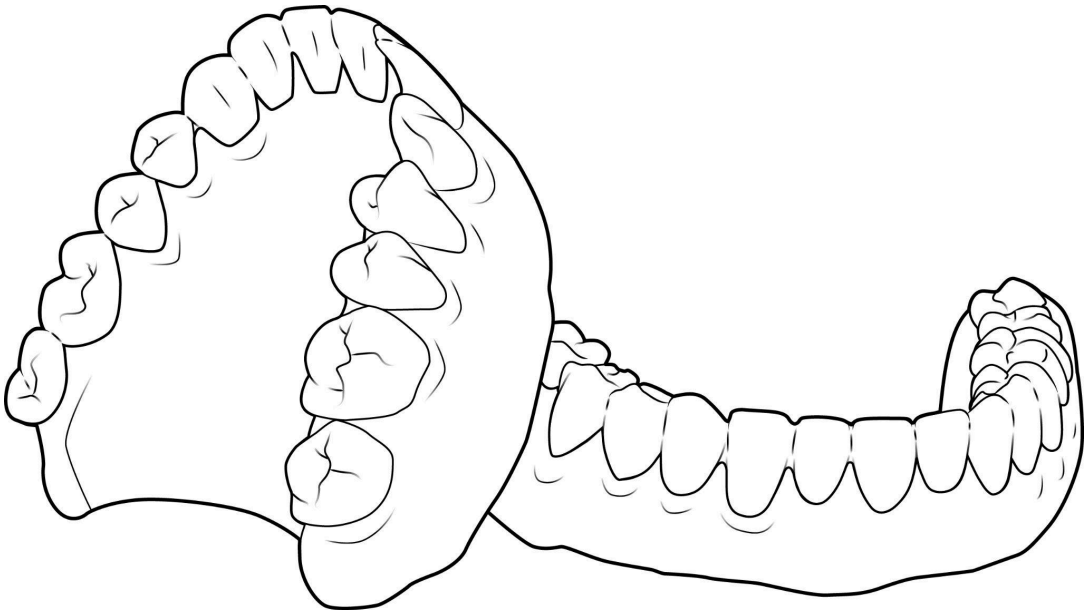
Workflow Guide:

3D Printing for Removable Dentures



3D printing provides a new way to fabricate dentures that are strong, aesthetic, and comfortable. With SprintRay in your office, you can deliver dentures in fewer appointments while providing an exceptional patient experience.

Zest LOCATOR workflow
If you're using the Zest LOCATOR workflow for placing a removable overdenture, scan the QR code for an addendum to this guide that walks you through the necessary steps.

Workflow at a Glance

1.Capture Data

Tools:

- Intraoral scanner

2. Order Design

Tools:

- Computer with internet
- Patient data
- SprintRay account

3. Create Print Job

Tools:

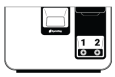
- Computer with internet
- SprintRay account

4. 3D Print

Tools:

- SprintRay 3D printer (Pro 2 preferred)
- Apex Base resin
- Apex Teeth resin
- Duo Kit

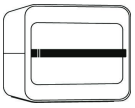
5. Wash

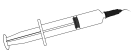


Tools:

- SprintRay wash device
- Duo Kit wash adapter

6. Post Cure

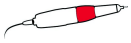


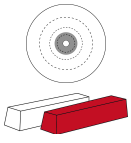


Tools:

- SprintRay NanoCure
- Apex Base resin
- Applicator

7. Finish & Polish





Tools:

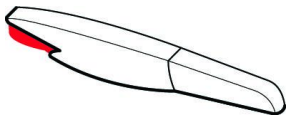
- Lab handpiece
- Abrasive wheels or burr
- Muslin polishing wheels
- Polishing compounds
-Ivoclar universal polishing paste

1. Capture Data

Time

10 minutes

Tools



Intraoral scanner

1.1 Determine Denture Type

SprintRay offers a full workflow for the 3 main types of removable dentures. Depending on which denture you need, the patient data required and the files you receive will vary.

