

## 3D PRINTING

---

[3D PRINTING](#) Additive Manufacturing is a process of creating 3D parts by building them layer by layer. It is a manufacturing process that uses a 3D model to create a physical part. The process involves creating a 3D model of the part, which is then sliced into thin layers. These layers are then printed one by one, with each layer being added to the previous one. The process is highly flexible and can be used to create parts of various shapes and sizes. It is also a highly efficient process, as it allows for the creation of complex parts that would be difficult to create using traditional manufacturing methods.

3D printing is a process of creating 3D parts by building them layer by layer. It is a manufacturing process that uses a 3D model to create a physical part. The process involves creating a 3D model of the part, which is then sliced into thin layers. These layers are then printed one by one, with each layer being added to the previous one. The process is highly flexible and can be used to create parts of various shapes and sizes. It is also a highly efficient process, as it allows for the creation of complex parts that would be difficult to create using traditional manufacturing methods.



## 3D PRINTING:

---

[3D PRINTING](#) Additive Manufacturing is a process of creating 3D parts by building them layer by layer. It is a manufacturing process that uses a 3D model to create a physical part. The process involves creating a 3D model of the part, which is then sliced into thin layers. These layers are then printed one by one, with each layer being added to the previous one. The process is highly flexible and can be used to create parts of various shapes and sizes. It is also a highly efficient process, as it allows for the creation of complex parts that would be difficult to create using traditional manufacturing methods.

(1) 加工精度 0.01mm 以内 加工速度 1.5 倍 加工效率 93% 以上 实现;

(2) 加工精度 0.01mm 以内 加工速度 1.5 倍 加工效率 93% 以上 实现;

加工精度  $<20\text{ppm}$  加工速度 1.5 倍 加工效率 93% 以上 实现;

(3) 加工精度 0.01mm 以内 加工速度 1.5 倍 加工效率 93% 以上 实现;

(4) 加工精度  $<0.04$  加工速度 1.5 倍 加工效率 93% 以上 实现;

[http://www.carmahaas.com](#)





□□□□□ □ □□□□□□□□□:

□□□□□ - □□□□ 3 □□ □□□□□□□□

Part Description	Focal Length (mm)	Scan Field (mm)	Entrance Pupil (mm)	Working Distance(mm)	Mounting Thread
SL-(1030-1090)-170-254-(20CA)-WC	254	170x170	20	290	M85x1
SL-(1030-1090)-170-254-(15CA)-M79*1	254	170x170	15	327	M79x1
SL-(1030-1090)-290-430-(15CA)	430	290x290	15	529.5	M85x1
SL-(1030-1090)-275-430-(20CA)	430	275x275	20	529.5	M85x1
SL-(1030-1090)-254-420-(20CA)	420	254x254	20	510.9	M85x1
SL-(1030-1090)-410-650-(20CA)-WC	650	410x410	20	560	M85x1
SL-(1030-1090)-440-650-(20CA)-WC	650	440x440	20	554.6	M85x1

