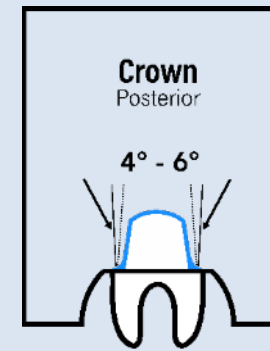


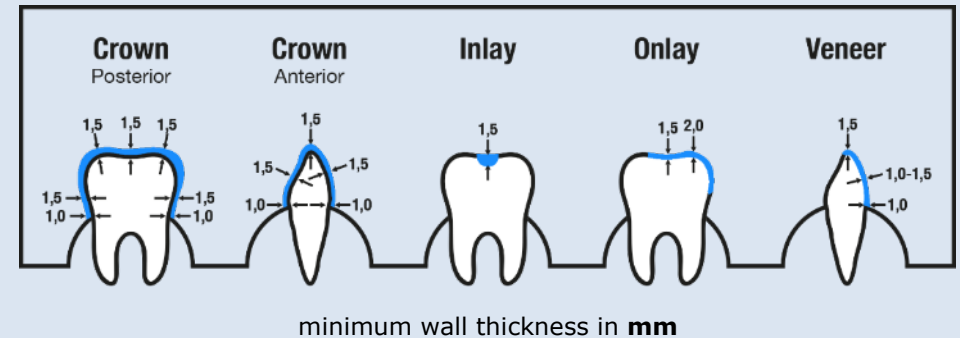
### **Tooth preparation**

- Make sure to create a stump with a 4° - 6° cone. Round off all the transitions within the preparation to avoid unwanted tension under the restoration material.
- Also make sure to avoid tangential, spring edge or lip preparations. Therefore, exercise special care when using instruments with a round tip and do not introduce them any further than up to half their diameter at maximum. Please note that tangential preparations are technically unfeasible and would result in too thin, i. e. instable and overcontoured, crown margins.
- The preparation limit must have a width of at least 1 mm.
- Both a shoulder preparation with rounded interior angles and a distinct chamfer preparation may be carried out. Rework the preparation margin using finishing instruments of matching shape.



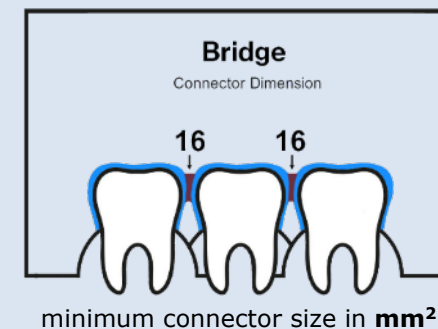
### Model the workpiece on the computer

- Permanent crowns, inlays, onlays, veneers:  
Always keep the minimum wall thickness – even after manual grinding  
(The dimensions apply also to artificial teeth and temporary crowns, inlays, onlays and veneers)



- Temporary bridges:  
Keep a connector size of at least 16 mm<sup>2</sup>

The connector area should be as large as possible.  
For physical stability, the height of the connector is more important than the width. Doubling the width results in only doubling the strength, while doubling the height results in eight times the strength.  
Oval connector areas are therefore recommended.



## Generate the printing file

Use the appropriate software "chitubox" and download the required parameter set from phrozen database. Deliver it in a suitable form to the printer by observing the instruction for use of the software and of the printer.

