

## Multi-Material Sintering

Selective Powder Deposition technology to unlock multi-material sintering

# Unlocking Multi-Material Additive Manufacturing



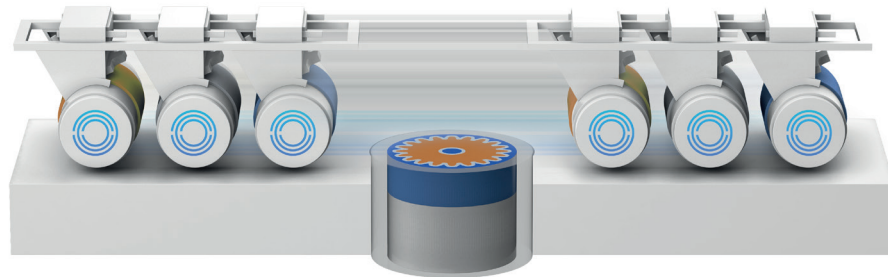


## Aerosint introduced

Aerosint was founded in 2016 with the goal to make powder based Additive Manufacturing multi-material.

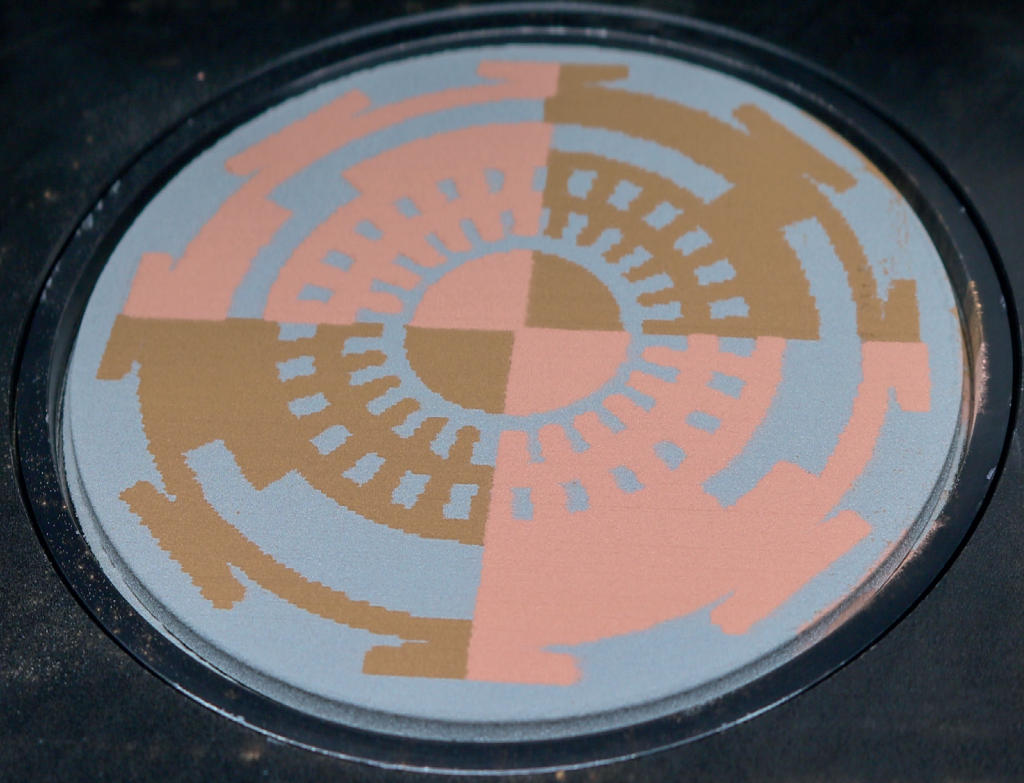
The major breakthrough from Aerosint is the invention of a technology called “Selective Powder Deposition (SPD)”. This patented technology selectively deposits two (or more) powders to form a single layer containing several materials. SPD is the key to unlock multi-material applications.

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





## Selective Powder deposition



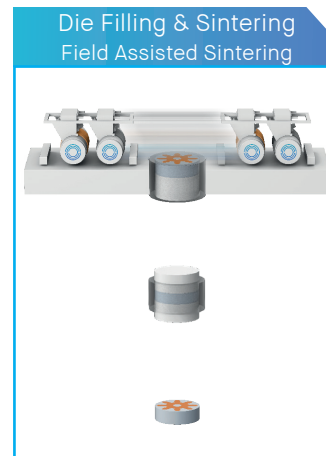
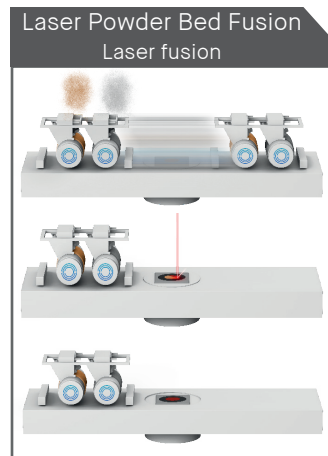


## SPD Technology Explained

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  $\mu\text{m}$  powder pixels to form an homogeneous multi-material powder layer.

