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IN-HOUSE LABORATORY

Cypress & Katy, TX

Document ID: SOP-LAB-040

Version 0.1 DRAFT | Target effective 09/10/2026

OnX Tough 2 Hybrids & Dentures

SprintRay OnX Tough 2 — Lab Manufacturing Procedure (monolithic)

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Do not use for competency sign-off until Doctor releases this document.

Smile Avenue Family Dentistry — In-House Laboratory

SprintRay OnX Tough 2 — Lab Manufacturing Procedure (monolithic)

Document ID	SOP-LAB-040
Version	0.1 DRAFT
Effective (target)	09/10/2026
Owner	Lab Technician (process owner)
Related	Station Job Aid SOP-LAB-040-JA

Start: Case received in Medit Lab with scan QC

End: Prosthetic bagged and logged in SEAZONA for outbound delivery

1. Purpose

This procedure standardizes in-house manufacturing of SprintRay OnX Tough 2 prosthetics so every case meets the same quality, safety, and traceability standard before leaving the lab. OnX Tough 2 is a tooth-shade ceramic-hybrid resin used for hybrid denture prosthetics, implant-supported denture prosthetics, monolithic full and partial removable dentures, and preformed denture teeth for use in a denture (IFU-020_8).

2. Scope

In scope (lab manufacturing): Medit Lab intake → scan QC → send accepted scans / Rx to **JB Dental** → receive STL → Lab Technician design approval → RayWare / Pro 2 print (monolithic; **no Duo Kit**) → preferred

IPA hand spray/wipe wash (or ProWash S alternate) → NanoCure **OnX Tough 2 - Max Strength** → finish / optional characterization → lab clean → bag & SEAZONA outbound log.

Indication forks covered in this SOP (per IFU-020_8):

Fork	Appliance type	Notes in procedure
H	Fixed hybrid / implant-supported denture	Screw channels; T-bar if present; channel cleaning required
F	Monolithic full removable denture	Full-arch monolithic OnX; no Duo / no separate base resin
P	Monolithic partial removable denture	Partial-arch monolithic OnX
T	Preformed denture teeth	Teeth printed for later assembly into a denture base (separate base workflow)

Out of scope: Chairside scanning technique; photogrammetry technique; clinical try-in, TiBase cementation, torque sequencing, and patient seat/delivery; chairside chemical disinfection; Apex Flex / Apex Teeth Duo Kit RPDs (SOP-LAB-030); Apex Base + teeth removable denture paths; Nightguards (SOP-LAB-020); Zest LOCATOR **removable** overdentures that use Apex denture resin (OnX applies only to LOCATOR **fixed** provisionals per Zest addendum); Duo Kit for OnX; non–SprintRay printers; inventing NanoCure exposure minutes.

3. Roles

Role	Responsibility
Clinical Assistant / Office	Sends case via Medit Lab; receives bagged prosthetic from lab
Lab Technician	Scan QC; sends accepted scans / Rx to JB Dental; receives STL; approves design; manufactures; finishes; bags; SEAZONA log
JB Dental	Designs prosthetic per Rx; returns print-ready STL (VERIFY portal / email handoff method)
Trainer / Lead Lab Technician	Competency observation and sign-off (after Doctor release of this SOP)
Doctor	Clinical indication, shade/Rx, clinical delivery / try-in / remake authorization (outside manufacturing steps)

