



# Removable Partial Denture Fabrication

SprintRay Apex Flex & Apex Teeth — Lab Manufacturing Procedure

|            |                                                               |
|------------|---------------------------------------------------------------|
| Owner      | Lab Technician (process owner)                                |
| Applies to | Smile Avenue Family Dentistry in-house lab                    |
| Start      | Case received in Medit Lab                                    |
| End        | Prosthetic bagged and logged in SEAZONA for outbound delivery |
| Related    | Station Job Aid SOP-LAB-030-JA                                |

## 1. Purpose

This procedure standardizes in-house manufacturing of SprintRay flexible removable partial dentures (Apex Flex Partial Base with Apex Teeth) so every case meets the same quality, safety, and traceability standard before leaving the lab.

## 2. Scope

- **In scope:** Medit Lab intake → scan QC → Heygears portal design → RayWare / Pro 2 Duo Kit print → ProWash S → assemble & NanoCure → finish & polish → lab clean → bag & SEAZONA outbound log.
- **Out of scope:** Chairside scanning technique; clinical try-in and patient delivery; chairside chemical disinfection; nightguards; cast-metal frameworks; non-SprintRay printers.

## 3. Roles

| Role                          | Responsibility                                                                        |
|-------------------------------|---------------------------------------------------------------------------------------|
| Clinical Assistant / Office   | Sends case via Medit Lab; receives bagged prosthetic from lab                         |
| Lab Technician                | Scan QC, Heygears portal submit/export/approve, manufacture, finish, bag, SEAZONA log |
| Trainer / Lead Lab Technician | Competency observation and sign-off                                                   |
| Doctor                        | Clinical indication, try-in, and remake authorization (outside manufacturing steps)   |

## 4. Practice Configuration

---

| #  | Item                         | Smile Avenue setting                                                                                       |
|----|------------------------------|------------------------------------------------------------------------------------------------------------|
| 1  | Printer (Flex base)          | Pro 2                                                                                                      |
| 2  | Cure unit                    | NanoCure — cycle <b>Apex Flex Denture</b>                                                                  |
| 3  | Case intake                  | Medit Lab                                                                                                  |
| 4  | Design                       | Heygears portal (Heygears designs; Lab Technician imports, exports, approves)                              |
| 5  | Duo Kit                      | Yes                                                                                                        |
| 6  | Wash                         | ProWash S                                                                                                  |
| 7  | Apex Flex shades             | Stock Standard Pink and Light Pink; select per prescription                                                |
| 8  | Apex Teeth default           | A2 (other shades per prescription)                                                                         |
| 9  | Lab clean before bag         | Soap, toothbrush, and warm water (and/or steamer), then dry. This is cleaning — not chemical disinfection. |
| 10 | Design approval before print | Lab Technician                                                                                             |
| 11 | Case log                     | SEAZONA                                                                                                    |

## 5. Safety

---

- Treat uncured Apex Flex and Apex Teeth as sensitizers. Work in a well-ventilated area.
- Wear nitrile gloves, protective eyewear, lab coat or gown, and face protection when handling uncured resin, IPA, or grinding/polishing.
- Do not place incompletely cured resin in the mouth. Do not bag an under-cured appliance.
- Skin contact: wash with soap and water. Persistent irritation: stop work and follow the SDS.
- Do not substitute non-validated printers, washers, cure units, or bonding resins for Apex Flex bases.
- Cure liquid waste resin fully before disposal. Follow hazardous-waste rules until cured.

## 6. Materials & Equipment

---

### Resins

- SprintRay Apex Flex (Standard Pink, Light Pink)
- SprintRay Apex Teeth (Bleach, A1, A2, B1 — default A2 unless prescribed otherwise)
- IPA ≥91%
- Apex Flex resin for tooth-to-base bonding

## Equipment stack

| Step         | System                              |
|--------------|-------------------------------------|
| Intake       | Medit Lab                           |
| Design       | Heygears portal                     |
| Nest / print | RayWare → Pro 2 + Duo Kit           |
| Wash         | ProWash S                           |
| Cure         | NanoCure — <b>Apex Flex Denture</b> |
| Case log     | SEAZONA                             |

## Design QC targets (review Heygears design)

| Area                     | Minimum  |
|--------------------------|----------|
| Palatal / lingual wall   | ≥ 1.0 mm |
| Facial / buccal wall     | ≥ 1.0 mm |
| Implant overdenture area | ≥ 1.5 mm |
| Apex Teeth thickness     | ≥ 0.5 mm |
| Clasp thickness (target) | ≥ 1.2 mm |

Export separate base and teeth STL files for Duo Kit printing.

