NEW: OPTOMET – First time right
Parameter Optimization Software for SLM Technology

Ra 6 µm
with OPTOMET

Ra 11 µm
without OPTOMET
Highlights

Automatic calculation of process parameters in the powder bed process

+ Parameter development for new and existing materials within minutes instead of days
+ Up to 50% more efficiency with OPTOMET Max. Power*
+ Advance calculation of mechanical properties for selected materials
+ 70% shorter material development cycles with unrestricted choice of the material supplier
+ Better after every print job – “Machine learning” with integrated database

Create your own parameter sets by mouse click!

Calculation of:
1. Laser power
2. Scan speed
3. Hatch spacing

Each for:
+ Hatch
+ Up-/Downskin
+ Top-Skin
+ Outer-/Inner-Contour

*Exclusive function for LASERTEC SLM
Range of functions

Parameter development

Automatic process parameter calculation and optimization for new and existing Additive Manufacturing materials incl. advance calculation of the material properties and mechanical properties for OPTOMET standard materials:

+ Aluminum AlSi10Mg0.5
+ Stainless steel 1.4404
+ Stainless steel 17-4 PH
+ Tool steel 1.2709
+ Inconel 625
+ Inconel 718
+ Cobalt chrome
+ Titanium Ti64

INDIVIDUAL PARAMETER ADJUSTMENT FOR MAXIMUM FLEXIBILITY

+ Change of layer thickness
+ Adaptation of mechanical properties like density or hardness
+ Parameter correction for recycling powder
+ Switching to new powder suppliers for an unrestricted choice of material manufacturer
Exclusive functions for LASERTEC SLM

OPTOMET Max. Power and Temperature Control

50 % INCREASED EFFICIENCY WITH UNCHANGED COMPONENT QUALITY

+ **Optimized exposure strategies** by using the full laser power and adjusting the scan speed as well as hatch spacing
+ Optimum utilization of the machine performance with up to 50 % higher build-up rates

OPTOMET TEMPERATURE CONTROL

Reduced residual stresses in the component due to active control of the build platform temperature for constant conditions at process level
Component quality

First time right

Consideration of powder and machine properties for perfect results

+ Chemical composition
+ Powder flowability
+ Powder density
+ Layer thicknesses for support and component
+ Focus diameter [min./max.]
+ Build platform temperature (max.)

Advance calculation of the material properties and mechanical properties for selected materials*

1. Density
2. Hardness
3. Tensile strength
   (Currently only for OPTOMET standard materials)
4. Yield strength
5. Elongation at break
6. Notch impact strength

“Machine learning”
The integrated material database can be extended with the results of each material test and thus creates the basis for a self-learning machine, which keeps getting better with each print job.

<table>
<thead>
<tr>
<th>Supplier A</th>
<th>Supplier B</th>
<th>Supplier C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh powder</td>
<td>200 μm</td>
<td>200 μm</td>
</tr>
<tr>
<td>20 recycling circuits</td>
<td>10 μm</td>
<td>10 μm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Powder Properties (PSD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D10</td>
</tr>
<tr>
<td>D50</td>
</tr>
<tr>
<td>D90</td>
</tr>
<tr>
<td>Peak</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>Apparent Density</td>
</tr>
<tr>
<td>Flowability</td>
</tr>
</tbody>
</table>
Create your own parameter sets!
OPTOMET Advanced: Choice of any alloy compositions* by mouse click based on the periodic table

WITHIN DAYS, NOT MONTHS!

70% shorter material development cycles

OPTOMET ADVANCED + rePLUG reSEARCH

+ Perfectly coordinated software and hardware particularly for the material development
+ Minimization of required material tests and machine runtime
+ Optimized for small material quantities with cleaning times <1 day
+ Parameter development on the series system

*Weldable materials within the chemical and physical limits / only in connection with OPTOMET Advanced Version
## OPTOMET versions

### OPTOMET Basic and Advanced

<table>
<thead>
<tr>
<th>Range of functions / material selection</th>
<th>Basic</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic calculation of process parameters</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Individual parameter adjustment and optimization</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Advance calculation of mechanical properties*</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>OPTOMET Max. Power Function**</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>OPTOMET Temperature Control**</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Machine Learning: Feedback of the measuring results to the local OPTOMET material database</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### OPTOMET standard materials

Aluminum AlSi10Mg0.5, Stainless steel 1.4404, Stainless steel 17-4 PH, Tool steel 1.2709, Inconel 625, Inconel 718, Cobalt chrome, Titanium Ti64

<table>
<thead>
<tr>
<th>Material development for any alloy compositions***</th>
<th>Basic</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection of material components via the periodic table</td>
<td>–</td>
<td>✓</td>
</tr>
</tbody>
</table>

*Currently only for OPTOMET standard materials  **Exclusive function for LASERTEC SLM machines  ***Weldable materials within the chemical and physical limits
Your Global Partner in Additive Manufacturing

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+ **20 years of experience** in SLM-Technology with REALIZER  
+ **> 100 technology experts** around the globe

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+ **Additive Pioneer in India** with over 6 years of experience  
+ **Application and Software knowledge**  
+ **70 technology experts** in Bangalore

**GLOBAL FOOTPRINT – 5 ADDITIVE MANUFACTURING EXCELLENCE CENTER (AMECs):**

- AMEC Bielefeld, Germany  
- AMEC Pfronten, Germany  
- AMEC Shanghai, China  
- AMEC Tokyo, Japan  
- AMEC Chicago, USA

**TECHNOLOGY CHANGER FOR SLM TECHNOLOGY**

OPTOMET enables a calculation of process parameters in the powder bed process within minutes, thus creating the basis for efficient production with maximum flexibility and at the same time independence from the material supplier.

**OPTOMET**

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