One universal system,

Introducing G-CEM LinkForce™

Now you can secure all your indirect restorations with one aesthetic resin cement solution.

- Universal indications
- Uncompromising strength and adhesion
- Fast and easy application
- Aesthetic and durable margins
- Consistent quality and performance
three strong links

**LINK 1**
G-Multi PRIMER

**LINK 2**
G-Premio BOND

**LINK 3**
G-CEM LinkForce™
**LINK 1: G-Multi PRIMER**

**One primer for all substrates**
G-Multi Primer uses three different chemical bonding agents to ensure perfect adhesion in all situations to all substrates. By adding silane to the primer (and not to the dentine adhesive), stability of adhesion is assured.

**Strong chemical bonding to all substrates**

![Shear Bond Strength Graph](image)

- **Silane**: Adhesion to glass ceramics, hybrid ceramics and composites
- **MDP**: Adhesion to zirconia, alumina and non-precious metals
- **MDTP**: Adhesion to precious metals

**Simple application**
- Apply and air dry, no waiting
- Same procedure for all substrates, no confusion

**Stabilised formulation**
- No refrigeration
- 2-year shelf life

**Measuring chemical bonding capabilities**
The chemical bonding capabilities of G-Multi PRIMER are measured by testing adhesion to highly polished substrate surfaces without using mechanical retention. This chemical bonding potential is achieved in addition to the micro-mechanical adhesion provided by prior surface treatment e.g. AlO₂ sandblasting.

Adhesion durability is best achieved with a combination of chemical bonding and micro-mechanical retention.

**MDP**: 10-methacryloyloxydecyl dihydrogen phosphate
**MDTP**: 10-methacryloyloxydecyl dihydrogen thiophosphate
Case study

CERASMART™ hybrid ceramic bonded with G-CEM LinkForce™. Dr Anthony Mak.

LINK 1: G-Multi PRIMER to the prepared indirect restoration

After trial fit, the CERASMART™ onlay is cleaned
Pre-treat with 5% HF (Hydrofluoric acid) for 60 secs
Clean with water and dry
Brush apply a thin layer of G-Multi PRIMER to create a durable chemical bond. Dry with an air syringe

One universal system

Strong, reliable and consistent

G-CEM LinkForce™ is a universal resin cement solution built on three strong links that ensure uncompromising, consistent and reliable adhesion.

This interface is shown in the adjacent SEM picture of CERASMART™ hybrid ceramic treated with G-Multi PRIMER (A), bonded to dentine (D) using G-Premio BOND (C) and G-CEM LinkForce™ (B).
LINK 2: G-Premio BOND

A premium chemical bonding formulation

Featuring three functional monomers in a proven formulation, G-Premio BOND delivers a no-compromise adhesive performance to all prepared tooth surfaces including liners and composite or metal cores.

Convenient application
- Suitable for all etching techniques
- Visible when applied, invisible after curing

Fluid consistency
- Exceptional wetting characteristics
- Rapid chemical bonding
- Quick and easy application

Stronger bond layer
- High-density, single-dispersion nanofiller
- HEMA-free to resist breakdown and discolouration
- Low 3μm film thickness

Optional dual-cure mode
- When selecting dual-cure mode, mix DCA (Dual Cure Activator) with G-Premio BOND in a 1:1 ratio

Stabilised formulation
- No refrigeration
- 2-year shelf life
Case study
CERASMART™ hybrid ceramic bonded with G-CEM LinkForce™. Dr Anthony Mak.

LINK 2: G-Premio BOND applied to the prepared tooth

Selective etch of enamel, rinse and dry

Dual-cure mode was selected. 1 drop each of G-Premio BOND and Dual Cure Activator were dispensed and mixed

The mixed bond was applied to the prepared enamel, dentine and composite liner and left for 20 secs

The surface was then dried with maximum air pressure for 5 secs to remove all water from the bond layer

Light-cure mode

A quick and convenient option is to simply apply G-Premio BOND and light-cure.