Denture Types:

1.2 Copy or Reference Denture

Use an existing denture to create an exact replica or slightly adjusted prosthetic with improved retention and aesthetics.

1.3 New Denture

For an edentulous patient who does not currently have a denture. A conventional wax rim impression is required for this treatment.

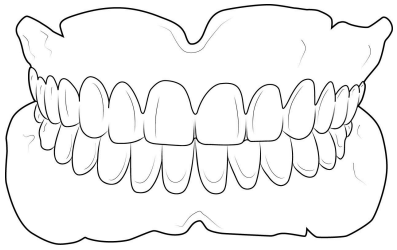
1.4 Immediate Denture

Create a temporary denture to be placed immediately after a patient has had their teeth extracted.

The fabrication process for all the major denture types is similar; most of the difference between denture types is the data you'll need to submit for design. If you're placing an overdenture, consult the Zest LOCATOR guide for additional instructions.

1.2 Copy or Reference Denture

Extra Tools



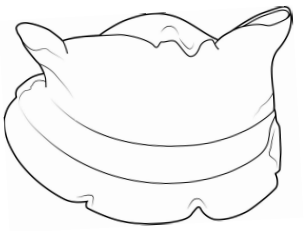
Existing denture

Copy and reference dentures use the patient’s existing prosthetic as the basis for designing a replacement.

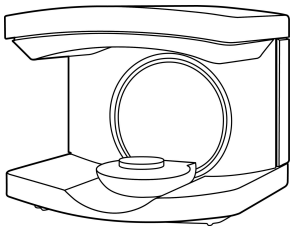
Use an intraoral scanner to directly scan the occlusal, palatal, and intaglio surfaces of the denture. If possible, include all surfaces of the denture in the same scan. If retention is poor, use the existing denture as a custom impression tray to take a functional impression.

1.3 New Denture

Extra Tools



Wax rim impression



Benchtop scanner (optional)

New dentures are for patients who are already edentulous and don’t already have a denture.

Take a conventional wax rim impression, then use an intraoral scanner or benchtop scanner to digitize. If using an intraoral scanner, directly scan the occlusal, palatal, and intaglio surfaces of the impression. If possible, include all surfaces of the impression in the same scan.

1.4 Immediate Denture

An immediate denture is for a patient who currently still has teeth and requires a temporary prosthetic for use after extraction.

Perform a pre-op scan of the patient's current anatomy. Scan as much of the gingiva as possible. Scan the depth of the sulcus if possible.

⚠ *This is a temporary appliance; the patient should return when fully healed for a reference or copy denture.*

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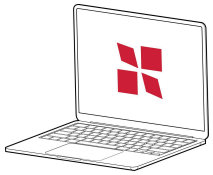
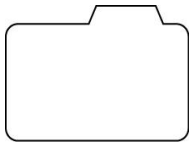
2. Submit Design Request

Time
3 business days

Tools		
		
Computer with internet access	Patient data	SprintRay account

2.1 Submit Treatment Request

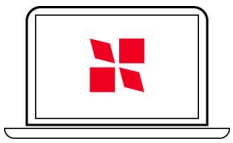
Visit dashboard.sprintray.com and sign in or sign up for a SprintRay account. Select or add your patient, then choose the 'Removable Dentures' treatment type and select the subtype you chose in step 1. Upload all relevant data.

2.2 Review and Approve Design

Once your designer has created the denture treatment, they will send you files and any notes to review the case. You can communicate with the designer via our integrated chat system if you have any questions or revision requests.

3. Create Print Job

Tools



Computer with internet access

SprintRay account

3.1 Import into RayWare

Navigate to RayWare Cloud, then start a new print job. The Pro 2 Duo Kit allows you to print both the base and teeth in a single job.

