



## Dental Application Print Guide

# 3D Printing Dentures

Denture Base Resin is a highly accurate material specifically formulated for the creation of custom denture bases of all types. Production capabilities include removable denture bases and denture try-ins to ensure final prosthetic appliance fitments as well as high-quality complete monolithic interim dentures for same-day delivery when fused with class IIa crown & bridge materials of the preferred shade. In this workflow guide, learn how to print denture bases successfully with SprintRay 3D printers.

In this workflow guide we will cover the following:

- ✓ Best practices for 3D printing dentures
- ✓ Cleaning and post-processing
- ✓ Characterizing dentures

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## STEP 1

### Data Capturing

In order to fabricate patient-specific prosthetics, you must first capture and record a patient's anatomy. This process of recording is commonly referred to as scanning, which can be achieved through a series of technologies available to dental clinics and laboratories.

Optical scanning via bench-top scanners, intra-oral scanners for direct in-mouth capture, and ConeBeam CT devices gather the required patient-specific information and package it as a usable 3D file for design/treatment planning and, ultimately, 3D fabrication.



### Design/Treatment Planning

Once a patient's anatomy has been captured, the usable 3D file can be loaded into a range of 3rd party Dental CAD software for custom design and treatment planning. It is important to utilize a Dental CAD software that can achieve the desired clinical goals while maintaining output file integrity.

For the design and treatment planning of denture bases and complete digital dentures we recommend the following certified programs for use:

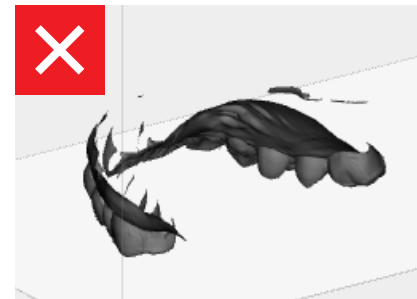


## STEP 2

### Print Preparation in Software

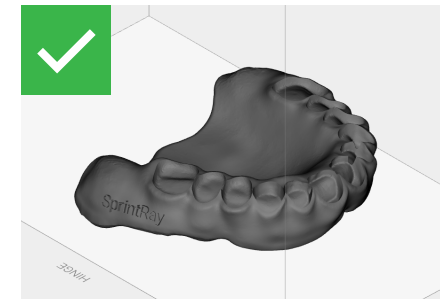
Import the denture model into SprintRay Software to set up the print. Recommended layer thickness for denture models is 100 microns. Note that they can be printed at 50 microns, but this will double the required print time.

In cases where a printable model is not created with the scanner, a 3rd party software is required to prepare the model for print. For additional information on how to repair non-printable models please visit [support.sprinray.com](http://support.sprinray.com)



#### Non-Printable Data

Direct scanned data will be displayed as open mesh in SprintRay Software. In this case, utilize 3rd party software to make the scan printable.



#### Printable Data

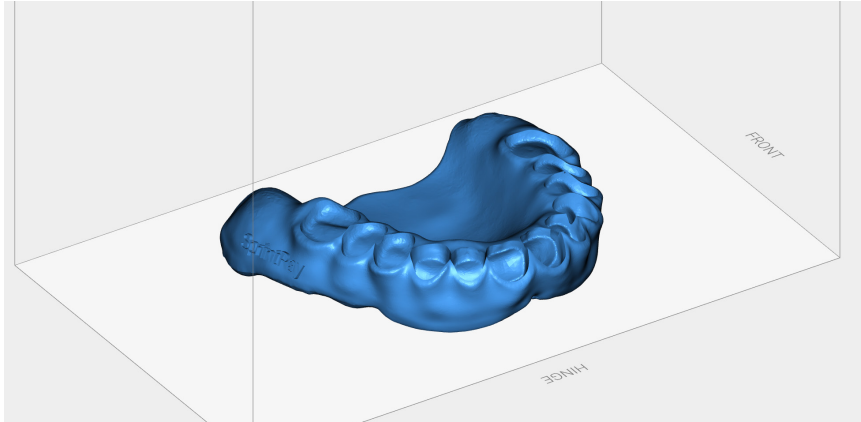
This 3D model is ready to print.

### Setting Up Accurate Prints

To print precisely with SprintRay 3D printers, it is important to orient the model correctly to avoid generating support structures on important holes or surfaces; this ensures the accuracy of the fit.

