EVOCURE

CAST PRO

Casting with 3d printing

syntegre®

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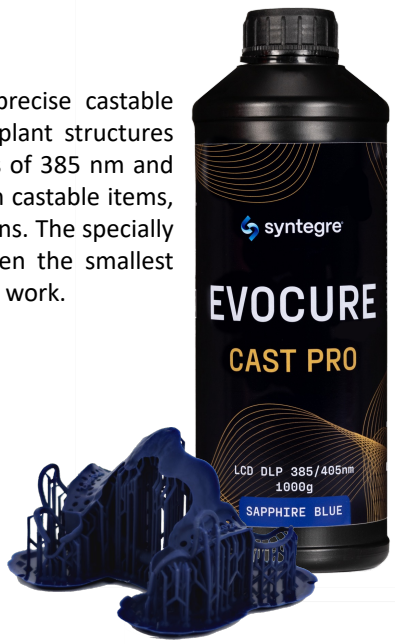
Benefits and Challenges

The use of 3D printing technology can significantly accelerate and simplify the entire casting process. Additionally, this technology is more financially accessible, generates much less waste, requires a smaller technological infrastructure, and offers a faster return on investment. Castable resin prints are not only exceptionally precise but also enable the creation of complex geometries that were previously difficult or impossible to achieve using traditional methods.

However, despite all the benefits, 3D printing-based casting differs from traditional techniques and brings new challenges. To fully harness the potential of 3D printing in casting, it is crucial to keep a few key factors in mind to avoid mistakes and ensure the highest quality outcome. This guide will serve as a valuable roadmap to achieving top-quality castings using 3D printing technology.

Our Solution

EVOCURE CAST PRO Resin is designed for printing precise castable objects such as crowns and bridges, partial dentures, and implant structures using 3D printing technologies like LDC and DLP at wavelengths of 385 nm and 405 nm. It offers a modern solution for producing high-precision castable items, ensuring fast and efficient performance across various applications. The specially formulated Sapphire Blue colour enhances the visibility of even the smallest details, while the smooth surfaces facilitate post-casting finishing work.



Key Features

- Low viscosity
- Fine detail reproduction
- Ultra accuracy
- Residue-free burnout
- Low Expansion
- High Hardness

more details

Casting Process

Traditional casting and 3D printing-based casting share many common elements, but they also introduce significant differences that affect the process, its precision, and efficiency.

- In the case of casting resins, precision in printing is extremely important, as later it will translate into the perfect fit of the casting. Therefore, special attention should be paid to the calibration of the printer and the correctness of the printing process, and casting objects are best printed at a layer height of 50 microns
- The investment will reflect even the smallest details of the print, so make sure that the print you want to cast meets your satisfaction. Any defects, chips, or corrections should be modelled using casting wax.

- Resin prints have a higher thermal expansion compared to traditional wax, which means that not following the procedures or using an inappropriate investment will result in errors in the castings. Pay special attention to choosing the right investment, which must demonstrate greater strength and have thermal expansion parameters suitable for 3D prints.
- All design rules remain the same. It doesn't matter whether you design the casting channels in CAD/CAM software or model them manually. It all comes down to strictly following the recommendations of the manufacturers of the investment and the casting process.
- Absolutely follow the instructions for the protective mass used, particularly regarding mixing parameters, vibration during pouring, times and mixing ratios of powder to liquid, and all temperatures. Casting 3D printed elements is simpler, but it is less forgiving of mistakes
- Be mindful of the number of objects being casted in the ring and their distance from the edge of the ring/mould. The minimum distance of an object from the edge is 1 cm.

Recommended Investment Materials

Cooperated with our partners, we have successfully tested several investment materials available on the market that are compatible with EVOCURE CAST PRO. At the end of this guide, you will find the parameters for each of the compatible investments. For more details, visit the manufacturer's website and read the current instructions for use.

Most Common Problems

Cracking Of The Investment

- use of an inappropriate investment material with insufficient strength and thermal expansion
- not following the manufacturer’s recommendations regarding the investment, including incorrect mixing ratios, working times or temperatures
- insufficient space between the object and the wall of the ring, a minimum of 1 cm should be left, or the manufacturer’s recommendations should be checked

Rough Surface of Castings, Reduced Details

- incorrect temperature/time for heating the ring
- excessively high temperature of the ring during casting
- excessively high temperature of the alloy during casting
- the print has not been adequately cured or cleaned

Bubbles Inside or on the Surface of the Casting (Gas Porosity)

- excessive amount of re-melted metal in the alloy
- excessively high temperature of the ring during casting
- excessively high temperature of the alloy during casting
- improper operation of the heating furnace, e.g., a faulty thermocouple