## Note

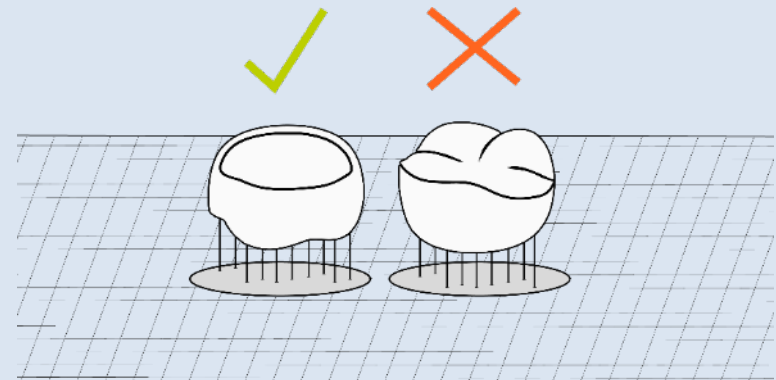
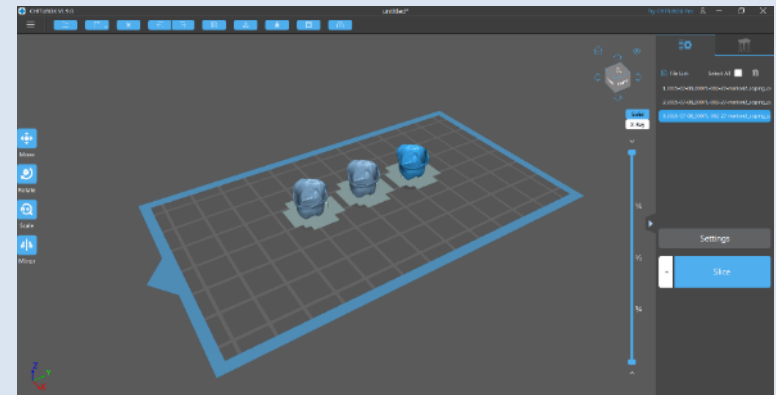
Ensure to use the appropriate **print parameters**.

- > [Phrozen Sonic 4K](#)
- > [Phrozen Sonic 4K XL](#)

## Useful hints

Create the supports on the occlusal surface.

With a 0.3 mm thick "Bounding Box" or also called "Base Plate" the material holds perfectly during printing and can easily be removed from the platform after printing.

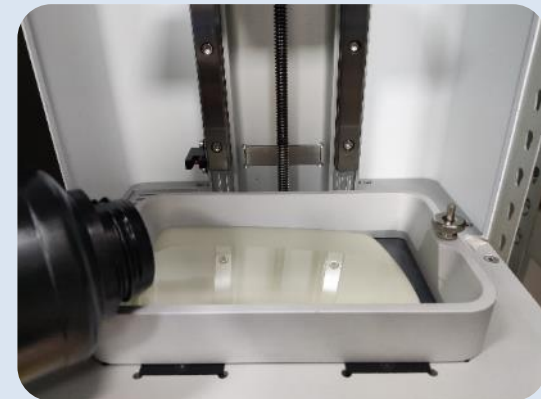


**Print**

- Work as clean as possible
- Dirty trays or machines can cause deformation/discoloration
- Briefly shake the resin and pour it into the tray of the printer
- Start the printing process

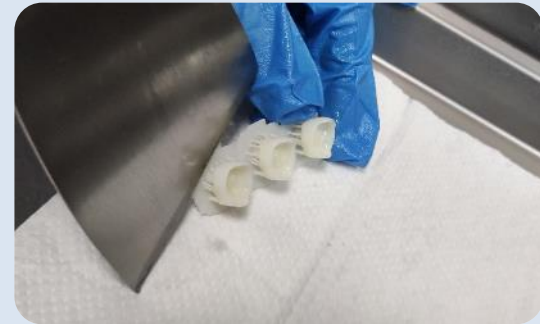
**Note**

Before starting printing, make sure that the printer together with the resin has reached operating temperature. A cold start must be avoided.



**Clean the printed job by following every step carefully**

- Clean the building platform with a suitable spatula
- Remove the building platform from the machine, place it on a cloth or paper
- Remove the printed object carefully from the platform



- Roughly snap off the supports



- Remove excessive material with an alcohol-soaked (96 %) cloth or brush
- Clean the interdental areas and the interior surfaces of the crown with a suitable alcohol-soaked (96 %) brush, until the surface is lightly matt

**Note**

Never soak the printed job into alcohol.