## Polish kit (SprintRay Master Workflow Guide — Partial Dentures)

| Step                | Tools / media                                                                            |
|---------------------|------------------------------------------------------------------------------------------|
| Smooth supports     | Lab handpiece; abrasive wheel or carbide bur (low RPM); Scotch-Brite / Fuzzies as needed |
| Resilience polish   | Dental lathe; black bristle wheel B27/B29; Resilience polish (wet, not runny)            |
| Interproximals      | Lab handpiece; Robinson #11; Tripoli Rouge                                               |
| High shine          | Dental lathe; cotton buff; Ivoclar Vivadent Universal Polishing Paste                    |
| Condition / cleanup | Mineral oil; fresh Robinson #11; steamer and/or soap + toothbrush + warm water           |

**Technique:** Polish at low speed. Do not let wheels dry out — heat can damage flexible resin.

## 7. Process Controls

| Gate     | Do not proceed if                             | Proceed when                                    |
|----------|-----------------------------------------------|-------------------------------------------------|
| Intake   | Case missing or files unreadable in Medit Lab | Case open with matching ID / Rx                 |
| Scan QC  | Holes, missing bite, inadequate soft tissue   | Scans usable for design                         |
| Printer  | Flex base queued to Pro / Pro S               | Flex base on Pro 2 only                         |
| Design   | Not Lab Technician–approved; below minima     | QC-A pass                                       |
| Resin    | Expired or wrong material                     | In-date Apex Flex + Apex Teeth; shaken 1 minute |
| Wash     | IPA < 91%                                     | ProWash S standard multi-cycle                  |
| Pre-cure | Part wet; base supports already removed       | Fully dry; base supports still on               |
| Cure     | Wrong cycle / classic ProCure for Flex base   | NanoCure <b>Apex Flex Denture</b> complete      |
| Outbound | Failed QC-E; not bagged; not logged           | Bagged + SEAZONA outbound ready                 |

## 8. Procedure

### A. Intake & scan QC

- 1 Open the case in **Medit Lab**.
- 2 Verify patient/case ID, arch, and prescription notes (Flex shade, teeth shade, due date).
- 3 Perform scan QC: required arches captured; bite usable; soft tissue/ridge adequate; no critical holes or wrong-patient files.
- 4 **QC-SCAN:** Pass → continue. Fail → stop manufacturing; request rescan or clarified Rx from the office. Do not design on failing scans.

### B. Design (Heygears portal)

- 5 Import accepted scans into the **Heygears portal**.
- 6 **Heygears** designs the flexible partial per prescription (clasps, teeth, shade targets).
- 7 Export print-ready **STL** files (base + teeth for Duo).
- 8 Lab Technician **approves** the design for print.  
**QC-A:** Clasps ≥ 1.2 mm; walls meet minima; occlusion reasonable; shades correct; STLs labeled.  
If QC-A fails — return to Heygears for redesign; do not nest.

### C. Nest (RayWare + Duo Kit)

- 9 Import approved STL(s) into RayWare.
- 10 Select Duo Mode on **Pro 2**.
- 11 Tank I: Partial denture base / Apex Flex — intaglio toward platform; anterior ~60°. Auto-orient is acceptable for most cases.