4. Practice Configuration

#	Item	Smile Avenue setting
1	Printer	Pro 2 only for this path
2	Cure unit (primary)	NanoCure — profile OnX Tough 2 - Max Strength (preferred per Master Workflow Guide 12/16/2025). Do not invent minutes — use on-device profile.
3	Cure alternate (if NanoCure unavailable)	ProCure 2 preprogrammed profile OnX Tough 2 ; or ProCure 60 min at 60°C (IFU only numeric ProCure cycle). Document alternate in SEAZONA.
4	Case intake	Medit Lab
5	Design	JB Dental designs; Lab Technician sends accepted scans / Rx; receives STL; Lab Technician approves before print. Doctor reviews at clinical delivery. VERIFY exact send/receive channel (portal vs email).
6	Duo Kit	Not used — OnX path is monolithic single-resin
7	Wash (preferred)	IPA ≥91% hand spray / wipe : 15 s spray+wipe → 30 s air dry → 15 s spray+wipe (IFU + MWG 12/16/2025)
8	Wash (alternate)	ProWash S Custom Cycle 3 / 0 / 3 (3 min wash, 0 min rinse, 3 min dry)
9	Shades	Bleach, A1, A2, B1, Hollywood White — select per Rx. VERIFY default if shade missing on Rx (soft suggestion: A2 , consistent with teeth default on other SOPs).
10	Layer thickness	100 µm (MWG Hybrid; RayWare typical default)
11	Min thickness	≥ 0.5 mm (IFU)
12	Fit & Adjustment (RayWare Desktop only)	–100 µm for Hybrid Dentures (IFU). RayWare Cloud auto-sets Hybrid Denture parameters.
13	Lab clean before bag	Soap, toothbrush, and warm water (and/or steamer), then dry. Cleaning — not chemical disinfection.
14	Design approval before print	Lab Technician
15	Case log	SEAZONA
16	Characterization (optional)	Vita Akzent LC™ if stocked — VERIFY inventory. Final cure after characterization: IFU = ProCure 2 5 minutes . VERIFY NanoCure final-cure path if ProCure 2 not used.

5. Safety

- Treat uncured OnX Tough 2 as a sensitizer. 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.
- Inhalation of high vapor: move to fresh air. Eye contact: rinse thoroughly. Ingestion: contact poison control.
- Do not substitute non-validated printers, washers, cure units, or resins for this path.
- Do not use expired resin. Store OnX Tough 2 at **15–25°C (60–77°F)**; protect from light; keep bottle/tank closed when not in use.
- Cure liquid waste resin fully before disposal. Follow hazardous-waste rules until cured.
- **Contraindications (IFU):** known allergy to ingredients; direct intraoral contact with resin that is not fully cured; any use outside indications for use.

6. Materials & Equipment

Resins

Resin	Shades	Notes
SprintRay OnX Tough 2	Bleach, A1, A2, B1, Hollywood White	Select per Rx. Soft default if unknown: VERIFY (suggest A2).

Also: IPA $\geq$ **91%**; optional Vita Akzent LC™ characterization kit; optional Clearfil Ceramic Primer Plus / TiBase cementation materials are **clinical / placement** — not required for bagged outbound under this SOP.

Equipment stack

Step	System
Intake	Medit Lab
Design	JB Dental → STL to Lab Technician
Nest / print	RayWare → Pro 2 (standard platform; no Duo Kit)
Wash	Preferred: IPA hand spray/wipe; Alternate: ProWash S Custom 3/0/3
Cure	NanoCure — OnX Tough 2 - Max Strength
Case log	SEAZONA

Design QC targets (review JB Dental STL / design)

Area	Minimum / rule
Wall / body thickness	≥ 0.5 mm (IFU)
Orientation intent	Occlusal toward build platform; occlusal plane parallel; intaglio away
Fork H	Screw channels present and clear; T-bar recommended if self/other-lab design (MWG)
Fork F / P	Coverage / arch matches Rx; intaglio free of critical voids
Fork T	Tooth geometry complete; thickness ≥ 0.5 mm; shade matches Rx
Shade	Matches Rx (or documented VERIFY default)

Finish kit

Step	Tools / media
Support stubs	Fine lab carbide bur or abrasive fiber wheel until smooth/uniform
T-bar (if present, Fork H)	Lab handpiece + cutting disc
Characterization (optional)	Vita Akzent LC™; fine brush; handheld curing light (tack between layers); clear glaze on entire surface except intaglio
Final cure after characterization	IFU: ProCure 2 5 minutes (VERIFY practice device)
Lab clean	Brush, soap + warm water (and/or steamer); dry completely