> ⚠ *If you are using a Pro S or Pro printer, or do not have a Duo Kit, you can print the base and teeth in two separate print jobs.*

Print Setup Details

Indication	**Duo Mode**	
Tank I	**Indication**: Denture base **Material**: Apex Base	Intaglio surface facing towards the build platform, anterior at a 60°angle
Tank II	**Indication**: Denture teeth **Material**: Apex Teeth	Occlusal surface facing toward and parallel to the build platform

3.2 Queue to Printer

Once you're happy with the setup of your print, select the 'Send to Queue' button, then choose the printer you'd like to use for this print job.

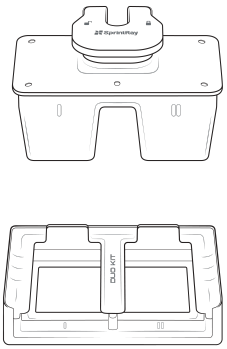
> ⚠ *You can also use the 'Print Now' button, but be sure to thoroughly inspect your printer before you start printing.*

4. 3D print and base and teeth

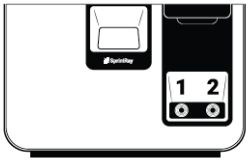
Tools

SprintRay 3D printer (Pro 2 preferred)

Apex Base and Apex Teeth resins

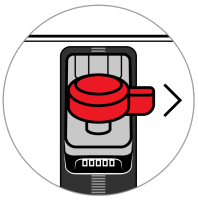


Duo Kit build platform & resin tank (preferred)



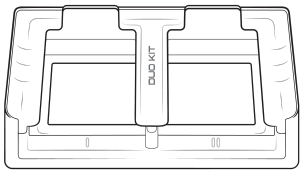
SprintRay wash device

4.1 Prepare and Start the Print Job

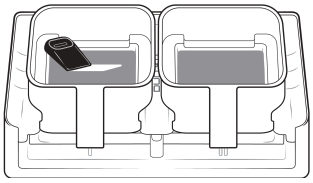


Locked
Ready to print

A) Install and lock the Duo Kit build platform

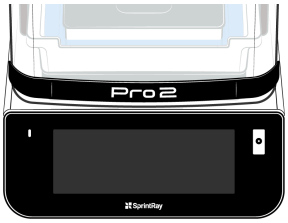


B) Install the Duo Kit tank cradle, then the tanks



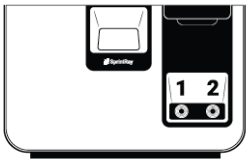
C) Fill one tank with Apex Base and the other with Apex Teeth resin

Go to the queue and press ‘Start Print’. This print job should take around 60 minutes



