

We pioneer motion

# Additive manufacturing with metal multi-material

Unique material combination and function integration



# Customer benefits through multi-material additive manufacturing

## **New perspectives thanks to multi-material**

In many areas, additive manufacturing has already established itself as an alternative to the conventional production of workpieces that were traditionally manufactured by turning, grinding, milling or ablation, ... In this context, multi-material 3D printing opens up almost unlimited possibilities.

## **Additive manufacturing**

is simpler than conventional manufacturing processes when it comes to producing components with complex geometries. A key enabler of Industry 4.0, it also offers a number of sustainability benefits, including reduced material consumption, increased energy efficiency in production, and material options that are more environmentally friendly.

### **Our 3D-multimaterial additive manufacturing system - called OmniFusion 3D - empowers you for**

- unique material combinations
- innovative functional integration in products & tools
- flexibility in form for individual, free design of products & tools
- fast response to changing market requirements and designs
- Reduced lead time, especially for tools & prototypes

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*The metal multi-material additive manufacturing is pioneering the revolution of healthcare, aerospace and automotive industry.*

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# Technology lead due to unique competence

## **Selective powder deposition**

Schaeffler Aerosint SA is a specialist in innovative additive manufacturing technologies.

Since October 2023 Aerosint is 100% part of Schaeffler and part of the Special Machinery network.

As leading company for multi-material applications, Schaeffler Aerosint SA is a key player to unlock the possibilities of new material combinations.

## **Automation & industrialization**

With more than 70 years of experience in production we at Schaeffler Special Machinery are experts for innovative manufacturing turnkey solutions - all in one from the idea and the development through to the design and implementation of the machines.



# INNOVATION MEETS DECADES OF EXPERIENCE

## **Holistic production solutions**

Combining the core competencies of Schaeffler Special Machinery and Schaeffler Aerosint SA we are reaching a milestone for additive manufacturing. Our new system, called OmniFusion 3D, will be a benchmark for the industrial application of metal multi-material additive manufacturing.

The innovative solutions from Schaeffler Aerosint SA and the decades of industrialization know how of Schaeffler Special Machinery merge into extended customer value add .

## **Our goal is to take a holistic approach**

From the design of the 3D geometry to the ready-to-use component. We ensures seamless integration into existing production workflows, from conception to fabrication.

Going beyond conventional boundaries, we combine cutting-edge technology with extensive expertise to accelerate product development and meet individual needs.

# OmniFusion 3D



Schaeffler Special Machinery OmniFusion 3D

### The „printing“ process

involves the deposition of material on the print bed in layers. Our innovative technology enables the use of up to three different materials, which are supplied by integrated powder reservoirs into the recoater. There, the material powders are arranged pixel-wise on the build platform and deposited layer by layer. During the scanning step, the part is created.

### Multiple laser sources and scanners

can be used to process a wide range of materials efficiently, like metals or ceramics. The printing process itself takes place in a sealed process chamber, filled with argon inert gas.

# Innovative material coating process

### Our unique competence

in 3D multi-material additive manufacturing is especially based on machinery know how as well as competence in automation solutions and the entire process chain.

### OmniFusion 3D details:

- component size: 250 x 250 x 250 mm
- pixel size: 0,3 mm
- layer thickness: 40-200 µm
- density: e.g. copper 98% & steel 99%
- 10 - 500 mm /s recoater speed
- spot size 25 mm ÷ 250 mm (AFX laser)

### In cooperation with our partners,

we offer a comprehensive range of services, including the machine, the corresponding software, and the provision of the printing material.

In addition, we provide complementary services such as „Design to Additive“, supporting our customers in the design of their 3D models, as well as services around measuring and calibration to ensure that the 3D manufactured products are of high quality and reliably produced by our machine.

### Recoater details

Deposition width	250 mm / 4.53 inches
Min. layer thickness at the depositions	80 µm (in process layer height control)
Min. layer thickness when using the leveler	40 µm
Recoating speed	Up to 50 mm/s / 1.97 inches/s
Integrated powder containers	400 ml per drum
Recoater size	480 x 361 x 182 mm / 18.9 x 14.2 x 7.2 inches
Software	Special Machinery with MCP from Materialise

# 300 µm

powder pixel resolution for the recoater and die filling platform with up to



# Applications with the use of different materials

## Tool components

### Injection molding insert

- high thermal conductivity
- fast availability of near-end-shape semi finish
- low waste of tool material

### Welding brackets

- high wear resistance and thermal conductivity
- minimal material waste



Injection molding insert



Welding brackets



Heat sink with organic structure



Medical implantW

## Products

### Heat sink

- organic structure
- high surface area for improved cooling
- high thermal conductivity with lightweight housing

### Medical implants

- innovative joint materials
- righth material at the right place

## Prototypes

### Hydrogen applications

- increased integration level
- reduction of precious materials
- controlled porosity

### Electric motor coil

- fully flexible design
- fast component availability

# Offering for “hard-to-weld” applications

## The die filling platform

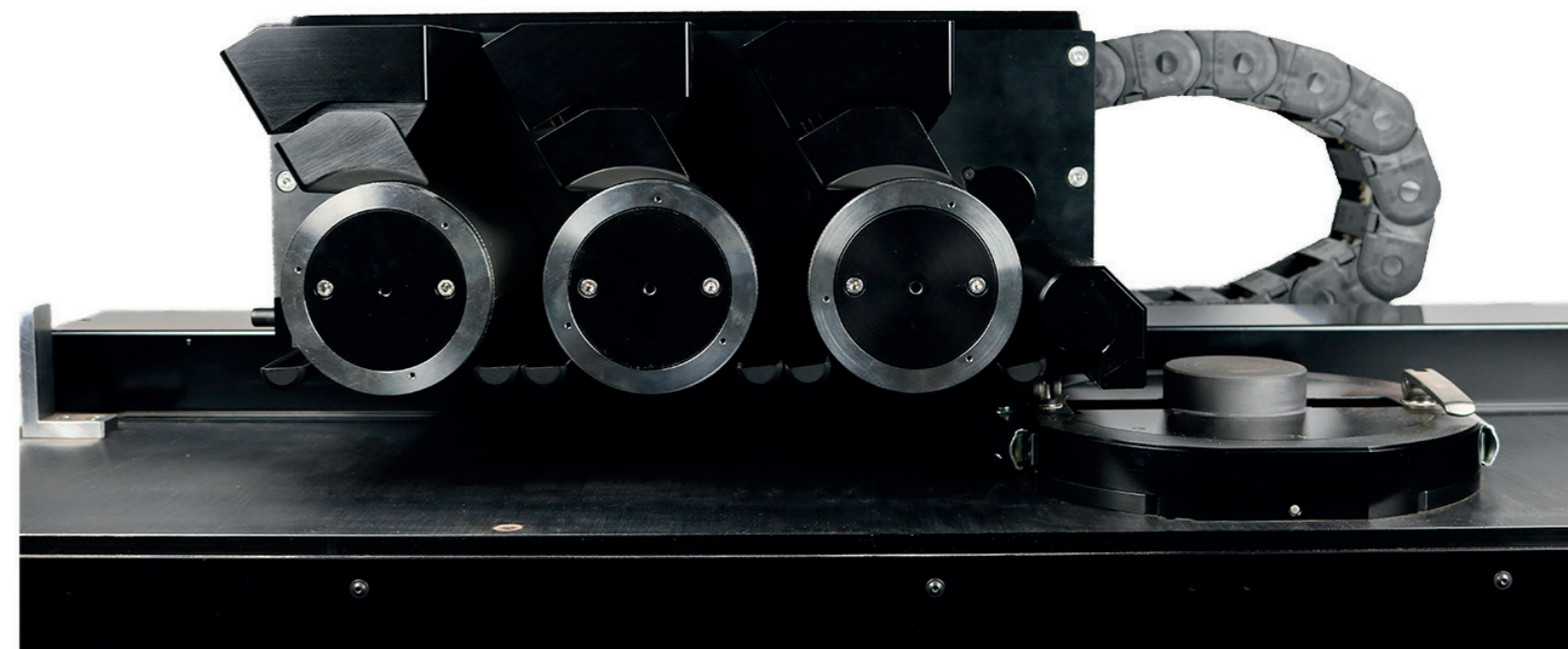
allows to stack powders precisely in a mold with an internal diameter of up to 100 mm / 4 inches. The powder placement is determined from a digital design, defined by the user. After the transfer in the controlling software of the machine, the die is automatically filled layer by layer, which can subsequently be sintered using conventional or pressure-assisted methods.

# 3

up to 3 different materials.

## Die filling platform details

Machine size	480 x 360 180 mm / 18.9 x 14.2 x 7 inches
Layer thickness	<ul style="list-style-type: none"> <li>• minimum at deposition 120 µm</li> <li>• minimum with use of leveler 40 µm</li> </ul>
Recoating speed	50 mm/s / 1.97 inches/s
Powder deposition width	115 mm
Powder containers	500 ml
Maximum operating temperature	50° C / 122° F
Software	Aerosint software





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