

Selection Guide

TYPE OF LUTING CEMENT	Glass Ionomer	Resin-reinforced Glass Ionomer	Resin-reinforced Glass Ionomer
	GC Fuji I	GC Fuji CEM	GC Fuji PLUS
PREFERRED INDICATIONS			
Prosthetic appliances made out of metal	✓	✓	✓
Prosthetic appliances made out of resin		✓	✓
Crowns and Bridges made from reinforced ceramics			✓
Inlays made from conventional ceramics		✓	✓
FEATURES			
Conditioner	No	Optional	Yes
Radiopacity	Yes	Yes	Yes
High fluoride release	Yes	Yes	Yes
Film thickness (μ)	15	3	10
Adhesion	Good	High	Very High
Working time	P/L 2'00" Capsules 2'15"	3'00"	2'30"/3'30" for EWT 2'30"
Setting time	4'30"	5'15"	5'00" and 6'30" for EWT
Available shades	Light Yellow	Yellow	A3/Yellow/Translucent (only P/L)
Delivery form	Powder-Liquid 1-1 package: 35g powder, 20ml liquid, accessories Refill: Bottle of 35g powder Bottle of 20ml liquid. Capsules 50 capsules (mixed volume per capsule : 0.19ml) Option: GC Capsule Applier	Paste Pak Refill: 2x3.3gr (7.2ml) Paste Pak Cartridge, mixing pad Paste Pak Dispenser	Powder-Liquid 1-1 package: 15g powder, 8ml liquid, 6,5ml GC Fuji PLUS Conditioner, accessories Refill: Bottle of 15g powder Bottle of 8ml liquid. Bottle of 6,5ml GC Fuji PLUS Conditioner Capsules 50 capsules (mixed volume per capsule : 0.19ml) Option: GC Capsule Applier GC Fuji Plus EWT Refill: Bottle of 15g powder

For literature see www.gceurope.com

All times are measured from start of mix.
Test conditions: temperature (23±1°C) Relative humidity (50±10%).
ISO 9917:1991 (E) (Dental water based cements)

Which Permanent Luting Cement?



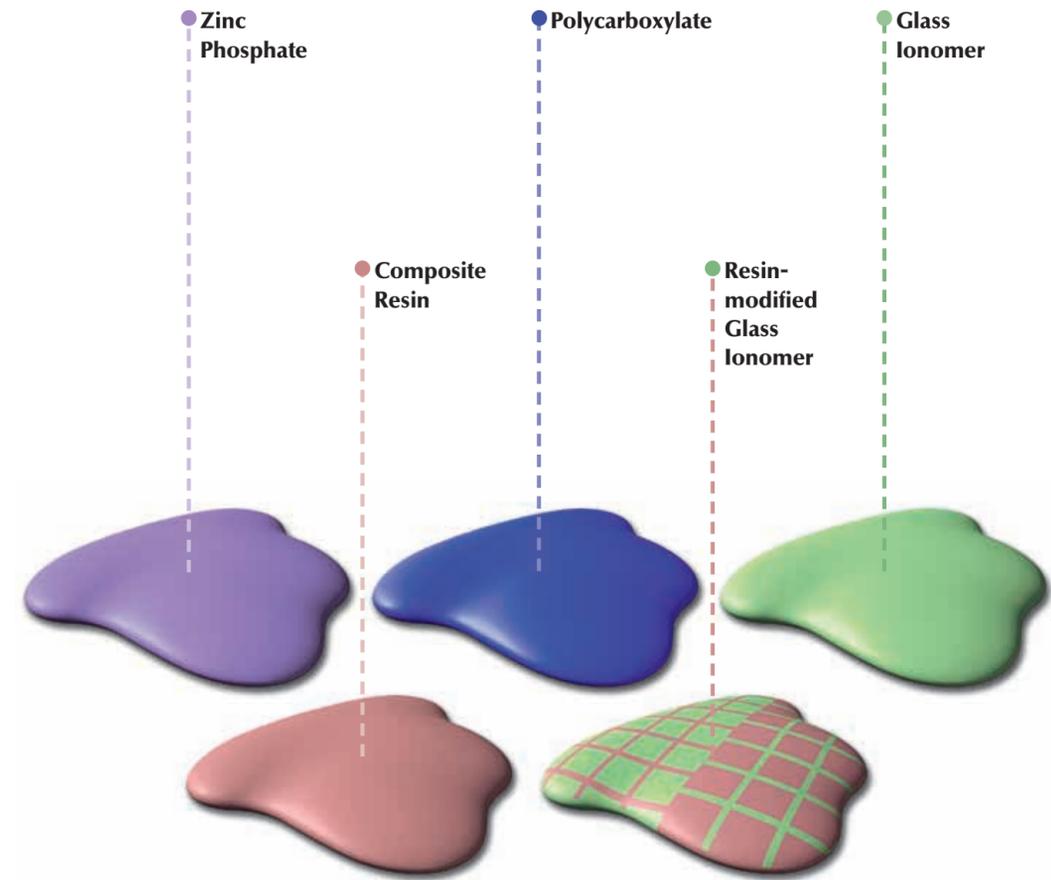
A guide to the selection and use of permanent luting cements from GC