This immediately seals the dentine, and the low film thickness of just 3μm ensures that there is no risk of the bond thickness compromising fit.

Apply G-Premio BOND. Wait 10 secs

Dry with MAXIMUM AIR PRESSURE for 5 secs

Light-cure for 10 secs
**LINK 3: G-CEM LinkForce™**

**Class-leading strength and aesthetics**

G-CEM LinkForce™ provides durable retention and long term margin aesthetics through enhanced dual-cure polymerisation systems and incorporation of high-density, single-dispersion glass filler technology.

![G-CEM LinkForce™](image1)

![Product A](image2)

![Product B](image3)

![Product C](image4)

**Very low film thickness**

- Just 4μm
- Guaranteed adaptation

![Film Thickness](chart1)

**Consistent handling and clean up**

The extruded excess G-CEM LinkForce™ has minimal slump, so after 1-2 secs tack-curing, excess cement is simple to remove, breaking cleanly from the margins.

![Consistent handling](image5)

**High strength and wear resistance**

- High-density, single-dispersion glass fillers
- Excellent polish
- Less chance of plaque retention

![High strength](chart2)

Dr Yoshikazu Kawamoto

R&D Dept.
GC Corporation
Case study

CERASMART™ hybrid ceramic bonded with G-CEM LinkForce™. Dr Anthony Mak.

LINK 3: G-CEM LinkForce™

G-CEM LinkForce™ is applied to the internal surface of the CERASMART™ onlay.

After seating, light-cure for 1–2 secs. Excess is removed.

Apply air barrier (optional) and light-cure all surfaces.

CERASMART™ onlay bonded with G-CEM LinkForce™.

Consistency in aesthetics

Available in a range of 4 shades, with tooth-like fluorescence, convenient automix delivery and matching Try-In Pastes. When bonding veneers, or for more aesthetically demanding applications, there is a clear path to follow for shade checking and achieving predictable aesthetic outcomes.

- **Translucent** (clear translucent): Perfect for very thin restorations to preserve the original shade.
- **A2** (A2 translucent): The standard for luting most of your prostheses.
- **Opaque** (universal opaque): Used to mask discoloured substrates when needed.
- **Bleach** (bleach opaque): Adapted for ultra-white restorations to increase opacity and value.
Clinical case

Lithium disilicate crown bonded with G-CEM LinkForce™.
Dr Graeme Milicich.

This is a good clinical case to highlight the effectiveness of G-CEM LinkForce™. When considering preparation design, there would have been difficulty gaining sufficient retention for a ferrule retained, cemented crown due to the loss of the palatal cusp. A more effective alternative is to create a fully-bonded ceramic restoration using a strong resin adhesive cement solution. This means a core does not need to be created because the ceramic is bonded directly to the tooth, instead of bonding a composite core to the dentine.

1. A patient presented with a fractured palatal cusp on tooth 15

2. An old, very deep amalgam restoration, but the tooth is vital

3. Removal of the old amalgam revealed the buccal cusp fracture

4. The underlying dentine was stained, but firm and non-carious

5. A hybrid veneer/onlay preparation was cut, then scanned and milled out of MT lithium disilicate

6. After try in, the restoration was cleaned, hydrofluoric acid etched and silane treated with G-Multi PRIMER

7. The thin buccal veneer type preparation is visible below the plane of the buccal cusp fracture
8. Isolation was managed with retraction cord and Isolite®, prior to air-abrasion to remove all surface smear layer and contaminants.

9. Note the clean matt surface following low pressure air abrasion using 27micron powder at 40psi.

10. Selective enamel etching, followed by application of G-Premio BOND mixed with Dual Cure Activator.

11. G-CEM LinkForce™ is applied into the silanated restoration and seated. Excess cement wiped off and the restoration was spot-cured.