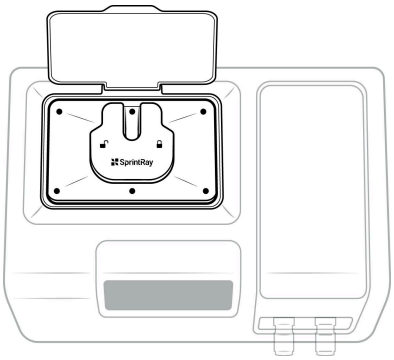
4. Wash the base and teeth

Tools

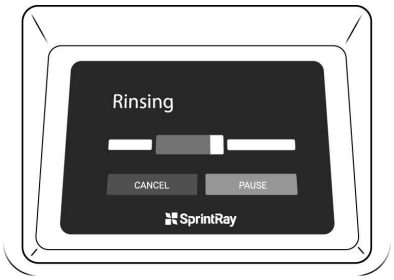


SprintRay wash device

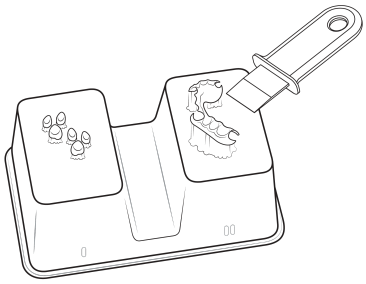
4.2 Wash the base and teeth



A) Transfer the build platform to SprintRay wash device with the Duo Kit adapter



B) Run a standard cleaning cycle



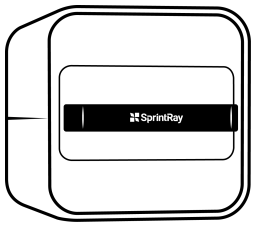
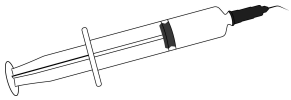
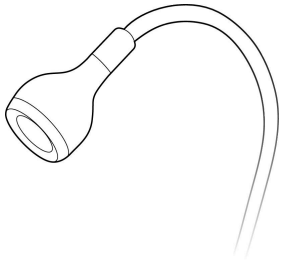
C) Remove the base and teeth from the Duo Kit platform

If you are printing denture teeth with a high-ceramic material such as Ceramic Crown, consult the IFU for separate washing instructions

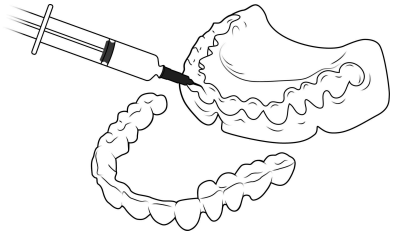
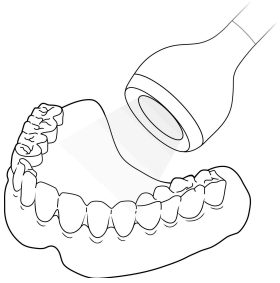
6. Assemble & Post Cure

Time

30 minutes

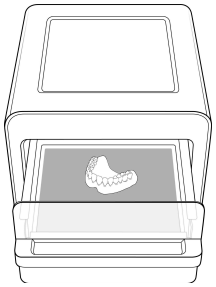
Tools			
			
Curing device (NanoCure preferred)	Syringe or applicator	Denture base resin	Gooseneck clamp-on curing light or handheld curing light

6.1 Assemble the teeth and base

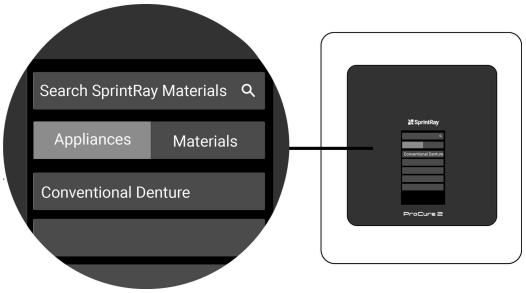
		
Use a syringe to cover each socket with denture base resin	Press the teeth and base firmly together, applying level pressure	Continue applying pressure while tack curing the teeth and base together

If you are creating the denture base and teeth from two different resin lines, first select 'Conventional Denture' on your cure device and follow the onscreen instructions for assembly and curing

6.2 Final cure



Place the assembled denture in NanoCure



Select ‘Conventional Denture’ on the touchscreen; follow the onscreen instructions for curing

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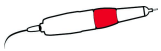
7. Smooth & Polish

