

# REALITY NOW

RATINGS & REVIEWS | practical • unbiased • trusted  
37<sup>TH</sup> anniversary | number 369

The Ratings | Composites — Flowable — Self-Cured

## Stela

### Manufacturer

SDI

<https://www.sdi.com.au/au/product/stela/>

### Prices

#### Intro Kits

Automix

\$256.15/8g

Capsule

\$188.70/10

#### Refills

Automix

\$203.40/8g (\$25.43/g)

Capsule

\$421.70/50 (\$8.43 ea)

Primer

\$97.95/5ml (\$19.59/ml)



### Shelf Life

2 years

### Raves & Rants

- ✓ Option of syringe or capsule
- ✓ No debonds or sensitivity
- ✗ One shade
- ✗ Polish is mediocre

2023

REALITY

RATINGS & REVIEWS

Four Star Award



★★★★☆ 4.3

## Introduction/ Manufacturer's Claims

Self-cure, flowable composite that is boldly being promoted by SDI as "The Future Of Composites." So what is behind this claim? Well, the first advantage is unlimited depth of cure. This, of course, is also true of all self-cure composites.

The next on the bucket list is low-stress polymerization which presumably leads to a gap-free interface. In essence, since light-cured composites are said to "shrink toward the light" when polymerized, creating marginal microgaps, self-cure composites presumably shrink toward the center of their mass and, since polymerization is slower, the stresses which cause marginal gaps are moderated. This, of course, can be claimed by all self-cure composites.

Light-cured, bulk fill composites also claim to reduce polymerization stress through the magic of their "advanced" chemistry.

In terms of self-cure composites sealing margins better than light-cured versions, slightly more than half (54%) of the evaluators acknowledged the self-cure mantra, but felt their clinical results with light-cured products were performing successfully, 39% were believers in the self-cure superiority, but 7% were not convinced that self-cure was better than light-cured. Some comments:

- Self-cure seems to create less post placement sensitivity compared to light-cured.
- Light cured combos are the best until proven otherwise.
- I like the concept of starting polymerization at the interface but does it really makes a clinical difference?

A third notch in its belt does seem to be noteworthy, namely the elimination of a tertiary amine for its polymerization kinetics. This means that the yellowing that is presumably the result of the reaction between the tertiary amine in the catalyst and benzoyl peroxide in the base will be eliminated.

Most (61.5%) evaluators believe the elimination of the tertiary amine to be a valuable attribute, while the other 38.5% were not impressed. Some comments:

- Definitive YES!
- I mainly use the material for core build-up. These build-ups will be covered with crowns.
- Once placed, we kind of forget about color changes over time.
- It's a toss-up. It depends on discoloration amount and how quickly.
- I have rarely seen yellowing.
- A little yellowing on posterior composites? Please, it does not make difference.
- Normally not used in the esthetic zone.

Finally, the self-etch primer, which is part of this system, is stated to only require 5 seconds of dwell time followed by 2-3 seconds of air-drying and, of course, no etching or light curing. This facilitates being able to squirt the material into your prep in 15 seconds or so. And the fact that it is a pure self-cure means you don't have to worry about using the filter on your loupes and your treatment unit light.

Most (84.5%) evaluators, however, don't believe any self-etch primer/adhesive can be effective on unetched enamel such as when the restorative is feathered beyond the margins on Class III and V restorations. Of course, if you only use it posteriorly or as a core build-up, then unprepared enamel may not be an issue. Some comments:

- Just not sure of this and wouldn't use it this way.
- I have not seen any evidence of this standing up in long term trials. Am I wrong?
- I would still want to roughen the enamel with air abrasion or etchant or both.
- SE great for dentin, not so much for enamel.
- PA etching is better first.
- Effect on unprepared enamel is very minimal.

Other benefits are stated to include incorporating MDP as an adhesion promoter in both the primer and composite, plus being HEMA and Bisphenol A free, which could minimize any untoward effects caused by these chemicals.



In addition, it is stated to be “the strongest self cure composite available, with its achieving 90% of its ultimate strength in 60 minutes.” This strength leads to its full range of indications including Class I, II, III, and V restorations, core build-ups, bases and liners, and sealing endo accesses.

