Indirect Restorative Materials

A Simple Guide to Choosing the Right Cement for Every Indication

Sponsored by 3M ESPE
Composite Resin Cements

Today's dental cements can be traced back to the mid 1850s. While inventors in those days were limited by the available materials and a very small body of data, today's materials engineers have access to vastly improved resources. For dentists, this has resulted in vastly improved cements.

The most commonly used dental cements today can be classified by their chemical compositions into three groups:

**Conventional Cements**
- Zinc phosphate cements
- Polycarboxylate cements
- Glass ionomer cements

**Hybrid Cements**
- Resin-modified glass ionomer (RMGI) cements
- Compomer cements

**Composite Resin Cements**
- Adhesive resin cements
- Self-adhesive resin cements

While each class of cement has its advantages, dentists must carefully consider what type is most suitable for each individual case, depending on the material and substrate(s) being bonded. Successful cements are easy to use, and should excel in adhesion, mechanical properties, long-term stability, esthetics and biocompatibility.

This eBook will provide an overview of 3M ESPE's state-of-the-art RMGI cement, adhesive resin cement, and self-adhesive resin cement.

These three varieties of cement give dentists tools for a broad range of indications, and also provide the convenience and exceptional performance to bring users peak productivity as well as peace of mind.
The Right Cement for Each Indication

In the past, adhesive resin cements were significantly more technique sensitive than self-adhesive resin cements, but today’s materials have narrowed this gap.

Resin cements are available in both adhesive and self-adhesive formulas.

- An adhesive resin cement requires pretreatment of the tooth surface with a separate dental adhesive.
- A self-adhesive resin cement does not require application of a separate adhesive. It is formulated to dispense in an acidic state in order to etch and penetrate into the tooth on its own, and then reaches a neutral pH after curing.

In the past, adhesive resin cements were significantly more technique sensitive than self-adhesive resin cements, but today’s materials have narrowed this gap.

These advancements allow dentists to choose their cement based on the indication and their desired bond strength, instead of fearing that a technique misstep will compromise the restoration.
IN-DEPTH

3M ESPE RelyX Ultimate Adhesive Resin Cement

Industry-leading bond strength with fewer components

Composition

RelyX Ultimate cement is a dual cure, adhesive resin cement developed with the specific needs of glass ceramic cementation in mind. It was designed for optimal performance when combined with 3M™ ESPE™ Scotchbond™ Universal Adhesive, and has an integrated dark cure activator for Scotchbond Universal adhesive that eliminates the need for a separate activator.*

Benefits At a Glance

- Ultimate bond strength
- Fewer components (eliminates the need for up to 4 separate bottles)
- Can be used in self-etch, selective-etch or total-etch approach
- Dual-cure with integrated dark-cure activator for Scotchbond Universal adhesive
- High esthetics and tooth-like fluorescence
- Moisture tolerance for challenging clinical situations

Base Paste

- Methacrylate monomers
- Radiopaque, silanated fillers
- Initiator components
- Stabilizers
- Rheological additives

Catalyst Paste

- Methacrylate monomers
- Radiopaque alkaline (basic) fillers
- Stabilizers
- Pigments
- Rheological additives
- Fluorescence dye
- Dark cure activator for Scotchbond Universal

* Scotchbond Universal Adhesive is a one-component dental adhesive designed to cover all techniques and all indications. It can be used in a self-etch mode, selective-enamel-etch mode or in a total-etch mode for both direct and indirect dental restorative procedures.

The material also functions as a metal and zirconia primer, as well as a silane. This innovative adhesive eliminates much of the technique sensitivity that has been associated with adhesive resin cements in the past.
In the images shown, Dr. Jeff Blank of Fort Mill, S.C., uses RelyX Ultimate cement with Scotchbond Universal adhesive in the total etch mode to place veneers for a patient with severe wear.

“I use RelyX Ultimate, most notably, because it is compatible with any indirect indication. A primary consideration for any cement is its bond strength, and RelyX Ultimate cement performs very well in this area, with strong test data on its adhesion bond to both dentin and enamel.”

–Dr. Jeff Blank

CASE HIGHLIGHT

Indications

Ideal for CAD/CAM and glass ceramics

- Final cementation of all-ceramic, composite or metal inlays, onlays, crowns and bridges; 2 – 3-unit Maryland bridges and 3-unit inlay/onlay bridges*
- Final cementation of all-ceramic or composite veneers
- Final cementation of all-ceramic, composite, or metal restorations to implant abutments
- Final cementation of posts and screws

* Excluded for patients with bruxism or periodontitis.
IN-DEPTH

3M ESPE RelyX Unicem 2
Self-Adhesive Resin Cement
The All-Rounder—Simplicity Powered by Performance

Composition

Representing the next generation of self-adhesive resin cements, RelyX Unicem 2 cement is based on the same chemistry as RelyX™ Unicem Self-Adhesive Resin Cement—the most clinically proven self-adhesive resin cement worldwide.

The improved formulation of RelyX Unicem 2 remains closely related to its predecessor, while offering even more convenience with an automix delivery system. An additional monomer and a new rheology modifier were added to this generation, and the processing of filler particles was optimized. These improvements make the new cement function smoothly with its syringe delivery, and display increased mechanical properties and excellent overall adhesion performance.