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 / fork type
Scan QC	Holes, missing bite, inadequate anatomy / tissue for design	Scans usable for JB Dental
Design handoff	Scans / Rx not sent; STL not received	STL received from JB Dental
Design approval	Not Lab Technician–approved; thickness < 0.5 mm	QC-A pass
Printer	Queued to any printer other than Pro 2; Duo Kit selected	Pro 2 monolithic path
Resin	Expired, wrong shade, or wrong material	In-date OnX Tough 2 shade per Rx; shaken 1 minute
Wash	IPA < 91%; preferred handwipe skipped without documenting alternate	Handwipe 15/30/15 or documented ProWash S 3/0/3
Pre-cure	Part wet; screw channels (Fork H) still dirty/wet	Fully dry
Cure	Wrong profile / invented custom minutes	NanoCure OnX Tough 2 - Max Strength complete (or documented IFU alternate)
Outbound	Failed QC-E; not bagged; not logged	Bagged + SEAZONA outbound ready

8. Procedure

Fork legend: Steps apply to all forks unless tagged **[H]**, **[F]**, **[P]**, or **[T]**.

A. Intake & scan QC

1. Open the case in **Medit Lab**.
2. Verify patient/case ID, arch, due date, and prescription notes:
 - Indication fork: **H** fixed hybrid / implant-supported · **F** monolithic full · **P** monolithic partial · **T** preformed teeth
 - Shade (Bleach / A1 / A2 / B1 / Hollywood White). If missing → **VERIFY** with office; soft default suggestion **A2** until confirmed.
 - Implant / screw-channel notes for Fork **H**; tooth count / clasp notes for Fork **P**; tooth set notes for Fork **T**.
3. Perform scan QC: required arches / tissue captured; bite usable when required; no critical holes or wrong-patient files.
 - [H]** Confirm post-op / implant-related scan package is complete per Rx (tissue scan, photogrammetry package if practice supplies it — capture technique is clinical/out of scope).
 - [F]/[P]** Confirm edentulous / partial scan set matches Rx.
 - [T]** Confirm opposing / setup references needed for tooth design are present.

4. **QC-SCAN:** Pass → continue. Fail → stop manufacturing; request rescan or clarified Rx from the office. Do not send failing scans to JB Dental.

B. Design (JB Dental)

5. Lab Technician sends **accepted** scans and prescription to **JB Dental**.
VERIFY: exact handoff method (portal login / upload URL / secure email). Document channel used in SEAZONA until practice locks one method.
6. **JB Dental designs** the prosthetic per Rx and returns a print-ready **STL**.
7. Lab Technician receives STL and reviews against Rx and design QC targets.
8. Lab Technician **approves** the design for print (Doctor reviews at clinical delivery — not a pre-print gate).
QC-A: Fork matches Rx; thickness ≥ 0.5 mm; shade correct; STL labeled; **[H]** channels/T-bar reviewed; **[F]/[P]/[T]** geometry complete.
If QC-A fails — return to JB Dental for redesign; do not nest.

C. Nest (RayWare — monolithic, no Duo)

9. Import approved STL into RayWare (Cloud or Desktop).
10. Select printer **Pro 2**. Do **not** select Duo Mode / Duo Kit.
11. Job / material setup:
- Material: **SprintRay OnX Tough 2** — exact shade per Rx.
 - Thickness: **100 μ m**.
 - Orientation: **occlusal surface toward** build platform; occlusal plane **parallel**; **intaglio facing away**.
 - Supports: default structures.
[H] ≥ 3 supports on the incisal edge; no supports around screw channels.
[F]/[P] Default supports; keep intaglio clear of unnecessary supports.
[T] Default supports; preserve occlusal anatomy.
12. **RayWare Desktop only:** set Fit and Adjustment to **-100 microns** for Hybrid Dentures (IFU). RayWare Cloud auto-sets Hybrid Denture parameters — verify job type/material.
13. Send to the Pro 2 queue. Do not aim this path at any printer other than Pro 2.

