

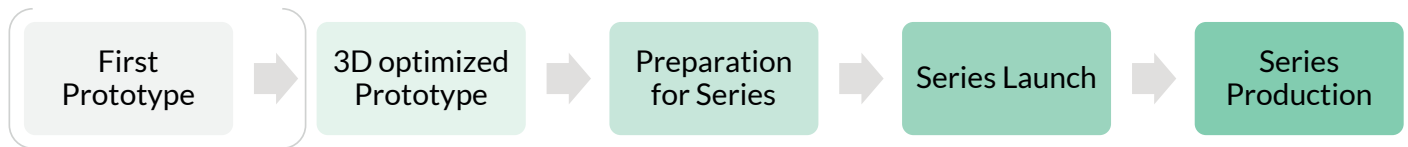
## Our Service Portfolio

**Production service provider for sinter-based additive manufacturing of high-precision small and micro metal parts.**

We offer production services tailored to your individual needs, from a first prototype as an initial sample to a series production of your application. The services are building on each other step by

step, but can also be ordered individually and additional services can be added. MetShape is focusing its services on the optimization and production of small and micro parts for series production.

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	First Prototype	3D optimized Prototype	Preparation for Series	Series Launch	Series Production
<b>details</b>	Prototype as first sample or for general feasibility assessment.	Prototype with 3D printing optimized design.	Finalisation of the component design and preparation of a series overall process.	Analysis of possible tolerances during series production and verification of quality requirements.	Individual series production of the application.
<b>lot size</b>	max. 30 pcs	max. 50 pcs	individual	individual	individual
<b>design optimisation from MetShape</b>	x	✓	✓	x	x
<b>process cycles</b>	1	2	as needed	as needed	as needed
<b>dimensional accuracy</b>	ISO 2768:1 m-c (geometry-dependent)	ISO 2768:1 f-m (geometry-dependent)	ISO 2768:1 f-m (geometry-dependent)	ISO 2768:1 f-m (geometry-dependent)	ISO 2768:1 f-m (geometry-dependent)
<b>measurement protocol</b>	x	Add-On-Service*	✓	✓	individual quality assurance concept
<b>post-processing</b>	x	x	depending on component	depending on component	depending on component
<b>priority production</b>	Add-On-Service*	Add-On-Service*	x	x	x
<b>Analyses</b>	x	x	Add-On-Service*	Add-On-Service*	Add-On-Service*
<b>lead time</b>	3 weeks	from 4 weeks	from 5 weeks	from 6-8 weeks	individual
<b>building on</b>	x	x	3D optimized Prototype	Preparation for Series	Series Launch
<b>optional finishing**</b>	Surface finishing: electropolishing, sandblasting, glass-bead blasting, vibratory finishing, electroplating hardening				

\*details can be found from page 2 onwards  
 \*\* possible extension of delivery time

## First Prototype

### Your benefit

With this service, you receive a first prototype at low cost with short delivery time. This enables a quick initial assessment of the suitability of additive manufacturing for your application.

### Our service

We produce your application according to your CAD design without production-related adjustments in a short time. You receive the result of the first production run, which usually shows further possible optimization potential that can be implemented in the subsequent service stage.

### Advantages

- cost-effective prototype
- short delivery time
- fast initial evaluation of additive manufacturing opportunities

### Limitations

- limited dimensional accuracy
- assembly capability and functionality not guaranteed
- design-changing distortions of the component possible
- potentially not all geometry elements are realized
- no mechanical post-processing included

## 3D optimized Prototype

### Your benefit

The 3D optimized Prototype is suitable for applications where a possible series production is intended. This prototype can be used for the basic evaluation of the series suitability of the part for series production.

### Our service

In the first step, the part is optimized for 3D printing and then printed in two iterations, with the goal of producing an optimized part purely by additive manufacturing.