Tools

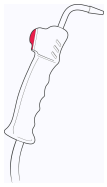


Lab handpiece

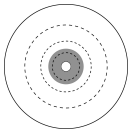
Red Scotch-Brite Fuzzies

Resilience polish

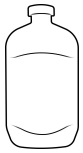
Dental lathe



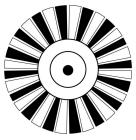
Steamer



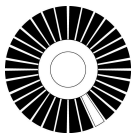
Cotton buff wheel



Mineral oil



Bristle wheel B27/B29

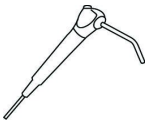


Robinson #11 wheel

Tripoli Rouge

Ivoclar universal polishing paste

Blue Shop Towel

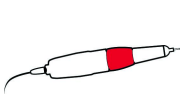


Compressed air

7.1 Smooth and Polish

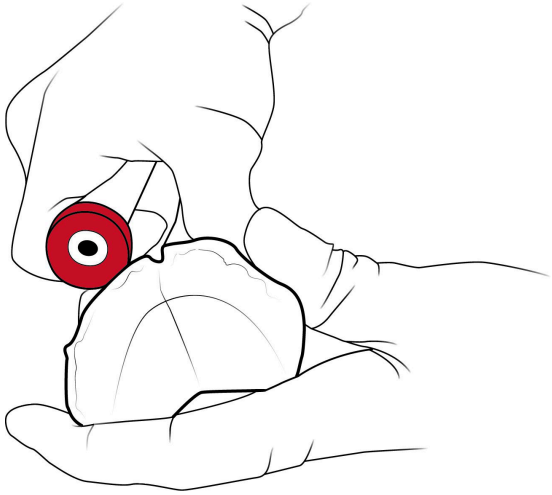
Smooth with Handpiece

Use low RPM with a Red Fuzzies and/or a carbide burr to remove any stumps left over from supports. Make sure to do a full pass along occlusion.



Lab handpiece

Red Scotch-Brite Fuzzies

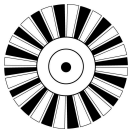


Smooth with Resilience

Use a black bristle wheel B27/B29 and Resilience polish. Resilience should be wet but not runny. Apply medium pressure.

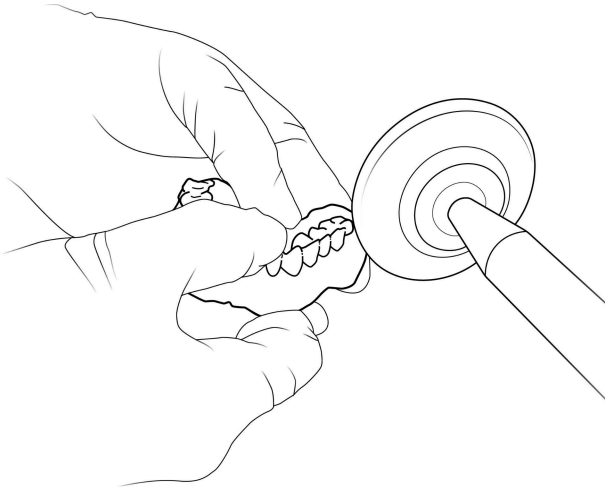
⚠ *Polish at low speed and do not let the wheel dry out*

Dental lathe



Bristle wheel B27/B29

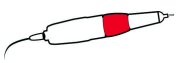
Resilience polish



Apply Tripoli Rouge

Apply Tripoli to a Robinson #11 wheel on a lab handpiece in hard-to-reach places and interproximal surface.

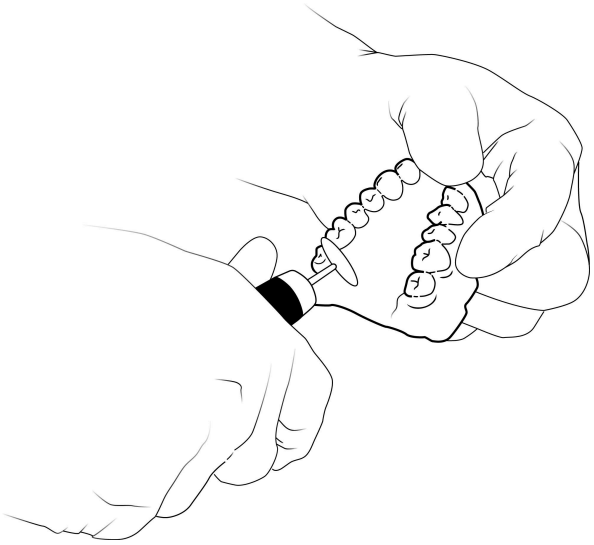
⚠ *Do not let the wheel dry out*



Lab handpiece

Tripoli Rouge

Robinson #11 Wheel

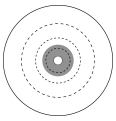


Apply Paste and Polish

Apply Ivocalr Vivadent Universal Polishing Paste to the denture. Use a fresh wheel to polish all surfaces of the denture using full pressure.