- 12 Tank II: Denture teeth / Apex Teeth — occlusal toward and parallel to platform.
- 13 Confirm supports: intaglio and interproximals clear of supports; adequate supports for success. Edit manually only if needed.
- 14 Send to the Pro 2 queue. Flex base must not be aimed at any printer other than Pro 2.  
*Fallback if Duo unavailable: sequential Flex then Teeth jobs at 100 µm — document in SEAZONA.*

#### D. Print

- 15 Confirm Apex Flex and Apex Teeth are not expired.
- 16 Shake Apex Flex for **1 minute**. Pour to at least the minimum fill line. Record lot in SEAZONA.
- 17 Shake Apex Teeth for **1 minute**. Pour to at least the minimum fill line. Record lot. Stir/filter tank resin if already poured.
- 18 Install and lock Duo Kit adapter, platform, and tanks. Protect tank bottoms when off the printer.
- 19 Assign the correct material to each tank/side on the touchscreen.
- 20 Confirm the build platform is clean and free of debris or cured resin.
- 21 Optional: preheat resin. After preheat, start within 15 minutes or the printer will re-preheat.
- 22 Start print from the queue (typically ~32–40 minutes at 100 µm — trust printer status).
- 23 When complete, wait for the safety lid lock to disengage. Remove the Duo Kit platform carefully.
- 24 **QC-B:** Fully formed; no delamination; inspect before wash. Fail → remake.

#### E. Wash & dry

- 25 Install the Duo Kit wash adapter in ProWash S. Seat the Duo Kit platform securely.
- 26 Run Standard Multi-Cycle Wash with IPA ≥ 91% (3 min wash / 3 min rinse / 3 min dry per Apex Flex IFU).
- 27 Keep teeth on the build platform during wash. Base may remain on the platform or wash in the basket.
- 28 Fully dry base and teeth with compressed air — especially tooth sockets, grooves, and internal surfaces. Residual IPA interferes with bonding and final cure.  
**QC-C:** Clean and fully dry. Do not assemble or cure wet parts.
- 29 Remove parts for assembly. **Leave supports attached to the denture base** through assemble/tack and until after NanoCure.

#### F. Assemble & post-cure

- 30 Roughen sockets or tooth bases if needed for bond.
- 31 Load Apex Flex into a syringe; apply into each tooth socket.
- 32 Seat teeth with firm, even pressure; tack-cure until teeth no longer move. Do not remove base supports before final cure.
- 33 Place the assembled RPD in NanoCure fully dry (supports still on). Select **Apex Flex Denture** and follow on-screen prompts.  
If base and teeth are from different resin lines, select **Conventional Denture** instead.  
Do not use classic ProCure for Flex bases.

- 34 After full cure, remove supports. Be careful around clasps. Prefer support snips; cut close to contact points. Remove the posterior support bar with snips.

**QC-D:** Cured, bonded, clasps intact. Fail → remake or salvage per remake criteria.

#### **G. Finish, clean, bag (end of procedure)**

- 35 Smooth remaining support contact points with a carbide bur at low RPM.
- 36 Polish using the SprintRay Master Workflow sequence: Resilience (B27/B29) → Tripoli (Robinson #11) → Ivoclar Universal paste (cotton buff) → mineral oil → fresh Robinson #11 cleanup. Low speed; keep wheels wet.
- 37 Clean with soap, toothbrush, and warm water (and/or steamer); dry. This is lab cleaning — not chemical disinfection.
- 38 Label and bag the prosthetic for outbound delivery from the in-house lab.
- 39 Complete the SEAZONA case log; mark status bagged / ready for outbound.

**QC-E:** Finish OK; cleaned; bagged; labeled; SEAZONA complete. Do not release if QC-E fails.

**End of SOP-LAB-030.** Office receipt, chairside disinfection before try-in, and patient delivery are handled under clinical protocols — not this manufacturing procedure.

## 9. Case Log (SEAZONA)

| Field                               | Entry                                                                                    |
|-------------------------------------|------------------------------------------------------------------------------------------|
| Date                                |                                                                                          |
| Patient / case ID                   |                                                                                          |
| Medit Lab reference                 |                                                                                          |
| Arch                                | <input type="checkbox"/> Max <input type="checkbox"/> Mand <input type="checkbox"/> Both |
| Scan QC                             | <input type="checkbox"/> Pass <input type="checkbox"/> Fail → returned                   |
| Designed by (Heygears)              |                                                                                          |
| Design approved by (Lab Technician) |                                                                                          |
| Apex Flex shade + lot               |                                                                                          |
| Apex Teeth shade + lot              |                                                                                          |
| Printer / Duo used                  | Pro 2 / Duo <input type="checkbox"/> Yes                                                 |
| ProWash S cycle OK                  | <input type="checkbox"/> Yes                                                             |
| NanoCure cycle                      | Apex Flex Denture <input type="checkbox"/>                                               |
| Lab Technician initials             |                                                                                          |
| QC-SCAN + A–E pass                  | <input type="checkbox"/> Yes                                                             |
| Remake?                             | <input type="checkbox"/> No <input type="checkbox"/> Yes — reason: _____                 |
| Bagged for outbound                 | <input type="checkbox"/> Yes — time _____                                                |