### Advantages

- production-oriented optimization of the part design
- evaluation for series production of an application possible

### Limitations

- slight distortion of the component possible
- no mechanical post-processing included
- assembly capability and functionality not guaranteed

## Preparation for Series

### Your benefit

After completion of this service, you will receive a production-ready CAD design and prototypes of this design, with which the suitability for series production will be verified.

### Our service

We create a CAD design ready for series production and implement all the necessary quality features for the subsequent series production.

### Advantages

- application is functional and ready for assembly
- CAD design of the application is ready for series production
- post-processing and quality requirements are developed and evaluated on a part-specific basis with the aim of series production

### Limitations

- minimal distortion of the part possible

## Series Launch

### Your benefit

You will receive the real tolerance ranges of the application and the binding series price can be determined.

### Our service

In the series launch phase, the process cycle is optimized in order to meet quality requirements. For this purpose, scrap rates, achievable tolerance ranges and the quality assurance concept required with them are examined and developed.

### Advantages

- series-optimized part design
- series unit price is fixed
- individual QS concept is developed

### Limitations

- number of parts to be manufactured is defined individually (in order that all quality assurance measures that need to be defined can be validated)
- no further modification of the CAD is possible

## Series Production

The series production is an individual service, which depends on the specifications of the customer. MetShape offers a high degree of flexibility in terms of lot sizes and delivery intervals. In addition, individual quality assurance measures are implemented, which ensure the success of series production.

### Advantages

- optimized unit prices
- individual lot sizes and delivery intervals
- quality assurance reports

## Finishing Services

<b>Surface optimization</b>	<p>To further improve the surface of a part after 3D printing, we offer various finishing processes depending on the material, from polishing to electroplating.</p> <ul style="list-style-type: none"> <li>✓ electropolishing</li> <li>✓ sandblasting, glass-bead blasting</li> <li>✓ vibratory finishing</li> <li>✓ electroplating</li> </ul>
<b>Hardening</b>	<p>In addition to surface finishing, we also offer hardening of 3D-printed components made out of 17-4PH.</p>


## Add-On-Services

<b>Priority Production</b>	<p>For prototype production services, priority production can optionally be booked if capacities are available, in order to reduce the specified standard delivery time. For series services, the delivery times are individually coordinated and priority production is no longer applicable.</p>
<b>Measurement protocol</b>	<p>Beim 3D-optimized Prototype kann ein zusätzliches Vermessungsprotokoll angefordert werden. Bei den Seriendienstleistungen sind Qualitätssicherungs- und Vermessungsprotokolle bereits inkludiert.</p>
<b>Analyses</b>	<p>Optionally, the produced 3D printed parts can be evaluated with various analyses.</p> <ul style="list-style-type: none"> <li>✓ 3D scan</li> <li>✓ mechanical parameters</li> <li>✓ Structural analyses</li> </ul>


## Information on specific offer positions

<b>Construction of sinter supports</b>	<p><b>for First Prototype und 3D optimized Prototype</b></p> <p>In order to produce parts with as little distortion as possible, we use so-called sinter supports in the sintering process. These have to be designed individually as they depend on the part geometry.</p> <p><b>Fixed price:</b> 120€ pro CAD design</p>
<b>CAD-Optimization</b>	<p><b>for 3D optimized Prototype</b></p> <p>We charge a fixed price for the optimization of the CAD design to a 3D-optimized design. This optimized design is focusing on the feasibility of the geometry with sinter-based additive manufacturing. For each optimized CAD we charge a fixed price.</p> <p><b>Fixed price:</b> 450€ pro CAD-Design</p>
<b>Application-specific Process optimization</b>	<p><b>for 3D optimized Prototype</b></p> <p>To ensure that the parts suffer from the lowest possible distortion and have a high dimensional accuracy, a process optimization is calculated during the process of the manufacturing of the 3D optimized prototype. This service includes an upstream process that is used for optimization before the final parts are manufactured.</p> <p><b>Variable price:</b> depending on part size</p>

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