\* □□□□□□□□ □□□□ □□□□ □□ □□□ □□

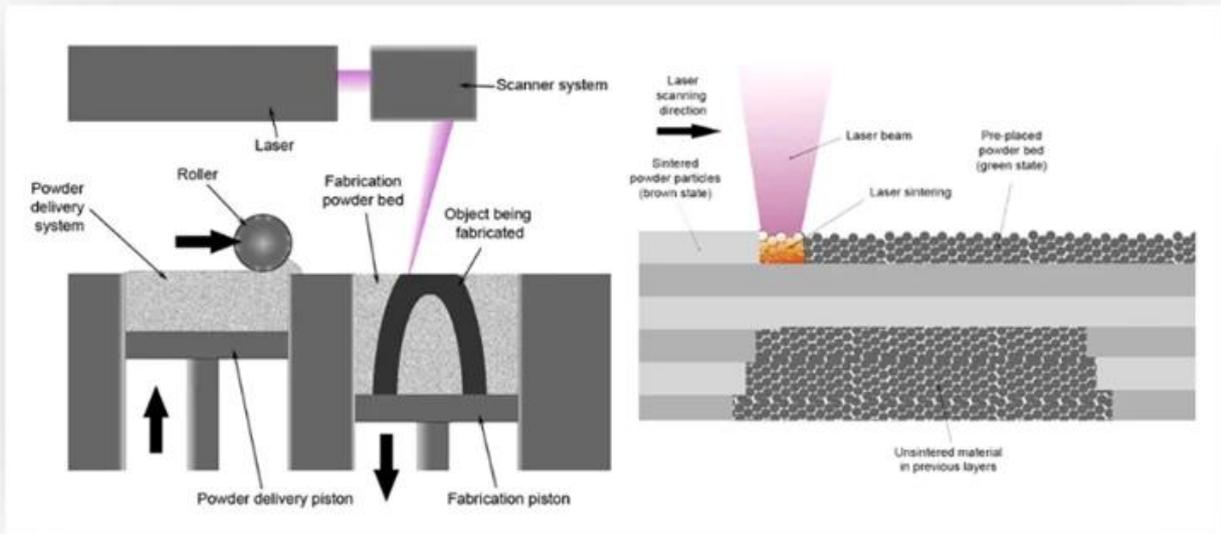
□□□□□ - □□□ □□□□ 3 □□ □□□□□□□□

Part Description	Focal Length (mm)	Scan Field (mm)	Entrance Pupil (mm)	Working Distance(mm)	Mounting Thread
SL-10.6-250-360	360	250x250	14/20	352.9	M85x1
SL-10.6-300-430	430	300x300	14/20	414.7	M85x1
SL-10.6-400-565	565	400x400	14/20	536.5	M85x1