As with the first generation cement, the need for any pre-treatment of the tooth is eliminated. The combination of proven technology with innovative features makes RelyX Unicem 2 cement a convenient and powerful material.

Benefits at a Glance

Simplicity
- Easy to use delivery system
- Self-adhesive
- Dual-cure
- Moisture-tolerant
- Very easy removal of excess

Performance
- The most clinically proven self-adhesive resin cement
- Very high bond strength on all substrates
- Low post-operative sensitivity
- Excellent mechanical properties
- Excellent color stability
- Long-term stability

Indications
- All-ceramic, composite or metal inlays, onlays, crowns and bridges
- Posts and screws
- All-ceramic, composite or metal restorations to implant abutments
- 2- or 3-unit Maryland bridges and 3-unit inlay/onlay bridges*

* The high adhesive bond strength of RelyX Unicem 2 Automix cement allows for reliable and comfortable cementation of Maryland and inlay/onlay bridges. For these indications, an additional enamel etching step is required to increase the available surface area for bonding.
In this case, Dr. Michael Colleran of San Luis Obispo, Calif., uses RelyX Unicem 2 cement with an endo tip on the automix dispenser to apply the cement deep into the root canal prior to placement of a fiber post.

The case is finished with 3M™ ESP™ Filtek™ Supreme Ultra Universal Restorative.

“The clinical performance of the cement lets dentists be confident in its strength.”

— Dr. Michael Colleran
Resin-Modified Glass Ionomer Cements

Resin-modified glass ionomer (RMGI) cements are helpful materials in cases where it is hard to control moisture during placement, or when the clinician would like the added benefits of sustained fluoride release.

While they offer lower strength than resin cements, their adhesion is typically adequate for most metal-based or strengthened-ceramic restorations. They are also lower in cost than resin cements.

Their fluoride release has made these cements a practitioner favorite for use with caries-prone patients.
IN-DEPTH

3M ESPE RelyX™ Luting Plus Cement

Reliable Performance with Fluoride Release

Composition

3M™ ESPE™ RelyX™ Luting Plus Cement is a self-curing, radiopaque, fluoride-releasing RMGI luting cement.

This cement provides for molecular bonding to the tooth surface without the use of a separate tooth conditioner. It also offers good strength properties, fluoride ion release and low solubility or acid erosion of the margins in an easy to use, non-technique sensitive procedure.

RelyX Luting Plus cement is the first RMGI that gives dentists a tack light cure option, allowing them to shorten cleanup to just seconds.

The cement is composed of two separate pastes dispensed out of the Clicker™ Dispenser in a 1:1 volume ratio. The RelyX Luting Plus cement Paste A is composed of a radiopaque fluoroaluminosilicate glass (FAS glass), opacifying agent, HEMA, water, a proprietary reducing agent that allows for the self-cure methacrylate setting, and a dispersion aid. The RelyX Luting Plus cement Paste B is composed of a non-reactive zirconia silica filler, the methacrylated polycarboxylic acid, HEMA, BisGMA, water and potassium persulfate.

<table>
<thead>
<tr>
<th>Paste A</th>
<th>Paste B</th>
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<tbody>
<tr>
<td>• Fluoroaluminosilicate (FAS) glass</td>
<td>• Methacrylated polycarboxylic acid</td>
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<td>• Proprietary reducing agent</td>
<td>• BisGMA</td>
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<td>• HEMA</td>
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<td>• Water</td>
<td>• Water</td>
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<tr>
<td>• Opacifying agent</td>
<td>• Potassium persulfate</td>
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Paste A paste B

Composition table
A Simple Guide to Choosing the Right Cement for Every Indication

IN-DEPTH

3M ESPE RelyX™ Luting Plus Cement

Benefits at a Glance

- The first RMGI cement with a tack light cure option that shortens cleanup to seconds
- Sustained fluoride release
- Virtually no post-operative sensitivity
- Convenient paste-paste delivery system
- Long history of proven bond strength
- Moisture tolerant
- Ideal for everyday use such as PFM, zirconia, metal and pediatric crowns

Indications

The PFM and Pediatric Crown Cement

- Porcelain-fused-to-metal (PFM) crowns and bridges
- Metal crowns, inlays and onlays
- All-alumina or all-zirconia strengthened core ceramic restorations (such as Lava™ Zirconia or Procera® AllCeram)
- Orthodontic bands
- Final cementation of PFM, metal crowns, all-alumina or all-zirconia strengthened core ceramic restorations to implant abutments

About Veneers

The Veneer Cement: 3M ESPE RelyX™ Veneer Cement

Veneers place their own unique demands on a cement, requiring outstanding esthetics.

- Customer-preferred shading system
- Extremely color stable
- Matching try-in pastes
- Light-cure formula
- Easy handling and clean-up
A Simple Guide to Choosing the Right Cement for Every Indication

FOR EACH INDICATION – THE IDEAL CEMENT

Dr. Christopher Ramsey, Jupiter, Fla.

“Adding the photoinitiator was huge. To be able to tack cure excess cement, peel it off and let the rest self cure underneath the restoration is huge. RelyX Luting Plus cement... has been around a very long time; it has a proven track record; there’s fluoride release—all the things that make glass ionomer cement great. There’s nothing I’d rather use when I’ve got something that has a core—it’s just too easy and too predictable to pass up.”
Cementation Solutions

For each indication – the ideal cement

For more information, click here to visit 3MESPE.com/RelyX