The first direct posterior composite to achieve less than 1% shrinkage.

The new record: <1% volumetric shrinkage!*
Setting a new standard for the future of composites.

Significant improvements in strength, wear-resistance, color and bonding have been made since dental composite resins were introduced. But the issue of volumetric shrinkage and its affect on marginal integrity has largely gone unresolved.

Any time you restore a patient’s tooth, you strive to achieve a “perfect margin” – a smooth connection between the tooth structure and restoration without interruptions or gaps. Even if your technique is perfect, the chemical response of the composite material you use is out of your control.

Because all composites shrink, achieving lasting marginal integrity has been a challenge – until now. 3M ESPE has gone back to the laboratory, working from the ground up to deliver a brand new solution.

Ten years in the making, Filtek™ Silorane Low Shrink Posterior Restorative is based on 3M ESPE’s latest product innovation: silorane chemistry. This scientific breakthrough is the long-awaited solution that combines lowest volumetric shrinkage with biocompatibility. The silorane-based composite works with a dedicated self-etch adhesive.

Why attaining an excellent margin is so important.

To illustrate why this product chemistry breakthrough is so important, we need to examine the clinical symptoms associated with volumetric shrinkage, polymerization stress and marginal gaps. Then we’ll show how Filtek Silorane restorative, along with the dedicated 3M ESPE Silorane System Adhesive Self-Etch Primer and Bond, work together to alleviate the problems.
Finally, a posterior composite that shrinks less than 1 %

When a composite is closer to “no shrink” than “low shrink” … it deserves to be called a breakthrough!

Since 1950, the main strategy to reduce shrinkage has been to increase the filler load. However, shrinkage is an intrinsic property of the resin matrix. To date, no methacrylate-based chemistry has been developed to solve the shrinkage problem.

Now, by changing the resin matrix, 3M ESPE has solved the problem with an innovative new ring-opening chemistry called “silorane”.

![Silorane – Volumetric Shrinkage <1%](image)

![Methacrylate – Volumetric Shrinkage](image)

As silorane-based composite polymerizes, “ring-opening” monomers connect by opening, flattening and EXTENDING toward each other. The result is significantly less volumetric shrinkage compared to methacrylate-based composites.

As methacrylate-based composites cure, the molecules of these “linear monomers” connect by actually SHIFTING closer together in a linear response. The result is a loss of volume.

Revolutionary “ring-opening” Silorane chemistry has resulted in the FIRST composite to shrink less than 1 %!

Silorane chemistry is the basis for a new composite category breakthrough: Filtek™ Silorane Low Shrink Posterior Restorative. The illustration (below) demonstrates how the new silorane-based composite works at the molecular level to reduce shrinkage dramatically, compared to methacrylate-based composites.
Lowest shrinkage to minimize polymerization stress

Polymerization shrinkage builds up forces that challenge the composite/adhesive interface and deforms the tooth. Lowering this “polymerization stress” reduces cusp displacement and helps to decrease the risk of enamel fractures and post-operative sensitivity. It also reduces risk of marginal gap formation and leakage.

Graph shows polymerization stress in correlation to the volumetric shrinkage, proving Filtek™ Silorane Low Shrink Posterior Restorative shrinks less and results in less polymerization stress. (Stress method: Bioman; shrinkage method: bonded-disc method.)

Source: University of Manchester

Finite element analysis images show how Filtek Silorane restorative helps to minimize problems caused by polymerization stress.

Note that the silorane restoration shows an absence of “gray” high-stress areas where enamel cracks and leakage in the margin can occur.

Source: University of Minnesota

Reduced tooth deformation is evidence of reduced polymerization stress.

In a study comparing Filtek Silorane restorative to four methacrylate-based composites, Filtek Silorane restorative showed the lowest cusp displacement in an MOD cavity.
The Filtek™ Silorane Restorative System is a key to excellent margins

Silorane System Adhesive Self-Etch Primer and Bond: A dedicated system adhesive for excellent bond strength.

3M ESPE Silorane System Adhesive Self-Etch Primer and Bond is an easy to use two-vial system that offers excellent bond strength to enamel and dentin, and provides the basis for low risk of post-operative sensitivity you expect from a self-etch system. Silorane System Adhesive Self-Etch Primer and Bond is a 6th generation two-step self-etching bonding system. It is the one and only adhesive formulated to ensure optimal bonding of the Filtek™ Silorane Low Shrink Posterior Restorative.

**NOTE:** It is not designed to work with other composites.

Low polymerization stress and excellent bond strength: the base of your clinical success.