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Which cement?

There are currently five types of permanent luting cement dentists regularly use in their daily practice

Products differ as to indications, performance, safety, protective ability, application technique, and cost. No single cement is ideal for every clinical situation.



Which cement you choose is important

The type of cement used can affect long-term outcome. It must be the right one for the clinical circumstance and the type and material of the restoration to be luted. It can also impact on practice profitability, particularly if used routinely, since luting cements differ in ease of use, time to use and accessories required eg. bonding agents.

GC Fuji CEM

Resin-modified Glass Ionomer Luting Cement

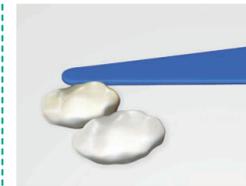
CLINICAL TECHNIQUE – Luting of a short span PFM bridge



Preparation of teeth
For pulp-capping use calcium hydroxide.



Loading the cartridge
Load cartridge into the Paste Pak Dispenser.



Mixing
Spread material out in a thin layer on the mixing pad using a plastic spatula. Mix with lapping strokes, for 10 seconds. For larger amounts (2/4 crowns) mix for 15 seconds. The working time is 3 minutes from the start of mixing at 23°C (73.4°F). Higher temperatures will shorten working time.



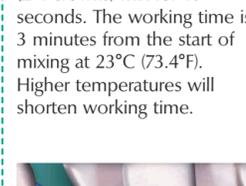
Removal of excess
Remove excess cement 1 minute 30 seconds after seating the restoration.



Cleaning
Clean with water and optionally apply GC Fuji PLUS CONDITIONER for 20 seconds.



Dispensing
Depress lever to dispense the required amounts of pastes onto the mixing pad. Cut off required amount



Protection
After finishing apply Fuji Coat LC or Fuji Varnish to protect the GIC during the first 24 hours.



Washing and drying
Dry by blotting or gently blowing with an air syringe. Do not desiccate the surface and do not remove the smear layer as this will affect the adhesion. Best results are obtained when the surface appears moist. Clean and dry inside of the bridge.



Application
Do not overfill and seat the restoration within 30 seconds of completing mixing. For inlays and onlays, apply only a thin layer of cement to the bonding surface. For porcelain inlays, pre-treat bonding surfaces with saline according to the manufacturer's instructions (eg. GC Ceramic Primer).



End result



Seating
Seat the restoration within 30 seconds of completing the mixing.

GC Fuji PLUS

Resin-modified Glass Ionomer Luting Cement

CLINICAL TECHNIQUE – Luting of a ceramic inlay



Preparation of tooth
For pulp-capping use calcium hydroxide.



Dispensing
Dispense 1 drop of liquid to 1 level small scoop of powder to achieve the standard powder to liquid ratio of 2.0g/1.0g. For bigger restorations 3 drops of liquid to 1 level large scoop of powder should be used. To vary working and setting times vary ratio of powder to liquid.



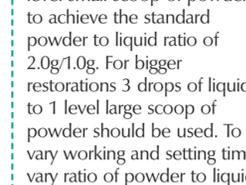
Activation
Tap the side of the capsule on a hard surface to loosen the powder. Press the plunger in on a hard surface.



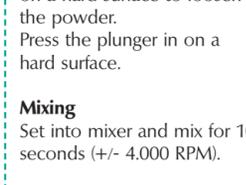
Seating
Seat the restoration within 30 seconds of completing mixing.



Cleaning
Clean with water and apply GC Fuji PLUS CONDITIONER for 20 seconds.



Mixing
Add all the powder to the liquid and mix rapidly for 20 seconds. For larger amounts e.g. bridge, divide powder into 2 equal parts. Mix the first portion with all of the liquid for 15 seconds. Incorporate the remaining portion and mix the whole thoroughly for 15-25 seconds (total 30-40 seconds). For more complex procedures requiring longer working time, it is recommended to mix powder and liquid on a cold mixing slab and/or use GC Fuji PLUS^{WT}.



