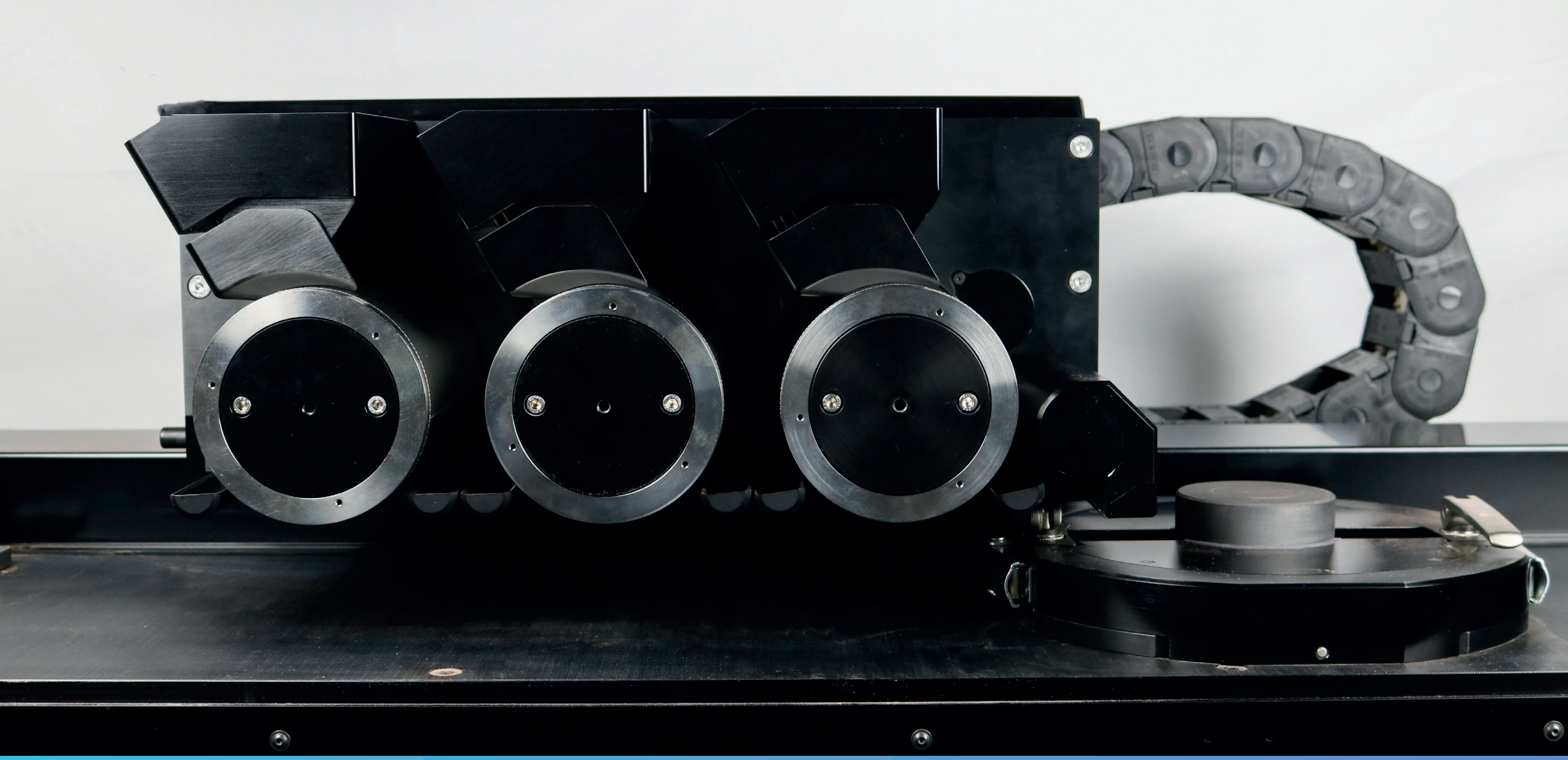


SPS Multi-Material Additive Manufacturing

How Selective Powder Deposition technology is the key to multi-material additive manufacturing.