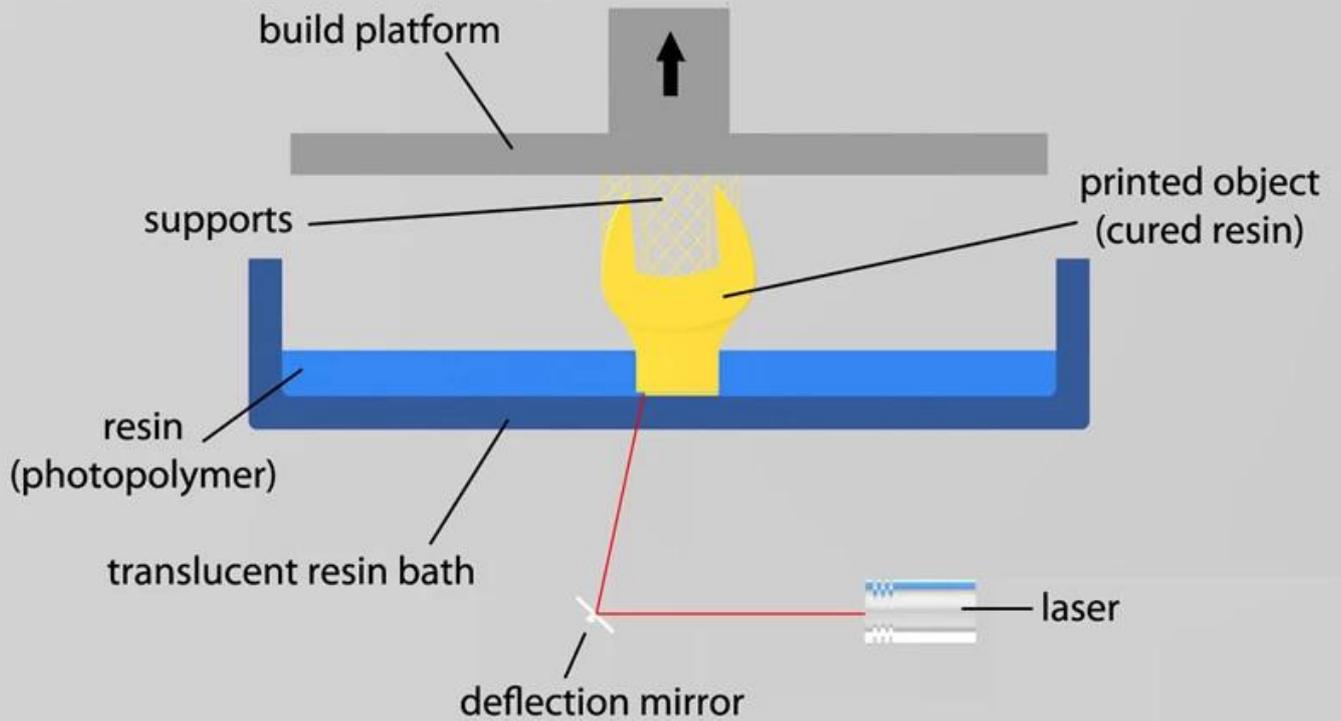
□□□□□ - □□□□ 3 □□ □□□□□□□□

Part Description	Focal Length (mm)	Scan Field (mm)	Entrance Pupil (mm)	Working Distance(mm)	Mounting Thread
SL-355-530-750	750	520x520	10	824.4	M85x1
SL-355-610-840-(15CA)	840	610x610	15	910	M85x1
SL-355-800-1090-(18CA)	1090	800x800	18	1193	M85x1