Most (69%) evaluators were comfortable using it across the board, while 23% would only use it for very small CI and II restorations and 8% were very doubtful of using it at all for CI and II. Some comments:

- If used in layers...negative side: time cost!
- I loved the hardness it set to.
- I just used it for smaller class I. I did not use it for class II other than an initial base material in deeper preps and I did use it as a core material.
- Only time will tell.
- Depends on the occlusion, functional demands etc.
- But this will not be sufficient when ideal aesthetics is required.
- In my tests, it was really strong enough.

Concerning not being able to sculpt flowable composites, most (61.5%) evaluators felt a flowable was fine for Class III and V, but not for Class I and II, while the other 38.5% preferred sculptable composites for all definitive restorations. Some comments:

- Layer technique used!
- I sculpted with a bur post setting.
- I could do slight modifications after set, but since self-cure, it takes a bit too long chair side.
- With class I, you just can't get any anatomical considerations.
- I use glass ionomers in addition to composite so I am okay with no always sculpting my Class I and II and instead having to create anatomy afterwards with burs.
- I had to wait for the material to set before placing anatomy. I wish it will have some light curing ability. At least to prevent running.
- I used it mainly for post root canal restorations.

## Dispensing

*Conventional dual-barrel syringes.* Comes with a relatively long (19.7mm), large gauge (1.3mm) metal tip that can rotate and be bent for easier access into preps.

All evaluators liked the long tip. Some comments:

- Very nice long tip. I did like that.
- I really liked it.
- The places where I normally need self-cure, I prefer this type of tip.

All evaluators except one felt the extruding force necessary using the syringe was acceptable, with the lone outlier finding it to be too easy.

The rotation feature was applauded by all evaluators, although 31% didn't use it very often.

*Capsules.* Similar to those of SDI glass ionomers with a slightly curved tip. All evaluators felt activating, mixing, and extruding the material were easy, although most (58%) were not big fans of capsules in general. Some comments:

- I prefer syringe use.
- My amalgamator is wearing out!
- Reminds me of the Riva Glass Ionomer systems.
- When the cavity is small, wastage is more in a capsule.

On a mano a mano preference, most (77%) evaluators preferred the syringe version, while the other 23% opted for the capsules. Two comments:

- Capsule because I use a lot of glass ionomer capsules.
- Syringe because it's easier to reach, longer tip, bendable.

## Average Particle Size (microns)

Syringe	2.8-4.0
Capsule	4.0

## Filler Content (%)

	Syringe	Capsule
Weight	61.2	76.8
Volume	36.4	55.4

## Consistency and Handling

### Syringe

Most (61.5%) evaluators thought it was just OK, about the same as most flowables, while the other 38.5% found its handling to be really nice and not too sticky. Two comments:

- I would say better than most flowables.
- Tends to self level on the occlusal, and runs a bit too much.

### Capsule

Most (75%) evaluators thought it was just OK, about the same as most flowables, while the other 25% found its handling to be really nice and not too sticky. One evaluator found the volume of material in the capsule to be a bit too small.

## Flow

Syringe	4.5
Capsule	5.0

Neither version is runny, but the capsule has the lesser flow.

The syringe flow was considered to be ideal by most (77%) evaluators, while 15% found it to be too runny and 8% thought it was too thick.

The capsule flow was considered to be ideal by most (91%) evaluators, while 9% found it to be too runny.

## Volumetric Shrinkage

As per the manufacturer: The shrinkage cannot practically be measured since there's no accurate method of obtaining the unpolymerized material volume immediately after mixing. The actual volumetric shrinkage is estimated to be similar to highly filled flowable composite materials.

## Extraoral Working Time (minutes)

**About 1.5 minutes** (manufacturer states 1.5 minutes).

Most (77%) evaluators thought it was acceptable, while the other 23% found it to be too long.

## Intraoral Set Time

**About 4.0 minutes** from the beginning of mixing (manufacturer states 4.0 minutes). For the syringe version, most (61.5%) evaluators found it to be acceptable, while the other 38.5% thought it was too slow. For the capsule version, half of the evaluators found it to be acceptable, while the other half thought it was too slow.

