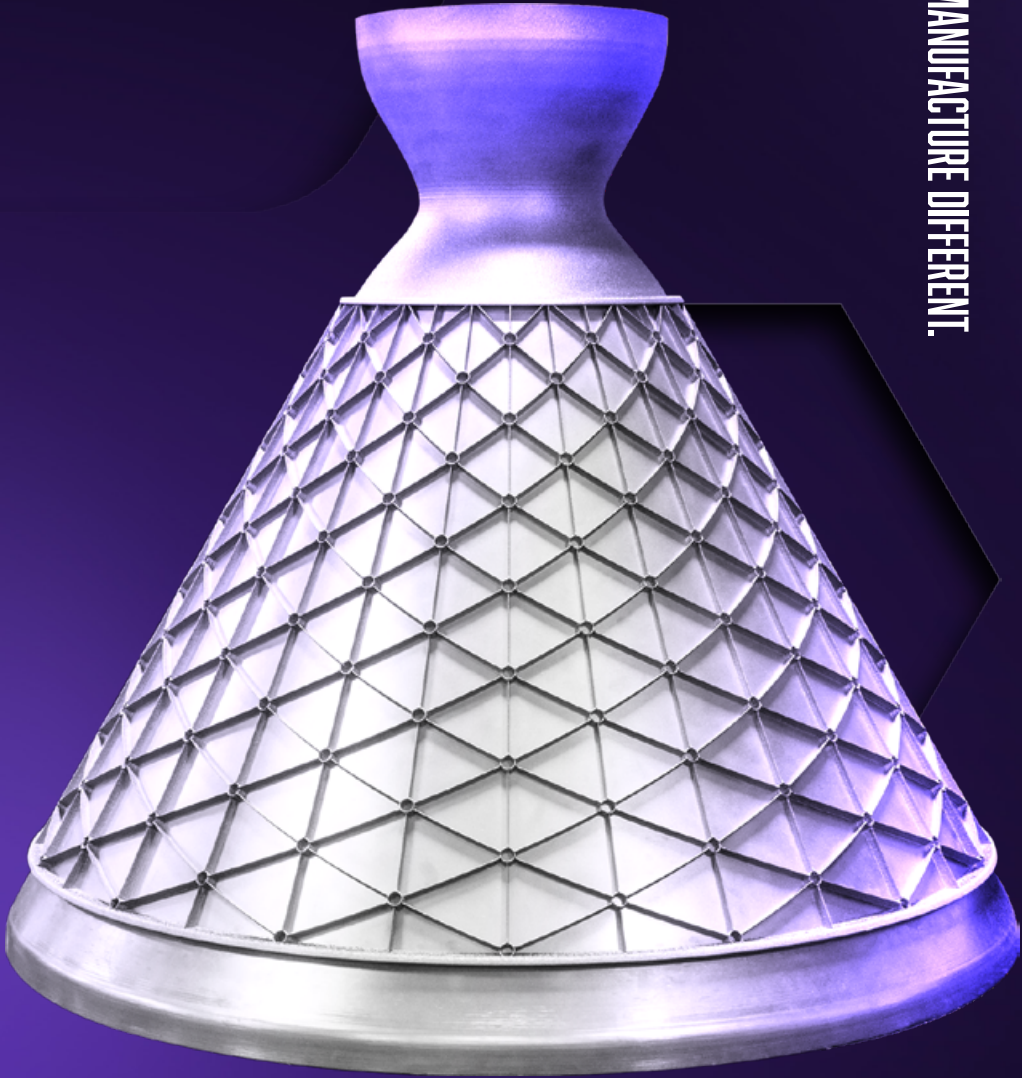


AddUp Solutions



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