12. G-CEM LinkForce™ goes through a gel phase that makes initial clean up easy and predictable. This can be accelerated with a 2 secs light exposure.

13. The completed adhesively bonded MT lithium disilicate restoration.

14. The G-CEM LinkForce™ cement is clearly identifiable in radiographs.

15. One week post placement.

16. One week post placement.

* Isolite is not a trademark of GC Corporation.
Q & A

Do GC make their own MDP?
Yes we do. We are on our 3rd generation of MDP as we constantly improve and refine our functional monomers.

How does the silane in G-Multi PRIMER remain stable and active for 2 years without requiring refrigeration?
The wide functionality and overall stability of G-Multi PRIMER is a key development from our R&D team. Unfortunately this formulation detail is proprietary and is not able to be disclosed.

Will G-Premio BOND adhere to any core substrate?
Yes it will. Whether glass ionomer cement, composite or metal. This is due to the effectiveness of the three functional monomers; 4MET, MDP and MDTP.

Can we use G-Premio BOND with the Immediate Dentine Sealing technique?
Yes. Whilst we don’t specifically endorse this technique, our laboratory testing of Immediate Dentine Sealing procedures with G-Premio BOND and G-CEM LinkForce™ showed effective adhesion and no reduction in bond strengths.

What is the working time of mixed G-Premio BOND (GPB) + Dual Cure Activator (DCA)?
Working time is 2-3 mins after mixing.

Why is application time (20 secs) longer for mixed GPB+DCA compared to application time (10 secs) for G-Premio BOND when used alone?
Application time is longer because, when mixed with DCA, there is dilution of the acid level, thus the strength of etching effect is reduced and application needs to be longer.

How many cement applications are available from a syringe of G-CEM LinkForce™?
Up to 20 applications.

What are the storage recommendations for G-CEM LinkForce™?
The G-CEM LinkForce™ cement should be stored in the refrigerator. G-Multi PRIMER, G-Premio BOND, Dual Cure Activator and Try-In Pastes can be stored at room temperature or refrigerated.

There is a high focus on ensuring a strong dual-cure setting reaction within the G-CEM LinkForce™ cement. Why is this so important?
Firstly, this is because we want maximum physical properties for any clinical situation, whether for post cementation, for bonding a Maryland bridge or securing a zirconia crown. The other key reason comes from research on light penetration through ceramics of 2mm thickness, which clearly identifies the significant reduction in light intensity that reaches the cement.
Without a strong dark cure reaction, this lack of light initiation will result in a reduction in cement adhesion and increased wear and discolouration of the cement over time. Hence the strong dark cure reaction of G-CEM LinkForce™ is important.

Source: Pereira et al., Sao Paulo University, Brazil
# A guide to pre-treatment technique