No SEAZONA bagged status = not released from the lab.

## 10. Quality Checkpoints

| ID      | When                   | Pass                           | Fail action        |
|---------|------------------------|--------------------------------|--------------------|
| QC-SCAN | After Medit Lab intake | Scans usable                   | Return to office   |
| QC-A    | Pre-print              | Approved design + minima       | Return to Heygears |
| QC-B    | Post-print             | Complete geometry              | Remake print       |
| QC-C    | Post-wash              | Clean + dry                    | Re-wash/dry        |
| QC-D    | Post-cure              | Bonded + cured                 | Remake / salvage   |
| QC-E    | Before outbound        | Finish + clean + bag + SEAZONA | Hold release       |

## 11. Remake Criteria

| Finding                                         | Action                                               |
|-------------------------------------------------|------------------------------------------------------|
| Failed scan QC                                  | Do not manufacture — request new scans               |
| Incomplete print / missing clasp / delamination | Remake print                                         |
| Flex base printed on non-Pro 2                  | Remake on Pro 2                                      |
| Wet / under-cured / wrong cure cycle            | Hold outbound; correct or remake                     |
| Teeth debond during finish                      | Re-bond and re-cure if appropriate; otherwise remake |
| Torn or thin clasp after supports               | Remake                                               |
| Light support nubs only                         | Salvage — finish and re-check QC-E                   |
| Unsure                                          | Stop and escalate to Doctor / lab lead               |

## 12. Competency

A Lab Technician may run this procedure unsupervised after:

| Requirement                                                                                         | Sign-off                   |
|-----------------------------------------------------------------------------------------------------|----------------------------|
| Read SOP-LAB-030 and Job Aid SOP-LAB-030-JA                                                         | Tech _____ Date _____      |
| Demonstrates Medit Lab intake, scan QC, Heygears portal submit/export/approve, and process controls | Trainer _____ Date _____   |
| Completes 3 observed cases to bagged outbound with SEAZONA log                                      | 1. _____ 2. _____ 3. _____ |
| Trainer attests ready                                                                               | Trainer _____ Date _____   |
| Lab lead authorizes unsupervised production                                                         | _____ Date _____           |

## 13. Troubleshooting & Escalation

| Problem                           | Action                                                         |
|-----------------------------------|----------------------------------------------------------------|
| Bad scans in Medit Lab            | QC-SCAN fail → return to office                                |
| Print failure                     | Remake; filter resin; verify Duo / material assignment         |
| Soft after cure                   | Confirm dry part and Apex Flex Denture cycle; remake if needed |
| Teeth debond                      | Re-bond or remake                                              |
| Allergy or wrong indication noted | Stop — Doctor; do not manufacture                              |

**Escalate to Doctor / lab lead:** unclear indication, allergy, chronic remakes, IFU deviation requests.

**Escalate to office (Medit Lab / SEAZONA):** failed scan QC; missing prescription.

**SprintRay Support:** 1-800-914-8004 — missing NanoCure Apex Flex Denture profile; repeated Pro 2 failures.

## 14. References

---

- SprintRay Apex Flex IFU-029 Rev 2
- SprintRay Apex Teeth IFU-022
- SprintRay Master Workflow Guide — Partial Dentures (effective 10/13/2025)
- FDA 510(k) K250617

---

Smile Avenue Family Dentistry — In-House Laboratory · Internal use only

SOP-LAB-030 Removable Partial Denture Fabrication (SprintRay Apex Flex) · Version 1.0 · Effective 09/10/2026

Supersedes prior draft revisions. Review annually or when SprintRay IFU / equipment changes.