



## Application Guide for dima Print Digital Denture

### Stress-free digital dentures with 3D printing

Version 03.2021

Learn more about  
digital denture!

[kulzer.com/  
digitaldenture](https://kulzer.com/digitaldenture)



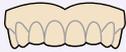
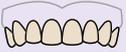
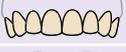
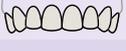
Giving a hand to oral health.



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Product details			
dima Print Denture Base Try-in	dima Print Denture Teeth	dima Print Denture Base	dima Print Digital Denture
			
<b>Try-in shade</b>	<b>7 tooth shades</b>	<b>4 gingiva shades</b>	<b>Easy “copy-paste” method:</b> fast reproduction of the existing denture (scan, print, finish)
 White	 A1	 Light Pink	
	 A2	 Light Reddish Pink	
	 A3	 Original Pink	
	 A3.5	 Dark Pink	
	 B1		
	 B2		
	 BL1		

# 1. Material-specific design and printing recommendations

## Design notes:

The recommended settings and design recommendations here only apply when used in combination with 3Shape. You can download the parameter as a DME file to import into 3Shape in the cara download area:

[kulzer.com/cara-print-3shape-dme](https://www.kulzer.com/cara-print-3shape-dme)

With CAM 2.0 most of the settings are generated automatically. The following details will help you with your design in CAM 1.0.

Register and get your free CAM licence!



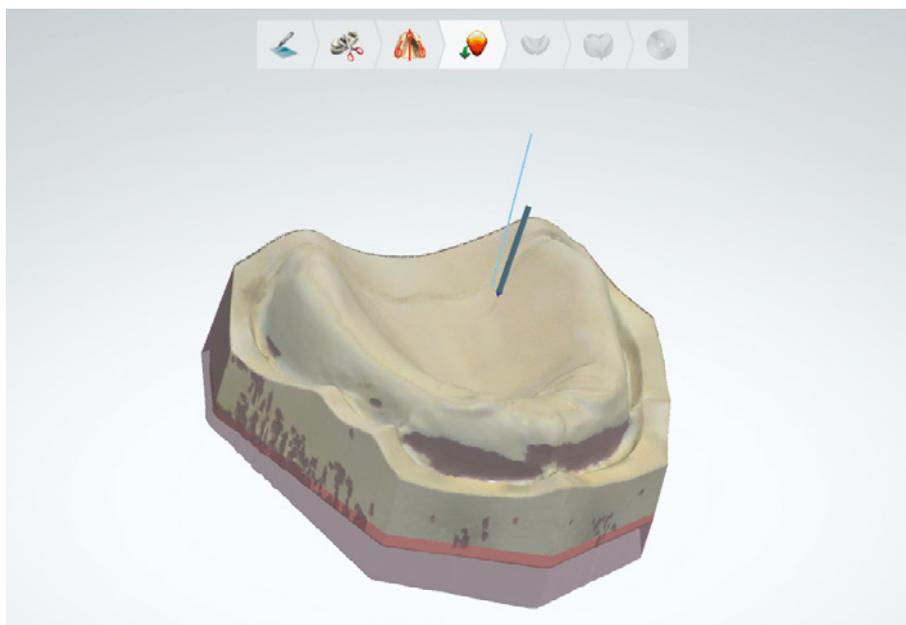
## 1.a dima Print Denture Base Try-in

With dima Print Denture Base Try-in you can produce monochromatic, white denture try-ins.



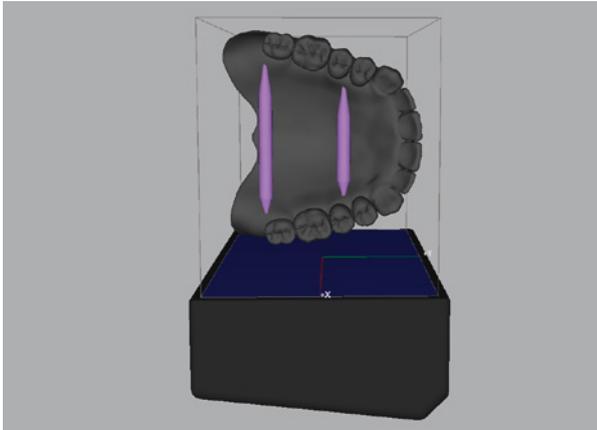
### Recommended settings:

- Minimum wall thickness:  $\geq 2.0$  mm
- Pay attention to the direction of insertion while designing dentures/ Try-in; blocking-out and paralleling undercuts might be necessary

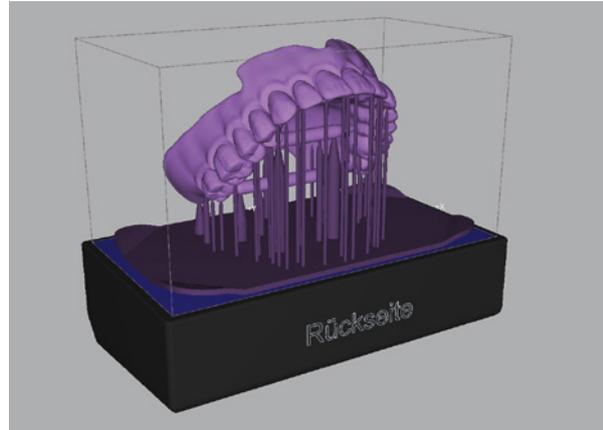


Change of direction of insertion and blocking out of undercuts

- We recommend to use 2 stabilization bars located in the area of teeth 4 or 5 and teeth 7 to stabilize the try-in during printing and postcuring
- These bars can be generated easily at the step “support” in CAM 2.0 software or need to be generated manually in CAM 1.0 (please see chapter: 4. How to manually generate stabilization bars)

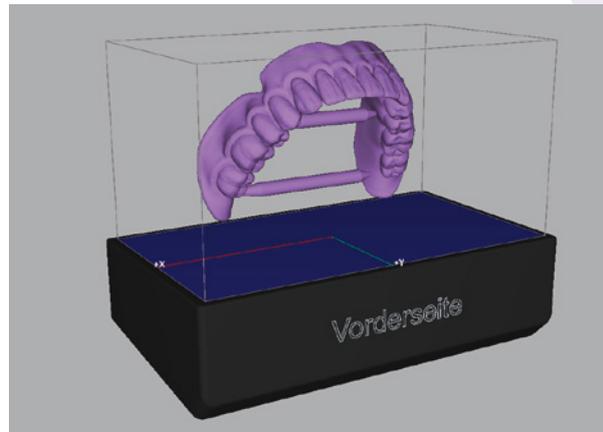
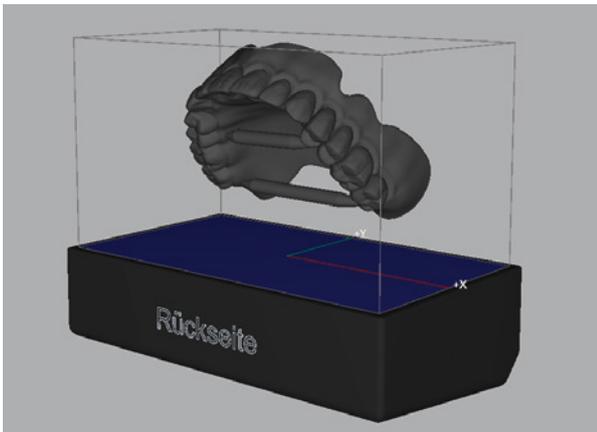


Stabilization bars can support your object for better precision



### Print position (angle and orientation):

- The recommended orientation is a tilted orientation such as space diagonal from 45° to 60° angle.
- Distance from appliance to building platform 8 to 10 mm



Place the intaglio surface up towards the build plate as shown

## Supports:

- We recommend manually placing the supports as shown in the photos (page 7)  
Supports should be placed all around on the border of the try-in only
- Use medium supports in general
- Add 6–8 robust supports for extra strength
- Add some fine supports for overhanging parts of teeth that require additional support
- Density of supports: Between 30 %–40 %, adjust manually if needed

