Dental Application Print Guide

3D Printing Indirect Bonding Trays

In this workflow guide we will cover the following topics:

- ✓ Capturing Patient Data and Designing Appliance
- ✓ Print Preparation in RayWare
- ✓ Orienting Models for Accurate Prints
- ✓ Printing
- ✓ Cleaning Printed Models
- ✓ Post-Processing Printed Materials

Tools/supplies needed for this workflow:

- ✓ SprintRay Pro or MoonRay S/D 3D Printer
- ✓ RayWare Desktop Software (Free)
- ✓ SprintRay IDB Resin
- ✓ SprintRay Pro Cure (Optional)
- ✓ Nitrile Gloves
- ✓ IPA 91% or greater for cleaning 3D printed models
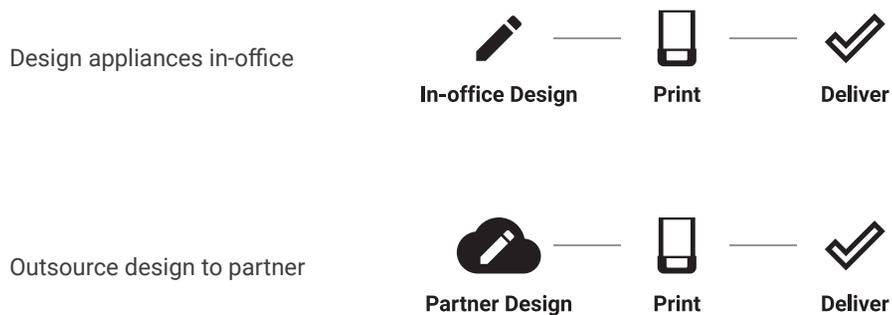- ✓ Cleaning Supplies

![SprintRay logo]

1 Capture Patient Data and Design Appliance

Obtain digital impression. This can be accomplished with a handheld intraoral scanner or with a traditional impression and a desktop box scanner.

CEREC

3shape▷

iTero

⬭ Carestream

MEDIT

Design In-House or Collaborate With Digital Partner

Because they print with the universal .STL file format, SprintRay 3D printers are compatible with almost all dental CAD and orthodontic design software as well as digital design services. With the exception of models that replicate a patient's oral anatomy, all dental models will require in-office or partner design to be printable.

Design appliances in-office

In-office Design — **Print** — **Deliver**

Outsource design to partner

**Partner Design** — **Print** — **Deliver**

2 Print Preparation in RayWare

In Print Settings, choose the desired printer, resin, and layer thickness for this job.

Recommended layer thickness for IDB models is 50 or 100 microns, depending on the desired surface finish.

Next, import your dental model(s). RayWare will automatically run printability checks to determine if your IDB model is properly saved. If it is not saved properly or if you have imported raw data from your intraoral scanner, follow the on-screen prompts to have RayWare attempt to fix it automatically.
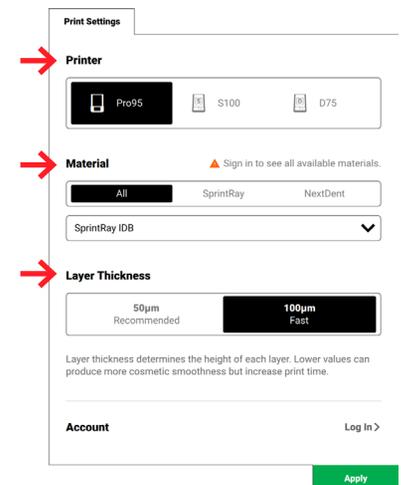
👍 **Printable Data - No Action Needed**
If RayWare does not flag issues with your model, proceed to the next steps.