## Hardness (Barcol)

**65** (after 10 minutes of self-cure). This shows it should have sufficient hardness to feel like dentin when cutting a prep if you use it for a core build-up.

## Porosity

*Syringe* From a clinical perspective, most (69%) evaluators found virtually no voids after finishing and polishing, while the other 31% found only a few surface voids.

*Capsule* From a clinical perspective, half of the evaluators found virtually no voids after finishing and polishing, while the other half found only a few surface voids.

## Shades

**1** (close to A1). Most (61.5%) evaluators wanted more shades, while the other 38.5% found one shade to be adequate. Some comments:

- 2-3 shades would be better.
- More shades if you are going to use it as a definitive restorative material.

- For posterior teeth, one may be sufficient, but a few other shades would be ideal.

## Translucency/Opacity (T/O%)

*Syringe 67.2* (body shade). All evaluators except one found it to be acceptable, while the lone outlier thought it was too opaque.

*Capsule 71.1* (dentin shade). All evaluators except one found it to be acceptable, while the lone outlier thought it was too translucent.

Of the evaluators who restored a through-and-through Class III, none of them were able to block out the darkness from the back of the mouth.

## Primer/Adhesive

Contains methacrylate monomers (including 10-MDP), methyl ethyl ketone, water, initiators, and stabilizers. The formulation is free of BPA-derived monomers and HEMA, while its pH is stated to be 2.3. As noted previously, you merely apply it to the prep, allow it to dwell for 5 seconds, and dry with air for 2-3 seconds or until there is no movement. No gentle agitation or scrubbing is recommended.

Slightly more than half (54%) of the evaluators found the primer application to be fast and easy, while the other 46% were not convinced that the 5 second dwell time was long enough. Some comments:

- Would love to see more studies ...
- I felt with any self-etch primer, time should be more than 5 seconds.
- What does data say of a 5 second vs 10 second primer application?

Its odor was deemed not noticeable by most (69%) evaluators, while 23% found it to be not pleasant but not overly so and 8% thought it was unpleasant. Some comments:

- Not that bad.
- I have no problems with it and patients never stated anything.
- Strong odor.

## Bond Strength (MPa)

Enamel	17.7 (SD = 1.9)
Dentin	17.7 (SD = 6.6)

These tests were done using the “moist” (blotting) substrate since the directions did not specify how to leave the substrate after cleaning and rinsing. In addition, slightly more than half (54%) of the evaluators used the moist protocol, while 39% used the “dry” (with air) and 7% used “wet”. Furthermore, we performed a pilot “dry” test on dentin, but the result was only 15.3MPa. Therefore, we recommend “moist” as the default substrate condition. Some comments:

- Must be dry field or I would not use.
- I have never been a fan of completely drying the enamel/dentin.
- Kind of a mistake in the directions — is there an optimal substrate condition for this material?
- Normally tried to dry well.

Interestingly, even though the enamel and dentin bond strengths were identical, the very low enamel SD (standard deviation) shows you will probably get more consistent results bonding to enamel (prepared) than to dentin.

Despite the directions being specific about “scrubbing” the primer being “not necessary”, slightly more than half (54%) of the evaluators chose to use “gentle agitation” when they applied the primer, 31% still scrubbed, and only 15% followed the directions and let the primer sit undisturbed. One evaluator even chose to apply “numerous coatings and scrubbed each time.”

No bond failures or post-op sensitivity were reported.

## Radiopacity

All evaluators except one considered it acceptable, with the one outlier stating it was not radiopaque enough.

## Fluorescence

Poor — much darker and purplish compared to natural teeth under black light.

## Finishing and Polishing

With a PoGo polisher, we were able to come close but could not achieve an enamel-like gloss. Most (67%) evaluators were also only able to come close to an enamel-like shine, 25% considered it easy to polish to an enamel-like gloss, while the other 8% were not able to even come close to an enamel-like gloss.

## Anterior Esthetics

Most (67%) evaluators considered the anterior esthetic results to be acceptable, but not outstanding, while the other 33% were not impressed with the results.

## Posterior Esthetics

Most (61.5%) evaluators considered the posterior esthetic results to be acceptable, but not outstanding, while the other 38.5% found it to be really nice with the restorations blending into the tooth structure well.