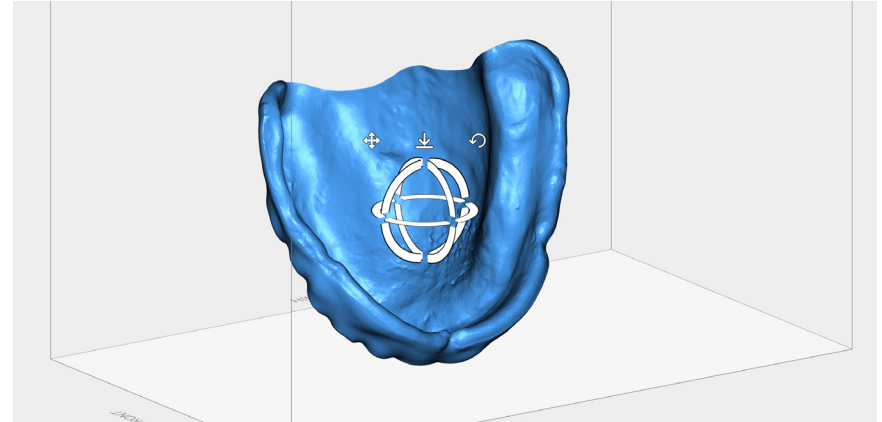
## STEP 2

### Setting Up Accurate Prints



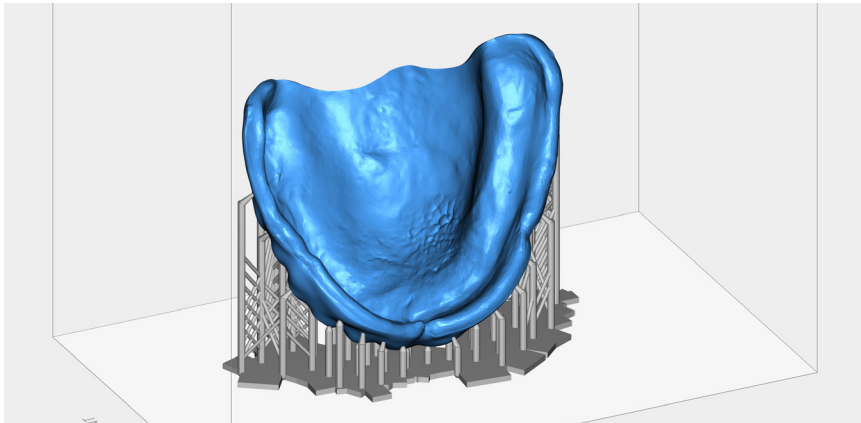
#### Import Models

Import printable denture models and verify their printability by making sure there are no open surfaces.



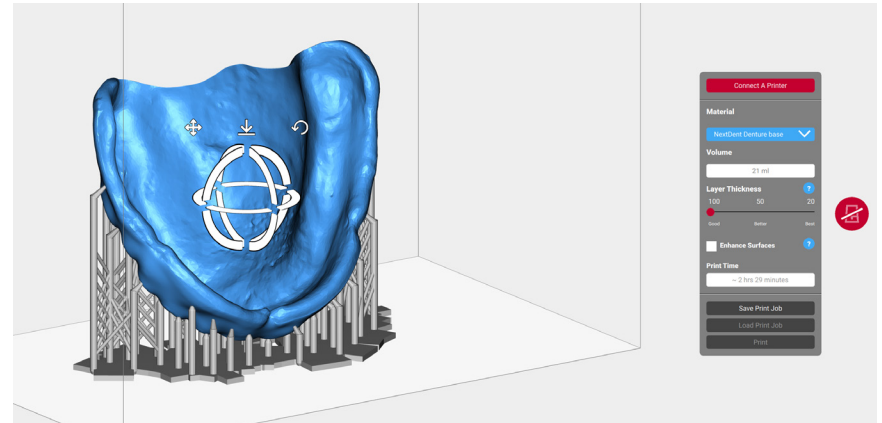
#### Orient Models

Orient important surfaces away from the build platform to generate the best placement of support structures.



#### Add and Edit Supports

Add supports and edit them to verify the placement of support structures to ensure an accurate print.