Use Cases

Multi-material applications

Thermal Conductivity / Insulation

Conformal cooling channels (moulds, rocket nozzles, injection nozzles, brake calipers...), heat exchangers /sinks /pipes

Electrical Conductivity / Insulation

Battery connectors, satellite power transfer, thermo-electric modules, shielding, embedded sensors

Wear Resistance

Plain bearings, low friction profiles

Magnetic performances

Motors, actuators, wave propagation optimization, antennas

Aesthetics

Luxury applications (watches, fashion accessories), sport accessories

Abrasion / Corrosion Resistance

Drillbit inserts, cutting tools, chemical reactors, conformal cooling

Unlocking Multi-Material Additive Manufacturing

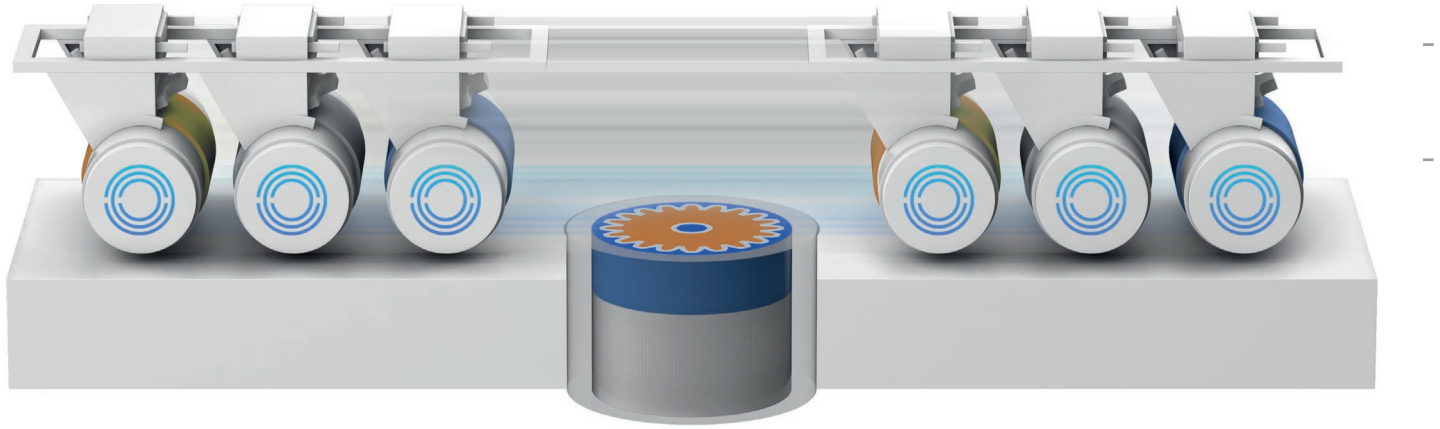
SPD technology for SPS additive manufacturing

Aerosint introduced

Aerosint was founded in 2016 with the goal to make powder based Additive Manufacturing multi-material. To accomplish that, it quickly became obvious that the powder spreading method needed to be completely redesigned.

The major breakthrough from Aerosint is the invention of a technology called “Selective Powder Deposition (SPD)”. This patented technology selectively deposits two (or more) powders to form a single layer containing several materials. SPD is the key to unlock multi-material AM.

Aerosint is since June 2021 part of Desktop Metal Inc. and operates out of Belgium with customers worldwide.