### Medium support parameters

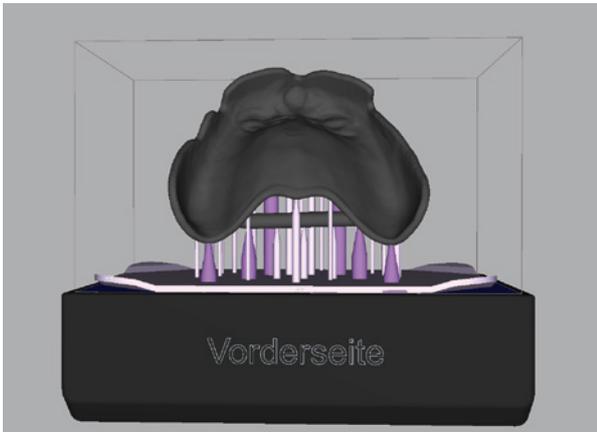
Top	
Shape	Cone 25 %
Radius (mm)	1
Length (mm)	4
Penetration (mm)	0.5
Angle Factor	100 %
Mid	
Shape	cylinder
Radius (mm)	1
Bottom	
Shape	Cone 75 %
Radius (mm)	6
Length (mm)	1.5
Penetration (mm)	0
Angle Factor	100 %

### Robust support parameters

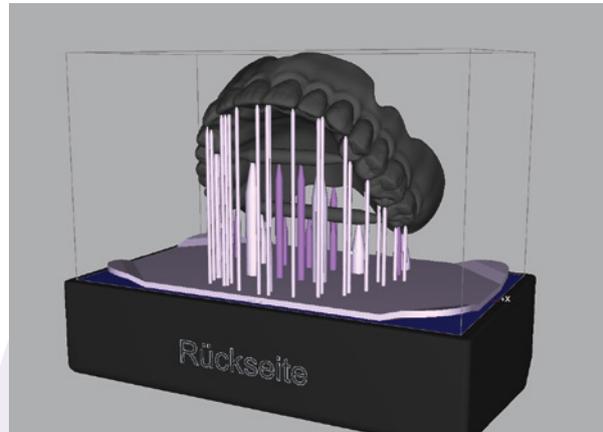
Top	
Shape	Cone 25 %
Radius (mm)	2
Length (mm)	8
Penetration (mm)	0.75
Angle Factor	100 %
Mid	
Shape	cylinder
Radius (mm)	2
Bottom	
Shape	Cone 75 %
Radius (mm)	12
Length (mm)	1.5
Penetration (mm)	0
Angle Factor	100 %

### Fine support parameters

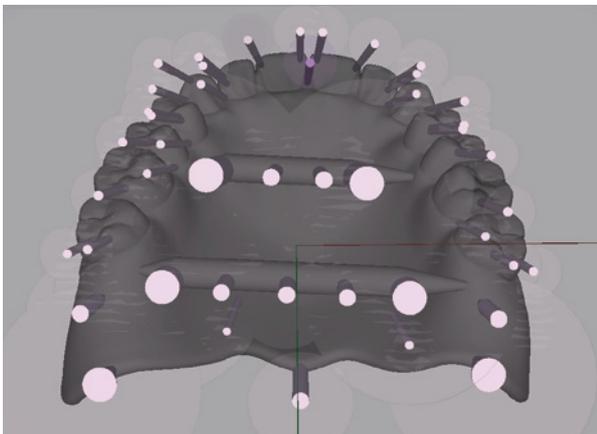
Top	
Shape	Cone 25 %
Radius (mm)	0.5
Length (mm)	1
Penetration (mm)	0.4
Angle Factor	100 %
Mid	
Shape	cylinder
Radius (mm)	0.5
Bottom	
Shape	Cone 75 %
Radius (mm)	3
Length (mm)	1.5
Penetration (mm)	0
Angle Factor	100 %



Robust supports added for extra strength.