D. Print

14. Confirm OnX Tough 2 bottle is not expired and shade matches Rx / SEAZONA entry.
15. Shake bottle thoroughly **1 minute**. Pour into resin tank to at least the minimum fill line; stir tank resin.
Record lot + shade in SEAZONA.
16. Install and lock clean, dry build platform. Assign tank to correct **material and shade** on the touchscreen.
17. Confirm platform is free of debris or cured resin.
18. Start print from the queue. Monitor on printer touchscreen or SprintRay Cloud.
19. When complete, wait for safety lid unlock. Remove platform carefully.
20. Remove part with Print Removal Tool / scraper.
QC-B: Fully formed; no delamination; **[H]** screw channels patent; geometry matches nest. Fail → remake.

E. Support trim (pre-wash)

- !1. Remove supports with flush cutters or round diamond disc; cut close to the device to minimize finishing. Small stubs may remain for later smooth.
[H] If printed with a **T-bar**, remove with cutters or lab handpiece + cutting disc (may finish residual at step G).
[T] Protect occlusal anatomy while trimming.

F. Wash & dry

- !2. **Preferred — hand spray / wipe (IFU + MWG; recommended for hybrids; use for all OnX forks unless documented alternate):**
 - a. Spray IPA ≥91% and wipe with dry towel — **15 seconds**.
 - b. Blow dry with compressed air — **30 seconds**.
 - c. Spray IPA ≥91% and wipe again — **15 seconds**.MWG notes handwipe produces parts with **~40% better mechanical properties** vs machine wash for hybrids.
- !3. **Alternate — ProWash S:** Custom Cycle **3 min wash / 0 min rinse / 3 min dry**. Document “ProWash S 3/0/3” in SEAZONA when used instead of handwipe.
- !4. [H] **Screw channels:** Spray each channel with IPA; clean with IPA-dipped micro applicator; compressed air until clean and dry. Repeat until channels are free of resin/IPA.
- !5. Dry the part **completely** before post-cure.
QC-C: Clean and fully dry (channels dry for Fork H). Do not cure wet parts.

G. Post-cure

- !6. Place dry prosthetic in **NanoCure**. Select profile **OnX Tough 2 - Max Strength**. Follow on-screen prompts. **Do not invent or override minutes**.
If NanoCure unavailable: ProCure 2 profile **OnX Tough 2**, or ProCure **60 min at 60°C** — document alternate in SEAZONA.
- !7. After post-cure, hand spray with IPA and wipe with dry towel for **30 seconds** (IFU).
- !8. **QC-D:** Fully cured; no soft spots; geometry intact. Fail → hold outbound; remake or escalate.

H. Finish, optional characterization, clean, bag

- !9. Smooth remaining support stubs with fine lab carbide bur or abrasive fiber wheel until surface is smooth and uniform.
[H] Finish any remaining T-bar remnant with handpiece + cutting disc.
- !0. **Optional characterization (recommended for aesthetics; VERIFY Vita kit stocked):**
 - Layer Vita Akzent LC™ stains as desired (e.g., gingival pink, incisal blue, character stains).
 - Tack-cure between layers with handheld curing light.
 - Apply thin clear glaze to entire surface **except intaglio**.
 - Final cure after characterization: **ProCure 2 for 5 minutes** (IFU). **VERIFY** if practice uses another validated final-cure path.
Skip this step when Rx / time does not call for characterization.
- !1. Lab clean: brush with soap and warm water (and/or steamer); dry completely. This is lab cleaning — not chemical disinfection.

Clinical disinfection before try-in/seat is an office/clinical step — not this SOP.

2. Label and bag the prosthetic for outbound delivery from the in-house lab.

Do not perform clinical try-in, TiBase cementation, or torque sequencing in this manufacturing run.