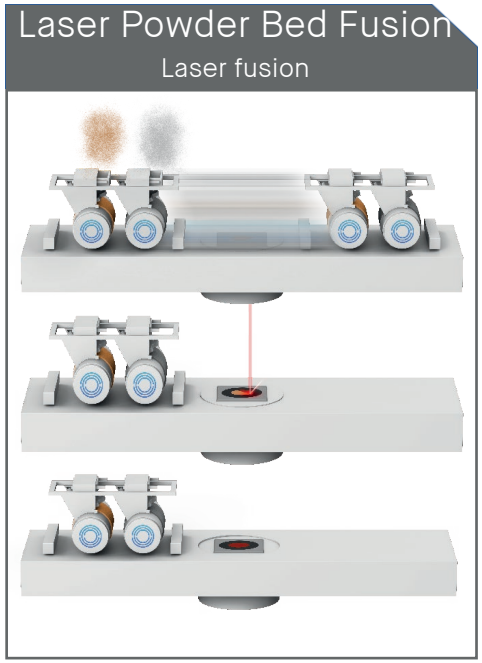
Selective Powder deposition

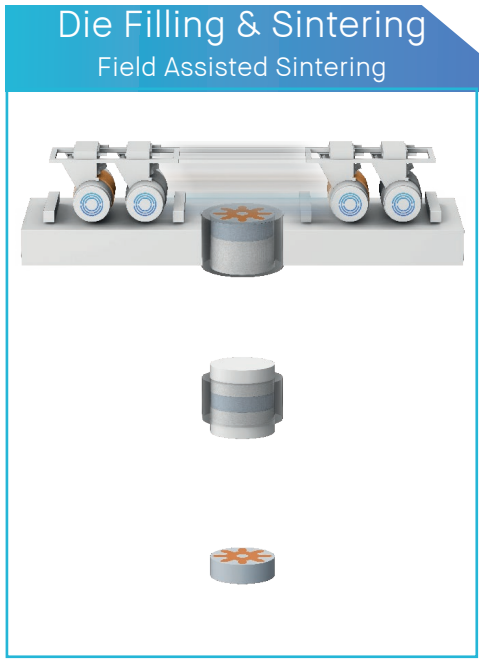
SPD Technology Explained

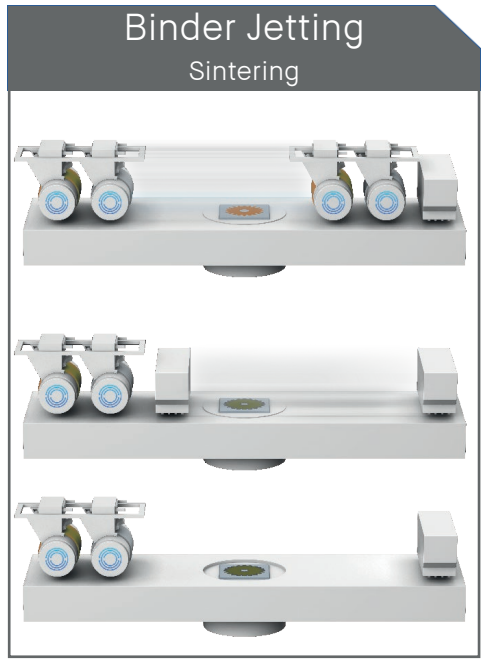
The SPD technology is an alternative to single material roller or blade recoaters traditionally used in powder bed processes.

This technology selectively deposits multiple powders to form a single layer containing at least two materials. The rotating powder patterning drums (1 per material) ‘print’ 300 µm powder pixels to form an homogeneous multi-material powder layer.

The technology applies to multiple additive manufacturing techniques like Laser Powder Bed Fusion (L-PBF), Binder Jetting or Die filling & Sintering.







SINTERING SYSTEM

Automatic die filling machine

For multi-material sintering research

This Aerosint die filling platform is a standalone setup allowing to stack up to 3 powders precisely in a mold with the SPD technology.

This bulk powder can then be sintered using Field Assisted Sintering Technology. This binder-free technique enables the combination of multiple materials into a multimaterial blank ready for final machining.

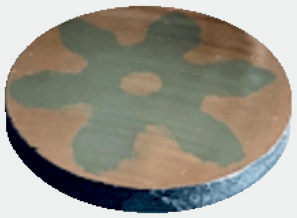
This equipment can be used with metal powders, ceramic powders and combinations

Key Benefits

- **Easy to use**
- **Allows research on multi-material**
- **Multi-material blanks creation**
- **Near net shaping**

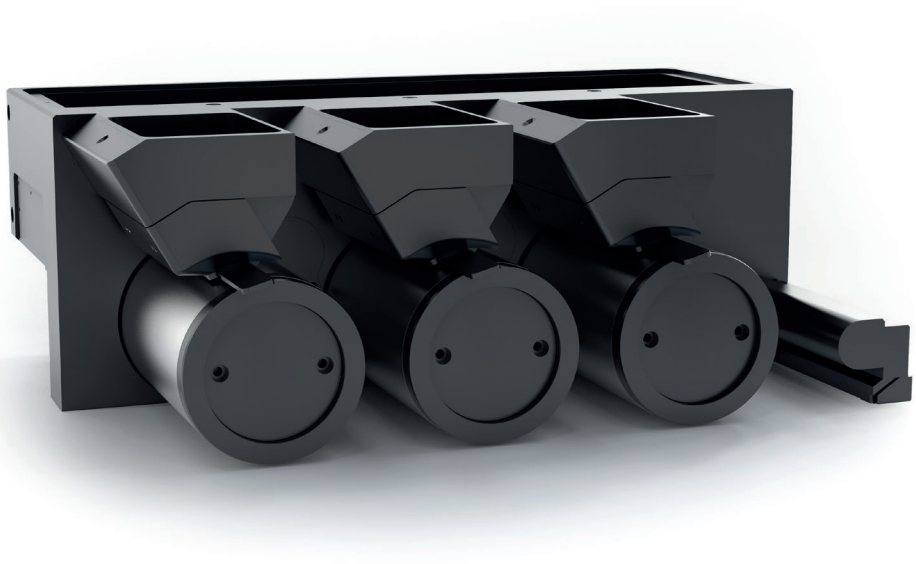
Technology Die pressing/Sintering	**Materials** up to 3
Material type Ceramics and metals	**Size** ≤ 100 mm Ø dies