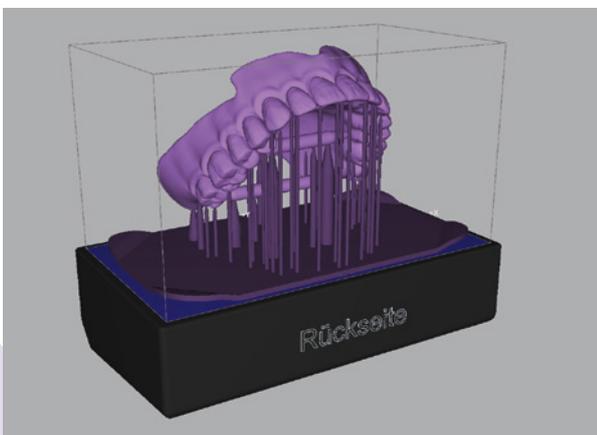
Medium supports for better print results



Fine supports added for teeth supporting

### Foundation:

- "Hash" or peel-off base
- Thickness: 1.5mm and around 140% coverage



Foundations are not mandatory, but might be helpful: Peel-off foundation; thickness 1.5mm

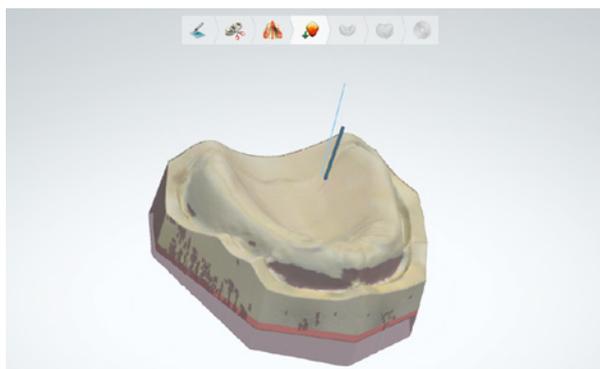
## 1.b dima Print Denture Base



dima Print Denture Base can be used to create digital dentures together with dima Print Denture teeth.

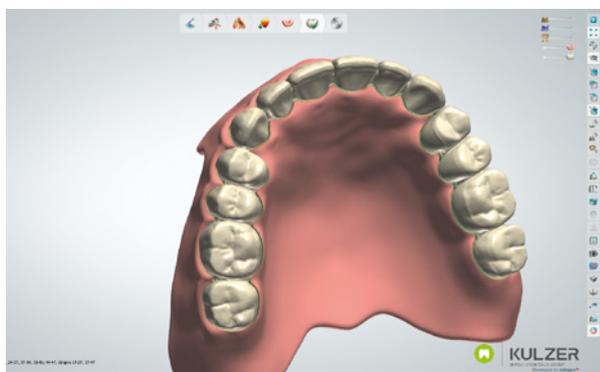
### Recommended setting:

- Minimum wall thickness:  $\geq 2.0\text{mm}$
- Pay attention to the direction of insertion while designing dentures/ Try-in; blocking-out and paralleling undercuts might be necessary



Change of direction of insertion and blocking out of undercuts

- Set bonding gap between base and teeth on  $300\mu\text{m}$



Bonding gap of  $0.3\text{mm}$

- We recommend to use 2 stabilization bars located in the area of teeth 4 or 5 and teeth 7 to stabilize the denture base during printing and postcuring
- These bars can be generated automatically in CAM 2.0 software or need to be generated manually in CAM 1.0 (please see chapter: 4. How to manually generate stabilization bars)
- dima Print Denture base can not be used for carded teeth

### Print position (angle and orientation):

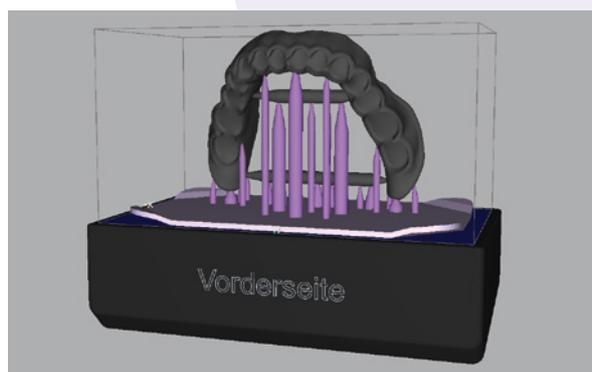
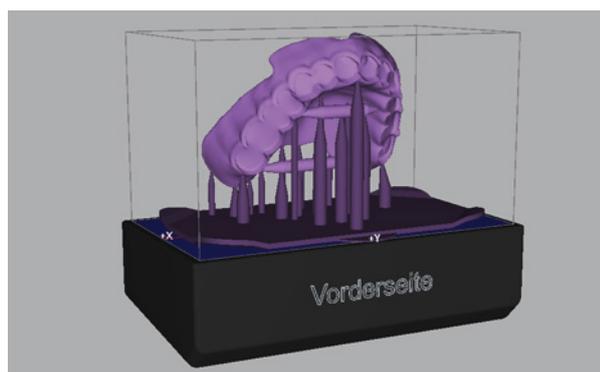
- The recommended orientation is a tilted orientation such as space diagonal from  $45^\circ$  to  $60^\circ$  angle
- Place the intaglio surface downwards up the build plate as shown in the pictures on page 7
- Distance from appliance to building platform 8 to 10 mm