## Packaging

### Syringe

Conventional cardboard box with the product identification on three sides and both ends. Manufacture and expiration date is on one side. Sealed with two labels for security. The label on the dual-barrels has the product name and expiration date. The mixing/dispensing tip has a short mixing helix and also rotates, which is a clever innovation.

### Capsule

Conventional cardboard box with the product identification on three sides and both ends. Manufacture and expiration date is on one side. Sealed with two labels for security. The capsules, which are sealed in foil packs with the product name and expiration date, feature a cool, kinda iridescent teal body and purple plunger. You press the plunger against a countertop so it's flush with the body, mix for 10 seconds, and insert it into an applicator instrument.

### Primer

Typical black plastic dropper bottle with a label displaying the product name and expiration date.

All evaluators thought the packaging was boilerplate.

## Directions

Multi-lingual, plain paper in annoying foldout format. All the directions are fairly detailed (except for the primer), but even though the font is nano-sized, the copy is reasonably easy to read. Concerning the primer, there was no instruction on how to leave the prep — dry, moist, or wet — after cleaning and rinsing. And the instruction to use calcium hydroxide for pulp capping is outdated.

All evaluators except one thought the directions were boilerplate, while the lone outlier felt they were exemplary. Leaving out the aforementioned prep moisture status was mentioned by one evaluator.



## Strengths



- Nice that it self-cures.
- Polymerization results achievable are excellent!
- I loved the hardness to which it set and thereby its polishability.
- Self-cure flowable material, does not have to wait long for self-cure (less than 4 minutes because of the temperature of the oral cavity).
- Easy to use, capsules a nice twist.
- Relatively easy to use with no sensitivity.
- Self-cure material with nice applications where light can't reach.
- Self-cure made it very convenient to use.
- Material strength and simplicity.
- Unlimited depth of cure, love the bendable syringe tip.
- Unlimited depth of cure, 10-MDP in primer and composite, fast to use, chameleon, potential for gap free margins, high strength.
- Tips are long and rotating. Bulk fill for post endo is very good. Easy to use.

## Weaknesses



- Couldn't use it for biting surfaces.
- I would prefer using a different bonding protocol.
- It takes too long to cure.
- Not as radiopaque as I would like.
- Self-cure takes more time.
- Hard to polish and sculpt.
- Not really a material for esthetic restorations.
- Not able to shape flowable.
- One color and some porosity.
- Too thick oxygen inhibited layer. Setting time is too long.
- Sticky, would like 2 more shades.
- A bit too little material in the capsule.
- Set time was long and capsule version caused wastage.

## — BOTTOM LINE —

- Product can be recommended.
- I would buy this product.
- I love it and have made additional purchases. Fits my practice very well.
- I especially used it for post and cores or P and C under existing crowns. Worked well.
- I am not sure where this fits in my practice. Maybe for a volume practice where a lot of small restorations are needed.
- A good material that could fill a void in your practice for a self-cure material.
- Comparable to other flowables with self-cure and self-etching added benefit.
- Great for buildups and posterior restorations.
- Like the concept but not for me.
- Great material.
- Can use it in those cases where the light-cured is not possible.
- Good product to have in your practice.
- A good addition to the narrow self-cure product line.



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# SDI | STELA

## SELF CURE COMPOSITE

Stela is an innovative high-performance self-cure composite. Stela offers an unlimited depth of cure and a gap-free interface. There is no need to acid etch or light cure.

Stela achieves its ground-breaking properties through a tailored combination of BPA-free resin monomers, optimized **ionglass™** fillers (SDI's bioactive proprietary hybrid glass), and specially surface-modified nanoparticles of amorphous silica. Stela's outstanding mechanical properties come from a rapid curing reaction.

Stela's simple two step process minimizes operator errors and patient sensitivity with no etch or curing lights required. Stela is the solution for all your clinical needs. Stela is available in two delivery systems: Stela Capsule and Stela Automix syringe.