👎 **Unprintable Data - Action Needed**
Raw scan data or improperly designed prints will be flagged by printability checks.
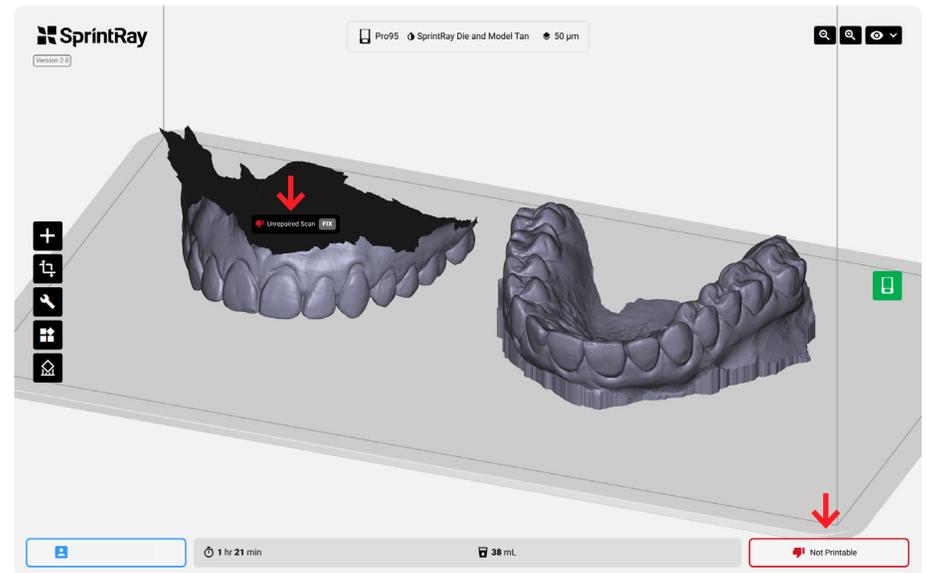
## 3 Orient Models for Accurate Prints

Import models into RayWare by dragging and dropping files onto the build platform or using the 'Import' button. Arrange models on build platform as desired.

──────────── Layout and Orientation ────────────

INTAGLIO SIDE UP

OR
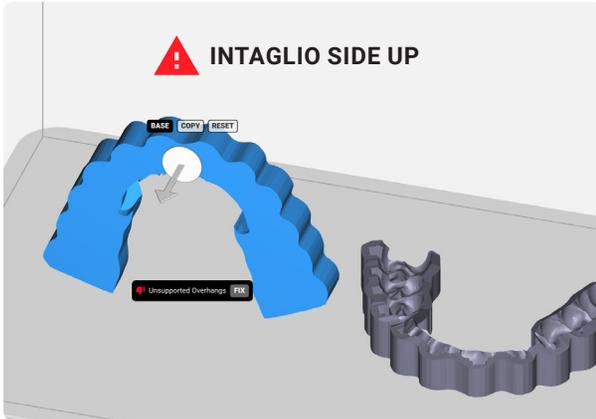
Orienting IDB
For best results, orient IDB models with the intaglio side up to avoid generating support pillars on the contact surface.
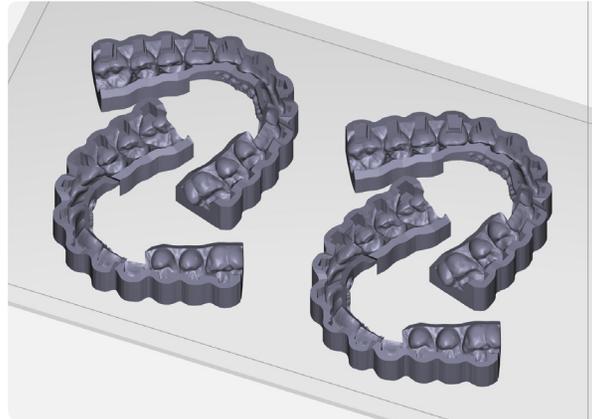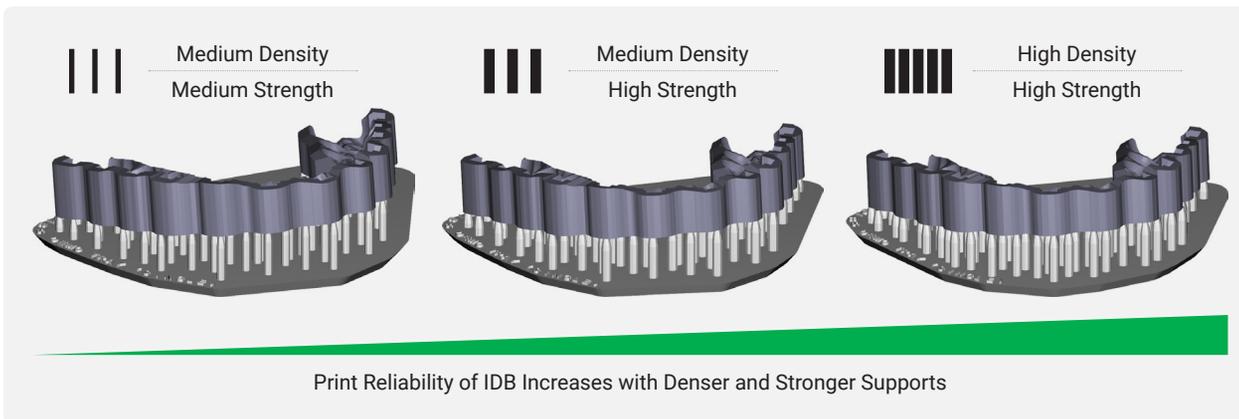
Printing IDB Directly on Platform (Recommended)
Because IDB is a flexible resin, we recommend designing your trays with a thick, flat base at the occlusal surface and printing directly on the platform for best results.
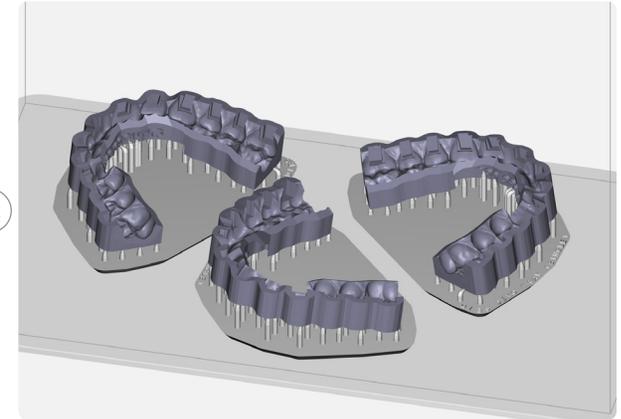
Printing IDB with Supports (As Needed)
We recommend printing IDB flat on the build platform whenever possible. However, if supports are necessary, generate high-strength supports in RayWare to ensure print success.