## Supports:

- We recommend manually placing the supports as shown in the pictures (page 6)  
Supports should be placed all around on the border of the denture base only
- Use medium supports in general
- Add 5–6 robust supports for extra strength
- Density of supports: Between 25 %–40%, adjust manually if needed

Medium support parameters	
<b>Top</b>	
Shape	Cone 25 %
Radius (mm)	1
Length (mm)	4
Penetration (mm)	0.5
Angle Factor	100 %
<b>Mid</b>	
Shape	cylinder
Radius (mm)	1
<b>Bottom</b>	
Shape	Cone 75 %
Radius (mm)	6
Length (mm)	1.5
Penetration (mm)	0
Angle Factor	100 %

Robust support parameters	
<b>Top</b>	
Shape	Cone 25 %
Radius (mm)	2
Length (mm)	8
Penetration (mm)	0.75
Angle Factor	100 %
<b>Mid</b>	
Shape	cylinder
Radius (mm)	2
<b>Bottom</b>	
Shape	Cone 75 %
Radius (mm)	12
Length (mm)	1.5
Penetration (mm)	0
Angle Factor	100 %



Add two stabilization bars as described in the chapter “4. How to manually create stabilizing bars in CAM 1.0”

## Foundation:

- “Hash” or peel-off base
- Thickness: 1.5mm and around 140 % coverage

## 1.c dima Print Denture Teeth



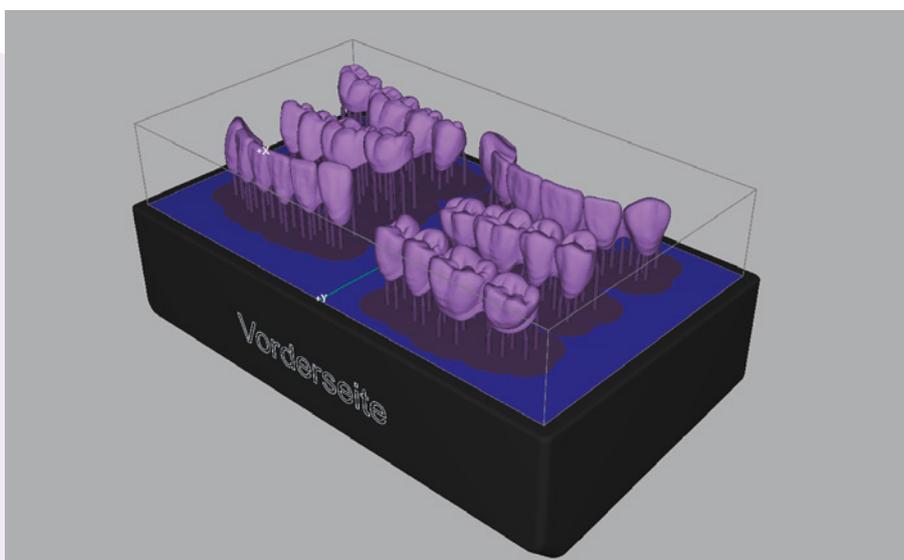
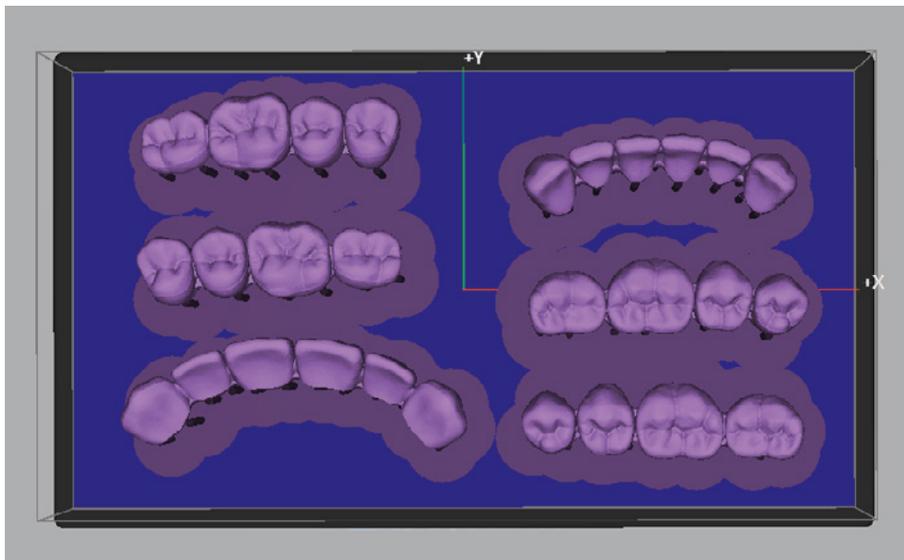
dima Print Denture Teeth can be used to create digital dentures together with dima Print Denture Base.

