SprintRay

Dental Application Print Guide

3D Printing Splints and Mouth Guards

Splints, mouth guards and retainers are rigid dental appliances that can be fabricated with SprintRay 3D Printers and a biocompatible Class IIa material. These commonly used dental appliances serve multiple functions including, the protection of teeth from Bruxism (grinding) and to help keep teeth in proper orthodontic alignment. These fabricated appliances are attractively clear, strong and durable.

In this workflow guide we will cover the following:

- ✓ Best practices for 3D printing mouth guards
- ✓ Cleaning and post-processing

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STEP 1

Digitizing Impression

In order to create mouth guards, the patient's impression must first be captured digitally. This can be accomplished with intraoral impression scanners, desktop impression/model scanners, or via CBCT impression/model scanners.

Designing Mouth Guards

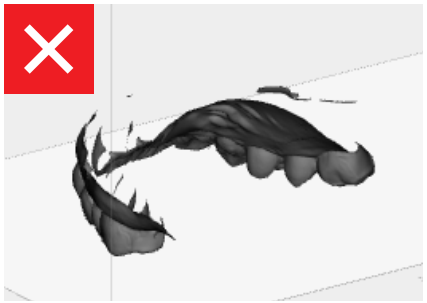
SprintRay Software allows you to choose mouth guard design software that meets your clinical needs. This list shows our recommended options, but our software accepts any design file formatted in .STL, which means you can use whichever software you're most comfortable with.

STEP 2

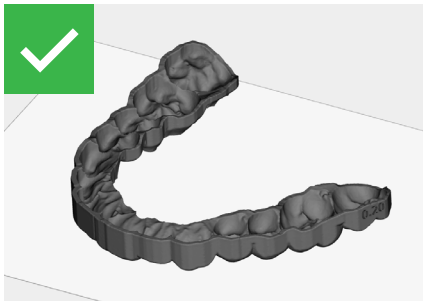
Print Preparation in Software

To begin, import the mouth guard model into SprintRay Software. Recommended layer thickness for printing mouth guards is 50 microns. Note that they can be printed at 100 microns, but this will adversely affect the surface quality.

In cases where a fully 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.sprintray.com**



Non-Printable Data
Direct scanned data will be displayed as open mesh in SprintRay Software. This data requires 3rd party software to make it printable.



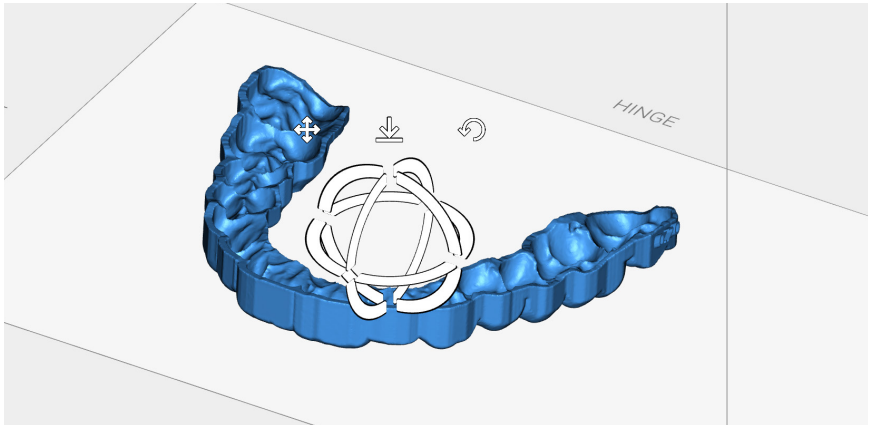
Printable Data
Example of ready-to-print data.

Setting Up Accurate Prints

To print precise mouth guards, it is important to orient the model correctly to avoid generating support structures on important holes or surfaces; this ensures accuracy of the fit.