Application
Place the capsule in the capsule applicator and apply the mixed cement to both restoration and prepared tooth.



Removal of excess
Remove excess cement at the first formation of gel stage. Total setting time is 4 minutes 30 seconds after start of mixing.



Washing and drying
Dry by blotting or gently blowing with an air syringe. Do not desiccate the surface and do not remove the smear layer as this will affect the adhesion. Best results are obtained when the surface appears moist. Clean and dry inside of restoration. For porcelain inlays and onlays, pre-treat bonding surfaces with saline according to manufacturer's (eg. GC Ceramic Primer) instructions



Application
Apply the mixed cement with the spatula to both restoration and prepared tooth.



Protection
After finishing apply Fuji Coat LC or Fuji Varnish to protect the GIC during the first 24 hours.

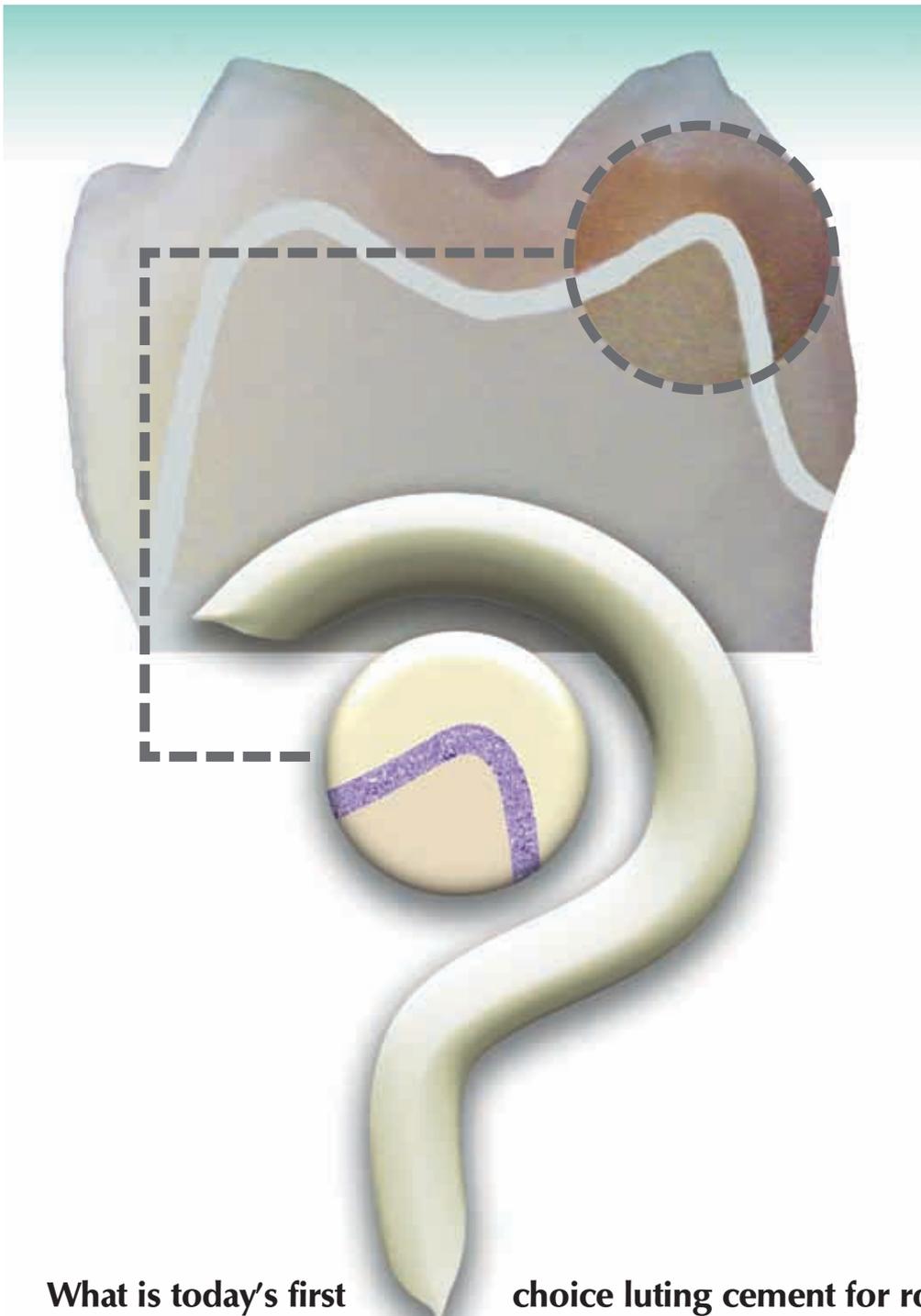


End result

A practical approach to selection is to have in mind a **FIRST CHOICE** permanent luting cement

In general, your first choice cement should be the best cement for your most frequent or routine procedures, and your most commonly used type of restoration and material - whether metal, resin or ceramic. Ideally, it should be as close as possible to 'multi-purpose'.