### Recommended setting:

- No minimum thickness required for denture teeth.
- Teeth should be designed connected as segments (6 anterior teeth and 2 x 4 posterior teeth) for faster teeth set up and better stability

### Print position (angle and orientation):

- Position the anterior and posterior teeth on the build table with the basal surface facing down toward the build table (see below pictures for reference).
- Distance from appliance to building platform min. 5mm



## Supports:

- We recommend manually place 5–6 supports per unit all around the border of the basal surface of the teeth as shown in the pictures. Supports should be also placed on the connector of each segment
- Only “light supports” needed.
- Supports Top shape should be “Cone 25%” (for easier removal after printing)

### Light support parameters

#### Top

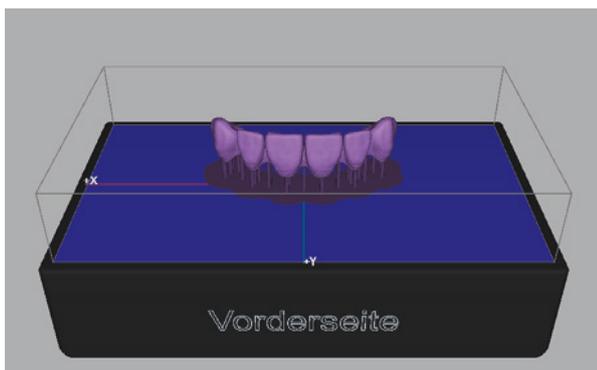
Shape	Cone 25 %
Radius (mm)	0.5
Length (mm)	2
Penetration (mm)	0.35
Angle Factor	100 %

#### Mid

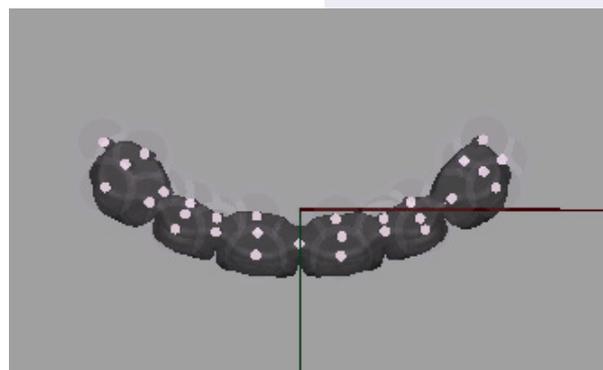
Shape	cylinder
Radius (mm)	0.5

#### Bottom

Shape	Cone 25 %
Radius (mm)	5
Length (mm)	0.75
Penetration (mm)	0
Angle Factor	100 %