Achieving the ideal margin begins with the right chemistry. After 10 years in development, 3M ESPE introduces the Filtek Silorane Low Shrink Posterior Restorative System. This extraordinarily low-shrinking composite and optimal adhesive are formulated to work together for great clinical outcomes with:

- excellent marginal integrity
- reduced marginal gaps and microleakage
- reduced risk of marginal staining
- reduced risk of secondary caries
- reduced cusp deflection
- reduced risk of stress-induced enamel fracture
- reduced risk of post-operative sensitivity

Studies show the Filtek™ Silorane Restorative System provides better marginal integrity in mixed MOD restorations before and after chewing simulation as compared to leading methacrylate systems. [SEM analysis]

Source: 3M ESPE internal data

Conventional composite: adhesive and shrinkage forces work in strong opposition.

The Filtek™ Silorane Restorative System showed significantly higher shear bond strength values after thermocycling as compared to a leading methacrylate system.

Source: University of Zurich
Finally, everything you want in a posterior restorative.

You’ll like the way it handles.

One thing you’ll notice from the first time you use Filtek™ Silorane Low Shrink Posterior Restorative, is how easy it handles.

- Impressive nonstick qualities
- Very good initial adaptation of restorative to bond film allows for an easy placement of the first increment
- Excellent operatory light stability gives you up to 9 minutes working time for shaping the filling and restoring the tooth to its natural function
- There’s no slumping – the filling holds its shape
- Fast and easy to polish
- Available in the delivery you prefer: capsule or syringe

Graph shows excellent ambient light stability of Filtek™ Silorane Restorative, giving dentists up to 9 minutes to place and shape the restoration under full operatory light illumination.

Source: 3M ESPE internal data

You’ll like the way it looks.

The emphasis today is on not just repairing teeth, but on restoring teeth to their natural beauty. This superb, low-shrinking composite comes in popular shades that easily blend with surrounding teeth.

- Available in 4 popular shades: A2, A3, B2, C2
- Holds its shape so you can create beautifully shaped, natural-looking restorations
- Good polishability
- Exceptional low water uptake and substantially decreased exogenic staining
- Exhibits a lower bacterial adhesion rate compared to many leading composites tested.

Source: University of Regensburg

You’ll like the way it lasts.

When you select a composite for the posterior region, you want assurance it can stand up to flexural forces during chewing. Filtek Silorane Restorative is strong and durable to protect the filling from fractures, and to stabilize the tooth at the same time.

- Proven to have excellent compressive strength for stress-bearing restorations
- High flexural strength protects the tooth from fractures and stabilizes it at the same time
- Wear resistant – ACTA test data on file
- Clinically proven strength and durability
It’s easy to use the Filtek™ Silorane Posterior Restorative System

Here is a step-by-step guide on how to create a Filtek Silorane restoration.

The procedure for using the low-shrinking Filtek Silorane composite and Silorane System Adhesive is much like the one you use with your current composite system. To achieve optimal strength of the Filtek Silorane system, it is important to light cure both the self-etch Primer and the Silorane System Adhesive Bond.

Select from four shades: A2, A3, B2, C2. A chameleon effect makes it easy to match composite shade to tooth enamel.

A load-bearing posterior composite filling has to be replaced. Marginal loss and leakage have led to secondary caries.

Light cure for 10 sec after drying with oil-free air.

A strong and durable Filtek™ Silorane filling restored the tooth to its natural function. Natural-looking esthetics were achieved with an easy single-shade technique.

In any restoration, using proper technique is important. But ultimately, the clinical outcome depends equally on your choice of product. The new chemistry breakthrough of Filtek Silorane Posterior Restorative System makes it your best choice for durable posterior restorations and long-term patient satisfaction.
Filtek™ Silorane Posterior Restorative System offers significant advantages.

- The first composite to shrink less than 1%
- Strong and durable
- Low water sorption for substantially decreased exogenic staining
- Radiopaque
- Available in 4 shades: A2, A3, B2, C2 (capsule or syringe)
- Up to 9 minutes operatory light stability
- Easy to handle; nonsticky; excellent ability to hold shape
- Dedicated self-etch adhesive with excellent bond strength
- Excellent marginal integrity

### Ordering Information

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<th>Item No.</th>
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<td>Filtek™ Silorane Low Shrink Posterior Restorative Capsule Intro Kit</td>
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<td>Filtek™ Silorane Low Shrink Posterior Restorative Syringe Intro Kit</td>
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