The cement must also be safe to use on patients, ideally have intrinsic long-term benefits and, most importantly for routine procedures, it should strike the right balance between performance and ease/cost in use. Only if your first choice is not suitable for a patient or procedure should you move on to other options.



Consider your most common types of procedure and restoration



METAL-BASED CROWN



METAL-BASED BRIDGE



CERAMIC INLAY



COMPOSITE CROWN



LONG SPAN BRIDGE

What is today's first choice luting cement for routine procedures?

What is today's first choice?

Zinc Phosphate

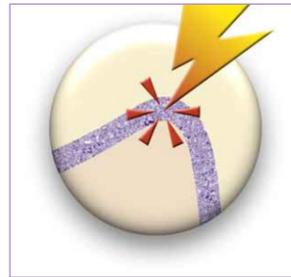
Superseded as first choice for routine luting?

Zinc Phosphate has been used for over a century for luting restorations involving metal and so it was the natural first choice against which the newer cements were measured. Even today, being familiar, cheap and relatively easy to use, it has remained some dentist's first choice.

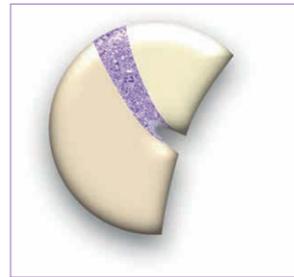
However, Zinc Phosphate cement does have certain weaknesses and inherent problems. Post-op sensitivity is possible as it can irritate pulp. It has no sealing properties, no therapeutic activity, high solubility in oral fluids and no translucency.

It is also not suitable for luting modern ceramic and composite materials. Last but not least, it has no intrinsic adhesion, relying solely on low to moderate mechanical retention. In this adhesive era, bonding strength is very important as it can help save tissue and enable luting even in cases where only minimal retention is available.

Quite simply, in many areas, Zinc Phosphate has been superseded in performance by all the new luting cements. Even for the most basic of procedures, the role of Zinc Phosphate as a first choice cement should be reconsidered.



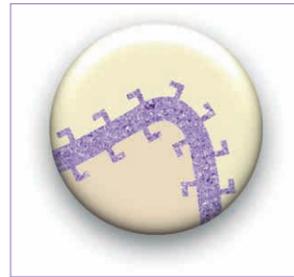
POTENTIAL SENSITIVITY



HIGH ORAL SOLUBILITY



NO SEALING ABILITY



ONLY MECHANICAL RETENTION



NO FLUORIDE RELEASE

Indicated for Metal Restorations only.

The role of Polycarboxylate?

Mention should also be made of another type of zinc oxide-based cement called Polycarboxylate. This cement chemically adheres to tooth structure and metals, and has a higher tensile strength than Zinc Phosphate with no post-op sensitivity. However, it is not as popular mainly because of its lower compressive strength and greater plastic deformation. If used, Polycarboxylate is best suited for luting single metal restorations in low stress areas and not long span prostheses.



LOW COMPRESSIVE STRENGTH



PLASTIC DEFORMATION

Composite Resin Cement

Excessive as first choice for routine luting?

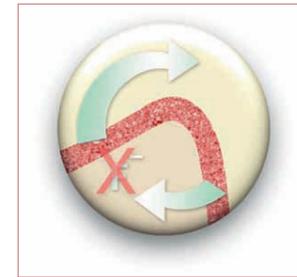
Composite Resin is the most used luting cement for aesthetic restoration with ceramics and composites. This is because if used correctly, they have the highest strength and bonding capability. They are also virtually insoluble in the mouth and are available in a wide range of shades and opacities.

But for routine luting these cements can give certain problems. Their correct use requires many technique sensitive steps and use of a multi-step bonding agent makes them very expensive. Viscosity or film thickness can be too large, increasing the risk of incomplete seating of the restoration. There is no relevant fluoride release and since moisture control is needed the risk of microleakage exists, possibly resulting in secondary caries.