Use fine supports, also on the connectors between the segments



## Foundation:

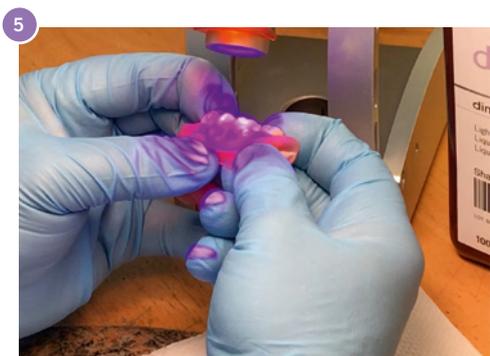
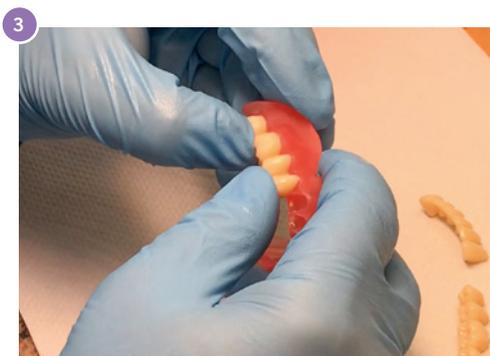
Adding a foundation is not necessary for printed teeth.

## 2. Step-by-step: how to fabricate a printed denture



### Step-by-step: how to fabricate a printed denture:

- After removing Denture Base and Teeth segments from the build table and completing the cleaning process (see 3. Cleaning and postcuring), leave the denture in its green state (uncured) and remove the supports.
  - You are now ready to bond the dima Print Denture Teeth to the dima Print Denture Base. Do not post-cure the base or teeth prior to bonding step.
- 1 Check the fitting of the dima teeth into the corresponding tooth sockets. A small gap between tooth and base is intended as glue space. Then remove the teeth.
  - 2 A small amount of the liquid denture base resin in the same color will work as adhesive. Apply the resin into the tooth sockets by using a small brush or a syringe applicator.
  - 3 Place the dima Print Denture Teeth segment into the corresponding tooth sockets on the printed denture base and press down until they are fully seated. Then wipe off any excess material with a paper towel or tissue.
  - 4 Use a small flat-headed brush to clear any additional excess base material away from the teeth and gingiva junction.
  - 5 Blue light for a few seconds will hold the segment in place, we recommend using HiLite pre 2.
  - 6 Repeat with the remaining segments



### Post-curing the Denture Base and Teeth combined:

- After assembling, post-cure the fully printed denture (base and teeth combined) in a glycerin bath (see 3. Cleaning and postcuring)

### Finishing the Denture Base and Teeth combined:

- Once post-curing is complete, grind the support spots and borders of the fabricated denture to make it smooth.
- Pumice and polish the denture with a polishing unit using desired pumice.
- We recommend using Pala Polish for achieving a high shine for the fully printed denture.

### 3. Cleaning and Post-curing

#### Cleaning recommendations:

- Before the usual cleaning see table below, we recommend using compressed air to blow out any remaining liquid monomer.

#### Curing recommendations:

- dima Print Denture Base Try-in, dima Print Denture Base and dima Print Denture Teeth materials must all be post-cured with an oxygen inhibitor (glycerin) to remove unreacted functional groups and create harder surfaces. We recommend using 99% glycerin.

	Cleaning time in Isopropanol (cara Print Clean or ultra sonic bath)	Post-curing time HiLite Power 3D	Post-curing time LEDcure (no turning of object necessary)
<b>dima Print Denture Base Try-in</b>		20 minutes (10 minutes front side +10 minutes reverse side) in Glycerin	Try-in program, cure in Glycerin
<b>dima Print Denture Base</b>	pre-cleaning: 3 minutes post-cleaning: 2 minutes	20 minutes (10 minutes front side +10 minutes reverse side) in Glycerin for combined	Denture program, cure in Glycerin for the chosen teeth color
<b>dima Print Denture Teeth</b>		Base & Teeth	

#### Using glycerin in Kulzer Light curing devices:

Glycerin is a non-flammable liquid that can be used in Kulzer light curing devices when handled with care:

- To cure the objects in glycerin you need an up to 80°C (176°F) heat-resistant glass bowl with a glass lid, which fits in your light curing device.
- The printed object must be covered with glycerin completely
- Glycerin can be reused and only needs to be changed when getting foggy

### Special information for HiLite power 3D users:

- Never forget to use the model tray of your HiLite power 3D below the glass bowl. This prevents the curing device from overheating.
- Maximum height of the glass bowl 5 cm, maximum width 10 cm at the bottom.
- Open and close the curing department door carefully so that no glycerin spills inside the device.
- We recommend a cool-down time for the HiLite Power 3D of 2–3 minutes after each 10 minutes operational cycle.