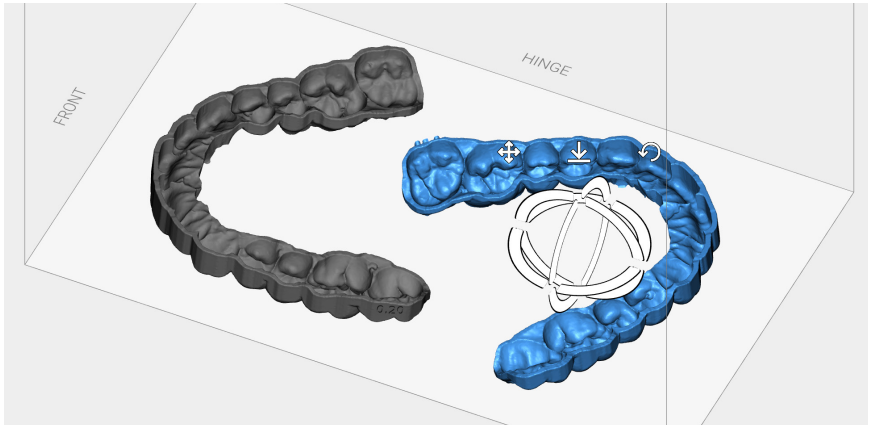
STEP 2

Setting Up Accurate Prints



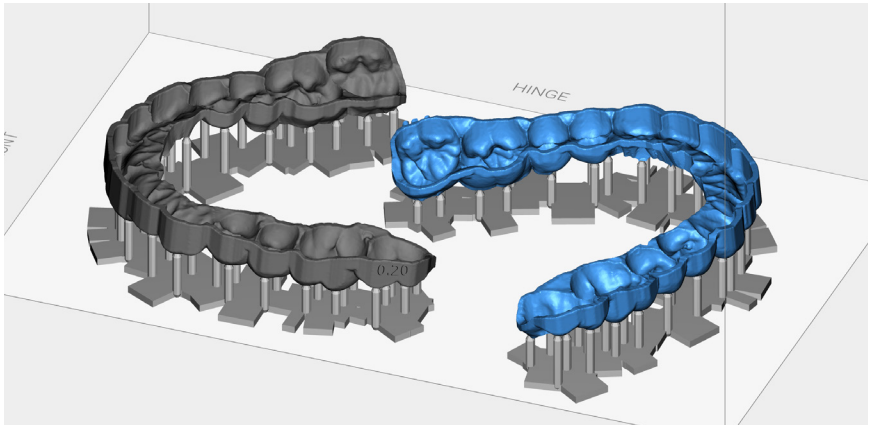
Import Models

Import models, orient them to be relatively flat with intaglio side faced up/away from platform.



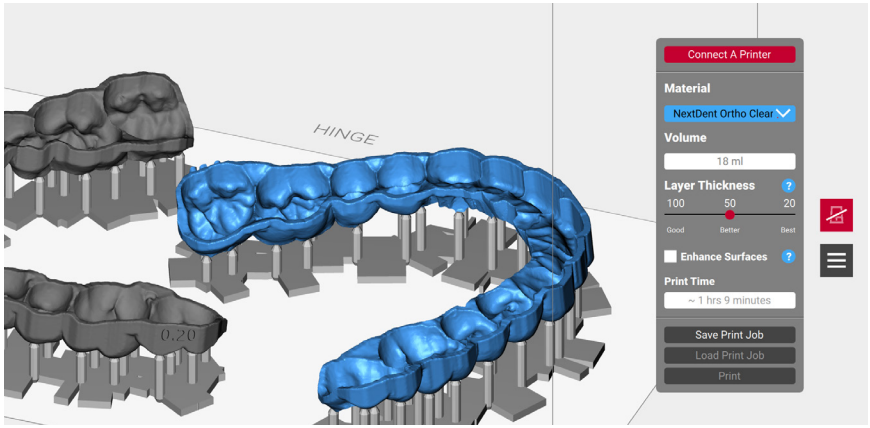
Duplicate and Orient Models

You can make duplicates and orient them to fit in build platform.



Add Supports

Add support structure and edit if necessary.



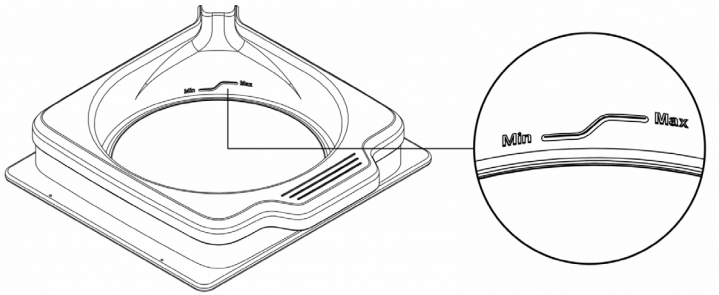
Printing

Connect to your 3D printer, select the desired settings, and send to print. Make sure to double check that you have selected the correct resin.

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 Models

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	SECOND	THIRD
IPA Brush <5 minutes	**UltraSonic** <10 Minutes	**Air Dry** 5 Minutes

Removing 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 mouth guards 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 Models (Optional)

To ensure a smooth surface finish, use a high speed headpiece or a small file and sand away any remaining nubs left over by the support structure. Sand in a circular motion to remove the nubs without leaving deep pits or obvious sanding marks; the goal is to blend the nubs into the surface of the print. Once finished, use a high speed headpiece, polishing wheel, or high grit sandpaper to blend the sanded areas.

Quick Tip: Chapstick maybe applied to mask any surface abrasion.

Customer Support

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

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

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