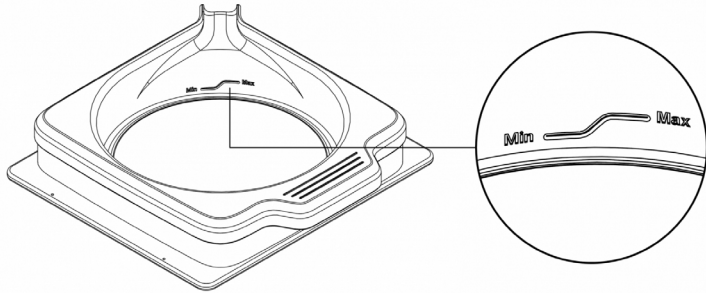
#### Printing

Connect to your 3D printer, select desired settings, and send to print. Make sure the correct resin is selected to avoid print failure.

## STEP 3

### Printing on MoonRay

Before you begin printing, shake the resin bottle to ensure complete mixture of the resin's chemical formulation. Fill the tank with the resin until it is above the min fill line, careful not to exceed the max. Now the print can begin.



If there is leftover resin in the tank from the previous print, use the provided resin wiper to stir the resin before printing. This ensures that the resin is properly mixed and clean.

### Maintaining the Resin Tank Drum

When cared for properly, the resin drum in MoonRay is designed to last for 50 liters of use. Resin left over after a print can be left in the tank for up to 24 hours. However, note that prolonged exposure to bright lights and air may inadvertently cause it to begin curing. It's therefore recommended that you pour extra resin back into the bottle and clean the tank within 24 hours.

To clean, gently use a paper towel and isopropyl alcohol to wipe the interior. Avoid using a coarse cloth or sharp tools to loosen cured resin from the tank, as this may cause damage. After 50 liters of use, the tank may become cloudy, causing your models to peel. If this happens, replace your resin tank to ensure continued print accuracy.

## STEP 4

### Post-Processing

After printing, models must be rinsed, dried, removed from the support structure and then post-cured. Read the following for detailed instructions on how to effectively post-process the 3D printed model.

#### [Washing Parts](#) (Click on the link to learn how to best clean your prints)

Bathe the 3D printed model in a bath of 96% isopropyl alcohol (IPA) to remove any liquid resin. Use a toothbrush to scrub the surface of the model to remove any partially-cured resin.

Once the majority of the resin is removed, transfer the model into an ultrasonic cleaner filled with clean IPA for no more than 5 minutes. For this process, orient the occlusal surface of the model downward to allow resin to fall away during the agitation process.

In total, the print should spend no more than 10 minutes in alcohol to avoid micro-cracks and abrasions. Once cleaned, air-dry the print using compressed air. If there are any particles or residue still on the model, spray it down with more alcohol. Rinse, dry, and repeat until all uncured resin is removed.

#### FIRST

IPA Brush  
<5 minutes

#### SECOND

UltraSonic  
<10 Minutes

#### THIRD

Air Dry  
5 Minutes

#### [Removing Supports](#) (Click on the link to learn how to best remove the supports)

Manually snap off or use a flush cutter to snip away the support structure from the printed model. Using the flush cutter, cut the supports as close as possible to their attachment points on the model. Be careful not to nick the model itself, as this can cause pitting that may be difficult to remove during sanding.

## STEP 4

### Post-Curing Requirements

The 3D printed models must be properly post-cured to manufacturer's specifications before use. The color of the model will slightly change during the post-curing process. Recommended post-cure time is between 15-25 minutes depending on the specification of your curing unit.

### Polishing Printed Guides (Optional)

To ensure a smooth surface finish, take a small file and sand away any nubs left over by the support structure. Sand in a circular motion to remove the nubs without leaving deep sanding marks; the goal is to blend the nubs into the surface of the print. Once finished, use high grit sandpaper to blend the sanded areas. To achieve a polished look, apply chapstick to mask the sanding scratches.

## STEP 5 - Optional

### Characterize the Printed Denture

With your final print you can now stain and glaze your appliance to your preferred aesthetics.





## Customer Support

Printer uptime is crucial to your practice. If you're experiencing issues, please get in touch. Our Los Angeles support team works Monday through Friday, 9AM - 5PM PST.

[www.support.sprintray.com](http://www.support.sprintray.com)

## Free Consultation

Set up a free consulting session with our sales team to see how 3D printing can dramatically enhance your dental practice and help improve patient care from day one.

[sales@sprintray.com](mailto:sales@sprintray.com)



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