**CAUTION: THE GLYCERIN WILL BE VERY HOT AFTER CURING. PLEASE USE AN INSTRUMENT TO FLIP THE APPLIANCE AND TO REMOVE THE APPLIANCE FROM THE HOT GLYCERIN ONCE CURING IS COMPLETE!**

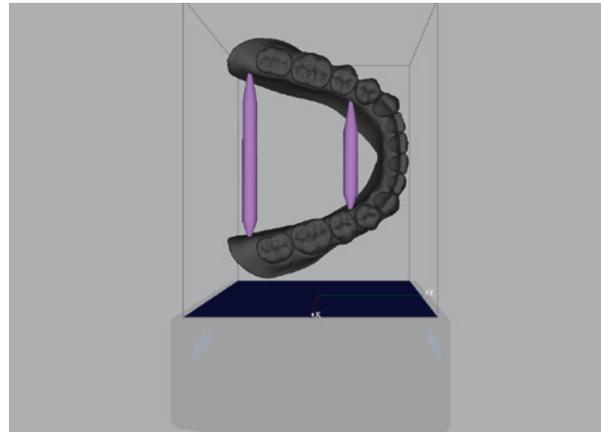


Use the model tray to carry the glass bowl for optimal ventilation

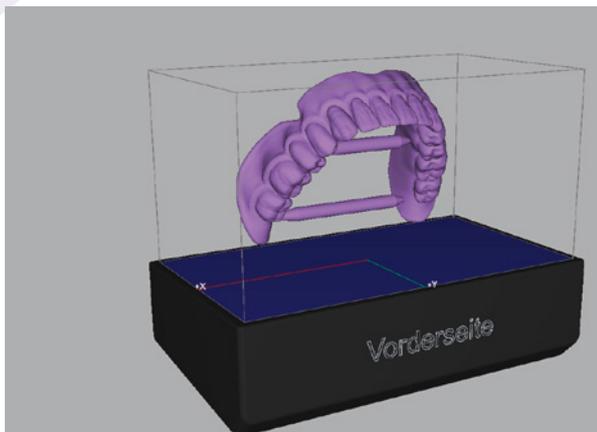
- Once curing is complete, wipe down the appliance with a paper towel to remove the glycerin and use compressed air to blow out any sockets and crevices or rinse the cured appliance under water.
- After this, the objects can be further processed, polished or individualized as needed.

## 4. How to manually create stabilizing bars in CAM 1.0 in CAM 1.0

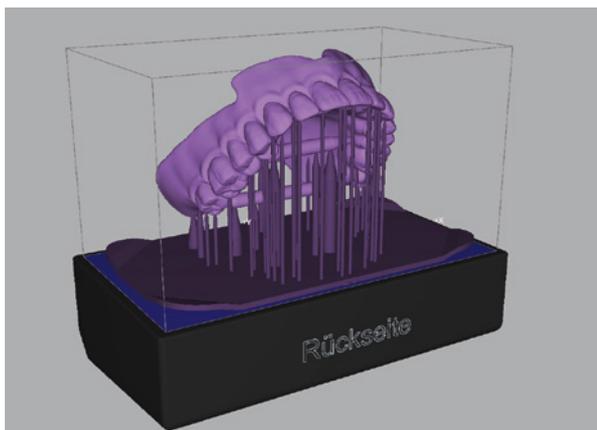
- Orient the Try-in/Denture Base in a vertical direction. Manually add two supports with diameter “heavy” on the middle and the back part of the appliance between the quadrants.



- After the supports are placed, click on model tab and select to highlight appliance on build table.



- Export the edited stl file on your desktop or on another storage device.
- Create new layout and discard the old project. Then reimport the edited stl file into your cara Print CAM Software and turn it in the right position.
- Make sure to put enough supports on the surface of the object and the bars, slice it and print it.



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**dima Print C&B temp:**

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For faster temporaries and provisionals.



**dima Print Stone beige:**

3D print all dental model types with a traditional look & feel.



**dima Print Stone teal:**

The color for orthodontics: less eye strain and high heat resistance.



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