Beading on the Surface of the Casting (Trapped Air)

- incorrect positioning of the casting object in the ring
- Too thick protective mass, incorrect proportions, or working time
- faulty mixing process; vacuum mixing is necessary
- improper sprueing of the casting object, sharp angles, lack of smooth transitions

Presence of Flashes

- incorrect proportions of the investment material
- now following the working time of the investment, disrupted expansion
- pouring the metal with excessive force
- excessively high temperature/time for heating the ring

Incomplete Castings

- too low temperature of the ring/metal during casting
- improper sprueing, excessively thin sprues, constrictions, or incorrect connections/angles.
- improper actions of the casting machine

SHERAVEST RP

BASIC INFORMATION

- Mixing ratio, powder/liquid: 100 g / 20 ml
- Vacuum mixing: 60 sec vacuum 80% 350 RPM
- Pouring at the lowest vibration level.
- Working time: 4 - 6 min
- Preheating temperature range before placing in furnace: 850°C (maximum 980°C)
- Placement in hot furnace: 20 min after mixing

PREHEATING

SPEED

- 20 min after mixing
- Furnace temperature: 850°C If necessary, heating can be continued after 20 minutes up to a maximum preheating temperature of 980°C.
- Hold times for final temperature min. 60 min

CONVENTIONAL

- From 0°C
- Linear temperature increase 9°C/min
- Maximum temperature 850°C
- Hold times for final temperature min. 45 min

VARSEOVEST P PLUS

BASIC INFORMATION

- Mixing ratio, powder/liquid: 100 g / 20 ml
- Vacuum mixing: 60 seconds at 250 - 350 RPM
- Working time: 4 - 5 min
- Preheating temperature range before placing in furnace: 900 - 950°C (maximum 950°C)
- Placement in hot furnace: 20 min after mixing
- important: pouring must be done without pressure

PREHEATING

SPEED

- 20 min after mixing
- Furnace temperature: 900°C - 950°C.
- Hold times for final temperature min. 90 min

VARSEOVEST C&B

BASIC INFORMATION

- Mixing ratio, powder/liquid: 100 g / 20 ml
- Vacuum mixing: 60 seconds at 250 - 350 RPM
- Working time: 3 - 4 min
- Preheating temperature range before placing in furnace: 800 - 900°C (maximum 900°C)
- Placement in hot furnace: 20 min after mixing
- important: pouring must be done without pressure

PREHEATING

SPEED

- 20 min after mixing
- Furnace temperature: 800°C - 900°C.
- Hold times for final temperature min. 90 – 120 min

HINRIVEST RP

BASIC INFORMATION

- Mixing ratio, powder/liquid: 100 g / 20 ml
- Vacuum mixing: 60 seconds
- Working time: 4 - 5 min
- Preheating temperature range before placing in furnace: 900 - 950°C (maximum 950°C)
- Placement in hot furnace: 20 min after mixing
- important: pouring must be done without pressure

PREHEATING

SPEED

- 20 min after mixing
- Furnace temperature: 900°C - 950°C.
- Hold times for final temperature ca. 60 min

CONVENTIONAL

- from 0°C
- Linear temperature increase 7 - 9°C/min
- old times for final temperature 30 - 50 min

PICOCAST SPEED NF

BASIC INFORMATION

- Mixing ratio, powder/liquid: 100 g / 20 ml
- Vacuum mixing: 90 sec 250 - 360 RPM
- Hold in vacuum: 10 sec
- Can be placed in pressure chamber up to 10 min
- Working time: 5 min
- Preheating temperature range before placing in furnace: 900 - 1000°C (maximum 1030°C)
- Placement in hot furnace: 25 to 35 min after mixing

PREHEATING

SPEED

- 25 to 35 min after mixing
- Furnace temperature: 900°C - 1000°C.
- Hold times for final temperature 400g - 60 min, 600g - 90min

CONVENTIONAL

- From 0°C
- Linear temperature increase 7 - 9°C/min
- Hold times for final temperature 400g - 60 min, 600g - 90min

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HERAVEST M PRINT +

BASIC INFORMATION

- Mixing ratio, powder/liquid: 100 g / 20 ml
- Vacuum mixing: 60 sec
- Working time: 5 min
- Preheating temperature range before placing in furnace: 900 - 950°C
- Placement in hot furnace: 20 min after mixing

PREHEATING

SPEED

- 20 min after mixing
- Furnace temperature: 900°C - 950°C. Maximum 950 °C
- Hold times for final temperature ca. 60 min

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rev. 2024-04