Using Composite Resin other than as a possible first choice for aesthetic restorations could be considered excessive, even wasteful, particularly if non-aesthetic restorations are your norm.



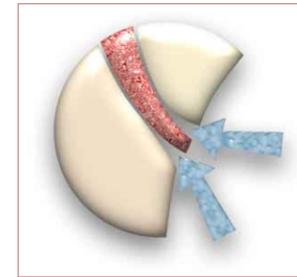
DIFFICULT TO USE



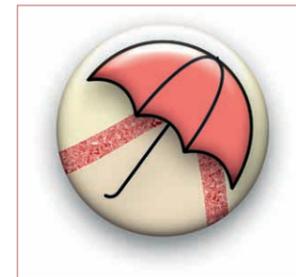
NO FLUORIDE RELEASE



COSTLY IN TIME AND MATERIALS



POOR SEALING ABILITY



MOISTURE CONTROL NEEDED

Indicated for Aesthetic Restorations only.



Conventional Glass Ionomer

Today's first choice for routine luting?



The Advantages

Intrinsic chemical adhesive to both tooth structure and metal. NO surface preparation or bonding agent is required.

High mechanical strength and low plastic deformation. It is sufficiently strong for most basic needs.

Good sealing ability helps minimise micro-leakage.

Inherent high release of fluoride.

Excellent radiopacity.

High resistance to oral solubility helping to maintain marginal seal.

GC Fuji I

GC's first glass ionomer luting cement, GC Fuji I, was introduced over 25 years ago, primarily for the luting of metals.

Advanced materials technology gives GC Fuji I many benefits over Zinc Phosphate and Polycarboxylate cements.

25 years of documented use has proven GC Fuji I to be safe and effective for many routine luting procedures.



GC Fuji I is indicated for luting metal-based restorations.

GC Fuji I B E N E F I T S



HIGH CHEMICAL ADHESION



HIGH BOND STRENGTH



GOOD SEALING ABILITY



HIGH FLUORIDE RELEASE



LOW SOLUBILITY



LOW PLASTIC DEFORMATION

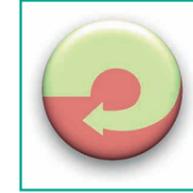
GC Fuji CEM B E N E F I T S



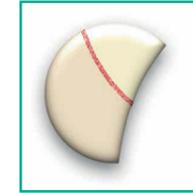
QUICK TO USE



EASY TO USE



EASY TO MIX



LOW FILM THICKNESS

GC Fuji CEM

To give the advantages of a glass ionomer and those of a resin, Resin-modified Glass Ionomer Cements were later introduced.

GC Fuji CEM is the first Resin-modified Glass Ionomer Cement in a PASTE formulation.

Specially developed SYSTEM designed to simplify and speed luting, whilst helping to ensure a perfect result every time.

Given its simplicity and timesaving benefits it's ideal for luting metal restorations and simple ceramic inlays, it has the same indications as GC Fuji I with many benefits, as well as higher physical properties.

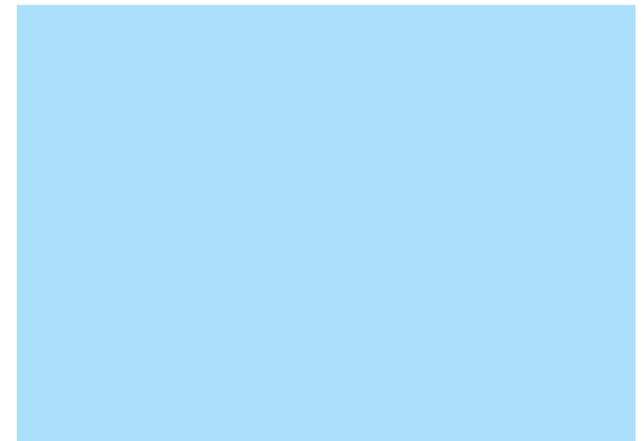
The paste comes in a cartridge that fits into a special dispenser to form a complete luting system, this gives many advantages.



GC Fuji CEM is the ideal cement for your most frequent luting procedures involving metal and simple ceramic inlays.

Resin-modified Glass Ionomer cement

Today's first choice for routine luting?



The Advantages

Greatly reduces the time to dispense.

Delivers just the right amount of material in their correct ratios, ensuring optimum workability and performance reducing material waste.

Easy to mix no air bubbles.

Low film thickness.