**Freshly printed**

**Surface:** glossy  
**Inside:** glossy



**Not enough cleaned**

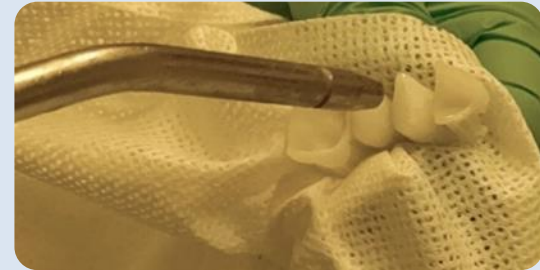
**Surface:** slightly matt  
**Inside:** glossy



**well cleaned**

**Surface:** slightly matt  
**Inside:** slightly matt

- Dry thoroughly with an air syringe



#### Optional step

Carefully sandblast the printed part surfaces to remove the remaining coating using a sandblaster with polish blasting material 50 µm at a maximum blasting pressure of 1.5 bar.

#### Note

Take care to avoid any deformation or damage of the printed job.



#### Optional step – Individualization of the crown or tooth

Apply intensive colors e.g. *els paintart* from SAREMCO.



### Finish the printed job - Cure

- Polymerize in an appropriate UV-light box with a wavelength of 320 – 500nm
- Make sure that the light device performs with the adequate light-power
- Recommendation (turn objects between the exposure cycles):
  - Haereus Kulzer "Signum HiLite Power" (2 x 180 s)
  - NK-Optik UV-Flash device "Otoflash G171" (2 x 2000 flashes)
  - Phrozen Cure: Post Curin UV Lamp (2 x 3 minutes)

### Note

To achieve the desired material properties, biocompatibility and final shade, post-curing of the completely dried and cleaned job is necessary.

### Useful hint (strongly recommended when using the Phrozen Cure Unit)

Speed up the color finalization by placing the printed job into boiling water (100 °C) for 2 minutes after post-curing. Additionally, the print object can be cured from each side 2 x 20 seconds with a hand polymerization lamp (e.g. Bluephase® G2).



### Finish the printed job – Polish

- Work out the restoration with 40 $\mu$  and 12 $\mu$  diamond burs
- Polish to a high gloss using polishing brushes, polishing discs, strips or silicone polishers





**Attach – permanent crowns, inlays, onlays or veneers to the tooth**

- Roughen the inside of the printed object by sandblasting with an abrasive ( $Al_2O_3$ ,  $110\mu m$ )
- Then, fix it definitively with an appropriate composite cement material. Panavia V5. (Kuraray) and Variolink (Ivoclar) are recommended

**Note**

Zinc-phosphate cements as well as glass-ionomer-cements are only of limited suitability due to their opacity.



**OR**

**Attach – temporary crowns, bridges, inlays, onlays or veneers to the tooth**

Attach the finished temporary prosthesis with a commercially available provisional cement.



**OR**

**Attach – artificial teeth on a denture base**

- Roughen the base surface of the printed artificial teeth for e.g. by sandblasting ( $\text{Al}_2\text{O}_3$ ,  $110\mu\text{m}$ )



- Apply a primer and a bonding material, insert in the prosthesis according to the natural shape and polymerize

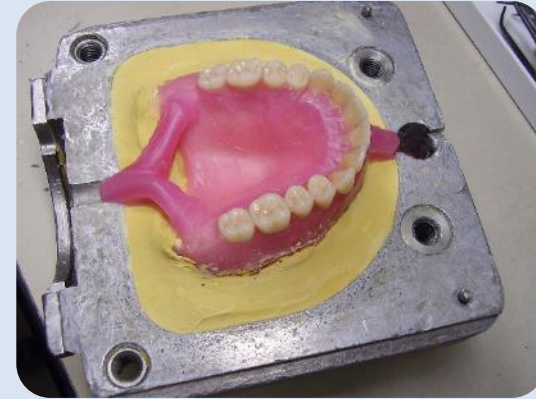
Alternatively, CROWNTEC or DENTURETEC can also be used directly as bonding material. Put a small amount of material with a brush on the roughened teeth-surface of the artificial tooth, put it into the prosthesis, eliminate any excess material and light-cure it from all sides for at least 20 seconds.



**or**

**Attach – artificial teeth in a denture base (classical manufacturing)**

Use a classical manufacturing procedure like the pouring method with cold cure resin after roughening the teeth.



[https://de.wikipedia.org/wiki/Datei:Making\\_of\\_complete\\_denture\\_04.JPG#filelinks](https://de.wikipedia.org/wiki/Datei:Making_of_complete_denture_04.JPG#filelinks)

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