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## **Additive manufacturing of monomer-free ORMOCER®-based composites for dental and audiological application**

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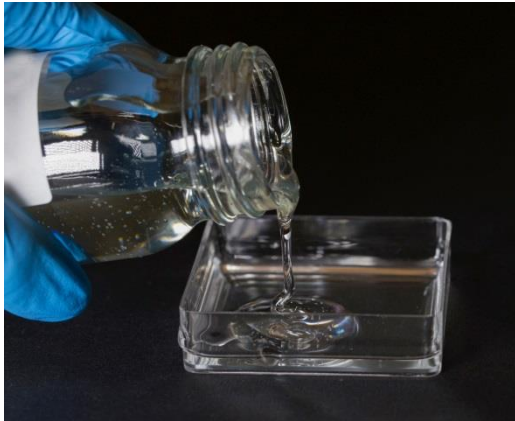
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## Additive manufacturing with ORMOCER®s

### Basic ORMOCER® properties and advantages

High-class characteristics profiles adapted to application due to the intrinsic potential of medical relevant ORMOCER® systems



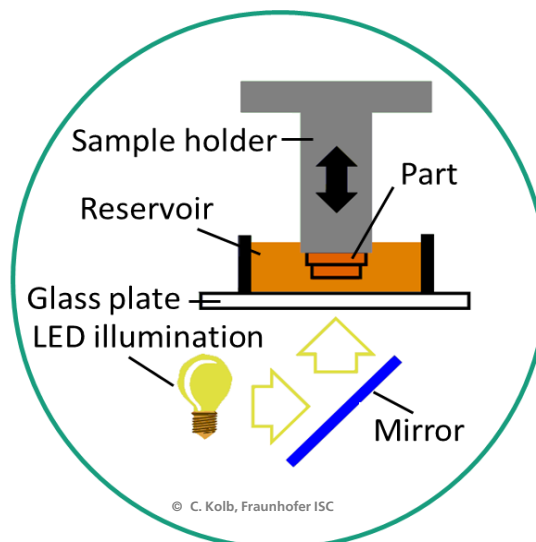
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- Biocompatible | monomer-free
- Adjustable Young's modulus
- Low polymerization shrinkage
- High abrasion resistance
- Degradable versions possible
- Highly flexible versions possible
- Thermoeffect possible:  
Solid | stiff at room temperature;  
Soft + flexible at body temperature  
→ Adjustable temperature range
- Specific functionalities on request

Further information: see data sheet *ORMOCER®-based (nano-)hybrid composites as (in)direct restorative materials*

### Digital Light Processing printing technique

- LED illumination:  
 $\lambda = 382 \text{ nm}$
- Lateral resolution:  
 $\approx \pm 19 \mu\text{m}$
- Slice thickness:  
 $\approx 10 \mu\text{m} - 100 \mu\text{m}$
- Building frame:  
 $\approx 40 \text{ mm} \times 73 \text{ mm}$
- Max. part height:  
 $\approx 110 \text{ mm}$
- Building time:  
Depending on the slice thickness and height of the part,  
independent of complexity and number of parts

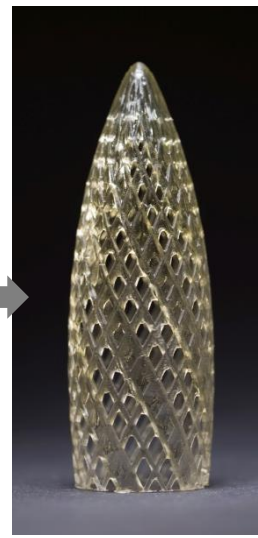


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## DLP printing process of complex structures



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## Advantages of technique

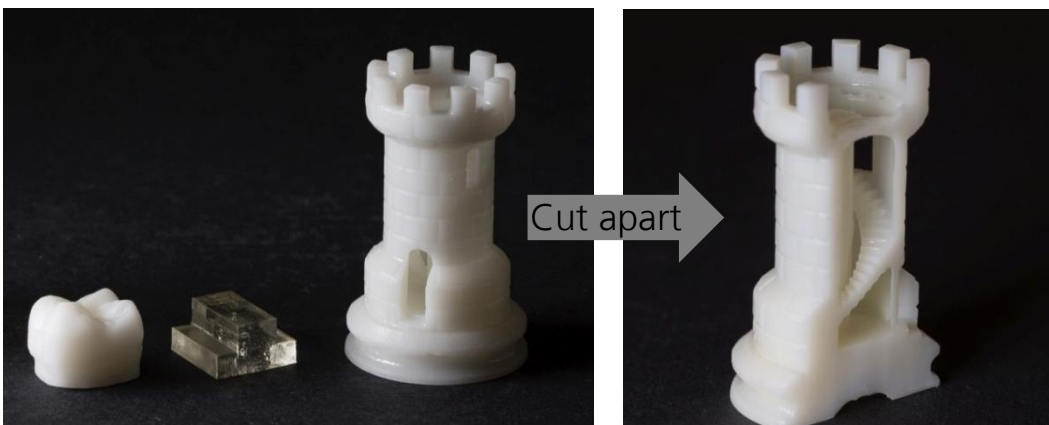
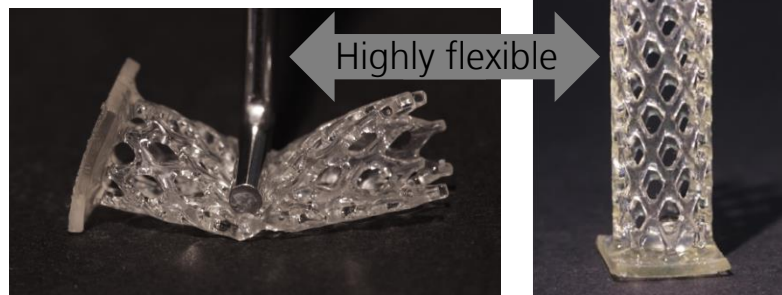
- Realization of complex geometries
- Individualization | flexibility
- Parallel | simultaneous curing of layers  
→ Time saving
- Compared to milling | cutting processes  
→ Material saving
- No milling tools | no casting molds
- Multi object capability (several different objects in one run producible)

Cost reduction

## Fields of application

- Individual parts
- Small-scale series production
- Prototypes  
→ e.g. for life sciences like medical and dental sector

## Examples



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