THE PASTEPAK DISPENSER DELIVERS THE TWO PASTES FROM THE PASTEPAK CARTRIDGE IN EXACTLY THE RIGHT RATIO.

Resin-modified Glass Ionomer cement

Today's first choice for routine luting?



GC Fuji PLUS^(EWT)

As a Resin-modified Glass Ionomer Cement, luting restorations with GC Fuji PLUS gives significant advantages over Zinc Phosphate, Polycarboxylate and Composite Resin Cement.

GC Fuji PLUS is multi-purpose, able to cement: Metal-based Restorations, Ceramic Inlays, all kinds of Acrylic/Resin Crowns, Inlays, Onlays and Bridges and Reinforced Ceramic Crowns and Bridges (eg, Procera™ (Nobel Biocare)).

GC Fuji PLUS^(EWT) has a longer working time and so is ideal for luting: Long-span bridges, combination work and luting several restorations in one step.



GC Fuji PLUS is indicated for all kinds of metal based, as well as most aesthetic restorations.

The Advantages

High retention and mechanical properties.

Hydrophilic properties eliminating the use of rubber dam.

No moisture sensitive bonding procedures and technique.

Great sealing ability to help minimise micro-leakage. Tighter marginal seal when used with GC Fuji PLUS Conditioner.

Thin film thickness for easy seating and improved fit.

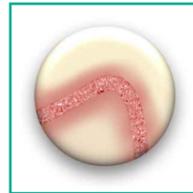
Very low solubility in oral fluids helps maintain margin.

Low risk of post-op sensitivity.

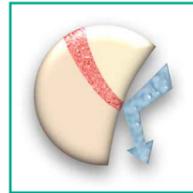
Continued high fluoride release.

GC Fuji PLUS^(EWT)

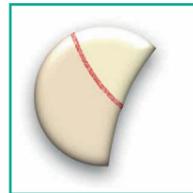
BENEFITS



HIGH CHEMICAL ADHESION



GOOD SEALING ABILITY



THIN FILM THICKNESS



VERY LOW ORAL SOLUBILITY



LOW RISK OF SENSITIVITY



HIGH FLUORIDE RELEASE

Which GC Luting Cement?



GC Fuji I

For basic routine luting of metals, the weight of documented evidence over 25 years has earned GC Fuji I its place as today's first choice.



GC Fuji CEM

For your most frequent luting procedures involving metal and simple ceramic inlays, the time-saving GC Fuji CEM system should be considered first choice.



GC Fuji PLUS

For outstanding performance, and wider use with aesthetic restorations, GC Fuji PLUS is first choice.



GC Fuji I

Glass Ionomer Luting Cement

CLINICAL TECHNIQUE – Luting of a PFM crown



Preparation of tooth

For pulp-capping use calcium hydroxide.



Washing and drying

Dry by blotting or gently blowing with an air syringe. Do not desiccate the surface and do not remove the smear layer as this will affect the adhesion. Best results are obtained when the surface appears moist. Clean and dry inside of restoration.

POWDER and LIQUID



Dispensing

Dispense 2 drops of liquid on to the mixing pad and add 1 level scoop of powder to achieve the standard powder to liquid ratio of 18/1.0g. To vary working and setting times vary ratio of powder to liquid.



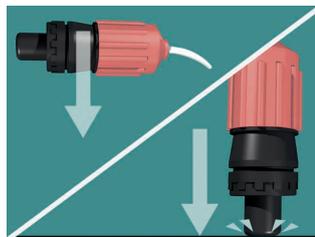
Mixing

Add all the powder to the liquid and mix rapidly for 20 seconds. For larger amounts, divide the powder into two equal parts. Mix the first portion with all of liquid for 5 seconds. Incorporate the remaining portion and mix the whole thoroughly for 15 seconds (total 20 seconds).

Application

Apply the mixed cement with the spatula to both restoration and prepared tooth.

CAPSULE



Activation

Tap the side of the capsule on a hard surface to loosen the powder. Press the plunger in on a hard surface.

Mixing

Set into mixer and mix for 10 seconds (+/- 4.000 RPM).



Application

Place the capsule in the capsule applicator and apply the mixed cement to both restoration and prepared tooth.



Seating

Seat the restoration within 30 seconds of completing mixing.



Removal of excess

Remove excess cement at the first formation of gel stage. Total setting time is 4 minutes 30 seconds after start of mixing.



Protection

After finishing apply Fuji Coat LC or Fuji Varnish to protect the GIC during the first 24 hours.



End result