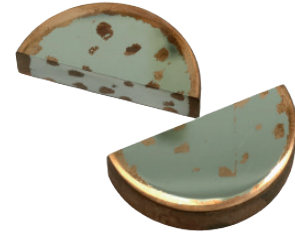
The technology applies to multiple additive manufacturing techniques like Laser Powder Bed Fusion (L-PBF), Binder Jetting or Die filling & Sintering.



# SINTERING SYSTEM

## Automatic die filling machine

### For multi-material sintering research



The Aerosint die filling machine allows to stack up to 3 powders precisely in a mold with an internal diameter of up to 100 mm / 3.94 inches. The powder placement is determined from a digital design defined by the user.

After uploading this file in the controlling software of the machine, the die is automatically filled layer by layer.

The die filled with powder can subsequently be sintered using hot pressing or field assisted sintering methods. This binder-free technique enables the combination of multiple materials into a multi-material blank or near net shape.

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

#### Key Benefits

- **Automated filling of dies (VS manual)**
- **Complex shaped dies possible**
- **Multi-material blanks creation**
- **Near net shaping**
- **Functionally graded materials**

Technology	Materials
Die pressing/Sintering	up to 3
<b>Material type</b>	<b>Size</b>
Ceramics and metals	≤ 100 mm Ø dies ≤ 3.94 inches

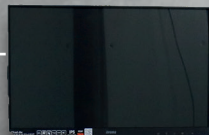




Integrated touch screen

Up to 3 materials

User friendly set up



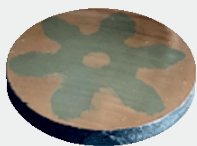
Automatic filling of dies (digital process)

Up to 100mm / 3.94 inches dies, custom geometry

Consistency and repeatability



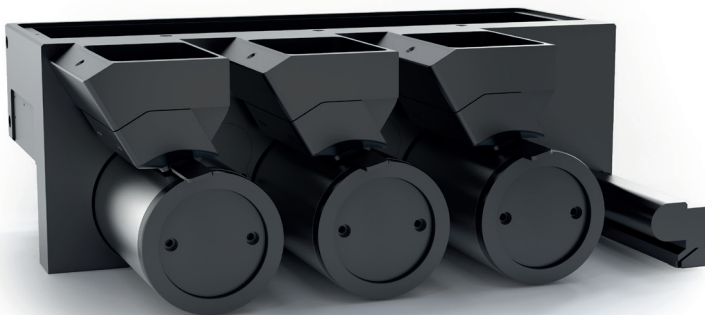
Multi-material blanks



Near net shaping



## 3 MATERIAL RECOATER



Simultaneous material deposition	3
Deposition width	115 mm / 4.53 inches
Min. layer thickness at the deposition	80 $\mu$ m (in process layer height control)
Min. layer thickness when using the leveler	50 $\mu$ m
Recoating speed	Up to 50 mm/s / 1.97 inches /s
Lateral powder pixel resolution	300 $\mu$ m
Integrated powder containers	400 mL per drum
Recoater size	480 x 361 x 182 mm / 18.9 x 14.2 x 7.2 inches

### Key Benefits

- Fast and precise powder deposition
- Up to 3 materials simultaneously
- Compatible with standard powders
- Patented





Use Cases

# Multi-material applications

## Die Filling Set Up



### **Automotive**

Brake pads, heat sinks for electronics, engine components, conductors/insulators.



### **Energy and Power**

Thermoelectric modules, gas turbine blades.



### **Manufacturing**

Hard alloy tools, reinforced cutting tools, sputter targets.



### **Aerospace & Defense**

Magnetic shielding, high temperature ceramic matrix composites, metal matrix for high stiffness.



### **Research**

Multi-layer sandwich structures, functionally graded materials, nanophases, porous materials.



### **Other Applications**

Colored ceramics for watches, precious metals combination for jewellery, fine ceramics combination.



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



## Contact us

**Aerosint.com**

sales@aerosint.com

+32 (0)4 422 167 30

CAP Business center  
31 Rue D'Abhooz | 4040 Herstal BELGIUM

#Team DM



**Desktop Health™**



**aidro**



**Aerosint.com**

**#Team DM | NYSE: DM**

2023 Desktop Metal, Inc. All rights reserved