Medium Density / Medium Strength

Medium Density / High Strength

High Density / High Strength

Print Reliability of IDB Increases with Denser and Stronger Supports

Support Settings for Printing IDB
If printing IDB models with supports, use high density and high strength support generation in RayWare. Because the IDB material is flexible, this will help increase the chance of print success.
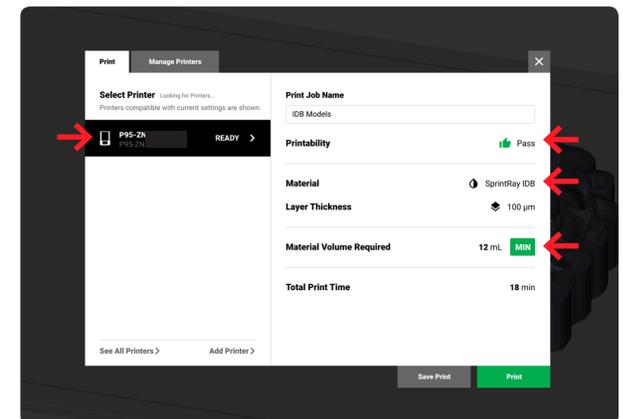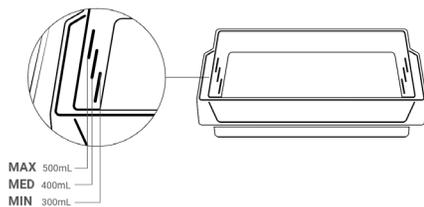

Printing
Before you print, double check that you have selected the correct printer, material, layer thickness, and that you have enough material in the tank.

4 Print

Begin by checking the tank of your SprintRay 3D printer. If the desired resin is already in the tank, use the provided resin stirrer to thoroughly mix before topping-off with new resin. When adding new resin to the tank, shake the bottle vigorously for several minutes to ensure proper incorporation.
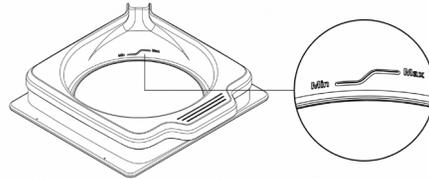
SprintRay Pro
If printing on SprintRay Pro, ensure the resin is filled to the minimum specified amount displayed on Pro's touchscreen.

MoonRay S/D
If printing on MoonRay, fill the tank until it rests between the min and max fill lines. The max line allows for up to 250mL.