3. 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-040. Office receipt, chairside disinfection, try-in, TiBase/torque placement, 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	
Indication fork	☐ H hybrid/implant-supported ☐ F monolithic full ☐ P monolithic partial ☐ T preformed teeth
Arch	☐ Max ☐ Mand ☐ Both
Shade (Rx)	☐ Bleach ☐ A1 ☐ A2 ☐ B1 ☐ Hollywood White ☐ VERIFY default used: ____
Scan QC	☐ Pass ☐ Fail → returned
JB Dental handoff method	☐ Portal ☐ Email ☐ Other: ____ (VERIFY)
Designed by (JB Dental)	
Design approved by (Lab Technician)	
OnX Tough 2 shade + lot	
Printer	Pro 2 ☐ (Duo Kit must be No)
Wash method	☐ Handwipe 15/30/15 ☐ ProWash S 3/0/3
NanoCure profile	☐ OnX Tough 2 - Max Strength ☐ Alternate documented: ____
Characterization	☐ None ☐ Vita Akzent LC + final 5 min (device: ____)
Lab Technician initials	
QC-SCAN + A–E pass	☐ Yes
Remake?	☐ No ☐ Yes — reason: __
Bagged for outbound	☐ 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 for JB Dental	Return to office
QC-A	Pre-print	Lab Tech–approved design + minima	Return to JB Dental
QC-B	Post-print	Complete geometry	Remake print
QC-C	Post-wash	Clean + fully dry (+ channels for H)	Re-wash/dry
QC-D	Post-cure	Fully cured on correct profile	Remake / escalate
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 / delamination / closed screw channels (H)	Remake print
Printed on non–Pro 2 or with Duo Kit	Remake on Pro 2 monolithic path
Wet / under-cured / wrong cure profile / invented minutes	Hold outbound; correct or remake
Wrong shade vs Rx	Remake (or Doctor-authorized accept — document)
Thickness below 0.5 mm / critical voids	Remake
Light support nubs only	Salvage — finish and re-check QC-E
Unsure	Stop and escalate to Doctor / lab lead

12. Competency

Competency sign-off begins only after Doctor approves this SOP for training (remove DRAFT banner).

A Lab Technician may run this procedure unsupervised after:

Requirement	Sign-off
Read SOP-LAB-040 and Job Aid SOP-LAB-040-JA	Tech _ Date _____
Demonstrates Medit Lab intake, scan QC, JB Dental handoff, RayWare nest, handwipe wash, NanoCure Max Strength, and process controls	Trainer _ Date _____
Completes 3 observed cases to bagged outbound with SEAZONA log (include at least one Fork H if hybrid volume exists)	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
JB Dental STL delayed / missing	Confirm handoff channel (VERIFY); escalate to office / JB Dental; do not nest without approved STL
Print failure	Remake; filter resin; verify material/shade assignment; confirm Pro 2 (not Duo)
Soft / under-cured after NanoCure	Confirm part was dry; confirm profile OnX Tough 2 - Max Strength ; remake if needed
Chalky surface after IPA	Avoid prolonged IPA dwell; re-finish carefully; document; remake if compromised (VERIFY whether older UK-guide chalk warning stays in training)
Screw channel blocked (H)	Re-clean with IPA + micro applicator + air before cure if still green; after cure may need remake
Allergy or wrong indication noted	Stop — Doctor; do not manufacture
Shade missing on Rx	VERIFY with office; do not guess permanently — soft hold suggestion A2 only until confirmed

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

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

Escalate to JB Dental: redesign, missing STL, design QC-A fails.

SprintRay Support: 1-800-914-8004 — missing NanoCure **OnX Tough 2 - Max Strength** profile; repeated Pro 2 failures.

14. References

- SprintRay OnX Tough 2 IFU-020_8, DCO#1682 — Effective **12/06/2024**
 - SprintRay Master Workflow Guide — Fixed Hybrid Dentures — Effective **12/16/2025** (preferred wash/cure)
 - Zest LOCATOR Denture Workflow Guide (2025-08-15) — OnX Tough 2 for **fixed** LOCATOR provisionals only; removable uses Apex
 - SprintRay Hardware–Resin Compatibility chart (OnX Tough 2: Pro 2, ProWash S, NanoCure, ProCure 2)
 - Research brief: </workspace/sprintray-ifu/onx/OnX-Tough-2-SOP-Research-Brief.md>
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Review annually or when SprintRay IFU / equipment / design partner changes.

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