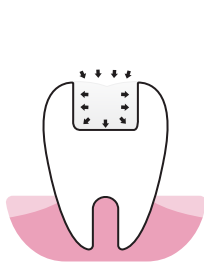


» The combination of Stela Primer and the self-curing Stela restorative generates **low polymerization stress**, which enables this bulk-fill composite system to create a **gap-free** bonding interface. «

PROF DR SALVATORE SAURO

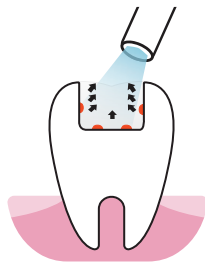


### GAP-FREE RESTORATIONS



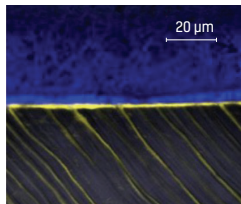
#### STELA GAP FREE

Stela's self-cure polymerization begins from the applied Stela Primer on the cavity walls, as the primer contains a catalyst. This polymerization sequence pulls the restorative towards the margins, providing gap-free restorations.



#### MARGINAL GAPS

Light cure composite polymerization begins at the light source. The resulting polymerization shrinkage pulls the restorative from the cavity walls, creating micro gaps that can cause sensitivity, leakage and recurrent caries.



#### STELA BONDING INTERFACE (SELF ETCH)

A confocal micrograph of a **gap-free Stela-dentine interface**, using the self etch Stela Primer.

Note the penetration depth of Stela Primer (yellow) within the dentine tubules. Pre-test failure rate: 0%

SOURCE: SAURO, Salvatore et al. 2022. Microtensile bond strength and interfacial adaptation of two bulk-fill composites compared to a conventional composite restorative system

### STELA AT A GLANCE

- ✓ Gap free restorations
- ✓ Unlimited depth of cure
- ✓ High Strength
- ✓ 2 steps, 15 second preparation
- ✓ Available in capsule and automix

### INDICATIONS



Class I



Class II



Class III



Class V



Core build-ups



Base or liner



Sealing endodontic access cavities where light cannot access

## 15 SECONDS TO PLACEMENT

STELA PRIMER	
Steps	Time
2	15 sec

Stela: straight to placement in 15 seconds

Prime cavity and margins  
Wait 5 sec  
Dry for 2-3 seconds  
Place Stela in a single increment, covering margins

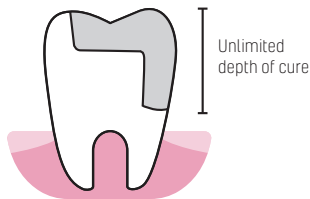
Place Stela with fewer steps and fewer failures. While other etch, prime and bond systems require up to 7 steps and 90-120 seconds to complete, the Stela Primer system is complete in only two steps and 15 seconds.

STANDARD ETCH, PRIME, BOND	
Steps	Time
7	90-120 sec

Etch  
Wait  
Rinse  
Dry  
Prime  
Dry  
Bond  
Light Cure  
Place standard composite

### UNLIMITED DEPTH OF CURE

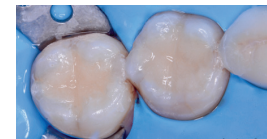
Stela is a new generation composite that will self cure to an unlimited depth. This allows full cure certainty for all restorations. Stela is fully cured 4 minutes after mixing/extrusion.



### CLINICAL PHOTOS



Caries removed and large Class I cavities prepared



Restoration complete

Images courtesy of Dr. José Cedillo



Cavity prepared and ready to be isolated with rubber dam



Final aspect after finishing and polishing

Images courtesy of Prof Dr Rocio Lazo



Cavity prepared and ready to be isolated with rubber dam



Final aspect after finishing and polishing

Images courtesy of Dr Gonzalo Arana Gordilo

### HIGH STRENGTH

Stela has an impressive combination of compressive and flexural strength. This is the result of the initiator system that starts a snap set fast cure to convert monomers into polymer chains.

#### COMPRESSIVE STRENGTH



328 MPa

#### FLEXURAL STRENGTH



143 MPa

### REDUCED INVENTORY WITHOUT SACRIFICING ESTHETICS

- Universal shade with chameleon effect that blends with surrounding tooth colour
- Can be used on all tooth shades in non-esthetic zones
- Great for anterior use on A2/A3 patients

### YOUR CHOICE: SYRINGE OR CAPSULE

Stela is available in either automix syringe or capsule.