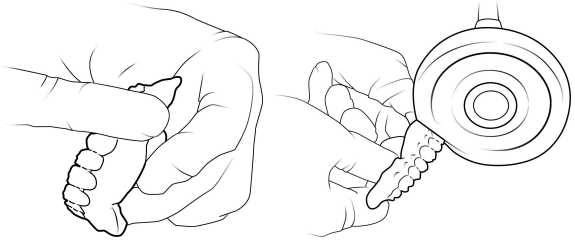
⚠ *Polish at low speed and do not let the wheel dry out*

Dental lathe



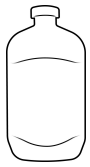
Cotton buff wheel

Ivoclar universal polishing paste



Apply Mineral Oil

Dip a gloved finger in mineral oil and smear across the denture surface.

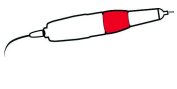


Mineral oil

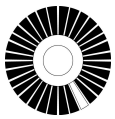
Remove Polishing Paste

Use medium/heavy pressure on a new Robinson #11 wheel to reach all the interproximal areas, removing mineral oil and polishing paste so the denture is shiny.

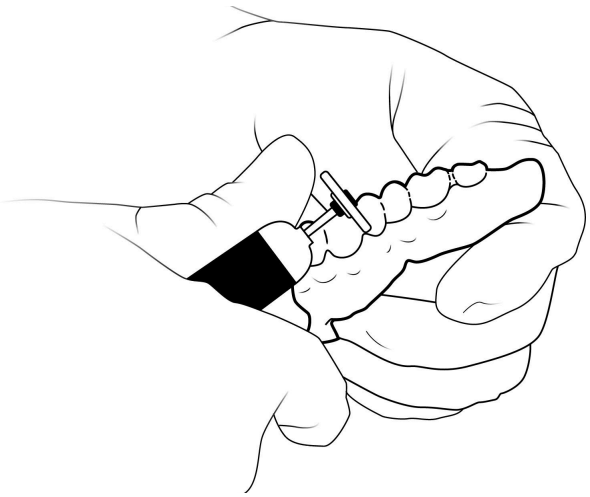
⚠ *Do not let the wheel dry out*



Lab handpiece



Robinson #11 wheel

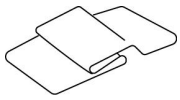


Clean

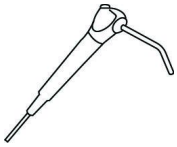
Remove residual mineral oil and brush the denture by hand, use a steamer, or rinse with water.

Dry with compressed air and/or a blue shop towel.

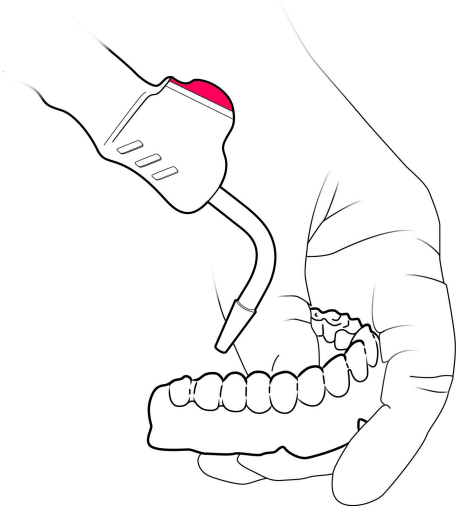
Steamer



Blue Shop Towel



Compressed air



Disinfect and then place the denture.