MAX 500mL
MED 400mL
MIN 300mL

⚠ **DO NOT POUR RESIN BEYOND THE MAX LINE.**

Resin Tank Maintenance

When resin sits still for long enough it's heavier components settle to the bottom of the tank/bottle and this mixture must be evenly distributed to print correctly.
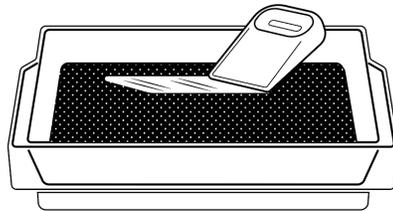
Always stir to homogenize the resin before initiating a new print. Failure to mix resin, especially when topping-off from a bottle, may result in failed prints. Always clean the tank between uses, especially when switching between material types.

To clean, gently use a paper towel and isopropyl alcohol to wipe the interior. If you frequently switch between different resin types, we recommend having separate tanks dedicated to each material. Always cover the resin tank with the included black plastic cover when storing, and always keep in a dark, dry place.

For an in-depth guide on resin maintenance and cleaning, visit **support.sprintray.com**

5 Clean Printed Models

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.
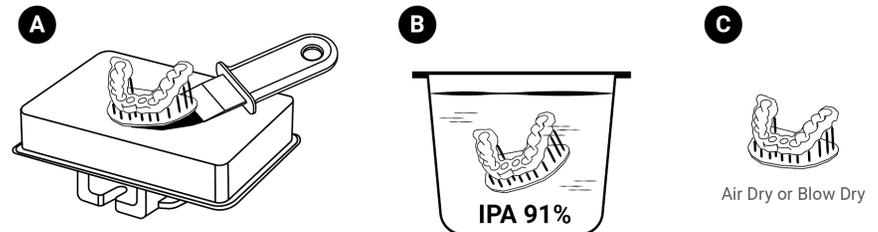

Wear Gloves

Washing Models

Dunk the 3D-printed model in a bath of 91% isopropyl alcohol (IPA) or greater.

Repeat this process a few times to remove uncured resin bound by surface tension to the model. Once the majority of the resin has been removed, transfer the model into an ultrasonic cleaner filled with clean IPA for 5-7 minutes.

A

B **IPA 91%**

C Air Dry or Blow Dry

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 the model feels tacky to the touch or has a shine, dunk it in IPA a few more times until the excess resin is totally removed.

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.
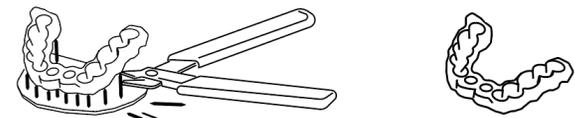
6 Post-Process Printed Models

The 3D printed models must be properly post-cured to manufacturer's specifications before use. If you are using SprintRay Pro Cure, simply place your models into the curing chamber and use the touchscreen to select the type of resin you are curing. Pro Cure will automatically heat to the specific temperature required and its LED array will run for a predetermined amount of time for optimal part strength and aesthetics.

If you do not have SprintRay Pro Cure, refer to the resin's Instructions for Use or Safety Data Sheet documentation for curing instructions.
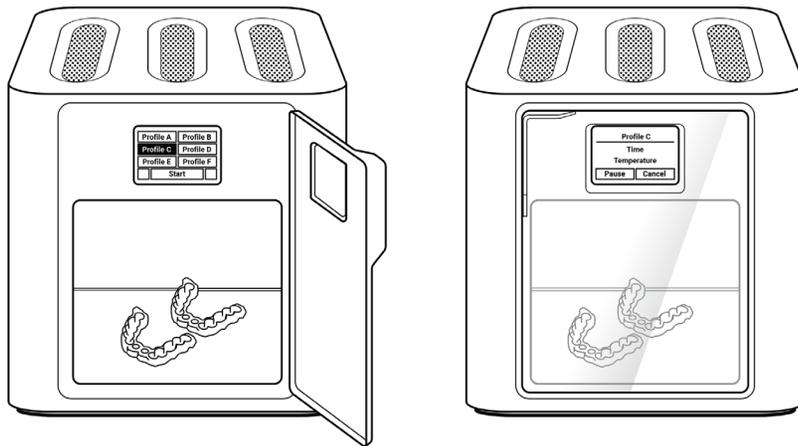
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Final Processing Steps

Some materials require additional steps before final placement. Once your parts have been fully washed and post-cured, they are safe for functional use.

Once IDB have been washed and post-processed according to materials specifications, insert brackets to ensure proper fit. IDB is a flexible material; take care not to rip or tear as this may compromise placement accuracy.

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

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.

support.sprintray.com