## How Does It Work? SLS

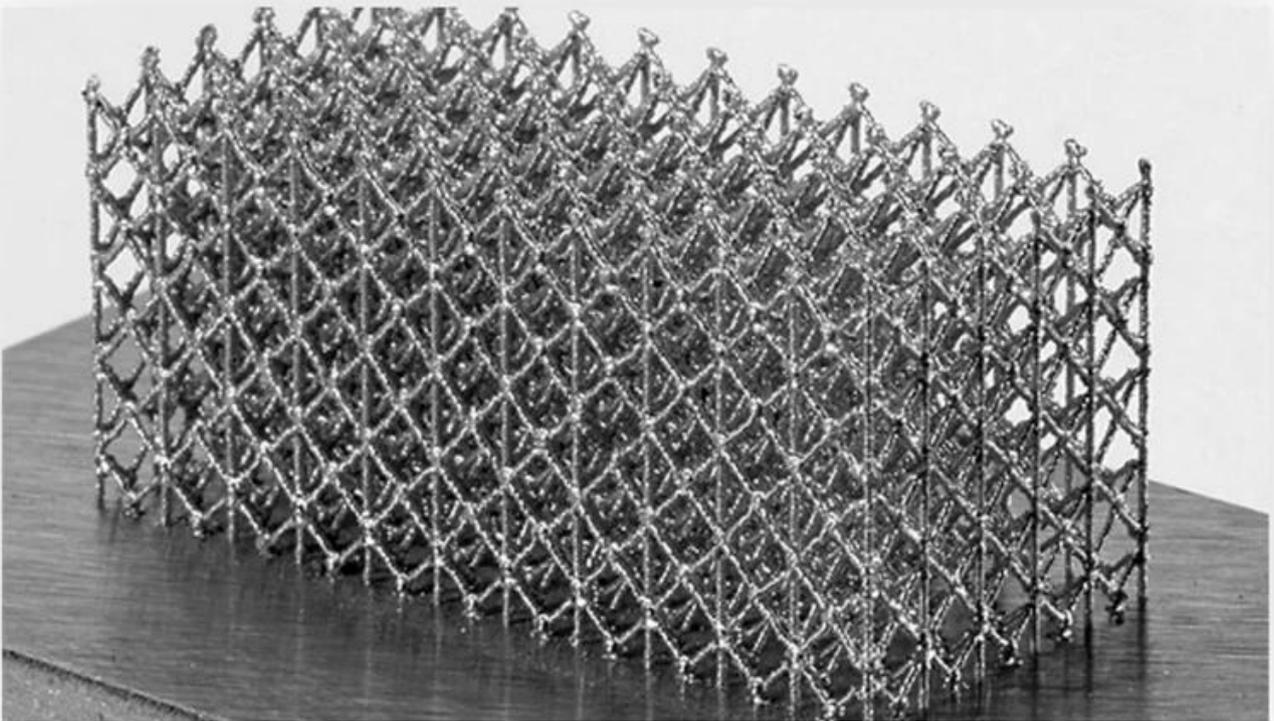


# How Does It Work? SLA

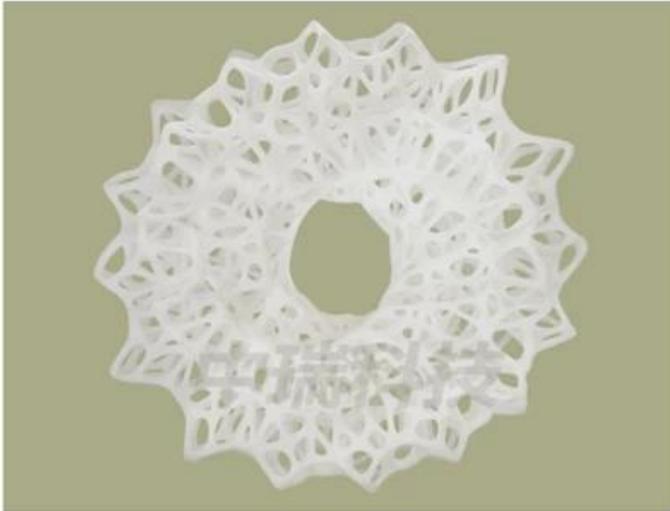


SELECTIVE LASER MELTING (SLM)

## Pros and Cons



## ZRPA12 ( PA12 Nylon Powder )



<b>PHYSICAL CHARACTERISTICS</b>	Grain Size: 50~55 $\mu$ m Shape: Spherical Apparent density: $\geq 0.40$ g/cm <sup>3</sup>
<b>THERMAL PROPERTY</b>	Melting Point: 182~185°C (10°C/min) Melting Enthalpy: $\geq 90$ J/g HDT: 83.8°C @1.8MPa / 146.1°C @0.45MPa
<b>MOLDING PERFORMANCE</b>	Density: 0.97 g/cm <sup>3</sup> Tensile Modulus: 1600 MPa Tensile Strength: 43 MPa Elongation at break: $\geq 15$ % Un-notched Impact Strength: 20.7 KJ/m <sup>2</sup> Notched Impact Strength: 3.8 KJ/m <sup>2</sup> Bending Modulus: 1432 MPa Bending Strength: 57 MPa

## ZRTPU ( Thermoplastic Polyurethanes Powder )



<b>PHYSICAL CHARACTERISTICS</b>	Grain Size: 60 $\mu$ m Shape: Spherical Apparent density: 0.47 g/cm <sup>3</sup>
<b>THERMAL PROPERTY</b>	Melting Point: 165°C HDT Heat deflection temperature: -25°C
<b>MOLDING PERFORMANCE</b>	Density: 1.15 g/cm <sup>3</sup> Tensile Modulus: 61 MPa Tensile Strength: 21 MPa Elongation at break: 310 % Tear strength: 101 N/mm Bending Modulus: 74 MPa Bending Strength: 3.3 MPa



Desktop FDM



Industrial FDM



Desktop SLA



Industrial SLA

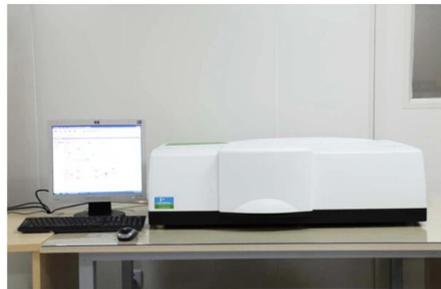


Industrial SLS





**TRIOPTICS OptiSpheric 2000 AF**  
---Testing EFL, R, Centering Error, Wedge Angle, BFL, MTF



**PerkinElmer Lambda 950**---Testing Transmission and Reflectivity



**Carmanhaas Coating Machine**





□□□□ □□□:

□□□□□ □ □□□□□□□ □□□□ □□□□:



