

OUR MATERIAL AND PROCESS EXPERTISE YOUR COMPETITIVE ADVANTAGE

Contact us



METAL 3D PRINTING BY MATERIAL EXTRUSION

Why one more
3D printing
method?

3D printing of nearly
all metals

Realisation of
multi-material
structures



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WZR
ceramic solutions

MATERIAL EXTRUSION DEVELOPMENT
KNOWLEDGE 3D PRINTING METAL
OPTIMISATION
BINDER JETTING MATERIAL ANALYSIS
MULTI-MATERIAL



Why one more 3D printing method?

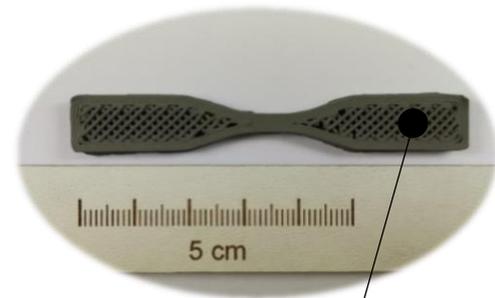
Laser-based methods are very well established for 3D printing metal components. However, the machines are very expensive, the choice of raw materials is limited and in many cases the properties of the printed components do not correspond to what users want.

Material Extrusion (MEX) is the **most cost-effective** of all 3D printing processes. At WZR, we specialise in the route of processing **pastes**, a process that takes place at room temperature. We use commercial metal powders, mix them with our water-based binder system and can produce initial test bodies with small

amounts of powder. The particle size is variable within wide limits, and we are also very flexible with the type of particles. 3D-printed components are sintered **without debinding**, i.e. **less than 2 days** pass from the start of 3D printing to the completion of the thermal process.



Anurag Kadam
project manager MEX



Increasing the levels of freedom

Starting with 200g metal powder



Our business is **material development** for 3D printing processes. We can carry out the first steps of a development with as little as 200g of metal powder. This allows us to obtain statements on feasibility, distinguish promising routes from unsuccessful routes and test initial material properties.

We can process metals in 3D printing that previously could not be processed with other 3D printing processes.

3D printing of nearly all metals

WZR develops pastes with a wide range of metals. We optimise the **3D printing parameters** and produce test specimens, which we sinter and examine. Our strength is our **experience in 3D printing**, our **well-equipped analysis lab** and our targeted development.



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Realisation of multi-material structures

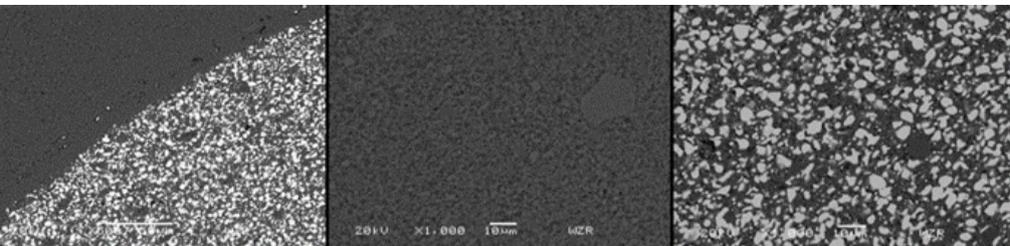
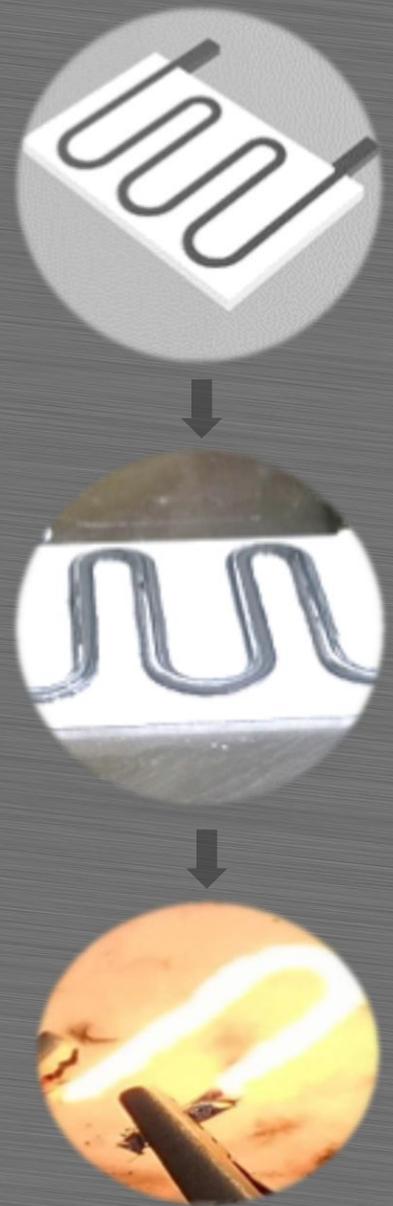
Modern requirements need modern solutions: When a single material is not enough, multi-material 3D printing is the way to go.

Mixing ceramics with metals in one paste can lead to novel properties: Adding alumina to aluminum, gives higher wear resistance.

By **co-extruding** two different pastes it is possible to produce hybrid parts either from two different metals or from metal and ceramic. This means that two properties such as **electrical insulation** and

electrical conductivity can be combined in one component. No other 3D printing method is that much versatile. It is just the beginning, the options are unlimited.

This advantage paired with the geometric **freedom** of additive manufacturing processes, it is possible to create unprecedented components which leads to a **new generation of manufacturing and design**.



How the additive manufacturing process “Material Extrusion (MEX)” improves product creation and production processes:

-  **Geometric freedom:**
No restrictions on creativity due to process-related restrictions
-  **Material-efficient and resource-saving:**
Only material that is contained in the component is consumed
-  **Cost advantages:**
Material Extrusion (MEX) is the most cost-effective of all 3D printing processes



STRENGTHS

Why you will benefit from us:

-  Many years of experience in the development of MEX pastes
-  Extensive experience in 3D printing
-  Observation of material properties with advanced analytical equipment

PERFORMANCES

Our services:

-  Optimisation of component properties by 3D printing
-  Development of novel materials
-  Realisation of multi-material structures



CERAMICS and METALS?

„We shape the future of ceramics“. The key motivation of WZR ceramic solutions. Our engineers are constantly checking ceramics, while also printing and coating with ceramics by using advanced knowledge and machinery, which builds the foundation to open a path to another relevant material: *Metal*. Due to our experience in ceramic 3D printing, we were able to realise the transition to metallic 3D printing by using Material Extrusion within a short period of time. We invite you to benefit from our expertise in process and material development.



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