Multi-material blanks



Near net shaping

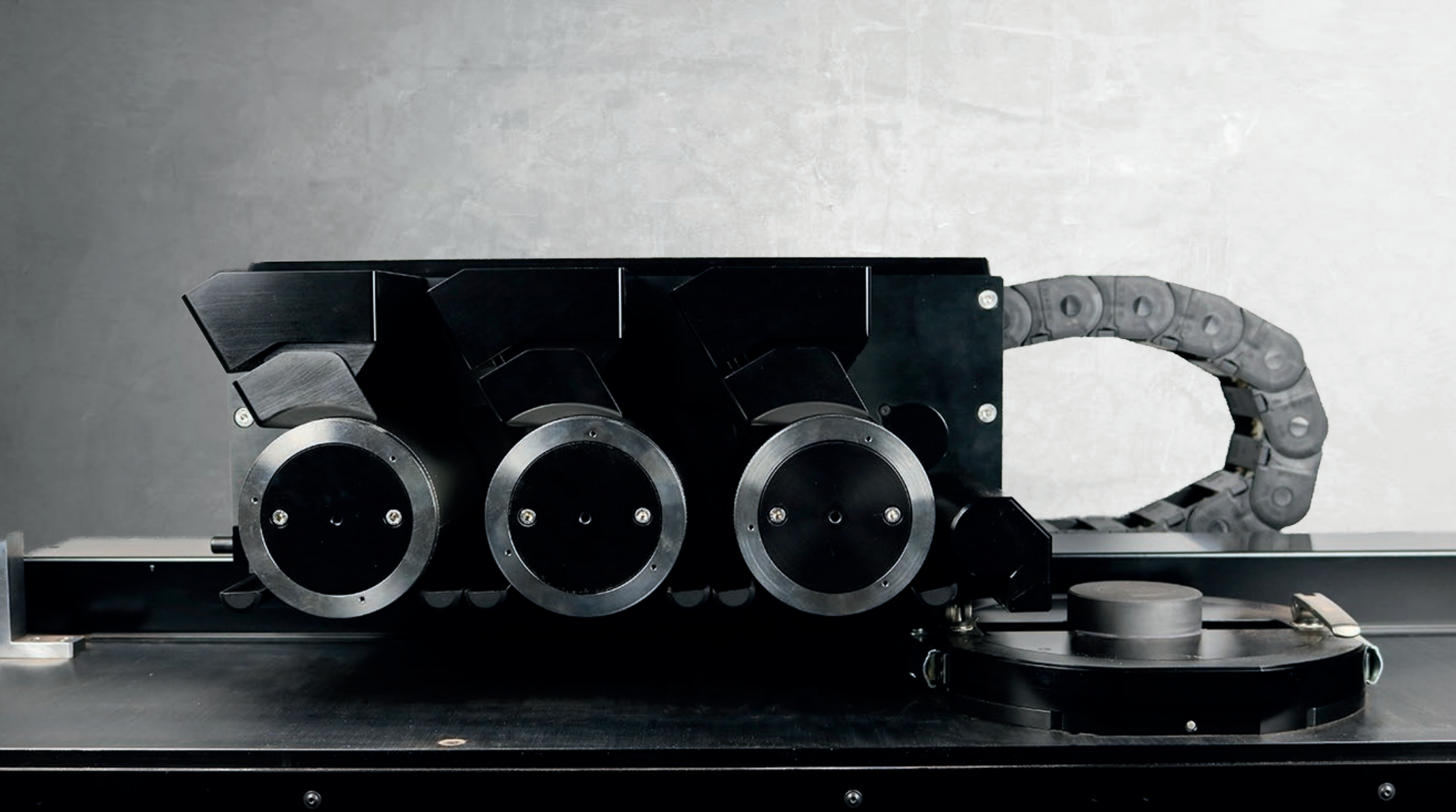
3 Material Recoater



Simultaneous material deposition	3
Deposition width	115 mm
Min. layer thickness at the deposition	80 µm (in process layer height control)
Min. layer thickness when using the leveler	50 µm
Recoating speed	Up to 50 mm/s
Lateral powder pixel resolution	300 µm
Integrated powder containers	400 mL per drum
Hoppers size	Optional recoater hoppers available for continuous printing
Max operating temperature	80 °C
Control software and interface	Aerosint control software
Recoater size	480 x 361 x 182 mm
Recoater weight	28 kg (without powder)

Key Benefits

- **Fast and precise powder deposition**
- **Up to 3 materials simultaneously**
- **Compatible with standard LPBF powders**
- **Patended**



For graphite and steel dies offering a wide range of consolidation options, including sintering via Hot-Pressing or Field Assisted Sintering (FAST/SPS).

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