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Pre-treatment at lab or chairside</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
<th>Step 6</th>
<th>Remark</th>
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<tbody>
<tr>
<td>Fedspathic ceramics, Leucite-reinforced ceramics</td>
<td>Etching at chairside</td>
<td>Try-in</td>
<td>Rinse thoroughly &amp; dry</td>
<td>Etch inner surface for 60 secs with 5% HF acid</td>
<td>Rinse &amp; dry</td>
<td>Clean with alcohol &amp; dry</td>
<td>G-Multi PRIMER Apply &amp; dry</td>
<td>Adhesion of G-Multi PRIMER through silane</td>
</tr>
<tr>
<td>Lithium disilicate</td>
<td>Etching at chairside</td>
<td>Try-in</td>
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<td>G-Multi PRIMER Apply &amp; dry</td>
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<tr>
<td>Zirconia Alumina</td>
<td>Sandblasting at chairside</td>
<td>Try-in</td>
<td>Rinse thoroughly &amp; dry</td>
<td>Sandblast</td>
<td>Rinse &amp; dry</td>
<td>New sandblasting or clean with Ivoclean*</td>
<td>G-Multi PRIMER Apply &amp; dry</td>
<td>Do not clean the Zr oxide surfaces with phosphoric acid. Adhesion of G-Multi PRIMER through MDP</td>
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<td></td>
<td>Already sandblasted by lab</td>
<td>Try-in</td>
<td>Rinse thoroughly &amp; dry</td>
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<td>New sandblasting or clean with Ivoclean*</td>
<td>G-Multi PRIMER Apply &amp; dry</td>
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<tr>
<td>Metal Composite Hybrid Ceramics</td>
<td>Sandblasting at chairside</td>
<td>Try-in</td>
<td>Rinse thoroughly &amp; dry</td>
<td>Sandblast**</td>
<td>Rinse &amp; dry</td>
<td>Clean with alcohol &amp; dry</td>
<td>G-Multi PRIMER Apply &amp; dry</td>
<td>Adhesion of G-Multi PRIMER through silane (to glass fillers), MDP (for non-precious metal, resins) and MDTP (for precious metal)</td>
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<td>Already sandblasted by lab</td>
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<td>Clean with alcohol &amp; dry</td>
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<tr>
<td>Fibre Post</td>
<td>At chairside</td>
<td>Try-in</td>
<td>Rinse thoroughly &amp; dry</td>
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<td>Clean with alcohol &amp; dry</td>
<td>G-Multi PRIMER Apply &amp; dry</td>
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* Ivoclean is not a trademark of GC Corporation

** in case of Hybrid Ceramics, acid etching with HF acid for 60 secs can also be used

HF: Hydrofluoric acid
When to cement?

A glass ionomer cement has the preferred characteristics for an ideal cementation material. The following clinical aspects will define your choice for the optimal CEMENTATION procedure:

- **Retentive Preparation**
- **Isolation not possible**
- **Moderate aesthetics needed**
- **Extra protection needed**

When to bond?

Bond with a resin cement when aesthetics are of the utmost importance or when extra adhesion is required.

- **Preparation is not retentive**
- **Isolation possible**
- **High aesthetics needed**
- **Extra adhesion needed**
# A guide to cement selection

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<th>Fuji I</th>
<th>Fuji PLUS</th>
<th>FujiCEM</th>
<th>G-CEM Capsule</th>
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<th>G-CEM LinkForce™</th>
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<td>Hybrid ceramics</td>
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<td>Crowns &amp; bridges</td>
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<td>Posts &amp; inlay-cores</td>
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<td>Metal Zirconia Fibre-reinforced</td>
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<td>Veneers</td>
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† If less than 2.0 mm thickness
**G-CEM LinkForce™ System Kit**

1 x G-CEM LinkForce™ A2 8.7g (5mL)
1 x G-CEM LinkForce™ Translucent 8.7g (5mL)
30 x GC Automix Tip Regular
5 x GC Automix Tip Endo
1 x G-Multi PRIMER (5mL)
1 x G-Premio BOND (5mL)
1 x G-Premio BOND DCA (3mL)
1 x GC ETCHANT 4.8g (3.6mL)
1 x G-CEM LinkForce™ Try-In Paste A2 1.5g (1.2mL)
1 x G-CEM LinkForce™ Try-In Paste Translucent 1.5g (1.2mL)
20 x Disposable dispensing dish
50 x Disposable applicator (fine)

**G-CEM LinkForce™ Starter Kit**

1 x G-CEM LinkForce™ A2 OR Translucent 8.7g (5mL)
20 x GC Automix Tip Regular
1 x G-Multi PRIMER (5mL)
1 x G-Premio BOND (5mL)

**Refills**

G-CEM LinkForce™ 8.7g (5mL)
(Translucent / A2 / Opaque / Bleach)
G-CEM LinkForce™ Try-In Paste 1.5g (1.2mL)
(Translucent / A2 / Opaque / Bleach)
G-Premio BOND, 5mL
G-Premio BOND DCA, 3mL
G-Multi-Primer, 5mL